

Dell PowerEdge C5220
Systems

Hardware Owner's Manual

Regulatory Model: B04S



Notes, Cautions, and Warnings



NOTE: A NOTE indicates important information that helps you make better use of your system.



CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Regulatory Model: B04S

2012-06 Rev. A02

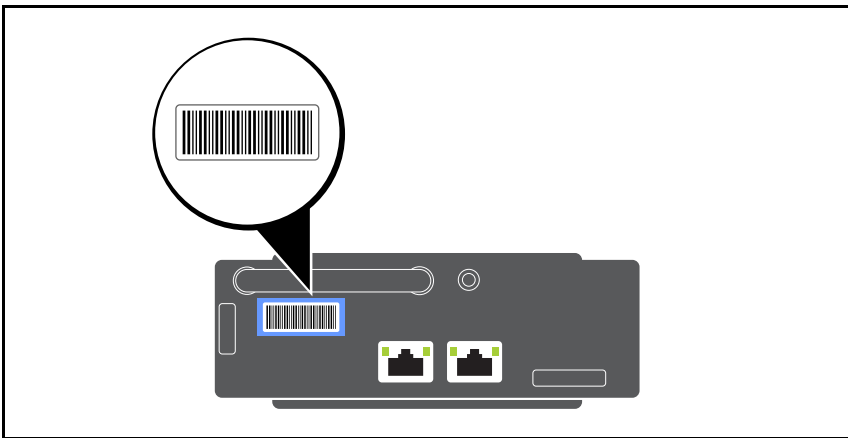
Important Information

- Your system must have BIOS version 2.0.1 or later to support Intel Xeon E3-1200 v2 series processors. You can download the latest version of the BIOS at support.dell.com.
- Your system must have the BMC version 1.13 or later to support Intel Xeon E3-1200 v2 series processors. You can download the latest version of the BMC firmware at support.dell.com.
- Your system must have the Backplane firmware version 1.0.9 or later to support Intel Xeon E3-1200 v2 series processors. You can download the latest version of the Backplane firmware at support.dell.com.



NOTE: PowerEdge C5220 systems with a service tag on the front panel support only Intel Xeon E3-1200 series.

Identifying Service Tag on the Front Panel of PowerEdge C5220 Systems.



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About Your System

The system includes the following configurations:

- 8-sled system board + 3.5-inch hard drive board + cables.
- 8-sled system board + 2.5-inch hard drive board + cables.
- 8-sled system board + mezzanine card + 3.5-inch hard drive board + cables.
- 8-sled system board + mezzanine card + 2.5-inch hard drive board + cables.
- 12-sled system board + 3.5-inch hard drive board + cables.
- 12-sled system board + 2.5-inch hard drive board + cables.



NOTE: Mixed SATA and SAS hard drives on the 2.5 and 3.5-inch hard drive board are not supported.

Front-Panel Features and Indicators

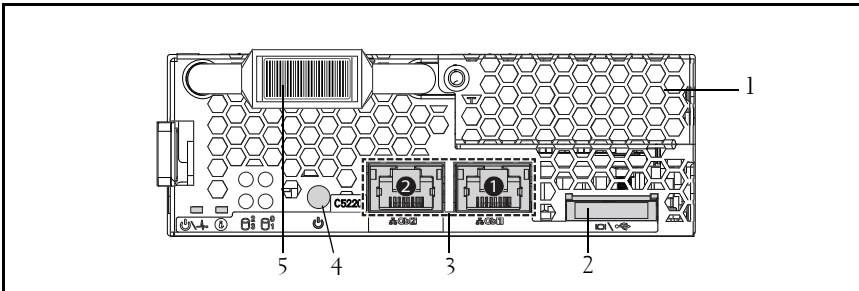
The Dell PowerEdge C5220 server is available in either a 12-sled or 8-sled, each supporting either two 3.5-inch or four 2.5-inch hard drives.

There are two sled SKUs available for the PowerEdge C5220 server, an eight sled SKU and a twelve sled SKU. For information on sled population, see "Sled Configuration" on page 61.

The following section provides information for the 8-sled, 12-sled, and mezzanine card options.

Features

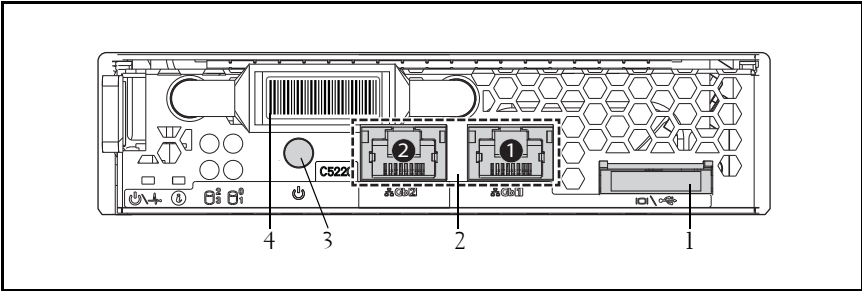
Figure 1-1. 8-Sled SKU Front Features (Rotated Counterclockwise 90°)



Item	Feature	Description
1	Mezzanine card cover	Cover for the Mezzanine card
2	VGA/USB connector	VGA/USB 2.0 connector
3	NIC LAN ports	10/100/1 Gb NIC LAN connector 1 10/100/1 Gb NIC LAN connector 2
4	Power button	On/Off button for sled
5	Service Tag	Identifying service tag

NOTE: PowerEdge C5220 systems with a service tag on the front panel support Intel Xeon E3-1200 series processors only.

Figure 1-2. 12-Sled SKU Front Features (Rotated Counterclockwise 90°)



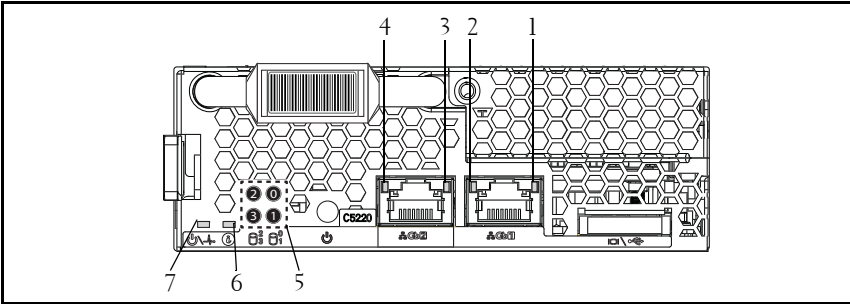
Item	Feature	Description
1	VGA/USB connector	VGA/USB 2.0 connector
2	NIC LAN ports	10/100/1G NIC LAN connector 1 10/100/1G NIC LAN connector 2
3	Power button	On/Off button for sled
4	Service Tag	Identifying service tag



NOTE: PowerEdge C5220 systems with a service tag on the front panel support Intel Xeon E3-1200 series processors only.

Indicators

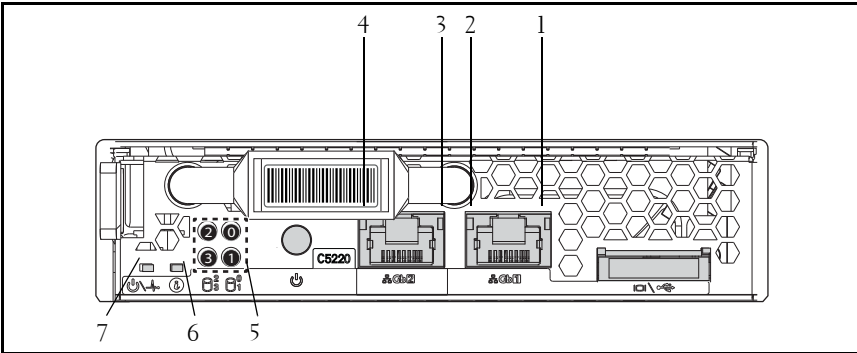
Figure 1-3. 8-Sled SKU Front Indicators (Rotated Counterclockwise 90°)



Item	Feature	Status	Description
1, 3	LAN link LED	Off	No link
2, 4	LAN activity LED	Off	No activity
	LAN link LED	Green	Link
	LAN activity LED	Off	No activity
	LAN link LED	Green	Link
	LAN activity LED	Off	Activity 10 Mb
	LAN link LED	Blinking green	Link
	LAN activity LED	Green	Activity 100 Mb
	LAN link LED	Blinking green	Link
	LAN activity LED	Amber	Activity 1Gb
5	Hard drive activity LEDs	Blinking green	Hard drive 0 active Hard drive 1 active Hard drive 2 active Hard drive 3 active

Item	Feature	Status	Description
6	Identity LED	Blue	Identifies the system
		On	Normal status
		Blue	Identifies the system
		Off	with an interval
		Blinking blue	
7	Power/Status	Green	System DC On
		On	
		Green	System DC Off
		Off	
		Amber	Normal status
	Off		
	Blinking amber	Event occurred in the system	

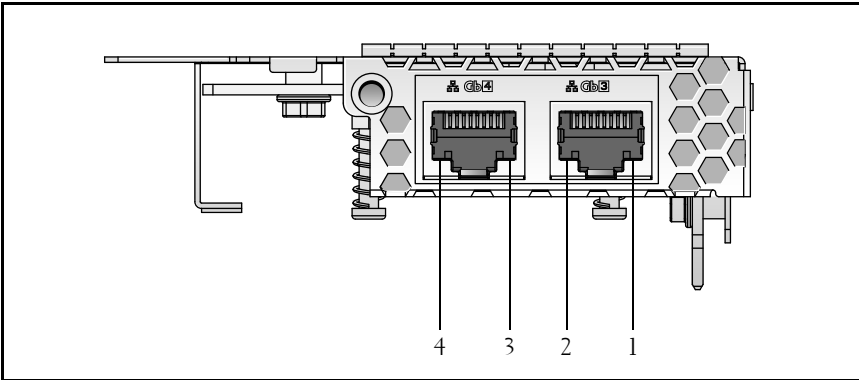
Figure 1-4. 12-Sled SKU Indicators (Rotated Counterclockwise 90°)



Item	Feature	Status	Description
1, 3	LAN link LED	Off	No link
2, 4	LAN activity LED	Off	No activity
	LAN link LED	Green	Link
	LAN activity LED	Off	No activity
	LAN link LED	Green	Link
	LAN activity LED	Off	Activity 10 Mb
	LAN link LED	Blinking green	Link
	LAN activity LED	Green	Activity 100 Mb
	LAN link LED	Blinking green	Link
5	Hard drive activity LEDs	Blinking green	Hard drive 0 active
			Hard drive 1 active
			Hard drive 2 active
			Hard drive 3 active

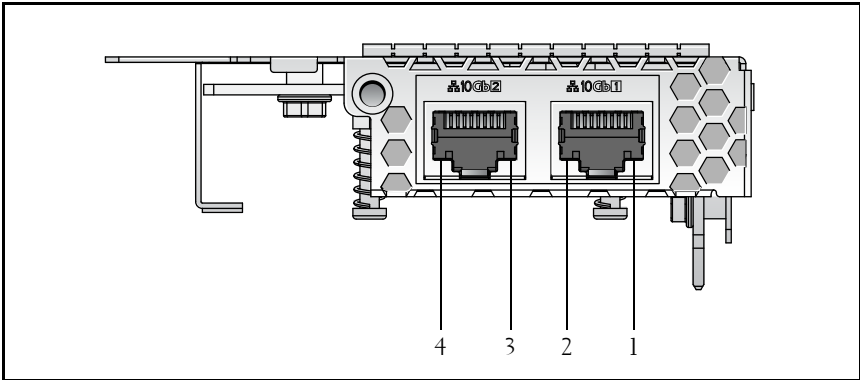
6	Identity LED	Blue On	Identifies the system
		Blue Off	Normal status
		Blinking blue	Identifies the system with an interval
7	Power/Status	Green On	System DC on
		Green Off	System DC off
		Amber Off	Normal status
		Blinking amber	Event occurred in the System

Figure 1-5. 1Gb Mezzanine Indicators (Rotated Counterclockwise 90°)



Item	Feature	Status	Description
1, 3	LAN activity LED	Off	No activity
2, 4	LAN link LED	Off	No link
	LAN link LED	Green	Link
	LAN activity LED	Off	No activity
	LAN link LED	Blinking green	Link
	LAN activity LED	Off	Activity 10 Mb
	LAN link LED	Blinking green	Link
	LAN activity LED	Green	Activity 100 Mb
	LAN link LED	Blinking green	Link
	LAN activity LED	Orange	Activity 1 Gb

Figure 1-6. 10Gb Mezzanine Indicators (Rotated Counterclockwise 90°)



Item	Feature	Status	Description
1, 3	LAN link LED	Off	No link
2, 4	LAN activity LED	Off	No activity
	LAN link LED	Green	Link
	LAN activity LED	Off	No activity
	LAN link LED	Blinking green	Link
	LAN activity LED	Off	Activity 100 Mb
	LAN link LED	Blinking green	Link
	LAN activity LED	Green	Activity 1Gb
	LAN link LED	Blinking green	Link
	LAN activity LED	Orange	Activity 10 Gb



NOTE: Intel 10Gb mezzanine card is supported by BIOS version 1.0.12 and later.

Using the System Setup Program

Start Menu

The system employs the latest AMI Core BIOS, which is stored in Flash memory. The Flash memory supports the plug-and-play specification, and contains a BIOS Setup program, the Power On Self Test (POST) routine, and the PCI auto-configuration utility.

This system board supports system BIOS shadowing enabling the BIOS to execute from 64-bit onboard write-protected DRAM.

Use the Setup Utility to configure items such as:

- Hard drives and peripherals
- Memory sizing and configuration
- Password protection from unauthorized use
- Protocol and feature enabling/disabling
- Power Management features

This Setup utility should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the Setup utility
- When redefining the communication ports to prevent any conflicts
- When changing the password or making other changes to the security setup



NOTE: Only items in brackets [] can be modified. Items that are not in brackets are display only.

BIOS Setup Options at Boot

The user initiates SETUP by pressing <F2> during POST.

Console Redirection

The console redirection allows a remote user to diagnose and fix problems on a server, which has not successfully booted to the OS. The centerpiece of the console redirection is the BIOS Console. The BIOS Console is a Flash ROM-resident utility that redirects input and output over a serial or modem connection.

BIOS supports redirection of both video and keyboard through a serial link (serial port). After enabling console redirection, the local (host server) keyboard input and video output are accessible by the local keyboard and video connections.

Operation through the remote console without the need for a local keyboard or monitor is also available.



NOTE: Full compatibility and functionality for the available emulation standards may vary.

Enable/Disable Console Redirection

The console redirection function can be enabled/disabled in the BIOS Setup menu. See "Remote Access Configuration" on page 46.

Configuring Special Keys

Console redirection uses ANSI terminal emulation, which is limited to basic ASCII characters. There are no function keys, arrow keys, or control keys in this character set. However, the PowerEdge C5220 software requires the use of function keys and control keys for ordinary functions. You can emulate a function key or control key by using a special key sequence called an escape sequence, to represent a specific key.

For console redirection, an escape sequence starts with an escape character. This character can be entered in a variety of different ways depending on the requirements of your terminal emulation software. For example, 0x1b, ^[, and <Esc> refer to the same escape character.

The following table lists the escape sequence that must be sent to represent a special key or command.

Key	ANSI Escape Sequence	Other Sequences
F1	<ESC><Shift>op	<ESC>1
F2	<ESC><Shift>oq	<ESC>2
F3	<ESC><Shift>or	<ESC>3
F4	<ESC><Shift>os	<ESC>4
F5		<ESC>5
F6		<ESC>6
F7		<ESC>7
F8		<ESC>8
F9		<ESC>9
F10		<ESC>0
F11		<ESC>!
F12		<ESC>@
Home	<ESC>[<Shift>h	<ESC>h
End	<ESC>[<Shift>k	<ESC>k
Ins		<ESC>+
Del		<ESC>-
Page Up		<ESC>?

Key	ANSI Escape Sequence	Other Sequences
Page Down		<ESC>/
Reset		<ESC>R<ESC>r <ESC>R

General Help

In addition to the Item Specific Help window, the Setup Utility also provides a General Help screen. This screen can be called up from any menu by pressing <F1>. The General Help screen lists the legend keys with their corresponding alternates and functions. To exit the help window, press the <Enter> or the <Esc> key.

Server Platform Setup Utility Screens

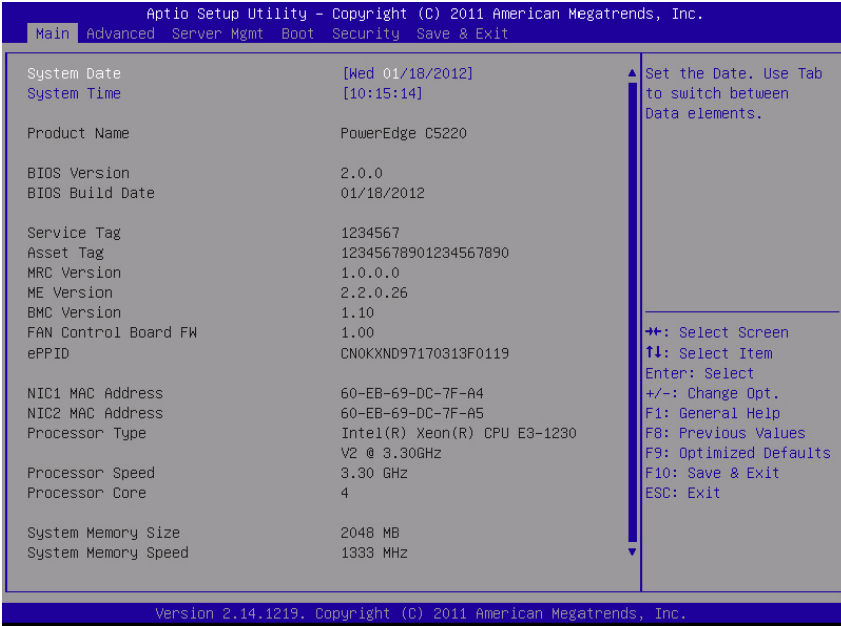
Conventions

The following typographical conventions are used in the tables:

- The text and values in the Setup Item, Options, and Help columns in the tables are displayed on the BIOS Setup screens.
- Text marked with an * in the Settings column of the tables indicates default values. These values are not displayed with an * on the setup screen. The marked text in this document is to serve as a reference point.
- The Comments column provides additional information where it may be helpful. This information does not appear in the BIOS Setup screens.
- Information in the screen shots that is enclosed in brackets (< >) indicates variables, depending on the option(s) installed. For example <Current Date> is replaced by the actual current date.
- Information that is enclosed in square brackets ([]) in the tables indicates areas where the user needs to type in text instead of selecting from a provided option.
- Whenever information is changed (except Date and Time) the systems requires a save and reboot to take place. Pressing <ESC> discards the changes and boot the system according to the boot order set from the last boot.

Main Menu

The Main menu is the screen that is first displayed when you enter BIOS Setup.

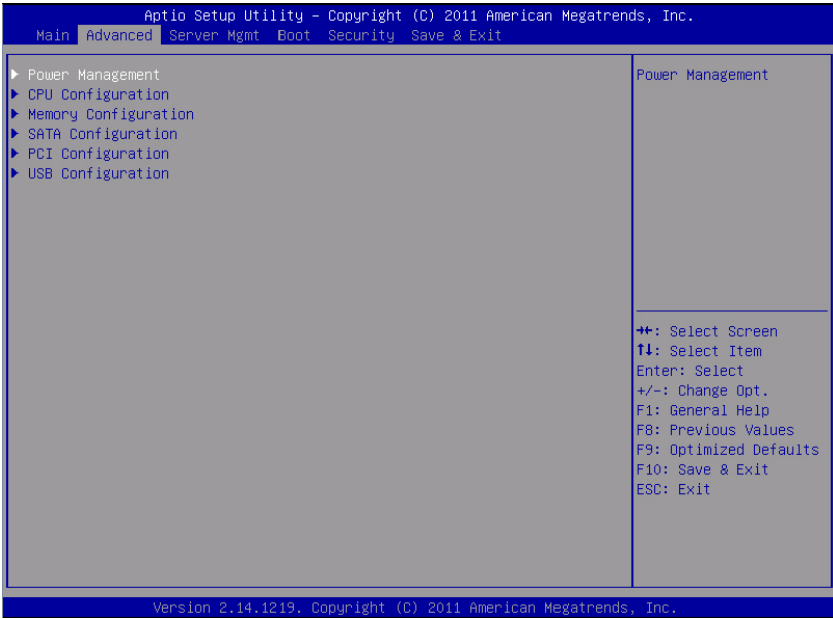



Menu Fields	Settings	Comments
Main		
System Date	MM/DD/YYYY	Set the Date. Use Tab to switch between Date elements.
System Time	HH:MM:SS	Set the time. Use Tab to switch between Time elements.
Product Name		Displays the product name.
BIOS Version		Displays the BIOS version.
BIOS Build Date		Displays the BIOS build date.
Service Tag		Displays the service tag.

Menu Fields	Settings	Comments
Asset Tag		Displays the asset tag.
MRC Version		Displays the MRC version.
ME Version		Displays the ME version.
BMC Version		Displays the BMC version.
FAN Control Board FW		Displays the fan control board firmware version.
ePPID		Displays the ePPID.
NIC1 MAC Address		Displays the NIC1 MAC address.
NIC2 MAC Address		Displays the NIC2 MAC address.
BMC NIC MAC Address		Displays the BMC NIC MAC address.
Processor Type		Displays the processor type.
Processor Speed		Displays the processor speed.
Processor Core		Displays the amount of processor core.
System Memory Size		Displays the amount of system memory.
System Memory Speed		Displays the memory speed.

Advanced Menu

The Advanced screen provides an access point to configure several options. On this screen, the user selects the option that is to be configured. Configurations are performed on the selected screen, not directly on the Advanced screen.

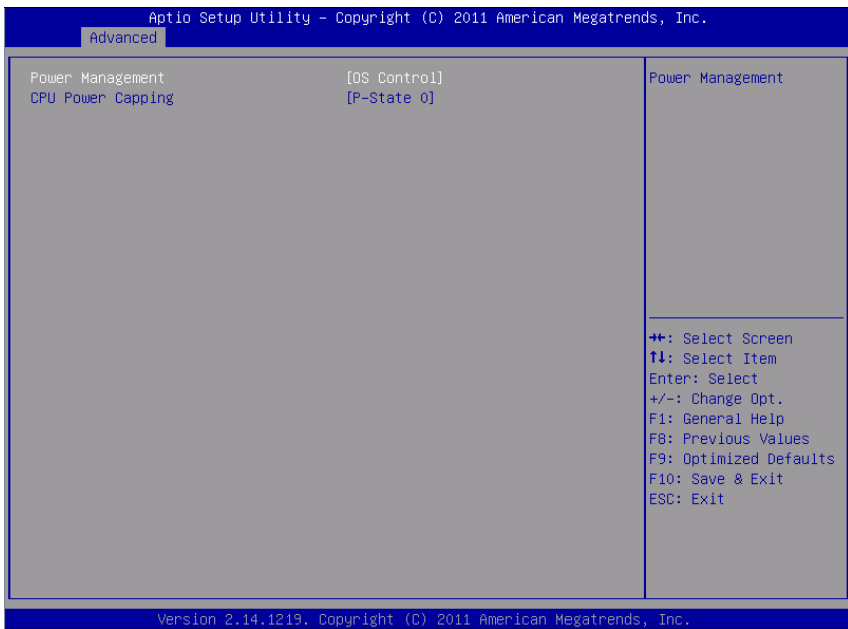


 **CAUTION:** Incorrect settings to items on the Advanced Menus may cause the system to malfunction. Unless you have experience adjusting these items, we recommend that you do not adjust the default values. If the system malfunctions or does not boot after changing the settings, open BIOS and choose "Load Optimal Defaults" in the Exit menu to boot up normally.

Menu Fields	Settings	Comments
Advanced		
Power Management		Power Management.
CPU Configuration		CPU Configuration.
Memory Configuration		Memory Configuration.

Menu Fields	Settings	Comments
SATA Configuration		SATA Devices Configuration.
PCI Configuration		PCI, PCI-X and PCI Express Settings.
USB Configuration		USB Configuration.

Power Management



Menu Fields	Settings	Comments
Advanced \Power Management		
Power management	Maximum Performance OS Control*	Power management.

Menu Fields	Settings	Comments
CPU power capping	P-state 0* P-state 1 P-state 2 P-state 3 P-state 4	CPU power capping.

CPU Configuration

The screenshot shows the Aptio Setup Utility interface with the following content:

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  advanced
Processor Information
Intel(R) Xeon(R) CPU E3-1230 V2 @ 3.30GHz
CPU Signature                306a8
Microcode Patch              a
Max CPU Speed                 3300 MHz
Min CPU Speed                 1600 MHz
CPU Speed                     3300 MHz
Processor Cores                4
Intel HT Technology           Supported
Intel VT-x Technology         Supported
Intel SMX Technology          Supported
64-bit                         Supported

L1 Data Cache                 32 kB x 4
L1 Code Cache                 32 kB x 4
L2 Cache                       256 kB x 4
L3 Cache                       8192 kB

Active Processor Cores        [All]
Max CPUID Value Limit         [Disabled]
Virtualization Technology     [Disabled]
Turbo Mode                     [Enabled]
C States                       [Enabled]
C1E State                      [Enabled]
C6 State                       [Enabled]
eXecute-Disable Bit Capability [Enabled]
Hyper-Threading Technology    [Enabled]
▶ Prefetch Configuration

Number of cores to enable in each processor package.
refetch Configuration

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

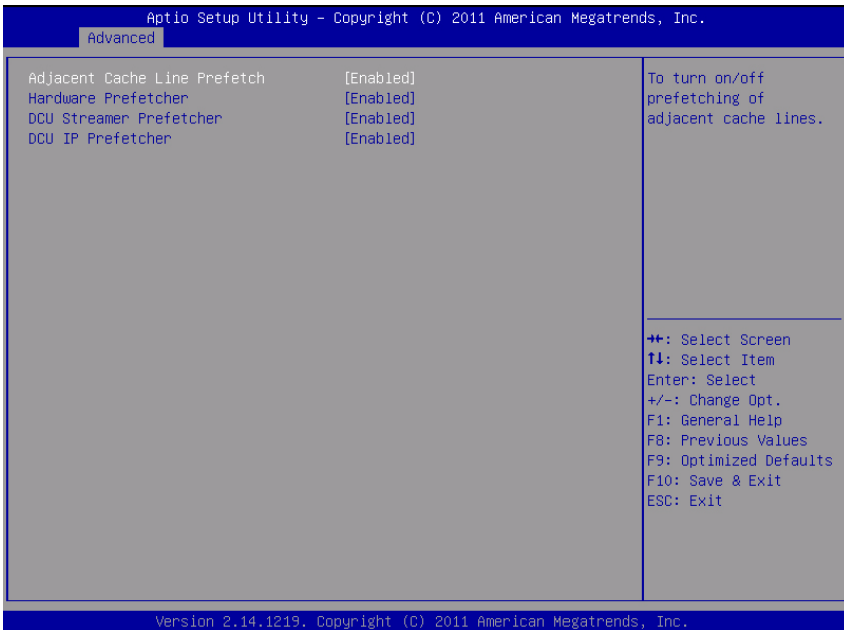
```

Menu Fields	Settings	Comments
Advanced	CPU Configuration	
Processor Information		

Menu Fields	Settings	Comments
Active Processor Cores	All* 1 2 4	Number of cores to enable in each processor package.
Max CPUID Value Limit	Disabled* Enabled	Some OS's (NT4) will fail if the value returned in EAX is > 3 when CPUID instruction is executed with EAX=0. This setting limits CPUID function to 3 or disable it.
Virtualization Technology	Disabled* Enabled	This feature will allow the users to disable/enable the VT technology in applicable CPUs. If disable, the VT feature is unusable in any OS.
Turbo Mode	Disabled Enabled*	Turbo Mode.
C States	Disabled Enabled*	Set to disable, there are no C states available for the processor. Set to enable (default), the processor can operate in all available Power C States.
C1E State	Disabled Enabled*	Set C1E disabled/enabled.
C6 State	Disabled Enabled*	Set C6 disabled/enabled. NOTE: Supported in BIOS version 2.0.X.
C7 State	Disabled Enabled*	Set C7 disabled/enabled. NOTE: Supported in BIOS version 2.0.X.

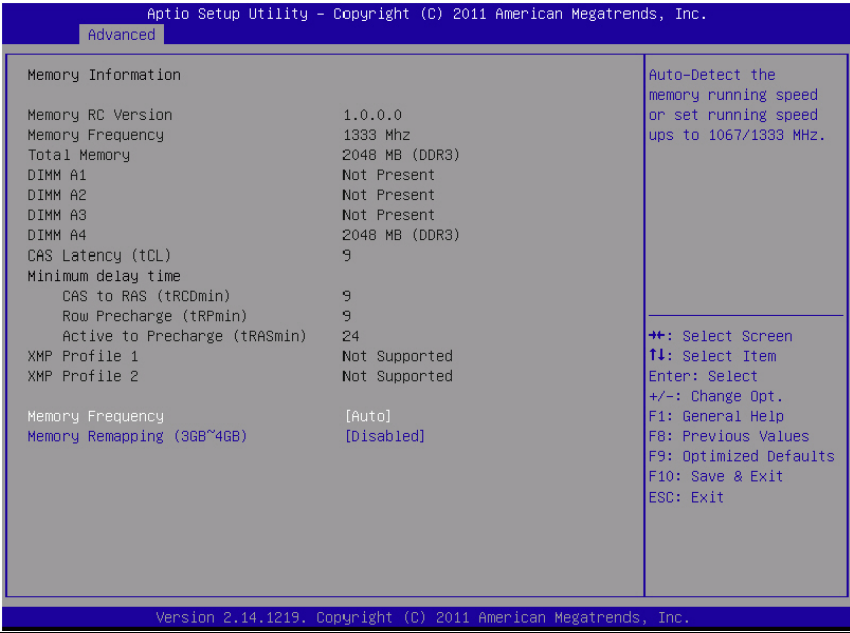
Menu Fields	Settings	Comments
eExecute-Disable Bit Capability	Disabled Enabled*	When disable, Intel CPUs that support the eExecute Disable (XD) feature will not report the support to the operating system. When enable, Intel CPUs that support the eExecute Disable (XD) feature will report the support to the operating system.
Hyper-Threading Technology	Disabled Enabled*	Disable/Enable Hyper-Threading Technology.
Prefetch Configuration		Prefetch Configuration

Prefetch Configuration



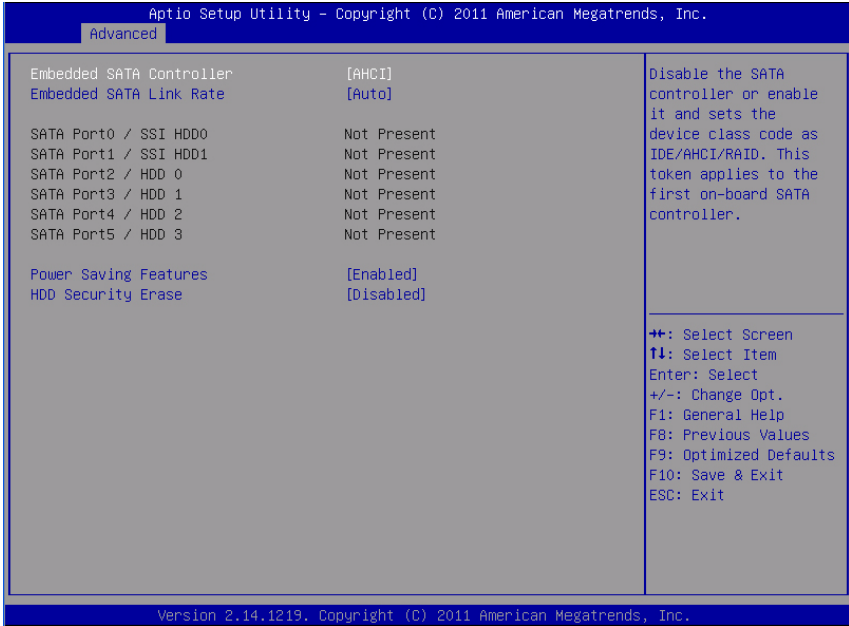
Menu Fields	Settings	Comments
Advanced\CPU Configuration\Prefetch Configuration		
Adjacent Cache Line Prefetch	Disable Enable*	To turn on/off prefetching of adjacent cache lines.
Hardware Prefetcher	Disable Enable*	To turn on/off the Mid Level Cache (L2) streamer prefetcher.
DCU Streamer Prefetcher	Disable Enable*	Disable/Enable the DCU Streamer Prefetcher.
DCU IP Prefetcher	Disable Enable*	Disable/Enable the DCU IP Prefetcher.

Memory Configuration



Menu Fields	Settings	Comments
Advanced\Memory Configuration		
Memory Frequency	Auto* 1067 MHz 1333 MHz	Auto-Detect the memory running speed or set running speed up to 1067/1333 MHz. NOTE: Supported detection and running speed of up to 1600 MHz.
Memory Remapping (3 GB - 4 GB)	Disable* Enable	Memory remapping relocates memory space 3 GB~4 GB to the space above 4 GB with this feature disabled/enabled.

SATA Configuration



Menu Fields	Settings	Comments
Advanced\SATA Configuration		
Embedded SATA Controller	Off	Disables the SATA controller or enables it and sets the device class code as IDE/AHCI/RAID. This token applies to the first on-board SATA controller. NOTE: Function available after BIOS 1.0.4.
	IDE	
	AHCI*	
	RAID	

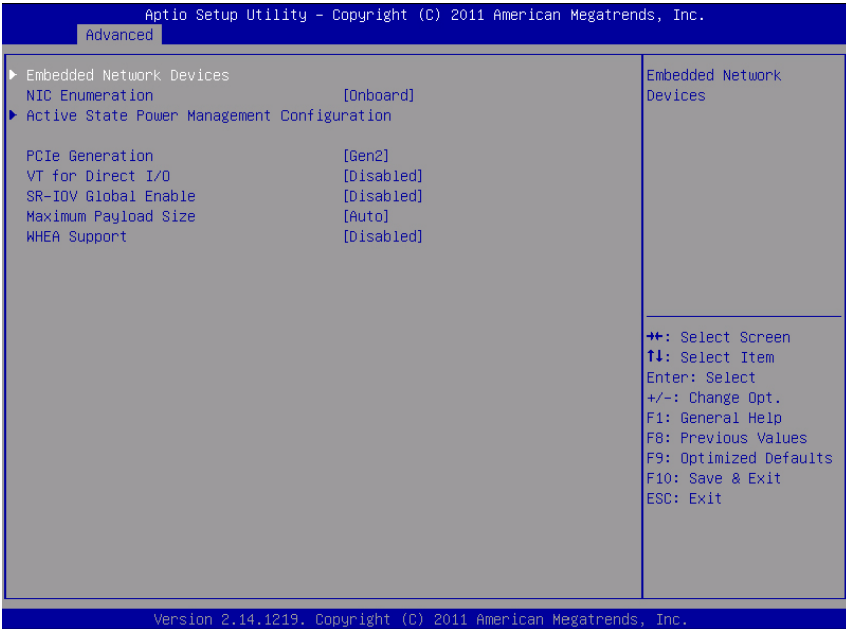
Menu Fields	Settings	Comments
Embedded SATA Link Rate	Auto* 1.5 Gbps 3.0 Gbps	Auto is default mode. Set SATA port to run on GEN1 mode by selecting 1.5 Gbps. NOTE: Function supported after BIOS 2.0.X.
SATA Port 0/SSI Hard drive 0		While entering setup, BIOS auto detects the presence of SATA devices and displays the status of detected SATA hard drives.
SATA Port1/SSI Hard drive 1		While entering setup, BIOS auto detects the presence of SATA devices and displays the status of detected SATA hard drives.
SATA Port2/Hard drive 0		While entering setup, BIOS auto detects the presence of SATA devices and displays the status of detected SATA hard drives.
SATA Port3/Hard drive 1		While entering setup, BIOS auto detects the presence of SATA devices and displays the status of detected SATA hard drives.
SATA Port4/Hard drive 2		While entering setup, BIOS auto detects the presence of SATA devices and displays the status of detected SATA hard drives.
SATA Port5/Hard drive 3		While entering setup, BIOS auto detects the presence of SATA devices and displays the status of detected SATA hard drives.

Menu Fields	Settings	Comments
Power Saving Features	Disable Enable*	Disable/Enable the feature that allows SATA hard drives to initiate link power management transitions.
HDD Security Erase	Disable* Enable	Not Set Security Freeze Lock Command.

Port Mapping of Cougar Point SATA Controllers

SATA Port0/SSI Hard Drive 0	Bus0:Dev31:Fun2 SATA Controller
SATA Port1/SSI Hard Drive 1	Bus0:Dev31:Fun2 SATA Controller
SATA Port2/Hard Drive 0	Bus0:Dev31:Fun2 SATA Controller
SATA Port3/Hard Drive 1	Bus0:Dev31:Fun2 SATA Controller
SATA Port4/Hard Drive 2	Bus0:Dev31:Fun5 SATA Controller
SATA Port5/Hard Drive 3	Bus0:Dev31:Fun5 SATA Controller

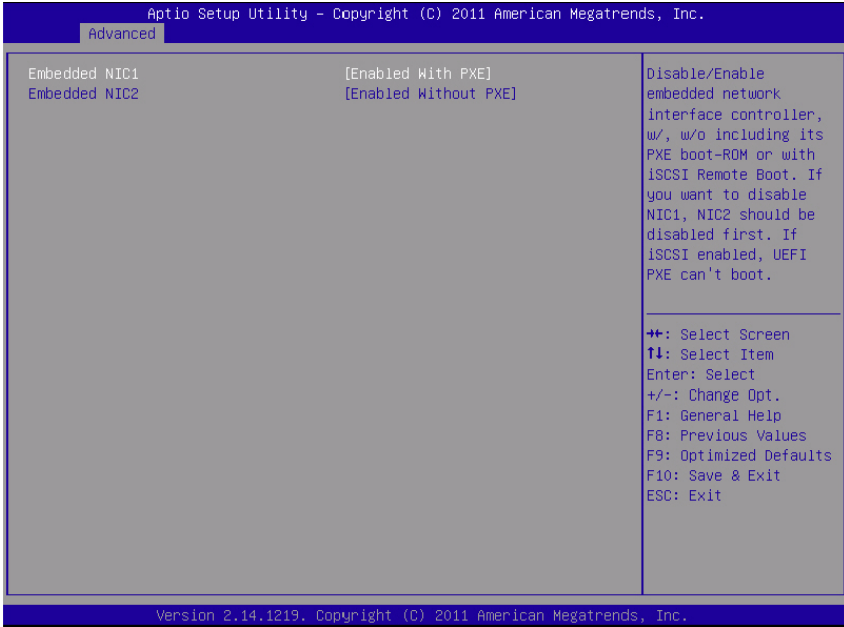
PCI Configuration



Menu Fields	Settings	Comments
Advanced\PCI Configuration		
Embedded Network Devices		Embedded Network Devices.
NIC Enumeration	Onboard* Add-in	Change the sequence of NIC OPROM initialization. NOTE: Function supported after BIOS 2.0.X.
Active State Power Management Configuration		Active State Power Management Configuration.

Menu Fields	Settings	Comments
PCI Slot Configuration		Disable if PCIe card is not installed. NOTE: Function supported after BIOS 2.0.X.
PCIe Generation	Gen2* Gen1	Set PCIe generation. NOTE: Function supported after BIOS 2.0.X.
VT for Direct I/O	Disable* Enable	Disable/Enable Intel Virtualization Technology for Direct I/O (VT-d) that enhances I/O support (DMA) when running a Virtual Machine Monitor.
SR-IOV Global Enable	Disable* Enable	Disable/Enable BIOS support for SR-IOV devices. To enable this feature, an add-on NIC with SR-IOV support is required.
Maximum Payload Size	Auto* 128 Bytes 256 Bytes	Auto detects the PCIe maximum payload size or sets it to 128/256 Bytes.
WHEA Support	Disable* Enable	Enable or disable Windows Hardware Error Architecture (WHEA).

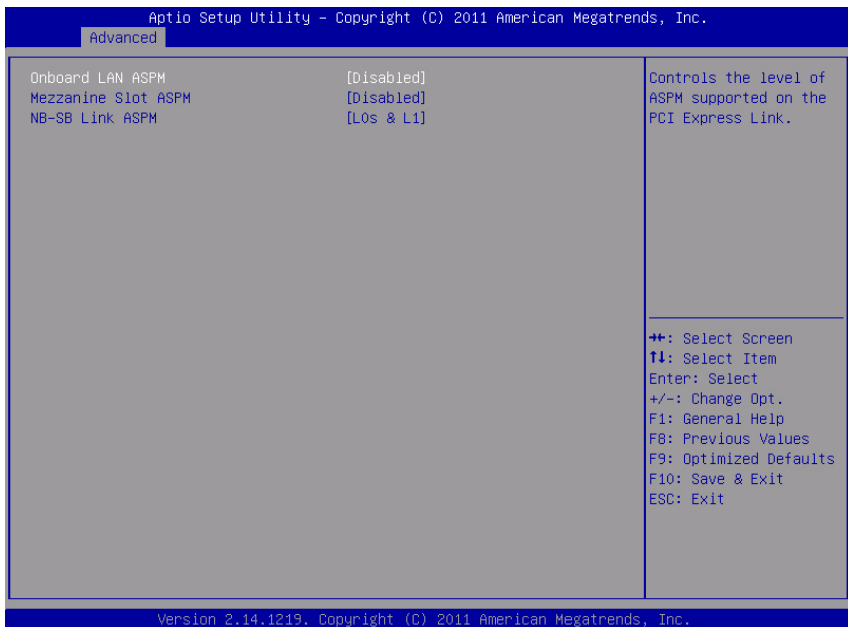
Embedded Network Devices



Menu Fields	Settings	Comments
Advanced\PCI Configuration\Embedded Network Devices		
Embedded NIC1	Disabled Enabled with PXE* Enabled without PXE iSCSI Remote Boot	Disable/Enable the system's primary embedded network interface controller (full-function), w/, w/o including its PXE boot-ROM or with iSCSI Remote Boot. To disable NIC1, NIC2 should be disabled first. If iSCSI is enabled, UEFI PXE can not boot.

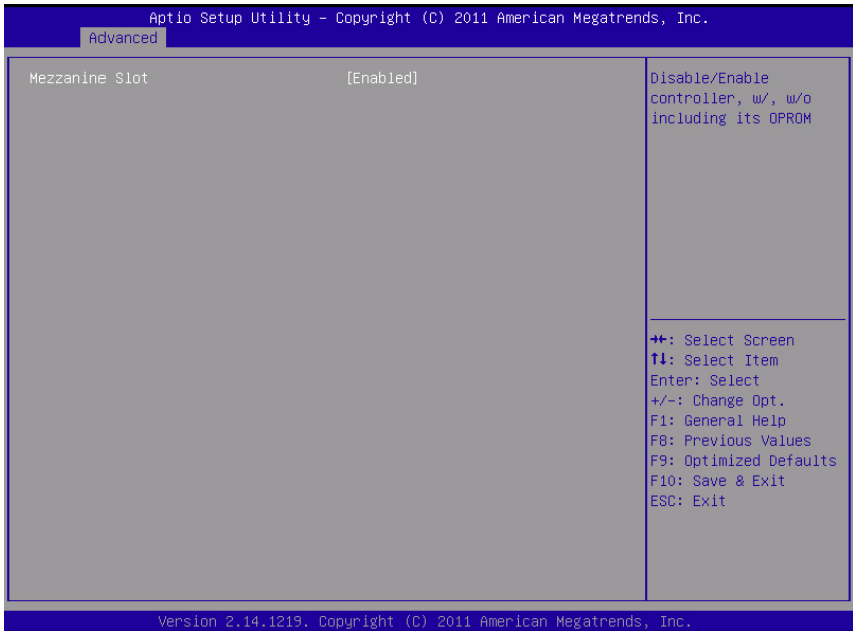
Menu Fields	Settings	Comments
Embedded NIC2	Disabled Enabled with PXE Enabled without PXE* iSCSI Remote Boot	Disables/Enables the system's secondary embedded network interface controller (full-function), w/, w/o including its PXE boot-ROM or with iSCSI Remote Boot. If iSCSI is enabled, UEFI PXE can not boot.

Active State Power Management Configuration



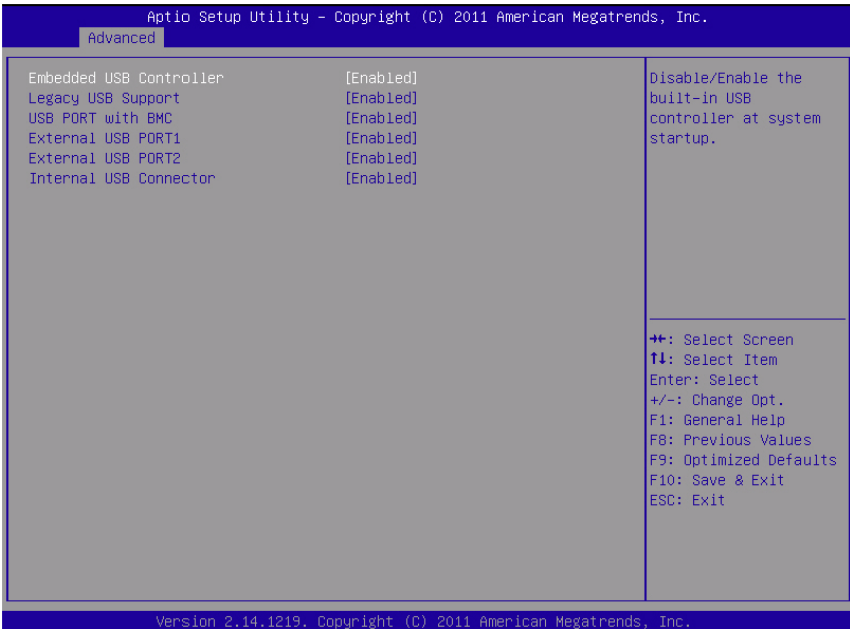
Menu Fields	Settings	Comments
Advanced\PCI Configuration\Active State Power Management Configuration		
Onboard LAN ASPM	Disabled* L0s L1 L0s & L1	Controls the level of ASPM supported on the PCI Express Link.
Mezzing Slot ASPM	Disabled* L0s L1 L0s & L1	Controls the level of ASPM supported on the PCI Express Link.
NB-SB Link ASPM	Disabled L0s & L1*	Controls the level of ASPM supported on the PCI Express Link.

PCI Slot Configuration



Menu Fields	Settings	Comments
Advanced\PCI Configuration\PCI Slot Configuration		
Mezzanine slot	Disabled Enabled* Enabled without OPROM	Disables/Enables controller, w/ or w/o OPROM.

USB Configuration



Menu Fields	Settings	Comments
Advanced\USB Configuration		
Embedded USB Controller	Disabled Enabled*	Disables/Enables the built-in USB controller at system startup.
Legacy USB Support	Disabled Enabled*	Enables Legacy USB support. Disable option keeps USB devices available only for EFI applications.

Menu Fields	Settings	Comments
USB PORT with BMC	Disabled Enabled*	Allows the users to electrically disable/enable the internal USB port which contacts to BMC.
External USB PORT1	Disabled Enabled*	Allows the users to electrically disable/enable the external USB port1.
External USB PORT2	Disabled Enabled*	Allows the users to electrically disable/enable the external USB port2.
Internal USB Connetor	Disabled Enabled*	Disables/Enables the internal USB port.

Server Management



Menu Fields	Settings	Comments
Server Management		
ACPI SPMI Table	Disabled Enabled*	ACPI SPMI Table.
Set BMC LAN Configuration		Configures BMC network parameters.
Remote Access Configuration		Remote Access Configuration.
Restore on AC Power Loss	Power Off Power On* Last State	System action to take on AC power loss.

Menu Fields	Settings	Comments
Power Staggering AC Recovery	Immediate* Random User Defined	Immediate: PowerOn (No Delay)\Random: (Auto)\User Defined: user defined delay time must be in the range of Minimum and Maximum Power On Delay.
Power Button	Disabled Enabled*	Select Disabled to disable power off function.
View System Event Log		Press <Enter> to view system Event Log records.
Clear BMC System Event Log		Select SEL clear method.
Event logging	Disabled Enabled*	Disable PCIE SERR/DRAM ECC Error Logging.
NMI On Error	Disabled Enabled*	Enable or disable NMI asserted for fatal error.

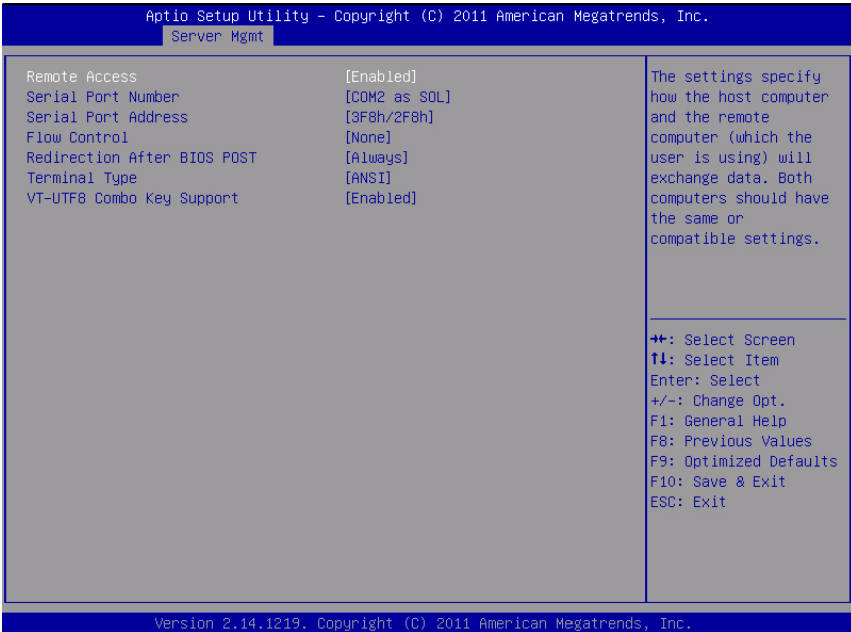
Set BMC LAN Configuration



Menu Fields	Settings	Comments
Server Management/BMC Network Configuration		
BMC LAN Port Configuration	Dedicated-NIC Shared-NIC*	BMC LAN Port Configuration NOTE: Dedicated-NIC port is found on the chassis.
BMC NIC IP Source	Static DHCP*	Select to configure LAN channel parameters statically or dynamically (DHCP).

Menu Fields	Settings	Comments
IP Address	xxx.xxx.xxx.xxx	Enter IP address in the form of XXX.XXX.XXX.XXX (XXX less than 256 and in decimal only).
Subnet Mask	xxx.xxx.xxx.xxx	Enter Subnet Mask in the form of XXX.XXX.XXX.XXX (XXX less than 256 and in decimal only).
GateWay Address	xxx.xxx.xxx.xxx	Enter Gateway Address in decimal in the form of XXX.XXX.XXX.XXX (XXX less than 256 and in decimal only).

Remote Access Configuration

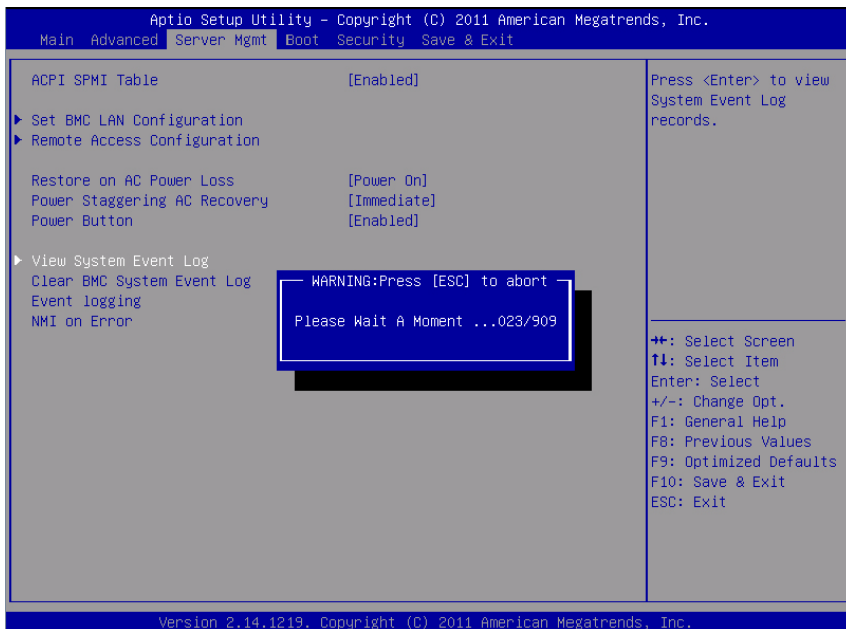


Menu Fields	Settings	Comments
Server/Remote Access Configuration		
Remote Access	Disabled Enabled*	<p>The settings specify how the host computer and the remote system exchanges data. Both systems should have the same or compatible settings.</p> <p>NOTE: The screen would keep 100x31 even when Remote Access is enabled. Client console utility should be supported.</p>

Menu Fields	Settings	Comments
Serial Port Number	COM1 COM2 as SOL*	Serial port number
Serial Port Address	3F8h/2F8h* 2F8h/3F8h	COM1/COM2 IO port address
Flow Control	None* Hardware	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
Redirection After BIOS POST	Disabled Always*	Redirection After BIOS POST
Terminal Type	ANSI* VT100 VT-UTF8	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
VT-UTF8 Combo Key Support	Disabled Enabled*	Enable VT-UTF8 combination key support for ANSI/VT100 terminals.

NOTE: BIOS setup screens display at 100 (columns) x 31 (lines). Change the client-side console utility settings to support 100 (columns) x 31 (lines) for accurate screen display.

View System Event Log



Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Server Mgmt

DATE	TIME	SENSOR TYPE	
12/19/11	19:01:54	Event Logging Disabled	Event Description:OS Graceful Shutdown, Assertion Event, ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F8: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
12/19/11	19:02:17	Power Unit	
12/19/11	19:26:03	Power Unit	
12/19/11	19:26:04	Power Unit	
12/19/11	19:32:07	Power Unit	
12/19/11	19:42:48	Power Unit	
12/20/11	10:57:07	Power Unit	
12/20/11	11:11:04	OS Stop/Shutdown	
12/20/11	11:11:04	OEM record dd	
12/20/11	11:11:09	Power Unit	
12/20/11	11:18:23	OS Stop/Shutdown	
12/20/11	11:18:23	OEM record dd	
12/20/11	11:22:51	Power Unit	
12/20/11	11:23:07	Power Unit	
12/20/11	11:23:22	Power Unit	
12/20/11	11:23:38	Power Unit	
12/20/11	11:23:55	Power Unit	
12/20/11	11:24:11	Power Unit	
12/20/11	11:24:27	Power Unit	
12/20/11	11:24:43	Power Unit	
12/20/11	11:26:09	Power Unit	
12/20/11	11:27:36	Power Unit	
12/20/11	11:27:37	Power Unit	
12/20/11	11:43:44	OS Stop/Shutdown	

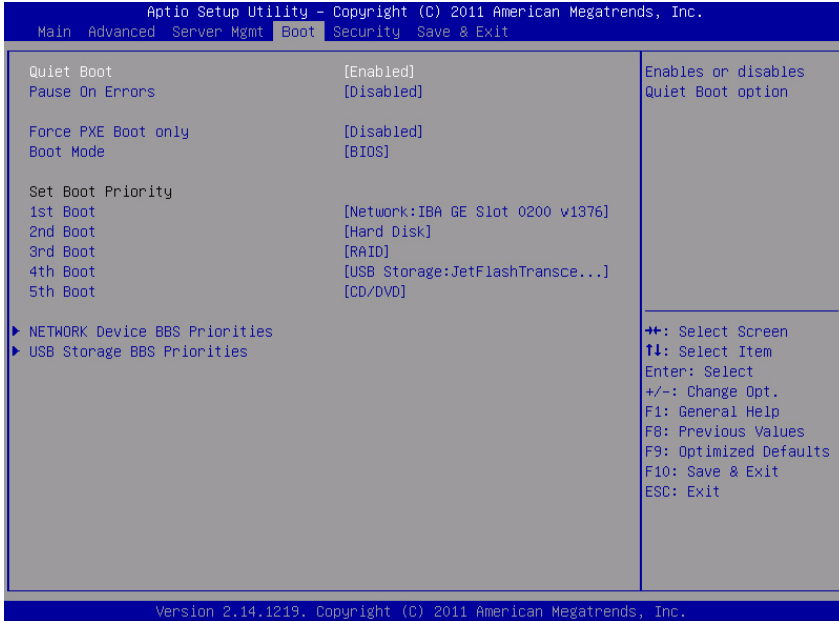
Version 2.14.1219, Copyright (C) 2011 American Megatrends, Inc.



NOTE: Only provides a brief SEL description for the user. If the user needs more detailed information, refer to the BMC Event Log in the Server Health of WebUI.

Boot Menu

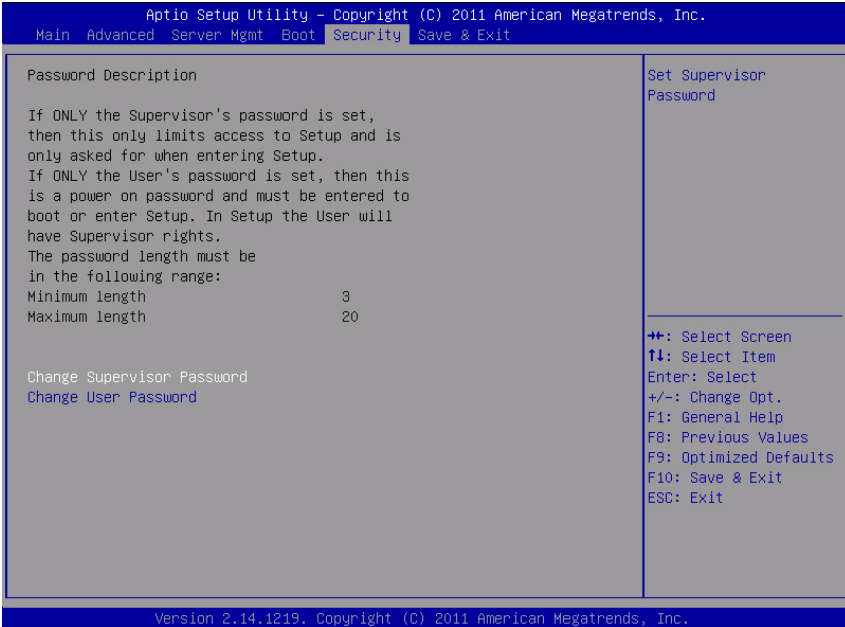
This page enables you to set POST boot parameters.



Menu Fields	Settings	Comments
Boot		
Quiet Boot	Disabled Enabled*	Enables or disables Quiet Boot option
Pause On Errors	Disabled* Enabled	Pause on Errors
Force PXE Boot Only	Disabled* Enabled	Force PXE Boot Only

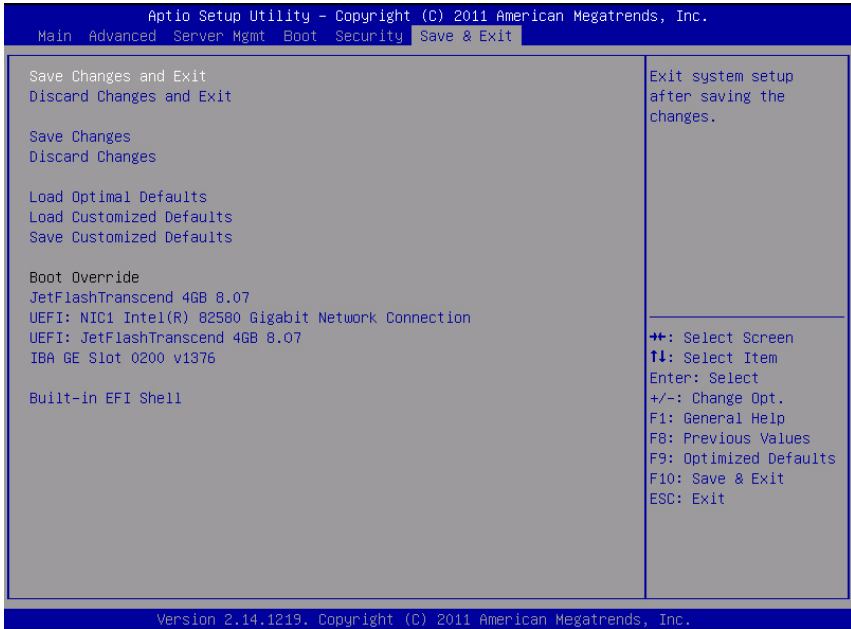
Menu Fields	Settings	Comments
Boot Mode	BIOS* UEFI	If Boot Mode UEFI/BIOS is selected, only UEFI legacy boot devices are selected for bootup.
1st Boot	Network* Hard Disk RAID USB Storage CD/DVD	Set Boot Priority
2nd Boot	Network Hard Disk* RAID USB Storage CD/DVD	Set Boot Priority
3rd Boot	Network Hard Disk RAID* USB Storage CD/DVD	Set Boot Priority
4th Boot	Network Hard Disk RAID USB Storage* CD/DVD	Set Boot Priority
5th Boot	Network Hard Disk RAID USB Storage CD/DVD*	Set Boot Priority

Security Menu



Menu Fields	Settings	Comments
Security		
Change Supervisor Password		Set Supervisor Password
Change User Password		Set User Password

Save and Exit



Menu Fields	Settings	Comments
Save & Exit		
Save Change and Exit		Exit system setup after saving the changes.
Discard Changes and Exit		Exit system setup without saving any changes.
Save Changes		Save Changes done so far to any of the setup option.
Discard Changes		Discard changes done so far to any of the setup option.

Menu Fields	Settings	Comments
Load Optimal Defaults		Restore/Load Default values for all the setup options.
Load Customized Defaults		Restore the User Defaults to all the setup option.
Save Customized Defaults		Save the changes done so far as User Defaults.
Boot Override		
Network		Hide if Device is not connected.
Hard Disk		Hide if Device is not connected.
RAID		Hide if Device is not connected.
USB Storage		Hide if Device is not connected.
CD/DVD ROM		Hide if Device is not connected.
Built-in EFI Shell		Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available file system devices.



NOTE: For further specifications see UEFI Shell Specification at uefi.org/specs/.

POST Error Handling

This section provides information on POST error message and handling.

Error Messages

Error messages are displayed at POST under the following fail conditions:

- Hard drive is not present in system
- MRC initialization failure in a DIMM module



NOTE: You can enable the **Pause on Error** function in the BIOS setup menu to pause the POST Error Message on Screen at time of display.

Error Message

DIMM A1 has been disabled by MRC.

DIMM A2 has been disabled by MRC.

DIMM A3 has been disabled by MRC.

DIMM A4 has been disabled by MRC.

Status Codes

A status code is a data value used to indicate progress during the boot phase. A subset of these status codes, known commonly as checkpoints, indicate common phases of the BIOS boot process.

The status codes can be viewed during POST at the right bottom corner of the screen as shown in Figure 2-1.

Figure 2-1. POST Error Codes



Status Code	Description
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect

Status Code	Description
0x9D	USB Enable
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAB	Setup Input Wait
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug

Command Line Interfaces for Setup options

The SETUP menu provides setup options through the system configuration utility (syscfg), included in the Dell OpenManage Deployment Toolkit (DTK).

Users can use the utility as following:

To change the SETUP option thru D4 token:

```
./syscfg -t=D4_token_id
```

Example:

```
./syscfg -t=0x002D to enable NIC1
```

To check token active status:

```
./syscfg --istokenactive=D4_token_id
```

Example:

```
./syscfg --istokenactive=0x002D to check the token active status of NIC1
```

To directly change the SETUP option thru BMC memory:

```
./ipmitool raw <command> <data>
```

Example:

```
./ipmitool raw 0xc 1 1 3 10 106 42 120 to set IP address of BMC LAN port  
as 10.106.42.120
```

Installing System Components

Safety Measures



CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

System components and electronic circuit boards can be damaged by discharges of static electricity. Working on systems that are still connected to a power supply can be extremely dangerous. To avoid injury to yourself or damage to system, follow these guidelines:

- If possible, wear a grounded wrist strap when you are working inside the system chassis. Alternatively, discharge any static electricity by touching the bare metal chassis of the system chassis, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging until you are ready to use the component for the installation.

Recommended Tools

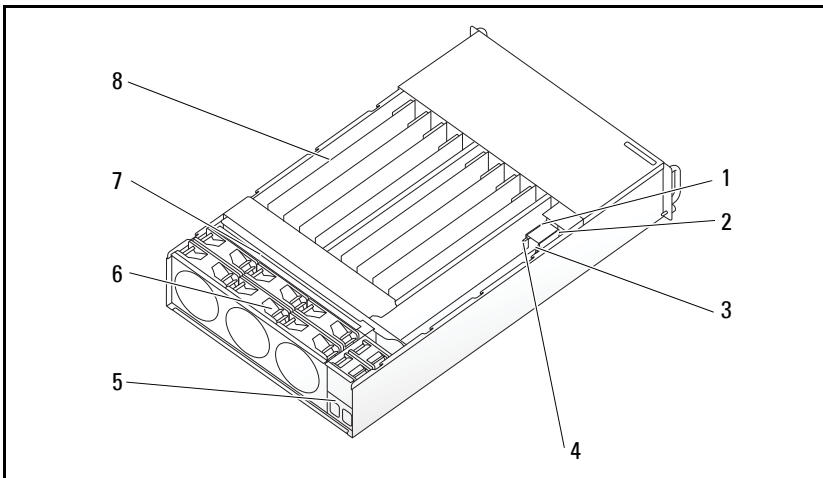
- Phillips screwdriver #2

Inside the System

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

CAUTION: This system must be operated with the system cover installed to make sure of proper cooling.

Figure 3-1. Inside the System



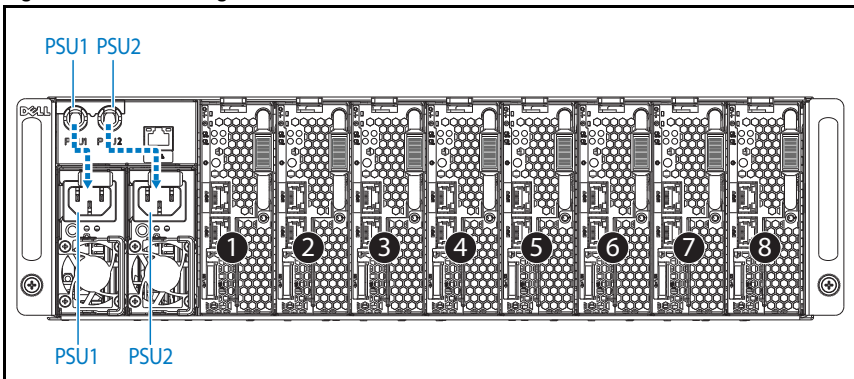
- | | | | |
|---|----------------------|---|------------|
| 1 | PSU 1 | 2 | PSU 2 |
| 3 | PDB 1 | 4 | PDB 2 |
| 5 | power socket bracket | 6 | fan cage |
| 7 | backplane | 8 | sleds (12) |

Sled Configuration

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

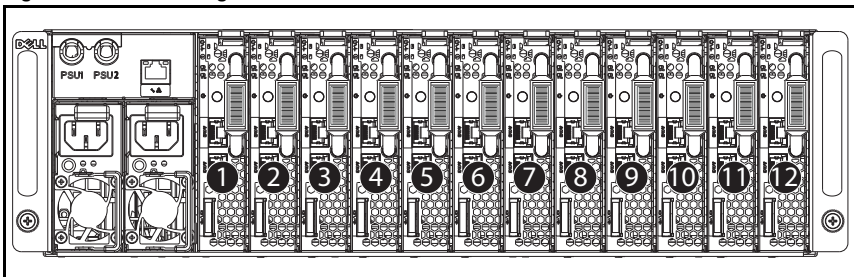
The following illustrations show the two server sled options and the sled numbering in each option.

Figure 3-2. PowerEdge C5220 8-Sled SKU



NOTE: Sled SKU may also include an LSI 2008, 1GbE or 10GbE mezzanine card.

Figure 3-3. PowerEdge C5220 12-Sled SKU



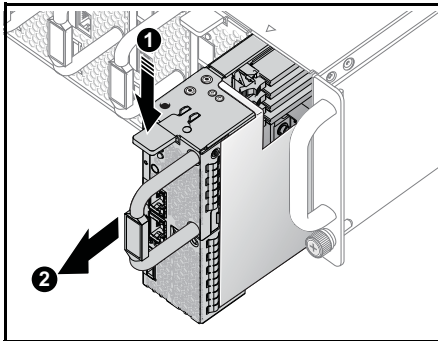
Sleds

Removing a Sled

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

⚠ CAUTION: To ensure proper airflow in the system, if a sled is removed it should be immediately replaced with another sled or sled dummy.

- 1 Press the release latch down **❶**.
- 2 Pull the sled out of the system **❷**.

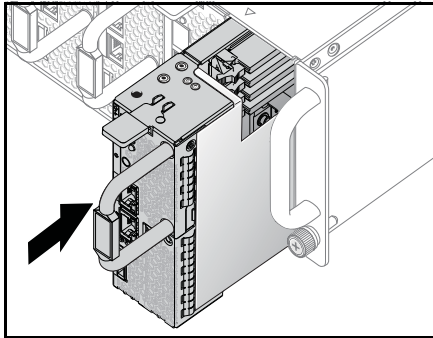


Installing a Sled

△ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

△ CAUTION: To ensure proper airflow in the system, if a sled is removed it should be immediately replaced with another sled or sled dummy.

Push the sled into the system until flush with the case and the release latch locks.

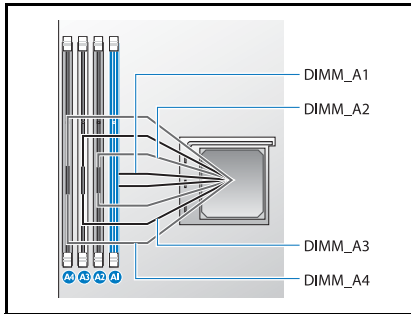


Memory Modules

Supported DIMM Configuration

The following DIMM configurations are supported by the system.

Figure 3-4. DIMM Slot Configuration



DIMM Population Rules

For a single DIMM, only install in DIMM A1.

For two DIMMs, install in DIMM A1 + A3.

Supported Memory



NOTE: Only Intel Xeon E3-1200v2 family of products support 1600 MHz memory.

Supported Memory

Configura- tion	Memory Type/Size	CPU	DIMMs	Type	Memory Speed (MHz)	Rank	Type (x8, x4)	Component Density	Total Size	DIMM Slot			
										A1	A2	A3	A4
8-Sled	DDR3 ECC UDIMM/2048 MB*1	1	1	UDIMM	1333/ 1600	1R	x8	2 Gb	2G	•			
8-sled	DDR3 ECC UDIMM/2048 MB*2	1	2	UDIMM	1333/ 1600	1R	x8	2 Gb	4G	•		•	
8-sled	DDR3 ECC UDIMM/2048 MB*3	1	3	UDIMM	1333/ 1600	1R	x8	2 Gb	6G	•	•	•	
8-sled	DDR3 ECC UDIMM/4096 MB*1 +2048 MB*2	1	3	UDIMM	1333/ 1600	2R/ 1R	x8	2 Gb	8G	2G	4G	2G	
8-sled	DDR3 ECC UDIMM/2048 MB*1 +4096 MB*2	1	3	UDIMM	1333/ 1600	1R/ 2R	x8	2 Gb	10G	2G	4G	4G	
8-sled	DDR3 ECC UDIMM/4098 MB*3	1	3	UDIMM	1333/ 1600	2R	x8	2 Gb	12G	•	•	•	
8-sled	DDR3 ECC UDIMM/2048 MB*4	1	4	UDIMM	1333/ 1600	1R	x8	2 Gb	8G	•	•	•	•
8-sled	DDR3 ECC UDIMM/4096 MB*1	1	1	UDIMM	1333/ 1600	2R	x8	2 Gb	4G	•			
8-sled	DDR3 ECC UDIMM/4096 MB*2	1	2	UDIMM	1333/ 1600	2R	x8	2 Gb	8G	•		•	
8-sled	DDR3 ECC UDIMM/2048 MB*2 +4096 MB*2	1	4	UDIMM	1333/ 1600	1R/ 2R	x8	2 Gb	12G	2G	4G	2G	4G
8-sled	DDR3 ECC UDIMM/4096 MB*4	1	4	UDIMM	1333/ 1600	2R	x8	2 Gb	16G	•	•	•	•
8-sled	DDR3 ECC UDIMM/8912 MB*1	1	1	UDIMM	1333/ 1600	2R	x8	4 Gb	8G	•			
8-sled	DDR3 ECC UDIMM/8912 MB*2	1	2	UDIMM	1333/ 1600	2R	x8	4Gb	16G	•		•	
8-sled	DDR3 ECC UDIMM/8912 MB*3	1	3	UDIMM	1333/ 1600	2R	x8	4Gb	24G	•	•	•	
8-sled	DDR3 ECC UDIMM/8912 MB*4	1	4	UDIMM	1333/ 1600	2R	x8	4Gb	32G	•	•	•	•
8-sled	DDR3 ECC UDIMM/8912 MB*2 +2048 MB*2	1	4	UDIMM	1333/ 1600	2R/ 1R	x8	4Gb/ 2Gb	20G	2G	8G	2G	8G
8-sled	DDR3 ECC UDIMM/8912 MB*2+4096MB*2	1	4	UDIMM	1333/ 1600	2R/ 2R	x8	4Gb/2Gb	24G	4G	8G	4G	8G

Supported Memory

Configura- tion	Memory Type/Size	CPU	DIMMs	Type	Memory Speed (MHz)	Rank	Type (x8, x4)	Component Density	Total Size	DIMM Slot			
										A1	A2	A3	A4
12 sled	DDR3 ECC UDIMM/2048 MB*1	1	1	VLP UDIMM	1333/ 1600	2R	x8	1Gb	2G	•			
12 sled	DDR3 ECC UDIMM/2048 MB*2	1	2	VLP UDIMM	1333/ 1600	2R	x8	1Gb	4G	•		•	
12 sled	DDR3 ECC UDIMM/2048 MB*3	1	3	VLP UDIMM	1333/ 1600	2R	x8	1Gb	6G	•	•	•	
12 sled	DDR3 ECC UDIMM/4096 MB*1 +2048 MB*2	1	3	VLP UDIMM	1333/ 1600	2R	x8	2Gb/ 1Gb	8G	2G	4G	2G	
12 sled	DDR3 ECC UDIMM/2048 MB*1 +4096 MB*2	1	3	VLP UDIMM	1333/ 1600	2R	x8	1Gb/ 2Gb	10G	2G	4G	4G	
12 sled	DDR3 ECC UDIMM/4098 MB*3	1	3	VLP UDIMM	1333/ 1600	2R	x8	2Gb	12G	•	•	•	
12 sled	DDR3 ECC UDIMM/2048 MB*4	1	4	VLP UDIMM	1333/ 1600	2R	x8	1Gb	8G	•	•	•	•
12 sled	DDR3 ECC UDIMM/4096 MB*1	1	1	VLP UDIMM	1333/ 1600	2R	x8	2Gb	4G	•			
12 sled	DDR3 ECC UDIMM/4096 MB*2	1	2	VLP UDIMM	1333/ 1600	2R	x8	2Gb	8G	•		•	
12 sled	DDR3 ECC UDIMM/2048 MB*2+4096 MB*2	1	4	VLP UDIMM	1333/ 1600	2R	x8	1Gb/2Gb	12G	2G	4G	2G	2G
12 sled	DDR3 ECC UDIMM/4096 MB*4	1	4	VLP UDIMM	1333/ 1600	2R	x8	2Gb	16G	•	•	•	•
12 sled	DDR3 ECC UDIMM/8912MB*1	1	1	VLP UDIMM	1333/ 1600	2R	x8	4Gb	8G	•			
12 sled	DDR3 ECC UDIMM/8912MB*2	1	2	VLP UDIMM	1333/ 1600	2R	x8	4Gb	16G	•		•	
12 sled	DDR3 ECC UDIMM/8912MB*3	1	3	VLP UDIMM	1333/ 1600	2R	x8	4Gb	24G	•	•	•	
12 sled	DDR3 ECC UDIMM/8912MB*4	1	4	VLP UDIMM	1333/ 1600	2R	x8	4Gb	32G	•	•	•	•
12 sled	DDR3 ECC UDIMM/8912MB*2 +2048MB*2	1	4	VLP UDIMM	1333/ 1600	2R	x8	4Gb/2Gb	20G	2G	8G	2G	8G
12 sled	DDR3 ECC UDIMM/8912MB*2 +4096MB*2	1	4	VLP UDIMM	1333/ 1600	2R	x8	4Gb/2Gb	24G	4G	8G	4G	8G



NOTE: 1600MHz VLP UDIMM will be available by June 2012.

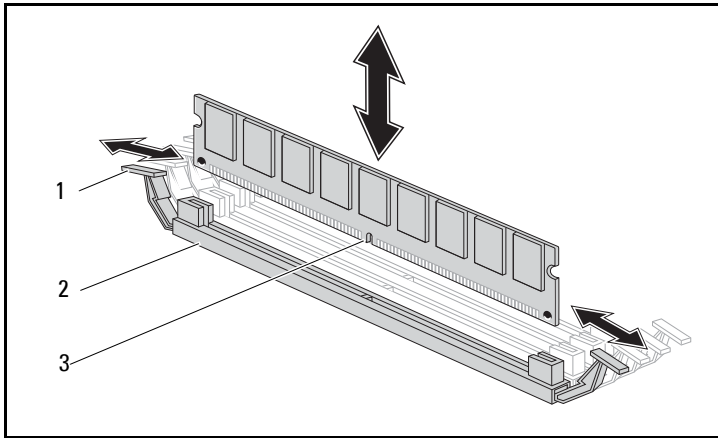
Removing a Memory Module

⚠ WARNING: The memory modules are hot to touch for some time after the system has been powered down. Allow time for the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components on the memory module.

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

- 1 Remove the sled from the system. See "Sled Configuration" on page 61.
- 2 Push the locking latches of the DIMM slot outwards. See Figure 3-5.
- 3 Remove the memory module from the system.

Figure 3-5. Removing and Installing a Memory Module



- 1 locking latch
- 2 DIMM slot
- 3 memory module notch

Replacing a Memory Module



WARNING: The memory modules are hot to touch for some time after the system has been powered down. Allow time for the memory modules to cool before handling them. Handle the memory modules by the card edges and avoid touching the components on the memory module.



CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

The system board has four slots in two channels for the installation of memory modules. See "System Board Jumpers and Connectors" on page 111 for the location of the memory modules.

Follow the instructions given below to install memory modules:

- 1 Align the memory module correctly with the DIMM slot. Note the notch and obstruction in Figure 3-5.
- 2 Press the edge connector of the memory module into the DIMM slot. Press down firmly on the memory module so that the locking latches of the DIMM slot are levered upwards to secure the memory module in place.

Hard Drives

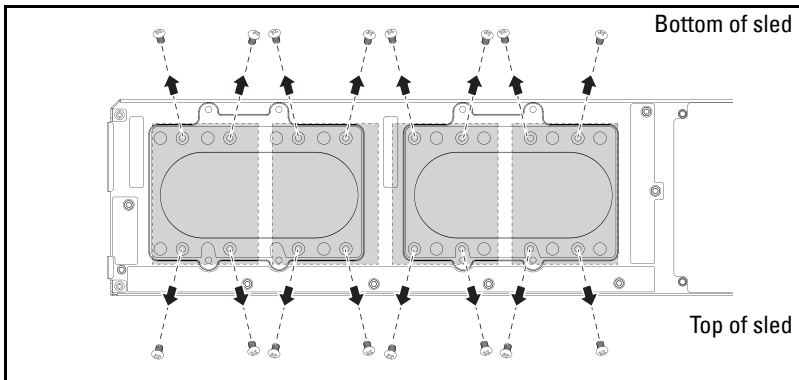
The following are examples showing the installation and removal procedures for the 2.5-inch and the 3.5-inch hard drives.

Removing a 2.5-inch Hard Drive

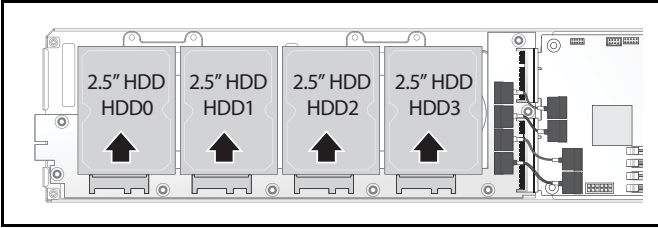
⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

✍ NOTE: Mixing SATA and SAS hard drive on the 2.5 and 3.5-inch hard drive board is not supported.

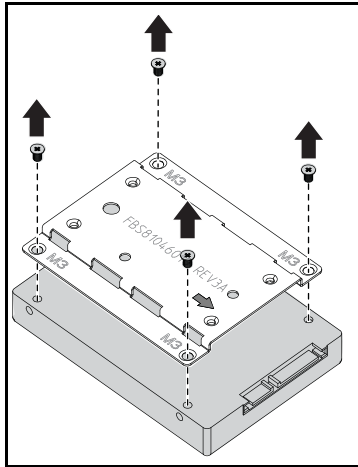
- 1 Remove the sled from the system. See "Sled Configuration" on page 61.
- 2 Remove the hard drive from the sled docking bay.
- 3 Select the hard drive to replace and remove the four hard drive bracket screws securing it underneath the sled.



- 4 Remove the hard drive from the sled docking bay.

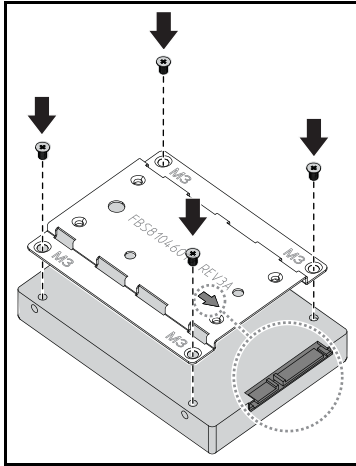



- 5 Remove the four screws from the 2.5-inch hard drive bracket, then detach the hard drive from the bracket.



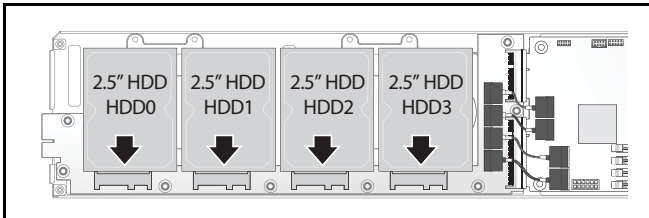
Installing a 2.5-inch Hard Drive

- 1 Align the 2.5-inch hard drive bracket on the new hard drive then replace the four screws.

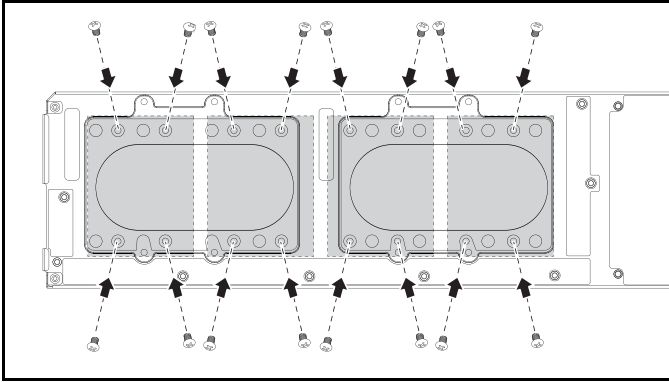


 **NOTE:** The correct orientation of the bracket with the arrow mark pointing towards the hard drive connector.

- 2 Connect the hard drive to the hard drive board in the sled.



- 3 Replace the sled hard drive bracket screws underneath the sled.

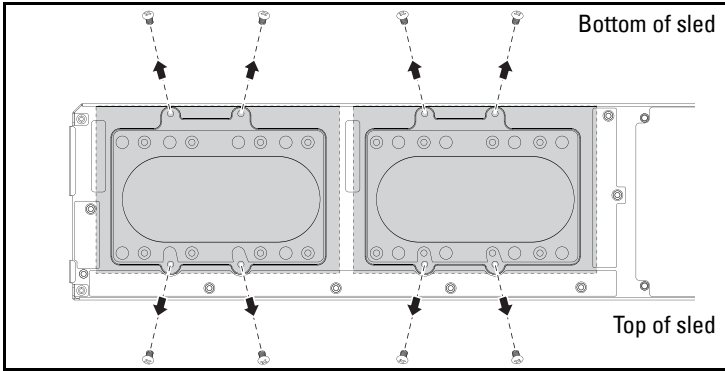


Removing a 3.5-inch Hard Drive

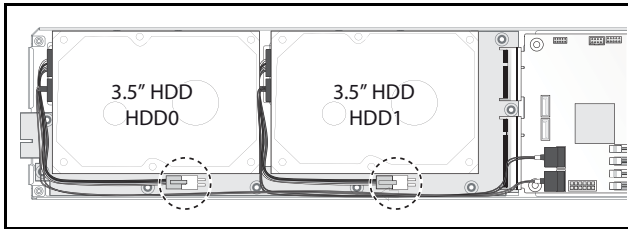
CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

NOTE: Mixing SATA and SAS hard drives on the 2.5 and 3.5-inch hard drive board is not supported.

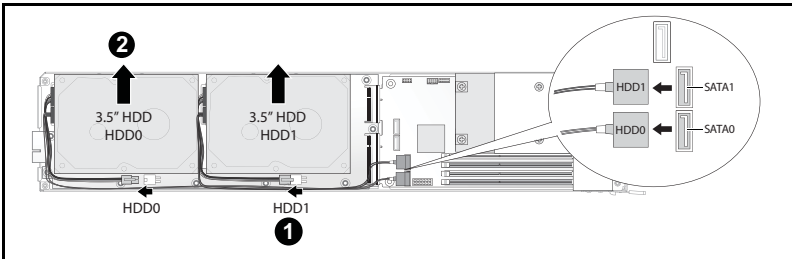
- 1 Remove the sled from the system. See "Sled Configuration" on page 61.
- 2 Remove the hard drive bracket screws from underneath the sled.



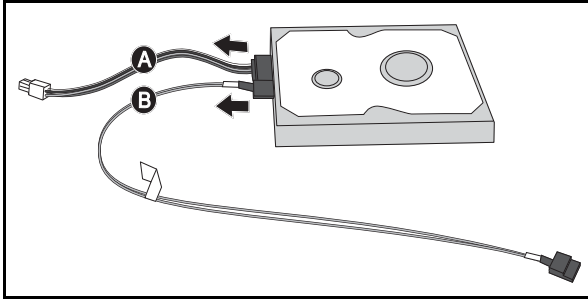
- 3 Remove the hard drive cables from the cable clips.



- 4 Disconnect the hard drive cables from the hard drive board and system board ❶ then lift the hard drive out of the sled ❷.

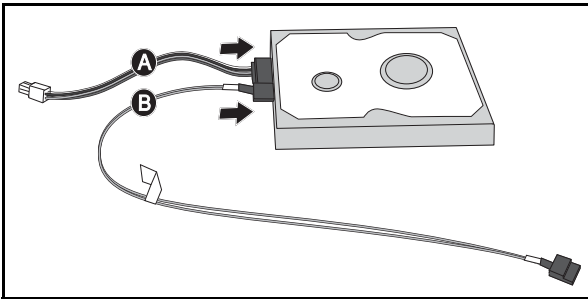


- 5 Disconnect the hard drive cables A and B from the hard drive.

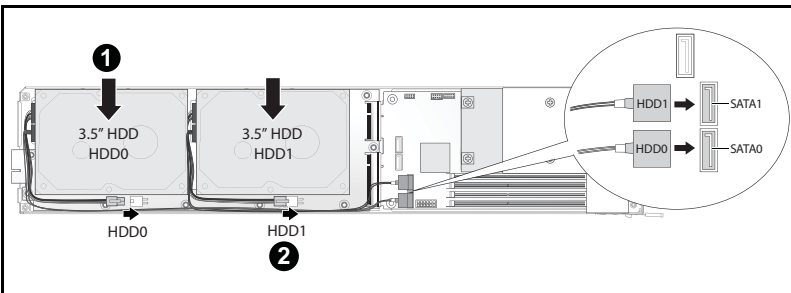


Installing a 3.5-inch Hard Drive

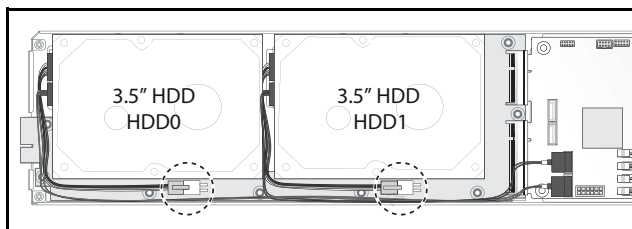
- 1 Connect the hard drive cables A and B to a new hard drive.



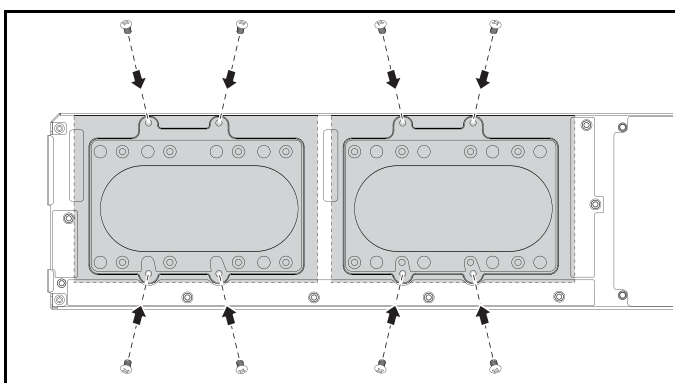
- 2 Place the hard drive in the sled **1** then connect the hard drive cables to the hard drive board and system board **2**.



- 3 Insert the hard drive cables into the cable clips.



- 4 Replace the hard drive bracket screws underneath the sled.

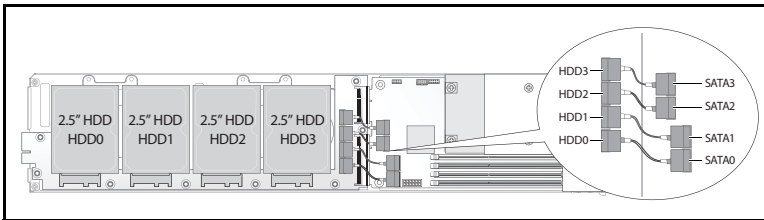


Hard Drive Boards

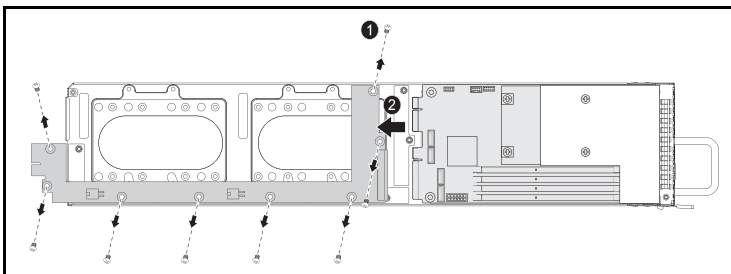
Removing a 2.5-inch Hard Drive Board

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

- 1 Remove the hard disks. See "Hard Drives" on page 69.
- 2 Disconnect the four SATA cables between the hard drive board and the system board.

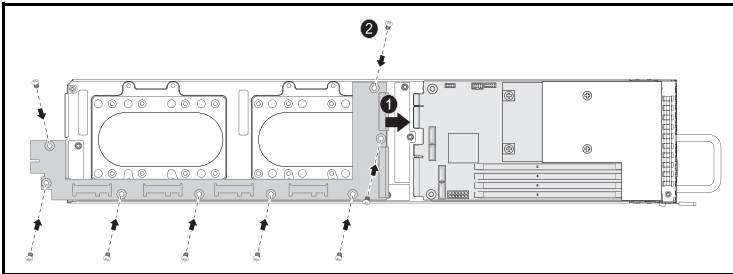


- 3 Remove the eight screws from the hard drive board **1**.
- 4 Disconnect the hard drive board from the system board **2** and lift out of the sled.

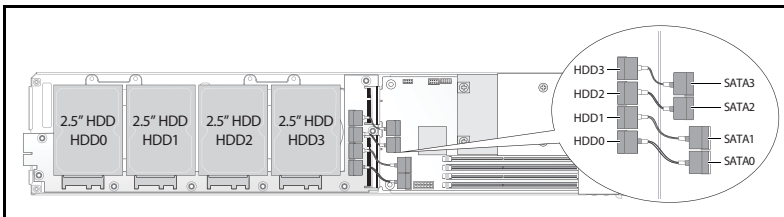


Installing a 2.5-inch Hard Drive Board

- 1 Holding the board by the edges, place the hard drive board into the sled and connect to the system board ❶.
- 2 Replace the eight screws to secure it in place ❷.



- 3 Connect the four SATA cables between the hard drive board and the system board.

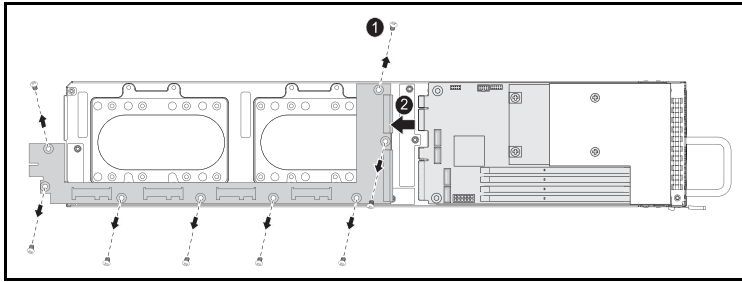


Removing a 3.5-inch Hard Drive Board



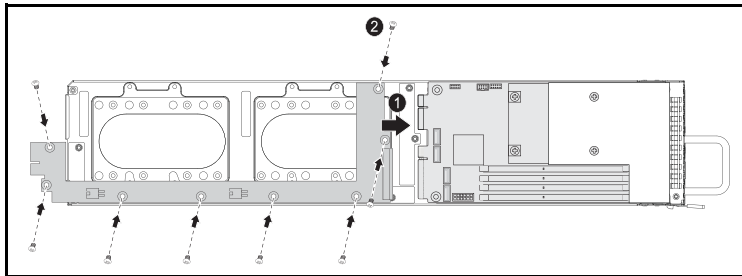
CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

- 1 Remove the hard drives. See "Removing a 3.5-inch Hard Drive" on page 72.
- 2 Remove the eight screws from the hard drive board ❶.
- 3 Disconnect the hard drive board from the system board ❷ and lift out of the sled.



Installing a 3.5-inch Hard Drive Board

- 1 Unpack the new hard drive board.
- 2 Holding the board by the edges, place the hard drive board into the sled and connect to the system board 1.
- 3 Replace the eight screws to secure it in place 2.



Heat Sinks

The following procedure as illustrated with an air shroud only applies to the 12-sled SKU system (Table 3-1). The 8-sled SKU does not require an air shroud.


Table 3-1. Processors Requiring an Air Shroud on C5220 12-Sled SKU

Series	Processor
Intel Xeon E3-1200v2 product family	Intel Xeon E3-1280v2
	Intel Xeon E3-1270v2
	Intel Xeon E3-1240v2
	Intel Xeon E3-1230v2
	Intel Xeon E3-1220v2

Removing a Heat Sink/Shroud

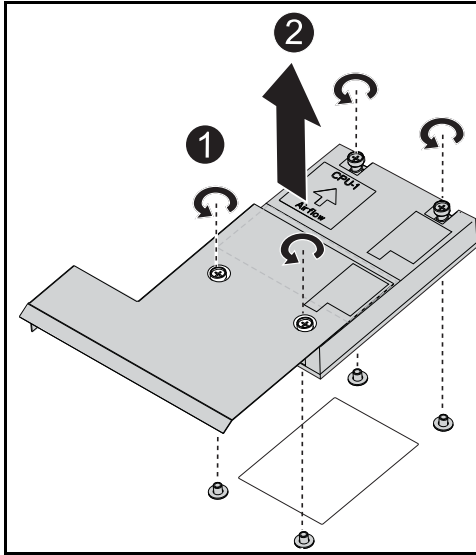


CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

- 1 Remove the required sled from the system. See "Sled Configuration" on page 61.
- 2 Loosen the four captive screws on the heat sink .

- 3 Remove the heat sink/shroud assembly by tilting the backend up to clear the shroud from under the sled flange and then lift upwards 2.

Figure 3-6. Removing a heat sink/shroud



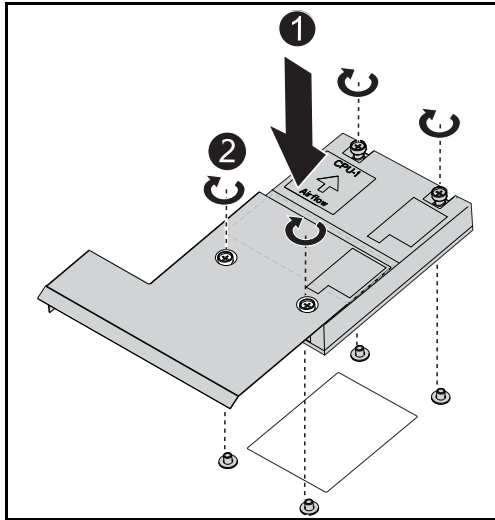
Installing a Heat Sink/Shroud

- 1 Use a lint-free cloth, remove thermal grease from the heat sink.
- 2 Apply new thermal grease evenly to the center of the top new processor.

△ CAUTION: Using excess thermal grease can cause grease to contact the processor shield, which can cause contamination of the processor socket.

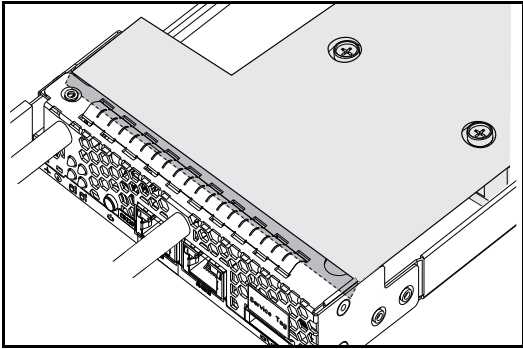
- 3 Position heat sink/shroud assembly at a slight tilt to insure shroud is inserted below the sled flange (see final installed view), then lower the assembly onto the four supporting posts on the motherboard **1**.
- 4 Align the four screws of the heatsink to the four threaded posts and tighten the four screws **2**.

Figure 3-7. Installing a heat sink/shroud



Final installed view shown in the following illustration.

Figure 3-8. Final installed view of a heat sink/shroud



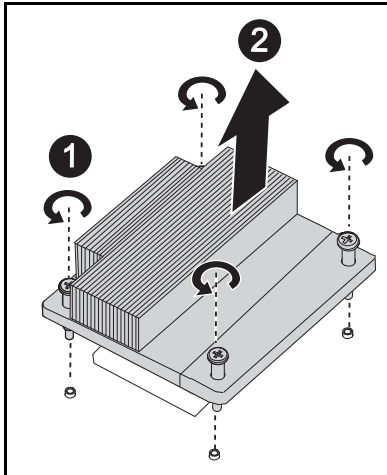
The following procedure as illustrated with an air shroud only applies to the 12-sled SKU system. The 8-sled SKU does not require an air shroud.

Removing a Heat Sink

△ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

- 1 Remove the required sled from the system. See "Sled Configuration" on page 61.
- 2 Loosen the four captive screws on the heat sink ①.
- 3 Remove the heat sink ②.

Figure 3-9. Removing a heat sink



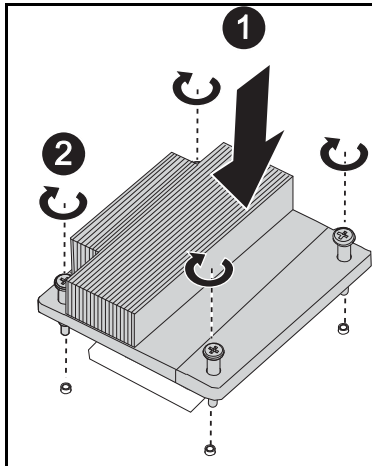
Installing a Heat Sink

- 1 Use a lint-free cloth, remove thermal grease from the heatsink.
- 2 Apply new thermal grease evenly to the center of the top new processor.

CAUTION: Using excess thermal grease can cause grease to contact the processor shield, which can cause contamination of the processor socket.

- 3 Place the new heatsink onto the system board ①.
- 4 Tighten the four captive screws on the heatsink ②.

Figure 3-10. Installing a heat sink

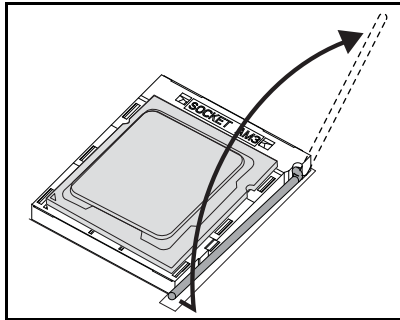


Processors

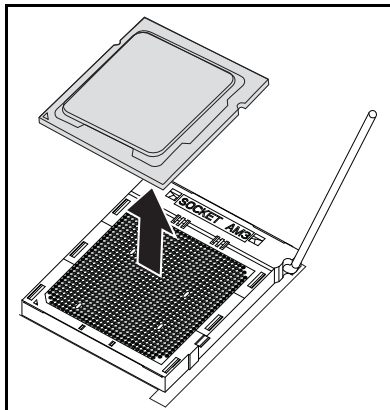
Removing a Processor

△ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

- 1 Remove the heatsink. See "Removing a Heat Sink/Shroud" on page 79.
- 2 Release the locking latch.



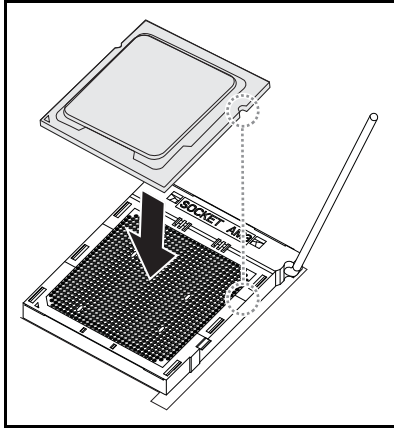
- 3 Remove the processor.



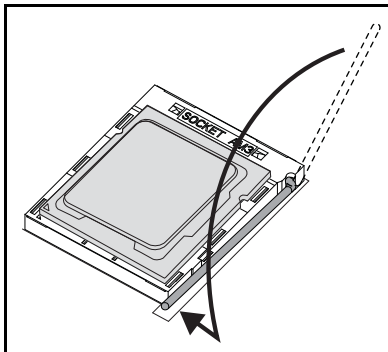
Installing a Processor

 **CAUTION:** Positioning the processor incorrectly can permanently damage the system board or the processor. Be careful not to bend the pins in the socket.

- 1 Place the new processor into the socket.



- 2 Close the locking latch.



Mezzanine Cards

Replacing a Mezzanine Card (Optional)

A mezzanine card is an optional component and can only be installed in an 8-sled system board.



CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

System components and electronic circuit boards can be damaged by discharges of static electricity. Working on systems that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damage to your system or injury to yourself.

- If possible, wear a grounded wrist strap when you are working inside the system chassis. Alternatively, discharge any static electricity by touching the bare metal chassis of the system chassis, or the bare metal body of any other grounded appliance.
- Hold electronic system boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the system board.
- Leave all components inside the static-proof packaging until you are ready to use the component for the installation.

Installing a 1 GbE and 10 GbE Mezzanine Card

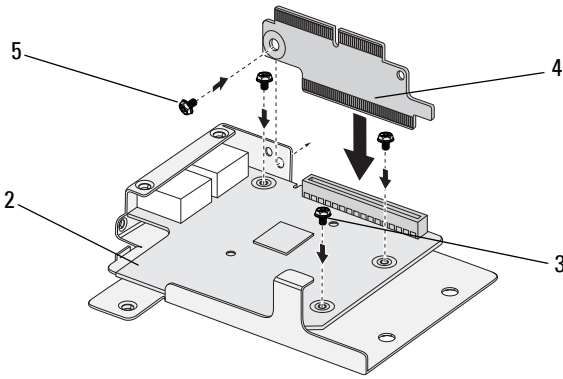
Prior to installing a mezzanine card, remove the sled board from the chassis, see "Removing a Sled" on page 62.

- 1 Remove the mezzanine card from its static-proof packing.
- 2 With the PCIe connector facing up, place the mezzanine card in the mezzanine bracket.
- 3 Secure the card on the bracket with the provided screws.
- 4 Insert the linking board into the mezzanine card.
- 5 Secure the linking board to the bracket with the provided screw.



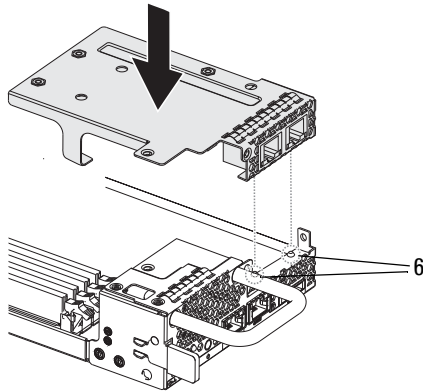
NOTE: 10GbE Mezzanine cards require BIOS 1.0.12 or 2.0.x.


Figure 3-11. Installing a Linking Board in a Mezzanine Card



- 6 Flip the mezzanine assembly over and align over the two guide pins on the sled, see following image.

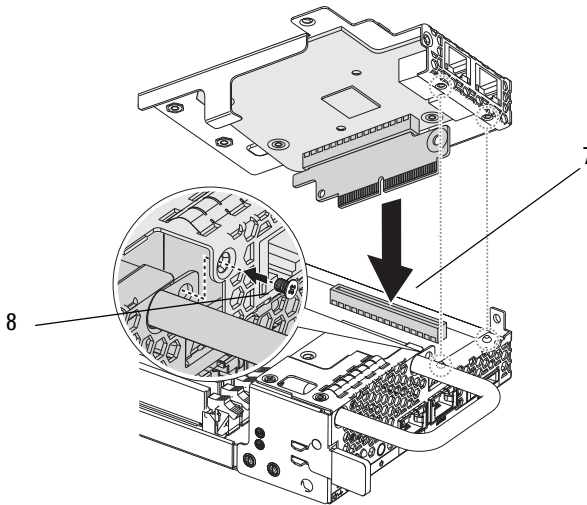
Figure 3-12. Installing a Mezzanine Assembly in a Sled



 **NOTE:** The I/O screw bracket tab must be behind the mezzanine bracket.

- 7 Align the linking board over the sled and insert as shown in the following image.

Figure 3-13. Securing a Mezzanine Assembly



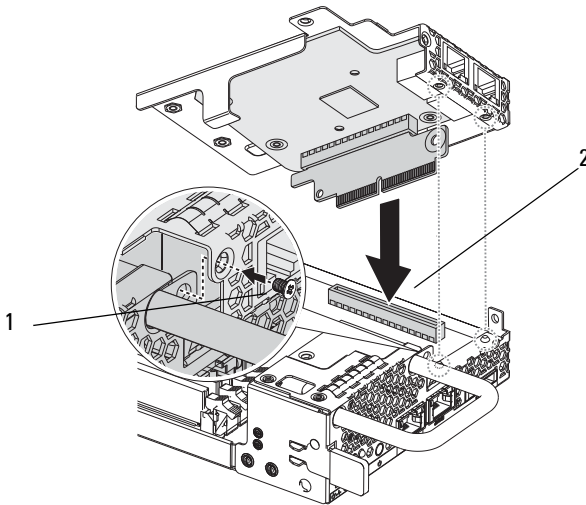
- 8 Secure the assembly to the sled assembly with the provided screw.

Removing a 1 GbE and 10 GbE Mezzanine Card

Prior to removing a mezzanine card, you must first remove the sled board from the chassis, see "Removing a Sled" on page 62.

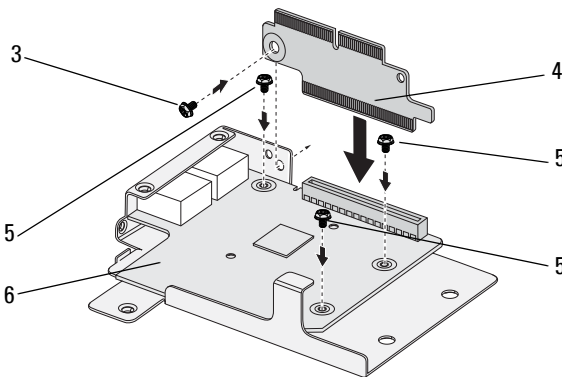
- 1 Remove the single screw to release the assembly.
- 2 Remove the assembly from the sled.

Figure 3-14. Removing a 1/10 GbE Mezzanine Assembly



- 3 Flip the assembly over and remove the provided screw securing the linking board.
- 4 Remove the linking board from the mezzanine card.
- 5 Remove the provided screws securing the card.

Figure 3-15. Removing a 1/10 GbE Mezzanine Card



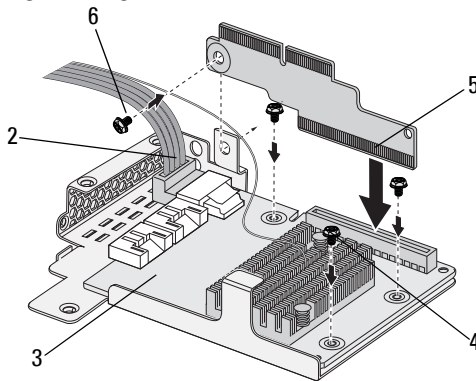
- 6 Remove the card from the assembly.

Installing a SAS Mezzanine Card with 2.5" HDD

Prior to installing a mezzanine card, you must first remove the sled board from the chassis, see "Removing a Sled" on page 62.

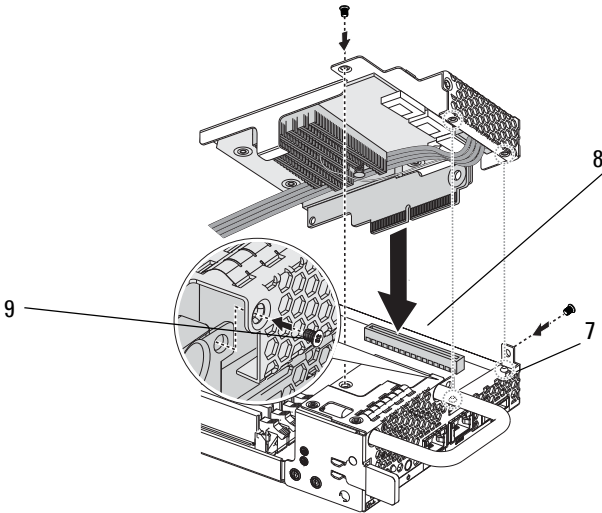
- 1 Remove the mezzanine card from its static-proof packing.
- 2 With the PCIe connector facing up, attach the 2.5-inch SAS cable to the SAS mezzanine card.
- 3 Place the mezzanine card in the mezzanine bracket.
- 4 Secure the card on the bracket with the provided screws.
- 5 Insert the linking board into the mezzanine card as shown in the following image.
- 6 Secure the linking board to the bracket with the provided screw.

Figure 3-16. Inserting a Linking Board in a SAS Mezzanine Card



- 7 Flip the mezzanine assembly over and align over the two guide pins on the sled, see following image.

Figure 3-17. Installing a SAS Mezzanine Assembly in a Sled

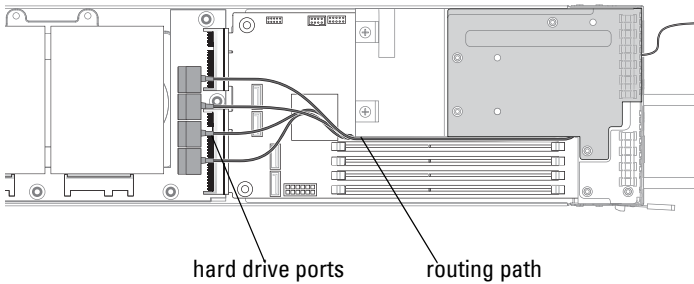


- NOTE:** The I/O screw bracket tab must be behind the mezzanine bracket.
- 8** Align the linking board over the sled and insert.
 - 9** Secure the assembly to the sled with the three screws.

Routing the 2.5" SAS Mezzanine Cables

After installing a mezzanine card, you need to route the SAS cabling as depicted in the following figure.

Figure 3-18. SAS Mezzanine Cable Routing

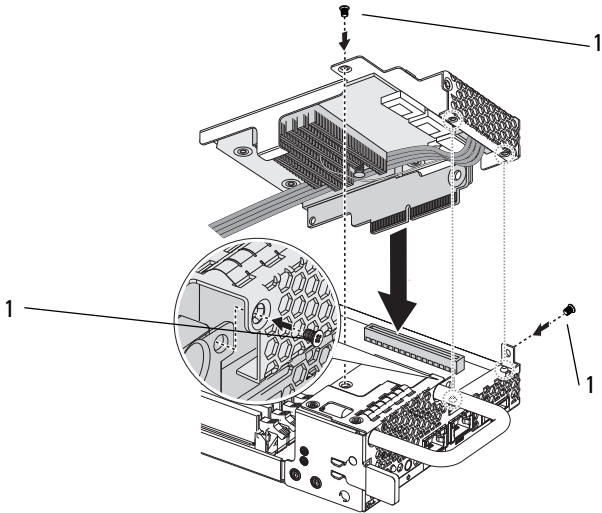


Removing a SAS Mezzanine Card with 2.5" HDD

Prior to removing a mezzanine card, you must first remove the sled board from the chassis, see "Removing a Sled" on page 62.

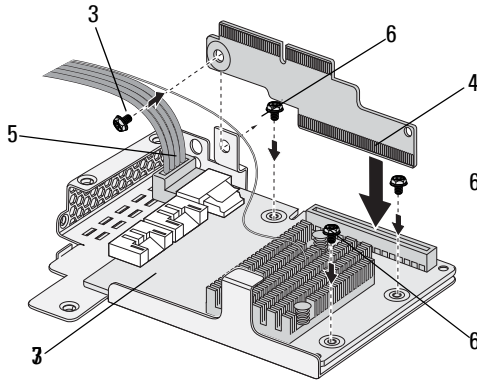
- 1 Remove the screws securing the assembly.
- 2 Remove the assembly from the sled.

Figure 3-19. Removing a SAS Mezzanine Assembly in a Sled



- 3** Flip the assembly over and remove the provided screw securing the linking board.
- 4** Remove the linking board from the mezzanine card.
- 5** Disconnect the SAS cable from the card.
- 6** Remove the provided screws securing the card.
- 7** Remove the mezzanine card from the assembly.

Figure 3-20. Removing a SAS Mezzanine Card

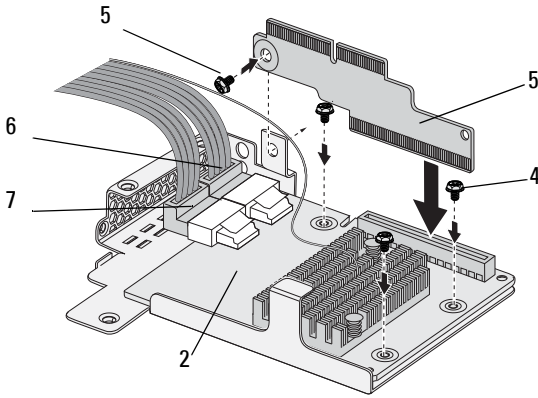


Installing a SAS Mezzanine Card with 3.5" HDD

Prior to installing a mezzanine card, you must first remove the sled board from the chassis, see "Removing a Sled" on page 62.

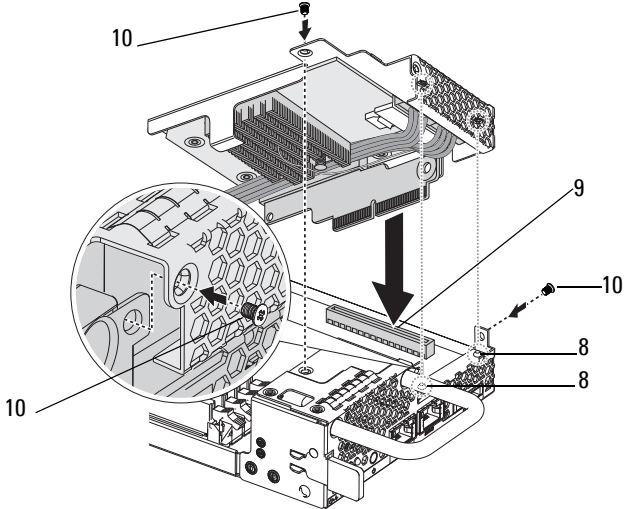
- 1** Remove the mezzanine card from its static-proof packing.
- 2** Place the mezzanine card in the mezzanine bracket.
- 3** Secure the card on the bracket with the provided screws.
- 4** Insert the linking board into the mezzanine card as shown in the following image.
- 5** Secure the linking board to the bracket with the provided screw.
- 6** With the PCIe connector facing up, attach the SATA cable 4 to the SAS mezzanine card.
- 7** With the PCIe connector facing up, attach the SATA cable 5 to the SAS mezzanine card.

Figure 3-21. Inserting a Linking Board on a 3.5" SAS Mezzanine Card



- 8 Flip the mezzanine assembly over and align over the two guide pins on the sled, see following image.
- 9 Align the linking board over the sled and insert.
- 10 Secure the assembly to the sled with the three screws.

Figure 3-22. Installing a SAS Mezzanine Assembly in a Sled

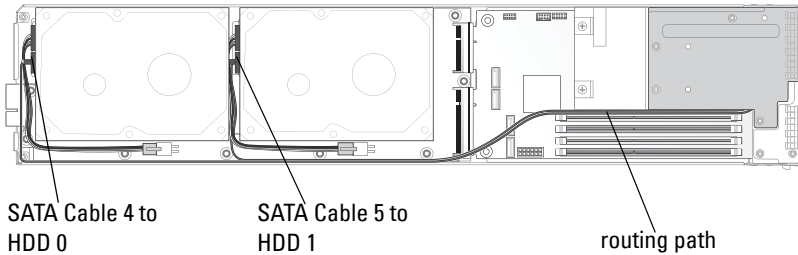


NOTE: The I/O screw bracket tab must be behind the mezzanine bracket.

Routing the 3.5" SAS Mezzanine Cables

After installing a mezzanine card, you need to route the SAS cabling as depicted in the following figure.

Figure 3-23. SAS Mezzanine Cable Routing



Removing a SAS Mezzanine Card with 3.5" HDD

Prior to removing a mezzanine card, you must first remove the sled board from the chassis, see "Removing a Sled" on page 62.

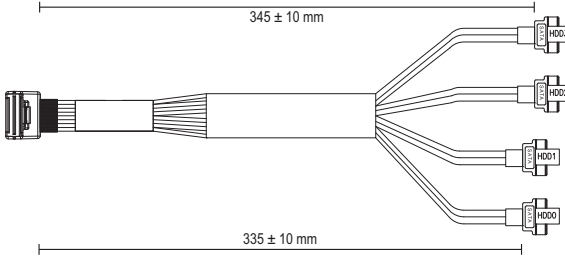
- 1 Remove the screws securing the assembly.
- 2 Remove the assembly from the sled.
- 3 Flip the assembly over and remove the provided screw securing the linking board.
- 4 Remove the linking board from the mezzanine card.
- 5 Disconnect the SAS cable from the card.
- 6 Remove the provided screws securing the card.
- 7 Remove the mezzanine card from the assembly.

SAS Cable Identification

The following is an outline of the SAS cable types used in the C5220 system for the mezzanine function.

2.5" SAS Cable

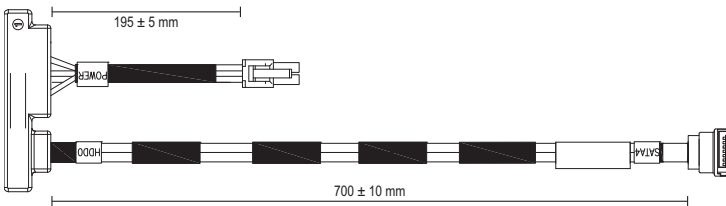
Figure 3-24. 2.5" SAS Cable



3.5" SAS Cable 1

The 3.5" SAS cable 1 is connected to the HDD0 connector.

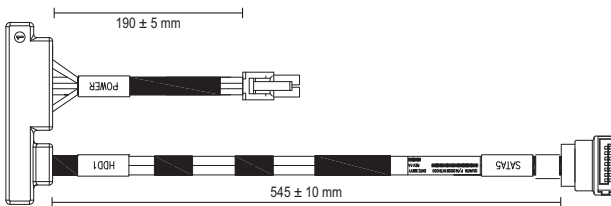
Figure 3-25. 3.5" SAS Cable 1 (SAS to HDD0)



3.5" SAS Cable 2

The 3.5" SAS cable 2 is connected to the HDD1 connector.

Figure 3-26. 3.5" SAS Cable 2 (SAS to HDD1)



Troubleshooting

Troubleshooting Sequence

Server Boot Issues

System Does Not Boot After Initial Installation

Power Connector Not Plugged In

Memory Issues

Monitor Issues

Power Supply and Chassis Issues

Cable Issues

Electrical Short or Overload

Defective Components

System Does Not Boot After Configuration Changes

Hardware Changes

Software Changes

BIOS Changes

Viewing System Event Logs for Investigation

Installation Problems

Troubleshooting External Connections

System Does Not Boot After Initial Installation

Power Connector Not Plugged In

If the power supply cable is not plugged into the system board processor power connector, the system cannot boot up, even though chassis front panel LEDs and the fan may be operational. Verify that the power connections are good.

Memory Issues

If you have installed incompatible memory modules, the system may not boot. Verify the memory you've installed has been tested with your system board. If the installed memory is compatible, remove and reinstall the memory modules.

Defective memory modules may cause boot errors. To isolate a specific memory module as defective, boot the system with just one memory module installed at a time.

Monitor Issues

Monitor configurations can cause boot failure. Run through the following checklist to verify monitor operation:

- Ensure the monitor is plugged in and turned on.
- Ensure all cables are connected properly between the monitor and the system.
- Check that the brightness and contrast controls on the monitor are not too low.

Most monitors employ indicator LEDs showing status. Refer to the monitor's documentation to confirm operation. If the problem still persists, test or replace the monitor on a different AC outlet or system.

Power Supply and Chassis Issues

- Verify if the chassis and power supply are compatible with the processor model.

Table 4-1. Supported Processor List for 8-sled and 12-sled SKU on PowerEdge C5220

	Intel Processors	8-Sled SKU	12-Sled SKU
Intel Xeon E3-1200 Product Family	Intel Xeon E3-1280	Y	
	Intel Xeon E3-1270	Y	
	Intel Xeon E3-1240	Y	
	Intel Xeon E3-1230	Y	
	Intel Xeon E3-1220	Y	
	Intel Xeon E3-1260L	Y	Y
	Intel Xeon E3-1220L	Y	Y

Table 4-1. Supported Processor List for 8-sled and 12-sled SKU on PowerEdge C5220

	Intel Processors	8-Sled SKU	12-Sled SKU
Intel Core & Pentium Processor Family	Intel Core i3-2120	Y	Y
	Intel Pentium 350	Y	Y
Intel Xeon E3-1200v2 Product Family	Intel Xeon E3-1280v2	Y	Y
	Intel Xeon E3-1270v2	Y	Y
	Intel Xeon E3-1265Lv2	Y	Y
	Intel Xeon E3-1240v2	Y	Y
	Intel Xeon E3-1230v2	Y	Y
	Intel Xeon E3-1220v2	Y	Y
	Intel Xeon E3-1220Lv2	Y	Y



NOTE: Please refer to page 3 Important Information about Intel E3-1200v2 series processor's support.



NOTE: Intel E3-1220Lv2 will be available in June 2012.



NOTE: Intel Pentium 350 processor is supported by BIOS version 1.0.12 or 2.0.x.

- Ensure all power cables and connectors are firmly connected to the power supply and the AC outlet.
- If the PDU or the AC outlet has an on/off switch, make sure that it is on and verify that the outlet is supplying current.
- Check for foreign objects inside the chassis such as screws that can short circuit connections.

Cable Issues

Ensure that all cable connections, both internal and external, are attached correctly and securely.

Electrical Short or Overload

Remove non-essential items such as extra controller cards or IDE/ATAPI devices to check for shorts and over-loads. If the system boots correctly, there may be a short or overload associated with one of the components. Replace each of the non-essential items one at a time to isolate which one is causing the problem.

If the problem occurs even after removing the non-essential components, the problem has to be with the system board, power supply, memory, or processor.

Defective Components

Defective components, especially processor and memory, can cause system boot issues.

- Swap the memory modules with known good memory. Verify correct operation of the suspected memory in a known working system.
- Swap the processor with a known good processor. Verify correct operation of the suspected processor in a known working system.

System Does Not Boot After Configuration Changes

Hardware Changes

If the system does not boot after making changes to hardware or adding new components, verify that the component installed is compatible with the system.

Software Changes

If you recently installed new software or new device drivers, try booting into Safe Mode and uninstall the new software or driver.

If you can now boot normally, there may be a compatibility issue between the new software or driver and some component in your system. Contact the software manufacturer for assistance.

BIOS Changes

Changes to some advanced BIOS settings (such as those found in the "Advanced Menu" on page 24) can cause boot issues. Changes to Advanced BIOS settings should only be made by experienced users.

If the BIOS Setup Utility is accessible by pressing F2 during boot, reset the BIOS to factory defaults by pressing F3. Save and exit the BIOS Setup (see "Start Menu" on page 17 for more details).

If you cannot access the BIOS Setup Utility, clear the CMOS by performing the following steps:

- 1 Turn off the system. Do not unplug the power cord.
- 2 Open the system.
- 3 Move jumper (JP5) from the default operation position, covering pins 1 and 2, to the reset / clear CMOS, covering pins 2 and 3.
- 4 Remove AC power.
- 5 Wait 5 seconds.
- 6 Move the jumper back to default position, covering pins 1 and 2.
- 7 Replace the chassis cover and turn on the system.

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

Viewing System Event Logs for Investigation

If the front panel LED blinks for 30 to 60 seconds upon applying AC power to the power supply, the baseboard management controller (BMC) is initializing. If not, then the BMC is not functioning. If the BMC is working, try to gather system event log (SEL) information for investigation. For more information, see "View System Event Log" on page 48.

Installation Problems

Perform the following checks if you are troubleshooting an installation problem:

- Check all cable and power connections (including all rack cable connections).
- Unplug the power cord, and wait one minute. Then reconnect the power cord and try again.
- If the network is reporting an error, see if there is enough memory installed and disk space available.

- Remove all peripherals, one at a time, and try to turn on the system. If after removing an option the system works, you may find that it is a problem with the option or a configuration problem between the peripheral and the system. Contact the option vendor for assistance.
- If the system does not turn on, check the LED display. If the power LED is not on, you may not be receiving AC power. Check the AC power cord to make sure that it is securely connected.

Troubleshooting External Connections

Loose or improperly connected cables are the most likely source of problems for the system, monitor, and other peripherals (such as a printer, keyboard, mouse, or other external device). Ensure that all external cables are securely attached to the external connectors on your system. See the system's hardware owner's manual for the back panel connectors on your system.

Update Utilities


This chapter provides information about the update utilities.

BMC Firmware Update

The BMC (Baseboard Management Controller) firmware can be updated using various ways, including of remotely or locally, and can be achieved by IPMI command or by utilities. The update should be taken only if necessary.

Firmware Recovery Utility-SOCFLASH Utility

For BMC recovery, the utility SOCFLASH is used. If irregularities occur, SOCFLASH can be also used as the regular BMC Update with or without erasing user configuration data.

 **NOTE:** All files and firmware are provided with each release package.

The format for SOCFLASH version 1.00.02 or later is:

```
socflash [operand]
```

operand list

- if=the name of the update file
- of=the name of the backup file

- cs= to set the chip select
AST2050: 2; default: get from SCU trapping.
- flashtype=the flash chip type
2:SPI
- skip=type the skip size in bytes at the start of input file (default=0)
- offset = type the offset in bytes at the start of the flash (default=0)
- count= type the size in bytes copy to the flash (default=the size of the flash)
- option=f|2|c
 - skip the comparison of flash data and force to update
 - use chip erase instead of sector erase
 - reset scratch
 - two flash update support

AST2050: two SPI solution: 1st SPI is on CS2; 2nd SPI is on CS0

Examples:

Flash All without Saving user configuration Data:

```
c:\socflash \dosflash>socflash cs=2 option=fc
if=firm.bin
```

Instructions for Linux SOCFLASH linux.sh:

Change directory to ./socflash

Execute sh ./linux.sh on Local System with Linux OS.

```
[root@localhost ~ socflash]# ./linux.sh
```

After the procedure is complete, wait 90 seconds for BMC to reset.

Instructions for DOS SOCFLASH dos.bat:

Change directory to .\socflash

Execute dos.bat on Local System with DOS.

```
c:\socflash\> dos.bat
```

After the procedure is complete, wait 90 seconds for BMC to reset.

Instructions for Windows 2008 64bit win.bat:

Change directory to `.\socflash`

Execute `win.bat` on Local System with Windows OS.

After flashing is complete, wait 90 seconds for BMC to reset.

Updates Through TFTP/HTTP/FTP

Updating Through TFTP/HTTP/FTP

- 1 Get Reservation ID.

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x30  
0x01
```

```
> 01
```

- 2 Enable Remote Update.

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x30  
0x02 0x01 0x10 0x01 0x00 0x00 0x00 0xff
```

```
>10 01 00 01 01
```

- 3 Get Protocol.

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x30  
0x02 0x01 0x10 0x02 0x00 0x00 0x00 0xff
```

```
>10 02 00 01 07
```

- 4 Set URL.

HTTP Server Update

(Ex: `http://192.168.1.111/s2gv112.bin`)

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x30  
0x03 0x01 0x10 0x03 0x00 0x00 0x00 0x01 0xFF 0x68 0x74 0x74 0x70  
0x3A 0x2F 0x2F 0x31 0x39 0x32 0x2E 0x31 0x36 0x38 0x2E 0x31 0x2E  
0x31 0x31 0x31 0x2F 0x73 0x32 0x67 0x76 0x31 0x31 0x32 0x2E 0x62  
0x69 0x6E
```

ASCII code for URL - "`http://192.168.1.111/s2gv112.bin`"

Response: 21 written data length

FTP Server Update

(Ex: ftp://user:user@192.168.1.111/s2gv112.bin)

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x30
0x03 0x01 0x10 0x03 0x00 0x00 0x00 0x01 0xFF 0x66 0x74 0x70 0x3A
0x2F 0x2F 0x75 0x73 0x65 0x72 0x3A 0x75 0x73 0x65 0x72 0x40 0x31
0x39 0x32 0x2E 0x31 0x36 0x38 0x2E 0x31 0x2E 0x31 0x31 0x31 0x2F
0x73 0x32 0x67 0x76 0x31 0x31 0x32 0x2E 0x62 0x69 0x6E
```

ASCII code for URL - "ftp://user:user@192.168.1.111/s2gv112.bin"

Response: 2a written data length

TFTP Server Update

(Ex: tftp://192.168.1.111/s2gv112.bin)

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x30
0x03 0x01 0x10 0x03 0x00 0x00 0x00 0x01 0xFF 0x74 0x66 0x74 0x70
0x3A 0x2F 0x2F 0x31 0x39 0x32 0x2E 0x31 0x36 0x38 0x2E 0x31 0x2E
0x31 0x31 0x31 0x2F 0x73 0x32 0x67 0x76 0x31 0x31 0x32 0x2E 0x62
0x69 0x6E
```

ASCII code for URL - "tftp://192.168.1.111/s2gv112.bin"

Response: 21 written data length

Updating BMC Firmware Through Firmware Command

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x08
0x01 0x01 0x80 0x00
```

Response: 34 firmware update task ID

(force update, config)

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x08
0x01 0x01 0x80 0x01
```

Response: 34 firmware update task ID

(normal update, no config)

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x08
0x01 0x01 0x00 0x00
```

Response: 34 firmware update task ID

(normal update, config)

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x08  
0x01 0x01 0x00 0x01
```

Response: 34 firmware update task ID

Get Firmware Status.

```
ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x08 0x02  
<Task ID (ex: 0x34)>
```

Response: Status Code as followed:

0x00: Transmitting Image

0x01: Validating Image

0x02: Programming

0x03: Ready to Accept Image

0x04: USB Unit Stage

0x05: Connecting to server

0x80: General Error

0x81: Cannot establish connection

0x82: Path not found

0x83: Transmission Abort

0x84: Checksum Error

0x85: Incorrect Platform

0x86: Allocate memory failed

0x87: Virtual media detach failed

0xFF: Completed

Restart firmware while status code is 0xFF

```
>ipmitool -H <BMC IP Address> -I lanplus -U root -P root raw 0x06  
0x02
```

BIOS System Update

This section describes the use of the AMI BIOS Flash Utility for updating system BIOS.

Firmware Update Utility-AMI Flash Utility

AMI Flash Utility can update BIOS through local interface.

- 1 Boot into DOS/Microsoft Windows.
- 2 Execute C5220BIOS(version).exe.



NOTE: DOS does not support long file names. To use a file under DOS mode, rename it to fit the required file structure before executing the file.

BIOS Recovery Mode

The BIOS has an embedded recovery technique in the 'boot block'. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. The routine is called when the 'system block' of the BIOS is empty or corrupt. The restore routine when called accesses the USB drive looking for a file named 5220BIOS.ROM.

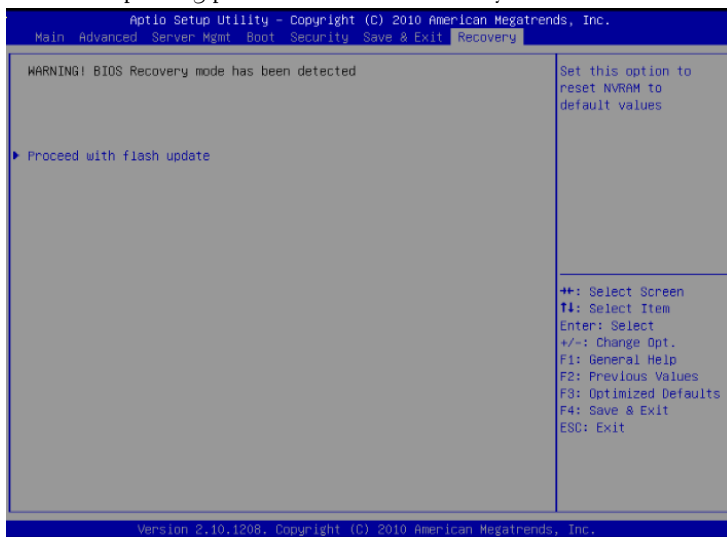
This is the reason the USB drive light comes on and the drive appears to be in use. If the file (5220BIOS.ROM) is found it is loaded into the 'system block' of the BIOS to replace the corrupted information.

To restore your BIOS, copy the most recent version of your system board's BIOS file to a USB key and rename it 5220BIOS.ROM.

BIOS Recovery Flow

- 1 Rename the ROM file to 5220BIOS.ROM and copy to the USB device.
- 2 Short the recovery jumper (JP11).
- 3 Power on the system.

The flash updating process starts automatically.



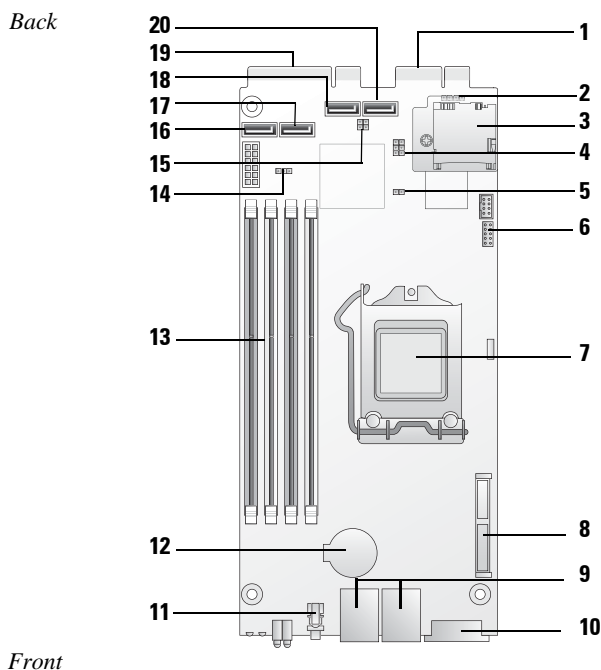
- 4 Remove the recovery jumper (JP11).

Jumpers and Connectors

System Board Jumpers and Connectors

Figure 5-1 displays the system components on the system board.

Figure 5-1. System Board Diagram



1	Hard drive board connectors (PCI-e x4)	2	BMC disable header (JP1)
3	SDHC module (System supports one SDHC card)	4	BIOS/BMC COM port switch header (JP3/JP4)
5	ME recovery mode header (JP10)	6	COM port connector (J9)
7	CPU socket	8	Mezzanine card connector (8-sled only)
9	NIC1/NIC2 RJ45 connector	10	VGA/USB connector
11	Power button	12	Battery socket
13	DIMM slots	14	NVRAM clear setting (JP5)
15	BIOS recovery mode jumper (JP11)	16	SATA connectors (hard drive 0)
17	SATA connectors (hard drive 1)	18	SATA connectors (hard drive 2)
19	Hard drive board connectors (PCI-e x8)	20	SATA connectors (hard drive 3)

Table 5-1. System Board Jumper Settings

Jumper	Description	Default Setting	Function
JP1	BMC disable header (JP1)	Open	Debug only Do not install jumper
JP3/4	BIOS/BMC COM port jumper	1&2: BIOS COM	1&2: BIOS COM port header (Default) 2&3: BMC debug header
JP5	NVRAM clear	1&2: Hold	1&2: Hold (Default) 2&3: Clear NVRAM & password
JP10	ME recovery mode	Open	Debug only Do not install jumper
JP11	BIOS recovery jumper	Open	1-2: BIOS recovery mode

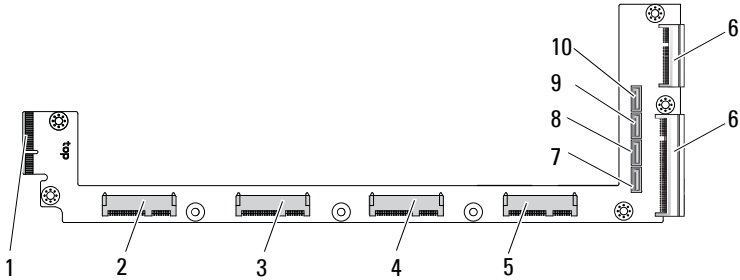


NOTE: BIOS default settings are loaded after an NVRAM clear procedure. All user defined settings are lost.

2.5-inch Hard Drive Board Connectors

Figure 5-2 shows the connectors on the 2.5-inch hard drive board.

Figure 5-2. 2.5-inch Hard Drive Board

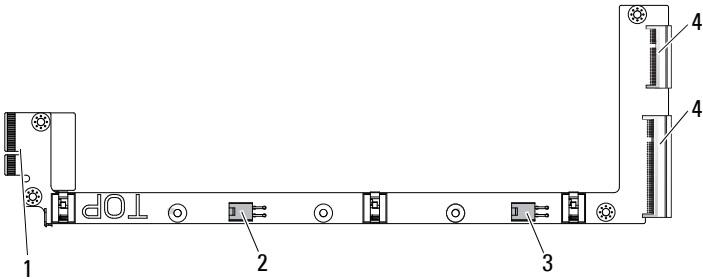


- | | | | |
|---|-----------------------------|----|-----------------------------|
| 1 | backplane connector | 2 | hard drive 0 connector |
| 3 | hard drive 1 connector | 4 | hard drive 2 connector |
| 5 | hard drive 3 connector | 6 | two board-edge connectors |
| 7 | hard drive 0 SATA connector | 8 | hard drive 1 SATA connector |
| 9 | hard drive 2 SATA connector | 10 | hard drive 3 SATA connector |

3.5-inch Hard Drive Board Connectors

Figure 5-3 shows connectors on the 3.5-inch hard drive board.

Figure 5-3. 3.5-inch Hard Drive Board



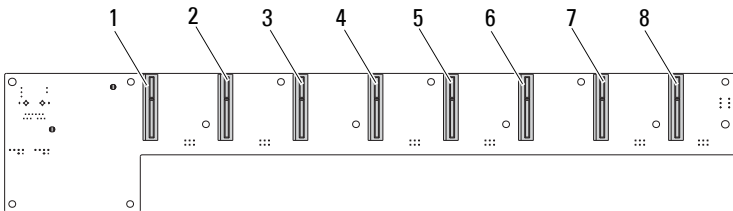
- 1 backplane connector
- 2 hard drive 0 power connector
- 3 hard drive 1 power connector
- 4 two board-edge connectors

Backplane Connectors

8-Sled Backplane Front Connectors

Figure 5-4 shows the 8-sled backplane front connectors.

Figure 5-4. 8-Sled Backplane Front Connectors

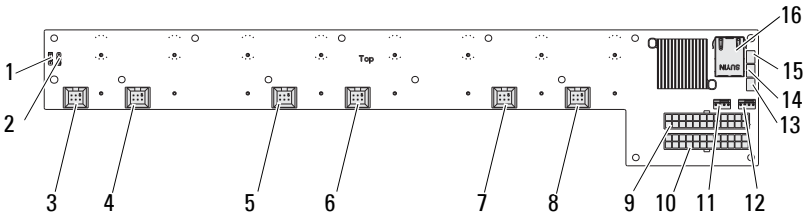


- 1 sled 1 connector
- 2 sled 2 connector
- 3 sled 3 connector
- 4 sled 4 connector
- 5 sled 5 connector
- 6 sled 6 connector
- 7 sled 7 connector
- 8 sled 8 connector

8-Sled Backplane Back Connectors

Figure 5-5 shows the connectors on the back of the backplane.

Figure 5-5. 8-Sled SKU Backplane Back Connectors



- 1 MD2 Jumper
- 2 MD1 Jumper
- 3 fan connector 1
- 4 fan connector 4
- 5 fan connector 2
- 6 fan connector 5
- 7 fan connector 3
- 8 fan connector 6
- 9 PSU 1 connector
- 10 PSU 2 connector
- 11 fan connector 7
- 12 fan connector 8
- 13 PMBus 2 connector
- 14 PMBus 1 connector
- 15 sideband connector
- 16 LAN connector

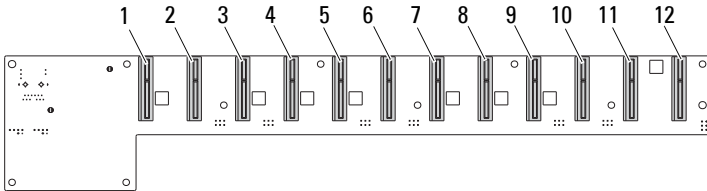
Table 5-2. 8-Sled Backplane Jumper Positions

MD2	MD1	Mode
0	1	Normal
1	1	JTAG
1	0	Boot

12-Sled Backplane Front Connectors

Figure 5-6 shows the 12-sled backplane front connectors.

Figure 5-6. 12-Sled Backplane Front Connectors

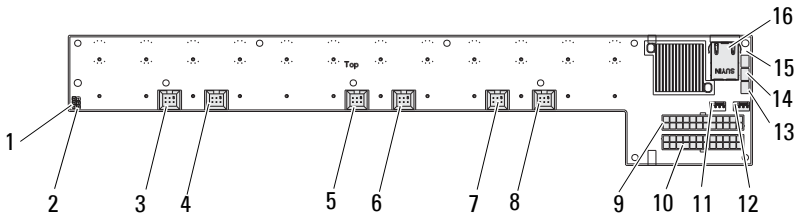


- | | | | |
|----|-------------------|----|-------------------|
| 1 | sled 1 connector | 2 | sled 2 connector |
| 3 | sled 3 connector | 4 | sled 4 connector |
| 5 | sled 5 connector | 6 | sled 6 connector |
| 7 | sled 7 connector | 8 | sled 8 connector |
| 9 | sled 9 connector | 10 | sled 10 connector |
| 11 | sled 11 connector | 12 | sled 12 connector |

12-Sled Backplane Back Connectors

Figure 5-7 shows the connectors on the back of the backplane.

Figure 5-7. 12-Sled SKU Backplane Back Connectors



1	MD2 Jumper	2	MD1 Jumper
3	fan connector 1	4	fan connector 4
5	fan connector 2	6	fan connector 5
7	fan connector 3	8	fan connector 6
9	PSU 1 connector	10	PSU 2 connector
11	fan connector 7	12	fan connector 8
13	PMBus 2 connector	14	PMBus 1 connector
15	sideband connector	16	LAN connector

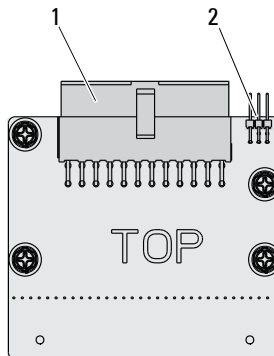
Table 5-3. 12-Sled Backplane Jumper Positions

MD2	MD1	Mode
0	1	Normal
1	1	JTAG
1	0	Boot

Power Distribution Board Connectors

Figure 5-8 shows the connectors on the PDB.

Figure 5-8. PDB Connectors



1 PSU connector

2 PMBus connector

PDB Power and SMBus Connectors

This section provides information on the PDB power and SMBus connector pin out.

Table 5-4. PDB Power and SMBus Connector Pin Out

Pin	Signal	Pin	Signal
1	+12V	2	+12V
3	+12V	4	+12V
5	+12V	6	+12V
7	+12V	8	+12V
9	+12V	10	CSHARE
11	PS_PRESENT_0	12	+12V
13	GND	14	GND
15	GND	16	GND
17	GND	18	GND
19	GND	20	GND
21	GND	22	P12V_STB
23	P12V_STB	24	GND
25	SMB_BP_CLK	26	SMB_BP_DAT
27	SMB_PDB_ALRT_0/1_N	28	PS_ON_N
29	NA	30	PSGD0/1

Getting Help

Contacting Dell

For customers in the United States, call 800-WWW-DELL (800-999-3355).



NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

- 1 Visit support.dell.com.
- 2 Click your country/region at the bottom of the page. For a full listing of country/region, click **All**.
- 3 Click **All Support** from **Support** menu.
- 4 Select the appropriate service or support link based on your need.
- 5 Choose the method of contacting Dell that is convenient for you.

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