Hitachi Advanced Server DS225 Hardware Guide

This guide provides the system overview and specifications for Hitachi Advanced Server DS225, including hardware component descriptions.

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About the System

Conventions

Several different typographic conventions are used throughout this manual. Refer to the following examples for common usage.

Bold type face denotes menu items, buttons and application names.

Italic type face denotes references to other sections, and the names of the folders, menus, programs, and files.

<Enter> type face denotes keyboard keys.

WARNING!
Warning information appears before the text it references and should not be ignored as the content may prevent damage to the device.

CAUTION!
CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES, SIMILAR TO NOTES AND WARNINGS. CAUTIONS, HOWEVER, APPEAR IN CAPITAL LETTERS AND CONTAIN VITAL HEALTH AND SAFETY INFORMATION.

Note:
Highlights general or useful information and tips.

Precautionary Measures

Read all caution and safety statements in this document before performing any of the instructions. To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read and observe all warnings and precautions in this chapter before installing or maintaining your system. To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following instructions and information. The following symbols may be used throughout this guide and may be marked on the product and / or the product packaging.

Safety Instructions about your system

In the event of a conflict between the information in this guide and information provided with the product or on the website for a particular product, the product documentation takes precedence.

Your system should be integrated and serviced only by technically qualified persons.

You must adhere to the guidelines in this guide and the assembly instructions in related chapters to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL Listing and other regulatory approvals of the product, and may result in noncompliance with product regulations in the region(s) in which the product is sold.

Table 1: Warning and Cautions

CAUTION	Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.
WARNING	Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.
⚠	Indicates potential hazard if indicated information is ignored.
⚡ 🚶	Indicates shock hazards that result in serious injury or death if safety instructions are not followed.
♨	Indicates hot components or surfaces.
✋	Indicates do not touch fan blades, may result in injury.
	Remove the system from the rack to disconnect power system.

Table 1: Warning and Cautions (Continued)

	The enclosure is designed to carry only the weight of the system sled. Do not use this equipment as a workspace. Do not place additional load onto any equipment in this system.
	Indicates two people are required to safely handle the system.
	Restricted Access Location: The system is intended for installation only in a Server Room or Computer Room where both these conditions apply: ● access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken; and ● access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

Intended Application Uses

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

Site Selection

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

● Clean, dry, and free of airborne particles (other than normal room dust).

● Well-ventilated and away from sources of heat including direct sunlight and radiators.

● Away from sources of vibration or physical shock.

● Isolated from strong electromagnetic fields produced by electrical devices.

● In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.

● Provided with a properly grounded wall outlet.

● Provided with sufficient space to access the power system, because they serve as the product's main power disconnect.

● Provided with either two independent DC power system or two independent phases from a single power system.

Equipment Handling Practices

Reduce the risk of personal injury or equipment damage:

- Conform to local occupational health and safety requirements when moving and lifting equipment.

- Use mechanical assistance or other suitable assistance when moving and lifting equipment.

- To reduce the weight for easier handling, remove any easily detachable components.

- Never lift or move your system soley by the handle on the component.

Power and Electrical Warnings

CAUTION!
MAKE SURE THE SYSTEM IS REMOVED FROM THE RACK BEFORE SERVICING ANY NON-HOT PLUG COMPONENTS. THE BUS BAR CLIPS MUST BE DISCONNECTED FROM THE POWER SYSTEM IN ORDER TO FULLY SEPARATE THE SYSTEM FROM THE POWER SOURCE.

CAUTION!
TO AVOID RISK OF ELECTRIC SHOCK, DISCONNECT ALL CABLING FROM THE SYSTEM AND REMOVE THE SYSTEM FROM THE RACK.

System Access Warnings

CAUTION!
TO AVOID PERSONAL INJURY OR PROPERTY DAMAGE, THE FOLLOWING SAFETY INSTRUCTIONS APPLY WHENEVER ACCESSING THE INSIDE OF THE PRODUCT:

- Disconnect from the power source by removing the system from the rack.
- Disconnect all cabling running into the system.
- Retain all screws or other fasteners when servicing. Upon completion servicing, secure with original screws or fasteners.

CAUTION!
IF THE SERVER HAS BEEN RUNNING, ANY INSTALLED HDD MODULES MAY BE HOT.

CAUTION!
UNLESS YOU ARE ADDING OR REMOVING A HOT-PLUG COMPONENT, ALLOW THE SYSTEM TO COOL BEFORE SERVICING.

CAUTION!
TO AVOID INJURY DO NOT CONTACT MOVING FAN BLADES. IF YOUR SYSTEM IS SUPPLIED WITH A GUARD OVER THE FAN, DO NOT OPERATE THE SYSTEM WITHOUT THE FAN GUARD IN PLACE.

Rack Mount Warnings

The following installation guidelines are required by UL for maintaining safety compliance when installing your system into a rack.

The equipment rack must be anchored to an unmovable support to prevent it from tipping when your system or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.

Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack.

Extend only one piece of equipment from the rack at a time.

You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the system(s).

To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.

Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained.

Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Electrostatic Discharge (ESD)

⚠ CAUTION!

ESD CAN DAMAGE DRIVES, BOARDS, AND OTHER PARTS. WE RECOMMEND THAT YOU PERFORM ALL PROCEDURES AT AN ESD WORKSTATION. IF ONE IS NOT AVAILABLE, PROVIDE SOME ESD PROTECTION BY WEARING AN ANTI-STATIC WRIST STRAP ATTACHED TO CHASSIS GROUND -- ANY UNPAINTED METAL SURFACE -- ON YOUR SERVER WHEN HANDLING PARTS.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges without any component and pin touching. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Cooling and Airflow

⚠ CAUTION!

CAREFULLY ROUTE CABLES AS DIRECTED TO MINIMIZE AIRFLOW BLOCKAGE AND COOLING PROBLEMS. FOR PROPER COOLING AND AIRFLOW, OPERATE THE SYSTEM ONLY WITH THE CHASSIS COVERS* / AIR DUCTS INSTALLED. OPERATING THE SYSTEM WITHOUT THE COVERS / AIR DUCTS IN PLACE CAN DAMAGE SYSTEM PARTS. TO INSTALL THE COVERS* / AIR DUCTS:

- Check first to make sure you have not left loose tools or parts inside the system.
- Check that cables, add-in cards, and other components are properly installed.

Attach the covers* / air ducts to the chassis according to the product instructions.

* May not apply to all systems.

Please be aware that slots and openings on the front and back side of the chassis are designed for ventilation; to make sure reliable operation of your system and to protect it from overheating, these openings must not be covered or blocked. The openings should never be covered or blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

Laser Peripherals or Devices

⚠ CAUTION!

TO AVOID RISK OF RADIATION EXPOSURE AND / OR PERSONAL INJURY:

- Do not open the enclosure of any laser peripheral or device.
- Laser peripherals or devices are not serviceable.
- Return to manufacturer for servicing.

Use certified and rated Laser Class I for Optical Transceiver product.

Heed safety instructions: Before working with the system, whether using this manual or any other resource as a reference, pay close attention to the safety instructions. Adhere to the assembly instructions in this manual to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components

specified in this manual. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in non-compliance with product regulations in the region(s) in which the product is sold.

System power on/off: To remove power from system, you must remove the system from rack. Make sure the system is removed from the rack before opening the chassis, adding, or removing any non hot-plug components.

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

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

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to electrostatic discharge (ESD). Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

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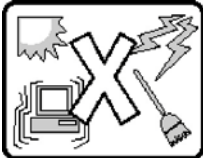
General Information

Before servicing this system, it is recommend to read this guide completely to be aware of any safety issues or requirements involved in the servicing of this system.

Assembly Safety Guidelines
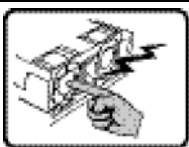
The power system in this product contains no user-serviceable parts.
Refer servicing only to qualified personnel.

	The system is designed to operate in a typical office environment. Choose a site that is: ● Clean and free of airborne particles (other than normal room dust). ● Well ventilated and away from sources of heat including direct sunlight. ● Away from sources of vibration or physical shock. ● Isolated from strong electromagnetic fields produced by electrical devices. ● In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm. ● Provided with a properly grounded wall outlet. ● Provided with sufficient space to access the power system, because they serve as the product's main power disconnect.
	WARNING! The system is safety certified as rack-mounted equipment for use in a server room or computer room, using an approved customer rack. The enclosure is designed to carry only the weight of the system sled. Do not place additional load onto any equipment.
	Heavy object. Indicates two people are required to safely handle the system.

About the System

Chapter 1

This section introduces the system, its different configuration(s) and the main features.

1.1 Introduction

As an optimized parallel computing architecture, your system breaks hardware configuration limitations in a 2U dual-socket system by supporting up to four accelerator cards, 3TBs of memory, and eight large form factor storage bays, which makes your system a perfect versatile platform for parallel computing-intensive applications such as VDI, HPC, and AI/Deep learning.

- Compact and Optimized 2U Accelerator Server Architecture to Propel Data Center Transformation.

- With Hitachi Vantara's excellent system designs, your system can accommodate sufficient compute, accelerator, and storage resources by conquering thermal/mechanical challenges due to its high performance processors and dual-width accelerators.

- Support dual Intel® Xeon® Processor Scalable Family of highest TDP. Faster socket interconnect, 1.5x memory bandwidth and 2x FLOPs peak performance capability.

- Up to 112 vCPU per server and 3.9x higher virtualized throughput compared to previous platforms based on the Intel® Xeon® E5 Processor Family.

- With four 300watt dual-width accelerator card while keeping 24 DIMM slots available makes your system support have no limitation to deploy VDI solutions. Your system can connect up to 128 concurrent users.

- Eight 3.5" HDD support increases local storage space for rendering application.

- Four U.2 option eliminate IO latency to expedite deep learning model training.

For the latest version of this manual, see support.HitachiVantara.com.

System Features

The system comprises a 2U/30.7" long chassis. Major features include:

- **Chipset**: Intel® C621 / C624 series

- **Processors (x2)**: Intel® Xeon® Processor Scalable Family (codename Skylake-SP)

- Expansion: See *SKU1/Front Storage/Back Expansion Slots* on page 1-3 for more information.

- **Memory:** Up to 24 DIMM slots are available; ECC DDR4 2666 MT/s RDIMM memory

- **Network*:**

    - Dedicated GbE management NIC port from PHY RTL8211 to BMC

    - Intel® C621 as 4x GbE Integrated Network Solution with PHY (optional)

    - Intel® C624 as 4x10GbE Integrated Network Solution with PHY (optional)

*Visit support.HitachiVantara.com for the latest Network support listings.

Note:

The system supports: 1600W and 2200W Platinum redundant PSU, 200-240Vac 50/60Hz, AC/HVDC.

Specifications

Table 1: System Specifications

SPECIFICATIONS	DESCRIPTION
Form factor	2U rack mount
Chassis dimensions (W x H x D)	438mm x 87.5 mm x 797.9 mm 17.24" x 3.4" x 31.41"
Processor	Processor type: Intel® Xeon® Processor Scalable Family (codename Skylake-SP) **Max. TDP support:** 205W, Optimized power delivery for 85W, VRD 13 **Number of processors:** 2 **Internal Interconnect:** 10.4 GT/s, 9.6 GT/s
Chipset	Intel® C621 / C624
Memory	**Total slots:** 24 **Memory type:** DDR4 2666 MT/s RDIMM **Memory size:** 8GB, 16GB, 32 GB* *More options refer to the AVL
Storage controller	Onboard (Intel® C621 / C624): ● (8) SATA 6Gbps port with (2) mini-SAS HD connector ● (6) sSATA 6Gbps port with (1) mini-SAS HD connector (reserved) and (2) 7-pin SATA port (reserved for SATA DOM)
Networking	● Dedicated GbE management NIC port from PHY RTL8211 to BMC ● Intel® C621 as 4x GbE Integrated Network Solution with PHY (optional) ● Intel® C624 as 4x10 GbE Integrated Network Solution with PHY (optional)

Table 1: System Specifications (Continued)

SPECIFICATIONS	DESCRIPTION
SKU1/Front Storage/ Back Expansion Slots	**SKU1 OPTION1** Front Storage (8) 3.5"/2.5" SATA – Front BP | SATA	SATA	SATA	SATA
SATA	SATA	SATA	SATA	 Back Expansion Slots [CPU0] ● (1) OCP Mezz x16 (can switch to PCH if not using OCP mezz) ● (2) GPU x16 (from Riser slot 1B or slot 4) [CPU1] ● (2) GPU x16 or (2) FHHL x16 (from Riser slot 2 or slot 3) ● (1) LP MD-2 x16 (from Riser slot 3 and slot 2) **SKU1 OPTION2** Back Expansion Slots [CPU0] ● (1) OCP Mezz x16 (can switch to PCH if not using OCP mezz) ● (2) GPU x16 (from Riser slot 1B or slot 4) [CPU1] ● (2) GPU x16 or (2) FHHL x16 (from Riser slot 2 or slot 3) ● (1) LP MD-2 PCIe x8 (from Riser slot 3) ● (1) LP MD-2 PCIe x8 (from Riser slot 2)
SKU2/Front Storage/ Back Expansion Slots	**SKU2 OPTION3** Front Storage (8) 3.5"/2.5" SAS/SATA – Front BP support SAS Mezz: QS-3008A/QS-3108A (and optional supercap) | SATA/SAS	SATA/SAS	SATA/SAS	SATA/SAS
SATA/SAS	SATA/SAS	SATA/SAS	SATA/SAS	 Back Expansion Slots [CPU0] ● (1) OCP Mezz x16 (can switch to PCH if not using OCP mezz) ● (2) GPU x16 (from Riser slot 1B or slot 4) [CPU1] ● (2) GPU x16 or (2) FHHL x16 (from Riser slot 2 or slot 3) ● (1) Type A SAS Mezz x8 (form Riser slot 3) ● (1) LP MD-2 PCIe x8 (from Riser slot 2)

Table 1: System Specifications (Continued)

SPECIFICATIONS	DESCRIPTION
SKU3/Front Storage/ Back Expansion Slots	SKU3 OPTION4 Front Storage (4) 3.5"/2.5" SATA + (4) NVMe x4 – Front BP Back Expansion Slots [CPU0] ● (1) OCP Mezz x16 (can switch to PCH if not using OCP mezz) ● (2) GPU x16 (from Riser slot 1B or slot 4) [CPU1] ● (2) GPU x16 or (2) FHHL x16 (from Riser slot 2 or slot 3) ● (2) NVMe x4 SSD (form Riser slot 3) ● (2) NVMe x4 SSD (form Riser slot 2)
Onboard storage	(1) SATADOM (optional)
Video	Integrated Aspeed AST2500 with 8MB DDR4 video memory
Network options	● (1) GbE quad port OCP mezzanine card or PHY card (Optional)* ● (1) 10 GbE quad port OCP mezzanine card or PHY card (Optional)* ● More options refer to the AVL at support.HitachiVantara.com *The quad port PHY card is Installed to OCP mezzanine slot
Front I/O	● Power/ID/Reset Buttons ● Power/ID/Status LEDs ● (2) USB ports ● (1) VGA port (Display Priority: First; one device one time)
Back I/O	● (2) USB 3.0 ports ● (1) VGA port (Display Priority: Second; one device one time) ● (1) RS232 serial port ● (1) GbE RJ45 management port ● (1) ID LED ● (1) MicroSD slot
TPM	Yes (optional, SPI mode)
ACPI	ACPI compliance, S0, S5 support
Power supply	(2) 1600W/2200W 86mm Platinum redundant PSUs, AC/ HVDC support ● 1600W (Lite-on/PS-2162-1Q): 200-240Vac, 50/60Hz, 10A or 240Vdc 10A ● 1600W (Acbel/FSE023): 200-240Vac, 50/60Hz, 10A or 240Vdc 8A ● 2200W (Artesyn/MC2200B4-3-4R-02):100-120*/200-240Vac, 50/60Hz, 15.5A/14A (*Output will be 1200W while the input voltage is 100-120Vac)
System Rating	● 200-240Vac, 50/60Hz, 10A or 240Vdc, 8A (each PSU Inlet) ● 100-120/200-240Vac, 50/60Hz, 10A or 240Vdc, 8A (each PSU Inlet)
Fan	(6) dual-rotor fans* *The system performance might be affected while a fan fault occurred.
System management	IPMI v2.0 Compliant, on board "KVM over IP" support

Table 1: System Specifications (Continued)

SPECIFICATIONS	DESCRIPTION
Operating environment	• Operating temperature: 5℃ to 35℃ (41°F to 95°F)* • Non-operating temperature: -40℃ to 70℃ (-40°F to 158°F) • Operating relative humidity: 20% to 85%RH • Non-operating relative humidity: 10% to 95%RH *Your system can support SSD only while installing four Tesla V100 cards.

Note:

Internal USB port is reserved for UDK USB drive installation only. Feature hot plug is not available on this internal USB port.

1.2 Package Contents

- (1) DS225 system

- (2) processor heat sinks

- (2) power supply units (optional)

- (2) power cords (optional)

> **Note:**
> For exact shipping contents, contact your Hitachi Vantara sales representative.

1.3 A Tour of the System

System Overview

The server is available as a 3.5″ storage drive configuration.

The 3.5″ storage drive configuration system overview is displayed in the following image:
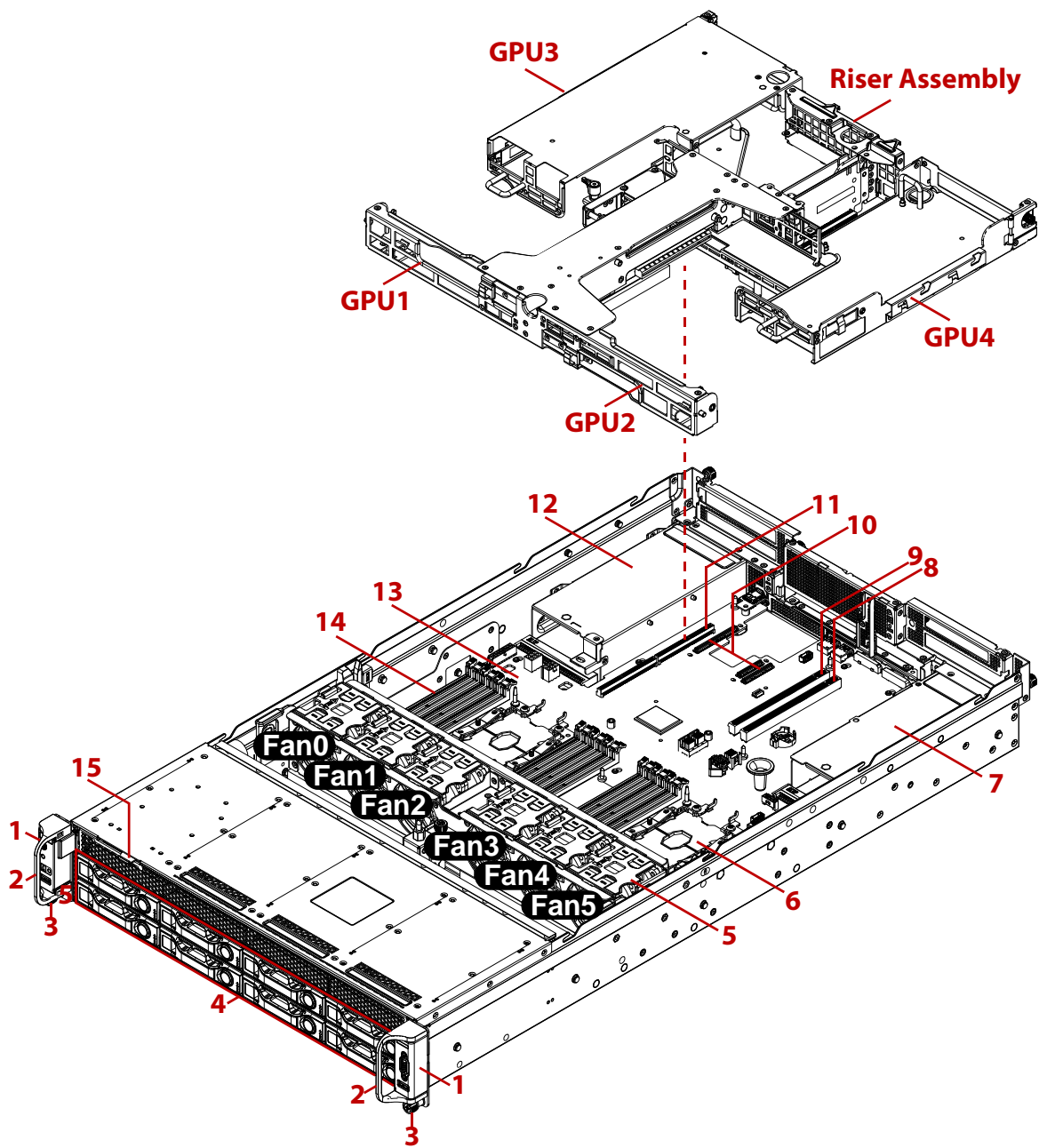
Figure 1-1.   3.5″ Storage Drive System Component Overview

Table 2: Component Overview

NO.	ITEM	DESCRIPTION
1	Front control panel	See *Front Control Panel (FCP)* on page 1-11
2	Handle	Two server handles used for pulling the system out of the rack **CAUTION!** THE HANDLES ARE DESIGNED FOR THE EXTENSION OF THE SYSTEM FROM THE RACK. THE HANDLES ARE NOT DESIGNED TO CARRY THE WEIGHT OF THE SYSTEM. DO NOT USE THE HANDLES TO MOVE OR LIFT THE SYSTEM.
3	Thumb screw	Secure the system to rack frame
4	HDD cage	Housing up to eight 3.5" HDDs
5	Fan modules (x6)	Cooling the system
6	CPU socket	Install the processor
7	PSU assembly	Redundant power supply unit assembly (PSU1)
8	Riser slot (CPU1)	Support PCIe add-on card and GPU4 installation with riser feature
9	Riser slot (CPU1)	Support PCIe add-on card and GPU3 installation with riser feature
10	OCP slot (CPU0)	Support OCP 2.0 mezzanine card installation
11	Riser slot (CPU0)	Support PCIe add-on card installation and GPU1/GPU2 with riser feature
12	PSU assembly	Redundant power supply unit assembly (PSU0)
13	Mainboard	System mainboard
14	DIMM slots	(12) DDR4 DIMM slots per CPU
15	Asset tag	Record serial number or other important information

System Front View
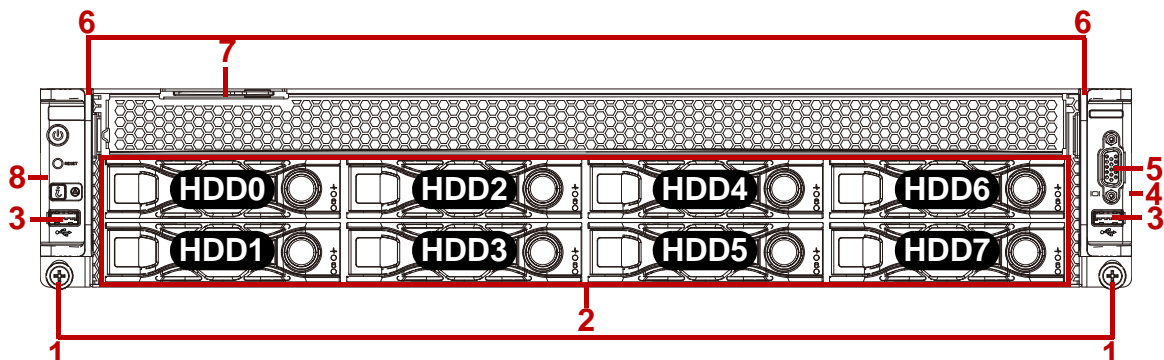
Figure 1-2.   3.5" Storage Drive System Front View

Table 3: Front Panel View

No.	Name	Description
1	Thumb screw	Secure the system to rack frame
2	3.5" storage drive tray	Housing up to eight 3.5" storage drive: SKU 1- [8 x SFF] (8) 3.5"/2.5" SATA – Front BP **SKU 2- [8 x SFF]** (8) 3.5"/2.5" SAS/SATA – Front BP support SAS Mezz: QS-3008A/QS-3108A (and optional supercap) **SKU 3- [8 x SFF]** (4) 3.5"/2.5" SATA + (4) NVMe x4 – Front BP *See *Enabling the Intel® VMD Technology* on page 1-15.
3	USB port	Connect to USB device
4	Front control panel (Right)	Provide VGA and USB connections
5	VGA port	Connect to display device (Display Priority: First; one device one time)
6	Handle	Two server handles used for pulling the system out of the rack **CAUTION!** THE HANDLES ARE DESIGNED FOR THE EXTENSION OF THE SYSTEM FROM THE RACK. THE HANDLES ARE NOT DESIGNED TO CARRY THE WEIGHT OF THE SYSTEM. DO NOT USE THE HANDLES TO MOVE OR LIFT THE SYSTEM.
7	Asset tag	Record serial number or other important information
8	Front control panel (Left)	Provide USB connection and basic control with status information. See *Front Control Panel (FCP)* on page 1-11

Table 4: Intel® VMD PCIe Root Port BIOS Setup Option Table*

HDD SLOT#	CPU SOCKET	PSTACK	VMD PORT
4	1	0	3C
5			3D
6		2	3A
7			3B

```
Intel® VMD technology
-----------------------------------------------------------------
► Intel® VMD for Volume Management Device on Socket 0
► Intel® VMD for Volume Management Device on Socket 1
```

```
VMD Config for PStack0
-----------------------------------------------------------------
Intel® VMD for Volume Management    [Disable]
Device for PStack0
VMD Config for PStack1
-----------------------------------------------------------------
Intel® VMD for Volume Management    [Disable]
Device for PStack1
VMD Config for PStack2
-----------------------------------------------------------------
Intel® VMD for Volume Management    [Disable]
Device for PStack2
```

*See *Enabling the Intel® VMD Technology* on page 1-15 for more information.

Front Control Panel (FCP)

The FCP includes the components listed in Figure 1-3, which are described in Table 5.
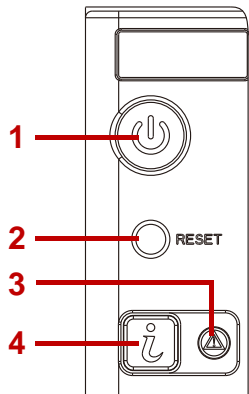
Figure 1-3.   Front Control Panel and Connectors

Table 5: Front Control Panel Definition

NO.	ICON	NAME	DESCRIPTION
1	⏻	Power button with LED	Power on / off Blue on - S0 system power on; Off - S5 system power off
2	◯ RESET	Reset button	Soft reset system function
3	⚠	System Status LED	Provides critical and non-critical failure notification Amber blinking - failed; Off - SEL cleared / good
4	𝑖	Identification button with LED	Toggles ID LED, activate ID LED to identify system Blue blinking - Identifier on front and back chassis; Off - Normal.

System Back View
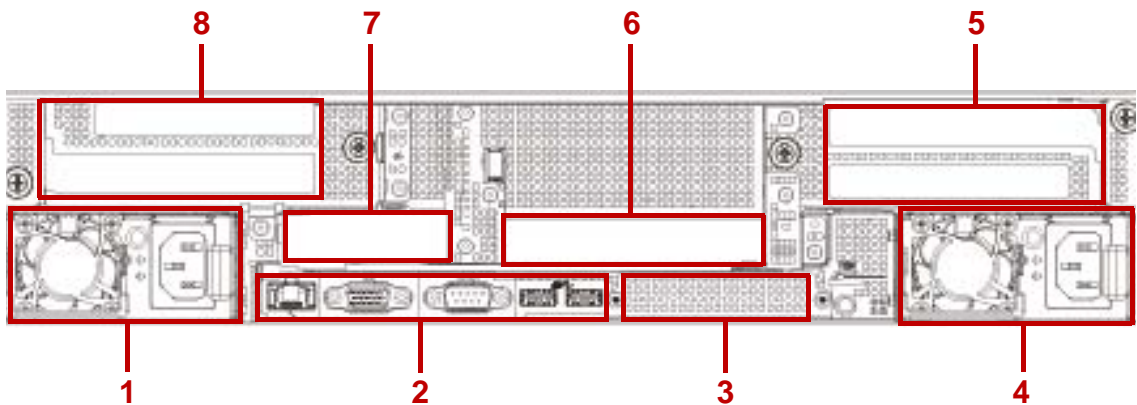
Figure 1-4.   System Back View

Table 6: System Back View

No.	Feature	Description
1	Power sub-system	Main power supply unit (PSU1). See *Power Sub-System* on page 1-13.
2	System I/O ports	See *System Back I/O* on page 1-12
3	Expansion slot	Support OCP 2.0 mezzanine card installation (CPU0)
4	Power sub-system	Main power supply unit (PSU0). See *Power Sub-System* on page 1-13.
5	Expansion slot	PCIe expansion slot with GPU3 or FHFL (CPU1)
6		PCIe expansion slot with FHHL (CPU1)
7		PCIe expansion slot with LP MD-2 (CPU1)
8		PCIe expansion slot with GPU4 or FHFL (CPU1)

System Back I/O
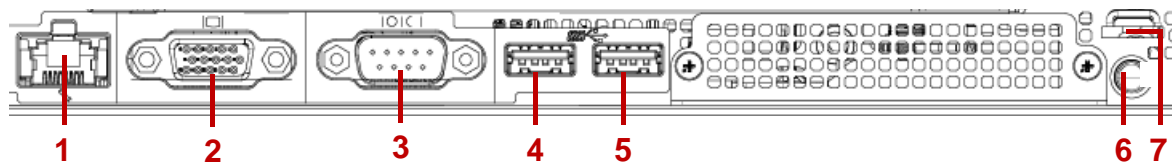
Figure 1-5.   System Back I/O

Table 7: System Back I/O Definition

No.	Icon	Name	Description
1		Dedicated NIC	Dedicated RJ45 connector
2		VGA port	Maximum display resolution: 1920x1200 32bpp@60Hz (reduced blanking) (Display Priority: First; one device one time)
3	IOIOI	COM A port	DB9 port (Serial_A) for debug or terminal concentrator
4		USB 3.0 port	USB 1 port; connect to USB device
5			USB 0 port; connect to USB device
6		Identification LED	Blue blinking - Identifier; Off - Normal.
7		MicroSD slot	Backup BMC SEL.

Power Sub-System

PSU LED
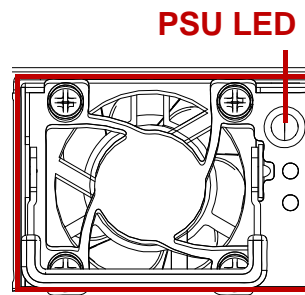
Figure 1-6.   PSU to Mainboard Module Description

A single power supply unit (default) is supplied in the system. A secondary PSU is available for redundancy functionality.

Table 8: Power Supply Units by Model

PSU	AC INPUT
2 x 1600W and 2200W Platinum high efficiency redundant PSU	(2) 1600W/2200W 86mm Platinum redundant PSUs, AC/ HVDC support • 1600W (Lite-on/PS-2162-1Q): 200-240Vac, 50/60Hz, 10A or 240Vdc 10A • 1600W (Acbel/FSE023): 200-240Vac, 50/60Hz, 10A or 240Vdc 8A • 2200W (Artesyn/MC2200B4-3-4R-02): 100-120*/200-240Vac, 50/60Hz, 15.5A/14A (Output will be 1200W when input voltage is 100-120Vac)

Table 9: Power Supply Unit LED

PSU LED COLOR	DESCRIPTION
Amber On	PSU failure
Green On	PSU good
Green Blinking at 0.5Hz	PSU standby
Green Blinking at 2Hz	PSU cold redundancy standby

LED Status Definitions

Front Control Panel LEDs

For location of the FCP, see *System Front View* on page 1-8.
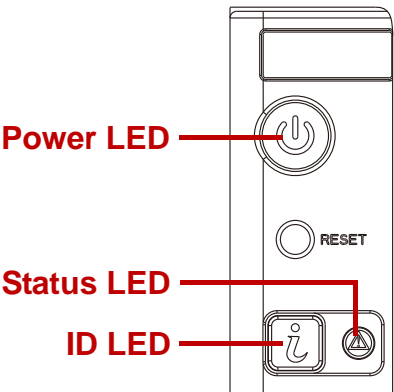
Figure 1-7.   Front Control Panel LEDs

Table 10: Front Control Panel LEDs Behavior

NAME	COLOR	CONDITION	DESCRIPTION
Power LED	Blue	On	System S0 power on
		Off	System S5 power off
Identification	Blue	Blinking	Unit selected for identification
		Off	No identification request
Status LED	Amber	Blinking	Critical Failure: critical fan, voltage, temperature state.
			Non-Critical Failure: non-critical fan, voltage, temperature state, CPU thermal trip, DC off.
		Off	SEL cleared
			Last pending warning or error has been de-asserted.

BMC Management Port LEDs

The system mainboard includes one dedicated RJ45 GbE management port. The RJ45 connector has two built-in LEDs. See the following illustration and table for details.
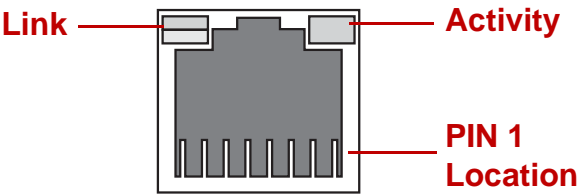
Figure 1-8.   GbE RJ45 Management Port

Table 11: RJ45 LED Description

CONDITION	LINK	ACTIVITY
Unplugged	Off	Off
1G active link	On amber	Blinking green
100M active link	On green	Blinking green

Table 11: RJ45 LED Description (Continued)

CONDITION	LINK	ACTIVITY
10M active link	Off	Blinking green

Storage Drive LED

Front 3.5" Storage Drive LED Status Behavior
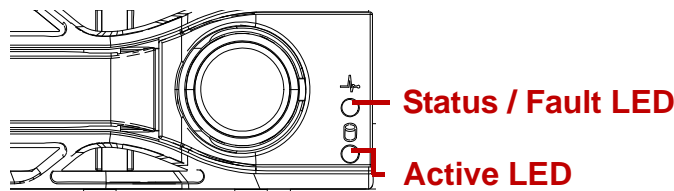
Figure 1-9.   3.5" Storage Drive LED Identification

The following LED behavior table represents LED conditions.

Table 12: 3.5" Storage Drive LED Status Behavior

| NAME	COLOR	CONDITION	DESCRIPTION
Drive Status / Fault	Blue	On	Drive is online
		Blinking	Twice per second: Identification Once per second: Rebuilding
	Amber	On	HDD failure
	Off		Slot is empty
Drive Active	Blue	Blinking	HDD access is active

Enabling the Intel® VMD Technology

 Note:
You can use Intel® VROC HII to create the RAID volume. These volumes can be created at any point before or after your system is successfully running your Windows installation, but may not be used as the boot volume.

To enable the Intel VMD technology feature, you might need to select "Intel® VMD technology" in "IIO configuration" under the "Socket Configuration" screen from BIOS Main screen.

Press the right arrow key until "Socket Configuration" is selected and press the down arrow key until "IIO Configuration" is selected.

```
    Main        Advanced      Platform Configuration    Socket Configuration      Server Mgmt
 ►Processor Configuration                                Displays and provides option
 ►Common RefCode Configuration                           to change the Processor
 ►UPI Configuration                                      Settings
 ►Memory Configuration
 ►IIO Configuration
```
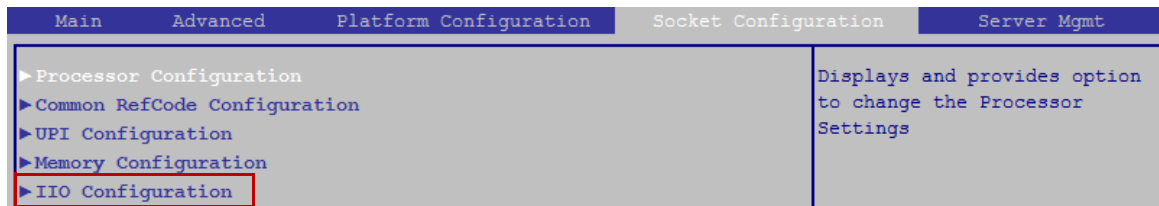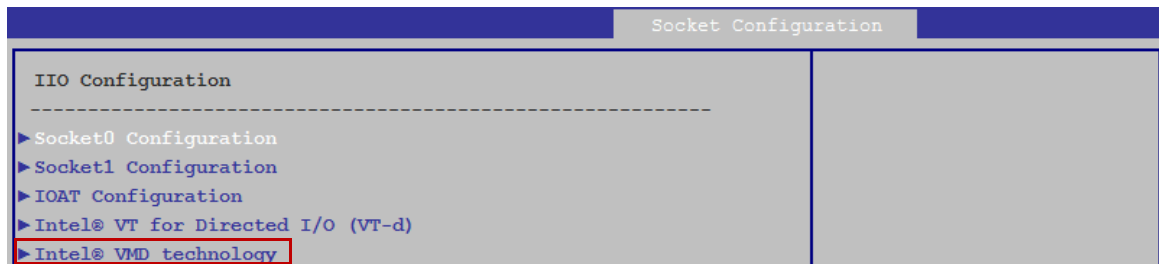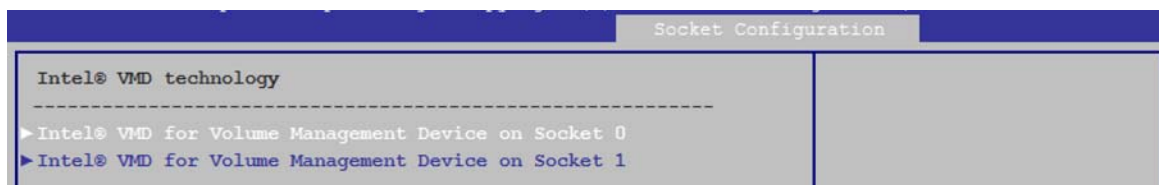
Press the down arrow key until "Intel® VMD technology" is selected.

```
                                              Socket Configuration

   IIO Configuration
   --------------------------------------------------------
 ►Socket0 Configuration
 ►Socket1 Configuration
 ►IOAT Configuration
 ►Intel® VT for Directed I/O (VT-d)
 ►Intel® VMD technology
```

Press up or down arrow key to select CPU socket0 or CPU socket1.

```
                                              Socket Configuration

   Intel® VMD technology
   --------------------------------------------------------
 ►Intel® VMD for Volume Management Device on Socket 0
 ►Intel® VMD for Volume Management Device on Socket 1
```

Then you can enable/disable the Intel® VMD feature for your system.
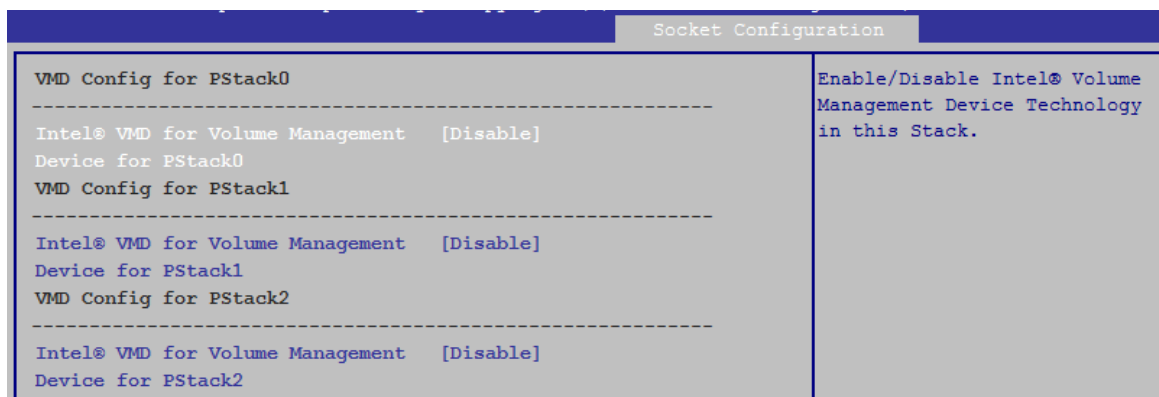
```
                                              Socket Configuration

   VMD Config for PStack0                              Enable/Disable Intel® Volume
   --------------------------------------------------------  Management Device Technology
   Intel® VMD for Volume Management    [Disable]       in this Stack.
   Device for PStack0
   VMD Config for PStack1
   --------------------------------------------------------
   Intel® VMD for Volume Management    [Disable]
   Device for PStack1
   VMD Config for PStack2
   --------------------------------------------------------
   Intel® VMD for Volume Management    [Disable]
   Device for PStack2
```

Table 1.1: Intel® VMD on Socket X Screen Description

| SETUP ITEM	OPTIONS	DESCRIPTION	COMMENTS
VMD Config for PStack0			Information only.
Intel® VMD for Volume Management Device for PStack0	[Disable] [Enable]	Enable/Disable Intel® Volume Management Device Technology in this Stack.	
VMD Config for PStack1			

Table 1.1: Intel® VMD on Socket X Screen Description (Continued)

SETUP ITEM	OPTIONS	DESCRIPTION	COMMENTS
Intel® VMD for Volume Management Device for PStack1	[Disable] [Enable]	Enable/Disable Intel® Volume Management Device Technology in this Stack.	
VMD Config for PStack2			
Intel® VMD for Volume Management Device for PStack2	[Disable] [Enable]	Enable/Disable Intel® Volume Management Device Technology in this Stack.	

Enabling Platform Trusted Technology (PTT)

To enable platform trusted technology feature, you might need to select "Server ME Configuration" in "Platform Configuration" screen from BIOS Main screen by pressing the right arrow until the Platform Configuration screen is chosen. Press the down arrow key until "Server ME Configuration" is selected.
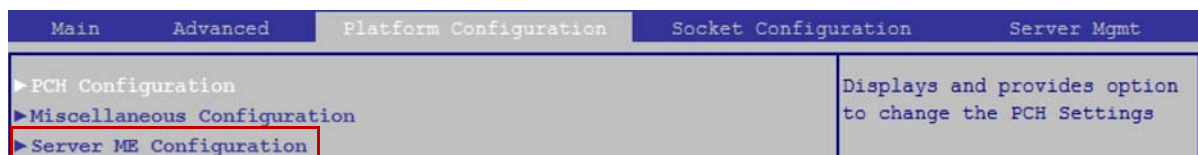

Press down arrow key to select PTT Support. Then you can enable/disable the PTT feature for your system
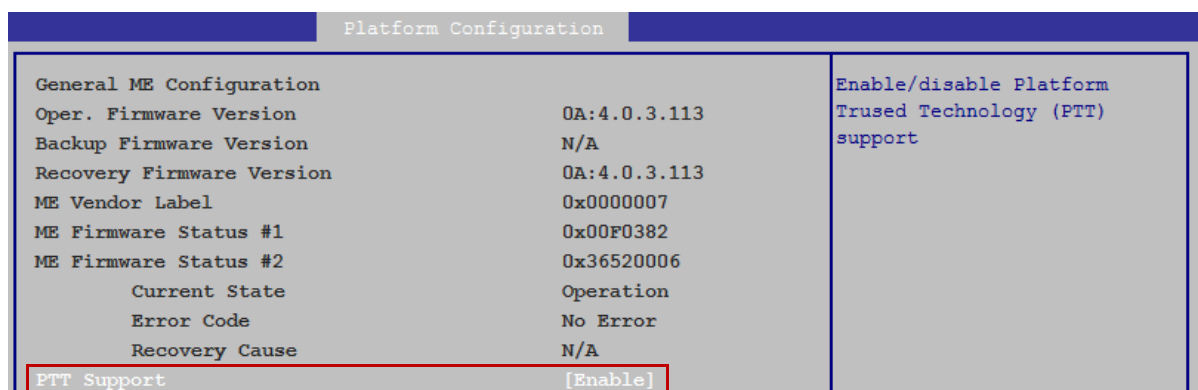
TPM Configuration Settings

To setup the TPM configuration, you might need to select "Trusted Computing" in "Advanced" screen from BIOS Main screen by pressing the right arrow until the Advanced screen is chosen. Press the down arrow key until "Trusted Computing" is selected.
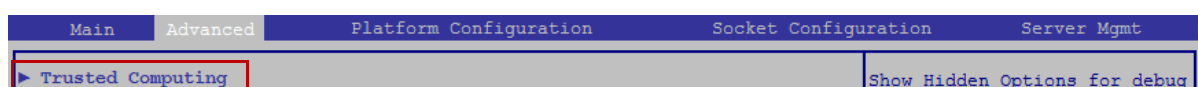
Now you can setup the TPM configuration.

```
   Main      Advanced        Platform Configuration     Socket Configuration     Server Mgmt

 Configuration                                                        Enable or Disable SHA-1 PCR
   TPM2.0 Device Found                                                banks

   Active PCR banks              SHA-1, SHA256
   Availible PCR banks           SHA-1, SHA256

   SHA-1 PCR bank                [Enabled]
   SHA256 PCR banks              [Enabled]

   Pending operation             [None]
   PH Randmization               [Enabled]
```

Table 1.2: Configuration on Trusted Computing Screen Description

SETUP ITEM	OPTIONS	DESCRIPTION	COMMENTS
TPM 2.0 Device Found			Information only. Displays current TPM Status.
Active PCR banks			Information only. Displays current active PCR banks.
Available PCR banks			Information only. Displays current available PCR banks.
SHA-1 PCR Bank	[Disabled] [Enabled]	Enable or Disable SHA-1 PCR Bank	Only appears when "Available PCR banks" includes this type.
SHA256 PCR Bank	[Disabled] [Enabled]	Enable or Disable SHA256 PCR Bank	Only appears when "Available PCR banks" includes this type.
Pending operation	[None] [TPM Clear]	Enable/Disable Security Device. NOTE: Your computer will reboot during restart in order to change state of the device.	Only appears when TPM device exists
PH Randomization	[Disabled] [Enabled]	Enables or Disables Platform Hierachy randomization.	Only appears when TPM device exists