Rackgo X Series

F06D

Revolutionary Converged Multi-node Infrastructure

User's Guide

Version: 1.0.0

Copyright

Disclaimer

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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 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.
	Do not move racks by yourself. Due to the height and weight of the rack, a minimum of two people should accomplish this task.
	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.

● 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.

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 INORDER 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, sercure with original screws or fasteners.

CAUTION!
IF THE SYSTEM HAS BEEN RUNNING, ANY INSTALLED COMPONENTS LINK HDD, MEMORY MODULES, HEAT SINK, PROCESSOR AND CHIPSET 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 safety regulatory 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 DUCT* INSTALLED. OPERATING THE SYSTEM WITHOUT THE COVERS / AIR DUCT* IN PLACE CAN DAMAGE SYSTEM PARTS . TO INSTALL THE COVERS* / AIR DUCT*:

- 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 duct* 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 rear 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 spec-

ified in this manual. Use of other products / components will void other safety 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 servicing. 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 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.

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.
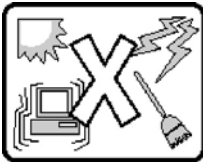
General Information

The information about rack and the wording "rack" in this technical guide supports the organization of Open Compute definition.

The term *Rack* as found in this technical guide referes to the term *Rack* or *Open Rack* as described and used in the Open Compute Project definition.

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

Assembly Safety Guidelines

	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.

Structure of this guide

- Chapter 1: About the System

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

- Chapter 2: Regulatory and Compliance Information

  "This section provides regulatory and compliance information applicable to this system."

About the System

Chapter 1

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

1.1 Introduction

Take Advantage of the Open Compute Spec v.3.0

F06D is a next generation converged infrastructure solution that consolidates the compute (server) tier and the storage tier (up to 32x disks) into a single, integrated system. Quanta F06D utilized the full advantage of the latest Open Compute Motherboard spec v.3.0, which are the same motherboard that powers the one of the largest datacenter in the world. Open Compute Motherboard spec v.3.0 had validated with the industry's highest reliability standards, it is also the single most manufactured motherboard in the world for its astonishing manufacturing perfection. It tailors these for mainstream enterprise and high-performance-computing

Highest Storage Density in Multi-node Infrastructure

F06D's innovated highest density storage design offers the converged infrastructure the deliver service more economically and efficiently with lowest latency. The power of convergence is best demonstrated by the integration of system-level overall 32x 2.5" hot-swappable storage into the server tier to drive faster I/O performance. Having compute and storage resources must be co-resident to deliver data I/O with low latency and with the ability to scale without constraints. F06D converges compute and storage into a single system, eliminating the need for traditional storage arrays. The convergence of compute and storage into a single appliance provides a flexible, scalable building block for the modern datacenter.

Module Design, with Full Potential in the Future

The modular building-block design protects your organization IT investment with potential upgrade in the future. Open Rack's centralized power shelf design allows your rack frame and power shelf continue to be used for multiple generation of hardware upgrades. F06D further takes this design to the next step, by offering modular swappable-backplanes, compartment-design enclosure that can flexibility insert the next generation computer, storage module of your choice. The scalability and performance that the world's largest, most efficient datacenters enjoy are now available to all enterprises and government agencies.

Specifications

Table 1: System Specifications

SPECIFICATION	DESCRIPTION
Form Factor	4 nodes in 2 OU (Open Rack) Rackmount
Dimensions	W x H x D (inch): 21.1 x 3.5 x 34.6 W x H x D (mm): 536 x 89 x 880
Expansion Slot	PCIe Slot: One x8 PCIe 3.0 LP MD-2 Mezzanine Slot: One x8 PCIe 3.0 OCP network mezzanine Slot

Table 1: System Specifications (Continued)

SPECIFICATION	DESCRIPTION
Front I/O	1x USB port per node 1x OCP debug header per node 1x Dedicated Rj45 management port 1x Power button 1x Reset button
Fan	6x hot-plug system fans
Operating Environment	Operating temperature: 5°C to 35°C (41°F to 95°F) Non-operating temperature: -40°C to 65°C (-40°F to 149°F) Operating relative humidity: 20% to 85%RH. Non-operating relative humidity: 40% to 90%RH
Processor	Processor Type: Intel® Xeon® processor E5-2600 v3 product family Max. TDP Support: 135W or 145W* Number of Processors: 2 per node Internal Interconnect: 6.4 / 8.0/ 9.6 GT/s L3 Cache: Up to 45MB
Chipset	Intel® C610
Memory	Total Slots: 16 per node Capacity: Up to 256GB RDIMM/ 512GB LRDIMM Memory Type: 2133 MHz DDR4 RDIMM/ LRDIMM Memory Size: 16GB, 8GB RDIMM/ 32GB LRDIMM
Storage	8 x 2.5" hot-plug storage device per node
Storage Controller	**Onboard:** Intel® 610: 6x SATA 6Gb ports; SATA RAID 0, 1, 10 **Optional Controller (more options refer to the CCL)** Quanta LSI® 3008 12Gb/s SAS mezzanine, RAID 0,1,10 Quanta LSI® 3108 6Gb/s RAID mezzanine, RAID 0, 1, 5, 10; RAID 6 with additional RAID key
Network Controller	**LOM:** Dedicated 1GbE management port per node **Optional NIC: (more options refer to the CCL)** Quanta Intel® i350 dual-port mezzanine Quanta Intel® X540 dual-port 10GbE BASE-T mezzanine Quanta Intel® 82599ES dual-port 10G SFP+ mezzanine Quanta Mellanox® ConnectX-3 QDR single-port mezzanine Quanta Mellanox® ConnectX-3 FDR singlel-port mezzanine
Onboard Storage	Option 1: NGFF Option 2: mSATA
Video Controller	Integraged AS2400 with 8MB DDR3 video memory
Drive Bays options	8x 2.5" hot-plug storage device per node
Drive Bay	8x 2.5" hot-plug storage device per node

* All specifications and figures are subject to change without prior notice.

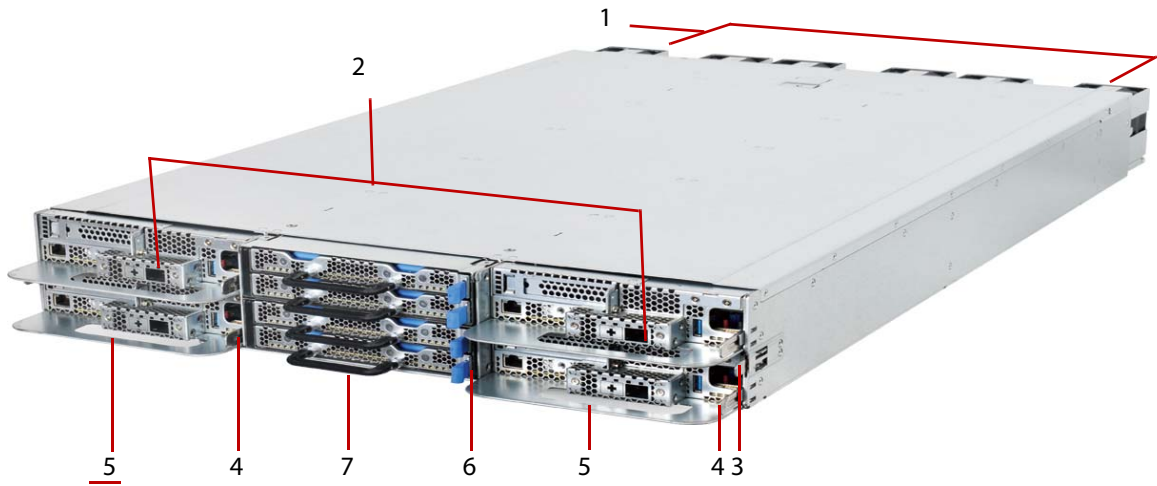# 1.2 A Tour of the System

System Overview

Figure 1-1.   System Component Overview

Table 2: Component Overview

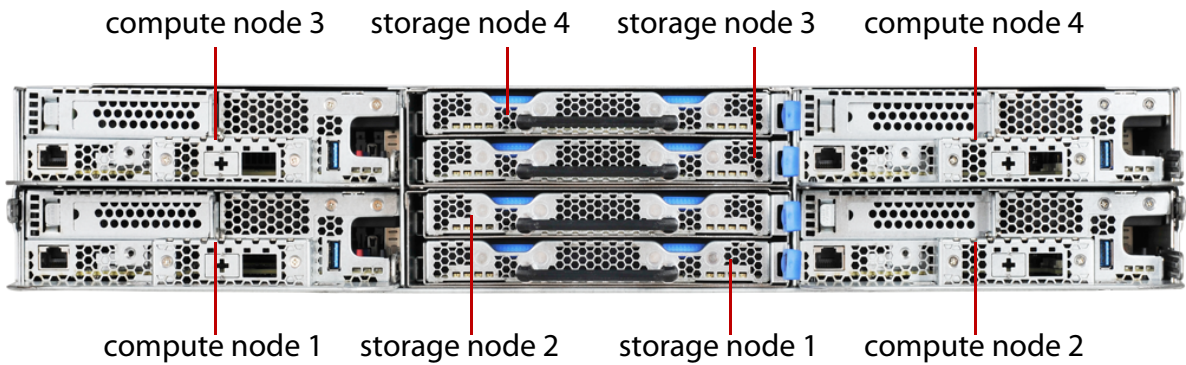| No.	Item	Description
1	Fan module	System fan modules (x6).
2	Sled	Four compute and storage sled assemblies. See *Node Front View* on page 1-6.
3	Chassis release latch	Hold to remove the chassis from the rack.
4	Compute Tray release	Press to unlock the compute sled assembly from the chassis.
5	Compute Tray handle	Hold to remove the compute sled assembly from the chassis.
6	Storage Tray release	Press to unlock the storage sled assembly from the chassis.
7	Storage Tray handle	Hold to remove the storage sled assembly from the chassis.

System Front View
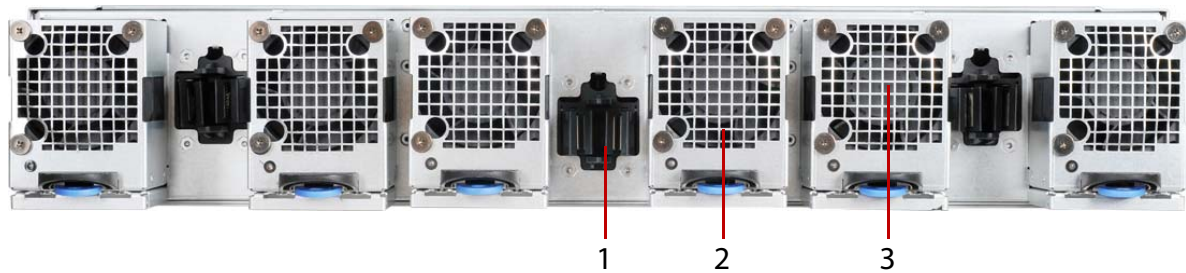

Figure 1-2.   System Front View

System Rear View

Figure 1-3.   System Rear View

Table 3: Rear Panel View

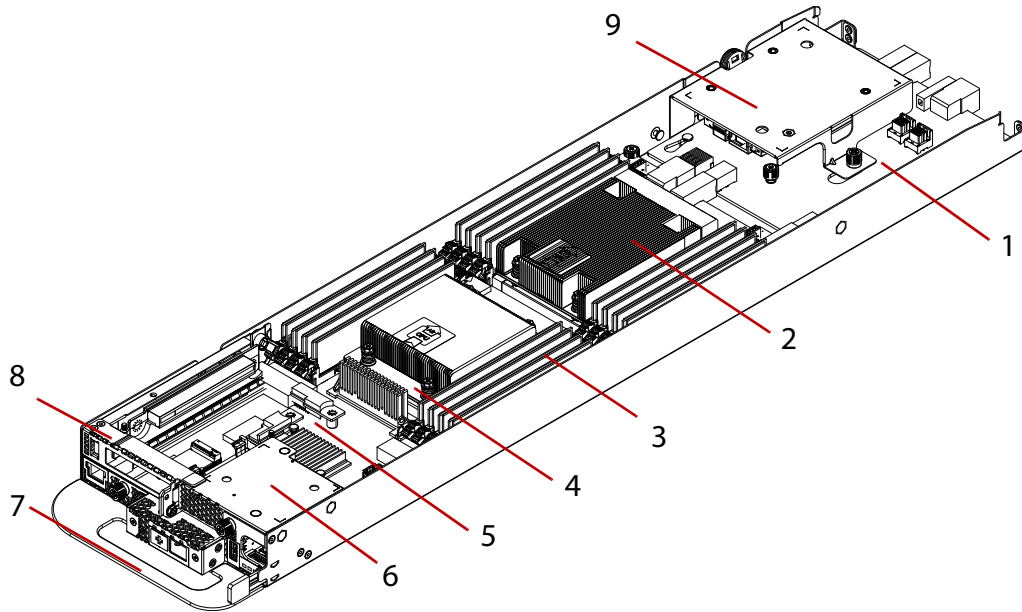| No.	Name	Description
1	Bus bar connector assembly	Bus bar connector assemblies for power input (x3)
2	Air grill	Air grills for heat discharge (x6)
3	Fan module	Fan modules are located inside the air grills.

Compute Node Overview

Figure 1-4.   Node Component Overview

Table 4: Component Overview

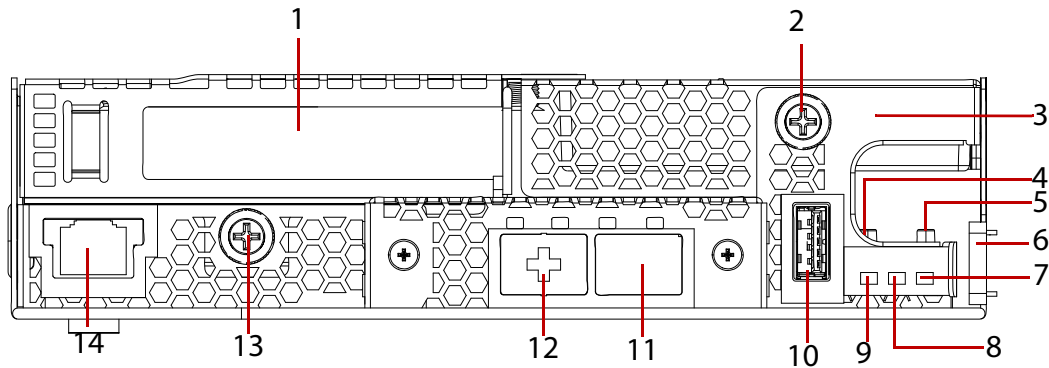| NO.	ITEM	DESCRIPTION
1	Interposer board	A board connects both motherboard and middle plane board
2	Heat sink	Lower the temperature of CPU
3	DIMM	Memory modules
4	CPU	Support the computing power to system
5	Mainboard	A printed circuit board that implements the components like CPU socket, memory slots, chipsets, expansion slots and I/O ports to provide the system hardware features
6	Supercap bracket assembly	House the Supercap (optional) supports the storage PCIe card (optional)
7	Compute Sled Handle	Hold to pull the compute sled from chassis
8	PCIe riser bracket	Features PCIe slot for the installation of expansion card (low-profile) or mezzanine card (need mezzanine bracket assembly) (optional)
9	Mezzanine bracket Assembly	House mezzanine card

Node Front View

Figure 1-5.   Node Front View

Table 5: Node Front View

No.	Item	Description
1	Expansion Slot	Supports low profile PCIe card / mezzanine (need mezzanine bracket) installation.
2	Thumb screw	Secure Supercap bracket assembly on the compute sled
3	Supercap bracket assembly	House the Supercap (optional) supports the storage PCIe card (optional)
4	Power button (Red)	Press less than four seconds to activate power management event. Press longer than four seconds to activate a hard power off.
5	Reset button (Black)	Press to perform a hard reset and begin executing the BIOS initialization code.
6	Sled release latch	Press and hold to release the system sled.
7	Power LED (Blue)	Displays during power on state. Blinking state indicates system ID event trigger. See *Mainboard LEDs* on page 1-8.
8	HDD activity LED (Green)	Displays during activity on the motherboard's SATA hard drive interfaces. See *Mainboard LEDs* on page 1-8.
9	Beep error LED (Amber)	Provides PC speaker functionality by illuminating the LED in place of the PC speaker audible tone. See *Mainboard LEDs* on page 1-8.
10	USB port	Connects to USB device
11	NIC port	Reserved for OCP mezzanine card designed for use with Open Compute project mainboard
12	NIC port	Reserved for OCP mezzanine card designed for use with Open Compute project mainboard
13	Thumb screw	Secure PCIe card / mezzanine bracket assembly on the compute sled.
14	Service NIC	Service Network Interface Controller port for management

Storage Node Overview

Figure 1-6.   Node Component Overview

Table 6: Component Overview

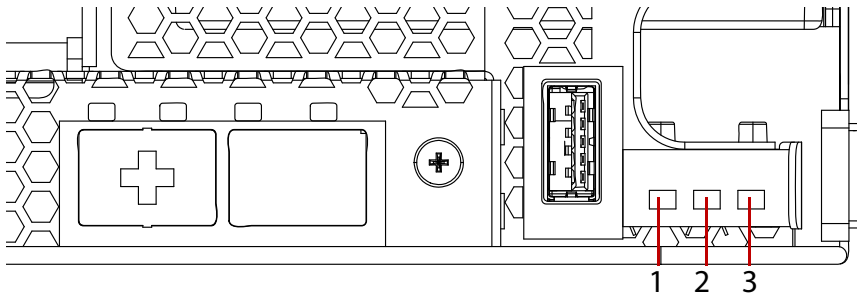| NO.	ITEM	DESCRIPTION
1	Release Latch	Press and Hold the handle then pull out the HDD Sled from Chassis.
2	Handle	Pull out the HDD sled from chassis with pressing the release latch
3	HDD carrier	House the HDD
4	HDD carrier handle	Press the release button on the HDD carrier then pull the handle to open position to lift the HDD carrier.

LED Definitions

Mainboard LEDs

Figure 1-7.   Mainboard LED Description

Table 7: Mainboard LED Description

NO.	NAME	STATE	DESCRIPTION
1	Power LED	Solid Blue	Powered on state.
		Blinking Blue	ID function activated.
		Off	System is powered off.
2	HDD activity LED	Solid Green	Activity detected on mainboard's SATA interfaces.
		Off	No activity detected.
3	Beep error LED	Solid Amber	Provides PC speaker error functionality. See *Beep Error LED Listing* on page 1-8.
		Off	No fault detected.

Beep Error LED Listing

Table 8: Beep Error LED Listing

ERROR DESCRIPTION	LED PATTERNS						
Memory refresh timer error	On (2sec)	Off (0.25sec)	On (2sec)	Off (0.25sec)	On (2sec)	Off (3sec)	...(repeat)
Base Memory read/write test error	On (2sec)	Off (0.25sec)	On (2sec)	Off (0.25sec)	On (0.25sec)	Off (3sec)	...(repeat)
Keyboard controller BAT test error	On (0.25sec)	Off (0.25sec)	On (25sec)	Off (0.25sec)	On (2sec)		
General exception error	On (2sec)	Off (0.25sec)	On (25sec)	Off (0.25sec)	On (0.25sec)	Off (3sec)	...(repeat)
Display memory error	On (0.25sec)	Off (0.25sec)	On (25sec)	Off (0.25sec)	On (0.25sec)		

LAN Port LEDs

The mainboard has an Intel® I210 Ethernet interface to the front RJ45 connector. The RJ45 connector has two built-in LEDs, see the following table for further details.
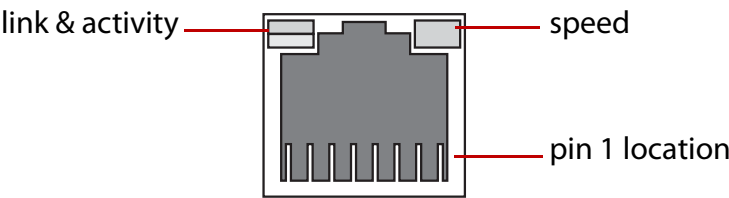

Figure 1-8.   RJ45 LAN Port LEDs

Table 9: LAN Port LED Definition

LED	STATUS	DESCRIPTION
Link LED	OFF	No link
	Solid Green	Link
	Blinking Green	Link with access
Speed LED	Off	No link
	Green	100 Mb
	Amber	1 Gb

Fan LED

The system supports six hot-swap fan modules connected through the midplane board. The fan module LEDs are located on each fan module, see the following illustration.
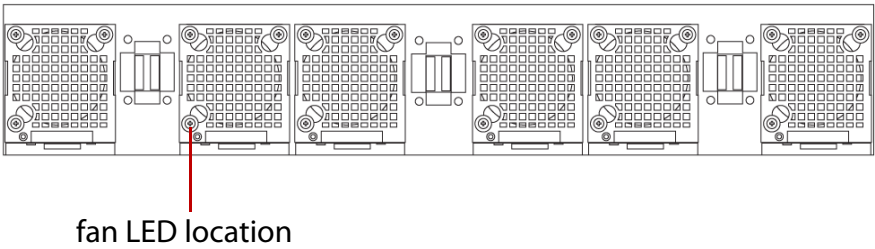

Figure 1-9.   Fan Module LED

Table 10: Fan LED Definition

LED	STATUS	DESCRIPTION
Fan LED	Blue	Fan failure
	Off	No failure

Regulatory and Compliance Information

Chapter 2

This section provides regulatory and compliance information applicable to this system.

Server Safety Information

To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your server product.

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

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

You must adhere to the guidelines in this guide and the assembly instructions in your server manuals 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.

Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and / or the product packaging.

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.
🔌🔌	Indicates to unplug all AC power cord(s) to disconnect AC power.
♻	Please recycle battery.
🚫	The rail racks are designed to carry only the weight of the server system. Do not use rail-mounted equipment as a workspace. Do not place additional load onto any rail-mounted equipment.
⚠ 👥	Indicates two people are required to safely handle the system.

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 supply cord(s), because they serve as the product's main power disconnect.
- Provided with either two independent AC power sources or two independent phases from a s single source.

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.

Power and Electrical Warnings

Caution: The power button, indicated by the stand-by power marking, DOES NOT completely turn off the system AC power, 5V standby power is active whenever the system is plugged in. To remove power from system, you must unplug the AC power cord from the wall outlet. Your system may use more than one AC power cord. Make sure all AC power cords are unplugged. Make sure the AC power cord(s) is / are unplugged before you open the chassis, or add or remove any non hot-plug components.

Do not attempt to modify or use an AC power cord if it is not the exact type required. A separate AC cord is required for each system power supply.

Some power supplies in servers use Neutral Pole Fusing. To avoid risk of shock use caution when working with power supplies that use Neutral Pole Fusing.

The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

To avoid risk of electric shock, turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it.

Power Cord Warnings

If an AC power cord was not provided with your product, purchase one that is approved for use in your country.

Caution: To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:

- *Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.*

- *The power cord(s) must meet the following criteria:*

  - *The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.*
  - *The power cord must have safety ground pin or contact that is suitable for the electrical outlet.*
  - *The power supply cord(s) is / are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.*
  - *The power supply cord(s) must be plugged into socket-outlet(s) that is /are provided with a suitable earth ground.*

System Access Warnings

Caution: To avoid personal injury or property damage, the following safety instructions apply whenever accessing the inside of the product:

- *Turn off all peripheral devices connected to this product.*

- *Turn off the system by pressing the power button to off.*

- *Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.*

- *Disconnect all cables and telecommunication lines that are connected to the system.*

- *Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.*

- *Do not access the inside of the power supply. There are no serviceable parts in the power supply. Return to manufacturer for servicing.*

- *Power down the server and disconnect all power cords before adding or replacing any non hot-plug component.*

- *When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing the power supply from the server.*

Caution: If the server has been running, any installed processor(s) and heat sink(s) may be hot.

Unless you are adding or removing a hot-plug component, allow the system to cool before opening the covers. To avoid the possibility of coming into contact with hot component(s) during a hot-plug installation, be careful when removing or installing the hot-plug component(s).

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

Note: *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 a server 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 server(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 overcurrent 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 antistatic 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. 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.

Other Hazards

Battery Replacement

Caution: *There is the danger of explosion if the battery is incorrectly replaced. When replacing the battery, use only the battery recommended by the equipment manufacturer.*

Dispose of batteries according to local ordinances and regulations.

Do not attempt to recharge a battery.

Do not attempt to disassemble, puncture, or otherwise damage a battery.

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 installed. Operating the system without the covers in place can damage system parts. To install the covers:*
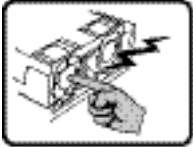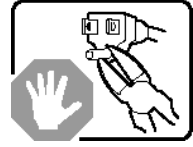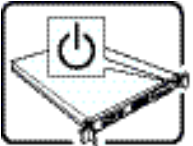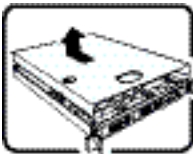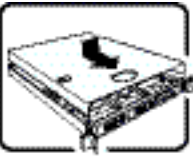
- *Check first to make sure you have not left loose tools or parts inside the system.*
- *Check that cables, add-in cards, and other components are properly installed.*
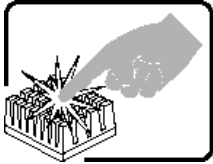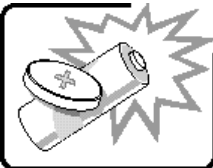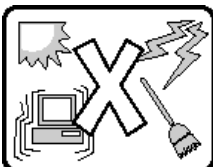- *Attach the covers to the chassis according to the product instructions.*

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 have are not serviceable*
- *Return to manufacturer for servicing*

Use certified Optical Fiber Transceiver Class I Laser Product

	The power supply in this product contains no user-serviceable parts. Refer servicing only to qualified personnel.
	Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.
	The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply. The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into shall be installed near the equipment and shall be easily accessible.
	SAFETY STEPS: Whenever you remove the chassis covers to access the inside of the system, follow these steps: 1. Turn off all peripheral devices connected to the system. 2. Turn off the system by pressing the power button. 3. Unplug all AC power cords from the system or from wall outlets. 4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system. 5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system-any unpainted metal surface-when handling components. 6. Do not operate the system with the chassis covers removed.
	After you have completed the six SAFETY steps above, you can remove the system covers. To do this: 1. Unlock and remove the padlock from the back of the system if a padlock has been installed. 2. Remove and save all screws from the covers. 3. Remove the cover(s).
	For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers: 1. Check first to make sure you have not left loose tools or parts inside the system. 2. Check that cables, add-in cards, and other components are properly

	installed.
	3. Attach the covers to the chassis with the screws removed earlier, and tighten them firmly.
	4. Insert and lock the padlock to the system to prevent unauthorized access inside the system.
	5. Connect all external cables and the AC power cord(s) to the system.
	A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.
	Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.
	The system is designed to operate in a typical office environment. Choose a site that is: • Clean and free of airborne particles (other than normal room dust). • Well ventilated and away from sources of heat including direct sunlight. • Away from sources of vibration or physical shock. • Isolated from strong electromagnetic fields produced by electrical devices. • In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm. • Provided with a properly grounded wall outlet. • Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.
	The rail racks are designed to carry only the weight of the server system. Do not use rail-mounted equipment as a workspace. Do not place additional load onto any rail-mounted equipment.
	Heavy object. Indicates two people are required to safely handle the system.

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Product Regulatory Compliance Markings

Regulatory Compliance	Region	Marking
cULus Listing Mark	USA / Canada	
CE Mark	Europe	

FCC Marking (Class A)	USA	This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
ICES	Canada	CAN ICES-3 (A)/NMB-3(A)
VCCI Marking (Class A)	Japan	この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A
BSMI Certification Number & Class A Warning	Taiwan	警告使用者： 此為甲類資訊技術設備，於居住環境使用中時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。
EAC Marking	Russia	
Recycling Package Mark	Other than China	Corrugated Recycles CFB
MSIP	Korea	A급 기기 (업무용 정보통신기기) 이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.
RCM	Australia	

Electromagnetic Compatibility Notices

FCC Verification Statement (USA)

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

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

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low voltage Directive (2006/95/EC) and EMC Directive (2004/108/EC). The product has been marked with the CE Mark to illustrate its compliance.

VCCI (Japan)

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

VCCI-A

English translation of the notice above:

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

BSMI (Taiwan)

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

警告使用者：
此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

MSIP (Korea)

Ministry of Science, ICT & Future Planning (MSIP) Class A Statement:

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니
판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약
잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기
바랍니다.

Regulated Specified Components

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

Updated product information for configurations can be found on the site at the following URL:

www.QuantaQCT.com

If you do not have access to the Web address, please contact your local representative.

- **Add-in cards:** must have a printed wiring board flammability rating of minimum UL94V-1. Add-in cards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in card containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.

- **Peripheral Storage Devices:** must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.

Restriction of Hazardous Substances (RoHS) Compliance

Quanta® Computer Inc. has a system in place to restrict the use of banned substances in accordance with the European Directive 2011/65/EU. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable threshold limits or (2) an approved / pending RoHS exemption applies.

RoHS implementation details are not fully defined and may change.

Threshold limits and banned substances are noted below:

- Quantity limit of 0.1% by mass (1000 PPM) for:

— Lead

— Mercury

— Hexavalent Chromium

— Polybrominated Diphenyl Ethers (PBDE)

- Quantity limit of 0.01% by mass (100 PPM) for:

— Cadmium

End of Life / Product Recycling

Product recycling and end-of-life take-back systems and requirements vary by country. Contact the retailer or distributor of this product for information about product recycling and / or take-back.