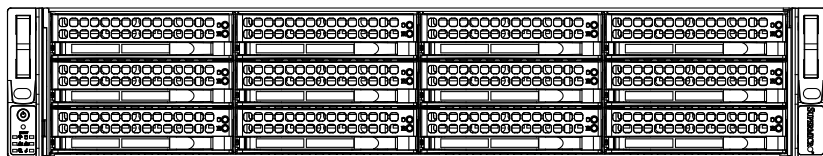




# SUPERSERVER<sup>®</sup> 6028UX-TR4



## User's Manual

Revision 1.0b

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Manual Revision 1.0b  
Release Date: July 21, 2017

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# Preface

## About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6028UX-TR4. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 6028UX-TR4 is a high-end server based on the SC829UACN4-R1K02 2U rackmount chassis and the dual processor X10DRU-X serverboard.

## Manual Organization

### **Chapter 1: Introduction**

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X10DRU-X serverboard and the SC829UACN4-R1K02 chassis.

### **Chapter 2: Server Installation**

This chapter describes the steps necessary to install the SuperServer 6028UX-TR4 into a rack and check out the server configuration prior to powering up the system.

### **Chapter 3: System Interface**

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

### **Chapter 4: Standardized Safety Warnings**

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6028UX-TR4.

### **Chapter 5: Advanced Serverboard Setup**

Chapter 5 provides detailed information on the X10DRU-X serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

### **Chapter 6: Advanced Chassis Setup**

Refer to Chapter 6 for detailed information on the SC829UACN4-R1K02 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

## **Chapter 7: BIOS**

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

## **Appendix A: BIOS Error Beep Codes**

## **Appendix B: System Specifications**



## Notes

## Table of Contents

### **Chapter 1 Introduction**

1-1	Overview .....	1-1
1-2	Serverboard Features .....	1-2
	Processors .....	1-2
	Memory .....	1-2
	Onboard Serial ATA.....	1-2
	Input/Output.....	1-2
1-3	Server Chassis Features .....	1-3
	System Power .....	1-3
	Hard Drives .....	1-3
	PCI Expansion Slots .....	1-3
	Front Control Panel.....	1-3
	Cooling System.....	1-3
1-4	Contacting Supermicro.....	1-5

### **Chapter 2 Server Installation**

2-1	Unpacking the System.....	2-1
2-2	Preparing for Setup.....	2-1
	Choosing a Setup Location.....	2-1
2-3	Warnings and Precautions .....	2-2
	Rack Precautions .....	2-2
	Server Precautions.....	2-2
	Rack Mounting Considerations .....	2-3
	Ambient Operating Temperature .....	2-3
	Reduced Airflow .....	2-3
	Mechanical Loading .....	2-3
	Circuit Overloading.....	2-3
	Reliable Ground .....	2-3
2-4	Installing the System into a Rack .....	2-4
	Identifying the Sections of the Rack Rails.....	2-4
	Releasing the Inner Rail .....	2-5
	Installing the Inner Rails on the Chassis .....	2-6
	Installing the Outer Rails onto the Rack.....	2-7
	Sliding the Chassis onto the Rack Rails.....	2-8

### **Chapter 3 System Interface**

3-1	Overview .....	3-1
3-2	Control Panel Buttons .....	3-2
3-3	Control Panel LEDs .....	3-2

---

Overheating.....	3-3
Overheat Temperature Setting .....	3-3
Responses.....	3-3
3-4 Drive Carrier LEDs.....	3-4
3-5 Power Supply LEDs .....	3-4
<b>Chapter 4 Standardized Warning Statements for AC Systems</b>	
About Standardized Warning Statements.....	4-1
Warning Definition .....	4-1
Installation Instructions.....	4-4
Circuit Breaker .....	4-5
Power Disconnection Warning .....	4-6
Equipment Installation.....	4-8
Restricted Area.....	4-9
Battery Handling.....	4-10
Redundant Power Supplies (if applicable to your system).....	4-12
Backplane Voltage (if applicable to your system).....	4-13
Comply with Local and National Electrical Codes .....	4-14
Product Disposal .....	4-15
Hot Swap Fan Warning (if applicable to your system) .....	4-16
Power Cable and AC Adapter .....	4-18
<b>Chapter 5 Advanced Serverboard Setup</b>	
5-1 Handling the Serverboard .....	5-1
Precautions .....	5-1
5-2 Processor and Heatsink Installation.....	5-2
Installing a Passive CPU Heatsink .....	5-5
Removing the Heatsink.....	5-5
5-3 Connecting Cables.....	5-6
Connecting Data Cables .....	5-6
Connecting Power Cables .....	5-6
5-4 I/O Ports.....	5-6
5-5 Installing Memory .....	5-7
Memory Support.....	5-8
5-6 Serverboard Details .....	5-10
X10DRU-X Quick Reference.....	5-10
5-7 Connector Definitions.....	5-12
5-8 Jumper Settings .....	5-17
5-9 Onboard Indicators.....	5-19
5-10 SATA Ports .....	5-20

5-11	Installing Software.....	5-21
	SuperDoctor® 5 .....	5-22
5-12	Onboard Battery.....	5-23

## **Chapter 6 Advanced Chassis Setup**

6-1	Static-Sensitive Devices.....	6-1
	Precautions .....	6-1
6-2	Control Panel .....	6-2
6-3	Removing the Chassis Cover .....	6-3
6-4	Hard Drive Installation.....	6-4
6-5	Adding PCI Expansion Cards .....	6-7
	Internal Expansion Card .....	6-8
6-6	System Fans .....	6-10
	Replacing System Fan.....	6-10
6-7	Power Supply .....	6-12
	Replacing a Power Supply Module.....	6-12

## **Chapter 7 BIOS**

7-1	Introduction.....	7-1
	Starting BIOS Setup Utility.....	7-1
	How To Change the Configuration Data .....	7-2
	Starting the Setup Utility .....	7-2
7-2	Main Setup .....	7-2
7-3	Advanced Setup Configurations.....	7-4
7-4	Event Logs .....	7-32
7-5	IPMI .....	7-34
7-6	Security Settings .....	7-36
7-7	Boot Settings.....	7-37
7-8	Save & Exit .....	7-39

## **Appendix A BIOS Error Beep Codes**

## **Appendix B System Specifications**

# Chapter 1

## Introduction

### 1-1 Overview

The SuperServer 6028UX-TR4 is a high-end server comprised of two main subsystems: the SC829UACN4-R1K02 1U server chassis and the X10DRU-X dual processor serverboard. Please refer to our website for information on operating systems that have been certified for use with the system ([www.supermicro.com](http://www.supermicro.com)).

In addition to the serverboard and chassis, various hardware components have been included:

- Four sets of 4-cm counter-rotating fans (FAN-0118L4)
- Two passive CPU heatsinks (SNK-P0058PU)
- Riser Cards
  - One riser for two full-height, full-length PCI-E x16 cards (RSC-W2-66)
  - One riser for one full-height, full-length PCI-E x8 card (RSC-R1UW-E8R)
  - One Ultra riser for one full-height, full-length PCI-E x16 and one x8 card (in a x16 slot) (AOC-2UR68-I4G)
- SAS Accessories
  - One SAS backplane (BPN-SAS3-826A-N4)
  - Twelve drive carriers (MCP-220-00075-0B)
- Rack mounting kit (MCP-290-00053-0N)

**Note:** For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your server.

- Product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <ftp://ftp.supermicro.com>
- Product safety information: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)

For support, email [support@supermicro.com](mailto:support@supermicro.com).

## 1-2 Serverboard Features

At the heart of the SuperServer 6028UX-TR4 lies the X10DRU-X, a dual processor serverboard based on the PCH C612. Below are the main features of the serverboard. (See Figure 1-1 for a block diagram).

### Processors

The server supports single or dual Intel E5-2600 v3/v4 Series processors in R3 LGA 2011 type sockets. Please refer to our website for a complete listing of supported processors ([www.supermicro.com](http://www.supermicro.com)).

### Memory

The server features 16 DIMM slots to support up to 2 TB of ECC LRDIMM or 512 GB of ECC RDIMM DDR4-2400/2133/1866/1600 MHz type memory. Please refer to Chapter 5 for details.

### Onboard Serial ATA

Ten SATA 3.0 connections supported by Intel PCH are included on the serverboard.

RAID 0, 1, 5 and 10 are supported. Refer to the following FTP site for setup guidelines:

<[ftp://ftp.supermicro.com/driver/SAS/LSI/LSI\\_SAS\\_EmbMRAID\\_SWUG.pdf](http://ftp.supermicro.com/driver/SAS/LSI/LSI_SAS_EmbMRAID_SWUG.pdf)>.

**Note:** You must have RAID set up to enable the hot-swap capability of the SATA drives.

### Input/Output

The rear I/O includes a VGA port, a COM port, two USB 3.0 ports, four Gb LAN ports and one dedicated IPMI LAN port.

## 1-3 Server Chassis Features

The 6028UX-TR4 is built upon the SC829UACN4-R1K02. Details and related procedures can be found in Chapter 6. The following is a general outline of the main features of the chassis.

### **System Power**

The chassis features a redundant 1000 watt power supply consisting of two hot-plug power modules. The system will continue to operate if one module fails or is being replaced.

### **Hard Drives**

The chassis supports up to twelve 3.5" hot-swap hard drives.

### **PCI Expansion Slots**

Riser cards are included with the system: the RSC-R1UW-E8R supports one low-profile PCI-E x8 expansion card and the RSC-W2-66 supports two full-height, full-length PCI-E x16 expansion cards. In addition, an Ultra riser (AOC-2UR68-I4G) is included to support one full-height, full-length PCI-E x16 and one full-height, full-length x8 card (in a x16 slot).

### **Front Control Panel**

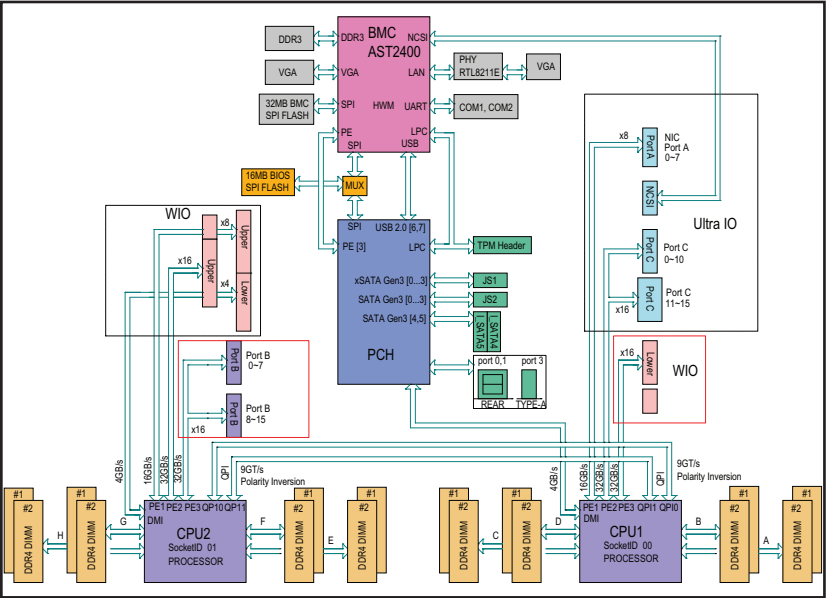
The chassis front control panel provides system monitoring and power control. Status LEDs indicate system power, HDD activity, network activity, UID, and overheat and fan failure.

### **Cooling System**

The chassis has an innovative cooling design that features four 8-cm high-performance fans. Fan speed can be determined by system temperature via IPMI. Each power supply module also includes a cooling fan.

**Figure 1-1. PCH C612 Chipset:  
System Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.





## 1-4 Contacting Supermicro

### Headquarters

Address: Super Micro Computer, Inc.  
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San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

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[support@supermicro.com](mailto:support@supermicro.com) (Technical Support)

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[rma@supermicro.nl](mailto:rma@supermicro.nl) (Customer Support)

Website: [www.supermicro.nl](http://www.supermicro.nl)

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Tel: +886-(2) 8226-3990

Fax: +886-(2) 8226-3992

Email: [support@supermicro.com.tw](mailto:support@supermicro.com.tw)

Website: [www.supermicro.com.tw](http://www.supermicro.com.tw)

**Notes**

## Chapter 2

# Server Installation

This chapter provides instructions for preparing and mounting your chassis in a rack.

### 2-1 Unpacking the System

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, file a damage claim with the carrier who delivered it.

### 2-2 Preparing for Setup

Decide on a suitable location for the rack unit that will hold your chassis. It should be a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. A nearby grounded power outlet is required.

The box your chassis was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws to mount the system into the rack. Please read this chapter in its entirety before beginning the installation procedure.

#### Choosing a Setup Location

- Leave at least 25 inches clearance in front of the rack to open the front door completely.
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and access for servicing.
- It should be a restricted access location, such as a dedicated equipment room or a service closet.

## 2-3 Warnings and Precautions

### Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

### Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SAS drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

## Rack Mounting Considerations

### ***Ambient Operating Temperature***

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

### ***Reduced Airflow***

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

### ***Mechanical Loading***

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

### ***Circuit Overloading***

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### ***Reliable Ground***

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).



**Warning!** To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

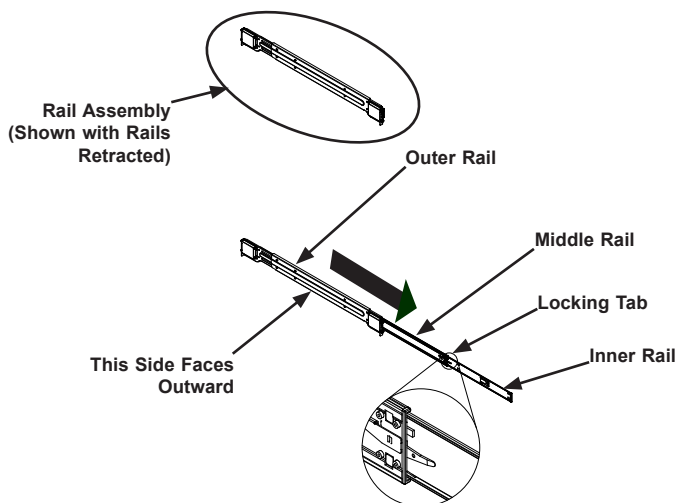
- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Slide rail mounted equipment is not to be used as a shelf or a work space.

## 2-4 Installing the System into a Rack

This section provides information on installing the server into a rack unit with the rack rails provided. There are a variety of rack units on the market, so the assembly procedure may differ slightly. Refer to the installation instructions that came with your rack. **Note:** This rail will fit a rack between 26.5" and 36.4" deep.

### Identifying the Sections of the Rack Rails

The chassis package includes two rail assemblies. Each assembly consists of three sections: An inner rail that secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis.



**Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rail**  
(Left Rail Assembly Shown)

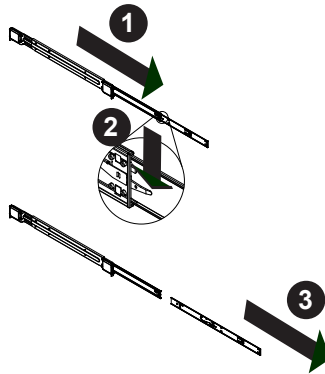
## Releasing the Inner Rail

Each inner rail has a locking latch. This latch prevents the server from coming completely out of the rack when the chassis is pulled out for servicing.

To mount the rail onto the chassis, first release the inner rail from the outer rails.

### ***Releasing Inner Rail from the Outer Rails***

1. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.
2. Press the locking tab down to release the inner rail.
3. Pull the inner rail all the way out.
4. Repeat for the other outer rail.

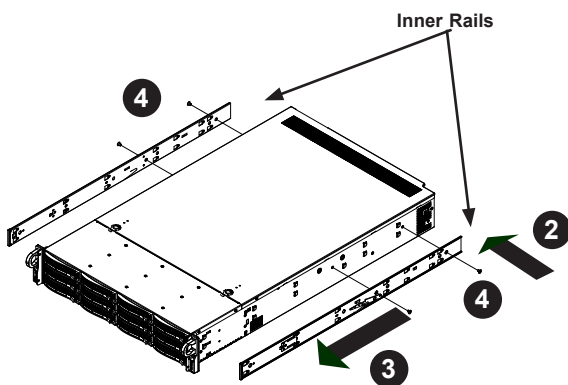


**Figure 2-2. Extending and Releasing the Inner Rail**

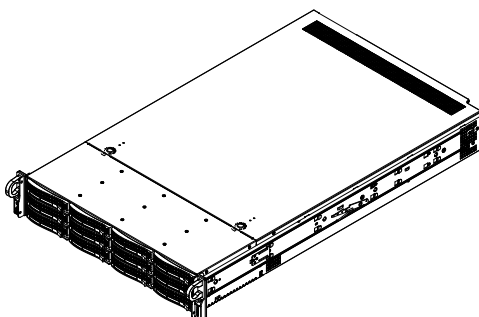
## Installing the Inner Rails on the Chassis

### *Installing the Inner Rails*

1. Identify the left and right inner rails. They are labeled.
2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.
3. Slide the inner rail forward toward the front of the chassis until the quick release bracket snaps into place, securing the rail to the chassis.
4. Optionally, you can further secure the inner rail to the chassis with a screw.
5. Repeat for the other inner rail.



**Figure 2-3. Installing the Inner Rails**



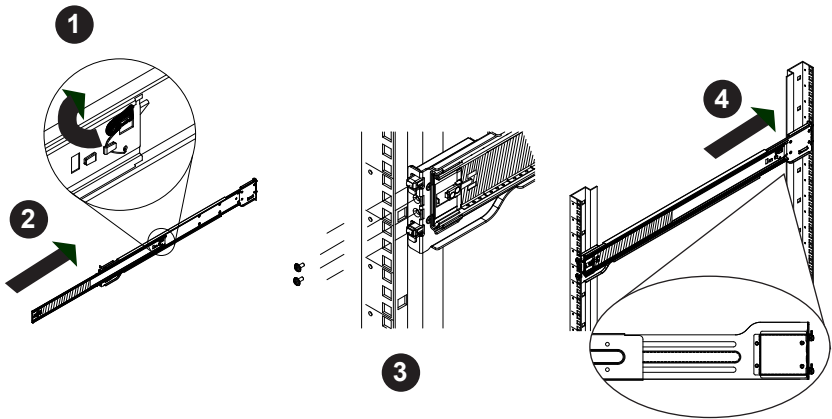
**Figure 2-4. Inner Rails Installed on the Chassis**



## Installing the Outer Rails onto the Rack

### *Installing the Outer Rails*

1. Press upward on the locking tab at the rear end of the middle rail.
2. Push the middle rail back into the outer rail.
3. Hang the hooks on the front of the outer rail onto the square holes on the front of the rack. If desired, use screws to secure the outer rails to the rack.
4. Pull out the rear of the outer rail, adjusting the length until it just fits within the posts of the rack.
5. Hang the hooks of the rear section of the outer rail onto the square holes on the rear of the rack. Take care that the proper holes are used so the rails are level. If desired, use screws to secure the rear of the outer rail to the rear of the rack.
6. Repeat for the other outer rail.



**Figure 2-5. Extending and Mounting the Outer Rails**



**Stability hazard.** The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.

Do not use a two post "Telco" type rack.

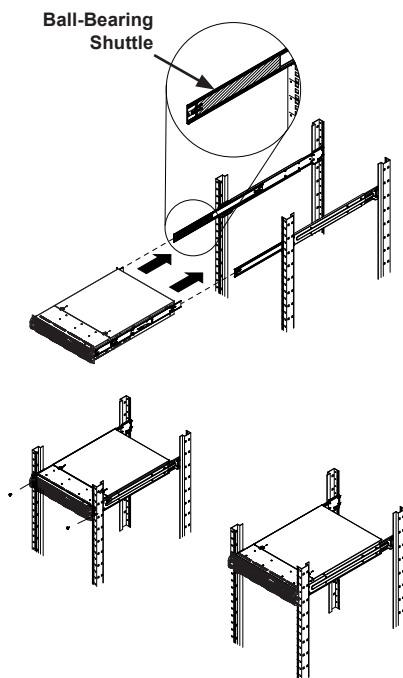
## Sliding the Chassis onto the Rack Rails



**Warning:** Mounting the system into the rack requires at least two people to support the chassis during installation. Please follow safety recommendations printed on the rails.

### *Installing the Chassis into a Rack*

1. Extend the outer rails as illustrated above.
2. Align the inner rails of the chassis with the outer rails on the rack.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.
4. Optional screws may be used to hold the front of the chassis to the rack.



**Figure 2-6. Installing into a Rack**

**Note:** The figure above is for illustrative purposes only. Always install servers to the bottom of the rack first.



**Caution:** Do not pick up the server with the front handles. They are designed to pull the system from a rack only.

## Chapter 3

# System Interface

### 3-1 Overview

The server includes:

- A control panel on the front that houses power buttons and status monitoring lights
- Status lights on the externally accessible hard drives
- Status lights for the power supply visible from the back of the chassis

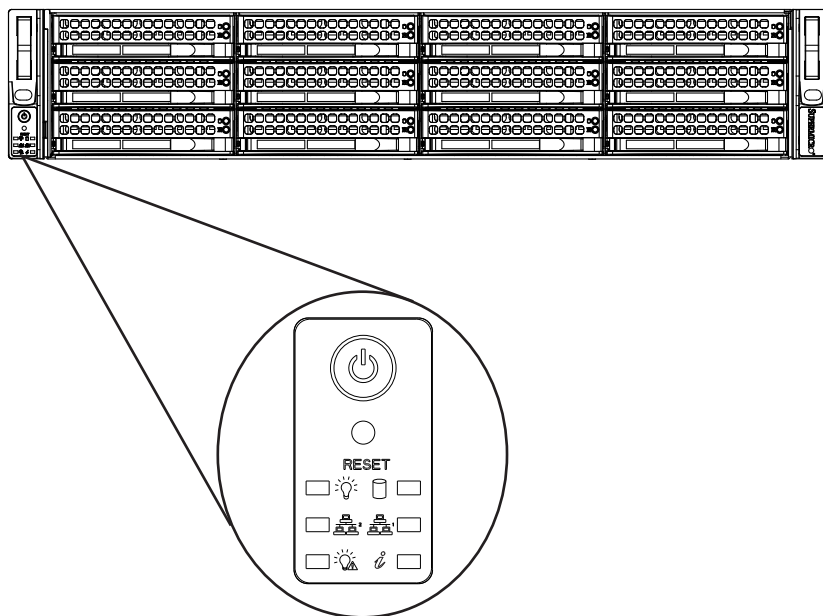


Figure 3-1. Control Panel

## 3-2 Control Panel Buttons

The chassis includes two push-buttons that control power to the system.



**Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.



**RESET**

**Reset:** The reset button is used to reboot the system.

## 3-3 Control Panel LEDs

There are six LEDs that provide status information about the system.



**Power:** Indicates power is being supplied to the system power supply units. This LED should normally be illuminated when the system is operating.



**HDD:** Indicates activity on the hard drive when flashing.



**NIC2:** Indicates network activity on GLAN2 when flashing.



**NIC1:** Indicates network activity on GLAN1 when flashing.



**NIC1:** Indicates network activity on GLAN1 when flashing.



**Information LED:** Alerts operator of several states, as noted in the table below.

Information LED	
Status	Description
Continuously on and red	An overheat condition has occurred. (This may be caused by cable congestion.)
Blinking red (1Hz)	Fan failure, check for an inoperative fan.
Blinking red (0.25Hz)	Power failure, check for a non-operational power supply.
Solid blue	Local UID has been activated. Use this function to locate the server in a rack mount environment.
Blinking blue	Remote UID is on. Use this function to identify the server from a remote location.

## Overheating

There are several possible responses if the system overheats.

### Overheat Temperature Setting

Some backplanes allow the overheat temperature to be set at 45, 50, or 55 by changing a jumper setting. For more information, consult the backplane user manual at [www.supermicro.com](http://www.supermicro.com). (Click Support, then the Manuals link.)

### Responses

#### *If the server overheats:*

1. Use the LEDs to determine the nature of the overheating condition.
2. Confirm that the chassis covers are installed properly.

3. Check the routing of the cables and make sure all fans are present and operating normally.
4. Verify that the heatsinks are installed properly.

### 3-4 Drive Carrier LEDs

The chassis includes externally accessible SAS/SATA drives. Each drive carrier displays two status LEDs on the front of the carrier.

- **Green:** When illuminated, this LED indicates drive activity. It blinks on and off when that particular drive is being accessed. This function is controlled by the backplane.
- **Red:** When illuminated, this LED indicates a drive failure. You should be notified by your system management software.

### 3-5 Power Supply LEDs

On the rear of the power supply module, an LED displays the status.

- **Solid Green:** When illuminated, indicates that the power supply is on.
- **Blinking Green:** When blinking, indicates that the power supply is plugged in and turned off by the system.
- **Blinking Amber:** When blinking, indicates that the power supply has a warning condition and continues to operate.
- **Solid Amber:** When illuminated, indicates that the power supply is plugged in and in an abnormal state. The server system might need service. Please contact Supermicro technical support.

## Chapter 4

### Standardized Warning Statements for AC Systems

#### 4-1 About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our web site at [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm).

#### Warning Definition



##### Warning!

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

##### 警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危險。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您目前所處的工作環境可能讓您受傷。您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

## Warnung

### WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

### INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

### IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

### תקנון הזהרות אזהרה

הזהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארגי סופרמיקרו.



اَكْ فِ حَالَةٍ وُكِيَ اَيُّ تَتَسَبَّبُ فِ اَصَابَةٍ جَسَدُهُ هَذَا الزَّهْزَعُ خَطَرٌ! تَحْذَرُ .  
قَبْلُ اَيُّ تَعْوَلُ عَلَى اَيِّ هَعْدَاتٍ، وِ كِي عَلَى عِلْنِ بِالْوَخَاطِرِ اَلْ اُجُوَّةِ عِي الذَّوَانِزِ  
الْكَهْزَبَائِيَّةِ  
وِ كِي عَلَى دَرَاةٍ بِالْوَوَارِسَاتِ الْمَقَائِيَّةِ لَوْ عٌ وَقَعَ اَيُّ حَادَثٍ  
اِسْتَخْدَمَ رَقْنِ الْبِ اِيَّ الْوَصُصِ فِ هَآءِ كُلِّ تَحْذَرُ لِلْعَثْرِ تَرْجُوْتَهَا

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오

#### BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

#### BEWAAR DEZE INSTRUCTIES

## Installation Instructions



### Warning!

Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前,请先阅读安装说明。

警告

將系統與電源連接前・請先閱讀安裝說明。

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقرأ إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

## Circuit Breaker



### Warning!

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

### 警告

此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V,20A。

### 警告

此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V,20A。

### Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

### ¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

### Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250VDC, 20A.

هذا المنتج يعتمد على معدات الحماية من الدوائر القصيرة التي تم تثبيتها في  
المبنى

تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw elektrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 250V, 20A.

## Power Disconnection Warning



### Warning!

The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.

### 電源切斷の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシ内部にアクセスするには、

システムの電源はすべてのソースから切斷され、電源コードは電源モジュールから取り外す必要があります。

### 警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

### 警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

### Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

**¡Advertencia!**

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

**Attention**

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du châssis pour installer ou enlever des composants de système.

אזהרה מפני ניתוק חשמלי

!אזהרה

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل انظاؤ من جميع مصادر انطاقت وإزانت سهك انكهرياء من وحدة امداد

انطاقت قيم

انصل إلى امناطق انداخييت نههيكم نتبيج أو إزانت مكناث الجهاز

**경고!**

시스템에 부품들을 장착하거나 제거하기 위해서는 새시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

**Waarschuwing**

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

## Equipment Installation



### Warning!

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

### 機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

### 警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

### 警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

### Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

### ¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

### Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

### אזהרה!

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للموظفيه المؤهليه

### 경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

### Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

## Restricted Area



### Warning!

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

### アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

### 警告

此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

### 警告

此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

### Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

### ¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

### Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת 'כלי אבטחה בלבד' (מפתח, מנעול וכד.).

تخصيص هذه انحدرة نترك بها ف مناطق محظورة تم .  
،مكن اننصل إن منطقت محظورة فقط من خلال استخداو أداة خاصت  
أو أ وس هت أصري نلألمما ققم ومفتاح

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

#### Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

### Battery Handling



#### Warning!

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

#### 電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

#### 警告

電池更換不當會有爆炸危險。請只使用同類電池或製造商推薦的功能相當的電池更換原有電池。請按製造商的說明處理廢舊電池。

#### 警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。



**Warnung**

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

**Attention**

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

**¡Advertencia!**

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

**אזהרה!**

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת. סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسبدال البطارية بطريقة غير صحيحة فاعلil

اسبدال البطارية

فقط بنفس النوع أو ما يعادلها مما أوصت به الشركة المصنعة

جخلص من البطاريات المسحمة وفقا لعليمات الشركة الصانعة

**경고!**

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

**Waarschuwing**

Er is ontplofingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

## Redundant Power Supplies



### Warning!

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

### 冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。  
ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

### 警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

### 警告

此装置连接的电源可能不只一个，必须切断所有电源才能停止对该装置的供电。

### Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein Strom zugeführt wird, müssen alle Verbindungen entfernt werden.

### ¡Advertencia!

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

### Attention

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

אם קיים יותר מספק אחד

אזהרה!

ליחידה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة .  
يجب إزالة كافة الاتصالات لغسل الوحدة عن الكهرباء

경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

### Backplane Voltage



#### Warning!

Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理する際にはご注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי

אזהרה!

קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر من التيار الكهربائي أو الطاقة المسجدة على اللوحة  
عندما يكن النظام يعمل كه حذرا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생  
합니다. 서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het  
systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

## Comply with Local and National Electrical Codes



### Warning!

Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y  
nacionales.

#### Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والطبية المتعلقة

بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

#### Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

### Product Disposal



#### Warning!

Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

#### Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

## Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה!

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية عند

## 경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

## Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

## Hot Swap Fan Warning



### Warning!



Hazardous moving parts. Keep away from moving fan blades. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

## ファン・ホットスワップの警告

警告!回転部品に注意。運転中は回転部(羽根)に触れないでください。シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

## 警告!

警告! 危険的可移動性零件。请务必与转动的风扇叶片保持距离。当您从机架移除风扇装置, 风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

## 警告

危險的可移動性零件。請務必與轉動的風扇葉片保持距離。當您從機架移除風扇裝置, 風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

### Warnung

Gefährlich Bewegende Teile. Von den bewegenden Lüfterblätter fern halten. Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

### ¡Advertencia!

Riesgo de piezas móviles. Mantener alejado de las aspas del ventilador. Los ventiladores podran dar vuelta cuando usted quite el montaje del ventilador del chasis. Mantenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

### Attention

Pieces mobiles dangereuses. Se tenir a l'ecart des lames du ventilateur Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

### אזהרה!

חלקים נעים מסוכנים. התרחק מלהבי המאוורר בפעולה כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير! أجزاء متحركة خطيرة. ابتعد عن شفرات المروحة المتحركة. من الممكن أن المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة

### 경고!

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 새시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

### Waarschuwing

Gevaarlijk bewegende onderdelen. Houd voldoende afstand tot de bewegende ventilatorbladen. Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

## Power Cable and AC Adapter



### Warning!

**Warning!** When installing the product, use the provided or designated connection cables, power cables and AC. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the code) for any other electrical devices than products designated by Supermicro only..

### 電源コードとACアダプター

製品を設置する場合、提供または指定および購入された接続ケーブル、電源コードとACアダプターを、該当する地域の条例や安全基準に適合するコードサイズやプラグと共に使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSEマークがコードに表記)を Supermicroが指定する製品以外に使用することを禁止しています。

### 警告

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器。包含遵照当地法规和安全要求的合规的电源线尺寸和插头.使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

### 警告

安装此產品時,請使用本身提供的或指定的或採購的連接線,電源線和電源適配器。包含遵照當地法規和安全要求的合規的電源線尺寸和插頭.使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品,電氣用品和材料安全法律規定禁止使用未經UL或CSA認證的線材。(線材上會顯示UL/CSA符號)。

### Warnung

Nutzen Sie beim Installieren des Produkts ausschließlich die von uns zur Verfügung gestellten Verbindungskabeln, Stromkabeln und/oder Adapter, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adapter können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet), an Geräten oder Produkten die nicht mit Supermicro gekennzeichnet sind.



## ¡Advertencia!

Cuando instale el producto, utilice la conexión provista o designada o procure cables, Cables de alimentación y adaptadores de CA que cumplan con los códigos locales y los requisitos de seguridad, incluyendo el tamaño adecuado del cable y el enchufe. El uso de otros cables y adaptadores podría causar un mal funcionamiento o un incendio. La Ley de Seguridad de Aparatos Eléctricos y de Materiales prohíbe El uso de cables certificados por UL o CSA (que tienen el certificado UL / CSA en el código) para cualquier otros dispositivos eléctricos que los productos designados únicamente por Supermicro.Attention

## Attention

Lors de l'installation du produit, utilisez les cables de connection fournis ou désigné ou achetez des cables, cables de puissance et adaptateurs respectant les normes locales et les conditions de securite y compris les tailles de cables et les prises electriques appropriées. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et la Loi sur la Sécurité Matériel interdit l'utilisation de câbles certifiés- UL ou CSA (qui ont UL ou CSA indiqué sur le code) pour tous les autres appareils électriques sauf les produits désignés par Supermicro seulement.

## AC כבלים חשמליים ומתאמי

## !אזהרה

אשר נרכשו או AC כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים הותאמו לצורך ההתקנה, ואשר הותאמו לדרישות הבטיחות המקומיות, כולל מידה נכונה של הכבל והתקע. שימוש בכל כבל או מתאם מסוג אחר, עלול לגרום לתקלה או קצר חשמלי. בהתאם לחוקי השימוש במכשירי החשמל וחוקי הבטיחות, קיים איסור להשתמש עבור UL/CSA) כאשר מופיע עליהם קוד של (UL-CSA או ב UL -כבבלים המוסמכים ב בלבד Supermicro כל מוצר חשמלי אחר, אלא רק במוצר אשר הותאם ע"י

عند تركيب المنتج، قم باستخدام التوصيلات المتوفرة أو المحددة أو قم بشراء الكابلات الكهربائية ومحوّلات التيار المتردد مع الالتزام بقوانين ومتطلبات السلامة المحلية بما في ذلك حجم الموصل والقابس السليم. استخدام أي كابلات ومحوّلات أخرى قد يتسبب في عطل أو حريق. يحظر قانون السلامة للأجهزة الكهربائية والمعدات استخدام مع أي معدات أخرى غير المنتجات المعنية (UL/CSA) والتي تحمل علامة UL أو UL الكابلات المعتمدة من قبل Supermicro والمحددة من قبل

### 전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굵기의 코드와 플러그를 포함한 안전 요구 사항을 준수하여 제공되거나 지정된 연결 혹은 구매 케이블, 전원 케이블 및 AC 어댑터를 사용하십시오.

다른 케이블이나 어댑터를 사용하면 오작동이나 화재가 발생할 수 있습니다. 전기 용품 안전법은 UL 또는 CSA 인증 케이블 (코드에 UL / CSA가 표시된 케이블) 을 Supermicro가 지정한 제품 이외의 전기 장치에 사용하는 것을 금지합니다.

### Stroomkabel en AC-Adapter

Waarschuwing! Bij het aansluiten van het Product uitsluitend gebruik maken van de geleverde Kabels of een andere geschikte aan te schaffen Aansluitmethode, deze moet altijd voldoen aan de lokale voorschriften en veiligheidsnormen, inclusief de juiste kabeldikte en stekker. Het gebruik van niet geschikte Kabels en/of Adapters kan een storing of brand veroorzaken. Wetgeving voor Elektrische apparatuur en Materiaalveiligheid verbied het gebruik van UL of CSA -gecertificeerde Kabels (met UL/CSA in de code) voor elke andere toepassing dan de door Supermicro hiervoor beoogde Producten.

## Chapter 5

### Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the X10DRU-X serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

#### 5-1 Handling the Serverboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling.

The following measures are generally sufficient to protect your equipment from static discharge.

##### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

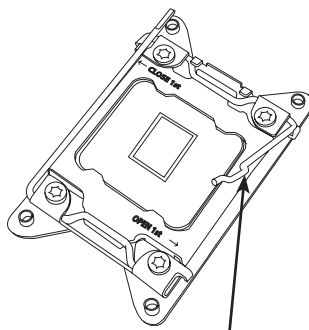
## 5-2 Processor and Heatsink Installation

### Notes:

- Always remove the power cord before adding, removing or changing a CPU.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- If you buy a CPU separately, use only an Intel-certified, multi-directional heatsink.
- Avoid placing direct pressure to the top of the processor package.
- Install the processor into the CPU socket before installing the heatsink.
- Refer to the Supermicro website for updates on CPU support.

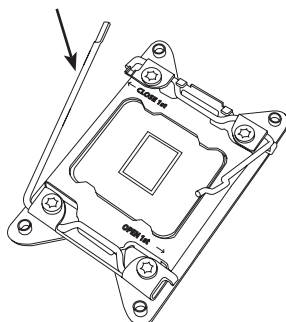
### Installing a CPU

1. There are two levers on the LGA 2011 socket. First press and release the load lever labeled "Open 1st".



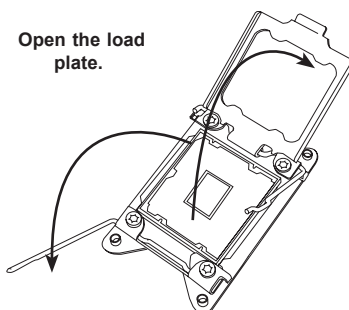
Release the lever labeled "Open 1st"

2. Press the second load lever labeled "Close 1st" to release the load plate from its locked position.

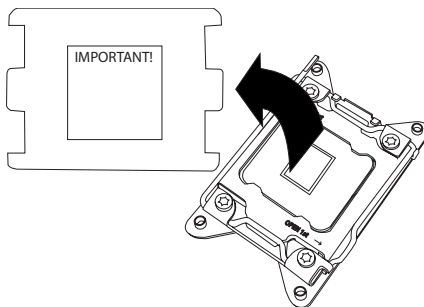


Release the lever labeled "Close 1st"

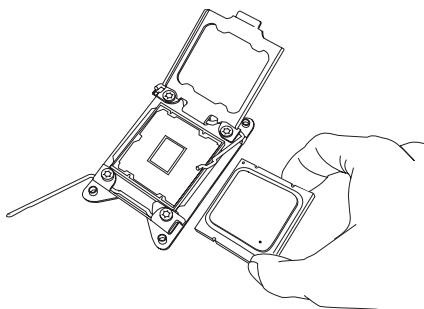
3. With the second lever fully retracted, gently push down on the "Open 1st" lever to loosen the load plate. Lift the load plate with your fingers to open it completely.



4. Pop the plastic cap marked "Warning" out of the load plate.
5. Holding the CPU carefully above the socket, orient the CPU so that all keys and edges will fit the socket.

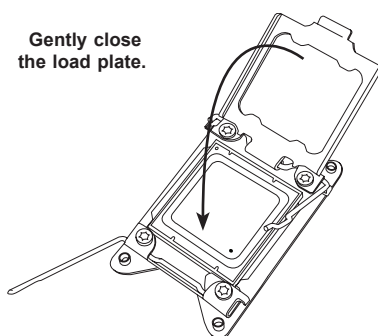


6. Carefully lower the CPU straight down into the socket. Do not move the CPU horizontally, and do not rub the pins of the socket. This may damage the CPU or the socket.

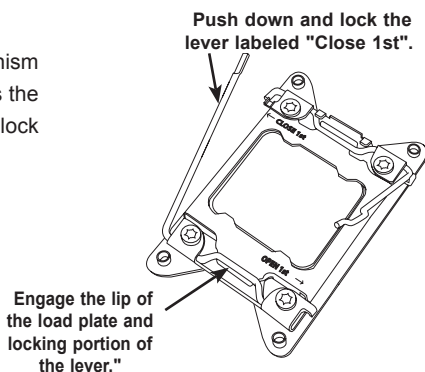


**Caution:** You can only install the CPU into the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it does not close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

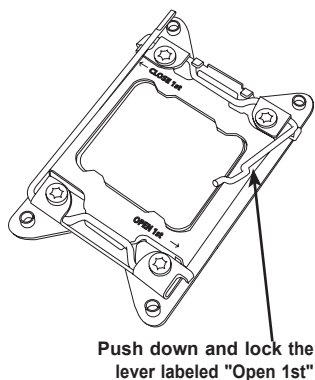
7. With the "Close 1st" lever fully retracted, gently close the load plate.



8. Make sure the locking mechanism on the "Close 1st" lever catches the lip of the load plate. Close and lock the "Close 1st" lever.

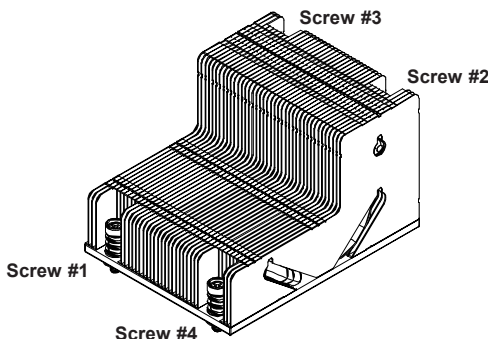


9. Close and lock the "Open 1st" lever.



## Installing a Passive CPU Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the serverboard's and the heatsink bracket underneath.
3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (to avoid possible damage to the CPU do not over-tighten the screws.)
4. Finish the installation by fully tightening all four screws.



## Removing the Heatsink

**Caution:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to prevent damage done to the CPU or the CPU socket.

1. Unscrew the heatsink screws in the sequence as shown in the illustration below.
2. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)
3. Once the CPU is loosened, remove the heatsink from the CPU.
4. Remove the used thermal grease and clean the surface of the CPU and the heatsink, Reapply the proper amount of thermal grease on the surface before reinstalling the heatsink.

## 5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

### Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, take care to reroute them as they were originally after reconnecting them and note the pin 1 locations. If configuring the system, keep the airflow in mind when routing the cables.

### Connecting Power Cables

Main power is supplied to the X10DRU-X through the PSU1 and PSU2 connectors, which connect directly to the power supplies in the system.

Four 12V, 8-pin power connectors (JPW19, JPW21, JPW22, JPW23) are used to supply power for backplane devices such as HDDs. Four additional 8-pin connectors are provided to supply power to any onboard GPUs. See the Connector Definitions section in this chapter for power connector pin definitions.

## 5-4 I/O Ports

See Figure 5-2 below for the locations of the various I/O ports located on the back of the serverboard.

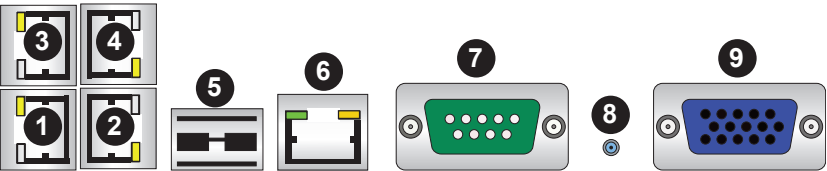


Figure 5-2. Rear Panel I/O Ports

Rear I/O Ports			
1	Gb LAN1 (Bypass Pair 1)	6	Dedicated IPMI LAN Port
2	Gb LAN2 (Bypass Pair 1)	7	COM Port
3	Gb LAN3 (Bypass Pair 2)	8	UID Button/UID LED
4	Gb LAN4 (Bypass Pair 2)	9	VGA Port
5	USB 3.0 Port		



## 5-5 Installing Memory

**Note:** Check the Supermicro website for recommended memory modules.

---

### **CAUTION**

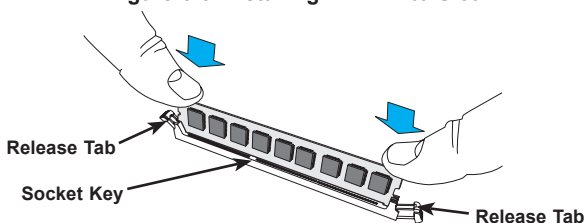
Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

---

#### ***Installing DIMMs***

1. Insert the desired number of DIMMs into the memory slots, starting with slot P1-DIMMA1.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key on the DIMM module with the receptive point on the slot.
4. Use two thumbs together to press on both ends of the module straight down into the slot until the module snaps into place.
5. Press the release tabs to the lock positions to secure the DIMM module into the slot. See Figure 5-3.

**Figure 5-3. Installing DIMM into Slot**



#### **Notes**

- For the memory to work properly, install DIMMs in pairs (with an even number of DIMMs installed).
- All channels in a system will run at the fastest common frequency.

Memory Support

The server features 16 DIMM slots to support up to 2 TB of ECC LRDIMM or 512 GB of ECC RDIMM DDR4-2400/2133/1866/1600 MHz type memory. For the latest memory updates, please refer to our website.

**Note:** Maximum of 1 DIMM per channel for DDR4-2133.

Processor & Memory Module Population Configuration

For memory to work properly, follow the tables below for memory installation.

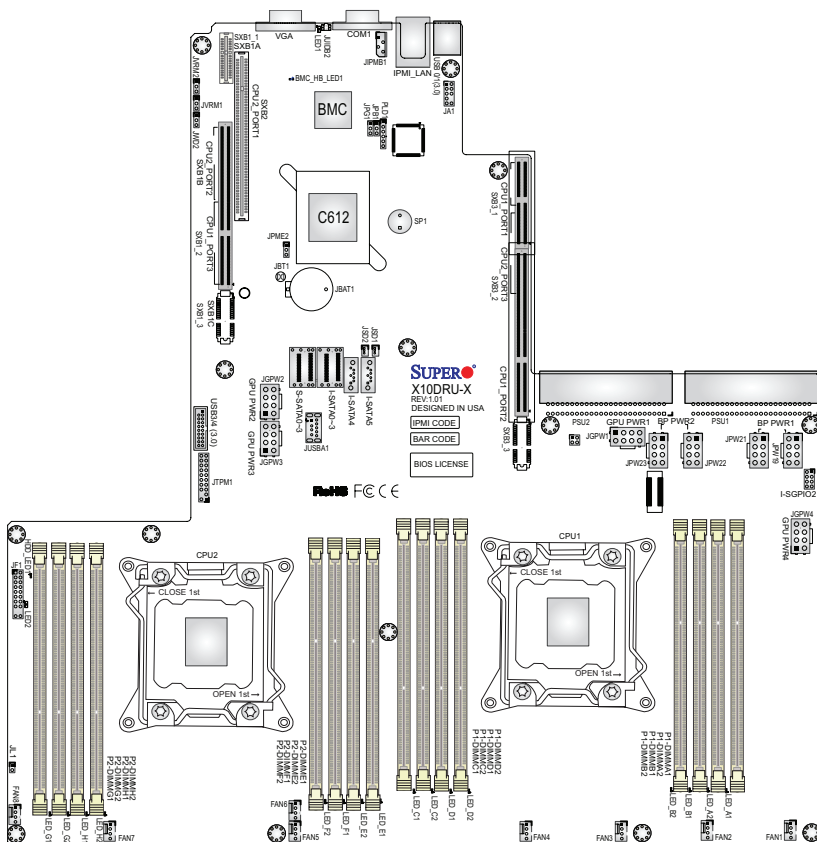
Processors and their Corresponding Memory Modules				
CPU#	Corresponding DIMM Modules			
CPU 1	P1-DIMMA1	P1-DIMMB1	P1-DIMMC1	P1-DIMMD1
CPU2	P2-DIMME1	P2-DIMMF1	P2-DIMMG1	P2-DIMMH1

Processor and Memory Module Population for Optimal Performance	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (For memory to work properly, please follow the instructions below.)
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs & 10~16 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + Any memory pairs in P1, P2 DIMM slots
2 CPUs & 16 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2, P2-DIMME2/P2-DIMMF2/P2-DIMMG2/P2-DIMMH2

Populating RDIMM/LRDIMM DDR4 Memory Modules							
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slots per Channel (SPC) and DIMMs per Channel (DPC)			
				2 Slots per Channel			
				1 DPC		2 DPC	
				E5-2600 V3	E5-2600 V4	E5-2600 V3	E5-2600 V4
		4 Gb	8 Gb	1.2 V	1.2 V	1.2 V	1.2 V
RDIMM	SRx4	8 GB	16 GB	2133	2400	1866	2133
RDIMM	SRx8	4 GB	8 GB	2133	2400	1866	2133
RDIMM	DRx8	8 GB	16 GB	2133	2400	1866	2133
RDIMM	DRx4	16 GB	32 GB	2133	2400	1866	2133
LRDIMM	QRx4	32 GB	64 GB	2133	2400	2133	2400
LRDIMM 3DS	8Rx4	64 GB	128 GB	2133	2400	2133	2400

## 5-6 Serverboard Details

**Figure 5-4. SUPER X10DRU-X Layout**



## X10DRU-X Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-8
JPB1	BMC Enabled	Pins 1-2 (Enabled)
JPG1	VGA Enabled	Pins 1-2 (Enabled)
JPME2	Manufacturing Mode	Pins 1-2 (Disabled)
JWD2	Watch Dog	Pins 1-2 (RST)
JVRM1/JVRM2	I <sup>2</sup> C Bus for VRM	Pins 1-2 (BMC: Normal)

**Notes:** "■" indicates the location of "Pin 1". Jumpers/LEDs not indicated are for testing purposes only. Components not documented are for internal use only.

Connector	Description
COM1	COM (Serial) Port 1
FAN1 - FAN8	System Cooling Fan Header
IPMI LAN	Dedicated IPMI LAN Port
I-SATA0~5	SATA 3.0 Ports (supported by Intel PCH)
I-SGPIO2	Serial Link General Purpose I/O Header
JF1	Front Panel Control Header
JGPW1 - JGPW4	GPU/VGA Power Connectors
JIPMB1	GPU/PCIe Auxiliary Power Connectors
JL1	Chassis Intrusion Detection Header
JPW19/21/22/23	Storage backplane Power Connectors
JSD1/JSD2	SATA DOM (Device On Module) Power Connectors
JTPM1	TPM (Trusted Platform Module)/Port 80
JUIDB2	UID (Unit Identifier) Switch
JUSBA1	Internal USB 3.0 Header
PSU1/PSU2	Power Connectors (directly to power supplies)
S-SATA0~3	SATA 3.0 Ports (supported by Intel SCU)
SXB1_1/1_2/1_3	PCI-E 3.0 (x16 + x16) Left Riser Card Slot
SXB2	PCI-E 3.0 (x8) + PCI-E 2.0 (x4 in x8) Center Riser Card Slot
SXB3_1/3_2/3_3	PCI-E 3.0 (x24 +x16) Right Ultra Riser Card Slot
USB0/1	Front Accessible USB 2.0 Ports 0/1
USB3/4	Front Accessible USB 3.0 Ports 3/4
VGA	Backpanel VGA Port

LED	Description (State)	Status
BMC_HB_LED1	BMC Heartbeat LED (Green: Blinking)	BMC Normal
LED1	Rear UID LED (Blue: On)	Unit Identified
HDD_LED1	HDD Heartbeat LED (Blinking)	HDD Normal
LED2	Onboard PWR LED (On)	System Power On
LED_A1-A3	Memory Fault LED (DIMM slots A1-A3)	Memory Error(s)
LED_B1-B3	Memory Fault LED (DIMM slots B1-B3)	Memory Error(s)
LED_C1-C3	Memory Fault LED (DIMM slots C1-C3)	Memory Error(s)
LED_D1-D3	Memory Fault LED (DIMM slots D1-D3)	Memory Error(s)
LED_F1-F3	Memory Fault LED (DIMM slots F1-F3)	Memory Error(s)
LED_G1-G3	Memory Fault LED (DIMM slots G1-G3)	Memory Error(s)
LED_H1-H3	Memory Fault LED (DIMM slots H1-H3)	Memory Error(s)

# 5-7 Connector Definitions

## Power Connectors

The X10DRU-X serverboard supports the following power configurations:

- Two proprietary power connectors (PSU1 and PSU2)
- Four 12V 8-pin backplane power connectors for backplane devices (JPW19, JPW21, JPW22, JPW23)
- Four 8-pin power-connectors (JGPW1-JGPW4) for GPUs.

**Warning:** To provide adequate power to your system and to avoid damaging the power supply or the serverboard, be sure to connect all power connectors mentioned above to the power supply when using the devices mentioned. Failure in doing so may void the manufacturer warranty on your power supply and serverboard.

## NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

## Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	3.3V
16	PWR LED

## HDD LED

The HDD LED connection is located on pins 13/14 of JF1. Attach a hard drive LED cable to display HDD activity. See the table on the right for pin definitions.

HDD/UID Switch Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HDD Active

## NIC1/NIC2 LED

The NIC (Network Interface Controller) LED connections for GLAN port 1 are located on pins 11 and 12 of JF1, and the LED connection for GLAN Port 2 are on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table on the right for pin definitions.

Note: The NIC LED connections for 10G\_LAN Ports 3/4 is located on LED1.

GLAN 1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC 2 Activity LED
10	NIC 2 Link LED
11	NIC 1 Activity LED
12	NIC 1 Link LED

## Overheat (OH)/Fan Fail/PWR Fail/UID LED

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/Fan Fail/Power Fail and UID LED connections. The Red LED on pin 8 provides warnings of overheat, fan failure or power failure. The Blue LED on pin 7 works as the front panel UID LED indicator. Refer to the table on the right for pin definitions.

OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Blue_UID LED
8	OH/Fan Fail/Power Fail

OH/Fan Fail/PWR Fail LED Status (Red LED)	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

## Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Supply Fail

## Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

## Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	Ground

## Fan Headers

The serverboard has eight system/CPU fan headers (Fan 1~Fan 8). All are 4-pin fans headers, which are backward compatible with traditional 3-pin fans. Fan speed control is available for 4-pin fans only. The fan speeds are controlled by thermal management via IPMI. See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	Pulse Width Modulation (PWM)

## Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground



### Internal Speaker

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions.

Internal Speaker Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

### TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. See the table on the right for pin definitions.

TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

### I-SGPIO2 Header

A Serial-Link General Purpose Input/Output header (I-SGPIO2) supports the S-SATA 0-3 ports. See the table on the right for pin definitions.

I-SGPIO Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

### DOM Power Connectors

Two power connectors for SATA DOM (Disk On Module) devices are located at JSD1 and JSD2. Connect an appropriate cable here to provide power for your SATA DOM devices.

DOM PWR Pin Definitions	
Pin#	Definition
1	+5V
2	Ground
3	Ground

### Unit Identifier Buttons/UID LED Indicators

A rear unit identifier button (JUIDB2) is located next to the COM port. The rear UID LED (LED1) is located next to the rear UID button. Pressing the UID button causes the UID LED indicator turn on. Press the UID button again to turn off the LED. The UID indicator provide easy identification of a system unit that may be in need of service.

**Note:** UID can also be triggered via IPMI. For more information on IPMI, please refer to the IPMI User's Guide posted on our website.

### LAN Port

A Dedicated IPMI LAN port is located on the backpanel to provide KVM support for IPMI 2.0. (Please refer to the LED Indicator Section for LAN LED information.)

### COM1

The COM1 port provides serial communication (RS-232) support for the serverboard.

### Universal Serial Bus (USB)

Two USB 3.0 ports (USB 0/1) are located on the rear I/O panel. A Type A USB connector (USB 2), and a USB header with two USB connections (USB 3/4) provide onboard USB 3.0 connections for front access (cables not included).

### IPMB I<sup>2</sup>C SMB

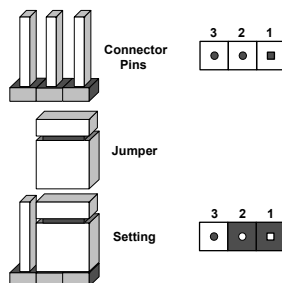
A System Management Bus header for the IPMI slot is located at JIPMB1. Connect an appropriate cable here to use the IPMB I<sup>2</sup>C connection on your system.

SMB Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

## 5-8 Jumper Settings

### Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the serverboard layout page for jumper locations.



**Note:** On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

### CMOS Clear

JBT1 is used to clear CMOS and will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

#### To clear CMOS

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

**Note:** Do not use the PW\_ON connector to clear CMOS.

### VGA Enable/Disable

JPG1 allows you to enable or disable the onboard VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings. The default setting is enabled.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

**I<sup>2</sup>C Bus for VRM**

Jumpers JVRM1 and JVRM2 allow the BMC or the PCH to access CPU and memory VRM controllers. See the table on the right for jumper settings.

**Watch Dog Enable/Disable**

JWD1 controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application “hangs”. Pins 1-2 will cause WD to reset the system if an application hangs. Pins 2-3 will generate a non-maskable interrupt signal for the application that has hung. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

**BMC Enable**

Jumper JPB1 allows you to enable the embedded the onboard BMC (Baseboard Management) controller to provide IPMI 2.0 support on the serverboard. See the table on the right for jumper settings.

BMC Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	BMC Enable
Pins 2-3	Normal

**ME Manufacturing Mode Select**

Close pin 2 and pin 3 of jumper JPME2 to bypass SPI flash security and force the system to operate in the Manufacturer (ME) mode, allowing the user to flash the system firmware from a host server for system setting modifications. See the table on the right for jumper settings.

ME Mode Select Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal
Pins 2-3	Manufacture Mode

## 5-9 Onboard Indicators

### IPMI Dedicated LAN LEDs

A dedicated IPMI LAN port is located on the rear I/O panel. The amber LED on the right indicates activity, while the LED on the left indicates the speed of the connection. See the tables at right for more information.

IPMI LAN Activity Indicator LED Settings		
Color	Status	Definition
Amber	Flashing	Active

IPMI LAN Speed LED	
LED Color	Definition
Off	No Connection
Green	100 Mbps
Amber	1 Gbps

### HDD Heartbeat LED

The HDD\_LED1 LED is used to indicate HDD activity. When this LED is blinking, HDD devices are being accessed. See the table at right for more information.

HDD Heartbeat LED Status	
Color/State	Definition
Green: Blinking	HDD: Activity

### Power LED

A Power LED is located at LED2 on the serverboard. When this LED is on, power is connected and the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

Onboard PWR LED Indicator LED Status	
LED Color	Definition
Off	System Off (Power cable not connected)
Green	System On

### BMC Heartbeat LED

A BMC Heartbeat LED is located at BMC\_HB\_LED1. When this LED is blinking, BMC is functioning normally.

BMC Heartbeat LED Status	
Color/State	Definition
Green: Blinking	BMC: Normal

## 5-10 SATA Ports

### SATA 3.0 Ports

Ten SATA 3.0 ports are located on the serverboard. The connector labeled I-SATA 0~3 (which provides four SATA port connections) and the two I-SATA 4, 5 ports together provide six SATA ports supported by the Intel PCH C612. The connector labeled S-SATA 0~3 provides an additional four ports, supported by the Intel SCU.

## 5-11 Installing Software

The Supermicro FTP site contains drivers and utilities for your system at <ftp://ftp.supermicro.com>. Some of these must be installed, such as the chipset driver.

After accessing the FTP site, go into the CDR\_Images directory and locate the ISO file for your serverboard. Download this file to create a CD/DVD of the drivers and utilities it contains. (You may also use a utility to extract the ISO file if preferred.)

Another option is to go to the Supermicro Website at <http://www.supermicro.com/products/>. Find the product page for your serverboard here, where you may download individual drivers and utilities.

After creating a CD/DVD with the ISO files, insert the disk into the CD/DVD drive on your system and the display shown in Figure 5-5 should appear.

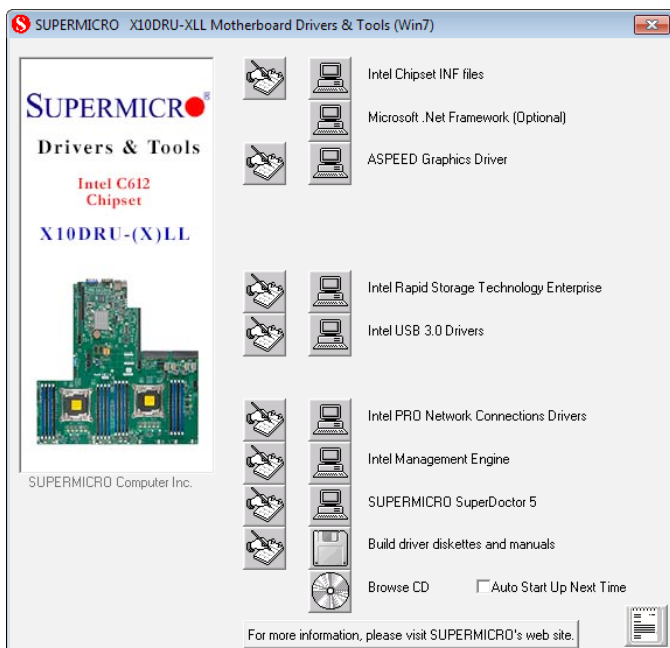


Figure 5-5. Driver Installation Display Screen

**Note:** Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents.

SuperDoctor® 5

The Supermicro SuperDoctor 5 is a program that functions in a command-line or web-based interface in Windows and Linux operating systems. The program monitors system health information such as CPU temperature, system voltages, system power consumption, fan speed, and provides alerts via email or Simple Network Management Protocol (SNMP).

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SD5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

**Note:** The default User Name and Password for SuperDoctor 5 is admin / admin.

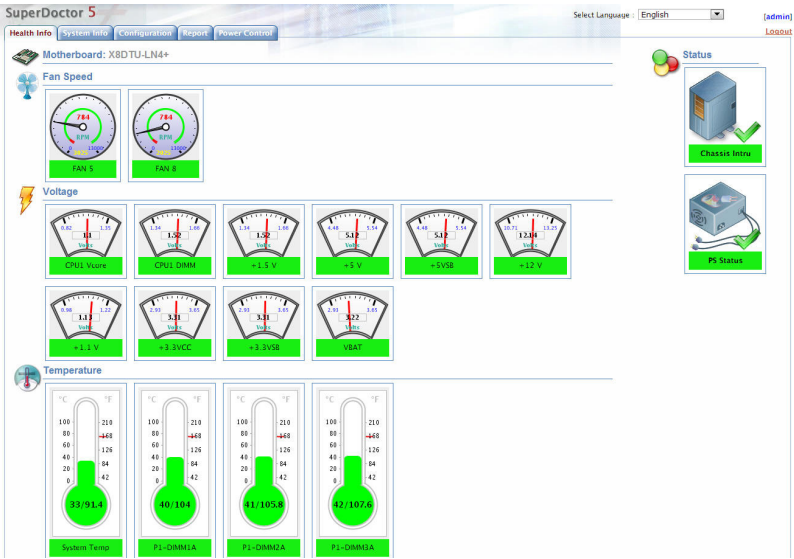


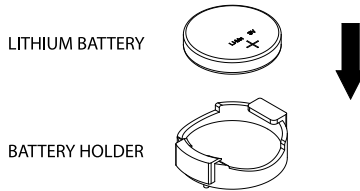
Figure 5-6. SuperDoctor 5 Interface Display Screen (Health Information)

**Note:** The SuperDoctor 5 program and User's Manual can be downloaded from the Supermicro web site at [http://www.supermicro.com/products/nfo/sms\\_sd5.cfm](http://www.supermicro.com/products/nfo/sms_sd5.cfm).



## 5-12 Onboard Battery

Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.



**Figure 5-7. Installing the Onboard Battery**

**Notes**

## Chapter 6

### Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

**Tools Required:** The only tool you will need to install components and perform maintenance is a Philips screwdriver.

#### 6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

##### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

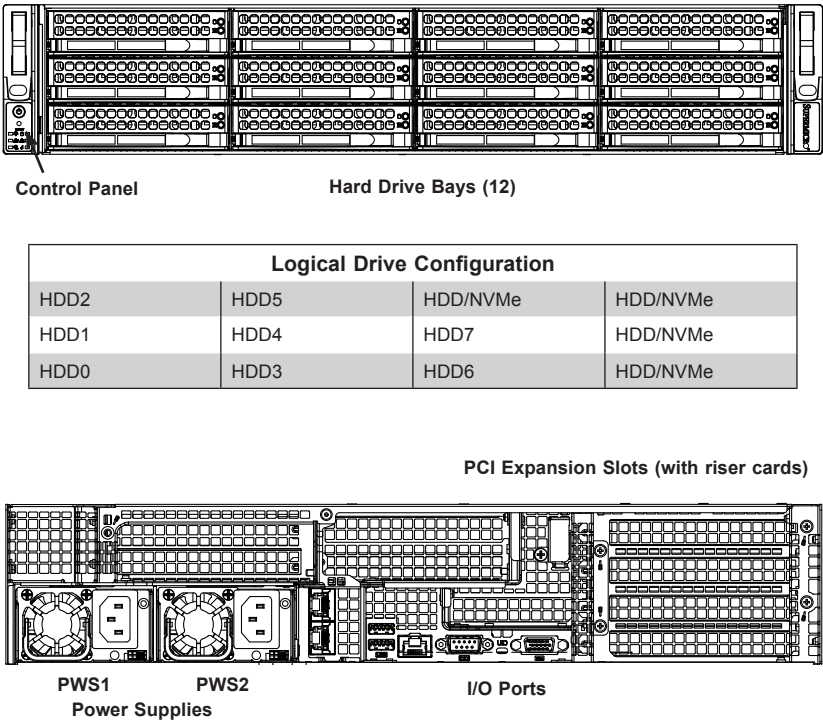


Figure 6-1. Chassis Front and Rear Views

## 6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indicators. These wires have been bundled together as a ribbon cable to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel printed circuit board. Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details. Details on the JF1 header can be found in "Chapter 5: Advanced Serverboard Setup."

### 6-3 Removing the Chassis Cover

1. If rack mounted, first, grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click").
2. Remove the two screws on each side of the cover, which secure the cover to the chassis.
3. Press the release tabs to remove the cover from the locked position. Press both tabs at the same time.
4. Once the top cover is released from the locked position, slide the cover toward the rear of the chassis.
5. Lift the cover off the chassis.
6. To remove the system from the rack completely, press the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position. See Figure 6-2

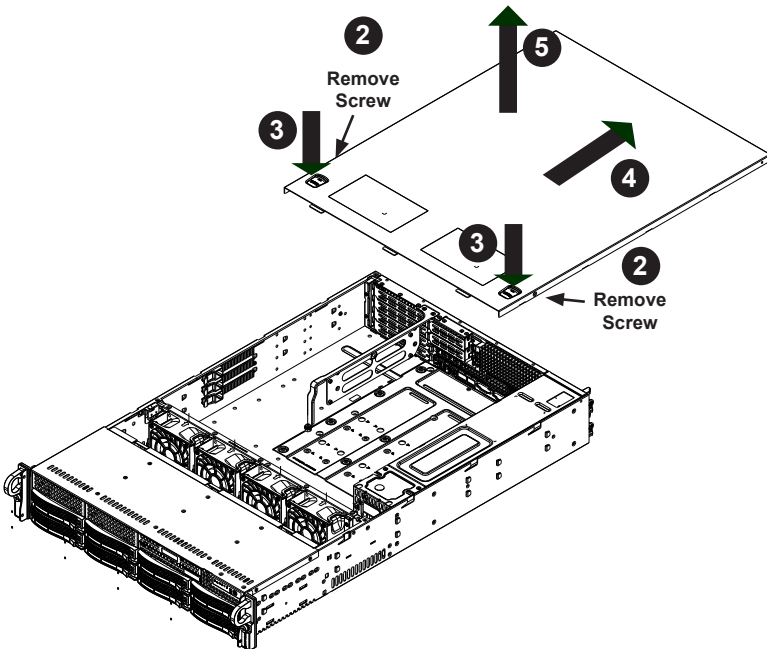


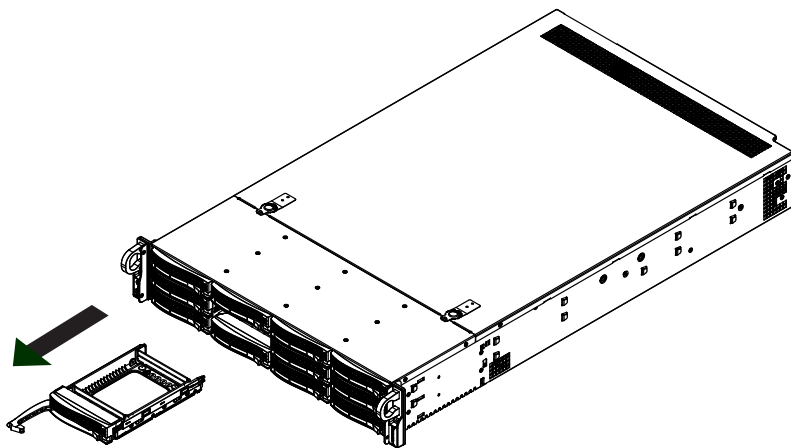
Figure 6-2. Accessing the Inside of the System

## 6-4 Hard Drive Installation

The SC829UACN4 chassis accepts twelve hot-swappable 3.5" hard drives. The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. System power may remain on when removing carriers with drives installed. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

### ***Removing Hard Drive Carrier from the Chassis***

1. Press the release button on the drive carrier. This extends the drive carrier handle.
2. Use the handle to pull the drive out of the chassis.

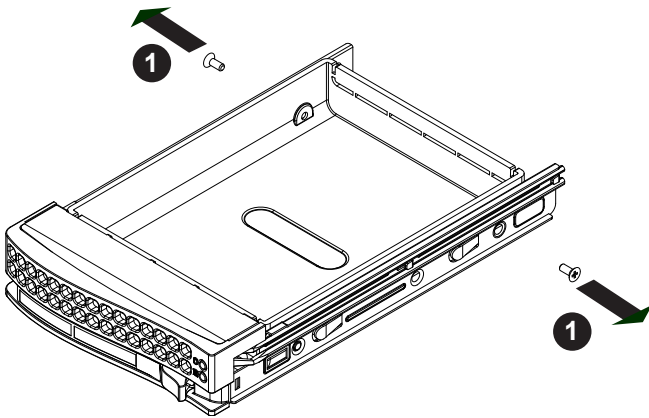


**Figure 6-3. Removing a Drive from the Server**

**Installing a Hard Drive into a Drive Carrier**

1. Remove the screws securing the dummy drive to the carrier.
2. Remove the dummy drive from the carrier.
3. Install a new drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.
4. Secure the hard drive by tightening all six screws.
5. Replace the drive carrier into the chassis bay, making sure that the drive carrier handle is completely closed.

**Caution:** Except for short periods of time (swapping hard drives), do not operate the server with the hard drives removed from the bays.



**Figure 6-4. Removing a Dummy Drive from a Carrier**

6. Install a new drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.
7. Secure the hard drive by tightening all six screws.
8. Replace the drive carrier into the chassis bay, making sure that the drive carrier handle is completely closed.

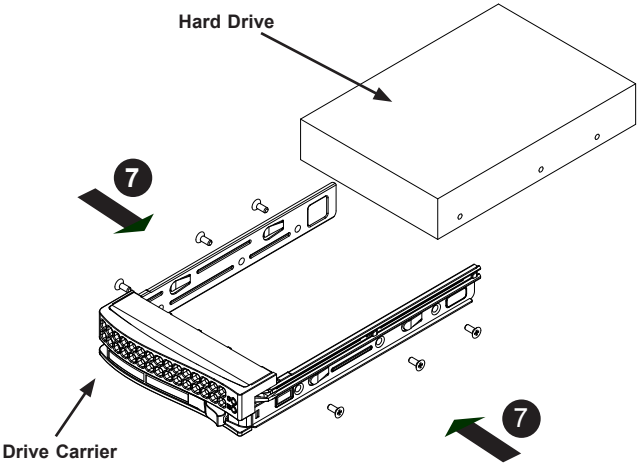


Figure 6-5. Installing a Hard Drive

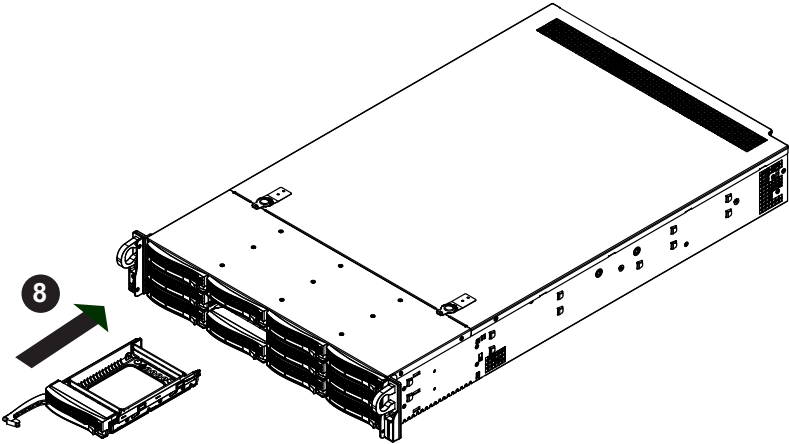


Figure 6-6. Installing a Carrier into its Bay

**Caution:** Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the website at <http://www.supermicro.com/products/nfo/storage.cfm>



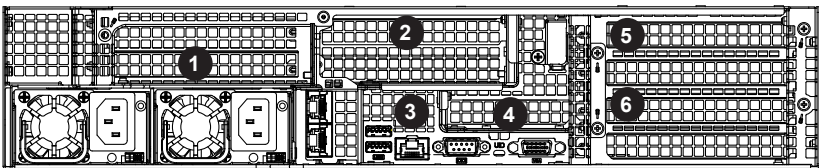
## 6-5 Adding PCI Expansion Cards

Riser cards installed to the system allow you to add PCI expansion cards. With these pre-installed riser cards, the 6028UX-TR4 can support the use of the PCI-Express expansion cards listed below.

### *Installing PCI Expansion Cards*

1. Power down the system and remove the top chassis cover.
2. Remove the Ultra riser bracket, then remove the WIO bracket as pictured in Figures 6-8 and 6-9. Note the screwdriver icons imprinted in the chassis. They indicate which screws must be removed to remove the brackets.
3. Insert the expansion card(s) into the riser card slot(s).
4. Replace the riser card into the serverboard expansion slot while aligning the bracket into the chassis. Replace the securing screws.
5. Replace the chassis cover.

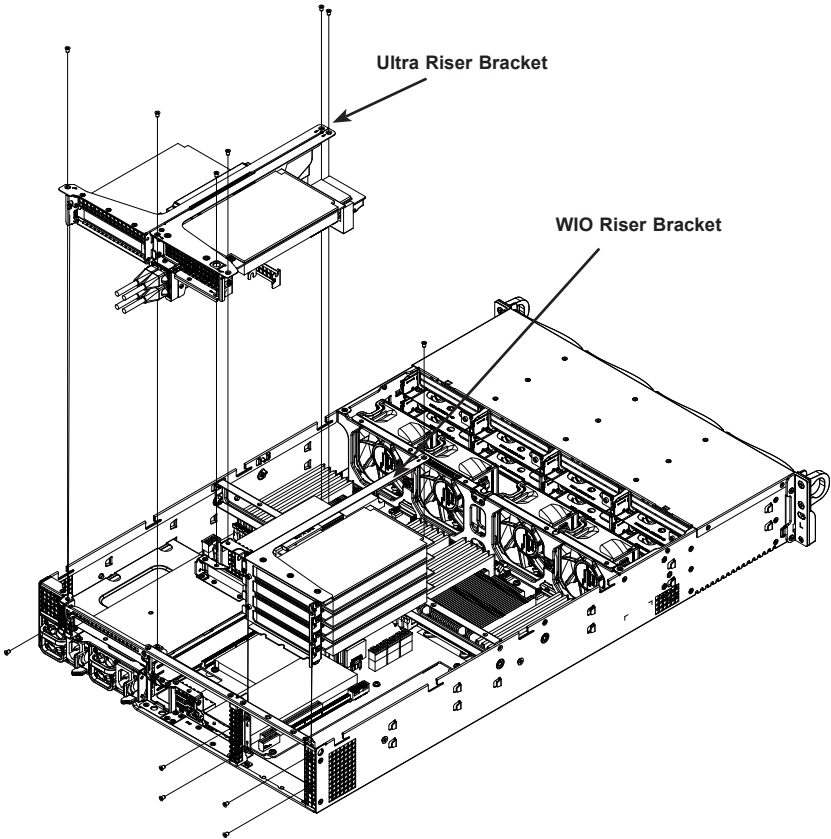
**Figure 6-7. PCI Expansion Card Chassis Slots**



Expansion Card Configurations		
Slot#	Mechanical	Electrical
1	Double width, full height, full length	x16 (CPU2)
2	Double width, full height, full length	x8 (CPU1)
3	Internal low profile, half Length	x8 (CPU1)
4	Low profile, half length	x8 (CPU2)
5	Full height, full length	x16 (CPU1)
6	Full height, full length	x16 (CPU2)

Full height = 4.2", Low profile = 2.5"

Full length = 10.5", Half length = 6.6"



**Figure 6-8. Expansion and Riser Cards—Rear View**

### **Internal Expansion Card**

The pre-installed Ultra Riser card that provides the four LAN ports may be replaced with a different card to support NVMe drives instead.

Please note that this is a pre-installed card only available at the time of purchase and is not sold separately.

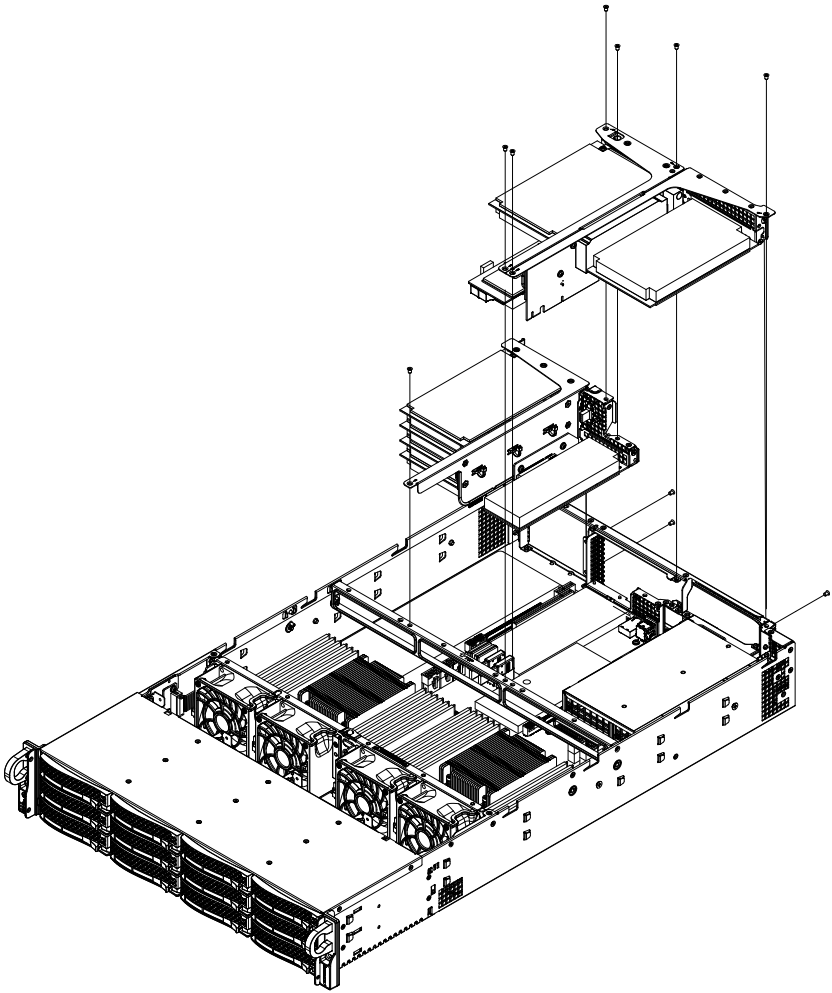


Figure 6-9. Expansion and Riser Cards—Front View

## 6-6 System Fans

The chassis contains four 8-cm high-performance fans.

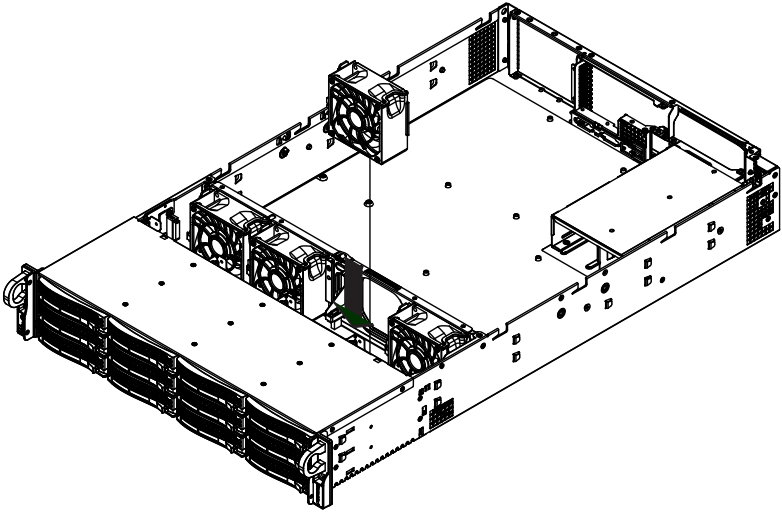
### Replacing System Fan

Fan speed is controlled by system temperature via IPMI. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

Remove the top chassis cover while the system is still running to determine which of the fans has failed. Then power down the system before replacing a fan. Removing the power cord(s) is also recommended as a safety precaution.

#### ***Replacing System Fans***

1. After determining which fan has failed, turn off the system power.
2. Unplug the fan wiring from the serverboard and remove the failed fan.
3. Press the fan release tab to lift the failed fan from the chassis and pull it completely from the chassis.
4. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
5. Power up the system and check that the fan is working properly before replacing the chassis cover.



**Figure 6-10. System Fans**

## 6-7 Power Supply

The 6028UX-TR4 has a 1000 watt redundant, hot-plug power supply consisting of two power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

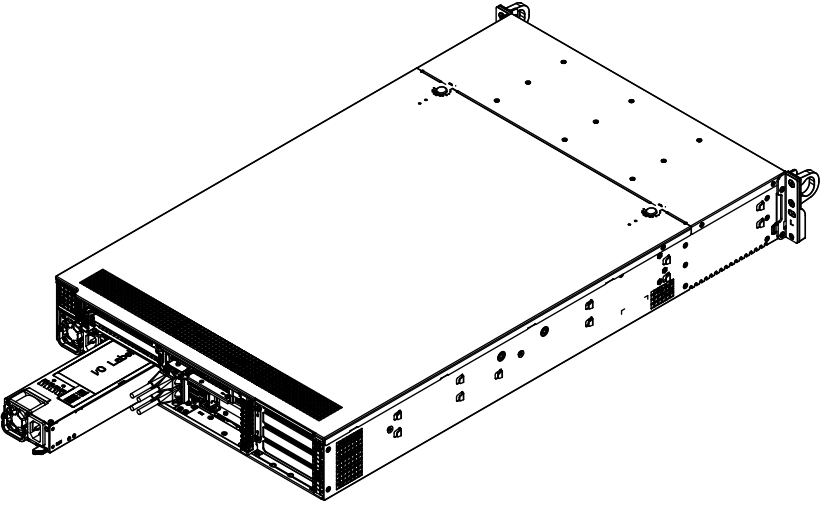
### Replacing a Power Supply Module

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Power Fail LED will illuminate and remain on until the failed unit has been replaced. Replacement units can be ordered directly from Supermicro.

The power supply units have a hot-plug capability, meaning you can replace the failed unit without powering down the system.

#### ***Replacing the Power Supply***

1. First unplug the AC power cord from the failed power supply module.
2. Depress the release tab on the power supply module as illustrated.
3. Use the handle to pull the module straight out of the chassis.
4. Replace the failed hot-swap unit with another identical power supply unit.
5. Push the new power supply unit into the power bay until it clicks.
6. Plug the AC power cord back into the unit and power up the server.



**Figure 6-11. Removing/Replacing the Power Supply**

**Notes**



## Chapter 7

### BIOS

#### 7-1 Introduction

This chapter describes the AMI BIOS Setup utility for the X10DRU-X(LL). It also provides the instructions on how to navigate the AMI BIOS Setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

#### Starting BIOS Setup Utility

To enter the AMI BIOS Setup utility screens, press the <Del> key while the system is booting up.

**Note:** In most cases, the <Del> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

**Note:** The AMI BIOS has default text messages built in. The manufacturer retains the option to include, omit, or change any of these text messages.

The AMI BIOS Setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

**Note 1:** Options printed in **Bold** are default settings.

**Note 2:** <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.

# How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <F2> at the appropriate time during system boot.

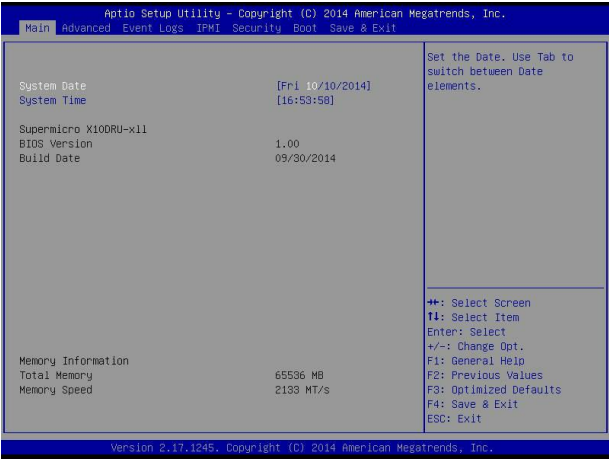
**Note:** For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @ <http://www.supermicro.com/support/manuals/>.

## Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <F2> key to enter the main menu of the AMI BIOS Setup utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

**Warning:** Do not upgrade the BIOS unless your system has a BIOS-related issue. In no event shall the manufacturer be liable for direct, indirect, special, incidental, or consequential damage arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is being updated to avoid possible boot failure.

## 7-2 Main Setup



When you first enter the AMI BIOS Setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.

The AMI BIOS main menu displays the following information:

**System Date**

This item displays the system date in Day MM/DD/YY format (e.g. Wed 10/12/2011).

**System Time**

This item displays the system time in HH:MM:SS format (e.g. 15:32:52).

**Supermicro X10DRU-X****BIOS Version**

This item displays the version of the BIOS ROM used in this system.

**Build Date**

This item displays the date that the BIOS Setup utility was built.

**Memory Information****Total Memory**

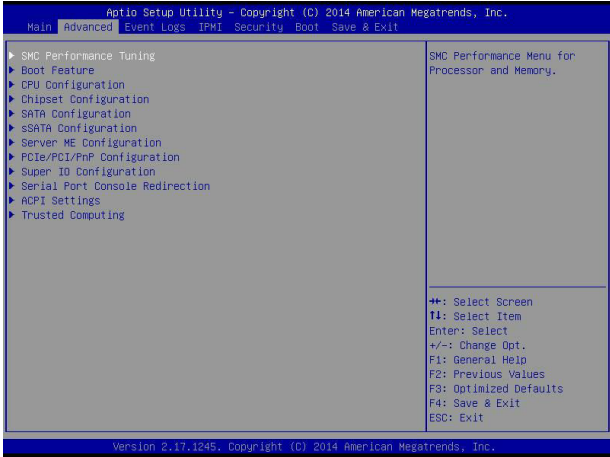
This displays the amount of memory that is available in the system.

**Memory Speed**

This displays the detected system memory speed.

## 7-3 Advanced Setup Configurations

Use the arrow keys to select Advanced Setup and press <Enter> to access the following submenu items.



### ► SMC Performance Tuning

#### SMC OverClocking

##### Supermicro Hyper-Speed

Hyper-Speed is Supermicro's proprietary enterprise-class hardware acceleration technology. Use this feature to select the Hyper-Speed level for the CPU, memory, PCIe, and other components in the system. The higher the Hyper-Speed level selected, the higher the acceleration for the aforementioned components. The options are Disabled, Level 1, Level 2, **Level 3**, Level 4 (not recommended).

##### Supermicro Hyper-Turbo

Use this feature to keep the CPU turbo mode frequency maximized for longer durations with proprietary power delivery algorithm. This feature improves performance of applications that require large power draws from CPUs. The options are Disabled and **Enabled**.

## ► Boot Features

### Quiet Boot

This feature selects the bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Enabled and **Disabled**.

### AddOn ROM Display Mode

This item sets the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

### Bootup Num-Lock

This feature sets the Power-on state for the Numlock key. The options are Off and **On**.

### Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

### Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Immediate** and Postponed.

### Retry Boot

Select Enabled to force the system to reboot when system fails to boot. The options are **Disabled** and Enabled.

## Power Configuration

### Watch Dog Function

If enabled, the Watch Dog timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

### Power Button Function

If this feature is set to **Instant\_Off**, the system will power off immediately as soon as the user presses the power button. If this feature is set to **4\_Second\_Override**, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant\_Off** and **4\_Second\_Override**.

### Restore on AC Power Loss

This feature sets the power state after a power outage. Select **Power-Off** for the system power to remain off after a power loss. Select **Power-On** for the system power to be turned on after a power loss. Select **Last State** to allow the system to resume its last state before a power loss. The options are **Power-On**, **Stay-Off** and **Last State**.

## ►CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configuration CPU settings.

### Socket 1 CPU Information/Socket 2 CPU Information

This submenu displays the following information regarding the CPU installed in Socket 1 and (or) Socket 2 as detected by the BIOS.

- Processor Socket
- Processor ID
- Processor Frequency
- Processor Maximum Ratio
- Processor Minimum Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- CPU1 Version
- CPU2 Version

**Clock Spread Spectrum**

Select **Enabled** to enable Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and **Enabled**.

**Hyper-Threading (ALL)**

Select **Enabled** to support Intel Hyper-threading Technology to enhance CPU performance. The options are **Enabled** and **Disabled**.

**Cores Enabled**

Set a numeric value to enable the number of cores. (Please refer to Intel's website for more information.) Enter **0** to enable all cores.

**Execute-Disable Bit Capability (Available if supported by the OS & the CPU)**

Select **Enabled** to enable the Execute-Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web sites for more information.)

**PPIN Control**

Select **Enabled** to unlock the PPIN control. The options are **Enabled** and **Disabled**.

**Hardware Prefetcher (Available when supported by the CPU)**

If set to **Enabled**, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are **Disabled** and **Enabled**.

**Adjacent Cache Prefetch (Available when supported by the CPU)**

The CPU prefetches the cache line for 64 bytes if this feature is set to **Disabled**. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to **Enabled**.

**DCU Streamer Prefetcher (Available when supported by the CPU)**

Select **Enabled** to enable the DCU (Data Cache Unit) Streamer Prefetcher which will stream and prefetch data and send it to the Level 1 data cache to improve data processing and system performance. The options are **Disabled** and **Enabled**.

**DCU IP Prefetcher (Available when supported by the CPU)**

Select **Enabled** for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are **Disabled** and **Enabled**.

**Direct Cache Access (DCA Support)**

Select Enabled to use Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are **Enabled** and Disabled.

**DCA Prefetch Delay**

A DCA prefetcher is used with a TOE (TCP/IP Offload Engine) adapter to prefetch data to shorten execution cycles and to maximize data processing efficiency. Prefetching data too frequently can saturate the cache directory and delay necessary cache access. This feature reduces or increases the frequency of system data prefetching activities. The options are Disable, 16, 24, **32**, 40, 48, 56, 64, 72, 80, 88, 96, 104, and 112.

**X2APIC**

Select Enable to activate APIC (Advanced Programmable Interrupt Controller) support. The options are **Enabled** and Disabled.

**AES-NI**

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enabled** and Disabled.

**Intel® Virtualization Technology (Available when supported by the CPU)**

Select Enabled to support Intel Virtualization Technology, which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled.

**Note:** If a change is made to this setting, you will need to reboot the system for the change to take effect. Refer to Intel's website for detailed information.

**IIO LLC Ways [19:0] (Hex)**

This feature is set to **fff00**.

**QLRU Config [63:32] (Hex)**

This feature is set to **0**.

**QLRU Config [31:0] (Hex)**

This feature is set to **0**.



## ► Advanced Power Management Configuration

This section is used to configure the following CPU Power Management settings.

### Power Technology

Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disable, **Energy Efficiency**, and Custom.

If the above is set to 'Custom' the following options are displayed:

## ► CPU P State Control

### EIST

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disabled, and **Enabled**.

### Turbo Mode (Available when Intel® EIST Technology is enabled)

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

### P-State Coordination

This feature allows the user to change the P-State (Power-Performance State) coordination type. P-State is also known as "SpeedStep" for Intel processors. Select HW\_ALL to change the P-State coordination type for hardware components only. Select SW\_ALL to change the P-State coordination type for all software installed in the system. Select SW\_ANY to change the P-State coordination type for a software program in the system. The options are **HW\_All**, SW\_ALL, and SW\_ANY.

## ► CPU C State Control

### Package C-State limit

This feature allows the user to set the limit on the C-State package register. The options are C0/C1 State, C2 State, C6 (Non Retention) State, and **C6 (Retention) State**.

### CPU C3 Report

Select Enabled to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enabled and **Disabled**.

### **CPU C6 Report**

Select Enabled to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are **Enabled** and Disabled.

### **Enhanced Halt State (C1E)**

Select Enabled to use Enhanced Halt-State technology, which will significantly reduce the CPU's power consumption by reducing the CPU's clock cycle and voltage during a Halt-state. The options are Disable and **Enable**.

## **► CPU T State Control**

### **ACPI (Advanced Configuration Power Interface) T-States**

Select Enable to support CPU throttling by the operating system to reduce power consumption. The options are **Enable** and Disable.

## **► SOCKET RAPL Config**

### **FAST\_RAPL\_NSTRIKE\_PL2\_DUTY\_CYCLE**

This feature displays the value of the item above within the range between 25 (10%) and 64 (25%).

### **Turbo Power Limit Lock**

Use this feature to disable or enable the turbo settings. The options are **Disabled** and Enabled.

### **Long Power Limit Override**

Use this item to enable or disable long term power limit override. If this option is disabled, the BIOS will program the default values for Long Term Power Limit and Long Term Power Limit Time Window. The options are **Enabled** and Disabled.

### **Long Duration Power Limit**

This item displays the power limit set by the user during which long duration power is maintained. The default setting is **0**.

### **Long Duration Time Window**

This item indicates the time window over which time duration power should be maintained.

### Package Clamping Limit1

Use this item to set the limit on power performance states for the run-time processor, with P0 being the state with the highest frequency (clock speed) and power (consumption), and P1, a step lower in performance than P0, with its frequency and voltage scaled back a notch. The options are Between P1/P0 and **Below P1**

### Short Duration Power Limit Enable

Select Enable to support Short Duration Power Limit (Power Limit 2). The options are **Enable** and Disable.

### Short Duration Power Limit

This item displays the period of time during which short duration power is maintained. The default setting is 0.

### Package Clamping Limit2

Use this item to set the limit on power performance states for the processor operating in turbo mode, with P0 being the state with the highest frequency (clock speed) and power (consumption), and P1, a step lower in performance than P0, with its frequency and voltage scaled back a notch. The options are Between P1/P0 and **Below P1**.

## ► Chipset Configuration

### ► North Bridge

This feature allows the user to configure the following North Bridge settings.

### ► Integrated I/O Configuration

#### EV DFX (Device Function On-Hide) Feature

When this feature is set to Enable, the EV\_DFX Lock Bits that are located on a processor will always remain clear during electric tuning. The options are **Disable** and Enable.

### ► I/O1 Configuration / I/O2 Configuration

#### IOU2 (I/O PCIe Port 1)

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4, X8, and **Auto**.

**II01 PORT 1A Link Speed**

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and **Gen 3 (Generation 3) (8 GT/s)**.

**II01 Port 1B Link Speed**

Use this item to configure the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and **Gen 3 (Generation 3) (8 GT/s)**.

**IOU0 (II0 PCIe Port 2)**

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

**II01 PORT 2A Link Speed**

Use this item to configure the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and **Gen 3 (Generation 3) (8 GT/s)**.

**IOU1 (II0 PCIe Port 3)**

Use this item to configure the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

**II01 PORT 3A Link Speed**

Use this item to configure the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and **Gen 3 (Generation 3) (8 GT/s)**.

**II01 PORT 3C Link Speed**

Use this item to configure the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s) and **Gen 3 (Generation 3) (8 GT/s)**.

**►IOAT (Intel® IO Acceleration) Configuration****Enable IOAT**

Select Enable to enable Intel I/OAT (I/O Acceleration Technology) support, which significantly reduces CPU overhead by leveraging CPU architectural improvements and freeing the system resource for other tasks. The options are **Enable** and **Disable**.

**No Snoop**

Select Enable to support no-snoop mode for each CB device. The options are **Disable** and Enable.

**Relaxed Ordering**

Select Enable to enable Relaxed Ordering support which will allow certain transactions to violate the strict-ordering rules of PCI bus for a transaction to be completed prior to other transactions that have already been enqueued. The options are **Disable** and Enable.

**► Intel VT for Directed I/O (VT-d)****Intel® VT for Directed I/O (VT-d)**

Select Enable to use Intel Virtualization Technology support for Direct I/O VT-d support by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

**► QPI (Quick Path Interconnect) Configuration****QPI Status**

The following information will display:

- Number of CPU
- Number of IIO
- Current QPI Link Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCIe Configuration Base/Size

**Link Speed Mode**

Use this item to select the data transfer speed for QPI Link connections. The options are **Fast** and Slow.

**Link Frequency Select**

Use this item to select the CPU Frequency. The options are 6.4 GB/s, 8.0 GB/s, 9.6 GB/s, **Auto**, Auto Limited.

**Link L0p Enable**

Select Enable for Link L0p support. The options are **Enable** and Disable.

**Link L1 Enable**

Select Enable for Link L1 support. The options are **Enable** and Disable.

**COD Enable (Available when the OS and the CPU support this feature)**

Select Enabled for Cluster-On-Die support to enhance system performance in cloud computing. The options are Enable, Disable, and **Auto**.

**Early Snoop (Available when the OS and the CPU support this feature)**

Select Enabled for Early Snoop support to enhance system performance. The options are Enable, Disable, and **Auto**.

**Isoc Mode**

Select Enabled for Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for Virtualization Technology. The options are Enable and **Disable**.

**►Memory Configuration****Enforce POR**

Select Enable to enforce POR restrictions on DDR4 frequency and voltage programming. The options are **Enabled** and Disabled.

**Memory Frequency**

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1333, 1400, 1600, 1800, 1867, 2000, 2133, 2200, 2400, 2600, 2667, and Reserved (Do not select Reserved).

**Data Scrambling**

Select Enabled to enable data scrambling to enhance system performance and data integrity. The options are **Auto**, Disabled and Enabled.

**DRAM RAPL Baseline**

Use this feature to set the run-time power-limit baseline for DRAM modules. The options are Disable, DRAM RAPL Mode 0, and **DRAM RAPL Mode 1**.

### Set Throttling Mode

Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

### Socket Interleave Below 4GB

Select Enabled for the memory above the 4G Address space to be split between two sockets. The options are Enable and **Disable**.

### A7 Mode

Select Enabled to support the A7 (Addressing) mode to improve memory performance. The options are **Enable** and Disable.

## ►DIMM Information

This item displays the status of a DIMM module specified by the user.

- P1-DIMMA1 - P1-DIMMD1
- P2-DIMME1 - P2-DIMMH1

## ►Memory RAS (Reliability\_Availability\_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

### RAS Mode

When Disable is selected, RAS is not supported. When Mirror is selected, the serverboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the serverboard uses two areas of memory to run the same set of operations in parallel to boost performance. The options are **Disable**, Mirror, and Lockstep Mode.

### Memory Rank Sparing

Select Enable to enable memory-sparing support for memory ranks to improve memory performance. The options are **Disabled** and Enabled.

### Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the IO hub will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are Enable and **Disable**.

### Patrol Scrub Interval

This feature allows you to decide how many hours the system should wait before the next complete patrol scrub is performed. Use the keyboard to enter a value from 0-24. The Default setting is **24**.

### Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enable to use Demand Scrubbing for ECC memory correction. The options are **Enable** and Disable.

### Device Tagging

Select Enable to support device tagging. The options are **Disable** and Enable.

## ►South Bridge Configuration

The following South Bridge information will display:

- USB Configuration
- USB Module Version
- USB Devices

### Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disable to have all USB devices available for EFI applications only. The options are **Enabled**, Disabled and Auto.



### **XHCI Hand-Off**

This is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The settings are **Enabled** and Disabled.

### **EHCI Hand-Off**

This item is for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When this item is enabled, EHCI ownership change will be claimed by the EHCI driver. The settings are Enabled and **Disabled**.

### **Port 60/64 Emulation**

Select Enabled for I/O port 60h/64h emulation support, which in turn, will provide complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are Disabled and **Enabled**.

### **USB 3.0 Support**

Select Enabled for USB 3.0 support. The options are Smart Auto, **Auto**, Enabled, Disabled and Manual.

### **EHCI1**

Select Enabled to enable EHCI (Enhanced Host Controller Interface) support on USB 2.0 connector #1 (-at least one USB 2.0 connector should be enabled for EHCI support.) The options are Disabled and **Enabled**.

### **EHCI2**

Select Enabled to enable EHCI (Enhanced Host Controller Interface) support on USB 2.0 connector #2 (-at least one USB 2.0 connector should be enabled for EHCI support.) The options are Disabled and **Enabled**.

### **XHCI Pre-Boot Driver**

Select Enabled to enable XHCI (Extensible Host Controller Interface) support on a pre-boot drive specified by the user. The options are Enabled and **Disabled**.

## **►SATA Configuration**

When this submenu is selected, AMI BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip and displays the following items:

### **SATA Controller**

This item enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enabled** and Disabled.

### Configure SATA as

Select IDE to configure a SATA drive specified by the user as an IDE drive. Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

*\*If the item above "Configure SATA as" is set to AHCI, the following items will display:*

#### Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

#### SATA Port 0~ Port 5

This item displays the information detected on the installed SATA drive on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

#### Port 0~ Port 5

Select Enabled to enable a SATA port specified by the user. The options are Disabled and Enabled.

#### Port 0 ~ Port 5 Hot Plug

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a SATA disk drive installed on this port without shutting down the system. The options are **Enabled** and Disabled.

#### Port 0 ~ Port 5 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to initialize the device. The options are Enabled and **Disabled**.

#### Port 0 ~ Port 5 SATA Device Type

Use this item to specify if the SATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

*\*If the item above "Configure SATA as" is set to IDE, the following items will display:*

**Serial ATA Port 0~ Port 5**

This item indicates that a SATA port specified by the user is installed (present) or not.

**Port 0 ~ Port 5 SATA Device Type (Available when a SATA port is detected)**

Use this item to specify if the SATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

*\*If the item above "Configure SATA as" is set to RAID, the following items will display:*

**Support Aggressive Link Power Management**

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

**SATA RAID Option ROM/UEFI Driver**

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Disabled, EFI, and **Legacy**.

**Serial ATA Port 0~ Port 5**

This item displays the information detected on the installed SATA drives on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

**Port 0~ Port 5**

Select Enabled to enable a SATA port specified by the user. The options are Disabled and **Enabled**.

**Port 0 ~ Port 5 Hot Plug**

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a SATA disk drive installed on this port without shutting down the system. The options are Enabled and **Disabled**.

**Port 0 ~ Port 5 Spin Up Device**

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

### Port 0 ~ Port 5 SATA Device Type

Use this item to specify if the SATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

## ►sSATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the SATA devices that are supported by the PCH-sSATA controller and displays the following items:

### sSATA Controller

This item enables or disables the onboard SATA controller supported by the Intel PCH-sSATA controller. The options are **Enabled** and Disabled.

### Configure sSATA as

Select IDE to configure an sSATA drive specified by the user as an IDE drive. Select AHCI to configure an sSATA drive specified by the user as an AHCI drive. Select RAID to configure an sSATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

*\*If the item above "Configure sSATA as" is set to AHCI, the following items will display:*

### Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

### sSATA Port 0~ Port 1

This item displays the information detected on the installed on the sSATA port. specified by the user.

- Model number of drive and capacity
- Software Preserve Support

### sSATA Port 0~ Port 1

Select Enabled to enable an sSATA port specified by the user. The options are Disabled and Enabled.

**sSATA Port 0 ~ Port 1 Hot Plug**

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a sSATA disk drive installed on this port without shutting down the system. The options are **Enabled** and Disabled.

**sSATA Port 0 ~ Port 1 Spin Up Device**

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

**Port 0 ~ Port 1 sSATA Device Type**

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

*\*If the item above "Configure sSATA as" is set to IDE, the following items will display:*

**sSATA Port 0~ Port 1**

This item indicates that an sSATA port specified by the user is installed (present) or not.

**Port 0 ~ Port 1 sSATA Device Type (Available when a SATA port is detected)**

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

*\*If the item above "Configure sSATA as" is set to RAID, the following items will display:*

**Support Aggressive Link Power Management**

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Enabled** and Disabled.

**sSATA RAID Option ROM/UEFI Driver**

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Disabled, EFI, and **Legacy**.

**sSATA Port 0~ Port 1**

This item displays the information detected on the installed sSATA drives on the particular sSATA port.

- Model number of drive and capacity
- Software Preserve Support

#### **sSATA Port 0~ Port 1**

Select Enabled to enable an sSATA port specified by the user. The options are Disabled and Enabled.

#### **sSATA Port 0 ~ Port 1 Hot Plug**

This feature designates this port for hot plugging. Set this item to Enabled for hot-plugging support, which will allow the user to replace an sSATA drive without shutting down the system. The options are Enabled and **Disabled**.

#### **sSATA Port 0 ~ Port 1 Spin Up Device**

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

#### **Port 0 ~ Port 1 sSATA Device Type**

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are Hard Disk Drive and Solid State Drive.

### **►Server ME (Management Engine) Configuration**

This feature displays the following system ME configuration settings.

- General ME Configuration
- Operational Firmware Version
- Recovery Firmware Version
- ME Firmware Features
- ME Firmware Status #1
- ME Firmware Status #2
  - Current State
  - Error Code

## ► PCIe/PCI/PnP Configuration

The following PCI information will be displayed:

- PCI Bus Driver Version

### **Above 4G Decoding (Available if the system supports 64-bit PCI decoding)**

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

### **SR-IOV (Available if the system supports Single-Root Virtualization)**

Select Enabled for Single-Root IO Virtualization support. The options are Enabled and **Disabled**.

### **Maximum Payload**

Select Auto for the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, and 256 Bytes.

### **Maximum Read Request**

Select Auto for the system BIOS to automatically set the maximum size for a read request for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

### **ASPM Support**

Use this item to set the Active State Power Management (ASPM) level for a PCI-E device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are **Disabled**, and Auto.

**Warning:** Enabling ASPM support may cause some PCI-E devices to fail!

### **MMIOHBase**

Use this item to select the base memory size according to memory-address mapping for the IO hub. The base memory size must be between 4032G to 4078G. The options are **56T**, 48T, 24T, 512G, and 256G.

### **MMIO High Size**

Use this item to select the high memory size according to memory-address mapping for the IO hub. The options are **256G**, 128G, 512G, and 1024G.

**PCI / PCIX / PCIe Slot 1 OPRPM****PCI / PCIX / PCIe Slot 2 OPRPM****PCI / PCIX / PCIe Slot 3 OPRPM**

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified by the user. The options are Disabled, **Legacy** and EFI.

**Onboard LAN Option ROM Type**

Select Enabled to enable Option ROM support to boot the computer using a network device specified by the user. The options are Disabled, **Legacy** and EFI.

**Onboard LAN1 Option ROM****Onboard LAN2 Option ROM****Onboard Video Option ROM**

Use this option to select the type of device installed in LAN Port1, LAN Port2, LAN Port3, LAN Port4, or the onboard video device used for system boot. The default setting for LAN1 Option ROM is **PXE**, **Disabled** for LAN2 Option ROM, and **Legacy** for Onboard Video Option ROM.

**VGA Priority**

Use this item to select the graphics device to be used as the primary video display for system boot. The options are **Onboard** and Offboard.

**Network Stack**

Select Enabled to enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disabled**.

**►Super IO Configuration****Super IO Chip AST2400****►Serial Port 1 Configuration/Serial Port 2 Configuration****Serial Port 1/Serial Port 2**

Select Enabled to enable the onboard serial port specified by the user. The options are **Enabled** and Disabled.

**Device Settings**

This item displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.



### Change Port 1 Settings/Change Port 2 Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1 or Serial Port 2. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified.

The options for Serial Port 1 are **Auto**, (IO=3F8h; IRQ=4), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12); (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).

The options for Serial Port 2 are **Auto**, (IO=3F8h; IRQ=4), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12); (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).

### Serial Port 2 Attribute

Select SOL to use COM Port 2 as a Serial\_Over\_LAN (SOL) port for console redirection. The options are COM and **SOL**.

## ►Serial Port Console Redirection

### COM 1

#### COM 1 Console Redirection

Select Enabled to enable COM Port 1 Console Redirection, which will allow a client machine to be connected to a host machine at a remote site for networking. The options are **Disabled** and Enabled.

*\*If the item above set to Enabled, the following items will become available for configuration:*

## ►COM1 Console Redirection Settings

### Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

### Bits Per second

Use this item to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the

client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

### Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 (Bits) and **8 (Bits)**.

### Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

### Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

### Flow Control

Use this item to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

### VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled.

### Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

### Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

### Legacy OS Redirection Resolution

Use this item to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and **80x25**.

### Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

### Redirection After BIOS Post

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When the option-Bootloader is selected, legacy Console Redirection is disabled before booting the OS. When the option- Always Enable is selected, legacy Console Redirection remains enabled upon OS bootup. The options are **Always Enable** and Bootloader.

## SOL/COM2

### Console Redirection

Select Enabled to use the SOL port for Console Redirection. The options are **Enabled** and Disabled.

*\*If the item above set to Enabled, the following items will become available for user's configuration:*

## ►SOL/COM2 Console Redirection Settings

Use this feature to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

### Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

### Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

### Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 (Bits) and **8 (Bits)**.

### Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

### Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and **2**.

### Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start data-sending when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

### VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled.

### Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

### Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

### Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and **80x25**.

### Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

### Redirection After BIOS Post

Use this feature to enable or disable legacy Console Redirection after BIOS POST (Power-On Self-Test). When this feature is set to Bootloader, legacy Console Redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy Console Redirection remains enabled upon OS boot. The options are **Always Enable** and Bootloader.

## ► Legacy Console Redirection Settings

### Legacy Console Redirection Settings

Use the feature to select the COM port to display redirection of Legacy OS and Legacy OPROM messages. The choices are **COM1** and SOL/COM2.

### Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

### EMS Console Redirection

Select Enabled to use a COM port selected by the user for EMS Console Redirection. The options are Enabled and **Disabled**.

*\*If the item above set to Enabled, the following items will become available for user's configuration:*

## ► EMS Console Redirection Settings

### Out-of-Band Management Port

The feature selects a serial port in a client server to be used by the Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1 (Console Redirection)** and COM2/SOL (Console Redirection).

### Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set.

Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and **VT-UTF8**.

### Bits Per Second

This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in both host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

### Flow Control

Use this item to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop data-sending when the receiving buffer is full. Send a "Start" signal to start data-sending when the receiving buffer is empty. The options are **None**, Hardware RTS/CTS, and Software Xon/Xoff.

The setting for each these features is displayed:

### Data Bits, Parity, Stop Bits

## ►ACPI Settings

### WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are Enabled and **Disabled**.

### High Precision Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

### NUMA (Available when the OS supports this feature)

Select Enabled to enable Non-Uniform Memory Access support to enhance system performance. The options are **Enabled** and Disabled.

## ► Trusted Computing (Available when a TPM device is detected)

### TPM Support

Select Enabled on this item and enable the TPM jumper on the serverboard to enable TPM support to improve data integrity and network security. The options are **Enabled** and Disabled.

### TPM State

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are Disabled and **Enabled**.

**Pending Operation:** This item displays the status of a pending operation.

**Current Status Information:** This item displays the information regarding the current TPM status.

### TPM Enable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

### TPM Active Status

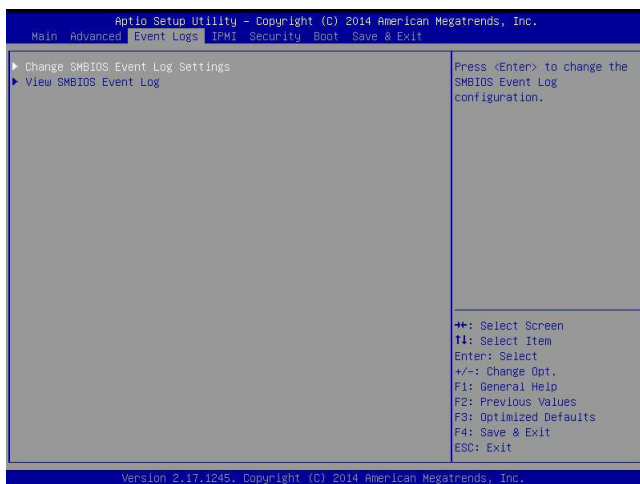
This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

### TPM Owner Status

This item displays the status of TPM Ownership.

## 7-4 Event Logs

Use this feature to configure Event Log settings.



### ►Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

#### Enabling/Disabling Options

##### SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

##### Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are Enabled and **Disabled**. If this item is set to Enable, the following item will be available for configuration:

##### Turn Off Memory Error LED

This item allows you to turn off the Memory Error alert LED. The options are **Do Nothing** (this is, leave the LED on) or Yes, Next Reset (that is, turn off the LED upon the next reboot).



## Erasing Settings

### Erase Event Log

Select Enabled to erase all error events in the SMBIOS (System Management BIOS) log before an event logging is initialized at bootup. The options are **No** and Yes.

### When Log is Full

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

## SMBIOS Event Log Standard Settings

### Log System Boot Event

Select Enabled to log system boot events. The options are **Disabled** and Enabled.

### MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

### METW (Multiple Event Count Time Window)

This item is used to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

**Note:** Please reboot the system for the changes to take effect.

## ►View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log. The following categories are displayed:

Date/Time/Error Code/Severity

## 7-5 IPMI

Use this feature to configure Intelligent Platform Management Interface (IPMI) settings.



### IPMI Firmware Revision

This item indicates the IPMI firmware revision used in your system.

### IPMI Status

This item indicates the status of the IPMI firmware installed in your system.

## ►System Event Log

### Enabling/Disabling Options

#### SEL Components

Select Enabled to enable all system event logging support at bootup. The options are **Enabled** and Disabled.

#### Erasing Settings

##### Erase SEL

Select Yes, On next reset to erase all system event logs upon next system reboot.  
Select Yes, On every reset to erase all system event logs upon each system reboot.  
Select No to keep all system event logs after each system reboot. The options are **No**, Yes, On next reset, and Yes, On every reset.

### When SEL is Full

This feature allows the user to determine what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

**Note:** After making changes on a setting, be sure to reboot the system for the changes to take effect.

### ►BMC Network Configuration

The following items will be displayed:

- IPMI LAN Selection
- IPMI Network Link Status

### Update IPMI LAN Configuration

Select Yes for the system BIOS to automatically reset the following IPMI settings at next system boot. The options are Yes and **No**.

### Configuration Address Source (Available when the item above - Update IPMI LAN Configuration is set to Yes)

Use this item to select the IP address source for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, AMI BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server attached to the network and request the next available IP address for this computer. The options are **DHCP** Unspecified, and Static.

### Station IP Address

This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

### Subnet Mask

This item displays the sub-network that this computer belongs to. The value of each three-digit number is separated by dots and it should not exceed 255.

### Station MAC Address

This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

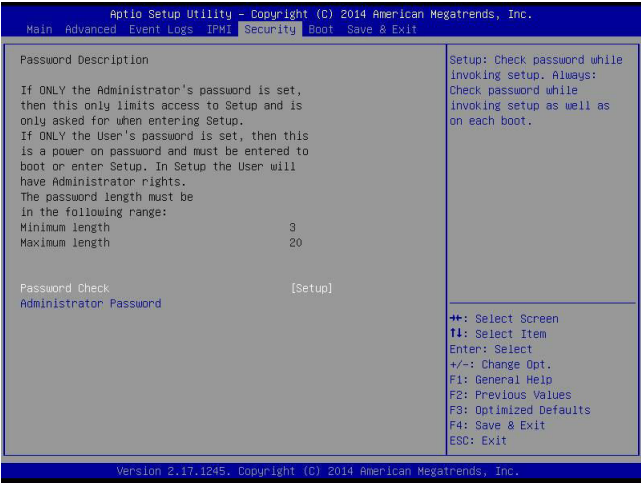
Gateway IP Address

This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

When you have completed the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click No to quit the BIOS and save changes.

7-6 Security Settings

This menu allows the user to configure the following security settings for the system.



Password Check

Select Setup for the system to prompt for a password at Setup. Select Always for the system to prompt for a password at bootup and upon entering the BIOS Setup utility. The options are **Setup** and **Always**.

Administrator Password

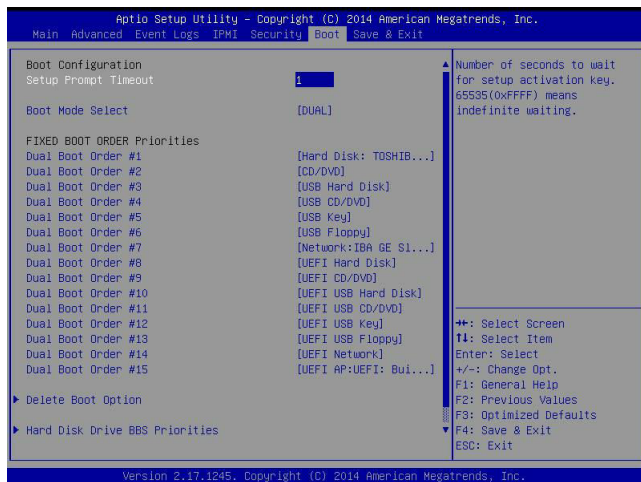
Use this feature to set the administrator password which is required before entering the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

## User Password

Use this feature to set the user password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

## 7-7 Boot Settings

Use this feature to configure Boot Settings:



## Boot Configuration

### Setup Prompt Timeout

Use this item to indicate how many seconds the system shall wait for the BIOS setup activation key to respond before the system starts to boot. The default setting is **1**.

### Boot Mode Select

Use this item to select the type of device to be used for system boot. The options are Legacy, UEFI, and **Dual**.

### Fixed Boot Order Priorities

This option prioritizes the order of bootable devices from which the system will boot. Press <Enter> on each entry from top to bottom to select devices.

- Dual Boot Order #1
- Dual Boot Order #2
- Dual Boot Order #3

- Dual Boot Order #4
- Dual Boot Order #5
- Dual Boot Order #6
- Dual Boot Order #7
- Dual Boot Order #8
- Dual Boot Order #9
- Dual Boot Order #10
- Dual Boot Order #11
- Dual Boot Order #12
- Dual Boot Order #13
- Dual Boot Order #14
- Dual Boot Order #15

### **Add New Boot Option**

This feature allows the user to add a new boot option to system boot features.

#### **Add Boot Option**

Use this item to specify the name of the driver that the new boot option is added to.

#### **Path for Boot Option**

This item is used to specify the path to the driver that the new boot option is added to. The format for the path is "fsx:\path\filename.efi".

### **Boot Option File Path**

#### **Create**

After the driver option name and the file path are set, press <Enter> to enter to submenu and click OK to create the new boot option drive.

### ►Delete Boot Option

Use this item to select a boot device to delete from the boot priority list.

#### Delete Boot Option

Select the target boot device to delete.

### ►Hard Disk Drive BBS Priorities

- Legacy Boot Order #1 - Legacy Boot Order #10

### ►Network Drive BBS Priorities

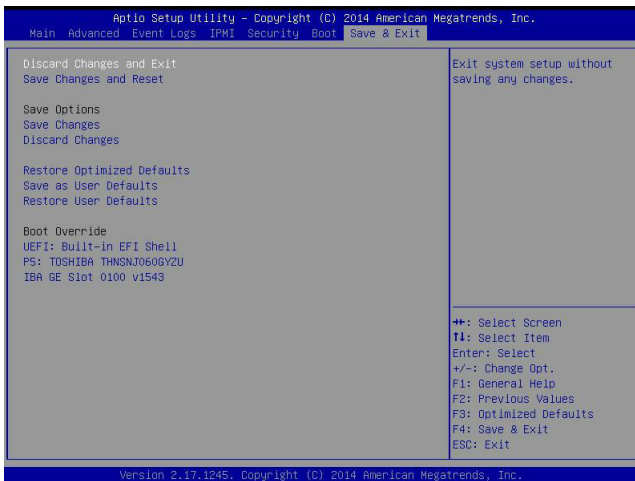
- Legacy Boot Order #1 - Legacy Boot Order #3

### ►UEFI Application Boot Priorities

- UEFI Boot Order #1

## 7-8 Save & Exit

Select the Save & Exit tab from the BIOS setup screen to configure the settings below.



**Discard Changes and Exit**

Select this option to quit the BIOS setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

**Save Changes and Reset**

When you have completed the system configuration changes, select this option to leave the BIOS setup utility and reboot the computer for the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

**Save Options****Save Changes**

When you have completed the system configuration changes, select this option to save all changes made. This will not reset (reboot) the system.

**Discard Changes**

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

**Restore Defaults**

To set this feature, select Restore Defaults from the Exit menu and press <Enter>. These are manufacture default settings designed for maximum system performance.

**Save As User Defaults**

To set this feature, select Save as User Defaults from the Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

**Restore User Defaults**

To set this feature, select Restore User Defaults from the Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

**Boot Override**

This feature allows the user to override the Boot priorities sequence in the Boot menu, and immediately boot the system with another device specified by the user. This is a one-time override.



## Appendix A

### BIOS Error Beep Codes

During the Power-On Self-Test (POST) routines, which are performed at each system boot, errors may occur.

**Non-fatal errors** are those which, in most cases, allow the system to continue to boot. The error messages normally appear on the screen.

**Fatal errors** will not allow the system to continue with bootup procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

BIOS Error Beep Codes		
Beep Code/LED	Error Message	Description
1 beep	Refresh	Ready to boot
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 beeps	No Con-In or No Con-Out devices	Con-In: USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL  Con-Out: Video Controller, PCI or Serial Console Redirection, IPMI SOL
1 beep per device	Refresh	1 beep for each USB device
IPMI Error Codes		
1 Continuous Beep	System OH	System Overheat

**Notes**

## Appendix B

### System Specifications

#### Processors

Two Intel E5-2600 v3/v4 series processors in R3 LGA 2011 type sockets

Note: Please refer to our web site for a complete listing of supported processors.

#### Chipset

Intel PCH C612

#### BIOS

16 MB SPI AMI BIOS® SM Flash UEFI BIOS

#### Memory Capacity

The server features 16 DIMM slots to support up to 2 TB of ECC LRDIMM or 512 GB of ECC RDIMM DDR4-2400/2133/1866/1600 MHz type memory

Note: See the memory section in Chapter 5 for details.

#### SATA Controller

Ten SATA 3.0 ports, RAID 0, 1, 5 and 10 supported

#### Drive Bays

The chassis supports twelve hot-swap 3.5" SATA hard disk drives.

#### Serverboard

X10DRU-X (proprietary form factor)

Dimensions: 16.8" x 17" (426.7 x 431.8 mm)

#### Chassis

SC829UACN4-R1K02 (2U rackmount)

Dimensions: (WxHxD) 17.2 x 3.5 x 27.8 in. (437 x 89 x 706 mm)

## System Cooling

Four sets of 8-cm cooling fans (fan speed controlled by IPMI)

## System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range

Rated Input Current: 9.8-7A (100-140V), 7-5A (180-240V) max

Rated Input Frequency: 50-60 Hz

## Power Supply

Rated Output Power: 1000W (Part# PWS-1K02A-1R)

Rated Output Voltages: +12V (62.5A @ 100-127V, 83A @ 200-240V), +12Vsb (2.1A)

## Operating Environment

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-Operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-Operating Relative Humidity: 5 to 95% (non-condensing)

## Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

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**Notes**