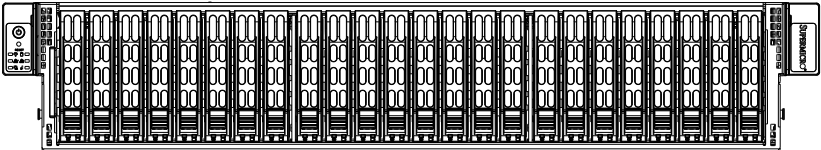




SUPERSTORAGE SERVER®

2028R-NR48N



USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

Release Date: June 14, 2016

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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. Installation and maintenance should be performed by experienced technicians only.

Please refer to the server specifications page on our Web site for updates on supported memory, processors and operating systems ([www.supernano.com](http://www.supernano.com)).

This manual may be periodically updated without notice. Please check the Supernano Web site for possible updates to the manual revision level.

## Warnings

Special attention should be given to the following symbols used in this manual.



**Warning!** Indicates important information given to prevent equipment/property damage or personal injury.



**Warning!** Indicates high voltage may be encountered when performing a procedure.

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**Notes**

# Chapter 1

## Introduction

### 1-1 Overview

The SuperStorage server 2028R-NR48N is a high-end solution comprised of two main subsystems: the SC226STS-R1K62P2 2U chassis and the X10DSC+ dual processor motherboard. It features forty-eight hot-swap drives, NVMe capability, and SIOM for networking flexibility. It is powered by dual redundant 1600 W high-efficiency, hot-swap power modules.

It is useful for IOPS-intensive storage applications, database applications such as MySQL or Casandra, virtual storage environments, single instance storage and data deduplication.

Refer to the Supermicro web site 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 above components, the server includes:

- Two SAS3 backplanes (BPN-SAS3-226SEL1-N4)
- Five 8-cm system cooling fans (FAN-0118L4)
- One add-on module for NVMe (AOC-SLG3-4E4R-P)
- Two passive CPU heatsinks (SNK-P0047PS)
- One rackmount rail kit (MCP-290-00138-0N)

**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.

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <ftp://ftp.supermicro.com>
- Product safety info:  
[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 Motherboard Features

The SuperStorage server 2028R-NR48N is built around the X10DSC+, a dual processor motherboard based on the Intel C612 chipset. Below are the main features. (See Figure 1-1 for a block diagram of the chipset.)

### Processors

The motherboard supports single or dual Intel E5-2600 v3/v4 Series processors in socket R3 (LGA 2011). Refer to the motherboard description pages on the Supermicro website for a complete listing of supported processors ([www.supermicro.com](http://www.supermicro.com)).

### Memory

The motherboard has 24 DIMM slots that can support Load Reduced (LRDIMM) or Registered (RDIMM) ECC DDR4-2400/2133/1866/1600 memory. See Chapter 5 for details.

### NVMe Ports

The motherboard features four NVMeExpress ports (PCI-E 3.0 x4) using OcuLink. The NVMe ports provide high-speed, low-latency connections directly from the CPU to NVMe solid state drives (SSDs). This greatly increases SSD throughput and significantly reduces storage device latency by simplifying driver and software requirements resulting from the direct PCI-E interface between the CPU and the NVMe SSD drives.

### Serial ATA

A SATA controller is integrated into the chipset to provide four SATA 3.0 (6/Gbps) ports), which support RAID 0, 1 and 10. RAID 5 is supported with Windows OS only.

### PCI Expansion Slots

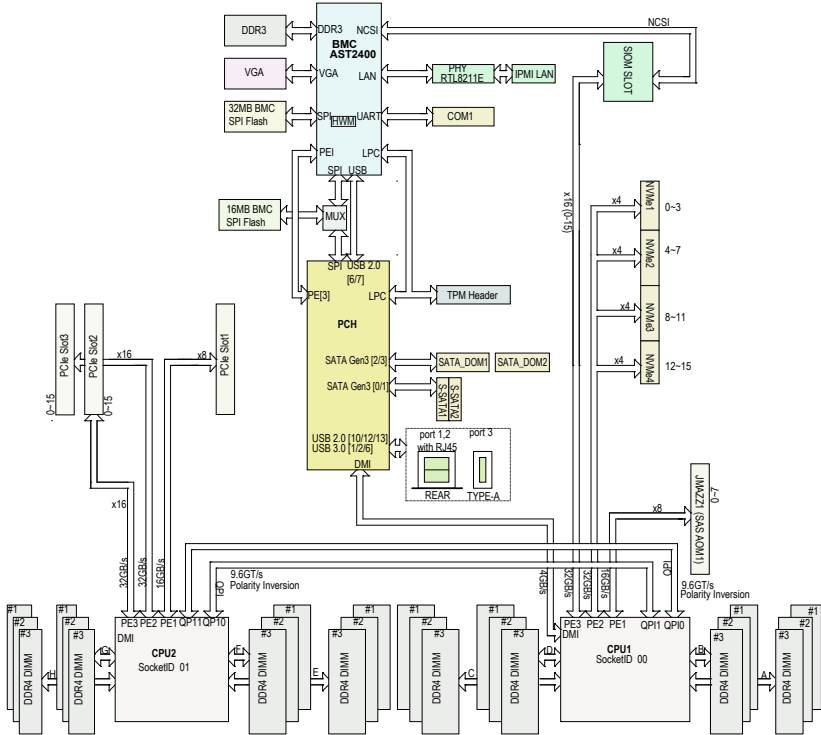
The X10DSC+ has two PCI-E 3.0 x16 and one PCI-E x8 slot.

### Rear I/O Ports

The I/O ports include one COM port, a VGA port, two USB 3.0 ports and a dedicated IPMI LAN (Ethernet) port.

## SIOM Network Slot

The motherboard provides a PCI-E x16 slot for a Super I/O module (SIOM) networking card. Several SIOM configurations are available.



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

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

## 1-3 Chassis Features

The 2028R-NR48N is built upon the SC226STS-R1K62P2 chassis.

### System Power

The system features dual redundant 1600 W power supplies consisting of two hot-plug power modules. They have 80 Plus certification at Titanium Level (96%) high-efficiency. The system will continue to operate if one module fails or is replaced.

### Drives

The chassis supports forty-eight hot-swap 2.5" NVMe solid state (SSDs) drives. Twenty-four are accessible from the front, and 24 additional drives are accessible on the top of the chassis by means of a pop-up riser bay. Each set of 24 drives is supported by a separate backplane, the rear-most referred to herein as the *mid-plane*.

The chassis also supports two additional hot-swap 2.5" hard drives at the rear.

### PCI Expansion Slots

The system allows three low profile, externally accessible PCI-E cards--two x16 slots and one x8 slot. One of the x16 slots is used for the NVMe add-on card.

### 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 five 8-cm hot-swap high-performance fans. Fan speed can be determined by system temperature through IPMI. The system also uses an air shroud to channel air where needed. Each power supply module also includes a cooling fan.



## 1-4 Contacting Supermicro

### Headquarters

Address: Super Micro Computer, Inc.  
980 Rock Ave.  
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Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

Email: [marketing@supermicro.com](mailto:marketing@supermicro.com) (General Information)  
[support@supermicro.com](mailto:support@supermicro.com) (Technical Support)

Web Site: [www.supermicro.com](http://www.supermicro.com)

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's-Hertogenbosch, The Netherlands

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

Web Site: [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)

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

**Notes**

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## Chapter 2

### Rack 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 installations, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure that the rack is stable before extending a component from the rack.
- Only one chassis should be extended from the rack at a time. Extending two or more chassis simultaneously may cause the rack to become unstable.

### General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- 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 upward.
- 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-swappable hard 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.

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## 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).

### ***Sufficient Airflow***

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

### ***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 Rack Mounting Instructions

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using. **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 in the rack mounting kit. 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 that slides in the outer rail. These assemblies are specifically designed for the left and right side of the chassis.

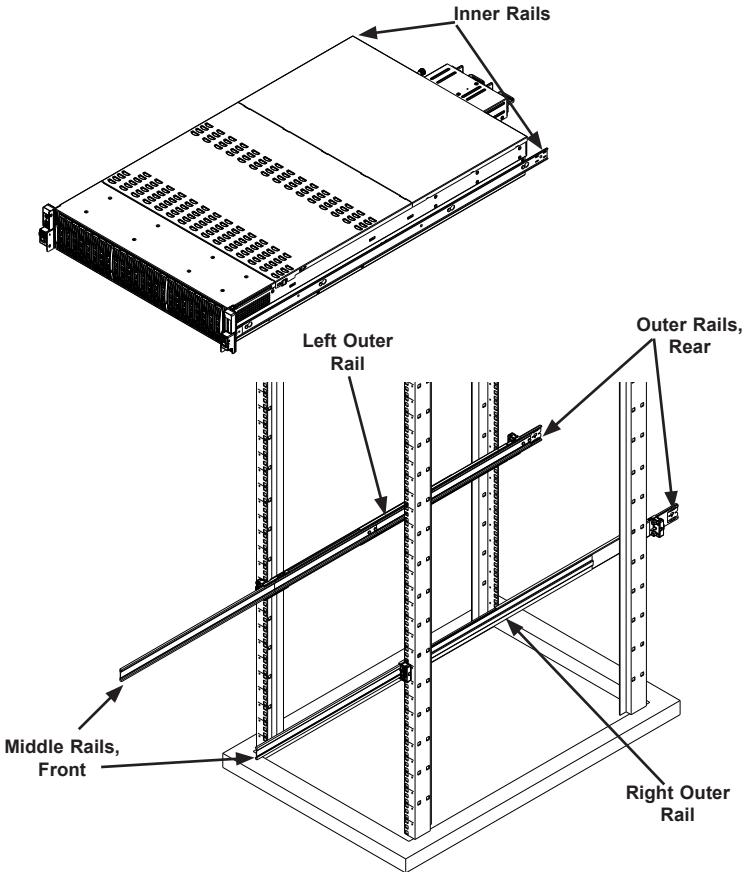


Figure 2-1. Identifying the Inner Rails, Middle Rails and Outer Rails

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## Releasing the Inner Rail

It is necessary to release the inner rail from the middle and outer rails before installing the inner rail on the chassis.

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

1. Lift the front latch on the inner rail and pull the inner rail out of the middle rail, and the middle rail out of the outer rail until the rails are fully extended.
2. Press down the locking lever on the inside of the inner rail to release the inner rail. Continue to pull the inner rail out of the middle rail.

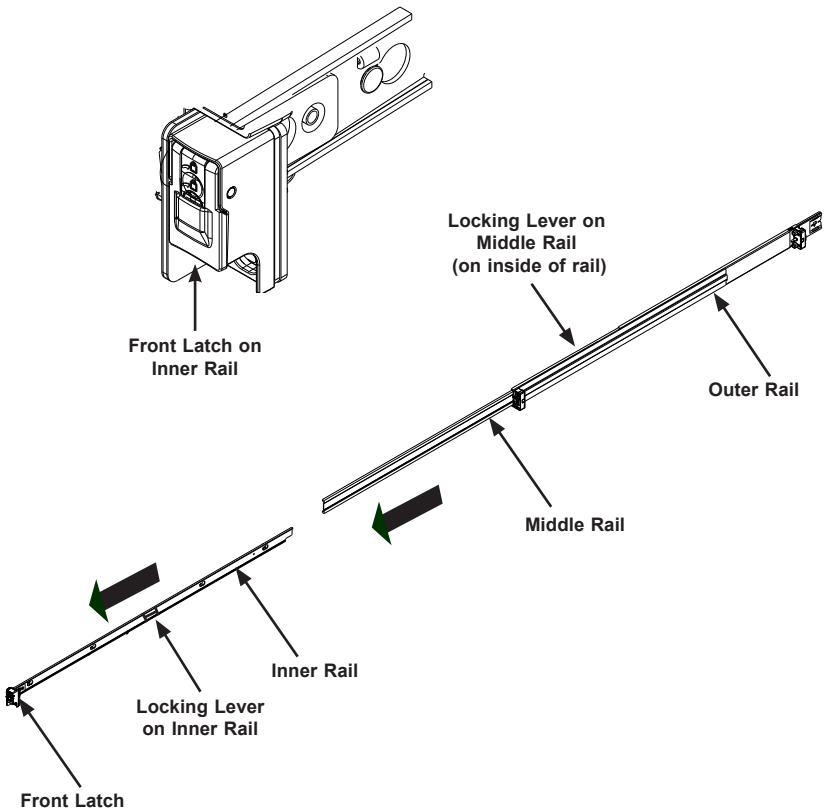


Figure 2-2. Extending the Rails and Releasing the Inner Rail

## Installing The Inner Rails on the Chassis

### Installing the Inner Rails

1. Confirm that the left and right inner rails have been correctly identified.
2. Place the inner rail firmly against the side of the chassis, aligning the pins on the side of the chassis with the slotted thru holes in the inner rail.
3. Slide the inner rail toward the rear of the chassis until the pins are at the end of the narrow slot, which secures the inner rail to the chassis. An optional screw may be added for extra security.
4. Repeat for the other inner rail.

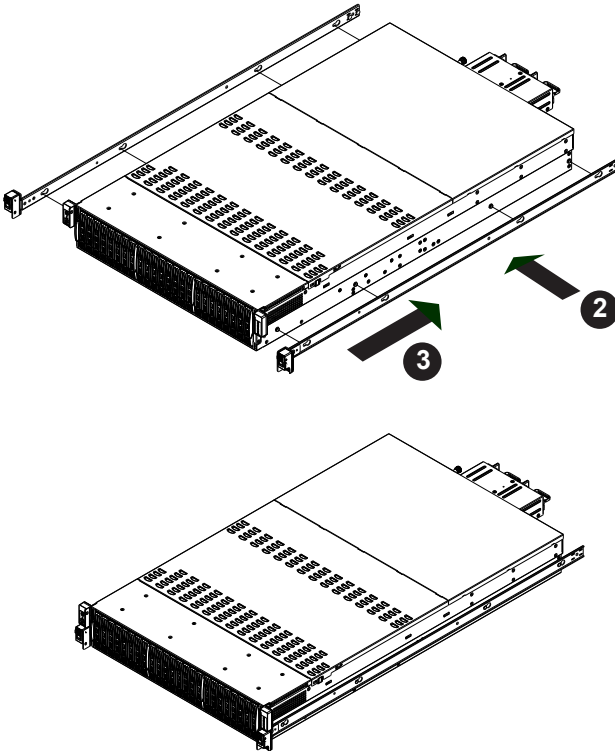


Figure 2-3. Installing the Inner Rails



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



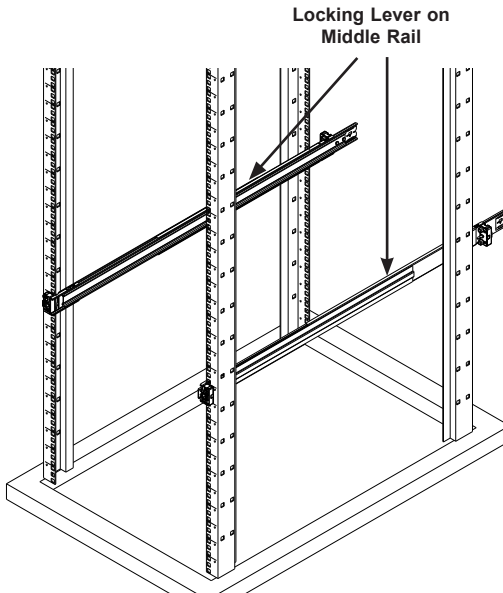
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## Installing the Outer Rails on the Rack

### *Installing the Outer Rails*

1. Confirm that the left and right outer rails have been correctly identified.
2. Release the small locking lever on the inside of the middle rail and push the middle rail back into the outer rail.
3. Insert the square pins at the front of the outer rail into the square holes on the front of the rack. Push until the latch snaps into place.
4. The outer rail is actually two pieces that slide to lengthen. Pull out the rear of the outer rail, adjusting the length until the square pin assembly passes, then fits against the back of the rear post. Be careful to keep the rail level.
5. Insert the square pins at the rear of the outer rail into the square holes on the rear of the rack. Push until the latch snaps into place.
6. Repeat for the other outer rail.



**Figure 2-4. Installing the Outer Rails**



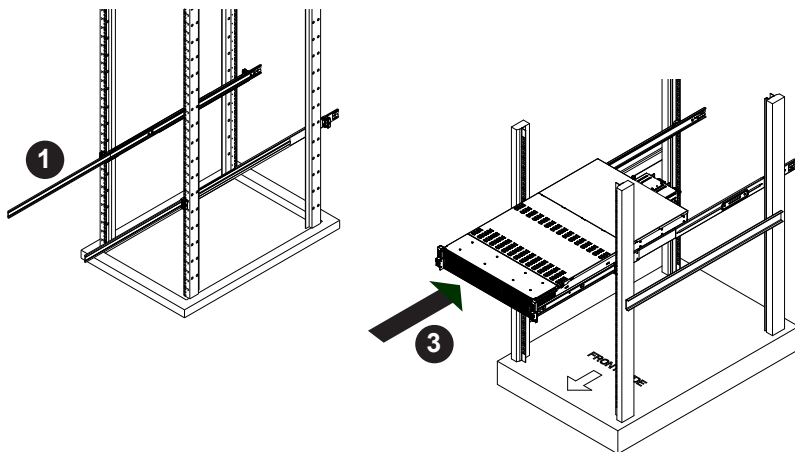
**Stability hazard.** The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.

## Installing into the Rack

After the rails are installed on the chassis and on the rack, the server can be installed in the rack. It is heavy and requires two to three people to lift.

### *Installing the Chassis into a Rack*

1. Pull both middle rails out the front of the outer rail until each clicks to a stop.
2. Align the inner rails on the chassis with the front of the middle rails.
3. Slide the inner rails on the chassis into the middle rails, keeping the pressure even on both sides. When partially in, the locking levers will stop further progress.
4. Press down the locking levers on the inside of the inner rails and push the chassis all the way into the rear of the rack. The front latches will click into place.



**Figure 2-5. Installing the Chassis into the Rack**

**Note:** Figures are for illustrative purposes only. Your actual chassis may differ. Always install servers into racks from the bottom up.

The server is now mounted in the rack. It can be pulled partially out for service by lifting both front latches.

---

---

## Removing the Chassis From the Rack

**Caution:** The server is heavy and requires two to three people to lift it out.

### *Removing the Chassis*

1. Lift the right and left front latches which are just below the LED control panels on the front edges of the chassis.
2. Pull the chassis forward until it clicks to a stop.
3. Press down the locking lever on the inside of the inner rail (Figure 2-2) to release the server. Continue to pull the server out of the middle rails.

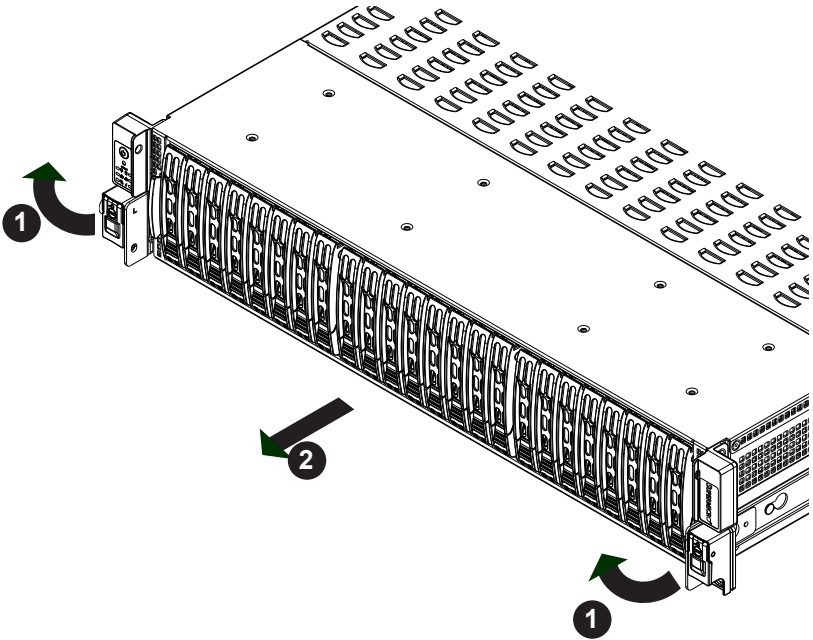


Figure 2-6. Removing the Chassis

## Removing the Outer Rails From the Rack

In the uncommon event that it is necessary to remove the outer rails from the rack, follow these instructions. The chassis must be out of the rack.

### Releasing the Outer Rails

1. On the front of the outer rail, slide the small plastic safety slider (red in drawing) up and hold it while pushing the plastic release button (green in drawing) just below it.
2. While holding the release button in, pull the outer rail forward to disengage the pins and the front of the rail from the rack.
3. Support the front of the outer and middle rail assembly while releasing the rear.
4. Remove the outer rail from the rear of the rack in the same way as the front. Slide the safety slider up and push and hold the release button, then pull the rear pins out of the rack and remove the rail.

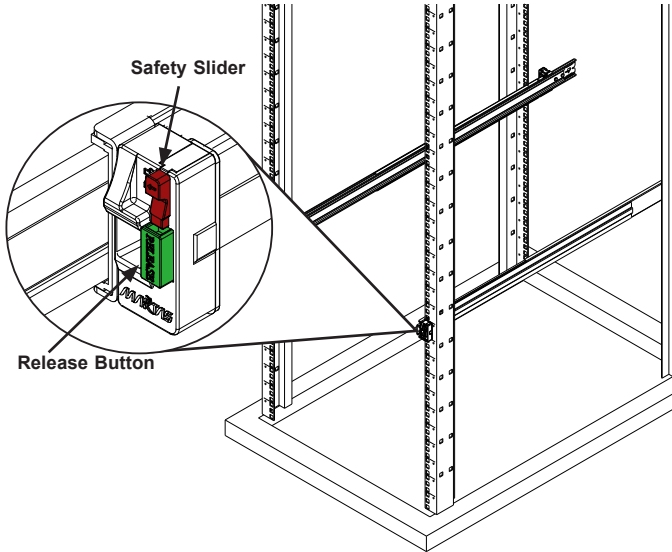


Figure 2-7. Removing the Outer Rails

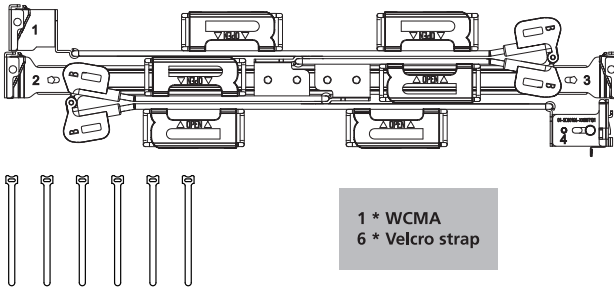
**Note:** A small number of customers may have received a different outer rail than the one pictured. This rail features side release latch on the front of the outer rail., which opens inward to release the outer rail from the rack. Contact Supermicro Technical Support department if you need additional assistance.

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## 2-5 Installing the Cable Management Arm

The SC226S chassis supports a cable management arm (CMA) that allows servicing while the server is running. The CMA keeps the rear cables organized and clear of the rail mechanisms when the system is extended out the front of the rack. The kit includes six fabric Velcro cable ties.

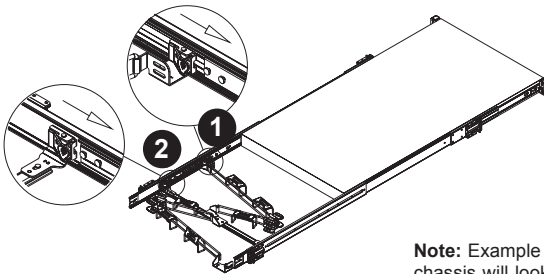


**Figure 2-8. Cable Management Arm and Velcro Straps**

The CMA attaches to the rack mounting rails by means of four connectors. They are labeled on the connectors 1, 2, 3, and 4.

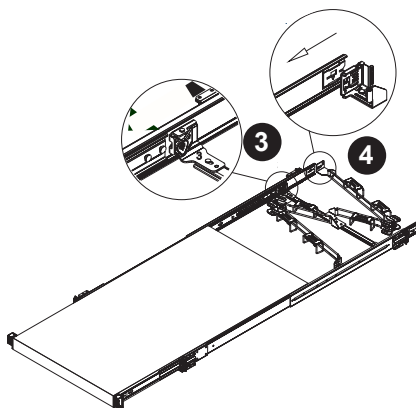
### ***Installing the Cable Management Arm***

1. Slide CMA connector #1 forward onto the two posts on the rear of the right inner rail (right side when viewed from the front). It snaps into place.
2. Slide CMA connector #2 forward onto the two posts on the rear of the right middle rail. It snaps into place.



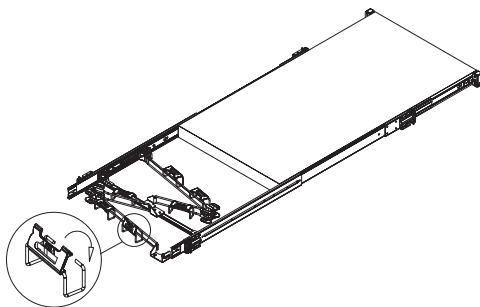
**Note:** Example only--your chassis will look different.

**Figure 2-9. Installing the Connectors 1 and 2**



**Figure 2-10. Intalling the Connectors 3 and 4**

3. Slide CMA connector #3 forward onto the two posts on the rear of the left middle rail. It snaps into place.
4. For CMA connector #4, align the metal tabs with the slots on the rear of the left outer rail and push it forward. It snaps into place.
5. Open the six red plastic caps and route the cables into the wire carrier.



**Figure 2-11. Routing the Cables**

6. Use the six Velcro straps to secure the cables to the CMA. Use a strap on either side of each joint and one on each connector.
7. Slide the chassis forward and backward in the rack to confirm that the cable management arm is operating smoothly.

---

---

If at some time you must remove the cable management arm, follow this procedure.

***Removing the Cable Management Arm***

1. Remove cables from the CMA, releasing the Velcro straps and the red plastic caps.
2. For CMA connector #4, pull the metal release tab toward the center of the rack and slide the connector toward the rear to release it.
3. For CMA connectors #3, #2, and #1, depress the front edge of the yellow plastic rocker lock, and slide the connector toward the rear to release it.

# Notes



# Chapter 3

## System Interface

### 3-1 Overview

The server includes a control panel on the front that house power buttons and status monitoring lights. The externally accessible hard drives display status lights. The power supply displays status lights visible from the back of the chassis.

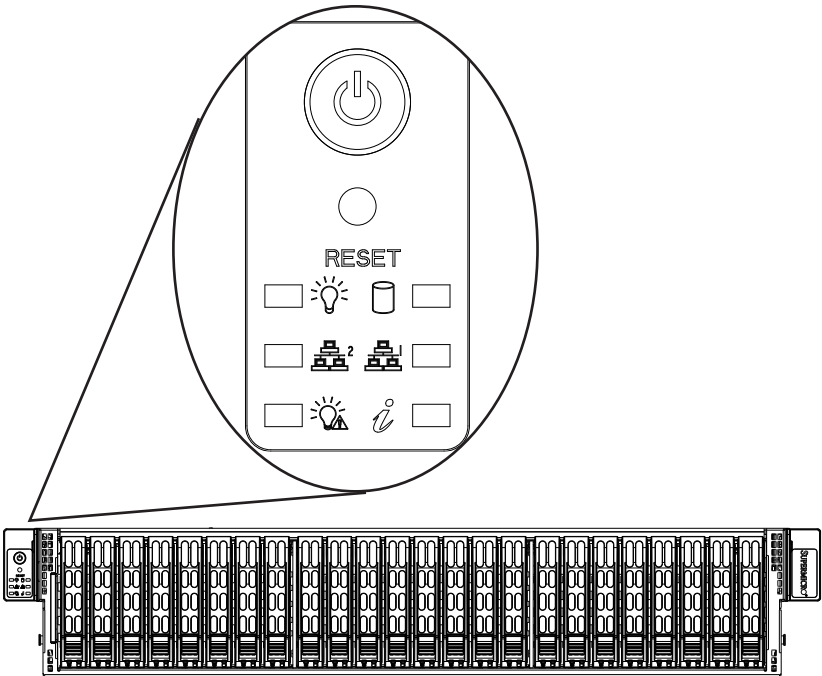


Figure 3-1. Front Control Panel

## 3-2 Control Panel Buttons

The chassis control panel includes two push-buttons that controls power.



### Power

The main power switch applies or removes primary power from the power supply to the computing nodes but maintains standby power. To perform most maintenance tasks, unplug the system to remove all power.



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 is illuminated when the system is operating normally.



### HDD

Indicates activity on the hard disk drive when flashing.



## NIC2

Indicates network activity on GLAN2 when flashing.



## NIC1

Indicates network activity on GLAN1 when flashing.



## Power Fail

Indicates a power supply module has failed.



## Information LED

Alerts operator to 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

A sensor on the backplane will issue a warning at 45°C. Overheating is critical at 49°C. There are several possible responses if the system overheats.

### *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/NVMe drives. Each drive carrier displays two LED indicators: an activity indicator and a status indicator. The status indicator functions in RAID configurations. For non-RAID configurations, it remains off. See the table below for details.

	LED Color	Blinking Pattern	Behavior for Device
<b>Activity LED</b>	Blue	Blinking	I/O activity
	Blue	Solid On	Idle SAS/NVMe drive installed
	Off	Off	Idle or SATA drive
<b>Status LED</b>	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for drive with RSTe support
	Red	On for five seconds, then off	Power on for drive with RSTe support
	Red	Blinking at 4 Hz	Identify drive with RSTe support
	Green	Solid On	Safe to remove NVMe device
	Amber	Blinking at 1 Hz	Attention state—do not remove NVMe device

### 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.
- **Solid Amber:** When illuminated, indicates the power supply is plugged in and turned off, or the system is off but in an abnormal state.
- **Blinking Amber:** When blinking, this system power supply temperature has reached 63C. The system will automatically power-down when the power supply temperature reaches 70C and restart when the power supply temperature goes below 60C.

**Notes**

## Chapter 4

# Standardized Warning Statements for AC Systems

### 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 chapter in its entirety before installing or configuring components in the Supermicro chassis. Some warnings may not apply for your system.

These warnings may also be found on our web site at [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。

您正處於可能身體可能會受損傷的工作環境中。在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.

## **תקנת הצהרות אזהרה**

הצהרות 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 במלוואו לפני התקנת או הגדרת הרכיבים במארוזי סופרמיקרו.



تحذير! هذا الرمز يعني خطر انك في حالة يمكن أن تتسبب في اصابة جسدية .  
قبل أن تعمل على أي معدات، كن على علم بالمخاطر الناجمة عن الدوائر  
الكهربائية  
وكن على دراية بالممارسات الوقائية لمنع وقوع أي حوادث  
استخدم رقم البيان المنصوص في نهاية كل تحذير للعثور ترجمتها

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。

### 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-250 V, 20 A

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 220V, 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、シャーシー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!**

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 النظام من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل الوصول إلى المناطق الداخلية للهيكल لتثبيت أو إزالة مكونات 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.

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتثبيت واستبدال أو خدمة هذا الجهاز

### 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

此装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').

تم تخصيص هذه الوحدة لت تركيبها في مناطق محظورة .  
يمكن الوصول إلى منطقة محظورة فقط من خلال استخدام أداة خاصة،  
قفل ومفتاح أو أي وسيلة أخرى للالأمين

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어 있습니다. 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 استبدال البطارية بطريقة غير صحيحة فعليك استبدال البطارية فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة تخلص من البطاريات المستعملة وفقا لتعليمات 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 ontploffingsgevaar 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 (if applicable to your system)



### 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 لعزل 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** (if applicable to your system)



#### **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，背板上有很危險的電壓或能量，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 الموجودة على اللوحة  
عندما يكون النظام يعمل كن 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 instalación 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 يمثل للقوانين المحلية والوطنية 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.

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

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 (if applicable to your system)



### Warning!

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

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

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**

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**

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!**

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**

Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

**אזהרה!**

כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

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!**

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**

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!

When installing the product, use the provided or designated connection cables, power cables and AC adaptors. 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、提供または指定された接続ケーブル、電源コードとACアダプターを使用下さい。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连接线,电源线和电源适配器.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

安装此产品时,请使用本身提供的或指定的连接线,电源线和电源适配器.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符號)。

### Warnung

Bei der Installation des Produkts, die zur Verfügung gestellten oder benannt Anschlusskabel, Stromkabel und Netzteile. Verwendung anderer Kabel und Adapter kann zu einer Fehlfunktion oder ein Brand entstehen. Elektrische Geräte und Material Safety Law verbietet die Verwendung von UL-oder CSA-zertifizierte Kabel, UL oder CSA auf der Code für alle anderen elektrischen Geräte als Produkte von Supermicro nur bezeichnet gezeigt haben.

### ¡Advertencia!

Al instalar el producto, utilice los cables de conexión previstos o designados, los cables y adaptadores de CA. La utilización de otros cables y adaptadores podría ocasionar un mal funcionamiento o un incendio. Aparatos Eléctricos y la Ley de Seguridad del Material prohíbe el uso de UL o CSA cables certificados que tienen UL o CSA se muestra en el código de otros dispositivos eléctricos que los productos designados por Supermicro solamente.



## Attention

Lors de l'installation du produit, utilisez les bables de connection fournis ou désigné. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et de loi sur la sécurité Matériel interdit l'utilisation de UL ou CSA cables certifiés qui ont UL ou CSA indiqué sur le code pour tous les autres appareils électriques que les produits désignés par Supermicro seulement.

## חשמליים ומתאמי AC

!אזהרה

כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים AC אשר נועדו וסופקו לשם כך. שימוש בכל כבל או מתאם אחר יכול לגרום לתקלה או קצר חשמלי. על פי חוקי שימוש במכשירי חשמל וחוקי בטיחות, קיים איסור להשתמש בכבלים המוסמכים ב- UL או ב- CSA (כשאר מופיע עליהם קוד של UL/CSA) עבור כל מוצר חשמלי אחר שלא צויין על ידי סופרמיקרו בלבד.

عند تركيب الجهاز يجب استخدام كابلات التوصيل، والكابلات الكهربائية ومحولات التيار المتردد التي . أن استخدام أي كابلات ومحولات أخرى يتسبب في حدوث عطل أو حريق. تم توفيرها لك مع المنتج الأجهزة الكهربائية ومواد قانون السلامة يحظر استخدام الكابلات CSA أو UL معتمدة من قبل لأي أجهزة كهربائية أخرى غير المنتجات المعينة من قبل Supermicro (التي تحمل علامة UL/CSA)

경고!

제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC 어댑터를 사용해야 합니다. 그 밖의 다른 케이블들이나 어댑터들은 고장 또는 화재의 원인이 될 수 있습니다. 전기용품안전법 (Electrical Appliance and Material Safety Law)은 슈퍼마이크로에서 지정한 제품들 외에는 그 밖의 다른 전기 장치들을 위한 UL 또는 CSA에서 인증한 케이블(전선 위에 UL/CSA가 표시)들의 사용을 금지합니다.

## Waarschuwing

Bij het installeren van het product, gebruik de meegeleverde of aangewezen kabels, stroomkabels en adapters. Het gebruik van andere kabels en adapters kan leiden tot een storing of een brand. Elektrisch apparaat en veiligheidsinformatiebladen wet verbiedt het gebruik van UL of CSA gecertificeerde kabels die UL of CSA die op de code voor andere elektrische apparaten dan de producten die door Supermicro alleen.

## Notes

## Chapter 5

### Advanced Motherboard Setup

This chapter provides detailed information on the X10DSC+ motherboard. All motherboard jumpers and connections are described. A layout and quick reference chart are also included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

#### 5-1 Handling the Motherboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the motherboard 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 electric static discharge.

##### Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- 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 motherboard, 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 motherboard.

## 5-2 Cable and Device Connections

All data and power connections between the motherboard to the system (including the power supplies and the hard drives) are provided through the midplane. Most of these connections are made automatically when the system is assembled. "Right" and "left" refer to the side of the chassis as viewed from the front of the system.

### ***Power Connections***

Power is routed from the power supplies to the power distribution board which in turn connects to the midplane. When the motherboards are seated in their bays they plug into the midplane to receive power.

### ***Fan Cabling***

All six sets of cooling fans are connected to headers on the motherboard and may be monitored through IPMI. Fans can be accessed for replacement by removing the entire hot-swap server module.

### ***Control Panels***

A ribbon cable connects each control panel to the midplane. The right and left side control panels connect to JP1 and JP2 on the midplane, respectively.

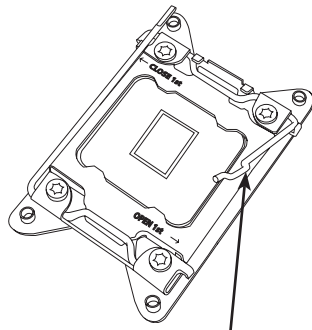
## 5-3 Processor and Heatsink Installation

### Notes:

- Always remove the power cord before adding, removing or changing a CPU.
- When receiving a motherboard 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.

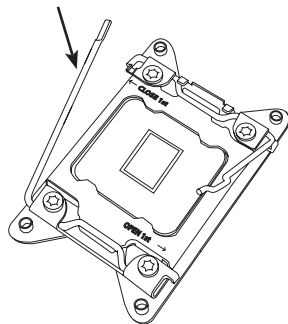
### Installing a CPU

1. There are two levers on the LGA 2011 socket. First press and release the load lever labeled "Open 1st".
2. Press the second load lever labeled "Close 1st" to release the load plate from its locked position.



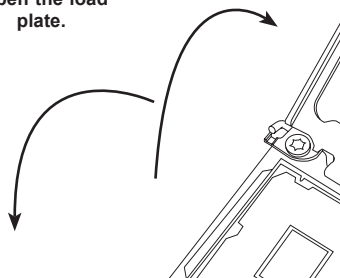
Release the lever labeled "Open 1st"

Release the lever labeled "Close 1st"

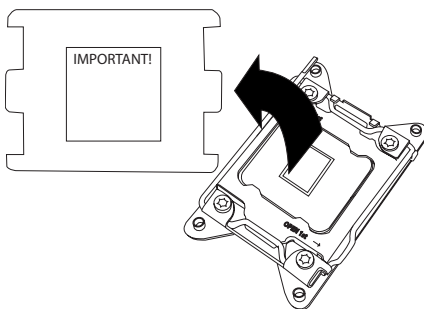


3. With the second lever fully retracted, gently push down on the "Open 1st" lever to loosen the load plate. Lift the load plate with your fingers to open it completely.

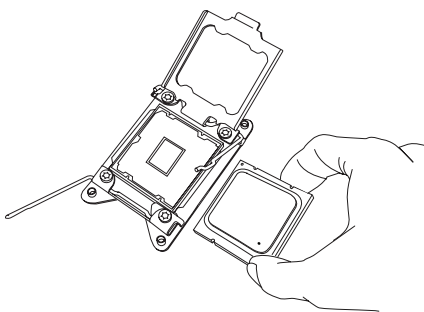
Open the load plate.



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.

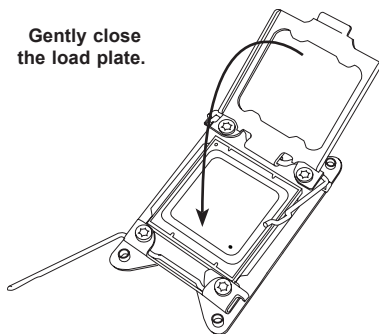


6. Carefully lower the CPU straight down into the socket. Do not move the CPU horizontally, and do not rub the pins of the socket. This may damage the CPU or the socket.

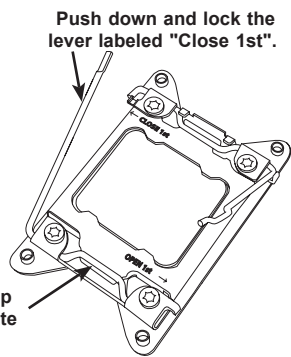


**Caution:** You can only install the CPU into the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it does not close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the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

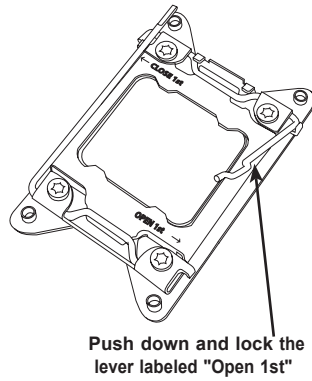
7. With the "Close 1st" lever fully retracted, gently close the load plate.



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 CPU Heatsink

1. Remove power from the system and unplug the AC power cord from the power supply.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the (preinstalled) heatsink retention mechanism.
3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug. Do not fully tighten the screws or you may damage the CPU.)
4. Add the two remaining screws then finish the installation by fully tightening all four screws.

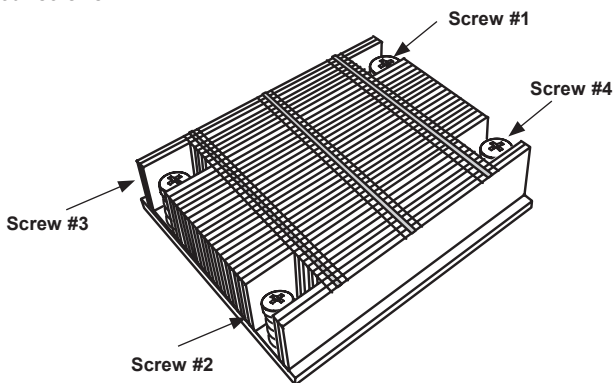


Figure 5-1. Heatsink Installation

## Removing the Heatsink

**Caution:** Removing the CPU or the heatsink is not recommended. If you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or other components.

1. Power down the node and unplug the AC power cord.
2. Unscrew and remove the heatsink screws in the sequence shown in the illustration above.
3. Hold the heatsink and gently wiggle it to loosen it from the CPU. (Do not use excessive force when doing this!) Once the heatsink is loosened, remove it from the CPU.
4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.



## 5-4 Installing Memory

### Memory Support

The X10DSC+ supports Load Reduced (LRDIMM) or Registered (RDIMM) ECC DDR4-2400/2133/1866/1600 memory. For best performance, install pairs of memory modules of the same type and speed. All channels will run at the fastest common frequency.

For optimal memory performance, install a pair (or pairs) of memory modules of the same type and speed (see the Memory Installation Table below).

**Note:** Memory speed support depends on the CPUs installed in the motherboard. For the latest memory updates, please refer to the product page on our website.

### DIMM Installation

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

#### *Installing Memory Modules*

Insert the desired number of DIMMs into the memory slots starting with DIMM slot #P1-DIMMA1.

1. Push the release tabs outwards on both ends of the DIMM slot to unlock it. Insert each DIMM module vertically into its slot. Pay attention to the key along the bottom of the module to avoid installing incorrectly (Figure 5-2).
2. Gently press down on the DIMM module until it snaps into place in the slot. Press the release tabs to the locking positions to secure the DIMM module into the slot.

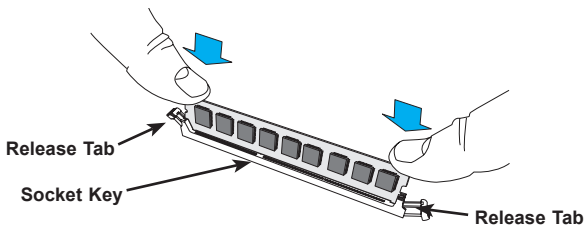


Figure 5-2. DIMM Installation

## Processor & Memory Module Population Configuration

Follow the tables below for correct memory installation.

Processors and their Corresponding Memory Modules												
CPU#	Corresponding DIMM Modules											
<b>CPU 1</b>	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
<b>CPU2</b>	E1	F1	G1	H1	E2	F2	G2	H3	E3	F3	G3	H3

Processor and Memory Module Population for Optimal Performance	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table
<b>1 CPU &amp; 2 DIMMs</b>	CPU1 P1-DIMMA1/P1-DIMMB1
<b>1 CPU &amp; 4 DIMMs</b>	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
<b>1 CPU &amp; 6~8 DIMMs</b>	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 + any pair of P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2 slots
<b>2 CPUs &amp; 4 DIMMs</b>	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
<b>2 CPUs &amp; 6 DIMMs</b>	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1
<b>2 CPUs &amp; 8 DIMMs</b>	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
<b>2 CPUs &amp; 10~16 DIMMs</b>	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + any pair of P1, P2 DIMM slots
<b>2 CPUs &amp; 16-24 DIMMs</b>	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, P1-DIMMA3/P1-DIMMB3/P1-DIMMC3/P1-DIMMD3, P2-DIMME3/P2-DIMMF3/P2-DIMMG3/P2-DIMMH3

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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)					
				3 Slots per Channel					
				1 DPC		2 DPC		3 DPC	
				E5-2600 V3	E5-2600 V4	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	1600	1600
RDIMM	SRx8	4 GB	8 GB	2133	2400	1866	2133	1600	1600
RDIMM	DRx8	8 GB	16 GB	2133	2400	1866	2133	1600	1600
RDIMM	DRx4	16 GB	32 GB	2133	2400	1866	2133	1600	1600
LRDIMM	QRx4	32 GB	64 GB	2133	2400	2133	2400	1600	1866
LRDIMM 3DS	8Rx4	64 GB	128 GB	2133	2400	2133	2400	1600	1866

## 5-5 Motherboard Details

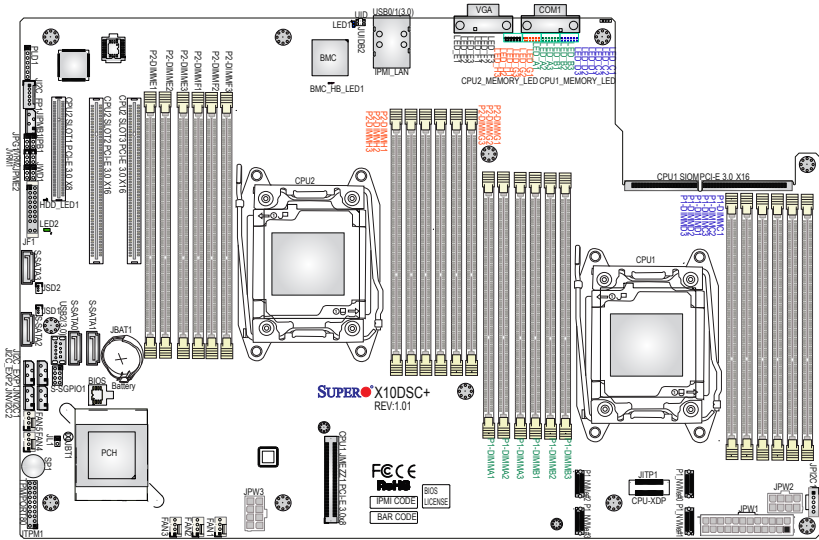


Figure 5-3. X10DSC+ Layout

### Notes

Jumpers not indicated are for test purposes only and should not have their settings changed.

Note that the PCI slots are enabled when their corresponding processors are installed. "CPU2 Slot 4" indicates that the second CPU must be installed to the CPU2 socket to enable this PCI slot.

"■" indicates the position of pin 1.

### X10DSC+ Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS/Reset BIOS Configuration	See Section 5-8
JPB1	BMC Enable	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPME2	Manufacture (ME) Mode Select	Pins 1-2 (Normal)
JWD1	Watch Dog Timer Enable	Pins 1-2 (Reset)

Connectors	Description
COM1	Rear COM Port
FAN1-FAN5	System Fan Headers (Fan 1-Fan 5)
JF1	Front Control Panel Header
J <sup>2</sup> C_EXP1/2	System Management Bus (SMBus) I <sup>2</sup> C for SAS3 Backplane
J <sup>2</sup> C_FP1	System Management Bus (SMBus) I <sup>2</sup> C for LCD Devices
JIPMB1	4-pin external BMC I <sup>2</sup> C Header (for an IPMI card)
JL1	Chassis Intrusion Header
JNVI <sup>2</sup> C1/2	System Management Bus (SMBbus) (I <sup>2</sup> C) for NVME Devices
JPI <sup>2</sup> C1	Power Supply SMBbus I <sup>2</sup> C Header
JPW1	24-pin ATX Main Power Header
JPW2/3	12V 8-pin Power Headers
JSD1/JSD2	SATA DOM (Device on Module) Power Connectors 1/2
JTPM1	TPM (Trusted Platform Module)/Port 80 Header
IPMI_LAN	Dedicated IPMI LAN
P1_NVMe#0-#3	NVM Express PCI-E 3.0 x4 Ports (from CPU1)
S-SATA 0-3	SAS 3.0 Ports (S-SATA 1/2 support SMCI SuperDOM with built-in power pins)
S-SGPIO 1	Serial Link General Purpose I/O Header (for S-SATA ports)
Slot1	PCI-Express 3.0 x8 Slot (from CPU2)
Slot2/3	PCI-Express 3.0 x16 Slot (from CPU2)
JMEZZ1 PCI-E	PCI-Express 3.0 x8 Add-On-Module (AOM) slot from CPU1 (for mezzanine card)
SIOM PCI-E	PCI-Express 3.0 x16 Slot (from CPU1, for SMCI SIOM add-on module support)
UID	UID (Unit Identification) Switch
USB 0/1	Backpanel USB 3.0 Ports
USB 2	Type A USB 3.0 Connector (for front access)

LED	Description	State	Status
BMC_HB_LED1	BMC Heartbeat LED	Green: Blinking	BMC Normal
HDD_LED1	HDD LED	Green: On	HDD Normal
LED1	Rear UID LED	Blue: On	Unit Identified
LED2	Power LED	On	Power On

LED	Description	State	Status
LED_A1-A3	CPU1 Memory Fail LED for DIMMs A1-A3	On	Memory Failure
LED_B1-B3	CPU1 Memory Fail LED for DIMMs B1-B3	On	Memory Failure
LED_C1-C3	CPU1 Memory Fail LED for DIMMs C1-C3	On	Memory Failure
LED_D1-D3	CPU1 Memory Fail LED for DIMMs D1-D3	On	Memory Failure
LED_E1-E3	CPU2 Memory Fail LED for DIMMs E1-E3	On	Memory Failure
LED_F1-F3	CPU2 Memory Fail LED for DIMMs F1-F3	On	Memory Failure
LED_G1-G3	CPU2 Memory Fail LED for DIMMs G1-G3	On	Memory Failure
LED_H1-H3	CPU2 Memory Fail LED for DIMMs H1-H3	On	Memory Failure

## 5-6 Connector Definitions

### Power Connectors

#### Power Connectors

A 24-pin main power supply connector (JPW1) and two 8-pin CPU power connectors (JPW2/JPW3) must be connected to the power supply to provide adequate power to the system. These power connectors meet the SSI EPS 12V specification. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

#### Secondary Power Connector

JPW2 and JPW3 must also be connected to the power supply. See the table on the right for pin definitions.

+12V 8-pin Power Pin Definitions	
Pins	Definition
1 - 4	Ground
5 - 8	+12V

#### Required Connection

**Caution:** To provide adequate power supply to the motherboard, be sure to connect JPW1 and both JPW2 and JPW3 to the power supply. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

## Control Panel Connector

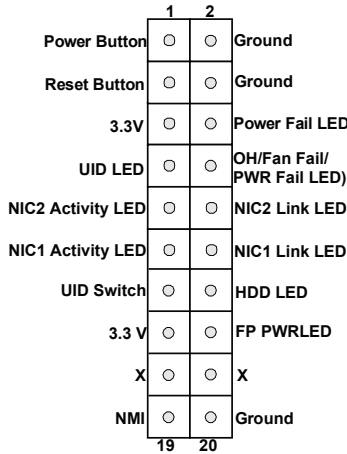


Figure 5-4. Control Panel Header Pins

### Power Button

The Power On connection is on pins 1 and 2 of JF1. These should be connected to the chassis power button. Momentarily contacting both pins will power on/off the system. To turn off the power when the system is on, press the button for 4 seconds or longer. See the table on the right for pin definitions.

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

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

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



### 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

### Overheat, Fan/Power Fail LED

Connect an LED cable to pins 7 and 8 of the 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

### NIC2 (JLAN2) LED

The LED connections for LAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Activity
10	Link

### NIC1 (JLAN1) LED

The LED connections for LAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Activity
12	Link

### HDD LED/UID Switch

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to pin 14 to show HDD activity status. Attach a cable to pin 13 to use UID switch. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	UID Switch
14	HD Active

### Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

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

### 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

## Other Connectors

### Fan Headers

There are five fan headers on the motherboard, all of which are 4-pin fans. Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. (Fan speed control is supported with 4-pin fans only.) See the table on the right for pin definitions. The onboard fan speeds are controlled by Thermal Management (via IPMI).

Fan Header Pin Definitions (FAN1-8)	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWR Modulation

### Chassis Intrusion

The Chassis Intrusion header is designated 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

### Dedicated IPMI LAN Port

A dedicated IPMI LAN port is located above the rear USB 0/1 ports. Connect an RJ45 cable here for IPMI LAN support. Please refer to the LED Indicator section for LAN LED information.

### Serial Ports

One serial port (COM1) is located at the rear of the server, as part of the rear I/O panel

### Video Connection

A Video (VGA) port is located next to COM Port 1 on the I/O back panel. Refer to the board layout below for the location.

### 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 Buzzer (SP1) Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

### SGPIO Headers

An SGPIO (Serial General Purpose Input/Output) header is used to communicate with the enclosure management chip on the backplane. SGPIO1 supports the I-SATA0-3 ports. See the table on the right for pin definitions.

SGPIO Header Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

**NC = No Connection**

### IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I<sup>2</sup>C connection on your system.

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

**Power Supply SMBus I<sup>2</sup>C Header**

The power System Management Bus header at JP<sup>2</sup>C1 is used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

PWR SMBus Header Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

**IPMB**

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I<sup>2</sup>C connection on your system.

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

**DOM Power Connectors**

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

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

**Universal Serial Bus (USB)**

Two USB 3.0 ports (USB 0/1) are located on the rear I/O panel. In addition, a Type A connector (USB 2) is provided to support front access (cables not included). See the table on the right for pin definitions.

**SMB (I<sup>2</sup>C) for NVME Connectors**

The System Management Bus (I<sup>2</sup>C) for NVME connectors are located at JNVI<sup>2</sup>C1/2. These connectors provides system management for onboard NVME devices.

**SMB (I<sup>2</sup>C) for SAS3 Backplanes Connectors**

The JI<sup>2</sup>C\_EXP1/2 connectors are used with the System Management Bus (I<sup>2</sup>C) for the devices installed on the SAS3 backplanes. Connect appropriate cables to these connectors for SAS3 health monitoring and system management.

## SMB (I<sup>2</sup>C) for LCD Connector

The connector used for System Management Bus (I<sup>2</sup>C) for LCD devices is located at JI<sup>2</sup>C\_FP1. Connect a cable here to provide health monitoring and management for LCD devices.

## Unit Identifier Switch

The UID switch and LED are located next to the rear I/O ports. The rear UID LED is located next to the UID switch. The front UID switch and its UID LED are both located on the front control panel. When you press the front or rear UID switch, both front and rear UID LEDs will be turned on. Press the UID switch again to turn off the LED indicators. These indicators provide easy identification of a system unit that may be in need of service.

UID Switch	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

UID LED Status	
Color/State	Status
Blue: On	Unit Identified

**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 at <http://www.supermicro.com>.

## TPM Header/Port 80

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

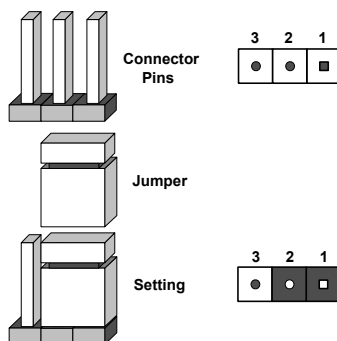
TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

## 5-7 Jumper Settings

### Explanation of Jumpers

To modify the operation of the motherboard, 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 motherboard layout pages for jumper locations.

**Note:** On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



### CMOS Clear

JBT1 is used to clear CMOS (which 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 VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

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

### Watch Dog Enable/Disable

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

**Note:** When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

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

### Manufacturer's Mode

Close pins 2 and 3 of jumper JPME2 allows the user to flash the system firmware from a host server in order to modify system settings. 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's Mode

### BMC Enable

Jumper JPB1 allows you to enable the embedded the ASpeed AST 2400 BMC (Baseboard Management) Controller to provide IPMI 2.0/KVM support on the motherboard. See the table on the right for jumper settings.

BMC Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

## 5-8 Onboard Indicators

### Dedicated IPMI LAN LEDs

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

IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mbps
	Amber: Solid	1 Gbps
Activity (Right)	Amber: Blinking	Active

### BMC Heartbeat LED

A BMC (Baseboard Management Controller) Heartbeat LED is located at BMC\_HB\_LED1. When BMC\_HB\_LED1 is blinking, BMC is functioning normally. See the table at right for more information.

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

### Onboard Power LED

The Onboard Power LED is located at LED2 on the motherboard. When this LED is on, 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 States	
Color/State	Definition
Off	System Power Off
Green: On	System Power On

### HDD LED

An HDD LED indicator, located at HDD\_LED1 on the motherboard, indicates the status of onboard hard drive disks including SATA devices. When HDD\_LED1 is blinking, all onboard HDDs are functioning normally. See the table at right for more information.

HDD LED Indicator States	
Color/State	Definition
Green: Blinking	HDDs Normal



### Onboard Memory\_Fault LED Indicators

The memory-fault LED indicators are located at LED\_A1 - LED\_H3 on the motherboard. Each memory LED indicates the status of the DIMM module installed on the memory slot that carries the same name. For example, if LED\_A1 is on, it indicates that an error has occurred to the DIMM module installed on the P1-DIMMA1 memory slot. See the tables on the right for more information.

Memory-Fault LED Indicators & Corresponding DIMM	
LED Indicator	Corresponding DIMMs
LED_A1-A3	P1DIMM_A1-A3
LED_B1-B3	P1DIMM_B1-B3
LED_C1-C3	P1DIMM_C1-C3
LED_D1-D3	P1DIMM_D1-D3
LED_E1-E3	P2DIMM_E1-E3
LED_F1-F3	P2DIMM_F1-F3
LED_G1-G3	P2DIMM_G1-G3
LED_H1-H3	P2DIMM_H1-H3

Memory-Fault LED Indicator LED State	
Color/State	Definition
Red: On	Corresponding DIMM module failed

## 5-9 Drive Ports

### SATA

Four S-SATA 3.0 connections are located on the motherboard. S-SATA (0-3) ports are supported by the Intel PCH chip. In addition, S-SATA 0/1, colored in yellow, are used with Supermicro SuperDOM (Disk-on-Module) connectors with power-pins built in. The SuperDOM connectors are backward-compatible with regular SATA HDDs and SATA DOMs.

**Note 1:** Supermicro SuperDOMs are yellow SATADOM connectors with power pins built in and do not require separate external power cables. These connectors are backward-compatible with non-Supermicro SATADOMs that require an external power supply.

**Note2:** For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our website at <http://www.supermicro.com>.

### NVMe

The motherboard features four NVMeExpress ports (#0-#3) in the form PCI-E 3.0 x4 slots. They are supported by CPU1 and use OCuLink. They provide a connection to the NVMe SSDs through the backplanes.

The NVMe ports provide high-speed, low-latency connections directly from the CPU to NVMe solid state drives (SSDs). This greatly increases SSD throughput and significantly reduces storage device latency by simplifying driver and software requirements resulting from the direct PCI-E interface between the CPU and the NVMe SSD drives.

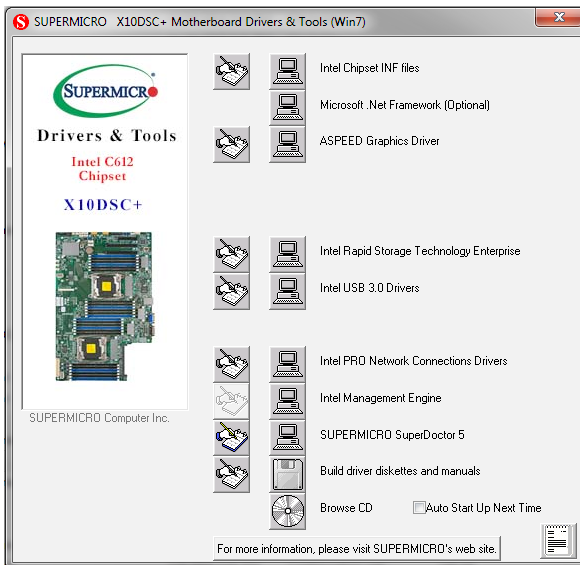
## 5-10 Installing Software

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 motherboard. 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 motherboard 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 5-6 should appear.



**Figure 5-6. Driver/Tool 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.

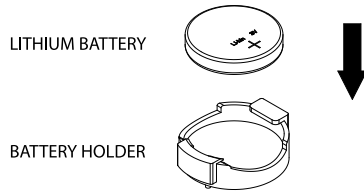


Figure 5-7. SuperDoctor 5 Interface Display Screen (Health Information)

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

## 5-11 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 5-8. Installing the Onboard Battery**

**Notes**

## Chapter 6

# Chassis Setup and Maintenance

### 6-1 Overview

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool required is a Phillips screwdriver.

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 2: *Warning Statements for AC Systems* and the warning/precautions listed in the setup instructions.

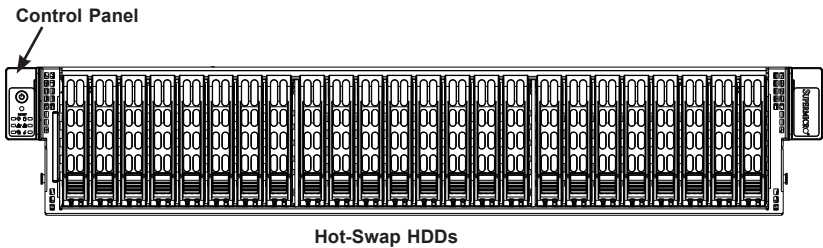


Figure 6-1. Front View

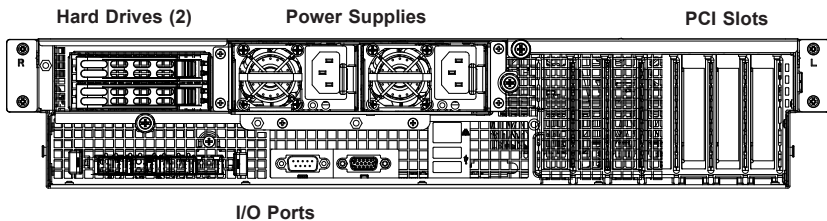


Figure 6-2. Rear View

## 6-2 Removing Power from the System

Before performing some setup or maintenance tasks, use the following procedure to ensure that power has been removed from the system.

1. Use the operating system to power down the node, following the on-screen prompts.
2. After the system has completely shut-down, carefully grasp the head of the power cord and gently pull it out of the back of the power supply. If your system has dual power supplies, remove the cords from both power supplies.
3. Disconnect the cords from the power strip or wall outlet.



## 6-3 Removing the Top Covers

### Mid-chassis Cover

The mid-chassis cover can be removed to access the mid-chassis drives or fans while the server continues to operate.

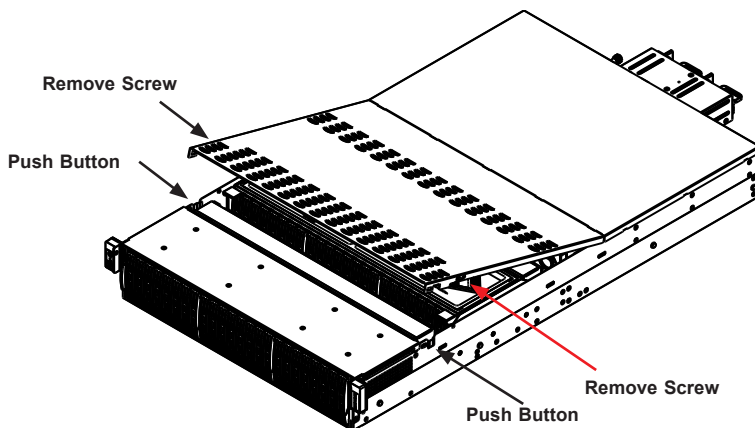


Figure 6-3. Removing the Mid-chassis Cover

#### *Removing the Mid-chassis Cover*

Remove the two screws securing each side of the cover, push in the tabs, then lift the cover.

**Caution:** Do not operate the for long periods of time without the covers. They are important for system cooling.

## Rear Cover

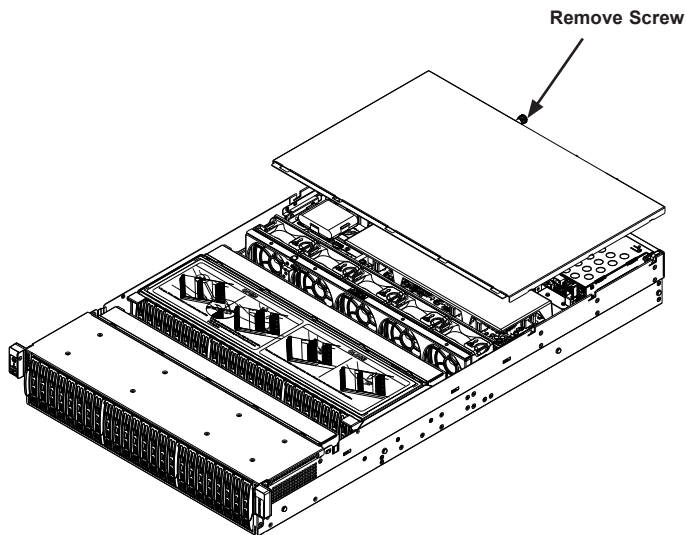


Figure 6-4. Removing the Rear Cover

### *Removing the Rear Cover*

Remove the thumbscrew at the rear of the chassis, then slide the cover to the rear and off.

## 6-4 Storage Drives

The SC226S chassis supports forty-eight 2.5" NVMe solid state drives (SSDs). They can be removed without powering down the system if your operating system supports RAID.

There are also two hot-swap hard drive bays in the rear.

**Note:** Enterprise level SSDs and hard disk drives are recommended for use in Supermicro servers. For information on recommended drives, visit the Supermicro website.

### Drive Connections

NVMe drive slot numbers 0-23 are attached through the front backplane and from 16 PCI-E 3.0 lanes from CPU1. NVMe drive slots 24-47 are attached through the mid-backplane and 16 PCI-E 3.0 lanes from CPU2.

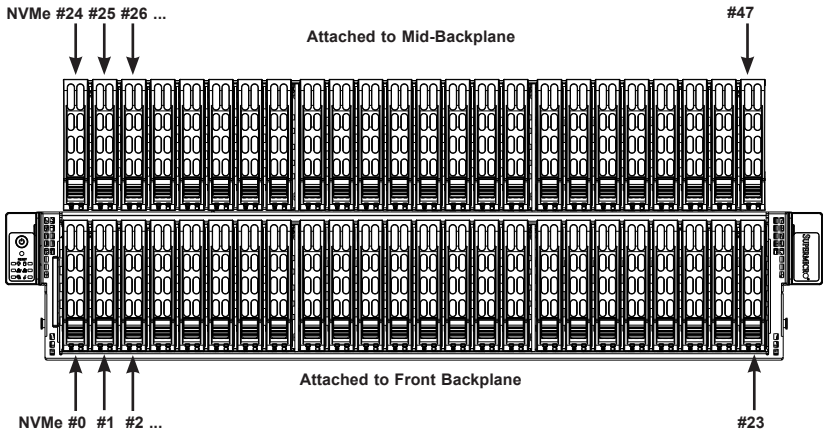


Figure 6-5. NVMe Drive Numbers and Connections

## Drive Carriers

The drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow through the drive bays. Each drive carrier has two LED indicators. These are described in Chapter 3.

### ***Removing Drive Carriers from the Chassis***

1. To access mid-chassis drives, open the mid-chassis cover and lift the drive rack.
2. Press the release button on the drive carrier, which will extend the drive carrier handle.
3. Use the drive carrier handle to pull the drive out of the chassis.

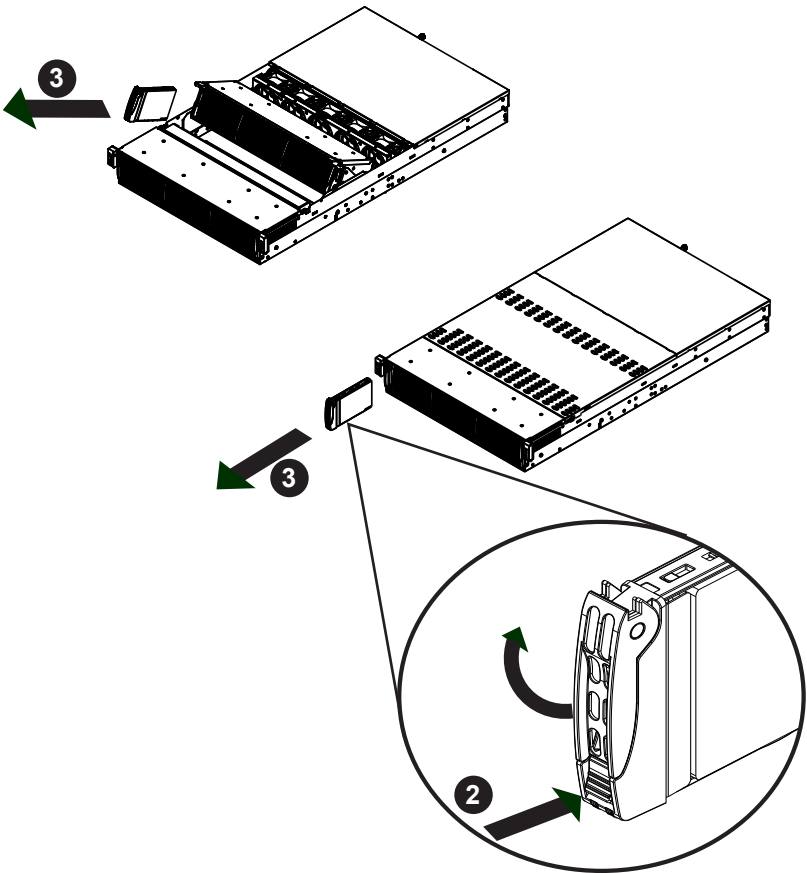
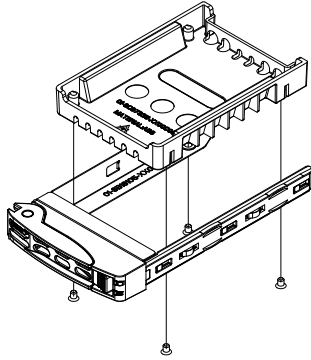


Figure 6-6. Removing a Drive Carrier

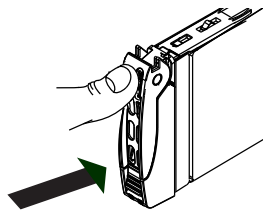
## Installing a Solid State Drive (SSD)

1. Remove the screws securing the dummy drive to the carrier.
2. Remove the dummy drive from the carrier.



**Figure 6-7. Removing a Dummy Drive from the Drive Carrier**

3. Insert the drive into the carrier with the printed circuit board side facing downward and so that the mounting holes in the drive align with those in the carrier.
4. Secure the drive to the carrier with the four screws included with the drive.
5. Insert the drive and carrier into its bay vertically, keeping the carrier oriented so that the release button is on the bottom. When the carrier reaches the rear of the bay, the release handle will retract.
6. Using the thumb, push against the upper part of the drive carrier handle until the it clicks into the locked position.



**Figure 6-8. Pushing the Drive Carrier into Place**

**Caution:** Except for short periods of time, such as swapping hard drives, do not operate the server with the hard drive bays empty.

### Installing Rear Hard Drives

The two drives in the rear of the chassis are installed in the same way as the main storage drives (SSDs).

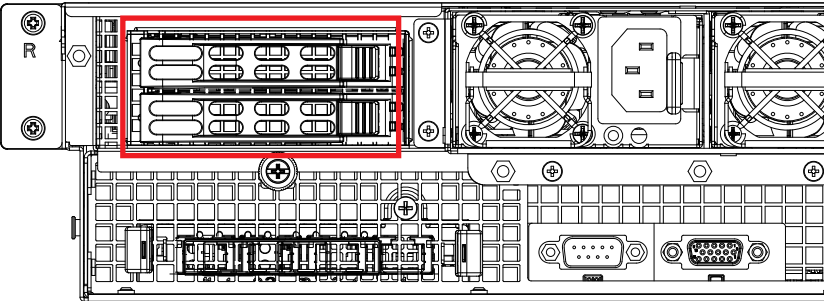
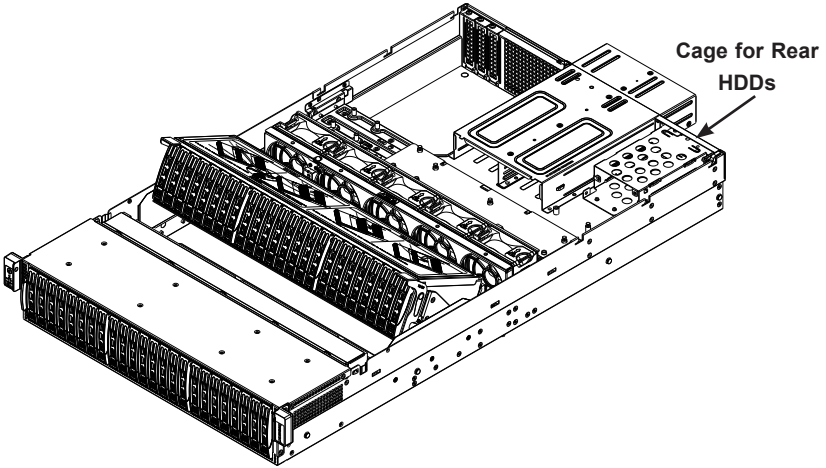


Figure 6-9. Rear HDDs

## 6-5 Installing the Expansion Cards

The system provides three PCI slots for low profile, full-length expansion cards.

### *Installing an Expansion Cards*

1. Power down the system as described in Section 6-2. Remove both covers as described in Section 6-3.
2. In the rear of the chassis, remove the screw securing the PCI slot shield in the PCI slot that you wish to use.
3. Slide the expansion card bracket into the open PCI slot while plugging the expansion card into the motherboard.
4. Secure the expansion card bracket into the PCI slot using the screw previously set aside.
5. Replace the top covers and power up the system.

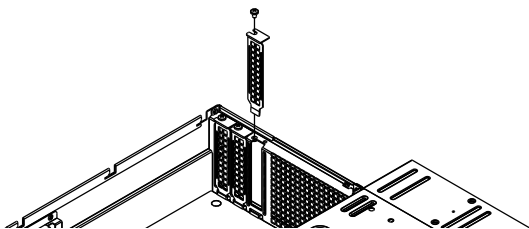


Figure 6-10. Removing the PCI Slot Shield

## 6-6 Installing a SIOM Card

The SIOM card provides options for network connection. It is inserted into a SIOM slot on the motherboard. This installation is usually performed by a system integrator or manufacturer.

### Installing a SIOM Card

1. Power down the system as described in Section 6-2.
2. Remove the small section of the chassis rear to allow access to the motherboard SIOM slot. Unscrew the single retaining screw to remove the cover.

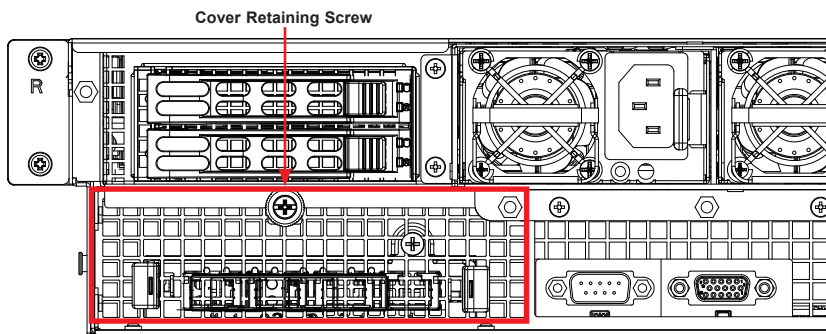


Figure 6-11. SIOM Card Position on Chassis Rear

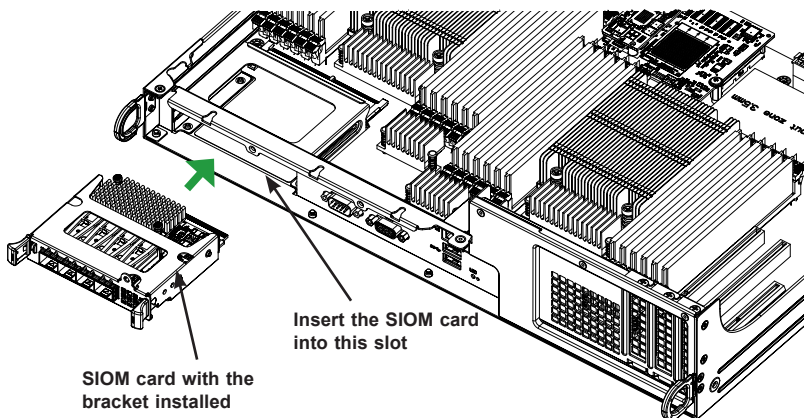


Figure 6-12. Inserting SIOM Card

3. Position the card with its cover bracket in front of the SIOM slot and gently push in both sides of the card until it slides into the slot.
4. Secure the SIOM card cover bracket to the chassis with the screw.



## 6-7 System Fans

Five heavy-duty fans provide cooling for the system. They can be replaced without powering down the system.

### *Replacing a System Fan*

1. If necessary, open the chassis while the power is running to determine which fan requires changing. (Never run the server for an extended period of time with the chassis open.)
2. Open the mid-chassis cover as described in Sections 6-3.
3. Press the fan release tab to lift the failed fan from the chassis and pull it completely out of 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. The fan will automatically begin running at the correct speed.

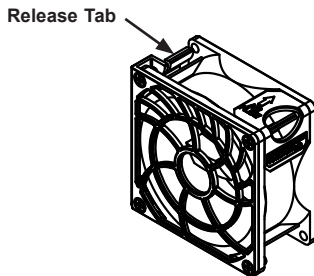
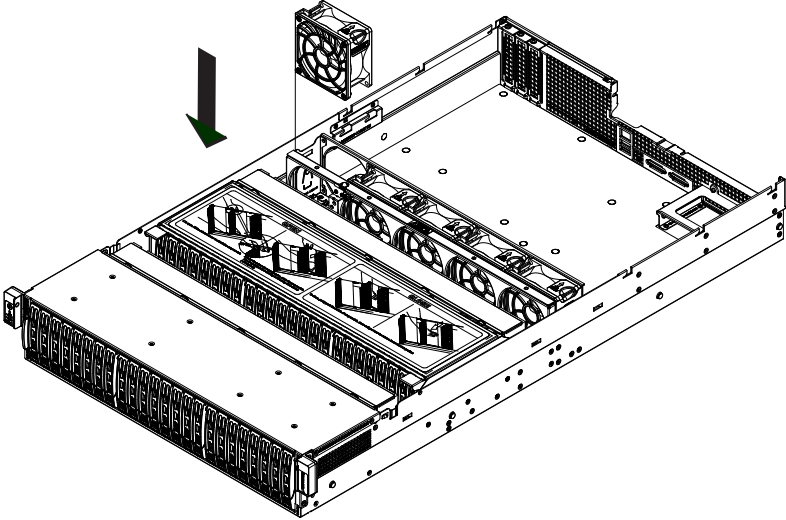


Figure 6-13. System Fan



**Figure 6-14. Placing the System Fan**

## 6-8 Installing the Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. They do not require screws for installation.

### *Installing the Air Shroud*

1. Power down the system as described in Section 5-2. Remove the covers as described in Section 5-3.
2. Place the air shroud in the chassis. The air shroud fits just behind the five fans in the fan rack.
3. Align the mounting holes in the air shroud with those in the chassis and secure them with the four screws provided with the air shroud.
4. Replace both chassis covers and power up the system.

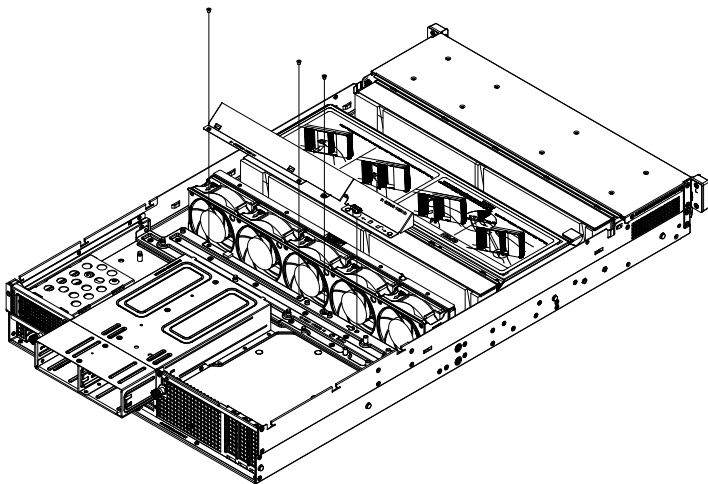


Figure 6-15. Air Shroud Installation

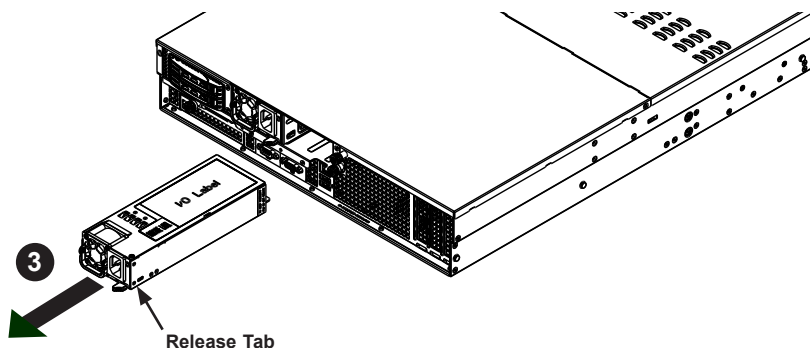
## 6-9 Power Supply

The chassis features redundant power supplies. The power modules can be changed without powering down the system. New units can be ordered directly from Supermicro or authorized distributors.

These power supplies are auto-switching capable. This feature enables them to automatically sense the input voltage and operate at a 100-120v or 180-240v. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

### ***Changing the Power Supply:***

1. Unplug the AC cord from the module to be replaced.
2. Push the release tab on the back of the power supply as illustrated.



**Figure 6-16. Power Supply Release Tab**

3. Pull the power supply out using the handle provided.
4. Replace the failed power module with the same model.
5. Push the new power supply module into the power bay until it clicks.
6. Plug the AC power cord back into the module.

# Chapter 7

## BIOS

### 7-1 Introduction

This chapter describes the AMI BIOS setup utility for the X10DSC+. 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 informational text. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it.

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

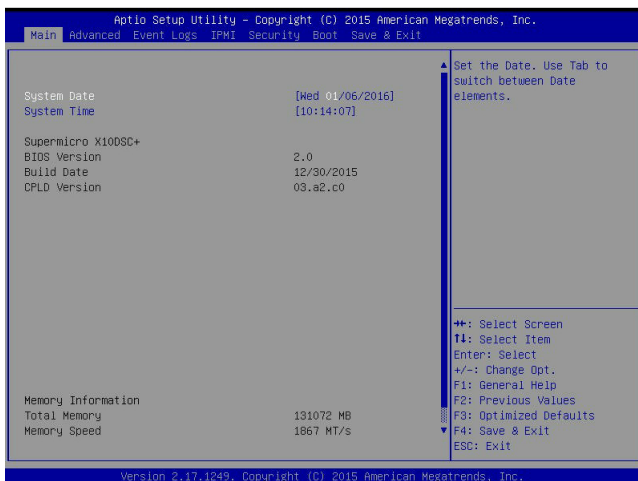
## Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> 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.

**Caution:** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. 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 X10DSC+**

### **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.

**CPLD (Complex Programmable Logic Device) Version:** This item displays the CPLD version used in the system.

## **Memory Information**

### **Total Memory**

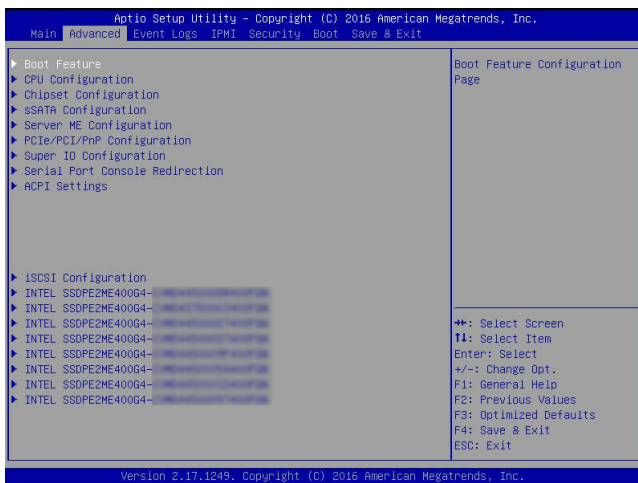
This displays the amount of memory that is available in the system.

### **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.



If the NVMe SSD firmware is supported, this screen will pull status information from the SSDs installed in the drive bays that support Option ROM (see Page 7-21 for more details).

**Caution:** Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or an incorrect BIOS timing setting may cause the system to malfunction. When this occurs, restore the setting to the manufacture default setting.

### ► Boot Feature

#### Quiet Boot

Use this item to select the screen display between POST messages or the OEM logo at bootup. 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

Use this item to set 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 State**

Use this item to set 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 when an error occurs. The options are Disabled and **Enabled**.

### **INT19 Trap Response**

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

### **Re-try Boot**

Select EFI Boot to allow the BIOS to automatically reboot the system from an EFI boot device after the initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after its initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

## **Power Configuration**

### **CPLD Watch Dog Function**

Select Enabled to allow the CPLD (Complex Programmable Logic Device) Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

### **Watch Dog Function**

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

### **Power Button Function**

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the system to power off after the user presses and holds the power button for 4 seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are 4 Seconds Override and **Instant Off**.

### Restore on AC Power Loss

Use this feature to set 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 power state before a power loss. The options are Power On, Stay Off, and **Last State**.

### ►CPU Configuration

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

- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- CPU 1 Version
- CPU 2 Version

### Clock Spread Spectrum

Select Enabled to 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 Enable to support Intel's Hyper-threading Technology to enhance CPU performance. The options are **Enable** and Disable.

### Cores Enabled

This feature allows the user to determine the number of CPU cores to be enabled. Enter "0" to enable all cores. The default setting is **0**, which enables all CPU cores in the system.

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

Select Enable for Execute Disable Bit Technology support, 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 to damage the system during an attack. The options are **Enable** and Disable. (Refer to Intel's and Microsoft's websites for more information.)

**PPIN Control**

Select Unlock/Enable to use the Protected-Processor Inventory Number (PPIN) control in the system. The options are **Unlock/Enable** and Unlock/Disable.

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

If set to Enable, 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 Disable and **Enable**.

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

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are Disable and **Enable**.

**Note:** Please reboot the system for the changes made on this setting to take effect. Please refer to Intel's website for detailed information.

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

If set to Enable, the DCU Streamer prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing to enhance CPU performance. The options are Disable and **Enable**.

**DCU IP Prefetcher**

If set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

**Direct Cache Access (DCA)**

Select Enable to use Intel DCA (Direct Cache Access) Technology to improve the efficiency of data transferring and accessing. The options are **Auto**, Enable, and Disable.

### **X2 APIC (Advanced Programmable Interrupt Controller)**

Based on Intel's Hyper-Threading architecture, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will expand(X2) from 8 bits to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. The options are **Disable** and Enable.

### **AES-NI**

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

### **Intel Virtualization Technology**

Select Enable to use Intel Virtualization Technology 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.

## **► Advanced Power Management Configuration**

### **Advanced Power Management Configuration**

#### **Power Technology**

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

*\*If the option is set to Custom or Energy Efficient, the following items will display:*

#### **Energy Performance Tuning (Available when Power Technology is set to Custom or Energy Efficient)**

Select Enable for energy-performance tuning support to enhance energy efficiency, which might compromise system performance. The options are Enable and **Disable**.

#### **Energy Performance Bias Setting (Available when Power Technology is set to Custom or Energy Efficient)**

Use this feature to select an appropriate power setting and performance level for the system. Select Performance to maximize system performance by using maximum amount of power. Select Balanced Performance to downgrade system performance a notch by using less power. Select Power to maximize power saving, which may greatly compromise system performance as a result. Select Balanced Power to downgrade power saving a notch and allow the system to

use more power to boost system performance. The options are Performance, Balanced Performance, Balanced Power, and Power.

### **Energy Efficiency Turbo (Available when Power Technology is set to Custom or Energy Efficient)**

Select Enable for the system to operate at turbo mode with reduced power consumption so that your machine can achieve maximum system performance with the maximum power efficiency possible. The options are **Enable** and Disable.

*\*If the option is set to Custom, the following items will display:*

### **► CPU P State Control (Available when Power Technology is set to Custom)**

#### **EIST (P-states)**

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 Disable and **Enable**.

#### **Turbo Mode**

Select Enable to use the Turbo Mode to boost system performance. The options are **Enable** and Disable.

#### **P-state Coordination**

This item is used 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 (Available when Power Technology is set to Custom)**

#### **Package C State limit**

Use this item to set the limit on the C-State package register. The options are C0/1 state, C2 state, **C6 (non-Retention) state**, and C6 (Retention) state.

### **CPU C3 Report**

Select Enable 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 Enable and **Disable**.

### **CPU C6 Report (Available when Power Technology is set to Custom)**

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

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

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

## **► CPU T State Control (Available when Power Technology is set to Custom)**

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

If this item is set to Enable, CPU throttling will be supported by the operating system to reduce power consumption. The options are **Enable** and Disable.

## **► Chipset Configuration**

**Caution!** Please set the correct settings for the items below. A wrong configuration setting may cause the system to malfunction.

### **► North Bridge**

This feature allows the user to configure the settings for the Intel North Bridge.

### **► I/O Configuration**

#### **EV DFX (Device Function On-Hide) Features**

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.

## ► IIO1 Configuration

### IOU2 (IIO1 PCIe Port 1)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4, x8, and **Auto**.

### IIO1 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)**.

### IOU0 (IIO1 PCIe Port 2)

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

### IIO1 Port 2A 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)**.

### IIO1 Port 2C 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)**.

### IOU1 (IIO1 PCIe Port 3)

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

### IIO1 Port 3A 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)**.

## ► IIO2 Configuration

### IOU2 (IIO2 PCIe Port 1)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4, x8, and **Auto**.

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### **IIO2 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)**.

### **IOU0 (IIO2 PCIe Port 2)**

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

### **IIO2 Port 2A 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)**.

### **IOU1 (IIO2 PCIe Port 3)**

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

### **IIO2 Port 3A 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)**.

## **► IOAT Configuration**

### **Enable IOAT**

Select Enable to enable Intel I/OAT (I/O Acceleration Technology), 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 for relaxed ordering support, which will allow certain transactions to be processed and completed prior to other transactions that have already been queued by overriding the strict ordering rules of PCI processing. 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 the Intel Virtualization Technology 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.

### Interrupt Remapping

Select Enable for Interrupt Remapping support to enhance system performance. The options are **Enable** and Disable.

## ► QPI (Quick Path Interconnect) Configuration

### ► QPI General 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 Frequency Select

Use this item to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 8.0GB/s, 9.6GB/s, **Auto**, and Auto Limited.

#### Link L0p Enable

Select Enable for Link L0p support to reduce power consumption. The options are **Enable** and Disable.

#### Link L1 Enable

Select Enable for Link L1 support to reduce power consumption. The options are **Enable** and Disable.

---

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

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

### **Home Dir Snoop with IVT-Style OSB (Available when the OS and the CPU support this feature)**

Select Enable for Home-Direct Snoop with IVT-Style\_OSB support to enhance system performance. The options are Enable, Disable, and **Auto**.

### **Isoc Mode**

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

## **► Memory Configuration**

This submenu allows the user to configure Integrated Memory Controller (IMC) settings.

### **Enforce POR**

Select Enabled 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, and 2400.

### **Data Scrambling**

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

### **DRAM RAPL (Running Average Power Limit) 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 CPU reliability and reduces power consumption via automatic-voltage control during CPU idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

### **A7 Mode**

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

### **► DIMM Information**

This item displays the status of a DIMM module as detected by the AMI BIOS.

- P1 DIMMA1 ~ P2 DIMMH3

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

Use this submenu to configure the following Memory RAS settings.

#### **RAS Mode**

When Independent is selected, all memory modules operate independently. When Mirror is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel to boost performance. The options are **Independent**, 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 corrections to the requestor (the original source). When this item is set to Enable, 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 Controllers
- USB Devices

### **Legacy USB Support**

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support when there are no legacy USB devices present. Select Disabled 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 to support I/O port 60h/64h emulation, which 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, and **Disabled**.

### 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 load Intel XHCI pre-boot driver. The settings are **Enabled** and Disabled.

## ►sSATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the s-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 chip. 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:*

### **sSATA AHCI ALPM**

Select Enabled for the sSATA controller to automatically generate link requests in partial or slumber mode when there is no commands for the system to execute. The options are Disabled, and **Enabled**.

### **sSATA Port 0~ Port 3**

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

- Model number of drive and capacity

### **sSATA Port 0~ Port 3**

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

### **sSATA Port 0 ~ Port 3 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 3 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 3 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 3**

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

### **Port 0~ Port 3 sSATA Device Type (Available when a sSATA 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.

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

#### **sSATA AHCI ALPM**

Select Enabled for the sSATA controller to automatically generate link requests in partial or slumber mode when there is no commands for the system to execute. The options are Disabled, and **Enabled**.

#### **sSATA RAID Option ROM/UEFI Driver**

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

#### **SATA/sSATA RAID Boot Select**

Select SATA Controller to boot the system from a SATA RAID device. Select sSATA Controller to boot the system from a sSATA RAID device. Select Both to boot the system either from a SATA RAID device or from an sSATA RAID device. Please note that the option-Both is not supported by the Windows Server 2012/R2 OS. The options are Both, SATA Controller, and **sSATA Controller**.

#### **sSATA Port 0 ~ Port 3 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 3 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 3 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

- ME Firmware Type
- Recovery Firmware Version
- ME Firmware Features
- ME Firmware Status #1
- ME Firmware Status #2
  - Current State
  - Error Code

## ► PCIe/PCI/PnP Configuration

The following items will display:

- PCI Bus Driver Version
- PCI Devices Common Settings

### **PCI PERR/SERR Support**

Select Enabled to support PERR (PCI/PCI-E Parity Error)/SERR (System Error) runtime error reporting for a PCI/PCI-E slot. The options are Enabled and **Disabled**.

### **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 I/O base memory size according to memory-address mapping for the PCH chip. The base memory size must be between 4032G to 4078G. The options are **56TB**, 40TB, 24T, 3T, 2T, and 1TB.

### **MMIO High Size**

Use this item to select the high I/O memory size according to memory-address mapping for the PCH chip. The options are **256G**, 128G, 512G, and 1024G.

### **PCI Devices Option ROM Settings**

#### **CPU2 PCI-E 3.0x8 Slot1 OPROM/CPU2 PCI-E 3.0x16 Slot2 OPROM/CPU2 PCI-E 3.0x16 Slot3 OPROM/CPU1 SAS AOM1 (Add-On Module#1) Slot4 OPROM/CPU1 SIOM Card Slot5 OPROM**

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.

#### **NVMe1 OPROM/NVMe2 OPROM/NVMe3 OPROM/NVMe4 OPROM**

Select EFI to enable Option ROM support to boot the computer from an NVMe SSD installed in the slot specified by the user. Only the following 8 slots support Option ROM: Slots 0,1 (NVMe1 OPROM), Slots 12,13 (NVMe2 OPROM), Slots 24,25 (NVMe3 OPROM), Slots 36,37 (NVMe4 OPROM). The options are Disabled and EFI.

### **Onboard Video Option ROM**

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 and Legacy and EFI.

### **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.

### **Onboard LAN1 Option ROM/Onboard LAN2 Option ROM**

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

## 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**.

### IPv4 PXE Support (Available when Network Stack is set to Enabled)

Set this item to **Enabled** to activate IPv4 PXE Support. The options are **Enabled** and **Disabled**.

### IPv6 PXE Support (Available when Network Stack is set to Enabled)

Set this item to **Enabled** to activate IPv6 PXE Support. The options are **Enabled** and **Disabled**.

## ► Super IO Configuration

### Super IO Chip AST2400

#### ► Serial Port 1 Configuration

##### Serial Port 1

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 for a serial port specified by the user. The default setting for Serial Port 1 is IO=3F8h IRQ=4.

##### Change Port 1 Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. 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).

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## ►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:*

### ►COM 1 Console Redirection Settings

#### Terminal Type

Use this item 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 item 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

Use this item to select 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 item to enable or disable legacy Console Redirection after BIOS POST (Power-On Self-Test). When "Bootloader" is selected, legacy Console Redirection is disabled before booting the OS. When "Always Enable" is selected, legacy Console Redirection remains enabled while the OS boots up. The options are **Always Enable** and Bootloader.

## SOL

### SOL 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 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 the overflow in the buffer. 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.

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## 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 (Available when EMS Console Redirection is enabled)

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.

#### 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 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.

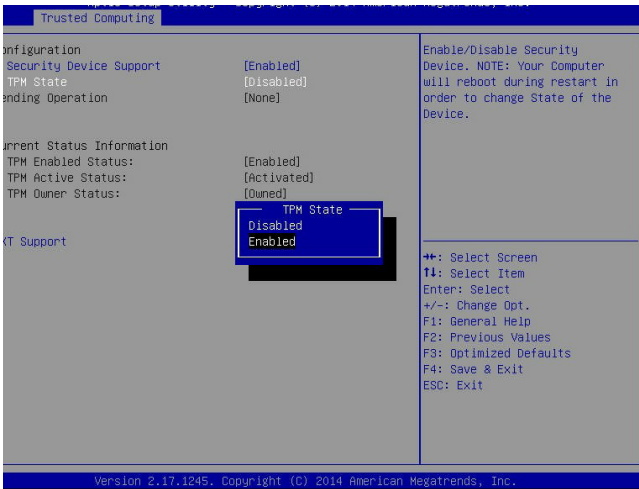
The following settings will be displayed:

### Data Bits, Parity, Stop Bits

## ► Enabling TPM in the BIOS

The steps below describe the proper procedure on how to enable the TPM in the BIOS. This process is necessary to activate support in the system before you can start using the TPM.

1. Enter the BIOS setup screen. You may do this either from the IPMI remote console or from the server directly using KVM. Reboot the system and press the <Del> key as the system boots until you reach the BIOS screen.
2. You will be presented with the BIOS setup main screen. Using the arrow keys, navigate to the Advanced tab. From there, navigate down and select the "CPU Configuration" option as shown below. Press <Enter>.



3. You will be taken to the CPU Configuration page. Using the arrow keys, navigate down to the "Intel Virtualization Technology" option and press <Enter>. Select "Enable" and press <Enter>.
4. Once you have enabled Virtualization support, press your <Esc> key until you are back to the Advanced tab. Navigate down to the "Trusted Computing" option and press <Enter>.
5. The Trusted Computing window will appear. Select "TPM State" and press <Enter>.



6. From the window that pops up, select "Enabled" and press <Enter>.
7. You must save your changes and reset for the changes to take effect. Scroll to the Save & Exit tab and select "Save Changes and Reset."

## ►Intel TXT (LT-SX) Configuration

This submenu allows the user to configure the following TXT settings.

### **TXT Support**

Select Enabled to enable Intel Trusted Execution Technology (TXT) support. The options are **Disabled** and Enabled.

**Note:** If the option for this item (TXT Support) is set to Enabled, be sure to disable EV DFX (Device Function On-Hide) support for the system to work properly. (EV DFX is under "I/O Configuration" in the "Chipset/North Bridge" submenu on Page 4-10). For more information on TPM, please refer to the TPM manual at [http://www.supermicro.com/manuals/other/AOM-TPM-9655V\\_9655H.pdf](http://www.supermicro.com/manuals/other/AOM-TPM-9655V_9655H.pdf)

## ►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 Event 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.

## ► iSCSI Configuration

This item displays iSCSI configuration information:

### iSCSI Initiator Name

Use this item to enter the name of the iSCSI Initiator, which is a unique name used in the world. The name must be in the IQN format. The following submenu will be available for configuration:

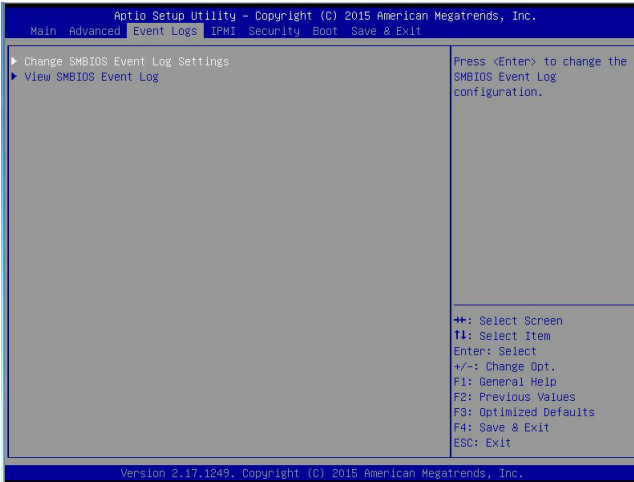
#### ► Add an Attempt

#### ► Delete Attempts

#### ► Change Attempt Order

## 7-4 Event Logs

This submenu allows the user 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 Enable to support Runtime Error logging. The options are **Enabled** and Disabled. If this item is set to Enabled, the following item will be available for configuration:

### Erasing Settings

#### Erase Event Log

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

#### 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) the multiple event counter should 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.

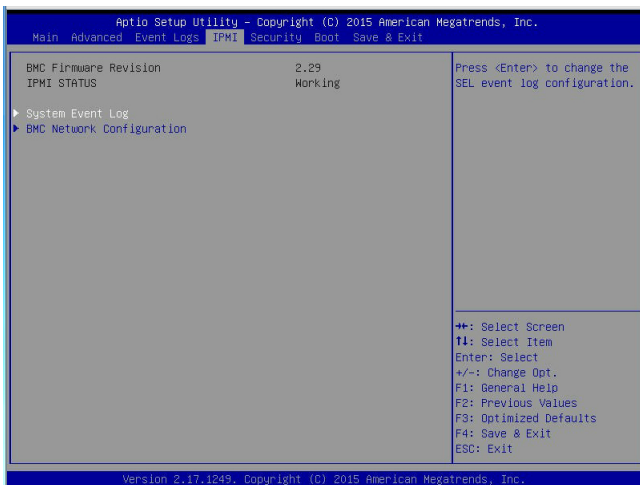
### ►View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. The following categories are displayed:

#### Date/Time/Error Code/Severity

## 7-5 IPMI

This submenu allows the user to configure IPMI settings.



The following items will be displayed:

- BMC (Baseboard Management Controller) Firmware Revision
- IPMI Status

### ► 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 AMI 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 upon 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** 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

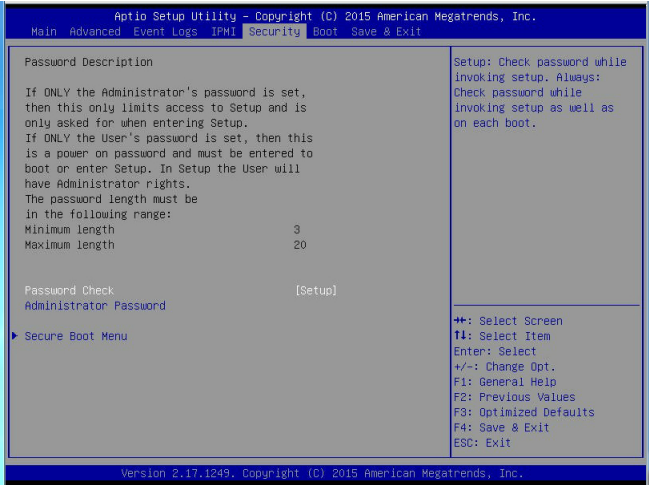
This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

### VLAN

Select Enabled to enable onboard LAN connections to be used for Intel Virtualization Technology. The options are Enable and **Disable**.

## 7-6 Security Settings

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



### Password Check

Select Setup for the system to prompt for a password upon entering the BIOS setup utility. 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 (Available after an Administrator Password is entered)

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.

### ► Secure Boot Menu

The following items will display:

- System Mode
- Secure Boot
- Vendor Keys

### **Secure Boot**

Select Enable for secure boot support to ensure system security at bootup. The options are Enabled and **Disabled**.

### **Secure Boot Mode**

This item allows the user to select the desired secure boot mode for the system. The options are Standard and **Custom**.

### **CSM Support**

Select Enabled to support Compatibility Support Module (CSM) to enhance system security. The options are **Enabled** and Disabled.

## **►Key Management**

### **Provision Factory Default Keys**

Select Enable to install all manufacturer default keys for the following system security settings. The options are **Disabled** and Enabled.

### **►Enroll All Factor Default Keys**

Select Enable to install all manufacturer defaults for the following system security settings. The options are **Yes** and No.

### **►Save All Secure Boot Variables**

This feature allows the user to set and save the following Secure Boot Variable settings:

### **►Platform Key (PK)**

This feature allows the user to configure and save platform key settings.

### **►Key Exchange Key**

This feature allows the user to configure and save Key-Exchange-Key settings.

### ► **Authorized Signatures**

This feature allows the user to set and save authorized signatures and grant access to those whose names appear on the list.

### ► **Forbidden Signatures**

This feature allows the user to set and save the forbidden signatures and deny the access to those whose names appear on the list.

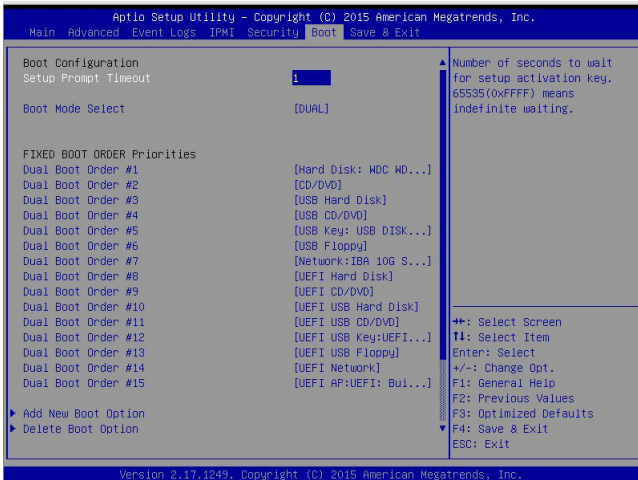
### ► **Authorized TimeStamps**

This feature allows the user to set and save the timestamps for authorized signatures to indicate when these signatures were entered into the system.



## 7-7 Boot Settings

This submenu allows the user to configure Boot settings for this system:



### Boot Configuration

#### Setup Prompt Timeout

Use this item to enter the number of seconds for the system to wait for the setup activation key before entering the Setup utility. Enter 65535 (0xFFFF) to wait indefinitely.

#### 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.

When the item above -"Boot Mode Select" is set to **Dual** (default), the following items will be displayed for configuration:

- Boot Option #1 - Boot Option #15

When the item above -"Boot Mode Select" is set to Legacy, the following items will be display for configuration:

- Boot Option #1 - Boot Option #7

When the item above -"Boot Mode Select" is set to UEFI, the following items will be display for configuration:

- Boot Option #1 - Boot Option #8

#### ▶Add New Boot Option

Use this item to select a new boot device to add to the boot priority list.

##### **Add New Boot Option**

Use this feature to select the target boot device to add to the boot priority list.

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

Use this feature to create a new path for boot option.

##### **Boot Option File Path**

Use this feature to set a new file path for boot option.

##### **Create**

Use this feature to create a new boot option for the new device.

#### ▶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 from the boot priority list.

#### ▶Hard Disk Drive BBS Priorities

- Legacy Boot Order #1

#### ▶Network Drive BBS Priorities

- Legacy Boot Order #1 - # 8

#### ▶USB Key Drive BBS Priorities

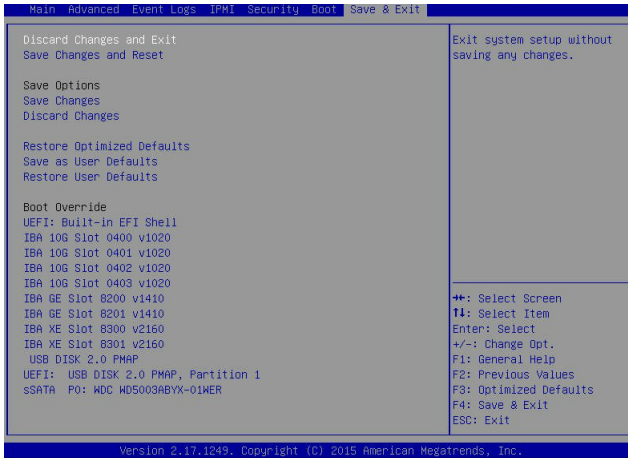
- Legacy Boot Order #1

#### ▶UEFI USB Key Drive BBS Priorities

- UEFI Boot Order #1

## 7-8 Save & Exit

This submenu allows the user to configure the following Save & Exit settings:



### Discard Changes and Exit

Select this item to exit from the BIOS setup without making any permanent changes to the system configuration, and reboot the computer.

### Save Changes and Reset

When you have completed the system configuration changes, select this item to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to take effect. Select Yes and press <Enter> to save the changes you've made and reboot the system.

### Save Options

### Save Changes

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

### Discard Changes

Select this item to discard all the changes and return to the AMI BIOS setup utility. Select Yes and press <Enter> to discard all changes made.

### Restore Defaults

Select this item and press <Enter> to load the manufacture default settings which are designed for maximum system performance but not for maximum stability.

### **Save As User Defaults**

Select this item and press <Enter> to save the current BIOS settings as user's default settings for future use.

### **Restore User Defaults**

Select this item and press <Enter> to retrieve the user-defined default settings that were previously saved to be used as current default settings.

### **Boot Override**

This feature allows the user to override the boot priority sequence in the Boot submenu 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 POST (Power-On Self-Test) 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 the 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.

<b>X10 Serverboard BIOS Error Beep Codes</b>		
<b>Beep Code/LED</b>	<b>Error Message</b>	<b>Description</b>
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 includes USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL.  Con-Out includes Video Controller, PCI or Serial Console Redirection, IPMI SOL.
1 beep per device	Refresh	1 beep for each USB device detected
<b>X10 IPMI Error Codes</b>		
1 Continuous Beep	System OH	System Overheat

**Notes**

## Appendix B

### UEFI BIOS Recovery Instructions

**Warning:** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

#### B-1 An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism for add-on card initialization to allow the UEFI OS loader, which is stored in the add-on card, to boot the system. The UEFI offers a clean, hands-off control to a computer system at bootup.

#### B-2 How to Recover the UEFI BIOS Image (-the Main BIOS Block)

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The boot block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original main BIOS image is corrupted. When the system power is on, the boot block codes execute first. Once it is completed, the main BIOS code will continue with system initialization and bootup.

**Note:** Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS boot crashes. However, when the BIOS boot block crashes, you will need to follow the procedures below for BIOS recovery.

#### B-3 To Recover the Main BIOS Block Using a USB-Attached Device

This feature allows the user to recover a BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

The file system supported by UEFI is FAT (including FAT12, FAT16, and FAT32) installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large because it contains too many folders and files.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\\" Directory of a USB device or a writeable CD/DVD.

**Note:** If you cannot locate the "Super.ROM" file in your driver disk, visit our website at [www.supermicro.com](http://www.supermicro.com) to download the BIOS image into a USB flash device and rename it "Super.ROM" for BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and power on the system
3. While powering on the system, please keep pressing <Ctrl> and <Home> simultaneously on your keyboard *until the following screen (or a screen similar to the one below) displays.*

**Caution:** Please **stop** pressing the <Ctrl> and <Home> keys immediately when you see the screen (or a similar screen) below; otherwise, it will trigger a system reboot.



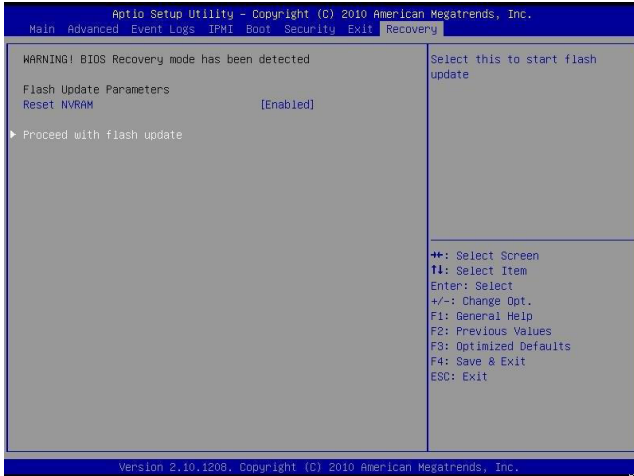
**Note:** On the other hand, if the following screen displays, please load the "Super.ROM" file to the root folder and connect this folder to the system. (You can do so by inserting a USB device that contains the new "Super.ROM" image to your machine for BIOS recovery.)





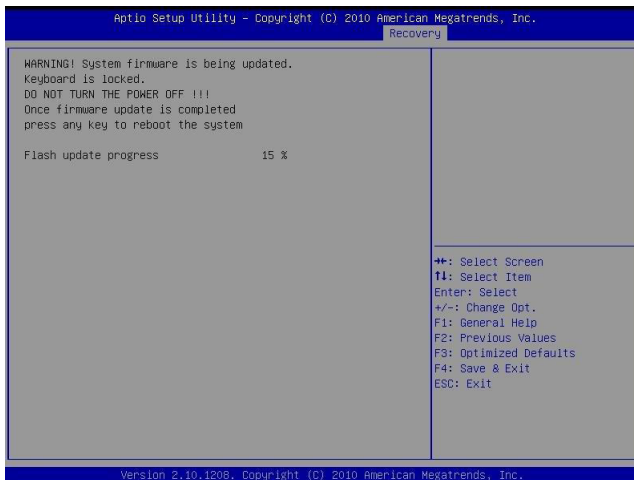
- After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below.

**Note:** At this point, you may decide if you want to start with BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

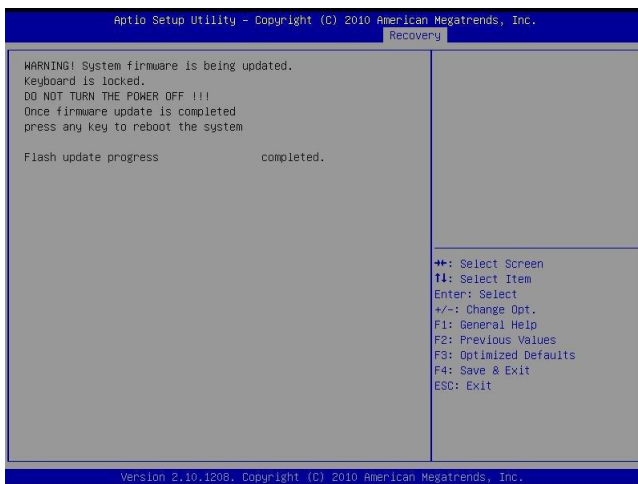


- When the screen as shown above displays, using the arrow key, select the item "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS recovery as shown in the screen below.

**Note:** Do not interrupt the process of BIOS flashing until it is completed.



6. After the process of BIOS recovery is completed, press any key to reboot the system.



7. Using a different system, extract the BIOS package into a bootable USB flash drive.
8. When a DOS prompt appears, enter FLASH.BAT BIOSName.### at the prompt.  
**Note:** Do not interrupt this process until BIOS flashing is completed.
9. After seeing the message that BIOS update is completed, unplug the AC power cable from the power supply to clear the CMOS, and then plug the AC power cable in the power supply again to power on the system.
10. Press <Del> continuously to enter the BIOS Setup utility.
11. Press <F3> to load default settings.
12. After loading default settings, press <F4> to save the settings and exit the BIOS Setup utility.

# Appendix C

## System Specifications

### Processors

Single or dual Intel E5-2600 v3/v4 Series processors in LGA2011 sockets

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

### Chipset

Intel C612 chipset

### BIOS

16 MB AMI SPI Flash EEPROM

### Memory Capacity

Twenty-four DIMM slots that can support ECC LRDIMM (Load Reduced) or ECC Registered (RDIMM) DDR4-2400/2133/1866/1600 memory

### Drive Bays

Forty-eight hot-swap drive bays to house 2.5" NVMe SSD drives, plus two 2.5 hard disk drives

### Expansion Slots

Three PCI-E 3.0 x16 slots (two x16 and one x8), Slot 3 Occupied by NVMe AOC

### Serverboard

X10DSC+ (Proprietary form factor)

Dimensions: 17 x 10.4 in (43.18cm x 26.42cm)

### Chassis

SC226STS-R1K62P2 (2U rackmount)

Dimensions: (WxHxD) 17.2 x 3.5 x 26.75 in. (437 x 88 x 679 mm)

## Dimensions

Width 17.2" (437mm), Height 3.5" (89mm), Depth 30.2" (767mm), with Cable Management Arm Installed 35.2" (895mm)

## Weight

Gross Weight: 74.5 lbs. (33.8 kg.)

Net Weight: 52 lbs. (23.6 kg.s)

## System Cooling

Five 8cm hot-swap redundant PWM cooling fans; two air shrouds; two CPU heat sinks

## System Input Requirements

AC Input Voltage: 100-127 V, 50-60 Hz, or 200-240 V, 50-60 Hz

## Power Supply

1600W Redundant Titanium Level AC Power Supplies with PMbus

+12V

Max: 83.3A and Min: 0A (100Vac-127Vac)

Max: 133A and Min: 0A (200Vac-240Vac)

12V SB

Max: 2.1A and Min: 0A

## Operating Environment

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

(continued from front)

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