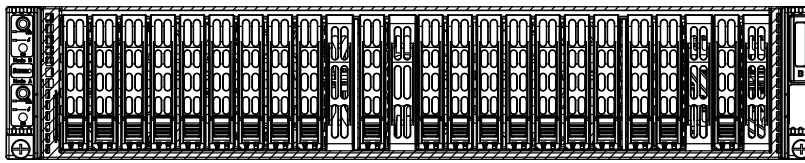
SUPERSERVER®

2028UT-BC1NRT
2028UT-BTNRT



USER'S MANUAL

Revision 1.0a

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. **Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.**

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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0a
Release Date: January 16, 2018

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 maintainance 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.supermicro.com).

This manual may be periodically updated without notice. Please check the Supermicro 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.

Contents

Chapter 3 System Interface

Chapter 4 Standardized Warning Statements for AC Systems

Chapter 5 Advanced Serverboard Setup

Chapter 1

Introduction

1-1 Overview

This chapter provides a brief outline of the functions and features of the 2028UT-BTNRT/BC1NRT. The server is two independent computing nodes, each based on the X10DBT-T serverboard, all in the SC227HD-R1K28 chassis. The 2028UT-BC1NRT model includes the LSI SAS3108 12Gb/s SAS RAID-on-Chip.

In addition to the serverboards and chassis, several important parts that are included with the system are listed below.

- Backplanes:
  - Supports sixteen 2.5" SAS/SATA drives and four PCIe SSD drive (BPN-SAS3-227HD-N2)
  - Two PBF Right 1U adapter cards for EX DP 2U, 8x PCIe gen3 lanes (BPN-ADP-8PCIE3-1UBR)
  - For 2028UT-BC1NRT only, two EX DP 2U, SAS 3108 daughter cards (BPN-ADP-8S3108-1UBL)
  - For 2028UT-BTNRT only, two PBF Left 1U adapter cards for EX DP 2U, 8x SATA3 ports (BPN-ADP-8SATA3-1UBL)
- Riser card (RSC-R1UW-2E16)
- Air shroud (MCP-310-22701)
- Heat sink (SNK-P0057PS)
- One rail set (MCP-290-00053, MCP-290-00060)

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

- Product manuals: http://www.supermicro.com/support/manuals/
- Product drivers and utilities: ftp://ftp.supermicro.com
- Product safety information: http://super-dev/about/policies/safety_information.cfm

For support, email support@supermicro.com.

1-2 Serverboard Features

At the heart of each node is the X10DBT-T, a dual processor serverboard based on the Intel C602 chipset. Below are the main features of the serverboard. See Figure 1-1 for a block diagram.

Processors

The serverboard supports two Intel Xeon E7-8800 v2/E7-4800 v2/E7-2800 v2 processors in LGA 2011 sockets (Socket R1). Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The serverboard has 32 DIMM slots that can support up to 1TB registered (RDIMM) or up to 2TB of load reduced (LRDIMM) memory. Memory Type is 1600/1333/1066/800MHz ECC DDR3 SDRAM 72-bit, 240-pin gold-plated DIMMs Modules of the same size and speed are recommended. See Chapter 5 for details.

Serial ATA

The serverboard supports eight SATA ports, that is two SATA3 and six SATA2. These allow RAID 0, 1, 5, 10. The SATA drives are hot-swappable. Additional SATA ports are available with a PCIe expansion card.

Expansion Slots

Each node has:

- Two PCI Express x16 slots for full height, half length expansion cards
- One PCIe x8 microLP card
- Two solid-state drive (SSD) slots for non-volatile memory express (NVMe) drives with Windows 8 support

Input/Output Ports

The rear I/O ports for each node include two 10Gbase-T Ethernet LAN ports, two USB 2.0 ports, one dedicated IPMI LAN port, a VGA (monitor) port, one serial COM port.

IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

1-3 Server Chassis Features

Some features of the SC227HD-R1K28 chassis are listed below.

System Power

The system features two high-efficiency, hot-plug, 80 Plus Platinum level, digital 1280W redundant power supplies. One power module may be removed without shutting down the system. See Chapter 6 for details.

Drive Bays

The chassis includes twenty 2.5" drive bays and four dummy bays to allow for cooling. Each node can control eight hot-swappable SATA or SAS drives and two NVMe (Non Volatile Memory Express) drives. .

Front Control Panel

Two control panels provide on the front of the chassis a system monitoring and control interface for each computing node. LEDs indicate network activity, system overheat, UID and power supply failure. A main power button and a UID button are also included.

Cooling System

The chassis has an innovative cooling design that includes four 4-cm PWM (Pulse Width Modulated) fans and an air shroud to focus airflow where it is needed. The power supply module also includes a cooling fan. All fans operate continuously.

The CPU and chassis fan speeds are controlled by IPMI Thermal Management. A thermal control sensor monitors the CPU temperature in real time and controls fan. The chassis thermal circuitry monitors the overall system temperature and alerts when the chassis temperature is too high.

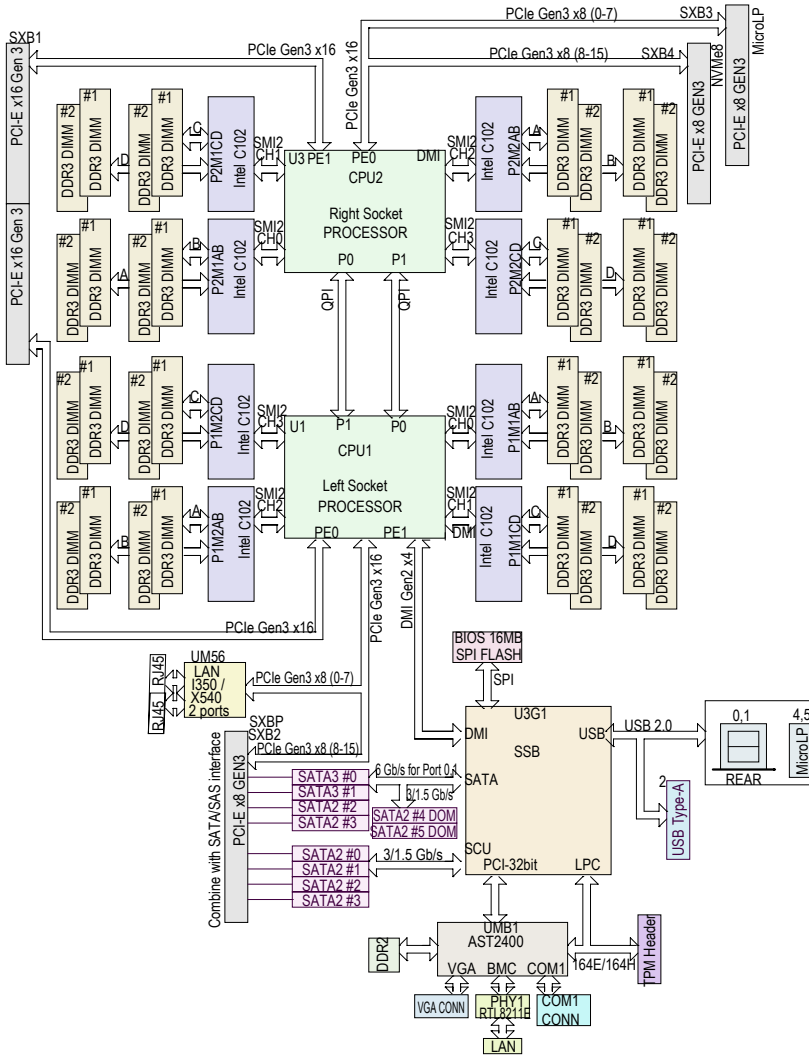

Figure 1-1. General System Block Diagram

1-4 Contacting Supermicro

Headquarters

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Tel:	+1 (408) 503-8000
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Web Site:	www.supermicro.nl

Asia-Pacific

Address:	Super Micro Computer, Inc. 3F, No. 150, Jian 1st Rd. Zhonghe Dist., New Taipei City 235 Taiwan (R.O.C)
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3992
Email:	support@supermicro.com.tw
Web Site:	www.supermicro.com.tw

Notes

Chapter 2

Server Installation

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

2-1 Unpacking the System

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

2-2 Preparing for Setup

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

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

Choosing a Setup Location

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

2-3 Warnings and Precautions

Rack Precautions

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

Server Precautions

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

Rack Mounting Considerations

Ambient Operating Temperature

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

Reduced Airflow

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

Mechanical Loading

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

Circuit Overloading

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

Reliable Ground

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

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

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

2-4 Installing the System into a Rack

This section provides information on installing the server into a rack unit with the rack rails provided. There are a variety of rack units on the market, so the assembly procedure may differ slightly. Refer to the installation instructions that came with your rack. **Note:** This rail will fit a rack between 26.8" and 36.4" deep.

Identifying the Sections of the Rack Rails

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

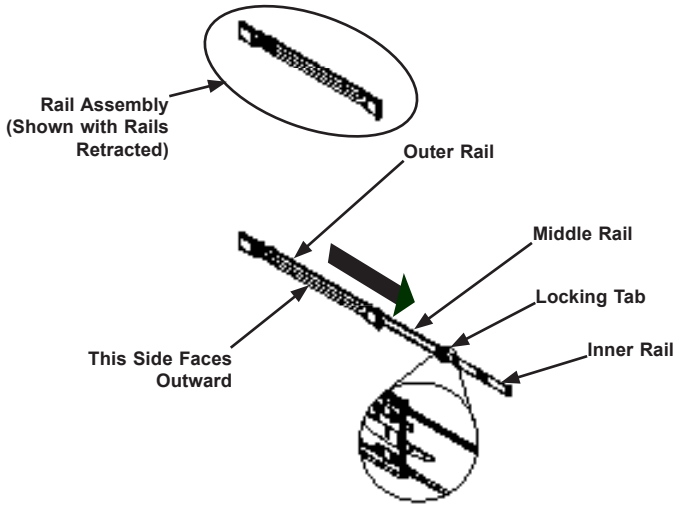


Figure 3-1. Identifying the Outer Rail, Middle Ra. Rail
(Left Rail Assembly Shown)

Releasing the Inner Rail

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

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

Releasing Inner Rail from the Outer Rails

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

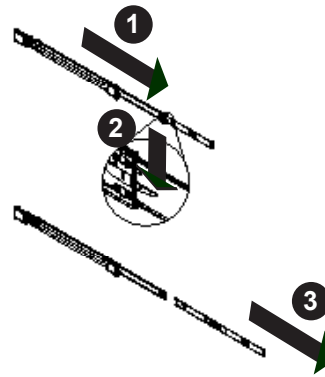


Figure 3-2. Extending and Releasing the Inner Rail

Installing the Inner Rails on the Chassis

Installing the Inner Rails

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

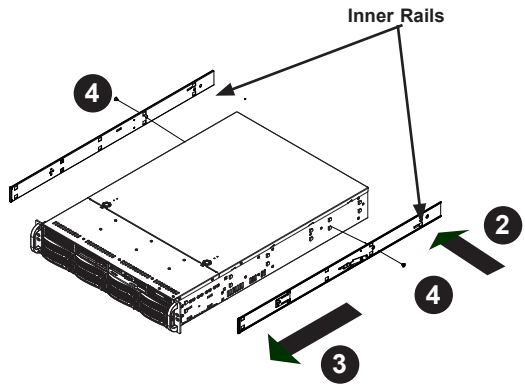


Figure 3-3. Installing the Inner Rails

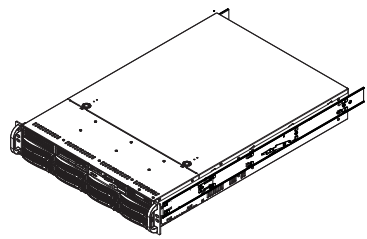


Figure 3-4. Inner Rails Installed on the Chassis

Installing the Outer Rails onto the Rack

Installing the Outer Rails

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

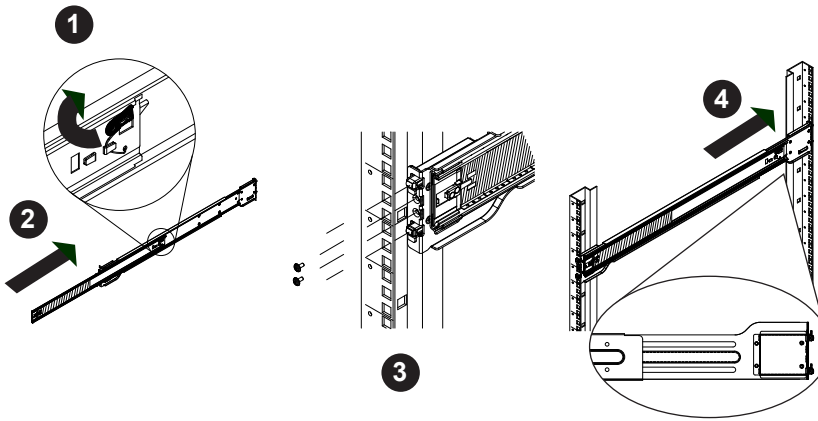


Figure 3-5. Extending and Mounting the Outer Rails

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

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

Sliding the Chassis onto the Rack Rails

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

Installing the Chassis into a Rack

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

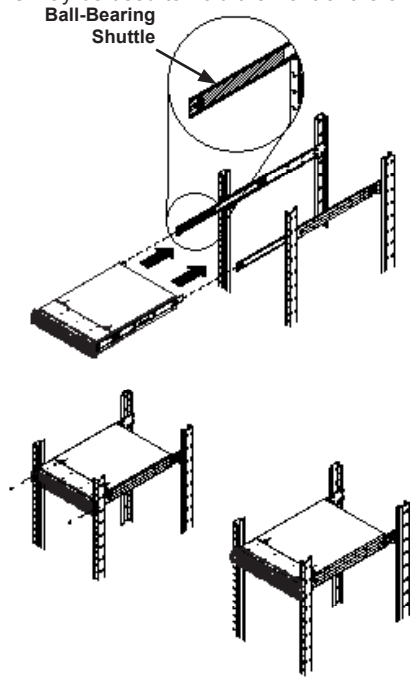


Figure 3-6. Installing into a Rack

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

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

Chapter 3

System Interface

3-1 Overview

The chassis includes:

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

These elements are described in this chapter with possible responses.

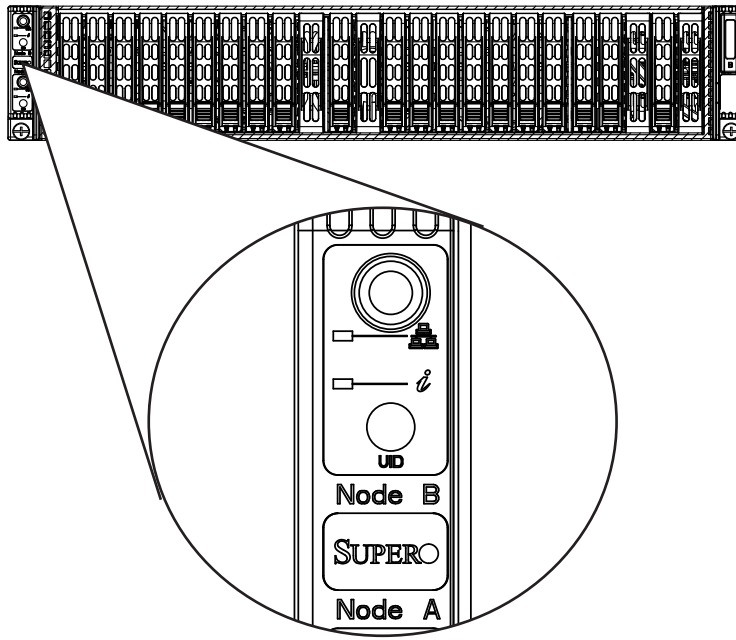


Figure 3-1. Control Panel

3-2 Control Panel Buttons

The chassis includes two push-buttons.

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

UID: The UID button is used to turn on or off the blue light function of the Information LED. It is used to locate the server in large racks and server banks.

3-3 Control Panel LEDs

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

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

Information LED	
Status	**Description**
Continuously on and red	An overheat condition has occured. (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.

NIC2: Indicates network activity when flashing.

Overheating

There are several possible responses if the system overheats.

Overheat Temperature Setting

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

Responses

If the server overheats:

1. Use the LEDs to determine the nature of the overheating condition.
2. Confirm that the chassis covers are installed properly.
3. Check the routing of the cables and make sure all fans are present and operating normally.
4. Verify that the heatsinks are installed properly.

3-4 Drive Carrier LEDs

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

	LED Color	Blinking Pattern	Behavior for Device
Activity LED	Blue	Solid On	SAS/NVMe drive installed
	Blue	Blinking	I/O activity
Status LED	Red	Solid On	Failed drive for SAS/SATA/NVMe with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive for SAS/SATA/ NVMe with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for SAS/SATA/NVMe with RSTe support
	Red	On for five seconds, then off	Power on for SAS/SATA/NVMe with RSTe support
	Red	Blinking at 4 Hz	Identify drive for SAS/SATA/ NVMe 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 restarts when the power supply temperature goes below 60C.

Chapter 4

Standardized Warning Statements for AC Systems

4-1 About Standardized Warning Statements

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

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

These warnings may also be found on our web site at http://www.supermicro.com/about/policies/safety_information.cfm.

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。

此警告符号代表危险。

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

此警告符號代表危險。

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

Warnung

WICHTIGE SICHERHEITSHINWEISE

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

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

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

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

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

CONSERVEZ CES INFORMATIONS.

תקנון 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 במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

ا كً ف حالة وٌكي أى تتسبب ف اصابة جسذ ةٌ هذا الزهز عٌ خطز !تحذ زٌ .

قبل أى تعول على أي هعذات،كي على علن بالوخاطز ال ٱجوة عي الذوائز

الكهزبائ ةٍ

وكي على درا ةٌ بالووارسات البقائ ةٍ لو عٌ وقىع أي حادث

استخذم رقن الب إٍ الو صٌص ف هًا ةٌ كل تحذ زٌ للعثىر تزجوتها

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.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

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

Circuit Breaker

Warning!

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

サーキット・ブレーカー

この製品は、短絡（過電流）保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

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

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

Warnung

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

¡Advertencia!

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

Attention

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

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

هذا المنتج يعتمد على معداث الحمايت مه الدوائرالقصيرة 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 electrische installatie. Controleer of het beveiligde aparaat 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.

電源切断の警告

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断され、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 chassis pour installer ou enlever des composants de systéme.

אזהרה מפני ניתוק חשמלי

!אזהרה

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק

.לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים

يجب فصم اننظاو من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد

انطاقت قبم

انصل إنى اىمناطق انداخهيت نههيكم نتثبيج أو إزانت مكناث الجهاز

경고!

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

Waarschuwing

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

Equipment Installation

Warning!

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

機器の設置

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

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה!

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

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاس يجب أن يسمح فقط للمظفيه المؤهليه

경고!

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

Waarschuwing

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

Restricted Area

Warning!

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

アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

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

警告

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

אזור עם גישה מוגבלת

אזהרה!

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

تخصيص هذه انحذة نترك بُها ف مناطق محظورة تم .
،مَكن انصل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت
أو أ وس هُت أخري نلالأمما قفم ومفتاح

경고!

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

Waarschuwing

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

Battery Handling

Warning!

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

電池の取り扱い

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

警告

电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

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 اسحبذال البطارية بطريقة غير صحيحة فعليل
اسحبذال البطارية
فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة
جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة 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

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
此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein trom 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!

ליחדה 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 لعسل الوحدة عن الكهرباء

경고!

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

Waarschuwing

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

Backplane Voltage

Warning!

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

バックプレーンの電圧

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

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

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

¡Advertencia!

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

Attention

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

מתח בפנל האחורי

אזהרה!

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

هناك خطر مه التيار الكهزبائي أوالطاقة المجسدة على اللحة

عندما يكن النظام يعمل كه حذرا عند خدمة هذا الجهاس

경고!

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

Waarschuwing

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

Comply with Local and National Electrical Codes

Warning!

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

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

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

Attention

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

תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقاويه المحلية والبطية المتعلقة

بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

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

Product Disposal

Warning!

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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القانين واللوائح البطنية عند

경고!

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

Waarschuwing

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

Hot Swap Fan Warning

Warning!

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

ファン・ホットスワップの警告

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

警告!

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה!

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

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

경고!

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

Waarschuwing

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

Power Cable and AC Adapter

Warning!

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

電源コードとACアダプター

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

警告

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

AC כבלים חשמליים ומתאמי

!אזהרה

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

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

전원 케이블 및 AC 어댑터

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

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

Stroomkabel en AC-Adapter

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

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the X10DBT-T serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

5-1 Handling the Serverboard

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

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

Precautions

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

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

5-2 Installing the Processor and Heatsink

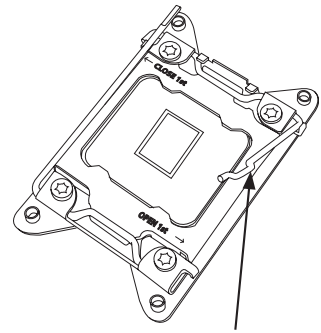
Notes:

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

Installing an LGA 2011 Processor

Installing a CPU

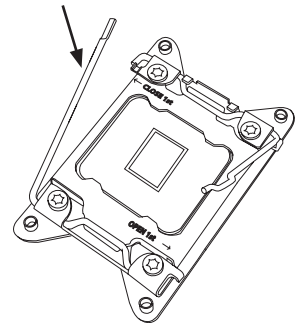
1. There are two levers on the LGA 2011 socket. First press and release the load lever labeled "Open 1st".



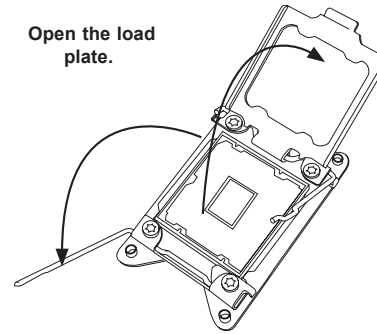
Release the lever labeled "Open 1st"

Release the lever labeled "Close 1st"

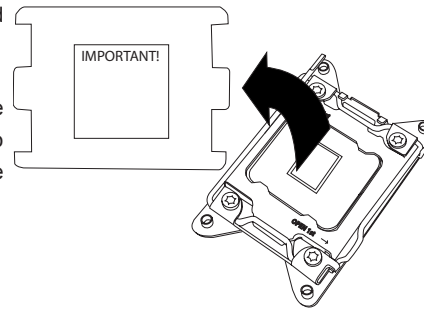
2. Press the second load lever labeled "Close 1st" to release the load plate from its locked position.



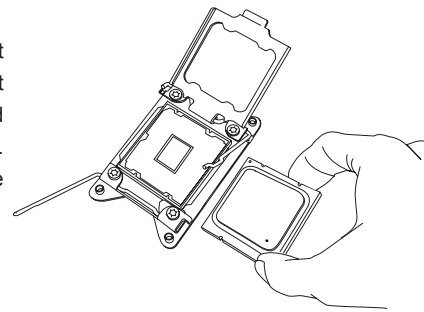
3. With the second lever fully retracted, gently push down on the "Open 1st" lever to loosen the load plate. Lift the load plate with your fingers to open it completely.



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

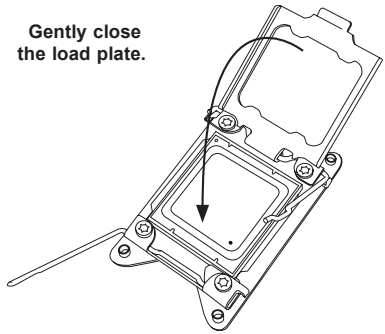


6. Carefully lower the CPU straight down into the socket. Do not move the CPU horizontally, and do not rub the pins of the socket. This may damage the CPU or the socket.

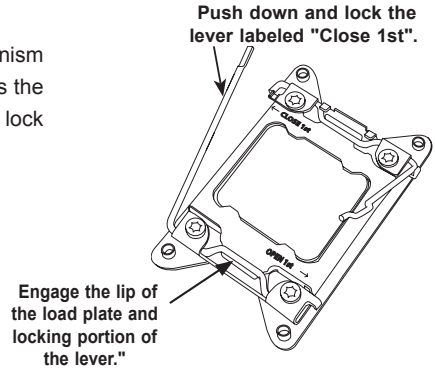


Caution: You can only install the CPU into the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it does not close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU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

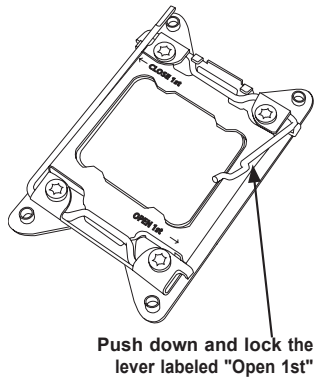
7. With the "Close 1st" lever fully retracted, gently close the load plate.



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



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



Installing a CPU Heatsink

1. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

2. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)

3. Finish the installation by fully tightening all four screws.

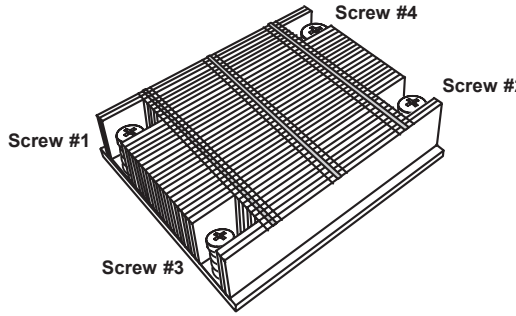


Figure 5-1. Heatsink

Removing the Heatsink

Caution: We do not recommend removing the CPU or the heatsink. If you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or the CPU socket.

1. Unplug the power cord from the power supply.

2. Unscrew and remove the heatsink screws in the opposite sequence shown in the picture above.

3. Hold the heatsink and gently wriggle it to loosen it from the CPU. (Do not use excessive force!)

4. Once the heatsink is loosened, remove it from the CPU.

5. 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 re-installing the heatsink.

5-3 Connecting Cables

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

Connecting Data Cables

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

The following data cables (with their connector locations noted) should be connected. See the serverboard layout diagram in this chapter for connector locations.

- Control Panel cable, connected to the backplane
- SATA cables (I-SATA0 ~ I-SATA5 and/or S-SATA0 ~ S-SATA3)

Connecting Power Cables

The X10DBT-T has a 4-pin primary power supply connector designated "JPW1" for connection to the power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the serverboard. See the Connector Definitions section in this chapter for power connector pin definitions.

5-4 I/O Ports

Figure 5-2 shows I/O ports on the rear I/O panel of the serverboard.

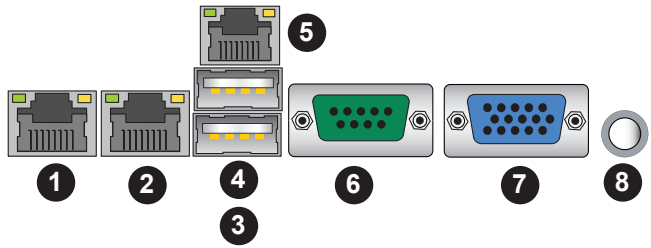


Figure 5-2. Rear Panel I/O Ports

1. Gigabit_LAN 1 (X10DBT), 10G_LAN 1 (X10DBT-T)	5. IPMI_Dedicated LAN
2. Gigabit_LAN 2 (X10DBT), 10G_LAN 2 (X10DBT-T)	6. COM1
3. Back Panel USB 2.0 Port 0	7. VGA (Blue)
4. Back Panel USB 2.0 Port 1	8. UID Switch/UID LED (LED1)

5-5 Installing Memory

Note: Check the Supermicro web site for recommended memory modules.

CAUTION

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

Installing DIMMs

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

To Install:
Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.

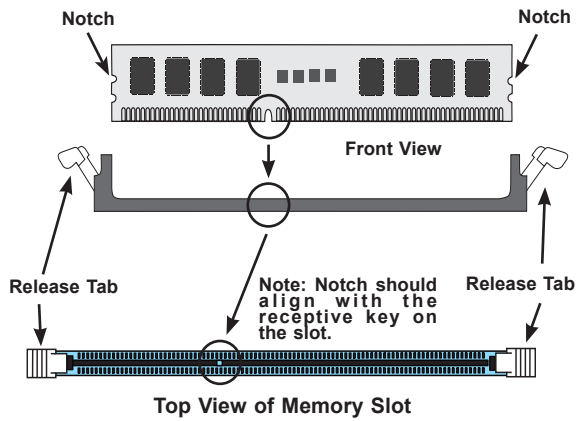


Figure 5-3. Installing DIMM into Slot

Memory Support

The X10DBT-T serverboard supports Up to 1TB of Registered (RDIMM) or up to 2TB of Load Reduced (LRDIMM) DDR3 ECC 800/1066/1333/1600 MHz 240-pin memory modules in 32 slots (2 DIMMs per channel). For the latest memory updates, please refer to our website a at http://www.supermicro.com/products/motherboard.

Processor & Memory Module Population Configuration

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

Fully-Populated Configuration

Processors and their Corresponding Memory Modules								
CPU#	**Corresponding DIMM Modules for Full-Populated Configuration**							
CPU 1	P1M1-DIMM A1/B1	P1M1-DIMM C1/D1	P1M1-DIMM A2/B2	P1M1-DIMM C2/D2	P1M2-DIMM A1/B1	P1M2 DIMM C1/D1	P1M2 DIMM A2/B2	P1M2 DIMM C2/D2
CPU2	P2M1-DIMM A1/B1	P2M1-DIMM C1/D1	P2M1-DIMM A2/B2	P2M1-DIMM C2/D2	P2M2-DIMM A1/B1	P2M2 DIMM C1/D1	P2M2 DIMM A2/B2	P2M2 DIMM C2/D2

Half-Populated Configuration

Processors and their Corresponding Memory Modules				
CPU#	**Corresponding DIMM Modules for Half-Populated Configuration**			
CPU 1	P1M1-DIMM A1/B1	P1M1-DIMM C1/D1	P1M2-DIMM A1/B1	P1M2 DIMM C1/D1
CPU2	P2M1-DIMM A1/B1	P2M1-DIMM C1/D1	P2M2-DIMM A1/B1	P2M2 DIMM C1/D1

An Important Note:

- For the memory modules to work properly, install DIMM modules of the same type, same speed and same operating frequency in the serverboard. Mixing DIMMs of different types or different speeds is not allowed.

RDIMM/LRDIMM DDR3 ECC in Performance Mode (2:1)

Type	Ranks Per DIMM and Data Width (x8 is supported for RDIMMs but not listed) SR Single Rank DR Dual Rank QR Quad Rank	Max DIMM Capacity (GB)		Max Speed (GHz) ; Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)									
				2 SPC				3 SPC					
				1DPC		2DPC		1DPC		2DPC		3DPC	
		2Gb	4Gb	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V
RDIMM	SRx4	4GB	8GB	1333	1333	1333	1333	1333	1333	1333	1066	1066	N/A
RDIMM	DRx4	8GB	16GB	1333	1333	1333	1333	1333	1333	1333	1066	1066	N/A
RDIMM	QRx4	16GB	32GB	1066	1066	1066	1066	1066	1066	N/A	N/A	N/A	N/A
LRDIMM	QRx4	16GB	32GB	1333	1333	1333	1333	1333	1333	1333	1333	1333	N/A
LRDIMM (RM)	8Rx4	32GB	64GB	1066	N/A	1066	N/A	1066	N/A	1066	N/A	1066	N/A

RDIMM/LRDIMM DDR3 ECC in Lockstep Mode (1:1)

Type	Ranks Per DIMM and Data Width (x8 is supported for RDIMMs but not listed)	Max DIMM Capacity (GB)		Max Speed (MT/s) ; Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)									
				2 SPC				3 SPC					
				1DPC		2DPC		1DPC		2DPC		3DPC	
		2Gb	4Gb	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V
RDIMM	SRx4	4GB	8GB	1600	1333	1600	1333	1333	1333	1333	1066	1066	N/A
RDIMM	DRx4	8GB	16GB	1600	1333	1600	1333	1333	1333	1333	1066	1066	N/A
RDIMM	QRx4	16GB	32GB	1066	1066	1066	1066	1066	1066	N/A	N/A	N/A	N/A
LRDIMM	QRx4	16GB	32GB	1600	1333	1600	1333	1600	1333	1600	1333	1333	N/A
LRDIMM (RM)	8Rx4	32GB	64GB	1066	N/A	1066	N/A	1066	N/A	1066	N/A	1066	N/A

5-6 Serverboard Details

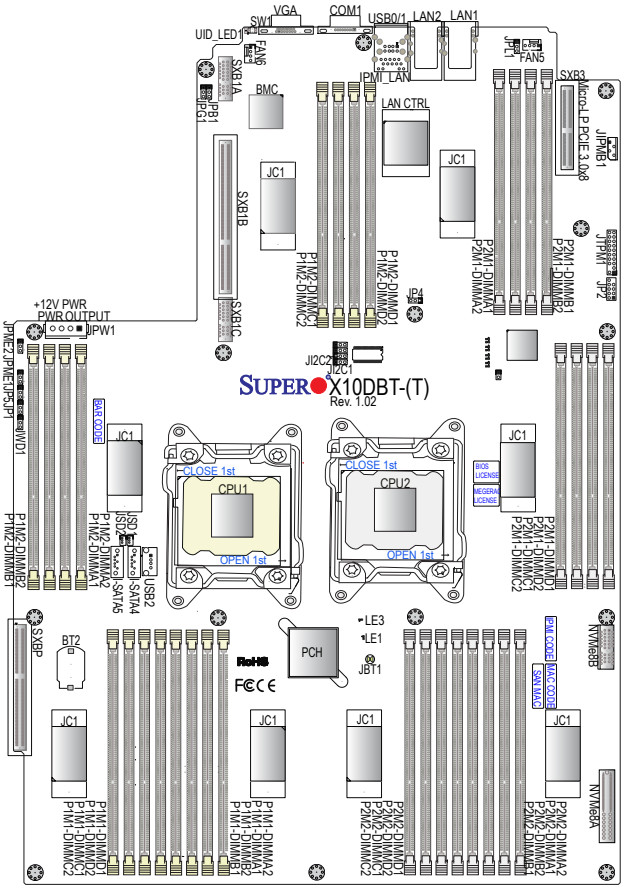


Figure 5-4. SUPER X10DBT-T Layout

Notes

- " " indicates the location of "Pin 1".
  ■
- Jumpers/LEDs not indicated are for testing purposes only. Also, components that are not documented in this manual are reserved for internal use only.

Quick Reference

X10DBT(-T) Jumpers

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-8
JI²C1/JI²C2	SMB to PCIe slots	Pins 2-3 (disabled)
JPB1	BMC Enable	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	GLAN1/GLAN2 Enable (X10DBT) 10_GLAN1/10G_LAN2 Enable (X10DBT-T)	Pins 1-2 (Enabled)
JPME1	Manufacture Mode (ME) Recovery	Pins 1-2 (Normal)
JPME2	Manufacture Mode (ME) Select	Pins 1-2 (Normal)
JWD1	Watch-Dog Timer Enable	Pins 1-2 (Reset)

X10DBT(-T) Connectors

Connectors	Description
Battery (BT2)	Onboard Battery (See Chpt. 3 for used battery disposal)
COM1	Backplane COM port
FAN5, FAN6	CPU/System fan headers
I-SATA4/5	Intel SATA 3.0 connectors (4/5) from Intel PCH
JIPMB1	4-pin external BMC I²C header (for IPMI-card support)
JPW1	+12V Power Output connector header
JSD1/JSD2	SATA DOM (Device-On-Module) power connectors 1/2
JTPM1	TPM (Trusted Platform Module)/Port 80 header
LAN1/LAN2	G-bit Ethernet (GLAN) ports 1/2 (for X10DBT) 10 G-bit Ethernet (GLAN) ports 1/2 (for X10DBT-T)
(IPMI)_LAN	IPMI_Dedicated LAN support by the BMC
NVMe8A/NVMe8B	Solid-State Drive (SSD) slots for proprietary Non-Volatile Memory Express (NVMe) devices with Windows 8 support (**Note**: The part number for the add-on card to be used with NVMe8A or NVMe8B is BPN-ADP-8PCIE3-1UBR.)
SXB1A/1B/1C	Proprietary PCIe 3.0 x16+x16 slot for riser card support (Left)
SXBP	Proprietary PCIe 3.0x8 slot for storage add-on cards with two SATA 3.0 and six SATA 2.0 connections supported (Right) (**Note**: The part number for the add-on card to be used for SXBP is BPN-ADP-8SATA3-1UBL-O-P or BPN-ADP-SAS3-227HD-N2.)
SXB3	Micro-LP (Low-Profile) PCIe 3.0 x8 slot
SXB4_2	Solid-State Drive (SSD) Slot B for Non-Volatile Memory Express (NVMe) drive with Windows 8 support

SW1	UID Switch
(BP) USB 0/1 (2.0)	Backpanel USB 2.0 Port 0/ Port 1
(FP) USB 2 (2.0)	Front-accessible Type A USB 2.0 connection header
VGA	Backpanel VGA port

X10DBT(-T) LED Indicators

LED	Description	State	Status
LE1	Standby Power LED	On	Power On
LE3	BMC Heartbeat LED	Green: Blinking	BMC Normal
UID_LED1	Rear UID LED	Blue: On	Unit Identified

5-7 Connector Definitions

Power Output Connector

This serverboard supports a proprietary power supply. A 4-pin +12V power output connector located at JPW1 on the serverboard. Be sure to use the power supply recommended for this serverboard for adequate power supply to your system.

Fan Headers

This serverboard has two system/CPU fan headers (Fan 5/Fan 6) on the serverboard. These 4-pin fan headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by Thermal Management via IPMI 2.0 interface. See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation

IPMB

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

IPMB Header Pin Definitions

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

TPM/Port 80 Header

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

TPM/Port 80 Header Pin Definitions

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

SATA 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 Serial Link DOM devices.

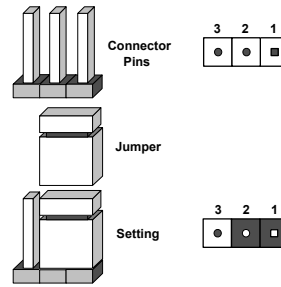
DOM PWR Pin Definitions

Pin#	Definition
1	+5V
2	Ground
3	Ground

5-8 Jumper Settings

Explanation of Jumpers

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



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

CMOS Clear

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

To clear CMOS

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

Note: *Do not use the PW_ON connector to clear CMOS.*

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard Ethernet (RJ45) ports LAN1 and LAN2. See the table on the right for jumper settings. The default setting is enabled.

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

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 (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

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

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

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

BMC Enable

Jumper JPB1 allows you to enable the embedded WPCM 450 BMC (Baseboard Management) Controller to provide IPMI 2.0/KVM support on the serverboard. See the table on the right for jumper settings.

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

I^2C Bus to PCI-Exp. Slots

Use jumpers JI^{2}C1 and JI^{2}C2 to connect the System Management Bus (I^{2}C) to PCI-Express slots in order to improve PCI slot performance. These two jumpers are to be set at the same time. The default setting is Closed to enable the connections. See the table on the right for jumper settings.

I^2C for PCI-E slots Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Enabled

Manufacture Mode Select

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

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

Management Engine (ME) Recovery

Use jumper JPME1 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation mode, online upgrade will be available via Recovery mode. See the table on the right for jumper settings.

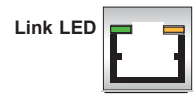
ME Recovery Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	ME Recovery

5-9 Onboard Indicators

LAN Port LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. One LED indicates activity when blinking while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

LAN LED Connection Speed Indicator	
LED Color	Definition
Off	No connection, 10 Mb/s, 100 Mb/s
Green	10 Gbps (X10DBT-T Only)
Amber	1 Gb/s



Dedicated IPMI LAN LEDs

In addition to LAN1 and LAN2, the serverboard has an dedicated IPMI LAN port located on the I/O backpanel. The amber LED indicates activity, while the Link LED indicates the speed of the connection. See the table on the right for more information.

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

Onboard Power LED

An Onboard Power LED is located at LE1 on the serverboard. 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 table on the right for more information.

Onboard PWR LED Indicator LED States	
LED Color	Definition
Off	Normal Power Off (w/ power cable connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State

BMC Heartbeat LED

A BMC Heartbeat LED is located at LEM1 on the serverboard. When LEM1 is blinking, BMC functions normally. See the table on the right for more information.

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

5-10 SATA Ports

SATA Ports

Four SATA 2.0 ports (I-SATA2-5) and two SATA 3.0 (I-SATA0/1) are provided on the serverboard. These SATA connections are supported by the Intel PCH. An additional four S-SATA connectors (S-SATA0-3), supported by Intel SCU, are also provided.

SATA Port Pin Definitions

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

SATA 2.0/3.0 Ports

Ten SATA 2.0/3.0 connections supported by Intel PCH 602 are located on the serverboard. Two SATA 3.0 ports are located at I-SATA 4/5. Two SATA 3.0 connections and six SATA 2.0 connections are supported by SXB2 (SXBP), which is an Supermicro proprietary PCIe 3.0x8 slot for a storage add-on card with SATA support (Right). These SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

SATA 3.0 (I-SATA 4/5) Pin Definitions

Pin#	Signal
1	Ground
2	SATA_TXP
3	SATA_TXN
4	Ground
5	SATA_RXN
6	SATA_RXP
7	Ground

Note: For more information on SATA HostRAID configuration, please refer to the "Intel SATA Host RAID User's Guide" posted on www.supermicro.com.

5-11 Installing Software

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

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

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

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

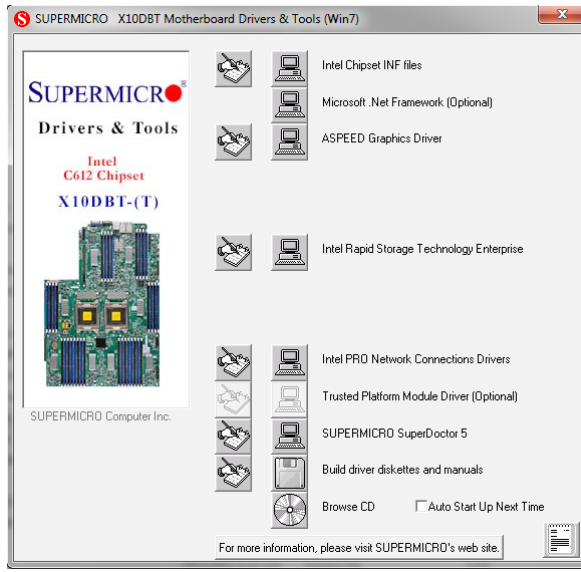


Figure 5-5. Driver Installation Display Screen

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

SuperDoctor® 5

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

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

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

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

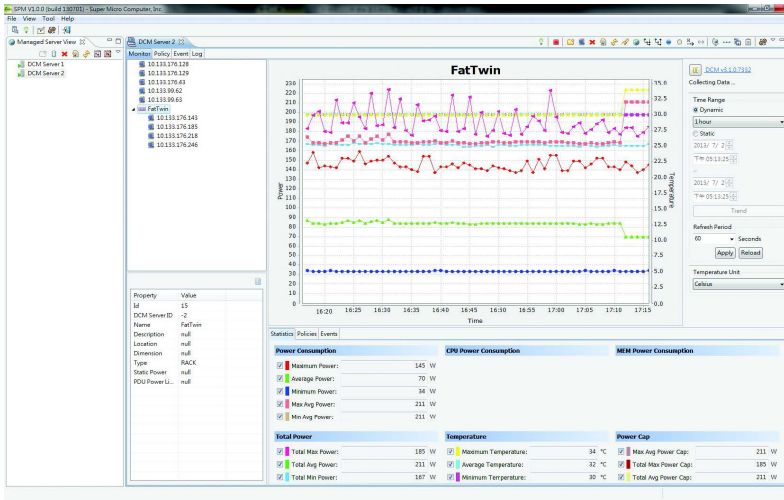


Figure 5-7. SuperDoctor 5 Interface Display Screen (Remote Control)

Note: The SuperDoctor 5 program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/nfo/sms_sd5.cfm. For Linux, we recommend that you use the SuperDoctor II application instead.

5-12 Onboard Battery

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

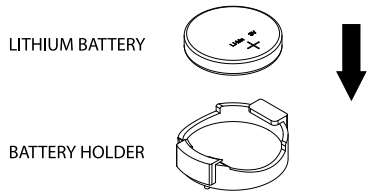


Figure 5-8. Installing the Onboard Battery

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC227HD-R1K28 chassis. The only tool required is a Phillips screwdriver.

Your system may require the installation of processors, memory, drives or expansion cards. Other procedures presented in this chapter are for maintenance or replacement.

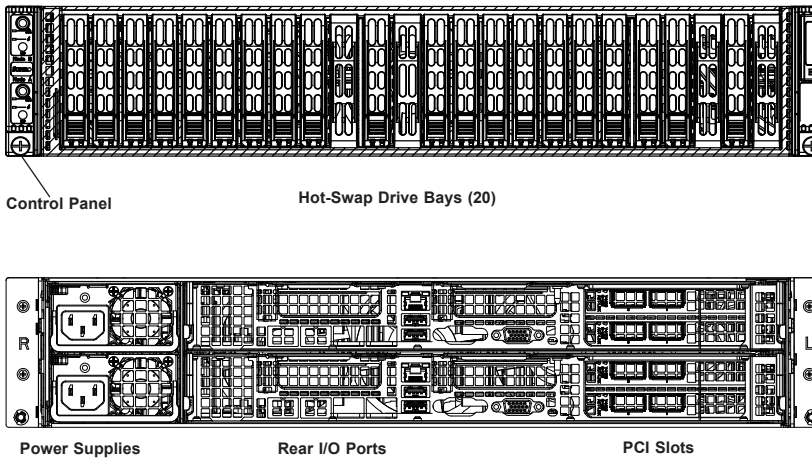


Figure 6-1. Chassis Front and Rear Views

6-1 Removing the Power

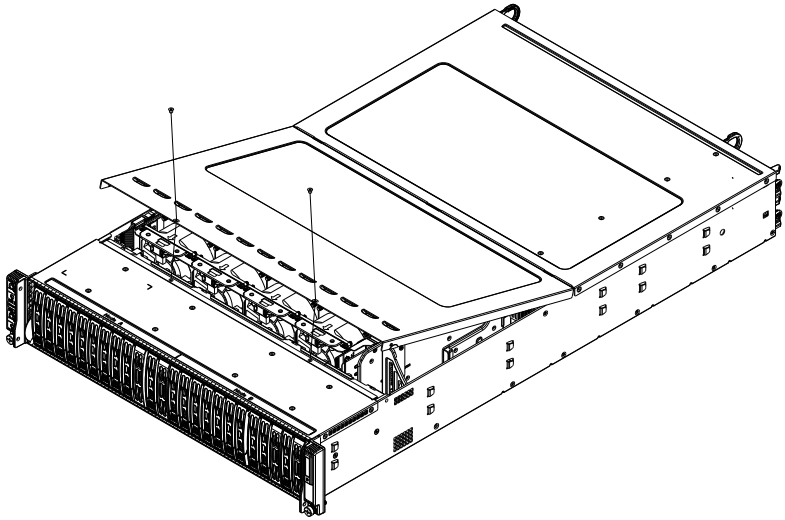
1. Use the operating system to power down the node, following the on-screen prompts.

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.

3. If your system has dual power supplies, remove the cords from both power supplies.

4. Disconnect the cord from the power strip or wall outlet.

6-2 Chassis Cover



6-2. Removing the Chassis Cover

Before operating the system for the first time, remove the protective film over the cover of the chassis, in order to allow for proper ventilation and cooling.

Removing the Chassis Cover and Protective Film

1. Peel off the protective film covering the top cover and the top of the chassis
2. Remove the two screws which secure the top cover onto the chassis as shown above.
3. Lift the top cover up and off the chassis.
4. Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.
5. Replace the chassis cover and reconnect the AC power cord.

6-3 Installing Drives

Drive bays are accessible from the front of the chassis without removing the chassis cover or powering down the system. The hard disk drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even carriers without drives installed must remain in the chassis during system operation.

Removing Hard Drive Carriers from the Chassis

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

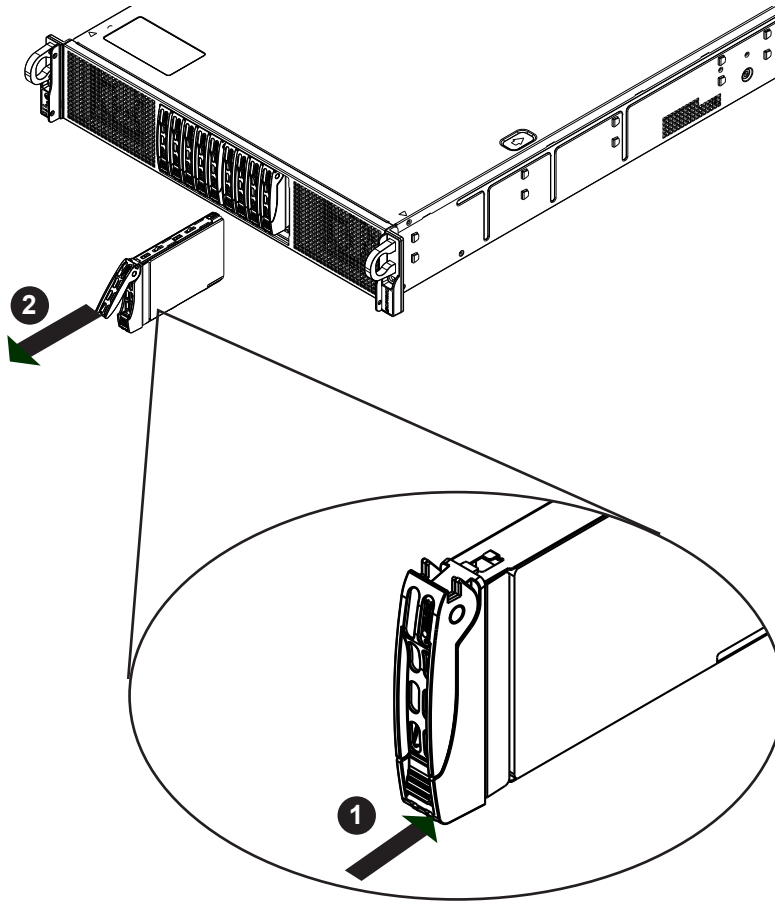


Figure 6-3. Removing a Hard Drive Carrier

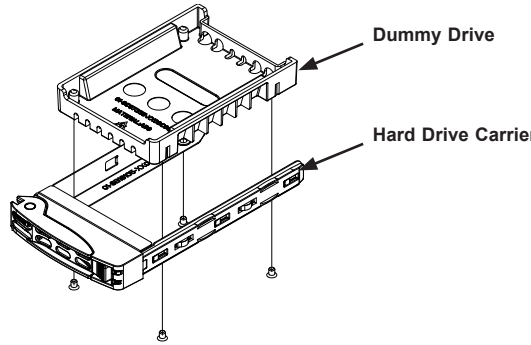


Figure 6-4. Removing a Dummy Drive from the Drive Carrier

Installing a Hard Drive into a Drive Carrier

1. Remove the four screws securing the dummy drive to the hard drive carrier.

2. Insert a hard drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier. Align the hard drive in the hard drive carrier so that the mounting holes of the carrier are aligned with the mounting holes of the drive. Note that there are holes in the carrier which are marked “SATA” to aid in correct installation.

3. Secure the drive to the carrier with four screws. Use the M3 flat-head screws included in the HDD bag of your accessory box. **Note:** The screws used to secure the dummy drive to the carrier cannot be used to secure the hard drive.

4. Insert the hard drive and drive 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 drive bay, the handle will retract.

5. Using your thumb, push against the upper part of the hard drive handle. Push the hard drive into the hard drive bay as illustrated below, until the hard drive clicks into the locked position.

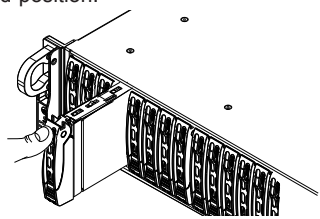


Figure 6-5. Proper Installation of the Carrier into the Hard Drive Bay

Note: The hard drives are designated with numbers 0 through 9 from left to right. When setting up RAID, one RAID level may be applied to drives 0-3, 8 and 9 (the I-SATA drives) and one RAID level may be applied to drives 4-7 (the S-SATA drives). You may not apply a single RAID level across all eight drives.

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

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

6-4 Expansion Card Setup

Each node supports two PCI Express full height, half length expansion cards and one MicroLP card. It uses a riser card and bracket.

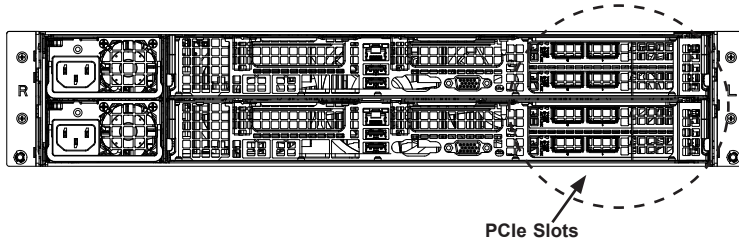


Figure 6-6. Rear Expansion Card Slots

Installing an Expansion Card

1. Disconnect the chassis from any power source.
2. Confirm that you have the correct expansion card, riser card and expansion card bracket for the chassis.
3. Remove the PCIe slot covers at the rear of the chassis.
4. Secure the riser card onto the bracket with screws.
5. Insert the expansion card into the expansion slot on the riser card.
6. Place the expansion card bracket into the chassis as shown on the following page, while inserting the riser card into its appropriate slot on the serverboard.
7. Secure the expansion card bracket to the chassis with the three screws provided.

6-5 System Cooling

Four 8-cm fans provide the cooling for the system. It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components.

System Fan Failure

Fan speed is controlled by system temperature by means of a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed. The system can continue to run with a failed fan. Replace any failed fan at your earliest convenience with the same type and model.

Changing a System Fan

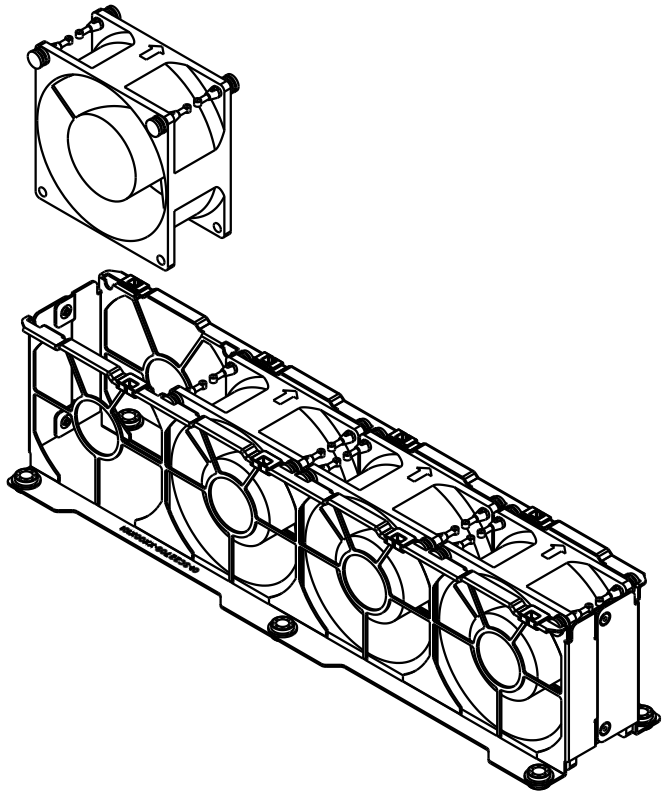
1. If necessary, open the chassis while the system is running to determine which fan has failed. Never run the server for an extended period of time with the chassis cover open.

2. After determining which fan needs to be replaced, power down the system as described in Section 6-1.

3. Remove the node drawer from the chassis.

4. Remove the failed fan's power cable from the backplane.

5. Lift the fan housing up and out of the chassis.



6-7. Replacing Fan in Housing

6. Push the fan up from the bottom and out of the top of the housing.

7. Place the replacement 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.

8. Put the fan housing back into the chassis and reconnect the cable.

9. Replace the drawer and confirm that the fan is working properly before replacing the chassis cover.

Air Shroud

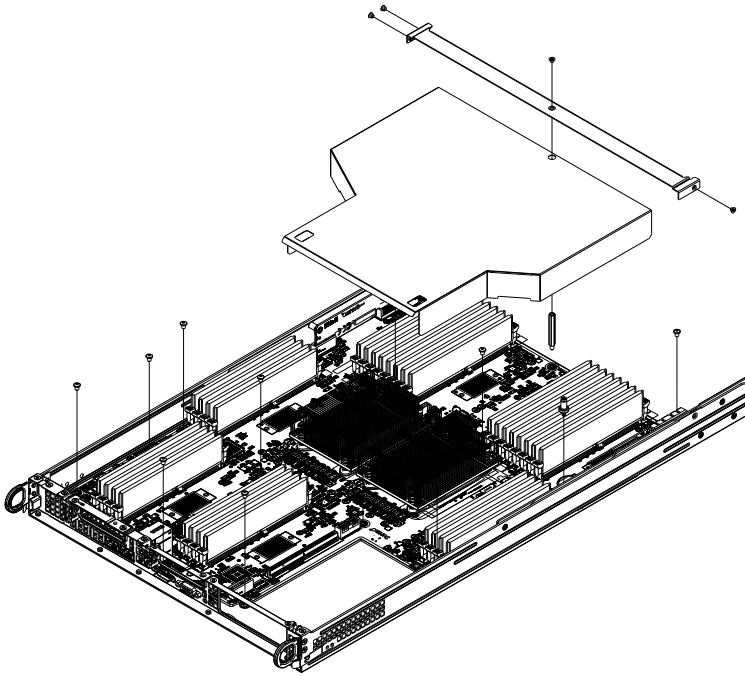
Air shrouds concentrate airflow to maximize fan efficiency. The chassis requires air shrouds for each node.

Installing an Air Shroud

1. Make sure that expansion cards, if desired, and all components are properly installed in each node.

2. Place the first air shroud over the serverboard, as shown below. The air shroud sits behind the system fans and goes over the top of the serverboard and its components.

3. Repeat the procedure for the remaining node.



6-8. Installing the Air Shroud

6-6 Power Supply

The system includes dual 1280W power modules. They automatically sense the input voltage between 100v to 240v, and operate at that voltage. Note that different input voltages will result in different maximum power output levels.

In the event of a power supply failure, the remaining power supply will automatically take over. The failed power module can be replaced without powering-down the system. Replace with the same model. Replacement modules can be ordered directly from Supermicro.

An amber light on the power supply is illuminated when the power is switched off. An green light indicates that the power supply is operating.

Replacing the Power Supply

1. Push the release tab on the rear of the failed power supply.
2. Grasp the handle of the power supply and pull it out of the power supply bay.
3. Push the new power supply module into the power bay until it clicks into the locked position.

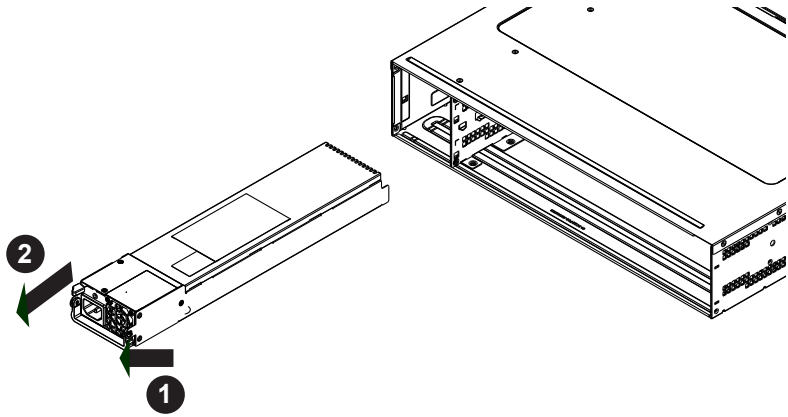


Figure 6-9. Removing the Power Supply

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS setup utility for the X10DBT/X10DBT-T. 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 at http://www.supermicro.com/support/manuals/.

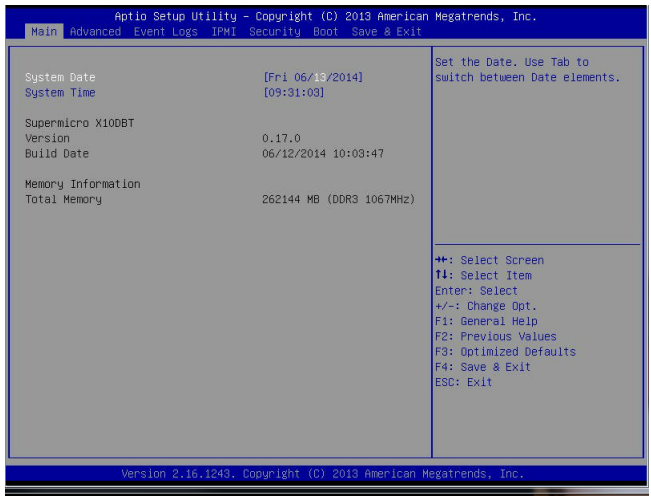
Starting the Setup Utility

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.

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 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

The AMI BIOS setup utility opens with the Main screen. You can always return 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/System Time

Use this option to change the system date and time using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YYYY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.).

Supermicro X10DBT-T

Version

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

Build Date

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

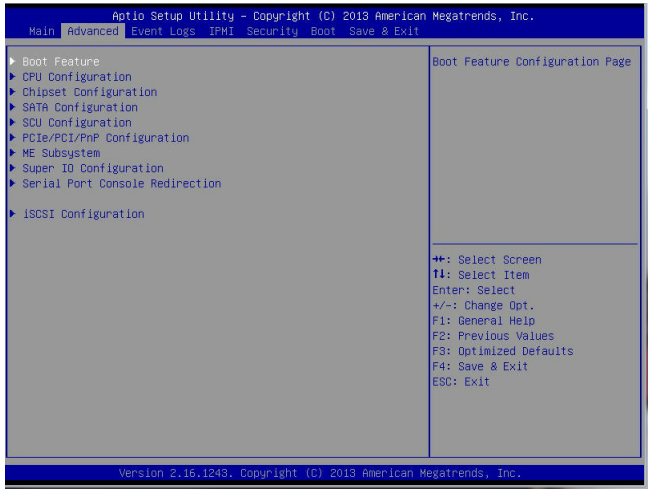
Memory Information

Total Memory

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

7-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.



▶Boot Features

Boot Configuration

Quiet Boot

Use this item to select bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

CSM (Compatibility Support Module) Support

Select Enabled to enable CSM booting support to boot an UEFI-compatible device from a legacy BIOS-based system. 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 set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

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**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the BIOS ROM of the host adaptors will immediately capture Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, the BIOS ROM of the host adaptors will only capture Interrupt 19 during bootup from a legacy device. The options are **Immediate** and Postponed.

Re-try Boot

Select Legacy Boot for the BIOS to continuously attempt to boot from the legacy boot drive. Select EFI Boot for the BIOS to continuously attempt to boot from the EFI boot drive. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error that lasts for more than five minutes occurs. The options are Enabled and **Disabled.**

Power Button Function

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

Restore on AC Power Loss

Use this item to set the power state after a power outage. Select Stay Off for the system power to remain off after a power outage. Select Power On to turn on the system power after a power outage. Select Last State to allow the system to resume its last power state before a power outage. 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 0/Processor 1

This submenu displays the following information of the CPU installed a CPU socket detected by the BIOS.

- Processor Socket
- Processor ID
- Processor Frequency
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version
- Processor 1 Version

Clock Spread Spectrum

Select Enable to allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disable** and Enable.

Hyper-Threading [All]

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

Performance/Watt

Select Power Optimized to enable Intel® Turbo Boost Technology support when the Power Performance State-P0 has lasted more than two seconds. The options are **Traditional** and Power Optimized.

Clear MCA (Available if supported by the OS & the CPU)

Select Yes to enable Machine-Check Architecture (MCA) support for CPU error logging. This feature is used in conjunction with the items below: "Execute Disable Bit," "VMS," "Enable SMX," and "Lock Chipset" for Virtualization media support. The default setting is **No.**

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

Select Enable to support Intel® Execute Disable Bit Technology, which will allow the processor to designate areas in the system memory where an application code can be executed and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. This feature is used in conjunction with the items: "Clear MCA," "VMX," "Enable SMX," and "Lock Chipset" for Virtualization media support. The default setting is **Enable**. (Refer to Intel and Microsoft websites for more information.)

Intel TXT (Trusted Execution Technology) Support

Select Enable to support Intel Trusted Execution Technology to verify the authenticity of a platform and its operating system (OS). This feature is used in conjunction with the items below: "Clear MCA," "Enable SMX," and "Lock Chipset" for Virtualization media support. The options are **Enable** and Disable.

VMX

Select Enable to support CPU-related Virtualization. This feature is used in conjunction with the items: "Clear MCA," "Enable SMX," and "Lock Chipset" for Virtualization media support. The options are **Enable** and Disable.

Enable SMX

Select Enable to support Safer Mode Extensions (SMX) which will enhance data security in the processor. This feature is used in conjunction with the items: "Clear MCA," "VMX," and "Lock Chipset" for Virtualization media support. The options are Enable and **Disable**.

Lock Chipset

Select Enable to lock chipset register tables and set the register tables to "read-only" to prevent new data being written into the processor to ensure system security. This feature is used in conjunction with the items: "Clear MCA," "VMX," and "Enable SMX" for Virtualization media support. The options are **Enable** and Disable.

BIST Selection

Select Enable to configure Built-In_Self_Test (BIST) settings, which will allow the system to perform BIST testing on the processors at bootup. The options are Enable and **Disable**.

Hardware Prefetcher (Available when supported by the CPU)

If this item is 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 changes on this setting to take effect. Please refer to Intel's web site for detailed information.

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

If this item is 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 for CPU performance enhancement. The options are Disable and **Enable**.

DCU IP Prefetcher

If this feature is 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.

DCU Mode

Use this feature to set the data-prefecting mode for the DCU (Data Cache Unit). The options are **32KB 8Way Without ECC** and 16KB 4Way With ECC.

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 **Enable** and Disable.

DCA Prefetch Delay

A DCA Prefetcher is used with a TOE (TCP/IP Offload Engine) adapter to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching data too frequently can saturate the cache directory and delay necessary cache access. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120].

Extended 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 be expanded 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 (New Encryption Standard-New Instructions)

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

Down Stream PECI (Platform Environment Control Interface)

Select Enable to allow the client server to interact with the host server directly to achieve better host-client communication in the PECI platform, which will result in power saving and energy use efficiency. The options are **Disable** and Enable.

SMM Save State (System Management Mode)

Select Enable for SMM (System Management Mode) Save state support which is used for advanced power management and other operating-system-independent functions. The options are Enable and **Disable**.

Cbox Pipe Serial Mode

Cbox is the caching agent that works as the external cache and system interface unit within the Intel 7500 (or newer) series processors. Select Pipe Serial Mode Enable to connect various serial ports used by different host/client virtual machines together (pipe) for processor-interconnect and system-interface communications. The options are **Pipe Serial Mode Enable** and Pipe Serial Mode Disable.

▶ Advanced Power Management Configuration

Advanced Power Management Configuration

Power Technology

Select Energy Efficient to support power-saving mode, which might have an impact on system performance. Select Custom to customize system power settings. Select Max Performance to optimize system performance, which might increase power consumption. Select Disabled to disable power-saving settings. The options are Disabled, **Energy Efficient**, and Custom. 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 Enabled to use the Turbo Mode to boost system performance. The options are **Enable** and Disable.

P-state Coordination

This feature 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)

C2C3TT (C2-to-C3 Transaction Timer)

This feature sets the transaction timer from C2 to C3. Enter 0 for Auto, which will allow the BIOS to configure the transaction timer automatically. The Default setting is **0 (Auto)**.

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

▶ CPU T State Control

ACPI (Advanced Configuration Power Interface) T-States

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

▶ CPU Advanced PM (Power Management) Tuning

▶ Energy Perf (Performance) BIAS

Energy Performance Tuning

Select OS for the operating system to manage the settings of energy-performance tuning. Select BIOS for the BIOS to manage the settings of energy-performance tuning. The options are **OS** and BIOS.

Energy Performance Bias Setting

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Power, and Power.

Workload Configuration

Use this feature to set the power management setting optimized for regular workload condition. The options are **Balanced** and I/O sensitive.

▶ Socket RAPL (Running Average Power Limit) Configuration

Turbo Pwr (Power) Limit Lock

Select Enable to set the power use limit for the machine when it is running in the turbo mode. The options are Enable and **Disable**.

Long Pwr (Power) Limit Ovrd (Override)

Select Enable to support long-term power limit override. If this feature is set to Disabled, BIOS will set the default value. The options are Enable and **Disable**.

Short Pwr (Power) Limit En (Enable)

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

▶Chipset Configuration

▶North Bridge

This feature is used to configure Intel North Bridge settings.

▶Integrated IO 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.

IIO Configuration

Note: For /IIO1 Configuration/IIO2 Configuration/ IIO3 Configuration, please refer to Page 4-16.

IIO0 Configuration

PCI-E Completion Timeout

Select Enable for PCI-E Completion Timeout support for electric tuning. The options are **Enable** and Disable.

PCI-E Completion Timeout Value

Use this item to set the PCI-E Completion Time-out value for electric tuning. Enter a value between 260ms to 900ms.

▶PCI Express Port 0 (DMI)

Note: For PCI Express Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/Port 2D/ Port 3A/Port 3B/Port 3C/Port 3D, see the next section.

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

Use this feature to set the link speed for a selected PCI-E port to override the maximum link-width which was previously set by PCI-Bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force non-fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force correctable error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, II0 will never put its transmitter in the L0s state. The options are **Disable** and Enable.

▶PCI Express Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/ Port 2D/Port 3A/Port 3B/Port 3C/Port 3D

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

PCI-E Port Link

Select Disable to disable the link that is not involved in PCI training, but its CFG space is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

This item allows the user to set the link speed for a selected PCI-E port to override the maximum link-width which was previously set by PCI-Bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force the non-fatal error propogation to the II0 core error logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force the correctable error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, II0 will never put its transmitter in the L0s state. The options are **Disable** and Enable.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set PCI-E Gen3 Adaptive Equalization mode. The options are **Auto**, Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only, Enable Phase 0, 1 Only, and Advanced.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Gen3 device. The options are **Auto**, 0.70 July, 0.70 Sept and 071 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to configure the Loop-count setting for PCI-E Gen3 Phase 2. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN RX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream Resets (from the master device to a slave device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB) P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device).The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Hide Port?

Select Yes to hide a selected PCI-E port from the OS. The options are **No** and Yes.

IIO1 Configuration/IIO2 Configuration/IIO3 Configuration

IOU0 (II0 PCIE Port 2)

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

IOU1 (II0 PCIE Port 3)

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

PCI-E Completion Timeout

Select Enable to issue a "time-out" command when PCI-E electric tuning is completed. The options are **Enable** and Disable.

PCI-E Completion Timeout Value

Use this item to set the PCI-E Completion Time-out value. Enter a value between 260ms to 900ms.

No PCI-E Port Active EC0

This is a workaround setting when there is no active PCI-E port detected. The options are **PCU Squelch exit ignore option**, and Reset the SQ FLOP by CSR optio.

▶PCI Express Port 0/Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/Port 2D/Port 3A/Port 3B/Port 3C/Port 3D

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

PCI-E Port Link

Select Disable to disable the link that is not involved in training activities, but its CFG is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

Use this item to set the link speed for a selected PCI-E port to override the maximum link width that was set by PCI-bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force the non-fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force the correctable error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, II0 will never put its transmitter in the L0s state. The options are **Disable** and Enable.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set the "Adaptive Equalization" mode for PCI-E Generation 3 devices. The options are **Auto**, Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only, Enable Phase 0, 1 Only, and Advanced.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Generation 3 devices. The options are **Auto**, 0.70 July, 0.70 Sept and 071 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to set the PCI-E Generation 3 Phase 2 mode. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN TX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB) P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device).The options are **Auto**, P0 (-6.0/0.0 dB),

P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Hide Port?

Select Yes to hide the PCI-E port specified from the OS. The options are **No** and Yes.

▶Integrated IO Configuration

Enable I/OAT

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.

Disable TPH

Select Enable to de-activate TLP Processing Hint support. The options are **Disable** and Enable.

▶ II0 Generation Configuration

The following information will display:

TXT DPR memory setting

Use this item to set TXT DPR settings. The options are 1M DPR, **3M DPR**, 64M DPR, 128M DPR, and 255M DPR.

Unhide QPI PMU Counter

Select Enable to use the PCI-Express counters. Select Disable to hide the PCI-Express counters. The options are **Disable** and 255M Enable.

IIO0/IIO1/IIO2/IIO3

II0 IOAPCI

Select Enable to support IIO IOAPIC (I/O Advanced Power Interface Configuration). The options are **Enable** and Disable.

▶ Intel VT for Directed I/O (VT-d)

Intel VT for Direct I/O (VT-d)

Isoc

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

Intel® VT for Directed I/O (VT-d)

Select Enable to enable Intel Virtualization Technology support for Direct I/O VT-d 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.

VTD (VT-d) BARLock Enable

Select Enable to enable Bar-lock support for the devices used in Intel Virtualization Technology. The options are **Enable** and Disable.

Interrupt Remapping

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

Pass Through DMA

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

ATS

Select Enable for the Non-Iscoh VT-d engine to pass through ATS to enhance system performance. The options are **Enable** and Disable.

Super Pages

Select Enable for VT-d Super-Pages support to improve system performance. The options are **Enable** and Disable.

Coherence Support

Select Enable for Non-Iscoh VT-d Engine Coherence support to improve system performance. The options are **Disable** and Enable.

PCI Express Global Options

Gen3 (Generation 3) Phase3 Loop Count

Use this feature to set the Loop-Count value for PCI-E Gen3 Phase3 operations. The options are 1, 4, **16**, and 256.

Skip Halt On DMI Degradation

Select Enable to avoid the system being put on hold during DMI width/link degradation. The options are **Disable** and Enable.

Power Down Unused Ports

Select Enable to disable the PCI-E ports that are not active. The options are **Disable**, Enable, HSX Disable

▶QPI (Quick Path Interconnect) Configuration

QPI Status

The following information will display:

- Number of CPU
- Number of IIO
- LInk Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCI-E Configuration Base/Siz (Size)

Link Speed Mode

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

Link Frequency Select

Use this feature to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 7.2GB/s, 8.0GB/s, **Auto,** and Use Per LInk Setting.

Link L0p Enable

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

Link L1 Enable

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

Legacy VGA Socket

Enter the VGA socket number (from 0-7)t hat will used to support legacy VGA. The default setting is **0**.

MMIO P2P Disable

Select No to prevent MMIO (Memory-Mapped I/0) P2P (PCI-E device to PCI-E device) signals from crossing the CPU socket. The options are **No** and Yes.

PPIN Opt-in

Select Yes to use the Protected-Processor Inventory Number (PPIN) in the system. The options are **No** and Yes.

QPI Debut Print Level

Use this item to select the QPI Debug level that will be displayed in the monitor. The options are Fatal, Warning, Summary, Detail, and **All**.

Resource Auto Adjust

Select Enable for the PCI resource-requests for each CPU socket to be automatically adjusted on the need-base when the PCI resource allocator fails. The options are **Enable** and Disable.

▶QPI Per Socket Configuration

▶CPU 0/CPU 1

Bus Resource Allocation Ratio

Use this feature to set the bus resource-allocation ratio (from 0-8). The default setting is **1**.

IO Resource Allocation Ratio

Use this feature to set the IO resource-allocation ratio (from 0-8). The default setting is **1**.

MMIOL Resource Allocation Ratio

Use this feature to set the Memory-Mapped IO resource-allocation ratio (from 0-8). The default setting is **1**.

IIO UniPhy Disable

Select Yes to hide the entire UNIFY in L2 cache. The options are **No**, Yes, and Yes w/Memory Hot Add.

▶Memory Configuration

This section displays the following Integrated Memory Controller (IMC) information.

Promote Warnings

Select Enable to treat memory warnings as memory errors or memory faults for system-level debugging. The options are **Enable** and Disable.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified in the specification. The options are **Auto**, 1067, 1333, 1600, 1867, and 2133.

DDR Voltage Level

Select Auto for the BIOS to set the voltage settings for all DDR3 memory modules. Select Force to 1.50V to force all DDR3 memory modules to operate at 1.50V. The options are **Auto** and Force to 1.50V.

Advanced Clk (Clock) Training

Select Enable to support Advanced Clock Training, which will allow the memory command line to be synchronized with the clock line to enhance memory performance. The options are Enable and **Disable**.

Perbit (Per-bit) Deskew Training

Select Enable to support Perbit Deskew Training, which will allow the memory controller to include various adjustable delay circuits in both Read and Write paths on a per-bit base for effective memory interface to maximize memory performance. The options are **Disable** and Enable.

0DT (On-Die Termination) Timing Mode

Use this feature to configure the timing mode setting for the ODT (On-Die Termination) where the termination resistor for impedance matching in

transmission lines is located inside a chip instead of on a printed circuit board. The options are **Aggressive Timing** and Conservative Timing.

MxB Rank Sharing Mapping

Use this feature to select the address-mapping setting for memory-rank sharing to enhance extended multimedia platform performance. The options are **Maximum Performance** and Maximum Margin.

DIMM Vref. (Voltage Reference) Circuit

This feature allows the user to decide how to configure the voltage reference point (gate) for a DDR3 memory module. The options are Internal and **External**.

BIOS VMSE Reset

If this feature is set to Enable, BIOS settings pertaining to the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller will be reset to improve system performance. The options are Disable and **Enable**.

Save JCK Error Longs

Select Enable to save the JCK Error log at each system reset caused by system firmware. The options are Enable and **Disable**.

Phase Shedding

Select Enabled to enable Static Phase-Shedding support for DDR3 memory voltage regulators to improve memory performance. The options are **Auto**, Disabled and Enabled.

Multi-Threaded MRC (Memory Reference Code)

Select Enabled for the system to execute multi-threaded memory codes to improve memory performance. The options are **Auto**, Disabled and Enabled.

Rank Multiplication

Select Enabled to force the LRDIMM (Load-Reduced DIMM) memory modules to operate at the Rank-Multiplication mode for memory performance enhancement. The options are **Auto** and Enabled.

LRDIMM (Load-Reduction DIMM) Module Delay

When this item is set to Disabled, the MRC (Memory Regulator Controller) will not use SPD bytes 90-95 for module delay on LRDIMM memory. The options are **Disabled** and Auto.

Memory Type

Use this feature to select the memory type to be used in this system. The options are RDIMMs only, UDIMMs only, and **UDIMMs and RDIMMs**.

Skip MemTest (Memory Test) on Fast Boot

Select Enable to skip memory routine testing at bootup if this machine is set to Fast-boot mode. The options are Disable and **Enable**.

BDAT

Select Enabled for BDAT (Binary Data Advanced Technology) support to increase system performance. The options are **Disabled** and Enabled.

Data Scrambling

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

Scrambling Speed Low

Use this feature to set the data scrambling speed to low-32 bits. Enter a value between 0 and 32. The default setting is **0**.

Scrambling Speed High

Use this feature to set the data scrambling speed to high-32 bits. Enter a value between 0 and 32. The default setting is **0**.

Enable ADR

Select Enabled for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are Enabled and **Disabled**.

VMSE Lockstep Mode

Select Enabled to support the VMSE Lockstep mode, which will support Lock step mode for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **2:1 Mode**.

NB Persistent Error

Select Enable to allow the system to properly handle the persistent errors occurred in the North Bridge. The options are Enable and **Disable**.

SB Persistent Error

Select Enable to allow the system to properly handle the persistent errors occurred in the South Bridge. The options are is **Enable** and Disable.

SB Error Threshold

Use this feature to set the threshold for South Bridge errors. When the number of South Bridge errors reaches beyond the threshold, the system will automatically take corrective actions. The default setting is **10**.

Link Failure Threshold

Use this feature to set the link failure threshold. When the number reaches beyond the threshold, the system will automatically take corrective actions. The default setting is **7**.

Refresh Options

Use this feature to set self-refresh mode The options are **Acc Self Refresh** and 2x Refresh.

HA (Hash Mode) Early Write Post Mode

Select Enable to support memory hash-method-comparison mode when the system is running at the early stage of POST (Power-On-Self-Test). The options are is **Enable** and Disable.

MC Channel Hash Mode

Select Enabled to support the hash-method-comparison mode for the memory controller to improve memory performance. The options are Enabled and **Disabled**.

Unused Memory Channel Input

Select Enabled to allow input from unused memory channels. The options are **Enabled** and Disabled.

Command 2 Data Tuning

Select Enabled to fine-tune electrical command paths from the host system to the memory-extension buffer (MXB). The options are **Enabled** and Disabled.

JordonCreek Power Management

Select Enabled to activate power management features embedded in the Jordon Creek chip for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **Enabled** and Disabled.

MRC Debug Level

Use this feature to set the debugging level for memory reference codes, which are used for memory multiple threads initialization. The options are **L0**, L1 and L2.

Halt on Memory Fatal Error

Select Enabled to put the system on hold when a memory fatal error occurs. The options are **Enabled** and Disabled.

Promote MEM (Memory) Train Err (Error)

Select Enabled to promote warnings when a memory training-error occurs. The options are Enabled and **Disabled**.

Promote MEM (Memory) RAS Warnings

Select Enabled to promote warnings pertaining to RAS (Reliability, Availability, Serviceability) issues. The options are Enabled and **Disabled**.

Memory Test

When this feature is set to Enabled, memory tests will be performed in the system. The options are Enabled and **Disabled**.

JCK (Jordon Creek) per DIMM Parity Error Enable

Select Enabled for the system to monitor and keep track of DIMM parity errors occurred on each DIMM module. The options are Enabled and **Disabled**.

DRAM RAPL (Running Average Power Limit) Mode

Use this feature to set the run-time power-limit mode for DRAM modules. The options are Disabled, **VR Measured** and Estimated.

Closed Loop Thermal Throttling

Select Enabled to support Closed-Loop Thermal Throttling which will improve reliability and reduces CPU power consumption via automatic voltage control while the CPU are in idle states. The options are Disabled and **Enabled**.

Memory Hot Sense Thermal Throttling

Select Enabled to activate thermal-throttling when the hot-sensor reaches the predefined threshold via automatic voltage control when the CPU is in idle states. The options are **Enabled** and Disabled.

Memory Hot Output Thermal Throttling

Select Enabled to provide thermal-throttling warnings when the hot-sensor reaches the predefine threshold via automatic voltage control when the CPU is in idle states. The options are **Enabled** and Disabled.

MC ODT Mode

This feature sets the ODT (On-Die Termination) mode for the memory controller. The options are **Auto**, 100 Ohms, and 50 Ohms.

MRC (Memory Reference Code) Promote Warnings

Select Enabled for the system to provide MRC warnings to improve memory performance. The options are **Enabled** and Disabled.

Num (Number) of Sparing Transac (Transaction)

Use this feature to set the number of memory sparing transactions that will allow data to be written from a failing component to another component to ensure data security. The options are **4**.

PSMI Support

Select Enabled for Power Supply Management Interface (PSMI) support. The options are Enabled and **Disabled**.

VMSE Clock Stop

Select Enabled to de-activate the clock driver for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **Enabled** and Disabled.

Safe MC (Micro Code) BGF (Buffer Generation First-in-First-Out) PSV

Select Enabled to use the Micro-Code Safe mode to allow the onboard power control mechanism to supply power to the memory buffer on the on-demand basis in an effort to save power consumption. The options are Enabled and **Disabled**.

▶Memory Topology

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

- Node
- Channel
- DIMM Frequency

▶Memory Thermal

Memory Power Savings Mode

Use this item to configure chipset-related memory power-saving features. The options are Auto, **Slow**, Fast, Disabled, and User Defined.

▶Memory Power Savings Advanced Options

IBT (Intel Burn Test) Off

Select Enabled to turn off Intel Burn-in memory tests. The options are Disabled, **Auto**, and Enabled.

CK in SR

This feature is used to configure PCH behaviors while in self-refreshing cycles. The options are Auto, **Driven**, Tri-State, Pulled Low, and Pulled High.

MDLL Off

Select Enable to shut down MDLL (Multiple Delay-Locked Loop) operations while system memory is synchronizing resources for power-saving. The options are **Auto**, Disabled, and Enabled.

▶Extreme Memory Profile

XMP Profile Support

Select Enabled for Extreme Memory support. The options are **Disabled**, Profile 1, and Profile 2.

XMP Profile

Use this item to select which type of Extreme Profile to use. The options are **Disabled** and Manual.

Memory Frequency

Use this item to set the frequency of system memory. The options are **Auto**, 1067 (MHz), 1333 (MHz), 1600 (MHz), 1867 (MHz), 2133 (MHz), and 2400 (MHz).

▶Memory RAS (Reliability_Availability_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

Memory RAS Configuration Setup

Socket 0 Branch 0/Socket 0 Branch1/Socket 1 Branch 0/Socket 1 Branch1

Select Enable to enable the memory module installed on the socket specified by the user. The default setting is **Enable** and Disable.

Migration Spare

Use this feature to set the bit-mask of the riser card that is designated as a spare riser. The default setting is **0**.

Current Memory Speed

This item displays the current memory speed.

Mirroring

This item indicates if memory mirroring is supported by the motherboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing

This item indicates if memory sparing is supported by the motherboard. Memory sparing enhances system performance.

Memory Rank Sparing

This item indicates if memory rank sparing is supported by the motherboard. Memory rank sparing enhances system performance.

Spare Error/Memory Correctable Thr (Threshold)

Use this feature to set the correctable error threshold for spare memory modules. The default setting is **10**.

Leaky Bucket Low Bit

Use this feature to set the Low Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **40**.

Leaky Bucket High Bit

Use this feature to set the High Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **41**.

Publish SRAT (Static Resource Affinity Table)

Select Enable for the BIOS to report the ACPI SRAT table to the OS in order to enhance CPU and memory performance when the NUMA (Non-Uniformed Memory Access) is optimized. The options are **Enable** and Disable.

Memory Interleaving

Use this feature to set the DIMM memory interleaving mood. The options are NUMA (1-way) Node Interleave, 2-way Node Interleave, 4-way Interleave, 8 Way Interleaving, Inter-socket, and **Auto**.

Socket Interleave Below 4GB

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

Channel Interleaving

Use this feature to set the DIMM channel interleaving mood. The options are **Auto**, 1-Way Interleave, 2-Way Interleave, 3-Way Interleave, and 4-Way Interleave.

Rank Interleaving

Use this feature to select a rank memory interleaving method. The options are **Auto**, 1-Way, 2-Way, 4-Way, and 8-Way.

DRAM Maintenance

Select Auto for the BIOS to automatically configure DRAM Refreshing and Patrol settings. The options are Manual and **Auto**.

pTRR (Pseudo Target Row Refresh) Support

Select Enabled for Pseudo TRR support which will allow the BIOS to assign an invalid address to a questionable memory module to prevent this memory module from being accessed by other components. The options are **Enabled** and Disabled.

Injection Probability

AMEI (Asynchroous MCA Error Injection) (AMEI) is a error-handling mechanism that allows the BIOS to report the MCA errors to the CPU core or the CPU before resuming normal operations. This item is used to set the threshold of the AMEI events beyond which the BIOS will report the error events before resuming operations. The options are 512, 1024, 1365, 1638, 1820, 1928, 2048, 2731, 3277, 3641, **4096**, 5461, 6554, 8192, 10923, 16384, 32768.

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.

Memory Power Management

Select Enabled for memory power management support. The options are **Disabled** and Enabled.

Memory Rank Mask

Select Enabled to support memory rank in the memory controller. The options are **Disabled** and Enabled.

A7 Mode

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

DDDC Support

Select Enabled to enable Double-Device Data Correction (DDDC) support for the error-correction codes to correct memory errors caused by two failed DRAM devices. The options are **Disable** and Enable.

DDDC Wirekill (Wire-Kill)

Select Enabled for Double-Device Data Correction (DDDC) Wire-kill support which will disable the wire connection between two DRAM devices when they fail. The options are **Disable** and Enable.

DDDC Wirekill (Wire-Kill) Threshold

Use this feature to set the DDDC Wirekill threshold. When the memory errors reach the threshold,wire-connections between the failed DRAM modules will be disconnected. The default setting is **2**.

Apply Memory RAS (Reliability-Availability-Serviceability Policy Globally

When this item is set to Enabled, the configuration settings for memory sparing, Mirroring, DDDC, Device-Tagging will be applied to all nodes in the system. The options are **Disable** and Enable.

Apply Memory RAS Policy Globally

Select Enable to apply Memory RAS policy to all related components and systems. The options are **Disable** and Enable.

Memory Mirroring

Select Enable to enable memory-mirroring support which will create a duplicate copy of the data stored in the memory to enhance data security. The options are **Disable** and Enable.

▶South Bridge

This feature is used to configure Intel South Bridge settings.

▶USB Configuration

The following USB items will display.

- USB Module Version
- USB Devices

Legacy USB Support (Available when USB Functions is not Disabled)

Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disabled to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, **Enabled** and Auto.

U**SB 3.0 Support**

Select Enabled for USB 3.0 support. The options are Disabled and **Enabled**.

XHCI Hand-Off

This feature 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**.

USB Mass Storage Driver Support

Select Enabled to use USB mass storage devices. The options are Disabled and **Enabled**.

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support which will provide complete USB keyboard legacy support for the operating system that does not support Legacy USB devices. The options are Disabled and **Enabled**.

USB Hardware Delays and Time-outs

U**SB Transfer Time-out**

Use this feature sets the USB Transfer Time-out values for control, bulk, and interrupt transfers. The default setting is **20 sec (seconds)**.

Device Reset Time-out

Select Auto for the BIOS to automatically configure the delay maximum time setting before a USB device properly reports itself to the system. The options are **Auto** and Manual.

Device Power-up Delay

Use this feature sets the maximum time-out value for initialization of USB mass storage devices. The options are **Auto** and Manual.

Mass Storage Devices:

Aten Virtual CDROM YS0J

Use this feature select the emulation type for the mass storage device. The options are **Auto**, Floppy, Forced FDD, Hard Disk, and CD-ROM.

▶SATA Configuration

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

SATA Controller

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

Configure SATA as

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

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

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link in a low power mode during

extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Enabled** and Disabled.

SATA Port 0~ Port 5

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

- Model number of drive and capacity
- Software Preserve Support

Port 0~ Port 5

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

Port 0 ~ Port 5 Hot Plug

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

Port 0 ~ Port 5 Spin Up Device

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

Port 0 ~ Port 5 SATA Device Type

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

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

Serial ATA Port 0~ Port 5

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

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

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

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

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Enabled** and Disabled.

SATA RAID Option ROM/UEFI Driver

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

Serial ATA Port 0~ Port 5

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

- Model number of drive and capacity
- Software Preserve Support

Port 0~ Port 5

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

Port 0 ~ Port 5 Hot Plug

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

Port 0 ~ Port 5 Spin Up Device

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

Port 0 ~ Port 5 SATA Device Type

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

▶SCU (Storage Control Unit) Configuration

Storage Controller Unit

Select Enabled to enable PCH SCU storage devices. The options are Disable and **Enable**.

Onchip SCU Option ROM

Select Disabled to boot the system from a SAS device. Select EFI to boot the system from an EFI device. Select Legacy to boot the system from a Legacy SCU device. The options are Disable, EFI, and **Legacy**.

Boot from SCU or SATA RAID

Use this feature to select device from which the system will boot. The options are Boot from SCU, **Boot from SATA RAID**, Do not boot form SATA or SCU drives, and No Legacy RAM Space Restrictions.

The AMI BIOS will display the status of an SCU port as detected:

- SCU Port 0
- SCU Port 1
- SCU Port 2
- SCU Port 3

▶PCIe/PCI/PnP Configuration

PCI Latency Timer

Use this feature to set the latency timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are **32**, 64, 96, 128, 160, 192, 224 and 248 (PCI Bus Clocks).

VGA Palette Snoop

Select Enabled to support VGA palette register snooping which will allow the PCI cards that do not contain their own VGA color palette to examine the video cards palette and mimic it for proper color display. The options are **Disabled** and Enabled.

PERR# Generation

Select Enabled to allow a PCI/PCI-E device to generate a PCI/PCI-E Parity-Error (PERR) number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI/PCI-E device to generate a System-Error (SERR) number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

PCI AER (Advanced Error-Reporting) Support

Select Enabled to support Advanced Error-Reporting for onboard PCI devices. The options are **Disabled** and Enabled.

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**.

42-bit Address AOC

Select Enabled to enable 42-bit Address Add-On card for Nvidia Tesla support. The options are Enabled and **Disabled**.

SR-IOV Support (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 to allow 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, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

PCI AER (Advanced Error-Reporting) Support

Select Enabled to support Advanced Error-Reporting for onboard PCI devices. The options are **Disabled** and Enabled.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size 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

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0s, and Auto.

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

PCI Devices Option ROM Settiing

Slot1 x16 thru (through) SXB1 OPROM/Slot2 x16 thru (through) SXB1 OPROM/Slot SXB2 x8 thru (through) BPN-ADP-8SATA3-1 OPROM/Slot SXB3 x8 OPROM

Use this feature to select the type of device installed on a slot specified by the user for the system to boot from. The options are EFI, **Legacy** and Disabled.

NVME thru (through) BPN-ADP-8SATA3-1 OPROM

Use this feature to select the type of NVME (Non-Volatile Memory Express) device installed on the slot specified above for the system to boot from. The options are **EFI**, Legacy and Disabled.

Onboard Video OPROM

This feature controls how the system executes UEFI (Unified Extensible Firmware Interface), and legacy Option ROM. Select Legacy Only to boot the system using a legacy video device. The options are Do not launch, UEFI Only and **Legacy Only**.

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard** and Offboard.

Onboard LAN Option ROM Type

Use this item to select the device type for onboard LAN Option ROM for system boot. The options are EFI and **Legacy**.

Onboard LAN 1 OpROM/Onboard LAN 2 OpROM

Select iSCSI to use the iSCSI Option ROM to boot the computer using a iSCSI network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a PXE network device. The default option for Onboard LAN 1 is **PXE and for** Onboard LAN 2 is **Disabled.**

▶ME (Management Engine) Subsystem

This feature displays the following ME Subsystem Configuration settings.

General ME Configuration

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

▶Super IO Configuration

Super IO Chip: This item displays the Super IO chip used in the motherboard.

▶Serial Port 1 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 1 (COM).

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 (COM). Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2E8h; IRQ=IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **24MHz/13** and 24MHz.

▶Serial Port 2 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 2.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 2 (SOL). Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, O=2F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2E8h; IRQ=IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **24MHz/13** and 24MHz.

Serial Port 2 Attribute

Use this feature to select the attribute for this serial port. The options are **SOL** (Serial Over LAN), and COM.

▶Serial Port Console Redirection

COM 1 Console Redirection

This submenu allows the user to configure the following Console Redirection settings for this port.

Console Redirection

Select Enabled for Console Redirection support. The options are Enabled and **Disabled**.

COM2/SOL Console Redirection

This submenu allows the user to configure the following Console Redirection settings for the SOL Port specified by the user.

Console Redirection

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

▶Console Redirection Settings

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

Terminal Type

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

Bits Per second

Use this 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

This feature allows the user 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 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. When set to Bootloader, legacy console redirection is disabled before booting the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

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.

Console Redirection (for EMS)

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

▶Console Redirection Settings (for EMS)

This feature allows the user 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 used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1 Console Redirection** and COM2/SOL Console Redirection.

Terminal Type

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

Bits Per Second

This item sets 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, 57600, and **115200** (bits per second).

Flow Control

This feature allows the user 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,** Hardware RTS/CTS, and Software Xon/Xoff.

The setting for each these features is displayed:

Data Bits, Parity, Stop Bits

▶Trusted Computing (Available when a TPM device is detected by the BIOS)

Configuration

Security Device Support

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

TPM (Trusted-Platform Module) State

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

Pending Operation

Use this item to schedule an operation for the security device. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

> **Note:** The computer will reboot in order to execute the pending commands and change the state of the security device.

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

TPM Enable Status

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

TPM Active Status

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

TPM Owner Status

This item displays the status of TPM Ownership.

▶iSCSI Configuration

This item displays iSCSI configuration information:

iSCSI Initiator Name

This item displays the name of the iSCSI Initiator, which is a unique name used in the world. The name must use IQN format. The following actions can also be performed:

▶Add an Attempt

▶Delete Attempts

▶Change Attempt Order

7-4 Event Logs

Select the Event Logs tab to access the following submenu items.

▶Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Runtime Error Logging Support

Select Enabled to enable runtime error logging upon system boot. The options are **Auto**, Enabled, and Disabled.

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.

Erasing Settings

Erase Event Log

Select Enabled to erase the SMBIOS (System Management BIOS) event log, which is completed before a event logging is initialized upon system reboot. The options are **No**, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS 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 from 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

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

Custom Options

Log OEM Codes

Select Enabled to log the OEM's EFI Status codes that is not in Legacy format. The options are **Enabled** and Disabled.

Convert OEM Codes

Select Enabled to convert the OEM's EFI Status codes to standard SMBIOS-compatible codes. The options are **Enabled** and Disabled.

Note: Please reboot your system for your changes to take effect.

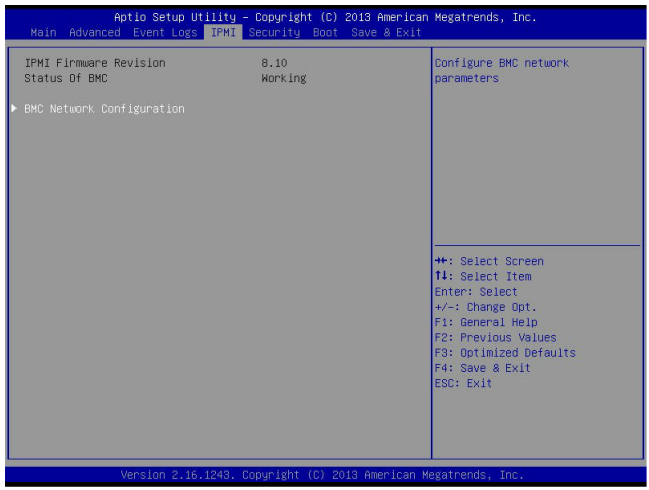
▶View SMBIOS Event Log

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

Date/Time/Error Code/Severity

7-5 IPMI

Select the IPMI (Intelligent Platform Management Interface) tab to access the following submenu items.



These items indicates your system IPMI firmware revision number and status.

- IPMI Firmware Revision
- IPMI Status

▶BMC Network Configuration

Update IPMI LAN Configuration

Select Yes for the AMI BIOS to configure the following IPMI LAN settings. The options are **No** and Yes. If the option is set to Yes, the following items will be available for the user to configure IPMI network settings:

Configuration Address Source (Available when the item above is set to Yes)

This feature allows the user to select the source of the IP address 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, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP**, Unspecified, and Static.

The following items are assigned IP addresses automatically if DHCP is selected, or can be configured manually if Static is selected.

Station IP Address (Available when the item above is set to Yes)

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 (Available when the item above is set to Yes)

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

Station MAC Address (Available when the item above is set to Yes)

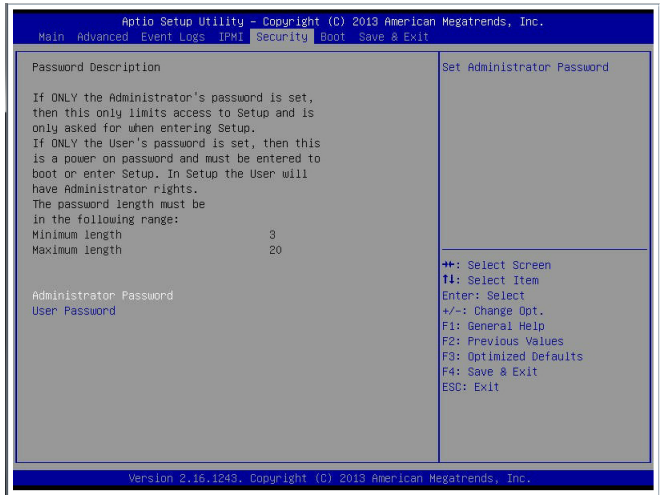
This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Router IP Address (Available when the item above is set to Yes)

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

7-6 Security

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



Administrator Password

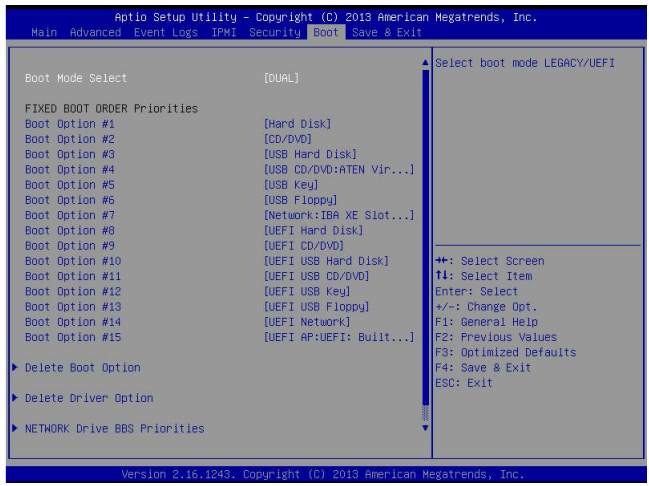
Use this item to set the administrator password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this item to set a user password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

7-7 Boot

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



Boot Mood Select

Use this item to configure boot mood select settings for the machine. The options are Legacy, UEFI, and **Dual**.

Fixed Boot Order Priorities

This option prioritizes the order of bootable devices that the system to boot from. Press [ENTER] on each entry from top to bottom to select devices.

- Boot Order #1 through #15

▶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.

▶Delete Driver Option

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

Delete Driver Option

Select the target driver to delete.

▶Hard Disk Drive BBS Priorities (Available when a device is installed in this drive)

This item sets the boot sequence of available hard disk drives.

- Boot Order #1

▶CD/DVD ROM Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶USB Hard Disk Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶Network Drive BBS Priorities (Available when a device is installed in this drive)

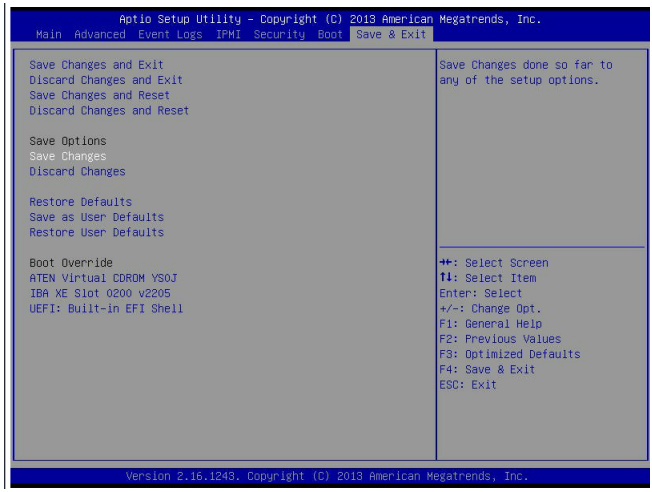
- Boot Order #1

▶UEFI Application Boot Priorities (Available when a device is installed in this drive)

- Boot Order #1

7-8 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.



Save Changes and Exit

When completing the system configuration changes, select this option to save the changes and exit from the BIOS setup utility. When a dialog box appears, asking you if you want to save configuration and exit, select Yes to save the changes and exit from the BIOS setup utility.

Discard Changes and Exit

Select this option to quit the BIOS setup without making any changes to the system configuration. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes.

Save Changes and Reset

When completing the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect.

Discard Changes and Reset

When completing the system configuration changes, select this option to discard the changes made the user and reboot the computer so that the new system configuration settings can take effect.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've made so far and return to the AMI BIOS utility. When the dialog box appears, asking you if you want to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

Restore Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load the factory defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized defaults.

Save as User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, select **Yes** to save the current values as user's default settings, or select No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to override the Boot Option Priority sequence set in the Boot menu, and boot the system with one of the listed devices instead. This is a one-time override.

Appendix A

BIOS POST Error Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

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

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

BIOS POST Error Codes		
Beep Code	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
1 long beep + 8 short beeps	Display memory read/write error or no video	No video display, video adapter missing or with faulty memory
Continuous high (pitch) + low (pitch)	System Overheat	System overheat

Notes

Appendix B

System Specifications

Processors

Each node has dual Intel Xeon E7-8800 v2/E7-4800 v2/E7-2800 v2 series processors in LGA 2011 sockets (Socket R1)

Chipset

Each node has Intel C602 chipset

BIOS

128Mb SPI Flash EEPROM with AMI BIOS

Memory Capacity

Each node has 32 DIMM slots supporting up to 1TB RDIMM or up to 2TB of LRDIMM memory of type 1600/1333/1066/800MHz ECC DDR3 SDRAM 72-bit, 240-pin gold-plated DIMMs.

DIMM sizes up to 32GB (RDIMM @ 1.25V, 1.5V, LRDIMM @ 1.35V, 1.5V)

Drives

Each node supports eight 2.5" SATA 3.0 ports, which allow RAID 0, 1, 5, 10. The SATA drives are hot-swappable. Additional SATA ports are available with a PCIe expansion card.

Each node also supports two NVMe drives

Expansion Slots

The node has:

- Two PCI Express x16 slots for full height, half length expansion cards
- One PCIe x8 microLP card
- Two solid-state drive (SSD) slots for non-volatile memory express (NVMe) drives with Windows 8 support

Serverboard

Each node has X10DBT-T (Proprietary form factor)
Dimensions: 19.33" x 13.68" (491 mm x 347 mm)

Chassis

SC227HD-R1K28
Form Factor: 2U rackmount with two node drawers
Dimensions: 17.2" x 3.5" x 28.6" (437mm x 89mm x 726mm)

Weight

Gross (Bare Bone): 50 lbs. (22.7 kg.)

System Cooling

Four 8cm four pin PWM heavy-duty fans

System Input Power Requirements

AC Input Voltage: 100-240 VAC
100-140V: 12-8A, 50-60 Hz
180-240: 8-6A, 50-60 Hz

Output Power

Rated Output Power: 1280W Platinum certified redundant modules
Output Voltages:
1000W: +12V (83A), +5Vsb (4A)
1280W: +12V (107A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º 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”

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