



**MBI-6128R-T2  
MBI-6128R-T2X**

**MicroBlade Module**



**User's Manual**

Revision 1.0e

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Manual Revision 1.0e

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# Preface

## About this Manual

This manual is written for professional system integrators, Information Technology professionals, service personnel and technicians. It provides information for the installation and use of the Supermicro MBI-6128R-T2/T2X MicroBlade module. Installation and maintenance should be performed by experienced professionals only.

## Manual Organization

### Chapter 1: Introduction

The first chapter provides a checklist of the main components included with MBI-6128R-T2/T2X MicroBlade module and describes their main features.

### Chapter 2: System Safety

You should familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing MBI-6128R-T2/T2X MicroBlade module.

### Chapter 3: Setup and Installation

Refer to this chapter for details on installing the MBI-6128R-T2/T2X MicroBlade module into the MicroBlade chassis. Other sections cover the installation and placement of memory modules and the installation of hard disk drives into the blade module.

### Chapter 4: Blade Module Features

This chapter covers features and component information about MBI-6128R-T2/T2X MicroBlade module. Included here are descriptions and information for motherboard components, connectors, LEDs and other features of the blade module.

### Chapter 5: BIOS

BIOS setup is covered in this chapter for MBI-6128R-T2/T2X MicroBlade module.

### Appendix A: BIOS POST Codes

BIOS POST Codes for MBI-6128R-T2/T2X MicroBlade module are explained in this appendix.

## Secure Data Deletion

A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: [https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wftp/utility/Log9\\_Secure\\_Data\\_Deletion\\_Utility/](https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wftp/utility/Log9_Secure_Data_Deletion_Utility/)

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# Chapter 1

## Introduction

### 1-1 Overview

This user's manual covers the MBI-6128R-T2/T2X MicroBlade module. This MicroBlade module is a compact self-contained server that connects into a pre-cabled enclosure that provides power, cooling, management and networking functions. One enclosure for the MBI-6128R-T2/T2X MicroBlade module can hold twenty-eight blade units. The only difference between these modules is that the MBI-6128R-T2X module uses 10Gbps Ethernet ports whereas the MBI-6128R-T2 module uses only 1Gbps Ethernet ports.

In this manual, "blade system" refers to the entire system (including the enclosure and blades units), "blade", "MicroBlade" or "blade unit" refers to a single MicroBlade module and "blade enclosure" is the chassis that the MicroBlades, power supplies and MicroBlade modules are housed within.

Please refer to our web site for information on operating systems that have been certified for use with the MicroBlade (<http://www.supermicro.com/products/nfo/microblade.cfm>).

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

- Supermicro product manuals: <http://www.MicroBlade.com/support/manuals/>
- Product drivers and utilities: <http://www.supermicro.com>
- Product safety information: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)
- If you have any questions, please contact our support team at:  
**support@supermicro.com**

**Note:** A complete list of safety warnings is provided on the Supermicro web site at [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm).

## 1-2 Blade Module Features

**Table 1-1** lists the main features of the MBI-6128R-T2/T2X MicroBlade module. See the proceeding section for components typically included in a blade system and other optional components. Specific details for the MBI-6128R-T2/T2X MicroBlade module are found in [Chapter 4: "MicroBlade Module Features" on page 4-1](#).

**Table 1-1. MBI-6128R-T2/T2X MicroBlade Module Specification Features**

|                         |                                                                                                                                                |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Motherboard             | B1DRi/(proprietary form factor)                                                                                                                |
| Blade System Enclosures | MBE-628E-420/820                                                                                                                               |
| Chassis Specifications  | Chassis Dimensions (HxWxD): 1.2" x 4.94" x 23.2" (30.48-mm x 125.476-mm x 589.28-mm), Gross Weight: 7.5 lbs (3.4 kg)                           |
| Processors              | Two Intel® Xeon® E5-2600 V3/V4 embedded in LGA2011 sockets on the motherboard                                                                  |
| Chipset                 | Intel C612                                                                                                                                     |
| BIOS                    | 128 MB SPI Flash EEPROM with AMI® BIOS                                                                                                         |
| Memory Capacity         | Supports up to 256 GB VLP RDIMM of DDR4 2400/2133 MHz speed and 32 GB, 16 GB, 8 GB and 4 GB size VLP DIMM memory in eight 288-pin DIMM sockets |
| Hard Drive Bays         | The blade module supports two 2.5" SATA3 HDD/SSD SATA3 HDD/SSD disk drives                                                                     |

### Processors

The MBI-6128R-T2/T2X MicroBlade module supports two Intel Xeon E5-2600 V3/V4 series processors in LGA2011 sockets embedded in the motherboard.

Refer to the Supermicro web site for a complete listing of supported processors (<http://www.supermicro.com/products/microblade>). Please note that you will need to check the detailed specifications of a particular blade module for a list of the CPUs it supports.

Details on installation of the processor into the MBI-6128R-T2/T2X MicroBlade module are found in [Chapter 3: "Setup and Installation" on page 3-1](#).

### Memory

Each of the MBI-6128R-T2/T2X MicroBlade module's nodes has eight 288-pin DIMM sockets that can support up to 256 GB VLP RDIMM of DDR4 2400/2133 MHz speed, 32 GB, 16 GB, 8 GB and 4 GB size VLP DIMM memory. Memory is interleaved, which requires both modules to be of the same size and speed.

Please refer to the Supermicro web site for a list of supported memory <http://www.supermicro.com/products/microblade>. The detailed specifications for a blade module will contain a link to a list of recommended memory sizes and manufacturers.

Details on installation of memory modules into the MBI-6128R-T2/T2X MicroBlade module are found in [Chapter 3: "Setup and Installation" on page 3-1](#).

## Storage

The MBI-6128R-T2/T2X MicroBlade module has two 2.5" SATA3 HDD/SSD internally mounted drives and one SATA-DOM drive that it can also use for storage or for installation of the node's operating system. See [Chapter 3: "Setup and Installation"](#) on [page 3-1](#) for storage installation details.

## RAID

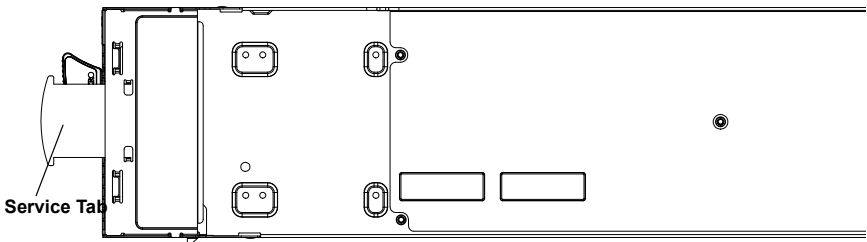
The MBI-6128R-T2/T2X MicroBlade module has only two hard drives, so only a RAID 0 or 1 array is possible.

## Density

A maximum of twenty-eight blade modules may be installed into a single blade enclosure. Each blade enclosure is a 6U form factor, so a standard 42U rack may accommodate up to seven enclosures with 196 blade modules, the equivalent of 784 1U servers. With the inclusion of up to fourteen CMM modules and up to twenty-eight Gigabit Ethernet switches this would occupy up to 826U space in a conventional 1U server configuration.

## BMC Password

For security, each blade unit is assigned a unique default BMC password for the ADMIN user. It can be found on a sticker on the blade service tab, and a sticker on the motherboard. The sticker also displays the BMC MAC address. For more information, refer to our website at [https://www.supernmicro.com/en/support/BMC\\_Unique\\_Password](https://www.supernmicro.com/en/support/BMC_Unique_Password). The service tab and an example sticker are illustrated below.



Password  
Sticker



## 1-3 Contacting Supermicro

### Headquarters

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

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

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

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

### Europe

Address: Super Micro Computer B.V.  
Het Sterrenbeeld 28, 5215 ML  
's-Hertogenbosch, The Netherlands

Tel: +31 (0) 73-6400390

Fax: +31 (0) 73-6416525

Email: [sales@supermicro.nl](mailto:sales@supermicro.nl) (General Information)  
[support@supermicro.nl](mailto:support@supermicro.nl) (Technical Support)  
[rma@supermicro.nl](mailto:rma@supermicro.nl) (Customer Support)

### Asia-Pacific

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

Technical Support:

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# Chapter 2

## Standardized Warning Statements

### 2-1 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 website at [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm).

#### Warning Definition



##### Warning!

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

##### 警告の定義

この警告サインは危険を意味します。

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

此警告符号代表危險。

您正處於可能受到嚴重傷害的工作環境中。在您使用設備開始工作之前，必須充分意識到觸電的危險，並熟練掌握防止事故發生的標準工作程序。請根據每項警告結尾的聲明號碼找到此設備的安全性警告說明的翻譯文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

## **Warnung**

### **WICHTIGE SICHERHEITSHINWEISE**

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

BEWAHREN SIE DIESE HINWEISE GUT AUF.

### **INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

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

GUARDE ESTAS INSTRUCCIONES.

### **IMPORTANTES INFORMATIONS DE SÉCURITÉ**

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

CONSERVEZ CES INFORMATIONS.

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

יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

تحذير! هذا الرمز يعني خطر انك في حالة يمكن أن تتسبب في اصابة جسيمة .  
قبل أن تعمل على أي معدات، كن على علم بالمخاطر الناجمة عن الدوائر  
الكهربائية

وكن على دراية بالممارسات الوقائية لمنع وقوع أي حوادث  
استخدم رقم البيان المنصوص في نهاية كل تحذير للعثور ترجمتها

안전을 위한 주의사항

경고 !

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

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

### **BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

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

BEWAAR DEZE INSTRUCTIES

### **Installation Instructions**



#### **Warning!**

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

### **設置手順書**

システムを電源に接続する前に、設置手順書をお読み下さい。

#### **警告**

将此系统连接电源前，请先阅读安装说明。

#### **警告**

將系統與電源連接前，請先閱讀安裝說明。

### **Warnung**

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

### **¡Advertencia!**

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

### Attention

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

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقرأ إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

### Waarschuwing

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

### Circuit Breaker



#### Warning!

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

20 A.

サーキット・ブレーカー

この製品は、短絡（過電流）保護装置がある建物での設置を前提としています。

保護装置の定格が 250 V、20 A を超えないことを確認下さい。

#### 警告

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

#### 警告

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

### Warnung

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

### ¡Advertencia!

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

### Attention

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

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

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

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

경고 !

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

### Waarschuwing

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

### Power Disconnection Warning



#### Warning!

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

#### 電源切断の警告

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 châssis pour installer ou enlever des composants de système.

## אזהרה מפני ניתוק חשמלי

### אזהרה !

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

يجب فصل النظام من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل الوصول إلى المناطق الداخلية للهيكل لتثبيت أو إزالة مكونات الجهاز

경고 !

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

### Waarschuwing

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

## Equipment Installation



### Warning!

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

### 機器の設置

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

### 警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

### 警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

### Warnung

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

### ¡Advertencia!

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

### Attention

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

אזהרה !

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

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتكوين واستبدال أو خدمة هذا الجهاز  
경고 !

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

### Waarschuwing

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

### Restricted Area



#### Warning!

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

#### アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

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

#### 警告

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

#### 警告

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

### אזור עם גישה מוגבלת

#### אזהרה !

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

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

경고 !

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

### Waarschuwing

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

## Battery Handling



### Warning!

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

### 電池の取り扱い

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

### 警告

電池更換不當會有爆炸危險。請只使用同類電池或制造商推荐的功能相当的電池更換原有電池。請按制造商的說明處理廢旧電池。

### 警告

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

### Warnung

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

### Attention

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

### ¡Advertencia!

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

### אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة فعليك  
استبدال البطارية  
فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة  
تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة

경고 !

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

### Waarschuwing

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

## Redundant Power Supplies



### Warning!

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

### 冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

### 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 Strom zugeführt wird, müssen alle Verbindungen entfernt werden.

### ¡Advertencia!

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

### Attention

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

אם קיים יותר מספק אחד

אזהרה !

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

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

경고 !

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

### Waarschuwing

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

### Backplane Voltage



#### 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・背板上有很危險的電壓或能量・進行維修時務必小心。

### Warnung

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

### ¡Advertencia!

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

### Attention

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

## מתח בפנל האחורי

אזהרה !

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

هناك خطر من التيار الكهربائي أو الطاقة الموجودة على اللوحة عندما يكون النظام يعمل كن حذرا عند خدمة هذا الجهاز

경고 !

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

### Waarschuwing

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

### Comply with Local and National Electrical Codes



#### Warning!

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

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

### Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

### ¡Advertencia!

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

### Attention

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

## תיאום חוקי החשמל הארצי

אזהרה !

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والوطنية المتعلقة  
بالكهرباء

경고 !

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다 .

### **Waarschuwing**

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

## **Product Disposal**



### **Warning!**

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

### **製品の廃棄**

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

### **警告**

本产品的废弃处理应根据所有国家的法律和规章进行。

### **警告**

本產品的廢棄處理應根據所有國家的法律和規章進行。

### **Warnung**

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

### **¡Advertencia!**

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

### **Attention**

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

## **סילוק המוצר**

**אזהרה !**

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

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

경고 !

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

### Waarschuwing

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

## Hot Swap Fan Warning



### Warning!

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

### ファン・ホットスワップの警告

シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

### 警告 !

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

### 警告

危険的可移動性零件。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

Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

### ¡Advertencia!

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

### Attention

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

אזהרה!

חלקים נעים מסוכנים. התרחק מלהבי המאוורר בפעולה כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את

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

새시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

### Waarschuwing

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

### Power Cable and AC Adapter



#### Warning!

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

#### 電源コードと AC アダプター

製品を設置する場合、提供または指定された接続ケーブル、電源コードと AC アダプターを使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。電気用品安全法は、UL または CSA 認定のケーブル (UL/CSE マークがコードに表記) を Supermicro が指定する製品以外に使用することを禁止しています。

#### 警告

安装此产品时, 请使用本身提供的或指定的或采购的连接线, 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

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

### ¡Advertencia!

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

### Attention

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

## חשמליים ומתאמי AC

אזהרה !

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

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

### 경고 !

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

### Waarschuwing

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



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# Chapter 3

## Setup and Installation

### 3-1 Overview

This chapter covers the setup and installation of the MicroBlade module and its components.

### 3-2 Installing MicroBlade Modules

Up to twenty-eight MBI-6128R-T2/T2X MicroBlade module may be installed into a single MBE-628E-420/820 MicroBlade module enclosure. MicroBlade modules with Windows and Linux operating systems may be mixed together in the same blade enclosure.

#### Powering Up a MicroBlade Module Unit

Each MicroBlade module unit may be powered on and off independently from the rest of the MicroBlade modules installed in the same enclosure. A MicroBlade module unit may be powered up in two ways:

- Press the power button on the MicroBlade module unit.
- Use IPMIView or the web-browser based management utility to apply power using the CMM MicroBlade module.

#### Powering Down a MicroBlade Module Unit

A MicroBlade module unit may be powered down in either of the following ways:

- Press the power button on the MicroBlade module unit.
- Use IPMIView or the web-browser based management utility to power down (if you have Operator or Admin privileges on the CMM).
- Use IPMITool when connected to the CMM to power down (if you have Operator or Admin privileges on the CMM).

## Removing a MicroBlade Module Unit from the Enclosure

Although the MicroBlade module system may continue to run, individual MicroBlade modules should always be powered down before removing them from the enclosure.

### ***Removing a MicroBlade Module Unit from the Enclosure***

1. Power down the MicroBlade module unit (see ["Powering Down a MicroBlade Module Unit"](#) above).
2. Squeeze both handles to depress the red sections then pull out both handles completely and use them to pull the MicroBlade module unit from the enclosure.

**Note:** MicroBlade modules can be hot-plugged from the enclosure.

## Installing a Blade Unit into the Enclosure

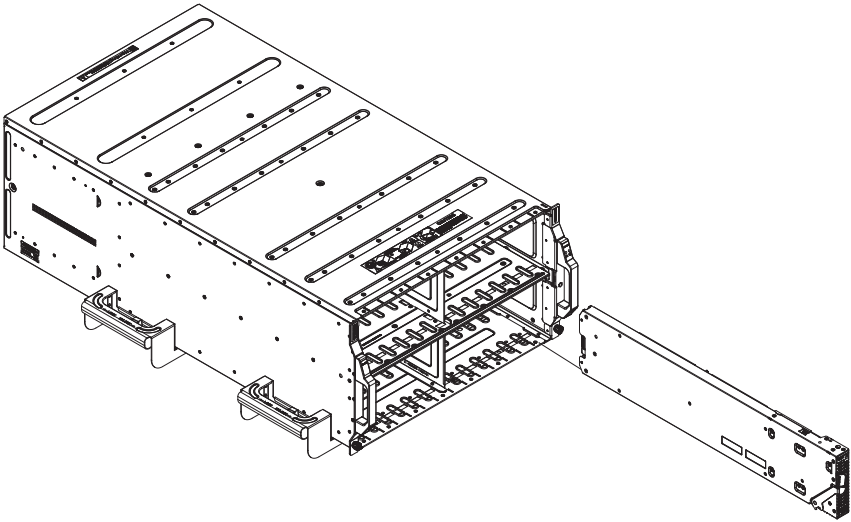
Use the procedure below to install a blade unit into an enclosure.

### ***Installing a MicroBlade Module Unit into the Enclosure***

1. Slowly push the MicroBlade module unit into its bay with the handles fully pulled out (see [Figure 3-1](#)).
2. When the MicroBlade module stops, push the handles back in to their locked position, making sure the notches in both handles catch the lip of the enclosure.

**Note:** MicroBlade modules can be Hot-Plugged into the enclosure.

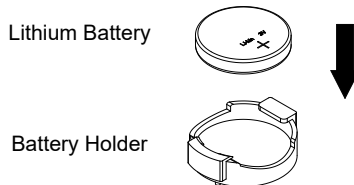
**Caution:** Use extreme caution when inserting a MicroBlade module into the enclosure. If the MicroBlade module's power connector becomes damaged, it can damage pins on other MicroBlade module bays that it is inserted into.

**Figure 3-1. Inserting a MicroBlade Module into the Enclosure**

### 3-3 Onboard Battery Installation

A battery is included on the motherboard to supply certain volatile memory components with power when power has been removed from the MicroBlade module. If this battery dies, it must be replaced with an equivalent CR2032 Lithium 3V battery. Dispose of used batteries according to the manufacturer's instructions. See [Figure 3-2](#) for a diagram of installing a new onboard battery.

**Caution:** There is a danger of explosion if the onboard battery is installed upside down, which reverses its polarities.

**Figure 3-2. Installing the Onboard Battery**

## 3-4 Processor and Heatsink Installation

**WARNING: Warning!** When handling the processor package, avoid placing direct pressure on the label area.

**WARNING: Warning!** Always connect the power cord last, and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

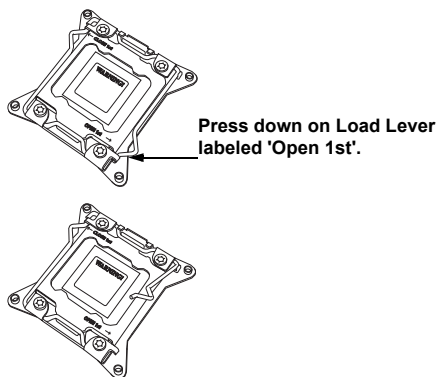
**Important!** If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.

### Notes:

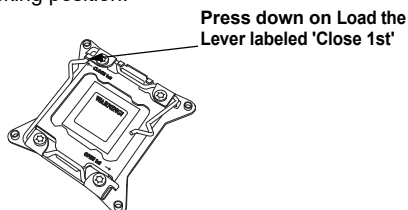
- Make sure to install the system board into the chassis before you install the CPU heatsink.
- When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro website for updates on CPU support.

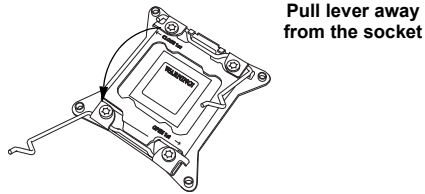
### *Installing the LGA2011 Processor*

1. There are two load levers on the LGA2011 socket. To open the socket cover, first press and release the load lever labeled 'Open 1st'.

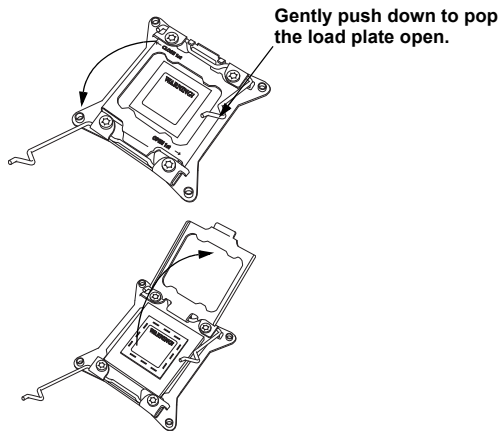


2. Press the second load lever labeled 'Close 1st' to release the load plate that covers the CPU socket from its locking position.

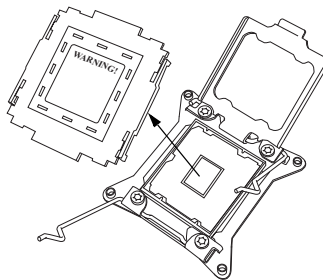




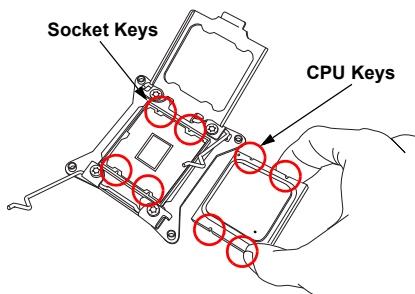
3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.



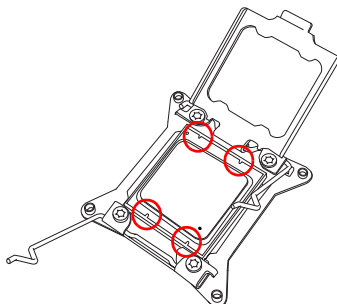
4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.



5. Use your thumb and index finger to hold the CPU on its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.

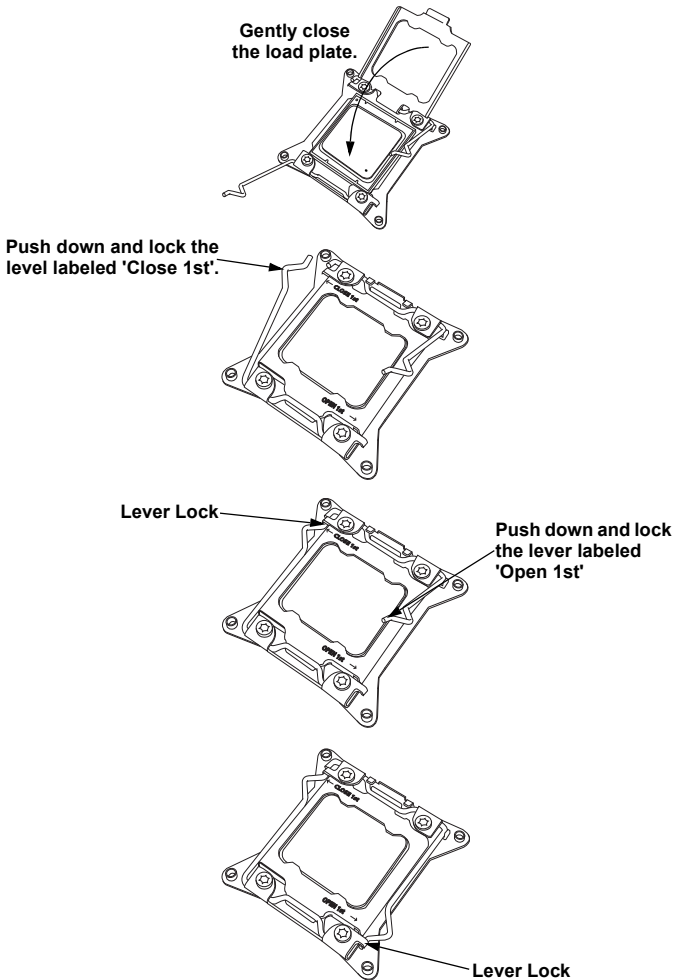


6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)



7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

8. Close the load plate with the CPU inside the socket. Lock the lever labeled 'Close 1st' first, then lock the lever labeled 'Open 1st' second. Use your thumb to gently push the load levers down to the lever locks.



### Installing a Passive CPU Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die -- the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard's and the Heatsink Bracket underneath.

**Note:** The direction of the fins on the heatsink should align with the direction of the airflow in your system.

3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (-do not over-tighten the screws to avoid possible damage to the CPU.)
4. Finish the installation by fully tightening all four screws.

**Note:** The heatsink with the air tunnel (SNK-P0047PSC) needs to be at the CPU1 location with the air tunnel facing to the right (when looking from the front of the system) in order to increase the airflow for CPU2 heat sink (SNK-P0047PS).

### Removing the Heatsink

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

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.
2. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)
3. Remove the heatsink from the CPU.

### 3-5 Memory Installation

The motherboard of each blade unit must be populated with DIMMs (Dual In-line Memory Modules) to provide system memory. **The DIMMs should all be of the same size and speed and from the same Super Micro authorized manufacturer due to compatibility issues.** See details below on supported memory and our web site ([www.supermicro.com/products/superblade](http://www.supermicro.com/products/superblade) for recommended memory.

#### Populating Memory Slots

The motherboard of a MBI-6128R-T2/T2X blade module has eight (8) memory slots, four for each processor. Both interleaved and non-interleaved memory are supported, so you may populate any number of DIMM slots.

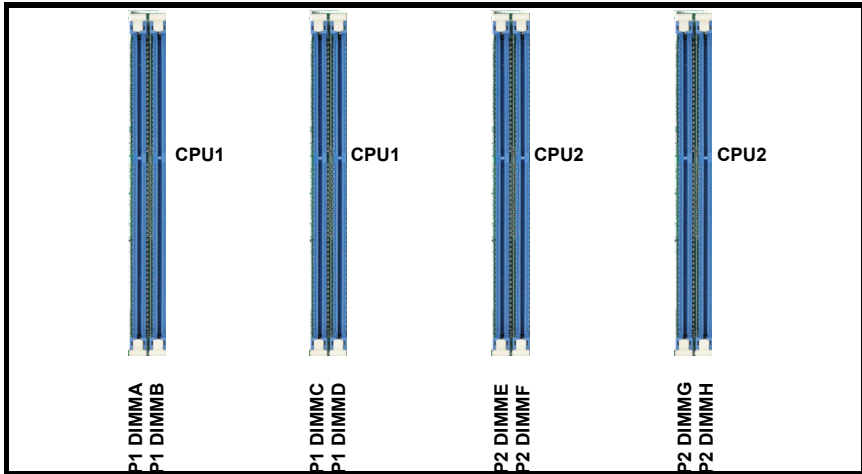
Populating two slots at a time (DIMM1A + DIMM2A, DIMM3A + DIMM4A, etc.) with memory modules of the same size and of the same type will result in dual-channel, interleaved memory, which is faster than single-channel, non-interleaved memory. See [Table 3-1: "Populating Eight Memory Slots for Interleaved Operation" on page 3-9](#) for details.

**For an interleaved configuration, memory modules of the same size and speed must be installed in pairs. You should not mix DIMMs of different sizes and speeds.**

**Table 3-1. Populating Eight Memory Slots for Interleaved Operation**

| # of DIMMs | CPU1      |           |           |           | CPU2      |           |           |           |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|            | Channel A | Channel B | Channel C | Channel D | Channel E | Channel F | Channel G | Channel H |
| 4          | X         |           | X         |           | X         |           | X         |           |
| 8          | X         | X         | X         | X         | X         | X         | X         | X         |

**Figure 3-3. 16-slot DIMM Numbering**



**Note:** Though multiple DIMM memory module types and speeds may be supported, you need to use DIMM memory modules of the same speed and type.

**Note:** An "X" in [Table 3-1](#) indicates the memory slot is populated by a DIMM module.

**Note:** For an optimized memory bandwidth, it is recommended that you populate the memory modules in sets of four DIMMs for the CPU's.

## DIMM Installation

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

### *Installing DIMM Memory Modules*

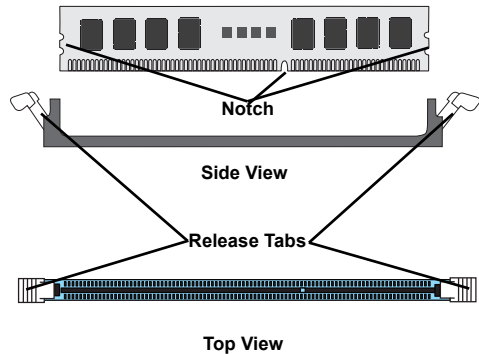
1. Power down the blade module (see ["Powering Down a MicroBlade Module Unit" on page 3-1](#)).
2. Remove the blade from the enclosure.
3. Remove the air shroud that covers the DIMM slots.
4. Insert each DIMM vertically into its slot, starting with slots A1 and A2. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM incorrectly (see [Figure 3-4](#)).

**Figure 3-4. Installing a DIMM into a Memory Slot**

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

**To Remove:** Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

**Note:** The notch should align with the receptive key point on the



5. Gently press down on the DIMM until it snaps into place in the slot. Repeat for all modules (see [Table 3-1](#) for installing DIMMs into the slots in the correct order).
6. Replace the air shroud and install the blade module back into the enclosure.
7. Power up the blade unit (see ["Powering Up a MicroBlade Module Unit" on page 3-1](#)).

## 3-6 Hard Disk Drive Installation

A single SATA3 HDD/SSD can be installed in the MicroBlade module for each node (four nodes/drives total) and cannot be removed or replaced without powering down the blade unit they reside in. A blade module needs a hard disk drive with an operating system installed to operate.

## 3-7 Installing the Operating System

An operating system (OS) must be installed on each MicroBlade module. Blades with Microsoft Windows OS and blades with Linux OS can both occupy and operate within the same blade enclosure. Refer to the SuperMicro web site for a complete list of supported operating systems.

There are several methods of installing an OS to the blade modules.

### Installing with a SATA-DOM Module

The MBI-6128R-T2/T2X MicroBlade module contains a SATA-DOM socket for each node on the motherboard. The operating system can be installed separately onto the SATA-DOM module, which when plugged into the SATA-DOM socket of a node of the MBI-6128R-T2/T2X MicroBlade module, can be used as the system's operating system just as if it was a hard disk drive of the system.

## Installing via PXE Boot

PXE (Preboot Execution Environment) is used to boot a computer over a network. To install the OS via PXE, the following conditions must be met:

1. The PXE BOOT option in BIOS must be enabled.
2. A PXE server has been configured (this can be another blade in the system).
3. The PXE server must be connected over a network to the blade to be booted.
4. The blade has only non-partitioned/unformatted hard drives installed and no bootable devices attached to it.

Once these conditions are met, make sure the PXE server is running. Then turn on the blade on which you wish to boot and/or install the OS. The BIOS in the blade will look at all bootable devices and finding none will connect to the PXE server to begin the boot/install.

## Installing via Virtual Media (Drive Redirection)

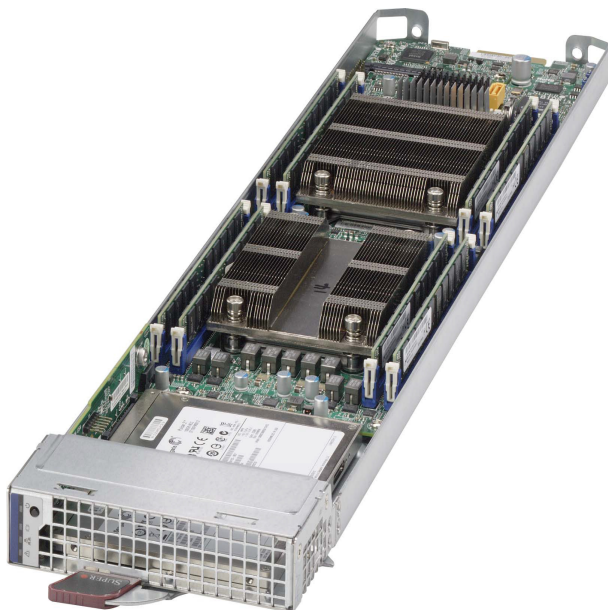
You can install the OS via Virtual Media through either the *IPMIview* (Java based client utility), *IPMITool* or the *Web-based Management Utility*. With this method, the OS is installed from an ISO image that resides on another system/blade.

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# Chapter 4

## MicroBlade Module Features

**Figure 4-1. MBI-6128R-T2/T2X Blade Unit Front View**



This chapter describes the MBI-6128R-T2/T2X MicroBlade module unit. Installation and maintenance should be performed by experienced technicians only.

See [Figure 4-1](#) for a front view of the blade unit and [Table 4-1](#) for its features.

**Table 4-1. MBI-6128R-T2/T2X Blade Unit Features**

| Feature    | Description                                                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Processors | Supports two Intel Xeon E5-2600 V3/V4 processors embedded in LGA2011 sockets on the motherboard                                                  |
| Memory     | Supports up to 256 GB VLP RDIMM of DDR4 2400/2133 MHz speed and 32 GB, 16 GB, 8 GB and 4 GB size RDIMM memory SDRAM in eight (8) 288-pin sockets |
| Storage    | Supports two (2) 2.5" SATA3 HDD/SSD SATA3 HDD/SSD disk drives and one SATA DOM                                                                   |
| BIOS       | 128 MB SPI Flash EEPROM with AMI® BIOS                                                                                                           |

### 4-1 Control Panel

Each MicroBlade module has a similar control panel (Figure 4-2) with power on/off button, reset button and LEDs on the front left side of the module. The numbers mentioned in Figure 4-2 are described in Table 4-2.

Figure 4-2. Blade Control Panel

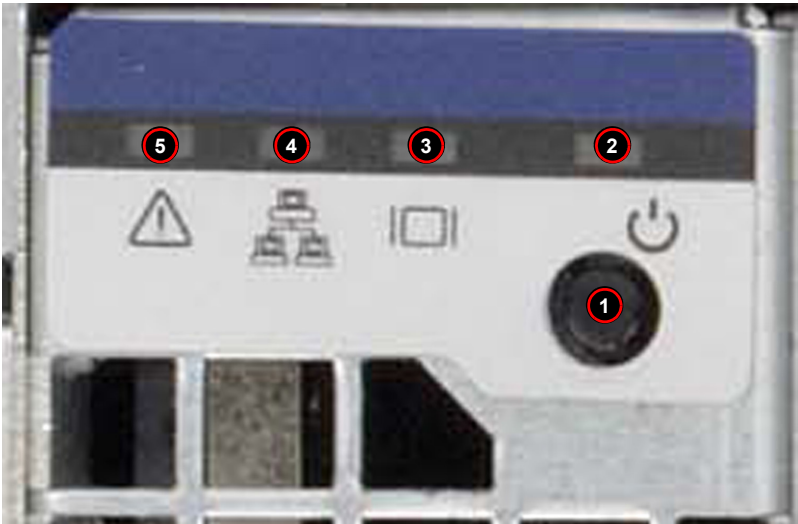


Table 4-2. Blade Control Panel

| Item | Function               | State           | Description                                                                                                                                                                            |
|------|------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Power Button           | N/A             | Turns MicroBlade module on and off                                                                                                                                                     |
| 2    | Power LED              | Green           | Indicates power status "On"                                                                                                                                                            |
|      |                        | Amber           | Before the BMC is ready, the Amber LED will blink until the last node out of the four is ready.                                                                                        |
|      |                        | Red             | Power Failure                                                                                                                                                                          |
| 3    | KVM/UID LED (Blue)     | Steady On       | Indicates that KVM has been initialized on this blade module                                                                                                                           |
|      |                        | Flashing        | Serves as a UID indicator (the UID function is activated with a management program)                                                                                                    |
| 4    | Network LED (Green)    | Flashing Green  | Flashes on and off to indicate traffic (Tx and RX data) on the LAN connection to this blade module.                                                                                    |
|      | Network LED (Orange)   | Flashing Orange | Flashes on and off to indicate traffic over the InfiniBand module (when present in the system)                                                                                         |
| 5    | System Fault LED (Red) | Steady On       | This LED illuminates red when a fatal error occurs. This may be the result of a memory error, a VGA error or any other fatal error that prevents the operating system from booting up. |

## Power Button

Each MicroBlade module has its own power button so that individual blade units within the enclosure may be turned on or off independently of the others. Press the power button (#1) to turn on the blade server. The power LED (#3) will turn green. To turn off, press and hold the power button for >4 seconds and the power LED will turn orange.

## LED Indicators

Blade module LEDs are described below in [Table 4-3](#).

**Table 4-3. Blade Module LED Indicators**

| LED                    | State     | Description                                                                                                                                                                            |
|------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power LED              | Green     | Power On                                                                                                                                                                               |
|                        | Amber     | Standby                                                                                                                                                                                |
|                        | Red       | Power Failure <sup>a</sup>                                                                                                                                                             |
| System Fault LED (Red) | Steady On | This LED illuminates red when a fatal error occurs. This may be the result of a memory error, a VGA error or any other fatal error that prevents the operating system from booting up. |

- 
- a. In the event of a power failure, the N+1 Redundant Power Supply (if included in your system's configuration) automatically turns on and picks up the system load to provide uninterrupted operation. The failed power supply should be replaced with a new one as soon as possible.

## 4-2 Motherboard

The motherboard of the MBI-6128R-T2/T2X MicroBlade module unit is a proprietary design, which is based on the Intel Xeon E5-2600 V3/V4 processor. See [Figure 4-4](#) for a block diagram of this chipset, [Figure 4-3](#) for a view of the B1DRi motherboard and [Figure 4-5](#) for an exploded view diagram of the MicroBlade module unit.

Figure 4-3. B1DRi Motherboard

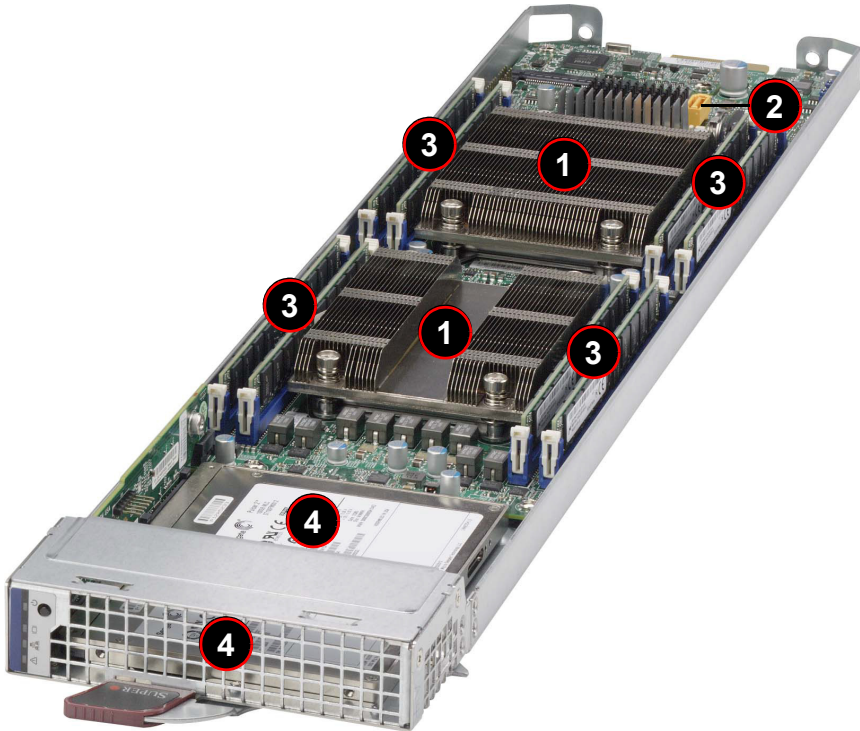
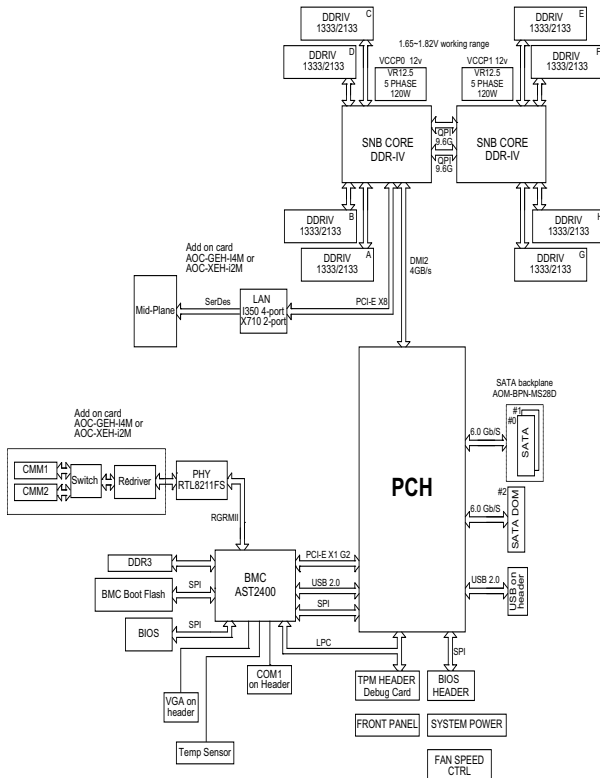


Table 4-4. B1DRi Motherboard Layout

| Item | Description                                                  |
|------|--------------------------------------------------------------|
| 1    | Two Intel Xeon E5-2600 V3/V4 processors in a LGA2011 sockets |
| 2    | One SATA3 SATA-DOM connector                                 |
| 3    | Eight memory slots for RDIMM memory modules                  |
| 4    | Two 2.5" SATA3 HDD/SSD drives                                |

**Figure 4-4. Intel B1DRi Block Diagram**

## Jumpers

Any jumpers present on the motherboard are used by the manufacturer only; there are no jumpers used to configure the operation of the motherboard.

## CMOS Clear

JBT1 is used to clear CMOS and will also clear any passwords. JBT1 consists of two contact pads located near the BIOS chip.

### Clearing CMOS

1. First power down the blade and remove it from the enclosure.
2. Short the CMOS pads with a metal object such as a small screwdriver.
3. Install the blade back into the enclosure and power it on.

## 4-3 Blade Unit Components

Figure 4-5. Exploded View of a MBI-6128R-T2/T2X Blade Module

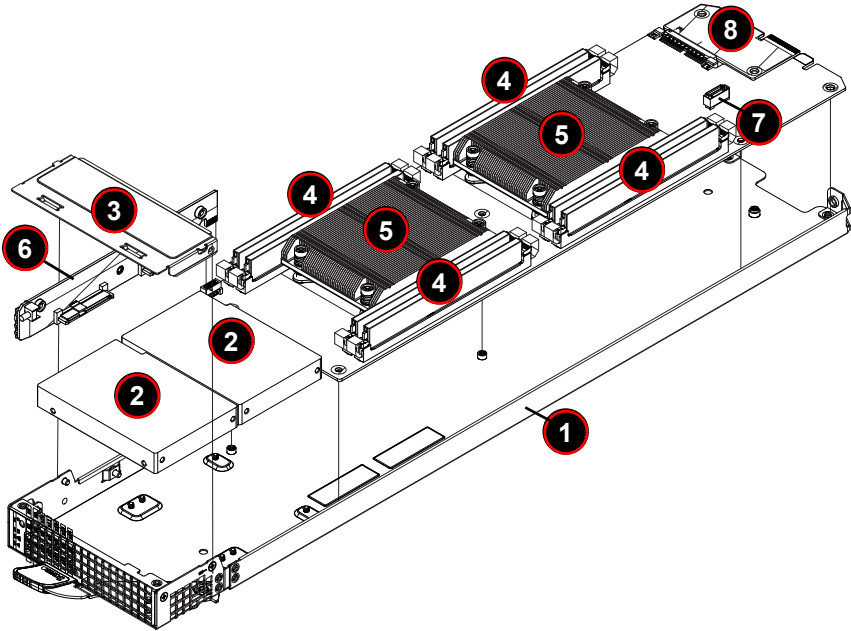


Table 4-5. Main Components of a MBI-6128R-T2/T2X Blade Module

| Item | Description                    |
|------|--------------------------------|
| 1    | Blade Unit/Module              |
| 2    | 2.5" SATA3 HDD/SSD Hard Drives |
| 3    | Front Top Cover                |
| 4    | DIMM slots                     |
| 5    | CPU/Heatsinks                  |
| 6    | Hard Drive Backplane           |
| 7    | SATA DOM                       |
| 8    | LAN Board                      |

### Memory Support

The MBI-6128R-T2/T2X MicroBlade module supports up to 256 GB VLP RDIMM of DDR4 2400/2133 MHz speed, 32 GB, 16 GB, 8 GB and 4 GB size memory in eight (8) 288-pin RDIMM sockets. See [Section 3-4: Processor and Heatsink Installation on page 3-4](#) for further details on motherboard memory installation.

## Hard Disk Drives

The MBI-6128R-T2/T2X MicroBlade module accommodates two (2) 2.5" SATA3 HDD/SSD SATA3 HDD/SSD drives. The drives cannot be removed or replaced without powering down the blade unit they reside in. See [Chapter 1](#) for information on RAID Setup.

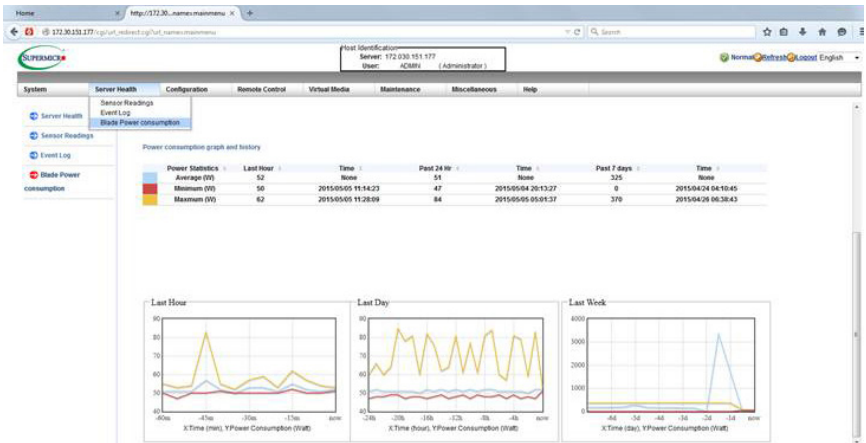
**WARNING:** Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at <http://www.supermicro.com/products/nfo/storage.cfm>.

## Blade Power Consumption Page

Using the Web-based Management Utility from the CMM module you may use the System Health - Blade Power Consumption page to view graphs and other information about the power consumption of each MBI-6128R-T2/T2X blade in your system (Figure).

For more details on the Web-based Management Utility see <http://www.supermicro.com/products/superblade/management/> on the Supermicro Website.

Figure 4-6. System Health - Blade Power Consumption Page





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# Chapter 5

## BIOS

### 5-1 Introduction

This chapter describes the BIOS for the MBI-6128R-T2/T2X MicroBlade module. This MicroBlade module uses a 128 MB SPI Flash EEPROM with AMI® BIOS™ that is stored in a flash chip. This BIOS can be easily upgraded using a floppy disk-based program.

**Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the <http://www.supermicro.com/products/microblade/module/> web site for further details on BIOS setup and the BIOS menus for your MicroBlade module.

#### System BIOS

BIOS stands for Basic Input Output System. The 128 MB SPI Flash EEPROM with AMI® BIOS flash chip stores the system parameters, types of disk drives, video displays, in the CMOS. The CMOS memory requires very little electrical power. When the blade unit is turned off, a backup battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the blade is powered on it is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot up.

#### How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <DELETE> key at the appropriate time during system boot. (See "Starting the Setup Utility" below.)

#### Starting the Setup Utility

Normally, the only visible POST (Power-On Self-Test) routine is the memory test. As the memory is being tested, press the <DELETE> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus.

**Caution:** To prevent possible boot failure, do not shut down or reset the system while updating the BIOS.

## 5-2 BIOS Updates

It may be necessary to update the BIOS used in the blade modules on occasion. However, it is recommended that you not update BIOS if you are not experiencing problems with a blade module.

Updated BIOS files are located on our web site (<http://www.supermicro.com/products/microblade>). Please check the current BIOS revision and make sure it is newer than your current BIOS before downloading.

There are several methods you may use to upgrade (flash) your BIOS. After downloading the appropriate BIOS file (in a zip file format), follow one of the methods described below to flash the new BIOS.

### Flashing BIOS

Use the procedures below to "Flash" your BIOS with a new update using the USB ports on the CMM module or by use of a Floppy Image file.

#### ***Flashing a BIOS using the USB Ports on the CMM:***

1. Copy the contents of the zip file to a bootable USB pen drive.
2. Connect your bootable USB pen drive to one of the two USB slots on the CMM (located on the back side of the enclosure).
3. Boot to the USB pen drive and go to the directory where you saved the contents of the zip file.
4. Type **flash filename.rom** (replace *filename.rom* by the actual ROM file name).

#### ***Flashing a BIOS using a Floppy Image File***

This method must be performed remotely.

1. Copy the image file from the zip file to your desktop.
2. Use the web browser or IPMIView to access your CMM remotely using its IP Address.
3. Go to the VIRTUAL MEDIA menu and select FLOPPY IMAGE UPLOAD.
4. BROWSE or OPEN to locate the \*.img file on your desktop and select it.
5. Press the UPLOAD button and wait a few seconds for the image to upload to the CMM.
6. Once the upload finishes, turn on the blade module and press <DEL> to enter the BIOS setup utility.
7. In the BOOT MENU, bring **USB LS120: PEPPCMM VIRTUAL DISC 1** to the top of the boot priority list.
8. Exit while saving the changes. The blade module will boot to the virtual media (floppy image) **A:\>**.
9. Type **flash filename.rom**.

**Note:** Replace *filename.rom* by the actual ROM file name (such as **B8DTE142.rom** for example) in the command.

## 5-3 Running Setup

**Note:** Default settings are in **bold** text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the MAIN BIOS SETUP screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options.

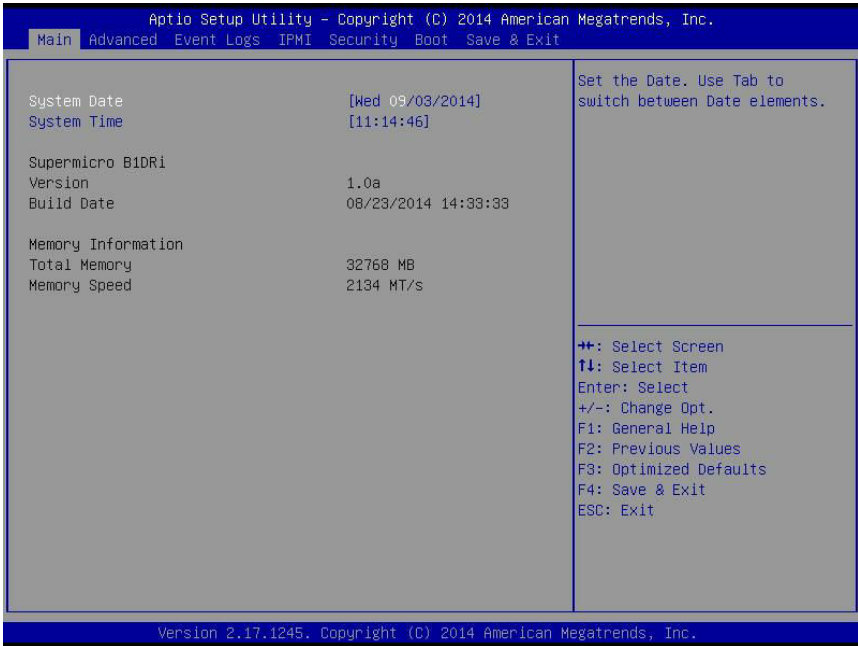
When you first power on the computer, the BIOS is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <DELETE> immediately after turning the system on, or
2. When the message **Press the <Delete> key to enter Setup** appears briefly at the bottom of the screen during the POST, press the <DELETE> key to activate the main SETUP menu:

## 5-4 Main BIOS Setup

**Figure 5-1. BIOS Setup Screen**



All Main Setup options are described in this section. Use the UP/DOWN arrow keys to move among the different settings in each menu. Use the LEFT/RIGHT arrow keys to change the options for each setting. Press the <ESC> key to exit the CMOS SETUP menu. The next section describes in detail how to navigate through the menus. Items that use sub-menus are indicated with the ► icon. With the item highlighted, press the <ENTER> key to access the sub-menu.

Menu options found in the MAIN BIOS SETUP menu are described in [Table 5-1](#).

**Table 5-1. Main BIOS Setup Menu Options**

| Menu Option      | Description                                                                                                                                             |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| System Date      | Using the arrow keys, highlight the month, day and year fields, and enter the correct data for the system date. Press the <Enter> key to save the data. |
| System Time      | To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.                 |
| BIOS Information | BIOS static display information including the motherboard number, SMC version, SMC Build Date and Total Memory is also shown on the screen.             |

## 5-5 Advanced Setup

Choose **Advanced** from the BIOS Setup Utility main menu with the arrow keys to display the ADVANCED SETUP menu. The items with a triangle beside them are sub-menus that can be accessed by highlighting the item and pressing <ENTER>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <ENTER>.

Table 5-2 describes all sub-menus found in the ADVANCED SETUP menu.

**Table 5-2. Advanced Setup Menu Options**

| Sub-menu                             | Description                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------|
| ► Boot Feature                       | See Table 5-3 for a description of BIOS setup menu options in this sub-menu.  |
| ► CPU Configuration                  | See Table 5-4 for a description of BIOS setup menu options in this sub-menu.  |
| ► Chipset Configuration              | See Table 5-5 for a description of BIOS setup menu options in this sub-menu.  |
| ► SATA Configuration                 | See Table 5-6 for a description of BIOS setup menu options in this sub-menu.  |
| ► sSAT<br>A Configuration            | See Table 5-7 for a description of BIOS setup menu options in this sub-menu.  |
| ► Server ME Information              | See Table 5-8 for a description of BIOS setup menu options in this sub-menu.  |
| ► PCIe/PCI/PnP<br>Configuration      | See Table 5-9 for a description of BIOS setup menu options in this sub-menu.  |
| ► Super I/O Configuration            | See Table 5-10 for a description of BIOS setup menu options in this sub-menu. |
| ► Serial Port Console<br>Redirection | See Table 5-11 for a description of BIOS setup menu options in this sub-menu. |
| ► ACPI Settings                      | See Table 5-12 for a description of BIOS setup menu options in this sub-menu. |
| ► iSCSI Configuration                | See Table 5-14 for a description of BIOS setup menu options in this sub-menu. |

**Table 5-3. Boot Feature Sub-menu**

| Menu Option              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quiet Boot               | Use this feature to select the screen display between the POST messages and the OEM logo upon bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are <b>Enabled</b> and Disabled.                                                                                                                                                                                                                                          |
| AddOn ROM Display Mode   | Use this feature to set the display mode for the Option ROM. Select Keep Current to display the current AddOn ROM setting. Select Force BIOS to use the Option ROM display set by the system BIOS. The options are <b>Force BIOS</b> and Keep Current.                                                                                                                                                                                                                                                                |
| Bootup NUM-Lock          | Use this feature to set the Power-on state for the <Numlock> key. The options are Off and <b>On</b> .                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Wait for 'F1' If Error   | Use this feature to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and <b>Enabled</b> .                                                                                                                                                                                                                                                                                                                                                                          |
| Interrupt 19 Capture     | Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are <b>Immediate</b> and Postponed. |
| Re-try Boot              | This feature allows you to set Re-try Boot options to either <b>Disabled</b> , Legacy Boot or EFI Boot.                                                                                                                                                                                                                                                                                                                                                                                                               |
| Watch Dog Function       | If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and <b>Disabled</b> .                                                                                                                                                                                                                                                                                                                                                            |
| Power Button Function    | This feature controls how the system shuts down when the power button is pressed. Select 4_Seconds_Override for the user to power off the system after pressing and holding the power button for 4 seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are 4 Seconds Override and <b>Instant Off</b> .                                                                                                                                  |
| Restore on AC Power Loss | Use this feature to set the power state after a power outage. Select Stay-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last power state before a power loss. The options are Power-On, <b>Stay-Off</b> and Last State.                                                                                                                                                     |

**Table 5-4. CPU Configuration Sub-menu**

| Menu Option           | Description                                                                                                                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor Information | Static processor information is displayed at the top of the menu for Processor ID, Processor Frequency, Microcode Revision, L1 Cache RAM, L2 Cache RAM and Processor Version.                                                                  |
| Clock Spread Spectrum | If this feature is set to Enabled, the BIOS utility will monitor the level of Electromagnetic Interference caused by the components and will attempt to reduce the interference whenever needed. The options are Enabled and <b>Disabled</b> . |
| Hyper-Threading (ALL) | This feature enables Hyper Threading (software method to enable/disable logical processor threads). Options include <b>Enable</b> or Disable.                                                                                                  |

Table 5-4. CPU Configuration Sub-menu (Continued)

| Menu Option                     | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Core's Enabled                  | Use this setting to specify the number of cores to enable. Use the number pad "+" or "-" keys to specify a number up to 12. The number <b>0</b> means all cores with 12 cores available.                                                                                                                                                                                                                          |
| Execute Disable Bit             | Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor and damage the system during an attack. The default is <b>Enable</b> . (Refer to Intel and Microsoft Web Sites for more information.) |
| PPIN Control                    | This setting is used to unlock and enable or disable PPIN control for your system. Options include <b>Unlock/Enable</b> or Unlock/Disable.                                                                                                                                                                                                                                                                        |
| Hardware Prefetcher             | This setting lets you <b>Enable</b> or Disable the Hardware Prefetcher to prefetch streams of data and instructions from the main memory to the L1 cache in order to improve CPU performance.                                                                                                                                                                                                                     |
| Adjacent Cache Prefetch         | This setting lets you <b>Enable</b> or Disable the use of the Adjacent Prefetch to prefetch streams of data and instructions from the main memory to the L1 cache in order to improve CPU performance.                                                                                                                                                                                                            |
| DCU Streamer Prefetcher         | This setting lets you <b>Enable</b> or Disable the DCU Streamer Prefetcher to prefetch streams of data and instructions from the main memory to the L1 cache in order to improve CPU performance.                                                                                                                                                                                                                 |
| DCU IP Prefetcher               | This setting lets you <b>Enable</b> or Disable the DCU IP Prefetcher to prefetch streams of data and instructions from the main memory to the L1 cache in order to improve CPU performance.                                                                                                                                                                                                                       |
| Direct Cache Access (DCA)       | This setting enables direct cache access for your system. Options include <b>Auto</b> , Enable or Disable.                                                                                                                                                                                                                                                                                                        |
| X2APIC                          | Use this setting to enable/disable extended APIC support for your system. Options include <b>Disable</b> or Enable.                                                                                                                                                                                                                                                                                               |
| AES-NI                          | This setting <b>Enables</b> or Disables AES-NI support for your system.                                                                                                                                                                                                                                                                                                                                           |
| Intel Virtualization Technology | This setting <b>Enables</b> or Disables Vanderpool technology for your system and takes effect only after a reboot.                                                                                                                                                                                                                                                                                               |

**Table 5-5. Chipset Configuration Sub-menu**

| Menu Option                      | Description                                                                                                                                                                                    |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ►North Bridge Configuration      | This sub-menu configures North Bridge features and shows configuration information.                                                                                                            |
| ►IIO Configuration               | Use this sub-menu to set IIO configuration features and options.                                                                                                                               |
| EV DFX Features                  | Set this option to allow DFX Lock Bits to remain clear. Options include <b>Enable</b> and <b>Disable</b> .                                                                                     |
| ►IIO0 Configuration              | Use this sub-menu to set IIO0 configuration features and options.                                                                                                                              |
| IOU2 (IIO PCIe Port 1)           | This setting selects PCIe port bifurcation for selected slot(s). Options include x4x4, x8 and <b>Auto</b> .                                                                                    |
| IOU0 (IIO PCIe Port 2)           | This setting selects PCIe port bifurcation for selected slot(s). Options include x4x4x4x4, x4x4x8, x8x4x4, <b>x8x8</b> , x16 and Auto.                                                         |
| IOU1 (IIO PCIe Port 3)           | This setting selects PCIe port bifurcation for selected slot(s). Options include x4x4x4x4, x4x4x8, x8x4x4, <b>x8x8</b> , x16 and Auto.                                                         |
| No PCIe Port Active ECO          | This setting is used for workaround settings when no PCIe port is active. Options include <b>PCU Squelch exit ignore option</b> and Reset the SQ FLOP by CSR option.                           |
| ►Socket 0 PCIeD00F0 - Port 0/DMI | Use this sub-menu for settings related to PCI Express Ports                                                                                                                                    |
| Link Speed                       | Link Speed is specified as either <b>Auto</b> , Gen 1 (2.5 GT/s) or Gen 2 (5 GT/s).                                                                                                            |
| PCI-E Port DeEmphasis            | This setting specifies De-Emphasis control (LNKCON2 [6]) for this PCIe port. Options include <b>-6.0 dB</b> or -3.5 dB.                                                                        |
| PCI-E Information                | Information for the PCI-E Port Link for Status, Max and Speed is shown here.                                                                                                                   |
| PCI-E Port L0s Exit Latency      | This setting specifies the length of time this port requires to complete transition from L0s to L0. Only the <b>4us - 8us</b> option is available.                                             |
| PCI-E Port L1s Exit Latency      | This setting specifies the length of time this port requires to complete transition from L1 to L0. Options include settings from <1us all the way to >64us with <b>8us - 16us</b> the default. |
| Fatal Err Over                   | Use this setting to Enable or <b>Disable</b> forcing fatal error propagation to the IIO core error logic for this port.                                                                        |
| Non-Fatal Err Over               | Use this setting to Enable or <b>Disable</b> forcing non-fatal error propagation to the IIO core error logic for this port.                                                                    |
| Corr Err Over                    | Use this setting to Enable or <b>Disable</b> forcing correctable error propagation to the IIO core error logic for this port.                                                                  |
| L0s Support                      | When <b>Disabled</b> , IIO never puts its transmitter in L0s state.                                                                                                                            |
| ►IIO1 Configuration              | Use this sub-menu to set IIO1 configuration features and options.                                                                                                                              |
| IOU2 (IIO PCIe Port 1)           | This setting selects PCIe port bifurcation for selected slot(s). Options include x4x4, x8 and <b>Auto</b> .                                                                                    |

**Table 5-5. Chipset Configuration Sub-menu (Continued)**

| Menu Option                        | Description                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IOU0 (IIO PCIe Port 2)             | This setting selects PCIe port bifurcation for selected slot(s). Options include x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16 and <b>Auto</b> .                                  |
| IOU1 (IIO PCIe Port 3)             | This setting selects PCIe port bifurcation for selected slot(s). Options include x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16 and <b>Auto</b> .                                  |
| No PCIe Port Active ECO            | This setting is used for workaround settings when no PCIe port is active. Options include <b>PCU Squelch exit ignore option</b> and Reset the SQ FLOP by CSR option.    |
| ► IOAT Configuration               | Use this sub-menu to set IOAT configuration features and options.                                                                                                       |
| Enable the IOAT                    | Use this setting to <b>Enable</b> or Disable IOAT devices.                                                                                                              |
| No Snoop                           | Use this setting to Enable or <b>Disable</b> No Snoop for each CB device.                                                                                               |
| Relaxed Ordering                   | Use this setting to Enable or <b>Disable</b> Relaxed Ordering.                                                                                                          |
| ► Intel VT for Directed I/O (VT-d) | Use this sub-menu to set Intel VT for Directed I/O configuration features and options.                                                                                  |
| Intel VT for Directed I/O (VT-d)   | This setting <b>Enables</b> or Disables Intel Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI tables. |
| Interrupt Remapping                | This setting <b>Enables</b> or Disables VT-d interrupt remapping support.                                                                                               |
| ► QPI Configuration                | Use this sub-menu to set QPI configuration features and options.                                                                                                        |
| ► QPI General Configuration        | Use this sub-menu to display and provide options to change the QPI General Settings.                                                                                    |
| ► QPI Status                       | This sub-menu leads QPI Status information.                                                                                                                             |
| Link Frequency Select              | This setting allows for selecting the QPI Link Frequency. Option include 6.4GB/s, 8.0GB/s, 9.6GB/s, <b>Auto</b> and Auto Limited.                                       |
| Link L0p Enable                    | Use this setting to <b>Enable</b> or Disable the Link L0p setting.                                                                                                      |
| Link L1 Enable                     | Use this setting to <b>Enable</b> or Disable the Link L1 setting.                                                                                                       |
| COD Enable                         | Use this setting to Enable or <b>Disable</b> the Cluster on Die setting.                                                                                                |
| Early Snoop                        | Use this setting to set the Early Snoop setting. Options include Disable, Enable and <b>Auto</b> .                                                                      |
| Isoc Mode                          | Use this setting to Enable or <b>Disable</b> Isoc Mode.                                                                                                                 |
| ► Memory Configuration             | Use this sub-menu to set Memory Configuration features and options.                                                                                                     |
| Enforce PDR                        | This setting <b>Enables</b> or Disables the system's ability to enforce POR restrictions for DDR4 frequency and voltage programming.                                    |
| Memory Frequency                   | This setting selects the memory frequency in Mhz. Options include <b>Auto</b> , and speed 1333 through 3200. Do not select Reserved.                                    |
| Data Scrambling                    | This setting Enables or Disables data scrambling. Options include <b>Auto</b> , Disabled and Enabled.                                                                   |

**Table 5-5. Chipset Configuration Sub-menu (Continued)**

| Menu Option                   | Description                                                                                                                                                                                                                                                                                                        |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DRAM RAPL Baseline            | Use this setting to set the DRAM RAPL Baseline mode. Options include Disabled, DRAM RAPL Mode 0 and <b>DRAM RAPL Mode 1</b> .                                                                                                                                                                                      |
| Set Throttling Mode           | Use this setting to configure Thermal Throttling mode. Options include Disabled and <b>CLTT</b> .                                                                                                                                                                                                                  |
| Socket Interleave Below 4GB   | This setting splits the 0-4GB address space between two sockets, so that both sockets get a chunk of local memory below 4GB. Options include Enable and <b>Disable</b> .                                                                                                                                           |
| A7 Mode                       | Use this setting to <b>Enable</b> or Disable A7 Mode in your system.                                                                                                                                                                                                                                               |
| ►DIMM Information             | This sub-menu displays memory topology with DIMM population information when selected.                                                                                                                                                                                                                             |
| ►Memory RAS Configuration     | This sub-menu displays and provides options to change the memory RAS settings.                                                                                                                                                                                                                                     |
| RAS Mode                      | Use this setting to Enable or <b>Disable</b> RAS Mode.                                                                                                                                                                                                                                                             |
| Memory Rank Sparing           | This setting allows you to Enable or <b>Disable</b> Memory Rank Sparking.                                                                                                                                                                                                                                          |
| Patrol Scrub                  | Use this setting to <b>Enable</b> or Disable Patrol Scrub.                                                                                                                                                                                                                                                         |
| Patrol Scrub Interval         | This setting allows you to select the number of hours (1-24) required to complete a full scrub. A value of zero (0) means auto. The number is determined by pressing the "+" or "-" keys on your keyboard's number pad.                                                                                            |
| Demand Scrub                  | This setting <b>Enables</b> or Disables the Demand Scrub.                                                                                                                                                                                                                                                          |
| Device Tagging                | Use this setting to Enable or <b>Disable</b> Device Tagging.                                                                                                                                                                                                                                                       |
| ►South Bridge Configuration   | This sub-menu static displays PCH Information (chipset Name, Stepping and USB Devices), and allows you to configure other South Bridge features.                                                                                                                                                                   |
| USB Configuration Information | This static display shows information regarding the USB Version and the system's USB Devices.                                                                                                                                                                                                                      |
| Legacy USB Support            | This setting allows you to enable the use of Legacy USB devices. If this option is set to Auto, legacy USB support will be automatically disabled if no USB device is connected. The Disable option will keep USB devices available only for EFI applications. Options include Auto, Disabled and <b>Enabled</b> . |
| XHCI Hand-off                 | This item 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 options are <b>Enabled</b> and Disabled.                                                                   |
| EHCI Hand-off                 | This item is for the 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 <b>Disabled</b> .                                                                 |
| Port 60/64 Emulation          | This feature enables or disables I/O port 60h/64h emulation support. This feature should be enabled for complete USB keyboard legacy support for operating systems that cannot detect the presence of USB devices . Options include <b>Enabled</b> or Disabled.                                                    |

**Table 5-5. Chipset Configuration Sub-menu (Continued)**

| Menu Option    | Description                                                                                                                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| USB3.0 Support | This setting enables or disables USB 3.0 (XHCI) controller support. Options include Smart Auto, Auto, Enabled or <b>Disabled</b> .              |
| EHCI1          | This setting controls the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled. Options include <b>Enabled</b> or Disabled. |
| EHCI2          | This setting controls the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled. Options include <b>Enabled</b> or Disabled. |

**Table 5-6. SATA Configuration Sub-menu**

| Menu Option                        | Description                                                                                                                                                                                                                                                                                   |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SATA Controller                    | This setting allows you to <b>Enable</b> or Disable the SATA device.                                                                                                                                                                                                                          |
| Configure SATA as                  | Use this setting to select the SATA mode you desire. Options include IDE, <b>AHCI</b> and RAID.                                                                                                                                                                                               |
| Support Aggressive Link Power Mana | Use this setting to <b>Enable</b> or Disable SALP.                                                                                                                                                                                                                                            |
| SATA Port 0~5 Settings             | For each of the ports you many configure the settings listed below.                                                                                                                                                                                                                           |
| Spin Up Device                     | This setting allows you to Enable or <b>Disable</b> the Spin up Device for the system. If enabled for any ports staggered spin up will be performed and only the drives that have this option enabled will spin up at boot. Otherwise all drives spin up at boot if this setting is disabled. |
| SATA Device Type                   | This setting allows you to identify that the SATA port is connected to either a Solid State Drive or a <b>Hard Disk Drive</b> .                                                                                                                                                               |

**Table 5-7. sSATA Configuration Sub-menu**

| Menu Option                        | Description                                                                                                                                                                                                                                                                                   |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sSATA Controller                   | This setting allows you to <b>Enable</b> or Disable the SATA controller.                                                                                                                                                                                                                      |
| Configure sSATA as                 | Use this setting to select the SATA mode you desire. Options include IDE, <b>AHCI</b> and RAID.                                                                                                                                                                                               |
| Support Aggressive Link Power Mana | Use this setting to <b>Enable</b> or Disable SALP.                                                                                                                                                                                                                                            |
| sSATA Port 0~3 Settings            | For each of the ports you many configure the settings listed below.                                                                                                                                                                                                                           |
| Spin Up Device                     | This setting allows you to Enable or <b>Disable</b> the Spin up Device for the system. If enabled for any ports staggered spin up will be performed and only the drives that have this option enabled will spin up at boot. Otherwise all drives spin up at boot if this setting is disabled. |
| SATA Device Type                   | This setting allows you to identify that the SATA port is connected to either a Solid State Drive or a <b>Hard Disk Drive</b> .                                                                                                                                                               |

**Table 5-8. Server ME Configuration Sub-menu**

| Menu Option                          | Description                                                                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General ME Configuration Information | General ME configuration information is displayed at the top of this screen.                                                                                                                          |
| Altitude                             | The altitude of the platform location above sea level, expressed in meters, is set using the keyboard's number pad "+" or "-" keys. Use the default <b>80000000</b> value if the altitude is unknown. |
| MCTP Bus Owner                       | This setting is for specifying the MCTP bus owner location on PCIe. Values can be [15:8] bus, [7:3] device or [2:0] function. If <b>0</b> , then the sending bus owner is disabled.                   |

**Table 5-9. PCIe/PCI/PnP Configuration Sub-menu**

| Menu Option                                                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PCI Latency Timer                                                           | Use this feature to set the latency Timer of each PCI device installed on a PCI bus. Select 32 to set the PCI latency to 32 PCI clock cycles. The options are <b>32 PCI Bus Clocks</b> , 64 PCI Bus Clocks, 96 PCI Bus Clocks, 128 PCI Bus Clocks, 160 PCI Bus Clocks, 192 PCI Bus Clocks, 224 PCI Bus Clocks and 248 PCI Bus Clocks.                                                                                          |
| PERR# Generation                                                            | Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are <b>Disabled</b> and Enabled.                                                                                                                                                                                                                                                                                  |
| SERR# Generation                                                            | Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are <b>Enabled</b> and Disabled.                                                                                                                                                                                                                                                                                 |
| PCI PERR/SERR Support                                                       | This setting Enables or <b>Disables</b> the runtime event for SERR/PERR errors.                                                                                                                                                                                                                                                                                                                                                |
| Above 4G Decoding<br>(Available if the system supports 64-bit PCI decoding) | Select Enabled to decode a 64-bit PCI device in the space above 4G Address. The options are Enabled and <b>Disabled</b> .                                                                                                                                                                                                                                                                                                      |
| SR-IOV Support                                                              | If the system has SR-IOV capable PCIe device, this option Enables or <b>Disables</b> single root I/O virtualization support.                                                                                                                                                                                                                                                                                                   |
| 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 <b>Auto</b> , 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.                                                                                                                                                                                   |
| 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 <b>Auto</b> , 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 L0 to force all PCI-E links to operate at L0 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 <b>Disabled</b> , Force L0, and Auto.<br>Enabling ASPM support may cause some PCI-E devices to fail! |
| MMIOHBase                                                                   | This setting must specify a number between 4032 - 4078. Options include <b>56T</b> , 48T, 24T, 2T, 512G and 256G.                                                                                                                                                                                                                                                                                                              |

**Table 5-9. PCIe/PCI/PnP Configuration Sub-menu (Continued)**

| Menu Option                 | Description                                                                                                                              |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| MMIO High Size              | This setting allocates MMIOH size per CPU. Options include <b>256G</b> , 128G, 512G and 1024G.                                           |
| CPU1 Slot 1 PCI-E OPROM     | This setting enables or disables the PCIe Slot OPROM option. Options include Disabled, <b>Legacy</b> or EFI.                             |
| Onboard Video OPROM         | Use this setting to control the execution of UEFI and Legacy Video OPROM on your system. Options include Disabled, <b>Legacy</b> or EFI. |
| VGA Priority                | This setting decides the priority between <b>Onboard</b> and the first Offboard video device found.                                      |
| Onboard LAN Option ROM Type | Select the onboard LAN option ROM type from this setting. Options include <b>Legacy</b> and EFI.                                         |
| Onboard LAN 1 OPROM         | This setting enables or disables Onboard LAN 1 Option ROM. Options include <b>PXE</b> , iSCSI or Disabled.                               |
| Onboard LAN 2 OPROM         | This setting enables or disables Onboard LAN 2 Option ROM. Options include PXE or <b>Disabled</b> .                                      |
| Network Stack               | This setting Enables or <b>Disables</b> the UEFI Network Stack.                                                                          |

**Table 5-10. SuperIO Device Configuration Sub-menu**

| Menu Option                                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Super IO Chip                                                 | This static display shows the name of the Super IO chip installed for your system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ►Serial Port 1/2 Configuration                                | This sub-menu allows the user the configure settings of Serial Port 1 or Serial Port 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Serial Port                                                   | Select Enabled to enable the a selected onboard serial port. The options are <b>Enabled</b> and Disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Device Settings                                               | This item displays the status of a serial part specified by the user.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Change Settings                                               | <p>This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address.</p> <p>The options for Serial Port 1 are <b>Auto</b>, (IO=3F8h; IRQ=4), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12) and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).</p> <p>The options for Serial Port 2 are <b>Auto</b>, (IO=2F8h; IRQ=3), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12) and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).</p> |
| Device Mode                                                   | Use this feature to set the optimal setting for a super I/O device. The options are <b>24MHz/13</b> and 24MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Serial Port 2 Attribute<br>(Available for Serial Port 2 only) | This feature specifies the attribute of Serial Port 1. The options are <b>SOL</b> and COM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Table 5-11. Serial Port Console Redirection Sub-menu**

| Menu Option                                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>COM1 Console Redirection, COM2/SOL/Legacy Console Redirection Sub-menus</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Console Redirection                                                            | Select Enabled to enable console redirection support for a serial port specified by the user. The options are Enabled and <b>Disabled</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ► 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, <b>VT100+</b> , 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 <b>115200</b> (bits per second).                                                                                                                                                                                                                                               |
| Data Bits                                                                      | Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and <b>8 Bits</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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 <b>None</b> , 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 <b>1</b> and 2.                                                                                                                                                                                                                                                                                                                                                                                     |
| Flow Control                                                                   | Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are <b>None</b> 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 <b>Enabled</b> 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 <b>Disabled</b> and Enabled.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Resolution 100x31                                                              | Select Enabled for extended-terminal resolution support. The options are Disabled and <b>Enabled</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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 <b>80x25</b> .                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Table 5-11. Serial Port Console Redirection Sub-menu (Continued)**

| Menu Option                                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Putty KeyPad                                                                              | This feature selects the settings for Function Keys and KeyPad used for Putty, which is a terminal emulator designed for the Windows OS. The options are <b>VT100</b> , <b>LINUX</b> , <b>XTERM6</b> , <b>SC0</b> , <b>ESCN</b> , and <b>VT400</b> .                                                                                                                                                      |
| 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 <b>Always Enable</b> and <b>Bootloader</b> .                                                                           |
| Legacy Serial Redirection Port (for Legacy Console Redirection only)                      | Use this setting to select a COM port to display redirection of Legacy OS and Legacy OPRM messages. Options include <b>COM1 Console Redirection</b> or <b>COM2/SOL Console Redirection</b> .                                                                                                                                                                                                              |
| <b>Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)</b> |                                                                                                                                                                                                                                                                                                                                                                                                           |
| Console Redirection (for EMS)                                                             | Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and <b>Disabled</b> .                                                                                                                                                                                                                                                                              |
| ► 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 <b>COM1 Console Redirection</b> and <b>COM2/SOL Console Redirection</b> .                                                                                                                                                                        |
| 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 <b>VT-UTF8</b> . |
| 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 <b>115200</b> (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 <b>None</b> , <b>Hardware RTS/CTS</b> , and <b>Software Xon/Xoff</b> .                          |
| Data Bits, Parity, Stop Bits                                                              | The status of each item above is displayed.                                                                                                                                                                                                                                                                                                                                                               |

**Table 5-12. ACPI Settings Sub-menu**

| Menu Option                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WHEA Support               | This feature Enables the Windows Hardware Error Architecture (WHEA) support for the Windows 2008 (or a later vision) operating system. The options are <b>Enabled</b> and Disabled.                                                                                                                                                                                                                                                                                                               |
| High Precision Event Timer | Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are <b>Enabled</b> and Disabled. |
| NUMA                       | Use this setting to <b>Enable</b> or Disable NUMA.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| PCI AER Support            | This setting allows you to Enable or <b>Disable</b> PCI AER Support.                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Table 5-13. Trusted Computer Sub-menu**

| Menu Option                | Description                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security Device Support    | This setting <b>Enables</b> or Disables BIOS support for a security device. The OS will not show the security device if enabled. TCG EFI protocol and INT1A interface will not be available.                 |
| TPM State                  | This setting <b>Enables</b> or Disables a security device.<br><b>NOTE:</b> Your computer will reboot during restart in order to change the state of the device.                                              |
| Pending Operation          | This setting schedules an operation for the security device. Options include <b>None</b> and TPM Clear.<br><b>NOTE:</b> Your computer will reboot during restart in order to change the state of the device. |
| Current Status Information | Static information about TPM Enabled Status, TPM Active Status and TPM Owner Status are displayed in this location.                                                                                          |
| TXT Support                | This setting Enables or <b>Disables</b> TXT support.                                                                                                                                                         |

**Table 5-14. iSCSI Configuration Sub-menu**

| Menu Option          | Description                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------------------|
| iSCSI Initiator Name | Use this setting to enter a unique name of the iSCSI Initiator. Only IQN format is accepted. Range is from 4 to 223. |

## 5-6 Event Logs Setup

**Table 5-15. Event Logs Menu**

| Menu Option                        | Description                                                                                                                                                                                                                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ► Change SMBIOS Event Log Settings | This sub-menu allows you to change the SMBIOS Event Log configuration settings.                                                                                                                                                                                                                                      |
| SMBIOS Event Log                   | Change this setting to enable or disable all features of the SMBIOS Event Logging during system boot. The options are <b>Enabled</b> and <b>Disabled</b> .                                                                                                                                                           |
| Runtime Error Logging Support      | This setting <b>Enables</b> or <b>Disables</b> Runtime Error Logging Support.                                                                                                                                                                                                                                        |
| Memory Corrected Error Enabling    | This setting <b>Enables</b> or <b>Disables</b> Corrected Memory Error Logging.                                                                                                                                                                                                                                       |
| PCI-Ex Error Enable                | This setting <b>Enables</b> or <b>Disables</b> PCI-Ex Error Logging.                                                                                                                                                                                                                                                 |
| Memory Corr. Error Threshold       | Use this setting to set the Corrected Memory Error Logging Threshold using the keyboard's "+" or "-" keys. Default is <b>10</b> .                                                                                                                                                                                    |
| Erase Event Log                    | If No is selected, data stored in the event log will not be erased. Select Yes, Next Reset, data in the event log will be erased upon next system reboot. Select Yes, Every Reset, data in the event log will be erased upon every system reboot. The options are <b>No</b> , Yes, Next reset, and Yes, Every reset. |
| When Log is Full                   | Select Erase Immediately for all messages to be automatically erased from the event log when the event log memory is full. The options are <b>Do Nothing</b> and Erase Immediately.                                                                                                                                  |
| Log System Boot Event              | This option toggles the System Boot Event logging to enabled or disabled. The options are <b>Disabled</b> and Enabled.                                                                                                                                                                                               |
| MECI                               | The Multiple Event Count Increment (MECI) counter counts the number of occurrences that a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is <b>1</b> .                                                                                               |
| METW                               | The Multiple Event Time Window (METW) defines number of minutes must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is <b>60</b> .                                                                                                                |
| ► View SMBIOS Event Log            | This section displays the contents of the SMBIOS Event Log. It provides a date, time, error code and severity with a brief description of each event.                                                                                                                                                                |

## 5-7 IPMI Setup

**Table 5-16. IPMI Menu**

| Menu Option                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPMI Information              | This item indicates the IPMI firmware revision used in your system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ►System Event Log             | Use this sub-menu to configure the System Event Log.<br><b>NOTE:</b> All values changed here in this sub-menu do not take effect until the computer is restarted.                                                                                                                                                                                                                                                                                                                                                                                |
| SEL Components                | Use this setting to <b>Enable</b> or Disable all features of the System Event Logging during boot.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Erase SEL                     | Use this setting to choose options for erasing SEL. Options include <b>No</b> , Yes on Next Reset and Yes on Every Reset                                                                                                                                                                                                                                                                                                                                                                                                                         |
| When SEL is Full              | Use this setting to choose what reactions to use when SEL is full. Options include <b>Do Nothing</b> and Erase Immediately.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Log EFI Status Codes          | Use this setting to disable the logging of EFI Status Codes or log only error codes or other progress codes or both. Options include Disabled, Both, <b>Error Code</b> and Progress Code.                                                                                                                                                                                                                                                                                                                                                        |
| ►BMC Network Configuration    | Use this sub-menu to configure BMC network parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Update IPMI LAN Configuration | This setting updates the IPMI LAN Configuration. BIOS will be set to the other settings specified and changed in this screen to the IPMI on the next boot. Options include <b>No</b> or Yes.                                                                                                                                                                                                                                                                                                                                                     |
| Configuration Address Source  | 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. Options include Static or <b>DHCP</b> . The following items are assigned IP addresses automatically if DHCP is selected. |
| Station IP Address            | This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).                                                                                                                                                                                                                                                                                                                                                                                                           |
| Subnet Mask                   | This item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.                                                                                                                                                                                                                                                                                                                                                                                                  |
| Station MAC Address           | This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Router IP Address             | 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).                                                                                                                                                                                                                                                                                                                                                                                                            |
| Router MAC Address            | This item displays the Router MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 5-8 Security

Choose **Security** from the BIOS Setup main menu with the arrow keys to bring up the SECURITY SETUP menu. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <ENTER>. All Security BIOS settings are described in [Table 5-17](#) below.

**Table 5-17. Security Menu Options**

| Menu Option            | Description                                                                                                                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Administrator Password | This allows you to create an administrator password for the system.                                                                                                                                 |
| User Password          | Use this feature 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. |

## 5-9 Boot

Choose **Boot** from the 128 MB SPI Flash EEPROM with AMI® BIOS BIOS Setup Utility main menu with the arrow keys to bring up the BOOT SETUP menu. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <ENTER>. All Security BIOS settings are described in [Table 5-18](#) below.

**Table 5-18. Boot Setup Menu Options**

| Menu Option                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Boot Priority Option 1 ~ 15       | This feature allows you to specify the sequence of priority for the boot device (such as hard disk drives, USB devices, CD-ROM drives, Network drives and so on). The menu options are for 1st Boot Device, 2nd Boot Device and 3rd Boot device. Each numbered boot device can be set to a specific device installed in your system or to Disabled.<br><b>NOTE:</b> A device enclosed in parenthesis has been disabled in the corresponding type menu. |
| ►Delete Boot Option               | This sub-menu allows you to remove an EFI boot option from the boot order.                                                                                                                                                                                                                                                                                                                                                                             |
| ►Delete Driver Option             | This sub-menu allows you to remove an EFI driver option from the boot order.                                                                                                                                                                                                                                                                                                                                                                           |
| ►Hard Drive BBS Priorities        | This sub-menu allows you to set the order of the legacy devices in this group for setting the boot order.                                                                                                                                                                                                                                                                                                                                              |
| ►Network Device BBS Priorities    | This sub-menu allows you to set the order of the legacy devices in this group for setting the boot order.                                                                                                                                                                                                                                                                                                                                              |
| ►UEFI Application Boot Priorities | This sub-menu specifies the boot device priority sequence from the available UEFI application.                                                                                                                                                                                                                                                                                                                                                         |

## 5-10 Save & Exit

Choose **SAVE & EXIT** from the 128 MB SPI Flash EEPROM with AMI® BIOS BIOS Setup Utility main menu with the arrow keys to display the **SAVE & EXIT SETUP** menu. All Exit BIOS settings are described in [Table 5-19](#) below.

**Table 5-19. Exit Menu Options**

| Menu Option                | Description                                                                                                                                                                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discard Changes and Exit   | Highlight this item and hit <ENTER> to exit the BIOS Setup utility without saving any changes you may have made. Any changes you have made to the BIOS Setup will not take effect upon system bootup.                                        |
| Save Changes and Reset     | Highlight this item and hit <ENTER> to save any changes you made and to exit the BIOS Setup utility. The system will reboot and implement the changes you have made to the BIOS Setup.                                                       |
| Save Changes               | Highlight this item and hit <ENTER> to save changes done so far to any of the setup options.                                                                                                                                                 |
| Discard Changes            | Highlight this item and hit <ENTER> to discard (cancel) any changes you made. You will remain in the Setup utility.                                                                                                                          |
| Restore Optimized Defaults | Highlight this item and hit <ENTER> to load the default settings for all items in the BIOS Setup. These are the safest settings to use and are designed for maximum system performance, but may not work best for all computer applications. |
| Save as Users Defaults     | Highlight this item and hit <ENTER> to save changes done so far as user defaults.                                                                                                                                                            |
| Restore User Defaults      | Highlight this item and hit <ENTER> to restore the user defaults to all the setup options.                                                                                                                                                   |
| Boot Override              | For each boot device you have the option of saving the configuration for it and exiting.                                                                                                                                                     |

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# Appendix A

## AMI UEFI BIOS POST Codes

A status code is a data value used to indicate progress during the boot phase. A subset of these status codes, known commonly as checkpoints, indicate common phases of the BIOS boot process.

Checkpoints are typically output to I/O port 80h, but Aptio 4.x core can be configured to send status codes to a variety of sources. Aptio 4.x core outputs checkpoints throughout the boot process to indicate the task the system is currently executing. Checkpoints are very useful in aiding software developers or technicians in debugging problems that occur during the pre-boot process.

### A-1 Checkpoint Ranges

**Table A-1. Checkpoint Ranges**

| Status Code Range | Description                                        |
|-------------------|----------------------------------------------------|
| 0x01 – 0x0B       | SEC execution                                      |
| 0x0C – 0x0F       | SEC errors                                         |
| 0x10 – 0x2F       | PEI execution up to and including memory detection |
| 0x30 – 0x4F       | PEI execution after memory detection               |
| 0x50 – 0x5F       | PEI errors                                         |
| 0x60 – 0x8F       | DXE execution up to BDS                            |
| 0x90 – 0xCF       | BDS execution                                      |
| 0xD0 – 0xDF       | DXE errors                                         |
| 0xE0 – 0xE8       | S3 Resume (PEI)                                    |
| 0xE9 – 0xEF       | S3 Resume errors (PEI)                             |
| 0xF0 – 0xF8       | Recovery (PEI)                                     |
| 0xF9 – 0xFF       | Recovery errors (PEI)                              |

## A-2 Standard Checkpoints

**Table A-2. SEC Phase**

| <b>Codes</b>          | <b>Description</b>                                   |
|-----------------------|------------------------------------------------------|
| <b>Status Code</b>    |                                                      |
| 0x00                  | Not Used                                             |
| <b>Progress Codes</b> |                                                      |
| 0x01                  | Power on. Reset type detection (soft/hard).          |
| 0x02                  | AP initialization before microcode loading           |
| 0x03                  | North Bridge initialization before microcode loading |
| 0x04                  | South Bridge initialization before microcode loading |
| 0x05                  | OEM initialization before microcode loading          |
| 0x06                  | Microcode loading                                    |
| 0x07                  | AP initialization after microcode loading            |
| 0x08                  | North Bridge initialization after microcode loading  |
| 0x09                  | South Bridge initialization after microcode loading  |
| 0x0A                  | OEM initialization after microcode loading           |
| 0x0B                  | Cache initialization                                 |
| 0x0C – 0x0D           | Reserved for future AMI SEC error codes              |
| 0x0E                  | Microcode not found                                  |
| 0x0F                  | Microcode not loaded                                 |

**Table A-3. PEI Phase**

| <b>Status Codes</b>   | <b>Description</b>                                                    |
|-----------------------|-----------------------------------------------------------------------|
| <b>Progress Codes</b> |                                                                       |
| 0x10                  | PEI Core is started                                                   |
| 0x11                  | Pre-memory CPU initialization is started                              |
| 0x12                  | Pre-memory CPU initialization (CPU module specific)                   |
| 0x13                  | Pre-memory CPU initialization (CPU module specific)                   |
| 0x14                  | Pre-memory CPU initialization (CPU module specific)                   |
| 0x15                  | Pre-memory North Bridge initialization is started                     |
| 0x16                  | Pre-Memory North Bridge initialization (North Bridge module specific) |
| 0x17                  | Pre-Memory North Bridge initialization (North Bridge module specific) |
| 0x18                  | Pre-Memory North Bridge initialization (North Bridge module specific) |

**Table A-3. PEI Phase**

| Status Codes           | Description                                                                      |
|------------------------|----------------------------------------------------------------------------------|
| 0x19                   | Pre-memory South Bridge initialization is started                                |
| 0x1A                   | Pre-memory South Bridge initialization (South Bridge module specific)            |
| 0x1B                   | Pre-memory South Bridge initialization (South Bridge module specific)            |
| 0x1C                   | Pre-memory South Bridge initialization (South Bridge module specific)            |
| 0x1D – 0x2A            | OEM pre-memory initialization codes                                              |
| 0x2B                   | Memory initialization. Serial Presence Detect (SPD) data reading                 |
| 0x2C                   | Memory initialization. Memory presence detection                                 |
| 0x2D                   | Memory initialization. Programming memory timing information                     |
| 0x2E                   | Memory initialization. Configuring memory                                        |
| 0x2F                   | Memory initialization (other).                                                   |
| 0x30                   | Reserved for ASL (see ASL Status Codes section below)                            |
| 0x31                   | Memory Installed                                                                 |
| 0x32                   | CPU post-memory initialization is started                                        |
| 0x33                   | CPU post-memory initialization. Cache initialization                             |
| 0x34                   | CPU post-memory initialization. Application Processor(s) (AP) initialization     |
| 0x35                   | CPU post-memory initialization. Boot Strap Processor (BSP) selection             |
| 0x36                   | CPU post-memory initialization. System Management Mode (SMM) initialization      |
| 0x37                   | Post-Memory North Bridge initialization is started                               |
| 0x38                   | Post-Memory North Bridge initialization (North Bridge module specific)           |
| 0x39                   | Post-Memory North Bridge initialization (North Bridge module specific)           |
| 0x3A                   | Post-Memory North Bridge initialization (North Bridge module specific)           |
| 0x3B                   | Post-Memory South Bridge initialization is started                               |
| 0x3C                   | Post-Memory South Bridge initialization (South Bridge module specific)           |
| 0x3D                   | Post-Memory South Bridge initialization (South Bridge module specific)           |
| 0x3E                   | Post-Memory South Bridge initialization (South Bridge module specific)           |
| 0x3F-0x4E              | OEM post memory initialization codes                                             |
| 0x4F                   | DXE IPL is started                                                               |
| <b>PEI Error Codes</b> |                                                                                  |
| 0x50                   | Memory initialization error. Invalid memory type or incompatible memory speed    |
| 0x51                   | Memory initialization error. SPD reading has failed                              |
| 0x52                   | Memory initialization error. Invalid memory size or memory modules do not match. |

**Table A-3. PEI Phase**

| <b>Status Codes</b>             | <b>Description</b>                                            |
|---------------------------------|---------------------------------------------------------------|
| 0x53                            | Memory initialization error. No usable memory detected        |
| 0x54                            | Unspecified memory initialization error.                      |
| 0x55                            | Memory not installed                                          |
| 0x56                            | Invalid CPU type or Speed                                     |
| 0x57                            | CPU mismatch                                                  |
| 0x58                            | CPU self test failed or possible CPU cache error              |
| 0x59                            | CPU micro-code is not found or micro-code update is failed    |
| 0x5A                            | Internal CPU error                                            |
| 0x5B                            | reset PPI is not available                                    |
| 0x5C-0x5F                       | Reserved for future AML error codes                           |
| <b>S3 Resume Progress Codes</b> |                                                               |
| 0xE0                            | S3 Resume is started (S3 Resume PPI is called by the DXE IPL) |
| 0xE1                            | S3 Boot Script execution                                      |
| 0xE2                            | Video repost                                                  |
| 0xE3                            | OS S3 wake vector call                                        |
| 0xE4-0xE7                       | Reserved for future AML progress codes                        |
| <b>S3 Resume Error Codes</b>    |                                                               |
| 0xE8                            | S3 Resume Failed                                              |
| 0xE9                            | S3 Resume PPI not Found                                       |
| 0xEA                            | S3 Resume Boot Script Error                                   |
| 0xEB                            | S3 OS Wake Error                                              |
| 0xEC-0xEF                       | Reserved for future AML error codes                           |
| <b>Recovery Progress Codes</b>  |                                                               |
| 0xF0                            | Recovery condition triggered by firmware (Auto recovery)      |
| 0xF1                            | Recovery condition triggered by user (Forced recovery)        |
| 0xF2                            | Recovery process started                                      |
| 0xF3                            | Recovery firmware image is found                              |
| 0xF4                            | Recovery firmware image is loaded                             |
| 0xF5-0xF7                       | Reserved for future AML progress codes                        |
| <b>Recovery Error Codes</b>     |                                                               |
| 0xF8                            | Recovery PPI is not available                                 |
| 0xF9                            | Recovery capsule is not found                                 |

**Table A-3. PEI Phase**

| Status Codes | Description                         |
|--------------|-------------------------------------|
| 0xFA         | Invalid recovery capsule            |
| 0xFB – 0xFF  | Reserved for future AMI error codes |

**Table A-4. PEI Beep Codes**

| # of Beeps | Description                                                                    |
|------------|--------------------------------------------------------------------------------|
| 1          | Memory not Installed                                                           |
| 1          | Memory was installed twice (InstallPeiMemory routine in PEI Core called twice) |
| 2          | Recovery started                                                               |
| 3          | DXE IPL was not found                                                          |
| 3          | DXE Core Firmware Volume was not found                                         |
| 4          | Recovery failed                                                                |
| 4          | S3 Resume failed                                                               |
| 7          | Reset PPI is not available                                                     |

**Table A-5. DXE Phase**

| Status Codes | Description                                                    |
|--------------|----------------------------------------------------------------|
| 0x60         | DXE Core is started                                            |
| 0x61         | NVRAM initialization                                           |
| 0x62         | Installation of the South Bridge Runtime Services              |
| 0x63         | CPU DXE initialization is started                              |
| 0x64         | CPU DXE initialization (CPU module specific)                   |
| 0x65         | CPU DXE initialization (CPU module specific)                   |
| 0x66         | CPU DXE initialization (CPU module specific)                   |
| 0x67         | CPU DXE initialization (CPU module specific)                   |
| 0x68         | PCI host bridge initialization                                 |
| 0x69         | North Bridge DXE initialization is started                     |
| 0x6A         | North Bridge DXE SMM initialization is started                 |
| 0x6B         | North Bridge DXE initialization (North Bridge module specific) |
| 0x6C         | North Bridge DXE initialization (North Bridge module specific) |
| 0x6D         | North Bridge DXE initialization (North Bridge module specific) |
| 0x6E         | North Bridge DXE initialization (North Bridge module specific) |
| 0x6F         | North Bridge DXE initialization (North Bridge module specific) |

**Table A-5. DXE Phase**

| Status Codes | Description                                                    |
|--------------|----------------------------------------------------------------|
| 0x70         | South Bridge DXE initialization is started                     |
| 0x71         | South Bridge DXE SMM initialization is started                 |
| 0x72         | South Bridge devices initialization                            |
| 0x73         | South Bridge DXE Initialization (South Bridge module specific) |
| 0x74         | South Bridge DXE Initialization (South Bridge module specific) |
| 0x75         | South Bridge DXE Initialization (South Bridge module specific) |
| 0x76         | South Bridge DXE Initialization (South Bridge module specific) |
| 0x77         | South Bridge DXE Initialization (South Bridge module specific) |
| 0x78         | ACPI module initialization                                     |
| 0x79         | CSM initialization                                             |
| 0x7A – 0x7F  | Reserved for future AMI DXE codes                              |
| 0x80 – 0x8F  | OEM DXE initialization codes                                   |
| 0x90         | Boot Device Selection (BDS) phase is started                   |
| 0x91         | Driver connecting is started                                   |
| 0x92         | PCI Bus initialization is started                              |
| 0x93         | PCI Bus Hot Plug Controller Initialization                     |
| 0x94         | PCI Bus Enumeration                                            |
| 0x95         | PCI Bus Request Resources                                      |
| 0x96         | PCI Bus Assign Resources                                       |
| 0x97         | Console Output devices connect                                 |
| 0x98         | Console input devices connect                                  |
| 0x99         | Super IO Initialization                                        |
| 0x9A         | USB initialization is started                                  |
| 0x9B         | USB Reset                                                      |
| 0x9C         | USB Detect                                                     |
| 0x9D         | USB Enable                                                     |
| 0x9E – 0x9F  | Reserved for future AMI codes                                  |
| 0xA0         | IDE initialization is started                                  |
| 0xA1         | IDE Reset                                                      |
| 0xA2         | IDE Detect                                                     |
| 0xA3         | IDE Enable                                                     |
| 0xA4         | SCSI initialization is started                                 |

**Table A-5. DXE Phase**

| Status Codes           | Description                                           |
|------------------------|-------------------------------------------------------|
| 0xA5                   | SCSI Reset                                            |
| 0xA6                   | SCSI Detect                                           |
| 0xA7                   | SCSI Enable                                           |
| 0xA8                   | Setup Verifying Password                              |
| 0xA9                   | Start of Setup                                        |
| 0xAA                   | Reserved for ASL (see ASL Status Codes section below) |
| 0xAB                   | Setup Input Wait                                      |
| 0xAC                   | Reserved for ASL (see ASL Status Codes section below) |
| 0xAD                   | Ready To Boot event                                   |
| 0xAE                   | Legacy Boot event                                     |
| 0xAF                   | Exit Boot Services event                              |
| 0xB0                   | Runtime Set Virtual Address MAP Begin                 |
| 0xB1                   | Runtime Set Virtual Address MAP End                   |
| 0xB2                   | Legacy Option ROM Initialization                      |
| 0xB3                   | System Reset                                          |
| 0xB4                   | USB hot plug                                          |
| 0xB5                   | PCI bus hot plug                                      |
| 0xB6                   | Clean-up of NVRAM                                     |
| 0xB7                   | Configuration Reset (reset of NVRAM settings)         |
| 0xB8 – 0xBF            | Reserved for future AMI codes                         |
| 0xC0 – 0xCF            | OEM BDS initialization codes                          |
| <b>DXE Error Codes</b> |                                                       |
| 0xD0                   | CPU initialization error                              |
| 0xD1                   | North Bridge initialization error                     |
| 0xD2                   | South Bridge initialization error                     |
| 0xD3                   | Some of the Architectural Protocols are not available |
| 0xD4                   | PCI resource allocation error. Out of Resources       |
| 0xD5                   | No Space for Legacy Option ROM                        |
| 0xD6                   | No Console Output Devices are found                   |
| 0xD7                   | No Console Input Devices are found                    |
| 0xD8                   | Invalid password                                      |
| 0xD9                   | Error loading Boot Option (LoadImage returned error)  |

**Table A-5. DXE Phase**

| Status Codes | Description                                       |
|--------------|---------------------------------------------------|
| 0xDA         | Boot Option is failed (StartImage returned error) |
| 0xDB         | Flash update is failed                            |
| 0xDC         | Reset protocol is not available                   |

**Table A-6. DXE Beep Codes**

| # of Beeps | Description                                           |
|------------|-------------------------------------------------------|
| 1          | Invalid password                                      |
| 4          | Some of the Architectural Protocols are not available |
| 5          | No Console Output Devices are found                   |
| 5          | No Console Input Devices are found                    |
| 6          | Flash update is failed                                |
| 7          | Reset protocol is not available                       |
| 8          | Platform PCI resource requirements cannot be met      |

**Table A-7. ACPI/ASL Checkpoints**

| Status Codes | Description                                                                   |
|--------------|-------------------------------------------------------------------------------|
| 0x01         | System is entering S1 sleep state                                             |
| 0x02         | System is entering S2 sleep state                                             |
| 0x03         | System is entering S3 sleep state                                             |
| 0x04         | System is entering S4 sleep state                                             |
| 0x05         | System is entering S5 sleep state                                             |
| 0x10         | System is waking up from the S1 sleep state                                   |
| 0x20         | System is waking up from the S2 sleep state                                   |
| 0x30         | System is waking up from the S3 sleep state                                   |
| 0x40         | System is waking up from the S4 sleep state                                   |
| 0xAC         | System has transitioned into ACPI mode. Interrupt controller is in PIC mode.  |
| 0xAA         | System has transitioned into ACPI mode. Interrupt controller is in APIC mode. |

## A-3 OEM-Reserved Checkpoint Ranges

**Table A-8. OEM-Reserved Checkpoint Ranges**

| Status Codes | Description                                     |
|--------------|-------------------------------------------------|
| 0x05         | OEM SEC initialization before microcode loading |
| 0x0A         | OEM SEC initialization after microcode loading  |
| 0x1D – 0x2A  | OEM pre-memory initialization codes             |
| 0x3F – 0x4E  | OEM PEI post memory initialization codes        |
| 0x80 – 0x8F  | OEM DXE initialization codes                    |
| 0xC0 – 0xCF  | OEM BDS initialization codes                    |



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# Disclaimer

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.

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## Appendix B

### Specifications and Compliance

#### Operating Environment

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

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

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

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

#### Regulatory Compliance

FCC, ICES, CE, VCCI, RCM, NRTL, CB

#### Applied Directives, Standards

EMC/EMI: 2014/30/EU (EMC Directive)

FCC Part 15

ICES-003

VCCI 32-1

AS/NZS CISPR 32

EN55032

EN55035

CISPR 24

EN 61000-3-2

EN 61000-3-3

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

Green Environment:

2011/65/EU (RoHS Directive)

EC 1907/2006 (REACH)

2012/19/EU (WEEE Directive)

Product Safety: 2014/35/EU (LVD Directive)

UL/CSA 60950-1, 62368-1 (USA and Canada)

IEC/EN 60950-1, 62368-1

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## **Perchlorate Warnings**

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

## ***General Data Center Environmental Specifications***

### **Particulate contamination specifications**

Air filtration: Data centers must be kept clean to Class 8 of ISO 14644-1 (ISO 2015). The air entering the data center should be filtered with a MERV 11 filter or better. The air within the data center should be continuously filtered with a MERV 8 filter or better.

Conductive dust: Air should be free of conductive dust, zinc whiskers, or other conductive particles.

Corrosive dust: Air should be free of corrosive dust.

### **Gaseous\* contamination specifications**

Copper coupon corrosion rate: <300 Å/month per class G1 as defined by ANSI. ISA71.04-2013, reference by ASHRAE TC 9.9

Silver coupon corrosion rate: <200 Å/month per class G1 as defined by ANSI. ISA71.04-2013, reference by ASHRAE TC 9.9

\*If testing with silver or copper coupons results in values less than 200 Å/month or 300 Å/month, respectively, then operating up to 70% relative humidity (RH) is acceptable. If the testing shows corrosion levels exceed these limits, then catalyst-type pollutants are probably present and RH should be driven to 50% or lower.