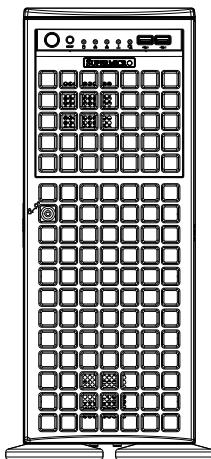


SUPER[®]

SuperWorkstation

7047GR-TPRF



USER'S MANUAL

Revision 1.0b

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Manual Revision 1.0b
Release Date: October 16, 2014

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperWorkstation 7047GR-TPRF. Installation and maintenance should be performed by experienced technicians only.

The SuperWorkstation 7047GR-TPRF is based on the SC747TQ-R1620B 4U/Tower rackmount chassis and the Super X9DRG-QF serverboard. Please refer to our web site for an up-to-date list of supported operating systems, processors and memory.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the workstation system and describes the main features of the Super X9DRG-QF serverboard and the SC747TQ-R1620B chassis.

Chapter 2: Workstation Installation

This chapter describes the steps necessary to install the system into a rack and check out the workstation configuration prior to powering up the system. If your workstation was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

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

Chapter 4: Standardized Warning Statements

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

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X9DRG-QF serverboard, including the locations and functions of connectors, headers and jumpers. Refer to

this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC747TQ-R1620B 4U/Tower rackmount chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS Beep Codes

Appendix B: System Specifications

Notes

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Appendix A BIOS Error Beep Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1 Overview

The SuperWorkstation 7047GR-TPRF is comprised of two main subsystems: the SC747TQ-R1620B 4U/Tower chassis and the X9DRG-QF dual Intel Xeon processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the workstation, as listed below:

- Two 80-mm exhaust fans (FAN-0082L4)
- Two 92 x 38 mm front fans (FAN-0114L4)
- Two 80-mm rear fans (FAN-0116L4)
- Two 92 x 38 mm GPU fans (FAN-0138L4)
- Two 4U active CPU heatsinks (SNK-P0050AP4)
- SATA accessories:
 - One HD backplane (BPN-SAS-747TQ)
 - Eight 3.5" hard disk drive trays (MCP-220-00094-0B)
 - Three 5.25" drive trays (MCP-220-00073-0B)

Optional

- One 4U 17.2" width rack rail set (MCP-290-00059-0N)
- SC747B GPU / Add-on Card Dummy Assembly (2 Slots), Single Pack (MCP-240-00096-0N)

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

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: [ftp://ftp.supermicro.com](http://ftp.supermicro.com)
- Product safety info: http://super-dev/about/policies/safety_information.cfm

1-2 Serverboard Features

At the heart of the SuperWorkstation 7047GR-TPRF lies the X9DRG-QF, a dual processor serverboard based on the Intel C602 chipset. Below are the main features of the X9DRG-QF. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X9DRG-QF supports two Intel® E5-2600 (v2) Series processors in LGA 2011 sockets (Socket R). Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Note: For Intel E5-2600(v2) processor support, BIOS version 3.0 or above is required.

Memory

The X9DRG-QF has sixteen DIMM slots that can support up to 1 TB ECC LRDIMM, 512 GB ECC RDIMM or 128 GB ECC/non-ECC UDIMM DDR3-1866/1600/1333/1066/800 memory. Modules of the same size and speed are recommended. See Chapter 5 for details.

SATA

A SATA controller is integrated into the chipset to provide a ten-port SATA subsystem, which is RAID 0, 1, 5 and 10 supported. The I-SATA 0-1 ports are SATA 3.0 ports while the I-SATA2-5 and the S-SATA0-3 ports are SATA 2.0 ports. The SATA drives are hot-swappable units.

Note: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives.

PCI Expansion Slots

The X9DRG-QF has four PCI-E 3.0 x16, two PCI-E 3.0 x8 (in x16) and one PCI-E 2.0 x4 (in x8) slots for a total of seven PCI expansion slots.

Rear I/O Ports

The color-coded I/O ports include one COM port, a VGA (monitor) port, four USB 2.0 ports, a dedicated IPMI LAN port and two Gb Ethernet LAN ports.

IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for

Supermicro workstation platforms. IPMI allows administrators to view a workstation's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

1-3 Chassis Features

The following is a general outline of the main features of the SC747TQ-R1620B chassis.

System Power

The SC747TQ-R1620B chassis includes a 1620W high-efficiency, redundant (1+1) power supply consisting of two power supply modules. In the unlikely event a power supply module fails, replacement is simple and can be done without tools. The AC power cord should be removed from the system before servicing or replacing a power supply module. See Chapter 6 for details.

Mounting Rails (optional)

The SC747 can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual in Chapter 2.

Hard Drive/Drive Bays

The SC747 chassis features eight drive bays for SATA drives. These drives are hot-swappable. Once set up correctly, these drives can be removed without powering down the workstation.

The SC747 chassis also provides three 5.25" peripheral drive bays for floppy drives, DVD-ROM/CD-ROM drives, or additional hard drives.

Control Panel

The control panel on the workstation provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, system overheat, UID and power supply failure. A main power button and a system reset button are also included.

Cooling System

The SC747 chassis accepts four system fans and two rear exhaust fans. System fans are powered from the serverboard. These fans are 4U high and are powered by 4-pin connectors.

1-4 GPU Subsystem

The 7047GR-TPRF is a massively parallel-processing, quad-GPU server with support for up to four NVIDIA® Fermi™ GPUs (such as Fermi, Kepler K10, K20, K20X) and Xeon Phi™ Coprocessor GPUs, placing this system at the forefront of today's GPU computing solutions.

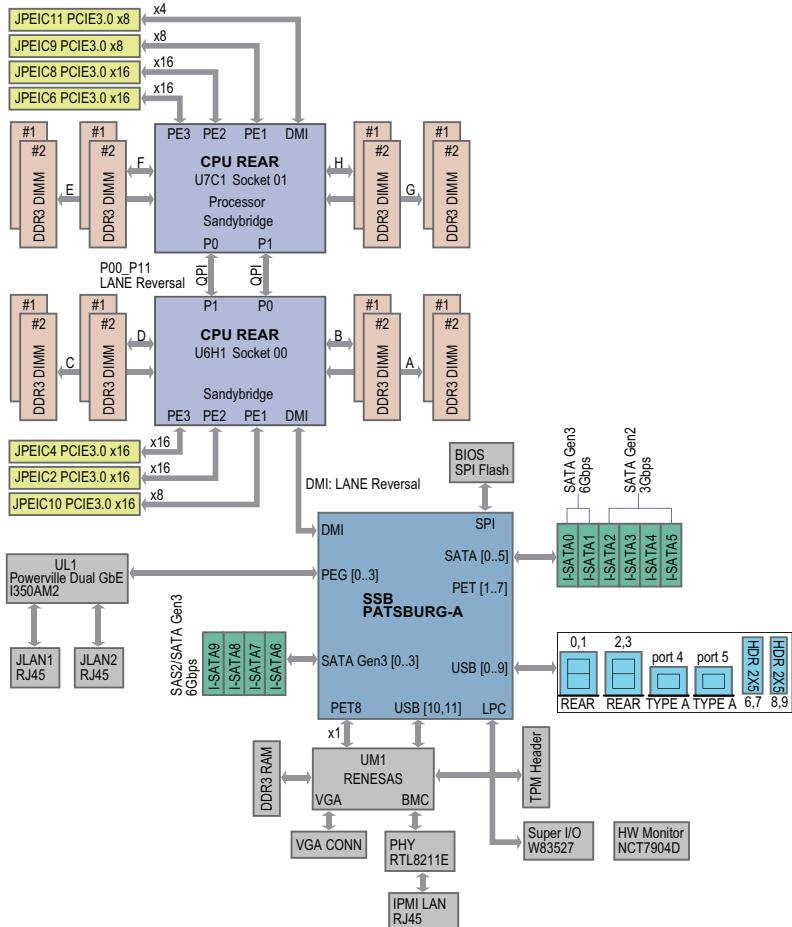
Please refer to the NVIDIA web site (www.nvidia.com) for details on Fermi GPUs. Please refer to Intel website (www.intel.com) for more details on Xeon Phi Coprocessor GPUs.

The GPUs can be bundled with the system as follows:

System Name	GPU Configuration
7047GR-TPRF-FM409	4x NVIDIA Tesla M2090 GPUs
7047GR-TPRF-FM475	4x NVIDIA Tesla M2075 passive GPUs

**Figure 1-1. Intel C602 Chipset:
System Block Diagram**

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



1-5 Contacting Supermicro

Headquarters

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Fax: +886-(2) 8226-3992
Email: support@supermicro.com.tw
Website: www.supermicro.com.tw

Chapter 2

Workstation Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperWorkstation 7047GR-TPRF up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperWorkstation 7047GR-TPRF was shipped in and note if it was damaged in any way. If the workstation itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for setting up and operating the SuperWorkstation 7047GR-TPRF. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet.



Warnings and Precautions!



- Review the electrical and general safety precautions in Chapter 4.
- Use a regulating uninterruptible power supply (UPS) to protect the workstation from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the power supply units and Serial ATA drives to cool before touching them.
- To maintain proper cooling, always keep all chassis panels closed when not being serviced.

2-3 Preparing for Setup

The box your workstation was shipped in may include two sets of rail assemblies, two rail mounting brackets and the mounting screws needed to install the system into the rack (optional parts). Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

2-4 Warnings and Precautions

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.
- Rack-mounted equipment should not be used as a shelf or work space.

Workstation Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest workstation components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the workstation from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SATA drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the workstations closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

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

Reduced Airflow

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

Mechanical Loading

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

Circuit Overloading

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

Reliable Ground

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

2-5 Installing the Chassis onto a Rack

This section provides information on installing the SC747 chassis into a rack unit with the optional 4U 17.2" width rail set (MCP-290-00059-0B). There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Notes: The outer rail is adjustable from 26" to 38.25". The MCP-290-00059-0N rail kit is an optional accessory.

Removing the Chassis Cover and Feet

The SC747 chassis is shipped with the chassis cover and feet pre-installed. Both the feet and cover must be removed for before installing the rails.

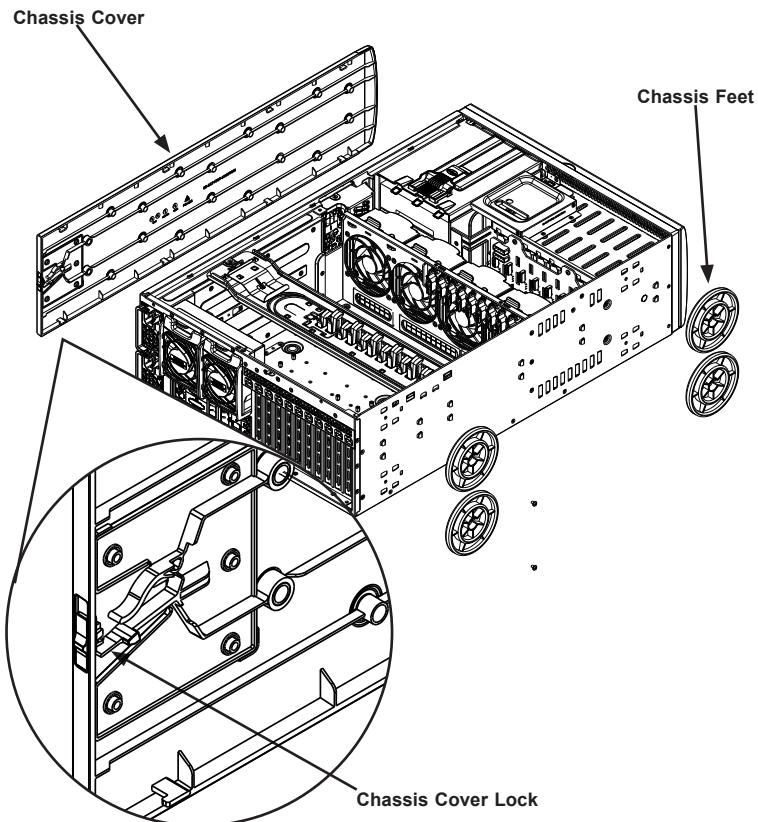
Removing the Chassis Top Cover

1. Locate the chassis cover lock (blue lever) at the rear of the chassis cover.
2. Slide the chassis cover lock to the right and push chassis cover forward.
3. Lift the chassis top cover off the chassis.

Removing the Chassis Feet

1. Place the chassis on its side with the chassis side cover facing upward.
2. Remove the screw holding the chassis foot in place.
3. The foot lock is a tab located in the center of the foot that prevents the foot from sliding. Using a flat head screwdriver, **gently** lift the foot lock upward and slide the foot toward the rear of the chassis.
4. Repeat steps 2 and 3 with each remaining foot.

Figure 2-1. Removing the Feet and Chassis Top Cover



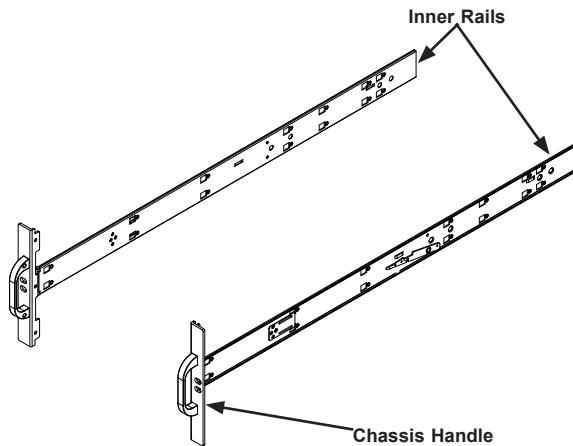
Warning! To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the workstation chassis and an outer fixed rack rail that secures directly to the rack itself.

Figure 2-2. Identifying the Inner Rails and Chassis Handles



Installing the Chassis Handles and Inner Rails

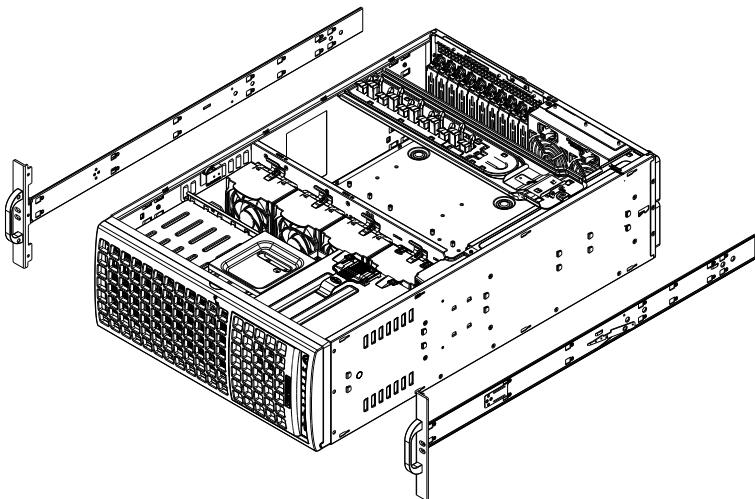
Installing the Inner Rails

1. Locate the chassis handles and handle screws.
2. Align the chassis handle with the front of the chassis and secure with the three chassis handle screws.
3. Repeats steps 1 and 2 with the other handle.
4. Locate the inner rails and screws in the shipping package.
5. Align the inner rails against the chassis, as shown. Confirm that the rails are flushed against the edge of the chassis.
6. Tighten the screws. Do not over-tighten.
7. Repeat steps 5 and 6 with the other inner rail.



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

Figure 2-3. Installing the Inner Rack Rails



Installing the Outer Rails to the Rack

Installing the Outer Rails

1. Attach the rear bracket to the middle bracket.
2. Adjust both the brackets to the proper distance so that the rail fits snugly into the rack.
3. Secure the rear of the outer rail with two M5 screws and the rear of the rack.
Note: The outer rail is adjustable from approximately 26" to 38.25".
4. Repeat steps 1-3 for the left outer rail.

Figure 2-4. Assembling the Outer Rails

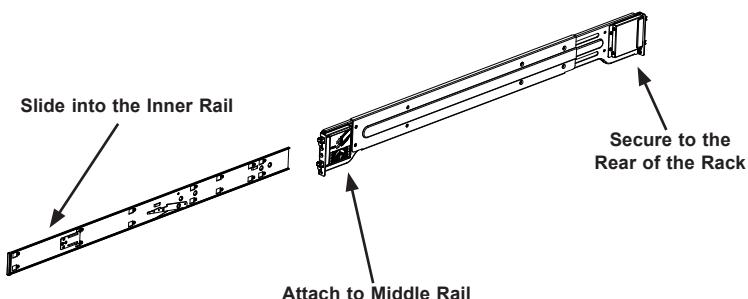
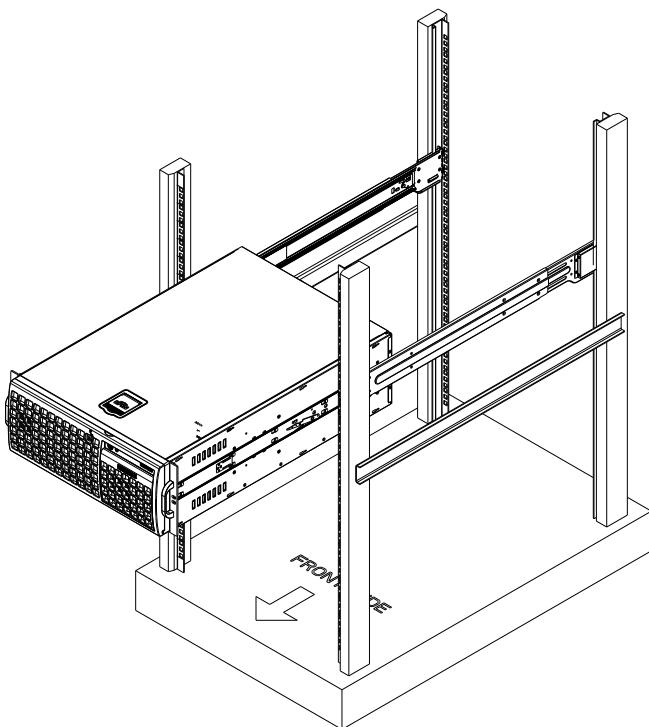


Figure 2-5. Installing the Rack Rails



Note: figures are for illustrative purposes only. Always install servers to the bottom of a rack first.

Installing the Chassis into a Rack

Installing the Chassis

1. Confirm that chassis includes the inner rails and the outer rails.
2. Align the inner chassis rails with the front of the outer rack rails (C).
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the chassis has been pushed completely into the rack, you should hear the locking tabs "click" into the locked position.

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

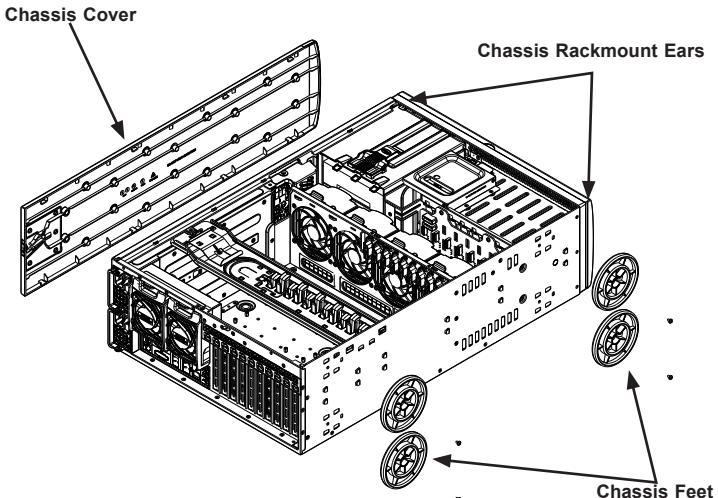


2-6 Tower Mounting Instructions

The SC747 chassis is shipped with the chassis cover and feet pre-installed. To use the chassis as a desktop workstation, no other installation is required.

Use the instructions in this section if you have converted the chassis for rack use and need to return the chassis to tower mounting.

Figure 2-6. Adding Chassis Feet and Top Cover



Installing the Chassis Cover

Installing the Cover

1. Remove the rack mount ears.
2. Align the cover post with the corresponding holes on the top of the chassis and place the cover on top of the chassis. The cover should overhang approximately one-half inch over the front of the chassis.
3. Slide the chassis cover toward the rear of the chassis to lock the cover into place.

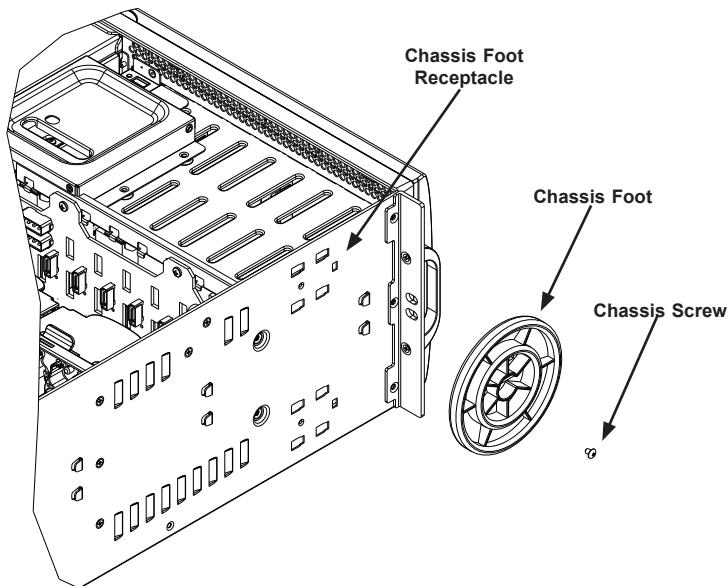


Warning: When initially installing the server to a rack, test that the rail locking tabs engage to prevent the server from being overextended. Have a rack lift in place as a precaution in case the test fails.



Slide rail mounted equipment is not to be used as a shelf or a work space.

Figure 2-7. Placing Chassis Feet



Installing Feet on the Chassis

Installing the Chassis Feet

1. Place the chassis foot in the foot receptacle and slide the foot toward the front of the chassis. The foot should lock into place.
2. Secure the foot to the chassis using one screw enclosed in the packaging.
3. Repeat steps 1 and 2 for the remaining three chassis feet.

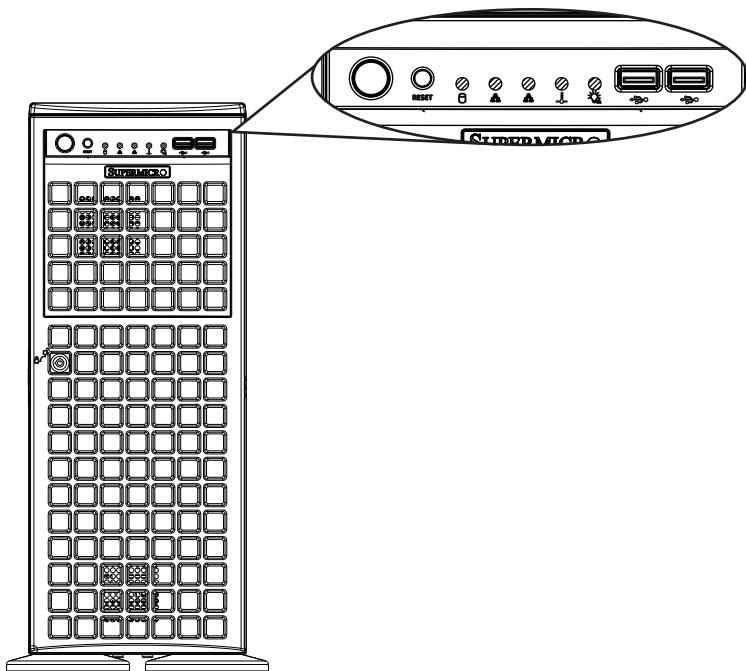
Chapter 3

System Interface

3-1 Overview

There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are two buttons on the chassis a control panel: a reset button and an on/off switch. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

Figure 3-1. Front LEDs



3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are power on/off button and a reset button.



Power

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



Reset

The reset button is used to reboot the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC747 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



HDD

Indicates IDE channel activity. SAS/SATA and/or DVD-ROM drive activity when flashing.



NIC1

Indicates network activity on LAN1 when flashing.



NIC2

Indicates network activity on LAN2 when flashing.



Overheat/Fan Fail

When this LED flashes it indicates a fan failure. When continuously on (not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the overheat condition exists.



Power Fail

Indicates a power failure to the system's power supply units.

3-4 Drive Carrier LEDs

Each SATA drive carrier has two LEDs.

- Green: Each drive carrier has a green LED. When illuminated, this green LED (on the front of the drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- Red: The red LED indicates a SATA drive failure. If one of the SATA drives fail, you should be notified by your system management software.

Chapter 4

Standardized Warning Statements for AC Systems

4-1 About Standardized Warning Statements

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

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

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

Warning Definition



Warning!

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

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、

電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

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

此警告符號代表危險。

您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.

תקנון הצהורות אזהרה

הצהורות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היבטים בעיה כלשהו, יש לצטור קשר עם מחלקת תמייה. תכנית של סופרמייקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במאורי סופרמייקרו.

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

안전을 위한 주의사항

경고!

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

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

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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

BEWAAR DEZE INSTRUCTIES

Installation Instructions



Warning!

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

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前, 请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

Warnung

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

¡Advertencia!

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

Attention

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

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

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

Circuit Breaker



Warning!

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

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V, 20 Aを超えないことを確認下さい。

警告

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

מוחץ זה מסתמך על הגנה המותקנת במבנה למונעת קצר חשמלי. יש לוודא
המכ舍יר המגן מפני הקצר החשמלי הוא לא יותר מ- 60VDC, 20A
הذا המנזהج ייעמיד עליה מعدادת הלחם אין מ- הדוואיזר הפעסירהaltı נטבינה-ה
المبني
تأكد من أن نظيفه الـ جهاز الوقائي ليس أكثر من: 20A, 250VDC

경고!

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

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw elektrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 220V, 20A.

Power Disconnection Warning



Warning!

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

電源切断の警告

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

在您打开机箱并安装或移除内部器件前, 必须将系统完全断电, 并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה !

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כל החשמל מהספק לפניה 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 لتنبيت 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.

ازהרה !

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לחת שירות עבורו הציוד.

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتركيب 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 installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת**אזהרה !**

יש להתקין את היחידה באזורי שיש בהם האבלת גישה. הגישה ניתנת בעזרת כל אבטחה בלבד (מפתח, מנעול וכד').

تم تخصيص هذه الوحدة لتركيبها في مناطق محظورة .
يمكن الوصول إلى منطقة محظورة فقط من خلال استخدام أداة خاصة،
قفل وفتح 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

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

סילוק הסוללות המשומשות יש לבצע לפי הוראות הייצורן.

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 وفقاً لتعليمات الشركة الصانعة

경고!

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

Waarschuwing

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

Redundant Power Supplies



Warning!

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

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein 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 קיימים יותר מספק אחד

אוורה!

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

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة.
يجب إزالة كافة الاتصالات 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りています。

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

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

¡Advertencia!

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

Attention

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

מתה בפנل האחורי**אזהרה !**

קיימת סכנת מתה בפנל האחורי בזמן תפעול המערכת. יש להיזהר ב�行ן העבودה.

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

Attention

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

תיאום חוקי החשמל הארץ

אזהרה!
התקנת הציגוד חייבת להיות توأمת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل لقوانين 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 وفقاً 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

当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

警告

當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

Warnung

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

¡Advertencia!

Los ventiladores podran dar vuelta cuando usted quite ell montaje del ventilador del chasis. Mandtenga 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.

ازההה !

כאשר מסרים את חלקו המאוחר מהמאיז, יתכן והמאזרדים עדיין עובדים. יש להרוחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתחום המאוחר

من الممكن أن المرواح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع وفكك البراغي وغيرها من الأشياء بعيداً عن الفتحات في كتلة المروحة.

경고!

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

Waarschuwing

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

Power Cable and AC Adapter



Warning!

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

電源コードとACアダプター

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

警告

安装此产品时,请使用本身提供的或指定的连接线,电源线和电源适配器. 使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

警告

安裝此產品時,請使用本身提供的或指定的連接線,電源線和電源適配器. 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 ומתאימים AC

אזהרה !

כאשר מתקנים את המוצר, יש להשתמש בcabלים, ספקים ומתחאים AC אשר נועדו וסופקו לשם כך. שימוש בכל כבל או מתאם אחר יכול לגרום לתקלה או קוצר חשמלי. על פי חוקי שימוש במכשורי חשמל וחוקי בטיחות, קיימים איסור להשתמשocabלים המומכימים ב- UL או ב- CSA (क्षार मोफियु उलिहम कोड शे UL/CSA) עבור כל מוצר חשמלי אחר שלא צוין על ידי סופראקמייקרו בלבד.

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

경고!

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

Waarschuwing

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

Notes

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the X9DRG-QF serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

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

Unpacking

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

5-2 Connecting Cables

Several cables need to be connected from the chassis to the serverboard. These include the data cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the serverboard layout for connector locations.)

- SATA drive data cables (I-SATA0 ~ SATA7)
- Control Panel cable (JF1)

Important! Make sure the the cables do not come into contact with the fans.

Connecting Power Cables

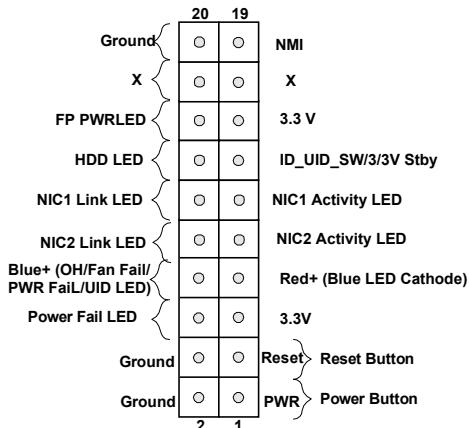
The X9DRG-QF has a 24-pin proprietary power supply connector (JPW1) for connection to the ATX power supply. In addition, there are two 8-pin secondary power connectors (JPW2, JPW3) that also must be connected to your power supply. See Section 5-8 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See below for details and pin descriptions.

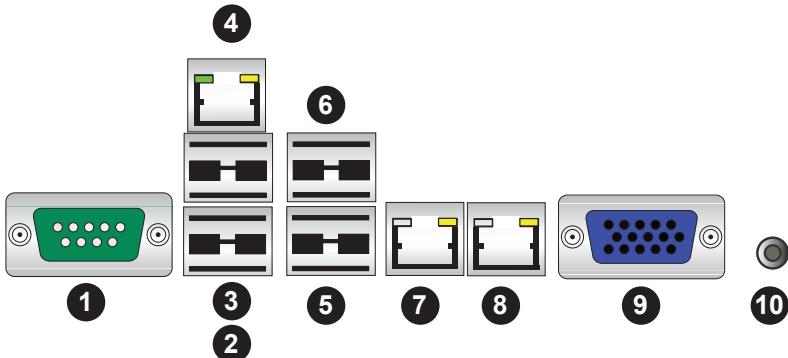
Figure 5-1. Control Panel Header Pins



5-3 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



Rear I/O Ports	
1. COM1 Port	2. USB0 Port
3. USB1 Port	4. Dedicated IPMI LAN Port
5. USB2 Port	6. USB3 Port
7. LAN1 Port	8. LAN2 Port
9. VGA Port	10. UID Switch

5-4 Installing the Processor and Heatsink

Warning: When handling the processor package, avoid placing direct pressure on the label area of the fan.

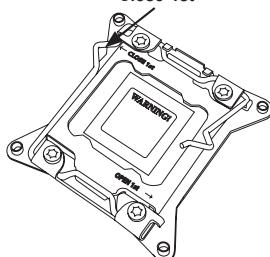
Notes:

- 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.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

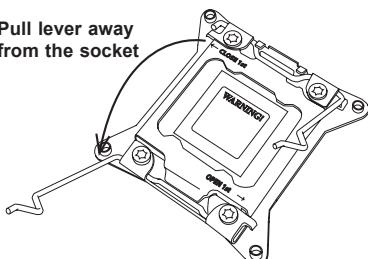
Installing an LGA2011 Processor

Press down on the lever labeled
'Close 1st'

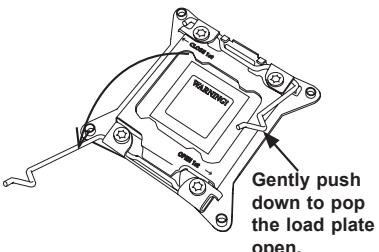
1. There are two levers on the LGA2011 socket. First press and release the load lever labeled 'Open 1st' on CPU socket 1.
2. Press the second load lever labeled 'Close 1st' to release the load plate from its locked position.



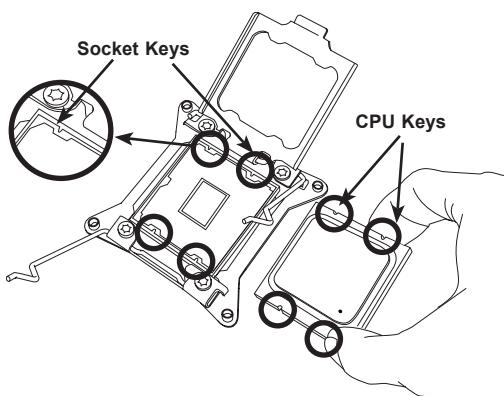
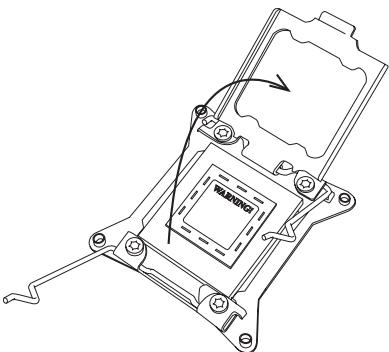
Pull lever away
from the socket



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.

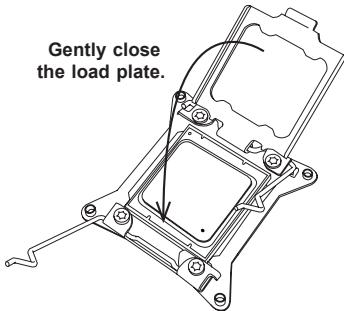


4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.
5. Use your thumb and index finger to hold the CPU by its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.
6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically and do not rub the CPU against any pins of the socket, which may damage the CPU or the socket.)

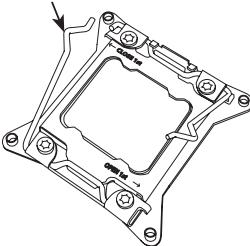


Warning: You can only install the CPU to the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is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

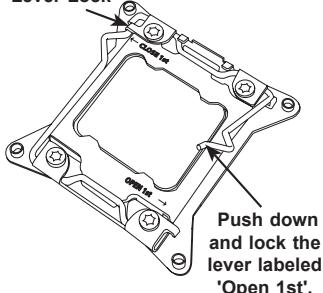
7. With the CPU in the socket, inspect the four corners of the CPU to make sure that they are flush with the socket.
8. Close the load plate. Lock the lever labeled 'Close 1st', then lock the lever labeled 'Open 1st'. Use your thumb to gently push the load levers down until the lever locks.
9. Repeat steps to install a CPU to socket 2.



Push down and lock the lever labeled 'Close 1st'.



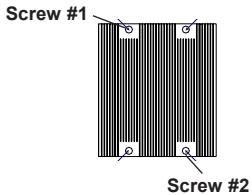
Lever Lock



Installation and Removal of the Heatsink

Installing the Heatsink

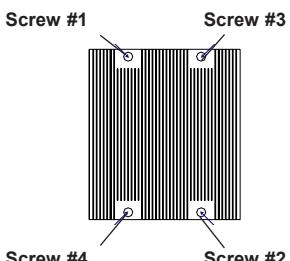
1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
3. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until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



Uninstalling the Heatsink

Warning: We do not recommend removing the CPU or the heatsink. However, if you do need to uninstall the heatsink, please follow these instructions to avoid damaging the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws in the sequence shown in the picture on the right.
2. Hold the heatsink as shown in the picture on the right and gently wriggle to loosen it from the CPU. (Do not use excessive force when doing this!)
3. Once the heatsink is loosened, remove it from the CPU socket.
4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.



5-6 Installing Memory

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

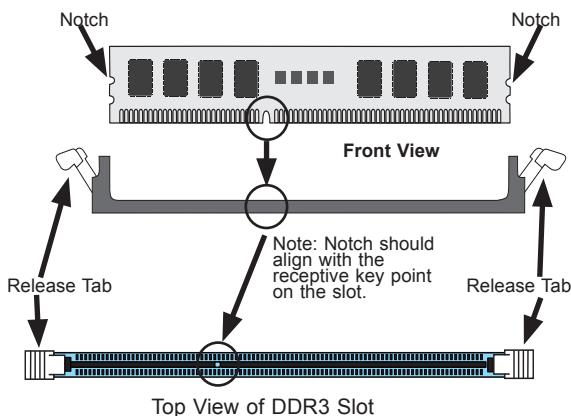
Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM1. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-3).
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

Figure 5-3. DIMM Installation

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

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



Memory Support for the X9DRG-QF Serverboard

The X9DRG-QF serverboard supports up to 1 TB ECC LRDIMM, 512 GB ECC RDIMM or 128 GB ECC/non-ECC UDIMM DDR3-1866/1600/1333/1066/800 memory in 16 DIMM slots. See the following table for memory installation. For the latest memory updates, please refer to our website at <http://www.supermicro.com/products/serverboard>.

Processor & Memory Module Population Configuration

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

Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Modules							
CPU 1	P1-DIMMA1	P1-DIMMB1	P1-DIMMC1	P1-DIMMD1	P1-DIMMA2	P1-DIMMB2	P1-DIMMC2	P1-DIMMD2
CPU2	P2-DIMME1	P2-DIMMF1	P2-DIMMG1	P2-DIMMH1	P2-DIMME2	P2-DIMM F2	P2-DIMMG2	P2-DIMMH2
Processor and Memory Module Population for Optimal Performance								
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (For memory to work properly, please install as shown below)							
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1							
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1							
1 CPU & 5~8 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 + Any memory pairs in P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2 slots							
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1							
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1							
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1							
2 CPUs & 10~16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + Any memory pairs in P1, P2 DIMM slots							
2 CPUs & 16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2, P2-DIMME2/P2-DIMMF2/P2-DIMMG2/P2-DIMMH2							

Notes:

- For optimal memory performance, please install DIMM modules in pairs (w/even number of DIMMs installed).
- All channels in a system will run at the fastest common frequency.

Populating UDIMM (ECC/Non-ECC) Memory Modules

Intel E5-2600(v2) Series Processor UDIMM Memory Support													
Ranks Per DIMM & Data Width	(See the Note below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
				2 Slots Per Channel				3 Slots Per Channel					
				1DPC		2DPC		1DPC		2DPC			
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V		
SRx8 Non-ECC	1GB	2GB	4GB	NA	1066, 1333, 1600, 1866	NA	1066, 1333, 1600	N/A	1066, 1333, 1600, 1866	N/A	1066, 1333, 1600		
DRx8 Non-ECC	2GB	4GB	8GB	NA	1066, 1333, 1600, 1866	NA	1066, 1333, 1600	N/A	1066, 1333, 1600, 1866	N/A	1066, 1333, 1600		
SRx16 Non-ECC	512MB	1GB	2GB	NA	1066, 1333, 1600, 1866	NA	1066, 1333, 1600	N/A	1066, 1333, 1600, 1866	N/A	1066, 1333, 1600		
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600		
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600		

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating RDIMM (ECC) Memory Modules

Intel E5-2600(v2) Series Processor RDIMM Memory Support													
Ranks Per DIMM & Data Width	(See the Note Below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
				2 Slots Per Channel				3 Slots Per Channel					
				1DPC		2DPC		1 DPC		2DPC		3DPC	
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	800	800, 1066
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	800	800, 1066
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	800	800, 1066
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	800	800, 1066
QRx4	8GB	16GB	32GB	800	800, 1066	800	800	800	800, 1066	800	800	N/A	N/A
QRx8	4GB	8GB	16GB	800	800, 1066	800	800	800	800, 1066	800	800	N/A	N/A

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating UDIMM (ECC/Non-ECC) Memory Modules

Intel E5-2600 Series Processor UDIMM Memory Support												
Ranks Per DIMM & Data Width	(See the Note below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)								
				2 Slots Per Channel				3 Slots Per Channel				
				1DPC		2DPC		1DPC		2DPC		
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	
SRx8 Non-ECC	1GB	2GB	4GB	NA	1066, 1333	NA	1066, 1333	N/A	1066, 1333	N/A	1066, 1333	
DRx8 Non-ECC	2GB	4GB	8GB	NA	1066, 1333	NA	1066, 1333	N/A	1066, 1333	N/A	1066, 1333	
SRx16 Non-ECC	512MB	1GB	2GB	NA	1066, 1333	NA	1066, 1333	N/A	1066, 1333	N/A	1066, 1333	
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066, 1333	1066, 1333	
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066, 1333	1066, 1333	

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating RDIMM (ECC) Memory Modules

Intel E5-2600 Series Processor RDIMM Memory Support												
Ranks Per DIMM & Data Width	(See the Note Below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)								
				2 Slots Per Channel				3 Slots Per Channel				
				1DPC		2DPC		1 DPC		2DPC		3DPC
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	N/A
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	N/A
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	N/A
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	N/A
QRx4	8GB	16GB	32GB	800	1066	800	800	800	800	1066	800	N/A
QRx8	4GB	8GB	16GB	800	1066	800	800	800	1066	800	800	N/A

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating LRDIMM (ECC) Memory Modules

Intel E5-2600(v2) Series Processor LRDIMM Memory Support											
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)	Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
		2 Slots Per Channel				3 Slots Per Channel					
		1DPC		2DPC		1DPC		2DPC		3DPC	
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
QRx4 (DDP)	16GB	32GB	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	1066	1066
8Rx4 (QDP)	32GB	64GB	1066	1066	1066	1066	1066	1066	1066	1066	1066

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Intel E5-2600 Series Processor LRDIMM Memory Support											
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)	Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
		2 Slots Per Channel				3 Slots Per Channel					
		1DPC		2DPC		1DPC		2DPC		3DPC	
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
QRx4 (DDP)	16GB	32GB	1066	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066
QRx8 (QDP)	8GB	16GB	1066	1066, 1333	1066	1066, 1333	1066	1066	1066	1066	1066

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Important Notes and Restrictions

- For the memory modules to work properly, please install DIMM modules of the same type, same speed and same operating frequency on the serverboard. Mixing of RDIMMs, UDIMMs or LRDIMMs is not allowed. Do not install both ECC and Non-ECC memory modules on the same serverboard.
- Using DDR3 DIMMs with different operating frequencies is not allowed. All channels in a system will run at the lowest common frequency.

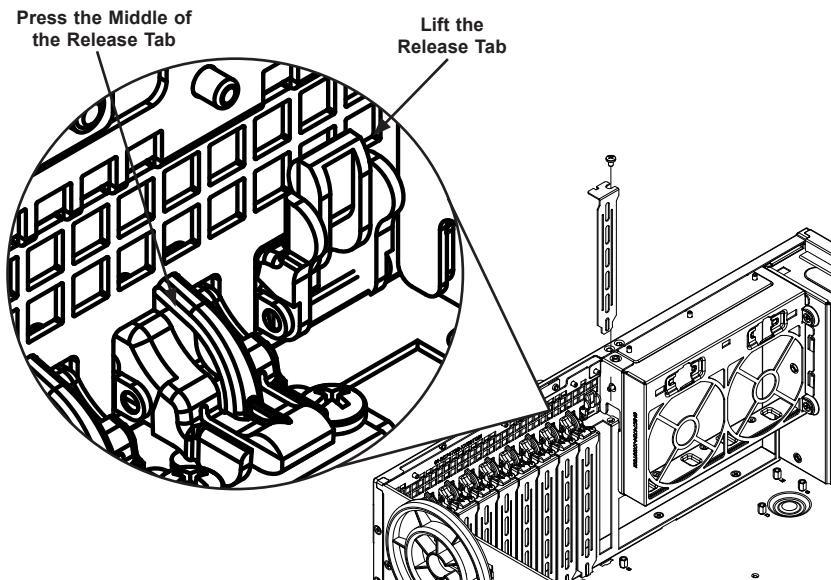
5-6 Adding PCI Add-On Cards

The 7047GR-TPRF can support four PCI-E 3.0 x16 (may support four double-width GPU cards), two PCI-E 3.0 x8 (in x16) and one PCI-E 2.0 x4 (in x8) slots.

Installing an Add-on Card

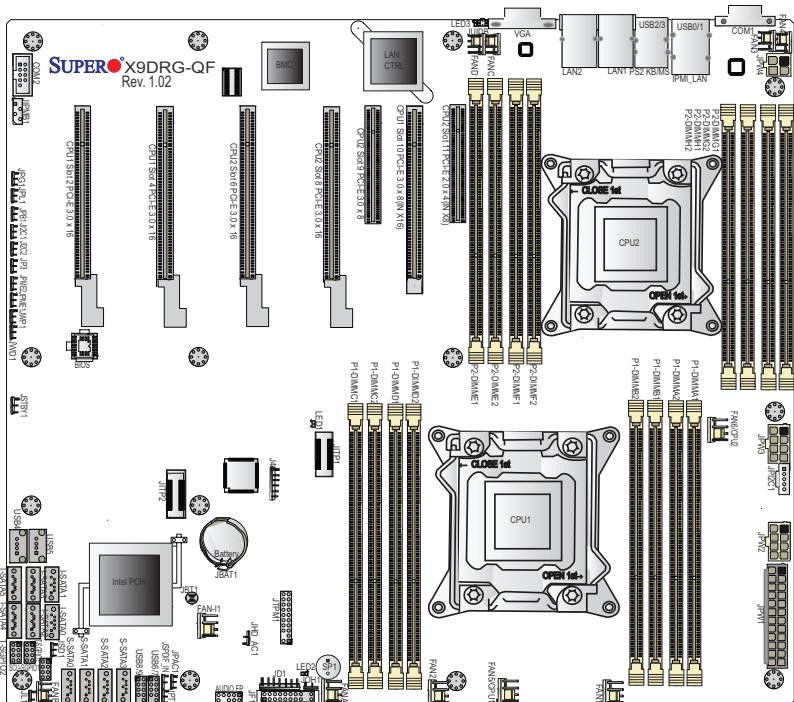
1. Locate the release tab on the top of the PCI slot bracket. Gently apply pressure to the middle of the release tab to unlock the PCI slot bracket.
2. Pull the release tab upward.
3. Remove the screw holding the bracket in place and pull the bracket from the chassis.
4. Install your PCI card or other add-on card into the PCI slot bracket and serverboard.
5. Push the PCI bracket release tab down until it locks into place with an audible "click".
6. Secure the PCI card with the screw previously removed from the chassis.
7. Repeat this process with each PCI card you want to install into the chassis.

Figure 5-7: Add-on Card/Expansion Card Port



5-7 Serverboard Details

Figure 5-8. X9DRG-QF Layout
(not drawn to scale)



Note: Jumpers not indicated are for test purposes only.

X9DRG-QF Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-9
JHD_AC1	High Definition Audio Enable/Disable	On (Enabled)
JI ² C1/JI ² C2	PCI-Exp Slots to SMB Connections	Pins 1-2 (Enabled)
JPAC1	Audio Enable/Disable	Pins 1-2 (Enabled)
JPB1	BMC Enable/Disable	Pins 1-2 (Enabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN1/GLAN2 Enable/Disable	Pins 1-2 (Enabled)
JWD1	Watch Dog Timer	Pins 1-2 (Reset)

Connector	Description		
AUDIO_FP	Front Panel Audio Header (Optional)		
COM1/COM2	Back Panel COM Port1/Front Accessible COM2 Header		
FAN#1~6, FAN #A~D, FAN11	CPU/System Fan Headers (Fan1~Fan4, Fan5: CPU1 Fan, Fan6: CPU2 Fan, FanA~FanD, Fan11)		
I-SATA 0~5	Two SATA 3.0 Ports (I-SATA 0~1), four SATA 2.0 Ports (I-SATA 2~5)		
JBAT1	Onboard Battery (See Chpt. 3 for Used Battery Disposal)		
JD1	Power LED/Speaker Header (Pins 4~7:External Speaker, Pins 6/7: Internal Speaker)		
JF1	Front Panel Control Header		
JIPMB1	4-pin External BMC I ² C Header (for an IPMI Card)		
JL1	Chassis Intrusion		
JOH1	Overheat LED Indicator		
JPI ² C1	Power System Management Bus (SMB) Header		
JPW1	24-Pin ATX Main Power Connector		
JPW2/JPW3	12V 8-Pin Power Connectors		
JPW4	4-Pin Power Connector		
JSD1	SATA DOM (Device-On-Module) Power Header		
JSPDIF_In	SPDIF (Sony/Philips Digital Interface) In Header		
JSTBY1	Standby Power Header		
JTPM1	TPM (Trusted Platform Module)/Port 80		
JUIDB	UID (Unit Identification) Switch		
LAN1/LAN2	G-bit Ethernet Ports 1/2 (See Note Below)		
(IPMI) LAN	IPMI_Dedicated LAN		
S-SATA 0~3	SATA 2.0 Ports		
SP1	Internal Speaker (Onboard Buzzer)		
T-SGPIO 1/2	Serial Link General Purpose I/O Headers for SATA Ports		
USB 0/1, 2/3	Back Panel USB 0/1, 2/3 Ports		
USB4, USB5	Front Accessible Type A USB 4/5 Ports		
USB 6/7, 8/9	Front Accessible USB 6/7, 8/9 Headers		
LED	Description	State	Status
LED1	BMC Heartbeat LED	Green	BMC Normal
LED2	Standby PWR LED	Green: On	SB Power On
LED3	UID Switch LED		

Note: LAN connections will be available when two CPUs are installed.

5-8 Connector Definitions

Power Connections

A 24-pin main power supply connector (JPW1), two 8-pin CPU PWR connectors (JPW2/JPW3) and a 4-pin PWR connector (JPW4) are provided on the serverboard. These power connectors meet the SSI EPS 12V specification. See the tables on the right for pin definitions.

Warning: To provide adequate power to the serverboard, be sure to connect the 24-pin PWR (JPW1), and an 8-pin connector for each CPU (JPW2, JPW3) to the power supply. Failure to do so will void the manufacturer warranty on your power supply and serverboard.

The 4-pin PWR connector (JPW4) is optional, however Supermicro recommends that this connector also be connected to the power supply for optimal power delivery.

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

12V 8-pin PWR Pin Definitions		12V 4-pin PWR Pin Definitions	
Pins	Definition	Pins	Definition
1~4	Ground	1/2	Ground
5~8	+12V	3/4	+12V

NMI Button

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

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

Power LED

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

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

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	3.3V Standby
14	HD Active

NIC1/NIC2 LED Indicators

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

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Vcc
10	NIC 2 LED
11	Vcc
12	NIC 1 LED

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

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

OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Red_LED-Cathode/OH/Fan Fail/Power Fail 5.5V.SB
8	Blue_UID LED

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

Power Fail LED

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

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

Reset Button

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

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

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - See Chapter 5). To turn off the power when the system is in suspend mode, press the button for 4 seconds or longer. Refer to the table on the right for pin definitions.

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

Serial Ports

Two COM connections (COM1 & COM2) are located on the serverboard. COM1 is located on the rear I/O panel. COM2, located close to PCI-E CPU1 Slot1, provides front access support. See the table on the right for pin definitions.

Serial COM Ports Pin Definitions			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

NC = No Connection

Universal Serial Bus (USB)

Four Universal Serial Bus ports (USB 0/1, 2/3) are located on the I/O back panel to provide rear USB connections. Four front-accessible USB connections (USB 6/7, 8/9) are located next to S-SATA Port 3. In addition, two Type A USB Embedded Drive connectors (USB 4, USB 5), located next to I-SATA 4/5, are also used to provide front panel USB connections (cables not included). See the tables on the right for pin definitions.

Backplane USB (0/1, 2/3) Pin Definitions	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	NA

Front Panel USB 6/7, 8/9, USB 4, 5 Pin Definitions			
USB 6/8, 4 Pin #	Definition	USB 7/9, 5 Pin #	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

Standby Power Header

The +5V Standby Power header is located at JSTBY1 on the serverboard. See the table on the right for pin definitions. (You must also have a card with a Standby Power connector and a cable to use this feature.)

Standby PWR Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Unit Identifier Switch

A Unit Identifier (UID) Switch and two LED Indicators are located on the serverboard. The UID Switch is located next to LAN2 port on the backplane. The Rear UID LED (LED3) is located next to the UID Switch. The Front Panel UID LED is located at Pins 7/8 of the Front Control Panel at JF1. Connect a cable to Pin 8 on JF1 for Front Panel UID LED indication. When you press the UID switch, both Rear UID LED and Front Panel UID LED Indicators will be turned on. Press the UID switch again to turn off both LED Indicators. These UID Indicators provide easy identification of a system unit that may be in need of service.

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

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

UID LED Status		
Color/State	OS	Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified

Power SMB (I²C) Connector

The Power System Management Bus (I²C) connector (JPI²C1) is used to monitor power supply, fan and system temperatures. See the table on the right for pin definitions.

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

Fan Headers

There are eleven system/CPU fan headers (Fans 1~6, Fans A~D and Fan 11) on the serverboard. All these 4-pin fans headers are backward compatible with traditional 3-pin fans, however, fan speed control is available for 4-pin fans only. The fan speeds are controlled by firmware thermal management via IPMI. See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation (Available for 4-pin fans only)

Chassis Intrusion

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

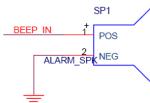
Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

Power LED/Speaker

On JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper. See the tables on the right for pin definitions.

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Settings	
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker



Overheat LED/Fan Fail

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables on right for pin definitions.

Overheat LED Pin Definitions		OH/Fan Fail LED Status	
Pin#	Definition	State	Message
1	5vDC	Solid	Overheat
2	OH Active	Blinking	Fan Fail

TPM Header/Port 80 Header

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

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

Ethernet Ports

Two Gigabit Ethernet ports (LAN1, LAN2) are located on the I/O backplane. In addition, a dedicated IPMI LAN port is located above the USB 0/1 ports on the backplane to provide KVM support for IPMI 2.0. All these ports accept RJ45 type cables.

LAN Ports Pin Definition			
Pin#	Definition	Pin#	Definition
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Yellow, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	18	Ground

NC = No Connection

T-SGPIO/S-SGPIO Headers

T-SGPIO 1/2 headers provide general input/output support for SATA devices. In addition, S-SGPIO1 is used to provide I/O support for SCU (Storage Control Unit) devices. These headers support a Serial Link interface to enhance system performance. See the table on the right for pin definitions.

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

NC = No Connection

IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system.

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

DOM Power Connector

A power connector for SATA DOM (Disk On Module) devices is located at JSD1. Connect an appropriate cable here to provide power support for your DOM devices.

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

Front Panel Audio Header

Front Panel Audio header is located at AUDIO_FP. Connect a cable to this header to use front panel audio device. To use the FP Audio for '97 Audio, close pins 1~2 of jumper JPAC1. To use this header for High Definition Audio, close pins 1~2 of jumper JHD_AC1.

HD Front Panel Audio Pin Definitions	
Pin#	Signal
1	MIC_L
2	AUD_GND
3	MIC_R
4	FP_Audio-Detect
5	Line_2_R
6	Ground
7	FP_Jack-Detect
8	Key
9	Line_2_L
10	Ground

SPDIF_In Header

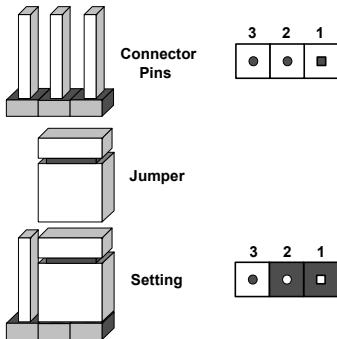
A SPDIF-In (Sony/Philips Digital Interface In) header is located at JPSPDIF_In. Connect a cable to this header to use an SPDIF device.

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

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



CMOS Clear

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

To clear CMOS,

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

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

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1/LAN2 Ethernet ports on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

VGA Enable/Disable

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

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

Watch Dog Enable/Disable

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

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

BMC Enable

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

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

'97 Audio Enable

Close pins 1~2 of Jumper JPAC1 to enable '97 Audio support. See the table on the right for jumper settings. The default setting is enabled.

'97 Audio Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

High Definition (HD) Audio Enable

Jumper JHD_AC1 allows the user to enable High Definition Audio support. Close pins 1~2 of JHD_AC1 to use HD audio. See the table on the right for jumper settings. The default setting is enabled.

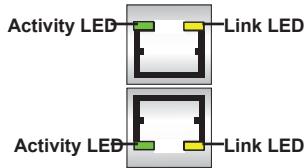
HD Audio Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

5-10 Onboard Indicators

GLAN LEDs

There are two GLAN ports on the serverboard. An additional IPMI dedicated LAN port is also located above the USB 0/1 ports on the backpanel. Each Gigabit Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the Link LED may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.

Note: IPMI dedicated LAN does not operate at 1 Gbps.



GLAN Activity Indicator LED Settings

Color	Status	Definition
Green	Flashing	Active

GLAN Link Indicator LED Settings

LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

Onboard Power LED

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

Onboard PWR LED Indicator LED Settings

LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 (STR) State

BMC Heartbeat LED

A BMC Heartbeat LED is located at LED1. When LED1 is blinking, BMC functions normally. See the table at right for more information.

BMC Heartbeat LED Status

Color/State	Definition
Green: Blinking	BMC: Normal

Rear UID LED

The rear UID LED is located at LED3 on the backplane. This LED is used in conjunction with the rear UID switch to provide easy identification of a system that might be in need of service. Refer to **UID Switch** on Page 2-17 for more information.

5-11 SATA Ports

Serial ATA Ports

There are two Serial ATA 3.0 Ports (I-SATA0~I-SATA1) and eight SATA 2.0 ports (I-SATA2~I-SATA5 and S-SATA0~3) on the serverboard. These ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

Serial ATA Pin Definitions	
Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

5-12 Installing Software

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

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

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

After creating a CD/DVD with the ISO files, insert the disk into the CD/DVD drive on your system and the display shown in Figure 5-6 should appear.

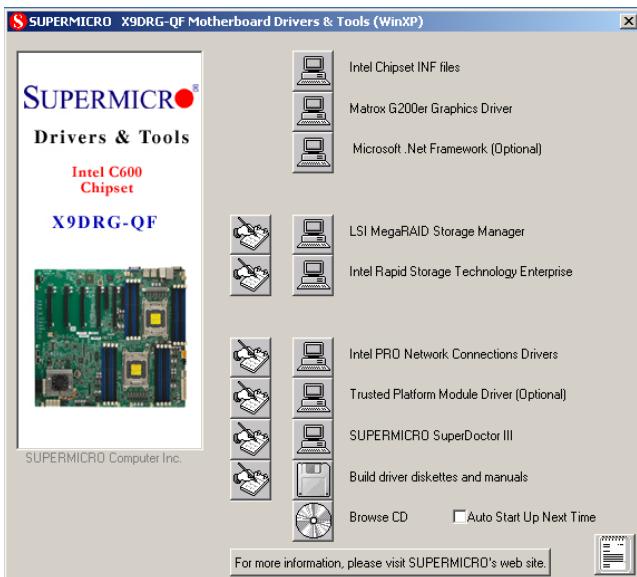


Figure 5-6. Driver/Tool Installation Display Screen

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

SuperDoctor III

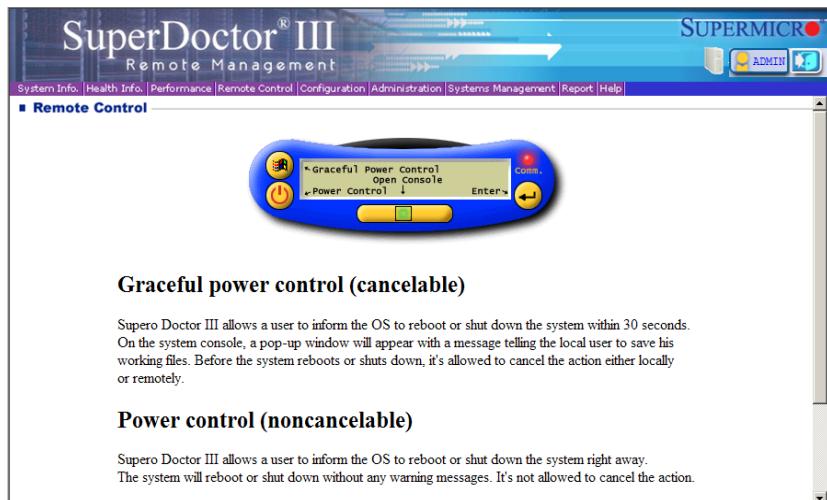
The SuperDoctor® III program is a web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the figures below for examples of the SuperDoctor III interface.

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

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor III, as the SuperDoctor III settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

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

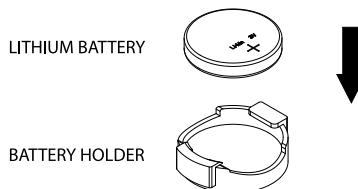


Figure 5-8. SuperDoctor III Interface Display Screen (Remote Control)

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

5-13 Onboard Battery

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

Figure 5-9. Installing the Onboard Battery

Notes

Chapter 6

Advanced Chassis Setup

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

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

Warning: Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 4: System Safety and the warning/precautions listed in the setup instructions.

Figure 6-1. Chassis: Front and Rear Views

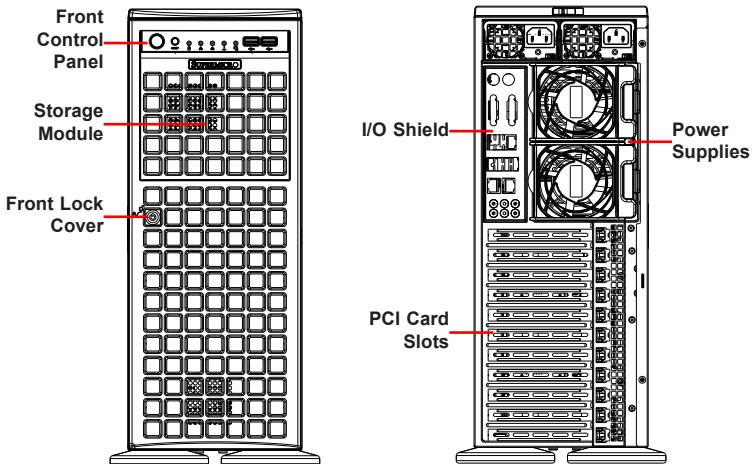
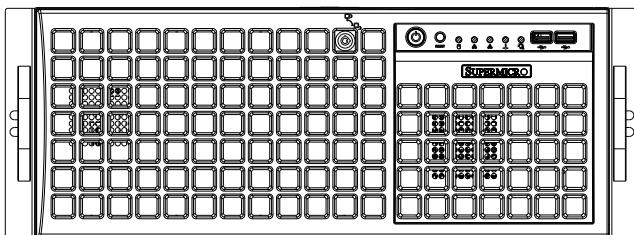


Figure 6-2. Chassis in Rack Mount Mode



6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully.

The following measures are generally sufficient to protect your equipment from ESD damage:

Precautions

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

6-2 Control Panel

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

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

6-3 System Cooling

Eight heavy-duty fans provide cooling for the chassis. Four fans are located in the mid-section of the chassis and four fans are located in the rear. These fans circulate air through the chassis as a means of lowering the chassis internal temperature.

The fans come pre-installed to the chassis. Each fan is hot-swappable and can be replaced without removing any connections.

System Fan Failure

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

Replacing System Fans

The SC747 chassis contains two types of system fans: mid-system fans and rear system fans.

Replacing Mid-System Fans (FAN-0114L4 and FAN-0138L4)

1. Determine which fan has failed. Because the fans are hot-swappable, the chassis does not need to be powered-down.
2. Press the fan release tab and lift the failed fan from the chassis. Mid fans must be pulled straight out of the chassis (see Figure 6-3). Part numbers: top two fans are FAN-0114L4 and bottom two are FAN-0138L4.
3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. As soon as the fan is connected, it will begin working.

Replacing the Rear System Fan (FAN-0082L4)

1. Determine which fan has failed.
2. Press the rear fan release tab (see Figure 6-4).
3. Pull the fan away from the chassis by pulling out the top first.
4. Place the new fan in the chassis, inserting the bottom of the fan first.
5. Push the fan fully into the housing until the fan clicks into place.

Figure 6-3. Mid-System Chassis Fans

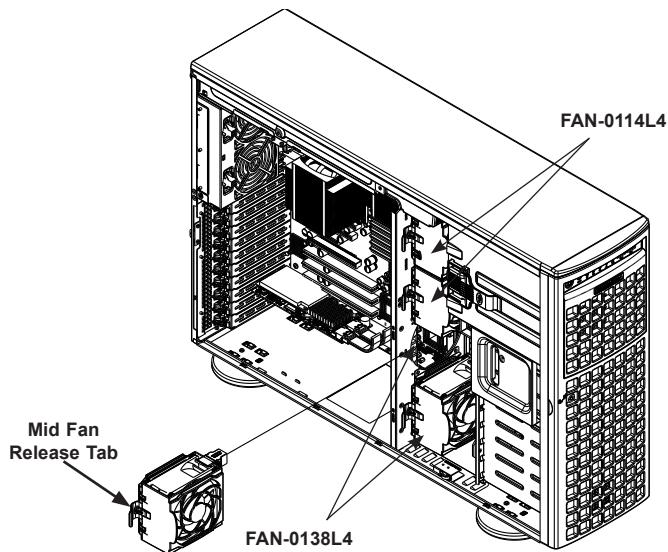
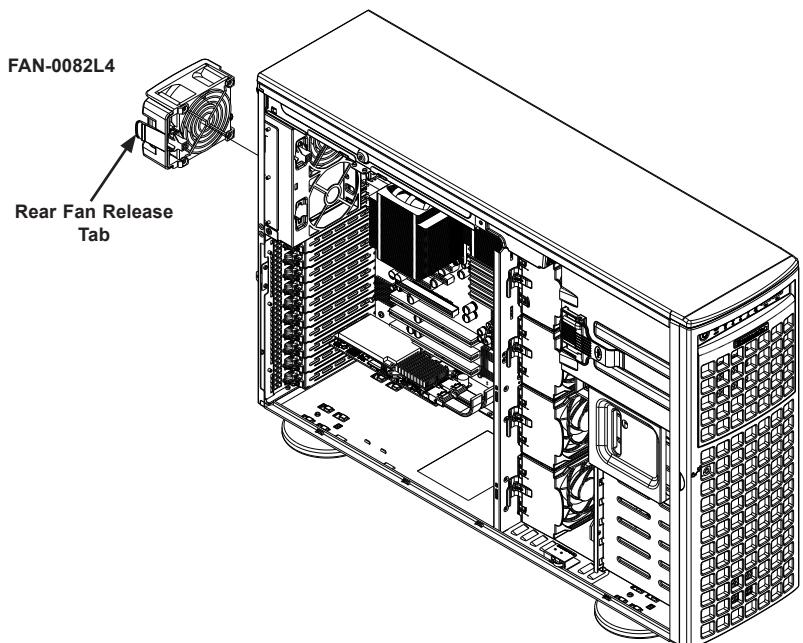
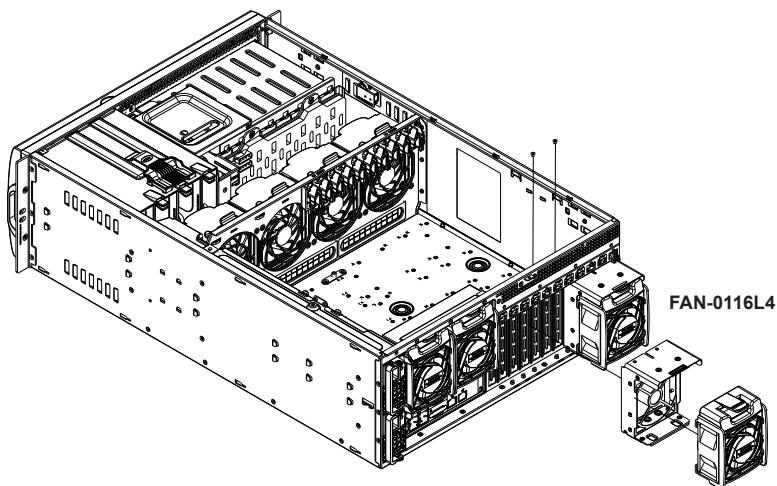


Figure 6-4. Rear System Chassis Fans



Replacing External Fans (FAN-0116L4)

1. Two additional fans located on the outside of the back of the chassis are included to help cool the passive GPU cards used in the system. Visually inspect the fans to determine which one has failed. The chassis does not need to be powered-down when replacing these fans.
2. Press the fan release tab and pull the failed fan from the housing that it sits in at the back of the chassis. See Figure 6-5.
3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. Push the fan into the housing until it clicks into place. As soon as the fan is connected, it will be activated.

Figure 6-5. External Fans

6-4 Power Supply

The SC747 chassis has a 1620W redundant, hot-swap power supply. This power supply is auto-switching capable. This enables it to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Failure

If the power supply module fails, the power module will need to be replaced. Replacements can be ordered directly from Supermicro (see contact information in the Preface).

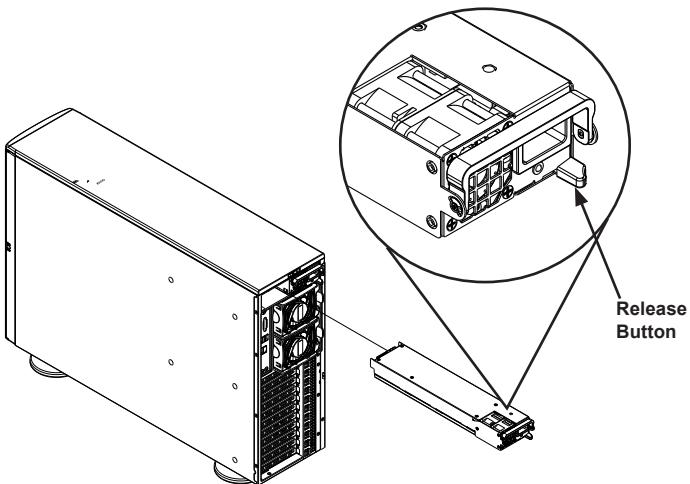
Replacing the Power Supply

With a redundant power supply, the system automatically switches to the second power supply if the first should fail.

Replacing the Power Supply

1. With a redundant power supply (two power modules), you can leave the workstation running and remove only the failed power supply.
2. Push the release tab (on the back of the power supply) as illustrated in Figure 6-6.
3. Pull the power supply out using the handle provided.
4. Replace the failed power module with the exact same model (available from Supermicro).
5. Push the new power supply module into the power bay until you hear a click.
6. Plug the AC power cord back into the module.

Figure 6-6. Power Supply Release Button



Power Supply Connections

Connect each of the following cables, as required, by your serverboard manufacturer. In some instances, some cables may not need to be connected. Some cables may not be available with your model.

Power Supply Cables			
Name	Qty	Connects to:	Description
20-pin or 24-pin power cable	1	Serverboard	20-pin or 24-pin power cable provides electricity to the serverboard. and has twenty to twenty-four yellow, black, gray, red, orange, green and blue wires.
HDD (Hard Drive) power cable	2	Backplane	Each cable has three connectors (two Hard Drive [HDD] and one Floppy Drive [FDD]). Attach the HDD connectors to the backplane. If you are using a Supermicro backplane, the FDD connector does not need to be attached.
8-pin serverboard cable	1	Serverboard	Provides power to the serverboard CPU. This cable has two black and two yellow wires.
4-pin serverboard cable	1	Serverboard	Provides power to PCI expansion card. This cable has two black and two yellow wires.
5-pin SMBus power cable (small)	1	Serverboard	Allows the SM (System Management) bus to monitor power supply
2-pin INT cable	1	Serverboard	Intrusion detection cable allows the system to log when the workstation chassis has been opened.

6-5 Configuring the Storage Module

This section covers configuring the storage module in the SC747 chassis.

Figure 6-7. Chassis in Tower Mode

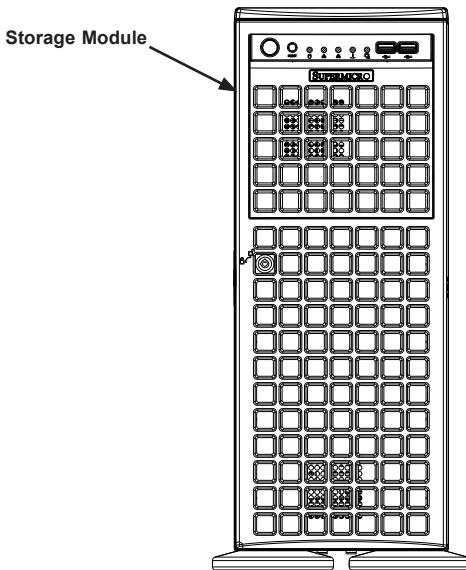
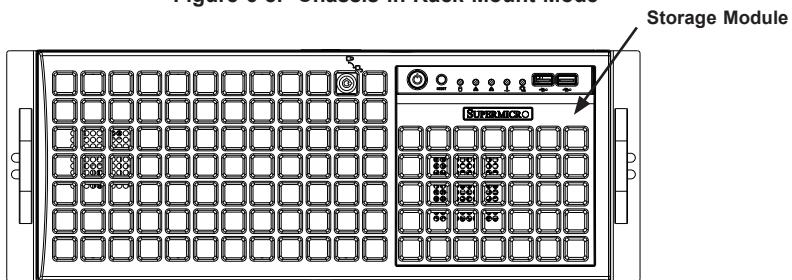


Figure 6-8. Chassis in Rack Mount Mode



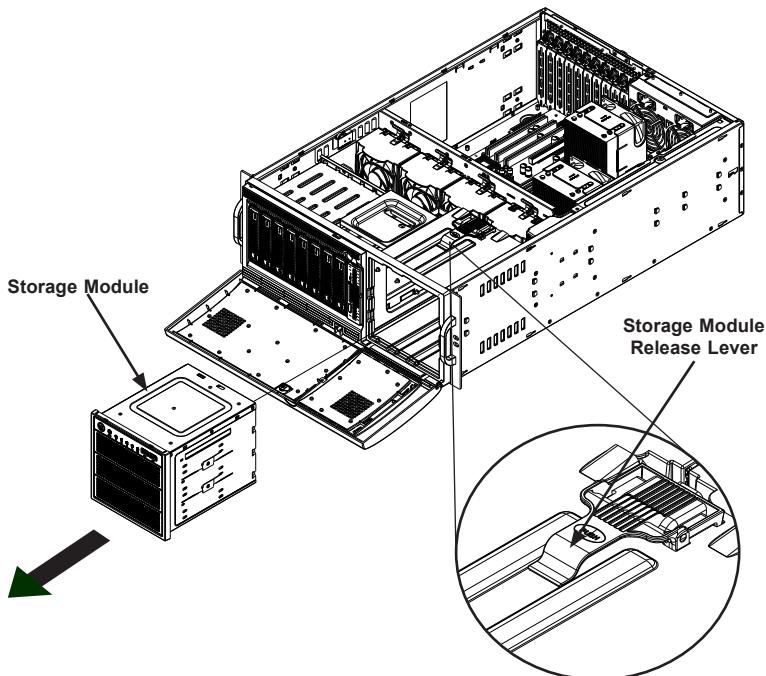
Tower or Rack Configuration

The SC747 chassis is shipped in tower mode and can be immediately used as workstation. If the chassis is to be used in a rack, the storage module must be rotated 90 degrees and the storage module cover must be replaced (see Figure 6-7). This can be done before, during, or after setup. It is not necessary to replace the storage module cover when the chassis is in the tower configuration.

Rotating the Storage Module

Use the procedure below to rotate the storage module for rack configurations.

Figure 6-9. Removing the Storage Module



Rotating the Storage Module for Rack Mounting

1. Open the chassis cover.
2. Locate the storage module and disconnect any cables from the storage module to any component in the chassis.
3. Push the storage module release lever. This lever unlocks the storage module (see Figure 6-9).
4. Grasp the external edges of the storage module and pull the unit from the chassis.

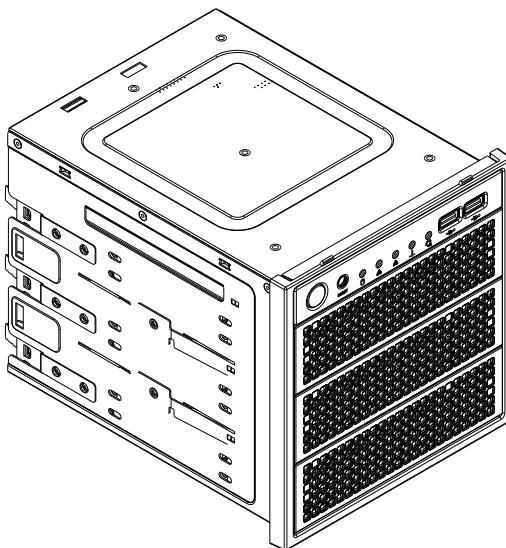
5. Turn the storage module 90 degrees (as illustrated).
6. Reinsert the module into the chassis and reconnect the cords.

Installing Drives in the Storage Module

The storage module (Figure 6-10) includes three full sized drive bays and the front LED panel. The storage module can be configured in one of three ways:

- Add up to three extra hard drives to the drive trays.
- Add up to three peripheral drives (CD-ROM, DVD-ROM, etc.) drive trays.
- Add five hot-swappable hard drives to the storage module. This configuration requires a mobile rack. More information on mobile rack installation can be found in the appendices at the end of this manual.

Figure 6-10. Chassis Storage Module



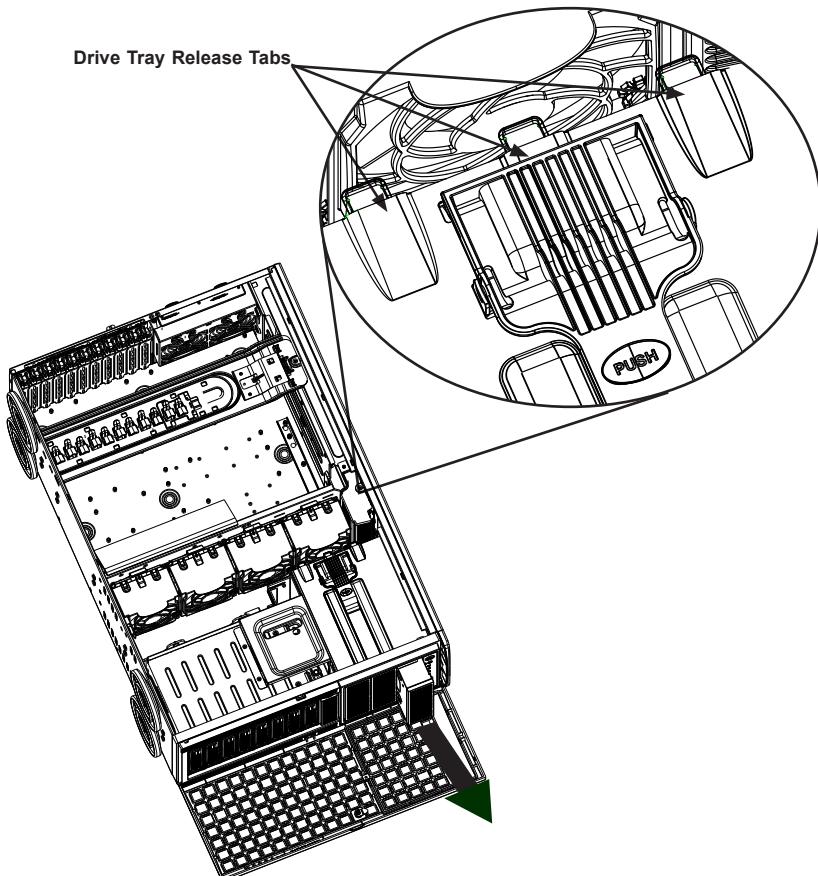
Removing a Drive Carrier

Use the procedure below to add hard drives to the drive carriers.

Adding Hard Drives to the Drive Carriers

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive (see Figure 6-11).
3. Push the drive tray toward the front of the chassis.

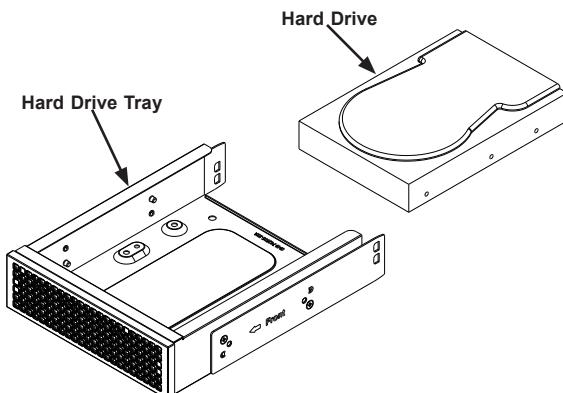
Figure 6-11. Removing a Drive Carrier



4. Place the hard drive to the hard drive tray. The hard drive may not completely fill the tray. See Figure 6-12 for details.
5. Secure the hard drive to the carrier with four screws from the bottom.
6. Slide the hard drive into the chassis until the carrier clicks into place.
7. Repeat these steps for each hard drive carrier.

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

Figure 6-12. Adding a Hard Drive to the Drive Carrier



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

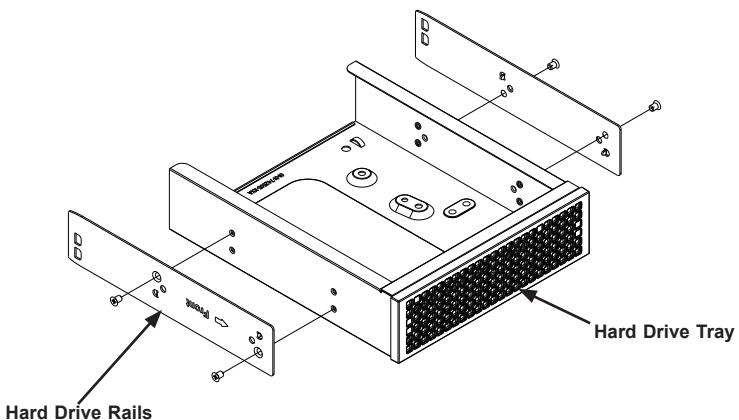
Adding Peripheral Drives

You can add up to three peripheral drives (DVD-ROM, CD-ROM, floppy drive, etc.) to the drive trays using the procedure below.

Adding Peripheral Drives

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive.
3. Push the drive tray toward the front of the chassis.
4. Remove the hard drive tray rails from the hard drive tray. To do this, you must remove two screws from each side (see Figure 6-13).
5. Attach the rails to a DVD-ROM, CD-ROM, floppy drive, or other peripheral. The rails should fit any standard sized peripherals.
6. Slide the peripheral into the chassis until the tray clicks into place.
7. Repeat these steps for each hard drive tray.

Figure 6-13. Adding Hard Drive Rails to the DVD-ROM Drive



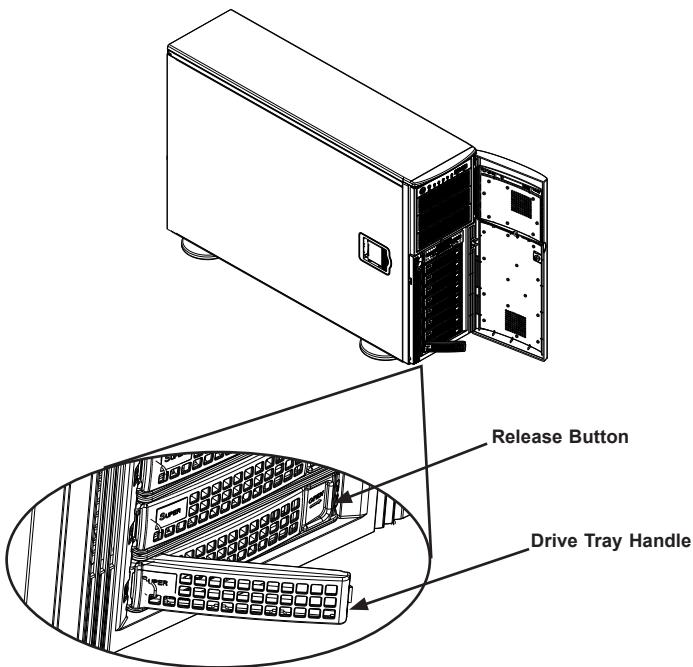
6-6 Installing Hard Drives in the Chassis

Chassis hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays.

Installing Hard Drives

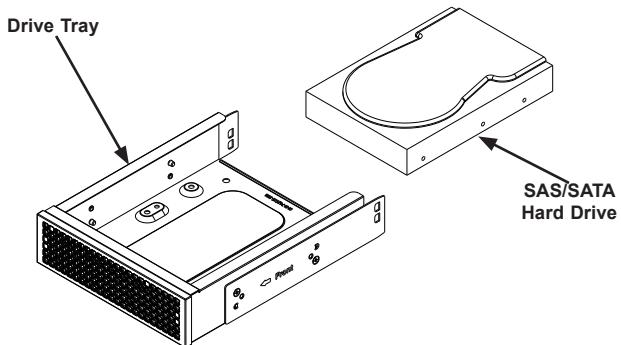
1. Unlock and open the chassis cover.
2. Press the release button to extend the drive tray handle (see Figure 6-14).
3. Using the handle, pull the drive tray out by the handle. The drive is hot swappable; there are no cables to disconnect.
4. Remove the screws holding the drive tray to the dummy drive.

Figure 6-14. Installing Hard Drives



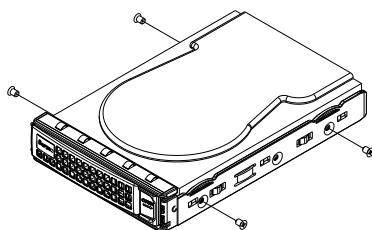
5. Place a hard drive in the drive tray (see Figure 6-15).
6. Secure the hard drive to the tray using four screws.

Figure 6-15. Removing a Dummy Drive Tray



7. Insert the hard drive into the chassis. To do this:
 - a. Press the hard drive release button to extend the drive tray handle.
 - b. Insert the hard drive into the chassis and close the handle to lock the hard drive into place (see Figure 6-16).

Figure 6-16. Installing a Hard Drive



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup utility for the X9DRG-QF. It also provides the instructions on how to navigate the AMI BIOS Setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility

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

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

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

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

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

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

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

How To Change the Configuration Data

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

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

Starting the Setup Utility

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

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

7-2 Main Setup

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

The AMI BIOS Main menu displays the following information:



System Date/System Time

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

Supermicro X9DRG-QF

Version

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

Build Date

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

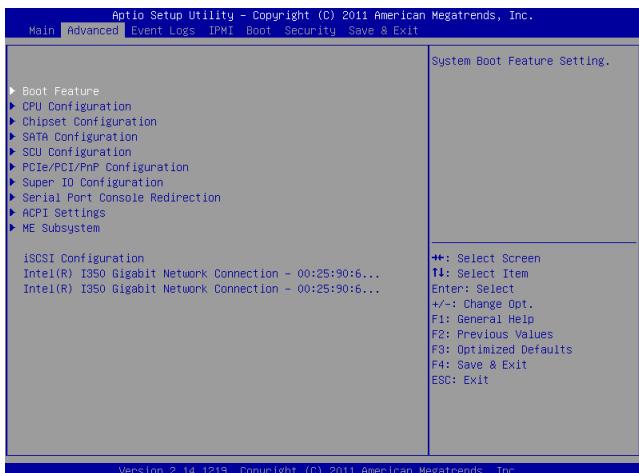
Memory Information

Total Memory

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

7-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.



► Boot Features

Quiet Boot

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

AddOn ROM Display Mode

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

Bootup Num-Lock

Use this feature to set the Power-on state for the Numlock key. The options are **Off** and **On**.

Wait For 'F1' If Error

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

Interrupt 19 Capture

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

Power Configuration

Watch Dog Function

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

Power Button Function

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

Restore on AC Power Loss

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

►CPU Configuration

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

►Socket 1 CPU Information/Socket 2 CPU Information

This submenu displays the following information regarding the CPUs installed in Socket 1/ Socket 2.

- Type of CPU
- CPU Signature
- Microcode Patch

- CPU Stepping
- Maximum CPU Speed
- Minimum CPU Speed
- Processor Cores
- Intel HT (Hyper-Threading) Technology
- Intel VT-x Technology
- Intel SMX Technology
- L1 Data Cache
- L1 Code Cache
- L2 Cache
- L3 Cache

CPU Speed

This item displays the speed of the CPU installed in Socket 1/Socket 2.

64-bit

This item indicates if the CPU installed in Socket 1 or Socket 2 supports 64-bit technology.

Clock Spread Spectrum

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

RTID (Record Types IDs)

This feature displays the total number of Record Type IDs for local and remote pools. The options are **Optimal** and **Alternate**.

Hyper-threading

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

Active Processor Cores

Set to Enabled to use a processor's second core and above. (Please refer to Intel's website for more information.) The options are **All**, 1, 2, 4 and 6.

Limit CPUID Maximum

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS).

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

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

Intel® AES-NI

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

MLC Streamer Prefetcher (Available when supported by the CPU)

If set to Enabled, the MLC (mid-level cache) streamer prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

MLC Spatial Prefetch (Available when supported by the CPU)

If this feature is set to Disabled, The CPU prefetches the cache line for 64 bytes. If this feature is set to Enabled the CPU fetches both cache lines for 128 bytes as comprised. The options are Disabled and **Enabled**.

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enabled to support Data Cache Unite (DCU) prefetch of L1 data to speed up data accessing and processing in the DCU to enhance CPU performance. The options are Disabled and **Enabled**.

DCU IP Prefetcher

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

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

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

Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's website for detailed information.)

► CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

Power Technology

Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are **Disabled**, **Energy Efficient**, and **Custom**. If the option is set to Custom, the following items will display:

EIST (Available when Power Technology is set to Custom)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are **Disabled** (GV3 Disabled), and **Enabled (GV3 Enabled)**. (**Note:** GV3 is Intel Speedstep support used on older platforms. Please refer to Intel's website for detailed information.)

Turbo Mode (Available when Power Technology is set to Custom)

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

C1E (Available when Power Technology is set to Custom)

Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are **Enabled** and **Disabled**.

CPU C3 Report (Available when Power Technology is set to Custom)

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

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

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

CPU C7 Report (Available when Power Technology is set to Custom)

Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are **Enabled** and **Disabled**.

Package C-State limit (Available when Power Technology is set to Custom)

This feature allows the user to set the limit on the C-State package register. The options are C0, C2, **C6**, and No Limit.

Energy/Performance Bias

This setting allows the user to adjust the fan speed based on performance (maximum cooling) or energy efficiency (maximum energy savings). The options are **Performance**, **Balanced Performance**, **Balanced Energy**, and **Energy Efficient**.

Factory Long Duration Power Limit

This item displays the power limit set by the manufacturer during which long duration power is maintained.

Long Duration Power Limit

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

Factory Long Duration Maintained

This item displays the period of time set by the manufacturer during which long duration power is maintained.

Long Duration Maintained

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

Recommended Short Duration Power

This item displays the short duration power settings recommended by the manufacturer.

Short Duration Power Limit

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

►Chipset Configuration

►North Bridge

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

►Integrated IO Configuration

Intel VT-d

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

Intel® I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing the system resource for other tasks. The options are **Disabled** and **Enabled**.

DCA Support

When set to Enabled, this feature uses Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The default is **Enabled** and can not be changed.

IIO 1 PCIe Port Bifurcation Control

This submenu configures the following IO PCIe Port Bifurcation Control settings for IIO 1 PCIe ports to determine how the available PCI-Express lanes to be distributed between the PCI-Exp. Root Ports.

CPU1 Slot 2 PCI-E 3.0 x16 OPROM

This feature allows the user to set the PCI-Exp bus speed for the slot specified above. The options are Gen1 (Generation 1), Gen2 and **Gen3**.

CPU1 Slot 4 PCI-E 3.0 x16 OPROM

This feature allows the user to set the PCI-Exp bus speed for the slot specified above. The options are Gen1 (Generation 1), Gen2 and **Gen3**.

IIO 2 PCIe Port Bifurcation Control

This submenu configures the following IO PCIe Port Bifurcation Control settings for IIO 2 PCIe ports to determine how the available PCI-Express lanes to be distributed between the PCI-Exp. Root Ports.

CPU2 Slot 9 PCI-E 3.0 x8 OPROM

This feature allows the user to set the PCI-Exp bus speed for the slot specified above. The options are Gen1 (Generation 1), Gen2 and **Gen3**.

CPU2 Slot 8 PCI-E 3.0 x16 OPROM

This feature allows the user to set the PCI-Exp bus speed for the slot specified above. The options are Gen1 (Generation 1), Gen2 and **Gen3**.

CPU2 Slot 6 PCI-E 3.0 x16 OPROM

This feature allows the user to set the PCI-Exp bus speed for the slot specified above. The options are Gen1 (Generation 1), Gen2 and **Gen3**.

►QPI Configuration

Current QPI Link

This item displays the current status of the QPI Link.

Current QPI Frequency

This item displays the frequency of the QPI Link.

Isoc

Select Enabled to enable Isynchronous support to meet QoS (Quality of Service) requirements. This feature is especially important for virtualization technology. The options are Enabled and **Disabled**.

QPI (Quick Path Interconnect) Link Speed Mode

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

QPI Link Frequency Select

Use this feature to select the desired QPI frequency. The options are **Auto**, 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s.

►DIMM Configuration

This section displays the following DIMM information.

Current Memory Mode

This item displays the current memory mode.

Current Memory Speed

This item displays the current memory speed.

Mirroring

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

Sparing

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

►DIMM Information

CPU Socket 1 DIMM Information/ CPU Socket 2 DIMM Information

The status of the memory modules detected by the BIOS will be displayed as detected by the BIOS.

Memory Mode

When Independent is selected, all DIMMs are available to the operating system. When Mirroring is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel. The options are **Independent**, Mirroring, and Lock Step.

DRAM RAPL Mode

RAPL (Running Average Power Limit) provides mechanisms to enforce power consumption limits on supported processors. The options are DRAM RAPL MODE0 , **DRAM RAPL MODE1**, and Disabled.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified in the specification. The options are **Auto**, Force DDR3-800, Force DDR3-1066, Force DDR3-1333, Force DDR3-1600 and Force SPD.

Channel Interleaving

This feature selects from the different channel interleaving methods. The options are **Auto**, 1 Way, 2 Way, 3, Way, and 4 Way.

Rank Interleaving

This feature allows the user to select a rank memory interleaving method. The options are **Auto**, 1 Way, 2 Way, 4, Way, and 8 Way.

Patrol Scrub

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

Demand Scrub

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

Data Scrambling

Select Enabled to enable data scrambling to ensure data security and integrity. The options are **Disabled** and **Enabled**.

Device Tagging

Select Enabled to support device tagging. The options are **Disabled** and **Enabled**.

Thermal Throttling

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

►South Bridge Configuration

This feature allows the user to configure the settings for the Intel PCH chip.

PCH Information

This feature displays the following PCH information.

Name: This item displays the name of the PCH chip.

Stepping: This item displays the status of the PCH stepping.

USB Devices: This item displays the USB devices detected by the BIOS.

All USB Devices

This feature enables all USB ports/devices. The options are Disabled and **Enabled**. (If set to Enabled, EHCI Controller 1 and Controller 2 will appear.)

EHCI Controller 1/EHCI Controller 2 (Available when All USB Devices is set to Enabled)

Select Enabled to enable EHCI (Enhanced Host Controller Interface) Controller 1 or Controller 2. The options are Disabled and **Enabled**.

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

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

Port 60/64 Emulation

Select Enabled to enable I/O port 60h/64h emulation support for the legacy USB keyboard so that it can be fully supported by the operating systems that does not recognize a USB device. The options are Disabled and **Enabled**.

EHCI Hand-Off

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

►SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of IDE or SATA devices and displays the following items.

SATA Port0~SATA Port5: The AMI BIOS displays the status of each SATA port as detected by the BIOS.

SATA Mode

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

Serial-ATA (SATA) Controller 0~1

Use this feature to activate or deactivate the SATA controller, and set the compatibility mode. The options for SATA Controller 0 are Disabled, Enhanced, and **Compatible**. The options for SATA Controller 1 are Disabled and **Enhanced**.

AHCI Mode

The following items are displayed when the AHCI Mode is selected.

Aggressive Link Power Management

Select Enabled to enable Aggressive Link Power Management support for Cougar Point B0 stepping and beyond. The options are **Enabled** and **Disabled**.

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. The options are **Enabled** and **Disabled**.

Staggered Spin Up

Select Enabled to enable Staggered Spin-up support to prevent excessive power consumption caused by multiple HDDs spinning-up simultaneously. The options are **Enabled** and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for the particular port. The options are **Enabled** and **Disabled**.

►SCU (Storage Control Unit) Configuration

Storage Controller Unit

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

OnChip SCU Option ROM

Select Enabled to support the onboard SCU Option ROM to boot up the system via a storage device. The options are **Disabled** and **Enabled**.

SCU Port 0~SCU Port 3: The AMI BIOS will automatically detect the onboard SCU devices and display the status of each SCU device as detected.

►PCIe/PCI/PnP Configuration

PCI ROM Priority

Use this feature to select the Option ROM to boot the system when there are multiple Option ROMs available in the system. The options are **EFI Compatible ROM** and **Legacy ROM**.

PCI Latency Timer

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

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

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

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are **Enabled** and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

Maximum Payload

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

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force 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 **Disabled**, Force L0, and Auto.

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

**CPU1 Slot 2 PCI-E 3.0 x16 OPROM/ CPU1 Slot 4 PCI-E 3.0 x16 OPROM/
CPU2 Slot 6 PCI-E 3.0 x16 OPROM/ CPU2 Slot 8 PCI-E 3.0 x16 OPROM/
CPU2 Slot 9 PCI-E 3.0 x8 OPROM/ CPU1 Slot 10 PCI-E 3.0 x8 OPROM/
CPU2 Slot 11 PCI-E 3.0 x4 OPROM/**

Select Enabled to enable Option ROM support to boot the computer using a network interface from the slots specified above. The options are **Enabled** and **Disabled**.

Onboard LAN Option ROM Select

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a network device. The options are **iSCSI** and **PXE**.

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 Option ROM~LAN2 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**, and the default setting for LAN2 Option ROM is **Disabled**.

VGA Priority

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

Network Stack

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

►Super IO Configuration

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

►Serial Port 1 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 1.

Change Settings

Use this feature to set the optimal Platform Environment Control Interface (PECI) setting for a serial port specified. The default setting is **Auto**, which will allow the AMI BIOS to automatically select the best PECL setting.

►Serial Port 2 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 2.

Change Settings

Use this feature to set the optimal Platform Environment Control Interface (PECI) setting for a serial port specified. The default setting is **Auto**, which will allow the AMI BIOS to automatically select the best PECL setting.

Serial Port 2 Attribute

Use this feature to select the attribute for serial port 2. The options are **SOL** (Serial On LAN), and **COM**.

►Serial Port Console Redirection

COM 1/COM 2

These two submenus allow the user to configure the following Console Redirection settings for a COM Port specified by the user.

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled. The default setting for COM1 is **Disabled**, and for COM2 is **Enabled**.

►Console Redirection Settings

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

Terminal Type

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, **LINUX**, **XTERMR6**, **SC0**, **ESCN**, and **VT400**.

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

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

Console Redirection

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

►Console Redirection Settings

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

Out-of-Band Management Port

The feature selects a serial port used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1** and **COM2**.

Terminal Type

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

Bits Per Second

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

Flow Control

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

Data Bits, Parity, Stop Bits

The status of these features is displayed.

►ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Sleep State

Use this feature to select the ACPI State when the system is in sleep mode. Select **S1 (CPU_Stop_Clock)** to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select **Suspend Disabled** to use power-reduced mode. Power will only be supplied to limited com-

ponents (such as RAMs) to maintain the most critical functions of the system. The options are **S1 (CPU_Stop_Clock)**, S3 (Suspend to RAM), and Suspend Disabled.

NUMA (NON-Uniform Memory Access)

This feature enables the Non-Uniform Memory Access ACPI support. The options are **Enabled** and Disabled.

High Precision Event Timer

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

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

Configuration

TPM Support

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

TPM State

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

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

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

TPM Enable Status

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

TPM Active Status

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

TPM Owner Status

This item displays the status of TPM Ownership.

►Intel TXT (LT-SX) Configuration**Intel TXT (LT-SX) Hardware Support**

This feature indicates if the following hardware components support the Intel Trusted Execution Technology.

CPU: TXT (Trusted Execution Technology) Feature

Chipset: TXT (Trusted Execution Technology) Feature

Intel TXT (LT-SX) Configuration

This feature displays the following TXT configuration setting.

TXT (LT-SX) Support: This item indicates if the Intel TXT support is enabled or disabled.

Intel TXT (LT-SX) Dependencies

This feature displays the features that need to be enabled for the Intel Trusted Execution Technology to work properly in the system.

VT-d Support: Intel Virtualization Technology with Direct I/O support

VT Support: Intel Virtualization Technology support

TPM Support: Trusted Platform support

TPM State: Trusted Platform state

►ME Subsystem

This feature displays the following ME Subsystem Configuration settings.

- **ME BIOS Interface Version**
- **ME Version**

iSCSI Configuration: This item displays iSCSI configuration information:

iSCSI Initiator Name

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

- Add an Attempt
- Delete Attempts
 - Commit Changes and Exit
 - Discard Changes and Exit
- Change Attempt Order
 - Commit Changes and Exit
 - Discard Changes and Exit

Intel® I350 Gigabit Network Connections: These items display the following information on the Intel I350 LAN connections.

►NIC Configuration

Link Speed

Use this feature to change the link speed and duplex for the current port. The options are **AutoNeg**, 10Mbps Half, 10Mbps Full, 100Mbps Half, and 100Mbps full.

Wake on LAN

Select enabled to wake the system with a magic packet. The options are **Enabled** and **Disabled**.

Blink LEDs

This feature allows the user to specify the duration for LEDs to blink. The range is from 0 ~ 15 seconds. The default setting is **0**.

PORT CONFIGURATION INFORMATION

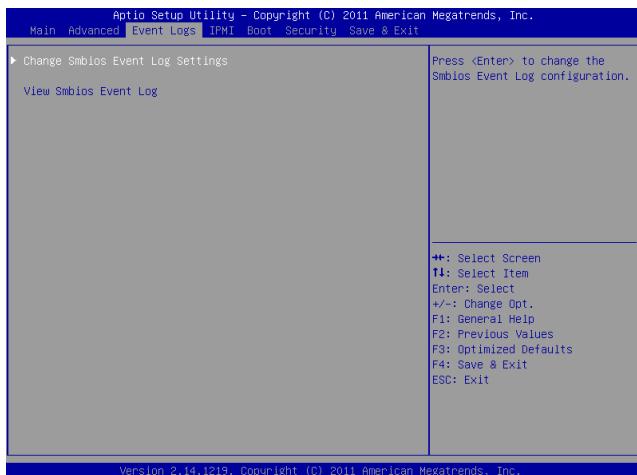
This section displays the following port information:

- UEFI Driver
- Adapter PBA

- Chip Type
- PCI Device ID
- PCI Bus:Device:Function
- Link Status
- Factory MAC Address
- Alternate MAC Address

7-4 Event Logs

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



►Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

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

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are **Enabled** and **Disabled**.

Memory Correctable Error Threshold

This feature allows the user to enter the threshold value for correctable memory errors. The default setting is **10**.

PCI Error Logging Support

Select Enabled to support error event logging for PCI slots. The options are **Enabled** and **Disabled**.

Erasing Settings

Erase Event Log

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

When Log is Full

Select **Erase Immediately** to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS event log is full. Select **Do Nothing** for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and **Erase Immediately**.

SMBIOS Event Log Standard Settings

Log System Boot Event

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

MECI (Multiple Event Count Increment)

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

METW (Multiple Event Count Time Window)

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

View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log.

Date/Time/Error Code/Severity

View System Event Log

This item allows the user to view the event in the system event log. Select this item and press <Enter> to view the status of an event in the log.

Date/Time/Error Code/Severity

7-5 IPMI

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



IPMI Firmware Revision

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

IPMI Status

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

►System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled for all system event logging at bootup. The options are **Enabled** and **Disabled**.

Erasing Settings

Erase SEL

Select Yes, On next reset to erase all system event logs upon next system reboot.

Select Yes, On every reset to erase all system event logs upon each system reboot.

Select No to keep all system event logs after each system reboot. The options are

No, Yes, On next reset, and Yes, On every reset.

When SEL is Full

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

Custom EFI Logging Options

Log EFI Status Codes

Select Enabled to log EFI (Extensible Firmware Interface) Status Codes, Error Codes or Progress Codes. The options are **Enabled** and Disabled.

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

►BMC Network Configuration

LAN Channel 1: This feature allows the user to configure the settings for LAN1 Port.

Update IPMI LAN Configuration

This feature allows the user to decide if the BIOS should configure the IPMI setting at next system boot. The options are **No** and Yes. If the option is set to Yes, the user is allow to configure the IPMI settings at next system boot:

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

Station IP Address

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.

Gateway IP Address

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

7-6 Boot

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



Boot Option Priorities

Boot Option #1/ Boot Option #2/ Boot Option #3, etc.

Use this feature to specify the sequence of boot device priority.

USB Device BBS Priorities, Hard Disk Drives, Network Devices

Use these options to set the order of the legacy network, USB, and Hard Disk Drive devices detected by the motherboard.

►Delete Boot Option

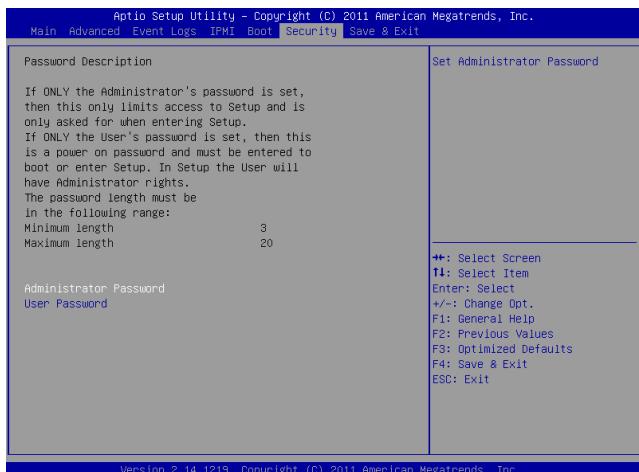
This feature allows the user to select a EFI boot device to delete from the boot priority list.

Delete Boot Option

Select the desired boot device to delete.

7-7 Security

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



Administrator Password

Use this feature to set the Administrator Password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 8 characters long.

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 8 characters long.

7-8 Save & Exit

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



Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click **No** to quit the BIOS and save changes.

Save Changes and Reset

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

Save Options

Save Changes

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

Discard Changes

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

Restore Optimized Defaults

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

Save as User Defaults

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

Restore User Defaults

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

Boot Override

This feature allows the user to override the Boot Option Priorities setting in the Boot menu, and instead boot the system with one of the listed devices.

Appendix A

BIOS Error Beep Codes

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

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

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

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list (on the following page) correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset (Ready to power up)
5 short beeps and 1 long beep	Memory error	No memory detected in the system
5 beeps	No Con-In or Con-Out devices	Con-In includes USB or PS/2 keyboard, PCI or serial console redirection, IPMI KVM or SOL. Con-Out includes video controller, PCI or serial console redirection, IPMI SOL.
1 Continuous beep	System OH	System Overheat

Notes

Appendix B

System Specifications

Processors

Two Intel E5-2600 (v2) Series processors in LGA 2011 sockets

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

Chipset

Intel C602 chipset

BIOS

128 Mb AMIBIOS® SPI Flash ROM

Memory Capacity

Sixteen DIMM slots that can support up to 1 TB ECC LRDIMM, 512 GB ECC RDIMM or 128 GB ECC/non-ECC UDIMM DDR3-1866/1600/1333/1066/800 memory

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

SATA Controller

Intel on-chip controller for 10 SATA ports (RAID 0, 1, 5 and 10 supported)

Drive Bays

Eight hot-swap drive bays to house standard SATA drives

Peripheral drive bays for three 5.25" peripheral drives

Expansion Slots

Ten PCI-E 3.0 x8 and one PCI-E 2.0 x4 (in x8) slots for a total of eleven PCI expansion slots

Serverboard

X9DRG-QF

Dimensions: 15.2" (L) x 13.2" (W) (386 mm x 335 mm)

Chassis

SC747TQ-R1620B (4U/Tower rackmount)

Dimensions: (WxHxD) 18.2 x 7 x 26.5 in. (462 x 178 x 673 mm)

Weight

Gross (Bare Bone): 62 lbs. (28.1 kg.)

System Cooling

Eight (four front and four rear) fans (fan speed controlled by IPMI)

System Input Requirements

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

Rated Input Current: 11.5 - 5.5A max

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 1620W (Part# PWS-1K62P-1R) 80 Plus Bronze Certified

Rated Output Voltages: +12V (84A @ 100-120VAC, 100A @ 120-140VAC, 135A @ 180-264VAC), +5Vsb (4A)

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: 20% to 95% (non-condensing)

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

Regulatory Compliance

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

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

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

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

Notes

(continued from front)

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.