# B2SD2-8C-TF
# B2SD2-12C-TF
# B2SD2-16C-TF
# B2SD1-8C-TF

## USER MANUAL

Revision 1.0

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Manual Revision 1.0

Release Date: October 03, 2019

# Preface

## About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the B2SD2(1)-8C/12C/16C-TF motherboard.

## About This Motherboard

The Supermicro B2SD2(1)-8C/12C/16C-TF MicroBlade module motherboard supports an Intel® Xeon D-2100 SoC processor in a BGA package. The B2SD2-8C/12C/16C supports two CPU nodes on each board and B2SD1-8C-TF only supports one CPU node. The B2SD2(1)-8C/12C/16C-TF motherboard offers superior performance, power efficiency with speeds up to 2400MHz in four DIMM slots for each node, and dual 10Gb Ethernet ports for increased cost effectiveness. Each node of B2SD2(1)-8C/12C/16C-TF supports up to 128GB VLP RDIMM memory, and features an ASPEED BMC on board. Please note that this motherboard is intended to be installed and serviced by professional technicians only. For processor/memory updates, please refer to our website at http://www.supermicro.com/products/.

## Manual Organization

**Chapter 1** describes the features, specifications and performance of the motherboard, and provides detailed information on the processor.

**Chapter 2** provides hardware installation instructions. Read this chapter when installing the processor, memory modules, and other hardware components into the system.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory, and system setup stored in the CMOS.

**Chapter 4** includes an introduction to the BIOS, and provides detailed information on running the CMOS Setup utility.

**Appendix A** provides BIOS Error Beep Codes.

**Appendix B** lists software program installation instructions**.**

**Appendix C** lists standardized warning statements in various languages**.**

**Appendix D** provides UEFI BIOS Recovery instructions**.**

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| Website: | www.supermicro.com.tw |

# Table of Contents

# Chapter 1

# Introduction

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer. The following items are included in the retail box:

## 1.1 Checklist

| Main Parts List (included in the retail box) | | |
|---|---|---|
| **Description** | **Part Number** | **Quantity** |
| Supermicro Motherboard | B2SD2(1)-8C/12C/16C-TF | 1 |
| Quick Reference Guide | B2SD2(1)-8C/12C/16C-TF | 1 |

## Important Links

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: https://www.supermicro.com/wftp/driver/
- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm
- If you have any questions, please contact our support team at: support@supermicro.com

This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.

**Figure 1-1. B2SD2-8C/12C/16C-TF Motherboard Image**

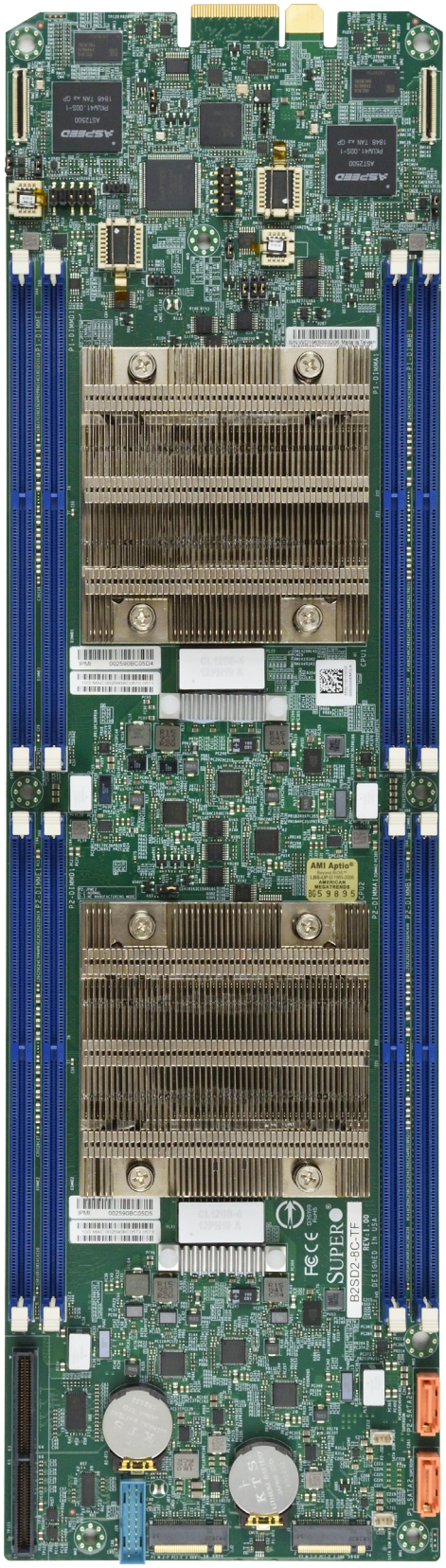


**Figure 1-2. B2SD1-8C-TF Motherboard Image**

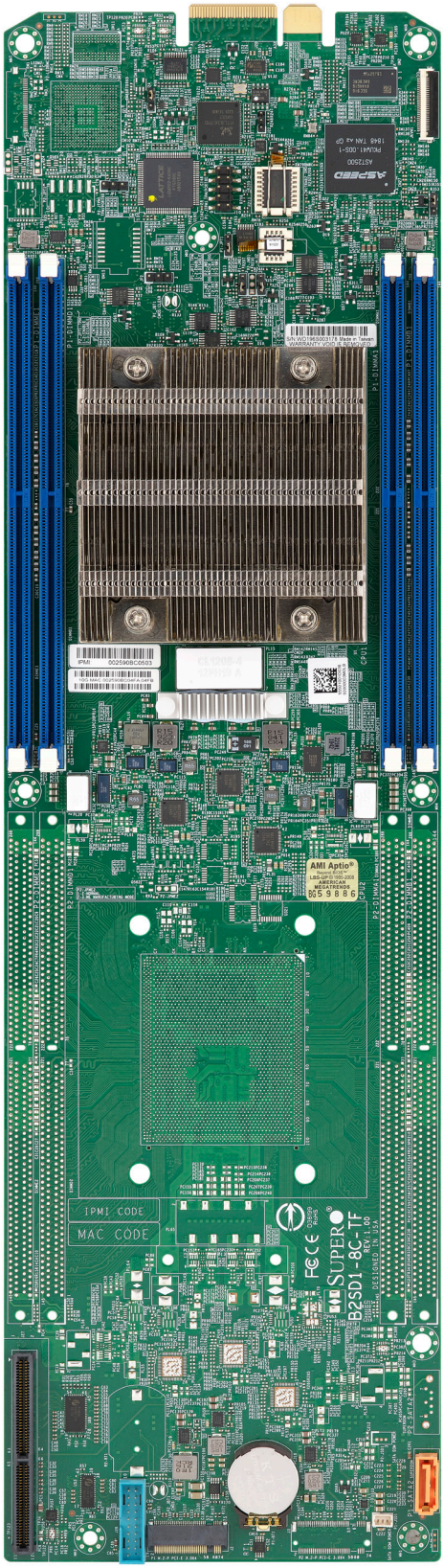
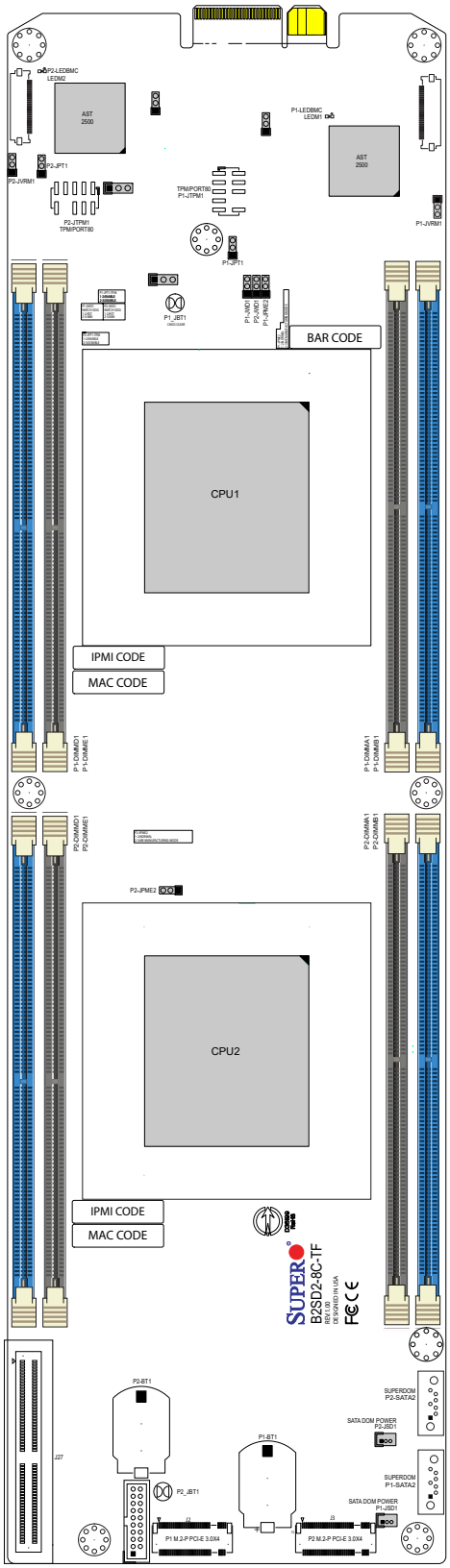
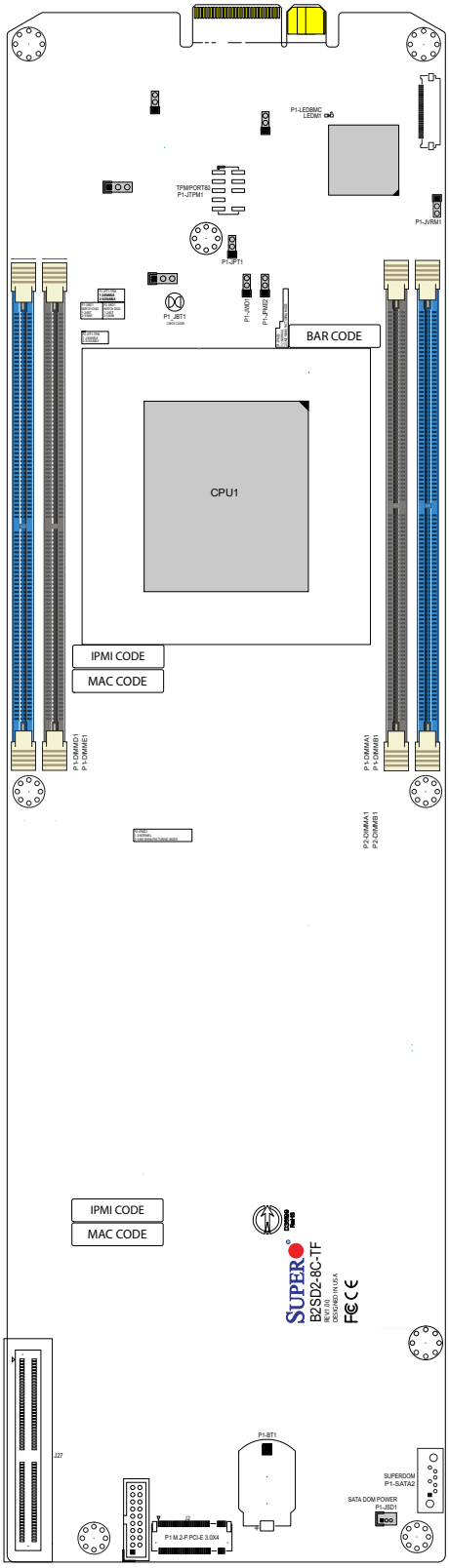


**Figure 1-3. B2SD2-8C/12C/16C-TF Motherboard Layout**
(not drawn to scale)



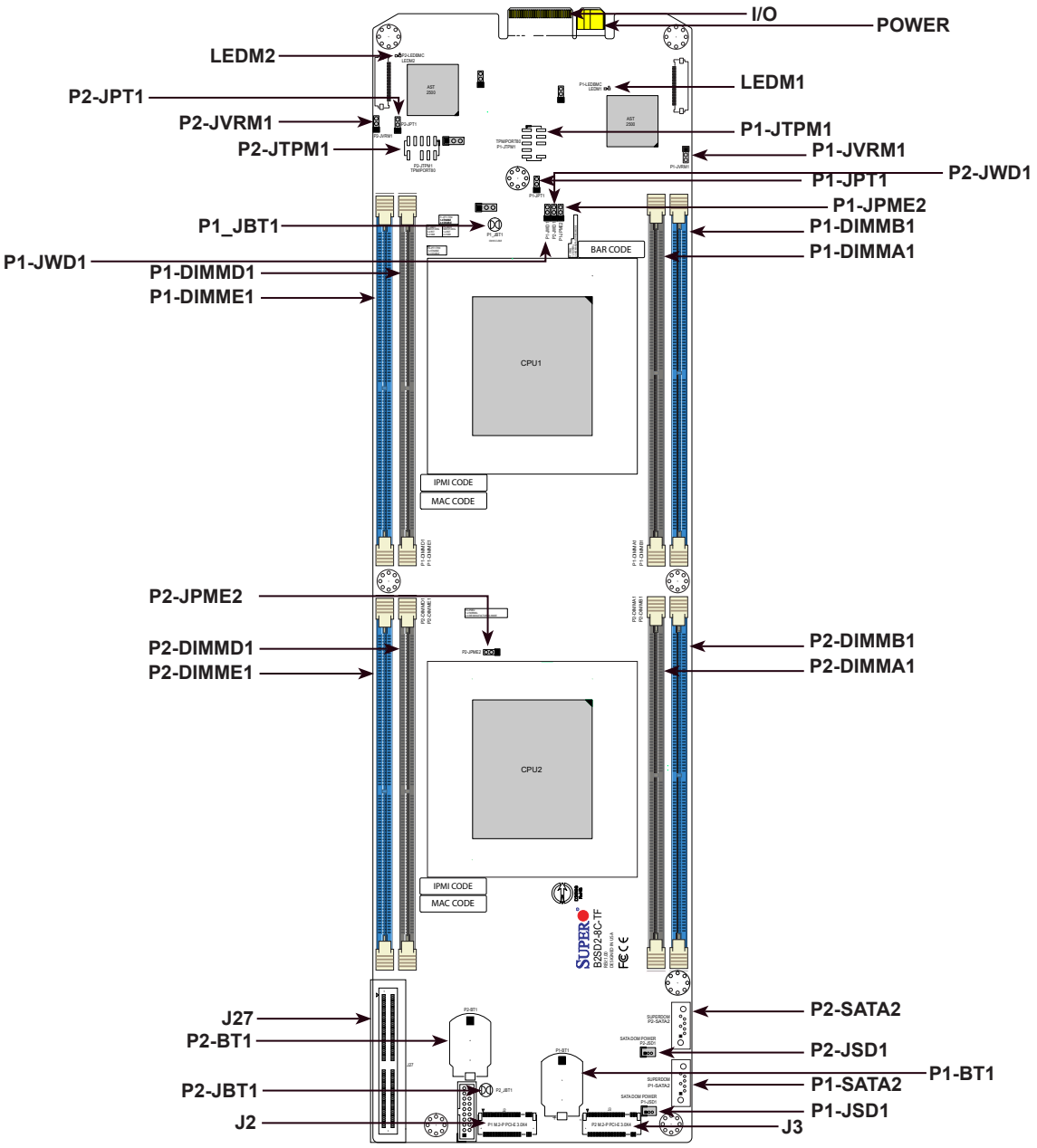

**Note:** Components not documented are for internal testing only.

**Figure 1-4. B2SD1-8C-TF Motherboard Layout**
(not drawn to scale)




**Note:** Components not documented are for internal testing only.

## Quick Reference




**Notes:**

- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections. Jumpers/LED indicators not indicated are used for testing only.
- "■" indicates the location of Pin 1.

## Quick Reference Table

| Jumper | Description | Default Setting |
|---|---|---|
| P1-JBT1 | CMOS Clear for Node 1 | Open (Normal) |
| P2-JBT1 | CMOS Clear for Node 2 | Open (Normal) |
| P1-JPME2 | Manufacturing Mode for Node 1 | Pins 1-2 (Normal) |
| P2-JPME2 | Manufacturing Mode for Node 2 | Pins 1-2 (Normal) |
| P1-JPT1 | Onboard TPM Enable/Disable for Node 1 | Pins 1-2 (Enabled) |
| P2-JPT1 | Onboard TPM Enable/Disable for Node 2 | Pins 1-2 (Enabled) |
| P1-JVRM1 | VRM SMB Data (to BMC or PCH) for Node 1 | Pins 1-2 (BMC) |
| P2-JVRM1 | VRM SMB Data (to BMC or PCH) for Node 2 | Pins 1-2 (BMC) |
| P1-JWD1 | Watch Dog Enable for Node 1 | Pins 1-2 (Reset) |
| P2-JWD1 | Watch Dog Enable for Node 2 | Pins 1-2 (Reset) |

| LED | Description | Status |
|---|---|---|
| LEDM1 | BMC Heartbeat LED for Node 1 | Blinking Green: BMC Normal |
| LEDM2 | BMC Heartbeat LED for Node 2 | Blinking Green: BMC Normal |

| Connector | Description |
|---|---|
| P1-BT1 | Onboard Battery for Node 1 |
| P2-BT1 | Onboard Battery for Node 2 |
| I/O | Back Panel Edge Connector (I/O, Network) |
| J27 | HDD Backplane Connector |
| P1-JSD1 | SATA DOM Power for Node 1 |
| P2-JSD1 | SATA DOM Power for Node 2 |
| P1-JTPM1 | Trusted Platform Module (TPM)/Port 80 Connector for Node 1 |
| P2-JTPM1 | Trusted Platform Module (TPM)/Port 80 Connector for Node 2 |
| P1-SATA2 | SATA DOM port for Node 1 |
| P2-SATA2 | SATA DOM port for Node 2 |
| Power | Backplane Edge Connector (Power) |
| J2 | M.2 slot M-key (PCI-E x4) for Node 1 |
| J3 | M.2 slot M-key (PCI-E x4) for Node 2 |

## Motherboard Features

| Motherboard Features | |
|---|---|
| **CPU** | |
| • Intel® Xeon D-2100 SoC (BGA Package) with a TDP of up to 100W | |
| **Memory** | |
| • Each of the two nodes supports up to 128GB of VLP RDIMM DDR4 memory with speeds of up to 2400MHz (sku dependent) | |
| **DIMM Size** | |
| • Each of the two nodes supports up to 128GB at 1.2V | |
| **Expansion Slots** | |
| • One (1) M.2 M-Key (PCI-E x4) | |
| **Network** | |
| • Intel SoC Integrated 10G Controller | |
| **Baseboard Management Controller (BMC)** | |
| • ASpeed AST2500 | |
| **Graphics** | |
| • Graphics controller via ASpeed AST2500 | |
| **I/O Devices** | |
| • One (1) SATA DOM<br>• Dual 10GbE/KR to backplane | • One (1) U.2/SATA3 via backplane<br>• IPMI 2.0 supported by ASpeed AST2500 BMC |
| **BIOS** | |
| • 256Mb AMI BIOS® SPI Flash BIOS<br>• Plug and Play (PnP), RTC Wakeup | |
| **Power Management** | |
| • ACPI power management<br>• S4, S5<br>• Power button override mechanism<br>• Power-on mode for AC power recovery | |
| **System Health Monitoring** | |
| • Onboard voltage monitors for CPU cores, +3.3V, +5V, +12V, +3.3V Stby, +5V Stby, Vstb, Vcore, Vmem, PCH temperature, CPU temperature, system temperature, DIMM temperature and Peripheral temperature<br>• CPU phase switching voltage regulator<br>• CPU/System overheat control<br>• CPU Thermal Trip support | |

**Note:** The table above is continued on the next page.

| Motherboard Features |
|---|
| **Fan Control** |
| • Fan status monitoring with firmware<br>• Multi-speed fan control via onboard BMC |
| **System Management** |
| • PECI (Platform Environment Control Interface) 3.0<br>• IPMI View, Supermicro IPMI Tool, IPMI CFG<br>• SuperDoctor® 5, Watch Dog, NMI<br>• Supermicro Power Manager (SPM), Supermicro Server Manager (SSM)<br>• Server platform service |
| **Other** |
| • RoHS<br>• Onboard TPM 2.0 with disable jumper |
| **Dimensions** |
| • Proprietary form factor (1.2" x 4.94" x 23.2") (30.48 mm x 125.48 mm x 589.28 mm) |

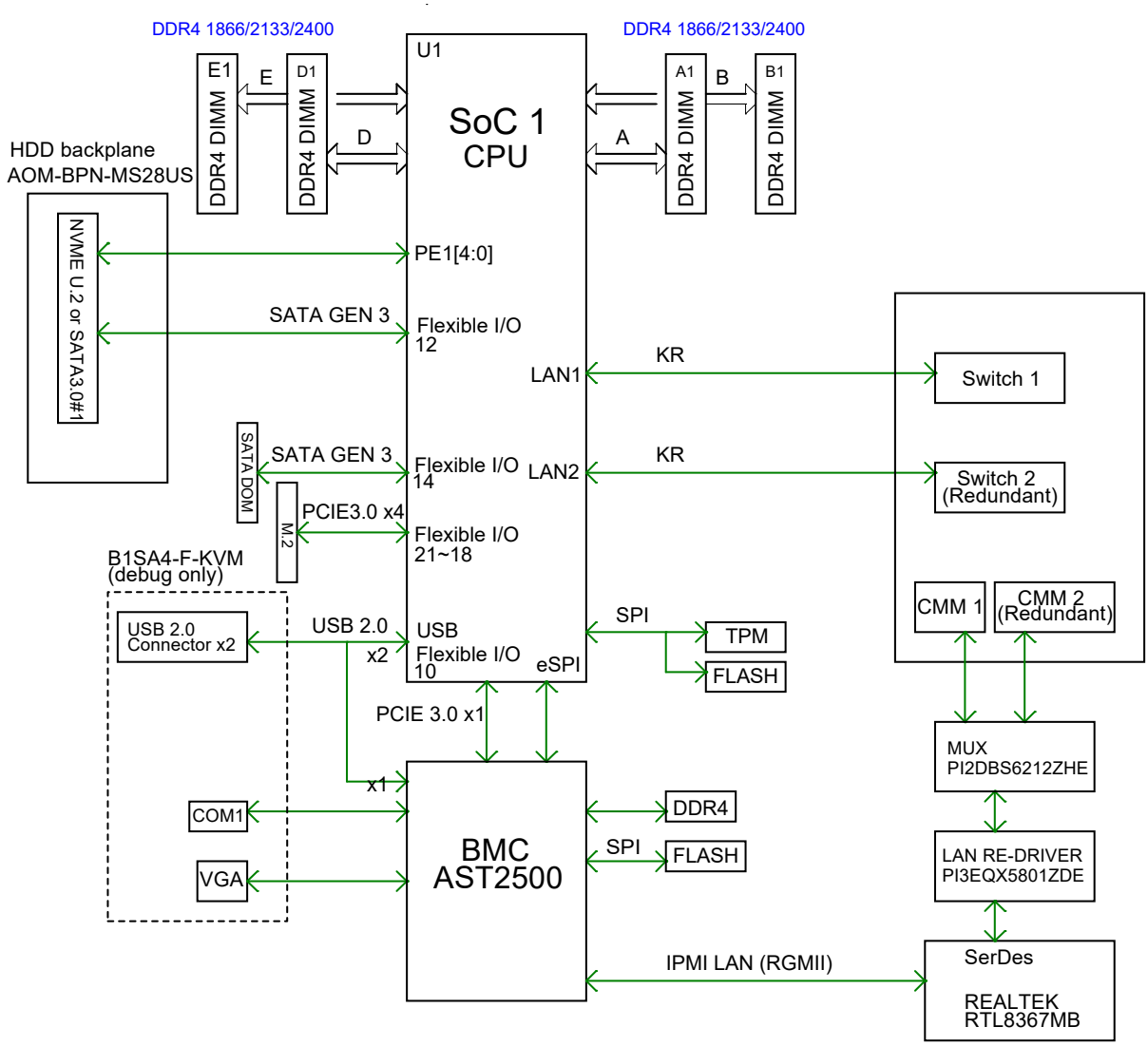
**Note 1:** The CPU maximum thermal design power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper CPU TDP sizing.

**Note 2:** For IPMI configuration instructions, please refer to the Embedded IPMI Configuration User's Guide available at http://www.supermicro.com/support/manuals/.

**Note 3:** If you purchase a Supermicro Out of Band (OOB) software license key (Supermicro P/N: SFT-OOB--LIC), please DO NOT change the IPMI MAC address.

**Note 4:** IPMI MAC address can be changed by the ipmitol command.

**Figure 1-5.**
**Chipset Block Diagram**




**Note:** This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

## 1.2 Processor Overview

The Intel Xeon D-2100 series SoC processor family, with up to 16 cores and up to 100W of power, offers performance, reliability, and high intelligence. As a low-power system-on-a-chip motherboard, the B2SD2(1)-8C/12C/16C-TF is optimized for a variety of workloads that requires high compute power in a compact form-factor.

- ACPI Power Management Logic Support Rev. 4.0a
- Intel Quick Assist Technology
- Intel Turbo Boost Technology
- Adaptive Thermal Management/Monitoring
- PCI-E 3.0, SATA 3.0, NVMe
- System Management Bus (SMBus) Specification Version 2.0
- Intel Trusted Execution Technology (Intel TXT)
- Intel Rapid Storage Technology
- Intel Virtualization Technology for Directed I/O (Intel VT-d)

## 1.3 Special Features

This section describes the health monitoring features of the B2SD2(1)-8C/12C/16C-TF motherboard. The motherboard has an onboard System Hardware Monitor chip that supports system health monitoring.

### Recovery from AC Power Loss

The Basic I/O System (BIOS) provides a setting that determines how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on), or for it to automatically return to the power-on state. See the Advanced BIOS Setup section for this setting. The default setting is **Stay off**.

# 1.4 System Health Monitoring

The motherboard has an onboard Baseboard Management Controller (BMC) chip that supports system health monitoring.

## Onboard Voltage Monitors

The onboard voltage monitor will continuously scan crucial voltage levels. Once a voltage becomes unstable, it will give a warning or send an error message to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor. Real time readings of these voltage levels are all displayed in IPMI.

## Fan Status Monitor with Firmware Control

The system health monitor chip can check the RPM status of a cooling fan. The CPU and chassis fans are controlled by BIOS Thermal Management through the back panel. Refer to the below table for available fan modes to choose the most appropriate one for nominal operation.

**Figure 1-6. Fan Speed Modes**

| Fan Mode | Description |
|---|---|
| Full Speed | Use this mode to set fan speed at full speed for maximum system cooling |
| Standard | Use this mode to set fan speed for normal system cooling |
| PUE2 | Use this mode to set fan speed for best power efficiency and maximum noise reduction |

## Environmental Temperature Control

System Health sensors monitor temperatures and voltage settings of onboard processors and the system in real time via the IPMI interface. Whenever the temperature of the CPU or the system exceeds a user-defined threshold, system/CPU cooling fans will be turned on to prevent the CPU or the system from overheating

**Note:** To avoid possible system overheating, please provide adequate airflow to your system.

## System Resource Alert

This feature is available when used with SuperDoctor 5® in the Windows OS or in the Linux environment. SuperDoctor is used to notify the user of certain system events. For example, you can configure SuperDoctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a predefined range.

## 1.5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a computer system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to enabling operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play, and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with Windows 2012/R2 and 2016 Server operating systems.

## 1.6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges. It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. For more information, please refer to the website at http://www.ssiforum.org/.

Keep the onboard power usage within the power limits specified above. Over current power usage may cause damage to the motherboard.

# Chapter 2

# Installation

## 2.1 Static-Sensitive Devices

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

### Precautions

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

### Unpacking

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

## 2.2 Motherboard Installation

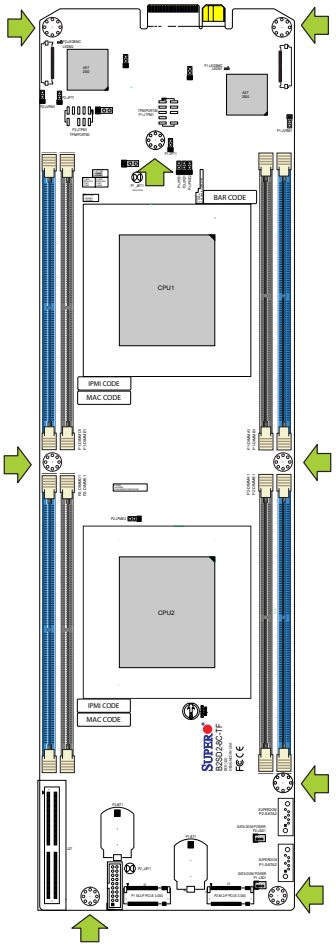
All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly.

**Phillips Screwdriver (1)**

**Phillips Screws (8)**

**Standoffs (8)**
**Only if Needed**

### Tools Needed

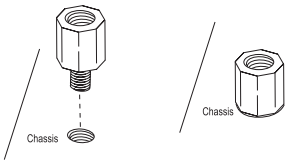



### Location of Mounting Holes

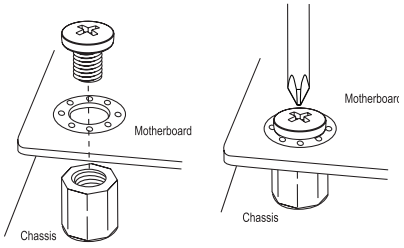
**Note:** 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

## Installing the Motherboard

1. Locate the mounting holes on the motherboard. See the previous page for the location.




2. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.




3. Install standoffs in the chassis as needed.
4. Install the motherboard into the chassis carefully to avoid damaging other motherboard components.
5. Using the Phillips screwdriver, insert a Phillips head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.
6. Repeat Step 5 to insert #6 screws into all mounting holes.
7. Make sure that the motherboard is securely placed in the chassis.

**Note:** Images displayed are for illustration only. Your chassis or components might look different from those shown in this manual.

## 2.3 Memory Support and Population

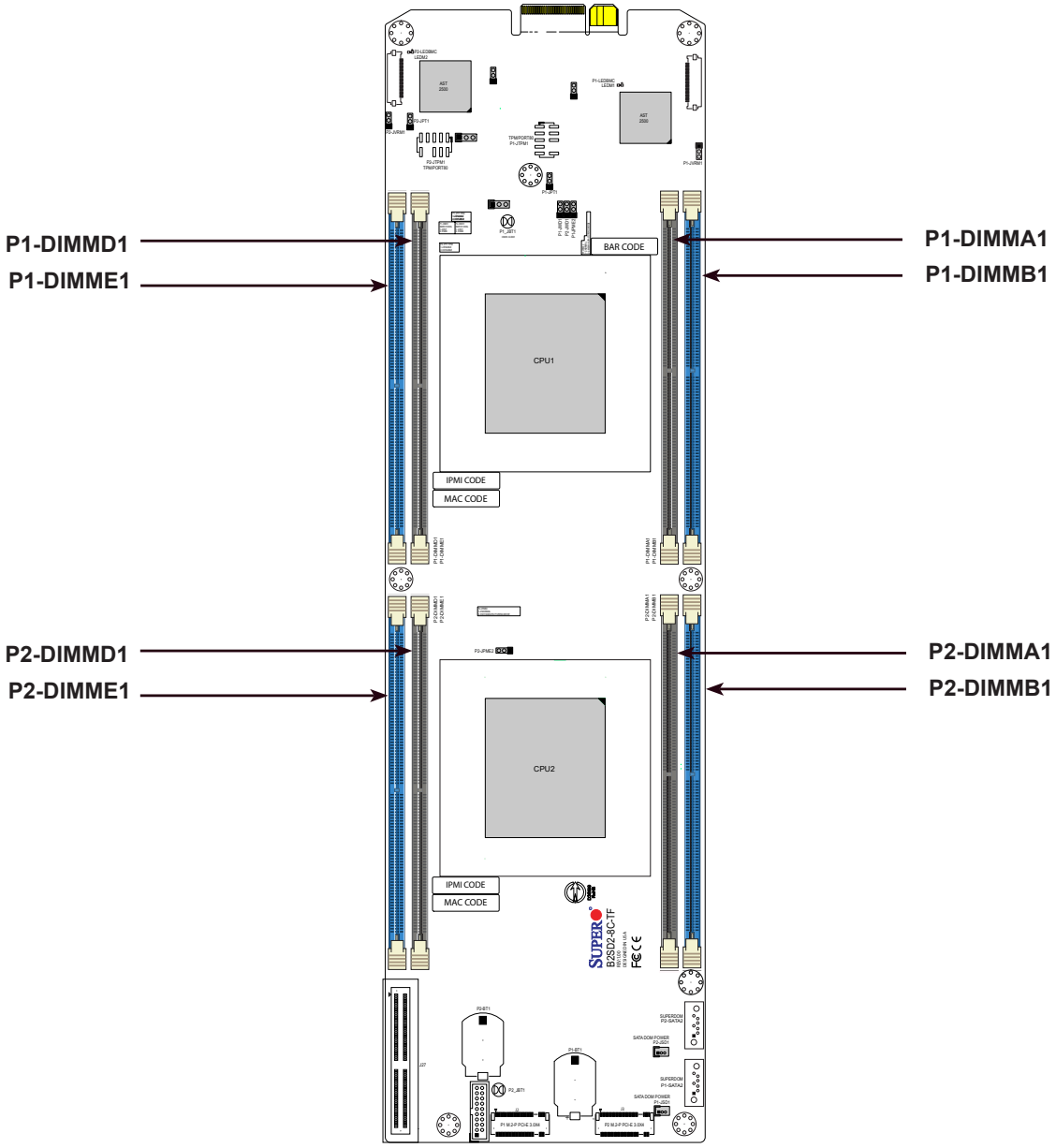
**Important:** Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

### Memory Support

The B2SD2(1)-8C/12C/16C-TF motherboard supports up to 128GB of VLP RDIMM DDR4 memory in four memory slots for each node. Populating these DIMM slots with memory modules of the same type and size will result in interleaved memory, which will improve memory performance.

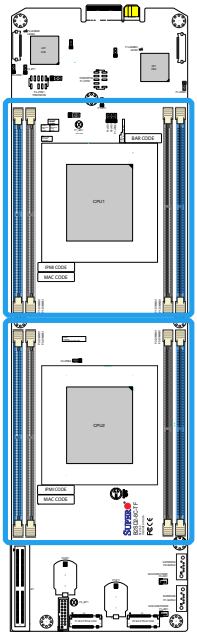
## DIMM Module Population

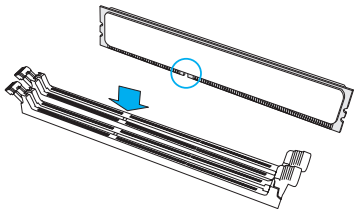
- Always use DDR4 DIMM modules of the same type and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.
- The motherboard will support odd-numbered modules (one or three modules installed). However, for best memory performance, install DIMM modules in pairs to activate memory interleaving.



## DIMM Installation

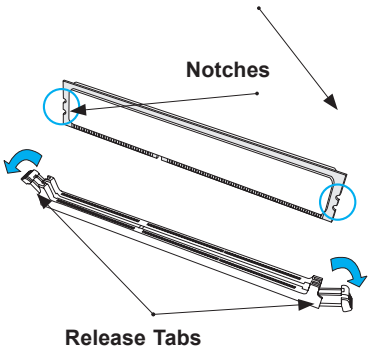
1. Insert the desired number of DIMMs into the memory slots For best performance, please use the memory modules of the same type and speed.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against the receptive points on the ends of the slot.
5. Press both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the lock positions to secure the DIMM module into the slot.

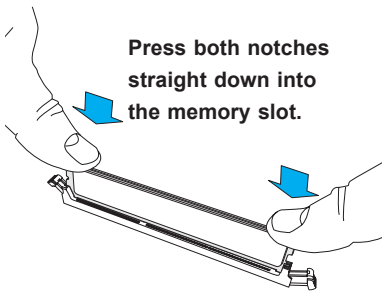




## DIMM Removal

Press both release tabs on the ends of the DIMM module to unlock it. Once the DIMM module is loosened, remove it from the memory slot.



# 2.4 Connectors and Headers

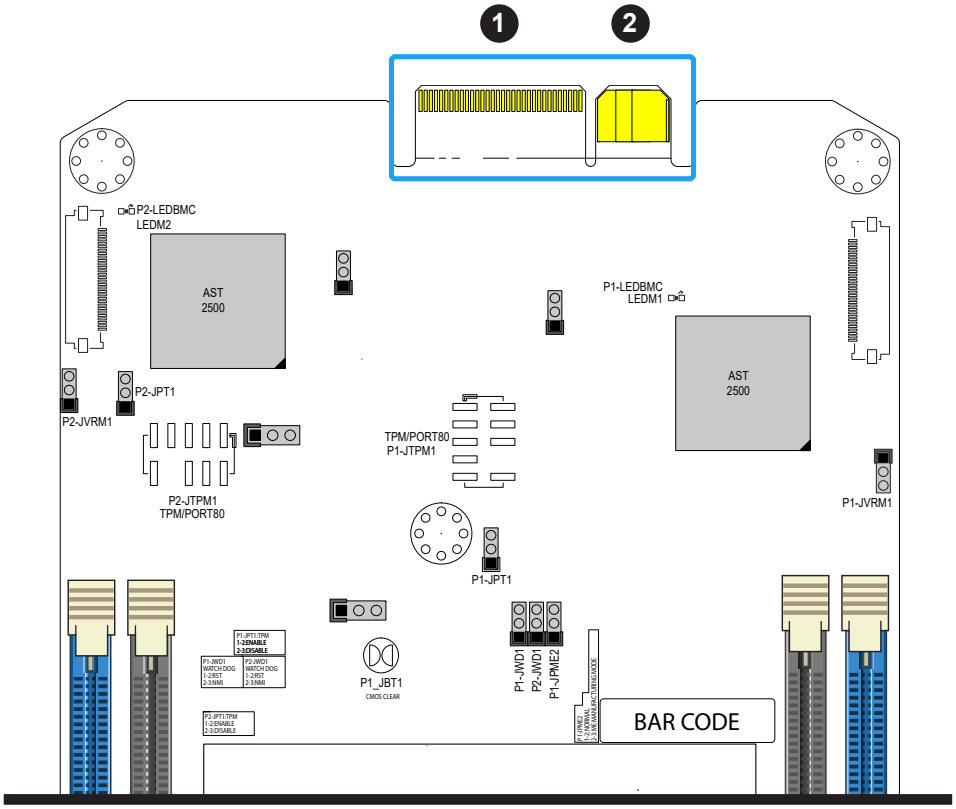
### I/O Edge Connector

When the motherboard is installed inside the chassis, the motherboard's edge connectors make contact with the chassis' backplane, where it connects electrically with the chassis network and other I/O devices.

### Power Edge Connector

The motherboard draws its power through this edge connector after it is installed inside the chassis. This edge connector makes contact with the chassis' backplane, where it connects electrically with the chassis.

1. I/O Edge Connector
2. Power Edge Connector

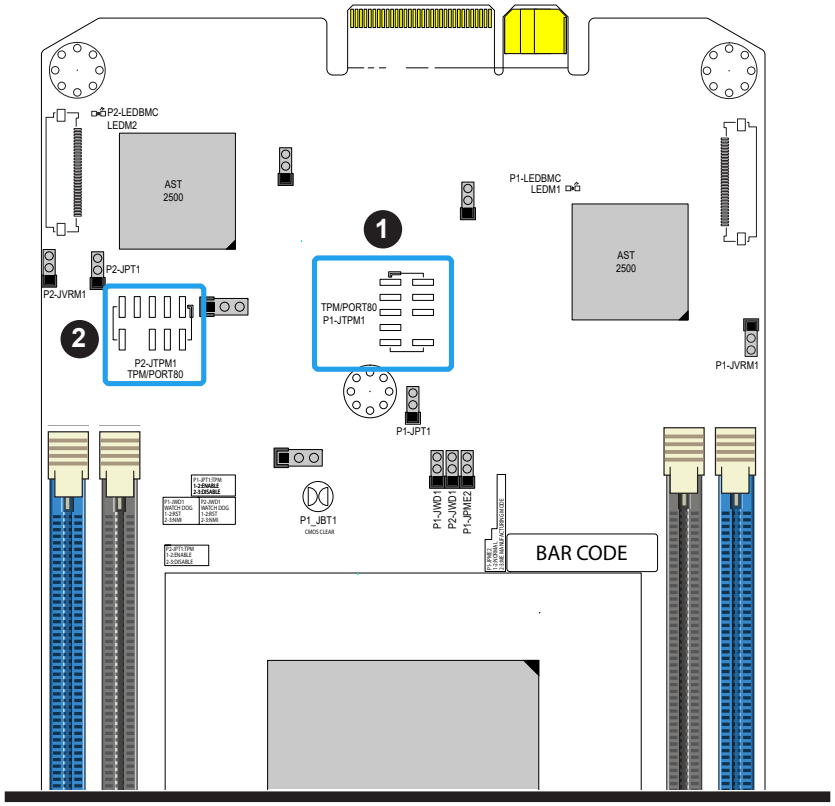


### TPM/Port 80 Header

The P1-JTPM1 and P2-JTPM1 headers are used to connect a Trusted Platform Module (TPM) and a Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions.

**Trusted Platform Module Header Pin Definitions**

| Pin# | Definition | Pin# | Definition |
|---|---|---|---|
| 1 | +3.3V | 2 | SPI_CS# |
| 3 | RESET# | 4 | SPI_MISO |
| 5 | SPI_CLK | 6 | GND |
| 7 | SPI_MOSI | 8 | |
| 9 | +3.3V Stby | 10 | SPI_IRQ# |

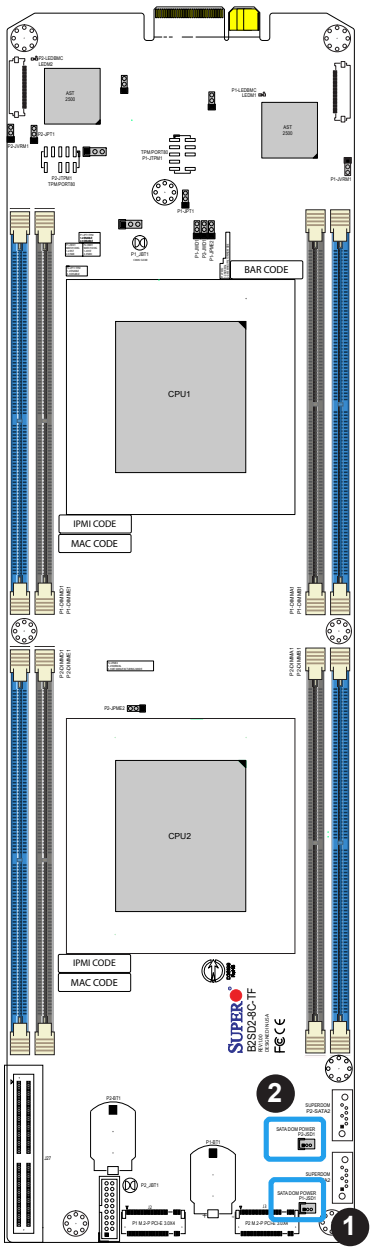



1. TPM Header for Node 1
2. TPM Header for Node 2

### Disk On Module Power Connector

The Disk On Module (DOM) power connector at P1-JSD1 AND P2-JSD1 provides 5V power to a solid-state DOM storage device connected to one of the SATA ports. Refer to the table below for pin definitions.

| DOM Power Pin Definitions | |
|---|---|
| **Pin#** | **Definition** |
| 1 | 5V |
| 2 | Ground |
| 3 | Ground |




1. P1-JSD1
2. P2-JSD1

### SATA Ports

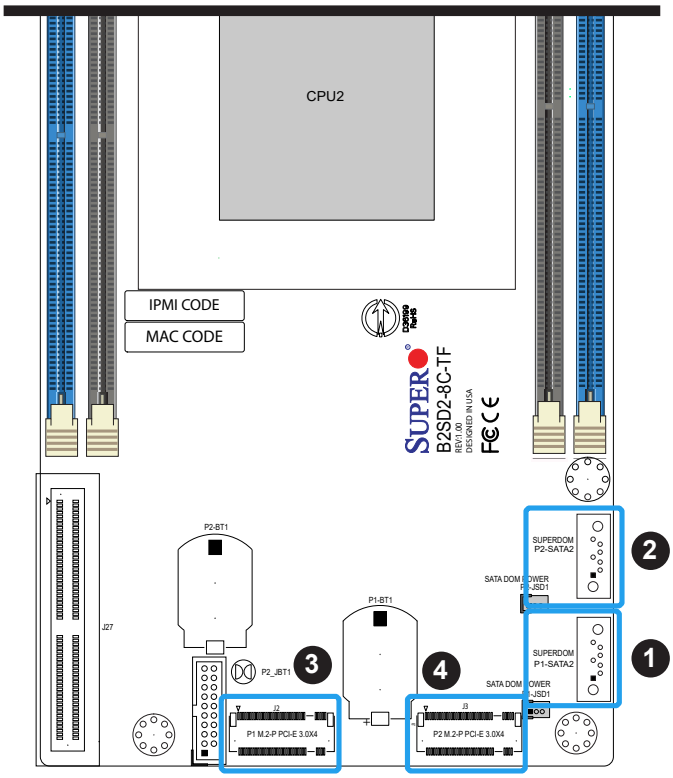
The B2SD2(1)-8C/12C/16C-TF motherboard has two SATA 3.0 connections (P1-SATA2 and P2-SATA2). Refer to the tables below for pin definitions. SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA.

**SATA 3.0 Port Pin Definitions**

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

### M.2 Slot

The B2SD2(1)-8C/12C/16C-TF motherboard has two M.2 slots. M.2 was formerly known as Next Generation Form Factor (NGFF). M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slot at J2 and J3 supports P1-PCI-E 3.0 x4 and P2-PCI-E 3.0 x4.



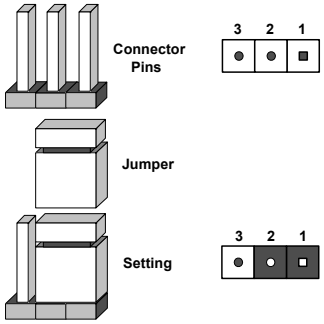

1. P1-SATA2
2. P2-SATA2
3. J2 - M.2 Key
4. J3 - M.2 Key

# 2.5 Jumper Settings

## How Jumpers Work

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

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



### CMOS Clear

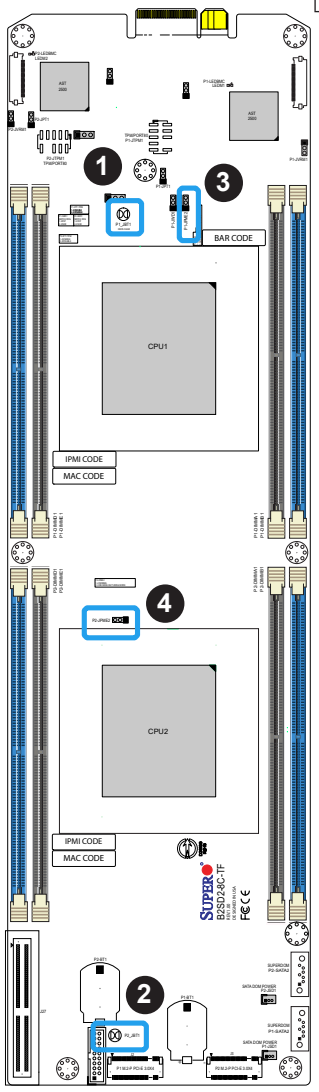
P1-JBT1 and P2-JBT1 is used to clear the CMOS. Instead of pins, this jumper consists of contact pads to prevent accidental clearing of the CMOS. To clear the CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection.

**Note:** Shut down the system and then short JBT1 to clear the CMOS.

### Manufacturing Mode Select

Close pins 2-3 of jumper P1-JPME2 and P2-JPME2 to bypass SPI flash security and force the system to operate in the manufacturing mode, which will allow the user to flash the system firmware from a host server for system setting modifications. Refer to the table below for jumper settings.

| Manufacturing Mode Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | Normal (Default) |
| Pins 2-3 | ME Manufacturing Mode |



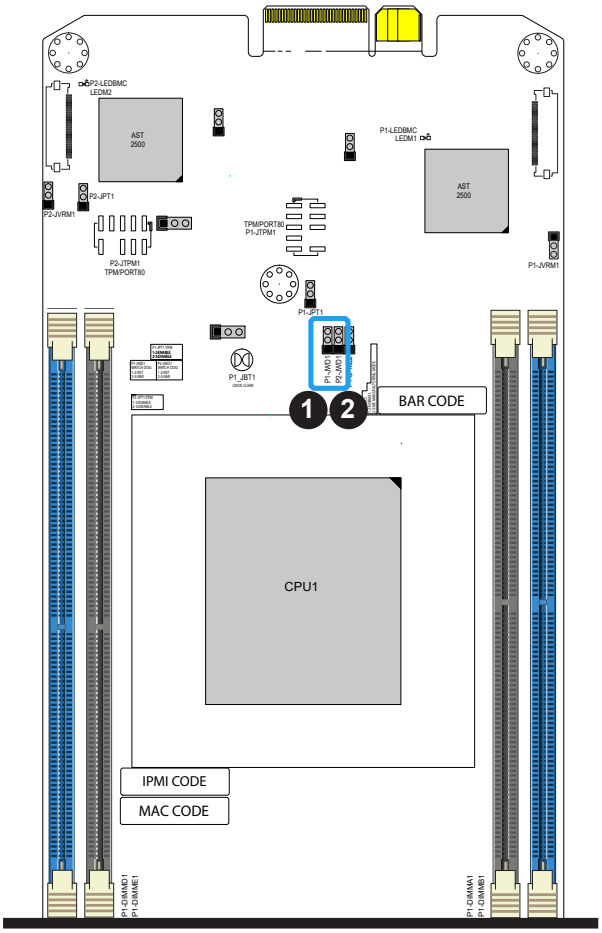

1. CMOS Clear-P1-JBT1
2. CMOS Clear-P2-JBT1
3. P1-JPME2
4. P2-JPME2

### Watch Dog Timer

P1-JWD1 and P2-JWD1 control the Watch Dog function. Watch Dog is a monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause Watch Dog to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. Watch Dog must also be enabled in BIOS.

**Note:** When Watch Dog is enabled, users need to write their own application software to disable it.

| Watch Dog Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | Reset (Default) |
| Pins 2-3 | NMI |
| Open | Disabled |

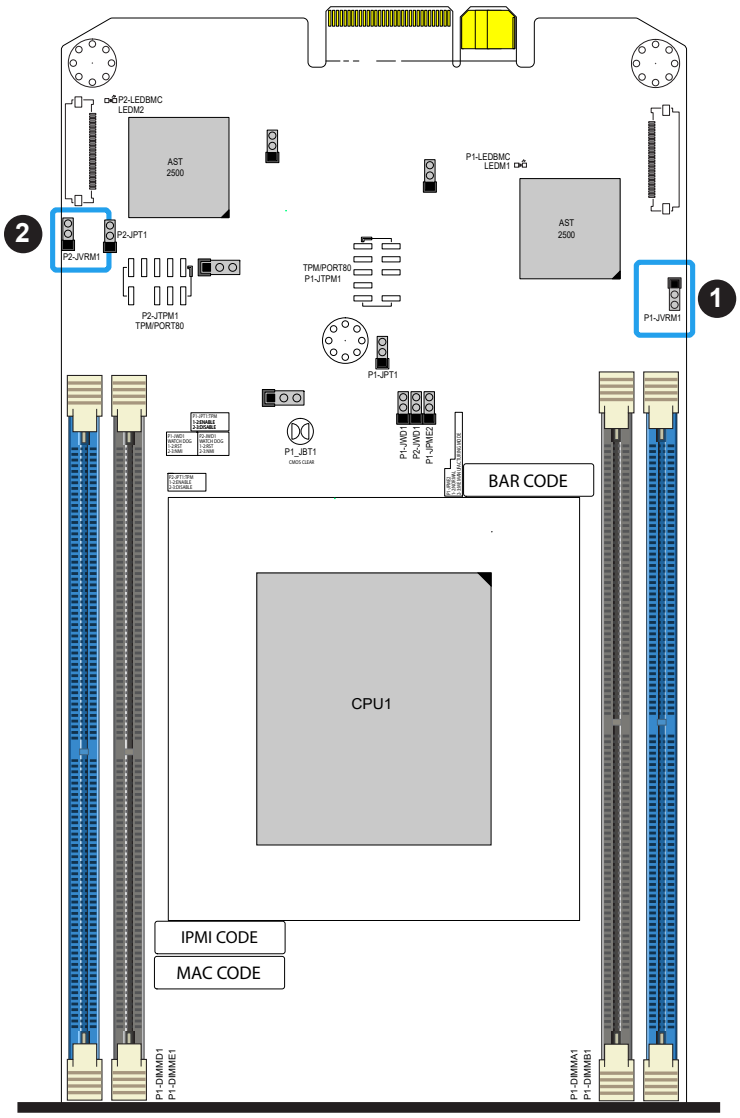



1. Watch Dog Timer-P1-JWD1
2. Watch Dog Timer-P2-JWD1

### I²C Bus for VRM

Jumper JVRM1 (P1-JVRM1 AND P2-JVRM1) allows the BMC or the PCH to access CPU and memory VRM controllers. Refer to the table below for jumper settings.

| VRM Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | BMC (Normal) |
| Pins 2-3 | PCH |

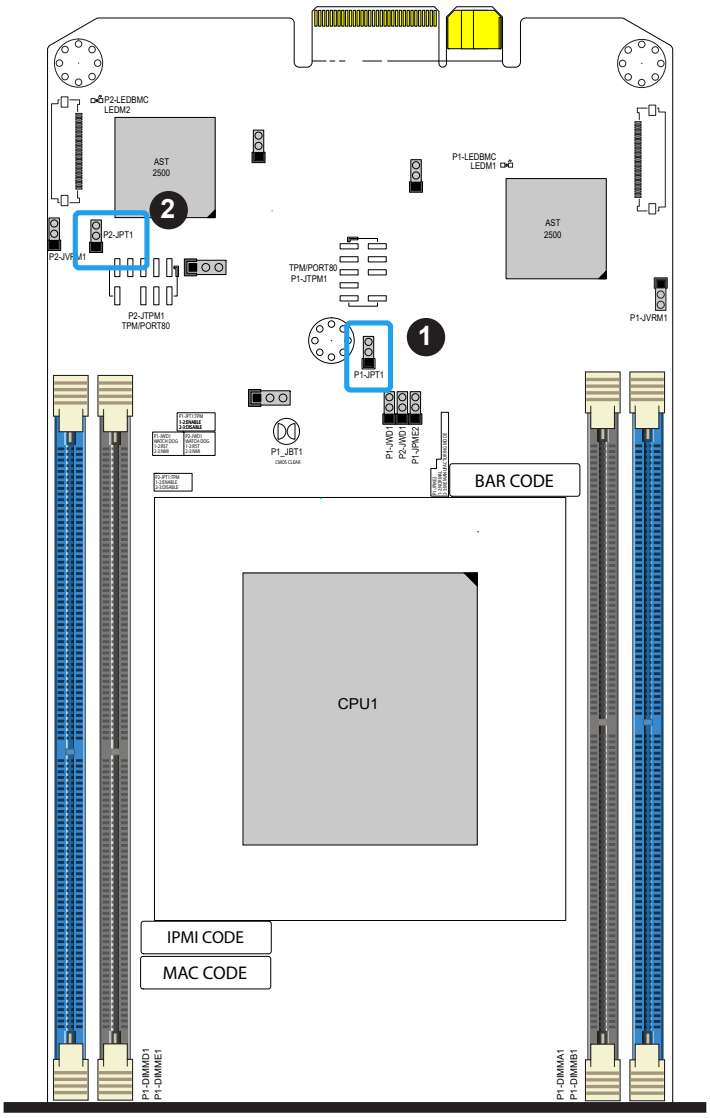



1. P1-JVRM1
2. P2-JVRM1

### TPM Enable

Use JPT1 to enable or disable support for the TPM module. Refer to the table below for jumper settings.

| TPM Enable/Disable Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | Enabled (Default) |
| Pins 2-3 | Disabled |




1.TPM Enable - P1-JPT1

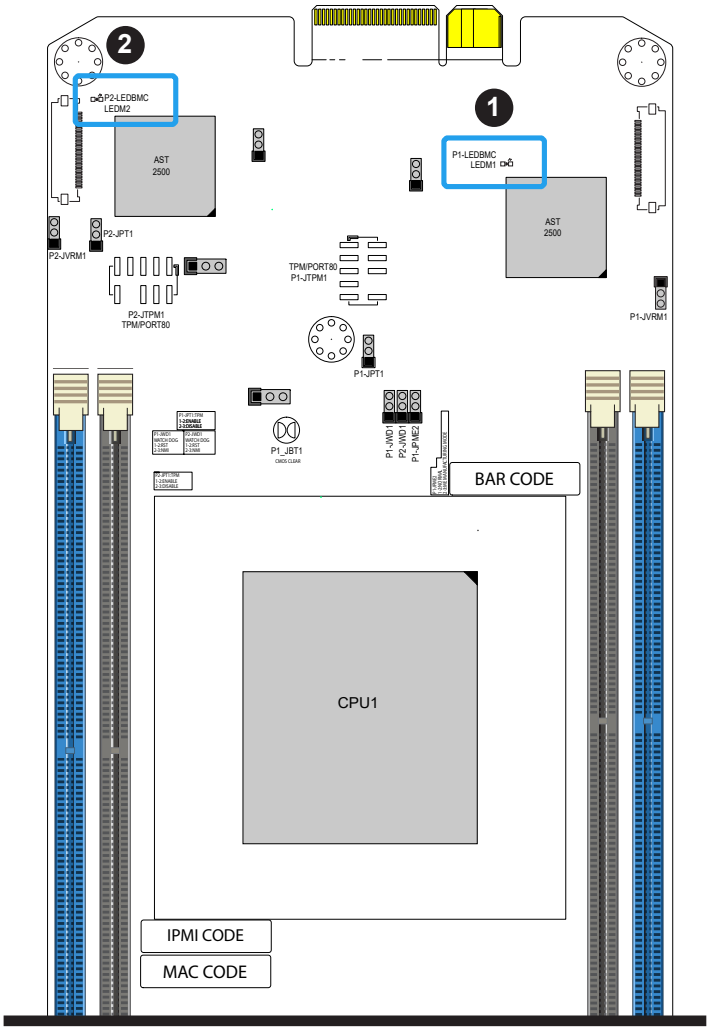
2.TPM Enable - P2-JPT1

# 2.6 LED Indicators

## BMC Heartbeat LED

LEDM1 is the BMC heartbeat LED for node 1 and LEDM2 is the BMC heartbeat LED for node 2. When the LED is blinking green, BMC is working. Refer to the table below for the LED status.

| Onboard Power LED Indicator | |
|---|---|
| **LED Color** | **Definition** |
| Blinking Green | BMC Normal |




1. BMC Heartbeat LED - LEDM1
2. BMC Heartbeat LED - LEDM2

# Chapter 3

# Troubleshooting

## 3.1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components.

### Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Connect the front panel connectors to the motherboard.

### No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that the 12V DC and/or ATX power connectors are properly connected.
3. Check that the 115V/230V switch, if available, on the power supply is properly set.
4. Turn the power switch on and off to test the system, if applicable.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

### No Video

1. If the power is on but you have no video, remove all add-on cards and cables.
2. Use the speaker to determine if any beep codes are present. Refer to Appendix A for details on beep codes.

3. Remove all memory modules and turn on the system (if the alarm is on, check the specs of memory modules, reset the memory or try a different one).

## System Boot Failure

If the system does not display POST or does not respond after the power is turned on, check the following:

1. Check for any error beep from the motherboard speaker.

- If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, replace the motherboard.
- If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS clear jumper (JBT1). (Refer to Section 2-7 in Chapter 2.)

2. Remove all components from the motherboard, especially the DIMM modules. Make sure that system power is on and that memory error beeps are activated.
3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

## Memory Errors

When a no-memory beep code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMMs are properly and fully installed. Click on the Tested Memory List link on the motherboard product page to see a list of supported memory.
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.
3. Make sure that you are using the correct type of ECC DDR4 RDIMM modules recommended by the manufacturer.
4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.
5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 2-3 in Chapter 2.
6. Please follow the instructions given in the DIMM population tables listed in Section 2-3 to install your memory modules.

## Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-7 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

## When the System Becomes Unstable

***A. If the system becomes unstable during or after OS installation, check the following:***

1. CPU/BIOS support: Make sure that your CPU is supported and that you have the latest BIOS installed in your system.

2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

   **Note**: Click on the Tested Memory List link on the motherboard product page to see a list of supported memory.

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check the system cooling to make sure that all heatsink fans and CPU/system fans, etc., work properly. Check the hardware monitoring settings in the IPMI to make sure that the CPU and system temperatures are within the normal range. Also check the front panel Overheat LED and make sure that it is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Please refer to our website for more information on the minimum power requirements.

6. Proper software support: Make sure that the correct drivers are used.

***B. If the system becomes unstable before or during OS installation, check the following:***

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as CD/DVD.

2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Using the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with the CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.

4. Identifying bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.

6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

## 3.2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problems with the specific system configuration that was sold to you.

1. Please go through the Troubleshooting Procedures and Frequently Asked Questions (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/FAQ/index.php) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html).
3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number
- BIOS release date/version (This can be seen on the initial display when your system first boots up.)
- System configuration

4. An example of a Technical Support form is on our website at http://www.supermicro.com/RmaForm/.

- Distributors: For immediate assistance, please have your account number ready when placing a call to our Technical Support department. We can be reached by email at support@supermicro.com.

## 3.3 Frequently Asked Questions

**Question: What type of memory does my motherboard support?**

**Answer:** The motherboard supports up to 128GB of VLP RDIMM DDR4 memory. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-3 in Chapter 2.

**Question: How do I update my BIOS?**

**Answer:** It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. Unzip the BIOS file onto a bootable USB device in the UEFI shell. Run the batch file using the format FLASH.NSH filename.rom from your bootable USB device in the UEFI shell to flash the BIOS. Then your system will automatically reboot.

**Warning**: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!)

**Note**: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For BIOS Recovery instructions, please refer to the AMI BIOS Recovery Instructions posted at http://www.supermicro.com/support/manuals/.

# 3.4 Battery Removal and Installation

## Battery Removal

To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.
2. Locate the onboard battery as shown below.
3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.
4. Remove the battery.

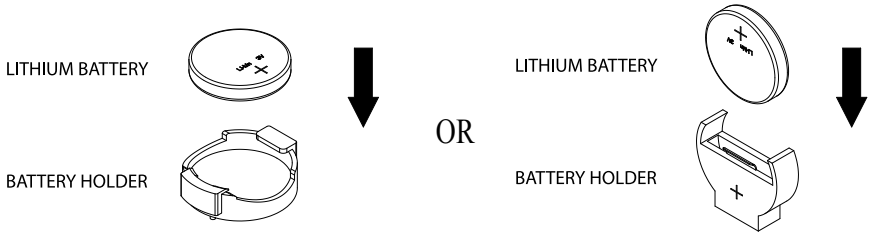
## Proper Battery Disposal

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.

## Battery Installation

1. To install an onboard battery, follow steps 1 and 2 above and continue below:
2. Identify the battery's polarity. The positive (+) side should be facing up.
3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

**Important:** When replacing a battery, be sure to only replace it with the same type.



## 3.5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

# Chapter 4

# UEFI BIOS

## 4.1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the B2SD2(1)-8C/12C/16C-TF motherboard. The BIOS is stored on a chip and can be easily upgraded using a flash program.

**Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our website for any changes to BIOS that may not be reflected in this manual.

### Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

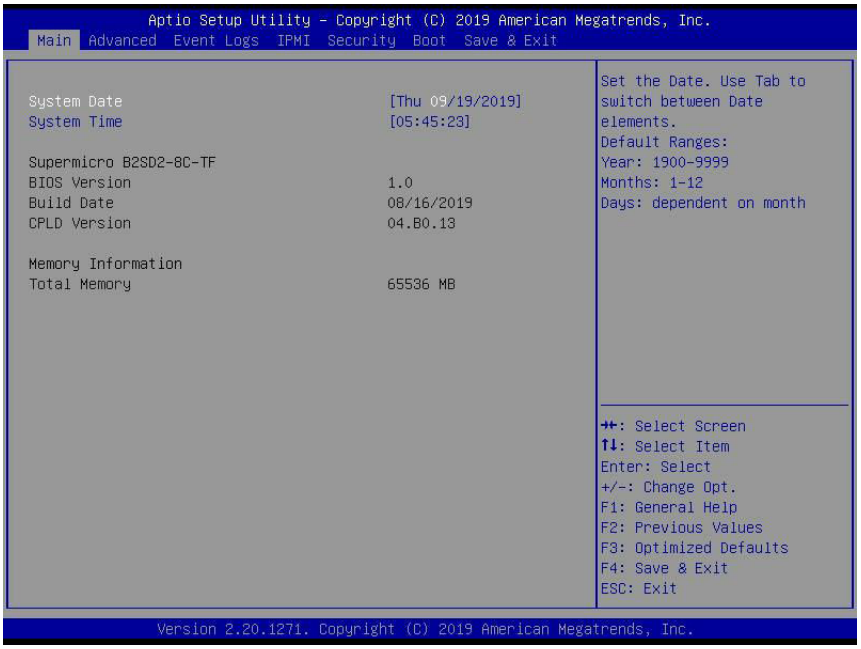
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.

A " ▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

## 4.2 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 and the following features will be displayed:




### System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in MM/DD/YYYY format. The time is entered in HH:MM:SS format.

**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00. The date's default value is the BIOS build date after RTC reset.

### Supermicro B2SD2-8C-TF

### BIOS Version

This feature displays the version of the BIOS ROM used in the system.

### Build Date

This feature displays the date when the version of the BIOS ROM used in the system was built.

### CPLD Version

This feature displays the CPLD version.

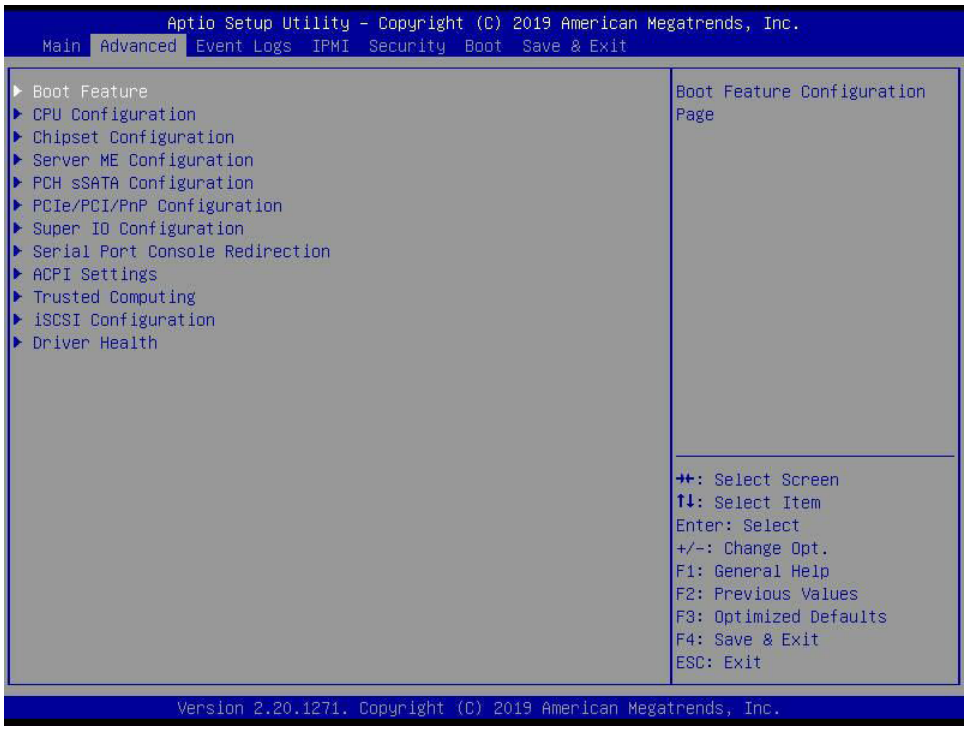
### Memory Information

#### Total Memory

This feature displays the total size of memory available in the system.

# 4.3 Advanced

Use this menu to configure advanced settings.




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

## ▶Boot Feature

### Quiet Boot

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

### Option ROM Messages

Use this feature to set the display mode for the Option ROM. The options are **Force BIOS** and Keep Current.

### Bootup NumLock State

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

**Wait For "F1" If Error**

This feature forces the system to wait until the F1 key is pressed if an error occurs. The options are Disabled and **Enabled**.

**INT19 Trap Response**

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

**Re-try Boot**

If this feature is enabled, the BIOS will automatically reboot the system from a specified boot device after its initial boot failure. The options are **Disabled,** Legacy Boot and EFI Boot.

**Port 61h Bit-4 Emulation**

Select Enabled to enable the emulation of Port 61h bit-4 toggling in SMM (System Management Mode). The options are **Disabled** and Enabled.

**Power Configuration**

**Watch Dog Function**

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

**Power Button Function**

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the user to power off the system after pressing and holding the power button for four seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. 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 power state before a power loss. The options are **Stay Off**, Power On, and Last State.

**Throttle on Power Fail**

Use this feature to decrease the systems power by throttling CPU frequency when one power supply has failed. The options are **Disabled** and Enabled.

## ▶CPU Configuration

The following CPU information will display:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version

**Hyper-Threading [ALL]**

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

**Cores Enabled**

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

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

Set to Enable for Execute Disable Bit support, which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during a virus attack. Set to Disable to force the XD feature flag to always return to 0. The options are Disable and **Enable**. Refer to Intel and Microsoft websites for more information.

**Intel Virtualization Technology**

Use this feature to enable the Vanderpool Technology. This technology allows the system to run several operating systems simultaneously. The options are Disable and **Enable**.

**PPIN Control**

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

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

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

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

The CPU prefetches the cache line for 64 bytes if this feature is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to Enable. The options are **Enable** and Disable.

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

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

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

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

**LLC Prefetch**

If set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L3 cache to improve CPU performance. The options are **Disable** and Enable.

**Extended APIC**

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

**AES-NI**

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

## ▶Advanced Power Management Configuration

**Power Technology**

This feature allows you to configure CPU power management settings. The options are Disable, **Energy Efficient**, and Custom.

***If the feature above is set to Custom, the following features will be available for configuration:***

**Power Performance Tuning**

This feature allows you to set whether the operating system or the BIOS controls the Energy Performance BIAS (EPB). The options are **OS Controls EPB** and BIOS Controls EPB.

***If the feature above is set to BIOS Controls EPB, the following features will be available for configuration:***

**ENERGY_PERF_BIAS_CFG mode**

The Energy Performance BIAS (EPB) feature allows you to configure CPU power and performance settings. Select Maximum Performance to set the highest performance. Select Performance to optimize performance over energy efficiency. Select Balanced Performance to prioritize performance optimization while conserving energy. Select Balanced Power to prioritize energy conservation while maintaining good performance. Select Power to optimize energy efficency over performance. The options are Maximum Performance, Performance, **Balanced Performance,** Balanced Power, and Power.

## ▶CPU P State Control

This feature allows you to configure the following CPU power settings:

**Uncore Freq Scaling (UFS)**

Use this feature to enable or disable uncore frequency scaling. The options are **Enable** and Disable.

**SpeedStep (Pstates)**

Intel SpeedStep Technology allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disable and **Enable**. This feature must be set to Enable to be able to configure the next two features.

**Config TDP**

Use this feature to configure the TDP level. The options are **Nominal**, Level 1, and Level 2.

**EIST PSD Funtion**

This setting allows you to choose between Hardware and Software to control the processor's frequency and performance (P-state). In HW_ALL mode, the processor hardware is responsible for coordinating the P-state, and the OS is responsible for keeping the P-state request up to date on all Logical Processors. In SW_ALL mode, the OS Power Manager is responsible for coordinating the P-state, and must initiate the transition on all Logical Processors. In SW_ANY mode, the OS Power Manager is responsible for coordinating the P-state and may initiate the transition on any Logical Processors. The options are **HW_ALL** and SW_ALL.

**Energy Efficient Turbo**

Use this feature to enable or disable energy efficient turbo. The options are **Enable** and Disable.

**Turbo Mode**

This feature will enable dynamic control of the processor, allowing it to run above stock frequency. The options are Disable and **Enable**.

## ▶Hardware PM State Control

**Hardware P-States**

This setting allows you to select between OS and hardware-controlled P-states. Selecting Native Mode allows the OS to choose a P-state. Selecting Out of Band Mode allows the hardware to autonomously choose a P-state without OS guidance. Selecting Native Mode with No Legacy Support functions as Native Mode with no support for older hardware. The options are Disable, **Native Mode**, Out of Band Mode, and Native Mode with No Legacy Support.

## ▶CPU C State Control

**Autonomous Core C-State**

Enabling this setting allows the hardware to autonomously choose to enter a C-state based on power consumption and clock speed. The options are **Disable** and Enable. This feature must be set to Disable to be able to configure the next two features.

**CPU C6 report**

Select Enable 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 Disable, Enable, and **Auto**.

**Enhanced Halt State (C1E)**

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

### ▶Package C State Control

**Package C State**

This feature allows you to set the limit on the C State package register. The options are C0/C1 state, C2 state, C6 (non Retention) state**,** C6 (Retention) state, No Limit, and **Auto.**

### ▶CPU T State Control

**Software Controlled T-States**

Use this feature to enable Software Controlled T-States. The options are Disable and **Enable**.

## ▶Chipset Configuration

**Warning:** Setting the wrong values in the sections below may cause the system to malfunction.

## ▶North Bridge

### ▶Memory Configuration

**Enforce POR**

Select POR (Plan of Record) to enforce POR restrictions on DDR4 frequency and voltage programming. The options are **POR** and Disable.

**Memory Frequency**

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 2133, 2400, and 2666.

**Data Scrambling for DDR4**

Use this feature to enable or disable data scrambling for DDR4 memory. The options are **Auto**, Disable, and Enable.

**tCCD_L Relaxation**

Select Auto to get TCDD settings from SPD (Serial Presence Detect) into memory RC code to improve system reliability. Select Disable for TCCD to follow Intel POR. The options are Disable and **Auto**.

**2X REFRESH**

Use this feature to select the memory controller refresh rate to 2x refresh mode. The options are **Auto** and Enable.

## ▶Memory Topology

This feature displays the information of onboard memory modules detected by the BIOS.

## ▶Memory RAS Configuration

**Static Virtual Lockstep Mode**

Select Enable to run the system's memory channels in lockstep mode to minimize memory access latency. The options are **Disable** and Enable.

**Mirror mode**

This feature allows memory to be mirrored between two channels, providing 100% redundancy. The options are **Disable** and Enable Mirror Mode (1LM).

**Memory Rank Sparing**

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

***If the feature above is set to Enable, Multi Rank Sparing will be available for configuration:***

**Multi Rank Sparing**

Use this feature to indicate how many memory ranks to reserve in case of memory failure. The options are One Rank and **Two Rank**.

**Correctable Error Threshold**

Use this feature to specify the threshold value for correctable memory error logging, which sets a limit on the maximum number of events that can be logged in the memory error log at a given time. The default setting is **100**.

**SDDC**

Single device data correction +1 (SDDC Plus One) organizes data in a single bundle (x4/x8 DRAM). If any or all of the bits become corrupted, corrections occur. The x4 condition is corrected on all cases. The x8 condition is corrected only if the system is in Lockstep Mode. The options are **Disable** and Enable.

**ADDDC Sparing**

Adaptive Double Device Data Correction (ADDDC) Sparing detects when the predetermined threshold for correctable errors is reached, copying the contents of the failing DIMM to spare memory. The failing DIMM or memory rank will then be disabled. The options are **Disable** and Enable.

**Patrol Scrub**

Patrol Scrub 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 feature is set to Enable, the IO hub will read and write back one cache line every 16K cycles if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are Disable and **Enable**.

***If the feature above is set to Enable, Patrol Scrub Interval will be available for configuration:***

**Patrol Scrub Interval**

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

## ▶IIO Configuration

**EV DFX Features**

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

### ▶CPU Configuration

**IOU0 (II0 PCIe Br1)**

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

## ▶P2:M.2-P PCI-E 3.0 x4 (PCI Express Ports)

**Link Speed**

Use this feature to select the link speed for this port. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

**PCI-E Port Link Status**

This feature shows the status of the device plugged into this slot.

**PCI-E Port Link Max**

This feature shows the status of the device plugged into this slot.

**PCI-E Port Link Speed**

This feature shows the status of the device plugged into this slot.

**PCI-E Port Max Payload Size**

Use this feature to select the maximum payload size for this port. The options are 128B, 256B, and **Auto.**

## ▶IOAT Configuration

**Disable TPH**

Transparent Huge Pages (TPH) is a Linux memory management system that enables communication in larger blocks (pages). Enabling this feature will increase performance. The options are **No** and Yes.

***If the feature above is set to No, Relax Ordering will be available for configuration:***

**Prioritize TPH**

Select Yes to prioritize TPH requests that will allow the hints to be sent to help facilitate and optimize the processing of certain transactions in the system memory. The options are Enable and **Disable.**

**Relaxed Ordering**

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

## ▶Intel® VT for Directed I/O (VT-d)

### Intel® VT for Directed I/O (VT-d)

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

****If the feature above is set to Enable, the five features below will be available for configuration:***

### Interrupt Remapping

Use this feature to enable Interrupt Remapping support, which detects and controls external interrupt requests. The options are **Enable** and Disable.

### PassThrough DMA

Use this feature to allow devices such as network cards to access the system memory without using a processor. Select Enable to use the Non-Isoch VT-d Engine Pass Through Direct Memory Access (DMA) support. The options are **Enable** and Disable.

### ATS

Use this feature to enable Non-Isoch VT-d Engine Address Translation Services (ATS) support. ATS translates virtual addresses to physical addresses. The options are **Enable** and Disable.

### Posted Interrupt

Use this feature to enable VT-d Posted Interrupt. The options are **Enable** and Disable.

### Coherency Support (Non-Isoch)

Use this feature to maintain setting coherency between processors or other devices. Select Enable for the Non-Isoch VT-d engine to pass through DMA to enhance system performance. The options are **Enable** and Disable.

### PCI-E Completion Timeout Disable

Use this feature to enable or disable the Completion Timeout. The options are Yes, **No**, and Per-Port.

## ▶South Bridge

The following South Bridge information will display:

- USB Module Version
- USB Devices

**Legacy USB Support**

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

**XHCI Hand-off**

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

**Port 60/64 Emulation**

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

## ▶Server ME Configuration

- General ME Configuration
- Oper. Firmware Version
- Backup Firmware Version
- Recovery Firmware Version
- ME Firmware Status #1
- ME Firmware Status #2
- Current State
- Error Code

## ▶PCH sSATA Configuration

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

**sSATA Controller**

This feature enables or disables the onboard sSATA controller supported by the Intel PCH chip. The options are **Enable** and Disable.

**SATA HDD Unlock**

This feature allows you to remove any password-protected SATA disk drives. The options are Disable and **Enable**.

**Aggressive Link Power Management**

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

**sSATA Port 0, Port 2**

This feature displays the information detected on the installed sSATA drive on the particular sSATA port.

- Model number of drive and capacity
- Software Preserve Support

**Port 0, Port 2 Hot Plug**

Set this feature to Enable for hot plug support, which will allow the user to replace a SATA drive without shutting down the system. The options are Disable and **Enable**.

**Port 0, Port 2 Spin Up Device**

Set this feature to enable or disable the PCH to initialize the device. The options are **Disable** and Enable.

**Port 0, Port 2 sSATA Device Type**

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

## ▶PCIe/PCI/PnP Configuration

The following information will display:

- PCI Bus Driver Version
- PCI Devices Common Settings:

**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 Disabled and **Enabled**.

**SR-IOV Support**

Use this feature to enable or disable Single Root IO Virtualization Support. The options are **Disabled** and Enabled.

**BME DMA Mitigation**

Enable this feature to help block DMA attacks. The options are Enabled and **Disabled**.

**MMIO High Base**

Use this feature to select the base memory size according to memory-address mapping for the IO hub. The options are **56T**, 40T, 24T, 16T, 4T, and 1T.

**MMIO High Granularity Size**

Use this feature to select the high memory size according to memory-address mapping for the IO hub. The options are 1G, 4G, 16G, 64G, **256G**, and 1024G.

**Maximum Read Request**

Use this feature to select the Maximum Read Request size of the PCI-Express device, or select Auto to allow the System BIOS to determine the value. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

**MMCFG Base**

Use this feature to select the low base address for PCI-E adapters to increase base memory. The options are 1G, 1.5G, 1.75G, **2G**, 2.25G, and 3G.

**NVMe Firmware Source**

Use this feature to select the NVMe firmware to support booting. The default option, Vendor Defined Firmware, is pre-installed on the drive and may resolve errata or enable innovative functions for the drive. The other option, AMI Native Support, is offered by the BIOS with a generic method. The options are **Vendor Defined Firmware** and AMI Native Support.

**VGA Priority**

Use this feature to select VGA priority when multiple VGA devices are detected. Select Onboard to give priority to your onboard video device. Select Offboard to give priority to your graphics card. The options are **Onboard** and Offboard.

**Consistent Device Name Support**

Select enabled for the BIOS to consistently name network devices. The options are Disabled and **Enabled**.

**P2: M.2-P PCI-E 3.0 X4 OPROM**

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled, **Legacy**, and EFI.

**Onboard LAN Option ROM Type**

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

**Onboard LAN1 Option ROM**

Use this feature to select which firmware function to be loaded for the specified LAN port used for system boot. The options for Disabled and **Legacy**.

**Onboard LAN2 Option ROM**

Use this feature to select which firmware function to be loaded for the specified LAN port used for system boot. The options for **Disabled** and Legacy.

**Onboard Video Option ROM**

Use this feature to select the Onboard Video Option ROM type. The options are Disabled, **Legacy**, and EFI.

## ▶Network Stack Configuration

**Network Stack**

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

***If the feature above is set to Enabled, the next six features will be available for configuration:***

**Ipv4 PXE Support**

Select Enabled to enable IPv4 PXE boot support. The options are Disabled and **Enabled**.

**Ipv4 HTTP Support**

Select Enabled to enable IPv4 HTTP boot support. The options are **Disabled** and Enabled.

**Ipv6 PXE Support**

Select Enabled to enable IPv6 PXE boot support. The options are **Disabled** and Enabled.

**Ipv6 HTTP Support**

Select Enabled to enable IPv6 HTTP boot support. The options are **Disabled** and Enabled.

**PXE boot wait time**

Use this option to specify the wait time to press the ESC key to abort the PXE boot. Press "+" or "-" on your keyboard to change the value. The default setting is **0**.

**Media detect count**

Use this option to specify the number of times media will be checked. Press "+" or "-" on your keyboard to change the value. The default setting is **1**.

## ▶Super IO Configuration

**Super IO Chip AST2500**

### ▶Serial Port 1 Configuration

**Serial Port 1**

Select Enabled to enable the onboard serial port specified by the user. The options are **Enabled** and Disabled. Enable this feature for the next two features to display and only the Change Settings feature is available for configuration.

**Device Settings**

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

**Change Settings**

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified. The options are **Auto**, (IO=3F8h; IRQ=4), (IO=2F8h; IRQ=4), (IO=3E8h; IRQ=4), and (IO=2E8h; IRQ=4).

## ▶Serial Port 2 Configuration

### Serial Port 2

Select Enabled to enable the onboard serial port specified by the user. The options are **Enabled** and Disabled. Enable this feature for the next two features to display and only the Change Settings feature is available for configuration.

### Device Settings

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

### Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified. The options are **Auto**, (IO=2F8h; IRQ=3), (IO=3F8h; IRQ=3), (IO=3E8h; IRQ=3), and (IO=2E8h; IRQ=3).

## ▶Serial Port Console Redirection

### COM1

### Console Redirection

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

***If the feature above is set to Enabled, the following features will become available for configuration:***

## ▶Console Redirection Settings

### Terminal Type

This feature allows you 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 VT100, **VT100+**, VT-UTF8, and ANSI.

**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 and **8**.

**Parity**

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

**Stop Bits**

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

**Flow Control**

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start 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 Disabled and **Enabled.**

**Recorder Mode**

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

**Resolution 100x31**

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

**Legacy OS Redirection Resolution**

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

**Putty KeyPad**

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

**Redirection After BIOS POST**

Use this feature to enable or disable legacy console redirection after BIOS POST. When set to BootLoader, legacy console redirection is disabled before booting the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and BootLoader.

**SOL**

**Console Redirection**

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

***If the feature above is set to Enabled, the following features are available for configuration:***

## ▶Console Redirection Settings

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

**SOL**

**Terminal Type**

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

**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 and **8**.

**Parity**

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

**Stop Bits**

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

**Flow Control**

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start 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 Disabled and **Enabled.**

**Recorder Mode**

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

**Resolution 100x31**

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

**Legacy OS Redirection Resolution**

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

**Putty KeyPad**

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

**Redirection After BIOS POST**

Use this feature to enable or disable legacy console redirection after BIOS POST. When set to BootLoader, legacy console redirection is disabled before booting the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and BootLoader.

**Legacy Console Redirection**

**Redirection COM Port**

Use this feature to select a COM port to display redirection of Legacy OS and Legacy OPROM messages. The options are **COM1** and SOL.

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

This submenu allows you 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 EMS Console Redirection. The options are **Disabled** and Enabled**.**

***If the feature above is set to Enabled, the following features are available for configuration:***

### ▶Console Redirection Settings

This feature allows you 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 Mgmt Port**

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

**Terminal Type**

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

**Bits per second**

This feature 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**

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

**Data Bits**

**Parity**

**Stop Bits**

## ▶ACPI Settings

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

**Headless Support**

Enable this feature for the system to function without a keyboard, monitor, or mouse attached. The options are **Disabled** and Enabled.

**WHEA Support**

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

**High Precision Event Timer**

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

## ▶Trusted Computing

The B2SD2(1)-8C/12C/16C-TF supports TPM 1.2 and 2.0. The following Trusted Platform Module (TPM) information will display if a TPM 2.0 module is detected:

**TPM20 Device Found**

**Vendor:**

**Firmware Version:**

**Security Device Support**

If this feature and the TPM jumper on the motherboard are both set to Enabled, onboard security devices will be enabled for TPM support to enhance data integrity and network security. Reboot the system for a change on this setting to take effect. The options are Disable and **Enable**.

The following TPM information will be displayed:

- Active PCR banks
- Available PCR banks

***If the feature "Security Device Support" is enabled, the following features are available for configuration:***

**SHA256 PCR Bank**

Use this feature to disable or enable the SHA256 Platform Configuration Register (PCR) bank for the installed TPM device. The options are Disabled and **Enabled**.

**Pending Operation**

Use this feature to schedule a TPM-related operation to be performed by a security device for system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **None** and TPM Clear.

**Platform Hierarchy**

Use this feature to disable or enable platform hierarchy for platform protection. The options are Disabled and **Enabled**.

**Storage Hierarchy**

Use this feature to disable or enable storage hierarchy for cryptographic protection. The options are Disabled and **Enabled**.

**Endorsement Hierarchy**

Use this feature to disable or enable endorsement hierarchy for privacy control. The options are Disabled and **Enabled**.

**PH Randomization**

Use this feature to disable or enable Platform Hierarchy (PH) Randomization. The options are **Disabled** and Enabled.

**SMCI BIOS-Based TPM Provision Support**

Use feature to enable the Supermicro TPM Provision support. The options are Disabled and **Enabled**.

**TXT Support**

Intel TXT (Trusted Execution Technology) helps protect against software-based attacks and ensures protection, confidentiality and integrity of data stored or created on the system. Use this feature to enable or disable TXT Support. The options are **Disabled** and Enabled.

## ▶iSCSI Configuration

**iSCSI Initiator Name**

This feature allows you to enter the unique name of the iSCSI Initiator in IQN format. Once the name of the iSCSI Initiator is entered into the system, configure the proper settings for the following features.

**▶Add an Attempt**

**▶Delete Attempts**

**▶Change Attempt Order**

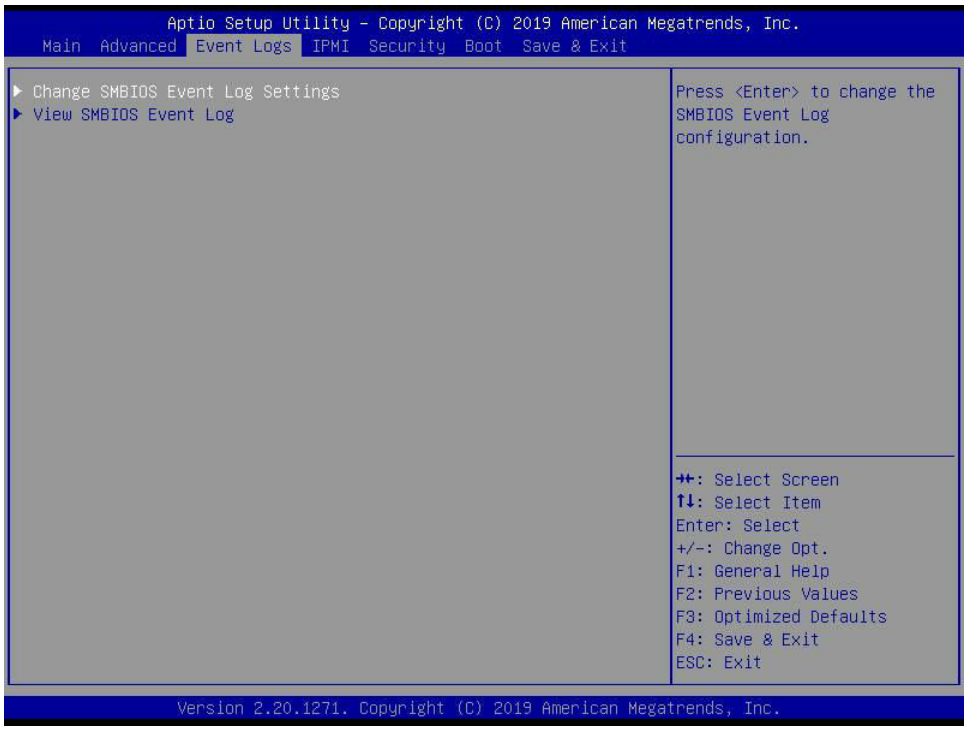
## ▶Driver Health

This submenu displays the health status of the drivers and controllers below.

### ▶Apache Pass 1.0.0.1970 Driver

# 4.4 Event Logs

Use this menu to configure event log settings.




## ▶Change SMBIOS Event Log Settings

### Enabling/Disabling Options

### SMBIOS Event Log

Change this feature to enable or disable all features of the SMBIOS Event Logging during system boot. The options are **Enabled** and Disabled.

### Erasing Settings

### Erase Event Log

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

### When Log is Full

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

**SMBIOS Event Log Standard Settings**

**Log System Boot Event**

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

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

**Note**: Reboot the system for the changes to take effect.

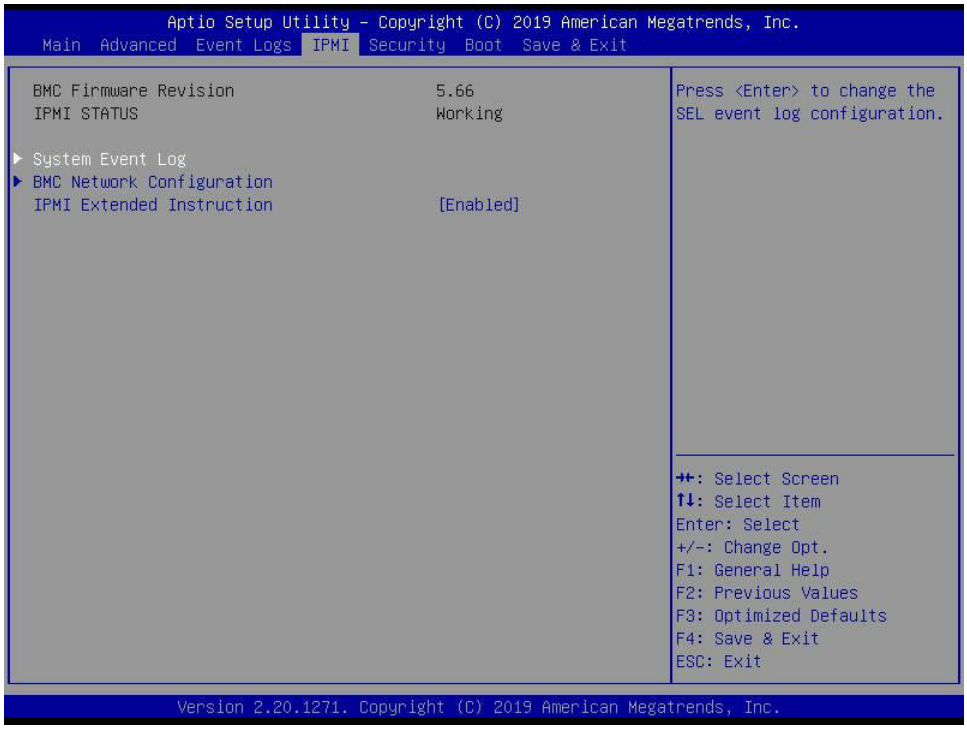
## ▶View SMBIOS Event Log

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

**DATE/TIME/ERROR CODE/SEVERITY**

# 4.5 IPMI

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




### BMC Firmware Revision

This feature displays the IPMI firmware revision used in your system.

### IPMI STATUS

This feature displays 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 Disabled and **Enabled**.

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

**Note**: Reboot the system for the changes to take effect.

## ▶BMC Network Configuration

**--BMC network configuration--**

**Update IPMI LAN Configuration**

Select Yes for the BIOS to implement all IP/MAC address changes at the next system boot. The options are **No** and Yes.

***If the feature above is set to Yes, the Configuration Address Source and VLAN features are available for configuration:***

**Configure IPV4 support**

**IPMI LAN Selection**

This feature displays the IPMI LAN setting. The default setting is **Dedicated**.

**IPMI Network Link Status**

This feature displays the IPMI Network Link status. The default setting is **Dedicated LAN**.

**Configuration Address Source**

Use this feature 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.

***If the feature above is set to Static, the Station IP Address/Subnet Mask/Gateway IP Address features are available for configuration:***

**Station IP Address**

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

**Gateway IP Address**

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

**VLAN**

This feature is configurable if the Update IPMI LAN Configuration feature is set to Yes. Use this feature to enable or disable the IPMI VLAN function. The options are **Disable** and Enable.

***If the feature above is set to Enabled, the VLAN ID feature below is available for configuration:***

**VLAN ID**

Use this feature to select a value for VLAN ID.

**Configure IPV6 support**

**IPV6 address status**

**IPV6 Support**

Use this feature to enable IPV6 support. The options are **Enabled** and Disabled.

**Configuration Address source**

Use this feature 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 Unspecified, Static, and **DHCP**.

***If the feature above is set to Static, the Station IP Address/Prefix Length/IPV6 Router1 IP Address features are available for configuration:***

**Station IPV6 Address**

Use this feature to enter the IPV6 address.

**Prefix Length**

Use this feature to change the prefix length.

**IPV6 Router1 IP Address**

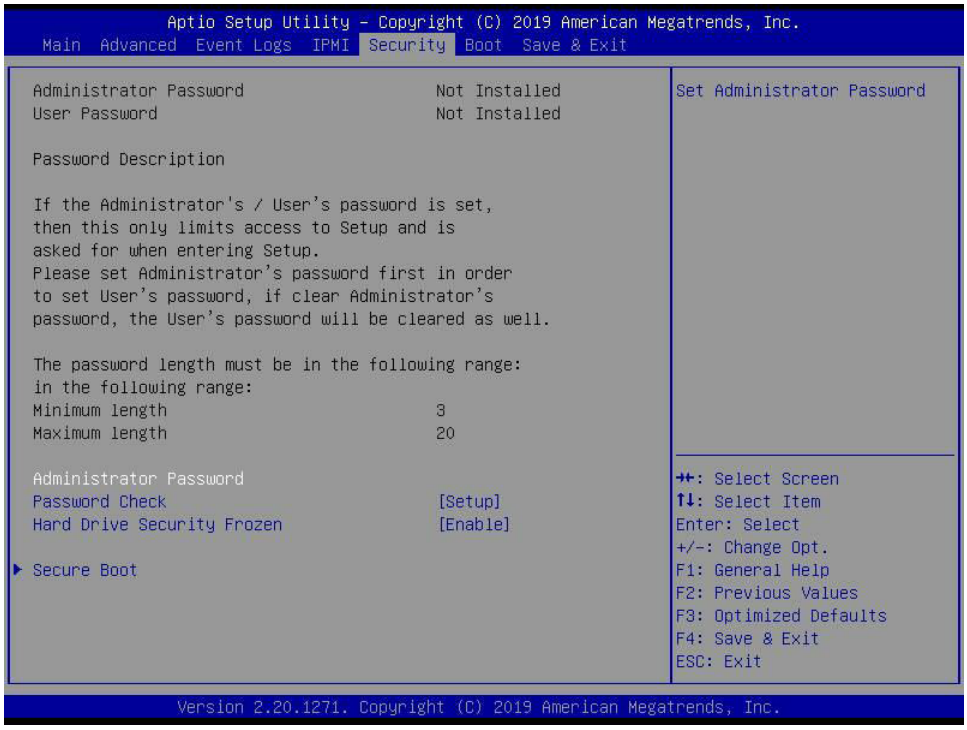
Use this feature to change the IPV6 Router1 IP address.

**IPMI Extended Instruction**

Use this feature to enable IPMI extended function support. The options are **Enabled** and Disabled. When Disabled, the system powers on quickly by removing BIOS support for extended IPMI features. The Disable option is for applications that require faster power on time without using Supermicro Update Manager (SUM) or extended IPMI features. The BMC network configuration in the BIOS setup will also be invalid when IPMI Extended Instruction is disabled. The general BMC function and motherboard health monitor such as fan control will still function even when this option is disabled.

# 4.6 Security

Use this menu to configure the security settings.




### 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 to 20 characters long.

### User Password

Use this feature to set a user password.

### Password Check

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

### Hard Drive Security Frozen

Use this feature to enable or disable the BIOS Security Frozen Command to SATA and NVME devices. The options are Enable and **Disable**.

## ▶Secure Boot

**System Mode**

**Secure Boot**

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

**Secure Boot Mode**

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

***If Secure Boot Mode is set to Custom, Key Management features are available for configuration:***

**CSM Support**

This feature is for manufacturing debugging purposes. The options are Disabled and **Enabled**.

## ▶Key Management

This submenu allows you to configure the following Key Management settings.

**Factory Key Provision**

Select Enabled to install the default Secure Boot keys set by the manufacturer. The options are **Disabled** and Enabled.

***If the feature above is set to Enabled, all features below are available for configuration:***

**▶Restore Factory Keys**

Select Yes to restore all factory keys to the default settings. The options are Yes and No.

**▶Reset To Setup Mode**

Select Yes to delete all Secure Boot key databases and force the system to Setup Mode. The options are Yes and No.

**▶Export Secure Boot variables**

Use this feature to copy the NVRAM contents of the secure boot variables to a file.

**▶Enroll Efi Image**

This feature allows the image to run in Secure Boot mode.

**Device Guard Ready**

**▶Remove 'UEFI CA' from DB**

Use this feature to remove the Microsoft UEFI CA certificate from the database. The options are Yes and No.

**▶Restore DB defaults**

Select Yes to restore the DB defaults.

**▶Platform Key (PK)**

Use this feature to configure the setting for platform keys.

**Details**

Select this feature to view PK information.

**Export**

Select this feature to export the PK from a file system.

**Update**

Select Yes to load the PK from factory default or No to load from a file or external media.

**Delete**

Select Ok to remove the PK. Reset the system for it to enter Setup/Audit Mode.

**▶Key Exchange Keys (KEK)**

Use this feature to configure the setting for key exchange keys.

**Details**

Select this feature to view KEK information.

**Export**

Select this feature to export the KEK from a file system.

**Update**

Select Yes to load the KEK from factory default or No to load from a file or external media.

**Append**

Select Yes to add the KEK from factory default or No to load from a file or external media.

**Delete**

Select Yes to delete the variable or No to delete a certificate from the key database.

### ▶Authorized Signatures

Use this feature to configure the setting for db keys.

**Details**

Select this feature to view authorized signatures information.

**Export**

Select this feature to export the db from a file system.

**Update**

Select Yes to load the db from factory default or No to load from a file or external media.

**Append**

Select Yes to add the db from factory default or No to load from a file or external media.

**Delete**

Select Yes to delete the variable or No to delete a certificate from the key database.

### ▶Forbidden Signatures

Use this feature to configure the setting for dbx keys.

**Details**

Select this feature to view forbidden signatures information.

**Export**

Select this feature to export the dbx from a file system.

**Update**

Select Yes to load the dbx from factory default or No to load from a file or external media.

**Append**

Select Yes to add the dbx from factory default or No to load from a file or external media.

**Delete**

Select Yes to delete the variable or No to delete a certificate from the key database.

### ▶Authorized TimeStamps

Use this feature to configure the setting for dbt keys.

**Details**

Select this feature to view authorized time stamp information.

**Export**

Select this feature to export the dbt from a file system.

**Update**

Select Yes to load the dbt from factory default or No to load from a file or external media.

**Append**

Select Yes to add the dbt from factory default or No to load from a file or external media.

**Delete**

Select Yes to delete the variable or No to delete a certificate from the key database.

**▶OsRecovery Signatures**

Use this feature to configure the setting for dbr keys.

**Details**

Select this feature to view the setting for dbr keys.

**Export**

Select this feature to export the dbr from a file system.

**Update**

Select Yes to load the dbr from factory default or No to load from a file or external media.

**Append**

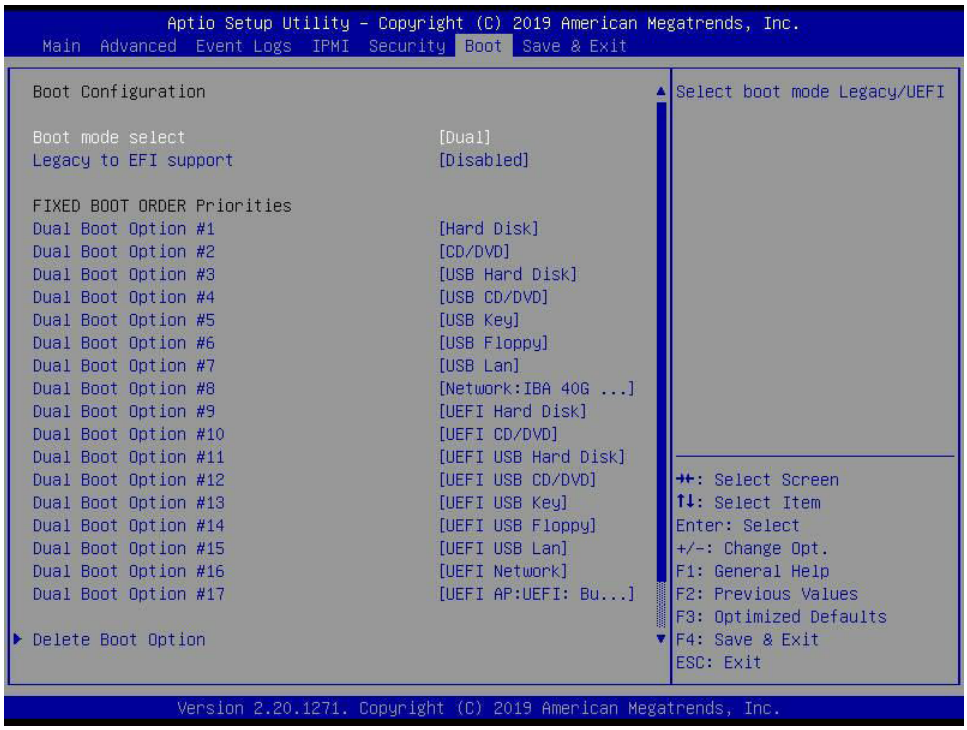
Select Yes to add the dbr from factory default or No to load from a file or external media.

**Delete**

Select Yes to delete the variable or No to delete a certificate from the key database.

# 4.7 Boot

Use this menu to configure boot settings:




### Boot Configuration

### Boot mode select

Use this feature to select the boot mode. The options are Legacy, UEFI, and **DUAL**.

### Legacy to EFI Support

Select Enabled to boot EFI OS support after Legacy boot order has failed. The options are **Disabled** and Enabled.

### Fixed BOOT ORDER Priorities

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

- Dual Boot Option #1
- Dual Boot Option #2
- Dual Boot Option #3
- Dual Boot Option #4
- Dual Boot Option #5
- Dual Boot Option #6

- Dual Boot Option #7
- Dual Boot Option #8
- Dual Boot Option #9
- Dual Boot Option #10
- Dual Boot Option #11
- Dual Boot Option #12
- Dual Boot Option #13
- Dual Boot Option #14
- Dual Boot Option #15
- Dual Boot Option #16
- Dual Boot Option #17

**▶Delete Boot Option**

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

***If storage has been installed on the system, then "Add New Boot Option" will appear.**

**▶UEFI Application Boot Priorities**

This feature allows the suer to specify which UEFI application devices are boot devices.

- Boot Option #1

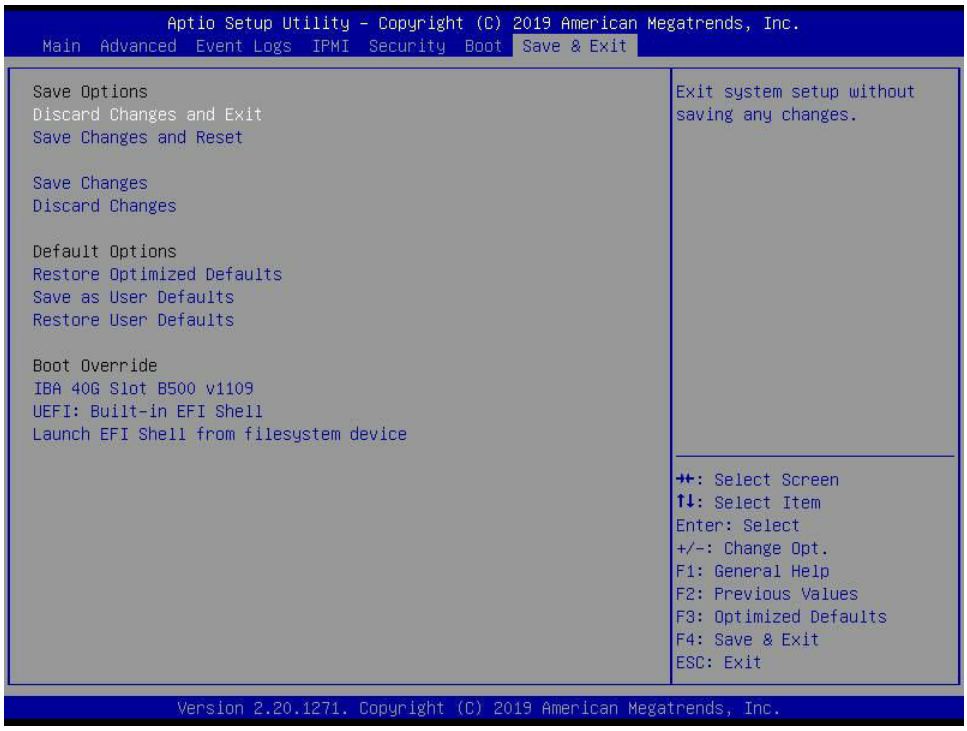
**▶NETWORK Drive BBS Priorities**

This feature allows the user to specify which network drives are boot devices.

- Boot Option #1

# 4.8 Save & Exit

Use this menu to configure save and exit settings.




### Save Options

### Discard Changes and Exit

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

### Save Changes and Reset

When you have completed the system configuration changes, select this option to save all changes made and reset the system.

### Save Changes

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

### Discard Changes

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

**Default Options**

**Restore Optimized Defaults**

To set this feature, select Restore Optimized Defaults and press <Enter>. These are factory settings designed for maximum system performance but not for maximum stability.

**Save as User Defaults**

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

**Restore User Defaults**

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

**Boot Override**

Other boot options are listed in this section. The system will boot to the selected boot option.

**IBA 40G SLOT B500 v1109**

**UEFI: Built-in EFI Shell**

**Launch EFI Shell from filesystem device**

# Appendix A

# BIOS Codes

## A.1 BIOS Error POST (Beep) Codes

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

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

**Fatal errors** will not allow the system to continue with bootup. 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 table below lists some common errors and their corresponding beep codes encountered by users.

| BIOS Beep (POST) Codes | | |
|---|---|---|
| **Beep Code** | **Error Message** | **Description** |
| 1 beep | Refresh | Circuits have been reset (Ready to power up) |
| 5 short, 1 long | Memory error | No memory detected in system |
| 5 long, 2 short | Display memory read/write error | Video adapter missing or with faulty memory |
| 1 long continuous | System OH | System overheat condition |

## A.2 Additional BIOS POST Codes

The AMI BIOS supplies additional checkpoint codes, which are documented online at http://www.supermicro.com/support/manuals/ ("AMI BIOS POST Codes User's Guide").

When BIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, a diagnostic card can be attached to the computer to read I/O port 0080h (Supermicro p/n AOM-SPI80-V).

For information on AMI updates, please refer to http://www.ami.com/products/.

# Appendix B

# Software Installation

## B.1 Installing Software Programs

The Supermicro website that contains drivers and utilities for your system at https://www.supermicro.com/wftp/driver. Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to create a DVD of the drivers and utilities it contains. (You may also use a utility to extract the ISO file if preferred.)

After creating a DVD with the ISO files, insert the disk into the DVD drive on your system and the display shown in Figure B-1 should appear.

Another option is to go to the Supermicro website at http://www.supermicro.com/products/. Find the product page for your motherboard here, where you may download individual drivers and utilities to your hard drive or a USB flash drive and install from there.

**Note:** To install the Windows operating system, please refer to the instructions posted on our website at http://www.supermicro.com/support/manuals/.

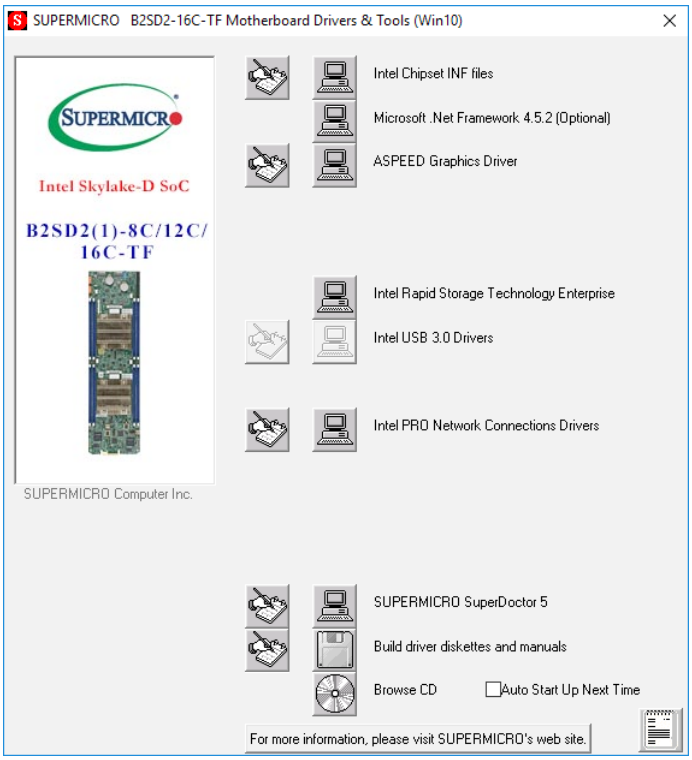



**Figure B-1. Driver/Tool Installation Display Screen**

Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to bottom) one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a DVD on it allows you to view the entire contents of the DVD.

When making a storage driver disk by booting into a driver DVD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

## B.2 SuperDoctor® 5

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

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

**Note:** The default Username and Password for SuperDoctor 5 is ADMIN / ADMIN.

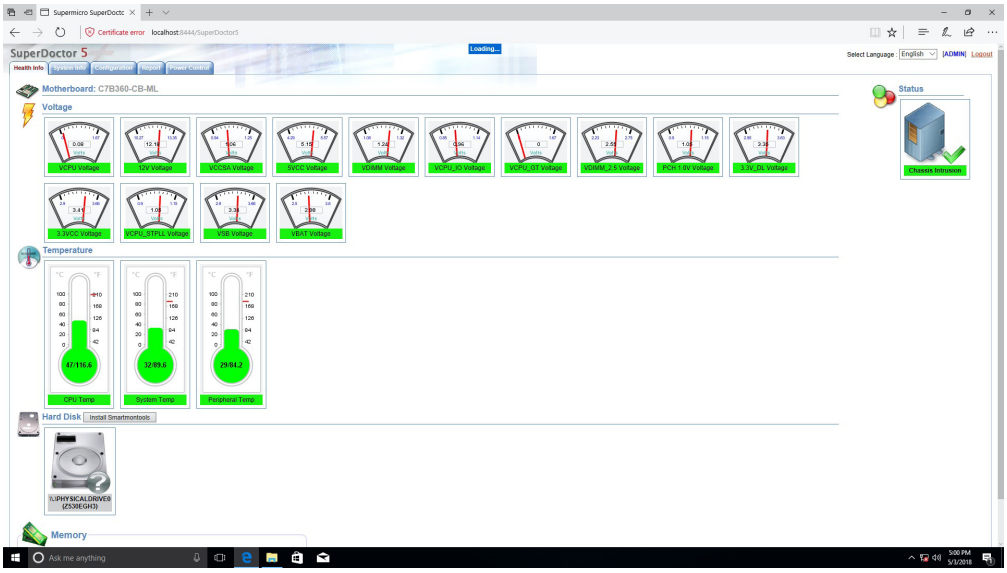



**Figure B-2. SuperDoctor 5 Interface Display Screen (Health Information)**

**Note:** The SuperDoctor 5 program and user's manual can be downloaded from the Supermicro website at http://www.supermicro.com/products/nfo/sms_sd5.cfm.

# Appendix C

# 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 section in its entirety before installing or configuring components.

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

## Battery Handling

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

**電池の取り扱い**

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

警告

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل
اسحبذال البطارية
فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة
جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

## Product Disposal

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

**製品の廃棄**

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

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

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.

# Appendix D

# UEFI BIOS Recovery

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

## D.1 Overview

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

## D.2 Recovering the UEFI BIOS Image

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The recovery block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a healthy BIOS image if the original main BIOS image is corrupted. When the system power is turned on, the recovery block codes execute first. Once this process is complete, the main BIOS code will continue with system initialization and the remaining POST (Power-On Self-Test) routines.

**Note 1:** Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS block crashes.

**Note 2:** When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. (For a RMA request, please see section 3.5 for more information). Also, you may use the Supermicro Update Manager (SUM) Out-of-Band (OOB) (https://www.supermicro.com.tw/products/nfo/SMS_SUM.cfm) to reflash the BIOS.

## D.3 Recovering the Main BIOS Block with a USB Device

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

The file system supported by the recovery block is FAT (including FAT12, FAT16, and FAT32) which is installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large due to the huge volumes of folders and files stored in the device.

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

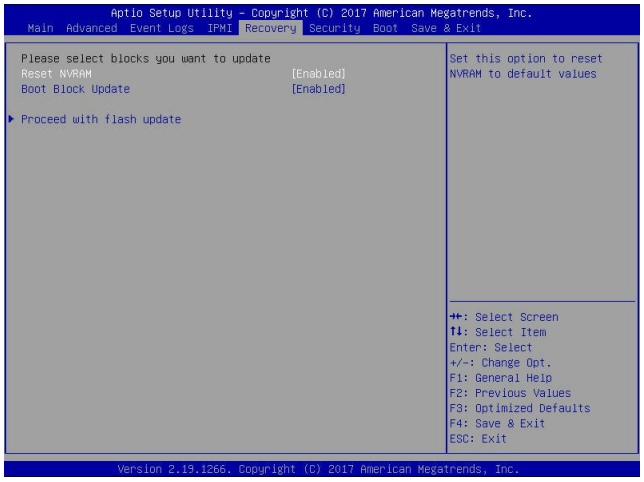
1. Using a different machine, copy the "Super.ROM" binary image file into the Root "\" directory of a USB device or a writable CD/DVD.

   **Note 1:** If you cannot locate the "Super.ROM" file in your drive disk, visit our website at www.supermicro.com to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

   **Note 2:** Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and reset the system when the following screen appears.

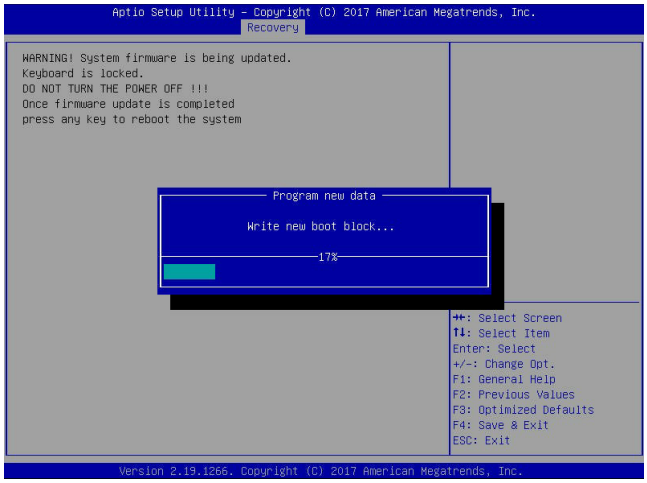
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.



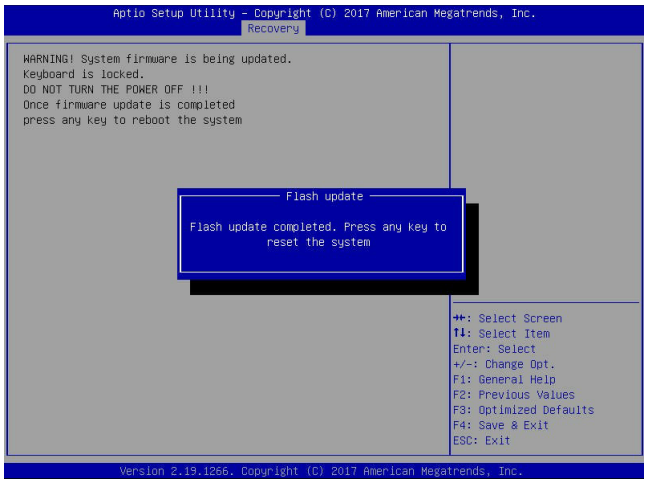

**Note**: At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

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

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

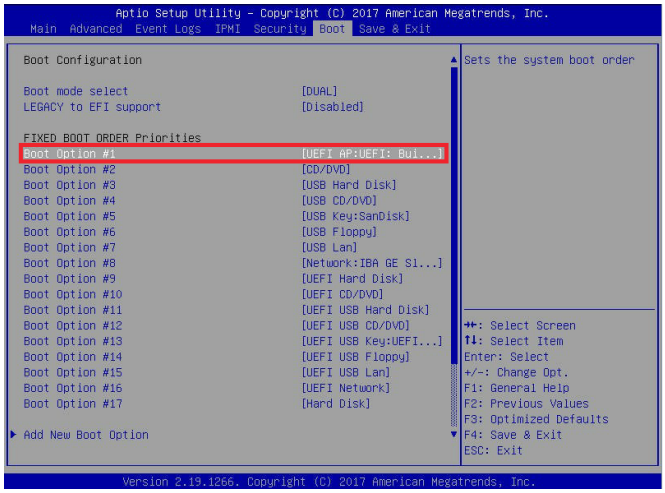


5. After the BIOS recovery process is complete, press any key to reboot the system.

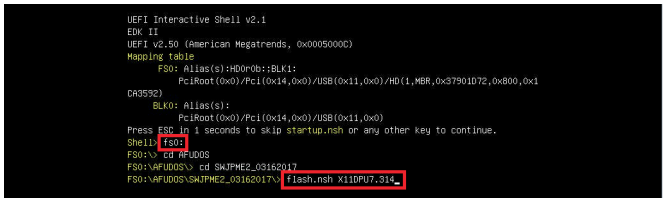



6. Using a different system, extract the BIOS package into a USB flash drive.

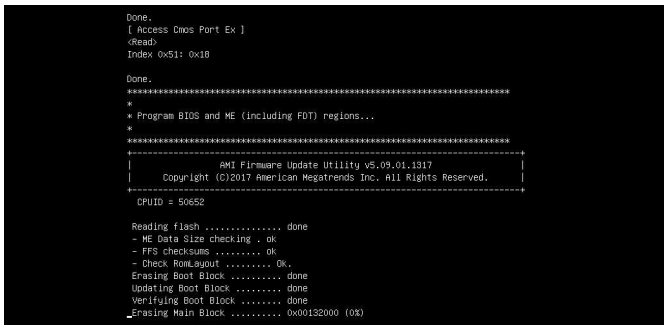
7. Press <Del> continuously during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.



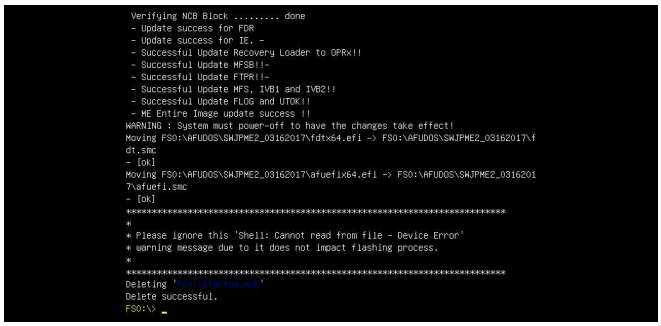
8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.




**Note:** *Do not interrupt this process* until the BIOS flashing is complete.




9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug the AC power cable in the power supply again to power on the system.




10. Press <Del> continuously to enter the BIOS Setup utility.

11. Press <F3> to load the default settings.

12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.