Inspur Server User Manual

NF3120M5

V1.0

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Abstract

This manual contains technical information such as specifications, hardware operations, software configuration, fault diagnosis, etc., that are relevant to the maintenance and operation of this server.

It is recommended that server installation, configuration and maintenance is performed by experienced technicians only.

Target Audience

This manual is intended for:

- Technical support engineers
- Product maintenance engineers
- Technicians

Warnings:

This manual introduces the NF3120M5 server's technical features, system installation and setup, which will help the user to understand how best to utilize the server and all its functions.

1.For your safety, please do not disassemble the server's components arbitrarily. Please do not extend configuration or connect other peripheral devices arbitrarily. If needed, please contact Inspur for our support and guidance.

2.Before disassembling the server's components, please be sure to disconnect all the power cables connected to the server.

3.BIOS and BMC setup is a significant factor in correctly configuring your server. If there are no special requirements, it is suggested to use the Default Values and not alter the parameter settings arbitrarily. After the first login, please change the BMC user password in time.

4.Please install the product-compatible operating system and use the driver provided by Inspur. If you use an incompatible operating system or non-Inspur driver, it may cause compatibility issues and affect the normal use of the product, Inspur will not assume any responsibility or liability.

Inspur is not responsible for any damages, including loss of profits, loss of information, interruption of business, personal injury, and/or any damage or consequential damage without limitation, incurred before, during, or after the use of our products.

Contents

1. Safety Instructions

⚠ **WARNING:** Please be advised to follow the instructions below for safety. Failure to do so could result to potential dangers that may cause property loss, personal injury or death.

1. The power supplies in the system may produce high voltages and energy hazards that may cause personal injury. For your safety, please do not attempt to remove the cover of the system to remove or replace any component without assistance provided by Inspur. Only service technicians trained by Inspur are authorized to remove the cover of the host, and to remove and replace internal components.
2. Please connect the equipment to the appropriate power supply. Use only power supplies with the correct voltage and electrical specifications according to the label. To protect your equipment from damages caused by a momentary spike or plunge of the voltage, please use relevant voltage stabilizing equipment, or uninterruptible power supplies.
3. If you must use an extension cable, please use a three-core cable with properly grounded plugs. Observe extension cable ratings. Ensure that the total rating of all equipment plugged into the extension cable does not exceed 80 percent of the ratings limit for the extension cable.
4. Please be sure to use the power supply components that come with the server, such as power cables, power socket (if provided with the server) etc. For your safety, please do not replace power cables or plugs randomly.
5. To prevent electric shock dangers caused by leakage in the system, please make sure that the power cables of the system and peripheral equipment are correctly connected to the earthed/grounded power socket. Please connect the three-core power cable plug to the three-core AC power socket that is well earthed and easy to access. Be sure to use earthing /grounding pin of power cables and do not use the patch plug or the earthing/grounding pin unplugged with cables. In the case that the earthing/grounding conductors are not installed and it is uncertain whether there are appropriate earthing/ grounding protections, please do not use or attempt to operate the equipment. Contact and consult an electrician.
6. Please do not push any objects into the openings of the system. Doing so may cause fire or electric shock.
7. Please place the system far away from the cooling plate and heat sources, and be sure

not to block the air vents.

8. Please be sure not to scatter food or liquid in the system or on other components, and do not use the product in humid or dusty environments.
9. Using an incompatible battery may cause explosion. When battery replacement is required, please consult the manufacturer first, and choose batteries of the same or equivalent type. Do not disassemble, crush, puncture the batteries or make the external connection point short circuit, and do not expose them in the environment over 60°C. Never throw batteries into fire or water. Please do not attempt to open or repair the batteries. Dispose of used batteries according to instructions. For battery recycling, please contact the local waste recycling center.
10. Before installing equipment into the rack, please install all front and side stabilizers on the independent rack first. Please install the front stabilizers first, if connecting with other racks. Please install stabilizers before installing equipment into the rack. Failure to install the corresponding stabilizers before installing equipment into the rack may cause the cabinet to tip over, possibly resulting to severe injury. After installing the equipment and other components into the rack, only one component can be pulled out from the rack through its sliding part at one time. Pulling out several components at the same time may cause the rack to turn over, resulting to serious personal injury.
11. A minimum of two people are required to safely move a rack. The racks are extremely awkward and heavy, moving them without adequate, trained personnel could result in severe injury or death.
12. It is prohibited to directly short-circuit the copper busbar. Please do not touch the copper busbar when the rack is powered on.
13. This is Class A product, and may cause radio interference. In such case, users may need to take necessary measures to mitigate the interference.

⚠ **Note:** The following considerations may help avoid the occurrence of problems that could damage the components or cause data loss, etc.

1. In the event of the following, please unplug the power cable plug from the power socket and contact Inspur’s customer service department:
   1) The power cables, extension cables or power plugs are damaged.
   2) The products get wet.

3) The products have fallen or have been damaged.
4) Other objects have fallen into the products.
5) The products do not or are unable to function normally even when attempting to operate according to the instructions.

2. If the system becomes wet or damp, please follow these steps:
    1) Power off the equipment, disconnect them with the power socket, wait for 10 to 20 seconds, and then open the host cover.
    2) Move the equipment to a well-ventilated place to dry the system at least for 24 hours and make sure that the system is fully dried.
    3) Close the host cover, reconnect the system to the power socket, and then power on.
    4) In case of operation failure or other abnormal situations, please contact Inspur and get technical support.
3. Pay attention to the position of system cables and power cables-avoid placing wires in high foot traffic locations. Please do not place objects on the cables.
4. Before removing the host cover, and/or touching the internal components, please allow for the equipment to cool first. To avoid damaging the motherboard, please power off the system and wait for five seconds, and then remove the components from the motherboard and/or disconnect the peripheral device from the system. Please remember that only service technicians trained by Inspur are authorized to remove the cover of the host, and to remove and replace internal components.
5. If there is modem, telecom or LAN options installed in the equipment, please pay attention to the followings:
    1) In the case of thunder and lightning, please do not connect or use the modem.
    2) Never connect or use the modem in a damp environment.
    3) Never insert the modem or telephone cables into the socket of network interface controller (NIC).
    4) Before unpacking the product package, installing internal components, touching uninsulated cables or jacks of the modem, please disconnect the modem cables.
6. In order to prevent electrostatic discharge from damaging the electronic components in the equipment, please pay attention to the followings:
    1) Please remove any static electricity on your body before dismounting or touching any electronic component in the equipment, to prevent the static electricity from conducting itself to the sensitive components. You may remove the static electricity

on the body by touching the metal earthing objects (such as the unpainted metal surface on the rack).

2) Please do not take electrostatic sensitive components that are not ready to be installed for application out of the antistatic package materials.

3) While working, please touch the earthing conductor or the unpainted metal surface on the cabinet regularly to remove any static electricity from the body that may damage the internal components.

7. Upon receiving the proper authorization from Inspur and dismounting the internal components, please pay attention to the followings:

   1) Switch the system power supply off and disconnect the cables, including all connections of the system. When disconnecting the cables, please hold the connector of the cables and slowly pull the plugs out. Never pull on the cables.

   2) The products need to completely cool down before dismounting the host cover or touching the internal components.

   3) During the dismounting process, avoid making large movement ranges to prevent damage to the components or scratching arms.

   4) Handle components and plug-in cards with care. Please do not touch the components or connection points on the plug-in cards. When handling the plug-in cards or components, firmly grab the edges of the plug-in cards and components, and/or their metal fixed supports.

8. During the process of rack installation and application, please pay attention to the followings:

   1) After the rack installation is finished, please ensure that the stabilizers have been fixed to the rack and supported to ground, and the weight of the rack is firm on ground.

   2) Always load from the bottom up, and load the heaviest items first.

   3) When pulling out the components from the rack, apply slight force to keep the rack balanced.

   4) When pressing down the release latch and the rail of components is sliding, please be careful; as the sliding may hurt your fingers.

   5) Do not overload the AC power supply branch circuits in the rack. The total load of the rack should not exceed 80% of the ratings of the branch circuits.

   6) Ensure that components in the rack have good ventilation conditions.

   7) When repairing components in the rack, never step on any other components.

2 Product Specifications

2.1 Overview

Inspur NF3120M5 is a one-socket E3 server with Intel® Xeon® scalable computing platform technology. It has powerful computing capacity, scalability and excellent RAS features. It provides basic computing and graphics performance, which is an ideal choice for small businesses, powerful mobile workstation, entry-level workstation, storage server, cloud workstation, media codec, edge computing and Internet of Things.

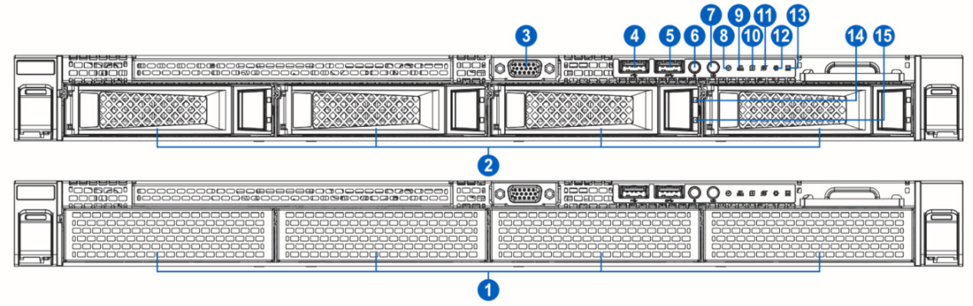
2.2 Features and Specifications

Processor	
Processor Type	1* new-generation Intel® Xeon® scalable processor (up to 95W)
Chipset	
Chipset Type	Intel® C242/C246 chipset
Memory	
Memory Type	DDR4 w/ECC UDIMM, 2666MHz
Memory Slot Qty	4
Total Memory Capacity	Supports up to 128GB (32G per memory module)
I/O	
USB	Front: 1 * USB3.0 port + 1 * USB2.0 port Rear: 4 * USB3.0 port
Serial Port	Rear: 1 * serial port (headphone jack)
VGA	Front: 1 * VGA port Rear: 1 * VGA port + 2 * DP ports

Network Port	Rear: 1 * RJ45 independent IPMI port + 2 * RJ45 independent data port
Display	
Controller Type	Integrated in Aspeed 2500 chip, supporting resolution up to 1900*1200
Drive	
Drive Type	Support hot plug: 3.5”/2.5” SATA/SAS - HDD/SSD and NVMe SSD (Based on the actual model you purchased) Up to 4 * 3.5”/2.5” SATA/SAS - HDD/SSD; Up to 2 * 2.5” NVMe SSD + 2 * 3.5”/2.5” SATA/SAS - HDD/SSD; Support non-hot plug: 3.5”/2.5” SATA/SAS - HDD/SSD (Based on the actual model you purchased) Up to 4 * 3.5”/2.5” SATA/SAS - HDD/SSD
Power	
Specifications	One-PSU configuration: Support 400W PSU Two-PSU configuration: Support 550W CRPS module Support 1+1 redundancy mode
Power Input	Please refer to the power input on the nameplate label of the host
Physical	
External Packing Dimensions	871mm (L) x 651mm (W) x 232mm (H)
Host Machine Dimensions	551mm (L) x 438mm (W) x 43.2mm (H) (without ears) 581mm (L) x 478mm (W) x 43.2mm (H) (with ears)
Weight	Full configuration GW 20kg (Gross weight including host + packing box + rails + accessory box)
Environmental	
Operating Temperature	5℃ ~35℃
Storage & Transportation Temperature	-40℃ ~60℃
Operating Humidity	20%~80% relative humidity
Storage & Transportation Humidity	20%~93% (40℃) relative humidity

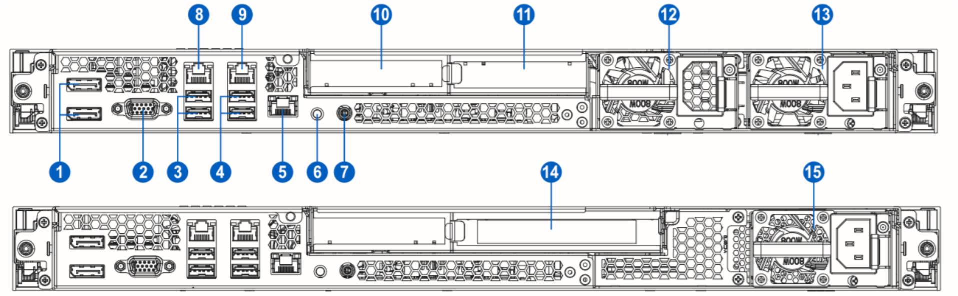
3 Component Identification

3.1 Front Panel Components



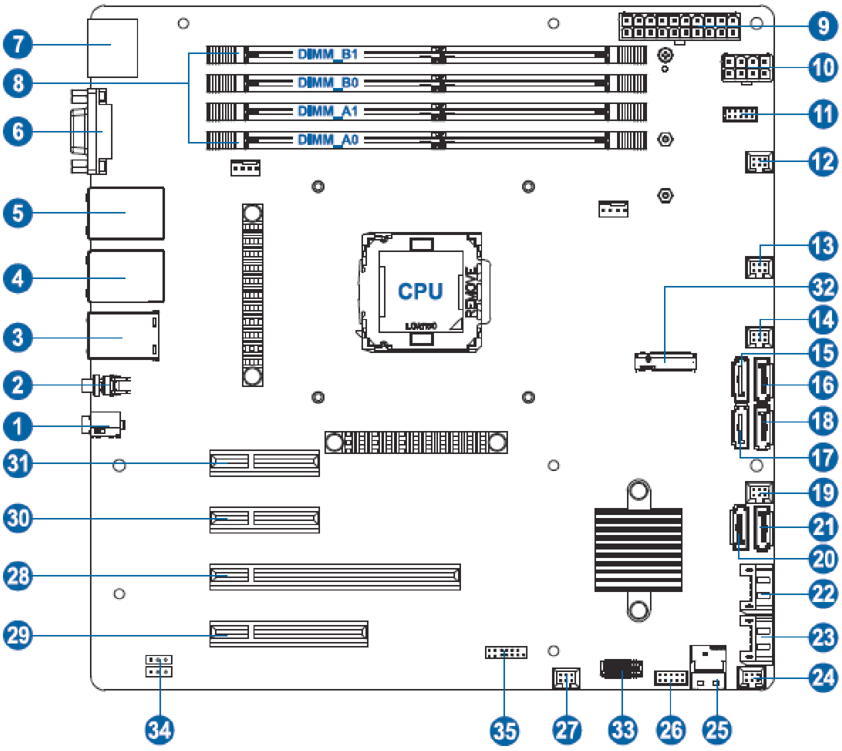
Item	Description
1	Hard drive modules (non-hot plug)
2	Hard drive modules (hot plug)
3	VGA port
4	USB2.0 port
5	USB3.0 port
6	Power button
7	UID LED & button
8	Power status LED
9	Memory failure LED
10	Power failure LED
11	System overheat LED
12	Fan failure LED
13	System failure LED
14	Drive failure LED
15	Drive status LED

3.2 Rear Panel Components



Item	Description
1	Display ports (0|1)
2	VGA port
3	USB3.0 ports (0|1)
4	USB3.0 ports (2|3)
5	MLAN management port
6	UID LED & button
7	Serial port
8	GE electrical port (onboard 1000M LAN0)
9	GE electrical port (onboard 1000M LAN1)
10	IO module0 (support half-height PCIE card)
11	IO module1 (support half-height PCIE card)
12	PSU1 (support hot plug)
13	PSU0 (support hot plug)
14	IO module1 (support full-height PCIE card)
15	PSU (non-hot plug configuration)

3.3 Motherboard Components



Item	Description
1	BMC serial port
2	UID LED & button
3	Management network port
4	LAN1 & USB3.0 (2|3) port module
5	LAN0 & USB3.0 (0|1) port module
6	VGA port
7	Display ports (0|1)
8	DIMM slots
9	PSU connector (20PIN)
10	PSU connector (8PIN)
11	PSUSMB1 connector
12	Fan connector3
13	Fan connector2
14	Fan connector B
15	SATA0 connector
16	SATA1 connector
17	SATA2 connector
18	SATA3 connector
19	Fan connector1
20	SATA4 connector
21	SATA5 connector
22	SATA6 connector
23	SATA7 connector
24	Fan connector0
25	USB3.0 (4) & USB2.0 (5) & VGA (1) ports
26	BP_SGPIO_SMBUS1 connector
27	Fan connector A
28	PCIE slot2
29	PCIE slot3
30	PCIE slot1
31	PCIE slot0
32	M.2 SSD slot
33	Front panel LED & power button connector
34	Clear_RTC
35	TPM connector

- Motherboard jumper introduction (For the position of the CMOS clear jumper, see the above motherboard components diagram.)

Item	Function description	Jumper function
CLR_ RTC	CMOS clear jumper	Short-circuit pin1-2, normal status; Short-circuit pin2-3, clear CMOS.

⚠ **Note:**

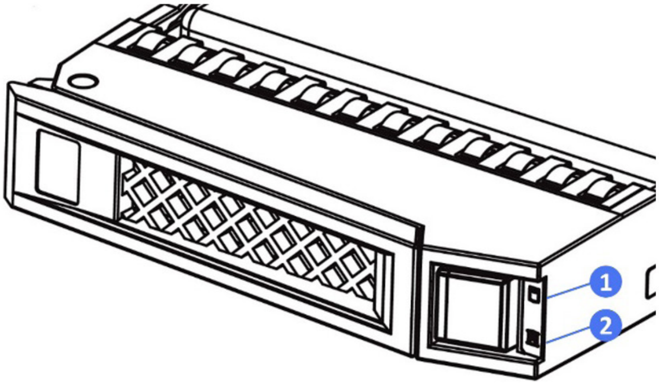
It is required to shut down the system, as well as disconnect the power supply during CMOS clearing. Hold for 5 seconds after short-circuiting Pin2-3, and then short-circuit Pin1 and Pin2 (the default status) of CLR_CMOS jumper with a jumper cap, to restore to its original status.

3.4 LEDs and Buttons Description

3.4.1 LEDs and Buttons on Front Control Panel

Icon	LED & Button	Status & Interpretation
⏻	Power button/LED	● Off: No power ● Green: Power-on state ● Orange: Standby state
○ UID	UID button/LED	● Off: Device not be located ● Blue: Device be located ● Short press the UID button to turn on the LED. Press and hold for 6 seconds to reset the motherboard BMC.
✓	Power status LED	● Off: Not powered on normally ● Green: Powered on normally
	Memory failure LED	● Off: Normal ● Red: A memory failure occurs.
⚡	Power failure LED	● Off: Normal ● Red: A power failure occurs.
	System overheat LED	● Off: Normal ● Red: CPU/Memory overheats.
	Fan failure LED	● Off: Normal ● Red: A fan failure occurs.
	System failure LED	● Off: Normal ● Red: A system failure occurs.

3.4.2 Drive Tray LEDs



Item	Description	Status & Interpretation
1	Fault alarm LED	Steady red: A failure occurs Steady blue: Drive positioning Flashing blue: RAID rebuilding
2	Activity status LED	Steady green: Normal Flashing green: Read and write activity

4 Operations

4.1 Power up the Server

Insert the power cable plug, then press the Power Button.

4.2 Power down the Server

⚠ **WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cable to remove power from the server. The front panel Power Button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

⚠ **IMPORTANT:** If installing a hot-plug device, it is not necessary to power down the server.

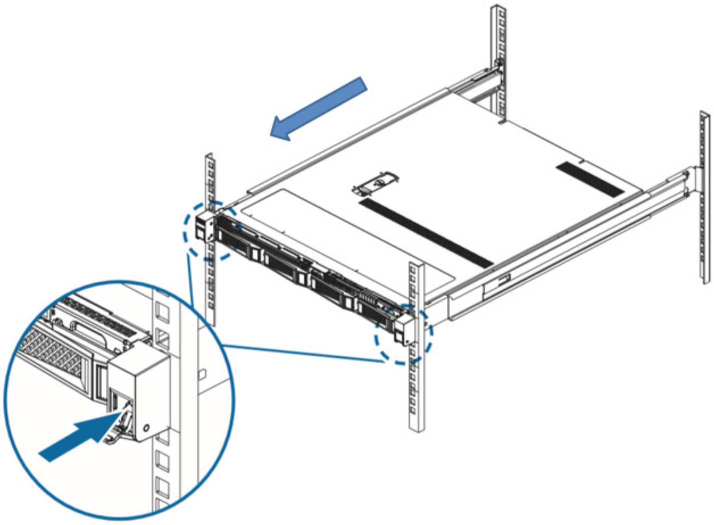
1. Back up the server data.
2. Shut down the operating system.
3. Disconnect the power cables.

The system is now without power.

4.3 Extend the Server from the Rack

1. Use a screwdriver to loosen the screws within the ears on both sides of the server.
2. Extend the server from the rack.

⚠ **WARNING:** To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.



3. After performing the installation or maintenance procedure, slide the server back into the rack. Use a screwdriver to tighten the screws within the ears on both sides of the server.

⚠ **WARNING:** To reduce the risk of personal injury, be careful when sliding the server into the rack. The sliding rails could pinch your fingers.

4.4 Remove the Access Panel

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ **CAUTION:** For proper cooling, do not operate the supercomputer without the access panel, air baffle, or fan installed. If the supercomputer supports hot-plug components, minimize the amount of time the access panel is open.

To remove the component:

1. Power down the server if performing a non-hot-plug installation or maintenance procedure.
2. Extend the server from the rack.
3. Loosen the security screw on the access panel with a screwdriver.
4. Lift up on the hood latch handle, and then remove the rear access panel.

4.5 Install the Access Panel

1. Place the access panel on the server. Open the hood latch, and pull the panel backward.
2. Press downward the hood latch. The access panel slides into the closed position.
3. Use a screwdriver to tighten the safety screw on the hood latch.

5 Setup

5.1 Optimum Environment

When installing the server in a rack, select a location that meets the environmental standards described in this section.

5.1.1 Space and Airflow Requirements

To allow for servicing and adequate airflow, observe the following space and airflow requirements when deciding where to install a rack:

- Leave a minimum clearance of 63.5 cm (25 in) in front of the rack.
- Leave a minimum clearance of 76.2 cm (30 in) behind the rack.
- Leave a minimum clearance of 121.9 cm (48 in) from the back of the rack to the back of another rack or row of racks.

Inspur Servers draw in cool air through the front door and expel warm air through the rear door. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet.

⚠ **CAUTION:** To prevent improper cooling and damage to the equipment, do not block the ventilation openings.

When vertical space in the rack is not filled by a server or rack component, the gaps between the components cause changes in airflow through the rack and across the servers. Cover all gaps with blanking panels to maintain proper airflow.

⚠ **CAUTION:** Always use blanking panels to fill empty vertical spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

⚠ **CAUTION:** If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors—If the 42U rack includes closing front and rear doors, you must allow 5,350 sq cm (830 sq in) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).

- Side—The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 in).

5.1.2 Temperature Requirements

To ensure continued safe and reliable equipment operation, install or position the system in a well-ventilated, climate-controlled environment.

The maximum recommended ambient operating temperature (TMRA) for most server products is 35°C (95°F). The temperature in the room where the rack is located must not exceed 35°C (95°F).

⚠ **CAUTION:** To reduce the risk of damage to the equipment when installing third-party options:

- Do not permit optional equipment to impede airflow around the server or to increase the internal rack temperature beyond the maximum allowable limits.
- Do not exceed the manufacturer's TMRA.

5.1.3 Power Requirements

Installation of this equipment must comply with local and regional electrical regulations governing the installation of information technology equipment by licensed electricians. This equipment is designed to operate in installations covered by NFPA 70, 1999 Edition (National Electric Code) and NFPA-75, 1992 (code for Protection of Electronic Computer/ Data Processing Equipment). For electrical power ratings on options, refer to the product rating label or the user documentation supplied with that option.

⚠ **WARNING:** To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack. Consult the electrical authority having jurisdiction over wiring and installation requirements of your facility.

⚠ **CAUTION:** Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

When installing more than one server, you may need to use additional power distribution devices to safely provide power to all devices. Observe the following guidelines:

- Balance the server power load between available AC supply branch circuits.
- Do not allow the overall system AC current load to exceed 80 percent of the branch circuit AC current rating.
- Do not use common power outlet strips for this equipment.
- Provide a separate electrical circuit for the server.

5.1.4 Electrical Grounding Requirements

The server must be grounded properly for optimal operation and safety. In the United States, you must install the equipment in accordance with NFPA 70, 1999 Edition (National Electric Code), Article 250, as well as any local and regional building codes.

In Canada, you must install the equipment in accordance with Canadian Standards Association, CSA C22.1, and Canadian Electrical Code. In all other countries, you must install the equipment in accordance with any regional or national electrical wiring codes, such as the International Electrotechnical Commission (IEC) Code 364, parts 1 through 7. Furthermore, you must be sure that all power distribution devices used in the installation, such as branch wiring and receptacles, are listed or certified grounding-type devices.

Because of the high ground-leakage currents associated with multiple servers connected to the same power source, Inspur recommends the use of a PDU that is either permanently wired to the building’s branch circuit or includes a nondetachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or those complying with IEC 60309 are considered suitable for this purpose. Using common power outlet strips for the server is not recommended.

5.2 Rack Warnings

⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, please be sure of the following:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.

- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

⚠ **WARNING:** To reduce the risk of personal injury or equipment damage when unloading a rack:

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115kg (253 lb), can stand more than 2.1m (7 ft) tall, and may become unstable when being moved on its casters.
- Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.

5.3 Identifying the Contents of the Server Shipping Carton

Unpack the server shipping carton and locate the materials and documentation necessary for installing the server. All the rack mounting hardware necessary for installing the server into the rack is included with the rack or the server.

The contents of the server shipping carton include:

- Server
- Power cable
- Installation documentation
- Rack-mounting hardware

In addition to the supplied items, you may need:

- Operating system or application software
- Hardware options

5.4 Installing Hardware Options

Install any hardware options before initializing the server. For options installation information, refer to the option documentation. For server-specific information, refer to “Hardware options installation”.

5.5 Installing the Server into the Rack

⚠ **CAUTION:** Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

1. Install the server and cable management arm into the rack. For more information, see the installation instructions included with the 1U Slide Rail System.
2. Connect peripheral devices to the server. For connector identification information, see “Rear panel components” in this guide.

⚠ **WARNING:** To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into RJ-45 connectors.

3. Connect the power cable to the rear of the server.
4. Connect the power cable to the AC power source.

⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cable grounding plug. The grounding plug is an important safety feature.
- Plug the power cable into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cable from the power supply to disconnect power to the equipment.
- Do not route the power cable where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

5.6 Installing the Operating System

To operate properly, the server must have a supported operating system installed. For the latest information on supported operating systems, refer to the Inspur website (http://www.inspur.com/eportal/ui?pageId=444443).

To install an operating system on the server, you can use the following method:

● Load the operating system software into an external USB drive and boot the server to install the operating system. This process may require downloading additional drivers from the Inspur website (http://www.inspur.com/eportal/ui?pageId=444443).

6 Hardware Options Installation

Overview

If more than one option is being installed, read the installation instructions for all the hardware options and identify similar steps to streamline the installation process.

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ **CAUTION:** To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

6.1 Processor Option

The server supports single-processor operation.

⚠ **CAUTION:** To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this server.

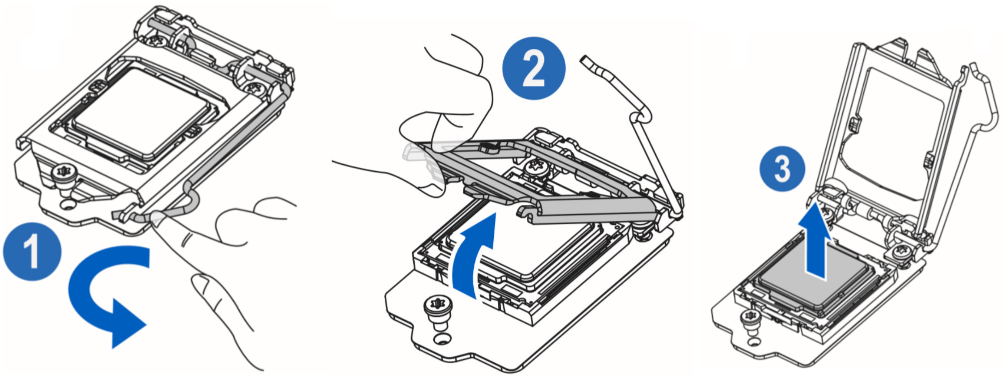
To help avoid damage to the processor and system board, do not install the processor without using the processor installation tool.

⚠ **CAUTION:** To install a faster processor, update the system ROM before installing the processor.

To install the component:

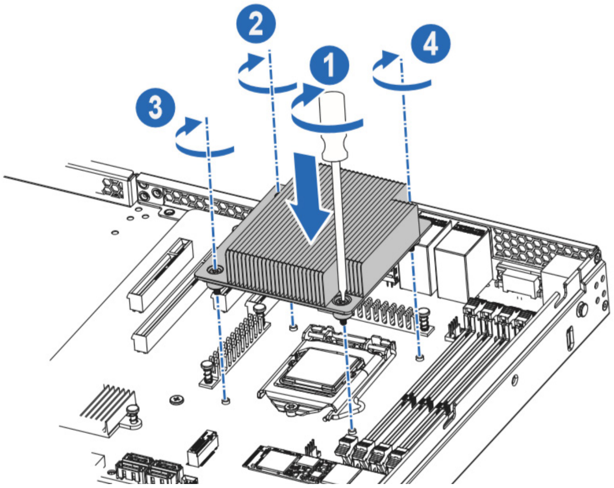
1. Power down the server.
2. Extend the server from the rack.
3. Remove the access panel.
4. Remove the air baffle.
5. Remove the heatsink.
6. Install the processor:

Step 1: Open the lever of the CPU socket, and remove the protective cover.



Step 2: Align the CPU's triangle mark with the corner mark on the CPU socket, and install the CPU.

Step 3: Place the heatsink directly on top of the CPU, so that the heatsink screws are aligned with the mounting holes on the plate. Screw in two diagonal screws until they are just snug (do not fully tighten). Then do the same with the remaining two diagonal screws. Finish by fully tightening all the screws.



Notes:

● It is required to coat thermal grease evenly onto the contact position between CPU heatsink and CPU.

● During fixing CPU heatsink, it is required to fasten screws according to the diagonal sequence.

6.2 Memory Option

Notes:

All DIMMs installed in the server must be the same type.

For the DIMM slot layout, please see “3.3 Motherboard Components”.

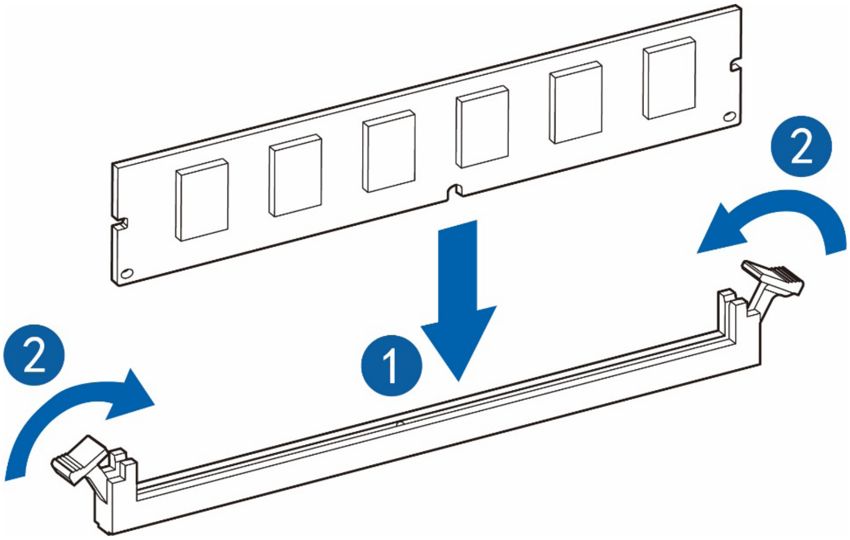
- DIMM population guidelines:

Only DIMMs of the same type could be used in the same machine. Detailed DIMM population and combination principles are as follows:

DIMM Qty	DIMM_A0	DIMM_A1	DIMM_B0	DIMM_B1
1	V			
2	V		V	
3	V	V	V	
4	V	V	V	V

Step 1: Open the lock tabs on both ends of the DIMM slot.

Step 2: Align the bottom key with the receptive point on the slot, press both ends of the DIMM with your thumbs. Insert the DIMM into the slot completely, and the lock tabs will automatically secure the DIMM, locking it into place.

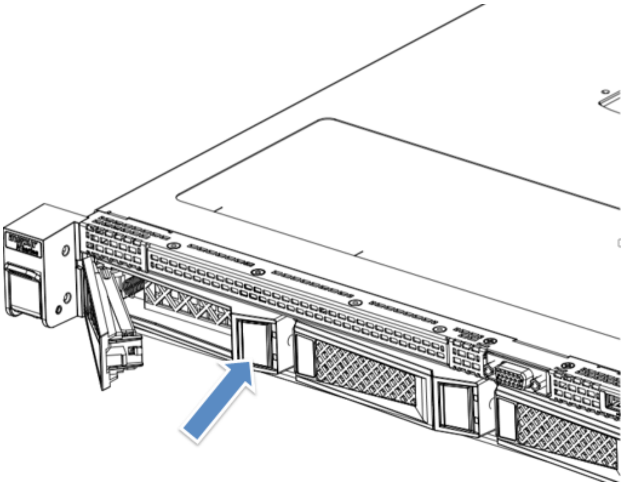


6.3 HDD Option

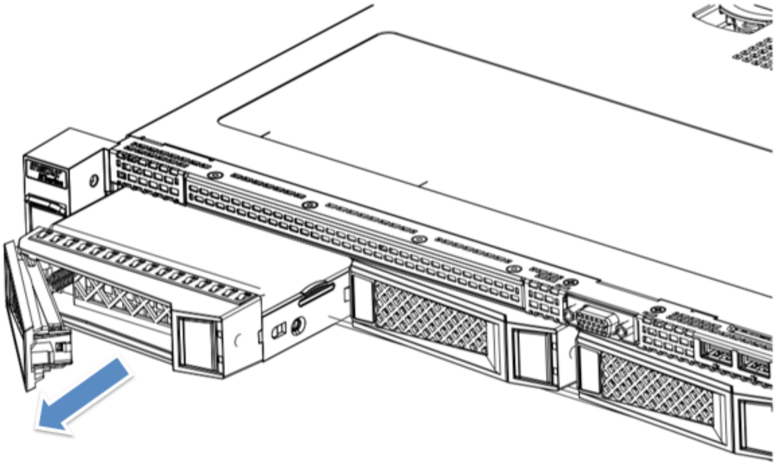
⚠ **CAUTION:** For proper cooling, do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

1. Check the status of the hard disk drive through the LED on the drive tray.
2. Back up all data on the hard disk drive.
3. Remove the hot-plug hard disk drive.

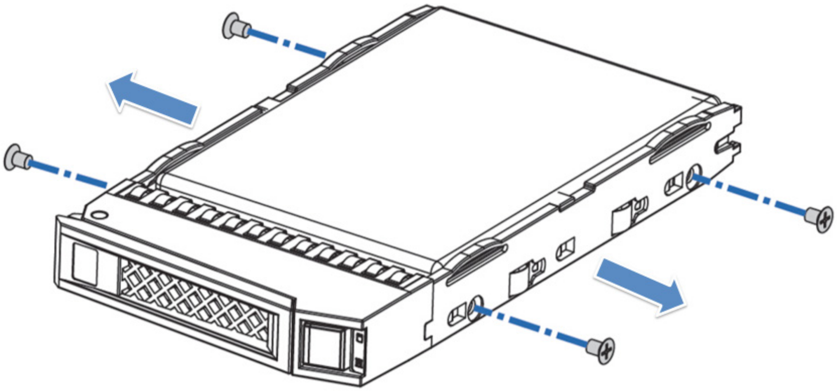
Step 1: Press the drive panel button. The lever on drive tray pops up automatically.



Step 2: Hold the lever and pull it outwards to remove the drive tray.



Step 3: Remove the screws on both sides and take out the old drive.



Step 4: Place a new drive into the tray and tighten the screws on both sides. Then install the drive back into the chassis.

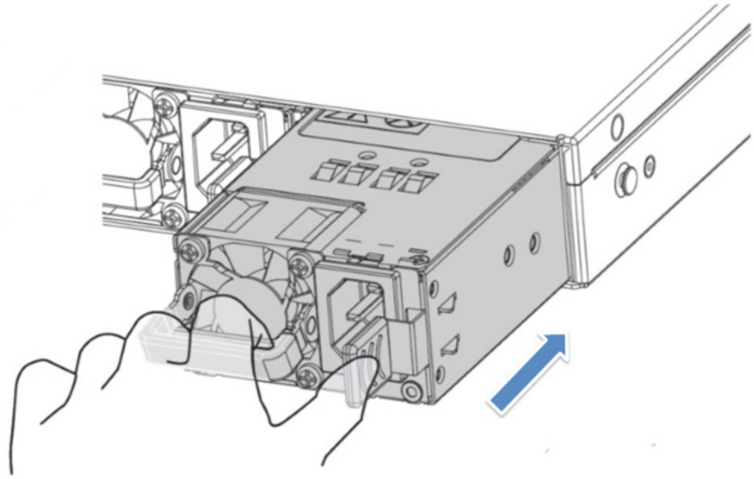
6.4 Hot-plug Power Supply Option

⚠ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

1. Access the product rear panel.
2. Remove the power supply blank.

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.

3. Install the power supply into the power supply bay.
4. Connect the power cable to the power supply.
5. Route the power cable through the power cable anchor or cable management arm.
6. Reposition the cable management arm into the operating position.
7. Connect the power cable to the power source.
8. Verify that the corresponding power supply LED is green.



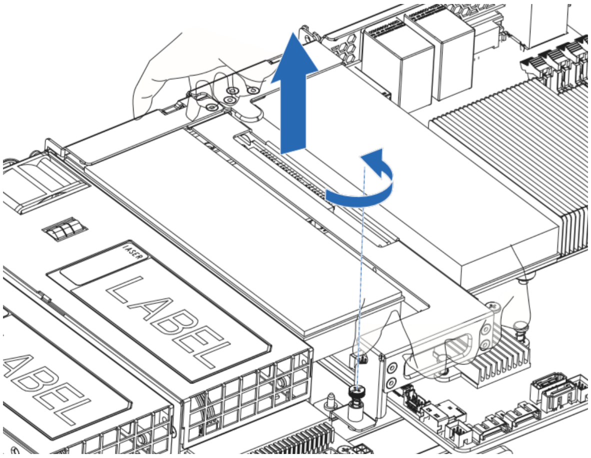
6.5 Expansion Card Option

⚠ **CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cables before removing or installing the PCIE riser cage.

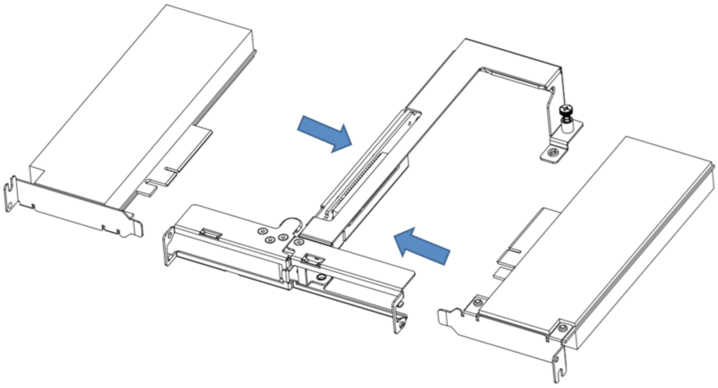
⚠ **CAUTION:** For proper cooling, do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

1. Power down the server.
2. Extend the server from the rack.
3. Remove the access panel.
4. Remove the PCIE riser cage:

Step 1: Loosen the locking screw, hold the handle on the riser cage and lift up in the direction of the arrow to remove the riser cage.



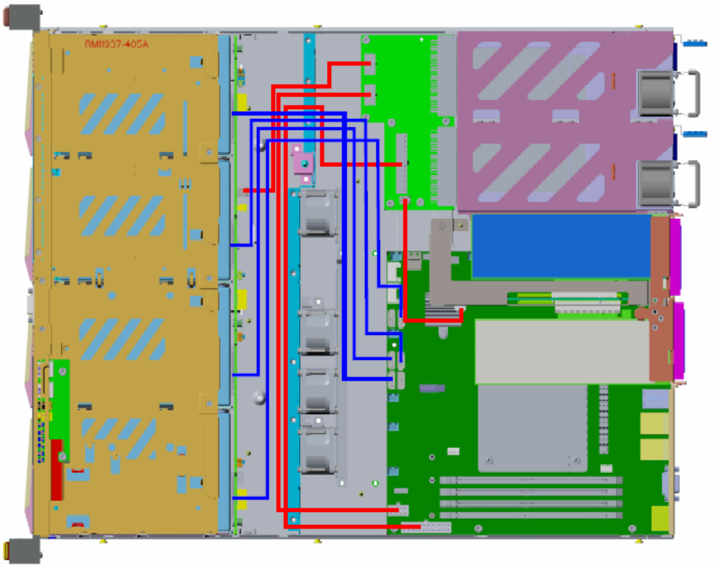
Step 2: Install the expansion card to the riser card.



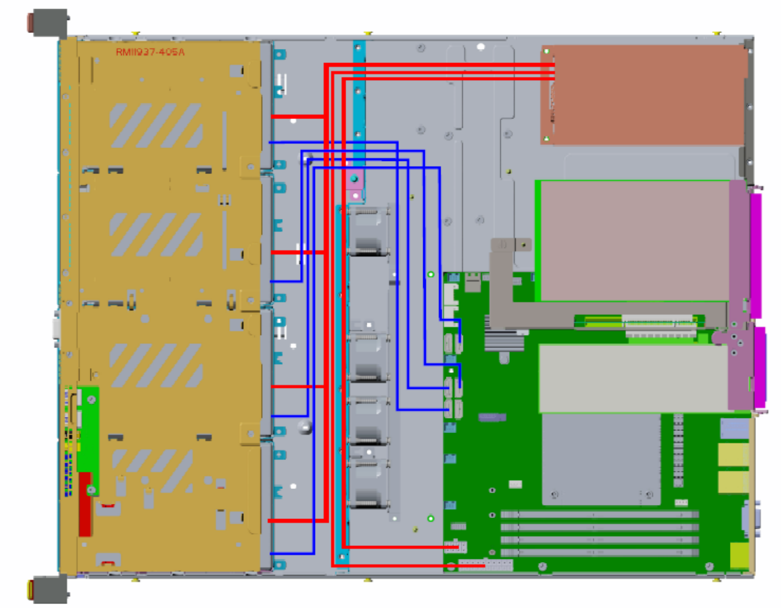
Step 3: Install the riser cage back into the server.

7 Cabling

7.1 Schematic diagram of cabling for hot-plug drive configuration using two power supplies



7.2 Schematic diagram of cabling for non-hot plug drive configuration using one power supply



⚠ **Note:** Please route the cables according to the purchased machine configuration.

8 BIOS Setup

8.1 Overview

BIOS is the basic input/output system, which is the basic program code loaded in the motherboard chipset. It stores the computer's most important input/output program, POST program and system auto-boot program. It provides the most basic and most direct hardware settings and control, detects the boot device, boots the system or other preboot execution environment.

Inspur Purley platform server is developed on the basis of AMI Codebase, supporting Legacy and UEFI operating environments, with abundant in-band and out-of-band configuration functions and scalability. It can meet the customization needs of different customers.

Notes:

1. We recommend that you record the original BIOS settings before you modify them so it can safely revert to its previous state if required. If there is an exception, such as failure to boot, caused by changing the BIOS settings, users can try to recover it through the Clear CMOS operation.

2. The factory default settings are the optimal settings. It is advised not to alter the parameters before understanding their denotations.

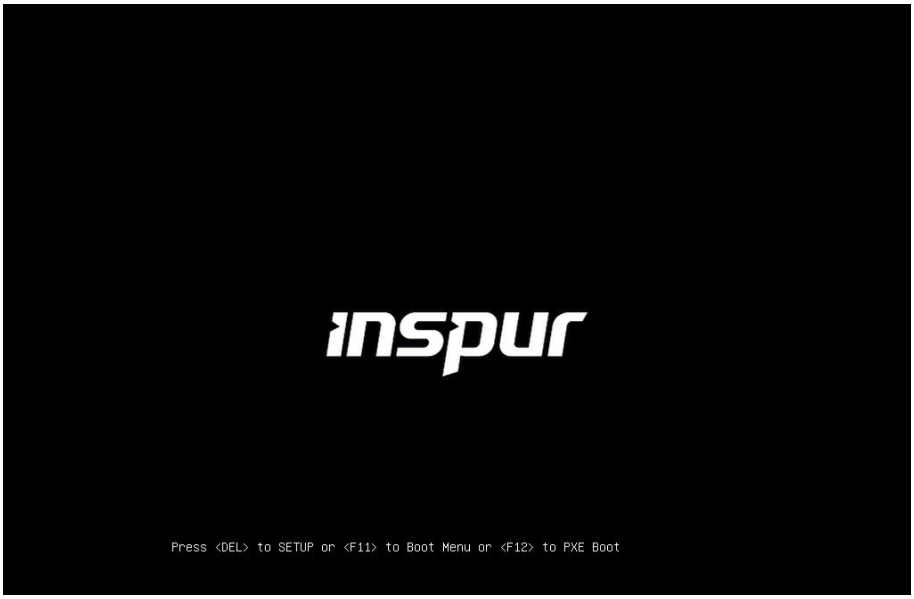
3. The common settings are introduced in detail in this chapter, but less common ones are not.

4. The BIOS content varies according to the particular configuration of the products; hence the detailed introduction is elided.

8.2 Common Operations

8.2.1 Log in to BIOS Interface

Power on the server. The system will then start to boot. When the following content appears below Inspur logo on the screen: "Press <DEL> to SETUP or <F11> to Boot Menu or <F12> to PXE Boot". Press DEL key. When "Entering Setup …" appears in the lower right corner of the screen, it will enter the BIOS setup soon. In the BIOS main menu, you could select the subitem through direction keys to enter the submenu.



Press <DEL> to SETUP or <F11> to Boot Menu or <F12> to PXE Boot

Hotkeys function:

- Press Del to enter BIOS Setup interface.
- Press F11 to enter the boot management interface, select the boot device.
- Press F12 to boot the PXE.

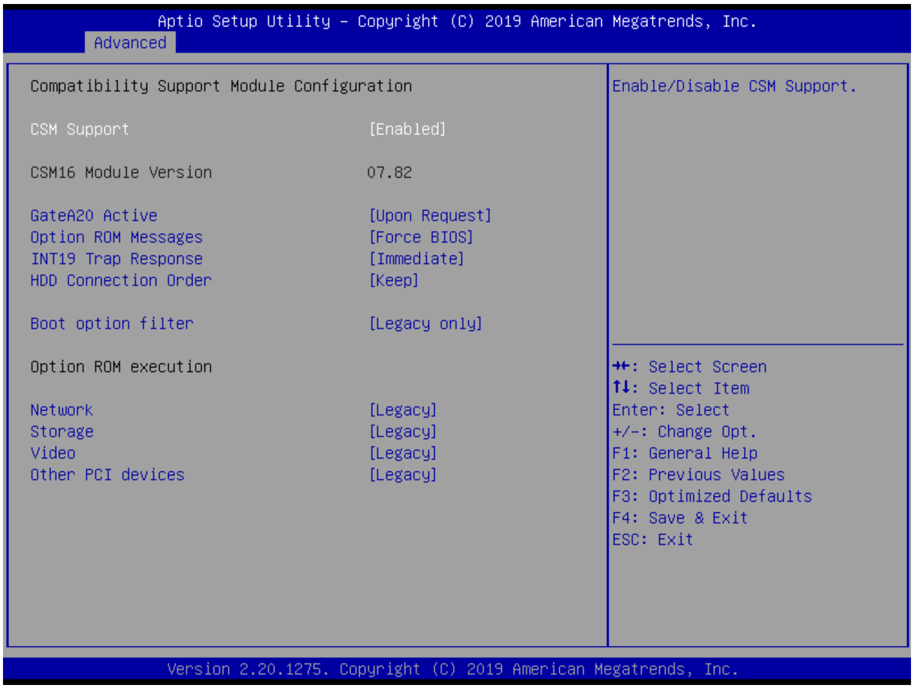
BIOS Setup Interface Control Key Instruction Table

Key	Function
<Esc>	Exit or return from submenu to main menu
<←> or <→>	Select a menu
<↑> or <↓>	Move the cursor up or down
<Home> or <End>	Move the cursor to the top or bottom of the screen
<+> or <->	Select the previous or next numerical value or setting of the current one
<F1>	Help
<F2>	Restore to the last configuration
<F9>	Restore to the default configuration
<F10>	Save and exit
<Enter>	Execute commands or select a submenu

⚠ **Note:** Options in grey are not available. Options with symbol "▶" have a sub-menu.

8.2.2 UEFI/Legacy Mode Switch

Log in to the BIOS Setup interface, select “Advanced -> CSM Configuration”. Press Enter, to set the Boot option filter ([UEFI only] or [Legacy only]). Set the Option ROM execution mode of Network, Storage, Video and Other PCI devices, as shown in the following figure.



```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
   Advanced
 Compatibility Support Module Configuration              Enable/Disable CSM Support.

 CSM Support                         [Enabled]

 CSM16 Module Version                07.82

 GateA20 Active                      [Upon Request]
 Option ROM Messages                 [Force BIOS]
 INT19 Trap Response                 [Immediate]
 HDD Connection Order                [Keep]

 Boot option filter                  [Legacy only]

 Option ROM execution                                    →←: Select Screen
                                                         ↑↓: Select Item
 Network                             [Legacy]            Enter: Select
 Storage                             [Legacy]            +/-: Change Opt.
 Video                               [Legacy]            F1: General Help
 Other PCI devices                   [Legacy]            F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

        Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

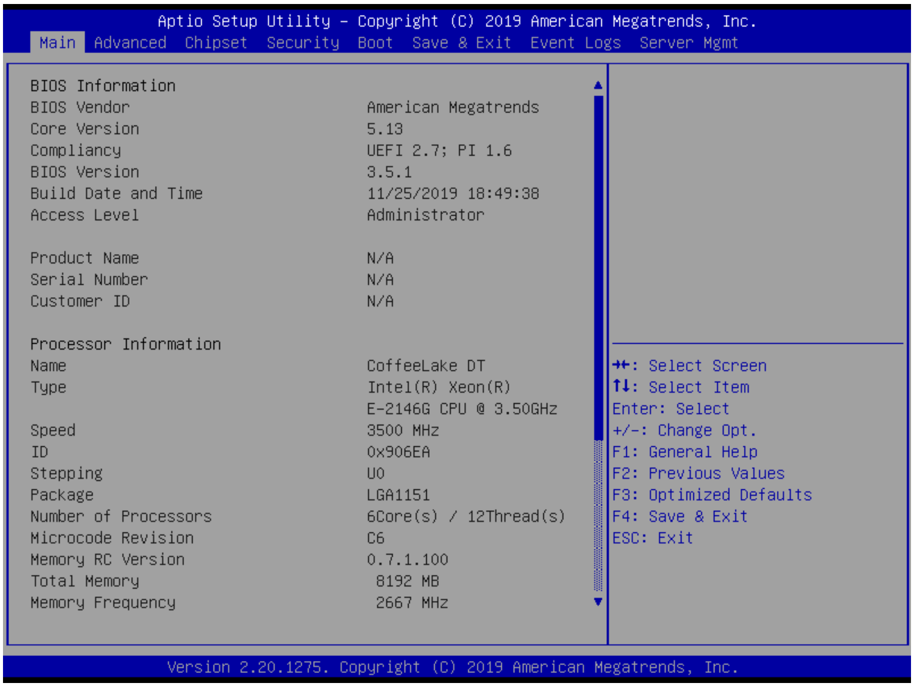
At present, Inspur NF3120M5 platform servers are set to UEFI only mode by default. Compared with Legacy mode, UEFI mode has many advantages: It supports boot from the GPT disk which is larger than 2.2T, supports IPv6/IPv4 PXE boot, and provides UEFI Shell environment. This option can be set according to customer’s demand.

If the Boot option filter is set to Legacy only, the Option ROM execution mode of Network, Storage, Video and Other PCI devices must be set to Legacy.

If the Boot option filter is set to UEFI only, the Option ROM execution mode of Network and Video must be set to UEFI, and the Option ROM execution mode of Storage and Other PCI devices is suggested to set to UEFI. If there are special requirements, it can be set to Legacy.

8.2.3 View System Information

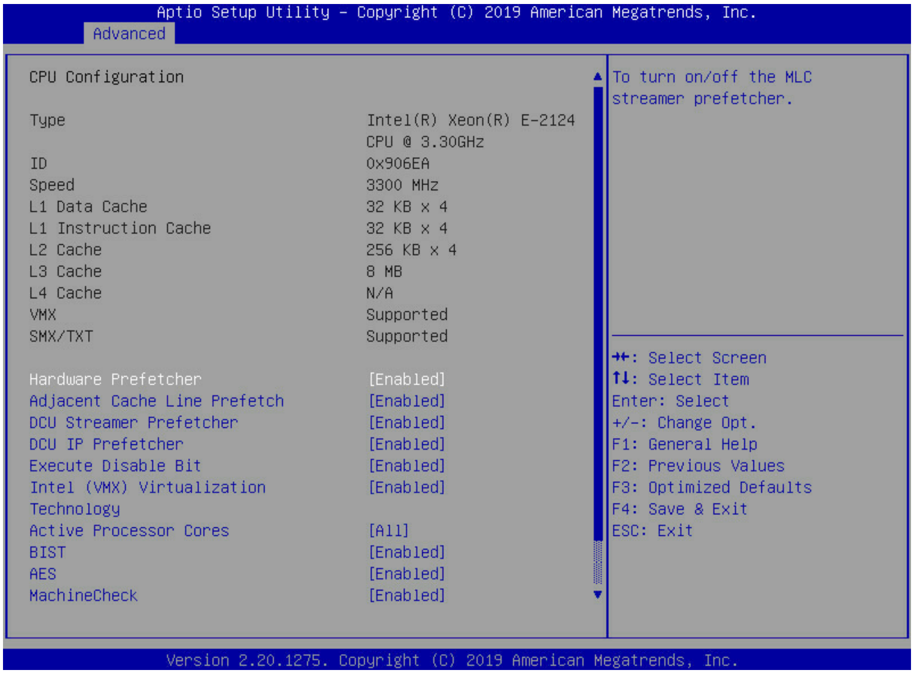
Log in to the BIOS Setup interface, and the Main menu displays the current system information, including BIOS/BMC/ME version, CPU/PCH SKU/RC version, memory and other information.



```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

  BIOS Information
  BIOS Vendor                          American Megatrends
  Core Version                         5.13
  Compliancy                           UEFI 2.7; PI 1.6
  BIOS Version                         3.5.1
  Build Date and Time                  11/25/2019 18:49:38
  Access Level                         Administrator

  Product Name                         N/A
  Serial Number                        N/A
  Customer ID                          N/A

  Processor Information
  Name                                 CoffeeLake DT               →←: Select Screen
  Type                                 Intel(R) Xeon(R)            ↑↓: Select Item
                                       E-2146G CPU @ 3.50GHz       Enter: Select
  Speed                                3500 MHz                    +/-: Change Opt.
  ID                                   0x906EA                     F1: General Help
  Stepping                             U0                          F2: Previous Values
  Package                              LGA1151                     F3: Optimized Defaults
  Number of Processors                 6Core(s) / 12Thread(s)      F4: Save & Exit
  Microcode Revision                   C6                          ESC: Exit
  Memory RC Version                    0.7.1.100
  Total Memory                          8192 MB
  Memory Frequency                      2667 MHz

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

8.2.4 View CPU Information

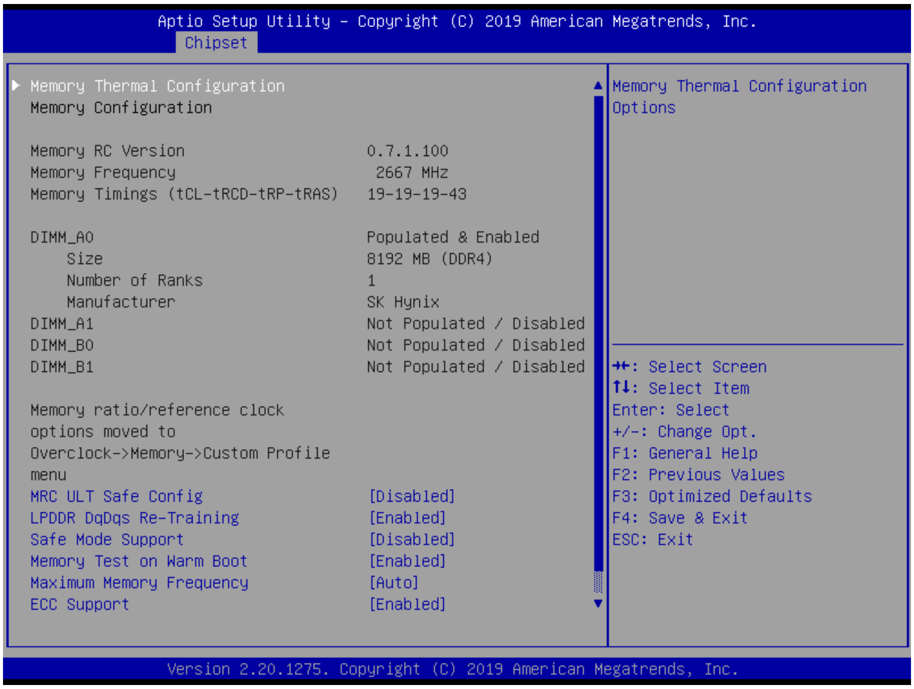
Log in to the BIOS interface, select “Advanced -> CPU Configuration”, and press Enter to display the CPU detailed information.



```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced

  CPU Configuration                                                To turn on/off the MLC
                                                                   streamer prefetcher.
  Type                                 Intel(R) Xeon(R) E-2124
                                       CPU @ 3.30GHz
  ID                                   0x906EA
  Speed                                3300 MHz
  L1 Data Cache                        32 KB x 4
  L1 Instruction Cache                 32 KB x 4
  L2 Cache                             256 KB x 4
  L3 Cache                             8 MB
  L4 Cache                             N/A
  VMX                                  Supported
  SMX/TXT                              Supported
                                                                   →←: Select Screen
  Hardware Prefetcher                  [Enabled]                   ↑↓: Select Item
  Adjacent Cache Line Prefetch         [Enabled]                   Enter: Select
  DCU Streamer Prefetcher              [Enabled]                   +/-: Change Opt.
  DCU IP Prefetcher                    [Enabled]                   F1: General Help
  Execute Disable Bit                  [Enabled]                   F2: Previous Values
  Intel (VMX) Virtualization           [Enabled]                   F3: Optimized Defaults
  Technology                                                       F4: Save & Exit
  Active Processor Cores               [All]                       ESC: Exit
  BIST                                 [Enabled]
  AES                                  [Enabled]
  MachineCheck                         [Enabled]

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

8.2.5 View Memory Information

Log in to the BIOS interface, select “Chipset -> System Agent (SA) Configuration -> Memory Configuration”, and press Enter to display the manufacturer, speed, capacity and other information of the memories in position.

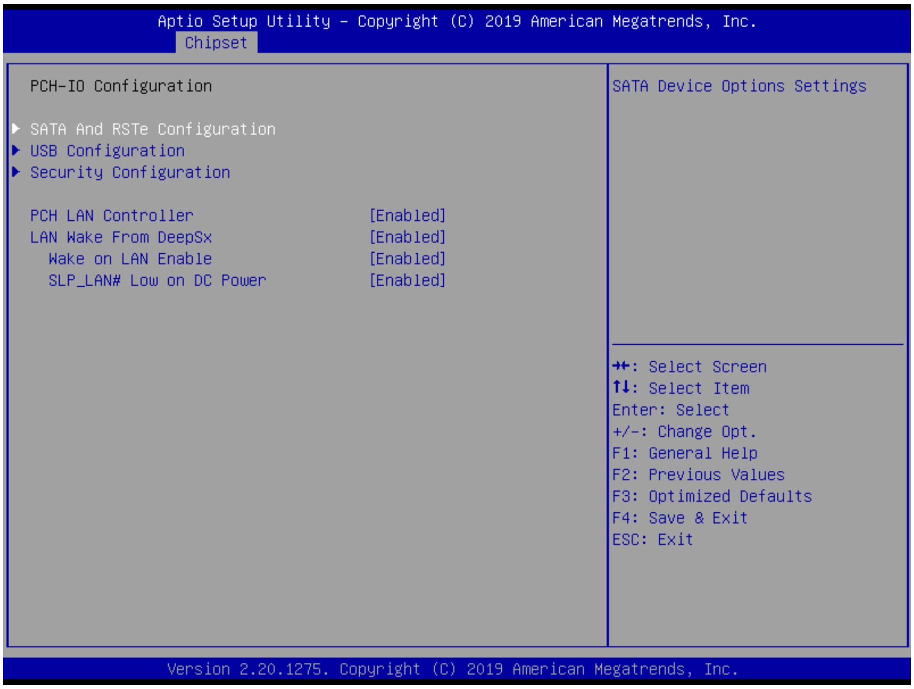


```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                   Chipset
▶ Memory Thermal Configuration                                ▲ Memory Thermal Configuration
  Memory Configuration                                          Options

  Memory RC Version                     0.7.1.100
  Memory Frequency                       2667 MHz
  Memory Timings (tCL-tRCD-tRP-tRAS)    19-19-19-43

  DIMM_A0                               Populated & Enabled
      Size                              8192 MB (DDR4)
      Number of Ranks                   1
      Manufacturer                      SK Hynix
  DIMM_A1                               Not Populated / Disabled
  DIMM_B0                               Not Populated / Disabled
  DIMM_B1                               Not Populated / Disabled  →←: Select Screen
                                                                  ↑↓: Select Item
  Memory ratio/reference clock                                    Enter: Select
  options moved to                                                +/-: Change Opt.
  Overclock->Memory->Custom Profile                               F1: General Help
  menu                                                            F2: Previous Values
  MRC ULT Safe Config                   [Disabled]                F3: Optimized Defaults
  LPDDR DqDqs Re-Training               [Enabled]                 F4: Save & Exit
  Safe Mode Support                     [Disabled]                ESC: Exit
  Memory Test on Warm Boot              [Enabled]
  Maximum Memory Frequency              [Auto]
  ECC Support                           [Enabled]               ▼

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

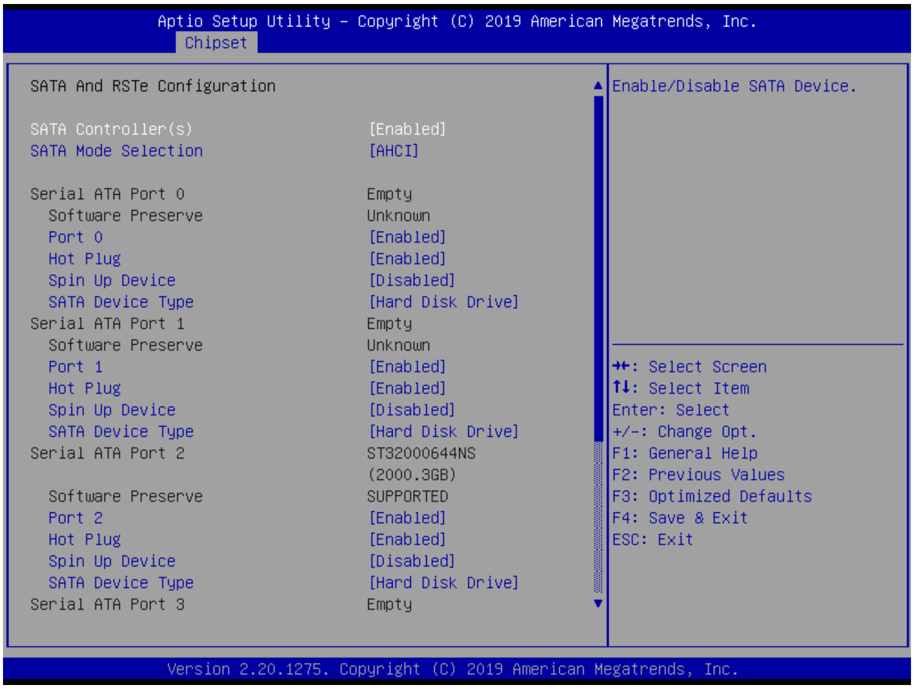
8.2.6 View HDD Information and RAID Configuration

8.2.6.1 View HDD Information

Log in to the BIOS interface, select “Chipset -> PCH-IO Configuration -> SATA And RSTe Configuration”, and press Enter to display the HDD information of the current onboard SATA ports.



```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                   Chipset

  PCH-IO Configuration                                    SATA Device Options Settings

► SATA And RSTe Configuration
► USB Configuration
► Security Configuration

  PCH LAN Controller                   [Enabled]
  LAN Wake From DeepSx                 [Enabled]
    Wake on LAN Enable                 [Enabled]
    SLP_LAN# Low on DC Power           [Enabled]
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```



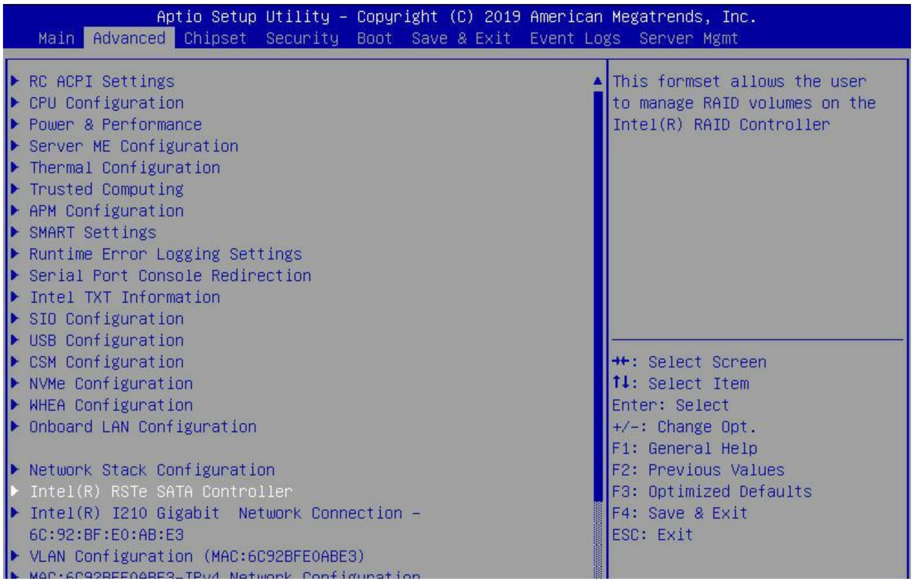
```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                   Chipset

  SATA And RSTe Configuration                             Enable/Disable SATA Device.

  SATA Controller(s)                   [Enabled]
  SATA Mode Selection                  [AHCI]

  Serial ATA Port 0                    Empty
    Software Preserve                  Unknown
    Port 0                             [Enabled]
    Hot Plug                           [Enabled]
    Spin Up Device                     [Disabled]
    SATA Device Type                   [Hard Disk Drive]
  Serial ATA Port 1                    Empty
    Software Preserve                  Unknown
    Port 1                             [Enabled]          →←: Select Screen
    Hot Plug                           [Enabled]          ↑↓: Select Item
    Spin Up Device                     [Disabled]         Enter: Select
    SATA Device Type                   [Hard Disk Drive]  +/-: Change Opt.
  Serial ATA Port 2                    ST32000644NS       F1: General Help
                                       (2000.3GB)         F2: Previous Values
    Software Preserve                  SUPPORTED          F3: Optimized Defaults
    Port 2                             [Enabled]          F4: Save & Exit
    Hot Plug                           [Enabled]          ESC: Exit
    Spin Up Device                     [Disabled]
    SATA Device Type                   [Hard Disk Drive]
  Serial ATA Port 3                    Empty

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

8.2.6.2 RAID Mode Settings

1. Set the SATA Mode Selection Option to [RAID], press F10 to save the setting, and the system reboots.

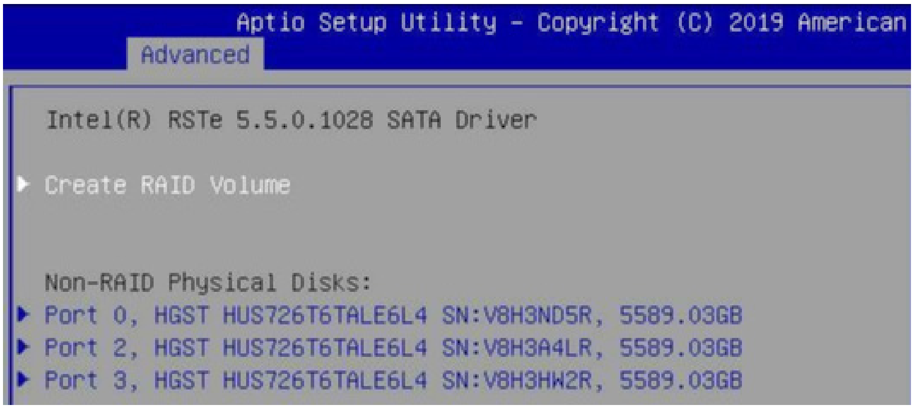
2. When Boot option filter is set to UEFI only, and Storage is set to UEFI, in the BIOS Setup

Advanced interface, there will be the Intel(R) RSTe SATA Controller menu.



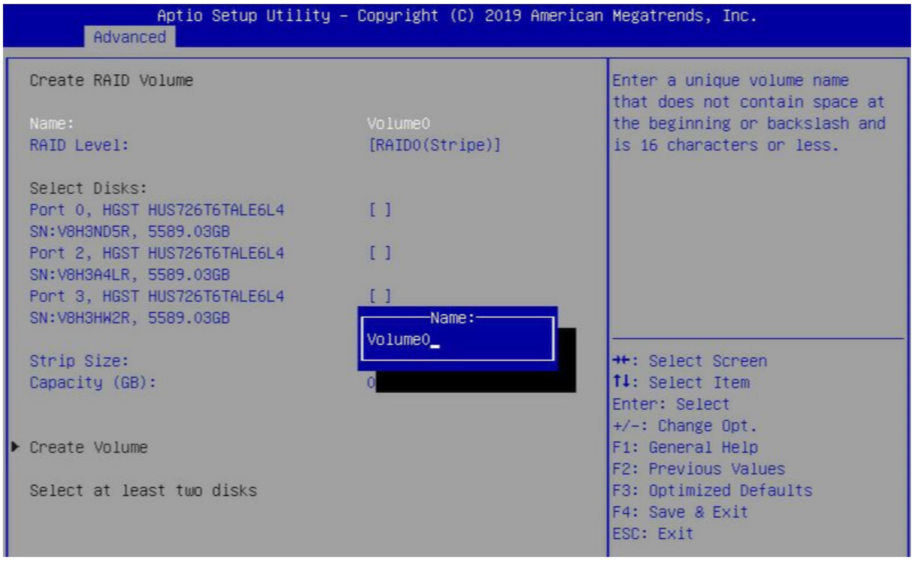
```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

▶ RC ACPI Settings                                     ▲ This formset allows the user
▶ CPU Configuration                                      to manage RAID volumes on the
▶ Power & Performance                                    Intel(R) RAID Controller
▶ Server ME Configuration
▶ Thermal Configuration
▶ Trusted Computing
▶ APM Configuration
▶ SMART Settings
▶ Runtime Error Logging Settings
▶ Serial Port Console Redirection
▶ Intel TXT Information
▶ SIO Configuration
▶ USB Configuration
▶ CSM Configuration                                      →←: Select Screen
▶ NVMe Configuration                                     ↑↓: Select Item
▶ WHEA Configuration                                     Enter: Select
▶ Onboard LAN Configuration                              +/-: Change Opt.
                                                         F1: General Help
▶ Network Stack Configuration                            F2: Previous Values
▶ Intel(R) RSTe SATA Controller                          F3: Optimized Defaults
▶ Intel(R) I210 Gigabit  Network Connection -            F4: Save & Exit
  6C:92:BF:E0:AB:E3                                      ESC: Exit
▶ VLAN Configuration (MAC:6C92BFE0ABE3)
▶ MAC:6C92BFE0ABE3-IPv4 Network Configuration
```

2.1 Press Enter, the executable operation and the current disk information will be displayed.



```
              Aptio Setup Utility – Copyright (C) 2019 American
        Advanced

   Intel(R) RSTe 5.5.0.1028 SATA Driver

▶  Create RAID Volume


   Non-RAID Physical Disks:
▶  Port 0, HGST HUS726T6TALE6L4 SN:V8H3ND5R, 5589.03GB
▶  Port 2, HGST HUS726T6TALE6L4 SN:V8H3A4LR, 5589.03GB
▶  Port 3, HGST HUS726T6TALE6L4 SN:V8H3HW2R, 5589.03GB
```

2.2 Create RAID volume. Select Create RAID Volume option, and press Enter.

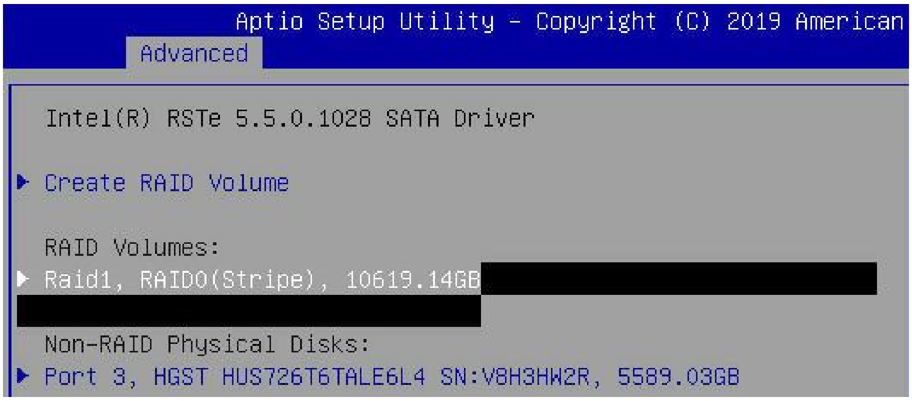


```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
     Advanced
  Create RAID Volume                                  Enter a unique volume name
                                                      that does not contain space at
  Name:                         Volume0               the beginning or backslash and
  RAID Level:                   [RAID0(Stripe)]       is 16 characters or less.

  Select Disks:
  Port 0, HGST HUS726T6TALE6L4  [ ]
  SN:V8H3ND5R, 5589.03GB
  Port 2, HGST HUS726T6TALE6L4  [ ]
  SN:V8H3A4LR, 5589.03GB
  Port 3, HGST HUS726T6TALE6L4  [ ]
  SN:V8H3HW2R, 5589.03GB       ┌────Name:────┐
                               │Volume0_     │
                               └─────────────┘
  Strip Size:                                         ↔: Select Screen
  Capacity (GB):                0                     ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
▶ Create Volume                                       F1: General Help
                                                      F2: Previous Values
  Select at least two disks                           F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit
```

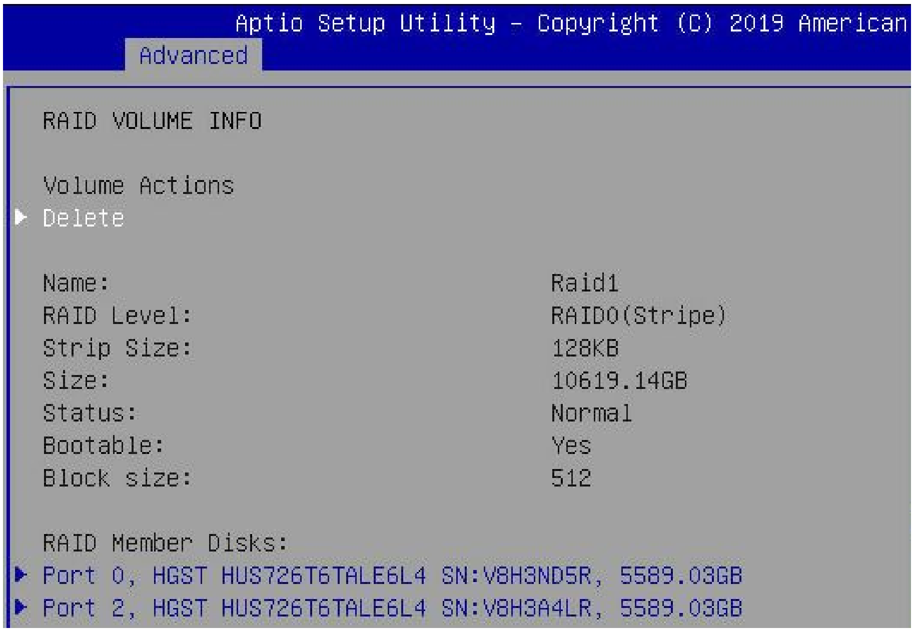
Create RAID Menu Instruction Table

Interface Parameters	Function Description
Name	Please enter a volume name less than 16 characters without containing any special characters.
RAID Level	Please select the RAID volume level. If no volume has been created at present, there are four volume levels of RAID0 (Stripe), RAID1 (Mirror), RAID10 (RAID0+1) and RAID5 (Parity) for selection. Please select the volume level according to actual requirements. RAID0: This RAID volume is allowed to be made on 2 or above disks. RAID1: This RAID volume is allowed to be made on 2 disks. RAID10: This RAID volume is allowed to be made on 4 disks, which is only available when disk quantity is 4 or above. RAID5 (Parity): This RAID volume is allowed to be made on 3 or above disks.
Select Disks	Select disks to make RAID volume, press Enter, select X, and then press Enter to return to Create RAID Volume interface.
Strip Size	Please select the strip size, only RAID0 and RAID5 volumes could enable this option.
Capacity	Set the volume capacity, and the maximum capacity is shown in the Help information on the right side.
Create Volume	After finishing the above settings, select this option to create RAID volume.

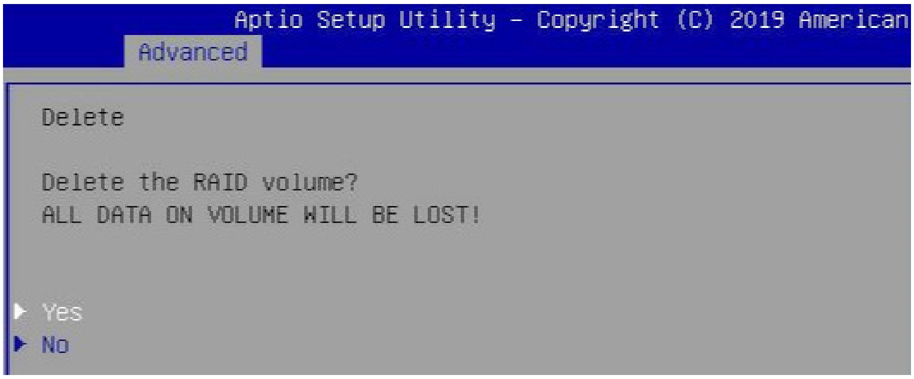
2.3 Delete RAID volume. Select a created RAID Volume, press Enter. Select “Delete”, there will be a prompt. To delete the volume, select “Yes” and press Enter; to cancel the deletion, select “No” and press Enter.



```
             Aptio Setup Utility - Copyright (C) 2019 American
       Advanced

  Intel(R) RSTe 5.5.0.1028 SATA Driver

▶ Create RAID Volume

  RAID Volumes:
▶ Raid1, RAID0(Stripe), 10619.14GB[redacted]

  Non-RAID Physical Disks:
▶ Port 3, HGST HUS726T6TALE6L4 SN:V8H3HW2R, 5589.03GB
```



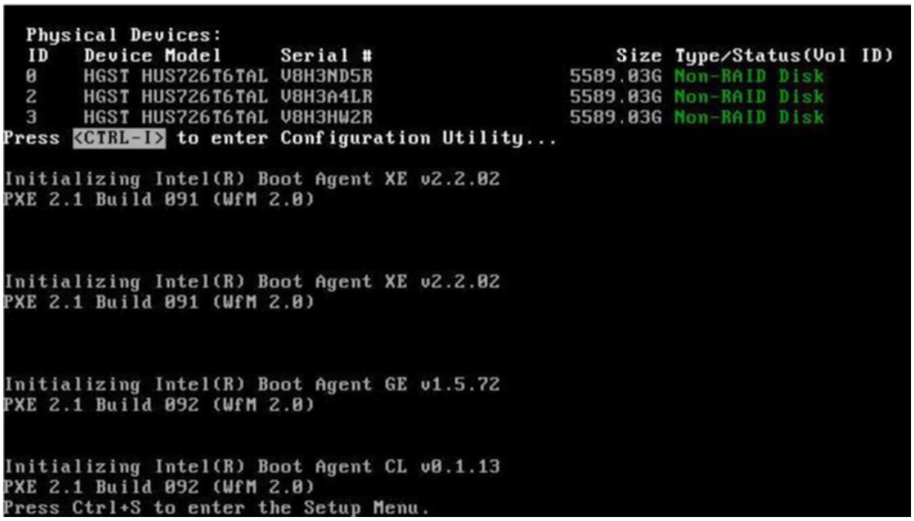
```
             Aptio Setup Utility - Copyright (C) 2019 American
       Advanced

  RAID VOLUME INFO

  Volume Actions
▶ Delete

  Name:                                 Raid1
  RAID Level:                           RAID0(Stripe)
  Strip Size:                           128KB
  Size:                                 10619.14GB
  Status:                               Normal
  Bootable:                             Yes
  Block size:                           512

  RAID Member Disks:
▶ Port 0, HGST HUS726T6TALE6L4 SN:V8H3ND5R, 5589.03GB
▶ Port 2, HGST HUS726T6TALE6L4 SN:V8H3A4LR, 5589.03GB
```



```
             Aptio Setup Utility - Copyright (C) 2019 American
       Advanced

  Delete

  Delete the RAID volume?
  ALL DATA ON VOLUME WILL BE LOST!


▶ Yes
▶ No
```

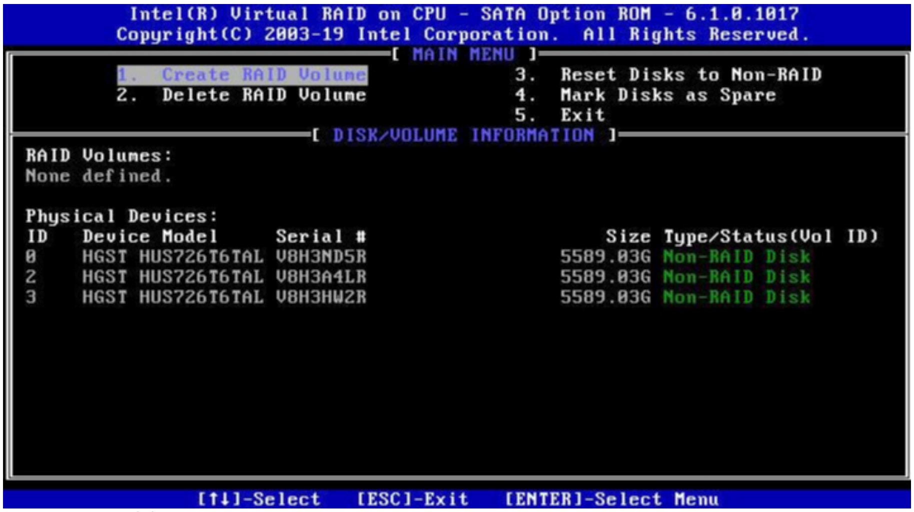
3. When Boot option filter is set to UEFI only, and Storage is set to Legacy, a prompt “Press <CTRL-I> to enter Configuration Utility…” will appear on the screen during system booting. Press [Ctrl] and [I] keys at the same time to enter SATA RAID configuration, as shown in the

following figure.



```
 Physical Devices:
 ID   Device Model      Serial #                         Size  Type/Status(Vol  ID)
 0    HGST HUS726T6TAL  V8H3ND5R                     5589.03G  Non-RAID Disk
 2    HGST HUS726T6TAL  V8H3A4LR                     5589.03G  Non-RAID Disk
 3    HGST HUS726T6TAL  V8H3HW2R                     5589.03G  Non-RAID Disk
Press <CTRL-I> to enter Configuration Utility...

Initializing Intel(R) Boot Agent XE v2.2.02
PXE 2.1 Build 091 (WfM 2.0)


Initializing Intel(R) Boot Agent XE v2.2.02
PXE 2.1 Build 091 (WfM 2.0)


Initializing Intel(R) Boot Agent GE v1.5.72
PXE 2.1 Build 092 (WfM 2.0)


Initializing Intel(R) Boot Agent CL v0.1.13
PXE 2.1 Build 092 (WfM 2.0)
Press Ctrl+S to enter the Setup Menu.
```

3.1 After entering SATA RAID configuration interface, it will display the main menu list, the information (disk ID, disk type, disk capacity, volume member or not) of disks connected to SATA controller, and the existing RAID volumes information (including volume ID, name, RAID level, capacity, status, bootable or not). There are 5 executable menus in the SATA RAID configuration interface, as shown in the following figure.



```
           Intel(R) Virtual RAID on CPU - SATA Option ROM - 6.1.0.1017
          Copyright(C) 2003-19 Intel Corporation.  All Rights Reserved.
                                  [ MAIN MENU ]
          1.  Create RAID Volume                3.  Reset Disks to Non-RAID
          2.  Delete RAID Volume                4.  Mark Disks as Spare
                                                5.  Exit
                           [ DISK/VOLUME INFORMATION ]
 RAID Volumes:
 None defined.

 Physical Devices:
 ID   Device Model      Serial #                        Size  Type/Status(Vol  ID)
 0    HGST HUS726T6TAL  V8H3ND5R                    5589.03G  Non-RAID Disk
 2    HGST HUS726T6TAL  V8H3A4LR                    5589.03G  Non-RAID Disk
 3    HGST HUS726T6TAL  V8H3HW2R                    5589.03G  Non-RAID Disk

                [↑↓]-Select   [ESC]-Exit   [ENTER]-Select Menu
```

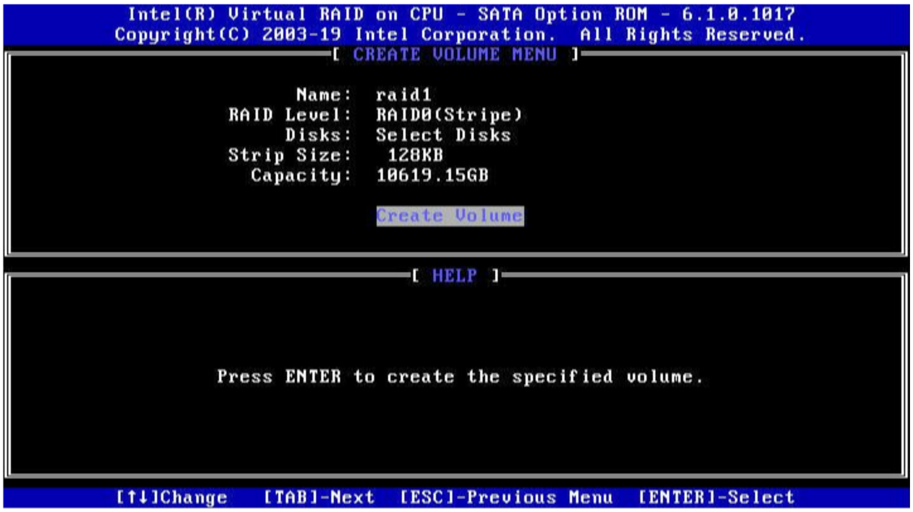
Key Instruction Table

Key	Description
↑↓	Used to move cursor in different menus or to change values of menu options
TAB	To select the next menu option
Enter	To select a menu
Esc	To exit menu or return to the previous menu from sub-menu

Operation Menu Instruction Table

Create RAID Volume	To create an RAID volume
Delete RAID Volume	To delete an existing RAID volume
Reset Disks to Non-RAID	To reset disks in RAID volume, and to restore them to non-RAID status
Mask Disk as Spare	To mask the disks as spare disks. The data will be cleared, and these disks cannot be selected during RAID setting. It can be restored through the Reset Disks to Non-RAID menu.
Exit	To exit SATA HostRAID configuration interface

3.2 Create RAID Volume menu. After entering SATA RAID configuration interface, you could use up and down arrow keys to select this menu, and then press Enter to enter the Create RAID Volume menu, or directly input the number before the menu to enter the Create RAID Volume menu. For other menu operations that are similar, it will not be repeated here.



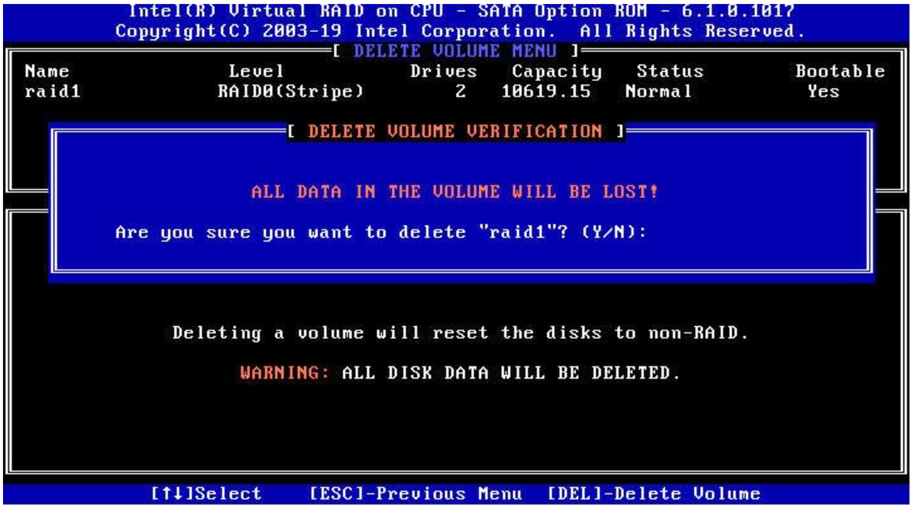
```
         Intel(R) Virtual RAID on CPU - SATA Option ROM - 6.1.0.1017
        Copyright(C) 2003-19 Intel Corporation.  All Rights Reserved.
                          [ CREATE VOLUME MENU ]

                         Name:  raid1
                   RAID Level:  RAID0(Stripe)
                        Disks:  Select Disks
                   Strip Size:   128KB
                     Capacity:  10619.15GB

                                Create Volume

                                [ HELP ]



                 Press ENTER to create the specified volume.



   [↑↓]Change   [TAB]-Next   [ESC]-Previous Menu   [ENTER]-Select
```

Create RAID Menu Instruction Table

Interface Parameters	Function Description
Name	Please enter a volume label name less than 16 characters without containing any special characters.
RAID Level	Please select RAID volume level. If no volume has been created at present, there are four volume levels of RAID0 (Stripe), RAID1 (Mirror), RAID10 (RAID0+1) and RAID5 (Parity) for selection. Please select volume level according to actual requirements. RAID0: This RAID volume is allowed to be made on 2 or above disks. RAID1: This RAID volume is allowed to be made on 2 disks. RAID10: This RAID volume is allowed to be made on 4 disks, which is only available when disk quantity is 4 or above. RAID5 (Parity): This RAID volume is allowed to be made on 3 or above disks.
Select Disks	Select disks to make RAID volume, press Enter, select X, and then press Enter to return to Create RAID Volume interface.
Strip Size	Please select the strip size, only RAID0 and RAID5 volumes could enable this option.
Capacity	Set the volume capacity.

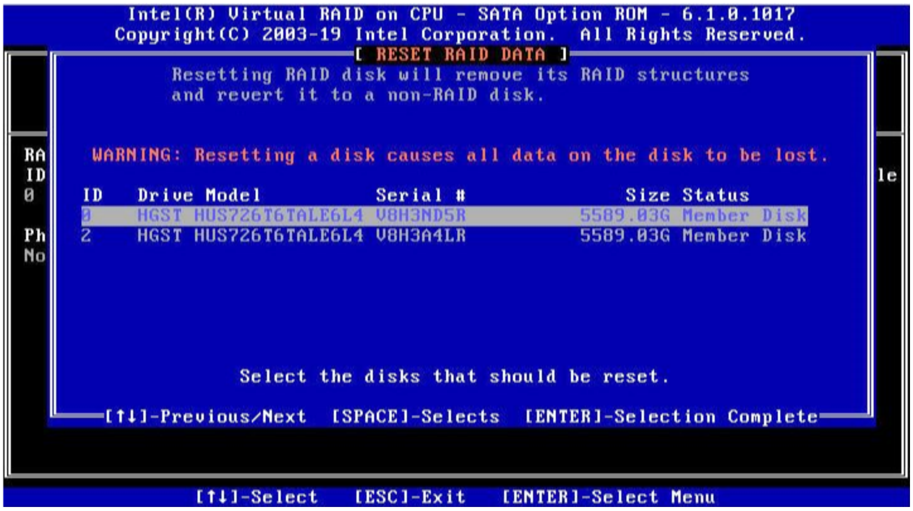
After completing the above settings, please select [Create Volume], and press Enter. The system will prompt “WARNING: ALL DATA ON THE SELECTED DISKS WILL BE LOST. Are you sure you want to create this volume? (Y/N)”. To create an RAID volume, please enter “Y”. A volume will be created, and all data on the selected disks will be lost. Otherwise, please enter “N”, to exit volume creation. Here we enter “Y” to create an RAID volume. After the creation is completed, return to MAIN MENU interface, the created RAID volume will be displayed.

3.3 Delete RAID Volume menu. After entering Delete RAID Volume menu, press [DEL] to delete the selected RAID volume, and the system will prompt “ALL DATA IN THE VOLUME WILL BE LOST! Are you sure you want to delete “Volume0*”? (Y/N)”. To delete this RAID volume, please enter “Y”, to cancel the deletion, please enter “N”.



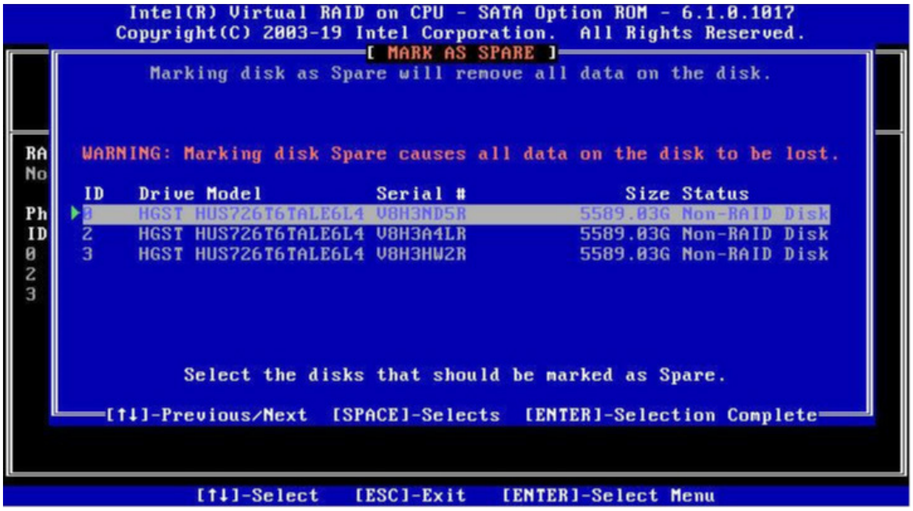
```
        Intel(R) Virtual RAID on CPU - SATA Option ROM - 6.1.0.1017
       Copyright(C) 2003-19 Intel Corporation.  All Rights Reserved.
                        [ DELETE VOLUME MENU ]
 Name            Level          Drives  Capacity   Status       Bootable
 raid1        RAID0(Stripe)       2    10619.15   Normal          Yes

                  [ DELETE VOLUME VERIFICATION ]

                    ALL DATA IN THE VOLUME WILL BE LOST!

              Are you sure you want to delete "raid1"? (Y/N):


              Deleting a volume will reset the disks to non-RAID.

                    WARNING: ALL DISK DATA WILL BE DELETED.


           [↑↓]Select     [ESC]-Previous Menu   [DEL]-Delete Volume
```

3.4 Reset Disks to Non-RAID menu. After entering Reset Disks to Non-RAID menu, system will display all disks in RAID volume. Please use the space key to select the disk to reset according to the actual demand, and then press Enter to reset the disk. The system will prompt “Are you sure you want to reset RAID data on selected disks? (Y/N)” again, enter “Y” or “N” according to the prompt. It is to be noted that all data on this disk will be lost after reset. Meanwhile, this disk will not belong to RAID volume any more.



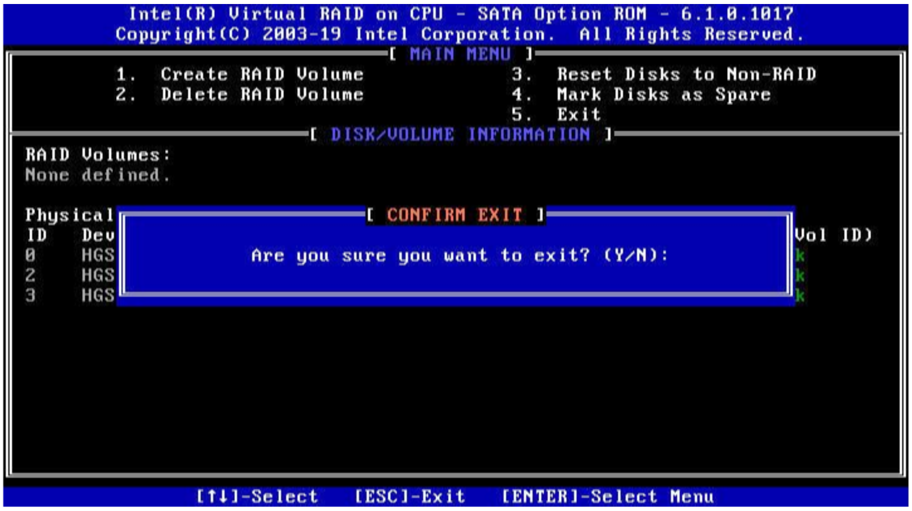
```
       Intel(R) Virtual RAID on CPU - SATA Option ROM - 6.1.0.1017
      Copyright(C) 2003-19 Intel Corporation.  All Rights Reserved.
                          [ RESET RAID DATA ]
            Resetting RAID disk will remove its RAID structures
            and revert it to a non-RAID disk.

RA   WARNING: Resetting a disk causes all data on the disk to be lost.
ID                                                                        le
0    ID   Drive Model            Serial #              Size Status
     0    HGST HUS726T6TALE6L4   V8H3ND5R          5589.03G Member Disk
Ph   2    HGST HUS726T6TALE6L4   V8H3A4LR          5589.03G Member Disk
No



                 Select the disks that should be reset.
   [↑↓]-Previous/Next   [SPACE]-Selects   [ENTER]-Selection Complete

               [↑↓]-Select    [ESC]-Exit    [ENTER]-Select Menu
```

3.5 Mask Disk as Spare menu. After entering Mask Disk as Spare menu, system will display the disks not in RAID volume. Please use the space key to select the disks according to the actual demand, and then press Enter. The system will prompt “Are you sure you want to mask selected disks as Spare? (Y/N)”, enter “Y” or “N” according to the prompt. It is to be noted that all data on this disk will be lost as the spare disk.



```
       Intel(R) Virtual RAID on CPU - SATA Option ROM - 6.1.0.1017
      Copyright(C) 2003-19 Intel Corporation.  All Rights Reserved.
                           [ MARK AS SPARE ]
          Marking disk as Spare will remove all data on the disk.


RA   WARNING: Marking disk Spare causes all data on the disk to be lost.
No
     ID   Drive Model            Serial #              Size Status
Ph  ▸0    HGST HUS726T6TALE6L4   V8H3ND5R          5589.03G Non-RAID Disk
ID   2    HGST HUS726T6TALE6L4   V8H3A4LR          5589.03G Non-RAID Disk
0    3    HGST HUS726T6TALE6L4   V8H3HW2R          5589.03G Non-RAID Disk
2
3


             Select the disks that should be marked as Spare.
   [↑↓]-Previous/Next   [SPACE]-Selects   [ENTER]-Selection Complete

               [↑↓]-Select    [ESC]-Exit    [ENTER]-Select Menu
```

3.6 Exit menu. Select Exit menu through up and down keys, or press ESC to exit SATA RAID configuration interface, as shown in the following figure. The system will prompt “Are you sure you want to exit? (Y/N)”, enter “Y” to exit, or enter “N” to cancel the exit operation.

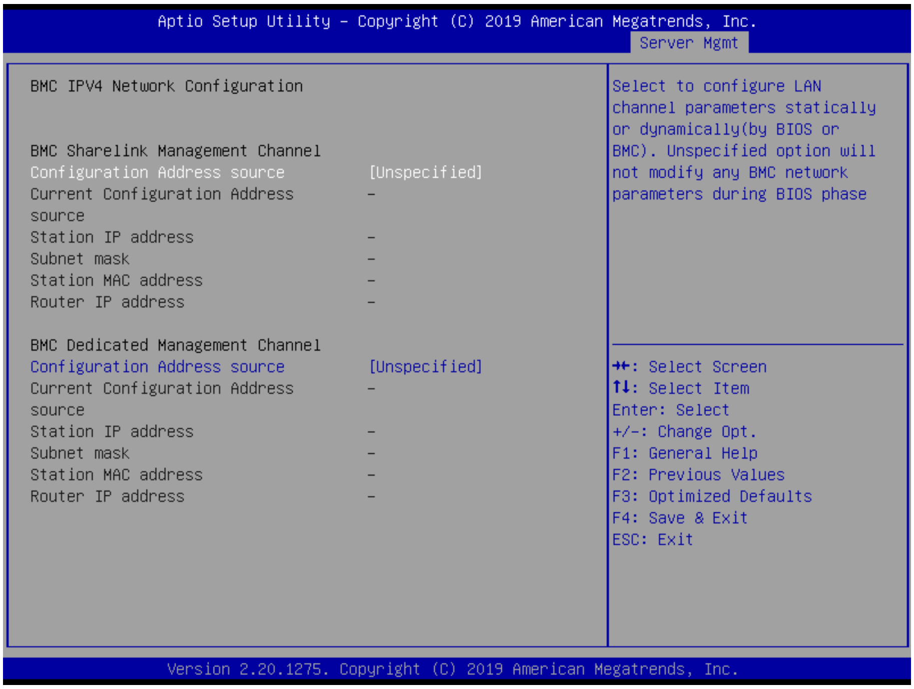


```
        Intel(R) Virtual RAID on CPU - SATA Option ROM - 6.1.0.1017
       Copyright(C) 2003-19 Intel Corporation.  All Rights Reserved.
                              [ MAIN MENU ]
         1.  Create RAID Volume              3.  Reset Disks to Non-RAID
         2.  Delete RAID Volume              4.  Mark Disks as Spare
                                             5.  Exit
                        [ DISK/VOLUME INFORMATION ]
 RAID Volumes:
 None defined.

 Physical                    [ CONFIRM EXIT ]
 ID    Dev                                                         Vol ID)
 0     HGS          Are you sure you want to exit? (Y/N):          k
 2     HGS                                                         k
 3     HGS                                                         k

           [↑↓]-Select    [ESC]-Exit    [ENTER]-Select Menu
```

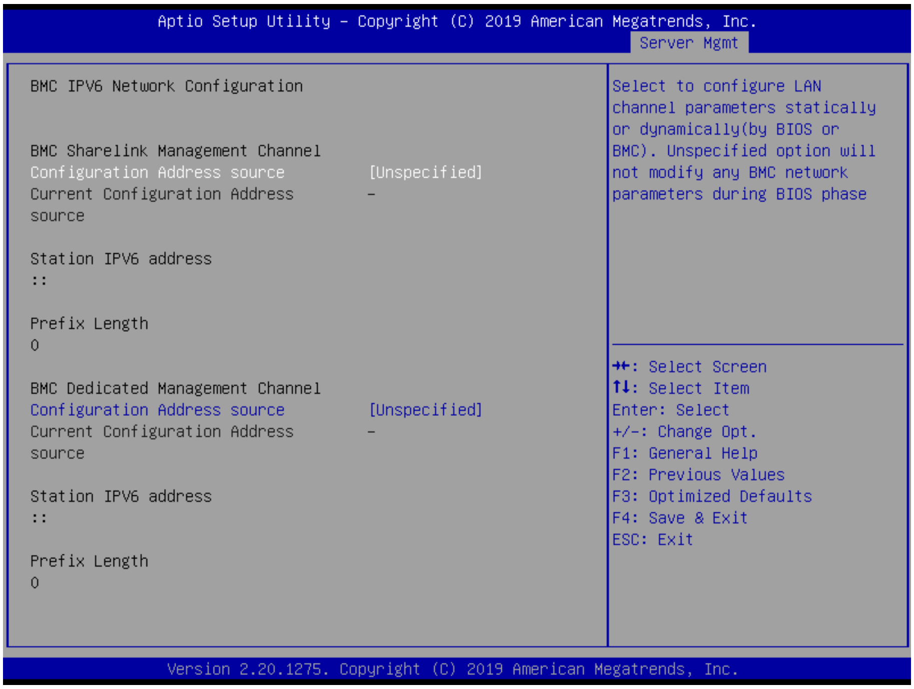
8.2.7 View and Set BMC Network Parameters

8.2.7.1 View BMC Network Parameters

Log in to the BIOS interface, select “Server Mgmt -> BMC Network Configuration -> BMC IPv4 Network Configuration/BMC IPv6 Network Configuration”. Press Enter to view the current configuration of BMC IPv4 and BMC IPv6 network, as shown in the following figures.



```
        Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                                                     Server Mgmt
 BMC IPV4 Network Configuration                     | Select to configure LAN
                                                    | channel parameters statically
                                                    | or dynamically(by BIOS or
 BMC Sharelink Management Channel                   | BMC). Unspecified option will
 Configuration Address source        [Unspecified]  | not modify any BMC network
 Current Configuration Address       -              | parameters during BIOS phase
 source                                             |
 Station IP address                  -              |
 Subnet mask                         -              |
 Station MAC address                 -              |
 Router IP address                   -              |
                                                    |
 BMC Dedicated Management Channel                   |----------------------------
 Configuration Address source        [Unspecified]  | →←: Select Screen
 Current Configuration Address       -              | ↑↓: Select Item
 source                                             | Enter: Select
 Station IP address                  -              | +/-: Change Opt.
 Subnet mask                         -              | F1: General Help
 Station MAC address                 -              | F2: Previous Values
 Router IP address                   -              | F3: Optimized Defaults
                                                    | F4: Save & Exit
                                                    | ESC: Exit

        Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                  Server Mgmt

BMC IPV6 Network Configuration                  Select to configure LAN
                                                channel parameters statically
                                                or dynamically(by BIOS or
BMC Sharelink Management Channel                BMC). Unspecified option will
Configuration Address source      [Unspecified] not modify any BMC network
Current Configuration Address     -             parameters during BIOS phase
source

Station IPV6 address
::

Prefix Length
0
                                                ++: Select Screen
BMC Dedicated Management Channel                ↑↓: Select Item
Configuration Address source      [Unspecified] Enter: Select
Current Configuration Address     -             +/-: Change Opt.
source                                          F1: General Help
                                                F2: Previous Values
Station IPV6 address                            F3: Optimized Defaults
::                                              F4: Save & Exit
                                                ESC: Exit
Prefix Length
0

Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

8.2.7.2 BMC Network Settings

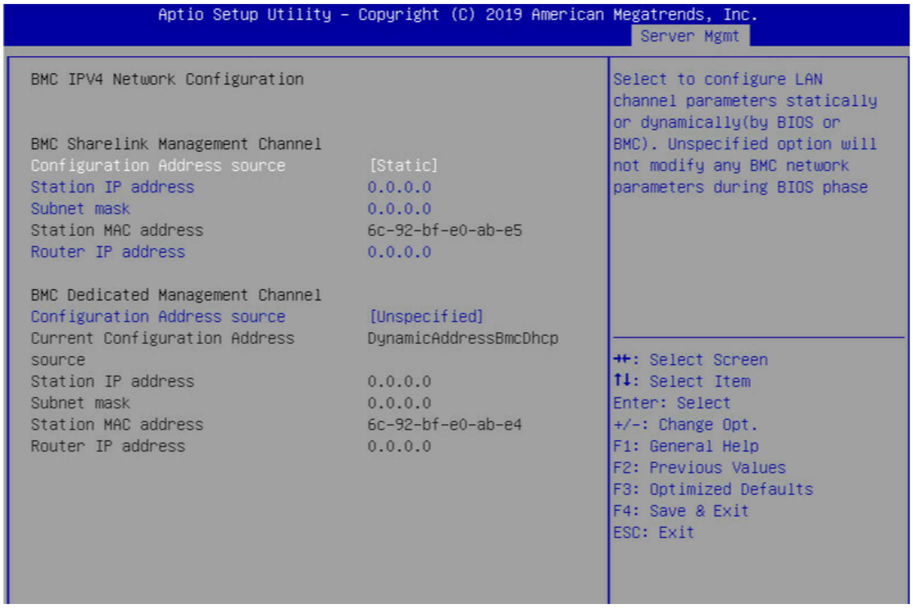
Take BMC Sharelink port as an example to introduce the settings of BMC IPv4 network parameters.

BMC Network Configuration Instruction Table

Interface Parameters	Function Description	Default Value
Configuration Address Source	Configure BMC network status parameters. When Get BMC Dedicated Parameters is set to [Manual], this option will be displayed. Options include: Unspecified Static DynamicBmcDhcp The static and dynamic settings take effect immediately.	Unspecified
Current Configuration Address	Display the current BMC network parameters configuration	----
Station IP address	BMC station IP address	----
Subnet mask	Subnet mask	----
Station MAC address	BMC station MAC address	----
Router IP address	BMC router IP address	----

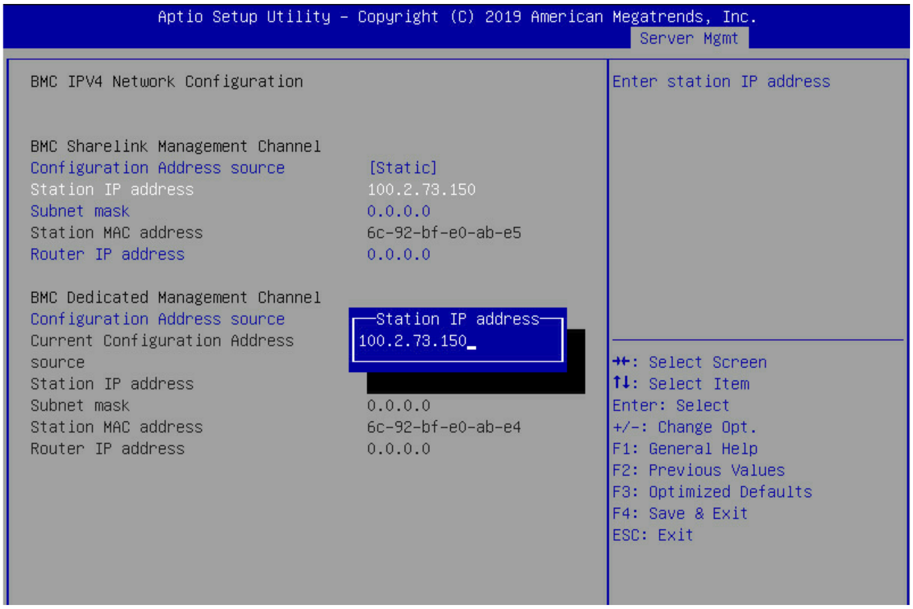
8.2.7.2.1 Set BMC Static Network Parameters

Set the Configuration Address Source option to [Static]. If the setting succeeds, BMC network will be set to static immediately.

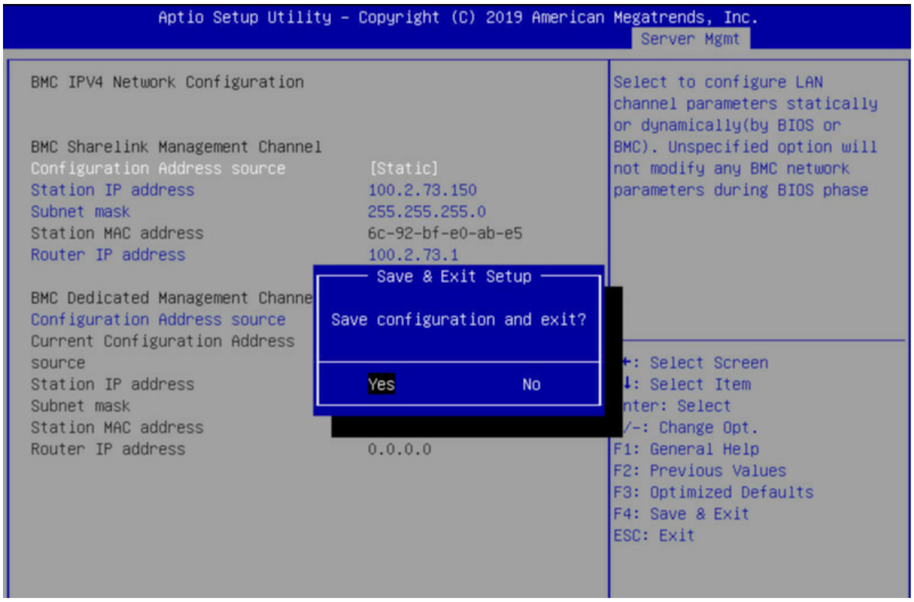


```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                        Server Mgmt

 BMC IPV4 Network Configuration                          Select to configure LAN
                                                         channel parameters statically
                                                         or dynamically(by BIOS or
 BMC Sharelink Management Channel                        BMC). Unspecified option will
 Configuration Address source        [Static]            not modify any BMC network
 Station IP address                  0.0.0.0             parameters during BIOS phase
 Subnet mask                         0.0.0.0
 Station MAC address                 6c-92-bf-e0-ab-e5
 Router IP address                   0.0.0.0

 BMC Dedicated Management Channel
 Configuration Address source        [Unspecified]
 Current Configuration Address       DynamicAddressBmcDhcp
 source                                                  →←: Select Screen
 Station IP address                  0.0.0.0             ↑↓: Select Item
 Subnet mask                         0.0.0.0             Enter: Select
 Station MAC address                 6c-92-bf-e0-ab-e4   +/-: Change Opt.
 Router IP address                   0.0.0.0             F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit
```

Select the Station IP Address option. Press Enter, the Station IP Address window pops up. Input the Static IP manually. After the setting is completed, press Enter to confirm.



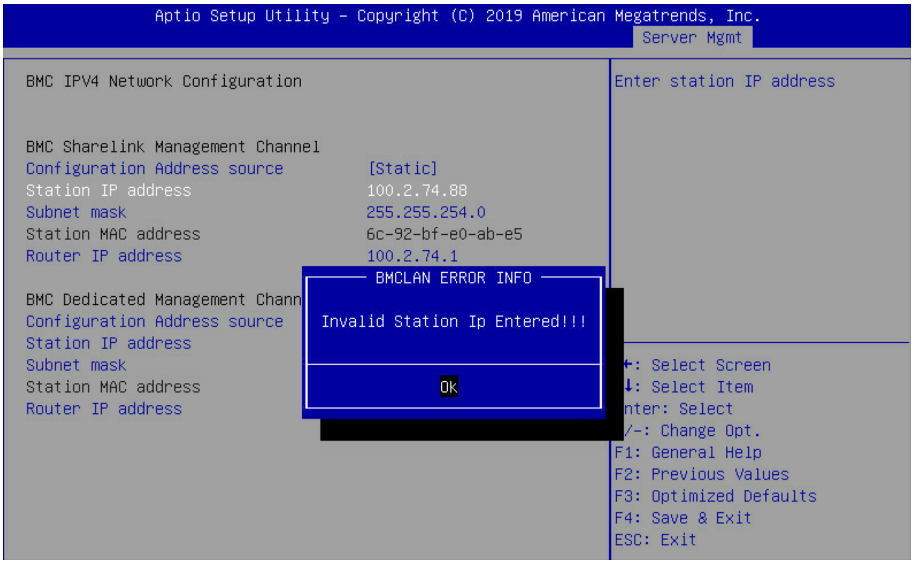
```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                        Server Mgmt

 BMC IPV4 Network Configuration                          Enter station IP address


 BMC Sharelink Management Channel
 Configuration Address source        [Static]
 Station IP address                  100.2.73.150
 Subnet mask                         0.0.0.0
 Station MAC address                 6c-92-bf-e0-ab-e5
 Router IP address                   0.0.0.0

 BMC Dedicated Management Channel
 Configuration Address source       ┌Station IP address┐
 Current Configuration Address      │100.2.73.150_     │
 source                             └──────────────────┘ →←: Select Screen
 Station IP address                                      ↑↓: Select Item
 Subnet mask                         0.0.0.0             Enter: Select
 Station MAC address                 6c-92-bf-e0-ab-e4   +/-: Change Opt.
 Router IP address                   0.0.0.0             F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit
```



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                  Server Mgmt

BMC IPV4 Network Configuration                   Select to configure LAN
                                                 channel parameters statically
                                                 or dynamically(by BIOS or
BMC Sharelink Management Channel                 BMC). Unspecified option will
Configuration Address source       [Static]      not modify any BMC network
Station IP address                 100.2.73.150  parameters during BIOS phase
Subnet mask                        255.255.255.0
Station MAC address                6c-92-bf-e0-ab-e5
Router IP address                  100.2.73.1
                          ─── Save & Exit Setup ───
BMC Dedicated Management Channe
Configuration Address source  Save configuration and exit?
Current Configuration Address
source                                                ←: Select Screen
Station IP address               Yes          No      ↓: Select Item
Subnet mask                                           nter: Select
Station MAC address                                   /-: Change Opt.
Router IP address                  0.0.0.0       F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit
```

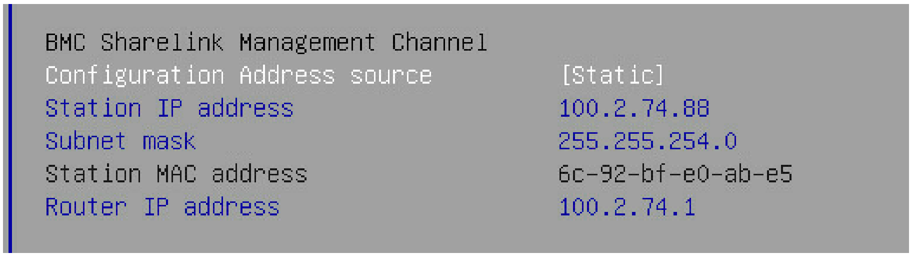
After the setting is completed, save it and exit. Restart the system, and the new BMC network IP will take effect.

If the input IP is invalid, the system prompts “Invalid Station IP Entered!!!”, and assign 0.0.0.0 to the IP address. The assignment only changes the IP address in BIOS Setup interface, and does not notify BMC to change the IP settings.



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                  Server Mgmt

BMC IPV4 Network Configuration                   Enter station IP address


BMC Sharelink Management Channel
Configuration Address source       [Static]
Station IP address                 100.2.74.88
Subnet mask                        255.255.254.0
Station MAC address                6c-92-bf-e0-ab-e5
Router IP address                  100.2.74.1
                          ─── BMCLAN ERROR INFO ───
BMC Dedicated Management Chann
Configuration Address source  Invalid Station Ip Entered!!!
Station IP address
Subnet mask                                           ←: Select Screen
Station MAC address                  Ok               ↓: Select Item
Router IP address                                     nter: Select
                                                      /-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit
```

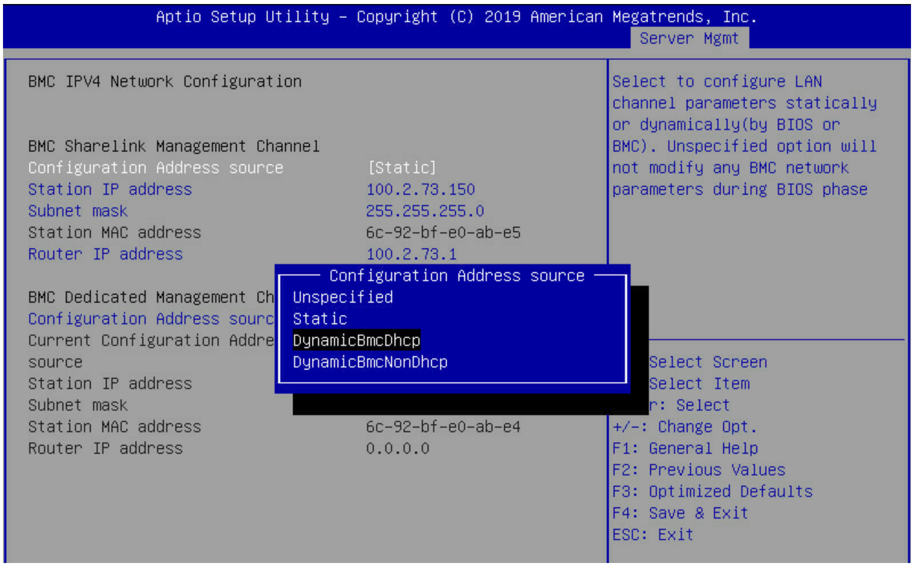
The prompts of Subnet mask and Router IP address settings are similar to those of Station IP address setting, there is no more detailed description here. As shown in the following figure, the BMC network parameters have taken effect, you can log in to BMC Web interface to operate.



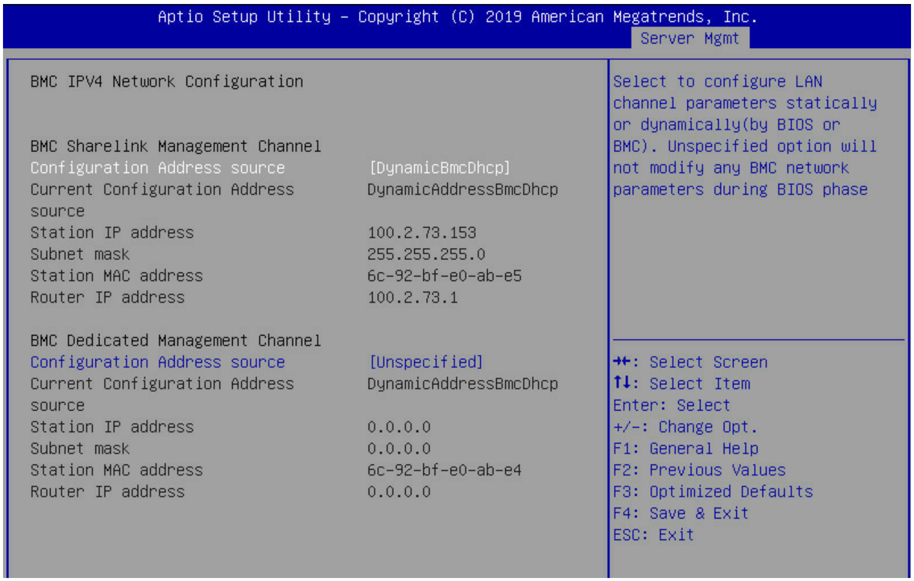
```
BMC Sharelink Management Channel
Configuration Address source          [Static]
Station IP address                    100.2.74.88
Subnet mask                           255.255.254.0
Station MAC address                   6c-92-bf-e0-ab-e5
Router IP address                     100.2.74.1
```

8.2.7.2.2 Set BMC Dynamic Network Parameters

Set the Configuration Address Source option to [DynamiBmcDhcp]. It will take effect after you save it, exit and restart the system.



```
         Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                        Server Mgmt

 BMC IPV4 Network Configuration                          Select to configure LAN
                                                         channel parameters statically
                                                         or dynamically(by BIOS or
 BMC Sharelink Management Channel                        BMC). Unspecified option will
 Configuration Address source        [Static]            not modify any BMC network
 Station IP address                  100.2.73.150        parameters during BIOS phase
 Subnet mask                         255.255.255.0
 Station MAC address                 6c-92-bf-e0-ab-e5
 Router IP address                   100.2.73.1
                                ── Configuration Address source ──
 BMC Dedicated Management Ch    Unspecified
 Configuration Address sourc    Static
 Current Configuration Addre    DynamicBmcDhcp
 source                         DynamicBmcNonDhcp          Select Screen
 Station IP address                                        Select Item
 Subnet mask                                               r: Select
 Station MAC address                 6c-92-bf-e0-ab-e4   +/-: Change Opt.
 Router IP address                   0.0.0.0             F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit
```



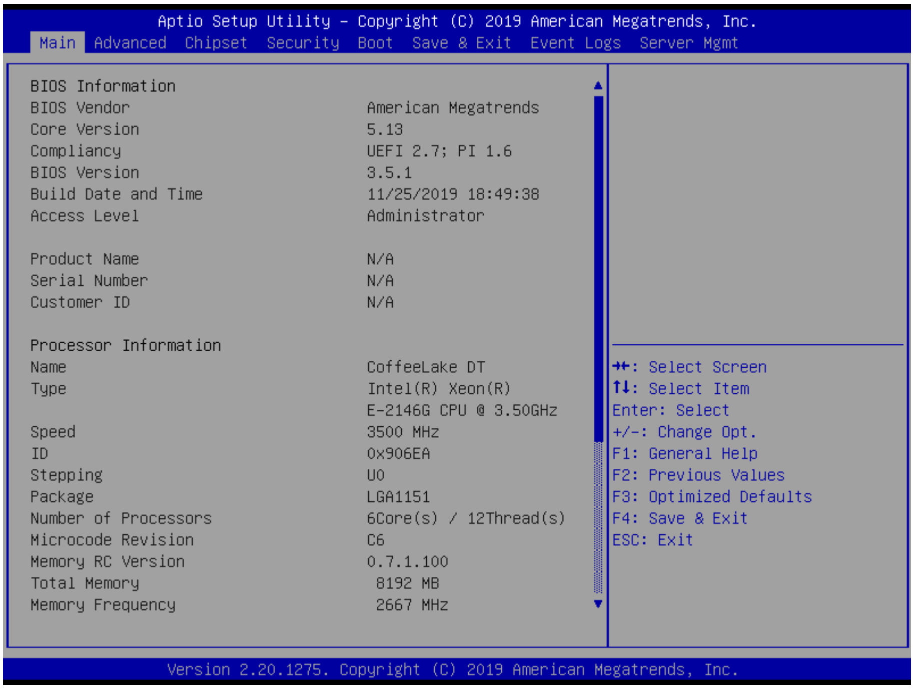
```
         Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                        Server Mgmt

 BMC IPV4 Network Configuration                          Select to configure LAN
                                                         channel parameters statically
                                                         or dynamically(by BIOS or
 BMC Sharelink Management Channel                        BMC). Unspecified option will
 Configuration Address source        [DynamicBmcDhcp]    not modify any BMC network
 Current Configuration Address       DynamicAddressBmcDhcp parameters during BIOS phase
 source
 Station IP address                  100.2.73.153
 Subnet mask                         255.255.255.0
 Station MAC address                 6c-92-bf-e0-ab-e5
 Router IP address                   100.2.73.1

 BMC Dedicated Management Channel
 Configuration Address source        [Unspecified]       →←: Select Screen
 Current Configuration Address       DynamicAddressBmcDhcp ↑↓: Select Item
 source                                                  Enter: Select
 Station IP address                  0.0.0.0             +/-: Change Opt.
 Subnet mask                         0.0.0.0             F1: General Help
 Station MAC address                 6c-92-bf-e0-ab-e4   F2: Previous Values
 Router IP address                   0.0.0.0             F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit
```

The settings of BMC IPv6 network parameters are similar to this, which will be omitted here.

8.3 BIOS Parameter Description

8.3.1 Main

Main interface displays the basic information of BIOS system, including BIOS/BMC/ME version, CPU type, total memory capacity and system time.



```
         Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

  BIOS Information
  BIOS Vendor                          American Megatrends
  Core Version                         5.13
  Compliancy                           UEFI 2.7; PI 1.6
  BIOS Version                         3.5.1
  Build Date and Time                  11/25/2019 18:49:38
  Access Level                         Administrator

  Product Name                         N/A
  Serial Number                        N/A
  Customer ID                          N/A

  Processor Information
  Name                                 CoffeeLake DT                 →←: Select Screen
  Type                                 Intel(R) Xeon(R)              ↑↓: Select Item
                                       E-2146G CPU @ 3.50GHz         Enter: Select
  Speed                                3500 MHz                      +/-: Change Opt.
  ID                                   0x906EA                       F1: General Help
  Stepping                             U0                            F2: Previous Values
  Package                              LGA1151                       F3: Optimized Defaults
  Number of Processors                 6Core(s) / 12Thread(s)        F4: Save & Exit
  Microcode Revision                   C6                            ESC: Exit
  Memory RC Version                    0.7.1.100
  Total Memory                          8192 MB
  Memory Frequency                      2667 MHz

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```
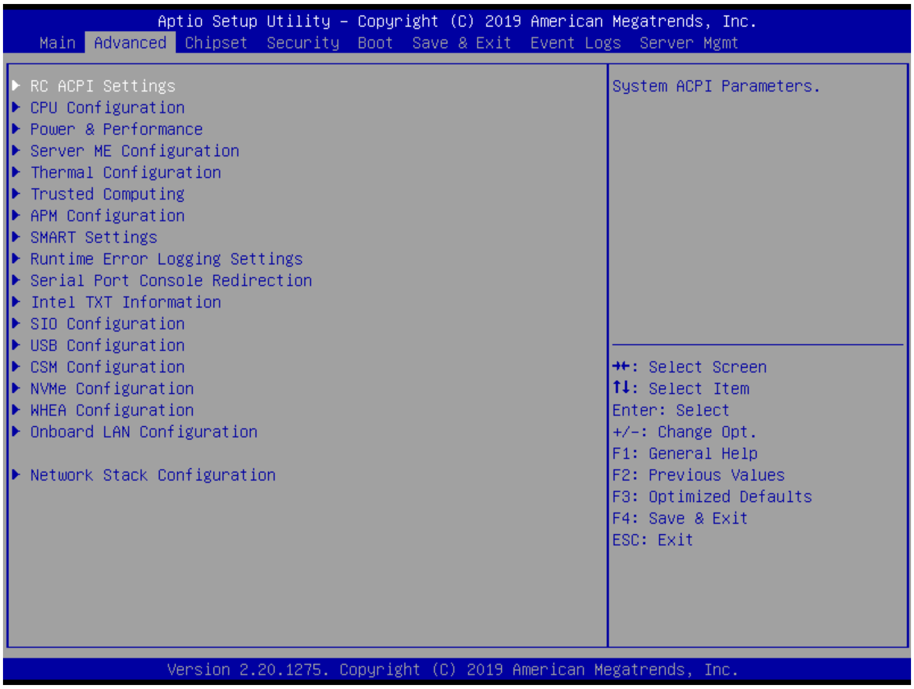

Interface Parameters	Function Description
BIOS Vendor	BIOS vendor
Core Version	UEFI core version
Compliancy	UEFI spec version
BIOS Version	BIOS version
Build Date and Time	Build date and time
Access Level	Current access level
Product Name	Product name
Serial Number	Serial number
Customer ID	Customer ID
Processor Information	Display the current CPU name, type, speed, ID, stepping, package, processor quantity and microcode version
Memory Information	Display the current total memory capacity, frequency and RC version
PCH Information	Display PCH name and SKU

BMC FW Version	Display BMC version
ME FW Version	Display ME version
System Date (Day mm/dd/yyyy)	Display and set system date Use [Tab] or [Enter] key to switch between system date and time, directly input the value or use +/- keys to change the value (Press + key, the value increases by 1, and press – key, the value decreases by 1)
System Time (hh/mm/ss)	Display and set system time Use [Tab] or [Enter] key to switch between system date and time, directly input the value or use +/- keys to change the value (Press + key, the value increases by 1, and press – key, the value decreases by 1)

8.3.2 Advanced

Advanced interface includes the BIOS system parameters and related function settings, such as ACPI, serial port, PCI subsystem, CSM, USB, onboard NIC and so on.



```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

▶ RC ACPI Settings                                    System ACPI Parameters.
▶ CPU Configuration
▶ Power & Performance
▶ Server ME Configuration
▶ Thermal Configuration
▶ Trusted Computing
▶ APM Configuration
▶ SMART Settings
▶ Runtime Error Logging Settings
▶ Serial Port Console Redirection
▶ Intel TXT Information
▶ SIO Configuration
▶ USB Configuration
▶ CSM Configuration                                   →←: Select Screen
▶ NVMe Configuration                                  ↑↓: Select Item
▶ WHEA Configuration                                  Enter: Select
▶ Onboard LAN Configuration                           +/-: Change Opt.
                                                      F1: General Help
▶ Network Stack Configuration                         F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

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```
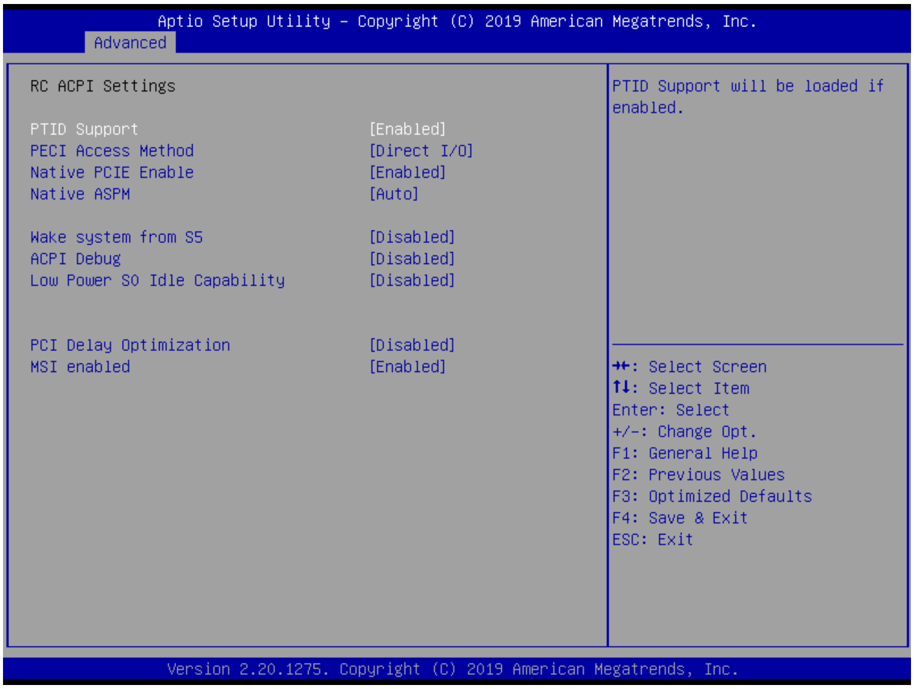

Interface Parameters	Function Description
RC ACPI Setting	System ACPI parameters
CPU Configuration	CPU configuration parameters
Power & Performance	Power & Performance options
Server ME Configuration	Server ME configuration
Thermal Configuration	Thermal configuration parameters

Trusted Computing	Trusted computing setting
APM Configuration	Advanced power management
SMART Setting	System SMART setting
Runtime Error Logging Settings	Runtime error logging settings
Serial Port Console Redirection	Serial port console redirection
Intel TXT Information	Display Intel TXT information
SIO Configuration	SIO 6796 configuration
USB Configuration	USB configuration parameters
CSM Configuration	CSM configuration: Enabled/Disabled, Option ROM execution settings, etc.
MVMe Configuration	NVMe device options settings
WHEA Configuration	General WHEA configuration
Onboard LAN Configuration	Onboard LAN configuration
Network Stack Configuration	Network stack settings

8.3.2.1 RC ACPI Settings

This option is used to set ACPI parameters.



```
                Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced
  RC ACPI Settings                                      PTID Support will be loaded if
                                                        enabled.
  PTID Support                  [Enabled]
  PECI Access Method            [Direct I/O]
  Native PCIE Enable            [Enabled]
  Native ASPM                   [Auto]

  Wake system from S5           [Disabled]
  ACPI Debug                    [Disabled]
  Low Power S0 Idle Capability  [Disabled]


  PCI Delay Optimization        [Disabled]
  MSI enabled                   [Enabled]               →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```
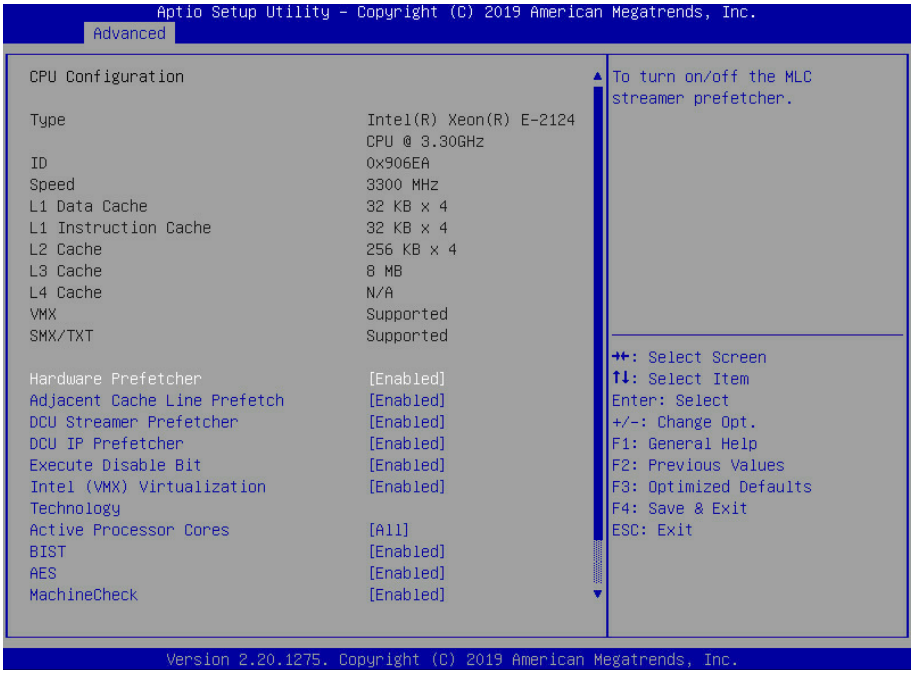

Interface Parameters	Function Description	Default Value
PTID	To load PTID support, if enabled. Options include: Enabled Disabled	Enabled
PECI Access Method	Set PECI access method to Direct I/O or ACPI. Options include: Direct I/O ACPI	Direct I/O
Native PCIE Enable	These features are defined in the PCI Express basic specifications and controlled by the operating system through the ACPI _OSC method. Options include: Enabled Disabled	Enabled
Native ASPM	Enabled - OS controls ASPM. Disabled - BIOS controls ASPM. Options include: Auto Enabled Disabled	Auto
Wake system from S5	Enable/Disable system wake-up alarm event. Options include: Enabled Disabled	Disabled
ACPI Debug	Open the memory buffer where debug strings are stored. Options include: Enabled Disabled	Disabled
Low Power S0 Idle Capability	This variable determines whether the ACPI low-power S0 idle capability is enabled. Options include: Enabled Disabled	Disabled
PCI Delay Optimization	ACPI addition used for FW delay optimization. Options include: Enabled Disabled	Disabled
MSI enabled	When disabled, MSI support will be disabled in FADT. Options include: Enabled Disabled	Enabled

8.3.2.2 CPU Configuration

This option is used to set CPU parameters.



```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
        Advanced
 CPU Configuration                                    ▲ To turn on/off the MLC
                                                        streamer prefetcher.
 Type                                 Intel(R) Xeon(R) E-2124
                                      CPU @ 3.30GHz
 ID                                   0x906EA
 Speed                                3300 MHz
 L1 Data Cache                        32 KB x 4
 L1 Instruction Cache                 32 KB x 4
 L2 Cache                             256 KB x 4
 L3 Cache                             8 MB
 L4 Cache                             N/A
 VMX                                  Supported
 SMX/TXT                              Supported
                                                        →←: Select Screen
 Hardware Prefetcher                  [Enabled]         ↑↓: Select Item
 Adjacent Cache Line Prefetch         [Enabled]         Enter: Select
 DCU Streamer Prefetcher              [Enabled]         +/-: Change Opt.
 DCU IP Prefetcher                    [Enabled]         F1: General Help
 Execute Disable Bit                  [Enabled]         F2: Previous Values
 Intel (VMX) Virtualization           [Enabled]         F3: Optimized Defaults
 Technology                                             F4: Save & Exit
 Active Processor Cores               [All]             ESC: Exit
 BIST                                 [Enabled]
 AES                                  [Enabled]
 MachineCheck                         [Enabled]       ▼

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```
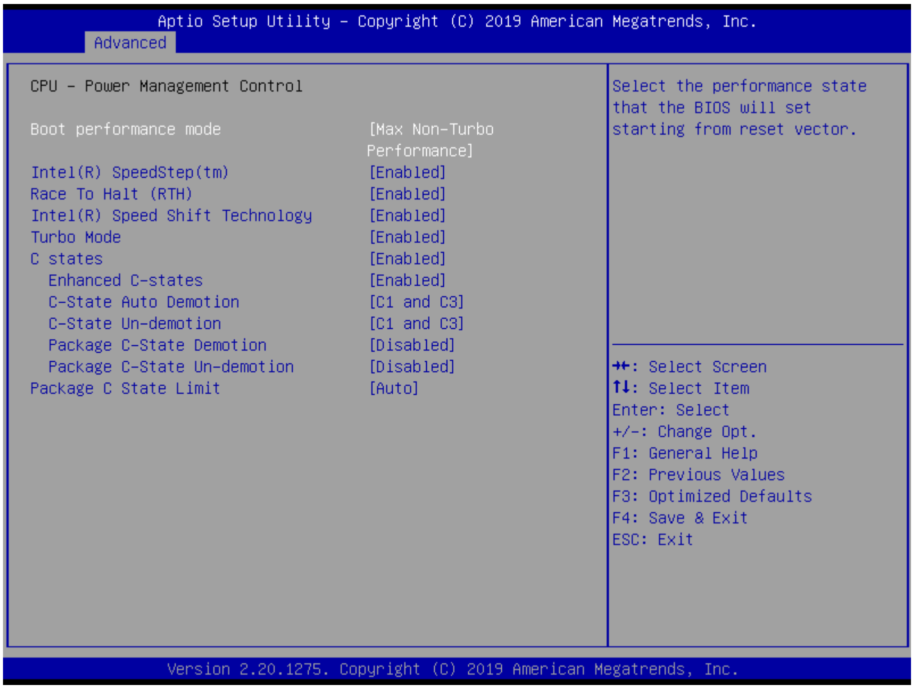

Interface Parameters	Function Description	Default Value
Processor Information	Processor information submenu, the processor's detailed information	----
Hardware Prefetcher	Hardware prefetcher on-off settings. Options include: Enabled Disabled Before CPU processing instructions or data, it will prefetch these instructions or data from memory to L2 cache, to shorten the amount of time that reading memory takes, to help eliminate potential bottlenecks and to improve system performance.	Enabled
Adjacent Cache Line Prefetch	Adjacent cache prefetch on-off settings. Options include: Enabled Disabled If this function is enabled, during computer data reading, it will intelligently consider the adjacent data is needed as well, and it will prefetch these data during processing, to speed up the reading process.	Enabled
DCU Streamer Prefetcher	DCU streamer prefetcher on-off settings. Options include: Enabled Disabled This function can prefetch CPU data to shorten the data reading time.	Enabled
DCU IP Prefectcher	DCU IP prefectcher on-off settings. Options include: Enabled Disabled This function can judge whether there is data to prefetch, to shorten the data reading time.	Enabled

Execute Disable Bit	Execute disable bit on-off setting. Options include: Enabled Disabled	Enabled
Intel (VMX) Virtualization Technology	Intel virtual machine extensions technology on-off settings. Options include: Enabled Disabled	Enabled
Active Processors Cores	CPU core settings. Enter the number of CPU cores to be enabled. In the help information, it will display the valid values you can set and the maximum number of physical cores based on the current CPU usage. The default is 0, which enables all cores.	0
Hyper Threading	Hyper threading technology on-off settings. Options include: Enabled Disabled	Enabled
BIST	Build-in Self-test. Options include: Enabled Disabled When the system is reset, the CPU performs a self-test.	Enabled
AES	AES instruction on-off settings. Options include: Enabled Disabled This menu mainly controls whether the CPU supports AES instruction. These instructions are mainly used for system virtualization. Enable this instruction, system performance will be improved.	Enabled
Machine Check	Machine check. Options include: Disabled Enabled Machine check exception is an error detected by the CPU.	Enabled
MonitorMwait	Support Monitor and Mwait instructions. Options include: Disabled Enabled When the CPU is idle, the CPU using Monitor and Mwait instructions will consume less power.	Enabled
Intel Trusted Execution Technology	Intel trusted execution technology on-off settings. Options include: Disabled Enabled	Disabled
Reset AUX Content	Reset TPM auxiliary content. Options include: Yes No	No

8.3.2.3 Power & Performance Configuration

This option is used to set the system Power and Performance parameters.



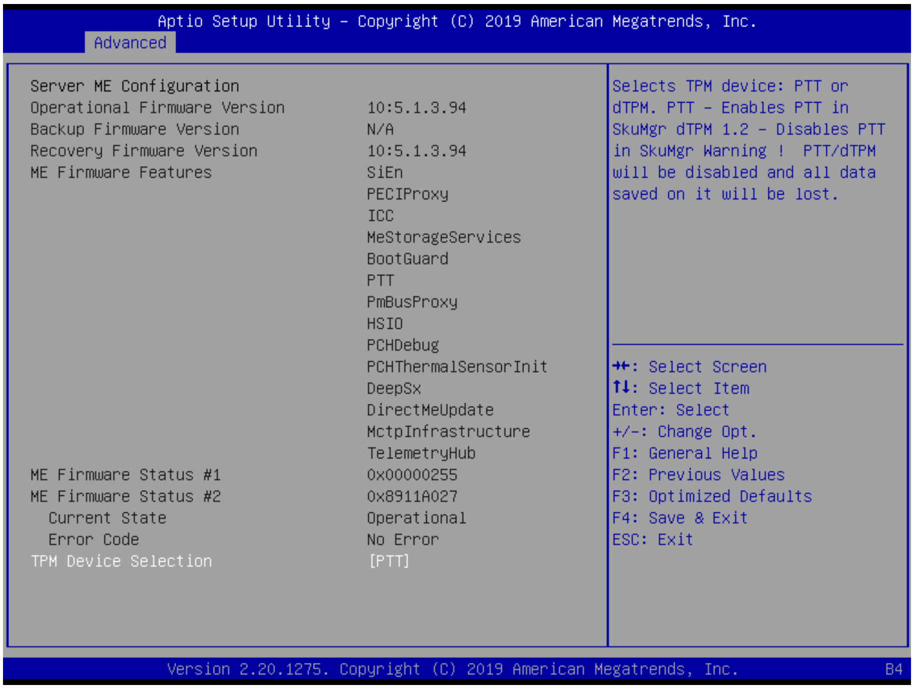
```
       Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced
 CPU – Power Management Control                        | Select the performance state
                                                       | that the BIOS will set
 Boot performance mode              [Max Non-Turbo     | starting from reset vector.
                                    Performance]       |
 Intel(R) SpeedStep(tm)             [Enabled]          |
 Race To Halt (RTH)                 [Enabled]          |
 Intel(R) Speed Shift Technology    [Enabled]          |
 Turbo Mode                         [Enabled]          |
 C states                           [Enabled]          |
   Enhanced C-states                [Enabled]          |
   C-State Auto Demotion            [C1 and C3]        |
   C-State Un-demotion              [C1 and C3]        |
   Package C-State Demotion         [Disabled]         |
   Package C-State Un-demotion      [Disabled]         | →←: Select Screen
 Package C State Limit              [Auto]             | ↑↓: Select Item
                                                       | Enter: Select
                                                       | +/-: Change Opt.
                                                       | F1: General Help
                                                       | F2: Previous Values
                                                       | F3: Optimized Defaults
                                                       | F4: Save & Exit
                                                       | ESC: Exit
        Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Boot performance mode	Select performance state, BIOS will start setting from reset vector. Options include: Max Battery Max Non-Turbo Performance Turbo Performance	Max Non-Turbo Performance
Intel® SpeedStep™	More than two frequency ranges are supported. Options include: Disabled Enabled	Enabled
Race to Halt (RTH)	Enable/Disable the RTH function. RTH will dynamically increase the CPU frequency to enter the package C state faster to reduce the total power. Options include: Disabled Enabled	Enabled
Intel® Speed Shift Technology	Enable/Disable the Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow hardware to control the P-state. Options include: Disabled Enabled	Enabled
Turbo Mode	Enable/Disable the processor turbo mode. This feature requires that Intel® SpeedStep or Speed Shift be provided and enabled. Options include: Disabled Enabled	Enabled

C States	Allows the CPU to enter the C state when it is not 100% utilized. Options include: Disabled Enabled	Enabled
Enhanced C-states	When enabled, the CPU will switch to the lowest speed when all cores enter the C state. Options include: Disabled Enabled	Enabled
C-State Auto Demotion	Configure C-state auto demotion. Options include: Disabled C1 C3 C1 and C3	C1 and C3
C-State Un-demotion	Configure C-state un-demotion. Options include: Disabled C1 C3 C1 and C3	C1 and C3
Package C-State Demotion	Configure package C-state demotion. Options include: Disabled Enabled	Disabled
Package C-State Un-demotion	Configure package C-state un-demotion. Options include: Disabled Enabled	Disabled
Package C State Limit	Maximum package C state limit setting. Options include: C0/C1 C2 C3 C6 C7 C7S C8 C9 C10 CPU Default Auto	Auto

8.3.2.4 Server ME Configuration

Server ME Configuration interface is used to display and set the options related with server ME configuration.

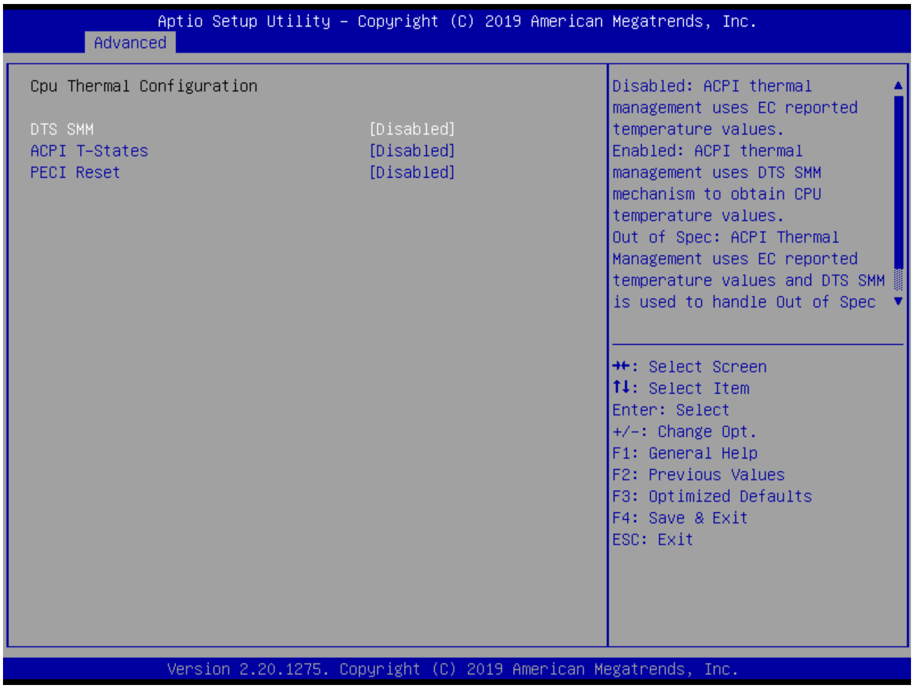


```
                Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
      Advanced
  Server ME Configuration                                  Selects TPM device: PTT or
  Operational Firmware Version       10:5.1.3.94           dTPM. PTT – Enables PTT in
  Backup Firmware Version            N/A                   SkuMgr dTPM 1.2 – Disables PTT
  Recovery Firmware Version          10:5.1.3.94           in SkuMgr Warning !  PTT/dTPM
  ME Firmware Features               SiEn                  will be disabled and all data
                                     PECIProxy             saved on it will be lost.
                                     ICC
                                     MeStorageServices
                                     BootGuard
                                     PTT
                                     PmBusProxy
                                     HSIO
                                     PCHDebug
                                     PCHThermalSensorInit  ↔: Select Screen
                                     DeepSx                ↑↓: Select Item
                                     DirectMeUpdate        Enter: Select
                                     MctpInfrastructure    +/-: Change Opt.
                                     TelemetryHub          F1: General Help
  ME Firmware Status #1              0x00000255            F2: Previous Values
  ME Firmware Status #2              0x8911A027            F3: Optimized Defaults
    Current State                    Operational           F4: Save & Exit
    Error Code                       No Error              ESC: Exit
  TPM Device Selection               [PTT]

               Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.          B4
```

Interface Parameters	Function Description	Default Value
Operational Firmware Version	Operational ME firmware version	----
Recovery Firmware Version	Recovery ME firmware version	----
ME Firmware Features	ME FW features	----
ME Firmware Status #1	ME FW status value #1	----
ME Firmware Status #2	ME FW status value #2	----
Current State	Current state	----
Error Code	ME FW error code	----
TPM Device Selection	Selects TPM device Options include: dTPM PTT	PTT

8.3.2.5 Thermal Configuration

This option is used to set the system thermal.



```
             Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced
 Cpu Thermal Configuration                           Disabled: ACPI thermal
                                                     management uses EC reported
 DTS SMM                             [Disabled]      temperature values.
 ACPI T-States                       [Disabled]      Enabled: ACPI thermal
 PECI Reset                          [Disabled]      management uses DTS SMM
                                                     mechanism to obtain CPU
                                                     temperature values.
                                                     Out of Spec: ACPI Thermal
                                                     Management uses EC reported
                                                     temperature values and DTS SMM
                                                     is used to handle Out of Spec

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

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```
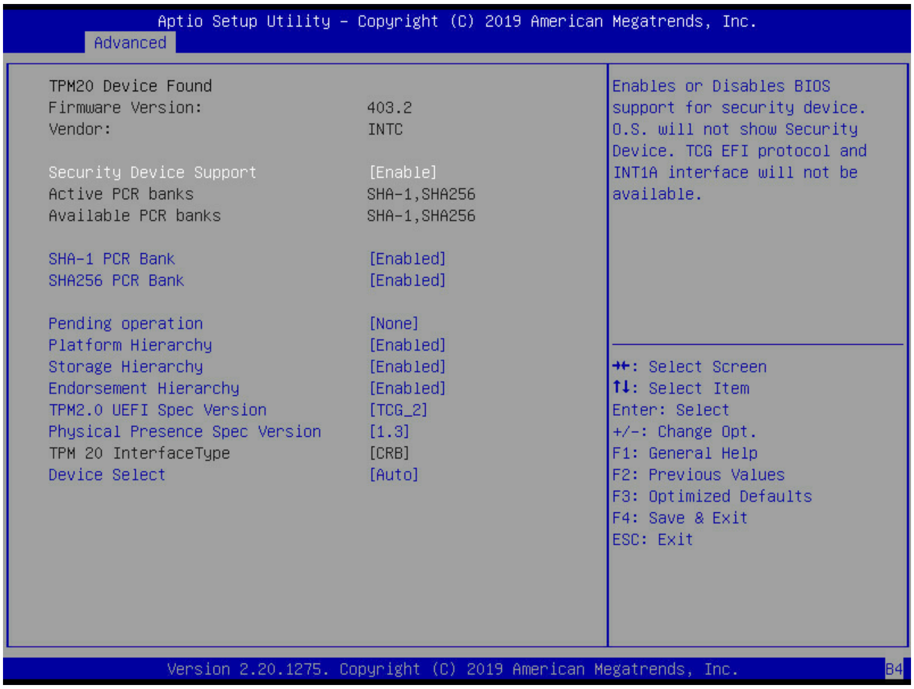

Interface Parameters	Function Description	Default Value
DTS SMM	Use the CPU temperature value reported by DTS SMM or EC. Options include: Disabled Enabled Critical temperature report (not meet specifications)	Disabled
ACPI T-States	Enable/Disable ACPI T state. Options include: Disabled Enabled	Disabled
PECI Reset	Enabling will trigger a PECI reset during boot to resolve rare Sx PECI issues. Options include: Disabled Enabled	Disabled

8.3.2.6 Trusted Computing

Trusted Computing interface describes how to configure security device support.



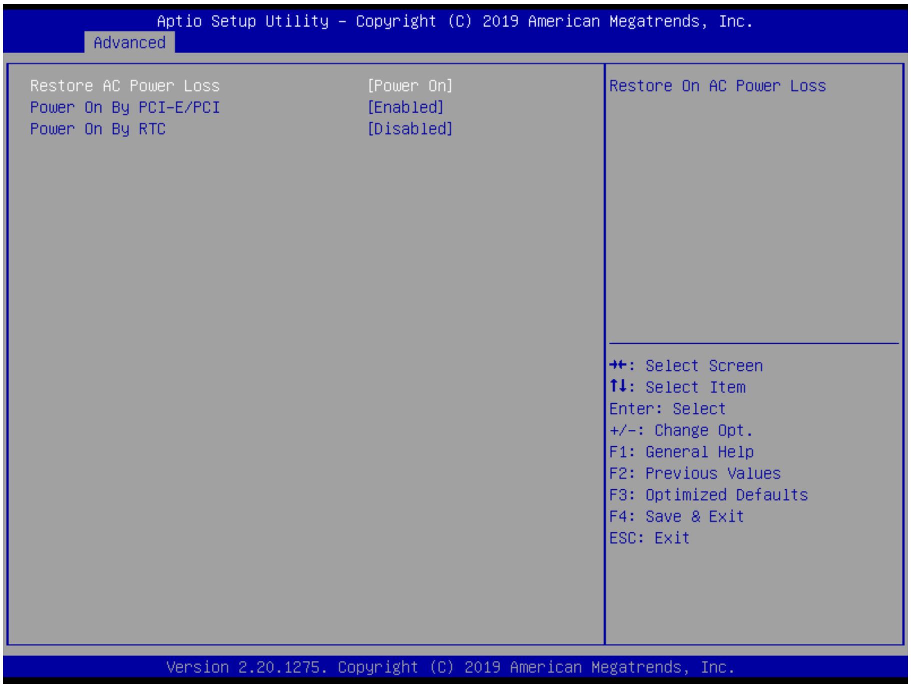
```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
      Advanced
    TPM20 Device Found                                    Enables or Disables BIOS
    Firmware Version:                403.2                support for security device.
    Vendor:                          INTC                 O.S. will not show Security
                                                          Device. TCG EFI protocol and
    Security Device Support          [Enable]             INT1A interface will not be
    Active PCR banks                 SHA-1,SHA256         available.
    Available PCR banks              SHA-1,SHA256

    SHA-1 PCR Bank                   [Enabled]
    SHA256 PCR Bank                  [Enabled]

    Pending operation                [None]
    Platform Hierarchy               [Enabled]
    Storage Hierarchy                [Enabled]            →←: Select Screen
    Endorsement Hierarchy            [Enabled]            ↑↓: Select Item
    TPM2.0 UEFI Spec Version         [TCG_2]              Enter: Select
    Physical Presence Spec Version   [1.3]                +/-: Change Opt.
    TPM 20 InterfaceType             [CRB]                F1: General Help
    Device Select                    [Auto]               F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.       B4
```

Interface Parameters	Function Description	Default Value
Security Device Support	Security device support settings. Options include: Enabled Disabled BIOS supports TPM TCG version 1.2/2.0. BIOS supports TPM module through TPM software binding, when the verification of software binding fails, BIOS will record the error to SEL.	Enabled
SHA-1 PCR Bank	Enable/Disable SHA-1 PCR bank. Options include: Enabled Disabled	Enabled
SHA256 PCR Bank	Enable/Disable SHA256 bank. Options include: Enabled Disabled	Enabled
Pending operation	Pending operation of the safety device. Note: During the restart, your computer will change the status of the security device. Options include: None TPM Clear	None
Platform Hierarchy	Enable/Disable platform hierarchy. Options include: Enabled Disabled	Enabled
Storage Hierarchy	Enable/Disable storage hierarchy. Options include: Enabled Disabled	Enabled
Endorsement Hierarchy	Enable/Disable endorsement hierarchy. Options include: Enabled Disabled	Enabled

TPM2.0 UEFI Spec Version	Select the TCG2 specification version. TCG_1_2: win8/win10 compatibility mode. TCG_2: Supports the new TCG2 protocol and the event format of win10 or higher. Options include: TCG_1_2 TCG_2	TCG_2
Physical Presence Spec Version	Select the physical presence specification version. Select this option to tell the operating system to support the PPI specification version 1.2 or 1.3. Options include: 1.2 1.3	1.3
Device Select	TPM 1.2 will limit support for TPM 1.2 devices; TPM 2.0 will limit support for TPM 2.0 devices; Auto will also support the default setting, that if TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated. Options include: TPM 1.2 TPM 2.0 Auto	Auto

8.3.2.7 APM Configuration

This option is used to set the system's wakeup mode and sleep mode.

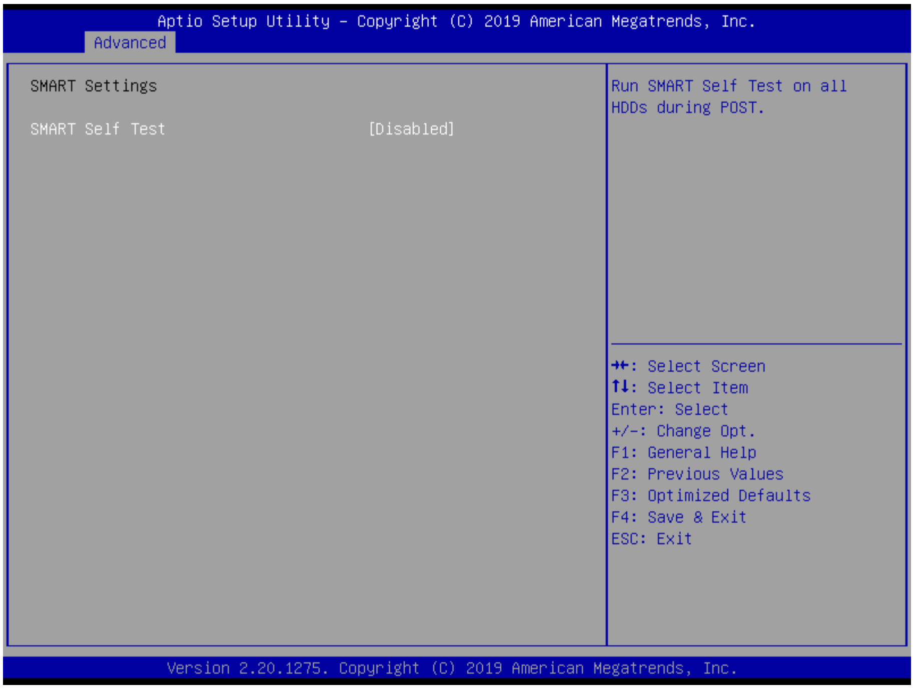


```
           Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced
  Restore AC Power Loss                [Power On]        Restore On AC Power Loss
  Power On By PCI-E/PCI                [Enabled]
  Power On By RTC                      [Disabled]

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

              Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Restore AC Power Loss	If set to [Power Off], the system will remain off when the system restores on AC power loss. If set to [Power On], the system will be on after the power is interrupted. If set to [Last State], the system settings will be restored to the state before the power was interrupted.	[Power On]
Power On By PCI-E/PCI	[Disabled] Disable wakeup events caused by PCIE devices. [Enabled] Enable the wakeup event caused by PCIE device.	[Enabled]
Power On By RTC	[Disabled] Disable the wakeup event caused by RTC. [Enabled] When set to [Enabled], the RTC Alarm Date (Days) and Hour/Minute/Second options allow the user to set the desired value.	[Disabled]

8.3.2.8 SMART Settings

This option is used to set the SMART Self Test.



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

SMART Settings                                  Run SMART Self Test on all
                                                HDDs during POST.
SMART Self Test             [Disabled]

                                                →←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit

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```
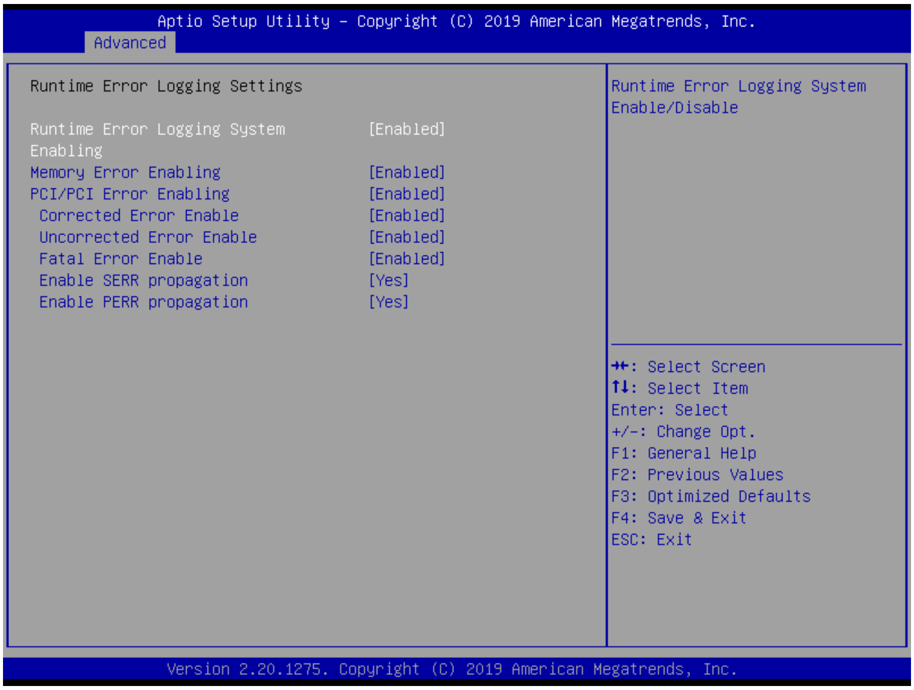

Interface Parameters	Function Description	Default Value
SMART Self Test	Run SMART on all hard drives during POST. Options include: Disabled Enabled	Disabled

8.3.2.9 Runtime Error Logging Settings

Runtime Error Logging interface is used to set the runtime error logs.



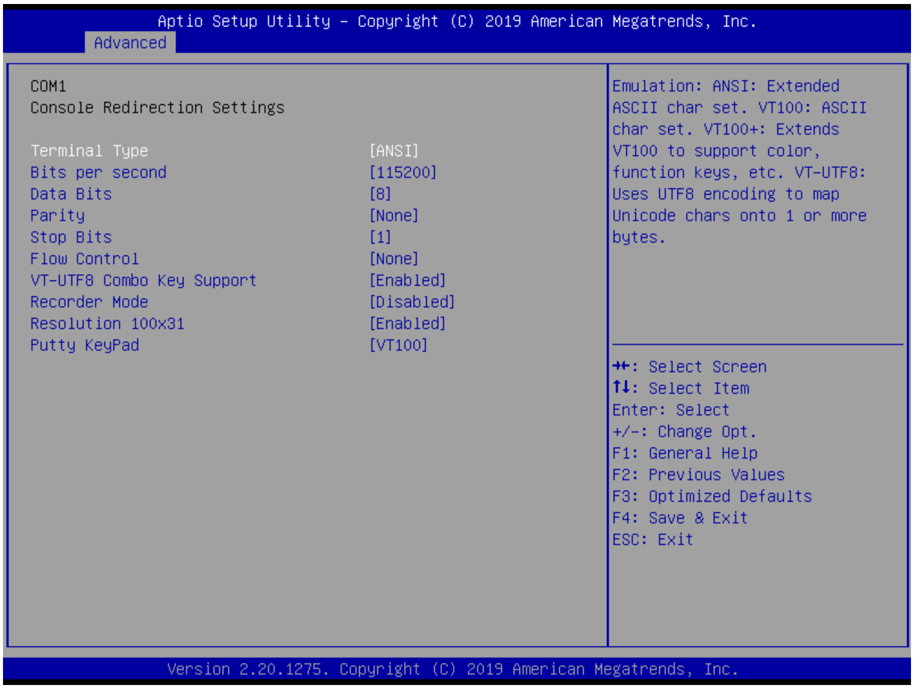
```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
        Advanced

 Runtime Error Logging Settings                          Runtime Error Logging System
                                                         Enable/Disable
 Runtime Error Logging System          [Enabled]
 Enabling
 Memory Error Enabling                 [Enabled]
 PCI/PCI Error Enabling                [Enabled]
  Corrected Error Enable               [Enabled]
  Uncorrected Error Enable             [Enabled]
  Fatal Error Enable                   [Enabled]
  Enable SERR propagation              [Yes]
  Enable PERR propagation              [Yes]

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

        Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Runtime Error Logging System Enabling	Enable/Disable runtime error logging system. Options include: Enabled Disabled	Enabled
Memory Error Enabling	Enable/Disable memory error logging. Options include: Enabled Disabled	Enabled
PCI/PCIE Error Enabling	PCI/PCIE error enabling setting. After enabling this function, you can configure error options under PCIE. Options include: Enabled Disabled	Enabled
Corrected Error Enable	Enable/Disable PCI corrected error logging. Options include: Enabled Disabled	Enabled
Uncorrected Error Enable	Enable/Disable PCI uncorrected error logging. Options include: Enabled Disabled	Enabled
Fatal Error Enable	Enable/Disable PCI fatal error logging. Options include: Enabled Disabled	Enabled
Enable SERR propagation	Whether to enable the SERR propagation function. Options include: Yes No	Yes
Enable PERR propagation	Whether to enable the PERR propagation function. Options include: Yes No	Yes

8.3.2.10 Serial Port Console Redirection

This option is used to set the console redirection function.

Console Redirection Settings:



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

COM1                                                Emulation: ANSI: Extended
Console Redirection Settings                        ASCII char set. VT100: ASCII
                                                    char set. VT100+: Extends
Terminal Type                     [ANSI]            VT100 to support color,
Bits per second                   [115200]          function keys, etc. VT-UTF8:
Data Bits                         [8]               Uses UTF8 encoding to map
Parity                            [None]            Unicode chars onto 1 or more
Stop Bits                         [1]               bytes.
Flow Control                      [None]
VT-UTF8 Combo Key Support         [Enabled]
Recorder Mode                     [Disabled]
Resolution 100x31                 [Enabled]
Putty KeyPad                      [VT100]           →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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```
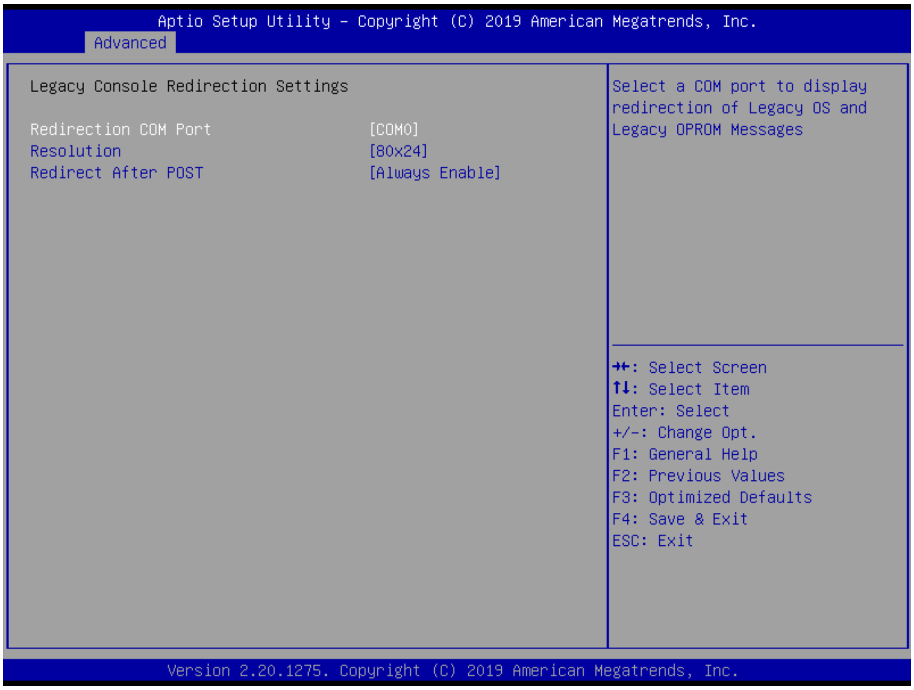

Interface Parameters	Function Description	Default Value
Terminal Type	Terminal type settings. Options include: VT100 VT100+ VT-UTF8 ANSI	ANSI
Bits per second	Baud rate settings. Options include: 9600 19200 38400 57600 115200	115200
Data Bits	Serial port data width settings. Options include: 7 8	8
Parity	Parity settings. Options include: None Even Odd Mark (odd-even check) Space (storage parity check)	None

Stop Bits	Stop bit settings. Options include: 1 2	1
Flow Control	Flow control settings. Options include: None Hardware RTS/CTS	None
VT-UTF8 Combo Key Support	VT-UTF8 combination key support on-off settings. Options include: Enabled Disabled	Enabled
Recorder Mode	Recorder mode on-off settings. Options include: Enabled Disabled	Disabled
Redirection 100×31	Expanded redirection resolution 100×31 on-off settings. Options include: Enabled Disabled	Enabled
Putty KeyPad	Putty function keys and keyboard settings. Options include: VT100 LINUX XTERMR6 SCO ESCN VT400	VT100

Legacy Console Redirection Settings:

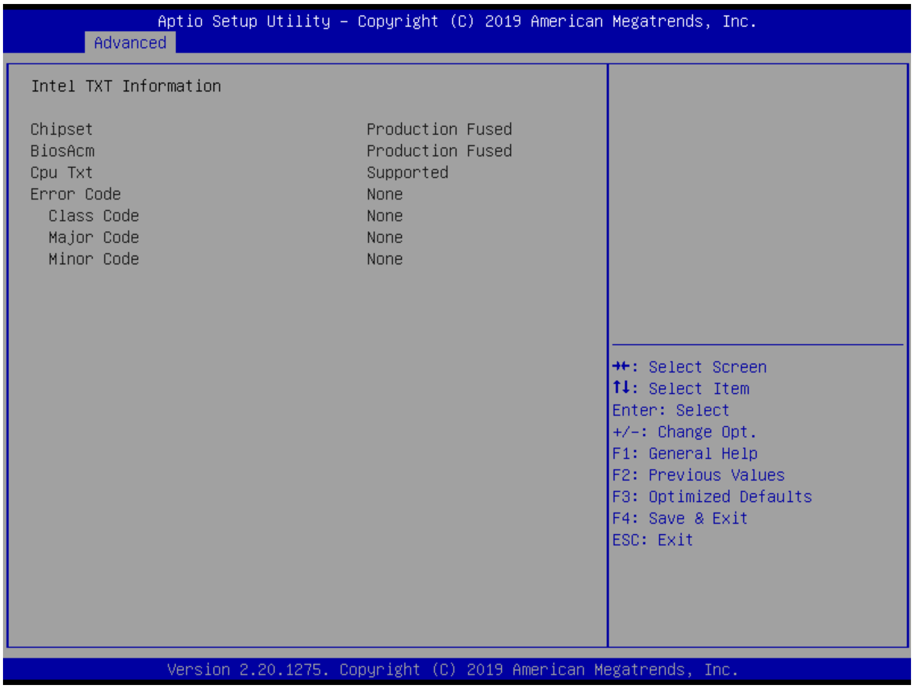


```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
          Advanced
  Legacy Console Redirection Settings                          Select a COM port to display
                                                               redirection of Legacy OS and
  Redirection COM Port                    [COM0]               Legacy OPROM Messages
  Resolution                              [80x24]
  Redirect After POST                     [Always Enable]

                                                               →←: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit

            Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Redirection COM Port	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages. Options include: COM0 COM1	COM0
Resolution	Legacy OS redirection resolution settings. Options include: 80×24 80×25	80 x 24
Redirect After POST	Redirection after BIOS POST settings. Options include: Always Enable BootLoader	Always Enable

8.3.2.11 Intel TXT Information

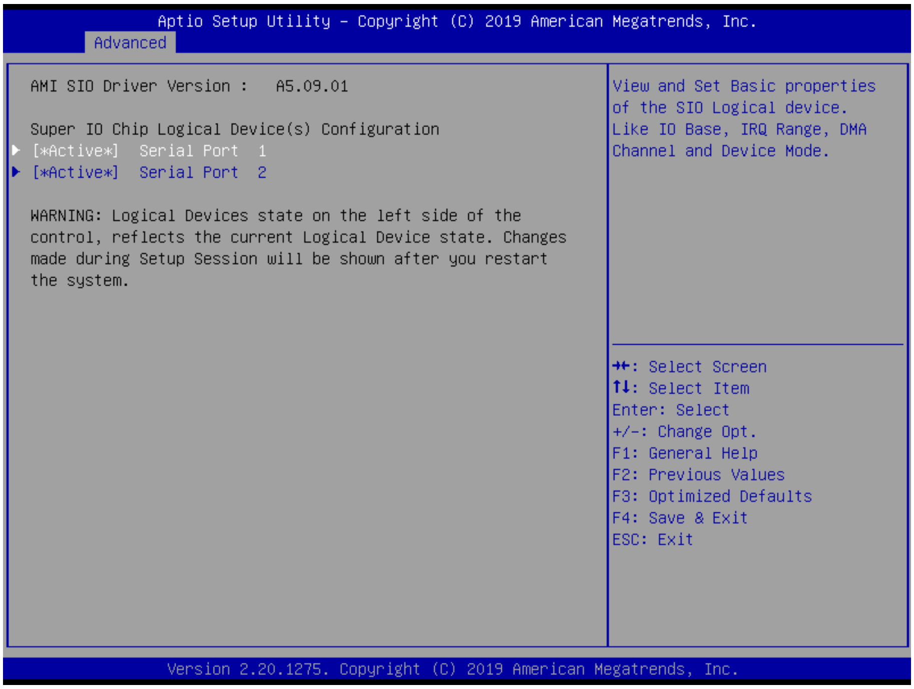
Intel Trusted Execute Technology information



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

Intel TXT Information

Chipset                               Production Fused
BiosAcm                               Production Fused
Cpu Txt                               Supported
Error Code                            None
  Class Code                          None
  Major Code                          None
  Minor Code                          None

Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

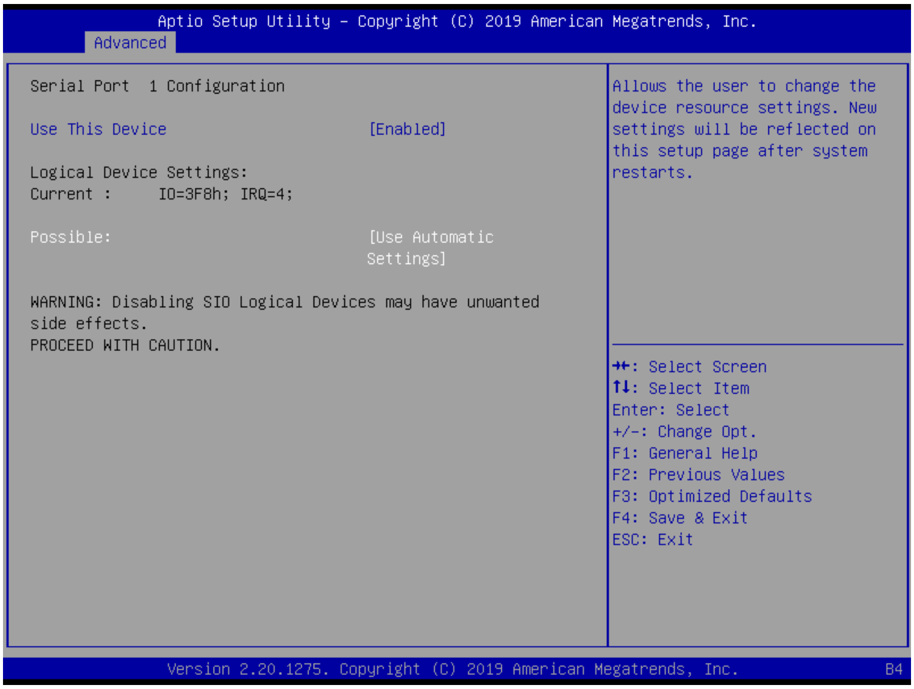
8.3.2.12 SIO Configuration

This option is used to set the system Super IO chip.



```
                Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
        Advanced

  AMI SIO Driver Version :   A5.09.01                     View and Set Basic properties
                                                          of the SIO Logical device.
  Super IO Chip Logical Device(s) Configuration           Like IO Base, IRQ Range, DMA
▶ [*Active*]  Serial Port  1                              Channel and Device Mode.
▶ [*Active*]  Serial Port  2

  WARNING: Logical Devices state on the left side of the
  control, reflects the current Logical Device state. Changes
  made during Setup Session will be shown after you restart
  the system.
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

           Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
[*Active*] Serial Port 1/2	View and set the basic performance of SIO logical devices.	----



```
                Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
        Advanced

  Serial Port  1 Configuration                            Allows the user to change the
                                                          device resource settings. New
  Use This Device                    [Enabled]            settings will be reflected on
                                                          this setup page after system
  Logical Device Settings:                                restarts.
  Current :     IO=3F8h; IRQ=4;

  Possible:                          [Use Automatic
                                     Settings]

  WARNING: Disabling SIO Logical Devices may have unwanted
  side effects.
  PROCEED WITH CAUTION.
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```
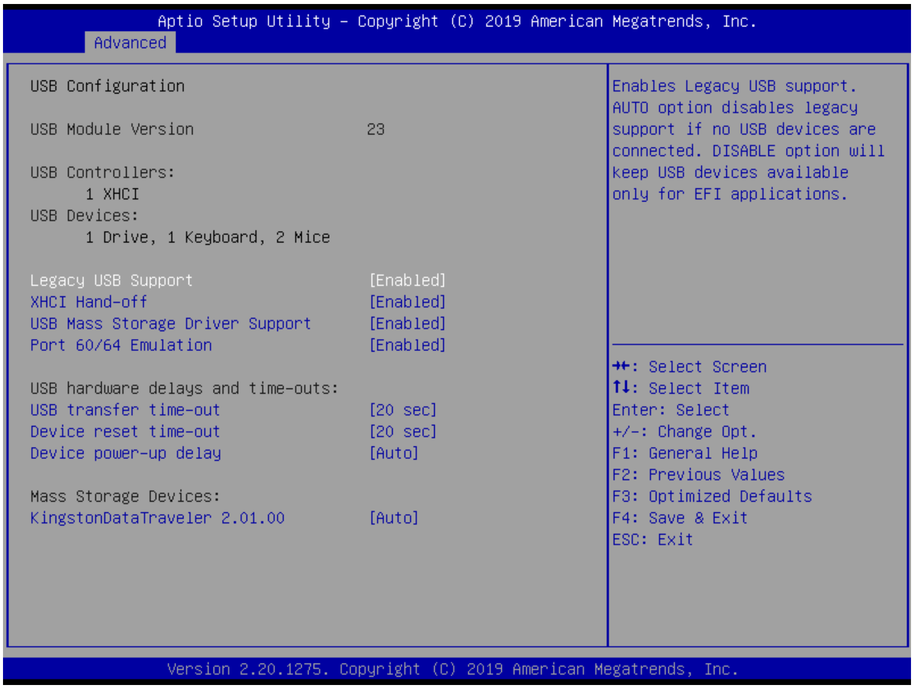

Interface Parameters	Function Description	Default Value
Use This Device	Enable/Disable the logical device.	Enabled
Possible	Change device resource settings. [Use Automatic Settings] [IO=3F8h; IRQ=4; DMA;] [IO=3F8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;] [IO=2F8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;] [IO=3E8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;] [IO=2E8h; IRQ=3, 4, 5, 7, 9, 10, 11, 12; DMA;]	[IO=3F8h; IRQ=4; DMA;]

8.3.2.13 USB Configuration

This option is used to change the settings related with the USB devices.



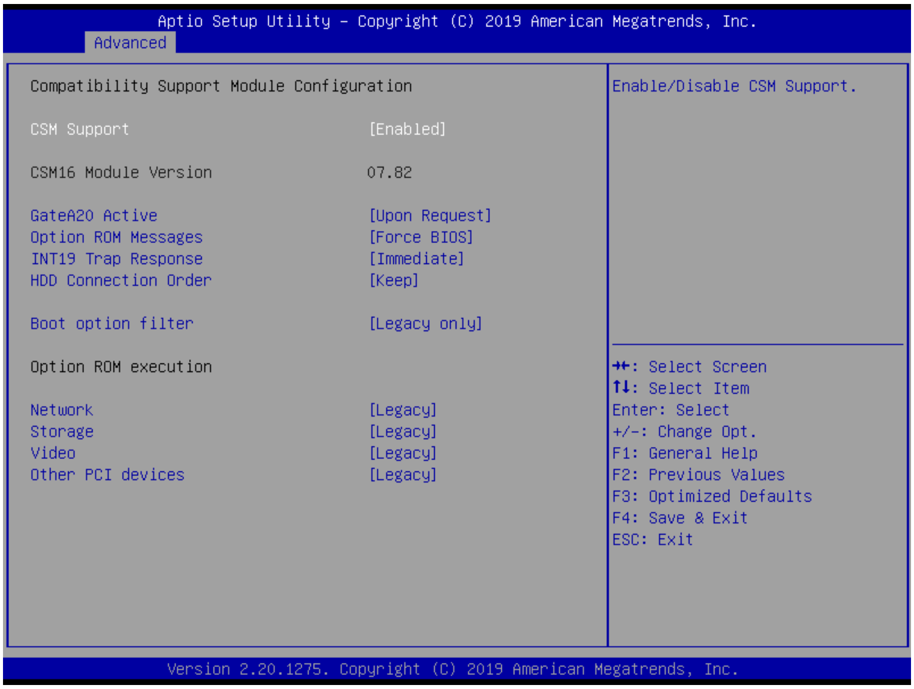
```
              Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced

 USB Configuration                                    Enables Legacy USB support.
                                                      AUTO option disables legacy
 USB Module Version                    23             support if no USB devices are
                                                      connected. DISABLE option will
 USB Controllers:                                     keep USB devices available
       1 XHCI                                         only for EFI applications.
 USB Devices:
       1 Drive, 1 Keyboard, 2 Mice

 Legacy USB Support                    [Enabled]
 XHCI Hand-off                         [Enabled]
 USB Mass Storage Driver Support       [Enabled]
 Port 60/64 Emulation                  [Enabled]
                                                      →←: Select Screen
 USB hardware delays and time-outs:                   ↑↓: Select Item
 USB transfer time-out                 [20 sec]       Enter: Select
 Device reset time-out                 [20 sec]       +/-: Change Opt.
 Device power-up delay                 [Auto]         F1: General Help
                                                      F2: Previous Values
 Mass Storage Devices:                                F3: Optimized Defaults
 KingstonDataTraveler 2.01.00          [Auto]         F4: Save & Exit
                                                      ESC: Exit

           Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Legacy USB Support	Enable/Disable legacy USB support. Options include: Enabled Disabled Auto	Enabled
XHCI Hand-off	This is a workaround for some OS. Options include: Enabled Disabled	Enabled
USB Mass Storage Driver Support	Enable/Disable USB mass storage driver support. Options include: Disabled Enabled	Enabled

Port 60/64 Emulation	This should be enabled for the complete USB keyboard legacy support for non-USB aware OS. Options include: Disabled Enabled	Enabled
USB transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers. Options include: 1 sec 5 sec 10 sec 20 sec	20 sec
Device reset time-out	USB mass storage device Start Unit command time-out. Options include: 10 sec 20 sec 30 sec 40 sec	20 sec
Device power-up delay	Maximum time the device will take before it properly reports itself to the Host Controller. Options include: Auto Manual	Auto

8.3.2.14 CSM Configuration

This option is used to set the compatibility support module to support various VGA, boot devices, and other devices for better compatibility.



```
              Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced

  Compatibility Support Module Configuration            Enable/Disable CSM Support.

  CSM Support                          [Enabled]

  CSM16 Module Version                 07.82

  GateA20 Active                       [Upon Request]
  Option ROM Messages                  [Force BIOS]
  INT19 Trap Response                  [Immediate]
  HDD Connection Order                 [Keep]

  Boot option filter                   [Legacy only]

  Option ROM execution                                  →←: Select Screen
                                                        ↑↓: Select Item
  Network                              [Legacy]         Enter: Select
  Storage                              [Legacy]         +/-: Change Opt.
  Video                                [Legacy]         F1: General Help
  Other PCI devices                    [Legacy]         F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```
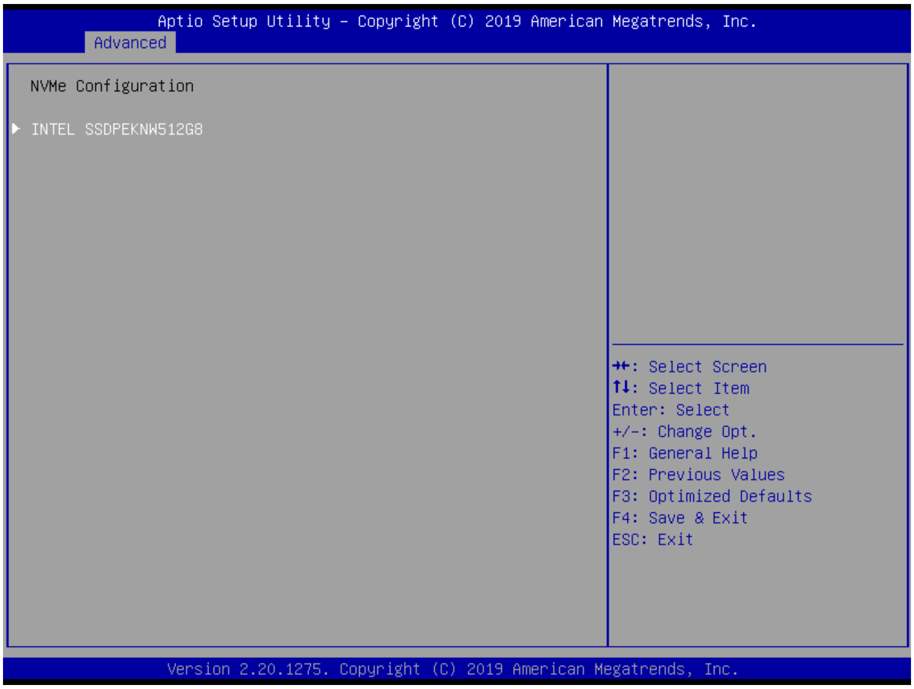
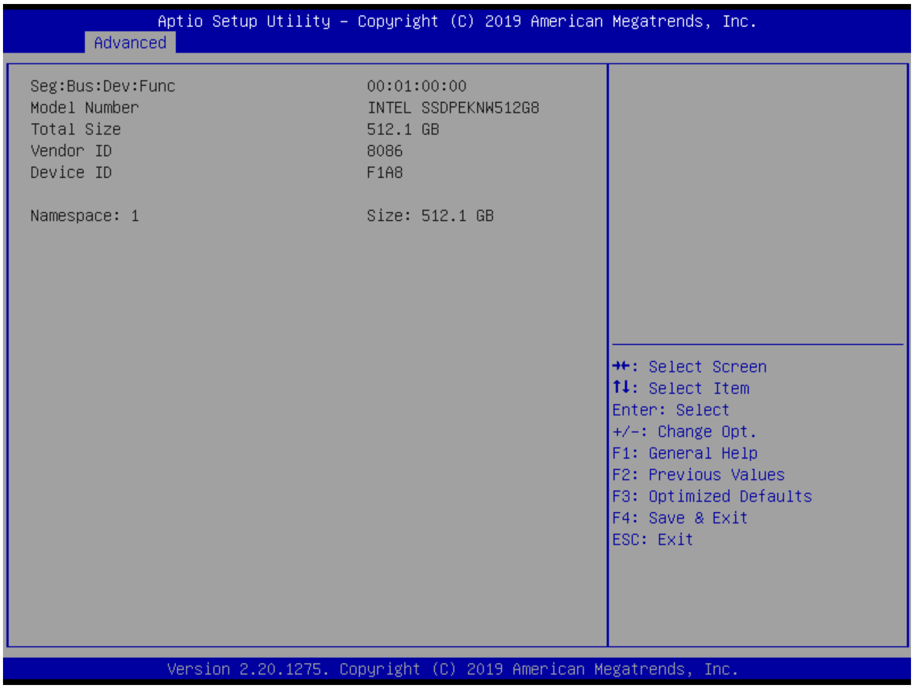

Interface Parameters	Function Description	Default Value
CSM Support	CSM support on-off settings. Options include: Enabled Disabled	Enabled
GateA20 Active	A20 line control mode settings. Options include: Upon Request Always A20 is an address line, which controls the system how to access the memory space larger than 1MB.	Upon Request
Option ROM Message	Third-party ROM information display settings. Options include: Force BIOS: During the boot process, the third-party ROM information will be forcibly displayed. Keep Current: The third-party ROM information is displayed only when the device is set to display ROM information by a third-party manufacturer.	Force BIOS
INT19 Trap Response	Interrupt/Capture signal response settings. Options include: Immediate Postponed	Immediate
HDD Connection Order	Select the HDD connection order. Some operating systems require that the HDDs are adjustable. Options include: Adjust Keep	Keep
Boot Option filter	Boot mode settings. Options include: UEFI Mode Legacy Mode	UEFI Mode
Network	NIC Option ROM execution mode settings. Options include: Do not launch Legacy UEFI	UEFI
Storage	Storage device Option ROM execution mode settings. Options include: Do not launch Legacy UEFI	UEFI
Video	Video device Option ROM execution mode settings. Options include: Do not launch Legacy UEFI	UEFI
Other PCI devices	Other PCI devices Option ROM execution mode settings. Options include: Do not launch Legacy UEFI	UEFI

8.3.2.15 NVMe Configuration

This interface displays the NVMe information.

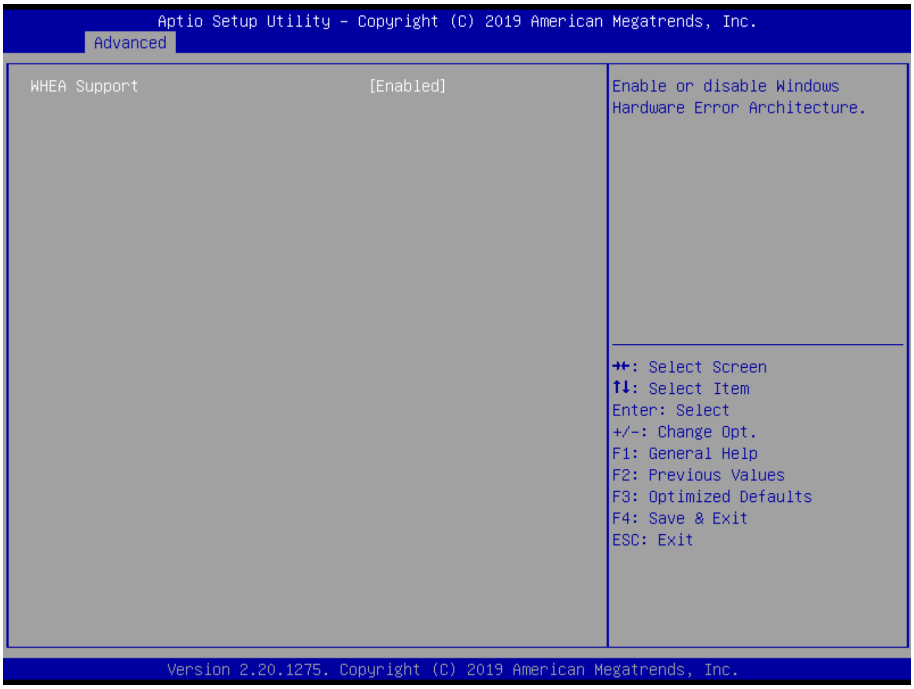


```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

NVMe Configuration

► INTEL SSDPEKNW512G8

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

Seg:Bus:Dev:Func                      00:01:00:00
Model Number                          INTEL SSDPEKNW512G8
Total Size                            512.1 GB
Vendor ID                             8086
Device ID                             F1A8

Namespace: 1                          Size: 512.1 GB

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

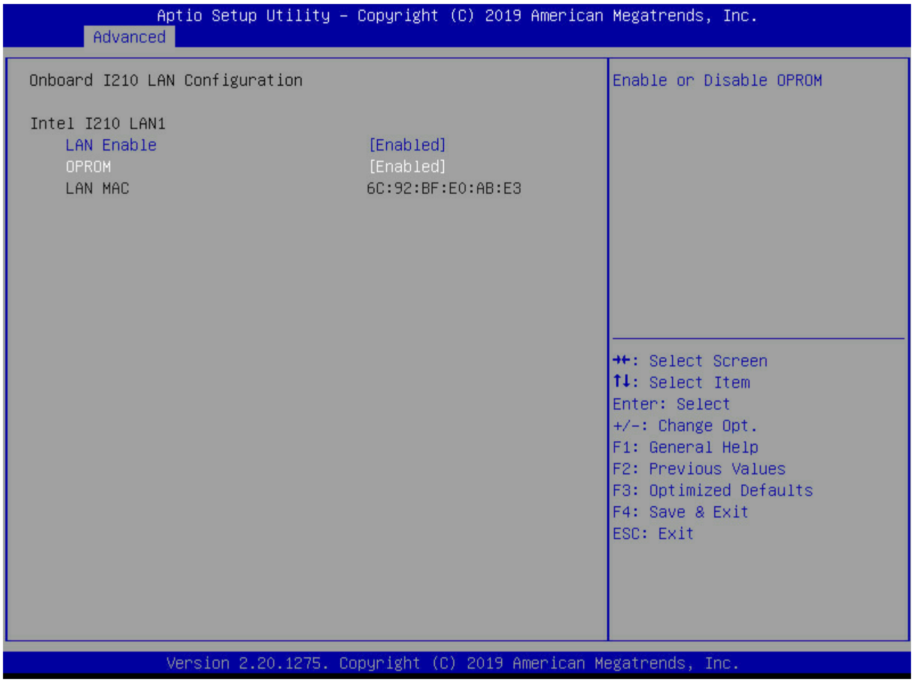
8.3.2.16 WHEA Configuration



```
              Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced
  WHEA Support                         [Enabled]            Enable or disable Windows
                                                            Hardware Error Architecture.

                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit
              Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
WHEA Support	An operating system hardware error handling mechanism. Options include: Enabled Disabled	Enabled

8.3.2.17 Onboard LAN Configuration

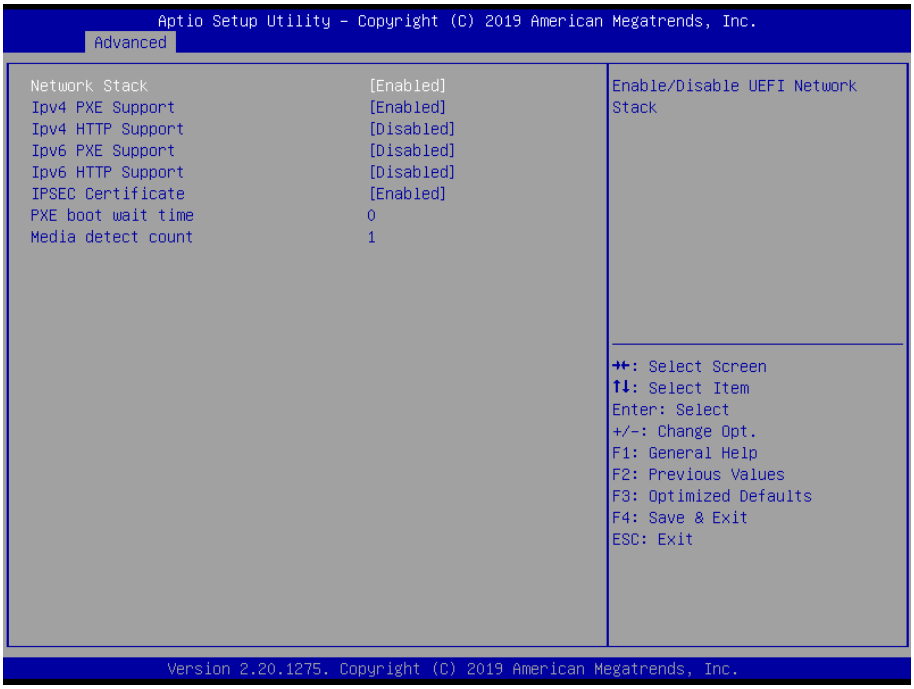


```
              Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
         Advanced
  Onboard I210 LAN Configuration                            Enable or Disable OPROM

  Intel I210 LAN1
      LAN Enable                       [Enabled]
      OPROM                            [Enabled]
      LAN MAC                          6C:92:BF:E0:AB:E3

                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit
              Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
LAN Enable	Serial port 0 on-off settings. Options include: Enabled Disabled	Enabled
OPROM	Select the optimal setting according to the demand. Options include: Enabled Disabled	Enabled

8.3.2.18 Network Stack Configuration

This option is used to set Ipv4/Ipv6 PXE and HTTP support, as well as IPSEC protocol.



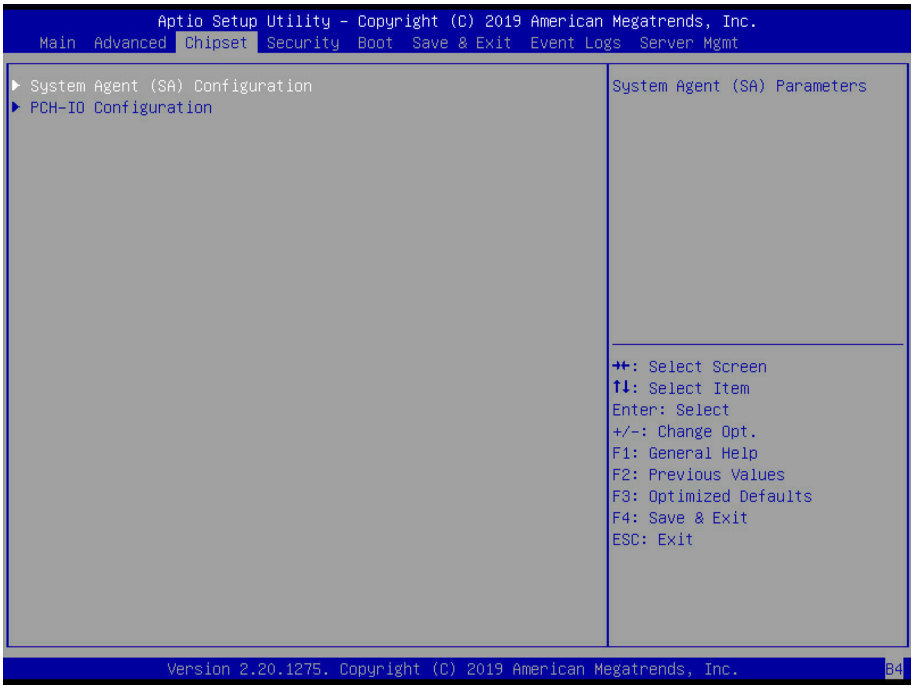
```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

Network Stack                       [Enabled]      Enable/Disable UEFI Network
Ipv4 PXE Support                    [Enabled]      Stack
Ipv4 HTTP Support                   [Disabled]
Ipv6 PXE Support                    [Disabled]
Ipv6 HTTP Support                   [Disabled]
IPSEC Certificate                   [Enabled]
PXE boot wait time                  0
Media detect count                  1
                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Network Stack	Network stack on-off settings. Options include: Enabled Disabled Only this option is enabled, the following options can be displayed and the functions can be set.	Enabled
Ipv4 PXE Support	UEFI Ipv4 PXE support on-off settings. Options include: Enabled Disabled	Enabled
Ipv4 HTTP Support	Ipv4 HTTP support on-off settings. Options include: Enabled Disabled	Disabled
Ipv6 PXE Support	UEFI Ipv6 PXE support on-off settings. Options include: Enabled Disabled	Disabled

Ipv6 HTTP Support	Ipv6 HTTP support on-off settings. Options include: Enabled Disabled	Disabled
IPSEC Certificate	Support IPSEC certificate for Ikev. Options include: Enabled Disabled	Enabled
PXE boot wait time	Set the wait time to cancel PXE boot after pressing ESC key, the setting range is 0~5.	0
Media detect count	Device detect count settings, the setting range is 1~50.	1

8.3.3 Chipset

This menu is used to change the chip settings.



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

▶ System Agent (SA) Configuration                  System Agent (SA) Parameters
▶ PCH-IO Configuration

                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

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```
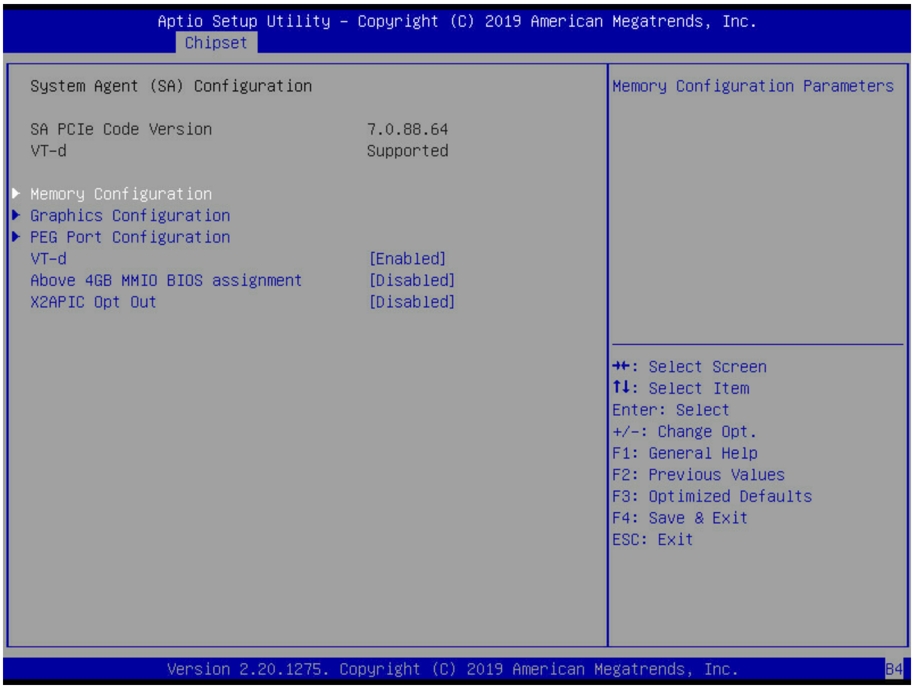

8.3.3.1 System Agent Configuration

8.3.3.1.1 Memory Configuration

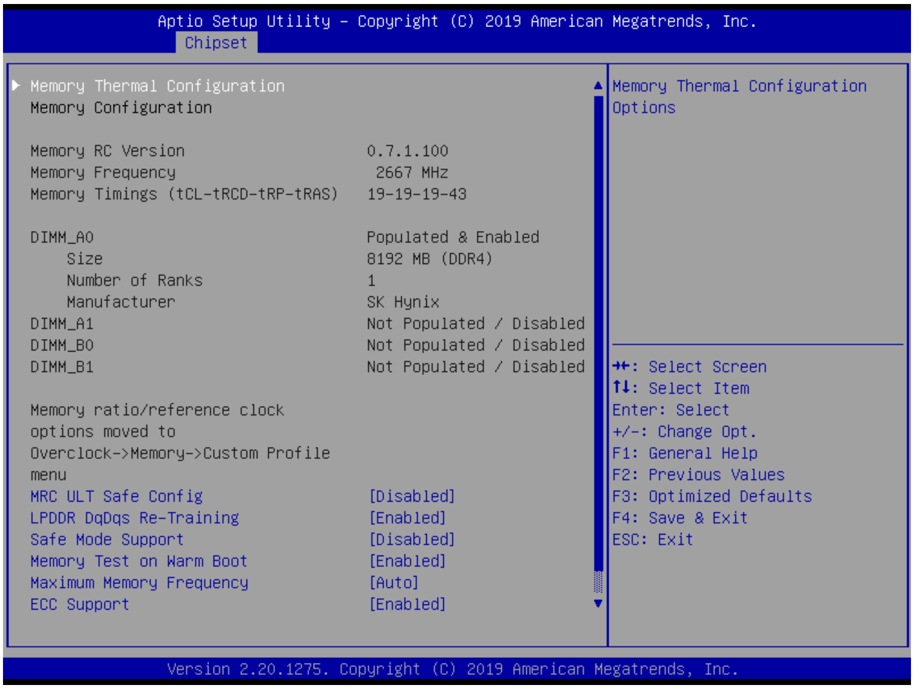
This menu is used to set the options related with memory.



```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                 Chipset
 System Agent (SA) Configuration                        Memory Configuration Parameters

 SA PCIe Code Version                 7.0.88.64
 VT-d                                 Supported

▶ Memory Configuration
▶ Graphics Configuration
▶ PEG Port Configuration
 VT-d                                 [Enabled]
 Above 4GB MMIO BIOS assignment       [Disabled]
 X2APIC Opt Out                       [Disabled]
                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.        B4
```

Memory Thermal Configuration

This menu is used to set the options related with thermal.



```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                 Chipset
▶ Memory Thermal Configuration                         Memory Thermal Configuration
 Memory Configuration                                  Options

 Memory RC Version                    0.7.1.100
 Memory Frequency                      2667 MHz
 Memory Timings (tCL-tRCD-tRP-tRAS)   19-19-19-43

 DIMM_A0                              Populated & Enabled
     Size                             8192 MB (DDR4)
     Number of Ranks                  1
     Manufacturer                     SK Hynix
 DIMM_A1                              Not Populated / Disabled
 DIMM_B0                              Not Populated / Disabled
 DIMM_B1                              Not Populated / Disabled   →←: Select Screen
                                                                 ↑↓: Select Item
 Memory ratio/reference clock                                    Enter: Select
 options moved to                                                +/-: Change Opt.
 Overclock->Memory->Custom Profile                               F1: General Help
 menu                                                            F2: Previous Values
 MRC ULT Safe Config                  [Disabled]                 F3: Optimized Defaults
 LPDDR DqDqs Re-Training              [Enabled]                  F4: Save & Exit
 Safe Mode Support                    [Disabled]                 ESC: Exit
 Memory Test on Warm Boot             [Enabled]
 Maximum Memory Frequency             [Auto]
 ECC Support                          [Enabled]

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```
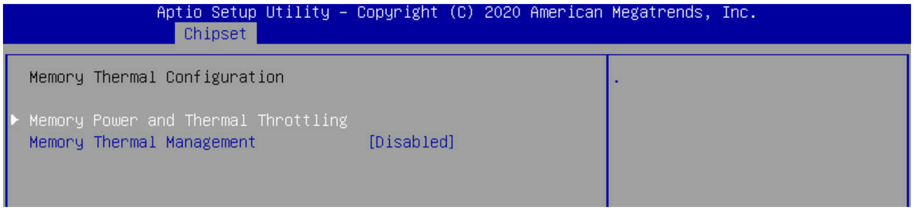
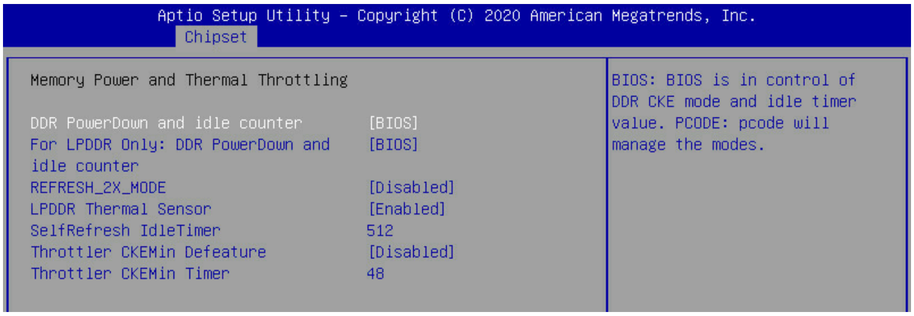

Interface Parameters	Function Description	Default Value
MRC ULT Safe Config	Fail-safe configuration settings. Options include: Enabled Disabled	Disabled
LPDDR DqDqs Re-training	LPDDR DqDqs Re-training settings. Options include: Enabled Disabled	Enabled
Safe Mode Support	Enable/Disable safe mode support. Options include: Enabled Disabled	Disabled
Memory Test on Warm Boot	Adjust whether to perform Memory Test again during Warm Boot. Options include: Enabled Disabled	Enabled
Maximum Memory Frequency	Adjust the maximum memory frequency. Options include: [Auto] [2133] [2200] [2400] [2600] [2666]	Auto
ECC Support	Enable/Disable ECC support. Options include: Enabled Disabled	Enabled
Fast Boot	Enable/Disable fast boot. Options include: Enabled Disabled	Enabled
Train on Warn Boot	Adjust whether to perform Memory Training again during Warm Boot. Options include: Enabled Disabled	Disabled

Memory Power and Thermal Throttling

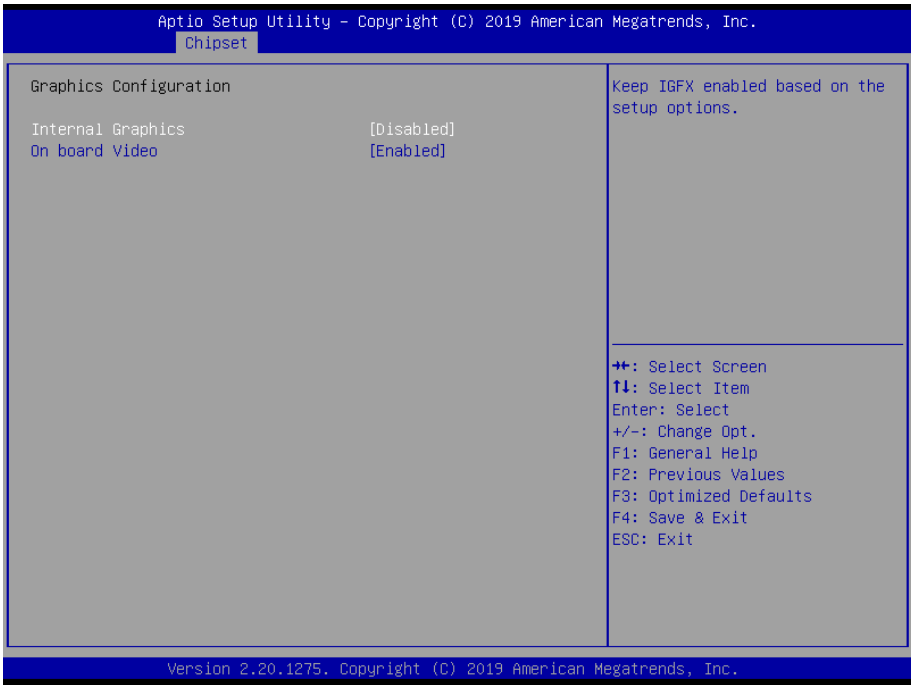

```
          Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
                     Chipset

  Memory Thermal Configuration                                   .

▶ Memory Power and Thermal Throttling
  Memory Thermal Management            [Disabled]
```



```
Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
Chipset

Memory Power and Thermal Throttling              BIOS: BIOS is in control of
                                                 DDR CKE mode and idle timer
DDR PowerDown and idle counter      [BIOS]       value. PCODE: pcode will
For LPDDR Only: DDR PowerDown and   [BIOS]       manage the modes.
idle counter
REFRESH_2X_MODE                     [Disabled]
LPDDR Thermal Sensor                [Enabled]
SelfRefresh IdleTimer               512
Throttler CKEMin Defeature          [Disabled]
Throttler CKEMin Timer              48
```

Interface Parameters	Function Description	Default Value
Memory Power and Thermal Throttling	Memory power and thermal throttling settings	----
DDR PowerDown and idle counter	BIOS or PCODE controls the DDR-CKE mode and the idle counter. Options include: PCODE BIOS	BIOS
For LPDDR Only: DDR PowerDown and idle counter	Only used for LPDDR or PCODE to control the DDR-CKE mode and the idle counter. Options include: PCODE BIOS	BIOS
REFRESH_2X_MODE	iMC enables 2x self-refresh of memory during WARM and HOT. Options include: Disabled 1- Enabled for WARM or HOT 2- Enabled HOT only	Disabled
LPDDR Thermal Sensor	When enabled, MC uses MR4 to read the LPDDR thermal sensor. Options include: Enabled Disabled	Enabled
SelfRefresh IdleTimer	Memory self-refresh interval, ranging from 512 to 65535.	512
Throttler CKEMin Defeature	Memory throttler CKEMin defeature. Options include: Enabled Disabled	Disabled
Throttler CKEMin Timer	Memory CKEMin interval, ranging from 0 to 255.	48
Memory Thermal Management	Memory thermal management. Options include: Enabled Disabled	Disabled

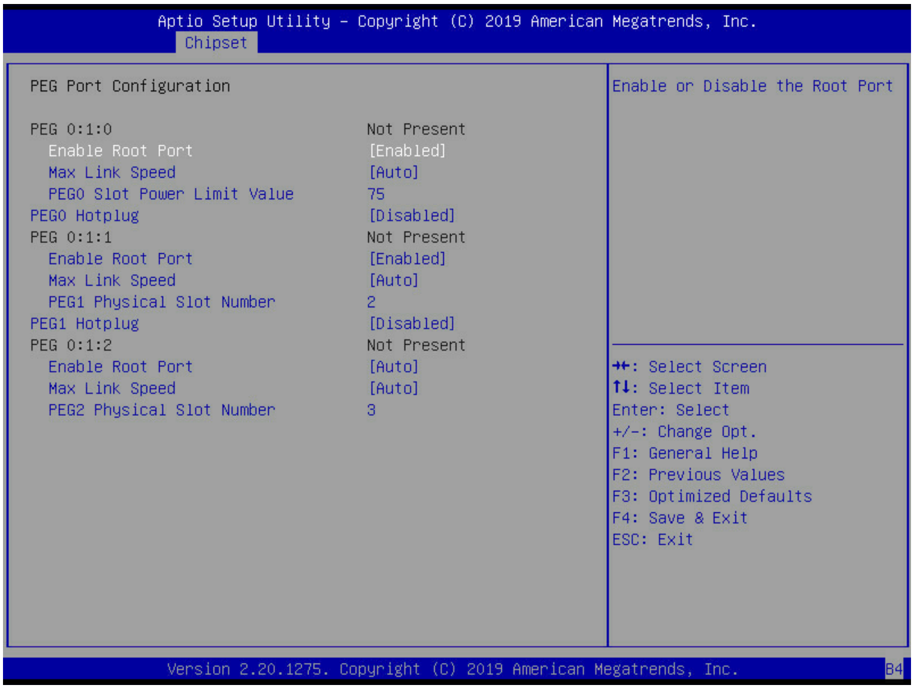
8.3.3.1.2 Graphics Configuration



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                 Chipset

Graphics Configuration                               Keep IGFX enabled based on the
                                                     setup options.
Internal Graphics                   [Disabled]
On board Video                      [Enabled]

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
Internal Graphics	Adjust Intel iGFX Display function. Options include: Auto Enabled Disabled	Disabled
On board Video	Adjust Aspeed VGA Display function. Options include: Enabled Disabled	Enabled

8.3.3.1.3 PEG Port Configuration



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Chipset

PEG Port Configuration                                    Enable or Disable the Root Port

PEG 0:1:0                           Not Present
  Enable Root Port                  [Enabled]
  Max Link Speed                    [Auto]
  PEG0 Slot Power Limit Value       75
PEG0 Hotplug                        [Disabled]
PEG 0:1:1                           Not Present
  Enable Root Port                  [Enabled]
  Max Link Speed                    [Auto]
  PEG1 Physical Slot Number         2
PEG1 Hotplug                        [Disabled]
PEG 0:1:2                           Not Present
  Enable Root Port                  [Auto]
  Max Link Speed                    [Auto]
  PEG2 Physical Slot Number         3
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```
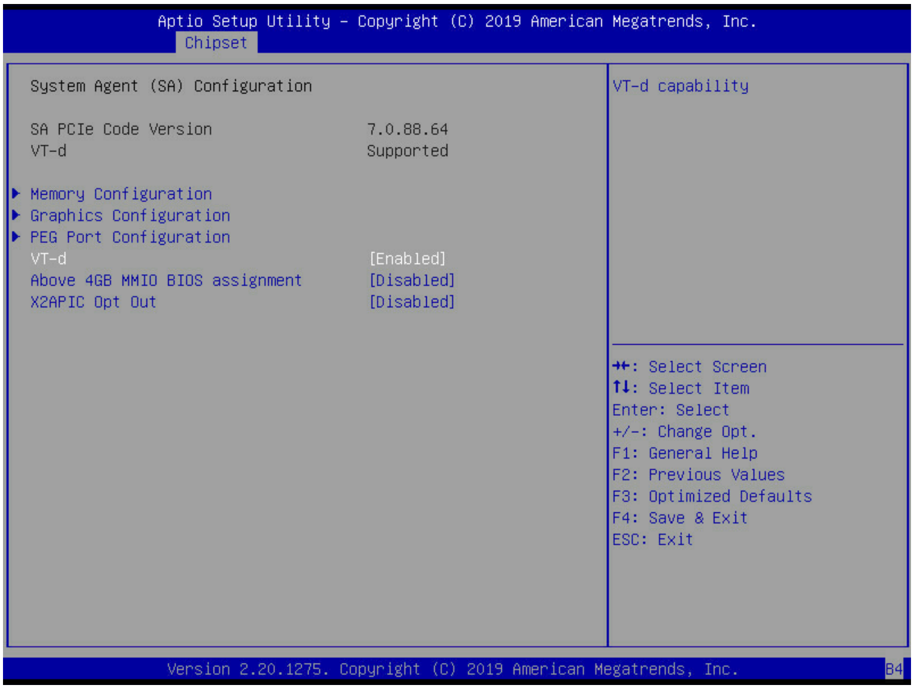

Interface Parameters	Function Description	Default Value
PEG 0:1:0		----
Enable Root Port	Enable/Disable root port support. Options include: Auto Enabled Disabled	Enabled
Max Link Speed	Adjust the max link speed. Options include: Auto Gen1 Gen2 Gen3	Auto
PEG0 Slot Power Limit Value	Adjust the max PEG0 power limit. Options include: 0 to 255	75
PEG 0:1:1		----
Enable Root Port	Enable/Disable root port support. Options include: Auto Enabled Disabled	Enabled
Max Link Speed	Adjust the max link speed. Options include: Auto Gen1 Gen2 Gen3	Auto
PEG1 Physical Slot number	Adjust PEG1's physical slot. Options include: 0 to 8191	2
PEG1 Hotplug	Adjust whether PEG1 supports Hot plug. Options include: Enabled Disabled	Disabled

PEG 0:1:2		----
Enable Root Port	Enable/Disable root port support. Options include: Auto Enabled Disabled	Auto
Max Link Speed	Adjust the max link speed. Options include: Auto Gen1 Gen2 Gen3	Auto
PEG1 Physical Slot number	Adjust PEG1's physical slot. Options include: 0 to 8191	3

VT-d/Above 4GB MMIO BIOS assignment/X2APIC Opt Out option

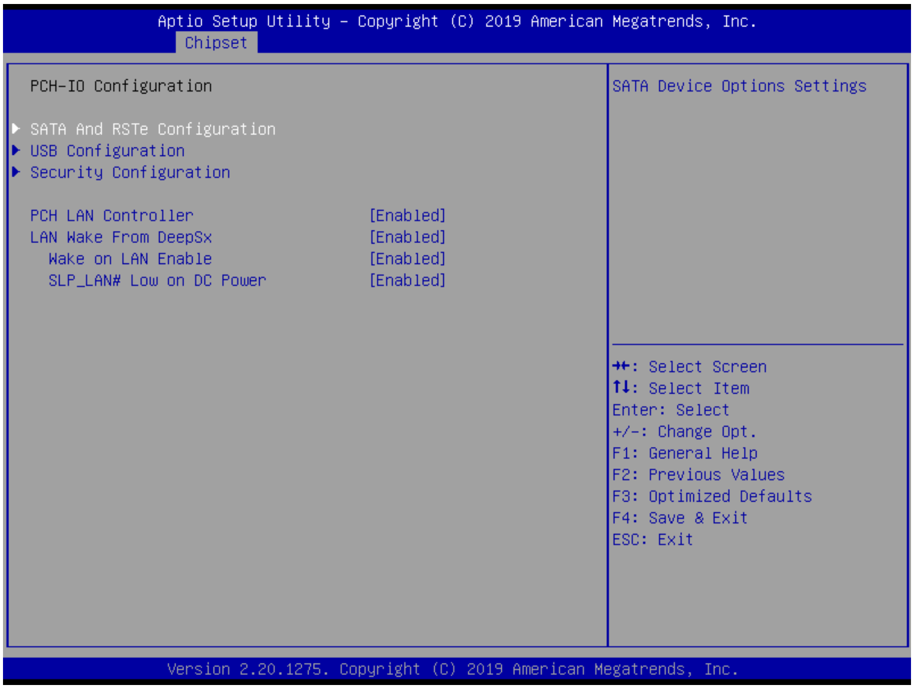


```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                  Chipset
  System Agent (SA) Configuration                        | VT-d capability
                                                          |
  SA PCIe Code Version                  7.0.88.64         |
  VT-d                                  Supported         |
                                                          |
▶ Memory Configuration                                    |
▶ Graphics Configuration                                  |
▶ PEG Port Configuration                                  |
  VT-d                                  [Enabled]         |
  Above 4GB MMIO BIOS assignment        [Disabled]        |
  X2APIC Opt Out                        [Disabled]        |
                                                          |--------------------------
                                                          | →←: Select Screen
                                                          | ↑↓: Select Item
                                                          | Enter: Select
                                                          | +/-: Change Opt.
                                                          | F1: General Help
                                                          | F2: Previous Values
                                                          | F3: Optimized Defaults
                                                          | F4: Save & Exit
                                                          | ESC: Exit
           Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.        B4
```

Interface Parameters	Function Description	Default Value
VT-d	Enable/Disable virtualization support. Options include: Enabled Disabled	Enabled
Above 4GB MMIO BIOS assignment	Enable/Disable above 4GB memory mapped IO BIOS assignment. Options include: Enabled Disabled	Disabled
X2APIC Opt Out	Enable/Disable X2APIC opt out. Options include: Enabled Disabled	Disabled

8.3.4 PCH-IO Configuration

BIOS automatically detects the installed SATA devices. Not Present will be displayed when no SATA device is detected.



```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                      Chipset
PCH-IO Configuration                                      SATA Device Options Settings

▶ SATA And RSTe Configuration
▶ USB Configuration
▶ Security Configuration

  PCH LAN Controller                  [Enabled]
  LAN Wake From DeepSx                [Enabled]
    Wake on LAN Enable                [Enabled]
    SLP_LAN# Low on DC Power          [Enabled]
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```
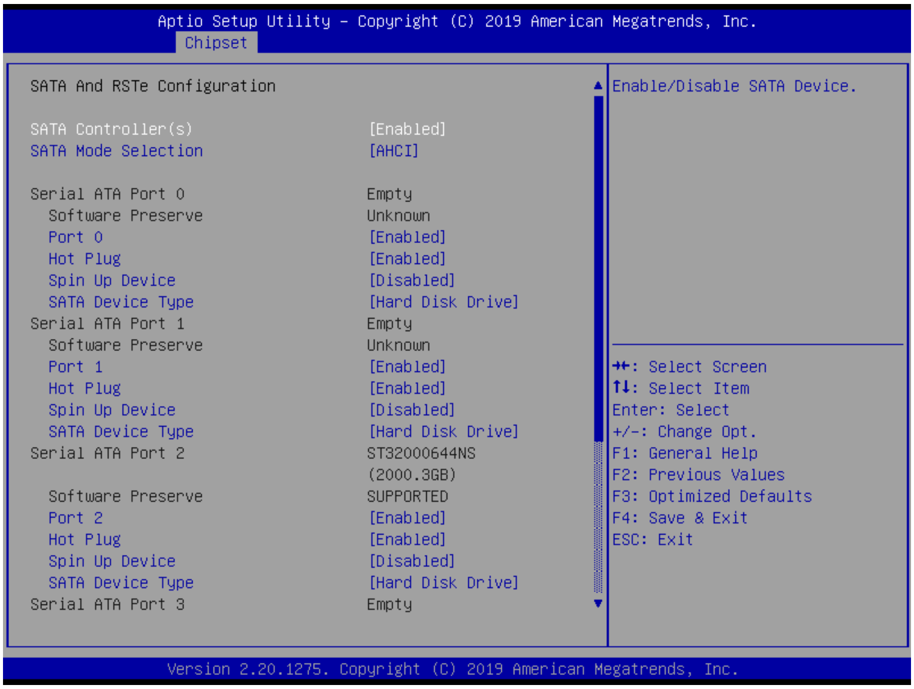

8.3.4.1 SATA and RSTe Configuration



```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                      Chipset
SATA And RSTe Configuration                             ▲ Enable/Disable SATA Device.

SATA Controller(s)                    [Enabled]
SATA Mode Selection                   [AHCI]

Serial ATA Port 0                     Empty
  Software Preserve                   Unknown
  Port 0                              [Enabled]
  Hot Plug                            [Enabled]
  Spin Up Device                      [Disabled]
  SATA Device Type                    [Hard Disk Drive]
Serial ATA Port 1                     Empty
  Software Preserve                   Unknown
  Port 1                              [Enabled]          →←: Select Screen
  Hot Plug                            [Enabled]          ↑↓: Select Item
  Spin Up Device                      [Disabled]         Enter: Select
  SATA Device Type                    [Hard Disk Drive]  +/-: Change Opt.
Serial ATA Port 2                     ST32000644NS       F1: General Help
                                      (2000.3GB)         F2: Previous Values
  Software Preserve                   SUPPORTED          F3: Optimized Defaults
  Port 2                              [Enabled]          F4: Save & Exit
  Hot Plug                            [Enabled]          ESC: Exit
  Spin Up Device                      [Disabled]
  SATA Device Type                    [Hard Disk Drive]
Serial ATA Port 3                     Empty             ▼

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```
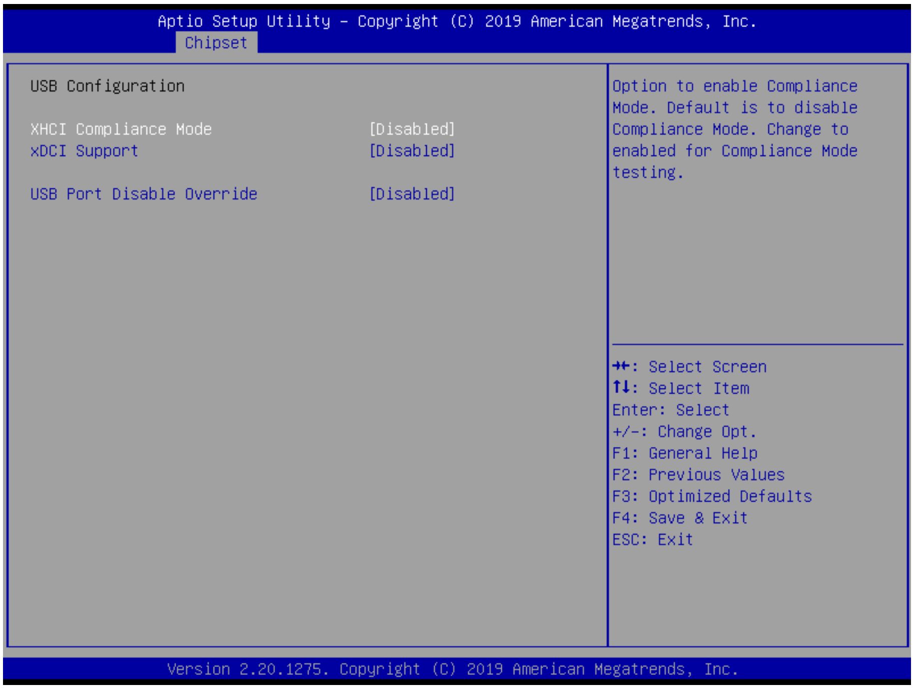

Interface Parameters	Function Description	Default Value
SATA Controller	Enable/Disable SATA controller. Options include: Enabled Disabled	Enabled
SATA Mode Selection	Identify the device connected to the SATA interface is an SSD or HDD. Options include: AHCI RAID	AHCI
SATA Port 0-4		
Port 0-4	Enable/Disable SATA port. Options include: Enabled Disabled	Enabled
Hot Plug 0-4	Adjust SATA hot plug function. Options include: Enabled Disabled	Enabled
Spin Up Device 0-4	Adjust SATA spin up device function. Options include: Enabled Disabled	Disabled
SATA Device Type 0-4	Adjust SATA device type function. Options include: Hard Disk Drive Solid State Drive	Hard Disk Drive

8.3.4.2 USB Configuration



```
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Chipset

USB Configuration                                  Option to enable Compliance
                                                   Mode. Default is to disable
XHCI Compliance Mode            [Disabled]         Compliance Mode. Change to
xDCI Support                    [Disabled]         enabled for Compliance Mode
                                                   testing.
USB Port Disable Override       [Disabled]

                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

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```
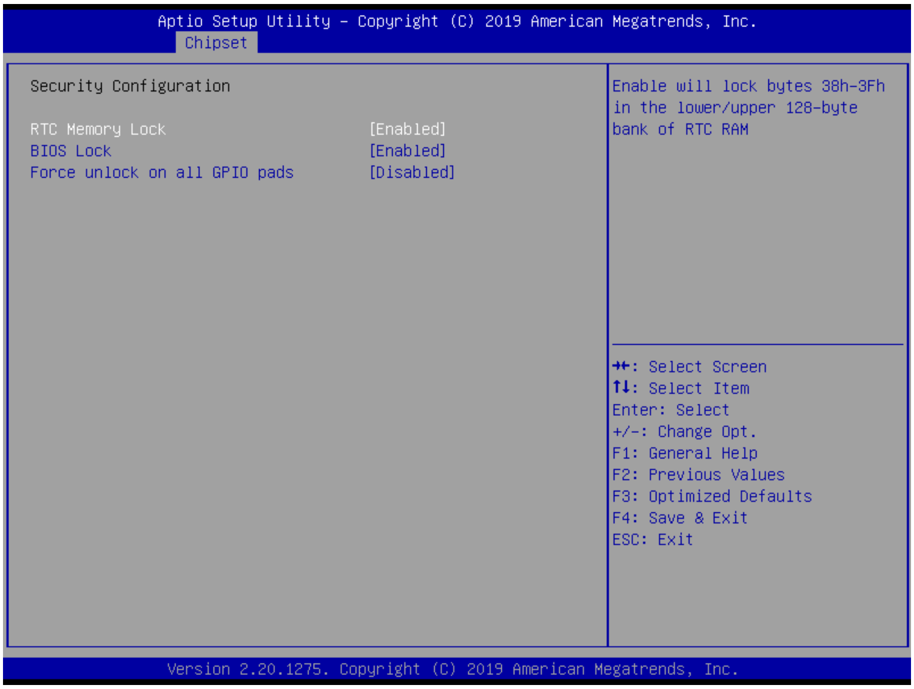

Interface Parameters	Function Description	Default Value
XHCI Compliance Mode	Adjust USB compliance mode function. Options include: Enabled Disabled	Disabled
xDCI Support	Enable/Disable xDCI function. Options include: Enabled Disabled	Disabled
USB Port Disable Override	Enable/Disable USB root port function. Options include: Disabled Select Per-Pin Note: Select Per-Pin instructions USB3_0 (FrontRight) USB3_2 (RearUp) USB3_3 (RearDown) USB3_0 (RearUp) USB3_1 (RearDown) USB2_0 (RearUp) USB2_1 (RearDown) USB2_0 (FrontRight) USB2_1 (FrontLeft) USB2_2 (RearUp) USB2_3 (RearDown)	Disabled

8.3.4.3 Security Configuration

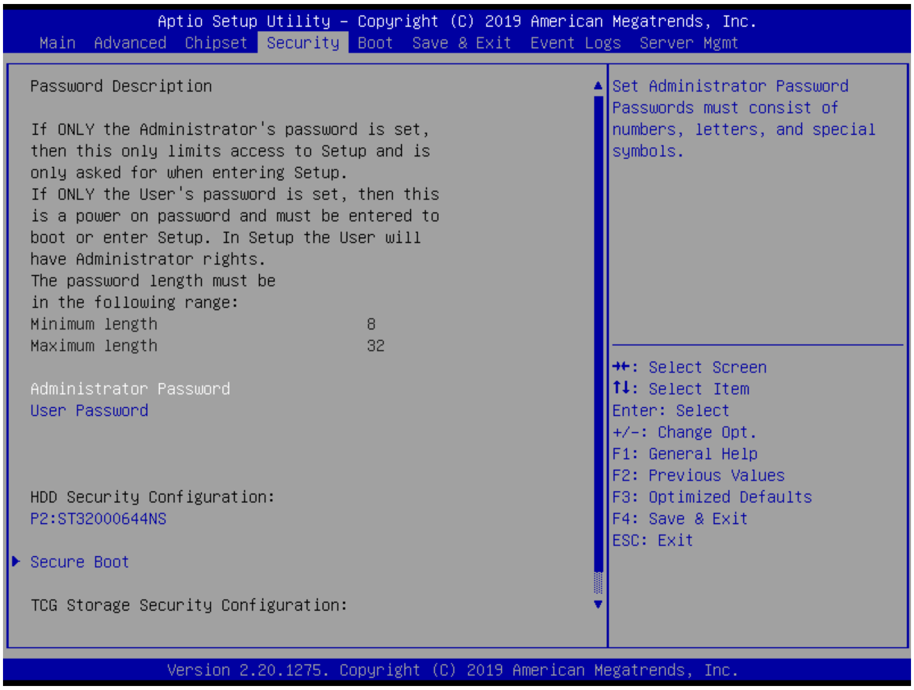


```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                    Chipset

  Security Configuration                              Enable will lock bytes 38h-3Fh
                                                      in the lower/upper 128-byte
  RTC Memory Lock                  [Enabled]          bank of RTC RAM
  BIOS Lock                        [Enabled]
  Force unlock on all GPIO pads    [Disabled]

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

        Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

Interface Parameters	Function Description	Default Value
RTC Memory Lock	Enabling will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM. Options include: Enabled Disabled	Enabled
BIOS Lock	PCH BIOS lock function. Required to enable to ensure the SMM protection of flash. Options include: Enabled Disabled	Enabled
Force unlock on all GPIO pads	If enabled, BIOS will force all GPIO boards to be unlocked. Options include: Enabled Disabled	Disabled
PCH LAN Controller	Enable/Disable the onboard NIC. Options include: Enabled Disabled	Enabled
LAN Wake From DeepSx	Wake from DeepSx. Options include: Enabled Disabled	Enabled
Wake on LAN Enable	Enable/Disable the integrated LAN to wake the system. Options include: Enabled Disabled	Enabled
SLP_LAN# Low on DC Power	Enable/Disable the SLP_LAN# Low on DC power. Options include: Enabled Disabled	Enabled

8.3.5 Security Menu

This menu is used to change the security settings of administrator and user password system, and allows users to enable or disable Secure Boot status and set the System Mode status.



```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

  Password Description                                  Set Administrator Password
                                                        Passwords must consist of
  If ONLY the Administrator's password is set,          numbers, letters, and special
  then this only limits access to Setup and is          symbols.
  only asked for when entering Setup.
  If ONLY the User's password is set, then this
  is a power on password and must be entered to
  boot or enter Setup. In Setup the User will
  have Administrator rights.
  The password length must be
  in the following range:
  Minimum length                      8
  Maximum length                      32
                                                        ↔: Select Screen
  Administrator Password                                ↑↓: Select Item
  User Password                                         Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
  HDD Security Configuration:                           F3: Optimized Defaults
  P2:ST32000644NS                                       F4: Save & Exit
                                                        ESC: Exit
► Secure Boot

  TCG Storage Security Configuration:

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```
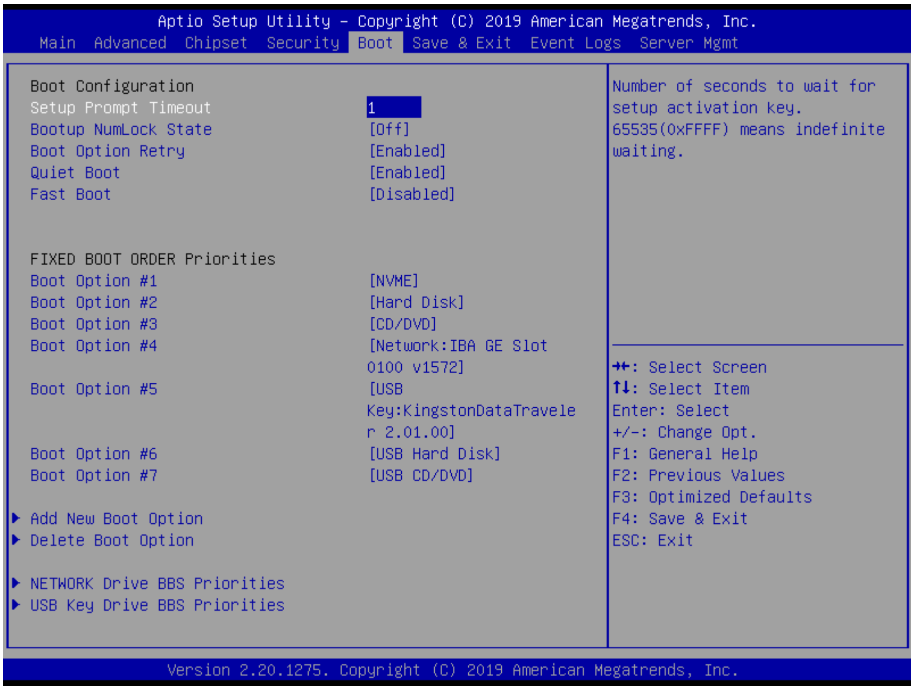

Interface Parameters	Function Description	Default Value
Administrator Password	Create an administrator password. It must contain uppercase and lowercase letters, special characters and numbers, within 8-20 characters.	----
User Password	Create a user password. It must contain uppercase and lowercase letters, special characters and numbers, within 8-20 characters.	----
Secure Boot	Secure boot menu	----

8.3.6 Boot Menu

This menu is used to change the system boot device and related functions.



```
               Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

 Boot Configuration                                      Number of seconds to wait for
 Setup Prompt Timeout                   1                setup activation key.
 Bootup NumLock State                   [Off]            65535(0xFFFF) means indefinite
 Boot Option Retry                      [Enabled]        waiting.
 Quiet Boot                             [Enabled]
 Fast Boot                              [Disabled]


 FIXED BOOT ORDER Priorities
 Boot Option #1                         [NVME]
 Boot Option #2                         [Hard Disk]
 Boot Option #3                         [CD/DVD]
 Boot Option #4                         [Network:IBA GE Slot
                                        0100 v1572]      ++: Select Screen
 Boot Option #5                         [USB             ↑↓: Select Item
                                        Key:KingstonDataTravele   Enter: Select
                                        r 2.01.00]       +/-: Change Opt.
 Boot Option #6                         [USB Hard Disk]  F1: General Help
 Boot Option #7                         [USB CD/DVD]     F2: Previous Values
                                                         F3: Optimized Defaults
▶ Add New Boot Option                                    F4: Save & Exit
▶ Delete Boot Option                                     ESC: Exit

▶ NETWORK Drive BBS Priorities
▶ USB Key Drive BBS Priorities

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```
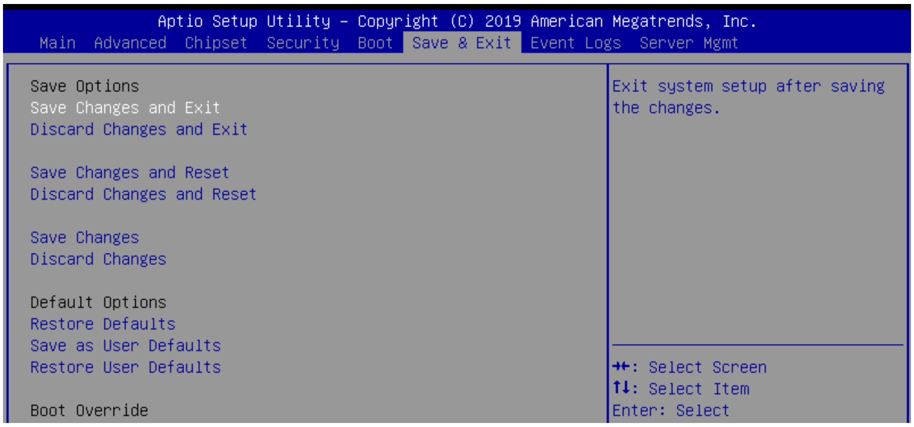

Interface Parameters	Function Description	Default Value
Setup Prompt Timeout	Setup prompt timeout settings. Set the time to wait for the Setup activate key, and the maximum value is 65535 seconds.	1
Bootup NumLock State	Bootup Numlock state on-off settings. Options include: On Off	Off
Boot Options Retry	Boot options retry on-off settings. Options include: Enabled Disabled	Enabled
Quiet Boot	Quite boot on-off settings. Options include: Enabled Disabled If it is set to Enabled, the boot logo displays as that set by manufacturer, if set to Disabled, the boot screen displays as the text-mode POST interface.	Enabled
Fast Boot	Enable the fast boot function to reduce the time to enter the operating system. Options include: Enabled Disabled	Disabled
Fixed Boot Order Priorities Boot Option #X	Boot options priority settings	----
XXXX Driver BBS Priorities	XXXX driver BBS priority settings	----

8.3.7 Save & Exit Menu

This menu allows you to read the factory default values of the BIOS program and exit the BIOS program.

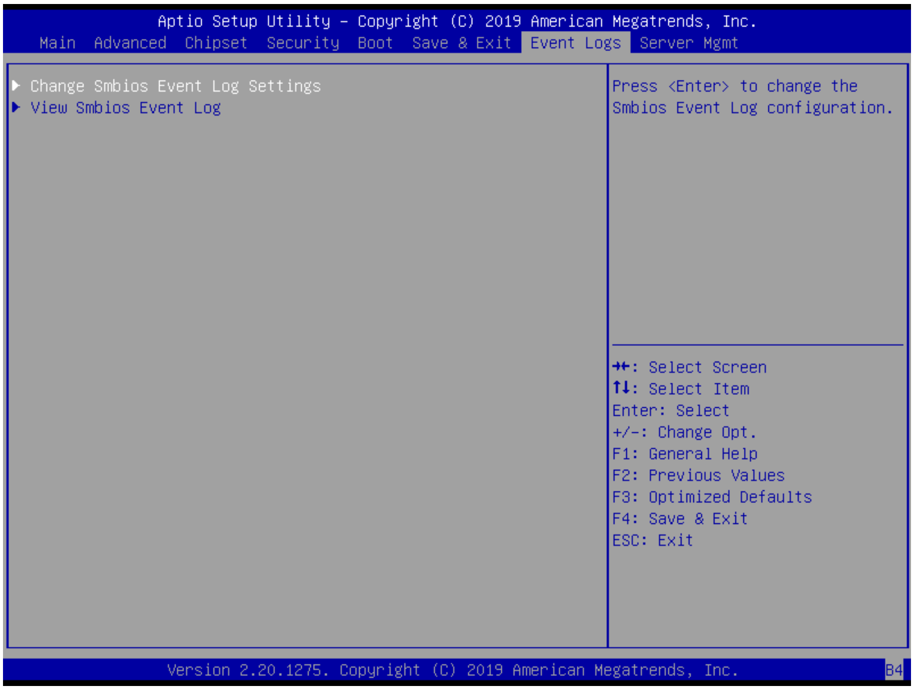


```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

  Save Options                                  | Exit system setup after saving
  Save Changes and Exit                         | the changes.
  Discard Changes and Exit                      |
                                                |
  Save Changes and Reset                        |
  Discard Changes and Reset                     |
                                                |
  Save Changes                                  |
  Discard Changes                               |
                                                |
  Default Options                               |
  Restore Defaults                              |
  Save as User Defaults                         | ↔: Select Screen
  Restore User Defaults                         | ↑↓: Select Item
                                                |
  Boot Override                                 | Enter: Select
```

Interface Parameters	Function Description
Save Changes and Exit	To save changes and exit
Discard Changes and Exit	To discard changes and exit
Save Changes and Reset	To save changes and reset
Discard Changes and Reset	To discard changes and reset
Save Changes	To save changes
Discard Changes	To discard changes
Restore Defaults	To restore defaults
Save as User Defaults	To save as user defaults
Restore User Defaults	To restore user defaults
Boot Override	To override the boot option, you could select the boot device from the following options

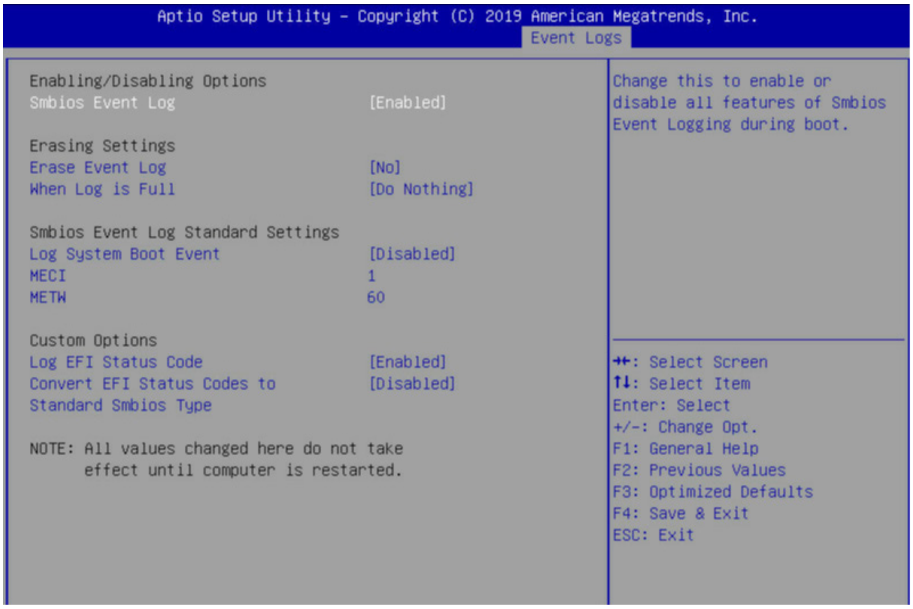
8.3.8 Event Logs Menu

This menu is used to display and set the Smbios event logs.



```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

► Change Smbios Event Log Settings                         Press <Enter> to change the
► View Smbios Event Log                                    Smbios Event Log configuration.

                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit

            Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.                B4
```

8.3.8.1 Change Smbios Event Log Settings

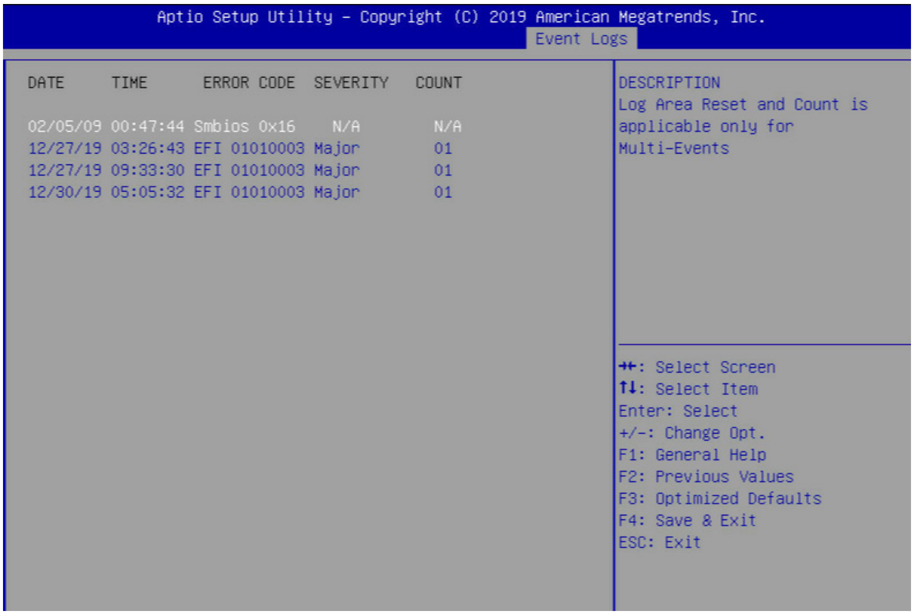


```
            Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                  Event Logs

 Enabling/Disabling Options                                Change this to enable or
 Smbios Event Log                  [Enabled]               disable all features of Smbios
                                                           Event Logging during boot.
 Erasing Settings
 Erase Event Log                   [No]
 When Log is Full                  [Do Nothing]

 Smbios Event Log Standard Settings
 Log System Boot Event             [Disabled]
 MECI                              1
 METW                              60

 Custom Options                                            →←: Select Screen
 Log EFI Status Code               [Enabled]               ↑↓: Select Item
 Convert EFI Status Codes to       [Disabled]              Enter: Select
 Standard Smbios Type                                      +/-: Change Opt.
                                                           F1: General Help
 NOTE: All values changed here do not take                 F2: Previous Values
       effect until computer is restarted.                 F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit
```

Interface Parameters	Function Description	Default Value
Enabling/Disabling Options		
Smbios Event Log	Enable/Disable Smbios event log	Enabled
Erasing Settings		
Erasing Event Log	Erase the event log	No

When Log is Full	Erase or do nothing when log is full	Do Nothing
Smbios Event Log Standard Settings		
Log System Boot Event	Enable system boot event log	Disabled
MECI	Multi-event count increment	1
METW	Multi-event time window	60
Custom Options		
Log EFI Status Code	Enable EFI status code log	Enabled
Convert EFI Status Codes to Standard Smbios Type	Enable EFI status code conversion to standard SMBIOS type	Disabled

8.3.8.2 View Smbios Event Log

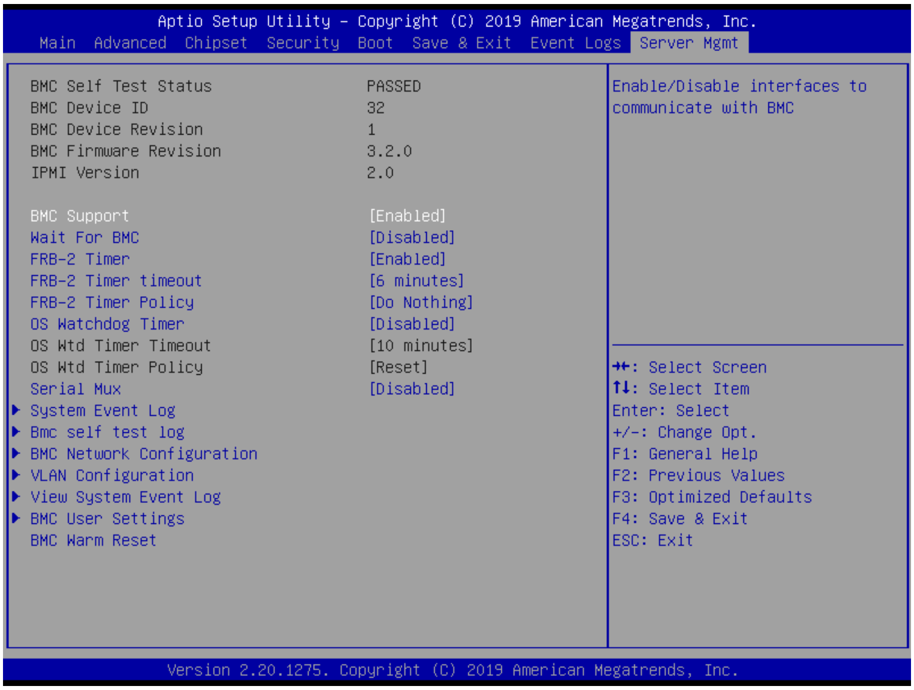


```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Event Logs

DATE     TIME      ERROR CODE  SEVERITY   COUNT       DESCRIPTION
                                                      Log Area Reset and Count is
02/05/09 00:47:44 Smbios 0x16     N/A        N/A      applicable only for
12/27/19 03:26:43 EFI 01010003 Major        01        Multi-Events
12/27/19 09:33:30 EFI 01010003 Major        01
12/30/19 05:05:32 EFI 01010003 Major        01

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit
```

Interface Parameters	Function Description
DATE	Event log date
TIME	Event log time
ERROR CODE	Smbios error code
SEVERITY	Severity

8.3.9 Server Mgmt Menu

This menu is used to display the server management status and change the settings.



```
         Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

  BMC Self Test Status                 PASSED          Enable/Disable interfaces to
  BMC Device ID                        32              communicate with BMC
  BMC Device Revision                  1
  BMC Firmware Revision                3.2.0
  IPMI Version                         2.0

  BMC Support                          [Enabled]
  Wait For BMC                         [Disabled]
  FRB-2 Timer                          [Enabled]
  FRB-2 Timer timeout                  [6 minutes]
  FRB-2 Timer Policy                   [Do Nothing]
  OS Watchdog Timer                    [Disabled]
  OS Wtd Timer Timeout                 [10 minutes]
  OS Wtd Timer Policy                  [Reset]         ↔: Select Screen
  Serial Mux                           [Disabled]      ↑↓: Select Item
▶ System Event Log                                     Enter: Select
▶ Bmc self test log                                    +/-: Change Opt.
▶ BMC Network Configuration                            F1: General Help
▶ VLAN Configuration                                   F2: Previous Values
▶ View System Event Log                                F3: Optimized Defaults
▶ BMC User Settings                                    F4: Save & Exit
  BMC Warm Reset                                       ESC: Exit

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```
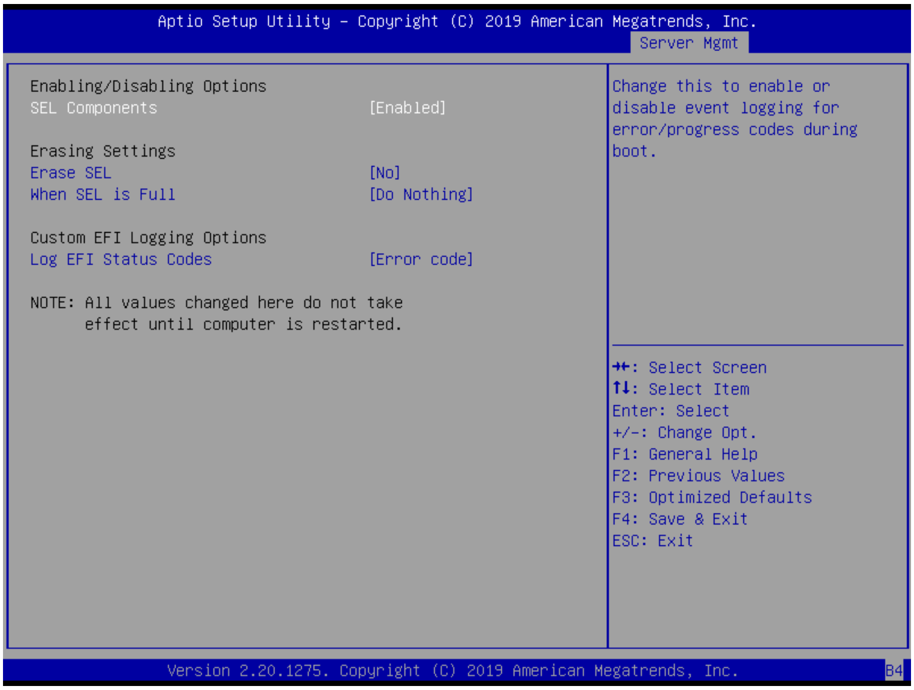

Interface Parameters	Function Description	Default Value
BMC Self Test Status	BMC self-test status	----
BMC Device ID	BMC device ID	----
BMC Device Revision	BMC device revision	----
BMC Firmware Version	Current motherboard’s BMC firmware version	----
IPMI Version	IPMI version	----
BMC Support	Enable/Disable the interface to communicate with BMC. Options include: Enabled Disabled	Enabled
Wait for BMC	Wait for BMC settings. Options include: Enabled Disabled	Disabled
FRB-2 Timer	FRB-2 timer on-off settings. Options include: Enabled Disabled	Enabled
FRB-2 Timer Timeout	FRB-2 timer timeout settings. Options include: 3 minutes 4 minutes 5 minutes 6 minutes	6 minutes
FRB-2 Timer policy	FRB-2 timer policy settings. Options include: Do Nothing Reset Power Down Power Cycle	Power Cycle

OS Watchdog Timer	OS watchdog timer on-off settings. Options include: Enabled Disabled	Disabled
OS Wtd Timer Timeout	OS watchdog timer timeout settings. Options include: 5 minutes 10 minutes 15 minutes 20 minutes	10 minutes
OS Wtd Timer policy	OS watchdog timer policy settings. Options include: Do Nothing Reset Power Down Power Cycle	Reset
Serial Mux	Serial Mux on-off settings. Options include: Enabled Disabled	Disabled
System Event Log	System event log configuration submenu	----
BMC self test Log	BMC self-test log submenu	----
BMC Network Configuration	BMC network configuration submenu	----
VLAN Configuration	VLAN configuration submenu	----
View System Event Log	View System Event Log submenu	----
BMC User Settings	BMC user settings submenu	----
BMC Warm Reset	BMC warm reset	----

8.3.9.1 System Event Log

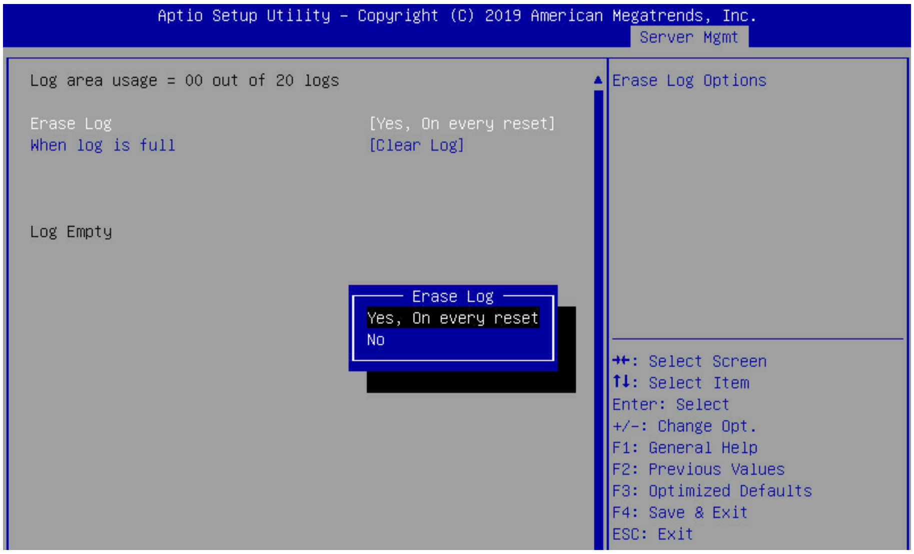
This submenu is used to set the BMC SEL parameters.



```
          Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                   Server Mgmt

  Enabling/Disabling Options                                  Change this to enable or
  SEL Components                    [Enabled]                 disable event logging for
                                                              error/progress codes during
  Erasing Settings                                            boot.
  Erase SEL                         [No]
  When SEL is Full                  [Do Nothing]

  Custom EFI Logging Options
  Log EFI Status Codes              [Error code]

  NOTE: All values changed here do not take
        effect until computer is restarted.
                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.            B4
```

Interface Parameters	Function Description	Default Value
SEL Components	Enable/Disable the error/progress code event logging. Options include: Enabled Disabled	Enabled
Erase SEL	Select the option to delete the system event log. Options include: No Yes, On next reset Yes, On every reset	No
When SEL is full	Select the action when SEL is full. Options include: Do Nothing Erase Immediately	Do nothing
Log EFI Status Codes	Select the option to log EFI status codes. Options include: Disabled Both Error code Progress code	Error Code

8.3.9.2 BMC Self Test Log



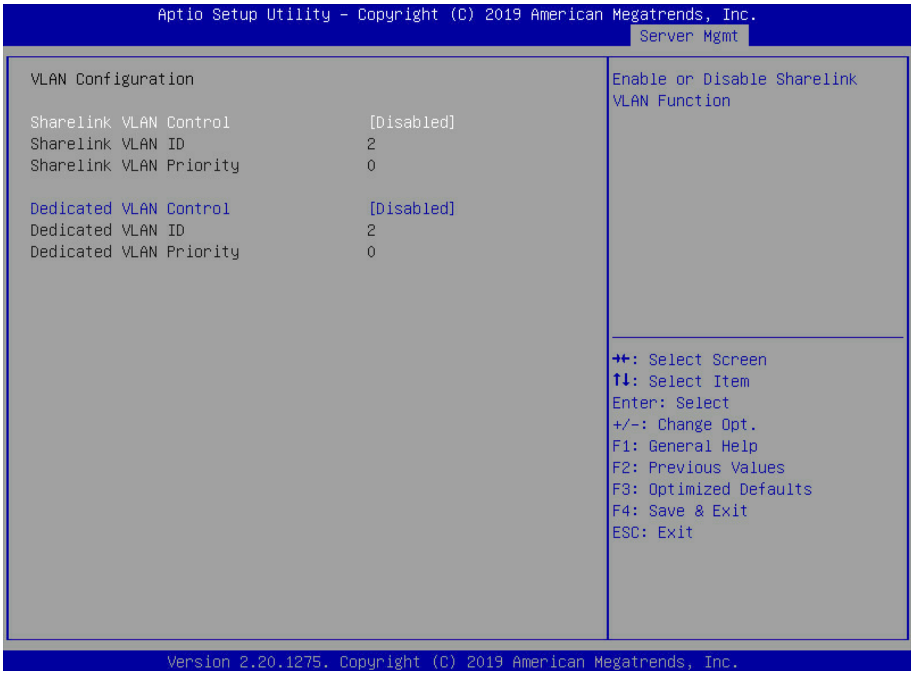
```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                        Server Mgmt

 Log area usage = 00 out of 20 logs                         Erase Log Options

 Erase Log                         [Yes, On every reset]
 When log is full                  [Clear Log]


 Log Empty


                                  Erase Log
                             Yes, On every reset
                             No
                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit
```

Interface Parameters	Function Description	Default Value
Erase Log	Erase log settings. Options include: Yes, On every reset No	Yes, On every reset
When log is full	Select the action when the log is full. Options include: Clear Log Do not log any more	Clear Log

8.3.9.3 BMC Network Configuration

Please refer to the Chapter 8.2.7, and there is no more description here.

8.3.9.4 VLAN Configuration



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                   Server Mgmt

VLAN Configuration                                 Enable or Disable Sharelink
                                                   VLAN Function
Sharelink VLAN Control          [Disabled]
Sharelink VLAN ID               2
Sharelink VLAN Priority         0

Dedicated VLAN Control          [Disabled]
Dedicated VLAN ID               2
Dedicated VLAN Priority         0
                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

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```
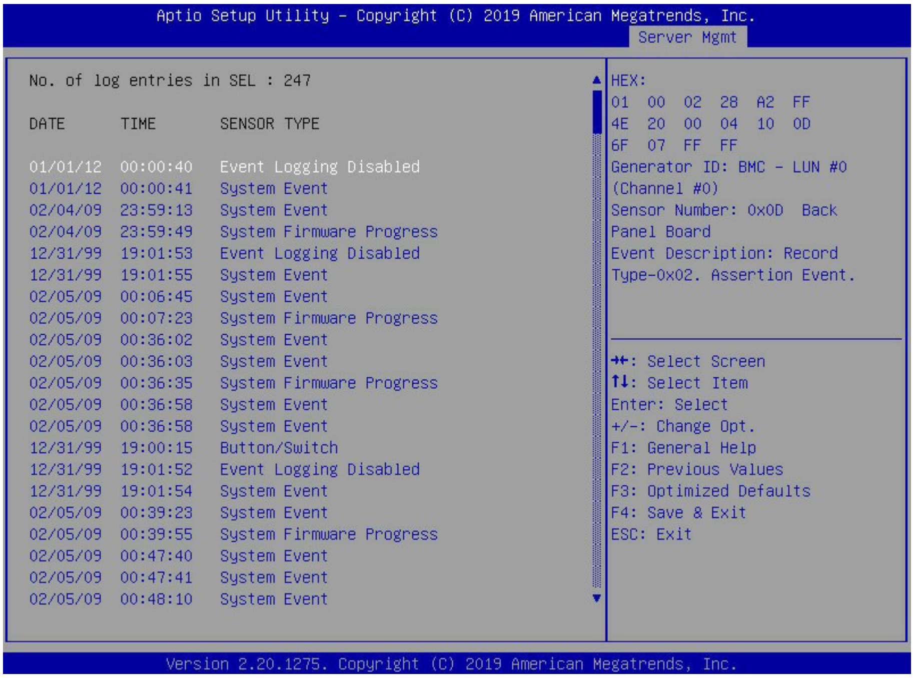

Interface Parameters	Function Description	Default Value
Sharelink/Dedicated VLAN Control	BMC sharelink/dedicated VLAN control on-off settings. Options include: Enabled Disabled To enable VLAN, it needs to set the VLAN ID first.	Disabled
Sharelink/Dedicated VLAN ID	BMC sharelink/dedicated VLAN ID settings, the range is 2~4094. The setting takes effect immediately.	2
Sharelink/Dedicated VLAN Priority	BMC sharelink/dedicated VLAN priority settings, the range is 1~7. The setting takes effect immediately.	0

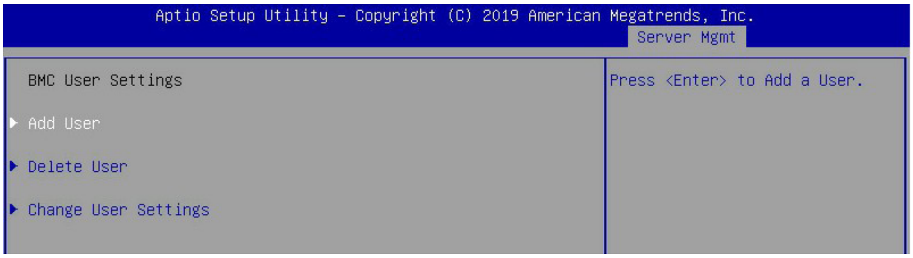
8.3.9.5 View System Event Log

This submenu is used to view the system event log.



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                      Server Mgmt

 No. of log entries in SEL : 247                      HEX:
                                                      01  00  02  28  A2  FF
 DATE      TIME       SENSOR TYPE                     4E  20  00  04  10  0D
                                                      6F  07  FF  FF
 01/01/12  00:00:40   Event Logging Disabled          Generator ID: BMC – LUN #0
 01/01/12  00:00:41   System Event                    (Channel #0)
 02/04/09  23:59:13   System Event                    Sensor Number: 0x0D  Back
 02/04/09  23:59:49   System Firmware Progress        Panel Board
 12/31/99  19:01:53   Event Logging Disabled          Event Description: Record
 12/31/99  19:01:55   System Event                    Type-0x02. Assertion Event.
 02/05/09  00:06:45   System Event
 02/05/09  00:07:23   System Firmware Progress
 02/05/09  00:36:02   System Event
 02/05/09  00:36:03   System Event                    →←: Select Screen
 02/05/09  00:36:35   System Firmware Progress        ↑↓: Select Item
 02/05/09  00:36:58   System Event                    Enter: Select
 02/05/09  00:36:58   System Event                    +/-: Change Opt.
 12/31/99  19:00:15   Button/Switch                   F1: General Help
 12/31/99  19:01:52   Event Logging Disabled          F2: Previous Values
 12/31/99  19:01:54   System Event                    F3: Optimized Defaults
 02/05/09  00:39:23   System Event                    F4: Save & Exit
 02/05/09  00:39:55   System Firmware Progress        ESC: Exit
 02/05/09  00:47:40   System Event
 02/05/09  00:47:41   System Event
 02/05/09  00:48:10   System Event

       Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

8.3.9.6 BMC User Settings

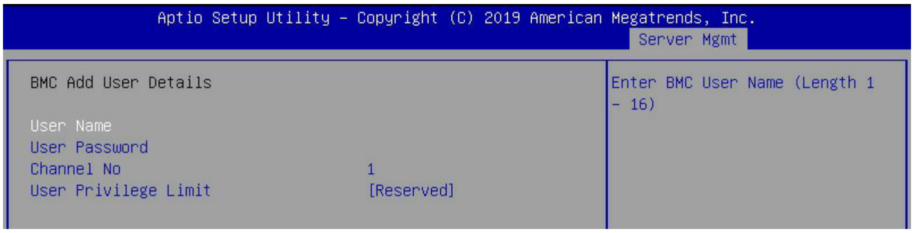


```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                      Server Mgmt

 BMC User Settings                                    Press <Enter> to Add a User.

▶ Add User

▶ Delete User

▶ Change User Settings
```

Interface Parameters	Function Description
Add User	Add user submenu
Delete User	Delete user submenu
Change User Settings	Change user settings submenu

8.3.9.6.1 Add user

Add User interface is used to add a BMC user through BIOS. The addition takes effect immediately, and the user will be added to the BMC user list.



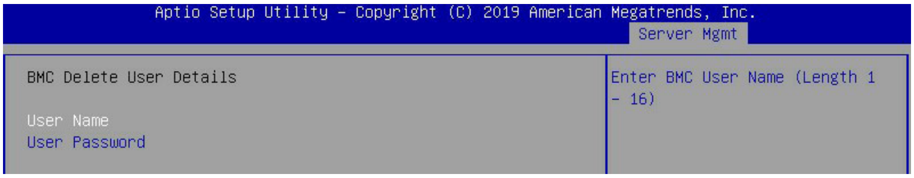
```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                      Server Mgmt

 BMC Add User Details                                 Enter BMC User Name (Length 1
                                                      - 16)
 User Name
 User Password
 Channel No                      1
 User Privilege Limit            [Reserved]
```

Interface Parameters	Function Description	Default Value
User Name	Set user name, supporting up to 16 characters.	----
User Password	Set user password. It must contain uppercase and lowercase letters, special characters and numbers, within 8-20 characters.	----
Channel NO	Set BMC channel, input 1 or 8.	1
User Privilege Limit	User privilege settings. Options include: Reserved Callback User Operator Administrator If the setting succeeds, it will prompt “Set User Access Command Passed”, and the BMC User takes effect immediately.	Reserved

Note: To enable the new user, it needs to set the User option in the Change User Settings interface to [Enabled], and then this user can log in to the BMC Web interface.

8.3.9.6.2 Delete User

Delete User interface is used to delete a BMC user through BIOS. The deletion takes effect immediately, and this user can not log in to the BMC Web interface any more.

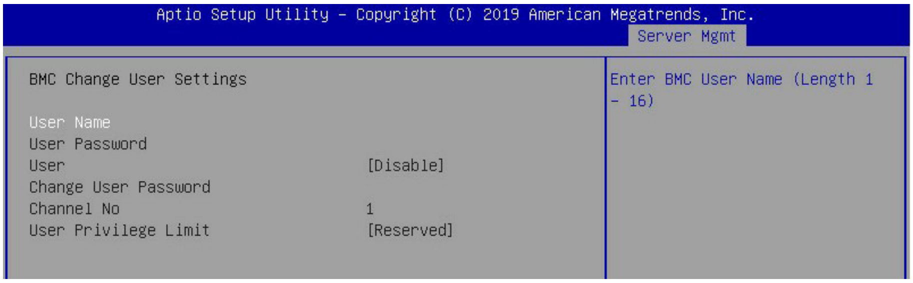


```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                  Server Mgmt

BMC Delete User Details                          Enter BMC User Name (Length 1
                                                 - 16)
User Name
User Password
```

Interface Parameters	Function Description
User Name	Input the name of user to delete
User Password	Input the password of user to delete. If the password is correct, it pops up “User Deleted!!!” The deletion takes effect immediately in BMC, and this user can not log in to the BMC Web interface any more.

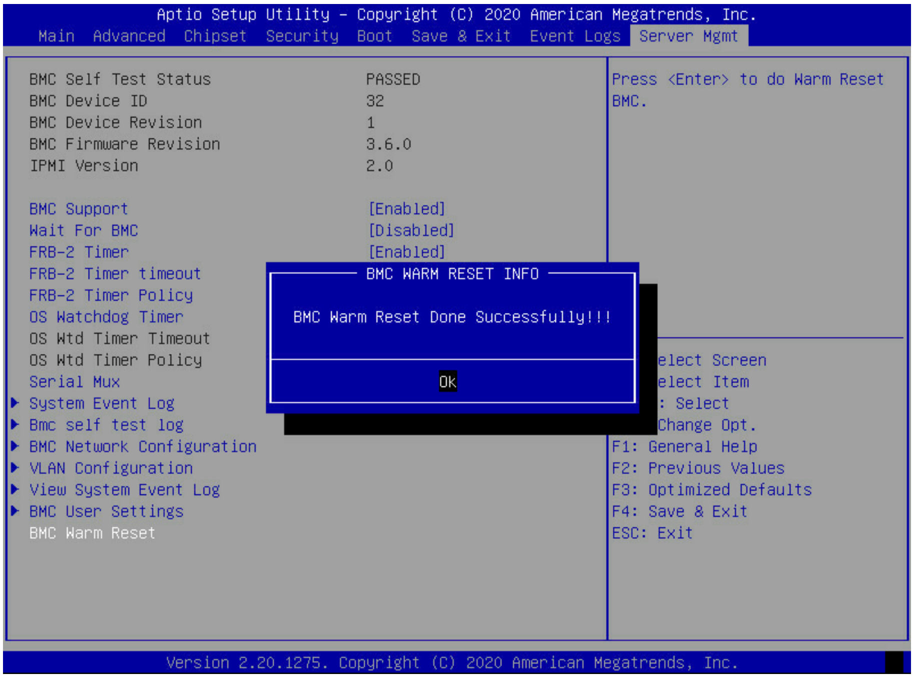
8.3.9.6.3 Change User Settings

Change User Settings interface is used to modify the BMC user settings through BIOS.



```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                  Server Mgmt

BMC Change User Settings                         Enter BMC User Name (Length 1
                                                 - 16)
User Name
User Password
User                          [Disable]
Change User Password
Channel No                    1
User Privilege Limit          [Reserved]
```

Interface Parameters	Function Description	Default Value
User Name	Input the name of user to modify	----
User Password	Input the password of user to modify. Only both the name and password are correct, the following options can be modified.	----
User	User privilege on-off settings. Options include: Enabled Disabled	Disabled
Change User Password	Change the user password. It must contain uppercase and lowercase letters, special characters and numbers, within 8-20 characters.	----
Channel NO	Set BMC channel, input 1 or 8.	0
User Privilege Limit	Modify the user privilege. Options include: Reserved Callback User Operator Administrator	Reserved



```
         Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit  Event Logs  Server Mgmt

  BMC Self Test Status                 PASSED          Press <Enter> to do Warm Reset
  BMC Device ID                        32              BMC.
  BMC Device Revision                  1
  BMC Firmware Revision                3.6.0
  IPMI Version                         2.0

  BMC Support                          [Enabled]
  Wait For BMC                         [Disabled]
  FRB-2 Timer                          [Enabled]
  FRB-2 Timer timeout        ┌─ BMC WARM RESET INFO ─┐
  FRB-2 Timer Policy         │                        │
  OS Watchdog Timer          │ BMC Warm Reset Done Successfully!!!
  OS Wtd Timer Timeout       │                        │
  OS Wtd Timer Policy        │                        │elect Screen
  Serial Mux                 │          Ok            │elect Item
▶ System Event Log           └────────────────────────┘: Select
▶ Bmc self test log                                    Change Opt.
▶ BMC Network Configuration                        F1: General Help
▶ VLAN Configuration                               F2: Previous Values
▶ View System Event Log                            F3: Optimized Defaults
▶ BMC User Settings                                F4: Save & Exit
  BMC Warm Reset                                   ESC: Exit

        Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.
```

8.4 Firmware update

For BIOS update, you could select to update in UEFI Shell or OS.

8.4.1 Update BIOS in UEFI shell

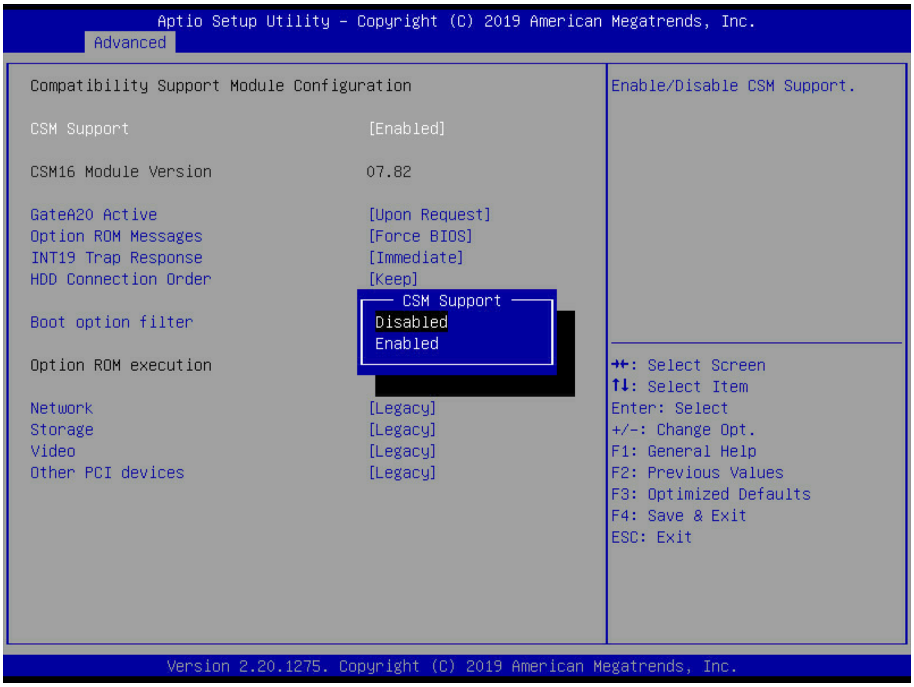
1) Insert the U disk containing the UEFI AMI BIOS update program (AfuEfi.cif) and the latest BIOS file into the USB port.

2) Press DEL key to enter the BIOS setup program. Select Advanced -> CSM Configuration.

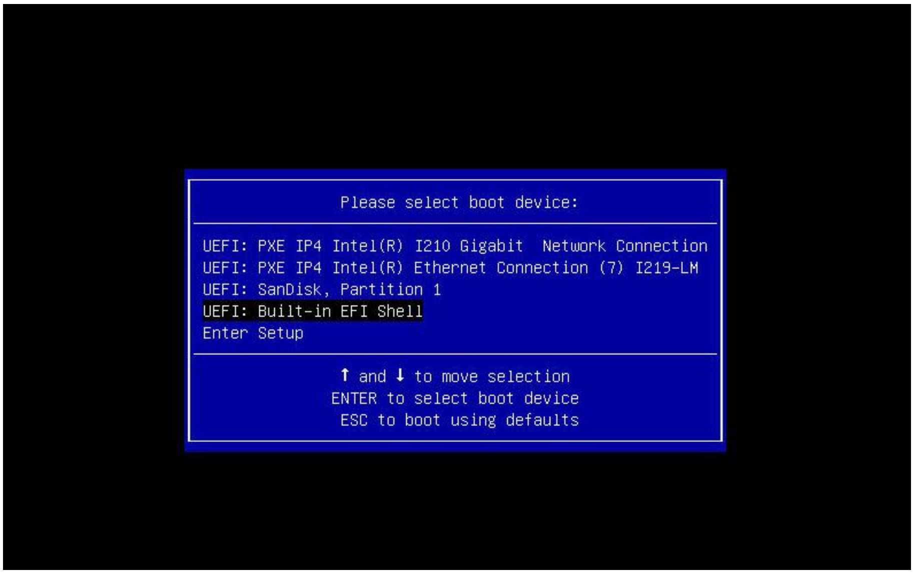
3) Select CSM Support and set it to [Disabled].

4) Press F4 to save and exit (Save & Exit).

5) Press F11 to enter Boot Override. Find the latest BIOS file and press Enter key.



```
        Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
     Advanced
 Compatibility Support Module Configuration            Enable/Disable CSM Support.

 CSM Support                           [Enabled]

 CSM16 Module Version                  07.82

 GateA20 Active                        [Upon Request]
 Option ROM Messages                   [Force BIOS]
 INT19 Trap Response                   [Immediate]
 HDD Connection Order                  [Keep]
                                     ┌─ CSM Support ─┐
 Boot option filter                  │ Disabled      │
                                     │ Enabled       │
 Option ROM execution                └───────────────┘ →←: Select Screen
                                                       ↑↓: Select Item
 Network                               [Legacy]        Enter: Select
 Storage                               [Legacy]        +/-: Change Opt.
 Video                                 [Legacy]        F1: General Help
 Other PCI devices                     [Legacy]        F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

        Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```



```
              Please select boot device:

 UEFI: PXE IP4 Intel(R) I210 Gigabit  Network Connection
 UEFI: PXE IP4 Intel(R) Ethernet Connection (7) I219-LM
 UEFI: SanDisk, Partition 1
 UEFI: Built-in EFI Shell
 Enter Setup

              ↑ and ↓ to move selection
             ENTER to select boot device
              ESC to boot using defaults
```

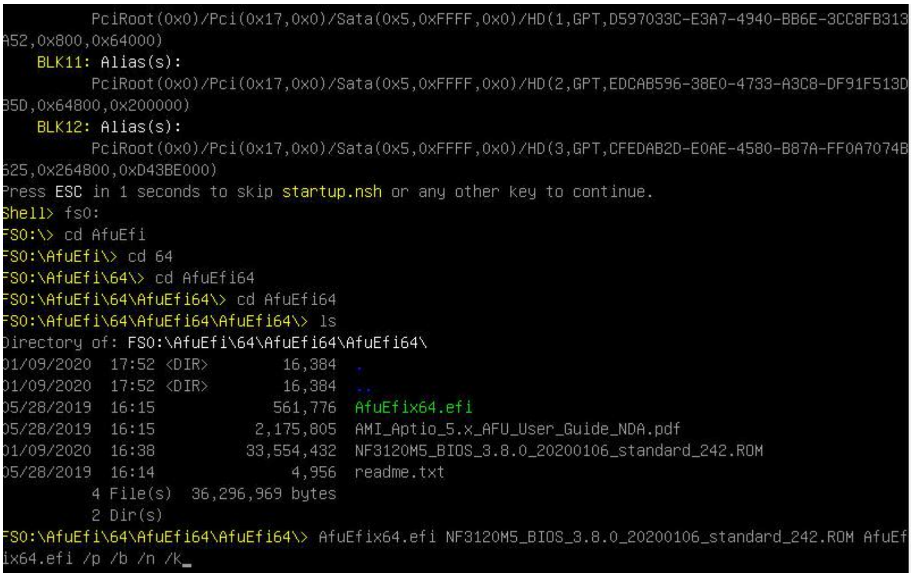
6) Select UEFI: Built-in EFI Shell and press Enter to DOS environment.

a. Input fs0: to enter the U disk.

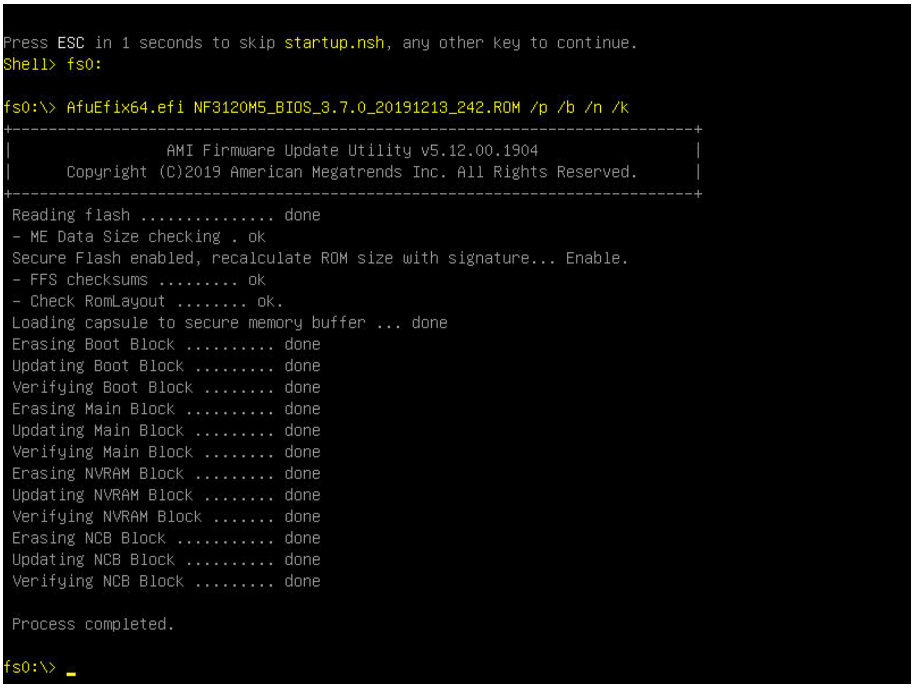
b. Find the path to the AfuEfi64.efi and BIOS (.ROM) files.

c. Input AfuEfi64.efi (.ROM) /p /b /n /k to start the update.

⚠ Note: Please use the BIOS ROM name to replace (.ROM).



```
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x5,0xFFFF,0x0)/HD(1,GPT,D597033C-E3A7-4940-BB6E-3CC8FB313
A52,0x800,0x64000)
    BLK11: Alias(s):
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x5,0xFFFF,0x0)/HD(2,GPT,EDCAB596-38E0-4733-A3C8-DF91F513D
B5D,0x64800,0x200000)
    BLK12: Alias(s):
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x5,0xFFFF,0x0)/HD(3,GPT,CFEDAB2D-E0AE-4580-B87A-FF0A7074B
625,0x264800,0xD43BE000)
Press ESC in 1 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\> cd AfuEfi
FS0:\AfuEfi\> cd 64
FS0:\AfuEfi\64\> cd AfuEfi64
FS0:\AfuEfi\64\AfuEfi64\> cd AfuEfi64
FS0:\AfuEfi\64\AfuEfi64\AfuEfi64\> ls
Directory of: FS0:\AfuEfi\64\AfuEfi64\AfuEfi64\
01/09/2020  17:52 <DIR>         16,384  .
01/09/2020  17:52 <DIR>         16,384  ..
05/28/2019  16:15              561,776  AfuEfix64.efi
05/28/2019  16:15            2,175,805  AMI_Aptio_5.x_AFU_User_Guide_NDA.pdf
01/09/2020  16:38           33,554,432  NF3120M5_BIOS_3.8.0_20200106_standard_242.ROM
05/28/2019  16:14                4,956  readme.txt
          4 File(s)  36,296,969 bytes
          2 Dir(s)
FS0:\AfuEfi\64\AfuEfi64\AfuEfi64\> AfuEfix64.efi NF3120M5_BIOS_3.8.0_20200106_standard_242.ROM AfuEf
ix64.efi /p /b /n /k_
```



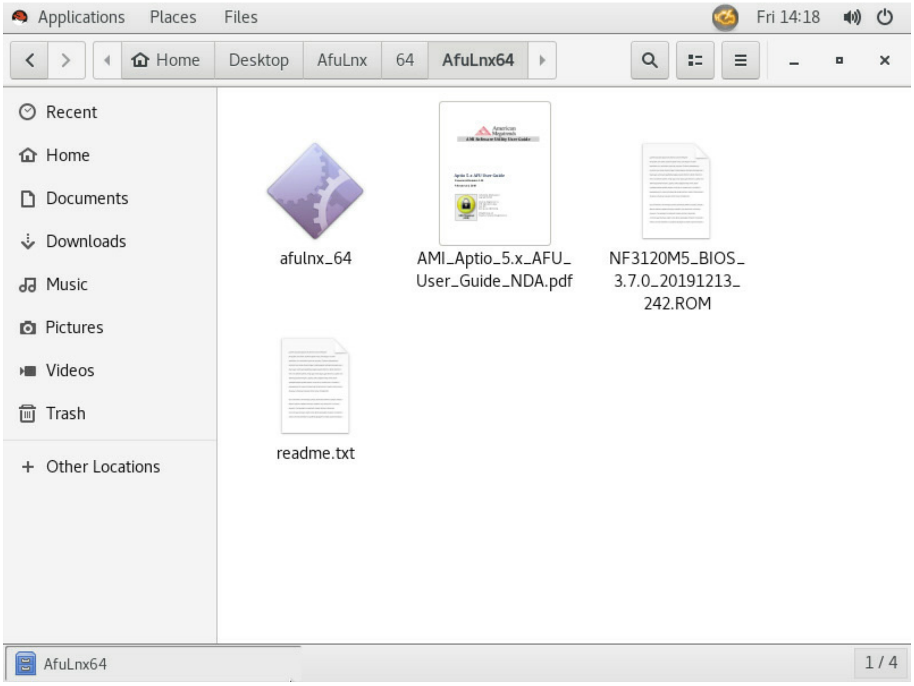
```
Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> fs0:

fs0:\> AfuEfix64.efi NF3120M5_BIOS_3.7.0_20191213_242.ROM /p /b /n /k
+---------------------------------------------------------------------------+
|                  AMI Firmware Update Utility v5.12.00.1904                 |
|      Copyright (C)2019 American Megatrends Inc. All Rights Reserved.      |
+---------------------------------------------------------------------------+
 Reading flash ............... done
 - ME Data Size checking . ok
 Secure Flash enabled, recalculate ROM size with signature... Enable.
 - FFS checksums ......... ok
 - Check RomLayout ........ ok.
 Loading capsule to secure memory buffer ... done
 Erasing Boot Block .......... done
 Updating Boot Block ......... done
 Verifying Boot Block ........ done
 Erasing Main Block .......... done
 Updating Main Block ......... done
 Verifying Main Block ........ done
 Erasing NVRAM Block ......... done
 Updating NVRAM Block ........ done
 Verifying NVRAM Block ....... done
 Erasing NCB Block ........... done
 Updating NCB Block .......... done
 Verifying NCB Block ......... done

 Process completed.

fs0:\> _
```

7) After the update is completed, please reboot the system.

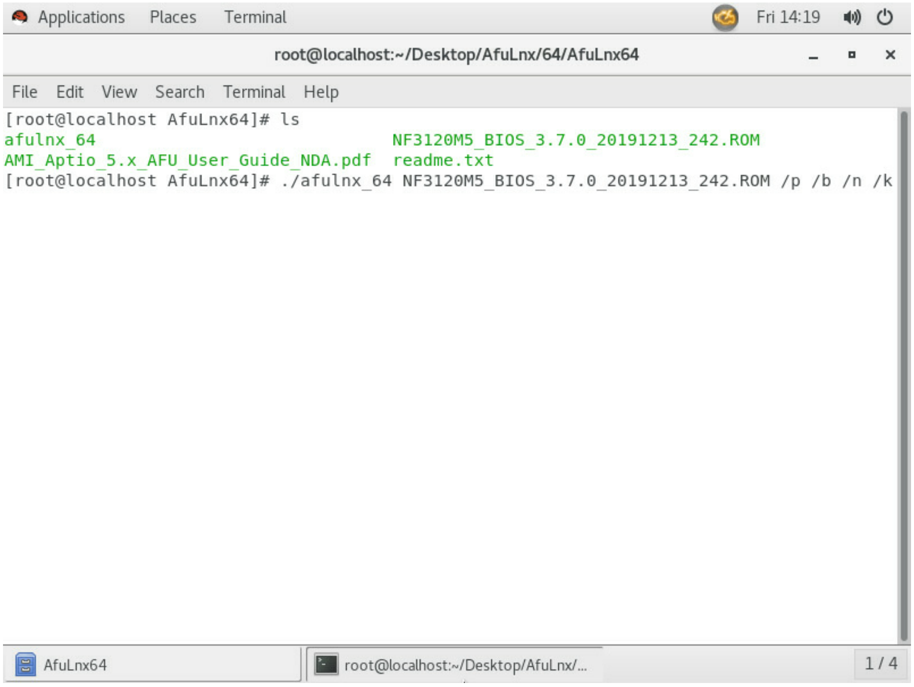
8.4.2 Update BIOS in Linux

1) Insert the U disk containing the Linux AMI BIOS update program (AfuEfi.cif) and the latest BIOS file into the USB port.

2) Move the latest BIOS file to the folder where the AMI BIOS update program (AfuEfi.cif) is stored.

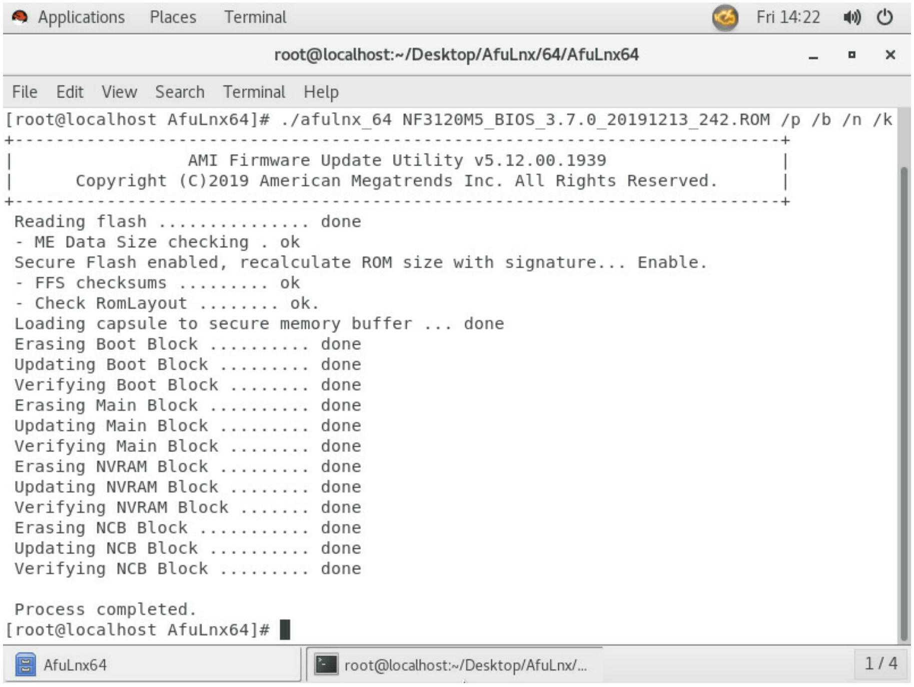


3) Right-click in the folder and select Open in terminal from the drop-down menu to enter the DOS environment.


Applications
Places
Terminal
Fri 14:19
root@localhost:~/Desktop/AfuLnx/64/AfuLnx64
File
Edit
View
Search
Terminal
Help
AfuLnx64
root@localhost:~/Desktop/AfuLnx/...
1 / 4

```
[root@localhost AfuLnx64]# ls
afulnx_64                          NF3120M5_BIOS_3.7.0_20191213_242.ROM
AMI_Aptio_5.x_AFU_User_Guide_NDA.pdf  readme.txt
[root@localhost AfuLnx64]# ./afulnx_64 NF3120M5_BIOS_3.7.0_20191213_242.ROM /p /b /n /k
```

4) Input ./afulnx_64 (.ROM) /p /b /n /k to start the update.

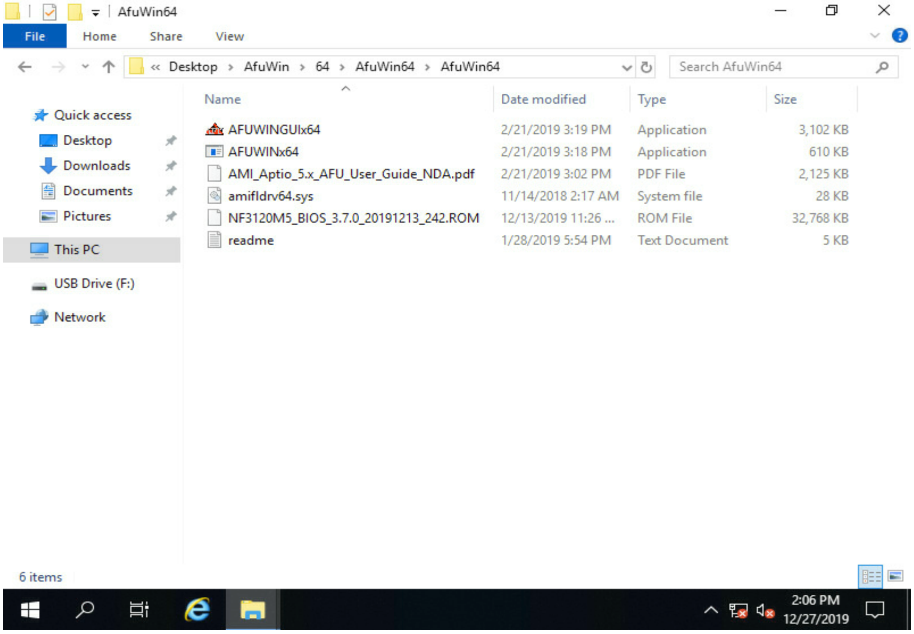

Applications
Places
Terminal
Fri 14:22
root@localhost:~/Desktop/AfuLnx/64/AfuLnx64
File
Edit
View
Search
Terminal
Help
AfuLnx64
root@localhost:~/Desktop/AfuLnx/...
1 / 4

```
[root@localhost AfuLnx64]# ./afulnx_64 NF3120M5_BIOS_3.7.0_20191213_242.ROM /p /b /n /k
+---------------------------------------------------------------------------+
|                 AMI Firmware Update Utility v5.12.00.1939                 |
|      Copyright (C)2019 American Megatrends Inc. All Rights Reserved.      |
+---------------------------------------------------------------------------+
 Reading flash ............... done
 - ME Data Size checking . ok
 Secure Flash enabled, recalculate ROM size with signature... Enable.
 - FFS checksums ......... ok
 - Check RomLayout ........ ok.
 Loading capsule to secure memory buffer ... done
 Erasing Boot Block .......... done
 Updating Boot Block ......... done
 Verifying Boot Block ........ done
 Erasing Main Block .......... done
 Updating Main Block ......... done
 Verifying Main Block ........ done
 Erasing NVRAM Block ......... done
 Updating NVRAM Block ........ done
 Verifying NVRAM Block ....... done
 Erasing NCB Block ........... done
 Updating NCB Block .......... done
 Verifying NCB Block ......... done

 Process completed.
[root@localhost AfuLnx64]# █
```

5) After the update is completed, please reboot the system.

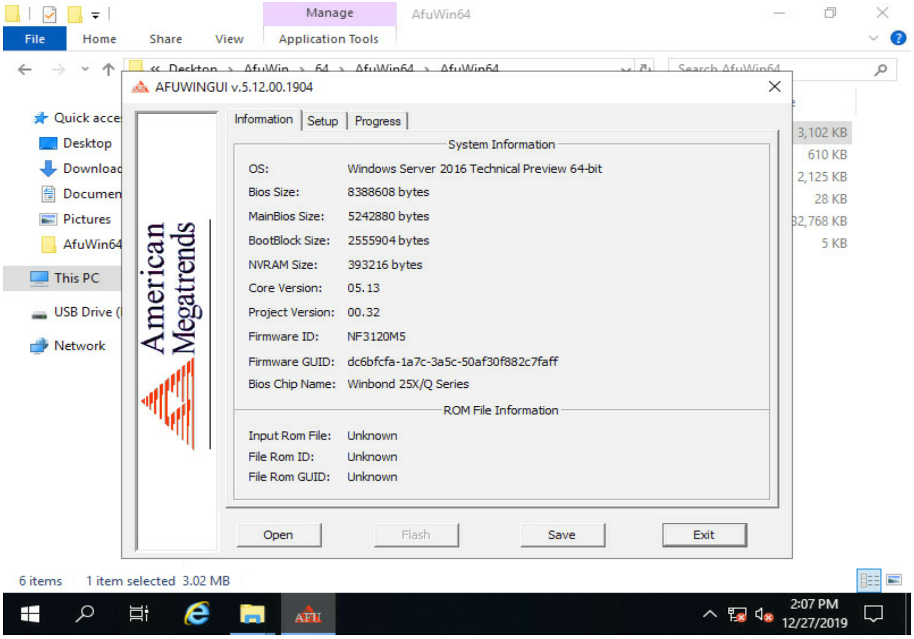
8.4.3 Update BIOS in Windows

1) Insert the U disk containing the Windows AMI BIOS update program (AfuEfi.cif) and the latest BIOS file into the USB port.



Name	Date modified	Type	Size
AFUWINGUIx64	2/21/2019 3:19 PM	Application	3,102 KB
AFUWINx64	2/21/2019 3:18 PM	Application	610 KB
AMI_Aptio_5.x_AFU_User_Guide_NDA.pdf	2/21/2019 3:02 PM	PDF File	2,125 KB
amifldrv64.sys	11/14/2018 2:17 AM	System file	28 KB
NF3120M5_BIOS_3.7.0_20191213_242.ROM	12/13/2019 11:26 ...	ROM File	32,768 KB
readme	1/28/2019 5:54 PM	Text Document	5 KB

2) Click Afu -> AfuWin -> 64 -> AfuWin64, then double-click on AFUWINGUIx64.EXE.



AFUWINGUI v.5.12.00.1904

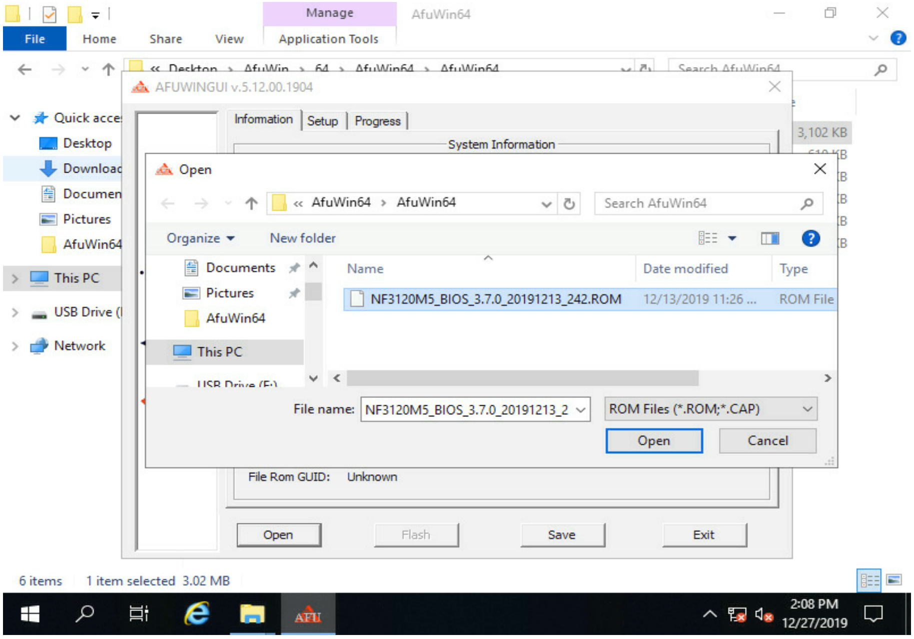
System Information

OS: Windows Server 2016 Technical Preview 64-bit
Bios Size: 8388608 bytes
MainBios Size: 5242880 bytes
BootBlock Size: 2555904 bytes
NVRAM Size: 393216 bytes
Core Version: 05.13
Project Version: 00.32
Firmware ID: NF3120M5
Firmware GUID: dc6bfcfa-1a7c-3a5c-50af30f882c7faff
Bios Chip Name: Winbond 25X/Q Series

ROM File Information

Input Rom File: Unknown
File Rom ID: Unknown
File Rom GUID: Unknown

3) Select Open and open the latest BIOS file. Click Open.



Open

AfuWin64 > AfuWin64

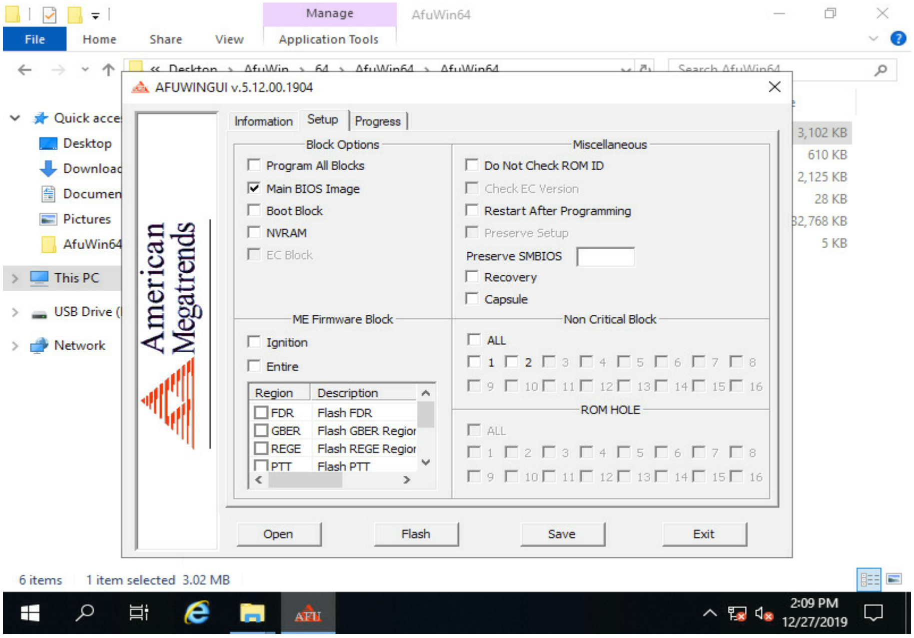
Name	Date modified	Type
NF3120M5_BIOS_3.7.0_20191213_242.ROM	12/13/2019 11:26 ...	ROM File

File name: NF3120M5_BIOS_3.7.0_20191213_2

ROM Files (*.ROM;*.CAP)

File Rom GUID: Unknown

4) Click Flash in the Setup tab to start the update.



AFUWINGUI v.5.12.00.1904

Information | Setup | Progress

Block Options
- ☐ Program All Blocks
- ☑ Main BIOS Image
- ☐ Boot Block
- ☐ NVRAM
- ☐ EC Block

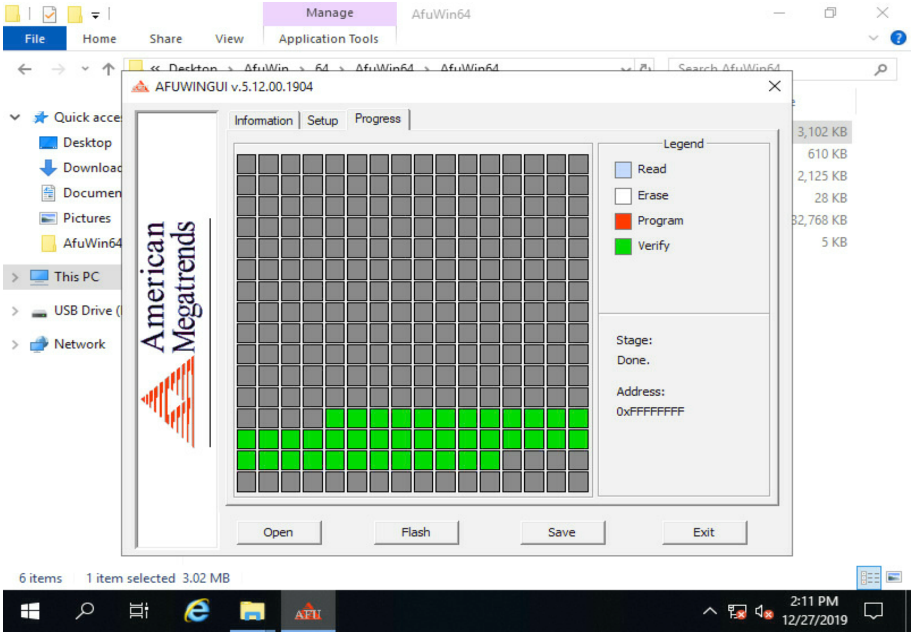
Miscellaneous
- ☐ Do Not Check ROM ID
- ☐ Check EC Version
- ☐ Restart After Programming
- ☐ Preserve Setup
- Preserve SMBIOS
- ☐ Recovery
- ☐ Capsule

ME Firmware Block
- ☐ Ignition
- ☐ Entire

Region	Description
☐ FDR	Flash FDR
☐ GBER	Flash GBER Region
☐ REGE	Flash REGE Region
☐ PTT	Flash PTT

Non Critical Block: ☐ ALL ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16

ROM HOLE: ☐ ALL ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16



AFUWINGUI v.5.12.00.1904

Information | Setup | Progress

Legend
- Read
- Erase
- 🟥 Program
- 🟩 Verify

Stage:
Done.

Address:
0xFFFFFFFF

5) After the update is completed, please reboot the system.

Parameter instructions:

- /B Program Boot Block

- /P Program main bios image

- /N Program NVRAM

- /X Do not check ROM ID
- /K Program all non-critical blocks
- /L Program all ROM Holes
- /ME Program ME Entire Firmware Block

9 BMC Settings

9.1 Introduction

This section describes the functional specifications for the Baseboard Management Controller (BMC). It also describes the features' detailed information.

This document is written for software developers, system integrators, testers and server management users.

9.2 Server System Overview

BMC is an independent system of host server system. This independent system has its own processor and memory; the host system can be managed by BMC system even if host hardware or OS hang or went down.

9.2.1 Main Features

✓ Supports IPMI2.0, IPMI interfaces include KCS, Lan and IPMB

● System interface (KCS)

● LAN interface (supports RMCP+)

● System Event Log (SEL)

● Sensor Data Record (SDR)

● Field Replaceable Unit (FRU)

● Remote power on/off and reset

● Serial Over LAN (SOL)

● Authentication type: RAKP-HMAC-SHA1

● Encryption (AES)

● Platform Event Filter (PEF)

● Platform Event Trap (PET)

● Watchdog Timer

✓ Private I2C bus

● Automatic monitor (temperature, voltage, fan speed and log events)

✓ PMBus*

● Supports PMBus power supply

✓ PSMI*

● Supports PSMI bus power supply

✓ Web User Interface

● Monitor, for displaying SDR/SEL/FRU and setting BMC/LAN

● Supports SSL (HTTPS)

● Multi-level user rights

● BMC firmware update

● Provides GUI graphical remote management interface, with Web interface management function. The graphical management interface can display the host's remote graphical console, keyboard and pointing device functions

● SSH (Secure Shell)

● When an operating system failure occurs, it can support 20 administrators to remotely access the dedicated management port through the Web interface for maintenance operations, so that the system administrators can coordinate the debugging.

● Remote control and supervision via network

● Supports Directory Integration – AD (Active Directory) and LDAP

● Users can operate 2 remote graphical interface consoles at the same time, so that different managers can work together to solve problems in different places

✓ Firmware update

● DOS tool

● Web GUI (Windows® XP/Vista/2003/2008, RHEL5.2, SLES10SP2)

✓ Prompt

● PET

● SNMP Trap

● e-Mail

● With self-diagnostic light display function, can display the hardware status

● Supports damage monitoring functions, such as CPU, memory and hard disk drive

● Web Remote Control

✓ Remote BIOS update

● Update BIOS using a remote floppy drive

✓ Remote storage (virtual media)

● Supports two remote memories for USB/CD-ROM/DVD and video

✓ Remote OS installation

● Install the operating system remotely using a remote saver

- Management interface function can provide virtual CD, virtual directory, ISO image mount and remote host program installation

✓ Supports SNMB MIB file

- The Management Information Base (MIB) is a database used to manage entities in a communication network, most commonly used together with Simple Network Management Protocol (SNMP)

✓ User interface

- CIM (Common Information Model)
- SMASH-CLP
- WSMAN

Notes:

* It must support PMBus and PSMI.

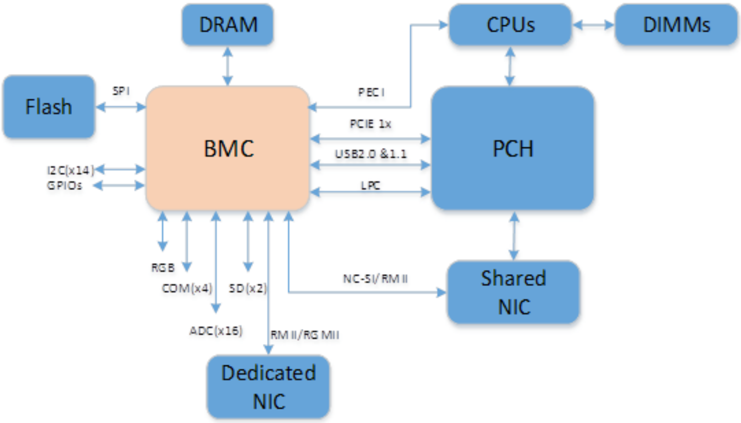
** Specifications are subject to change without notice.

9.2.2 Integrated BMC Hardware

ASPEED AST2500 is a processor of the server management subsystem, based on the ARM1176JZF-S 32-bit RISC CPU microcontroller.

The following functions are integrated into the component:

- Baseboard Management Controller (BMC) with peripherals
- Server-class Super I/O (SIO)
- Graphics controller
- Remote KVM redirection, USB media redirection, and HW Encryption



BMC hardware architecture

The LPC interface connected to the host is used for SIO and BMC communication. The LPC Bus interface provides IPMI Compliant KCS interfaces.

The PCI Express interface is mainly used for the graphics controller interface to communicate with the host. The graphics controller is a VGA-compliant controller with 2D hardware acceleration and full bus master support. The graphics controller can support up to 1920x1200 32bpp@60Hz resolution at high refresh rates. The PCI Express interface is also used for BMC messaging to other system devices using MCTP protocol.

The USB 2.0 Hub interface is used for remote keyboard and mouse, and remote storage support. BMC supports various storage devices such as CDROM, DVDROM, CDROM (ISO image), floppy and USB flash disk. Any of the storage devices can be used as a boot device and the host can boot from this remote media via redirection over the USB interface.

9.3 IPMI2.0

9.3.1 Channel ID Assignment for Each Interface

Table 1 Channel ID Assignment for Each Interface

Channel ID	Interface	Support Sessions
0x0	IPMB Channel	No
0x1	LAN Channel 1	Yes
0x4	SMBUS Channel	No
0x5	SMM Channel	No
0x6	SMLINK IPMB Channel	No
0x8	LAN Channel 2	Yes
0xa	Third IPMB Channel	No
0xf	SystemIf Channel	No

9.3.2 System Interface

LPC interface is supported, and LPC provides hardware path for KCS messaging.

9.3.3 IPMB Interface

BMC supports Intel NM5.0. Now, SMLINK IPMB Channel is used as the communication interface.

9.3.4 LAN Interface

BMC supports IPMI V2.0, compatible with V1.5, and supports receiving and sending IPMI messages based on RMCP or RMCP+ format.

BMC supports up to 2 LAN Interfaces (Dedicated NIC and Shared NIC).

List of supported cipher suites in IPMI:

Table 2 Supported Cipher Suites in IPMI

ID	Authentication Algorithm	Integrity Algorithm	Confidentiality Algorithm
0	RAKP- NONE	NONE	NONE
1	RAKP-HMAC-SHA1	NONE	NONE
2	RAKP-HMAC-SHA1	HMAC-SHA1-96	NONE
3	RAKP-HMAC-SHA1	HMAC-SHA1-96	AES-CBC-128
4	RAKP-HMAC-MD5	NONE	NONE
5	RAKP-HMAC-MD5	HMAC-MD5-128	NONE
6	RAKP-HMAC-MD5	HMAC-MD5-128	AES-CBC-128
7	RAKP-HMAC-MD5	MD5-128	NONE
8	RAKP-HMAC-MD5	MD5-128	AES-CBC-128
9	RAKP_HMAC_ SHA256	NONE	NONE
10	RAKP_HMAC_ SHA256	HMAC-SHA256-128	NONE
11	RAKP_HMAC_ SHA256	HMAC-SHA256-128	AES-CBC-128

9.3.5 IPMI Commands

Tables below define the IPMI commands supported by the BMC.

IPMI SPEC standard command:

Table 3 IPMI Spec Standard Command

NetFn	App	Chassis	S/E	Storage	Transport	Bridge
Value	0x06	0x00	0x04	0x0A	0x0C	0x02

	NetFn	CMD
IPM Device “Global” Commands		
reserved	App	00h
Get Device ID	App	01h
Broadcast ‘Get Device ID’	App	01h
Cold Reset	App	02h
Warm Reset	App	03h
Get Self Test Results	App	04h
Manufacturing Test On	App	05h
Set ACPI Power State	App	06h
Get ACPI Power State	App	07h
Get Device GUID	App	08h
reserved	App	09h~0Fh
Set Command Enables	App	60h
Get Command Enables	App	61h
Set Command Sub-function Enables	App	62h
Get Command Sub-function Enables	App	63h
Get OEM NetFn IANA Support	App	64h
BMC Watchdog Timer Commands		
Reset Watchdog Timer	App	22h
Set Watchdog Timer	App	24h
Get Watchdog Timer	App	25h
BMC Device and Messaging Commands		
Set BMC Global Enables	App	2Eh
Get BMC Global Enables	App	2Fh
Clear Message Flags	App	30h
Get Message Flags	App	31h
Enable Message Channel Receive	App	32h
Get Message	App	33h
Send Message	App	34h
Read Event Message Buffer	App	35h
Get BT Interface Capabilities	App	36h
Get System GUID	App	37h
Get Channel Authentication Capabilities	App	38h
Get Session Challenge	App	39h

Activate Session	App	3Ah
Set Session Privilege Level	App	3Bh
Close Session	App	3Ch
Get Session Info	App	3Dh
unassigned	App	3Eh
Get AuthCode	App	3Fh
Set Channel Access	App	40h
Get Channel Access	App	41h
Get Channel Info Command	App	42h
Set User Access Command	App	43h
Get User Access Command	App	44h
Set User Name	App	45h
Get User Name Command	App	46h
Set User Password Command	App	47h
Activate Payload	App	48h
Deactivate Payload	App	49h
Get Payload Activation Status	App	4Ah
Get Payload Instance Info	App	4Bh
Set User Payload Access	App	4Ch
Get User Payload Access	App	4Dh
Get Channel Payload Support	App	4Eh
Get Channel Payload Version	App	4Fh
Get Channel OEM Payload Info	App	50h
unassigned	App	51h
Master Write-Read	App	52h
unassigned	App	53h
Get Channel Cipher Suites	App	54h
Suspend/Resume Payload Encryption	App	55h
Set Channel Security Keys	App	56h
Get System Interface Capabilities	App	57h
Set System Info	App	58h
Get System Info	App	59h
Chassis Device Commands		
Get Chassis Capabilities	Chassis	00h
Get Chassis Status	Chassis	01h

Chassis Control	Chassis	02h
Chassis Reset	Chassis	03h
Chassis Identify	Chassis	04h
Set Front Panel Button Enables	Chassis	0Ah
Set Chassis Capabilities	Chassis	05h
Set Power Restore Policy	Chassis	06h
Set Power Cycle Interval	Chassis	0Bh
Get System Restart Cause	Chassis	07h
Set System Boot Options	Chassis	08h
Get System Boot Options	Chassis	09h
unassigned	Chassis	0Ch~0Eh
Get POH Counter	Chassis	0Fh
Event Commands		
Set Event Receiver	S/E	00h
Get Event Receiver	S/E	01h
Platform Event	S/E	02h
unassigned	S/E	03h~0Fh
PEF and Alerting Commands		
Get PEF Capabilities	S/E	10h
Arm PEF Postpone Timer	S/E	11h
Set PEF Configuration Parameters	S/E	12h
Get PEF Configuration Parameters	S/E	13h
Set Last Processed Event ID	S/E	14h
Get Last Processed Event ID	S/E	15h
Alert Immediate	S/E	16h
PET Acknowledge	S/E	17h
Sensor Device Commands		
Get Device SDR Info	S/E	20h
Get Device SDR	S/E	21h
Reserve Device SDR Repository	S/E	22h
Get Sensor Reading Factors	S/E	23h
Set Sensor Hysteresis	S/E	24h
Get Sensor Hysteresis	S/E	25h
Set Sensor Threshold	S/E	26h
Get Sensor Threshold	S/E	27h

Set Sensor Event Enable	S/E	28h
Get Sensor Event Enable	S/E	29h
Re-arm Sensor Events	S/E	2Ah
Get Sensor Event Status	S/E	2Bh
Get Sensor Reading	S/E	2Dh
Set Sensor Type	S/E	2Eh
Get Sensor Type	S/E	2Fh
Set Sensor Reading and Event Status	S/E	30h
FRU Device Commands		
Get FRU Inventory Area Info	Storage	10h
Read FRU Data	Storage	11h
Write FRU Data	Storage	12h
SDR Device Commands		
Get SDR Repository Info	Storage	20h
Get SDR Repository Allocation Info	Storage	21h
Reserve SDR Repository	Storage	22h
Get SDR	Storage	23h
Add SDR	Storage	24h
Partial Add SDR	Storage	25h
Delete SDR	Storage	26h
Clear SDR Repository	Storage	27h
Get SDR Repository Time	Storage	28h
Set SDR Repository Time	Storage	29h
Enter SDR Repository Update Mode	Storage	2Ah
Exit SDR Repository Update Mode	Storage	2Bh
Run Initialization Agent	Storage	2Ch
SEL Device Commands		
Get SEL Info	Storage	40h
Get SEL Allocation Info	Storage	41h
Reserve SEL	Storage	42h
Get SEL Entry	Storage	43h
Add SEL Entry	Storage	44h
Partial Add SEL Entry	Storage	45h
Delete SEL Entry	Storage	46h
Clear SEL	Storage	47h

Get SEL Time	Storage	48h
Set SEL Time	Storage	49h
Get Auxiliary Log Status	Storage	5Ah
Set Auxiliary Log Status	Storage	5Bh
Get SEL Time UTC Offset	Storage	5Ch
Set SEL Time UTC Offset	Storage	5Dh
LAN Device Commands		
Set LAN Configuration Parameters	Transport	01h
Get LAN Configuration Parameters	Transport	02h
Suspend BMC ARPs	Transport	03h
Get IP/UDP/RMCP Statistics	Transport	04h
Serial/Modem Device Commands		
Set Serial/Modem Configuration	Transport	10h
Get Serial/Modem Configuration	Transport	11h
Set Serial/Modem Mux	Transport	12h
Get TAP Response Codes	Transport	13h
Set PPP UDP Proxy Transmit Data	Transport	14h
Get PPP UDP Proxy Transmit Data	Transport	15h
Send PPP UDP Proxy Packet	Transport	16h
Get PPP UDP Proxy Receive Data	Transport	17h
Serial/Modem Connection Active	Transport	18h
Callback	Transport	19h
Set User Callback Options	Transport	1Ah
Get User Callback Options	Transport	1Bh
Set Serial Routing Mux	Transport	1Ch
SOL Activating	Transport	20h
Set SOL Configuration Parameters	Transport	21h
Get SOL Configuration Parameters	Transport	22h
Forwarded Command	Transport	30h
Set Forwarded Commands	Transport	31h
Get Forwarded Commands	Transport	32h
Enable Forwarded Commands	Transport	33h
Bridge Management Commands (ICMB)		
Get Bridge State	Bridge	00h
Set Bridge State	Bridge	01h

Get ICMB Address	Bridge	02h
Set ICMB Address	Bridge	03h
Set Bridge ProxyAddress	Bridge	04h
Get Bridge Statistics	Bridge	05h
Get ICMB Capabilities	Bridge	06h
Clear Bridge Statistics	Bridge	08h
Get Bridge Proxy Address	Bridge	09h
Get ICMB Connector Info	Bridge	0Ah
Get ICMB Connection ID	Bridge	0Bh
Send ICMB Connection ID	Bridge	0Ch
Discovery Commands (ICMB)		
PrepareForDiscovery	Bridge	10h
GetAddresses	Bridge	11h
SetDiscovered	Bridge	12h
GetChassisDeviceId	Bridge	13h
SetChassisDeviceId	Bridge	14h
Bridging Commands (ICMB)		
BridgeRequest	Bridge	20h
BridgeMessage	Bridge	21h
Event Commands (ICMB)		
GetEventCount	Bridge	30h
SetEventDestination	Bridge	31h
SetEventReceptionState	Bridge	32h
SendICMBEventMessage	Bridge	33h
GetEventDestination (optional)	Bridge	34h
GetEventReceptionState (optional)	Bridge	35h
OEM Commands for Bridge NetFn		
OEM Commands	Bridge	C0h~FEh
Other Bridge Commands		
Error Report (optional)	Bridge	FFh

9.4 Web GUI

HTTPS (Port 443) is supported to access Web GUI. HTTP is disabled by default, users can enable it by IPMI OEM CMD.

The Web GUI provides management interface for users to view the system information, system event and status, and to control the managed server.

The Web GUI is supported by following browsers:

Table 4 Supported Browsers

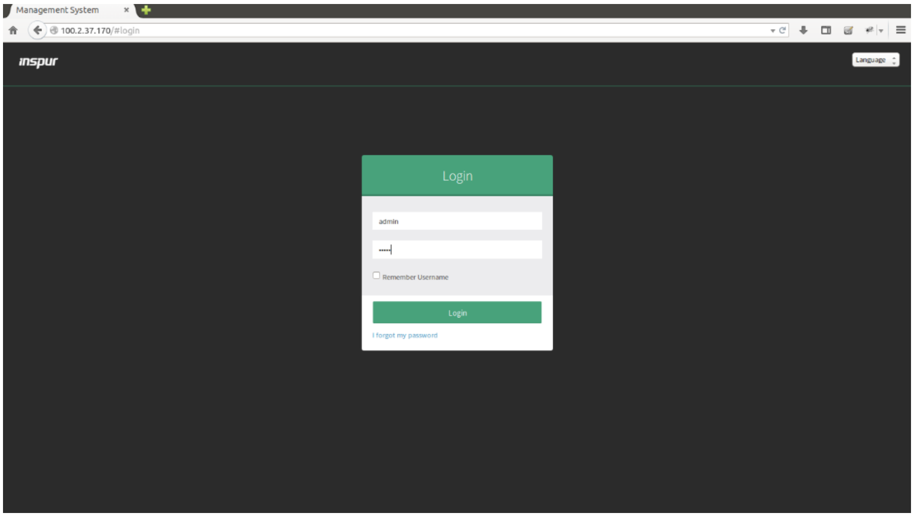
Client OS	Browser Versions
Windows 7.1 x64 Windows 8 x64 Windows 10 x64 Ubuntu 14.04.03 LTS x64 MAC OS X Fedora 23 x64 CentOS 7 x64	On Windows Clients: Edge ,Firefox 43, Chrome 47+, IE 11+ On Linux Clients: Firefox 43, Chrome 47+ On MAC Client: Safari

Step 1

Enter "https: // BMC_IP" in browser address bar. Port number is modifiable (See the "Services" section) and the http port number is 80 (disabled by default), https port number is 443. If you modify the port number, you need to specify the port number when logging in, such as https: // BMC_IP: sslport.

Step 2

In the Web login interface, enter the default user name (admin) and password (admin), click the "Login" button to enter the home page, as the figure shows.



100.2.37.170/#login

admin

•••••

□ Remember Username

When you forget password, you can click "Forgot Password?" link to get a new password by Email. Be sure to configure the Email address in advance in "User Management" page and configure SMTP server information in "SMTP" page.

Main features supported in Web GUI:

Menu	Submenu	Main Content
Dashboard	\	System status
		Monitor
		Information
		Log
Sensor	Sensor reading	Temperature, voltage, fan, power supply, hard disk, memory, error and various status reading
System inventory	System inventory	Processor
		Memory controller
		Power
		Thermal
		PCIE device
		Storage
		BMC NIC information
		System NIC information
BIOS option	BIOS option	Display main setting options
FRU information	FRU	Display FRU information
Logs & reports	IPMI event log	Display and export the system event log (SEL)
	System log	Display and export the system log
	Audit log	Display and export audit log
	Video log	Display video log
	BlackBox log	Display and export black box log
Settings	Capture BSOD	Display BSOD screen
	Date & Time	Set date, time and zone
	External user services	Set LDAP, AD and RADIUS
	KVM mouse setting	Mouse mode settings
	Log settings	Log policy and advanced log settings
	Manage licenses	View and add authorizations
	Media redirection settings	Virtual media instance and redirection settings
	Network settings	Network IP, bonding and DNS settings
	PAM order settings	Set PAM authentication order
	Platform event filter	Set PEF and alarm policy
	Services	View and set service port
	SMTP settings	SMTP settings
	SSL settings	View, generate and upload SSL certificate
	System firewall	IP, port and MAC firewall settings
	User management	View, add and modify user settings
	Video recording	Video and SOL settings
	Fan control	Automatic and manual mode settings

Remote control	KVM	Start and reset KVM
	JViewer	Start JViewer
	SOL	Enable SOL
Image redirection	Remote images	View, start and stop remote image redirection
Power control	Power actions	Power on, power off and reset
	BMC reset	BMC reset
	PSU settings	Set PSU’s active-standby status
Locator LED	Locator LED	Set the locator LED to be on, off or steady flashing
Maintenance	Backup configuration	Select specific configuration items to backup
	BMC recovery	Set BMC recovery mechanism
	Firmware image location	Select the protocol to be used when transferring the firmware image onto the BMC
	Firmware information	Display firmware version and build date
	BMC firmware update	BMC firmware update
	Preserve configuration	Save preserved configuration
	Restore configuration	Restore preserved configuration
	Restore factory defaults	Restore factory defaults
	System administrator	Display system administrator information
	BIOS update	BIOS firmware update
	PSU update	PSU firmware update
Sign out	\	User logout

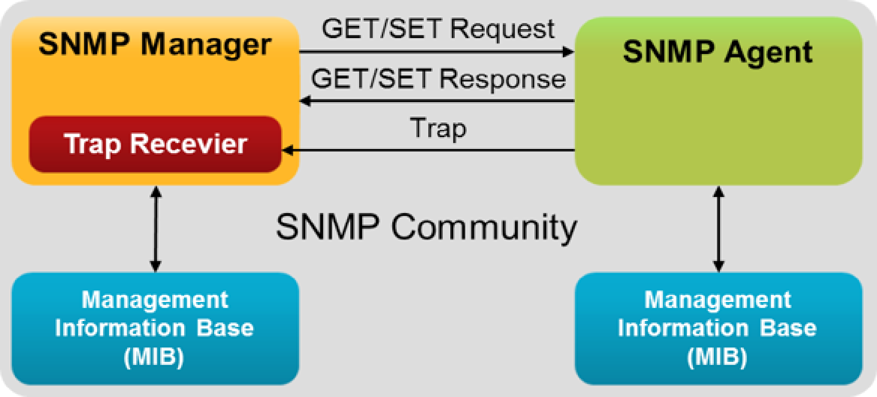
9.5 SNMP

SNMP (Simple Network Management Protocol) is a network management standard based on the TCP/IP protocol family. It is a standard protocol for managing network nodes (such as servers, workstations, routers, switches, etc.) in an IP network. SNMP enables network administrators to improve network management efficiency, identify and solve network problems in a timely manner, and plan for network growth. Network administrators can also receive network node notification messages and alarm event reports to learn about network problems.

In the BMC, the agent can obtain the server information such as network information, user information, temperature/voltage/fan speed and so on through the SNMP service. At the same time we can configure parameters and manage the server through BMC.

- Support SNMP Get/Set/Trap.
- Support V1/V2C/V3 version.
- SNMPv3 supports authentication algorithm MD5 or SHA, and encryption algorithm DES or AES.

- SNMP Get supports querying system health status, sensor status, hardware status, device asset information, etc.
- SNMP Set supports most of BMC settings.
- SNMP Trap supports IPM-based Trap messages.

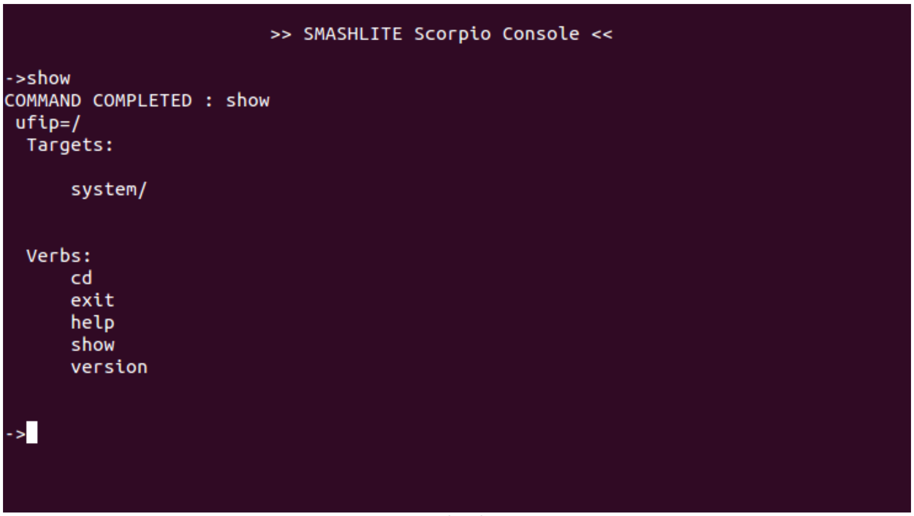


SNMP Schematic

9.6 Smash-Lite CLI

BMC supports Smash-Lite CLI, users can log in to BMC via SSH and enter Smash-Lite CLI. By entering the show command, related directories appear. Users can enter the corresponding directories as needed to view specific information, as the following figure shows.

- Smash-Lite show



```
                    >> SMASHLITE Scorpio Console <<

->show
COMMAND COMPLETED : show
 ufip=/
  Targets:

      system/


  Verbs:
      cd
      exit
      help
      show
      version


->
```

Smash show

9.7 System Information and Status

Log in to Web GUI to quickly view system information and status. Click or move the mouse over the item to see more information.

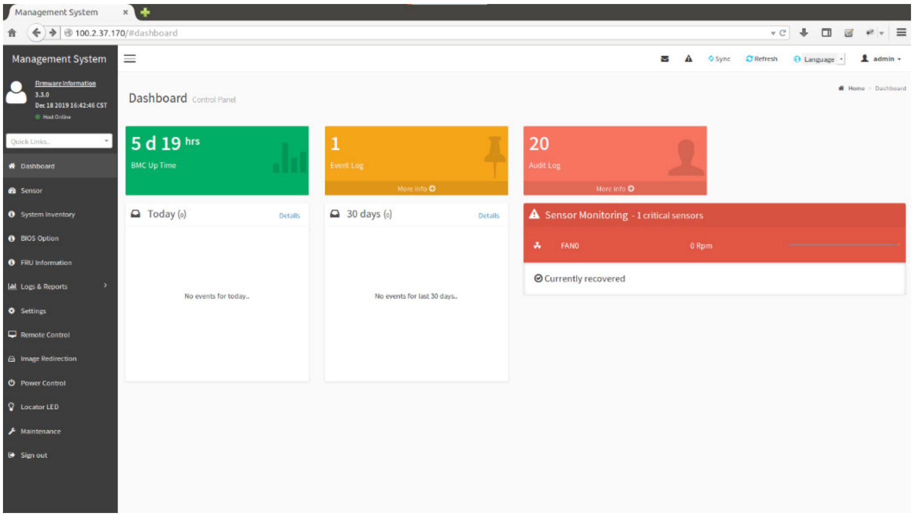
BMC Up Time: Displays the elapsed time of the BMC startup.

Event Log: Displays the total number and links of event logs.

Audit Log: Displays the total number and links of audit logs.

Today & 30 days: Displays the percentage of sensor events that occurred today or within 30 days, including the total and name.

Sensor Monitoring: Displays the current working status of the sensor.

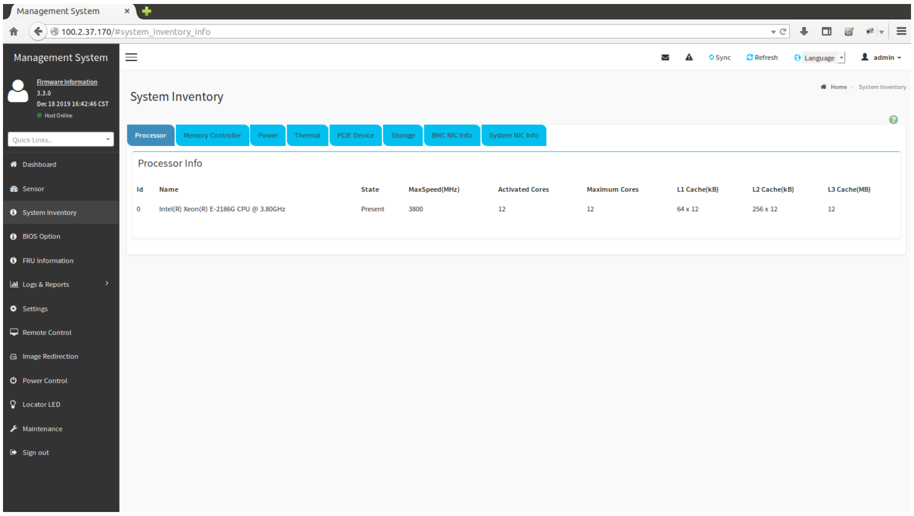


No events for today..

No events for last 30 days..

9.7.1 CPU

Log in to the Web GUI and enter the “System Inventory -> Processor” page, which displays the processor information. It specifically includes: ID, name, state, max speed (MHz), activated cores, maximum cores, L1 cache (KB), L2 cache (KB), L3 cache (MB).



Processor Info

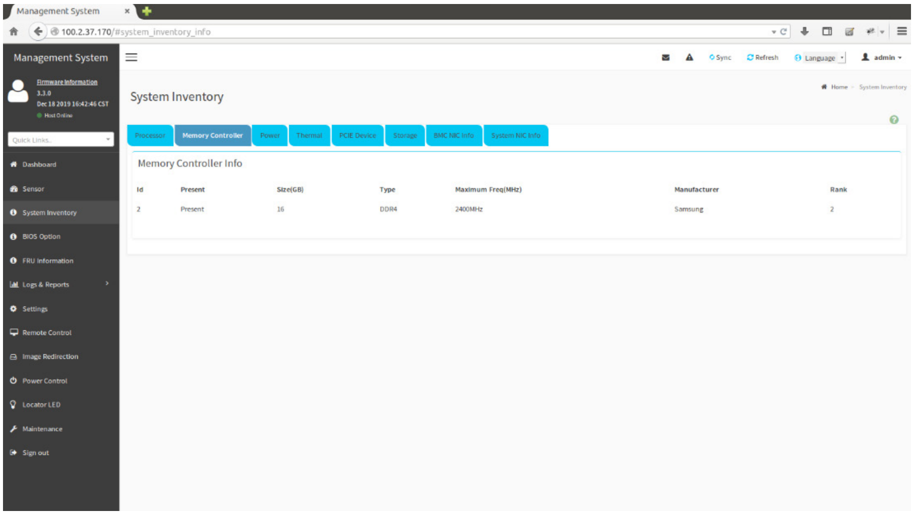
Id	Name	State	MaxSpeed(MHz)	Activated Cores	Maximum Cores	L1 Cache(kB)	L2 Cache(kB)	L3 Cache(MB)
0	Intel(R) Xeon(R) E-2186G CPU @ 3.80GHz	Present	3800	12	12	64 x 12	256 x 12	12

Table 5 CPU Information

Attribute	Value
ID	x, x denotes the CPU number., starting from 0.
Name	Product model
State	Present
MaxSpeed (MHz)	Processor speed
Activated Cores	Activated core number
Maximum Cores	Maximum core number
L1 Cache (KB)	L1 cache
L2 Cache (KB)	L2 cache
L3 Cache (MB)	L3 cache

9.7.2 Memory

Log in to the Web GUI and enter the "System Inventory -> Memory Controller" page, which displays the memory controller information. It specifically includes: ID, present, size (GB), type, maximum freq (MHz), manufacturer, rank.



System Inventory

Memory Controller Info

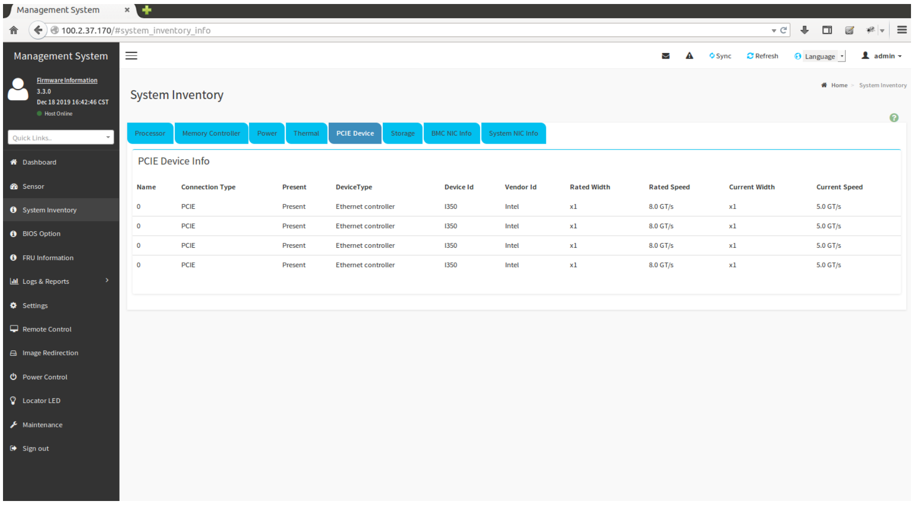
Id	Present	Size(GB)	Type	Maximum Freq(MHz)	Manufacturer	Rank
2	Present	16	DDR4	2400MHz	Samsung	2

Table 6 Memory Information

Attribute	Value
ID	x, x denotes the memory number.
Present	Present
Size (GB)	Memory size
Type	DDR3 or DDR4
Maximum Freq (MHz)	Maximum frequency
Manufacturer	Manufacturer
Rank	Rank

9.7.3 PCIE Device

Log in to the Web GUI and enter the “System Inventory -> PCIE Device” page, which displays the PCIE device information. It specifically includes: name, connection type, present, device type, device id, vendor id, rated width, rated speed, current width, current speed.



System Inventory

PCIE Device Info

Name	Connection Type	Present	DeviceType	Device Id	Vendor Id	Rated Width	Rated Speed	Current Width	Current Speed
0	PCIE	Present	Ethernet controller	I350	Intel	x1	8.0 GT/s	x1	5.0 GT/s
0	PCIE	Present	Ethernet controller	I350	Intel	x1	8.0 GT/s	x1	5.0 GT/s
0	PCIE	Present	Ethernet controller	I350	Intel	x1	8.0 GT/s	x1	5.0 GT/s
0	PCIE	Present	Ethernet controller	I350	Intel	x1	8.0 GT/s	x1	5.0 GT/s

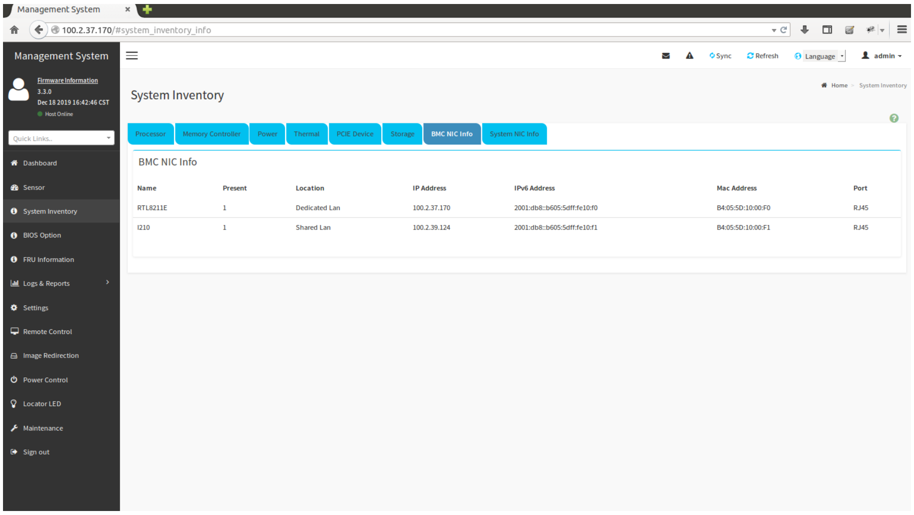
Table 7 PCIE Information

Attribute	Value
Name	Motherboard slot number where the device is located
Connection Type	Connection type
Present	Present
Device Type	Device type
Device ID	Device ID
Vender ID	Vendor ID
Rated Width	Rated width
Rated Speed	Rated speed
Current Width	Current width
Current Speed	Current speed

9.7.4 Network

Log in to the Web GUI and enter the “System Inventory -> BMC NIC Info” page, which displays the BMC NIC information. It specifically includes: name, present, location, IP address, IPv6 address, mac address, port.

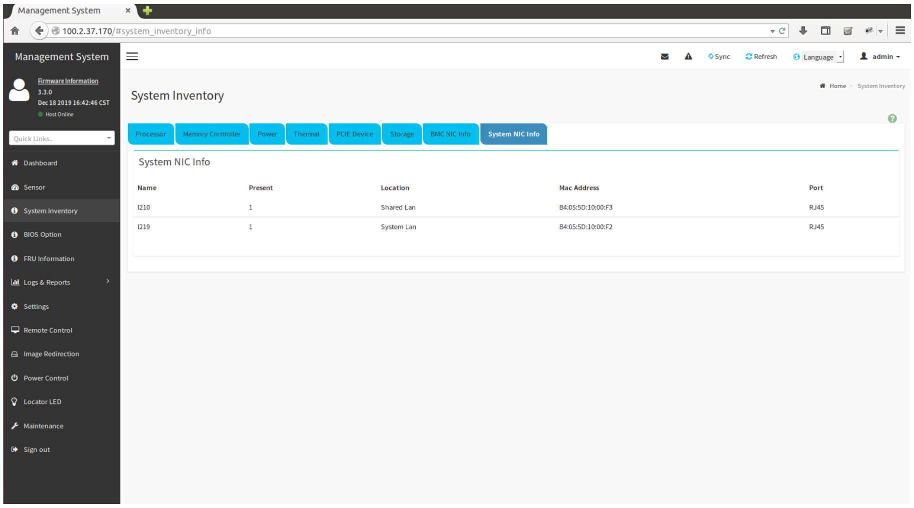
Enter the “System Inventory -> System NIC Info” page, which displays the system NIC information. It specifically includes: name, present, location, mac address, port.



System Inventory

BMC NIC Info

Name	Present	Location	IP Address	IPv6 Address	Mac Address	Port
RTL8211E	1	Dedicated Lan	100.2.37.170	2001:db8::b605:5dff:fe10:f0	B4:05:5D:10:00:F0	RJ45
I210	1	Shared Lan	100.2.39.124	2001:db8::b605:5dff:fe10:f1	B4:05:5D:10:00:F1	RJ45



System Inventory

System NIC Info

Name	Present	Location	Mac Address	Port
I210	1	Shared Lan	B4:05:5D:10:00:F3	RJ45
I219	1	System Lan	B4:05:5D:10:00:F2	RJ45

Table 8 BMC NIC Information

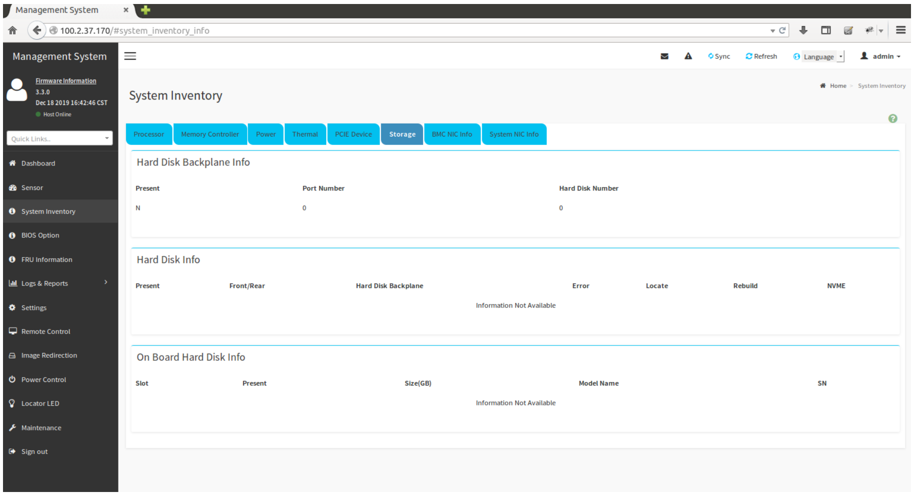
Attribute	Value
Name	Name
Present	Present
Location	Location
IPv4 Address	IPv4 address
IPv6 Address	IPv6 address

Table 9 System NIC Information

Attribute	Value
Name	Name
Present	Present
Location	Location
Mac Address	MAC address
Port	Port configuration

9.7.5 Hard Disk

Log in to the Web GUI and enter the “System Inventory -> Storage” page, which displays the storage information. It specifically includes: hard disk backplane info, present, port number, hard disk number, hard disk info, present, front/rear, hard disk backplane, error, locate, rebuild, NVME.



System Inventory

Hard Disk Backplane Info

Present	Port Number	Hard Disk Number
N	0	0

Hard Disk Info

Present	Front/Rear	Hard Disk Backplane	Error	Locate	Rebuild	NVME

Information Not Available

On Board Hard Disk Info

Slot	Present	Size(GB)	Model Name	SN

Information Not Available

Table 10 Hard Disk Backplane Information

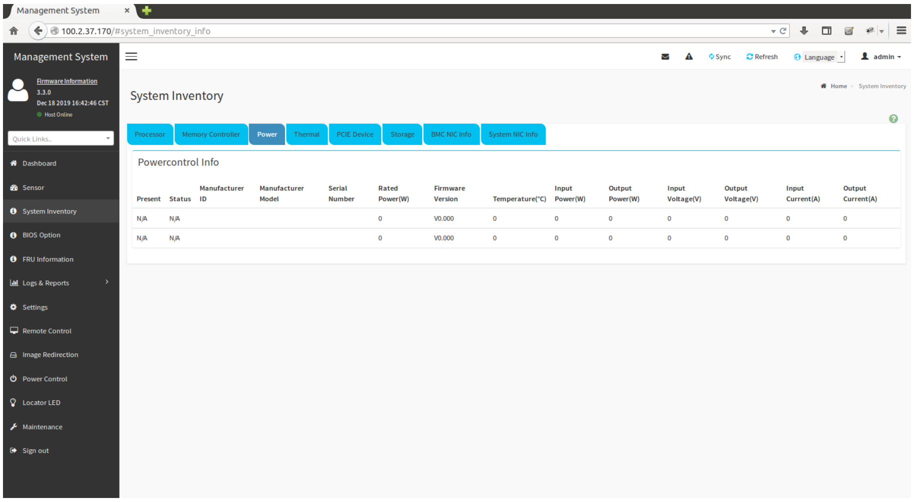
Attribute	Value
Present	N: Absent Y: Present
Port Number	Port number
Hard Disk Number	Hard disk number

Table 11 Hard Disk Information

Attribute	Value
Present	Present
Front/Rear	Hard disk location, front or rear
Hard Disk Backplane	Hard disk backplane number
Error	Error code
Locate	Locating Present or non-locating
Rebuild	Rebuilding Present or non-locating
NVME	Yes or No

9.7.6 Power

Log in to the Web GUI and enter the “System Inventory -> Power” page, which displays the power control information. It specifically includes: present, status, manufacturer model, serial number, rated power (W), firmware version, temperature (℃)， input power (W), output power (W), input voltage (V), output voltage (V), input current (A), output current (A).



System Inventory

Powercontrol Info

Present	Status	Manufacturer ID	Manufacturer Model	Serial Number	Rated Power(W)	Firmware Version	Temperature(°C)	Input Power(W)	Output Power(W)	Input Voltage(V)	Output Voltage(V)	Input Current(A)	Output Current(A)
N/A	N/A				0	V0.000	0	0	0	0	0	0	0
N/A	N/A				0	V0.000	0	0	0	0	0	0	0

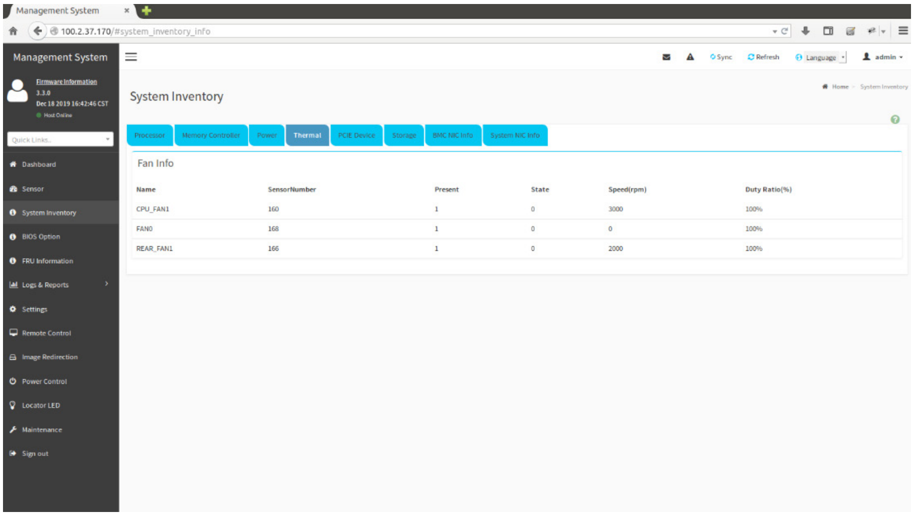
Table 12 Power

Attribute	Value
Present	Present
Status	Power status
Manufacturer ID	Manufacturer ID
Manufacturer Model	Manufacturer model

Serial Number	Serial number
Rated Power (W)	Rated power
Firmware Version	Firmware version
Temperature (℃)	Temperature
Input Power (W)	Input power
Output Power (W)	Output power
Input Voltage (V)	Input voltage
Output Voltage (V)	Output voltage
Input Current (A)	Input current
Output Current (A)	Output current

9.7.7 Fan

Log in to the Web GUI and enter the “System Inventory -> Thermal” page, which displays the fan information. It specifically includes: name, sensor number, present, state, speed (rpm), duty ratio (%).



Fan Info

Name	SensorNumber	Present	State	Speed(rpm)	Duty Ratio(%)
CPU_FAN1	160	1	0	3000	100%
FAN0	168	1	0	0	100%
REAR_FAN1	166	1	0	2000	100%

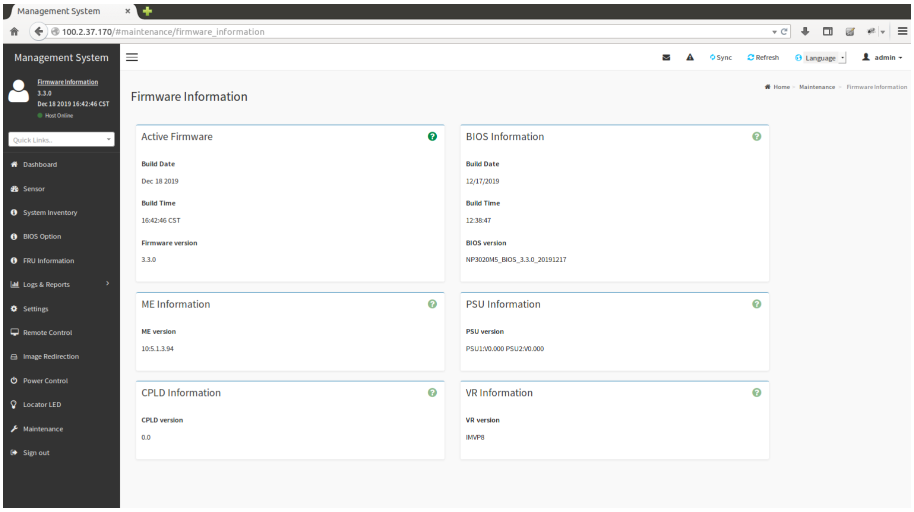
Table 13 Fan Information

Attribute	Value
Name	FANx_y, x denotes FAN or FAN group number, y denotes FAN number in group.
Sensor Number	Sensor number
Present	1: Present 0: Absent

State	State
Speed (rpm)	Speed
Duty Ratio (%)	Duty ratio

9.7.8 Firmware Version

Log in to the Web GUI and enter “Maintenance -> Firmware Information” page, which displays BMC firmware, BIOS firmware, ME, PSU, CPLD, VR version and related information.



Firmware Information

Active Firmware

Build Date
Dec 18 2019

Build Time
16:42:46 CST

Firmware version
3.3.0

BIOS Information

Build Date
12/17/2019

Build Time
12:38:47

BIOS version
NP3020M5_BIOS_3.3.0_20191217

ME Information

ME version
10:5.1.3.94

PSU Information

PSU version
PSU1:V0.000 PSU2:V0.000

CPLD Information

CPLD version
0.0

VR Information

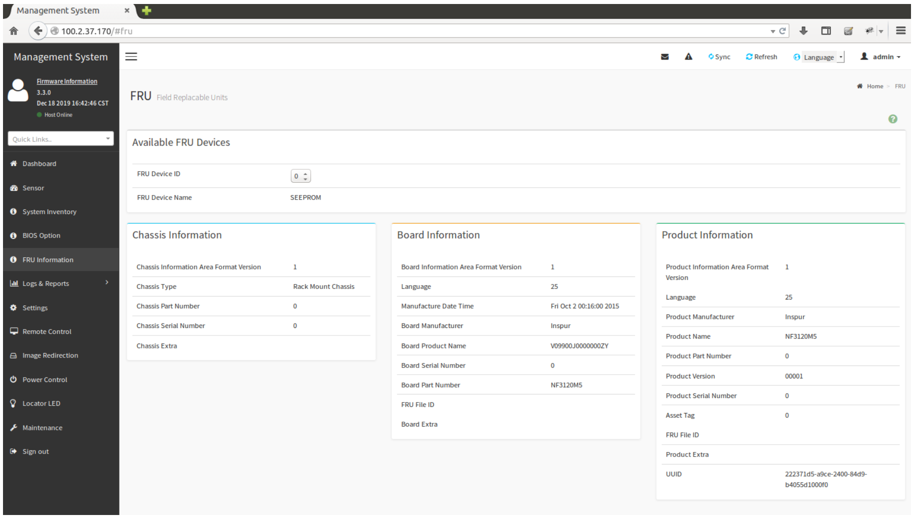
VR version
IMVP8

Table 14 All Firmware Which Monitored by BMC

Firmware	Revision Information
BMC	Revision and build time
BIOS	Revision and build time
ME	Revision
CPLD	Revision
PSU	Revision
VR	Revision
FPGA (if present)	Revision
PSOC (if present)	Revision

9.7.9 FRU

Log in to the Web GUI and enter “FRU Information” page, which displays the information overview of each FRU device in the system, and it can be switched by selecting different FRU IDs.



FRU Field Replacable Units

Available FRU Devices

FRU Device ID	0
FRU Device Name	SEEPROM

Chassis Information

Chassis Information Area Format Version	1
Chassis Type	Rack Mount Chassis
Chassis Part Number	0
Chassis Serial Number	0
Chassis Extra	

Board Information

Board Information Area Format Version	1
Language	25
Manufacture Date Time	Fri Oct 2 00:16:00 2015
Board Manufacturer	Inspur
Board Product Name	V09900J0000000ZY
Board Serial Number	0
Board Part Number	NF3120M5
FRU File ID	
Board Extra	

Product Information

Product Information Area Format Version	1
Language	25
Product Manufacturer	Inspur
Product Name	NF3120M5
Product Part Number	0
Product Version	00001
Product Serial Number	0
Asset Tag	0
FRU File ID	
Product Extra	
UUID	222371d5-a9ce-2400-84d9-b4055d1000f0

Table 15 FRU Information

Category	Item
Available FRU Devices	FRU Device ID: 0
	FRU Device Name: SEEPROM
Chassis Information	Chassis Information Area Format Version: *
	Chassis Type: Rack Mount Chassis
	Chassis Part Number: **
	Chassis Serial Number: **
	Chassis Extra: **
Board Information	Board Information Area Format Version: *
	Language: *
	Manufacture Date Time: weekday/month/day/year
	Board Manufacturer: Inspur
	Board Product Name: *****
	Board Serial Number: **
	Board Part Number: **
	FRU File ID: **
	Board Extra: **

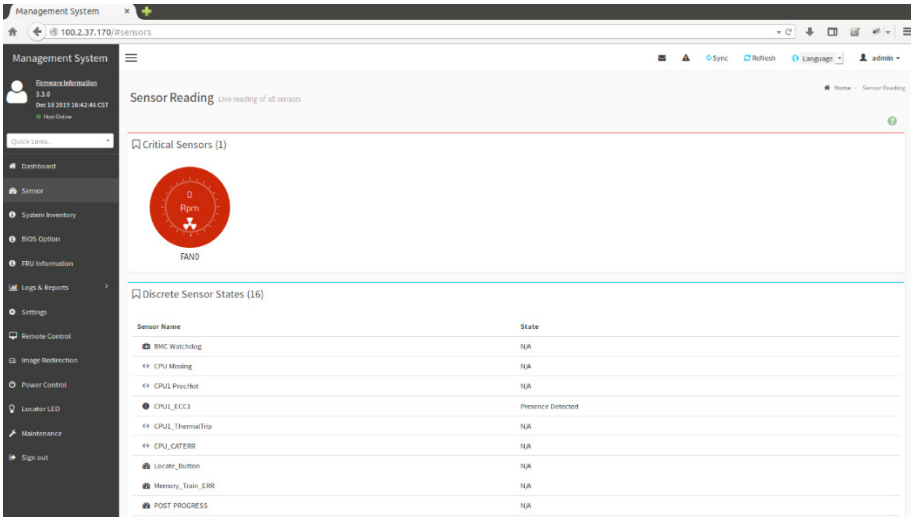
Product Information	Product Information Area Format Version: *
	Language: *
	Product Manufacturer: Inspur
	Product Name: *****
	Product Part Number: **
	Product Version: **
	Product Serial Number: **
	Asset Tag: *
	FRU File ID: **
	Product Extra: **
	UUID: **

9.8 Sensor

Log in to the Web GUI and enter the “Sensor” page, which displays information about the working sensors, such as the sensor name, type, status, current value and behavior. The sensor is used to obtain information such as temperature, fan, watchdog, voltage, etc. Discrete sensors are also supported. This page will automatically update the data by the database. There may be a delay when receiving data in real time.

Sensors can be divided into several categories according to their functions (can be distinguished by the icons):

- Voltage: Displays the monitoring of related voltage on the system.
- Temperature: Displays the monitoring of related temperature on the system.
- Fan: Displays the monitoring of related fans on the system.
- Power consumption: Displays the monitoring of related power consumption on the system.
- CPU error: Displays the monitoring of related CPU error events.
- ECC: Displays the monitoring of related ECC events on the system.
- Watchdog: Displays the monitoring of related Watchdog events on the system.
- Key: Displays the monitoring of related key events on the system.



Sensor Reading Live reading of all sensors

Critical Sensors (1)

Discrete Sensor States (16)

Sensor Name	State
BMC Watchdog	N/A
CPU Missing	N/A
CPU1 ProcHot	N/A
CPU1_ECC1	Presence Detected
CPU1_ThermalTrip	N/A
CPU_CATERR	N/A
Locate_Button	N/A
Memory_Train_ERR	N/A
POST PROGRESS	N/A

9.8.1 General Sensor

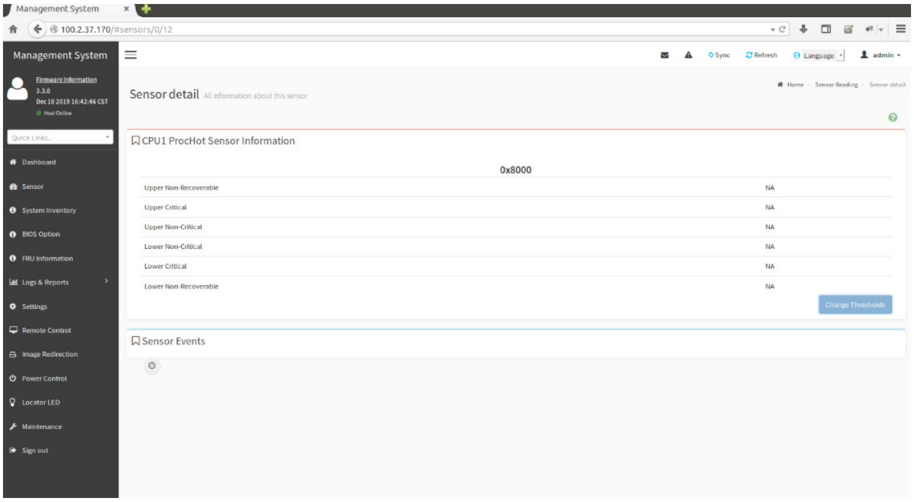
Sensor Information: Displays the sensor value read in the past time.

Sensor Events: Displays the events that have occurred with this sensor.

Threshold: To view and modify threshold settings for this sensor.

9.8.2 Discrete Sensor

Sensor Events: Displays the events that have occurred with this sensor.



Sensor detail All information about this sensor

CPU1 ProcHot Sensor Information

0x8000

Upper Non-Recoverable	NA
Upper Critical	NA
Upper Non-Critical	NA
Lower Non-Critical	NA
Lower Critical	NA
Lower Non-Recoverable	NA

Sensor Events

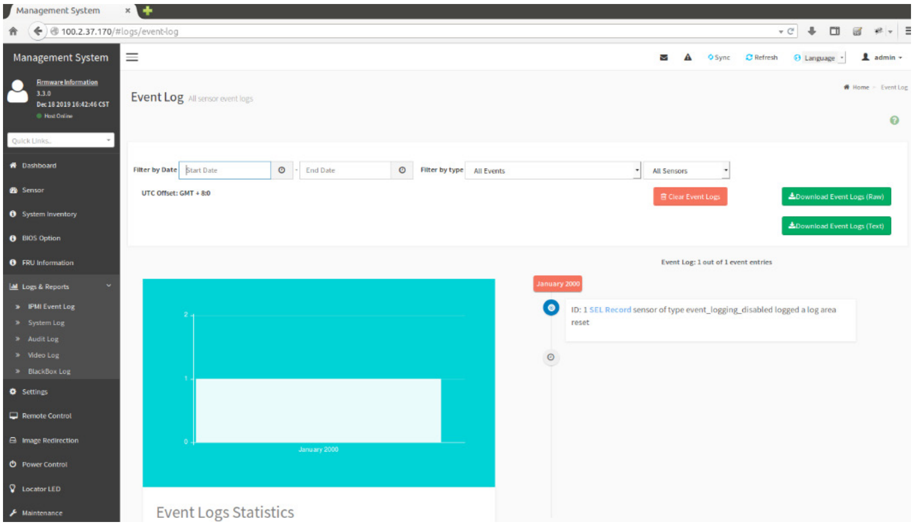
9.9 Logs

Log in to the Web GUI and enter the “Logs & Reports” page, which displays the IPMI event log, system log, audit log, video log, and blackbox log for troubleshooting.

9.9.1 IMPI Event Log

BMC provides the ability to record IPMI sensor based event history. System event log outputs following items and users can get the sensor event information by WEB or IPMI CMD.

Web GUI displays event logs of all sensors on the device. The left is the graph-type Event Logs Statistics, and the right is the event logs sorted by time. Click the log to view detailed information, click Download Event Logs to download raw data or text, and click Clear Event Logs to clear all event logs. For the definition and description of logs, refer to the SEL section in the IPMI file.



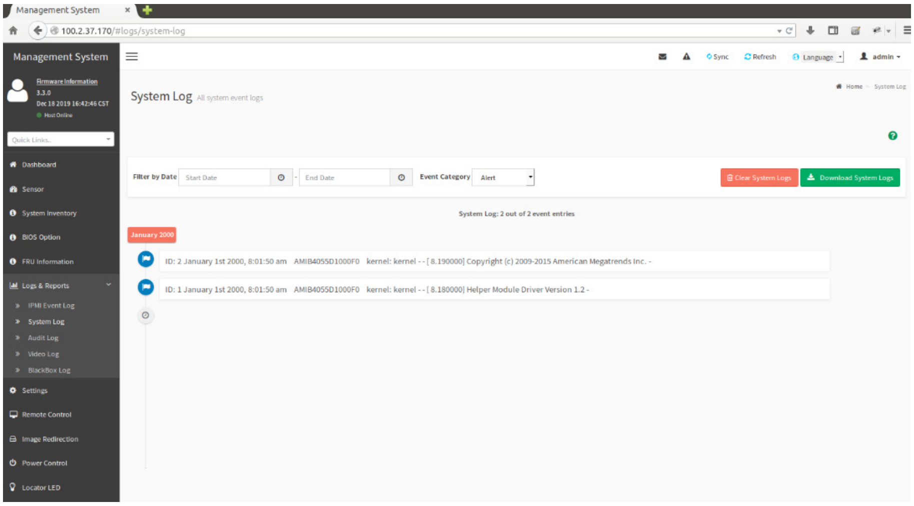
ID: 1 SEL Record sensor of type event_logging_disabled logged a log area reset

Table 16 SEL Attributes

Event ID	Event ID in SEL
Time Stamp	Event generate time
Severity	Event error level, include Error, Warning, Information
Sensor Name	Sensor name, to locate the device
Sensor Type	Sensor type defined in IPMI2.0
Description	Event details

9.9.2 System Log

This page displays the system logs on the device (requires pre-setting). The system log is mainly used to record related system information, such as Kernel, Service, and so on. Click Download System Logs to download logs, and click Clear System Logs to clear all system logs.



System Log: 2 out of 2 event entries

```
ID: 2 January 1st 2000, 8:01:50 am   AMIB4055D1000F0   kernel: kernel - - [ 8.190000] Copyright (c) 2009-2015 American Megatrends Inc. -
ID: 1 January 1st 2000, 8:01:50 am   AMIB4055D1000F0   kernel: kernel - - [ 8.180000] Helper Module Driver Version 1.2 -
```

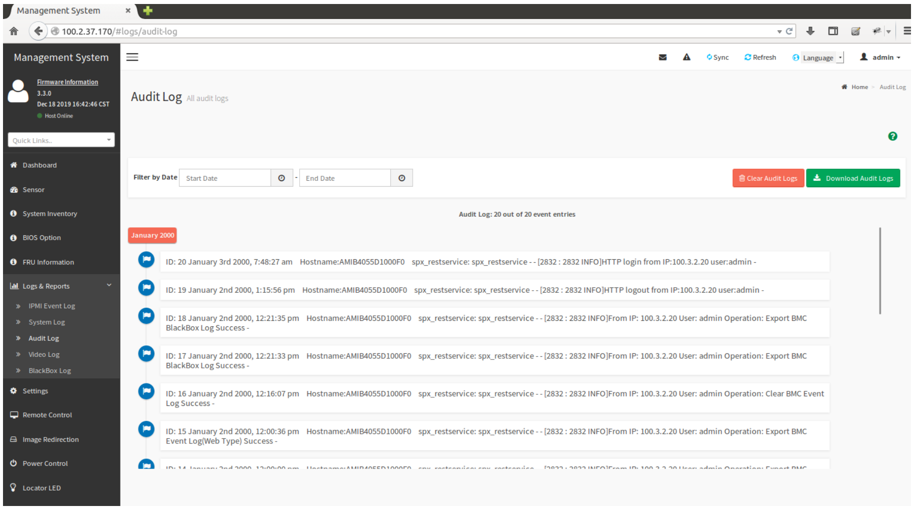
Note: The log needs to be enabled by Settings > Log Settings > Advanced Log Settings.

Follow these steps to view the system logs for a specific time range:

Please select the start and end dates from the calendar by the Filter by Date field. Please select the event type by the Event Category field, which can be divided into alert, critical, error, attention, alarm, debug, emergency, and information.

9.9.3 Audit Log

This page displays the audit logs on the device (requires pre-setting). The audit log is mainly used to record the log-in, log-out and other operations of users. Click Download System Logs to download logs, and click Clear System Logs to clear all system logs. Select the start and end dates from the calendar by the Filter by Date field to view the audit logs for a specific time range.



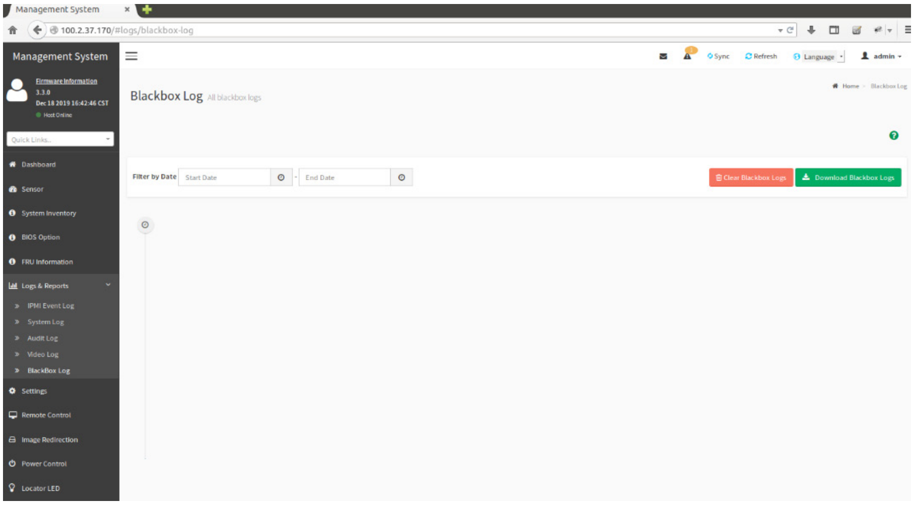
Audit Log: 20 out of 20 event entries

```
ID: 20 January 3rd 2000, 7:48:27 am   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]HTTP login from IP:100.3.2.20 user:admin -
ID: 19 January 2nd 2000, 1:15:56 pm   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]HTTP logout from IP:100.3.2.20 user:admin -
ID: 18 January 2nd 2000, 12:21:35 pm   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]From IP: 100.3.2.20 User: admin Operation: Export BMC
BlackBox Log Success -
ID: 17 January 2nd 2000, 12:21:33 pm   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]From IP: 100.3.2.20 User: admin Operation: Export BMC
BlackBox Log Success -
ID: 16 January 2nd 2000, 12:16:07 pm   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]From IP: 100.3.2.20 User: admin Operation: Clear BMC Event
Log Success -
ID: 15 January 2nd 2000, 12:00:36 pm   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]From IP: 100.3.2.20 User: admin Operation: Export BMC
Event Log(Web Type) Success -
ID: 14 January 2nd 2000, 12:00:00 pm   Hostname:AMIB4055D1000F0   spx_restservice: spx_restservice - - [2832 : 2832 INFO]From IP: 100.3.2.20 User: admin Operation: Export BMC
```

⚠ **Note:** The log needs to be enabled by Settings > Log Settings > Advanced Log Settings.

9.9.4 Blackbox Log

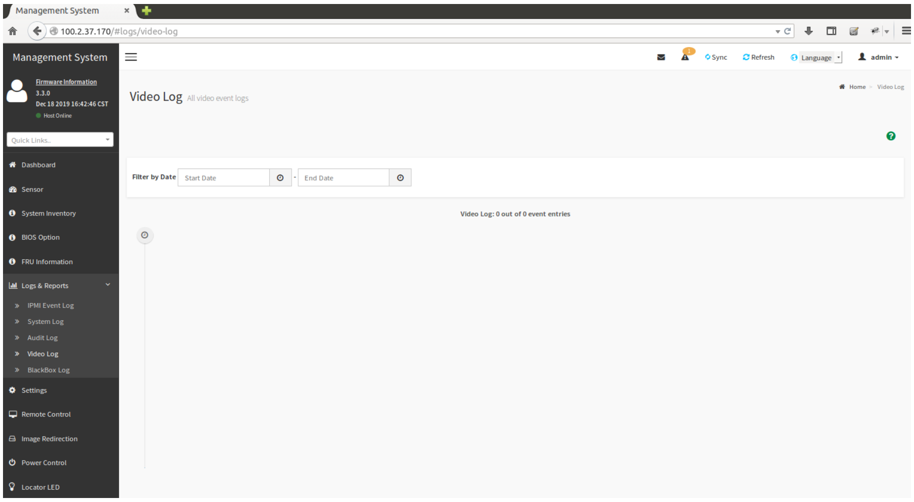
This page shows the blackbox logs on the device. The blackbox log mainly includes three parts, which are memory detection, power detection, and hard disk detection. Users can use these messages to know the status of the system at startup. Click Download Blackbox Logs to download logs, and click Clear Blackbox Logs to clear all black box logs.



Select the start and end dates from the calendar by the Filter by Date field to view the blackbox logs for a specific time range.

9.9.5 Video Log

This page displays the available recorded video files (requires pre-setting). The content of the video file depends on the conditions set by the video trigger. The video file can be downloaded, closed, played, and paused. If remote video support is enabled, up to 3 pre-event videos can be played. If remote video support is disabled, only 1 pre-event video and 2 post-event videos can be recorded. The video file size limit is 40MB. Select the start and end dates from the calendar by the Filter by Date field to view the video logs for a specific time range.



Video Log: 0 out of 0 event entries

Note: The log needs to be enabled by Settings > Log Settings > Advanced Log Settings.

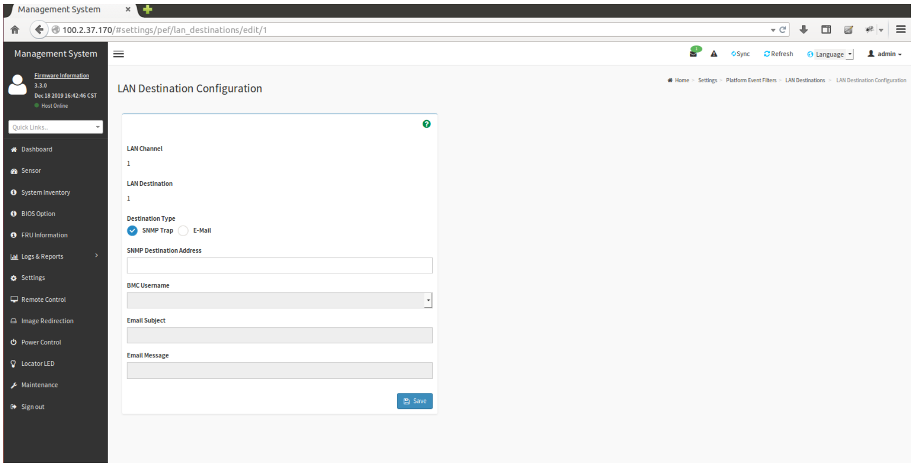
9.10 Event Alerting

BMC supports SNMP Trap and SMTP email alerts.

9.10.1 SNMP Trap Alert

BMC supports SNMP Trap. Users open trap receiver and set trap destination IP in BMC Web GUI. When BMC detects an event, BMC will send the event to the trap receiver.

- BMC supports Trap SNMP v1/v2c/v3. It depends on the user’s connection method.
- A Modular Information Block (MIB) file associated with the traps should be provided with the BMC firmware to help SNMP Trap receiver to translate the trap.
- SNMP default port number is 161.
- Only IPMI sensor based log supports SNMP Trap.



LAN Destination Configuration

LAN Channel

1

LAN Destination

1

Destination Type

● SNMP Trap ○ E-Mail

SNMP Destination Address

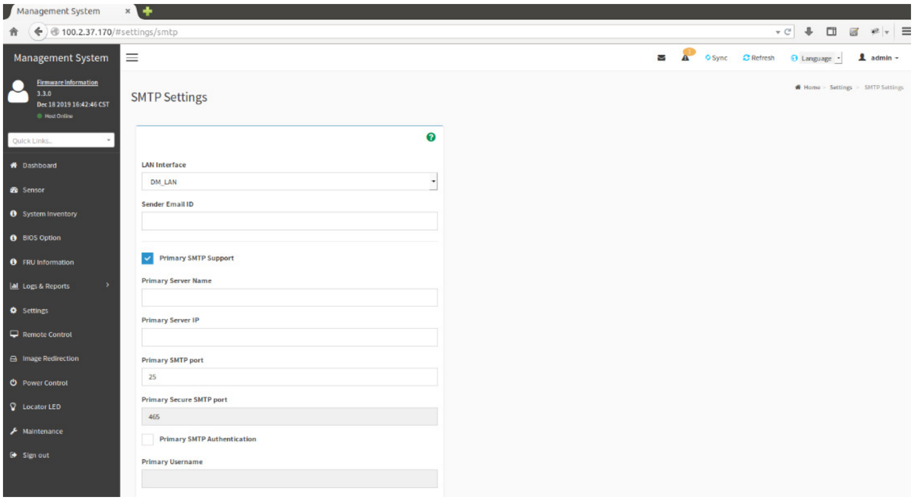
BMC Username

Email Subject

Email Message

9.10.2 SMTP Email Alert

SMTP page is used to set the SMTP mail server. To enable forgot your password and PEF function, you need to set this first. SMTP (Simple Mail Transport Protocol, defined in RFC821) email alert is supported. The email alert provides text information about the event.



SMTP Settings

LAN Interface

DM_LAN

Sender Email ID

☑ Primary SMTP Support

Primary Server Name

Primary Server IP

Primary SMTP port

25

Primary Secure SMTP port

465

□ Primary SMTP Authentication

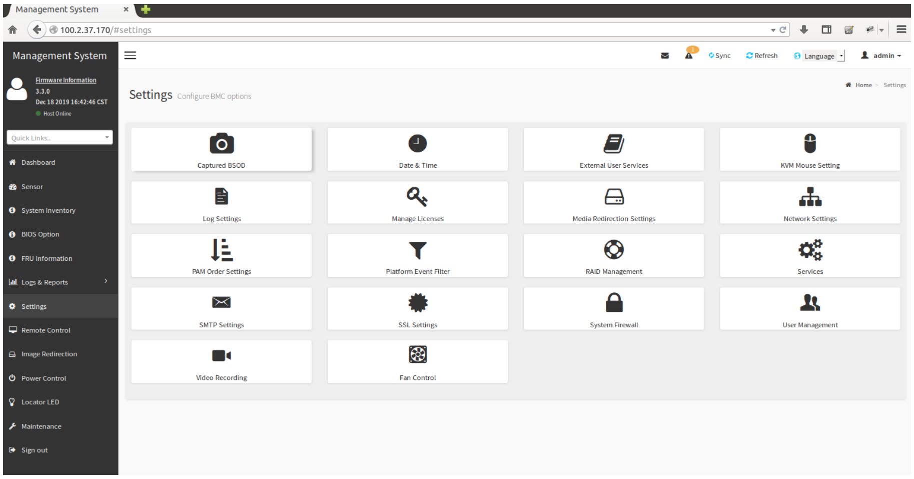
Primary Username

9.10.3 Syslog

Syslog supports on/off, supports log level filtering, supports 4 receiving targets and every target can configure the receiving server address (IPv4/IPv6/FQDN), port number, log type and enable status, and can send test information. Report log supports security log, operation log and system event log and it is configurable. These logs carry host log. Considering security, Syslog report logs support TLS encryption, and support bidirectional authentication based on imported certificate.

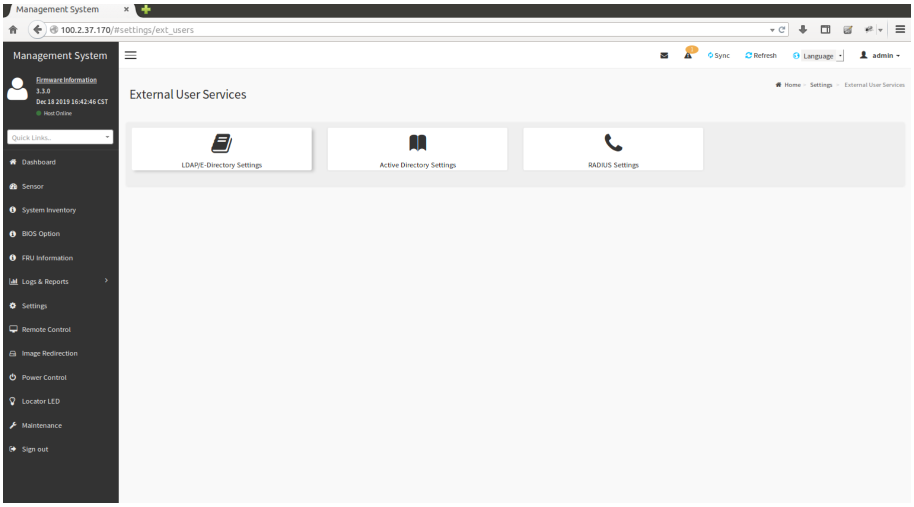
9.11 Settings

This page allows you to make various settings for the BMC. Please click on the item to view options.



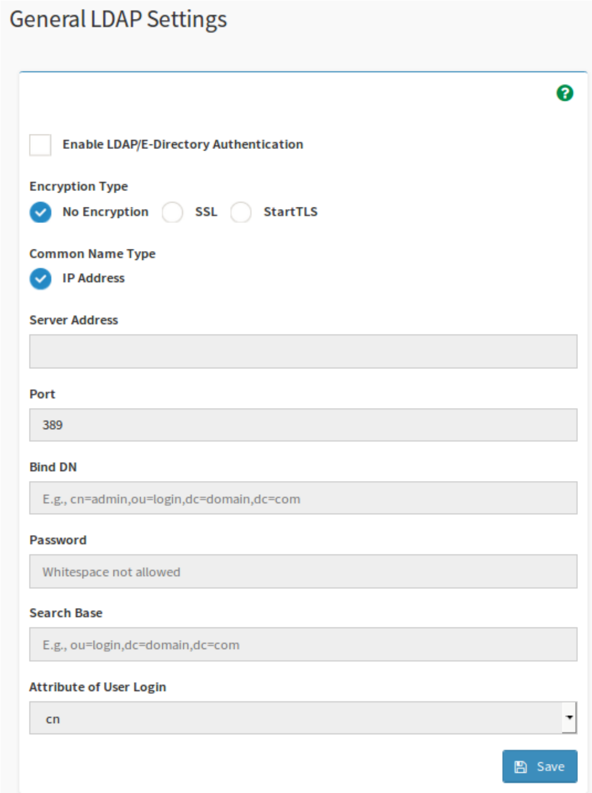
9.11.1 External User Services

This page provides LDAP/E-Directory Settings, Active Directory Settings, and RADIUS Settings.



LDAP/E-Directory Settings

This page provides LDAP/E-Directory settings. Lightweight Directory Access Protocol (LDAP) is an application protocol used to query and modify the date of directory services in the Internet Protocol (IP) network. If you have a configured LDAP server in your network, you can use it to easily add, manage, and authenticate MegaRAC SP-X card users. This is achieved by sending the login request to the LDAP server. This also means that there is no need to define additional authentication mechanisms when using the MegaRAC SP-X card. Because your existing LDAP server retains authentication function, you always know which users are using network resources, and you can easily define user or group rules for access control.



General LDAP Settings

□ Enable LDAP/E-Directory Authentication

Encryption Type

● No Encryption ○ SSL ○ StartTLS

Common Name Type

● IP Address

Server Address

Port: 389

Bind DN: E.g., cn=admin,ou=login,dc=domain,dc=com

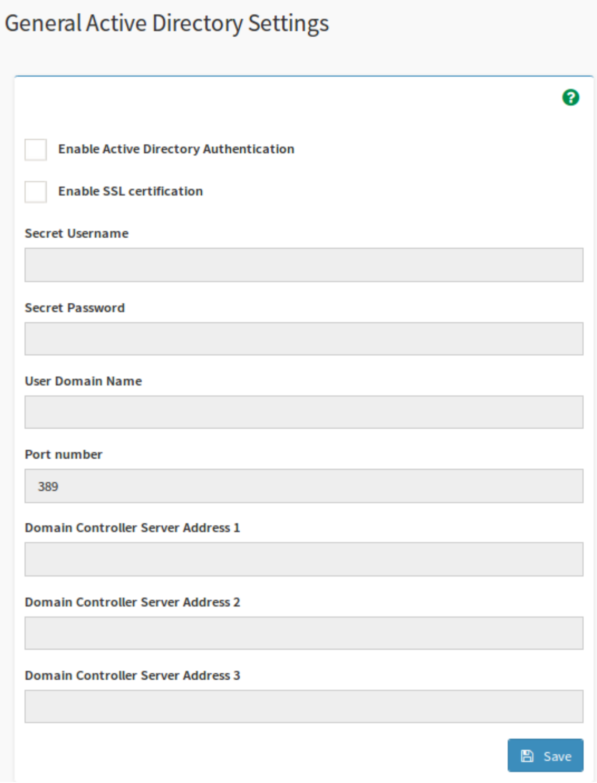
Password: Whitespace not allowed

Search Base: E.g., ou=login,dc=domain,dc=com

Attribute of User Login: cn

Active Directory Settings

This page provides Active Directory settings. Active Directory has several functions, including providing object information, organizing objects for better access, allowing users and administrators to access, and allowing administrators to set the directory security.



General Active Directory Settings

□ Enable Active Directory Authentication

□ Enable SSL certification

Secret Username

Secret Password

User Domain Name

Port number: 389

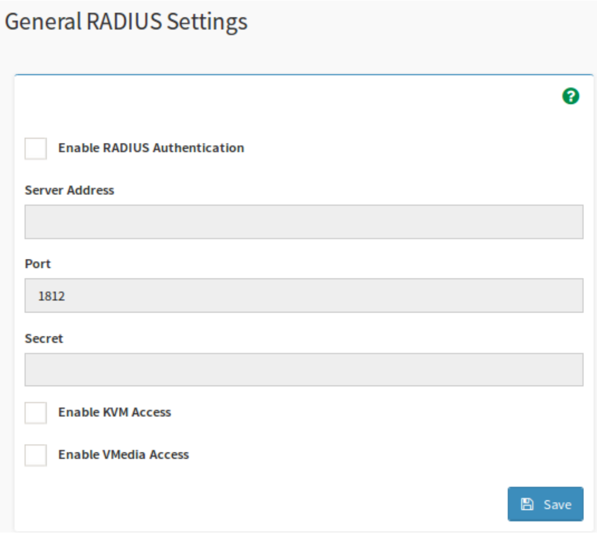
Domain Controller Server Address 1

Domain Controller Server Address 2

Domain Controller Server Address 3

RADIUS Settings

This page is used to enable or disable RADIUS authentication and enter the required information to access the RADIUS server.



General RADIUS Settings

□ Enable RADIUS Authentication

Server Address

Port: 1812

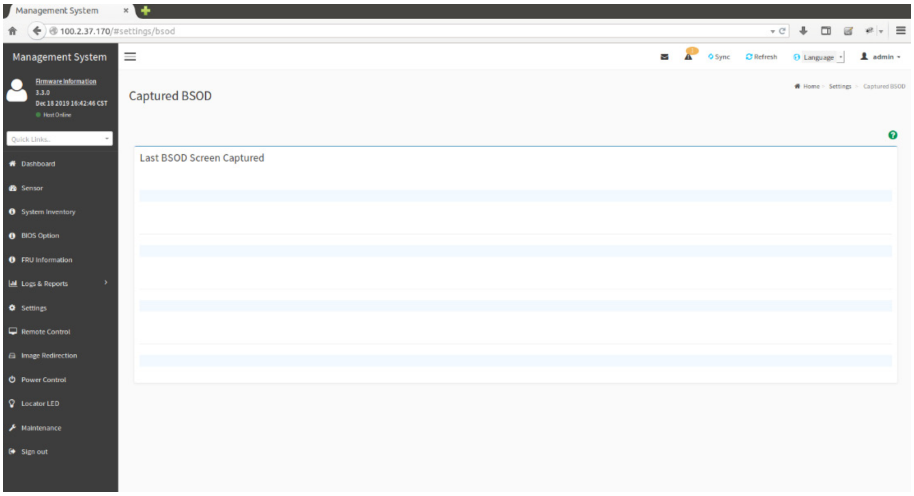
Secret

□ Enable KVM Access

□ Enable VMedia Access

9.11.2 Screen Capture

BMC will record monitor screen after server power reset or power off. BMC also supports BSOD (Blue Screen of Death) screen capturing, server OS should be Windows 2012R2 and above.



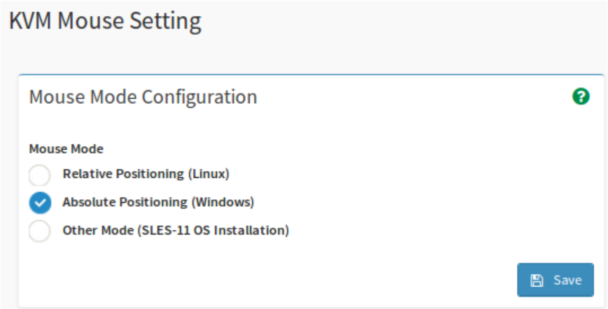
Captured BSOD

Last BSOD Screen Captured

⚠ **Note:** KVM service needs to be enabled to display BSOD. Please go to Settings > Services > KVM for setting.

9.11.3 KVM Mouse Setting

This page is used to select the mouse mode. The Redirection Console controls a mouse emulation system from a local window to a remote screen.



KVM Mouse Setting

Mouse Mode Configuration

Mouse Mode

○ Relative Positioning (Linux)

● Absolute Positioning (Windows)

○ Other Mode (SLES-11 OS Installation)

⚠ **Note:** Only the administrator has permission to modify this option.

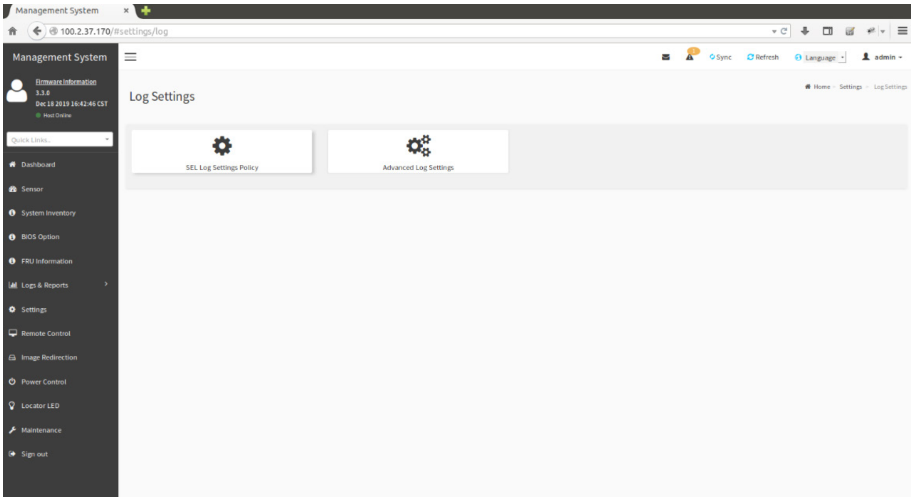
Relative Positioning: Relative mode calculates the relative displacement of the mouse and sends it to the server.

Absolute Positioning: Absolute mode sends the absolute position of the local mouse to the server.

Other Mode: Other mode calculates the displacement of the local mouse at the center position and sends it to the server.

9.11.4 Log Settings

This page is used to manage the event logs.



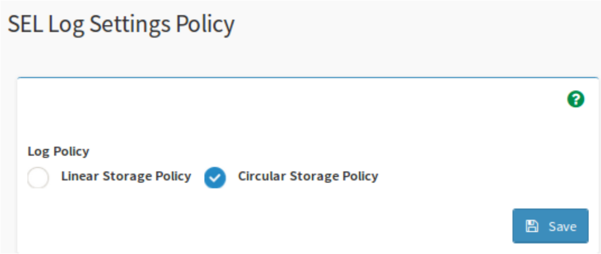
100.2.37.170/#settings/log

Log Settings

Firmware Information
3.3.0
Dec 18 2019 16:42:46 CST
Host Online

SEL Log Settings Policy

This page is used to set the log storage policy.



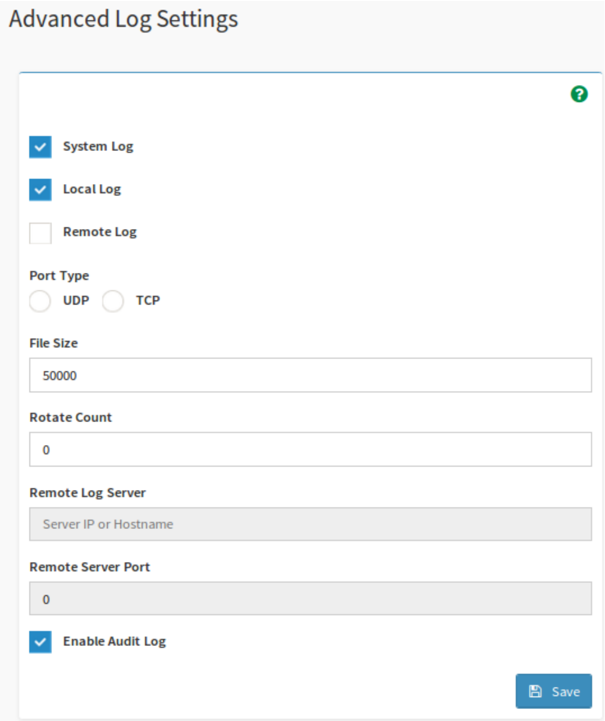
SEL Log Settings Policy

Log Policy

○ Linear Storage Policy ● Circular Storage Policy

Advanced Log Settings

This page is used for the advanced settings of event logs.



Advanced Log Settings

☑ System Log

☑ Local Log

□ Remote Log

Port Type

○ UDP ○ TCP

File Size

50000

Rotate Count

0

Remote Log Server

Server IP or Hostname

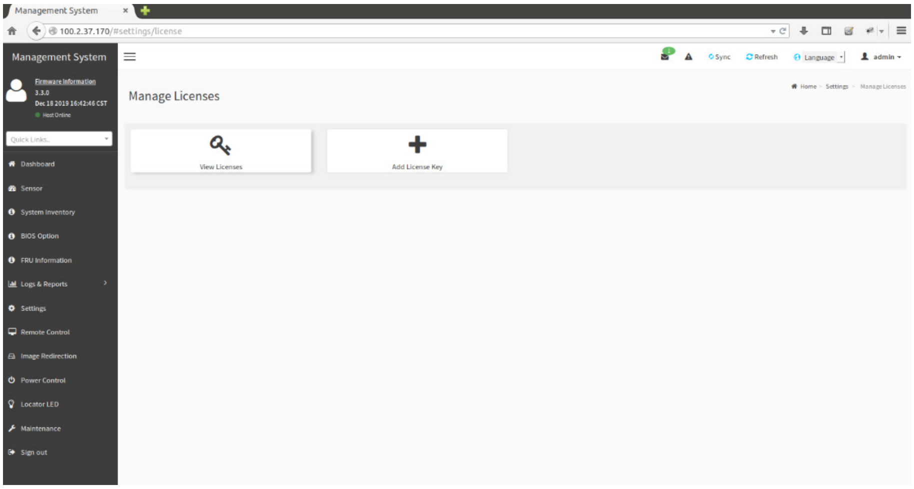
Remote Server Port

0

☑ Enable Audit Log

9.11.5 Manage Licenses

This page is used to manage the licenses.



Management System

100.2.37.170/#settings/license

Firmware Information
3.3.0
Dec 18 2019 16:42:46 CST
Host Online

Manage Licenses

View Licenses

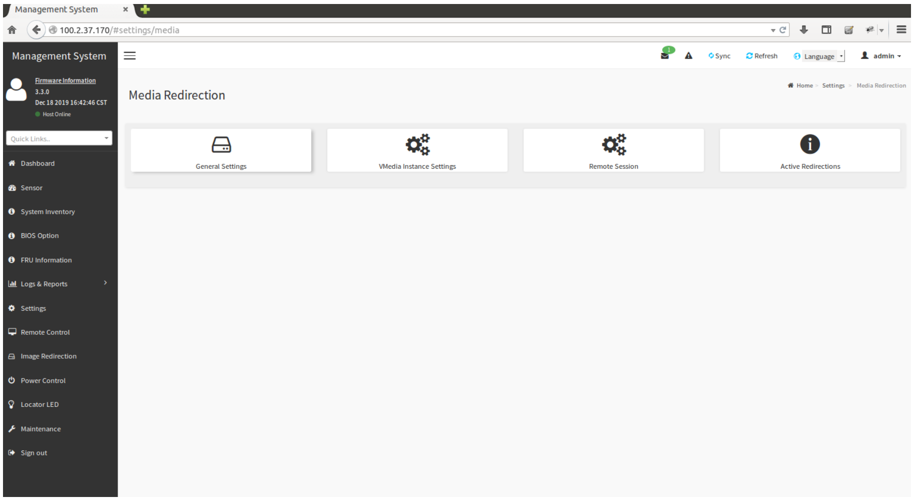
On this page, you can view the licenses and validity period.

Add License Key

Licenses can be added on this page to activate or extend related functions.

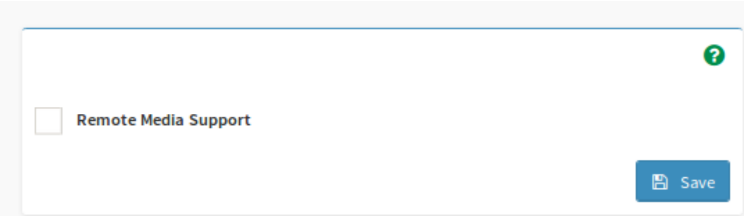
9.11.6 Media Redirection

This page is used to set the media redirection.



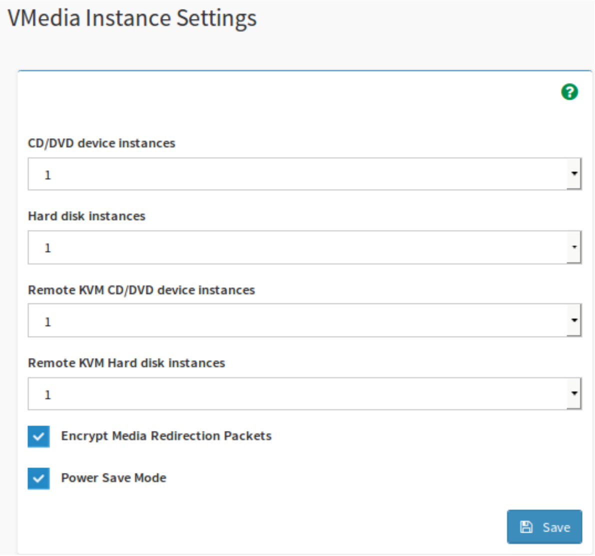
General Settings

This page allows you to enable or disable Remote Media Support, including CD/DVD and hard disk.



VMedia Instance Settings

This page is used to set the quantity of the media devices.



VMedia Instance Settings

CD/DVD device instances: 1

Hard disk instances: 1

Remote KVM CD/DVD device instances: 1

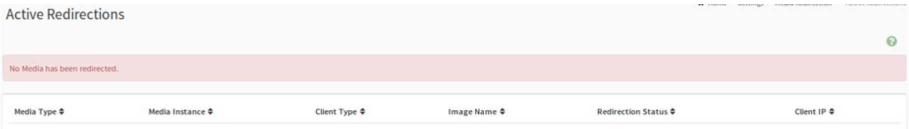
Remote KVM Hard disk instances: 1

☑ Encrypt Media Redirection Packets

☑ Power Save Mode

Active Redirections

This page displays the media that have been redirected.



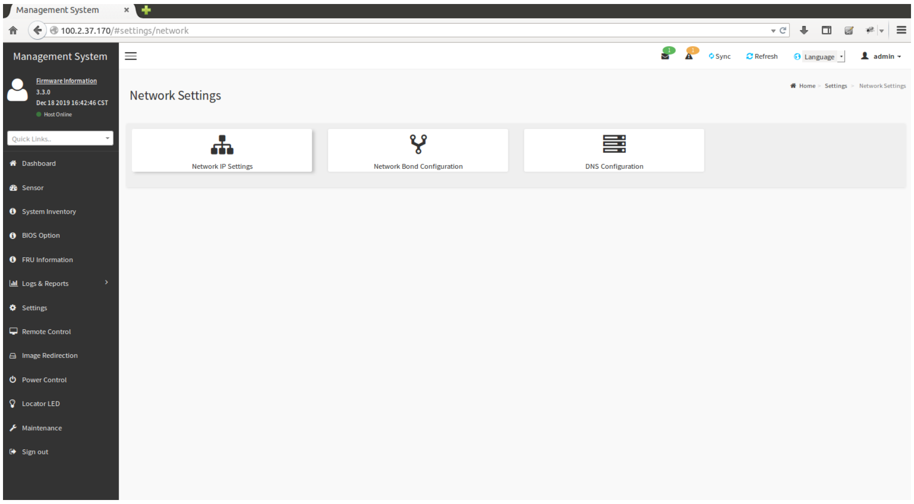
Active Redirections

No Media has been redirected.

Media Type	Media Instance	Client Type	Image Name	Redirection Status	Client IP

9.11.7 Network Settings

This page is used to set the network.



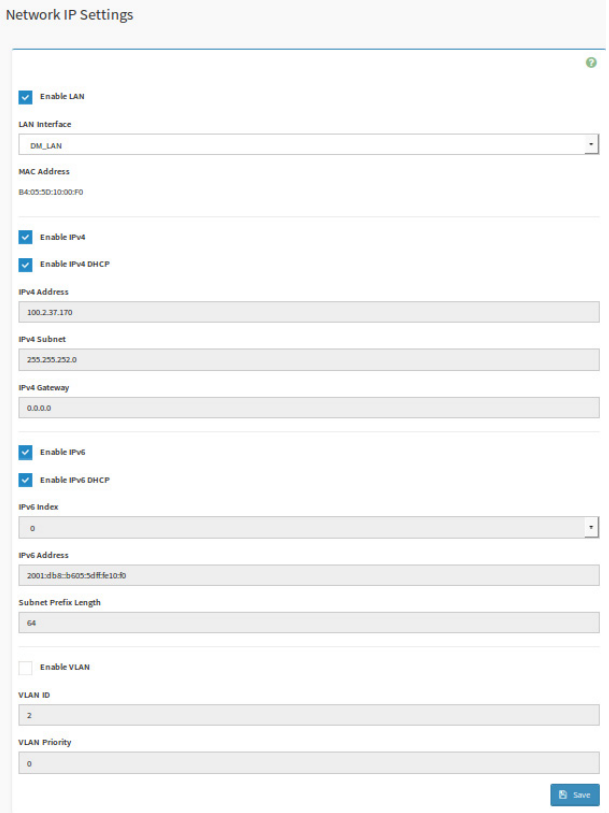
100.2.37.170/#settings/network

Network Settings

Firmware Information
3.3.0
Dec 18 2019 16:42:46 CST
Host Online

Network IP Settings

On this page, you can manage the LAN support, including IPv4, IPv6 and VLAN.



Network IP Settings

☑ Enable LAN

LAN Interface: DM_LAN

MAC Address: B4:05:5D:10:00:F0

☑ Enable IPv4

☑ Enable IPv4 DHCP

IPv4 Address: 100.2.37.170

IPv4 Subnet: 255.255.252.0

IPv4 Gateway: 0.0.0.0

☑ Enable IPv6

☑ Enable IPv6 DHCP

IPv6 Index: 0

IPv6 Address: 2001:db8::b605:5dff:fe10:f0

Subnet Prefix Length: 64

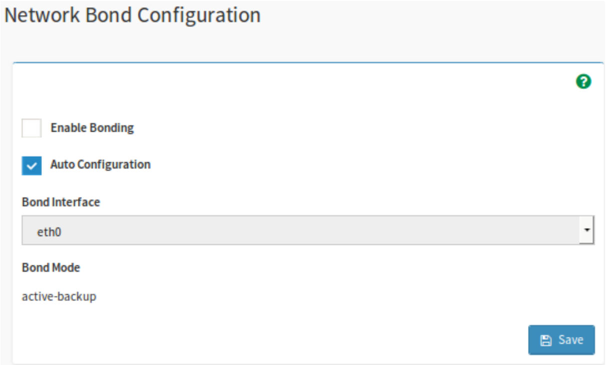
□ Enable VLAN

VLAN ID: 2

VLAN Priority: 0

Network Bond Configuration

This page is used to enable the network bonding function of the network interface.



Network Bond Configuration

□ Enable Bonding

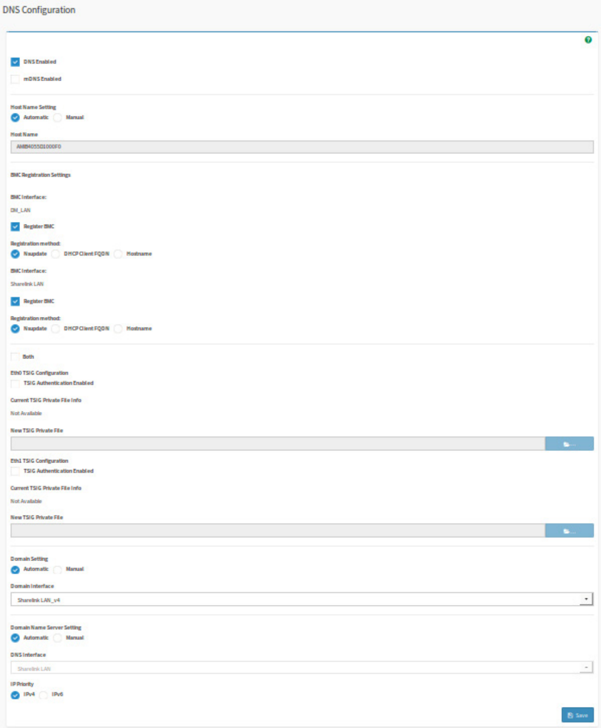
☑ Auto Configuration

Bond Interface: eth0

Bond Mode: active-backup

DNS Configuration

This page is used to manage the DNS service of the devices.



DNS Configuration

☑ DNS Enabled

□ mDNS Enabled

Host Name Setting

● Automatic ○ Manual

Host Name

AMIB4055D1000F0

BMC Registration Settings

BMC Interface:

DM_LAN

☑ Register BMC

Registration method:

● Nsupdate ○ DHCP Client FQDN ○ Hostname

BMC Interface:

Sharelink LAN

☑ Register BMC

Registration method:

● Nsupdate ○ DHCP Client FQDN ○ Hostname

□ Both

Eth0 TSIG Configuration

□ TSIG Authentication Enabled

Current TSIG Private File Info

Not Available

New TSIG Private File

Eth1 TSIG Configuration

□ TSIG Authentication Enabled

Current TSIG Private File Info

Not Available

New TSIG Private File

Domain Setting

● Automatic ○ Manual

Domain Interface

Sharelink LAN_v4

Domain Name Server Setting

● Automatic ○ Manual

DNS Interface

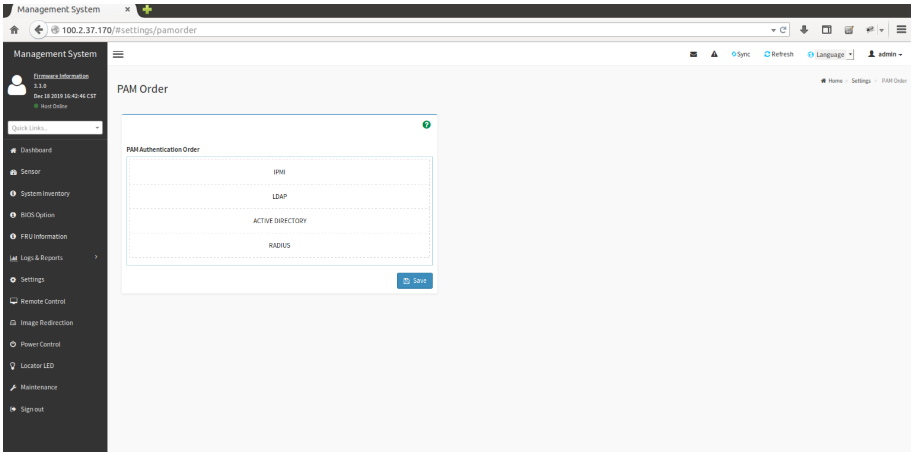
Sharelink LAN

IP Priority

● IPv4 ○ IPv6

9.11.8 PAM Order

This page is used to configure the PAM Authentication Order for user authentication into the BMC.



100.2.37.170/#settings/pamorder

Firmware Information
3.3.0
Dec 18 2019 16:42:46 CST
Host Online

PAM Order

PAM Authentication Order

IPMI

LDAP

ACTIVE DIRECTORY

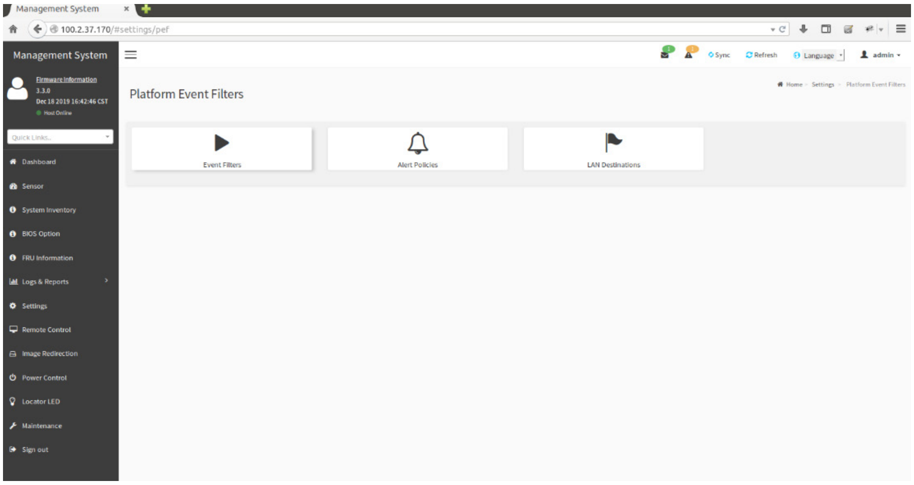
RADIUS

PAM Authentication Order

Please drag items to change the order.

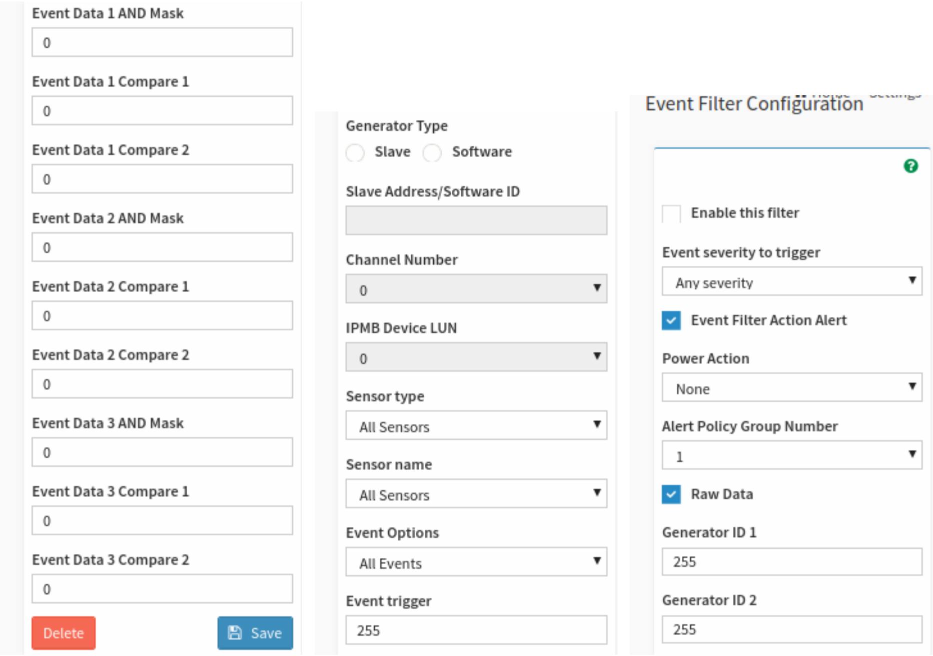
9.11.9 Platform Event Filter

Platform Event Filtering (PEF) provides a mechanism to set the BMC to take selective action on the event information it receives or generates internally. These actions include, for example, system shutdown, system restart, and alert generation. It is recommended to provide at least 16 entries in the event filtering table for running PEF. These entries should be preset to deal with common system failure events, such as system overheating, system startup failure, fan errors, etc.



Event Filter Configuration

This page displays all event filtering entries and empty slots. You can modify or add event filtering entries here. 15 event filtering entries are defaulted for 40 empty slots.


Event Filter Configuration

□ Enable this filter

Event severity to trigger: Any severity

☑ Event Filter Action Alert

Power Action: None

Alert Policy Group Number: 1

☑ Raw Data

Generator ID 1: 255

Generator ID 2: 255

Generator Type: ○ Slave ○ Software

Slave Address/Software ID:

Channel Number: 0

IPMB Device LUN: 0

Sensor type: All Sensors

Sensor name: All Sensors

Event Options: All Events

Event trigger: 255

Event Data 1 AND Mask: 0

Event Data 1 Compare 1: 0

Event Data 1 Compare 2: 0

Event Data 2 AND Mask: 0

Event Data 2 Compare 1: 0

Event Data 2 Compare 2: 0

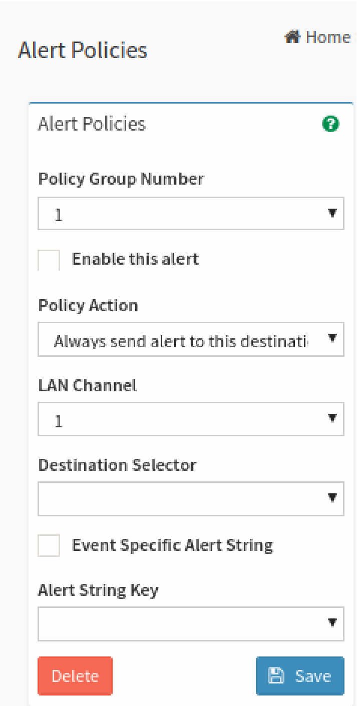
Event Data 3 AND Mask: 0

Event Data 3 Compare 1: 0

Event Data 3 Compare 2: 0

Alert Policies

This page shows all alert policies and empty slots. You can modify or add policies here. Up to 60 slots.



Alert Policies

Home

Alert Policies

Policy Group Number

1

□ Enable this alert

Policy Action

Always send alert to this destinati

LAN Channel

1

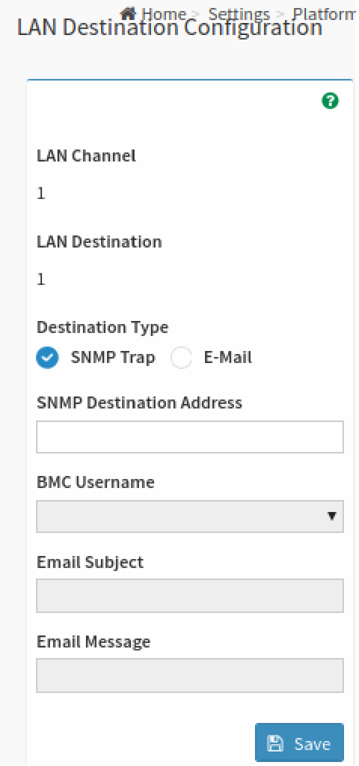
Destination Selector

□ Event Specific Alert String

Alert String Key

LAN Destination Configuration

This page shows all LAN destinations and empty slots. You can modify or add LAN destinations here. Up to 15 slots.



LAN Destination Configuration

Home > Settings > Platform

LAN Channel

1

LAN Destination

1

Destination Type

● SNMP Trap ○ E-Mail

SNMP Destination Address

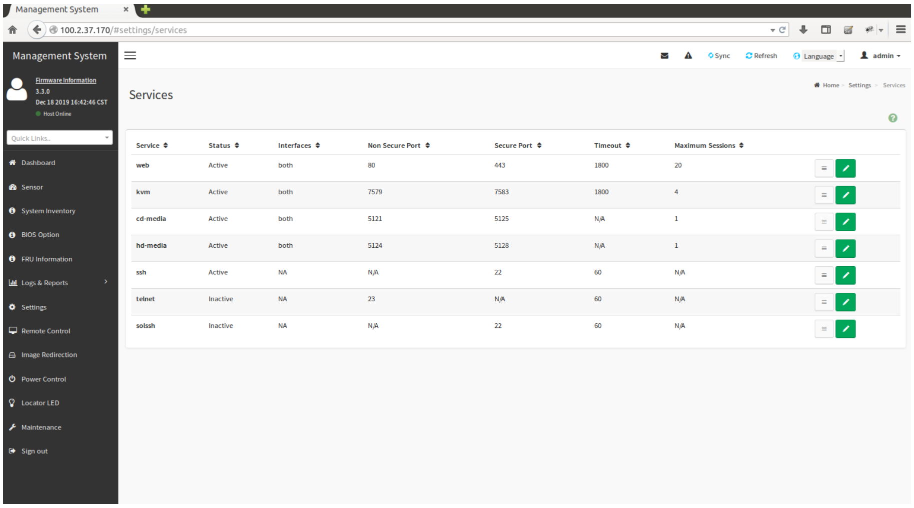
BMC Username

Email Subject

Email Message

9.11.10 Services

This page lists the services running on the BMC, and displays the current status and other basic information of the service. Click the icon on the right to modify the settings.



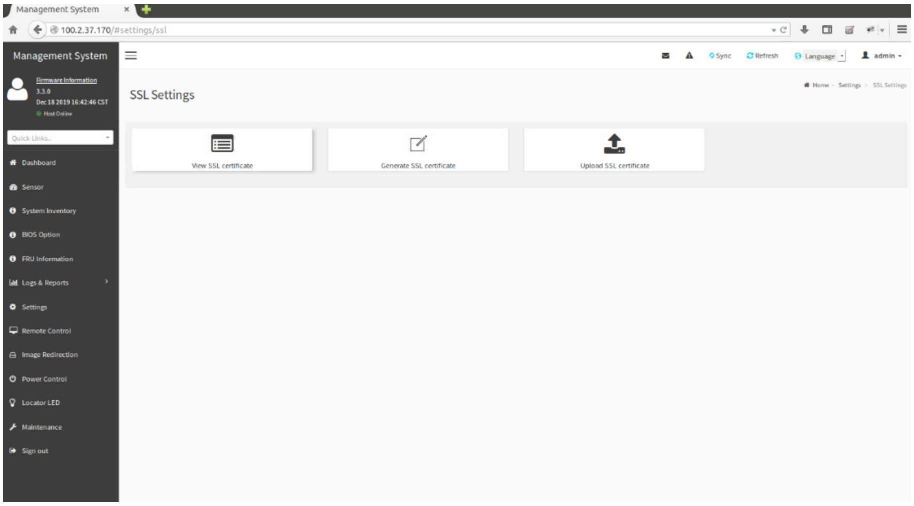
Services

Service	Status	Interfaces	Non Secure Port	Secure Port	Timeout	Maximum Sessions
web	Active	both	80	443	1800	20
kvm	Active	both	7579	7583	1800	4
cd-media	Active	both	5121	5125	N/A	1
hd-media	Active	both	5124	5128	N/A	1
ssh	Active	NA	N/A	22	60	N/A
telnet	Inactive	NA	23	N/A	60	N/A
solssh	Inactive	NA	N/A	22	60	N/A

Note: Only the administrator has permission to modify this option.

9.11.11 SSL Settings

The SSL (Secure Socket Layer) protocol was developed by Netscape to ensure the transmission between network servers and browsers. The protocol uses a third-party Certificate Authority (CA) to identify one or both ends of the transmission.



View SSL certificate

Users can view the uploaded SSL certificates on this page.

Generate SSL certificate

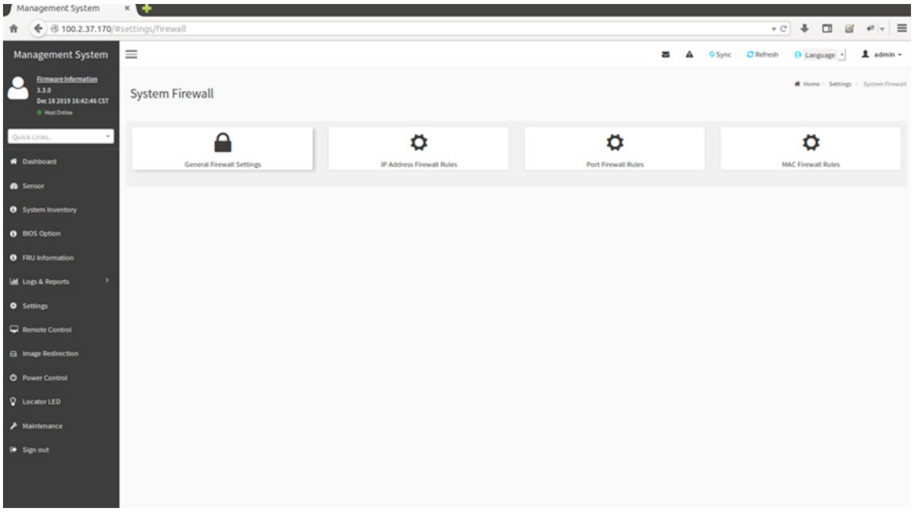
SSL certificates can be generated based on the setup information on this page.

Upload SSL certificate

SSL certificates and private key files can be uploaded on this page.

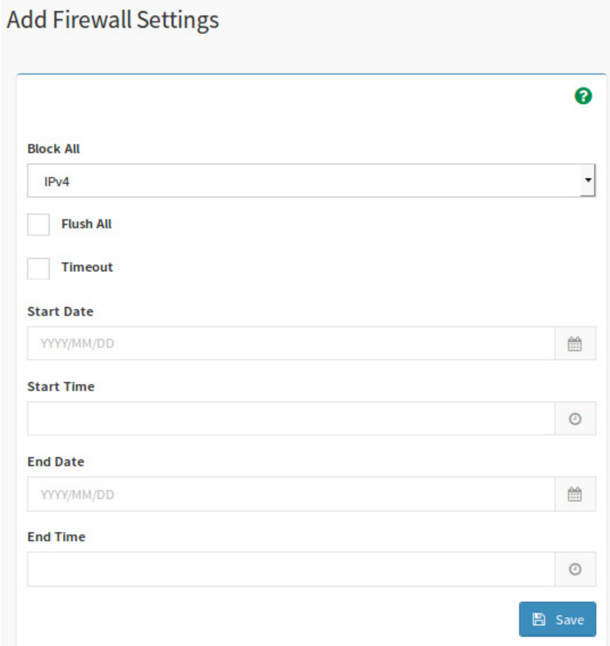
9.11.12 System Firewall

This page is used to build and manage the BMC firewalls.



General Firewall Settings

This page is used to build new firewalls and manage the existing firewall settings.



Add Firewall Settings

Block All

IPv4

□ Flush All

□ Timeout

Start Date

YYYY/MM/DD

Start Time

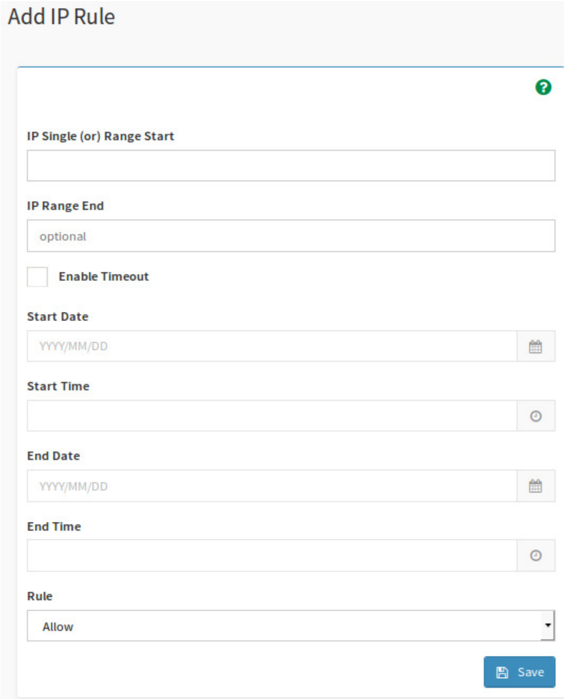
End Date

YYYY/MM/DD

End Time

IP Address Firewall Rules

This page is used to build new firewalls based on IP and manage the existing firewall settings.



Add IP Rule

IP Single (or) Range Start

IP Range End

optional

□ Enable Timeout

Start Date

YYYY/MM/DD

Start Time

End Date

YYYY/MM/DD

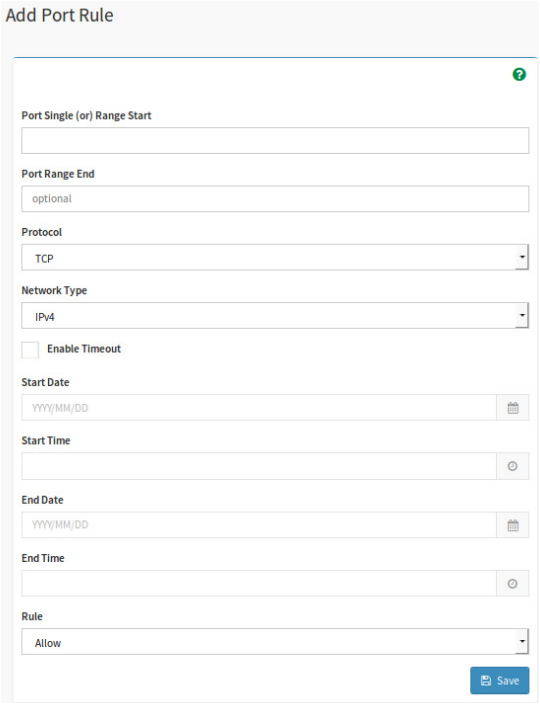
End Time

Rule

Allow

Port Firewall Rules

This page is used to build new firewalls based on port and manage the existing firewall settings.



Add Port Rule

Port Single (or) Range Start

Port Range End

optional

Protocol

TCP

Network Type

IPv4

□ Enable Timeout

Start Date

YYYY/MM/DD

Start Time

End Date

YYYY/MM/DD

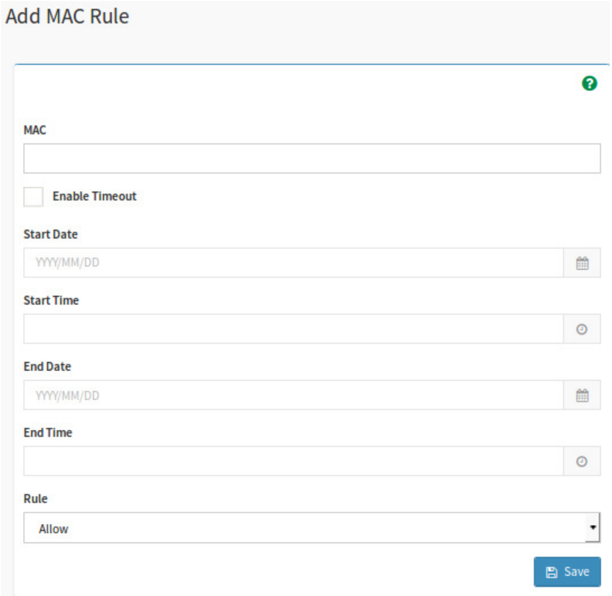
End Time

Rule

Allow

MAC Firewall Rules

This page is used to build new firewalls based on MAC and manage the existing firewall settings.



Add MAC Rule

MAC

□ Enable Timeout

Start Date

YYYY/MM/DD

Start Time

End Date

YYYY/MM/DD

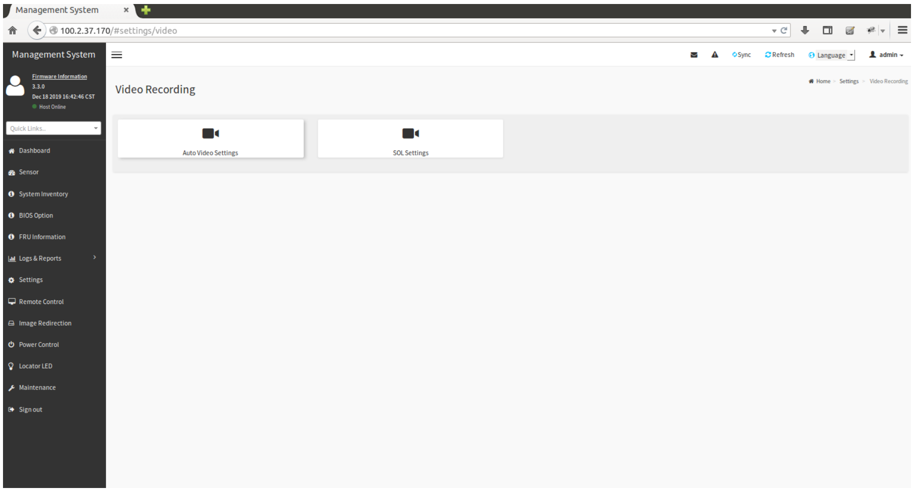
End Time

Rule

Allow

9.11.13 Video Recording

This page is used to adjust the Auto Video Settings and SOL Settings.



Management System

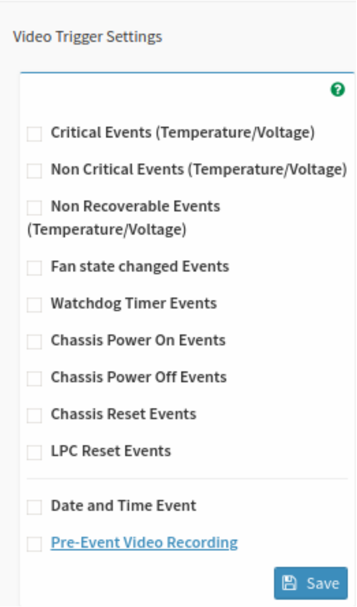
100.2.37.170/#settings/video

Video Recording

Firmware Information
3.3.0
Dec 18 2019 16:42:46 CST
Host Online

Auto Video Settings

This item is used to set the events that can trigger the automatic recording function of the KVM server and display the recorded video files in the BMC. Optional trigger event types and settings are as follows.



Video Trigger Settings

□ Critical Events (Temperature/Voltage)

□ Non Critical Events (Temperature/Voltage)

□ Non Recoverable Events (Temperature/Voltage)

□ Fan state changed Events

□ Watchdog Timer Events

□ Chassis Power On Events

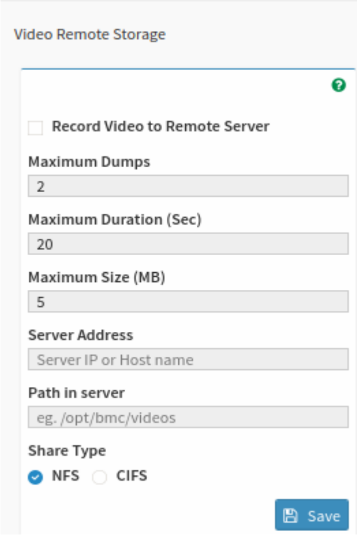
□ Chassis Power Off Events

□ Chassis Reset Events

□ LPC Reset Events

□ Date and Time Event

□ Pre-Event Video Recording



Video Remote Storage

□ Record Video to Remote Server

Maximum Dumps: 2

Maximum Duration (Sec): 20

Maximum Size (MB): 5

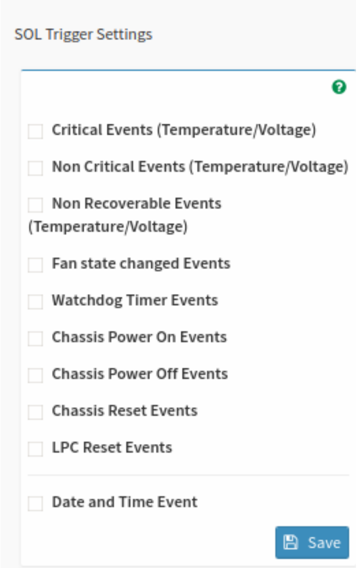
Server Address: Server IP or Host name

Path in server: eg. /opt/bmc/videos

Share Type: ● NFS ○ CIFS

SOL Settings

This item is used to set the events that can trigger the automatic recording function of the SOL server and display the recorded video files in the BMC. Optional trigger event types and settings are as follows.



SOL Trigger Settings

□ Critical Events (Temperature/Voltage)

□ Non Critical Events (Temperature/Voltage)

□ Non Recoverable Events (Temperature/Voltage)

□ Fan state changed Events

□ Watchdog Timer Events

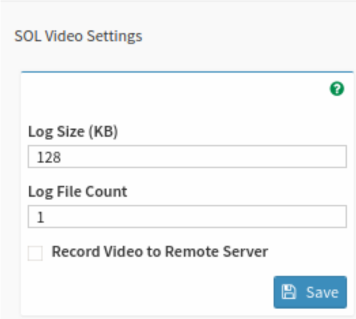
□ Chassis Power On Events

□ Chassis Power Off Events

□ Chassis Reset Events

□ LPC Reset Events

□ Date and Time Event



SOL Video Settings

Log Size (KB): 128

Log File Count: 1

□ Record Video to Remote Server

9.12 BMC Self Recovery

BMC Self Recovery provides the ability of automatic recovery operations as well if necessary.

9.12.1 Hardware Watchdog

Known fault scene:

- Kernel panic
- BMC operating system resources exhausted or error, system can’t create a new task, but the original task can continue to run.

Hardware watchdog:

- Watchdog starts when uboot loads kernel, and the timeout is 5 minutes. If BMC boot timeout occurs, BMC will reset.
- After the BMC system starts, the main process resets the Watchdog every minute. If the timeout is more than 1 minute, BMC will reset.
- When entering the flash mode, set watchdog time to 20 mins, if timeout BMC will reset automatically. When flashing image starts, the watchdog will update to 20 mins, if timeout BMC will reset automatically.

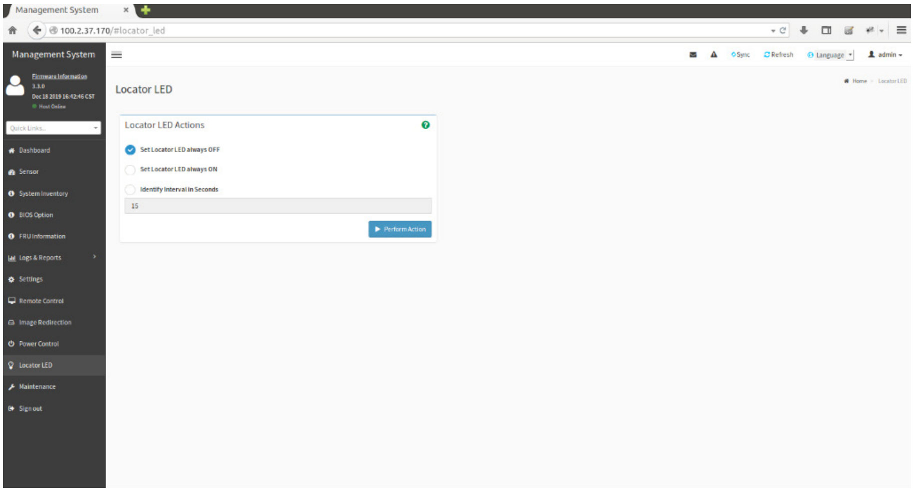
9.12.2 Software Watchdog

BMC regularly detects the working status of internal services. When the progress is abnormal, BMC will restart the corresponding service:

- IPMI Server
- KVM Server
- Virtual Media Server

9.13 Locator LED

The system provides LED to indicate the health of the system. Log in to the Web GUI and enter the “Locator LED” page. This page displays the current status of the locator LED of the server, and you can change the settings. Please select the option you want to use and click Perform Action to run the changes.



Locator LED

Locator LED Actions

● Set Locator LED always OFF

○ Set Locator LED always ON

○ Identify Interval in Seconds

15

9.14 BMC Network

9.14.1 LAN Interface

BMC usually supports an LAN controller dedicated to BMC and an LAN controller shared for both BMC and system.

- Maximum bandwidth: Dedicated NIC – 1000M, Shared NIC – 100M.
- BMC network interface compatibly supports IPV4 and IPV6, supports automatic access or IP address manual setting, and MAC address is stored in the EEPROM.
- Support VLAN.
- By default, IPMI LAN channels are assigned as below:

BMC LAN Interface

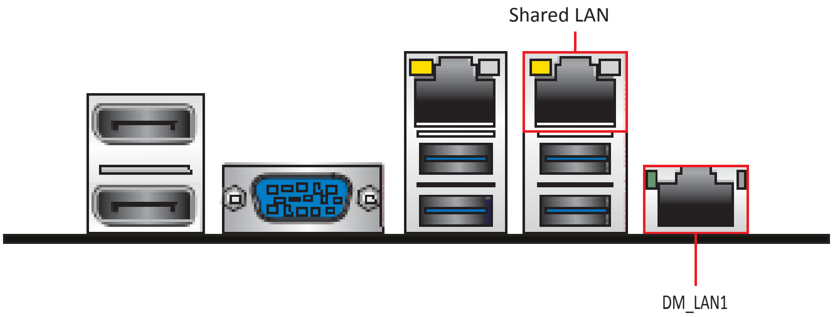
Channel ID	Interface	Support Sessions
1h	Primary LAN (eth1)	Yes
8h	Secondary LAN (eth0)	Yes

- BMC network interface supports enable/disable, enabled by default.

The server's motherboard supports MEGARAC SP-X remote management card with two LAN (RJ-45) ports: one for network connection and one for server management.

The ports for server management are labeled Shared LAN and DM_LAN1. You must use Shared LAN and DM_LAN1 ports to connect remote servers to a local/central host (direct LAN connection) or a network hub or router.

Please refer to the following icons for the location of the Shared LAN and DM_LAN1 ports.



9.14.2 BMC Network Bonding

Bonding feature provides a method for aggregating multiple network interfaces into a single logical bonded network interface. Although multiple network interfaces are bonded, only one is available at a time. In run-time, the netif_carrier (network link state) is monitored by polling periodically.

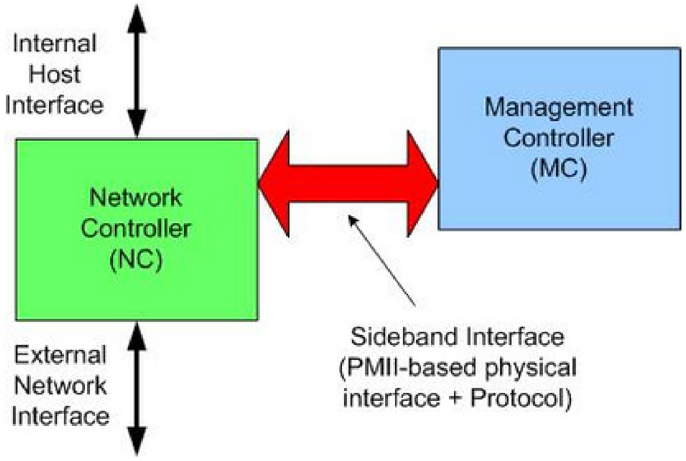
- Bonding function is disabled by default, users can enable it in Web GUI or IPMI CMD.
- Only support Active-backup bonding mode. Default bonding on both NICs (Dedicated and Shared NICs), means network will be working on the NIC plugged with cable. If both NICs plugged with cable before BMC bootup, shared NIC will be primary network to be working. If one NIC plugged with cable before BMC bootup, then anther plugged later, the first NIC will be working.
- After bonding, bonding interface uses shared NIC's MAC to access network, including bonding to dedicated or shared NIC.

9.14.3 NCSI

NC-SI (Network Controller Sideband Interface) is an electrical interface and protocol defined by the Distributed Management Task Force (DMTF), which enables the connection of a Baseboard Management Controller (BMC) to a set of Network Interface Controllers (NIC) in server computer systems for the purpose of enabling out-of-band remote manageability.

It mainly includes: a management controller (MC), one or more (support up to 4 NCSI electrical characteristics) network controllers (NC). The network controller, on the one hand, connects the external network interface to the internal host interface, and on the other hand, there is an out-of-band interface between the management controllers.

The network management module structure of the server is shown as below.



9.15 Users

BMC supports multiple types of users, including IPMI, WEB, SSH and SNMP users.

- BMC supports unified user management mechanism to manage IPMI, WEB and SSH users. Users created by IPMI or WEB will have IPMI, WEB and SSH user privilege. Through SSH, users can access Smash-Lit CLI.
- Sysadmin is used to access BMC diagnostic serial port, and cannot access IPMI, WEB and SSH.
- SNMP user is used for SNMP Get/Set.
- Uboot password is used to access BMC Uboot through the BMC diagnostic serial cable.

9.15.1 IPMI/WEB/SSH Unified User

- BMC supports IPMI 2.0 user model. Unified users can be created by IPMI CMD or Web GUI.
- Up to 16 users are supported.
- The 16 users can be assigned to any channel, including dedicated LAN and NCSI LAN.
- All of the created users can login simultaneously.
- The available user privilege levels are Administrator, Operator, User, and No Access.

⚠ **Note:** For system security, when you log in for the first time, please change the initial password in time and update it regularly.

IPMI Users

User ID	User Name	Password	Status	Default Privilege	Characteristics
1	admin	admin	Enabled	Administrator	User Name/Password can be changed
2 - 16	undefined	undefined	Disabled	Administrator	User Name/Password can be changed

User Security

Username

- User Name is a string of 1 to 16 alpha-numeric characters, including ‘-’, ‘_’ and ‘@’.
- It must start with an alphabetical character.
- It is case-sensitive.
- Special characters ‘,’ (comma), ‘.’ (period), ‘:’ (colon), ‘;’ (semicolon), ‘ ‘ (space), ‘/’ (slash), ‘\\’ (backslash), ‘(‘ (left bracket), ‘)’ (right bracket) and so on are not allowed.

Password Authentication

- Password encryption scheme: 64Bit Blowfish. Password is encrypted to store in BMC flash.

Password Complexity

- When password complexity check is disabled, password must be at least 1 character long.
- When password complexity check is enabled, password must include special characters, uppercase and lowercase letters, and numbers, at least 8 characters long.
- The maximum password length is 16 characters.
- Complexity check is disabled by default, we strongly suggest you enable this function for security.

Password Expiration

- Password Expiration, the range of the expiration is 0~90 days, and 0 presents forever.
- Disabled by default, we strongly suggest you enable this function for security.
- If enabled, you need change password in expiration time. If password will be expired less than 15 days, when you login Web GUI, Web will alert “From the password expiration remaining days: xx”.

- If password expired, you need disable this function in HOST OS by OEM IPMI CMD.
- *Password Expiration* is only supported in Web GUI.

Password Failed Locking

- Login Fail Retry Count: The retry count should be a number between 0 and 5.
- Lock Time: The range of the time is 5 ~ 60 minutes.
- If login failed time reaches *Login Fail Retry Coun*t, Web will alert “Input times of wrong password exceeds the limit, user is locked, please retry later!”, and the user will be locked for *Lock Time*.
- Disabled by default, we strongly suggest you enable this function for security.
- *Password Failed Locking* is only supported in Web GUI.

Password History Record

- Password History Records: The range is 0 ~ 5.
- Disabled by default. If enabled, you could not set password same to Password History Records (last N passwords).
- *Password History Record* is only supported in Web GUI.

9.15.2 BMC System Root User

The system root user can access the BMC diagnostic serial port. Users can change the password through IPMI CMD or Web GUI.

User name: sysadmin (Fixed, cannot be changed)

Default password: superuser

⚠ **Note:** For system security, when you log in for the first time, please change the initial password in time and update it regularly.

Username and Password Security

- Username is fixed, cannot be changed.

- Password must be at least 8 characters long.

- Password must include special characters, uppercase/lowercase letters and numbers.

- White space is not allowed.

- No more than 64 characters.

9.15.3 SNMP User

SNMP user is used to support SNMP Get/Set, and can be created by IPMI CMD or Web GUI.

- Default read & write community: inspur@0531
- For security, SNMP V1/V2c is an insecure protocol version, it is disabled by default.
- SNMPV3 supports user authentication, supported authentication algorithm is SHA and MD5;
- SNMPV3 supports user privacy , supported privacy algorithm is DES and AES;
- Default SNMPV3 user is sysadmin, authentication algorithm is MD5, authentication password is rootuser; privacy algorithm is DES, privacy password is rootuser.

⚠ **Note:** For system security, when you log in for the first time, please change the initial password in time and update it regularly.

User Security

- SNMPV3 supports user authentication, supported authentication algorithm is SHA and MD5;
- SNMPV3 supports user privacy, supported privacy algorithm is DES and AES.

9.15.4 Uboot Password

- Users can access BMC Uboot through the BMC diagnostic serial cable.
- For system security, the initial password is not set in Uboot by default, and users cannot access it.
- If users want to access Uboot, they must first set a password and then enter the password to access. Contact our technicians for the password setting method.

⚠ **Note:** For system security, if the Uboot password has been set, please update it regularly.

9.15.5 User Privilege

User Privilege for IPMI

BMC has two ways to receive IPMI CMD, out-band and in-band.

- **Out-band** mode means sending IPMI CMD to BMC by LAN, BMC will authenticate user and password.
- **In-band** mode means sending IPMI CMD in HOST OS. In this mode, IPMI CMD does

not need to authenticate user and password, because he will get the highest privilege if someone accesses the HOST OS. So if the user forgets password or password expires, this is a way to change password or disable password security rules.

Please refer to IPMI 2.0 Spec, Appendix G - Command Assignments. Common privilege as below:

User Privilege for IPMI

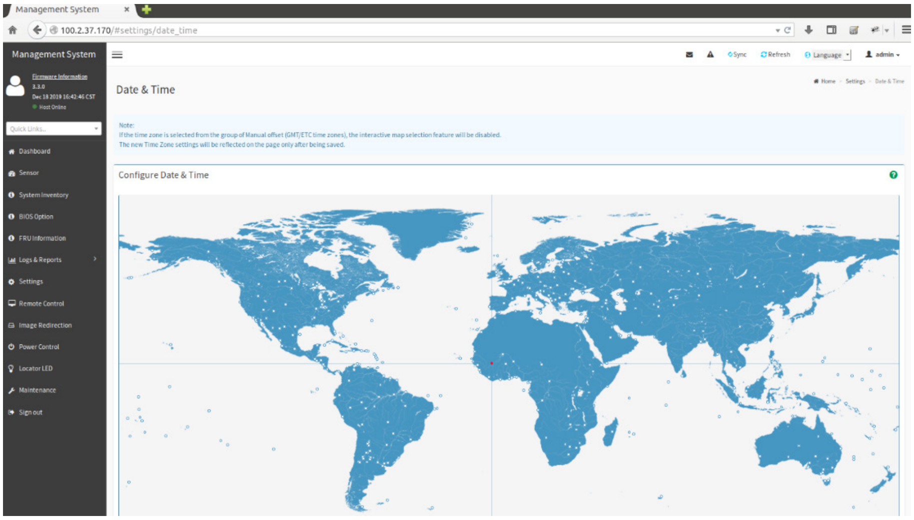
User Privilege	Supported Operation
Administrator	Write/Read
Operator	Read Only
User	Read Only
No Access	Non

User Privilege for Management Web GUI

Only IPMI/WEB/SSH Unified User supports Web GUI. For “Operator” and “User” privilege, if with RO attribute, the settings are visible, but the input fields and buttons are disabled, so users cannot modify the settings; if with NA attribute, the settings are invisible and no operation can be taken. “No Access” privilege cannot login Web GUI.

9.16 Date & Time

This page allows you to set the date and time of the BMC or automatically refresh the date and time via NTP.

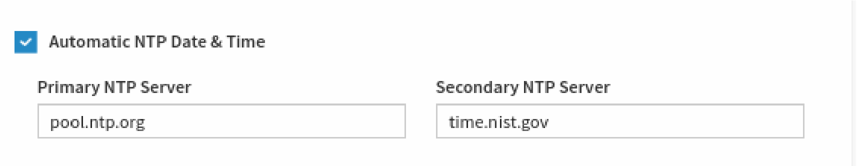


Date & Time

Note:
If the time zone is selected from the group of Manual offset (GMT/ETC time zones), the interactive map selection feature will be disabled.
The new Time Zone settings will be reflected on the page only after being saved.

Configure Date & Time

Automatic NTP Date & Time



☑ Automatic NTP Date & Time

Primary NTP Server: pool.ntp.org

Secondary NTP Server: time.nist.gov

9.17 BIOS and BMC

BIOS and BMC cooperate very closely in the server. BIOS uses IPMI command to communicate with BMC by means of KCS interface on LPC bus.

BIOS provides the following features to BMC.

- Sync Host RTC time with BMC by “Set SEL Time Command”
- Provide BMC information and configure BMC in BIOS Setup Menu
- Provide System Inventory information, like CPU and DIMM to BMC

BMC provides the following features to BIOS.

- FRB2 supported by means of IPMI Watchdog Timer Command (Please refer to the BMC watchdog chapter)
- BIOS firmware update and ME firmware update
- BIOS Setup Menu Configuration
- SEL repository device for system event logging
- BIOS Port80 POST Code log
- NMI to PCH, Non Maskable Interrupt. The highest priority interrupt in the system, after SMI. This interrupt has traditionally been used to notify the operating system fatal system hardware error conditions, such as parity errors and unrecoverable bus errors. It is also used as a Diagnostic Interrupt for generating diagnostic traces and ‘core dumps’ from the operating system.

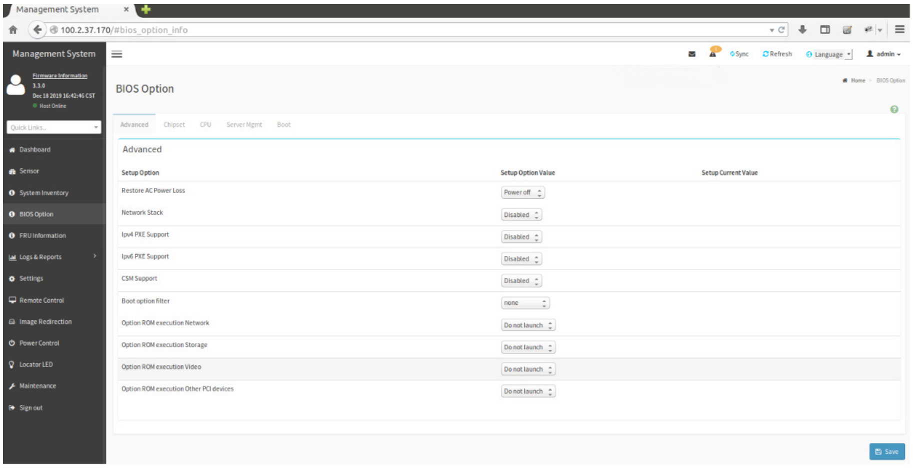
The AST2500 SOC also acts as a Super I/O (SIO), which provides system serial port to host. When SOL is activated, BMC redirects the System UART to BMC UART to reach SOL feature. For details, please refer to “Serial over LAN” chapter.

9.17.1 BIOS Option

BMC supports BIOS Option getting and setting.

- BIOS sends BIOS Option to BMC When BIOS POST completes.
- Users can use IPMI OEM CMD to change setup option value. BIOS will update setup option after next system restart.

Page “Information -> BIOS Option” in Web GUI displays the BIOS setup options.



BIOS Option

Advanced

Setup Option	Setup Option Value	Setup Current Value
Restore AC Power Loss	Power off	
Network Stack	Disabled	
Ipv4 PXE Support	Disabled	
Ipv6 PXE Support	Disabled	
CSM Support	Disabled	
Boot option filter	none	
Option ROM execution Network	Do not launch	
Option ROM execution Storage	Do not launch	
Option ROM execution Video	Do not launch	
Option ROM execution Other PCI devices	Do not launch	

9.18 Storage

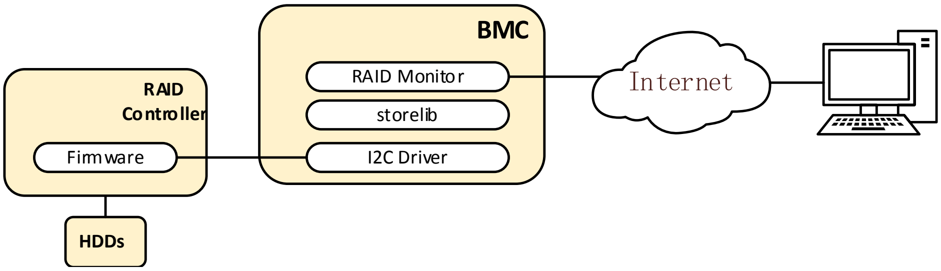
Server storage subsystem generally consists of RAID and SAS hard disks. BMC physically interacts with the RAID and SAS controllers through I2C to obtain information such as controllers, disks, and arrays, and to set RAID.

Currently Supported RAID and SAS

Model	Type	Manufacturer	Speed(G)	Firmware Version
9361-8i	RAID	Broadcom	12	ALL
3108	RAID	Broadcom	12	ALL
3008 IT	SAS	Broadcom	12	14.00.02.00
3008 IR	SAS	Broadcom	12	14.00.02.00
3008 iMR	RAID	Broadcom	12	ALL
9305-16i	SAS	Broadcom	12	
9361-16i	RAID	Broadcom	12	
2208-8i	RAID	Broadcom	6	X
9364-8i	RAID	Broadcom	12	ALL

8060	RAID	Microsemi	12	33083 and above
9300-8e	SAS	Broadcom	12	
9305-24i	SAS	Broadcom	12	
9460-8i	RAID	Broadcom	12	
9460-16i	RAID	Broadcom	12	
9400-8i	SAS	Broadcom	12	
9400-16i	SAS	Broadcom	12	
9440-8i	RAID	Broadcom	12	
9440-16i	RAID	Broadcom	12	
3408 IT	SAS	Broadcom	12	
3408 iMR	RAID	Broadcom	12	
3508	RAID	Broadcom	12	
3154-8i	RAID	Broadcom	12	
HBA1100	SAS	Microsemi	12	
SmartHBA2100	SAS	Microsemi	12	
3152-8i	RAID	Microsemi	12	
3154-8i	RAID	Microsemi	12	

Schematic that BMC accesses RAID/SAS controller:



Storage Management Information

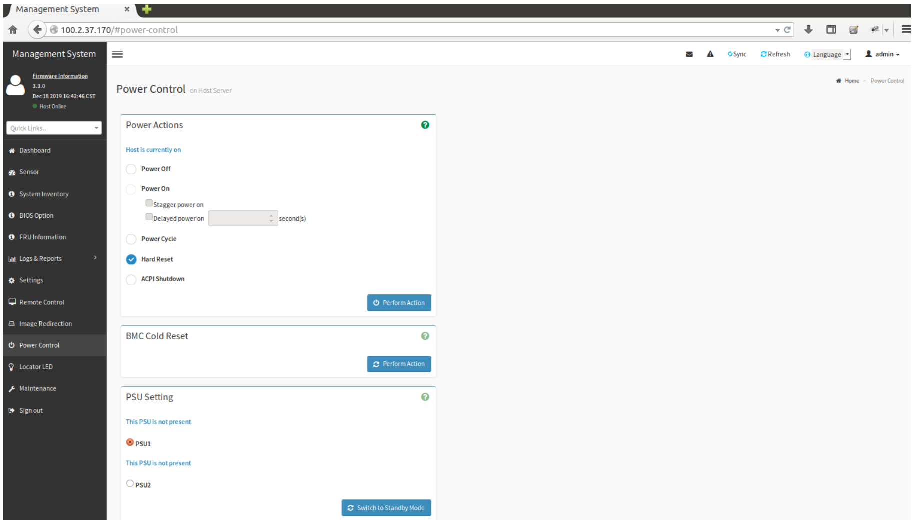
Device	Monitored Information
RAID controller	Product Name
	Serial Number
	Vendor (ID)
	SubVendor (ID)
	Device (ID)
	SubDevice (ID)
	Host Interface
	Firmware Version
	WebBIOS Version
	BIOS Version
	Firmware Package Version
	Firmware Time
	Device Interface
	Chip Temperature (Cel)
	Unconfigured Good Spin Down
	Hot Spare Spin Down
	Cluster Mode
	NCQ
	Coercion Mode
	Alarm Control
	Smart Copyback Enabled
	Auto Rebuild
	SAS Address
	Port Count
	Drive Count
	Virtual Drive Count
	NVRAM Size (KB)
	Memory Size (MB)
	Flash Size (MB)
	Min Strip Size (KB)
	Max Strip Size (KB)
	Spin Down Time (Minutes)
	Rebuild Rate
	Back Ground Init (BGI) Rate
	Consistency Check (CC) Rate
	Reconstruction Rate
	S.M.A.R.T Polling
	Cache Flush Interval (s)
	Spinup Drive Count
	Spinup Delay
	Controller BIOS
	Shield State Supported
	Maintain PD Fail History
	Battery Warning

Hard disk	Device ID Enclosure ID Firmware State Media Type Vendor (ID) Product Revision Level Max Speed (Gbps) Temperature (Cel) Raw Size (GB) Media Error Count User Data Block Size (B) Certified Disabled for Removal FW Download Allowed Security Rebuild Locate Copy Back Slot Number Connected Port Power State Device Interface Product ID Vendor Specific Info Negotiated Link Speed (Gbps) SAS Address Coerced size (GB) Predictive Fail Count Emulated Block Size (B) Is Path Broken FDE Capable Emergency Spare Commissioned Hotspare Clear All Data Secure Erase Patrol Read
Array	
Enclosure	Device ID Enclosure is Faulty Slot Count Internal Index Enclosure Type Drive Count

9.19 Power Control

This page displays the current power status of the server and allows you to make changes.

Please select the option you want to use and click Perform Action to run the changes.



Firmware Information
3.3.0
Dec 18 2019 16:42:46 CST
Host Online

Power Control on Host Server

Power Actions

Host is currently on

○ Power Off

○ Power On

□ Stagger power on

□ Delayed power on second(s)

○ Power Cycle

● Hard Reset

○ ACPI Shutdown

Perform Action

BMC Cold Reset

Perform Action

PSU Setting

This PSU is not present

● PSU1

This PSU is not present

○ PSU2

Switch to Standby Mode

9.19.1 Power Redundancy

BMC supports PSU Redundancy, which means if one or more PSUs cannot normally output power, the server will work normally powered by other PSUs.

9.19.2 PSU Active Standby

In the case of meeting the normal work, BMC provides a way to manually set the PSU to standby to improve power conversion efficiency.

PSU defaults to Active-Active mode, and if it need switch to Active-Standby mode, as the PSU is critical, the work need to do under the guidance of professional engineer.

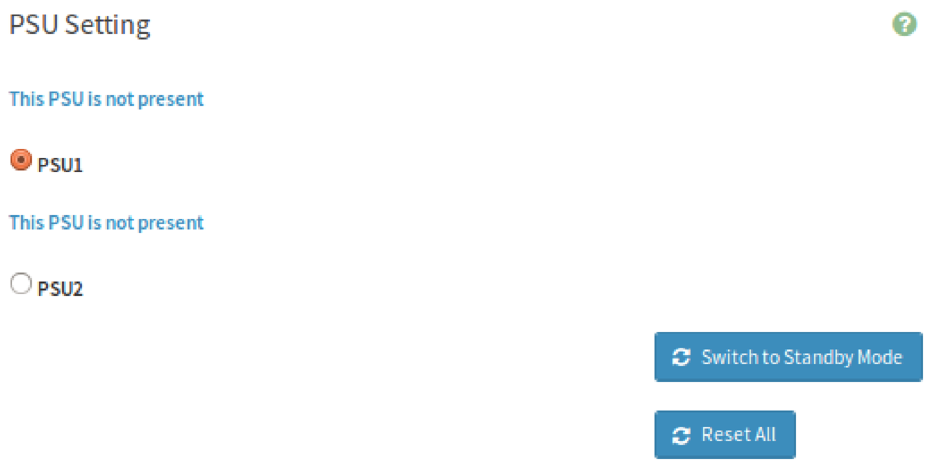
In the case of meeting business power consumption, reduce part of the power supply by 0.3V, suppress the standby current output by the voltage difference, and the system will be powered by the main power system. The power supply is in a hot standby state, once the main power supply is abnormal, standby power will switch to the main power supply smoothly without affecting the service.

Conditions that standby power switches to the main power:

1. Main power supply is pulled out;
2. Main power supply output voltage is low or no output;
3. Main power supply temperature is too high, input loss, overcurrent, or overvoltage;
4. The percentage of system power to the rated power of the main power supply reaches

the upper limit.

Users can switch the active and standby mode of PSU1 and PSU2 on this page.



PSU Setting

This PSU is not present

● PSU1

This PSU is not present

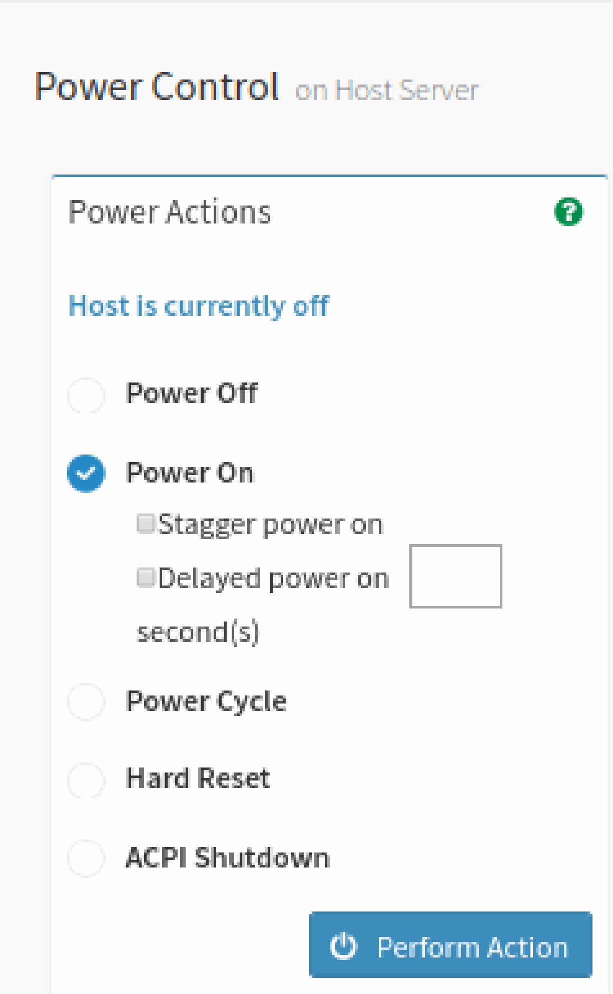
○ PSU2

9.19.3 Power Peak

Power peak is used to prevent many servers from being started at the same time, which would cause heavy power loading.

- Power peak can be enabled or disabled. Disabled by default.
- When it is enabled, users can configure the maximum random time.
- BMC will power on server with a random time delay within the time configured.

Click “Power Control” to enter the configuration page. Users can perform Power On action, checking Stagger power on or entering the seconds of Delayed power on.



Power Control on Host Server

Power Actions

Host is currently off

○ Power Off

● Power On

□ Stagger power on

□ Delayed power on ____ second(s)

○ Power Cycle

○ Hard Reset

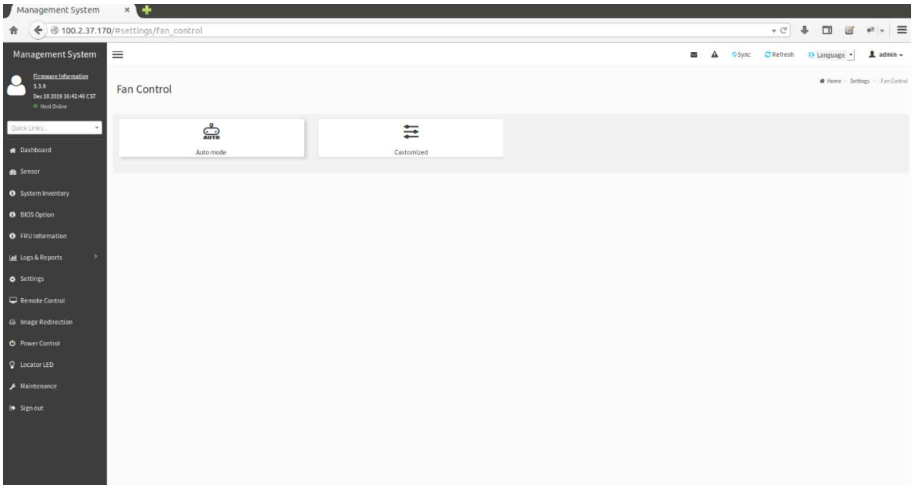
○ ACPI Shutdown

9.20 Fan Speed Control

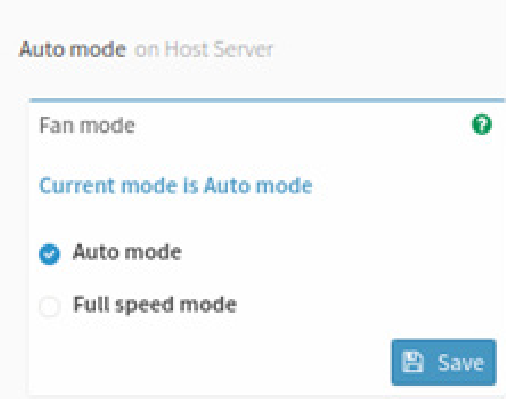
9.20.1 Fan Speed Control

BMC supports Auto Fan Control by default, and the fan module speed is controlled by the algorithm provided by thermal team.

Users can set the fan mode to automatic or customized mode in the Web GUI.



Auto mode can automatically adjust the fan speed according to the relevant temperature conditions.


Auto mode on Host Server

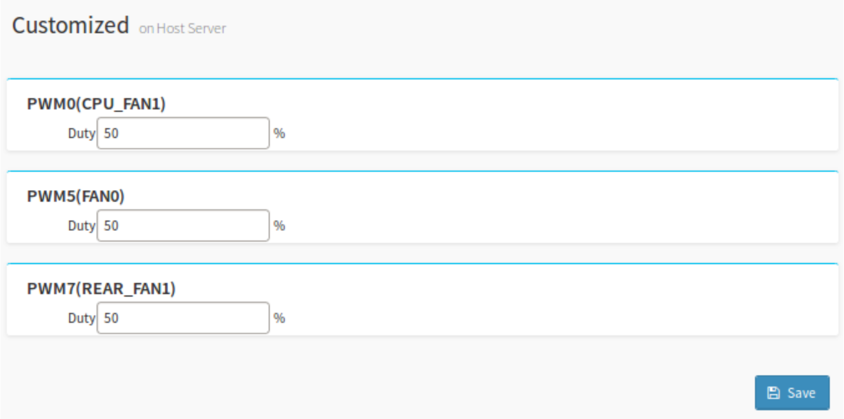
Fan mode

Current mode is Auto mode

● Auto mode

○ Full speed mode

Customized mode allows users to personalize the fan settings.


Customized on Host Server

PWM0(CPU_FAN1)
Duty 50 %

PWM5(FAN0)
Duty 50 %

PWM7(REAR_FAN1)
Duty 50 %

9.20.2 Fan Speed Control Watchdog

MCU or CPLD will monitor BMC fan control task by receiving BMC watchdog signal.

If MCU or CPLD cannot receive watchdog signal in 4 mins, all fans will be set to full speed to avoid system overheating.

9.21 Firmware Update

9.21.1 BMC Firmware Update

BMC firmware update supports the following two modes:

- WEB update, users login Web GUI and enter flash page to update firmware. This is a sideband mode, it supports Firmware Integrity Checking and preserving configuration. It is a suggested update mode.
- SOCflash tool update, SOCflash tool is used in DOS/Windows/Linux OS. SOCflash will directly erase and overwrite flash with new image without Firmware Integrity Checking. All configuration will be erased. This is an inband mode, users should accept user permission. SOCflash is disabled by default. We strongly don’t suggest customer to use SOCflash tool for security.

9.21.1.1 Firmware Integrity Checking

Each firmware image has a MD5 code calculated by MD5 tool (Hash.exe). Before firmware update, users must check integrity using MD5 tool to make sure the firmware image file is the correct one.

9.21.1.2 WEB Update

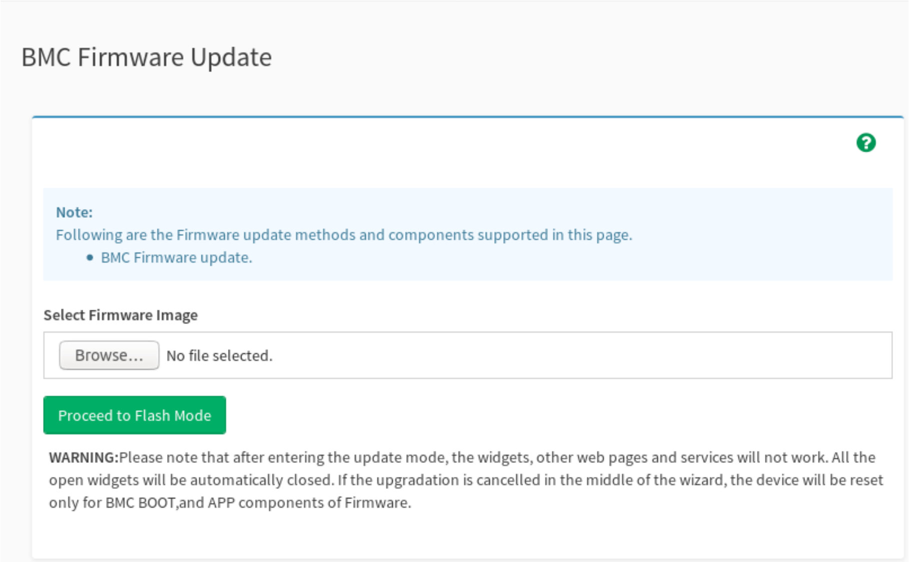
BMC firmware update is supported via the Web GUI.

- Support hardware watchdog, please refer to “Hardware watchdog” in section “BMC Self Recovery”.

Log in to the Web GUI, enter the “Maintenance -> BMC Firmware Update” page, and select the image to update. Configuration can be preserved separately. Please refer to section “Restore Factory Defaults”.

⚠ **Note:** The firmware update process is a crucial operation. Make sure that the chances of a power or connectivity loss are minimal when performing this operation.

Once you enter into Update Mode and choose to cancel the firmware flash operation, BMC must be reset. This means that you must close the Internet browser and log back onto the BMC before you can perform any other types of operations.



BMC Firmware Update

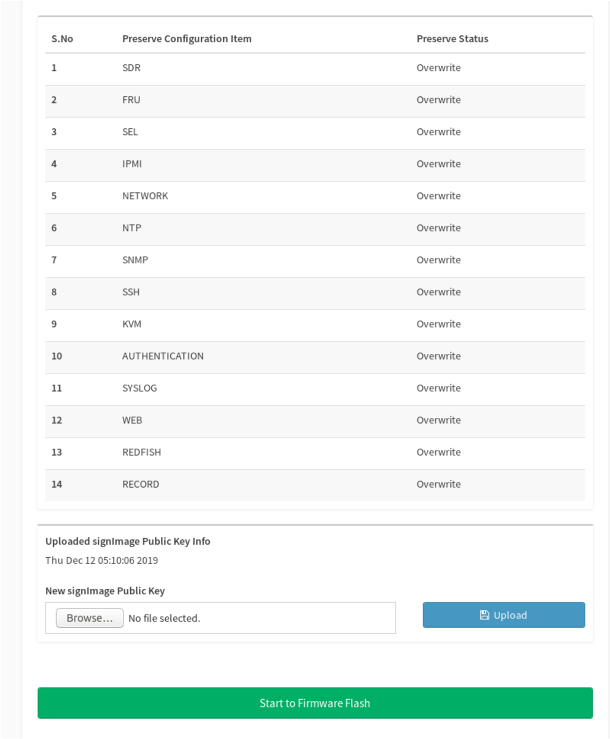
Note:
Following are the Firmware update methods and components supported in this page.

- BMC Firmware update.

Select Firmware Image

Browse... No file selected.

WARNING: Please note that after entering the update mode, the widgets, other web pages and services will not work. All the open widgets will be automatically closed. If the upgradation is cancelled in the middle of the wizard, the device will be reset only for BMC BOOT,and APP components of Firmware.

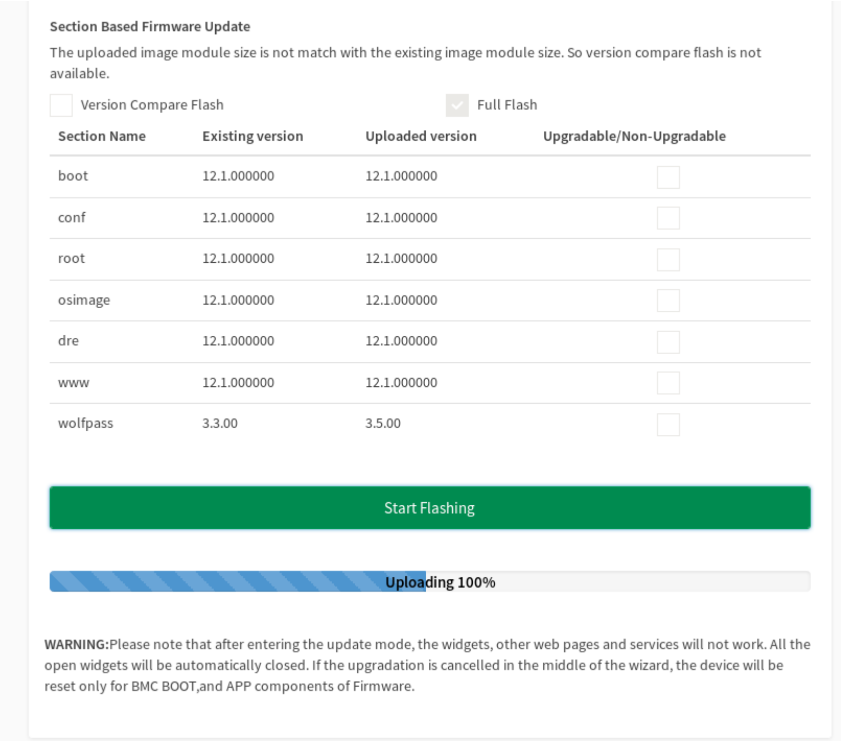


S.No	Preserve Configuration Item	Preserve Status
1	SDR	Overwrite
2	FRU	Overwrite
3	SEL	Overwrite
4	IPMI	Overwrite
5	NETWORK	Overwrite
6	NTP	Overwrite
7	SNMP	Overwrite
8	SSH	Overwrite
9	KVM	Overwrite
10	AUTHENTICATION	Overwrite
11	SYSLOG	Overwrite
12	WEB	Overwrite
13	REDFISH	Overwrite
14	RECORD	Overwrite

Uploaded signImage Public Key Info
Thu Dec 12 05:10:06 2019

New signImage Public Key

Browse... No file selected.



Section Based Firmware Update

The uploaded image module size is not match with the existing image module size. So version compare flash is not available.

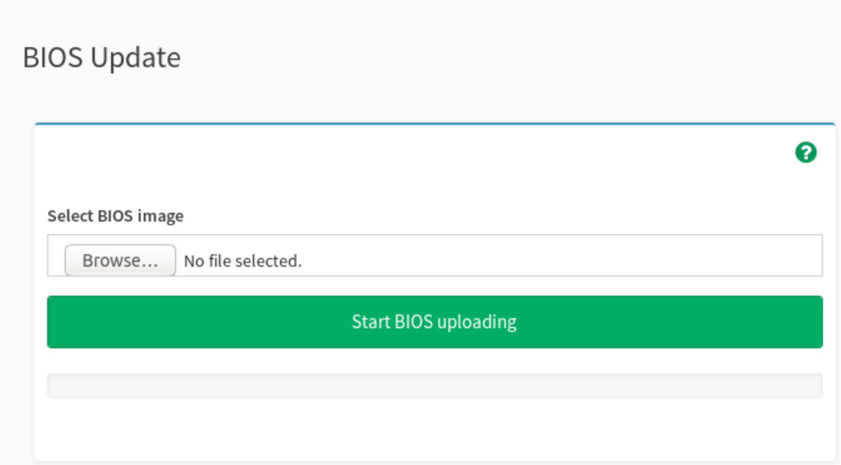
□ Version Compare Flash ☑ Full Flash

Section Name	Existing version	Uploaded version	Upgradable/Non-Upgradable
boot	12.1.000000	12.1.000000	□
conf	12.1.000000	12.1.000000	□
root	12.1.000000	12.1.000000	□
osimage	12.1.000000	12.1.000000	□
dre	12.1.000000	12.1.000000	□
www	12.1.000000	12.1.000000	□
wolfpass	3.3.00	3.5.00	□

WARNING: Please note that after entering the update mode, the widgets, other web pages and services will not work. All the open widgets will be automatically closed. If the upgradation is cancelled in the middle of the wizard, the device will be reset only for BMC BOOT,and APP components of Firmware.

9.21.2 BIOS Firmware Update

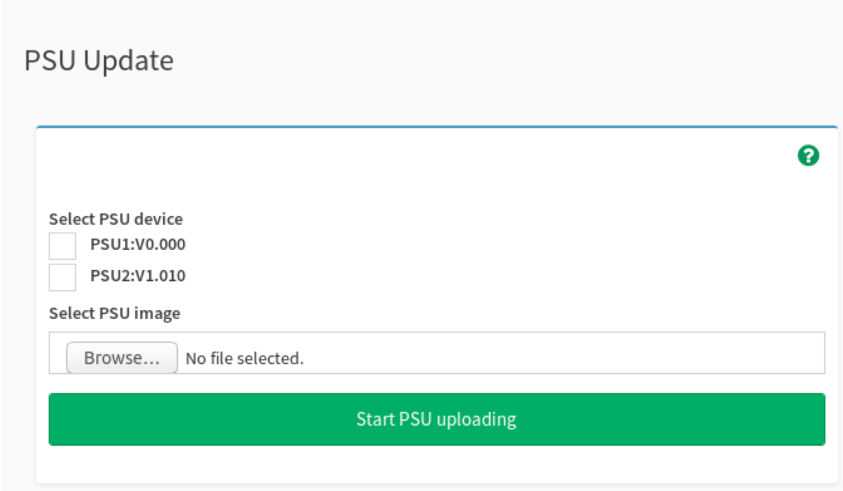
BMC supports BIOS Firmware update via the Web GUI. Log in to the Web GUI, enter the “Maintenance -> BIOS Update” page, select and upload the .com file to update BIOS.



9.21.3 PSU Firmware Update

BMC supports PSU Firmware update via the Web GUI. Log in to the Web GUI, enter the

"Maintenance -> PSU Update" page, select and update the PSU device firmware. Please make sure the system is shut down before updating.



PSU Update

Select PSU device

□ PSU1:V0.000

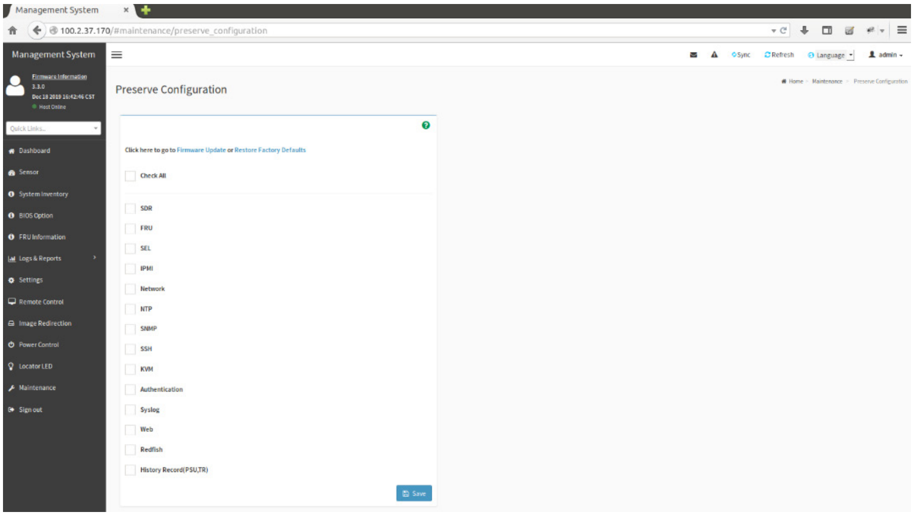
□ PSU2:V1.010

Select PSU image

Browse... No file selected.

9.22 Preserve Configuration

Log in to the Web GUI and enter the "Maintenance -> Preserve Configuration" page. This page allows you to select the items to keep when restoring the factory settings. If no item is selected, all items will be restored to the original factory settings.



Preserve Configuration

Click here to go to Firmware Update or Restore Factory Defaults

□ Check All

□ SDR

□ FRU

□ SEL

□ IPMI

□ Network

□ NTP

□ SNMP

□ SSH

□ KVM

□ Authentication

□ Syslog

□ Web

□ Redfish

□ History Record(PSU,TR)

⚠ **Note:** Update policy "Overwrite" means selected items will be overwritten to defaults after clicking "Restore Factory Defaults" or upgrading BMC; "Preserve" means selected items will remain unchanged after clicking "Restore Factory Defaults" or upgrading BMC.

Restore Factory Defaults

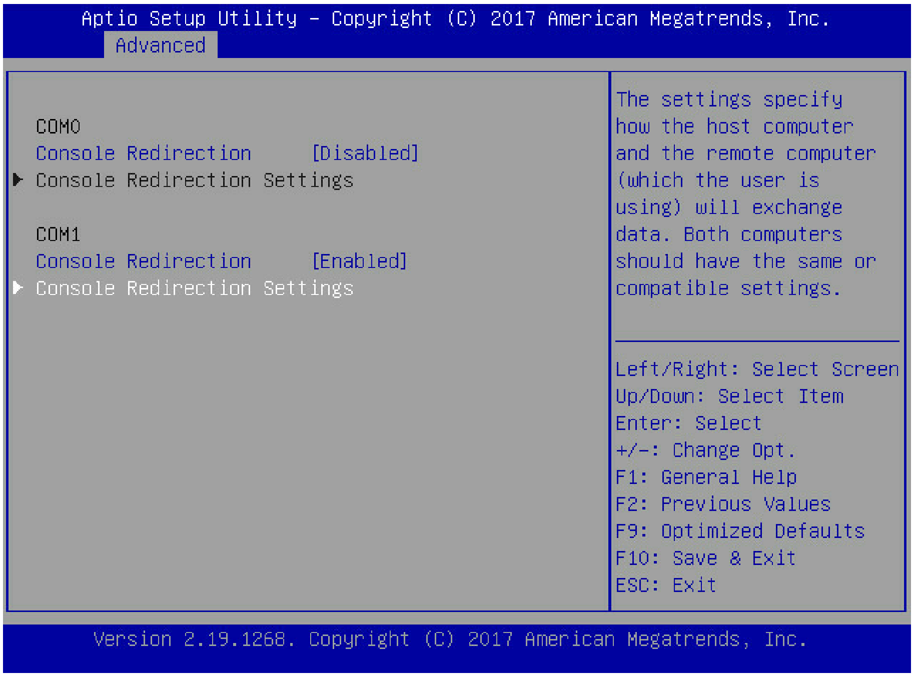
Items	Preserved Configuration	Note
SEL	SEL Log	
IPMI	IPMI, including PEF data, SOL data, IPMI user information, SMTP, DCMI data, etc.	
PEF	PEF	Select IPMI option when this configuration is included.
SOL	SOL	Select IPMI option when this configuration is included.
SMTP	SMTP	Select IPMI option when this configuration is included.
User	IPMI User	Select IPMI option when this configuration is included.
DCMI	DCMI	Select IPMI option when this configuration is included.
Network	BMC Network	
NTP	NTP	
SNMP	SNMP	
SSH	SSH	
KVM	KVM and Virtual Media Devices	
Authentication	Authentication, including LADP and superuser	
Syslog	System log	
Hostname	Host name	

9.23 Serial Over LAN (SOL) and System Serial Log Recording

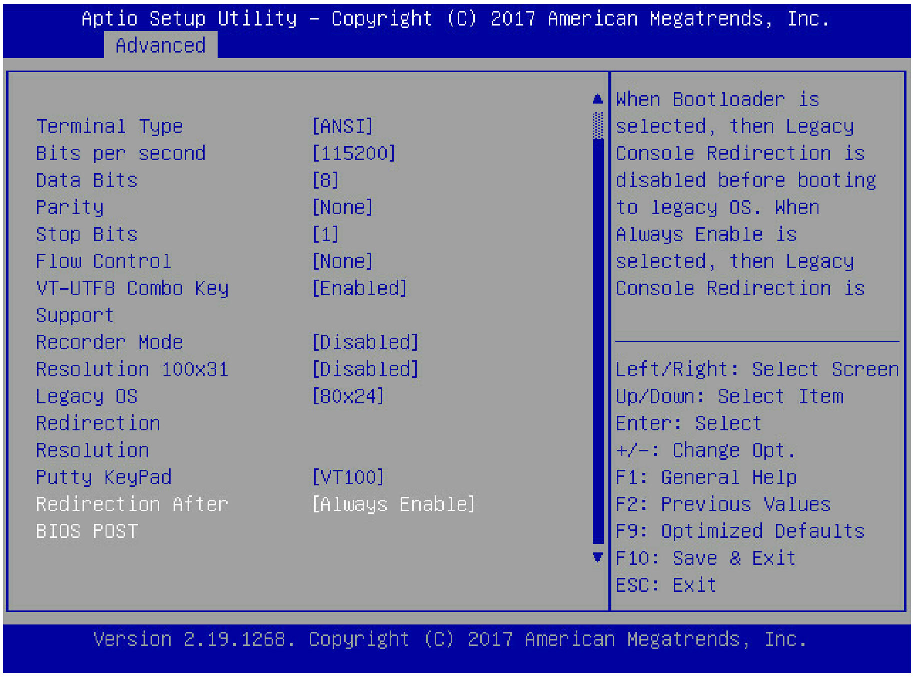
9.23.1 Serial Over LAN

Serial Over LAN (SOL) redirects the system serial port to the remote network client. Users connect to the BMC on the local PC, open the serial port redirection function with the standard IPMI command (sol activate), view the system serial output, and enter the system serial port.

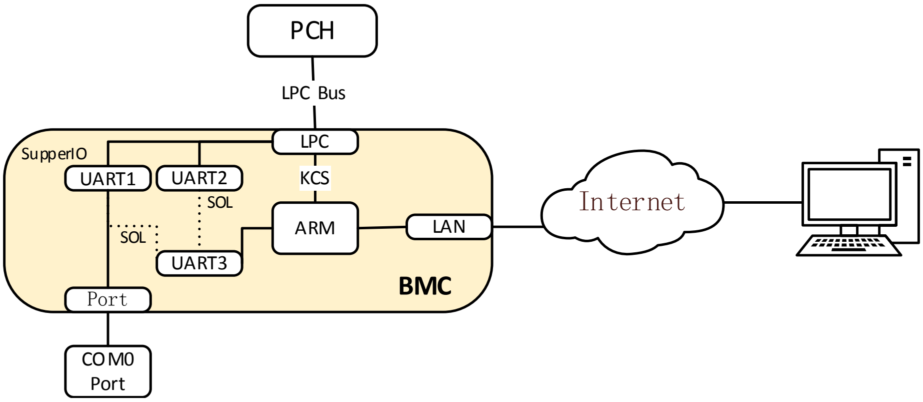
- COM0 and COM1 both support SOL. COM0 port has connector on the motherboard. The COM1 port is dedicated for SOL function.
- SOL is enabled on COM0 (some projects on COM1) by default, users should configure SOL in BIOS Setup (Serial Port Console Redirection), if needed.



```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

  COM0                                   The settings specify
  Console Redirection      [Disabled]    how the host computer
▶ Console Redirection Settings           and the remote computer
                                         (which the user is
  COM1                                   using) will exchange
  Console Redirection      [Enabled]     data. Both computers
▶ Console Redirection Settings           should have the same or
                                         compatible settings.

                                         Left/Right: Select Screen
                                         Up/Down: Select Item
                                         Enter: Select
                                         +/-: Change Opt.
                                         F1: General Help
                                         F2: Previous Values
                                         F9: Optimized Defaults
                                         F10: Save & Exit
                                         ESC: Exit

Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```



```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

                                        ▲ When Bootloader is
  Terminal Type            [ANSI]         selected, then Legacy
  Bits per second          [115200]       Console Redirection is
  Data Bits                [8]            disabled before booting
  Parity                   [None]         to legacy OS. When
  Stop Bits                [1]            Always Enable is
  Flow Control             [None]         selected, then Legacy
  VT-UTF8 Combo Key        [Enabled]      Console Redirection is
  Support
  Recorder Mode            [Disabled]
  Resolution 100x31        [Disabled]     Left/Right: Select Screen
  Legacy OS                [80x24]        Up/Down: Select Item
  Redirection                             Enter: Select
  Resolution                              +/-: Change Opt.
  Putty KeyPad             [VT100]        F1: General Help
  Redirection After        [Always Enable] F2: Previous Values
  BIOS POST                               F9: Optimized Defaults
                                        ▼ F10: Save & Exit
                                          ESC: Exit

Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

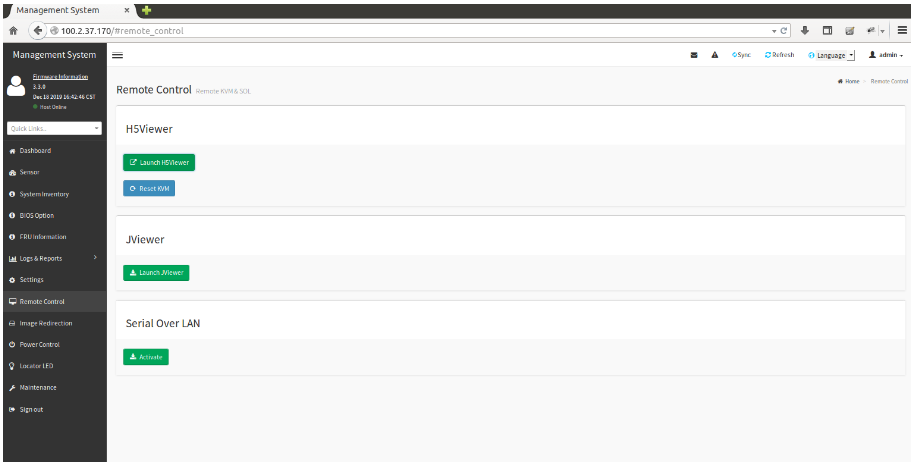


9.23.2 System Serial Log Recording

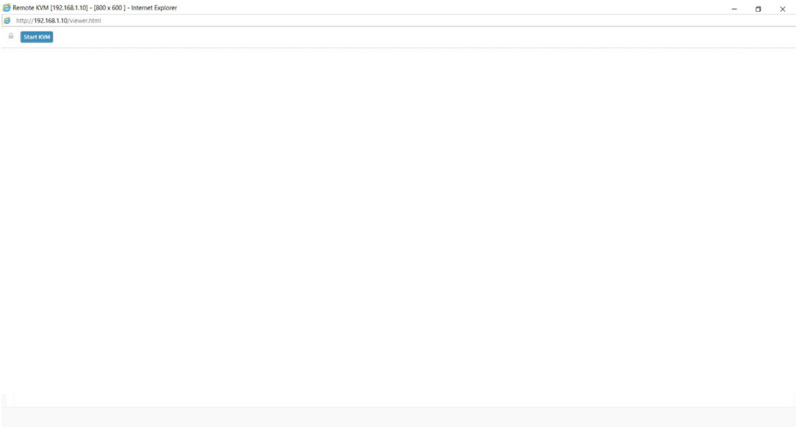
BMC can record system serial information. The logs BIOS or OS sends to the serial port will be recorded to the BMC's DDR, and up to 2M bytes of system serial log content will be saved. When more than 2M, log will loop to store, and the old log content will be deleted. When the system crashes or restarts, system serial log can be exported, and fault information can be used for fault diagnosis.

9.24 Console Redirection (KVM)

Remote KVM redirects the host system's console to user's PC by BMC. Users login BMC and open KVM, then host's screen will be displayed in KVM application. User PC's keyboard and mouse can be used to control server. Log in to the Web GUI and click Launch H5Viewer for remote operation. Click Reset KVM to reset KVM. Click to Launch JViewer for Java KVM remote operation. Click Activate for SOL remote operation.

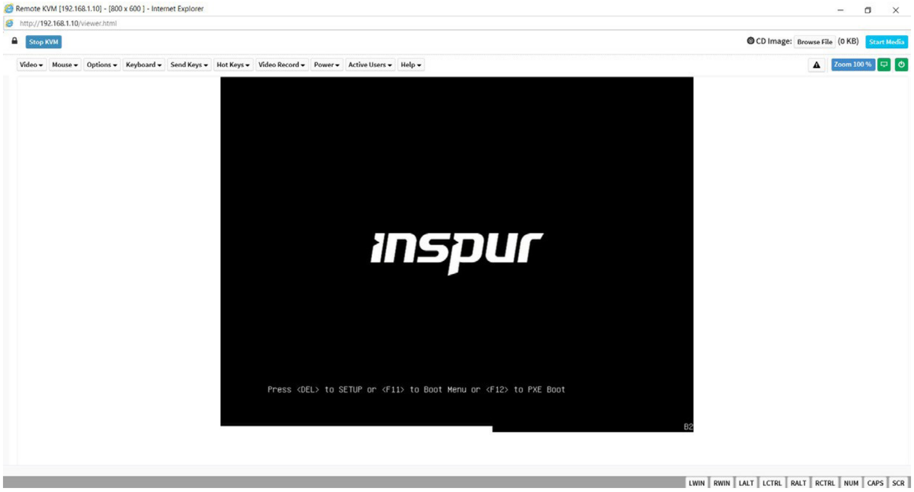


The remote control panel application uses the Web GUI to remotely control the server's operating system, use the screen, mouse and keyboard, and reset to a local CD/DVD and hard disk/U disk as if these devices were directly connected to the server. Click Start KVM to set it up.


Remote KVM [192.168.1.10] - [800 x 600] - Internet Explorer
http://192.168.1.10/viewer.html
Start KVM

Note: If KVM is enabled, you need to unblock the pop-up window. If you use Internet explorer, please enable the download file option from the settings.

9.24.1 Remote KVM Interface


Remote KVM [192.168.1.10] - [800 x 600] - Internet Explorer
http://192.168.1.10/viewer.html
Stop KVM
CD Image: Browse File (0 KB)
Start Media
Video
Mouse
Options
Keyboard
Send Keys
Hot Keys
Video Record
Power
Active Users
Help
Zoom 100 %
inspur
Press <DEL> to SETUP or <F11> to Boot Menu or <F12> to PXE Boot
B2
LWIN
RWIN
LALT
LCTRL
RALT
RCTRL
NUM
CAPS
SCR

Video

This menu contains the following sub-items:

1. Pause Redirection: This item is used to pause Console Redirection.
2. Resume Redirection: This item is used to restart Console Redirection when the session is paused.

3. Refresh Video: This item is used to update the display of the Console Redirection window.
4. Host Display: If you enable this option, the display will switch to the server screen.
5. Capture Screen: This item allows you to capture the Console Redirection screen.

Mouse

This menu contains the following sub-items:

1. Show Client Cursor: This item is used to show or hide the local mouse cursor in the remote client system.
2. Mouse Mode: This item allows you to select the supported mouse mode or type.

Options

This menu contains the following sub-items:

1. Zoom: This item is used to zoom in or out.
2. Block Privilege Request: This item allows you to block access.
3. Bandwidth: This item allows you to select the bandwidth.
4. Compression Mode: This item allows you to select the YUV compression mode.
5. DCT Quantization Table: This item allows you to select the quality from 0 (best) to 7 (worst).

Keyboard

Keyboard Layout: This item allows you to select the keyboard overview.

Send Keys

1. Hold (Hold Down): This item can be used as a down key for Console Redirection.
2. Press and Release: This item can be used as a press and release key for Console Redirection.

Hot Keys

The items in this menu allow you to use shortcut keys.

Video Record

1. Record Video: This item is used to record console redirection video.
2. Stop Recording: This item is used to pause recording.
3. Record Settings: This item can be used for video recording settings.

Power

This menu allows you to change power related settings. Please click on the item you want to change.

Active users

This menu shows the active users on the server.

Help

This menu provides you with operating instructions.

Browse File

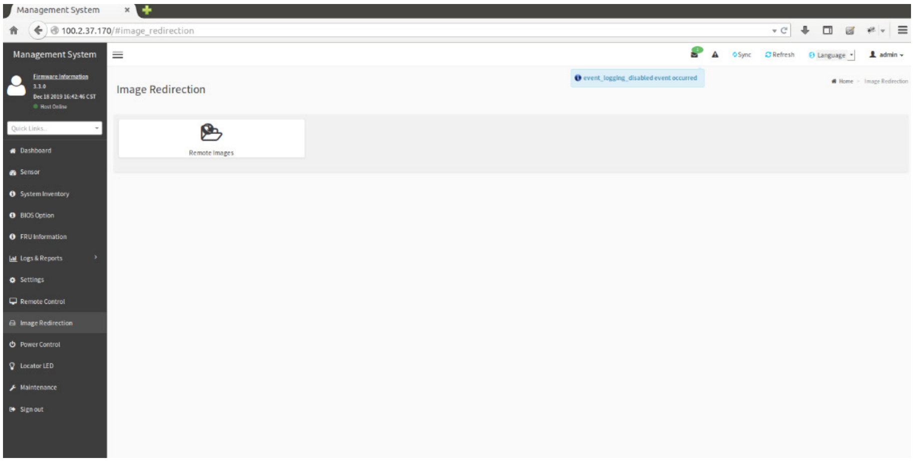
Click this button to add or modify CD media, and click Start Media to start or pause redirection to a physical DVD/CD-ROM drive and CD image type, such as iso.

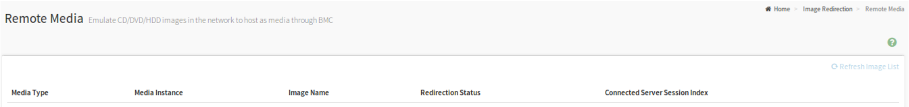
9.25 Image Redirection

The media redirection function will allow users to take various media devices and images that presented on the client side (Local Media Support) or remote (Remote Media Support), and attach them as virtual USB on the server side in which the BMC is resident.

- To set up an image file, enable Remote Media Support in Settings -> Media Redirection Settings -> General Settings.
- Only administrators have permission to redirect or delete image files.
- Support CD/DVD format: ISO9660, UDF (v1.02 ~ v2.60).
- Supports CD/DVD media file types: (*.iso), (*.nrg).
- Support hard disk media file types: (*.img), (*.ima).

This page allows you to select remote media via BMC and emulate it as host media.




Remote Media
Emulate CD/DVD/HDD images in the network to host as media through BMC
Home
Image Redirection
Remote Media
Refresh Image List

Media Type	Media Instance	Image Name	Redirection Status	Connected Server Session Index

9.26 Redfish

Redfish is a new management standard that uses the hypermedia RESTful interface to express data. Users can access the Redfish service through the Postman tool. The following is the use of curl in Linux to send the request to access redfish. The usual request operation is “GET”, “PUT”, “POST”, “PATCH”, “DELETE” and so on. The sending and receiving data are all in json format. Authentication type: Basic Auth; UserName: Administrator; Password: superuser.

9.26.1 GET

The client gets the data of the specified URL via HTTP GET.

For example: Use Postman to get information about existing users, and the basic format is as follows:

URL: https://{{ip}}/redfish/v1/AccountService/Accounts

Method: GET

Content-Type: application/json

Body: <empty>

Return the response information:

{

....

```
"Members": [
{
"@odata.id": "/redfish/v1/AccountService/Accounts/2"
},
{
"@odata.id": "/redfish/v1/AccountService/Accounts/1"
}
],
"Members@odata.count": 2,
..............
}
```

View the specific information of user 1, the basic format is as follows:

URL: https://{{ip}}/redfish/v1/AccountService/Accounts/1

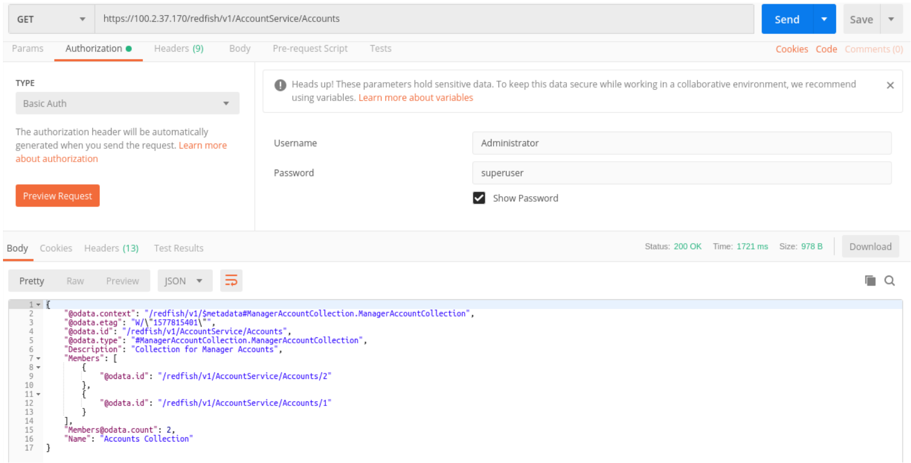
Method: GET

Content-Type: application/json

Body: <empty>

Return the information about user 1.

Use the Postman tool to query the user list as shown below:



https://100.2.37.170/redfish/v1/AccountService/Accounts

TYPE: Basic Auth

The authorization header will be automatically generated when you send the request. Learn more about authorization

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. Learn more about variables

Username: Administrator

Password: superuser

☑ Show Password

Status: 200 OK Time: 1721 ms Size: 978 B

```
{
    "@odata.context": "/redfish/v1/$metadata#ManagerAccountCollection.ManagerAccountCollection",
    "@odata.etag": "W/\"1577815401\"",
    "@odata.id": "/redfish/v1/AccountService/Accounts",
    "@odata.type": "#ManagerAccountCollection.ManagerAccountCollection",
    "Description": "Collection for Manager Accounts",
    "Members": [
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/2"
        },
        {
            "@odata.id": "/redfish/v1/AccountService/Accounts/1"
        }
    ],
    "Members@odata.count": 2,
    "Name": "Accounts Collection"
}
```

9.26.2 POST

The client sends data to the specified URL via HTTP POST, and the server is configured according to the POST data.

For example: To create a new user, the basic format is as follows:

URL: https://{{ip}}/redfish/v1/AccountService/Accounts

Method: POST

Content-Type: application/json

Body: (raw format)

{

“Name”: “Test account”,

“Description”: “just test”,

“Enabled”: true,

“Password”: “superuser”,

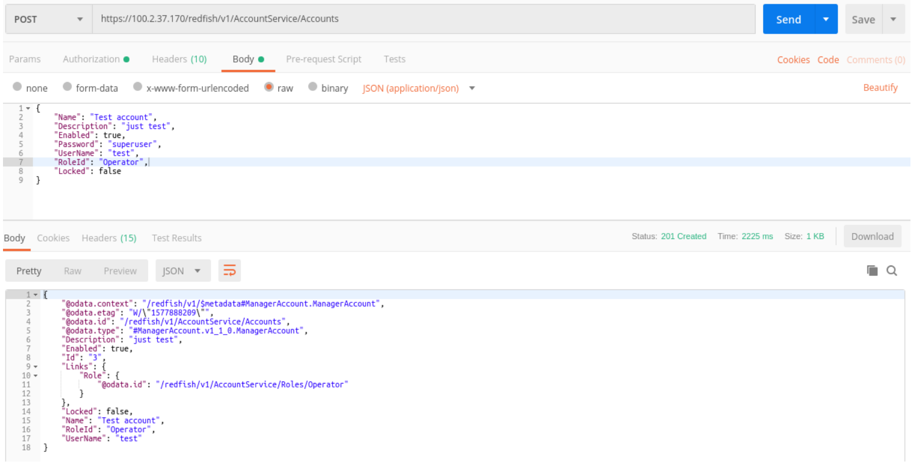
“UserName”: “admin”,

“RoleId”: “Operator”,

“Locked”: false

}

If the creation is successful, message code 201 is returned, and the created user information is displayed.



https://100.2.37.170/redfish/v1/AccountService/Accounts

```
{
    "Name": "Test account",
    "Description": "just test",
    "Enabled": true,
    "Password": "superuser",
    "UserName": "test",
    "RoleId": "Operator",
    "Locked": false
}
```

Status: 201 Created   Time: 2225 ms   Size: 1 KB

```
{
    "@odata.context": "/redfish/v1/$metadata#ManagerAccount.ManagerAccount",
    "@odata.etag": "W/\"1577888209\"",
    "@odata.id": "/redfish/v1/AccountService/Accounts",
    "@odata.type": "#ManagerAccount.v1_1_0.ManagerAccount",
    "Description": "just test",
    "Enabled": true,
    "Id": "3",
    "Links": {
        "Role": {
            "@odata.id": "/redfish/v1/AccountService/Roles/Operator"
        }
    },
    "Locked": false,
    "Name": "Test account",
    "RoleId": "Operator",
    "UserName": "test"
}
```

9.26.3 DELETE

The client deletes the data of the specified URL via HTTP DELTE, and the server deletes the configuration according to the URL.

For example: To delete the specified user 4, the basic format is as follows:

URL: https://{{ip}}/redfish/v1/AccountService/Accounts/4

Method: DELETE

Content-Type: application/json

Body: <empty>

9.27 Troubleshooting

The troubleshooting section provides solutions to some common issues to help you easily resolve them. If you have tried the methods in this section and have not resolved the problem or have other problems, please contact technical support.

Issue	Solution
Local/central server cannot connect to the MEGARAC SP-X remote management card.	1. Check if the network cable is correctly inserted into the LAN interface. 2. Make sure that the remote IP address and the local/central server IP address are in the same subnet. Execute “Ping xx.xx.xx.xx” (remote server IP) on the local/central server and confirm that the remote server can respond to the ping request. 3. Check if the IP source is set to [DHCP]. If set to [DHCP], you cannot set the IP address.
All SEL (System Event Log) cannot be displayed.	At most 900 SELs can be displayed.
Incorrect date/time displayed in SEL (System Event Log)	Check if the time zone is set incorrectly.
MEGARAC SP-X cannot connect to the network in a firewall environment.	Add the following port numbers in the firewall: 5123 (virtual floppy) (TCP) 5120 (Virtual CDROM) (TCP) 623 (IPMI) (TCP & UDP) 80 (HTTP) (TCP) 7578 (iKVM) (TCP) 443 (HTTPs) (TCP) 161 (SNMP) (UDP)
Java redirection screen does not display properly.	Click the Refresh Page key to refresh the redirection screen.

⚠ **Note:** ASMB JAVA console is only applicable to the built-in display adapter. It may not display properly on other video cards.

10 Common Faults, Diagnosis and Troubleshooting

This chapter introduces the common server faults, as well as corresponding diagnosis and troubleshooting suggestions.

10.1 Hardware Problems

1) Power-on failure at startup

Description: After pressing the power button, the LED (power status LED, HDD status LED) on server's front control panel is off. Meanwhile, no KVM (display) output is displayed, and server chassis fans do not rotate.

Suggestions:

a. Check the power supply situation: If the power module LED is on, it indicates normal power supply. If the power module LED is off or red, please check whether the power supply is normal, and whether the power cable is connected well.

b. If the power supply is normal, insert the power module again, and then power on for verification.

c. If there is a machine and a power module of the same type, you could change the power module to test whether there is a power module fault.

d. If the instructions above do not resolve the problem, please contact Inspur customer service.

2) No display after power on

Description: After pressing the power button, the power LED on server's front control panel is on, the chassis fans rotate normally, but there's no output on the display.

Suggestions:

a. Firstly check whether the monitor is powered up normally.

b. If the monitor is powered up normally, check whether it is connected normally with the server's VGA port.

c. Test on another monitor.

d. If there is no output on the new monitor, log in to the BMC Web interface. Open BMC remote KVM to check whether there is output on the monitor. If there is normal output, it indicates the VGA port may be abnormal, please contact Inspur customer service.

e. If above operations could not resolve the problem, please contact Inspur customer service.

3) Status LED on front panel is abnormal

Description: The server is under normal operation, but the status LED on front panel turns red.

Suggestions:

a. Firstly confirm which LED is abnormal according to the previous chapter about the LEDs on the front panel.

b. If the system failure LED is abnormal, check whether the system runs normally; if the system runs normally, you can log in to the BMC Web interface to view the BMC logs, to check whether there are errors reported.

c. If the power failure LED is abnormal, check whether the power module LED is normal; if the power module LED is normal, you can log in to the BMC Web interface to view the BMC logs, to check whether there are errors reported.

d. If other LEDs are abnormal, you can log in to the BMC Web interface to view the BMC logs, to check whether there are errors reported.

e. If above operations could not resolve the problem, please contact Inspur customer service.

4) Power module LED is off or red

Description: The server is under normal operation, but a certain power module LED is off or red.

Suggestions:

a. Firstly check whether all power cables are normal, and plug in the power cables again.

b. If the fault still exists, insert the power module again.

c. If shutdown is allowed, you could exchange the two power modules to judge whether it is a power module fault.

d. If above operations could not resolve the problem, please contact Inspur customer service.

5) HDD status LED is abnormal

Description: The server is under normal operation, but the HDD status LED is off or red.

Suggestions:

a. If it is caused by manual operations, restore the array through RAID configuration.

b. If there is no manual operations, check whether the HDDs are identified normally. If the server is configured with an RAID card, log in to the RAID management interface to check whether there is an HDD failure.

c. If there is an HDD failure, or the above operations could not resolve the problem, please contact Inspur customer service.

⚠ **Note:** Hot-plugging HDD allows users to take out or replace the HDD without system shutdown and power off, which improves the system disaster recovery capability, scalability and flexibility. It only means the hot-plug HDD can be plugged in and out online without damage, and the following two items need to be noticed: ① Depending on the RAID level, hot plugging the HDD in the RAID will cause RAID degradation or failure. When installing a new HDD, different RAID cards have different policies, you may need to log in to the RAID card management interface for recovery. ② Remove the HDD until the HDD motor stops completely, to prevent damage to the motor. For the operations on the RAID card management interface, please refer to Inspur technical website: www.4008600011.com.

6) Chassis fans make excessive noise

Suggestions:

a. Firstly check whether the chassis fans operate at a high speed caused by the over-temperature chassis.

b. If the chassis has a high temperature, check the temperature of server room, if it is excessively high, open the air conditioner to cool the room.

c. If the server room’s temperature is normal, check whether the front panel or chassis interior is jammed with dust, or the air inlet is blocked. It needs to improve the server room’s environment, to avoid server over-temperature running because of too much dust.

d. Check whether the server runs under high load.

e. If above operations could not resolve the problem, please contact Inspur customer service.

7) There is alarm sound during startup

Suggestions:

Firstly identify the source of alarm sound:

a. If the alarm sound comes from the power supply, check the power LED’s status. If the power LED is abnormal, refer to item 3) to handle it.

b. If the alarm sound comes from the chassis interior, open the chassis to identify the specific source.

c. If the alarm sound comes from the RAID card, check the HDD LED status or log in to the RAID management interface to check the HDD status. For the operations about the RAID management interface, please refer to Inspur technical website: www.4008600011.com.

d. If above operations could not resolve the problem, please contact Inspur customer service.

8) Keyboard and mouse are not available

Description: Neither keyboard nor mouse could be operated normally.

Suggestions:

a. Make sure the keyboard or mouse has been connected correctly and firmly.

b. Replace other parts to test whether it is a mouse or keyboard fault.

c. Power cycle the server and retest.

d. Reboot and enter BIOS or RAID configuration interface to test keyboard or mouse performance. When tested in a non-system situation, if the keyboard or mouse performance turns out to be normal, a system fault could be considered. If the keyboard or mouse fault still exists, a motherboard interface fault could be considered, and Inspur technical hotline can be called for support.

9) USB interface problem

Description: Unable to use devices with a USB interface.

Suggestions:

a. Make sure the operating system on server supports USB devices.

b. Make sure the system has been installed with correct USB device driver.

c. Power off the server, and then power on again to test.

d. Check whether the USB device is normal when connected to other hosts.

e. If the USB device is normal when connected to other hosts, the server may be abnormal: please contact Inspur customer service.

f. If the USB device turns out to be abnormal when connecting to other hosts, please replace the USB device.

10.2 Software Problems

1) System installation problems

Description: It fails to load the RAID driver or to create partitions larger than 2T during system installation, C disk utilization is too large, and other problems.

Suggestions:

a. If it fails to load the driver during system installation, check the RAID driver's version, please visit Inspur website (http://www.inspur.com) to download the correct RAID driver. For some RAID drivers, it needs to load several times.

b. If it fails to create 2T partitions, check BIOS Advance -> CSM Configuration-> Boot option filter, enable the UEFI option, and select UEFI mode to boot the system. It needs to enter the CMD command line to change the HDD format to GPT, and then partitions larger than 2T can be created.

c. If the C disk utilization is too large after system installation, open Computer Property-> Advanced System Property-> Advanced-> Performance-> Settings-> Change Virtual Memory, turn down the virtual memory or allocate the virtual memory to other partitions.

d. If above operations could not resolve the problem, please contact Inspur customer service.

2) Abnormal memory capacity

Description: The memory capacity displayed in the OS and the physical memory capacity are inconsistent.

Suggestions:

a. Check the OS version, the supported memory capacity varies with the version of Windows OS. Enter BIOS Setup to view the memory capacity, if the memory is identified completely, the operating system may have limits to the memory capacity, e.g. Windows server 2008 x86 supports 4G memory at most.

b. If the memory is not identified completely in BIOS Setup, confirm that the corresponding slots have been installed with memories of correct type.

c. If above operations could not resolve the problem, please contact Inspur customer service.

3) Abnormal network

Description: The network is disconnected, or the rate is lower than the actual rate of the network port.

Suggestions:

a. Check whether the network cable is connected well and whether the network LED flashes normally, re-insert the network cable to test again.

b. If the problem still exists, use a computer to connect with the server directly. If the direct connection is normal, check whether the network cable or the switch port is normal.

c. If the direct connection is abnormal, please visit Inspur website (http://www.inspur.com) to download the latest NIC driver.

d. If above operations could not resolve the problem, please contact Inspur customer service.

11 Battery Replacement

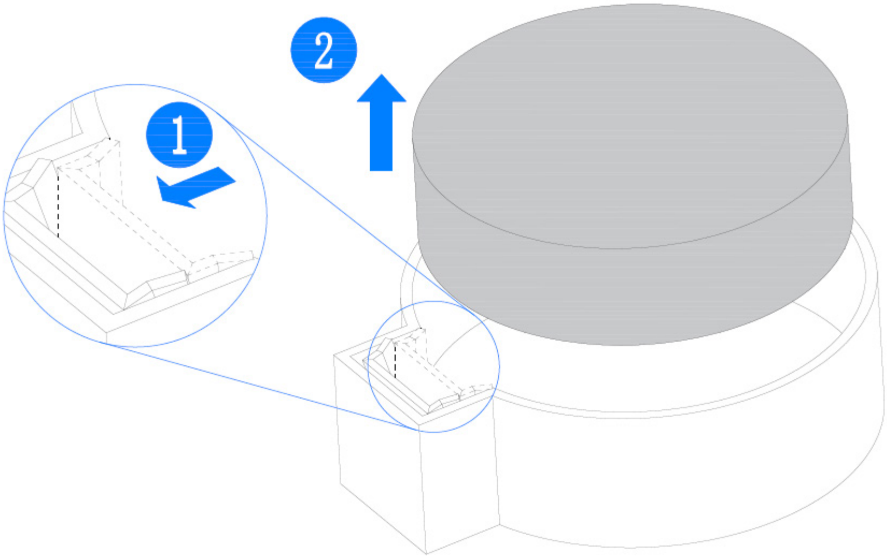
If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock.

⚠ **WARNING**: The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

To remove the component:

1. Power down the server.
2. Extend the server from the rack.
3. Remove the access panel.
4. Remove the battery.



12 Regulatory Compliance Notices

12.1 Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, this product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

12.2 Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

12.2.1 FCC Rating Label

The FCC rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or ID on the label. Class A devices do not have an FCC logo or ID on the label. After you determine the class of the device, refer to the corresponding statement.

Class A Equipment

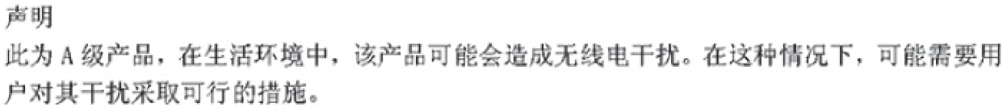
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

12.3 Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

12.4 Chinese Notice

Class A Equipment



声明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取可行的措施。

12.5 Battery Replacement Notice

⚠ **WARNING:** The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to Inspur, an authorized Inspur Partner, or their agents.

13 Electrostatic Discharge

13.1 Preventing Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

13.2 Grounding Methods to Prevent Electrostatic Discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ±10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact Inspur Customer Service.

14 Warranty

14.1 Introduction

Inspur warrants that all Inspur-branded hardware products shall provide a period of three (3) year warranty. This document describes Warranty Service, including a detailed description of service-level.

The warranty terms and conditions may vary by country, and some services and/or parts may not be available in all countries. For more information about warranty services in your country, contact Inspur technical support or Inspur local office.

14.2 Warranty Service

14.2.1 Service Overview

Type	**Duration**
Remote Services	3 years
RMA Services	3 years

14.2.2 Warranty Service Terms & Conditions

i. Remote Services

Inspur provides 24x7 remote service through Hotline, E-mail and Website. Through Hotline and E-mail Services, Inspur engineer helps customers determine the cause of the malfunction and provide solution. Website service provides a number of resources to help customers resolve problems, and learn about our products, such as product manuals, drivers and Firmware.

Below is how to obtain our remote service:

Type	Description	Response time

Hotline	1-844-860-0011(English)
	1-646-517-4966(English)
	86-800-860-0011(Chinese)
		Within 2hrs

E-mail	serversupport@inspur.com	Within 2hrs
Website	http://en.inspur.com/	

ii. RMA Services

Customers could return defective parts to the designated Inspur site after submitting a service request. Inspur may, at its discretion, repair or replace the defective parts. Repair or replacement parts may be new, used, or equivalent to new in performance and reliability. Replaced or repaired parts are warranted to be free of defects in material or workmanship for ninety (90) calendar days or, for the remainder of the warranty period of the product, whichever is longer.

14.3 Warranty Exclusions

Inspur does not guarantee that there will be no interruptions or mistakes during the use of the products. Inspur will not undertake any responsibility for the losses arising from any operation not conducted according to Inspur Hardware Products.

The Warranty Service Terms & Conditions do not apply to consumable parts, as well as any products the serial number of which falls off, is damaged or obscure for the following reasons:

- Accident, misuse, abuse, defiling, improper maintenance or calibration or other external causes
- Operating beyond the parameters as stipulated in the user documentation
- Use of the software, interface, parts or supplies not provided by Inspur
- Improper preparation place or maintenance
- Virus infection
- Loss or damage in transit
- Alterations or repairs have been made by unauthorized persons, or service organizations

Inspur does not undertake any responsibility for the damages or losses of any application, data or removable storage medium. Except for the software installed by Inspur in its production of this product, Inspur is not responsible for the restoration or reinstallation of any programs or data.