Inspur Server User Manual

OB5161M5

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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 NF5270M5server's technical features, system installation and setup, which will help the userto understand how best to utilize the server and all its functionalities.

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 contactInspur for our support and guidance.

2.Before disassembling the server's components, please be sure to disconnect all the power cords 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 incompati ble 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 liab ility.

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 lines, 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 line 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 lines 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.
14. The equipment is intended for installation in a Restricted Access Location.

⚠ **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 line 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 mainboard, please power off the system and wait for five seconds, and then remove the components from the mainboard 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 following:
   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 Specification

2.1 Introduction

Open19 server standard is designed to bring a simplified open standard for the construction of storage, network and server, and it is suitable for data centers of all sizes. The goal is to increase the “mainstream 19-inch data center rack” servers and storage, and the density of network devices, reduce the cost of rack equipment, optimize rack integration and deployment, optimize power utilization, and ultimately provide low-cost infrastructure solutions for data centers of different environments.

Under the demand and support of overseas business, at the CeBIT 2017 in Hannover, Inspur, as the first members of Open19 project, released the first batch of servers based on the Open19 standard when the Open19 project was only established for 9 months.

Open19 main specifications:

Standard 19-inch 4-block rack, 12RU or 8RU Brick Cage, support half width 1RU server, Half width 2RU server, Full width 1RU server, Full width 2RU server; Power Shelf - 12V Distribution, OTS Power Module; optional Battery Backup Unit (BBU); optional Switch (ToR).

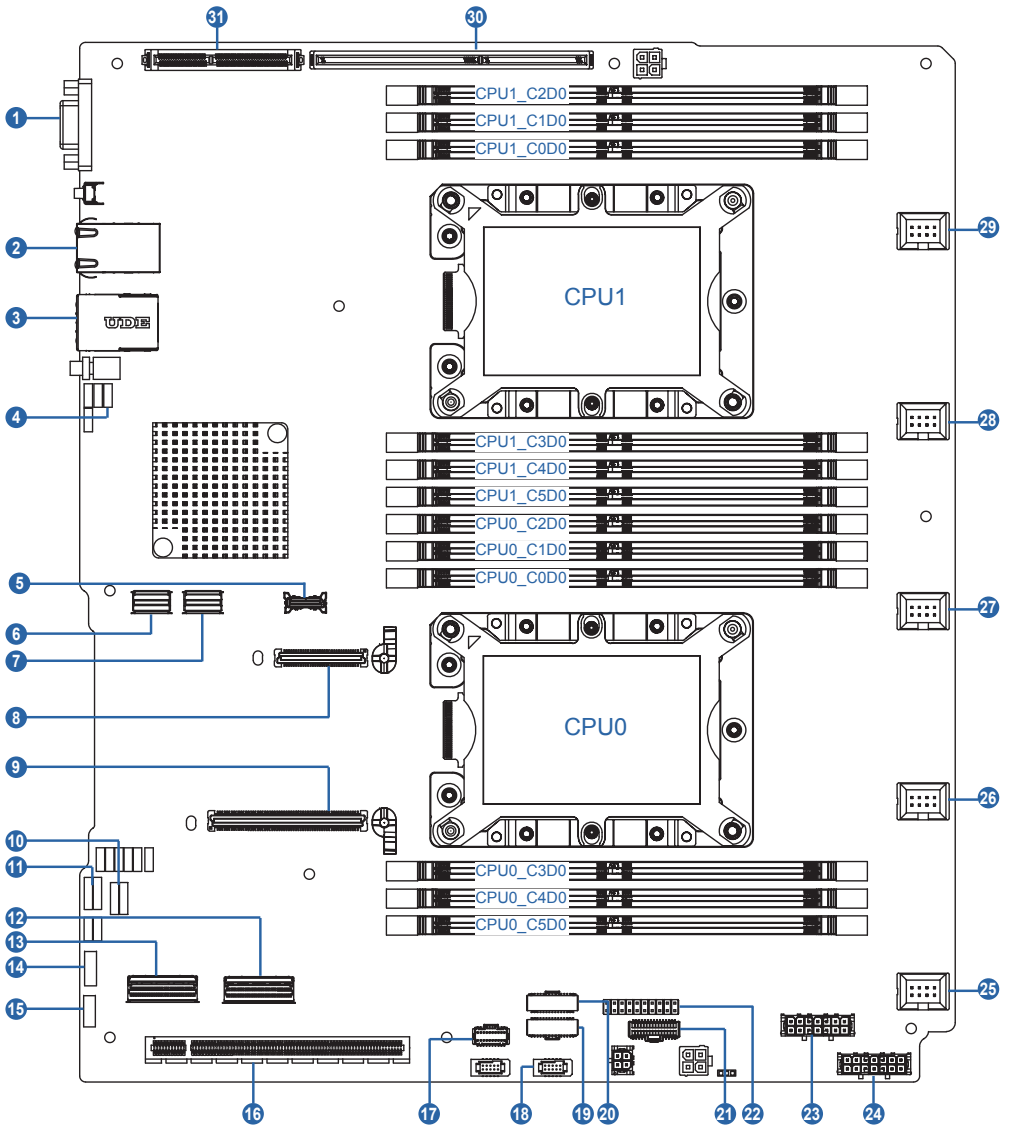
This server has great significance for overseas markets, especially the US market, we can take the initiative when overseas Internet customers switch to Open19 servers.

2.2 Product Specifications

Chassis Dimension	● (L* W * H) 901.34mm*441.1mm*41.65mm
CPU	● Dual Intel Scalable Processors TDP 165W
Memory	● 12*DDR4 DIMM
Front I/O	● 1* USB 2.0 port ● 1* VGA port
Storage Support	● 12*3.5"/2.5" SAS/SATA ● 2*2.5*SSD (hot plug, front)
HDD controller	● Onboard 6Gb PCH SATA controller or RAID
NIC	● 1*Management Port ● 1*OCP 2.0 (Support 10/25/50Gbe)
PCI Expansion	● 1*PCIe x16 for RAID card or 2 slimline x8 riser to card ● 1*PCIe x32 for 2 Slimline x8 to riser card
Power Support Per Brick	● 12V DC 800W ● Node Support hot swap

Management	● IPMI 2.0 compliant with AST 2500
Indicator Light	● Front: Power button with LED, UID button with LED, SYSTEM_ERROR LED, and HDD_ERRER LED
TPM	● Support TPM 2.0
Operating environment temperature	● 0˚C -40˚C
Storage and transport temperature	● -40˚C -70˚C
Operating humidity	● 5％ -90％ relative humidity

2.3 Motherboard Components



1	VGA connector	17	Power board connector
2	JBOD connector	18	VPP signal connector
3	RJ45 connector	19	BP I2C connector
4	CLR_CMOS	20	BP I2C connector
5	Front board connector	21	Front board connector
6	SSATA2-5 connector	22	TPM connector
7	SATA0-3 connector	23	PSU1
8	OCPC connector	24	PSU0
9	OCPA connector	25	FAN 0
10	CPLD JTAG connector	26	FAN 1
11	BMC debug connector	27	FAN 2
12	SLIMLINE0/1 connector	28	FAN 3
13	SLIMLINE2/3 connector	29	FAN 4
14	Raid key connector	30	x32 riser connector
15	BMC I2C connector	31	x8 riser connector
16	X16 riser connector		

- CLR_CMOSJumper Introduction

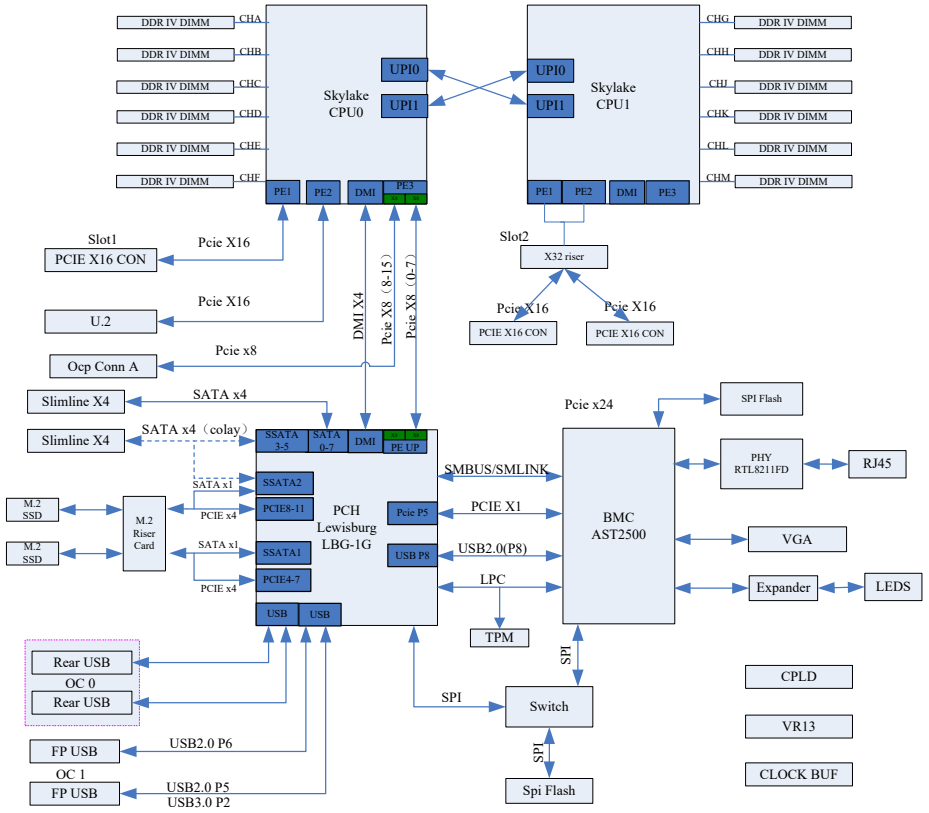
See [Motherboard Components] for the jumper position.

Item	Description	**Function**
CLR_CMOS	CMOS clear jumper	Short-circuit pin1-2, restore to 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.

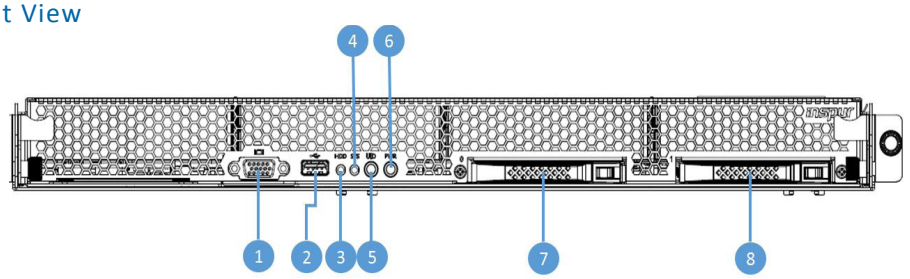
2.4 Motherboard Topology Diagram



3 Hardware system

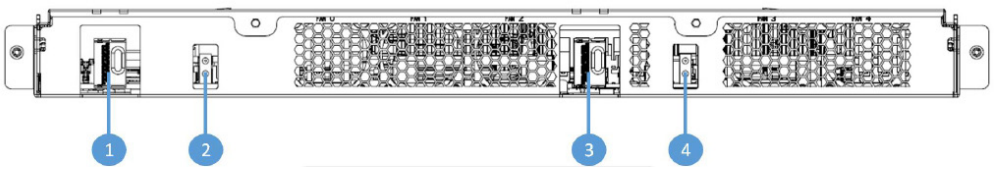
3.1 Product View

Front View



Item	Name	Function
1	VGA connector	
2	USB 2.0 connector	
3	HDD_LED	1. On (Red): Any of HDD0~HDD11 attached to HBA/Raid Card have error. 2. OFF: HDD0~HDD11 have no error.
4	SYS_ LED	1. On (Red): CPU error /RAM error/FAN error/System overheat. 2. OFF: No error.
5	UID button	ID LED (Blue): 1. Location LED, support local and remote control modes; 2. On: selected; Off: not selected
6	PWR button	Power button (Amber): In any case, short press the PWR button, the system will be power on Power button (Green): 1.In Shell or ESCOM, press the PWR button for more than 3 seconds, the system will be powered off; 2. In OS, press the PWR button for more than 3 seconds, the system will enter the soft shutdown mode; 3. After the system is powered on, in any case, press the PWR button for more than 7 seconds, the system will be powered down.
7	SSD0	
8	SSD1	

Rear View



Item	Name
1	Network connector 1
2	Power connector 1
3	Network connector 2
4	Power connector 2

3.2 Install the server into the rack

Rack prepare

Before installing the servers into the rack, the rack must be fixed tightly and be grounded well.

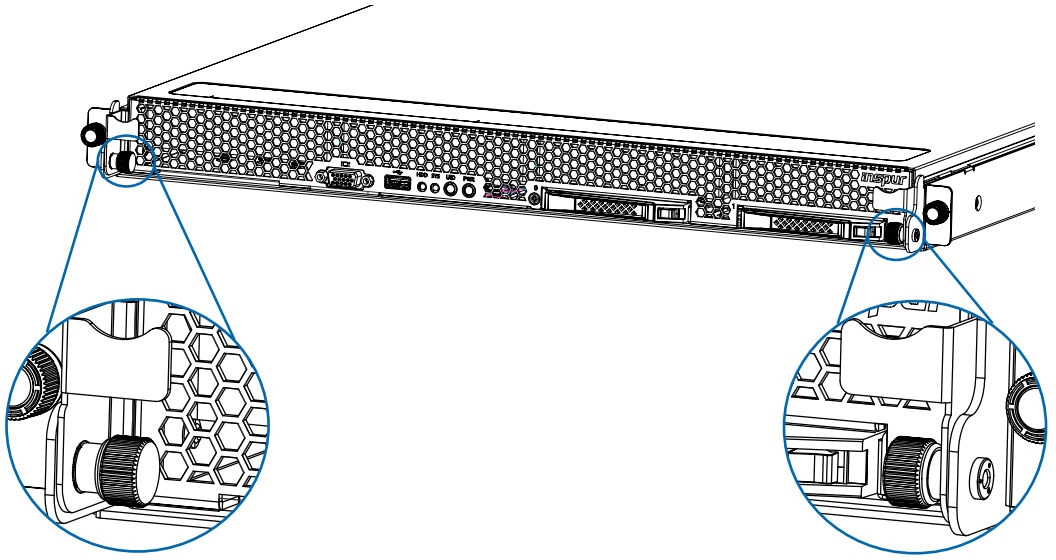
Connect Network cable and power cable.

- Connect Network cable to the Network connector and connect the power cable to the power connectors.

Installing the server into the rack

⚠ **Note:** The server is heavy, please ensure sufficient manpower or use assistive tools during installation.

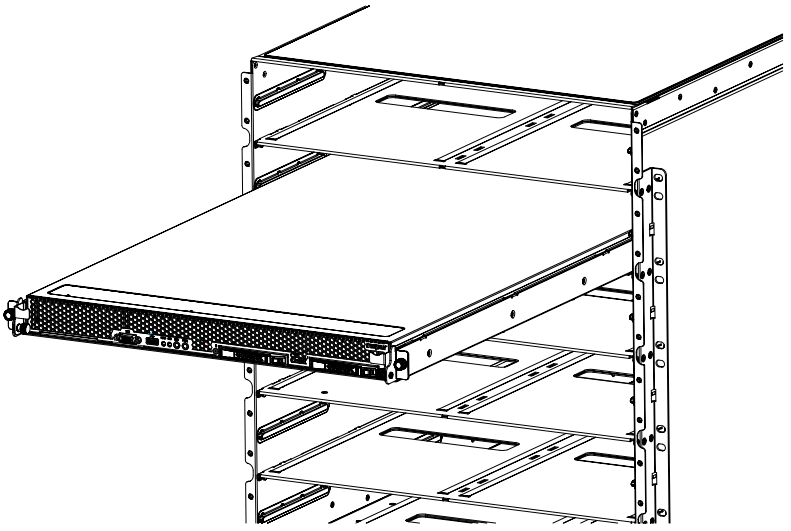
- Lock the screw and fix the storage tray in the chassis.



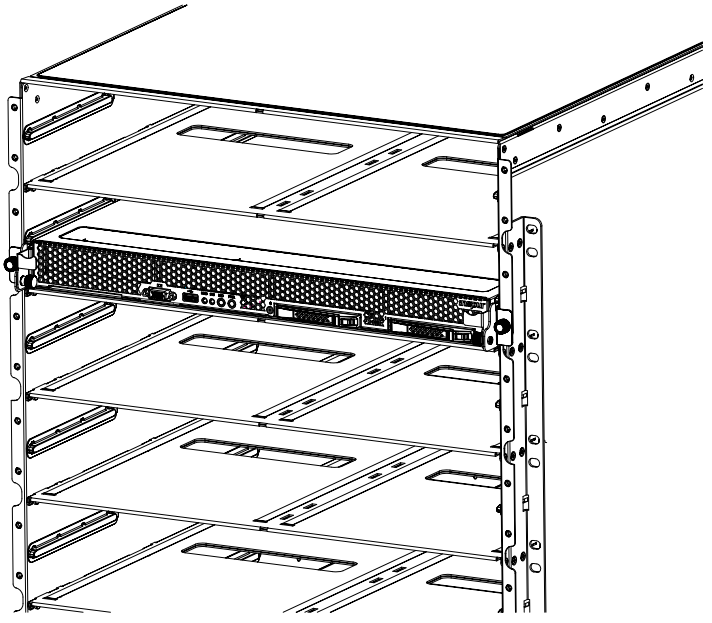
Lock the screw

Lock the screw

- Push the server into the rack horizontally.



- Fixed the server by tightening the screws on the both sides.



3.3 Start the server

CAUTION: Before starting the server, make sure that you have read and followed the contents of Safety Instructions in this manual. Once you have started the server, it is considered that you have read the contents of Safety Instructionsin this manual.

After connecting the power cables and network cables, press the power button to start the server.

4 BIOS Setup

This chapter introduces BIOS function setup and mainboard jumper of the server. All operations described in this section are only limited to operators or administrators with system maintenance qualification.

BIOS is a basic input and output system. The system parameter and the hard drive parameter can be adjusted through special set program. BIOS has great influence on the system start and running so that setting parameters improperly may arose the conflict among the hardware resource, or fall down the system run performance. Hence understanding the BIOS setup is significant to the configuration of your server. If no especial requirement, you are suggested to use the default value and not alter the parameters optionally.

Notes:

1. Before the server BIOS setup is altered, please record the corresponding original setup. Hence when there are operating problems in the system due to the option altered, the setup can revert.
2. Ordinarily the factory default system value is the optimized setup. Don't try to alter the parameters before you understand their denotations.
3. The common setup is introduced in detail in this paper. The less referred options in the application procedure are simply explained or not.
4. The content of the BIOS is diverse based on the different configurations of the products; hence the detailed introduction is elided.

4.1 Login to the BIOS Interface

Power up the server, the system starts to boot, when the screen shows the following Inspur Logo prompt:

When pressing <DEL> to SETUP or <TAB> to POST or <F11> to Boot Menu or <F12> to PXE Boot as shown in the following figure, press the [DEL] key, the system will show "Entering Setup..." in the lower right corner of the screen, and then will enter the system BIOS settings. In the BIOS main menu, you can use the arrow keys to select the sub-item and press Enter key to enter the submenu.

Other hotkeys are described in the following:

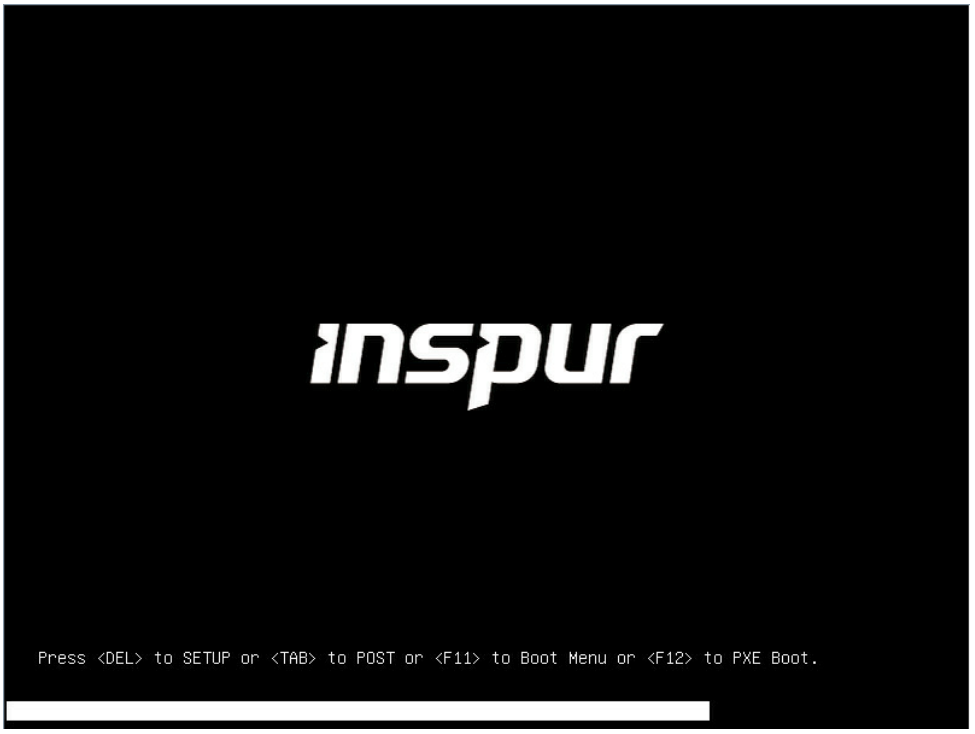
- Press "F2" key to enter the BIOS Setup interface.

- Press “TAB” key to display the POST process system information.
- Press “F11” key to enter the startup management interface and select the startup device to start.
- Press the “F12” key to start the network PXE pre-boot environment.

Description Table of BIOS Setup Interface Control Key

Key	Features
<Esc>	Exit or return to the main menu from the submenu
<←> or <→>	Select 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 value of the current item, set
<F1>	help
<F2>	Restore last setting
<F9>	Restore default settings
<F10>	Save and exit
<Enter>	Execute commands or select submenus

⚠ Note: The gray option is not available. Items with the “▶” symbol have submenus.

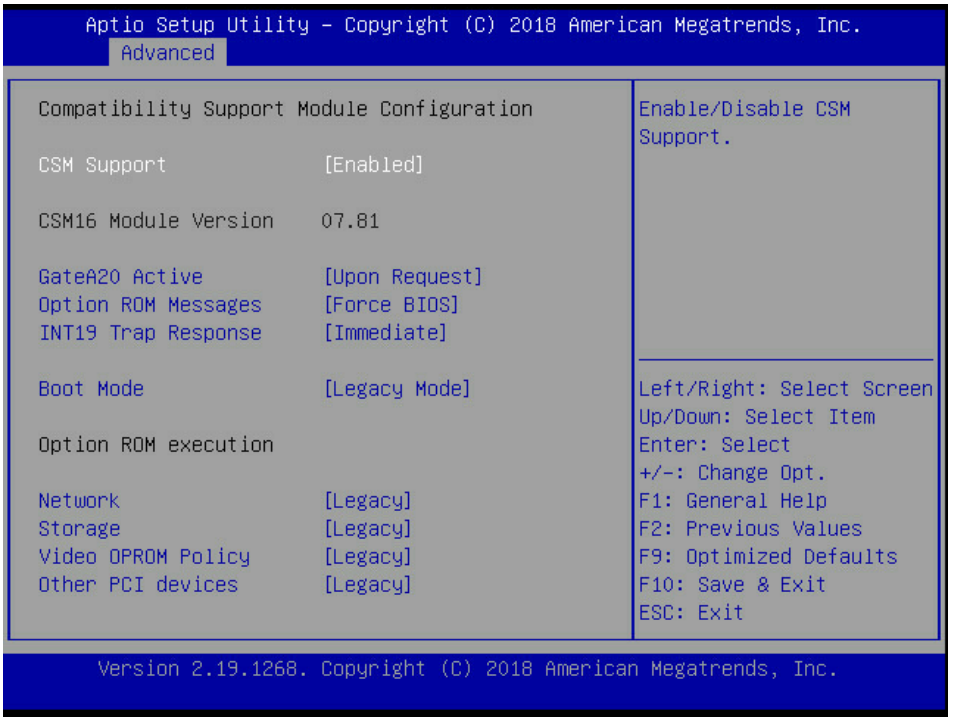


4.2 UEFI/Legacy Mode Switching

Log in to the BIOS Setup interface, select the “Advanced → CSM Configuration” interface, press Enter, set the Boot Mode option, set the system startup mode (UEFI Mode/Legacy Mode), and set the implementation method of Option ROM of Network, Storage, Video Oprom Policy and other PCI devices accordingly as shown in the following figure.

Currently, the default setting of the platform is Legacy Mode Network, Storage, Video Oprom Policy, and the Option ROM of Other PCI device is also set to Legacy.

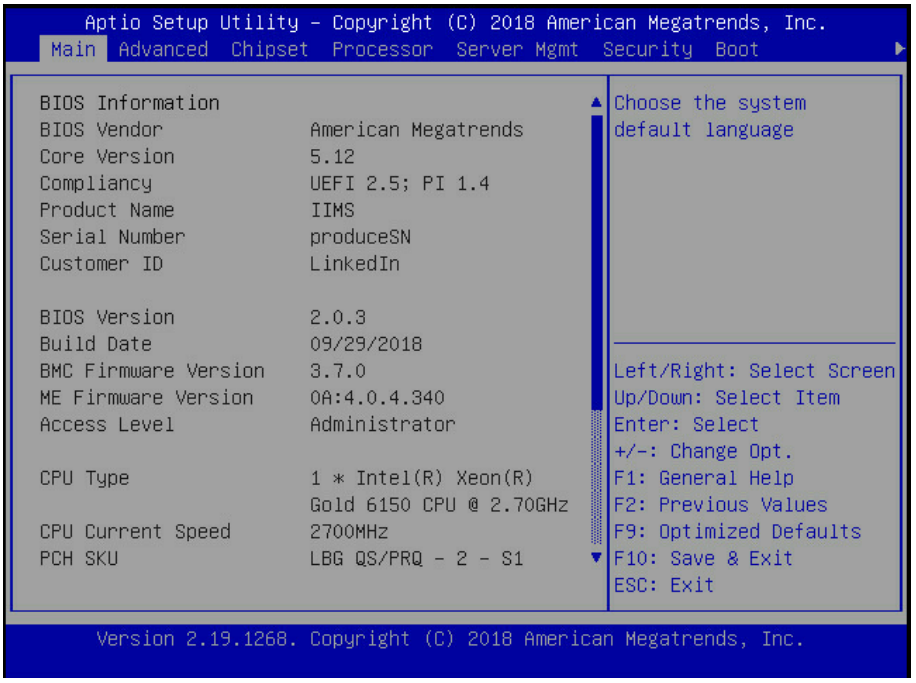
If the Boot Mode is set to UEFI Mode, the implementation mode of the Option ROM of the Network must be set to UEFI, Storage, Video Oprom Policy, and the implementation mode of the Option ROM of Other PCI device is recommended to be set to UEFI, which can also set to Legacy if there are special requirements. Compared with legacy mode, UEFI mode has many advantages, supporting booting from GPT format hard drive larger than 2.2T, PXE booting of IPv6/IPv4 network, and providing UEFI Shell environment. This item can be customized according to customer needs.



4.3 View System Information

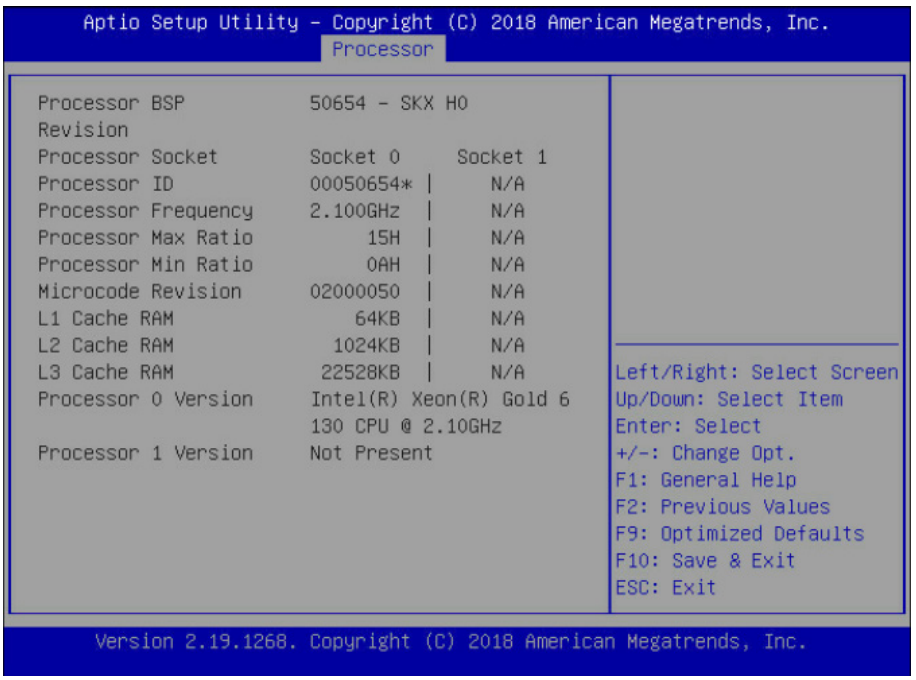
Log in to the BIOS Setup interface, and “Main” screen will display the information summary

of current system, including BIOS, BMC and ME version information, CPU, PCH SKU, RC version, memory etc. as shown in the following figure.



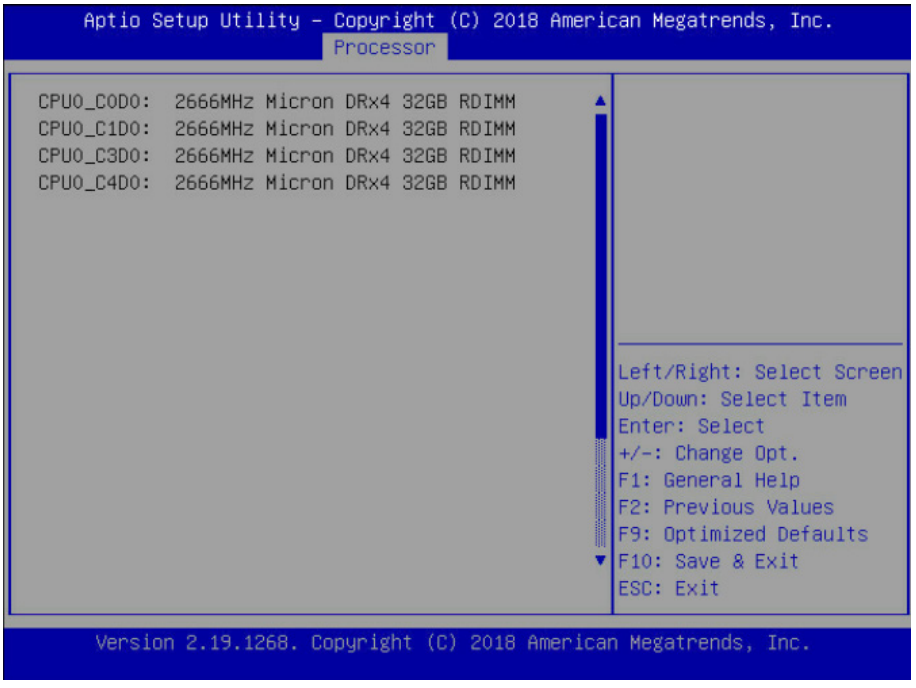
4.4 Viewing CPU Details

Log in to the BIOS interface, select “Processor →Processor Configuration→Processor Information”, press Enter to display CPU details as shown in the following figure.



4.5 Viewing Memory Information

Log in to the BIOS interface, select “Processor →Memory Configuration →Memory Topology”, press Enter to display manufacturer, rate, and capacity information of the in-position memory as shown in the following figure.



4.6 View Hard Drive Information and RAID Configuration

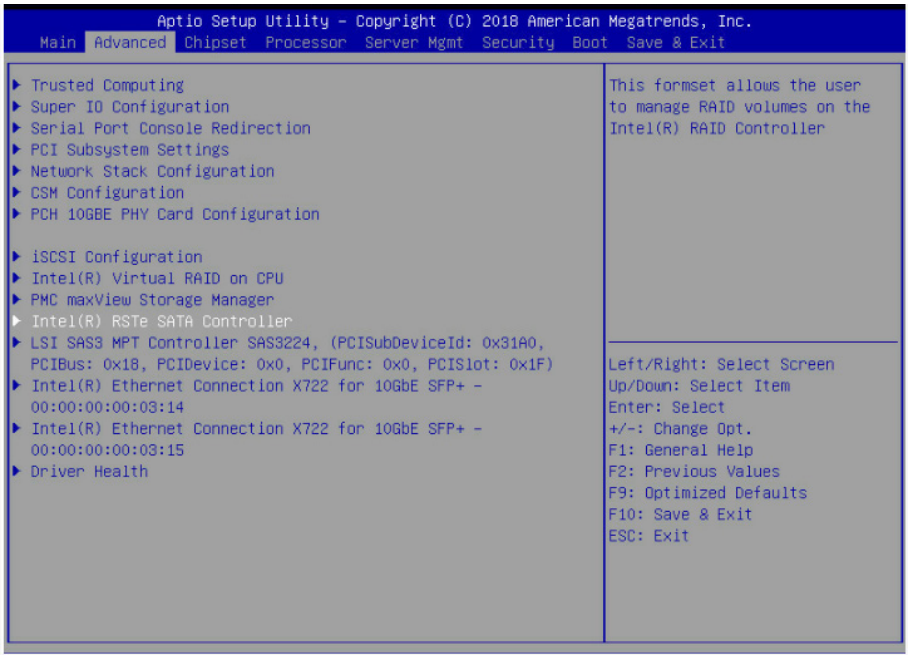
4.6.1 View Hard Drive Information

Log in to the BIOS and select “Chipset → PCH SATA Configuration/ PCH sSATA Configuration”. Press Enter to view the hard drive information of the current onboard SATA port or sSATA port.

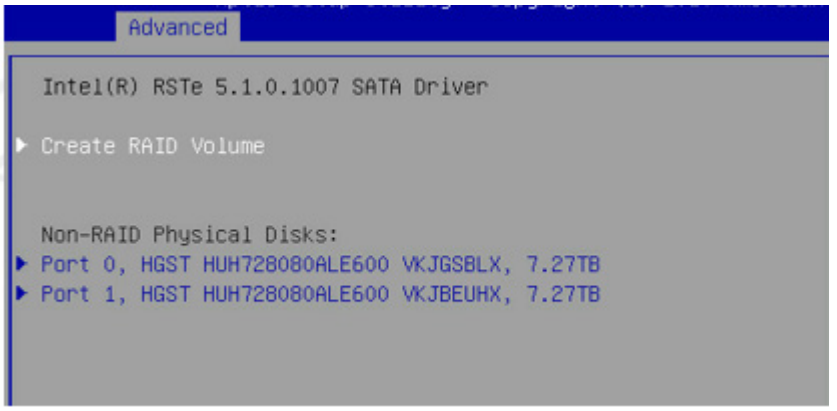
4.6.2 Hard Drive RAID Mode Configuration

1. Set the SATA Mode Option to [RAID], Press F10 to save the settings, and then the system will restart.

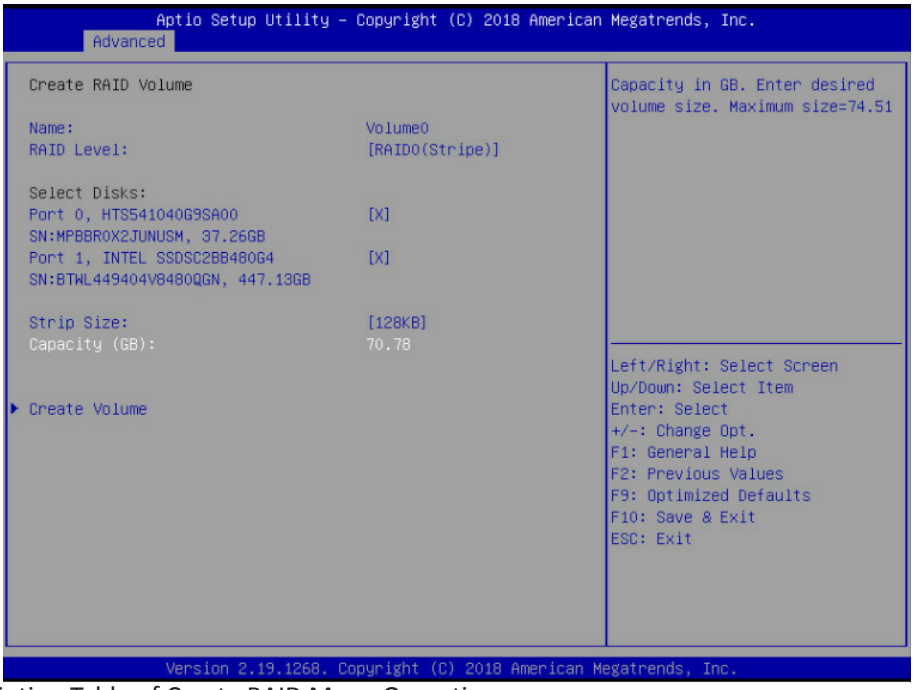
2. When the Boot Mode is set to UEFI mode, in the BIOS Setup Advanced interface, it will add Intel(R) RSTe SATA Controller menu as shown in the following figure.



3.Press Enter to enter, and then executable operation and current hard drive information will be displayed as shown in the following figure.



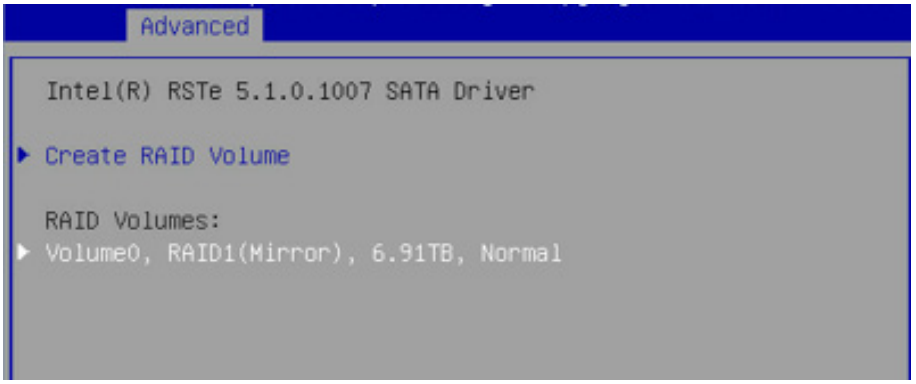
4.Create a RAID volume. Select “Create RAID Volume” option and press Enter to enter as shown in the following figure, please refer to the specific operation.

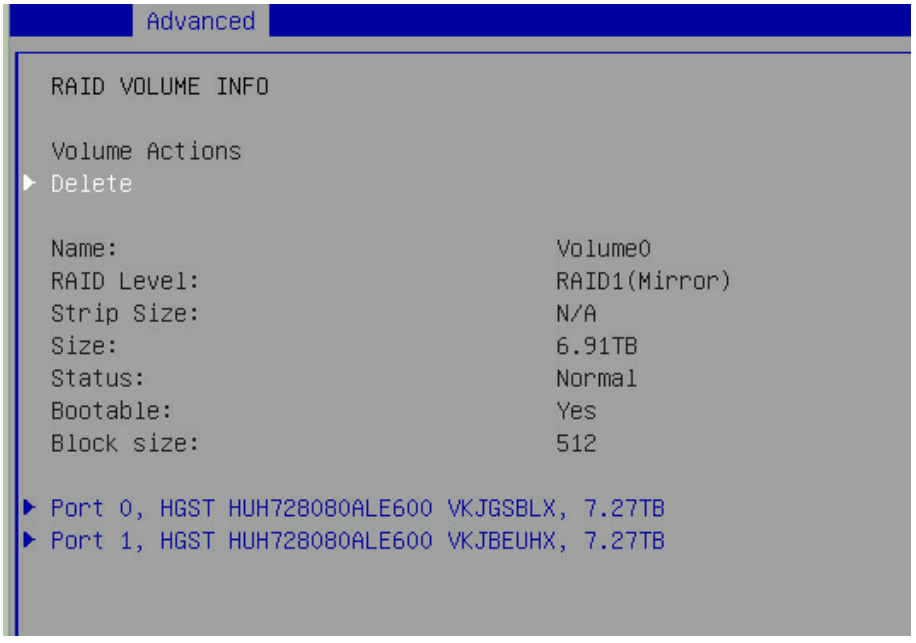


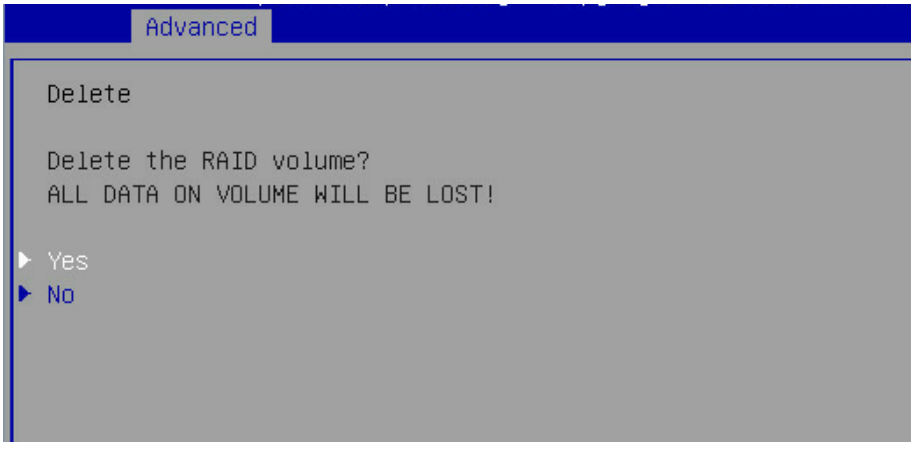
Description Table of Create RAID Menu Operation

Interface parameter	Function Description
Name	Please enter volume label names with the length of less than 16 characters but without special characters at the end.
RAID Level	Please select the RAID volume level. If you have not created a volume yet, there are four volume levels: RAID0 (Stripe), RAID1 (Mirror), RAID10 (RAID0+1) and RAID5 (Parity). Please choose according to actual needs. RAID0: Allow 2 or more hard drives to create this RAID volume. RAID1: Allow 2 hard drives to create this RAID volume. RAID10: Allow 4 hard drives to create this RAID volume. This option is only available when the number of hard drives is 4 or more. RAID5 (Parity): Allows 3 or more hard drives to create this RAID volume.
Select Disks	Select the hard drive to be RAID volume, press Enter, select the X number, and press Enter to return to the RAID volume creation interface.
Strip Size	Please select the strip size of the volume. Only RAID0 and RAID5 volumes can be selected.
Capacity	Enter the size of the RAID volume to be set, and maximum capacity information that can be set in the Help information is shown on the right.
Create Volume	After setting the above parameter information, select this option to create a RAID volume.

5.Delete the RAID volume. Select the created RAID Volume option and press Enter to enter as shown in the following figure. Selecting “Delete” option will take you to the Delete prompt menu, guiding you to delete the RAID volume as shown in the following figure. If you want to delete, select “Yes” option and press Enter. If you do not want to delete, select “No” option and press Enter.

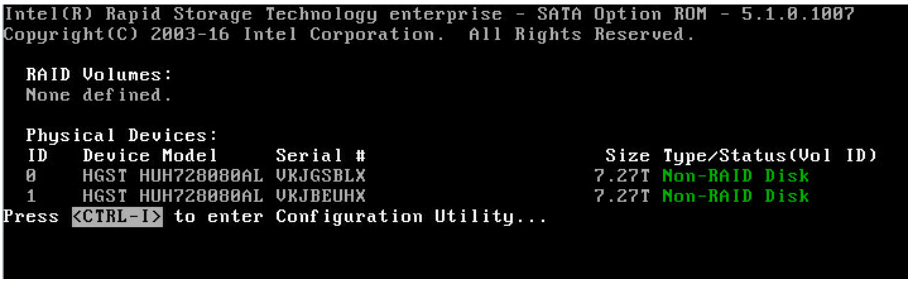




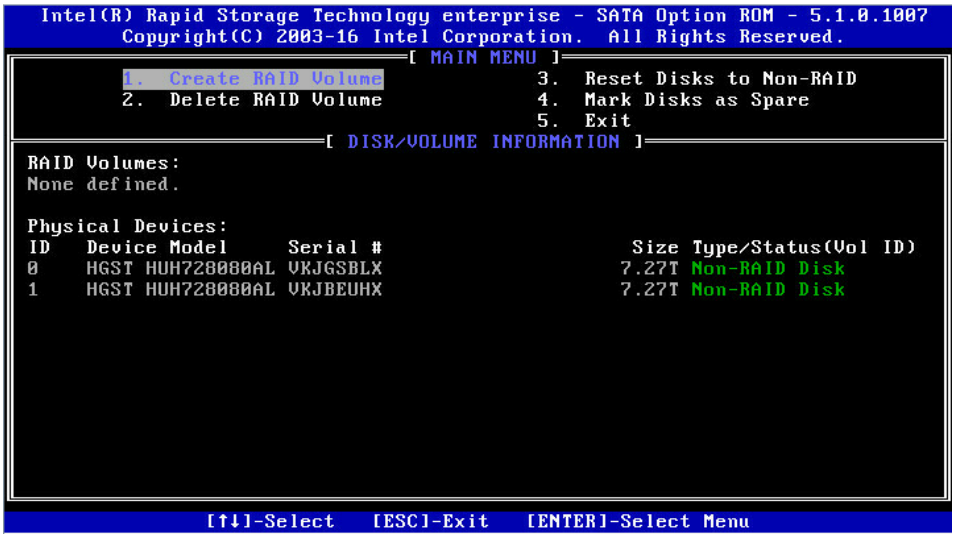


6.When the Boot Mode is set to Legacy mode, during the system startup process, the screen

will prompt: Press <CTRL-I> to enter Configuration Utility..., press <Ctrl> and <I> to enter the SATA RAID configuration interface, and the actual figure is shown in the following.



7.Enter the SATA RAID configuration interface as shown in the following figure, the system will show menu list information, hard drive information connected to the SATA controller (hard drive ID No., hard drive model, hard drive capacity and whether the hard drive is a volume member, etc.), existing RAID volume Information (including volume ID No., name, RAID level, capacity, status, whether it is bootable). The specific key operations are shown in the table, SATA RAID configuration interface has five menus that can be executed as shown in the table.



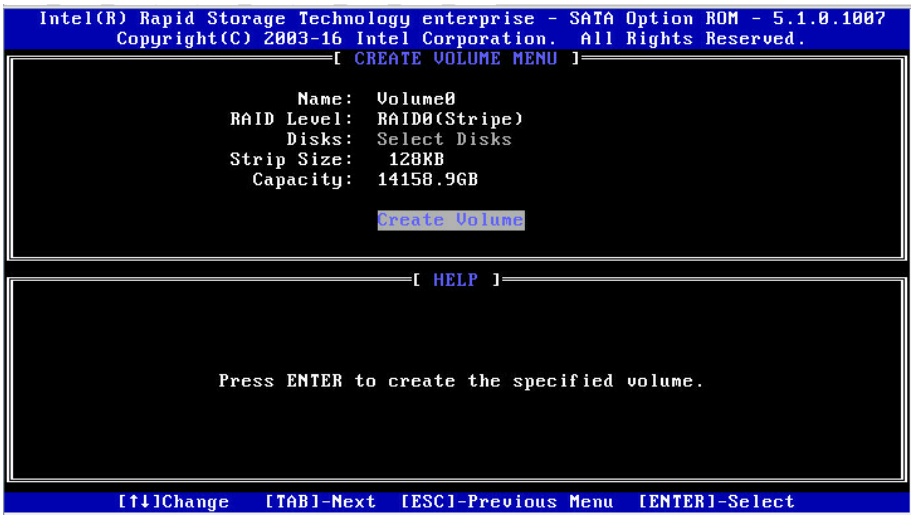
Description Table of Prompt key

Key	Description
↑↓	Used to move the cursor or change the menu option value in different menus
TAB	Select the next menu setting item
Enter	Select menu
Esc	Exit the menu or return to the previous menu from the submenu

Description Table of Operating Menu

Create RAID Volume	Create a RAID volume
Delete RAID Volume	Delete existing RAID volumes.
Reset Disks to Non-RAID	Reset the hard drive in the RAID volume to restore it to a non-RAID status.
Mask Disk as Spare	Mark the hard drive as spare mode. As a spare hard drive, the data will be cleared and cannot be selected when RAID is set. But it can be restored through the Reset Disks to Non-RAID menu.
Exit	Exit the SATA HostRAID configuration interface

8.Create RAID Volume Menu. After entering the SATA RAID configuration interface, you can use the up and down arrow keys to select this menu, and then press [Enter] to enter the Create RAID Volume menu, or directly enter the number key in front of the menu to enter the Create RAID Volume menu. Other menu operations are similar and will not discuss again. The Create RAID Volume instance is shown in the figure. The specific menu operation descriptions are shown in the table.



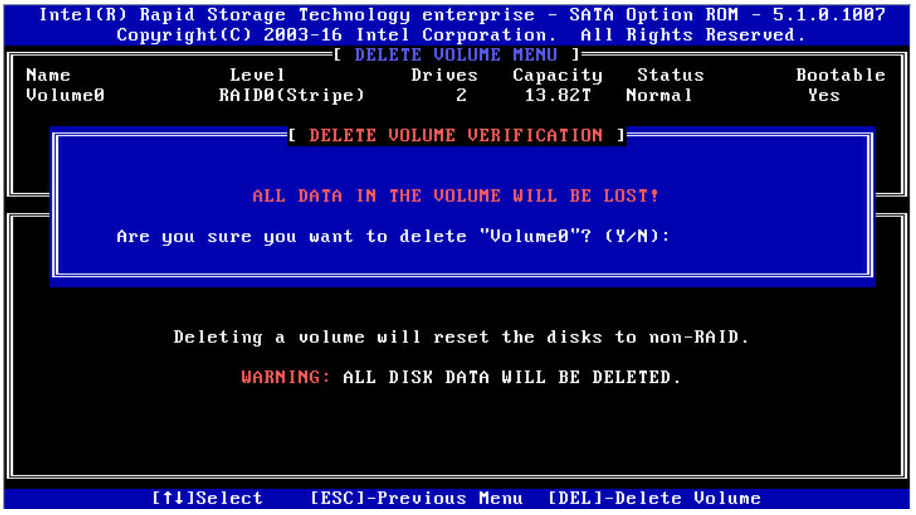
Description Table of Create RAID Menu Operation

Interface parameter	**Function Description**
Name	Please enter volume label names with the length of less than 16 characters but without special characters at the end.
RAID Level	Please select the RAID volume level. If you have not created a volume yet, there are four volume levels: RAID0 (Stripe), RAID1 (Mirror), RAID10 (RAID0+1) and RAID5 (Parity). Please choose according to actual needs. RAID0: Allow 2 or more hard drives to create this RAID volume. RAID1: Allow 2 hard drives to create this RAID volume. RAID10: Allow 4 hard drives to create this RAID volume. This option is only available when the number of hard drives is 4 or more. RAID5 (Parity): Allows 3 or more hard drives to create this RAID volume.
Select Disks	Select the hard drive to be RAID volume, press Enter, select the X number, and press Enter to return to the RAID volume creation interface.
Strip Size	Please select the strip size of the volume. Only RAID0 and RAID5 volumes can be selected.
Capacity	Enter the size of the RAID volume to be set.

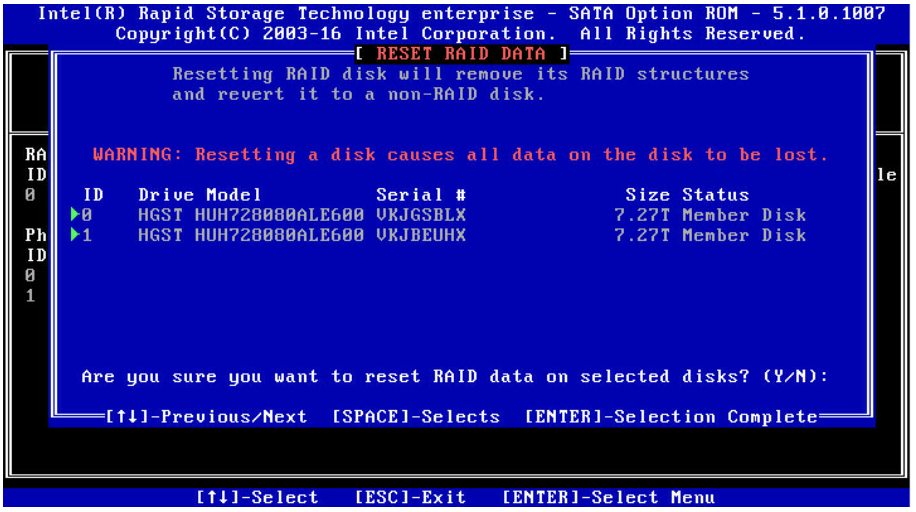
After the above settings are completed, please select [Create Volume] and press Enter key, and then the system prompts: “WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST. Are you sure you want to create this volume? (Y/N): “.

If you are sure to create a RAID volume, please enter “Y” and the volume will be created and all data on the selected hard drive will be lost. If you do not create a RAID volume, enter “N” to exit the creation of the volume. Here we enter “Y” to create a RAID volume. After the creation is complete, it will return to the MAIN MENU configuration main interface and display the created RAID volume in the RAID volume.

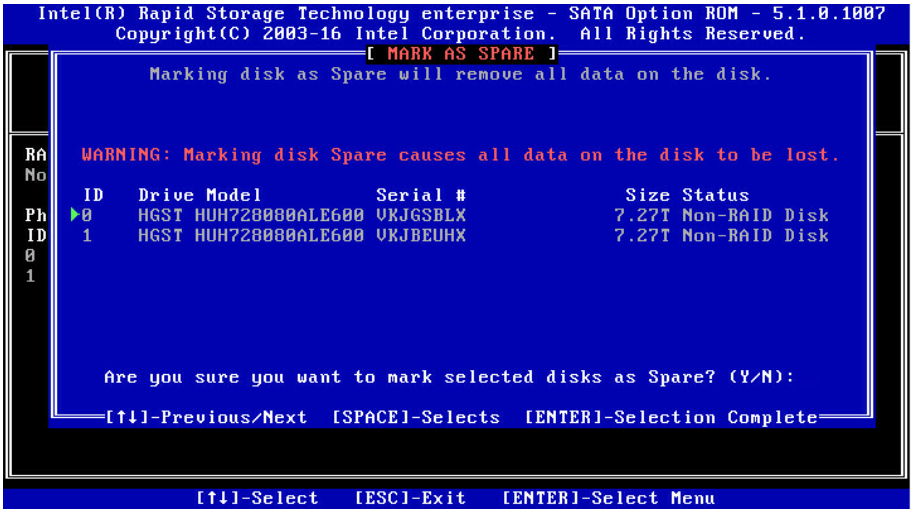
9.Delete RAID Volume menu. Enter the Delete RAID Volume menu as shown in the following figure. Press DEL to delete the selected RAID volume, and the system will pop up the prompt: “ALL DATA IN THE VOLUME WILL LOST! Are you sure you want to delete “Volume0”?(Y/N):”. If you are sure to delete the RAID volume, enter “Y”. If you want to cancel the operation of deleting the RAID volume, enter “N”.



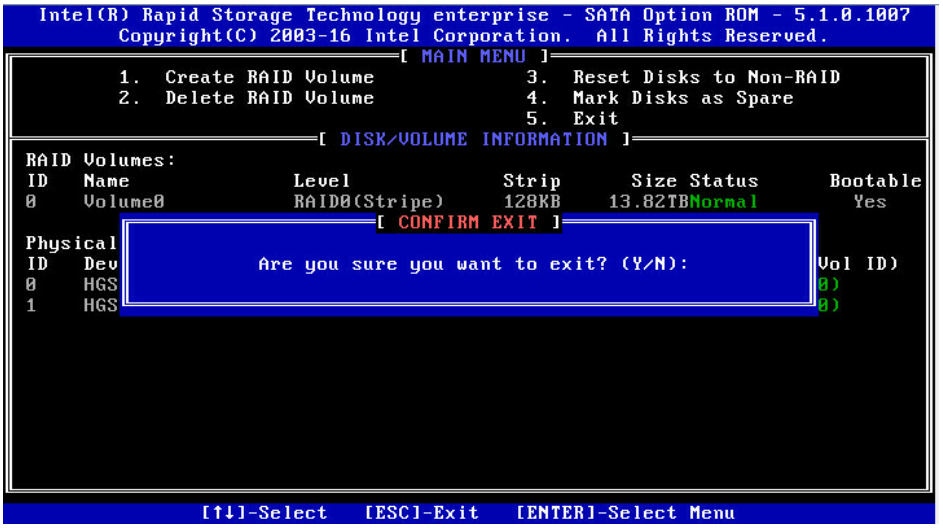
a)Reset Disks to Non-RAID menu. Enter the Reset Disks to Non-RAID menu as shown in the following figure, the system will display all the hard drives in the RAID volume. Use the space bar to select the hard drive to be reset according to actual needs, and then press Enter to reset the hard drive. The system prompts “Are you sure you want to reset RAID data on selected disks? (Y/N)”, type “Y” or “N” as prompted. Note that when you reset your hard drive, all data on the hard drive will be lost and the drive will no longer belong to the RAID volume.



b)Mask Disk as Spare menu. Enter the Mask Disk as Spare menu as shown in the following figure, the system will display the hard drive without RAID volume. Please use the space bar to select the hard drive as Spare mode and press Enter. The system prompts “Are you sure you want to Mask selected disks as Spare? (Y/N)”, type “Y” or “N” as prompted. Note that when you set up a spare hard drive, all data on the hard drive will be lost.



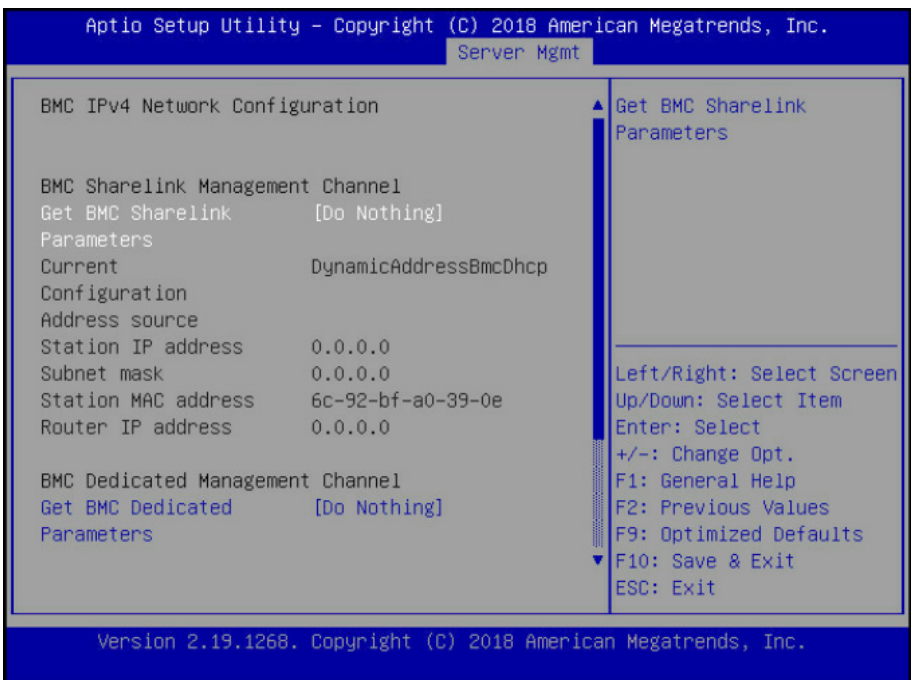
c)Exit menu. Use the up and down keys to move to the Exit menu or press ESC key to exit the SATA RAID configuration interface as shown in the following figure. The system prompts: “Are you sure you want to exit? (Y/N):”, enter “Y”, it will exit, enter “N”, it will cancel the exit operation.

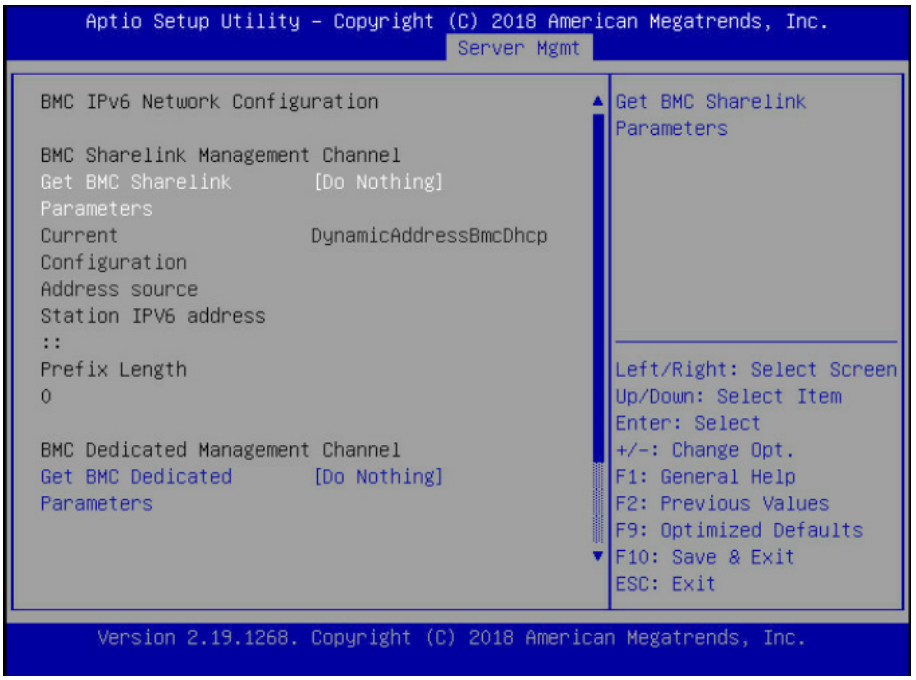


4.7 Viewing and Setting of BMC Network Parameter

4.7.1 View BMC Network Parameters

Log in to the BIOS and choose “Server Mgmt→BMC Network Configuration→BMC IPv4 Network Configuration/BMC IPv6 Network Configuration”, Press Enter to view the configuration of the current BMC IPv4 and BMC IPv6 network parameters as shown in the following figure.





4.7.2 BMC Network Settings

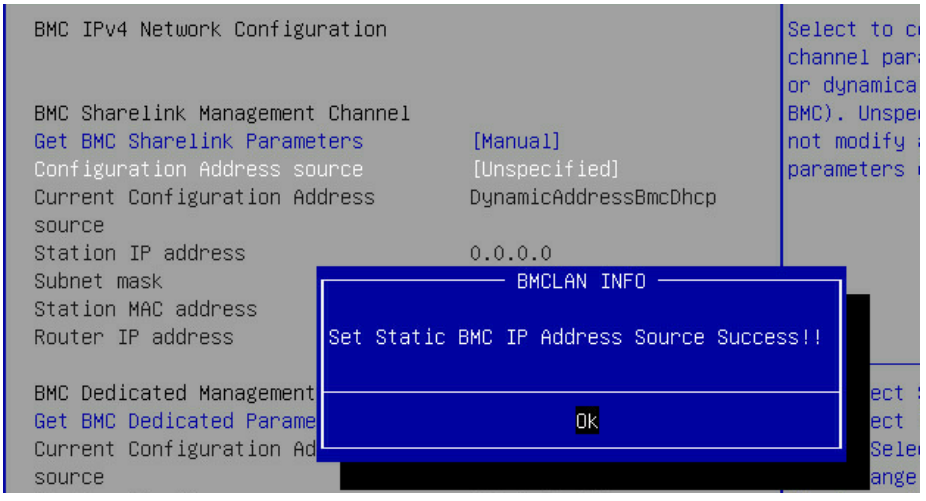
Take the BMC shared interface as an example to describe the settings of the BMC IPv4 network parameters. The specific parameter settings are shown in the table.

Description Table of BMC Network Configuration Interface

Interface parameter	Function Description	Defaults
Get BMC Sharelink/Dedicated Parameters	Get the mode setting of the BMC management network port parameters. The option parameters are: Do Nothing: Do not operate. Auto: Automatically obtain the current BMC network settings. Manual: Manually setting up BMC network	Do Nothing
Configuration Address Source	Configure the BMC network status parameter settings. When Get BMC Dedicated Parameters is set to [Manual], the option parameters are: Unspecified: Unspecified, the BMC network parameters will not be modified. Static: Static BMC network parameter settings: DynamicBmcDhcp: Dynamically obtain BMC network parameters: Static and dynamic network parameters take effect immediately after successful setup.	Unspecified
Current Configuration Address	Display current BMC network parameter configuration status	----
Station IP address	BMC network port IP address	----
Subnet mask	Subnet mask	----
Station MAC address	BMC network port MAC address	----
Router IP address	BMC network port routing IP address	----

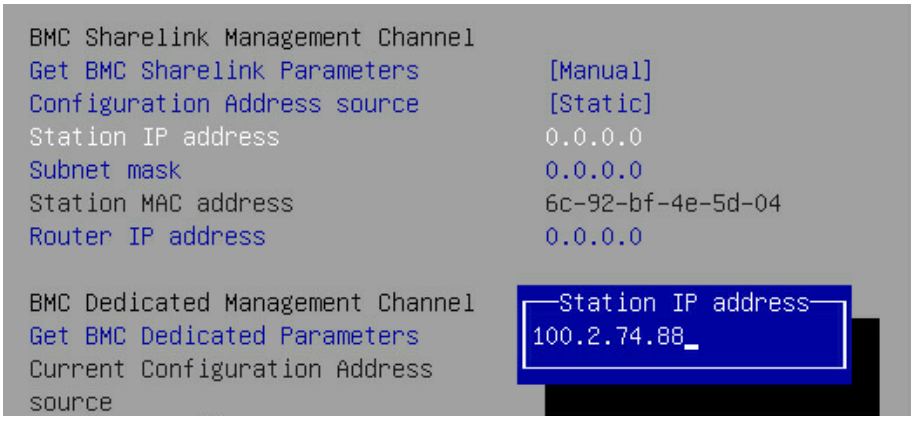
1.Set the BMC Static Network Parameters.

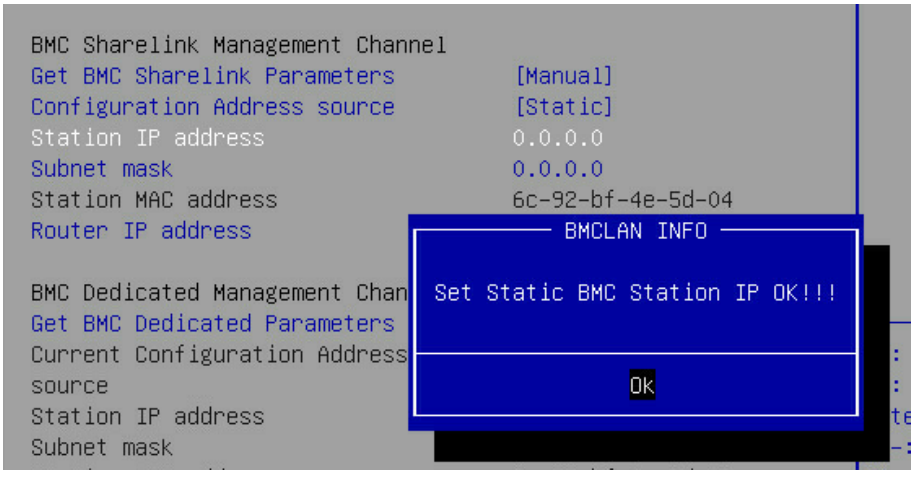
Set the Configuration Address source option to [Static]. After the setting is successful, it will shown the prompt: “Set Static BMC IP Address Source Success!!”. After the setting is successful, the BMC network will be set to static immediately as shown in the following figure.



Select the Station IP address item and press Enter. The Station IP address box will pop up, please manually enter the Static IP to be set. After the setting is completed, press Enter to

confirm as shown in the following figure:





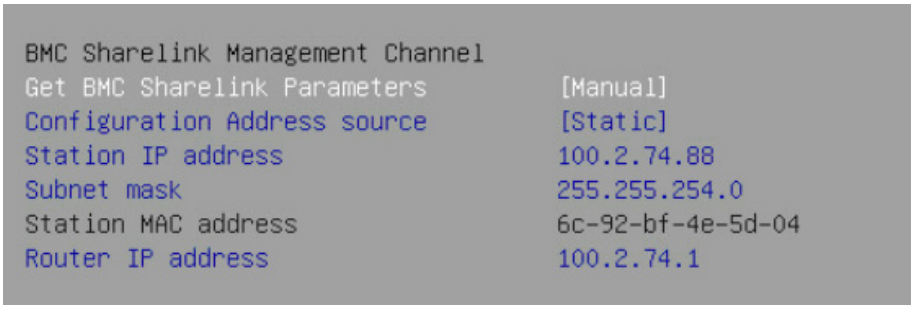
After the setting is successful, it will prompt: “Set Static BMC Station IP OK!!!”, press Enter to confirm, the BMC network IP will take effect immediately.

When setting fails, it will prompt: “Set Static BMC Station IP Fail!!!”,

If the setting IP is not changed, it will prompt: “Static BMC Station IP Not Change!!!”.

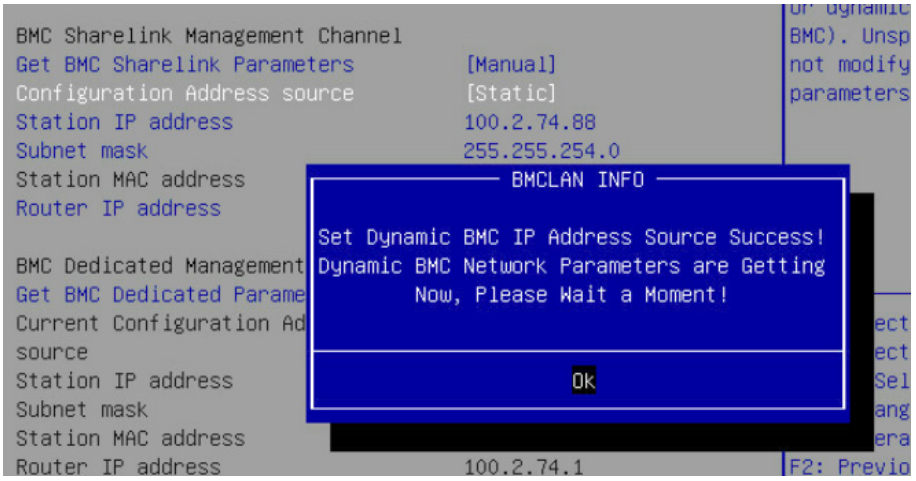
If the entered IP is invalid, it will prompt “Invalid Station Ip Entered!!!” and assign the IP address to 0.0.0.0. The assignment here only modifies the IP address in the BIOS setup interface, and does not notify the BMC to modify the IP settings.

The Subnet mask and Router IP address settings are similar to the Station IP address, which will not discuss here again. In the figure, the BMC network parameters are valid after the configuration is complete. You can log in to the BMC Web interface.

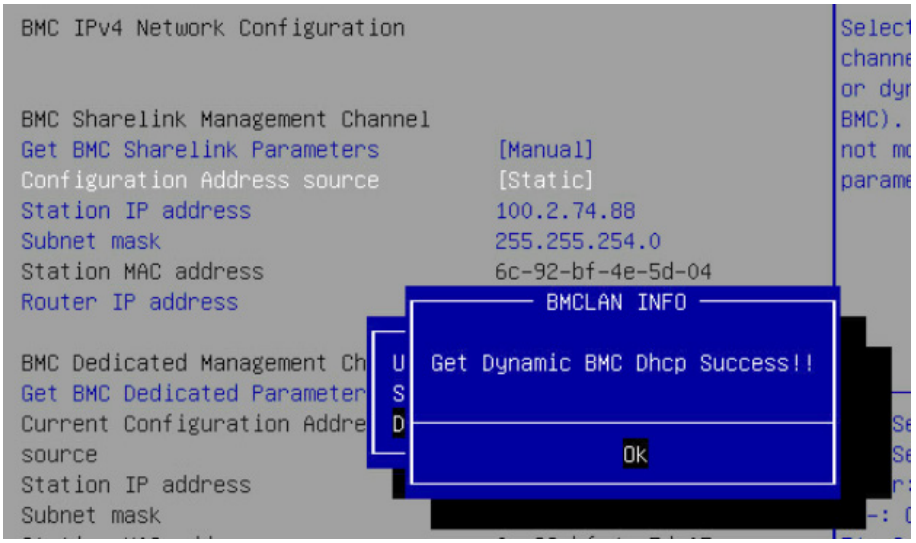


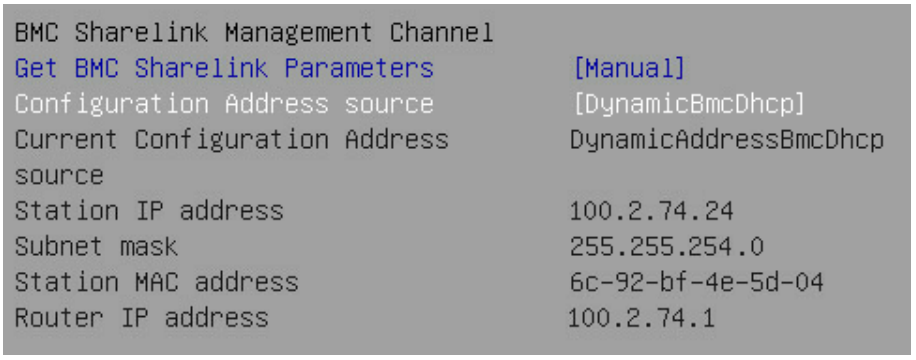
2.Set BMC Dynamic Network Parameters

Set the Configuration Address source option to [DynamiBmcDhcp] from [Static]. After the setting is successful, it will show the prompt: “Set Dynamic BMC IP Address Source Success! Dynamic BMC Network Parameters are Getting Now, Please Wait a Moment!” as shown in the following figure.



When setting the BMC dynamic network, it takes a period of time to take effect. It is recommended to wait for about 30s, that is, press Enter to confirm OK. Under normal circumstances, it will stop for about 30s on the interface as shown in the figure. After the dynamic network takes effect, it will prompt: “Get Dynamic BMC Dhcp Success!!” as shown in the following figure.





Note:

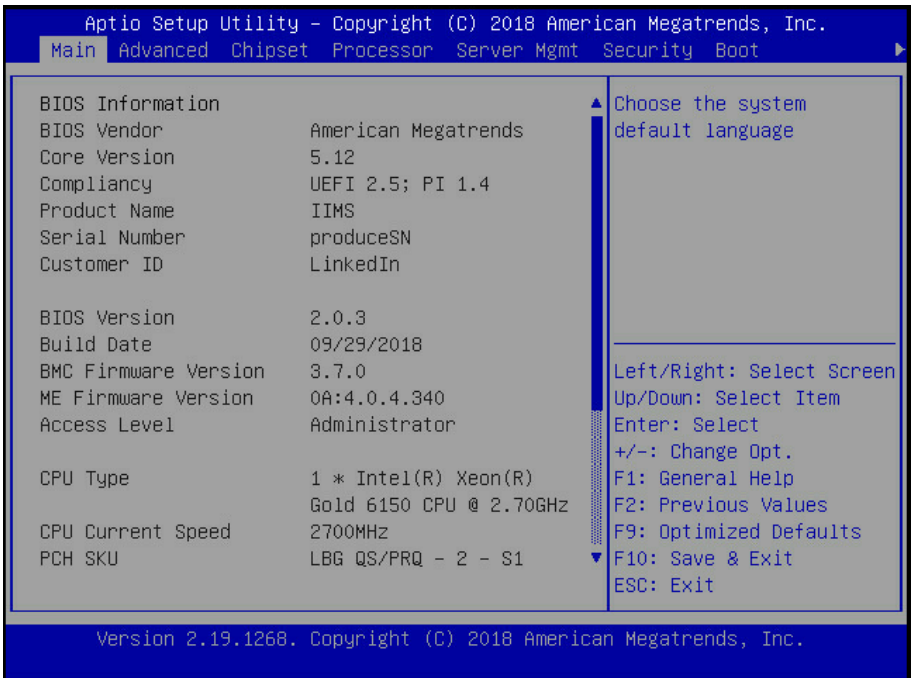
Whenever possible, use the Manual manual setting option to ensure that the network cable of the BMC management port is connected.

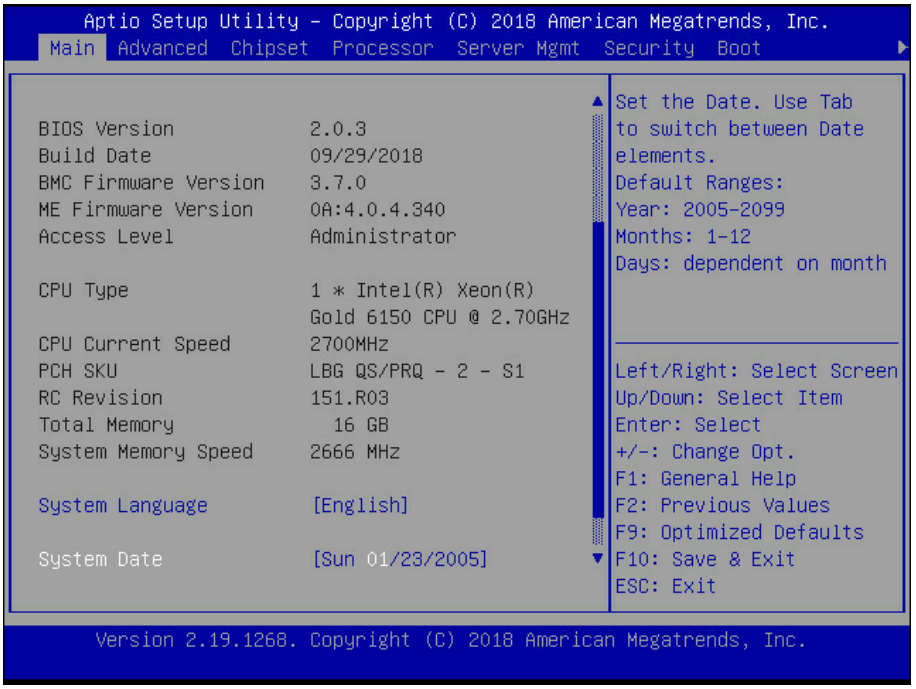
The option that takes effect immediately in the BIOS Setup interface is implemented by calling the Callback function. The Callback function is called only when the option in the BIOS Setup interface changes, otherwise the function will not take effect. For example, if you want to automatically obtain BMC parameters again, you need to set Get BMC Sharelink Parameters to [Do nothing] or [Manual], then set [Auto], then the function will take effect. The parameter settings of the BMC IPv6 network are similar, which will not discuss here again.

4.8 BIOS Parameter Description

4.8.1 Main

The Main interface contains basic information about the BIOS system, such as BIOS, BMC and ME version information, CPU model information, total memory capacity information and system time. The specific parameters are shown in the table, and the Main interface is shown in the figure.



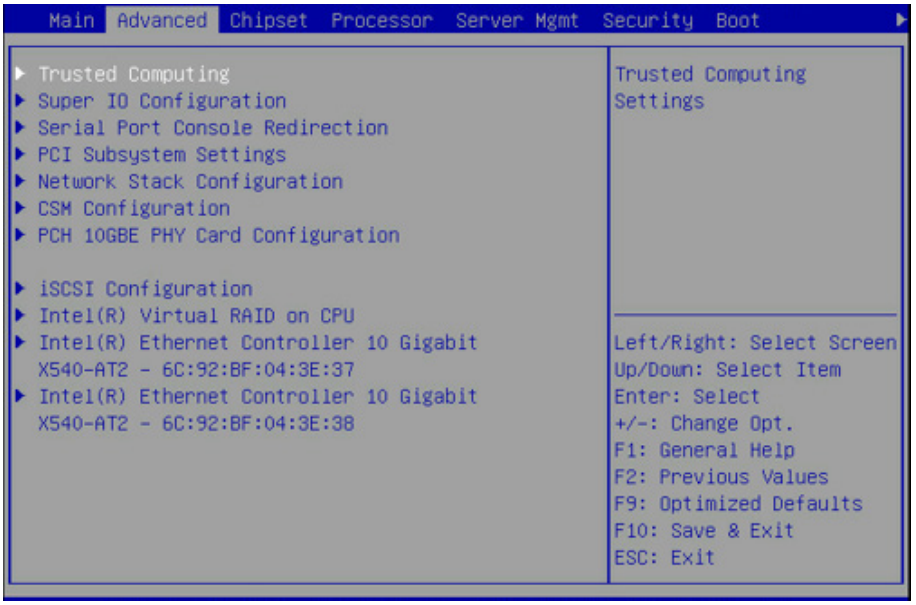


Description Table of Main Interface

Interface parameter	**Function Description**
Product Name	Product name
Serial Number	Serial Number
Customer ID	Customer ID
BIOS Version	BIOS version
Build Date	Build date
BMC Firmware Version	BMC FW version
ME Firmware Version	ME FW version
Access Level	Current access level
CPU Information	Display current CPU model, PCH SKU, RC version information
Memory Information	Display current memory total capacity and frequency information
System Date (Day mm/ dd/yyyy)	Display and set system date Use the <Tab> or <Enter> key to switch between the system date and time, directly type the value to modify or use the +/- keys to modify (press “+” key to increase the value by 1, press “-” key to decrease the value by 1)
System Time (hh/mm/ss)	Display and set system time Use the <Tab> or <Enter> key to switch between the system date and time, directly type the value to modify or use the +/- keys to modify (press “+” key to increase the value by 1, press “-” key to decrease the value by 1)

4.8.2 Advanced

The Advanced interface contains parameters for the BIOS system and related function controls, such as ACPI, serial port, PCI subsystem, CSM, USB, onboard network card, etc. The specific parameters are shown in the table, and the Advanced interface is shown in the figure.

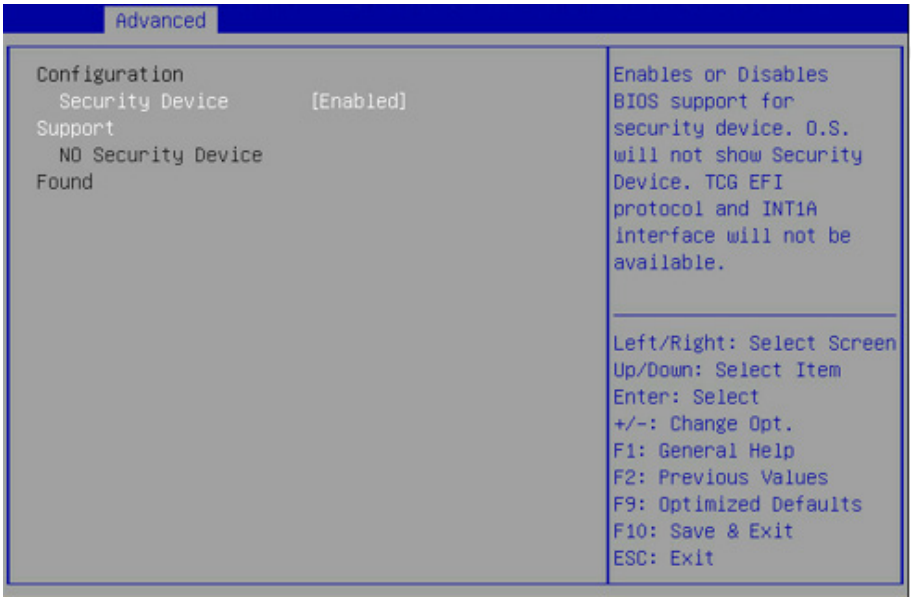


Description Table of Advanced Interface

Interface parameter	**Function Description**
Trusted Computing	Trusted Computing Configuration
Super IO Configuration	AST2400 I/O chip parameter configuration
Serial Port Console Redirection	Serial port redirection settings
PCI Subsystem Settings	PCI subsystem settings
Network Stack Configuration	Network stack configuration
CSM Configuration	CSM configuration
NVMe Configuration	NVMe configuration
PCH 10GBE PHY Card Configuration	PCH 10GBE NIC configuration
iSCSI Configuration	iSCSI configuration
Intel(R) Virtual RAID on CPU	Intel NVMe virtual RAID configuration
Intel® Enthernet Connection X722 for 10GbE SFP+XX:XX:XX:XX:XX:XX	Intel 10G network card UEFI OPROM configuration

① **Trusted Computing**

The Trusted Comuting interface describes how to configure a security device. The specific parameter description is shown in the table, and the Trusted Comuting interface is shown in the figure.

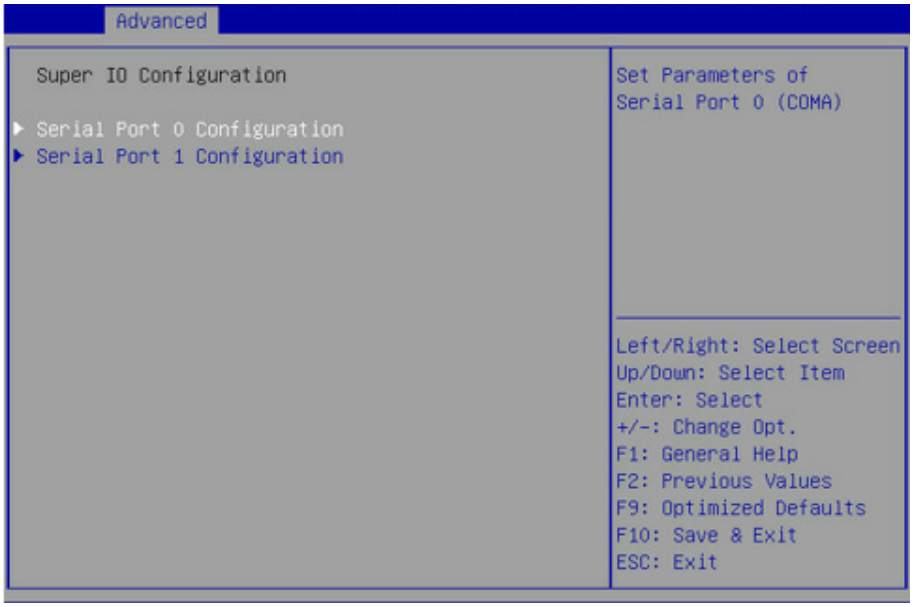


Description Table of Trusted Computing Interface

Interface parameter	Function Description	Defaults
Security Device Support	The security device supports the switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled The BIOS supports TPM TCG version 1.2/2.0. The BIOS supports the TPM module through the TPM software binding. When the software binding verification fails, the BIOS logs the error to the SEL.	Enabled
No Security Device Found	Display the status information of the current security device. There is no information displayed at present. If you need to support this function, you need to install the TPM chip.	----

② Super IO Configuration

The Super IO Configuration interface is about I/O chip's related option settings. The specific parameter description is shown in the table. The Super IO Configuration interface is shown in the figure.

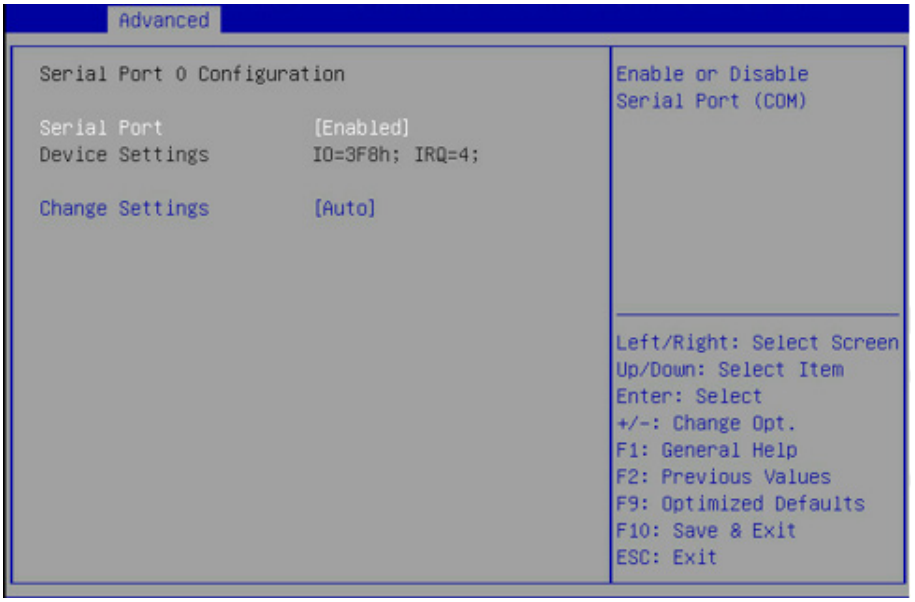


Description Table of Super IO Configuration Interface

Interface parameter	Function Description
Serial Port 0 Configuration	Serial port 0 configuration settings, the configuration page provides the switch control and resource adjustment control function of the serial port. The resource adjustment will enable to manually adjust the IO PORT and IRQ number used by COM PORT.
Serial Port 1 Configuration	Serial port 1 configuration (virtual serial port)

③ Serial Port 0 Configuration

Serial Port 0 Configuration interface is serial port 0's related option settings. The specific parameter description is shown in the table, Serial Port 0 Configuration interface is shown in the figure.



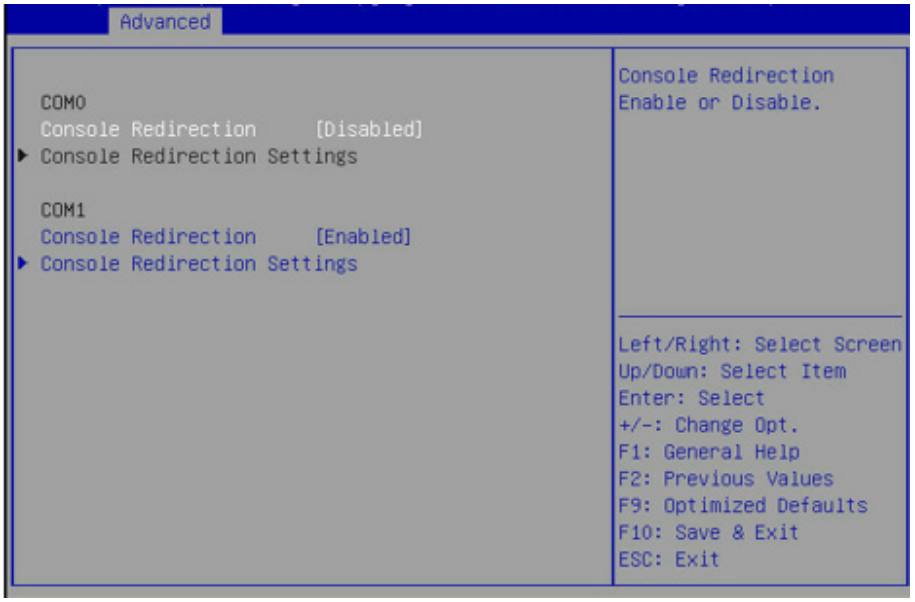
Description Table of Serial Port 0 Configuration Interface

Interface parameter	Function Description	Defaults
Serial Port	Serial port 0 switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Changer Settings	Select the optimal settings for the serial port based on your needs. The option parameters are: Auto I0=3F8h; IRQ=4; I0=3F8h; IRQ=3,4,5,6,7,9,10,11,12; I0=3E8h; IRQ=3,4,5,6,7,9,10,11,12; I0=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Auto

④ Serial Port Console Redirection

Serial Port Console Redirection interface is serial port redirection related option setting.

The specific parameter description is shown in the table, the Serial Port Console Redirection interface is shown in the figure.

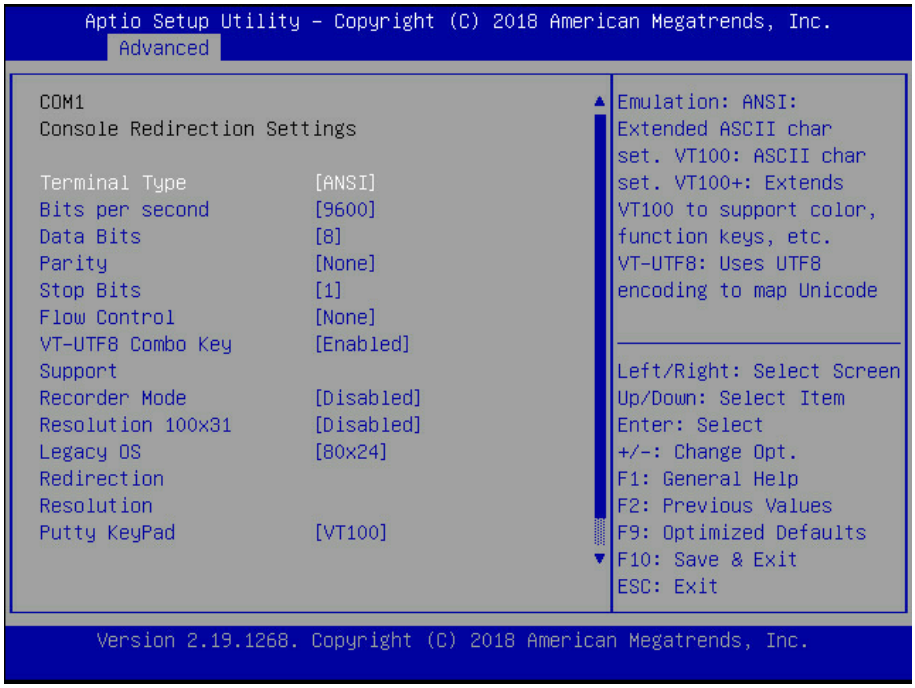


Description Table of Serial Port Console Redirection Interface

Interface parameter	Function Description	Defaults
Console Redirection	Serial console redirection switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Console Redirection Settings	Serial console redirection parameter settings	----

⑤ Console Redirection Settings

When the Console Redirection option is set to [Enabled], the Console Redirection Settings menu is enabled. The specific parameter description is shown in the table, the Serial Port Console Redirection interface is shown in the figure.



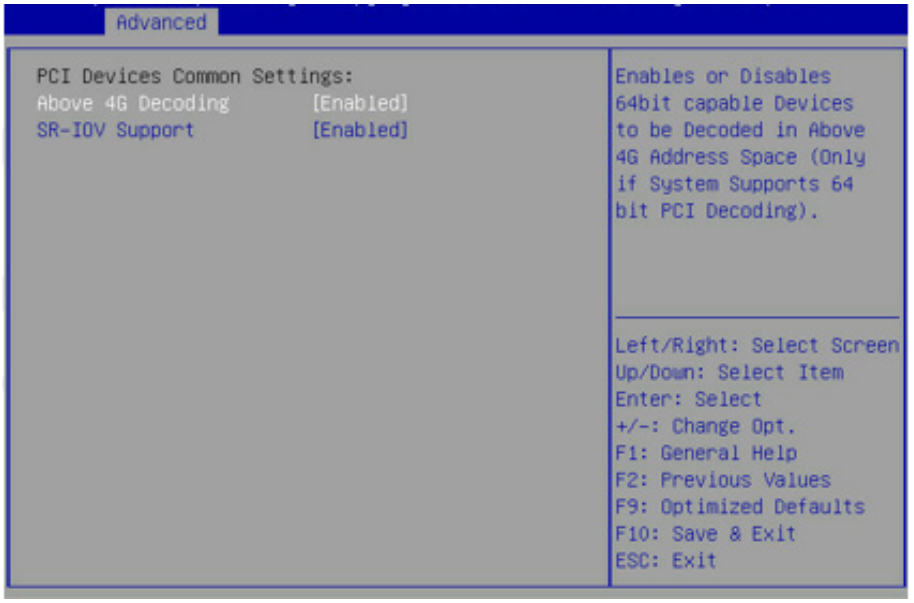
Description Table of Console Redirection Settings Interface

Interface parameter	Function Description	Defaults
Terminal Type	Terminal type setting. Option parameters are: VT100 VT100+ VT-UTF8 ANSI	ANSI
Bits per second	Bit rate setting. Option parameters are: 9600 19200 38400 57600 115200	9600
Data Bits	Serial data bit width setting. Option parameters are: 7 8	8
Parity	Parity settings. Option parameters are: None (no parity) Even (even parity) Odd (odd check) Mark (parity) Space (memory parity)	None
Stop Bits	Stop bits setting. Option parameters are: 1 2	1
Flow Control	Flow control settings. Option parameters are: None Hardware RTS/CTS	None

VT-UTF8 Combo Key Support	The VT-UTF8 combination key supports switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Recorder Mode	Recorder mode switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Redirection 100×31	Extended terminal resolution 100 × 31 switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Legacy OS Redirection Resolution	The terminal resolution setting of the legacy operation system, the option parameters are: 80×24 80×25	80×24
Putty KeyPad	Putty's function keys and keyboard settings, option parameters are: VT100 LINUX XTERMR6 SCO ESCN VT400	VT100
Redirection After BIOS POST	After the BIOS boots, the settings are redirected. The option settings are: Always Enable BootLoader (boot mode)	Always Enable

⑥ PCI Subsystem Settings

The PCI Subsystem Settings interface is a PCI subsystem related option setting. The specific parameters are shown in the table. The PCI Subsystem Settings screen is shown in the figure.



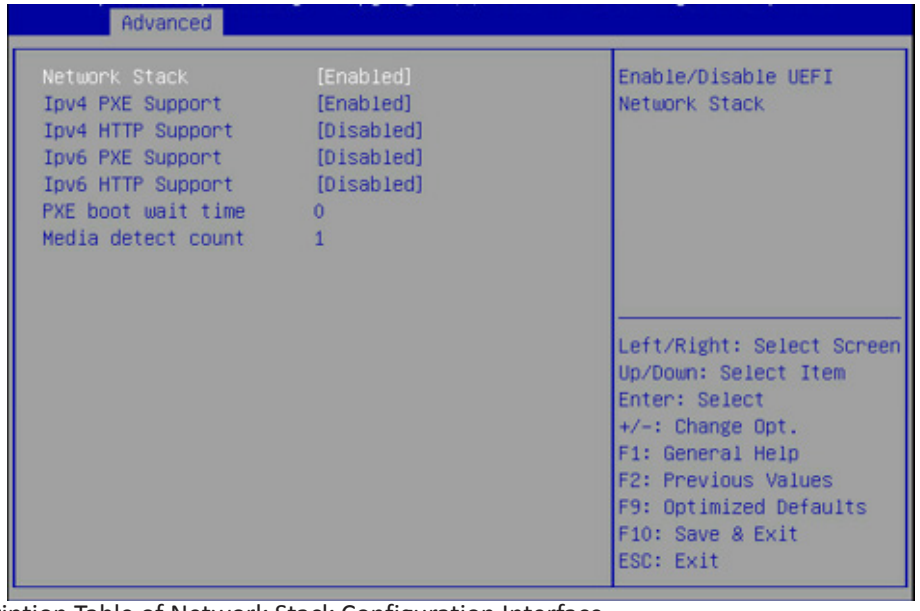
Description Table of PCI Subsystem Settings Interface

Interface parameter	Function Description	Defaults
Above 4G Decoding	Above 4G memory access control switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
SR-IOV Support	SR-IOV supports switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

⑦ Network Stack Configuration

The Network Stack Configuration interface is Network UEFI PXE related option setting.

The specific parameter description is shown in the table, the Network Stack Configuration interface is shown in the figure.



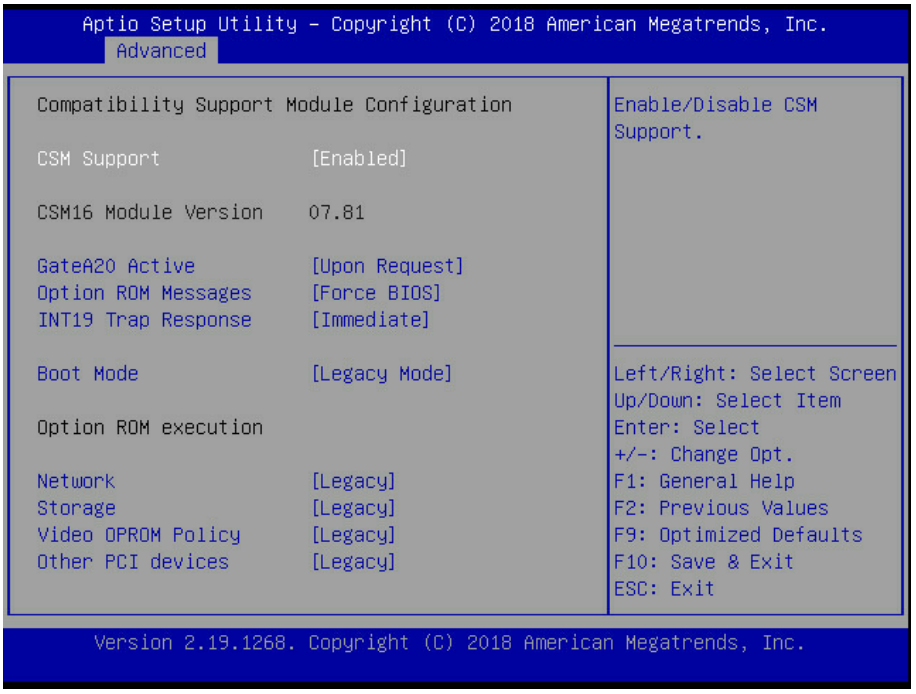
Description Table of Network Stack Configuration Interface

Interface arameter	Function Description	Defaults
Network Stack	Network stack switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled The following options are controlled by this option. Only if this option is enabled, the following options are displayed and the function can be set.	Enabled
Ipv4 PXE Support	Switch settings supported by UEFI Ipv4 PXE. Option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Ipv4 HTTP Support	Switch settings supported by Ipv4 HTTP boot. Option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Ipv6 PXE Support	Switch settings supported by UEFI Ipv6 PXE. Option parameters are: Enabled: Enabled Disabled: Disabled	Disabled

Ipv6 HTTP Support	Switch settings supported by Ipv6 HTTP boot. Option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
PXE boot wait time	Wait for pressing ESC to cancel time limit of PXE boot, and the setting range is 0~5.	0
Media detect Count	Device Detection Times Setting, and its range is 1~50.	1

⑧ CSM Configuration

CSM Configuration interface is compatible module related option setting. The specific parameter description is shown in the table, and the CSM Configuration interface is shown in the figure.



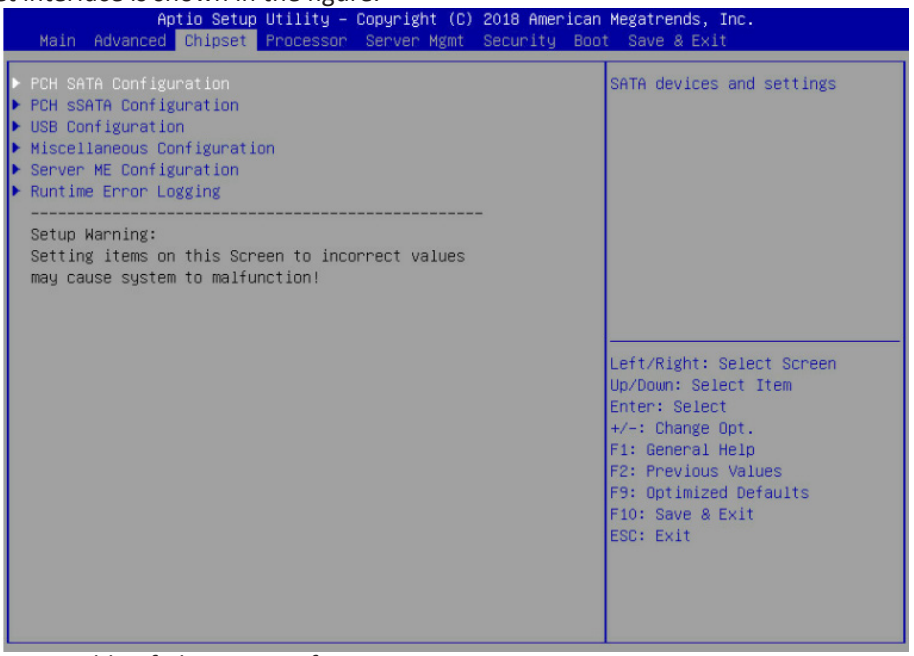
Description Table of CSM Configuration Interface

Interface parameter	Function Description	Defaults
CSM Support	Compatibility mode supports switch settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
GateA20 Active	Control mode setting of A20 address line Option parameters are: Upon Request: If needed Always: always A20 is an address line that controls how the system accesses the memory space with more than 1MB.	Upon Request
INT19 Trap Response	Interrupt, capture signal response settings. Option parameters are: Immediate: Immediate response Postponed: Postponed response	Immediate

Boot Mode	Start mode setting, control device Legacy or UEFI mode startup policy. Option parameters are: UEFI Mode: UEFI mode Legacy Mode: Legacy Mode	Legacy Mode
Network	The NIC Option Rom execution mode setting, the option parameters are: Do not launch: do not launch Legacy: traditional mode UEFI: UEFI mode	Legacy
Storage	Setting of Option Rom's execution mode of storage device, option parameters are the same as above.	Legacy
Video OPROM Policy	Setting of Video device Option Rom's execution mode, option parameters are the same as above	Legacy
Other PCI devices	Setting of other PCI device Option Rom's execution mode setting, option parameters are the same as above	Legacy

4.8.3 Chipset

The Chipset interface contains information and runtime error log settings for PCH SATA/ sSATA, USB, ME and other devices. The specific parameters are shown in the table, and the Chipset interface is shown in the figure.



Description Table of Chipset Interface

Interface parameter	**Function Description**
PCH SATA Configuration	PCH SATA configuration
PCH sSATA Configuration	PCH sSATA configuration
USB Configuration	USB configuration
Miscellaneous Configuration	Miscellaneous configurations
Server ME Configuration	Server ME configuration
Runtime Error Logging	Runtime error log configuration

4.8.4 PCH SATA Configuration/PCH sSATA Configuration

PCH sSATA Configuration and PCH SATA Configuration interface is used to configure onboard sSATA and SATA ports as shown in the following figure. The PCH SATA Configuration menu is used as an example to introduce the onboard SATA port hard drive configuration, which is similar to the PCH sSATA Configuration interface and will not discuss here again.

Description Table of PCH SATA Configuration Interface

Interface parameter	Function Description	Defaults
SATA Controller	SATA controller switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
SATA Mode Options	Set SATA mode, option parameters are: AHCI/RAID two modes	AHCI
SATA Port 0~4	hard drive information connected to SATA port 0~4	----
Port 0~4	SATA port switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

The PCH sSATA Configuration interface description is omitted.

4.8.5 USB Configuration

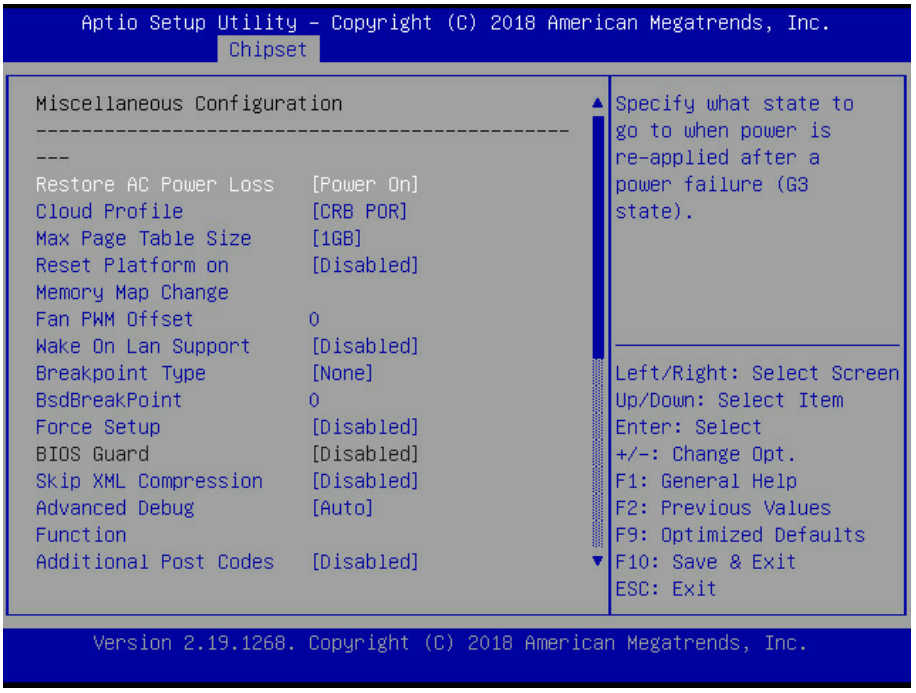
The USB Configuration interface is used to set the onboard USB port switch. The USB Configuration interface is shown in the figure, and the specific parameter description is shown in the table.

Description Table of USB Configuration Interface

Interface parameter	Function Description	Defaults
USB N	Onboard USB port switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

4.8.6 Miscellaneous Configuration

The Miscellaneous Configuration interface is a miscellaneous common setting item configuration. The specific parameter description is shown in the table, and the Miscellaneous Configuration interface is shown in the figure.

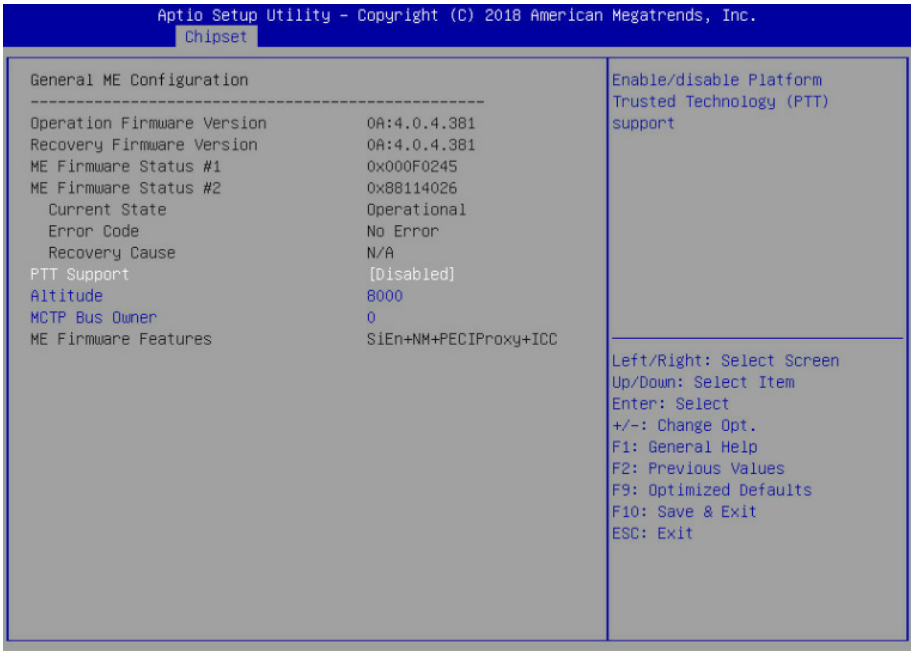


Description Table of Common Configuration Interface

Interface parameter	Function Description	Defaults
Restore AC Power Loss	AC power-on power state setting, option parameters are: Power OFF (power off state) Last State (restore the last state) Power ON (power-on state)	Power ON
Max Page Table Size	Size setting of maximum page table, the option parameters are: 1GB 2MB For older OS, please choose 2MB, otherwise it will cause problems.	1GB
VGA Priority	Integrated graphics and extrapolated graphics priority settings (hidden in UEFI mode). Option parameters are: Onboard Device: board device takes precedence. Offboard Device: extrapolated device takes precedence.	OffboardDevice

4.8.7 Server ME Configuration

The Server ME Configuration interface is used to set server ME's information display and related configuration. The specific parameter description is shown in the table, the Server ME Configuration interface is as shown in the following figure.

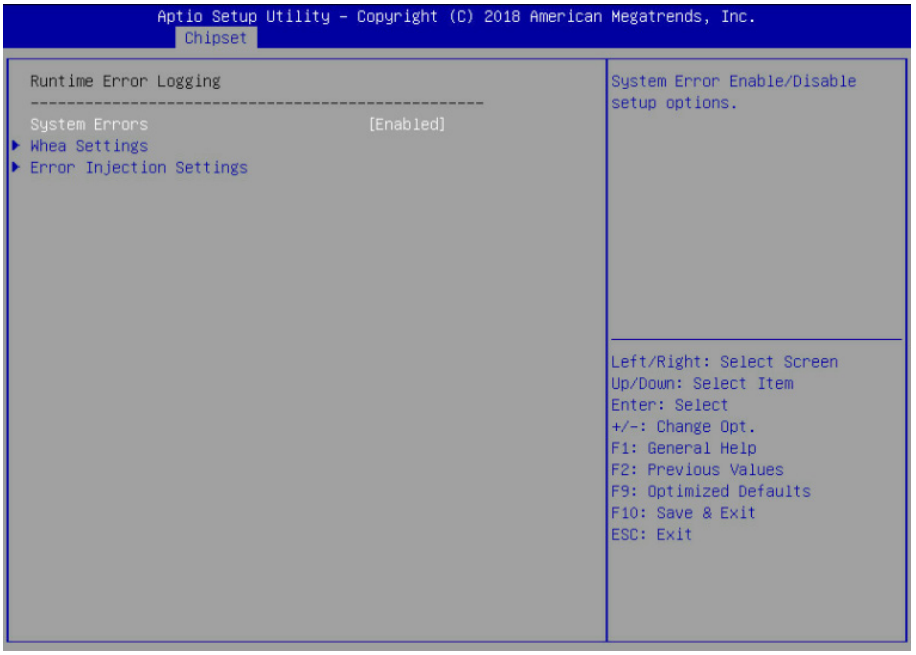


Description Table of Server ME Configuration Interface

Interface parameter	Function Description	**Defaults**
Operational Firmware Version	ME valid firmware version	----
Recovery Firmware Version	ME backup firmware version	----
ME Firmware Status #1	ME FW status value #1	----
ME Firmware Status #2	ME FW status value #2	----
Current State	Current state	----
Error code	Error code	----
Recovery Cause	Recovery cause	N/A
PTT Support	The platform trusted technology supports switch settings, and option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Altitude	Altitude setting	8000
MCTP Bus Owner	The MCTP bus master is located at PCIe: [15:8] bus, [7:3] device, [2:0] function. Set to 0, indicating it is disabled.	0
ME Firmware Features	ME FW features	----

4.8.8 Runtime Error Logging

The Runtime Error Logging interface is the system runtime error log setting. The specific parameter description is shown in the table, and Runtime Error Logging interface is shown in the figure.

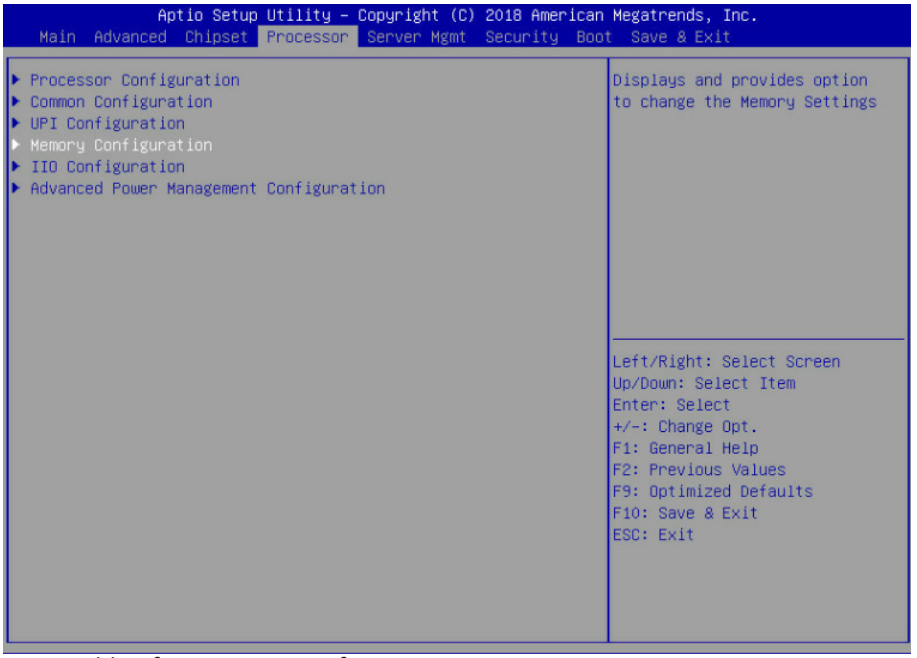


Description Table of Runtime Error Logging Interface

Interface parameter	Function Description	Defaults
System Errors	System error logging settings. Option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

4.9 Processor

The Processor interface is the processor, memory and other related option setting. The specific parameter description is shown in the table, and the Processor interface is shown in the figure.

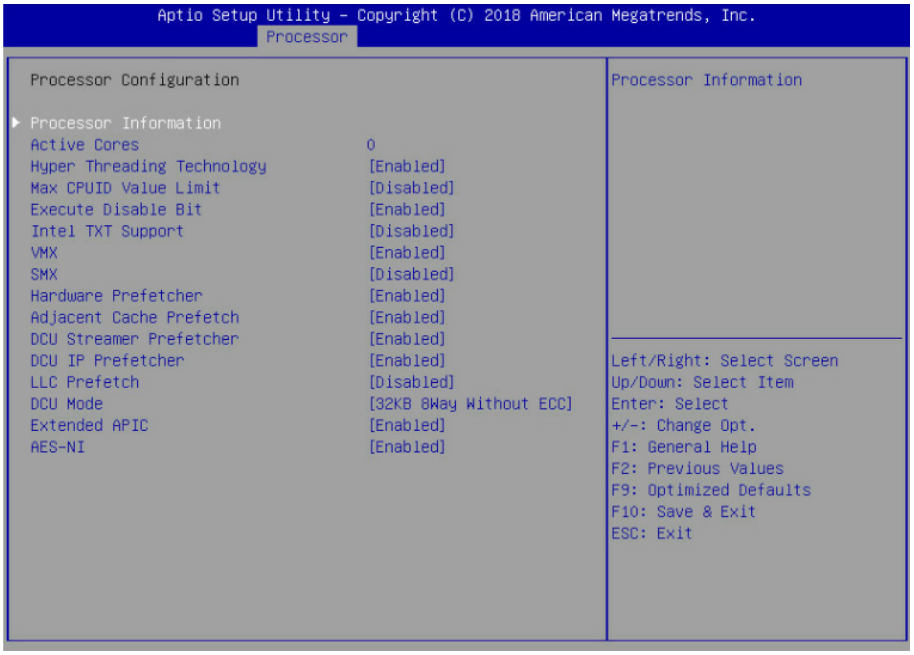


Description Table of Processor Interface

Interface parameter	**Function Description**
Processor Configuration	Processor configuration
Common Configuration	Common configuration
UPI Configuration	UPI configuration
Memory Configuration	Memory configuration
IIO Configuration	IIO configuration
Advanced Power Management Configuration	Advanced power management configuration

4.9.1 Processor Configuration

The Processor Configuration interface is the relevant option settings for the processor. The specific parameter description is shown in the table, and the Processor Configuration interface is shown in the figure.



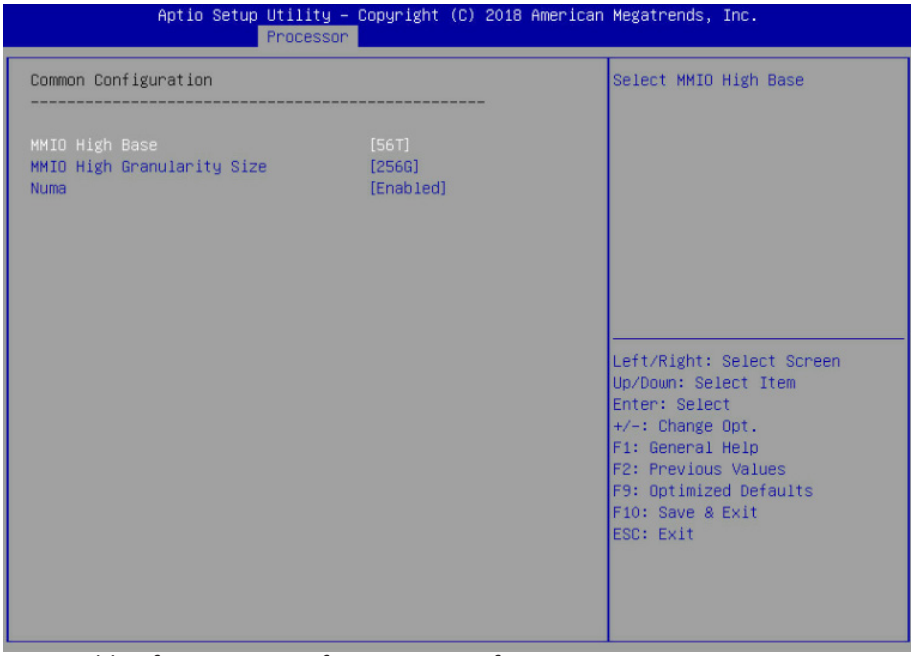
Description Table of Processor Configuration Interface

Interface parameter	Function Description	**Defaults**
Processor Information	Processor information submenu, processor details	----
Active Cores	Set the number of CPU cores, enter the number of CPU cores to be turned on, and the Help information will display the valid value that can be set by this option and maximum physical cores of the CPU based on the current CPU. The default value of 0 means to turn on the number of cores.	0
Hyper Threading Technology	Hyper-Threading Technology Switch Settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Max CPUID Value Limit	Switch setting of maximum CPUID value limits Enabled: Enabled Disabled: Disabled Enable this option when the traditional operating system boot does not support the CPU Extended CPUID feature.	Disabled
Execute Disable Bit	Hardware anti-virus technology switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Intel TXT Support	Intel Trusted Execution Technology supports switch settings, and option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
VMX	Intel hardware-assisted virtualization technology switch settings, option parameters are the same as above.	Enabled
SMX	The safety mode expands the switch setting with the option parameters as above.	Disabled

Hardware Prefetcher	Hardware prefetching switch setting, option parameters are the same as above. Hardware prefetching refers to pre-fetching instructions or data from memory into the L2 cache before the CPU processes the instructions or data, thereby reducing the memory read time and helping to eliminate potential bottlenecks and improve the system performance	Enabled
Adjacent Cache Prefetch	Adjacent cache prefetch switch settings, option parameters are the same as above. After the adjacent cache prefetch function is enabled, when the computer reads the data, it will intelligently think that the data next to or adjacent to the data to be read is also needed, so the adjacent data will be read out in advance during processing, which will speed up the reading.	Enabled
DCU Streamer Prefetcher	DCU streamer prefetch switch setting, option parameters are the same as above. DCU streamer prefetche function can pre-read the CPU data, thereby reducing the data read time.	Enabled
DCU IP Prefectcher	DCU IP prefetch switch setting, option parameters are the same as above. DCU IP prefetch function can judge whether there is data to be pre-read from the history, thus reducing the data reading time.	Enabled
LLC Prefetcher	All thread LLC prefetch switch settings, option parameters are the same as above.	Disabled
DCU Mode	DCU Mode settings, option parameters are: 32KB 8Way Without ECC 16KB 4Way With ECC	32KB 8Way Without ECC
Extended APIC	Extended APIC switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
AES-NI	AES command switch settings, option parameters are: Enabled: Enabled Disabled: Disabled This menu mainly controls whether the CPU supports AES instructions, which are mainly used in the virtualization system. After the command is turned on, the system performance can be improved.	Enabled

4.9.2 Common Configuration

The Common Configuration interface is a generic option setting. The specific parameter description is shown in the table, and the Common Configuration interface is as shown in the following figure.

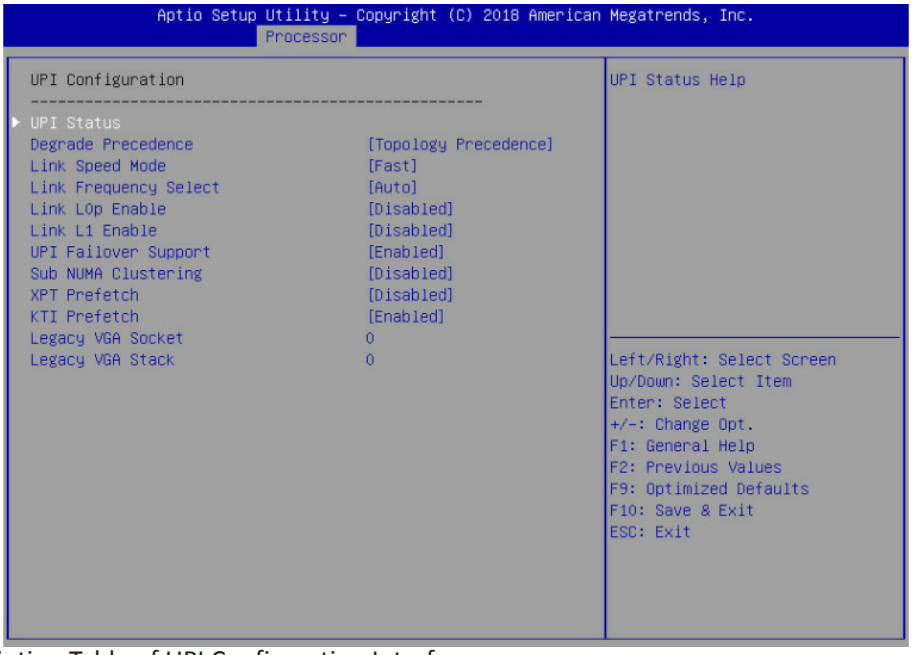


Description Table of Common Configuration Interface

Interface parameter	Function Description	Defaults
MMIO High Base	MMIO high base address setting, option parameters are: 56T 40T 24T 16T 4T 1T	56T
MMIO High Granularity Size	MMIO high interval size setting, option parameters are: 1G 4G 16G 64G 256G 1024G	256G
Numa	Numa switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

4.9.3 UPI Configuration

The UPI Configuration interface is a UPI related option setting. The specific parameter description is shown in the table, UPI Configuration interface is shown in the figure.



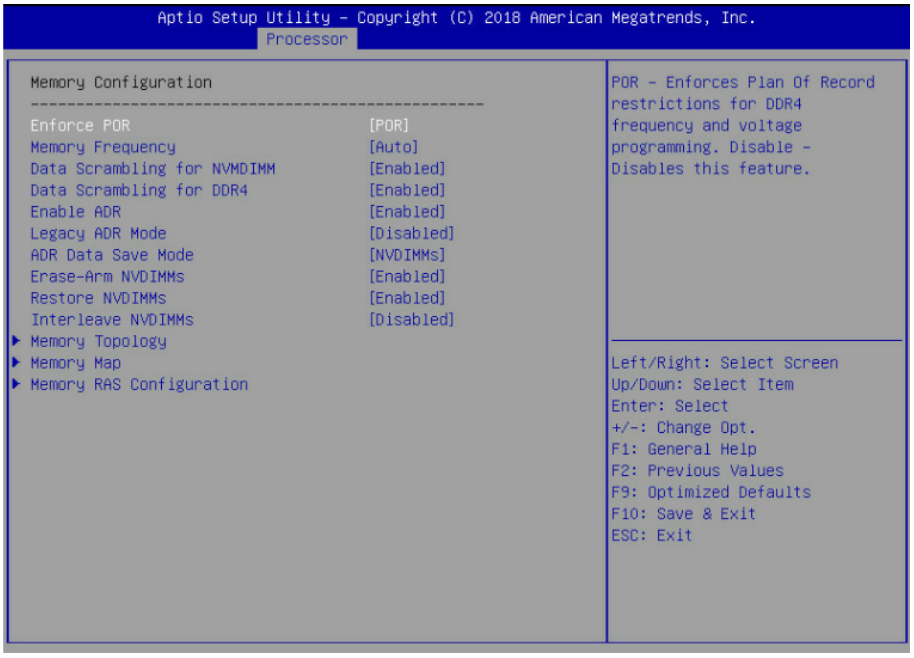
Description Table of UPI Configuration Interface

Interface parameter	Function Description	Defaults
UPI Satus	UPI link status submenu showing the current UPI link status	----
Degrade Precedence	Reduce the priority setting, the option parameters are: Topology Precedence Feature Precedence Reduce the feature by setting the Topology Precedence when the system settings conflict, or reduce the Topology by setting the Feature Precedence.	Topology Precedence
Link Speed Mode	Link speed mode settings, option parameters are: Fast Slow	Fast
Link Frequency Select	Link frequency selection settings, option parameters are: Auto 9.6 GT/s 10.4GT/s Use Per Link Setting	Auto
Link L0p Enable	Link L0p switch settings, option parameters are: Enabled: Enabled Disabled: Disabled Link power save mode setting, set when the bandwidth is half of the peak bandwidth	Disabled
Link L1 Enable	Link L1 switch settings, option parameters are: Enabled: Enabled Disabled: Disabled Adjust QPI Link to be off when the system is very idle	Disabled
UPI Failover Support	UPI failover support switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

Sub NUMA Clustering	Sub NUMA cluster settings, option parameters are: Auto: Support 1-cluster or 2-clusters based on IMC interleaving Enabled: Supports all SNC clusters (2-clusters) and 1-way IMC interleaving Disabled: SNC function is not supported.	Disabled
Legacy VGA Socket	The traditional VGA setting, the valid value range is 0~1.	0
Legacy VGA Stack	The number of traditional VGA stack settings, the valid value range is 0~6	0

4.9.4 Memory Configuration

The Memory Configuration interface is a memory related option setting. The specific parameter description is shown in the table, Memory Configuration interface as shown.



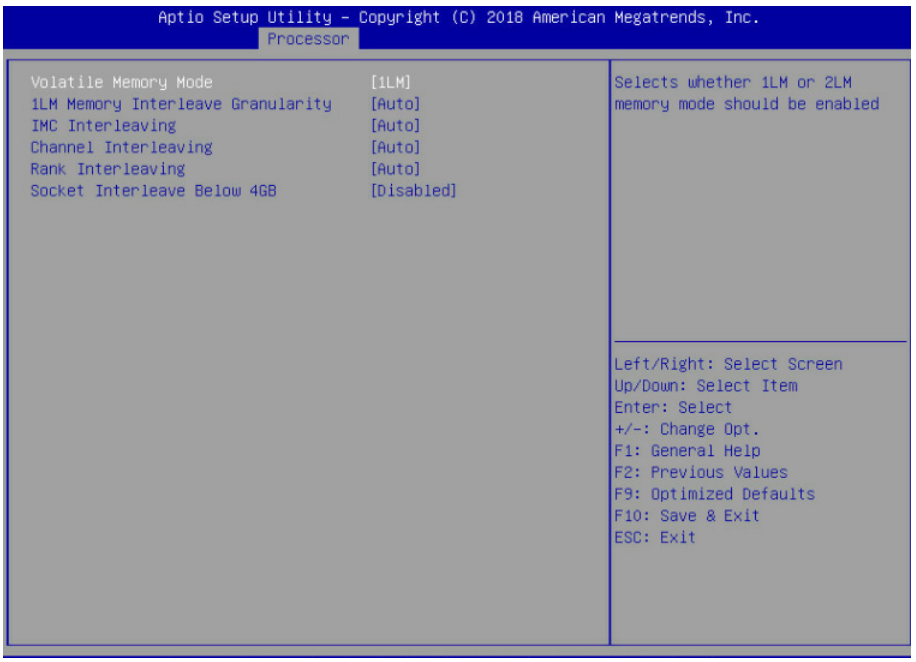
Description Table of Memory Configuration Interface

Interface parameter	**Function Description**	**Defaults**
Enforce POR	Enforce POR settings, the option parameters are: POR Disabled	POR
Memory Frequency	Memory frequency settings, option parameters are: Auto 1600 1866 2133 2400 2666 ……	Auto

Data Scrambling for NVMDIMM	NVMDIMM data scrambling switch setting, option parameters are the same as above.	Enabled
Data Scrambling for DDR4	DDR4 data scrambling switch settings, option parameters are: Auto: Automatic Enabled: Enabled Disabled: Disabled	Enabled
Enable ADR	ADR enable switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Legacy ADR Mode	The traditional ADR mode switch setting, the option parameters are the same as above.	Enabled
ADR Data Save Mode	ADR data save mode settings, option parameters are: Disabled: Disabled Batterybacked DIMMs NVDIMMs	NVDIM
Erase-Arm NVDIMMs	Erase-Arm NVDIMMs switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Restore NVDIMMs	Fix the NVDIMMs switch settings, the option parameters are the same as above.	Enabled
Interleave NVDIMMs	Interleaved NVDIMMs switch settings, option parameters are the same as above.	Disabled
Memory Topology	The Memory Topology submenu displays the current in-memory details.	----
Memory Map	Memory Map submenu	----
Memory RAS Configuration	Memory RAS Configuration Submenu	----

4.9.4.1 Memory Map

The Memory Map interface is the mode setting for memory. Specific parameters are shown in the table, Memory Topology interface as shown in the following figure.

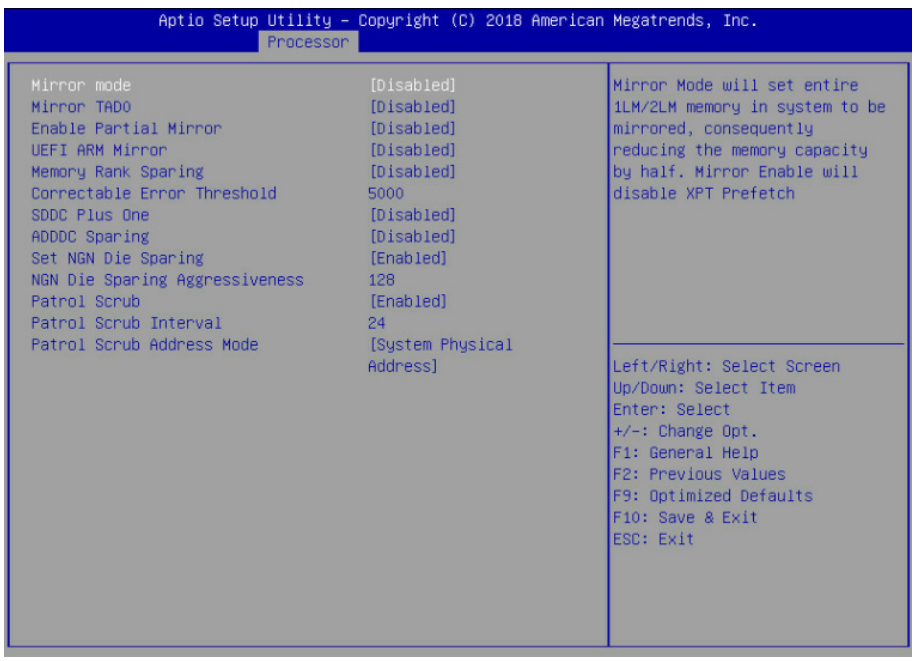


Description Table of Memory Map Interface

Interface parameter	Function Description	Defaults
Volatile Memory Mode	Volatile memory mode settings, option parameters are: 1LM 2LM Auto	1LM
1LM Memory Interleave Granularity	1LM memory cross-interval setting, option parameters are: Auto 256B Target, 256B Channel 64B Target, 64B Channel	Auto
IMC Interleaving	IMC Interleaving settings, option parameters are: Auto 1-way Interleavel 2-way Interleavel	Auto
Channel Interleaving	Channel Interleaving setting, option parameters are: Auto 1-way Interleavel 2-way Interleavel 3-way Interleavel	Auto
Rank Interleaving	Rank interleaving setting, option parameters are: Auto 1-way Interleavel 2-way Interleavel 4-way Interleavel 8-way Interleavel	Auto
Socket Interleave Below 4GB	4GB address space processor interleaving switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled

4.9.4.2 Memory RAS Congfiguation

The Memory RAS Configuration interface is a memory RAS feature related option setting. Specific parameters are shown in the table, Memory RAS Configuration interface is shown in the figure.



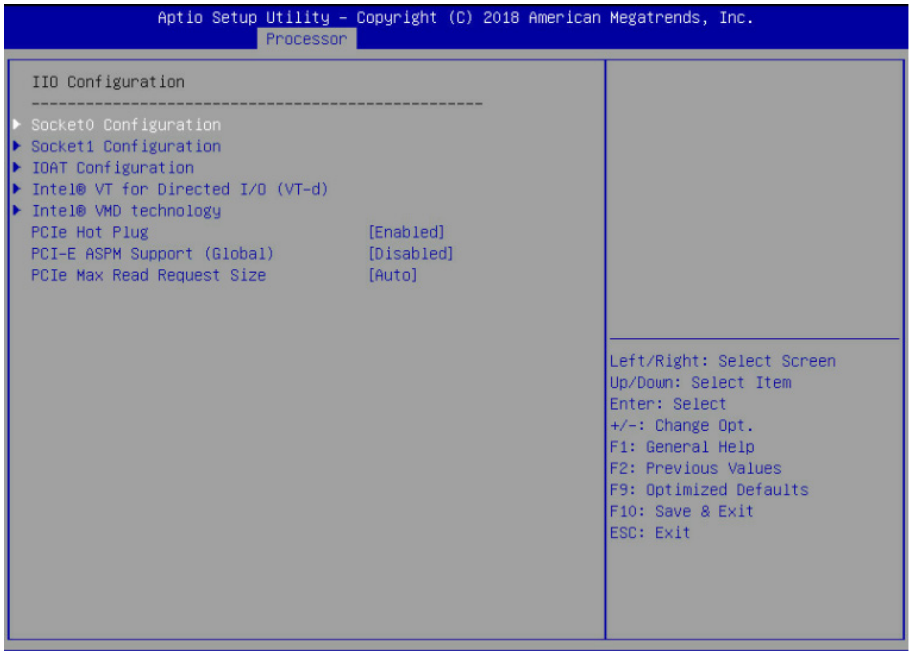
Description Table of Memory RAS Configuration Interface

Interface parameter	Function Description	Defaults
Static Virtual Lockstep Mode	Static virtual lockstep mode switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Mirror Mode	Mirror mode settings, option parameters are: Disabled Mirror Mode 1LM Mirror Mode 2LM	Disabled
Mirror TAD0	Mirror TAD0 mode switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Enable Partial Mirror	Enable partial mirror mode, the option parameters are: Disabled Partial Mirror mode 1LM Partial Mirror mode 2LM	Disabled
UEFI ARM Mirror	UEFI ARM mirror mode switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Memory Rank Sparing	Memory Rank hot standby switch settings, option parameters are: Enabled: Enabled Disabled: Disabled When it is set to Enabled, you can select the memory hot backup mode. It is a backup in the memory channel of Rank. The total memory capacity varies according to the choice of the hot standby mode. Half of the memory capacity in the maximum supported channel is used for hot standby.	Disabled
Correctable Error Threshold	Correctable error threshold setting	2
SDDC Plus One	SDDC+1 switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
ADDDC Sparing	ADDDC hot standby switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Set NGN Die Sparing	Set the NGN Die hot standby switch settings, and option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
NGN Die Sparing Aggressiveness	NGN Die hot standby setting, the option value range is 0~255, 0 means Die has no hot standby.	128
Patrol Scrub	Patrol Scrub Switch settings, option parameters: Enabled: Enabled Disabled: Disabled	Enabled
Patrol Scrub Interval	Patrol Scrub interval setting, the unit is hour, the range is 0~24	24
Patrol Scrub Address Mode	Patrol Scrub address mode settings, option parameters are: System Physical Address Reverse Address	System Physical Address

4.9.5 IIO Configuration

IIO Configuration interface is for configuring the PCIe slot. Specific parameters are shown in

the table, IIO Configuration interface is shown in the figure

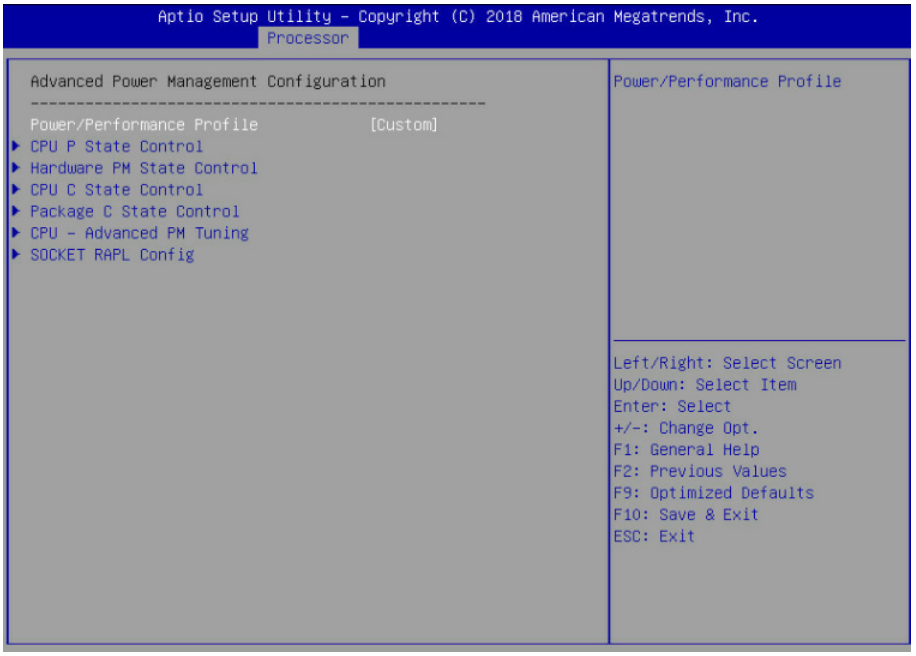


Description Table of IIO Configuration Interface

Interface parameter	Function Description	**Defaults**
Socket N Configuration	The Socket N configuration submenu is used to set the Link speed and Max Payload Size of CPU0's PCIE, ASPM and other settings on the device, and display the link status, maximum link, current link rate etc of current PCIE port.	----
Intel VT for Directed I/O (VT-d)	Intel VT-d technology related settings submenu, Intel VT-d technology switch settings.	----
Intel VMD Technology	Intel VMD technology related settings submenu, VMD switch settings on each PStack of each CPU.	----
Intel AIC Rtimer/AIC SSD Technology (Non-VMD)	Intel AIC Retimer/AIC SSD technology related settings submenu, switch settings for AIC Retimer/AIC SSD technology on each PStack of each CPU.	----
PCIe Hot Plug	PCIe hot plug switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
PCI-E ASPM Support(Global)	PCIE ASPM master switch settings, option parameters are: Disabled: Disabled Per-Port: separate control for each port L1 Only: L1 only	Disabled
PCIe Max Read Request Size	PCIe maximum reading request size setting, option parameters are: Auto 128B 256B 512B 1024B 2048B 4096B	Auto

4.9.6 Advanced Power Management Configuration

The Advanced Power Management Configuration interface is the CPU power management related option setting, the specific parameters are shown in the table, Advanced Power Management Configuration interface is shown in the figure.

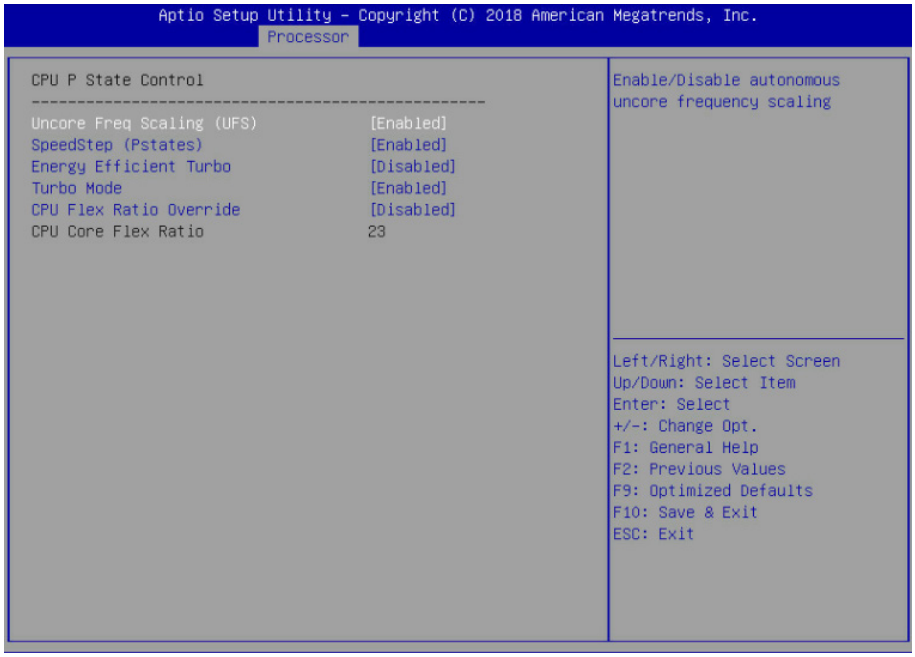


Description Table of Advanced Power Management Configuration Interface

Interface parameter	**Function Description**
CPU P State Control	CPU P state control settings submenu
Hardware PM State Control	Hardware Power Management Status Control Submenu
CPU C State Control	CPU C State control settings submenu
Package C State Control	Package C State Control submenu
CPU-Advanced PM Tuning	CPU performance and energy saving adjustment submenu
Socket RAPL Configuration	Socket RAPL configuration submenu

4.9.6.1 CPU P State Control

The CPU P State Control interface is the CPU P state related option setting. The specific parameters are described in the table. The CPU P State Control interface is shown in the figure.

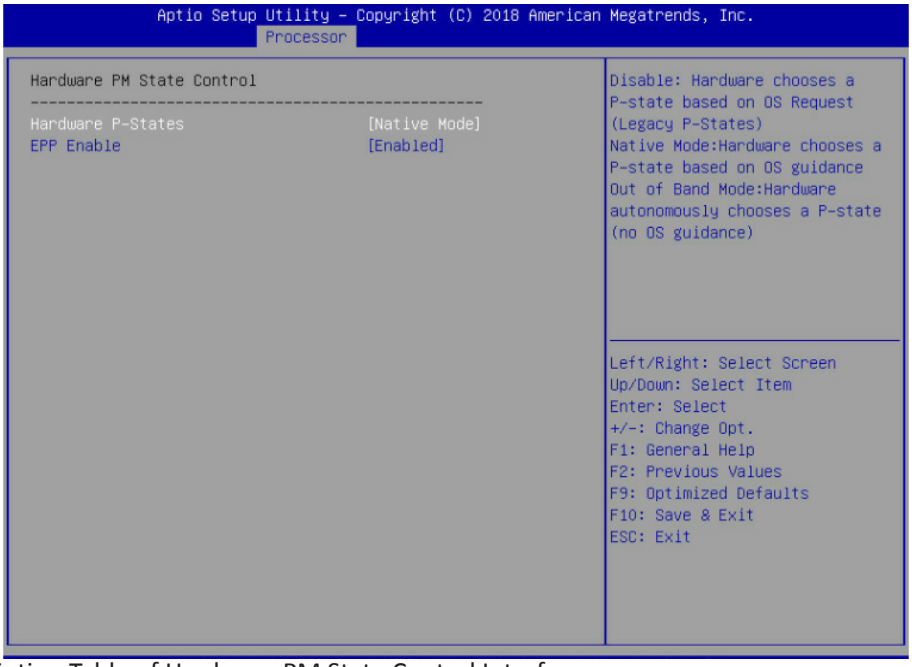


Description Table of CPU P State Control interface

Interface parameter	Function Description	**Defaults**
UncoreFreq Scaling (UFS)	UncoreFreq Scaling settings, option parameters are: Enabled Disabled(Min Frequency) Disabled(MAX Frequency) Custom	Enabled
UncoreFrequency	Uncore frequency setting, setting range is 1300-2300, which will display when UncoreFreq Scaling (UFS) is Custom option.	1300
SpeedStep(Pstates)	Smart FM switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Turbo Mode	Dynamic acceleration switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

4.9.6.2 Hardware PM State Control

The Hardware PM State Control interface is the hardware PM state-related option setting. The specific parameters are described in the table. The Hardware PM State Control interface is shown in the figure.

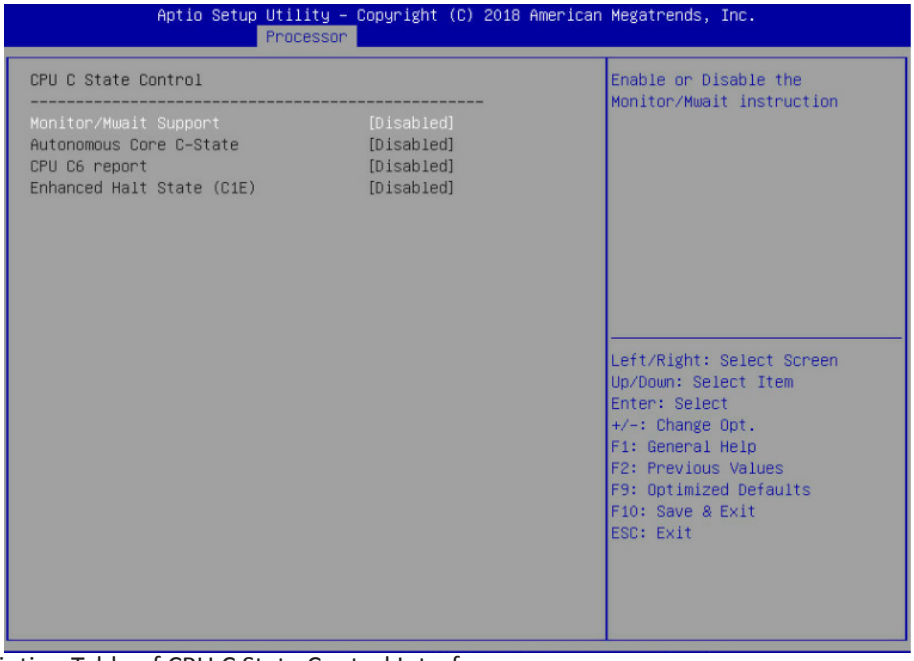


Description Table of Hardware PM State Control Interface

Interface parameter	Function Description	Defaults
Hardware P-States	The hardware selects whether the P-States is actively set by the OS, and the default value is determined based on the actual test. Option parameters are: Disabled: Hardware selects P-States based on traditional OS requests Native Mode: Hardware selects P-State based on traditional OS boot Out of Band Mode: hardware automatic selection, no OS boot required Native Mode with No Legacy Support	Native Mode
EPP Enable	EPP enable settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled

4.9.6.3 CPU C State Control

The CPU C State Control interface is a CPU C state related option setting that controls the power consumption of the CPU in the idle state. The specific parameters are as shown in the table and the CPU C State Control interface is shown in the figure.

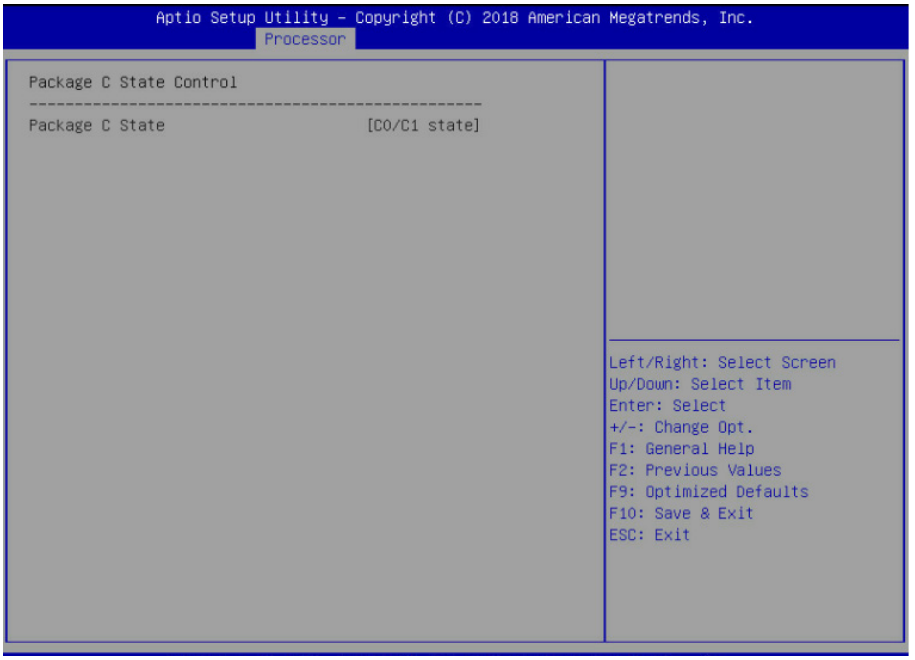


Description Table of CPU C State Control Interface

Interface parameter	Function Description	Defaults
Monitor/Mwait Support	Monitor/Mwait supports switch settings, and option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Autonomous Core C-State	The independent core C state switch is set, the option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
CPU C6 report	Report the C6 state switch settings to the OS, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Enhanced Halt State (C1E)	C1E switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled

4.9.6.4 Package C State Control

The Package C State Control interface is the Package C state related option setting. The specific parameters are described in the table, and Package C State Control interface is shown in the figure.

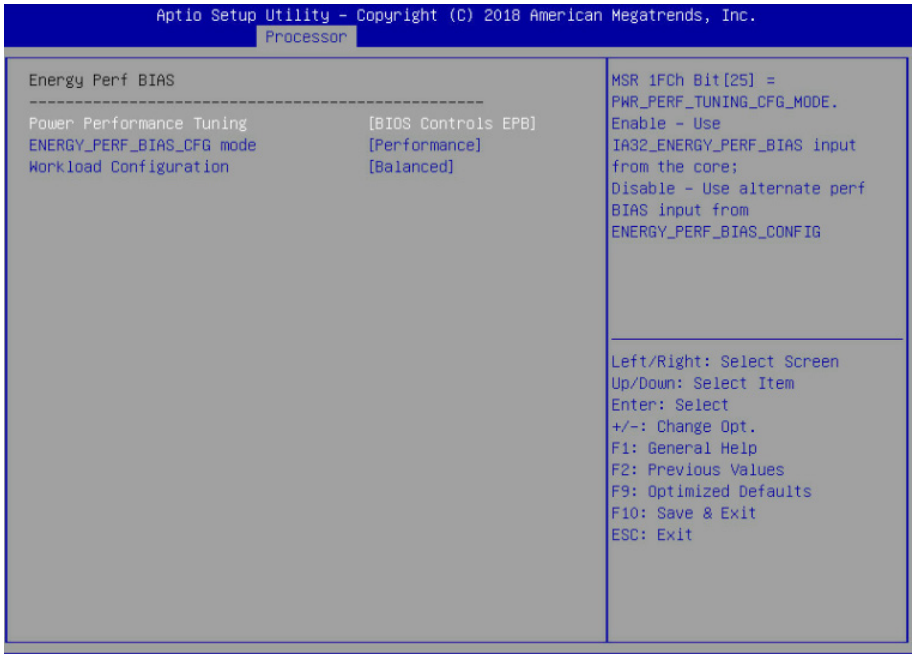


Description Table of Package C State Control Interface

Interface parameter	Function Description	Defaults
Package C State	Package C State settings, option parameters are: C0/C1 state C2 state C6(non Retention) state C6(Retention) state No Limit	C0/C1 state

4.9.6.5 CPU-Advanced PM Tuning

The CPU-Advanced PM Tuning interface is the CPU energy-saving performance related option setting, where the Energy Perf BIAS menu is available. The specific parameters are shown in the table and Energy Perf BIAS interface is shown in the figure.

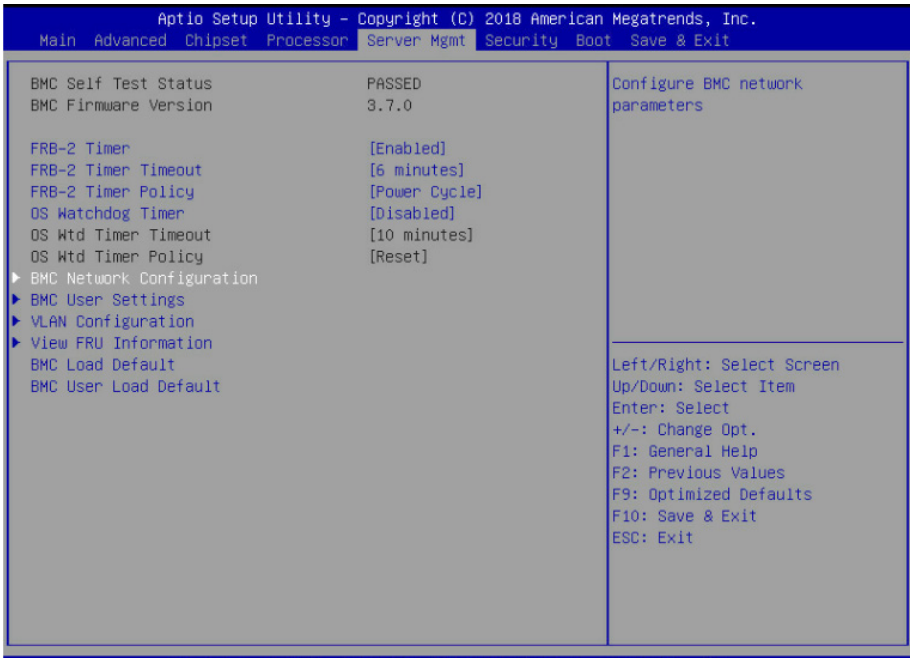


Description Table of Energy Perf BIAS Interface

Interface parameter	Function Description	Defaults
Power Performance Tuning	Energy-saving performance adjustment settings, option parameters are: OS Controls EPB: OS Controls Energy Saving Performance Adjustment BIOS Controls EPB: BIOS Controls Energy Saving Performance Adjustment	OS Controls EPB
ENERGY_PERF_BIAS_CFG Mode	Energy-saving performance management settings, option parameters are: Performance Balanced Performance Balanced Power Power This item can be set when Power Performance Tuning is set to BIOS Controls EPB.	Performance
Workload Configuration	The workload feature optimization settings, the option parameters are: UMA NUMA	

4.10 Sever Mgmt

The Server Mgmt interface is the server management related option setting that includes watchdog, BMC network settings, BMC user settings, system health information etc. The specific parameter description is shown in the table, Server Mgmt interface as shown.



Description Table of Server Mgmt Interface

Interface parameter	Function Description	Defaults
BMC Self Test Status	BMC self-test status	----
BMC Firmware Version	Current Board BMC firmware version number	----
FRB-2 Timer	FRB-2 clock switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
FRB-2 Timer timeout	FRB-2 clock timeout setting, option parameters are: 3 minutes 4 minutes 5 minutes 6 minutes	6 minutes
FRB-2 Timer policy	The strategy settings upon the FRB-2 clock expires, and the option parameters are: Do Nothing Reset Power Down Power Cycle	Power Cycle
OS Watchdog Timer	OS watchdog timer switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
OS Wtd Timer timeout	OS watchdog timer timeout setting, option parameters are: 5 minutes 10 minutes 15 minutes 20 minutes	10 minutes

OS Wtd Timer policy	The strategy setting upon OS watchdog clock is timeout, the option parameters are: Do Nothing Reset Power Down Power Cycle	Reset
BMC network configuration	BMC network configuration submenu	----
BMC User Settings	BMC User Settings Submenu	----
VLAN Configuration	VLAN configuration submenu	----
View FRU information	View FRU information submenu	----

4.10.1 BMC Network Configuration

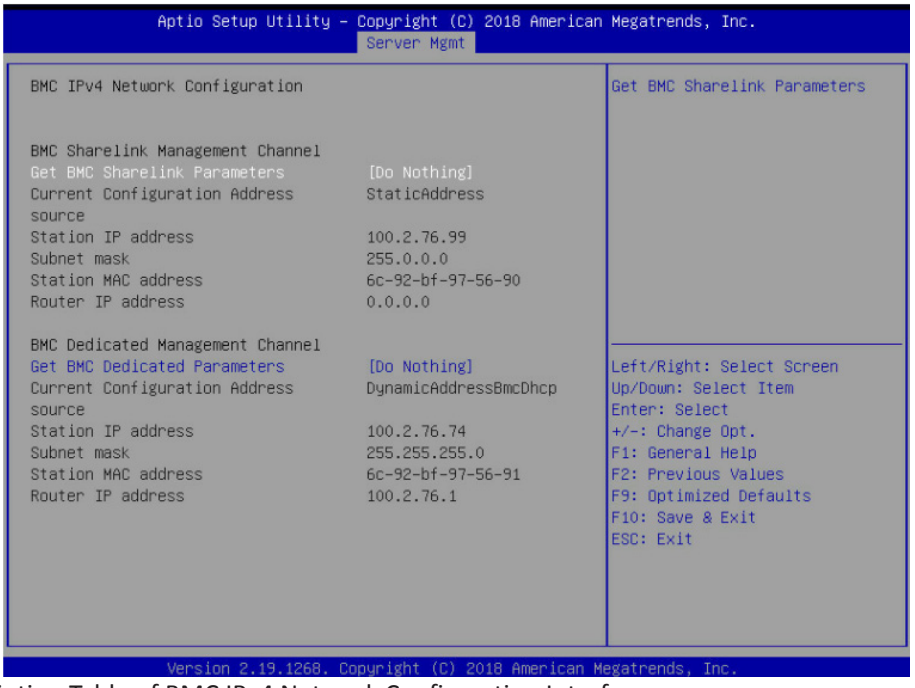
The BMC network configuration interface is used to configure the BMC management network through the BIOS. The specific parameters are shown in the table, BMC network configuration interface is shown in the figure.

Description Table of BMC network configuration Interface

Interface parameter	**Function Description**	**Defaults**
Sharelink Network	BMC Sharelink network switch settings, takes effective immediately after successful setup	Enabled
BMC IPv4 Network Configuration	BMC IPv4 network parameter settings	----
BMC IPv6 Network Configuration	BMC IPv6 network parameter settings	----

4.10.1.1 BMC IPv4 Network Configuration

The BMC IPv4 Network Configuration interface is used to configure the BMC IPv4 management network through the BIOS. The specific parameter description is shown in the table, the BMC IPv4 Network Configuration interface is shown in the figure.

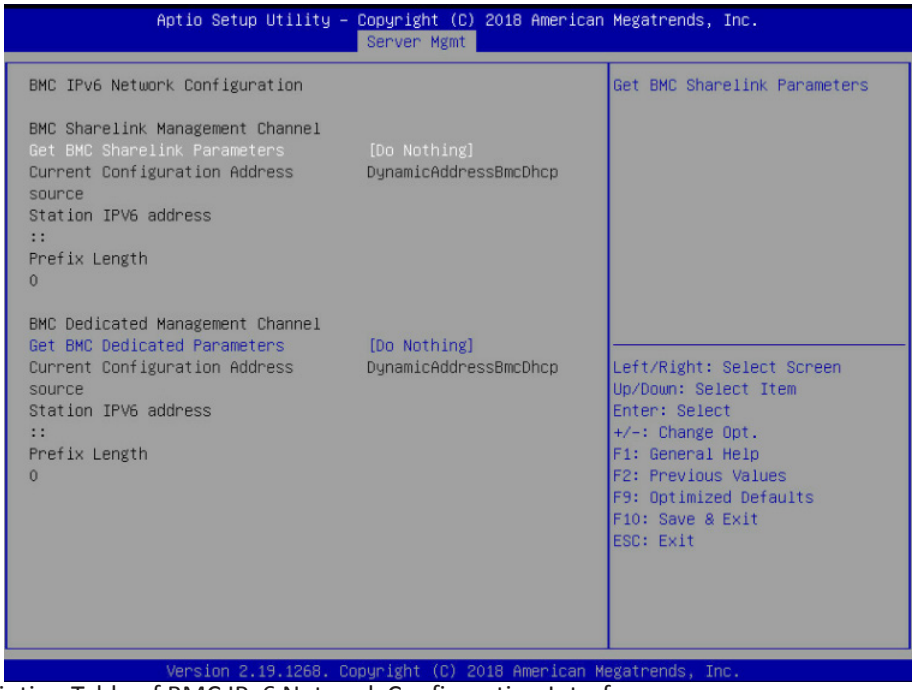


Description Table of BMC IPv4 Network Configuration Interface

Interface parameter	Function Description	Defaults
Get BMC Sharelink/Dedicated Parameters	Obtain the mode setting of the BMC management network port parameters, and option parameters are as follows: Do Nothing: Do nothing Auto: Obtain the current BMC network settings automatically. Manual: Manually setting up BMC network	Do Nothing
Configuration Address Source	Configure the BMC network status. The option parameters are: Unspecified, which means BMC network parameters will not be modified. Static: static DynamicBmcDhcp (dynamically obtaining BMC network parameters) The parameter takes effect immediately after the parameter setting is successful.	Unspecified
Current Configuration Address	Current BMC configuration address status	----
Station IP adderess	IP address of port	----
Subnet mask	Subnet mask	----
Station MAC address	MAC address of Port	----
Router IP address	Router IP address	----

4.10.1.2 BMC IPv6 Network Configuration

The BMC IPv6 Network Configuration interface is used to configure the BMC IPv6 management network through the BIOS. The specific parameter description is shown in the table. The BMC IPv6 Network Configuration interface is shown in the figure.



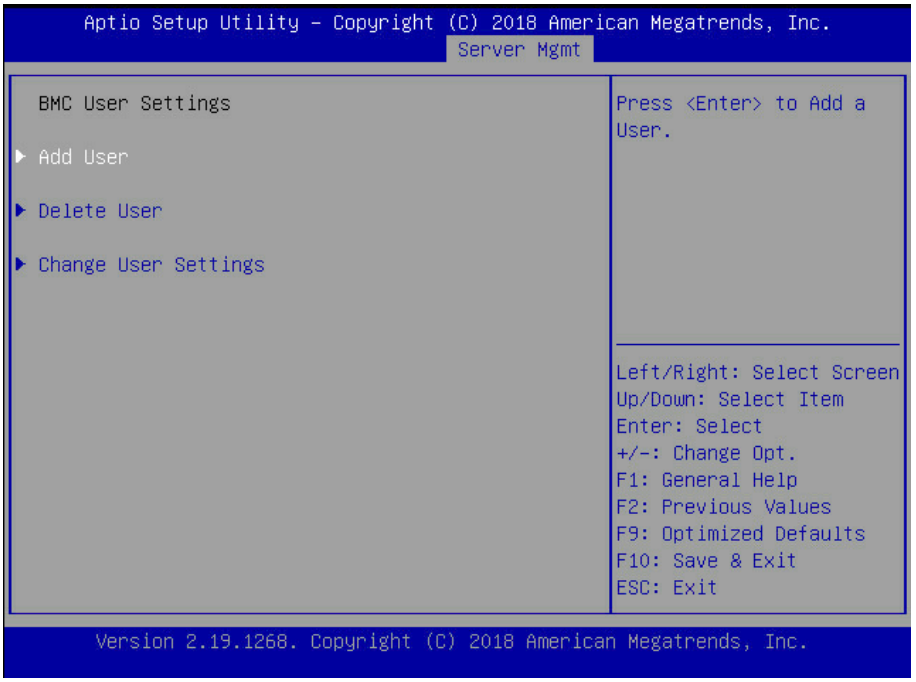
Description Table of BMC IPv6 Network Configuration Interface

Interface parameter	Function Description	Defaults
Get BMC Sharelink/ Dedicated Parameters	Obtain the mode setting of the BMC management network port parameters, and option parameters are as follows: Do Nothing: Do nothing Auto: Obtain the current BMC network settings automatically. Manual: Manually setting up BMC network	Do Nothing
Configuration Address Source	Configure the BMC network status, and option parameters are: Unspecified, which means BMC network parameters will not be modified. Static: static DynamicBmcDhcp: Dynamically obtain BMC network parameters. The parameter takes effect immediately after the parameter setting is successful.	Unspecified
Current Configuration Address	Current BMC configuration address status	----
Station IPv6 adderess	IPv6 address of port	----
Prefix Length	Ipv6 prefix length	----

4.10.2 BMC User Settings

The BMC User Settings interface is used to configure the BMC user through the BIOS. The specific parameter description is shown in the table, BMC User Settings interface is shown in

the figure.

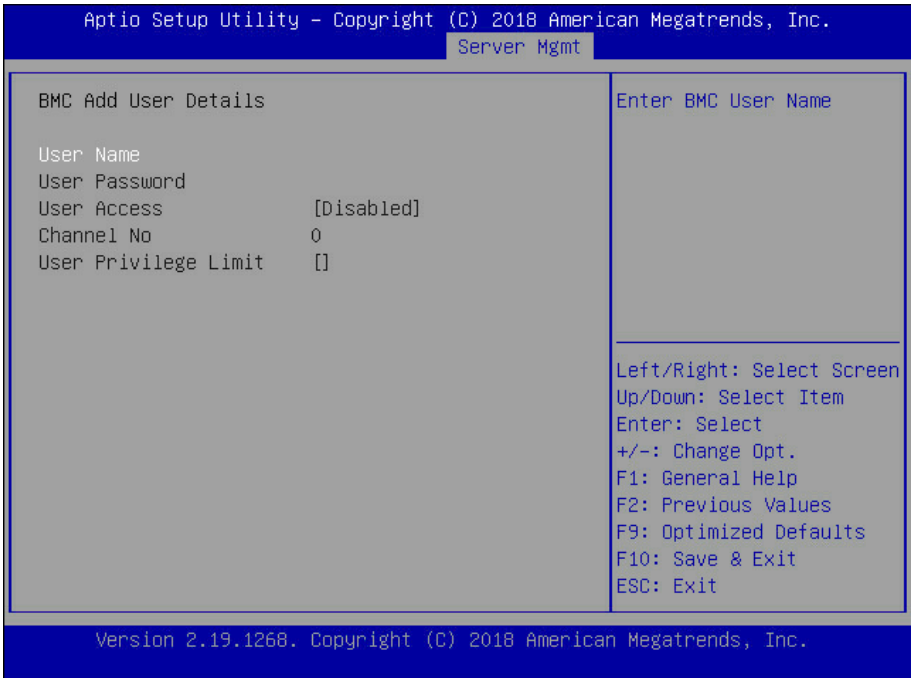


Description Table of BMC User Settings Interface

Interface parameter	Function Description
Add User	Add user submenu
Delete User	Delete user submenu
Change User Settings	Modify user settings submenu

4.10.2.1 Add User operation

The Add User interface is used to add BMC user through the BIOS. After the addition is completed, it will take effect immediately, and then user will be added to the BMC user list. The specific parameter description is shown in the table, Add User interface is shown in the figure.



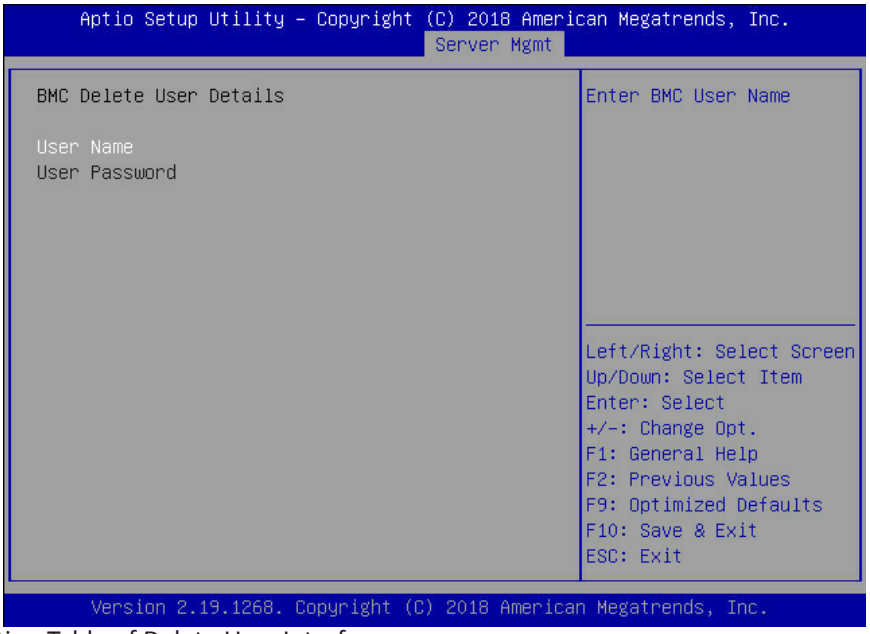
Description Table of Add User Interface

Interface parameter	Function Description	Defaults
User Name	User name setting, up to 16 characters.	----
User Password	User password setting, password characters must contain at least 8 characters and a maximum of 20 characters including uppercase and lowercase letters, special characters and numbers.	----
Channel NO	BMC channel setting, enter 1 or 8	----
User Privilege Limit	User permission settings, option parameters are: Reserved Callback User Operator Administrator After the setting is successful, “Set User Access Command Passed” will be prompted, and the BMC User will take effect immediately.	Reserved

⚠ **Note:** when enabling added user to enable, you need to go to the Change User settings interface, set the User item to [Enabled] to log in to the BMC Web interface.

4.10.2.2 Delete User

The Delete User interface is used to delete the BMC user through the BIOS. The deletion will take effect immediately after the deletion, and then user will not be able to log in to the BMC Web interface. The specific parameter description is shown in the table, Delete User interface is shown in the figure.

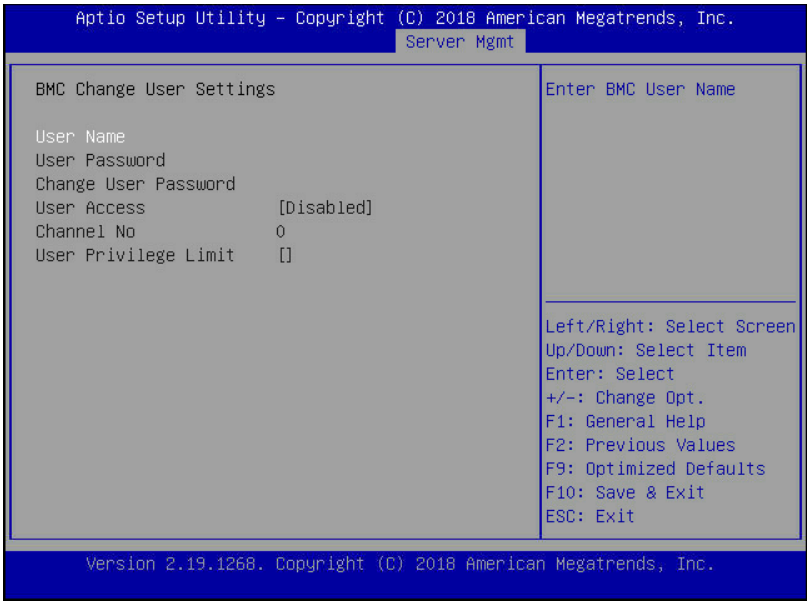


Description Table of Delete User Interface

Interface parameter	Function Description
User Name	Enter the name of the user you want to delete
User Password	If you want to delete the user password, please enter the password correctly, and then "User Deleted!!!" will pop up. The users who deleted successfully will take effect immediately in the BMC, and then they no longer be able to log in to the BMC web interface.

4.10.2.3 Change User Settings

Change User Settings interface is used to modify the BMC user settings through the BIOS. The specific parameter description is shown in the table, Change User Settings interface is shown in the figure.

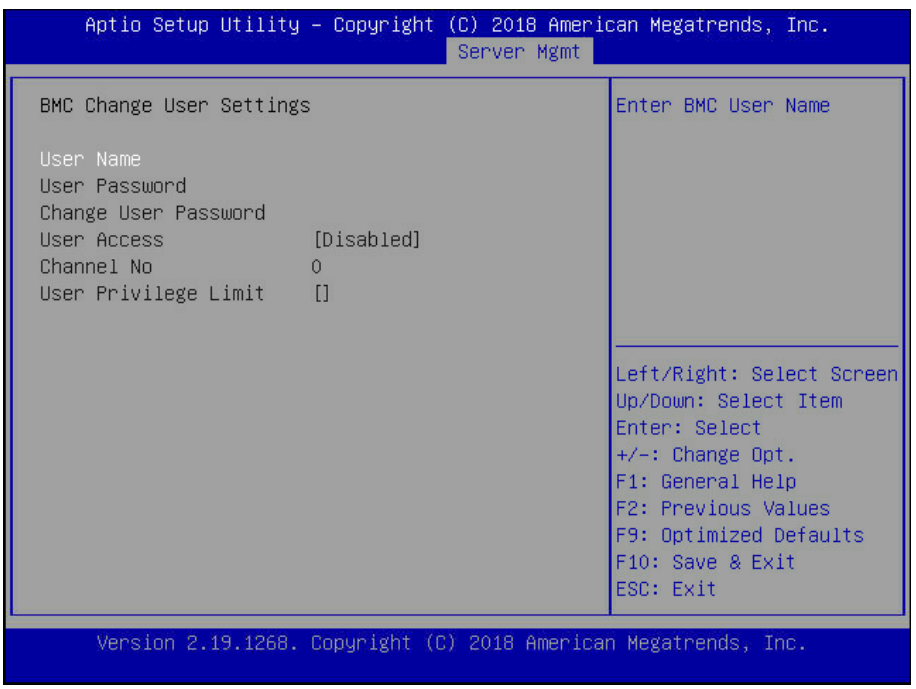


Description Table of Change User Settings Interface

Interface parameter	Function Description	Defaults
User Name	Enter the user name to be modified	----
User Password	Enter the user password to be modified. Only the name and password are entered correctly the following options can be modified.	----
User	User permission switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Disabled
Change User Password	Change the user password, the password must contain at least 8 characters, and a maximum of 20 characters including uppercase and lowercase letters, special characters and numbers.	----
Channel NO	BMC channel setting, enter 1 or 8	0
User Privilege Limit	Modify the user permission settings, the option parameters are: Reserved Callback User Operator Administrator	Reserved

4.10.3 VLAN Configuration

VLAN Configuration Interface BIOS sets BMC VLAN network parameters. The specific parameter description is shown in the table, VLAN Configuration interface is shown in the figure

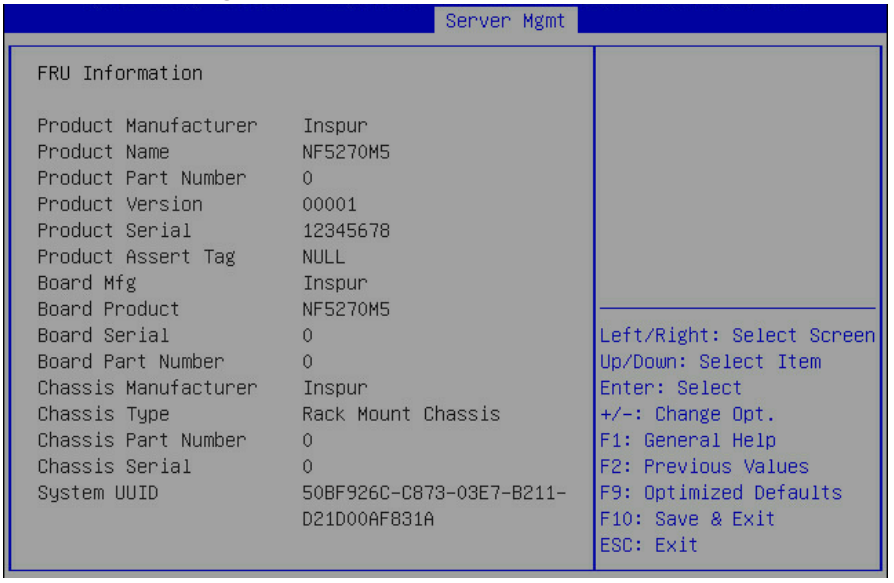


Description Table of VLAN Configuration Interface

Interface parameter	Function Description	Defaults
Sharelink/Dedicated VLAN Control	BMC shared port/private port VLAN control switch settings, and option parameters are: Enabled: Enabled Disabled: Disabled If VLAN is enabled, you need to set the VLAN ID to set the VLAN to be available.	Disabled
Sharelink/Dedicated VLAN ID	BMC shared port/private port VLAN ID setting, range 2~4094 After the VLAN ID is set, it takes effect immediately.	0
Sharelink/Dedicated VLAN Priority	BMC shared port/private port VLAN priority setting, range 1~7 After the VLAN Priority is set, it takes effect immediately.	0

4.10.4 View FRU Information

View FRU information displays the information of the BMC FRU read by the BIOS. Each time the system BIOS is restarted, it interacts with the BMC to keep the FRU information updated synchronously. Specific parameters are shown in the table, View FRU information Display interface is shown in the figure.

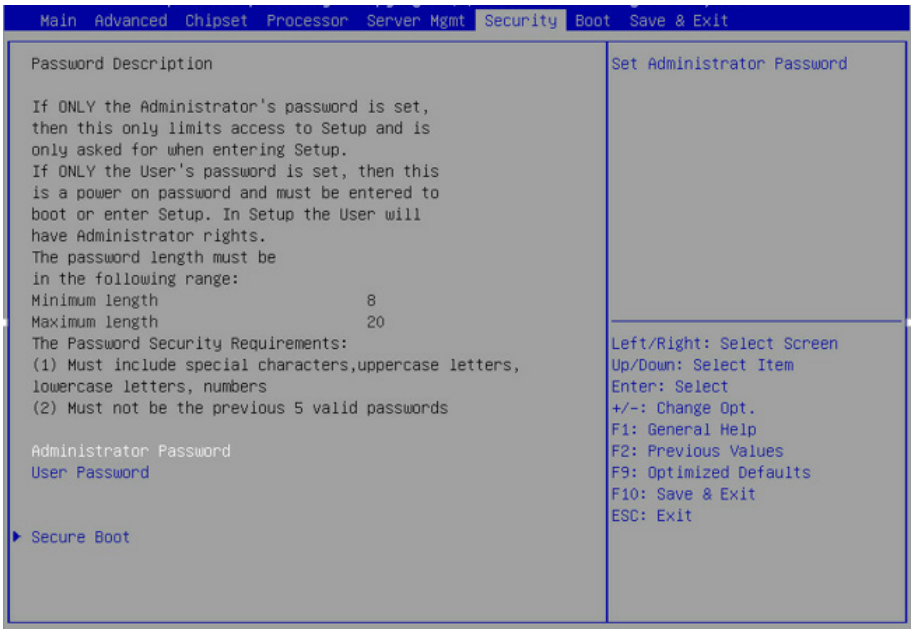


Description Table of View FRU Information Interface

Interface parameter	Function Description	Defaults
System Manufacturer	System manufacturer	----
System Product Name	System product name	----
System Product Part Number	System Part Number	----
System Version	system version	----
System Serial Number	System serial number	----
Board Manufacturer	Board manufacturer	----
Board Product Name	Board product name	----
Board Serial Number	Board serial number	----
Board Part Number	Board Part Number	----
Chassis Manufacturer	Chassis manufacturer	----
Chassis Product Name	Chassis product name	----
Chassis Serial Number	Chassis serial number	----

4.11 Security

The Security interface is used by administrator and user to set password. The specific parameters are shown in the table, Security interface is shown in the figure.

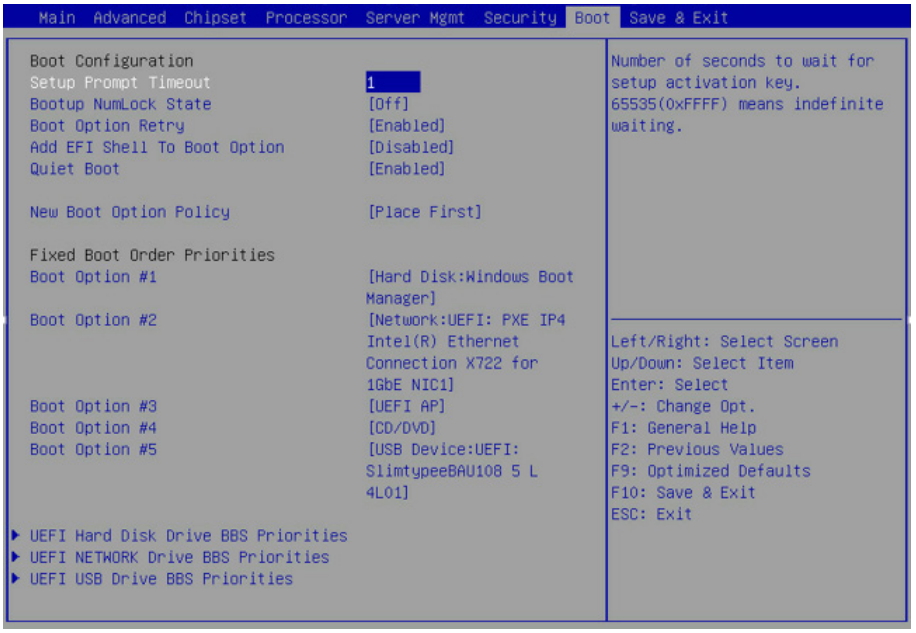


Description Table of Security Interface

Interface parameter	Function Description	Defaults
Administrator Password	Create an administrator password. The password must contain at least 8 characters, and a maximum of 20 characters, including uppercase and lowercase letters, special characters and numbers.	----
User Password	Create a normal user password. The password must contain at least 8 characters, and a maximum of 20 characters, including uppercase and lowercase letters, special characters and numbers.	----
Secure Boot	Secure boot menu	----

4.12 Boot

Boot interface is related to the boot settings, including the boot mode settings, sequence settings and process settings. The specific parameters are shown in the table, and Boot interface is shown in the figure.

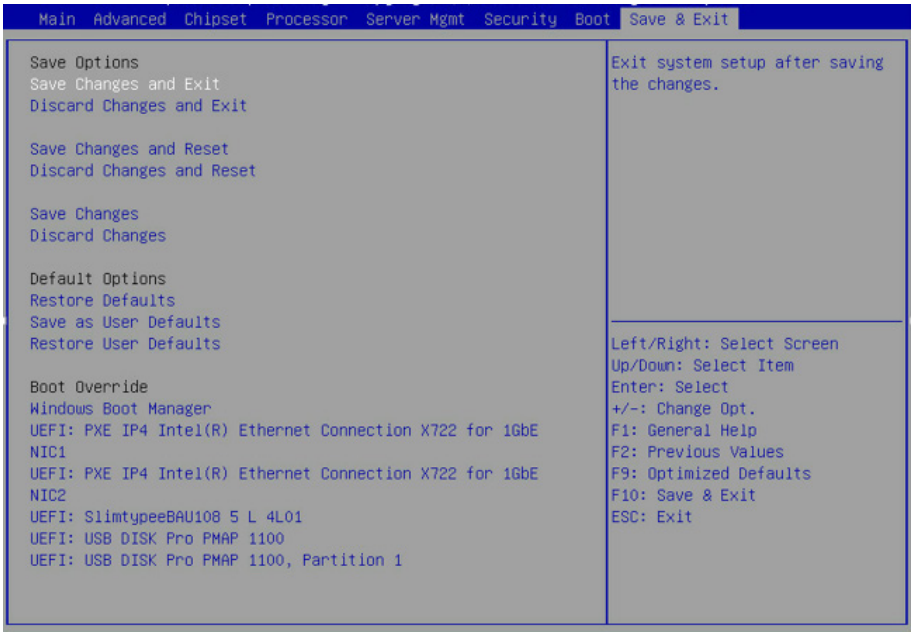


Description Table of Boot Configuration Interface

Interface parameter	Function Description	Defaults
Setup Prompt Timeout	Setup prompts the timeout setting and sets the time to wait for the Setup activation key with the maximum value of 65535 seconds.	1
BootupNumLock State	During the boot process, you can set keyboard Numlock indicator status switch, and option parameters are: On: On Off: Off	Off
Boot Options Retry	Device polling switch settings, option parameters are: Enabled: Enabled Disabled: Disabled	Enabled
Quiet Boot	Quiet mode boot switch settings, option parameters are: Enabled: Enabled Disabled: Disabled When it is set to Enabled, the boot logo is displayed as the logo set by the manufacturer. When it is set to disabled, the boot screen is displaying Post interface in text mode.	Enabled
New Boot Option Policy	New UEFI boot option policy settings, option parameters are: Default Place First Place Last	Place First
Fixed Boot Order Priorities Boot Option #X	Boot option priority setting	----
XXXX Driver BBS Priorities	XXXX device BBS priority setting	----

4.13 Save & Exit

Save & Exit interface is used to set BIOS parameter modification save and exit related option. The specific parameter description is shown in the table, and the Save & Exit interface is shown in the figure.



Description Table of Save & Exit Interface

Interface parameter	Function Description
Save Changes and Exit	Save changes and exit
Discard Changes and Exit	Discard changes and exit
Save Changes and Reset	Save changes and reset
Discard Changes and Reset	Discard Changes and Reset
Save Changes	Save changes
Discard Changes	Discard Changes
Restore Defaults	Restore defaults
Save as user Defaults	Save as user defaults
Restore user Defaults	Restore user defaults
Boot Override	Boot options override, you can select the boot items listed below

4.14 Firmware Update

BIOS upgrade version, you can choose to update under UEFIshell or OS.

4.14.1 Upgrade BIOS under UEFI Shell

1) Inspur Logo appears during system startup and the prompt “Press <DEL> to SETUP or

<TAB> to POST or <F11> to Boot Menu or <F12> to PXE Boot.” is displayed at the bottom. Press F11 to start the Boot Menu as shown in the following figure, select it by pressing the up and down keys and press Enter to enter UEFI: Built-in EFI Shell.

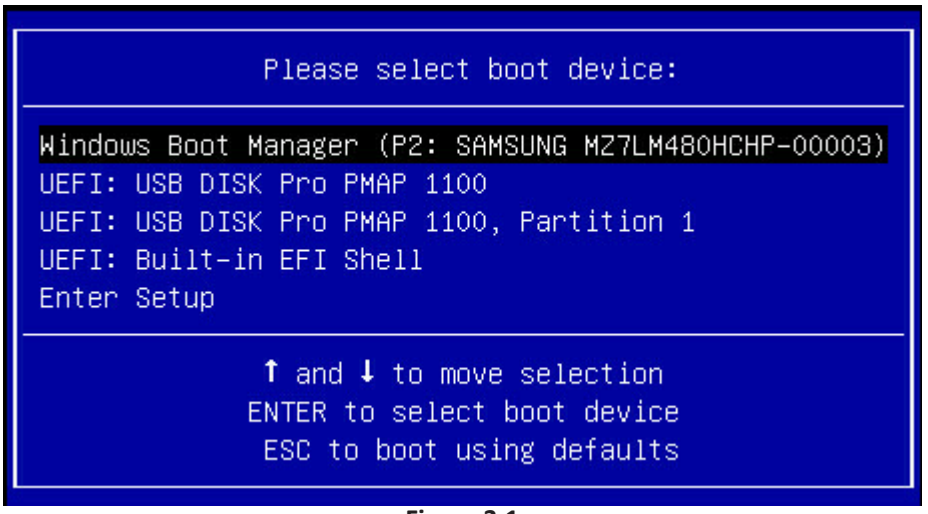


Figure 3.1

2) Enter the storage disk where the AfuEfi64 package is stored, use cd commands to access to the AfuEfi64 folder, and BIOS.bin is the 32M BIOS+ME file to be updated. as shown in the following figure.

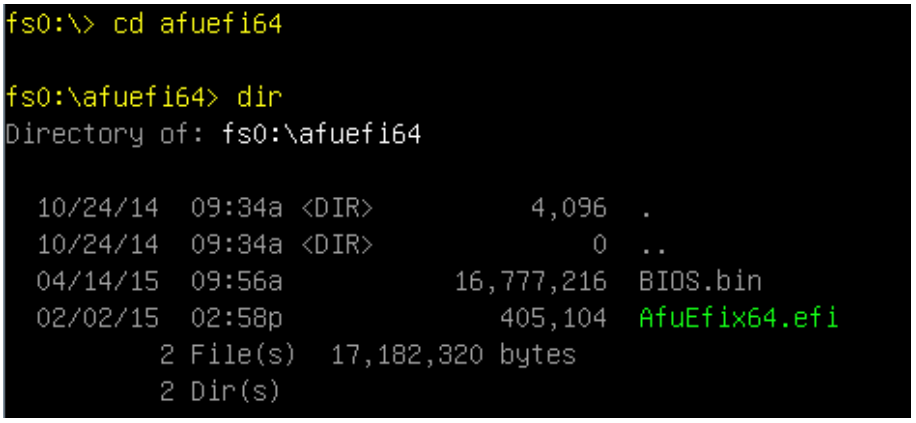


Figure 3.2

3) When the ME part is not updated, it shall only upgrade the 16M BIOS command: AfuEfix64.efi BIOS.bin /b /p /n /x /k /l, the refresh process is shown in the figure. After the update is complete, it is recommended to shut it down first and power on again.

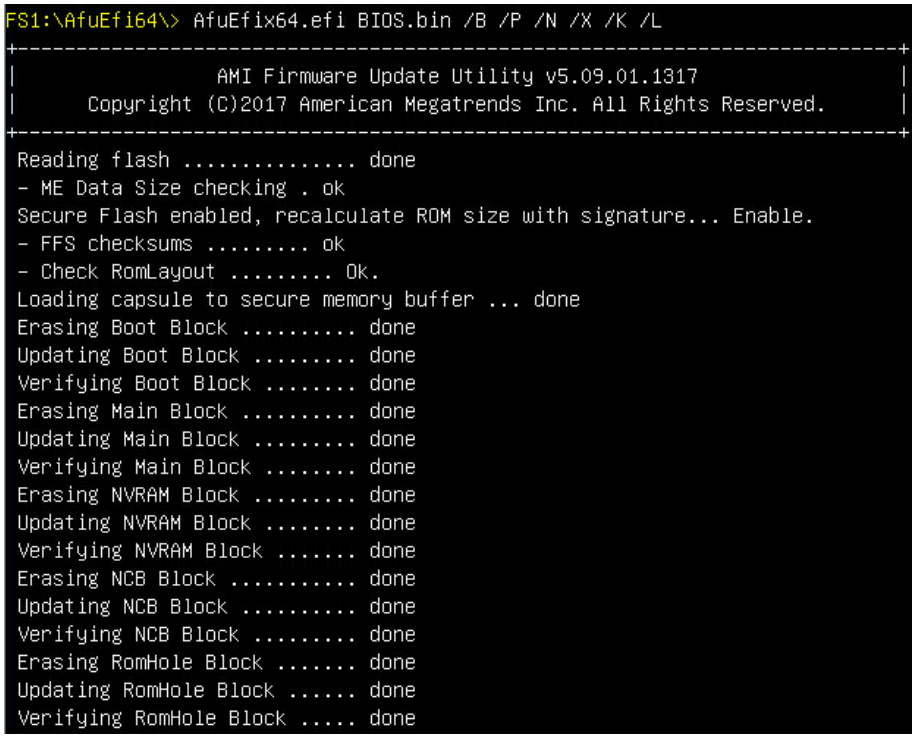


Figure 3.3

4) When the ME part is updated, the 32M ME+BIOS upgrade command is: AfuEfix64.efi BIOS.bin /b /p /n /x /k /l /me, the refresh process is shown in the figure.

Parameter Description:

- /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.

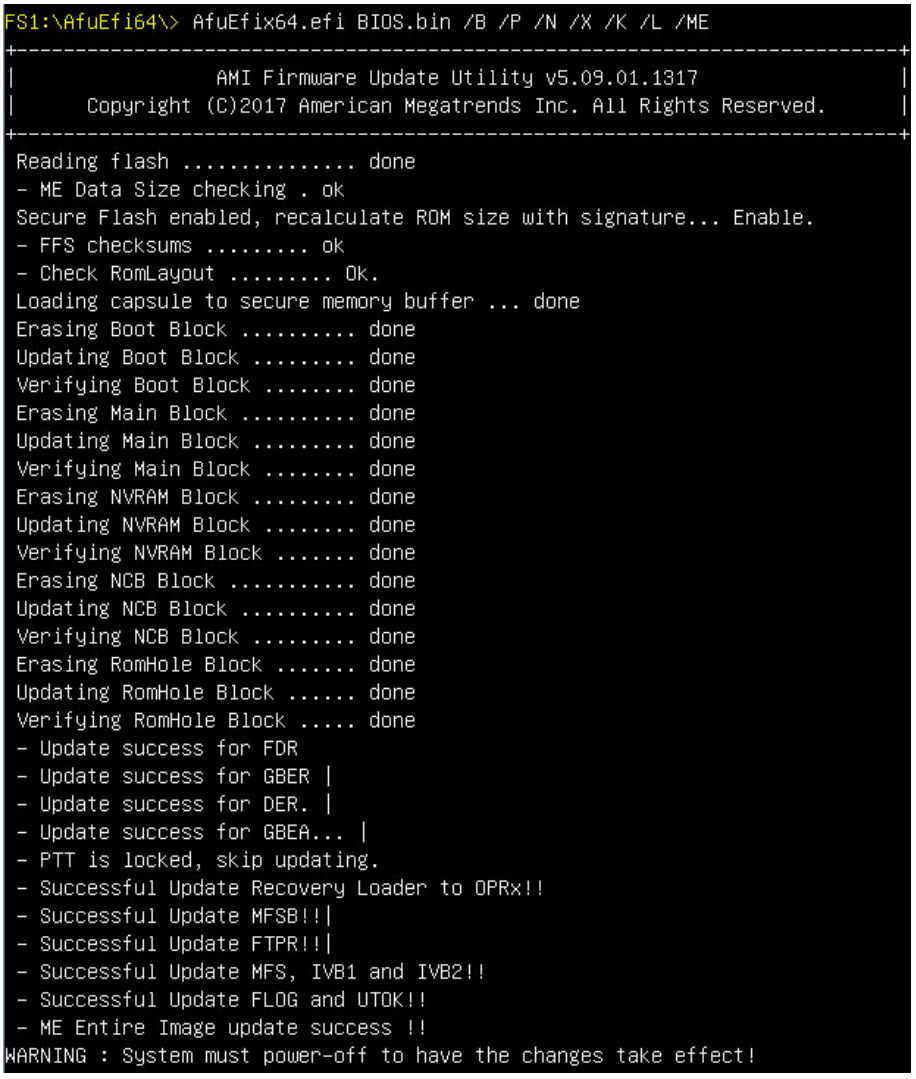


Figure 3.4

Note: After the update is completed, please cut off the power and confirm that there is no power remaining on the board, then power it on again.

4.14.2 Upgrade BIOS under Linux system

Linux OS uses afulnx tool to upgrade BIOS. The afulnx tool has 32-bit and 64-bit version. Take Linux 64bit OS as an example, use afulnx_64 tool to enter the directory of afulnx_64 tool, and put the corresponding BIOS bin file into this folder.

When the ME part is unchanged, just upgrade the BIOS section and execute the command:

./afulnx_64 BIOS.bin /b /p /n /x /k /l as shown in the following figure.

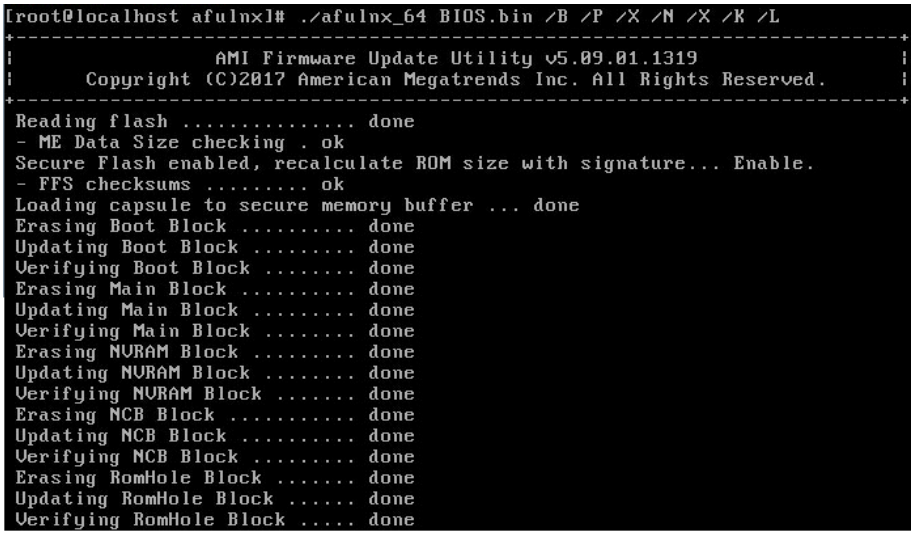


Figure 3.4

When the ME part is changed, you need to update the BIOS version and ME at the same time, execute the command: ./afulnx_64 BIOS.bin /b /p /n /x /k /l /me, BIOS.bin - the bin file of the BIOS to be updated as shown in the following figure.

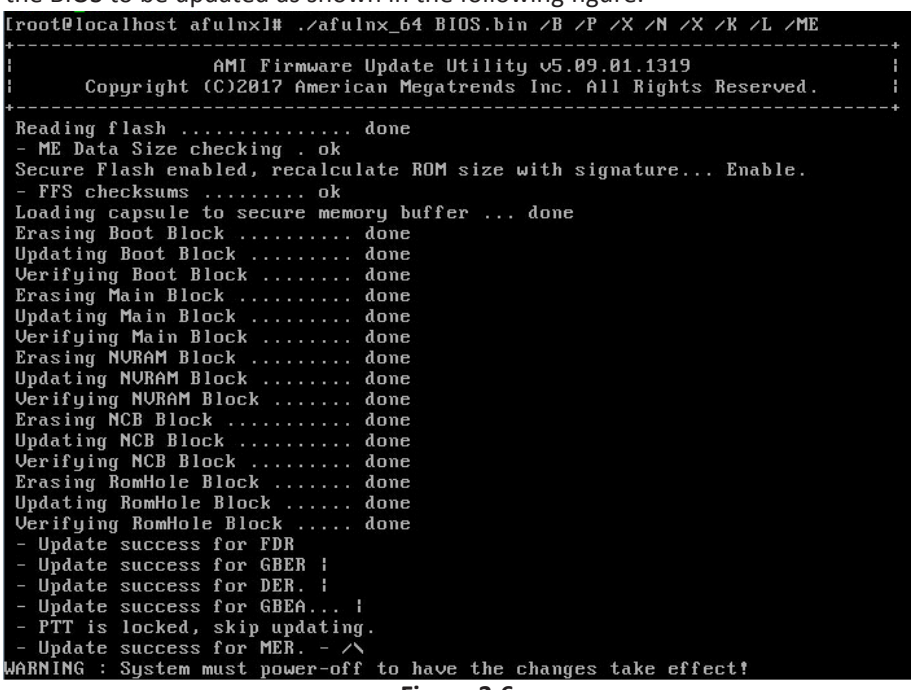


Figure 3.6

Note: 1. Linux system should run under root afulnx_64 tool.

2. After updating BIOS+ME, please cut off the power and confirm that there is no power on the board, then power it on again.

5 BMC Settings

5.1 Introduction

This section introduces the specifications that the management software follows and its main functions.

The Inspur Server Management System is a control unit for server management, which is compatible with the management standard IPMI2.0 specification.

Below are the main functions of the Inspur Server Management System:

- Remote control

Achieves server control via functions such as KVM (Keyboard Video and Mouse), SOL (Serial Over LAN), virtual media, etc.

Note: SOL function must be implemented via third-party tools, such as IPMITool.

- Warning management

Reports warning message in real time, and carries out corresponding solutions according to the information.

- State monitoring

Monitors the running states of all monitoring units in real time.

- Device information management

Provides device version, model and asset information.

- Heat dissipation control

It could adjust fan speed dynamically according to the ambient temperature and workload.

- Supports IPMITool management

Supports the command operation sent by IPMITool. The IPMITool is downloadable: **http://ipmitool.sourceforge.net/manpage.html**

- Supports WEB interface management

Provides a friendly and visual interface management. Configuration can quickly be completed as well as query tasks, by simply clicking on the interface.

- Supports account centralized management

Store accounts in the Active Directory server, direct the authentication process to server, and achieve management system login with domain accounts.

5.2 Functional Modules

This chapter introduces the Inspur Server Management System module composition, as well as the functions of these modules.

5.2.1 Module Composition

The Inspur Server Management System is mainly composed of IPMI module, command line module, WEB module, KVM Over IP and virtual media.

●The command line module attains the calling of IPMI module. The user performs the operation on IPMI module via command lines.

●The WEB module attains daily management on server in the form of visual interface via calling IPMI commands, and the WEB module integrates functions of KVM and virtual media.

Note: BMC out-of-band access control is enabled by default, allowing WEB or ipmitool out-of-band access.

5.2.2 IPMI Module Introduction

IPMI module attains management of the server system according to the IPMI2.0 standard. The functions of the IPMI module include:

●System real-time monitoring

Provides the alarm report and alarm indication in the event of fault detection.

●System remote control

Meets the management requirements such as remote power-on/off, and business system reset via command lines and Web.

5.2.3 Command Line Function Introduction

You can login to BMC command line from the management interface through SSH (Secure Shell) and Telnet protocols. For specific operations, please see the chapter of Login to Command Line.

5.2.4 Remote Control Module Introduction

The remote control module includes:

● KVM Over IP: A management method that carries out monitoring and control on remote devices via local video, keyboard and mouse to the client, enabling the operation of remote devices in real-time.

● Virtual Media: A method of providing remote access on local media (CD-ROM, floppy drive

or CD/floppy disk iso file) in the form of virtual CD driver and floppy drive on server via the internet.

To use the remote control function, the client should be equipped with appropriate browser and Java runtime environment.

5.3 Web Module

The Web module can be accessed through browser; you can login to the management user interface to manage the server through visual operations.

5.3.1 Login Web Interface

This guide introduces the operation steps to login to the Web management interface, taking the Windows Operating System and the Firefox browser as an example.

Note: When carrying out interface operation via Web, a maximum of 20 users can be logged in at the same time.

Step 1: Ensure the management network ports on the client and server are connected to the internet.

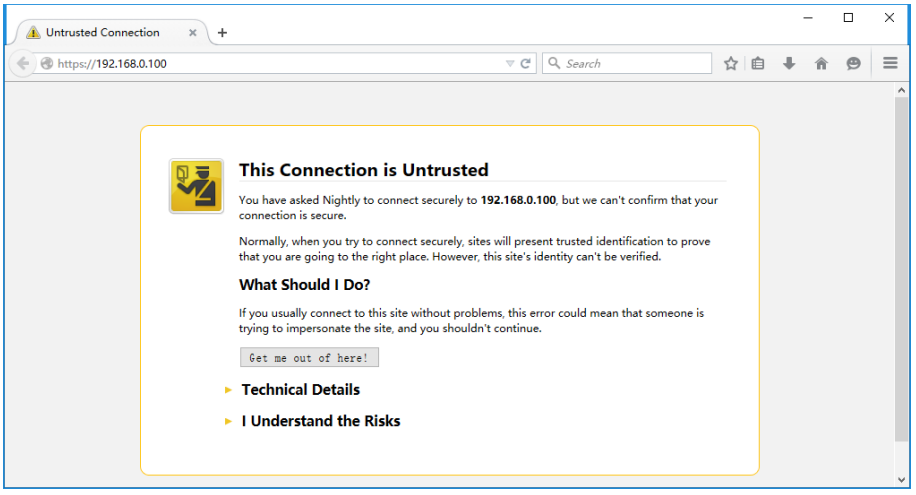
Step 2: Open the browser, and enter “http://ipaddress” in the address bar (ipaddress is the actual IP address of the management port. The default login mode is https, and the safe operation configuration is needed).

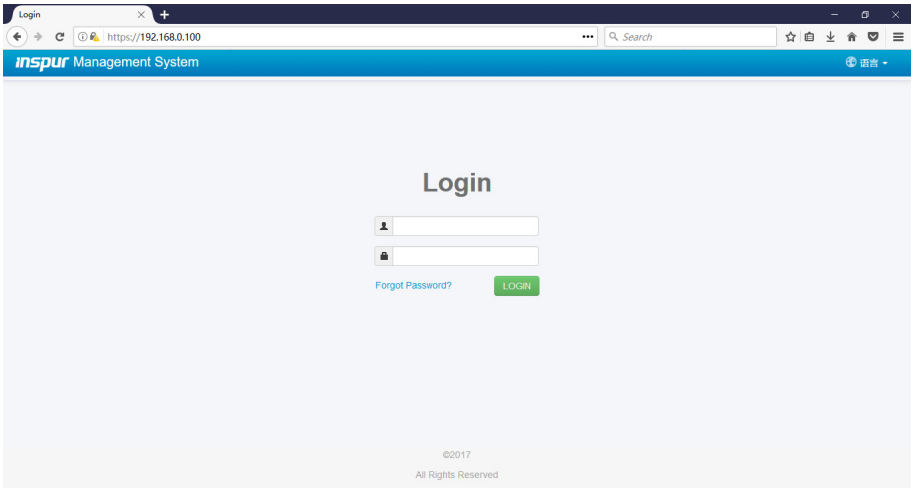
Step 3: The login interface should appear as shown below:

1. Enter the user name and password.

Note: The system provides a default user “admin” in administer user group, and the default password is “admin”. Please change the default password in time after the first login.

2. Click “Login”, to enter the management interface.



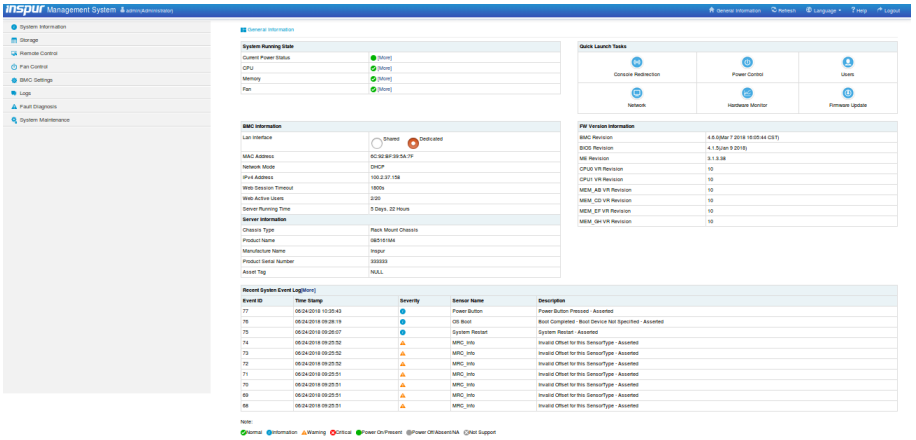


5.3.2 Web Interface Introduction

The Web interface helps users accomplish server management. The Web interface also has a help function so users can click the help button 

in the case that they may need it.

The Web interface is divided into several parts, as shown in the following figure.



- The name of the Web interface is displayed on top left of the interface.
- The meanings of all buttons on top right of the interface:

✧ OverView Click on the Overview button, to return to the overview page.

✧ Refresh Click on the Refresh button, to refresh the page.

✧ UID:ON Click on the UID button, to turn on/off the UID LED.

✧ POWER:ON Click on the Power button, to turn on/off the server.

✧ Language Click on the Language button, to change the language (which supports Chinese and English).

✧ Help Click on the Help button to query help information on the corresponding page.

✧ Logout Click on the Logout button, to return to the login page.

- The navigation tree is on the left. Via the nodes on the tree, you can select different functional interfaces. The following functions are included:

- View the overall situation
- View system information
- Remote control
- Power management
- Event and log query
- Real-time monitoring
- Diagnosis and orientation
- System maintenance

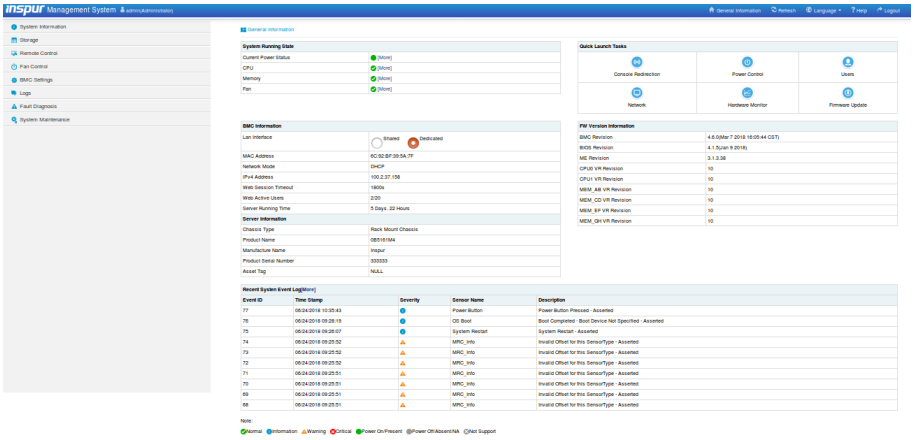
- System configuration

For detailed introduction on all functions, please refer to the following chapters.

- Specific operation interface is on the right of the interface.

5.3.3 Overview

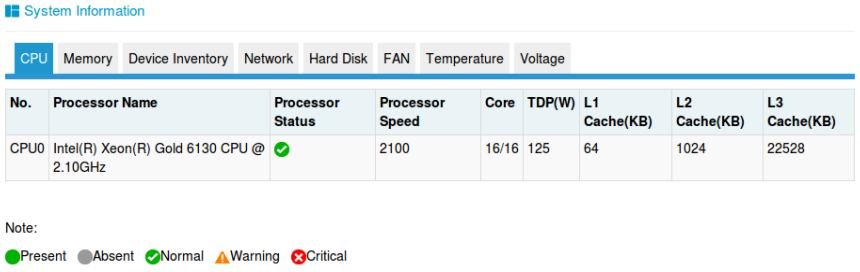
Click on Overview to open the “General Information” interface, as shown below.



5.3.4 System Information

Select “Information” on the navigation tree. It contains the interfaces of system information, as shown in the following figures below.

- Asset information: Displays system configuration information, including CPU, memory, pcie, shared nic information.
- Hardware Monitor: Displays system configuration information, including voltage monitoring information, power supply monitoring information, power module status information, processor / memory status information, fan speed information, and hard disk status monitoring information.
- BIOS setup options: Displays the key BIOS setup options information.
- FRU Information: This page displays the BMC Field Replaceable Unit file information.
- History record: Displays the history information of inlet air temperature and total power.



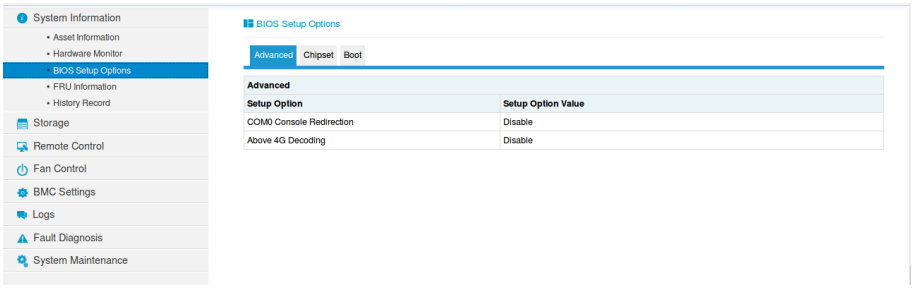
Hardware Monitor

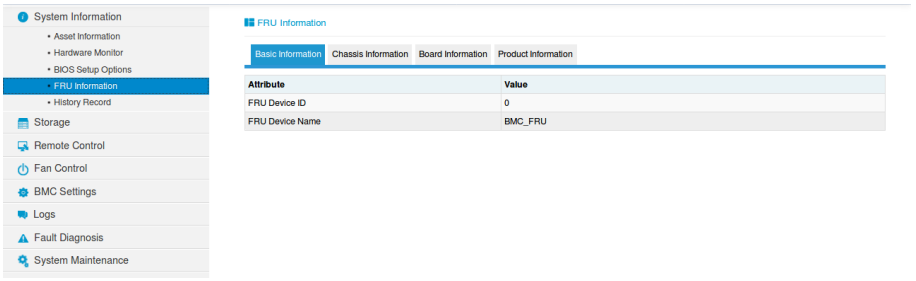
Temperature | Voltage | Processor | Memory | Drive Slot (Bay) | Power Supply | Power Unit | Fan | Event Logging disabled | Management Subsystem Health | Microcontroller / Coprocessor | Watchdog 2

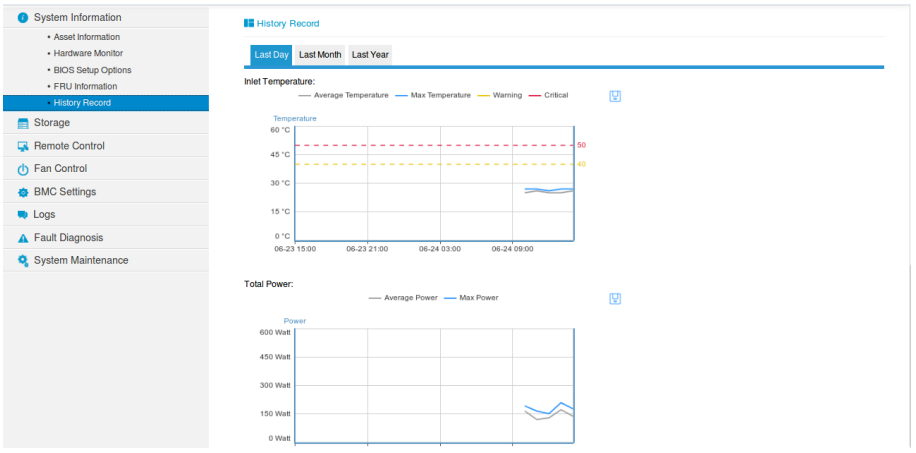
Sensor	Status	Reading	Low NRT	Low CT	Low NCT	Up NCT	Up CT	Up NF
SYS_VCCIO	✓	0.95Volts	0.69Volts	0.77Volts	0.85Volts	1.17Volts	1.25Volts	1.33V
PCH_P1V05	✓	1.06Volts	0.77Volts	0.85Volts	0.93Volts	1.17Volts	1.25Volts	1.33V
PCH_P1V5	✓	1.54Volts	1.18Volts	1.26Volts	1.34Volts	1.67Volts	1.75Volts	1.83V
SYS_12V	✓	12.408Volts	9.024Volts	9.776Volts	10.528Volts	13.536Volts	14.288Volts	15.04
SYS_3.3V	✓	3.342Volts	2.659Volts	2.8Volts	2.939Volts	3.657Volts	3.797Volts	3.937
SYS_5V	✓	5.148Volts	3.888Volts	4.176Volts	4.464Volts	5.544Volts	5.832Volts	6.12V
CPU0_VCORE	✓	1.8Volts	1.04Volts	1.12Volts	1.2Volts	2.3Volts	2.38Volts	2.46V
CPU1_VCORE	●	N/A	1.04Volts	1.12Volts	1.2Volts	2.3Volts	2.38Volts	2.46V
CPU0_DDR_VDDQAB	✓	1.23Volts	0.91Volts	0.99Volts	1.07Volts	1.33Volts	1.41Volts	1.49V
CPU0_DDR_VDDQCD	✓	1.23Volts	0.91Volts	0.99Volts	1.07Volts	1.33Volts	1.41Volts	1.49V
CPU1_DDR_VDDQEF	●	N/A	0.91Volts	0.99Volts	1.07Volts	1.33Volts	1.41Volts	1.49V
CPU1_DDR_VDDQGH	●	N/A	0.91Volts	0.99Volts	1.07Volts	1.33Volts	1.41Volts	1.49V

Note:

✓Normal ⚠Warning ✗Critical ●N/A

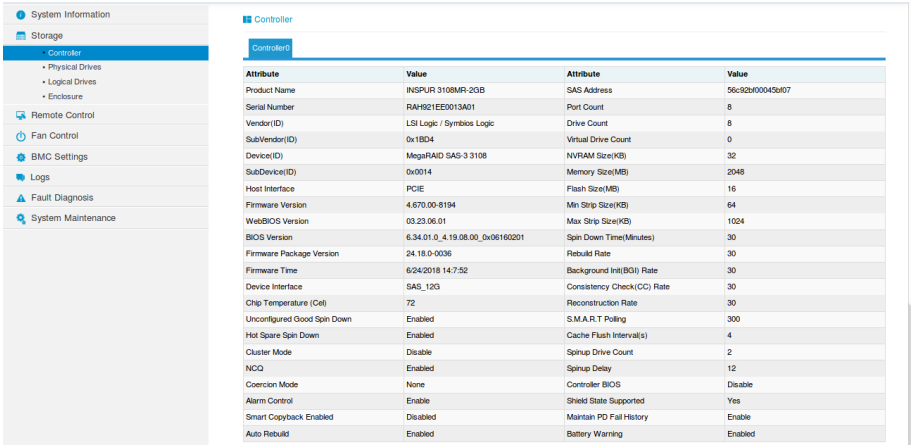






5.4 Storage

Select “Storage” on the navigation tree to open the storage interface. At present, the storage information control only supports LSI RAID card. This interface contains controller, physical drives, and logical drives information, as shown in the following figures.

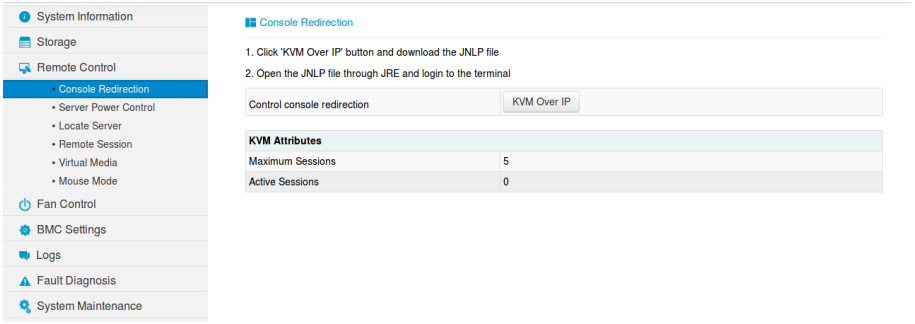


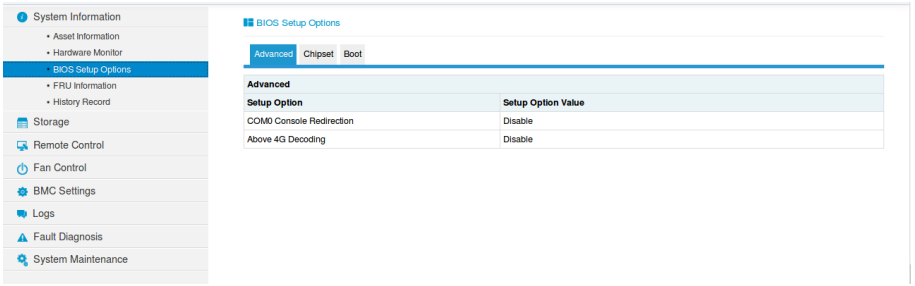
Attribute	Value	Attribute	Value
Product Name	INSPUR 3108MR-2GB	SAS Address	56c92bf00045bf07
Serial Number	RAH921EE0013A01	Port Count	8
Vendor(ID)	LSI Logic / Symbios Logic	Drive Count	8
SubVendor(ID)	0x1BD4	Virtual Drive Count	0
Device(ID)	MegaRAID SAS-3 3108	NVRAM Size(KB)	32
SubDevice(ID)	0x0014	Memory Size(MB)	2048
Host Interface	PCIE	Flash Size(MB)	16
Firmware Version	4.670.00-8194	Min Strip Size(KB)	64
WebBIOS Version	03.23.06.01	Max Strip Size(KB)	1024
BIOS Version	6.34.01.0_4.19.08.00_0x06160201	Spin Down Time(Minutes)	30
Firmware Package Version	24.18.0-0036	Rebuild Rate	30
Firmware Time	6/24/2018 14:7:52	Background Init(BGI) Rate	30
Device Interface	SAS_12G	Consistency Check(CC) Rate	30
Chip Temperature (Cel)	72	Reconstruction Rate	30
Unconfigured Good Spin Down	Enabled	S.M.A.R.T Polling	300
Hot Spare Spin Down	Enabled	Cache Flush Interval(s)	4
Cluster Mode	Disable	Spinup Drive Count	2
NCQ	Enabled	Spinup Delay	12
Coercion Mode	None	Controller BIOS	Disable
Alarm Control	Enable	Shield State Supported	Yes
Smart Copyback Enabled	Disabled	Maintain PD Fail History	Enable
Auto Rebuild	Enabled	Battery Warning	Enabled

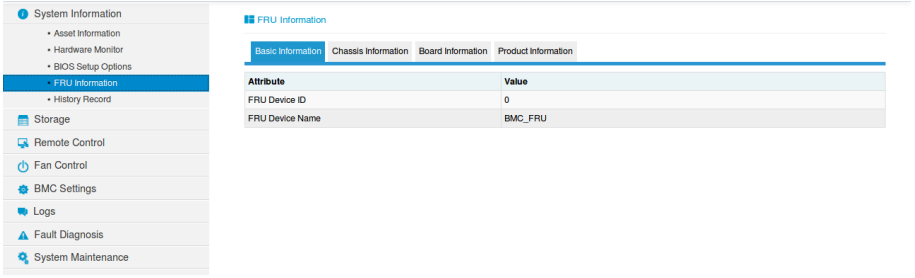
5.5 Remote Control

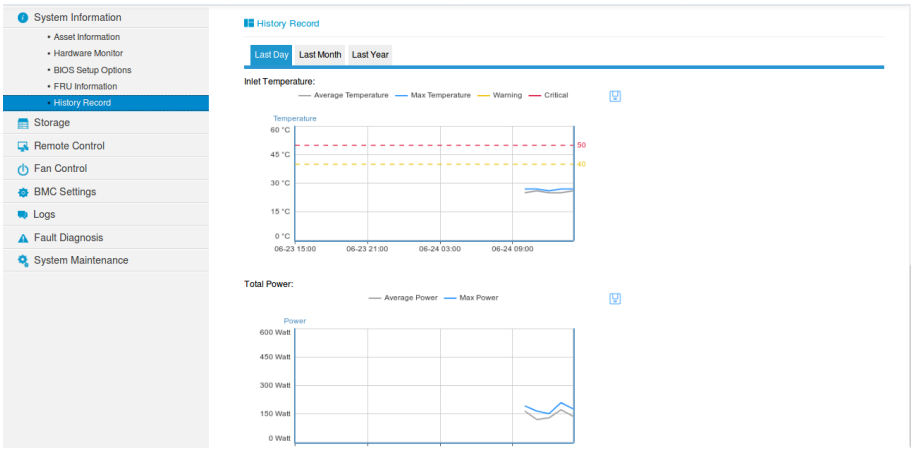
Select “Remote Control” on the navigation tree to open the remote control interface, which contains the interfaces of console redirection (KVM)”, server location, configure remote session, virtual media devices and mouse mode settings, as shown in the following figures.

- Console redirection (KVM): The KVM console window will pop up, Java KVM is supported.
- Server Power Control: This page helps you to view or perform any host power cycle operation.
- Server location: To turn on/off the system ID LED.
- Configure remote session: To set the KVM session encryption, media encryption and virtual media connection methods.
- Virtual media: To set the quantity of virtual media (floppy devices, CD/DVD devices and hard disk drives, etc.).
- Mouse mode: To set the mouse working mode for KVM remote console.


System Information
Storage
Remote Control
Console Redirection
Server Power Control
Locate Server
Remote Session
Virtual Media
Mouse Mode
Fan Control
BMC Settings
Logs
Fault Diagnosis
System Maintenance
Console Redirection
1. Click 'KVM Over IP' button and download the JNLP file
2. Open the JNLP file through JRE and login to the terminal
Control console redirection
KVM Over IP
KVM Attributes
Maximum Sessions 5
Active Sessions 0


System Information
Asset Information
Hardware Monitor
BIOS Setup Options
FRU Information
History Record
Storage
Remote Control
Fan Control
BMC Settings
Logs
Fault Diagnosis
System Maintenance
BIOS Setup Options
Advanced
Chipset
Boot
Advanced
Setup Option
Setup Option Value
COM0 Console Redirection
Disable
Above 4G Decoding
Disable


System Information
Asset Information
Hardware Monitor
BIOS Setup Options
FRU Information
History Record
Storage
Remote Control
Fan Control
BMC Settings
Logs
Fault Diagnosis
System Maintenance
FRU Information
Basic Information
Chassis Information
Board Information
Product Information
Attribute
Value
FRU Device ID
0
FRU Device Name
BMC_FRU


System Information
Asset Information
Hardware Monitor
BIOS Setup Options
FRU Information
History Record
Storage
Remote Control
Fan Control
BMC Settings
Logs
Fault Diagnosis
System Maintenance
History Record
Last Day
Last Month
Last Year
Inlet Temperature:
Average Temperature
Max Temperature
Warning
Critical
Temperature
60 °C
45 °C
30 °C
15 °C
0 °C
50
40
06-23 15:00
06-23 21:00
06-24 03:00
06-24 09:00
Total Power:
Average Power
Max Power
Power
600 Watt
450 Watt
300 Watt
150 Watt
0 Watt

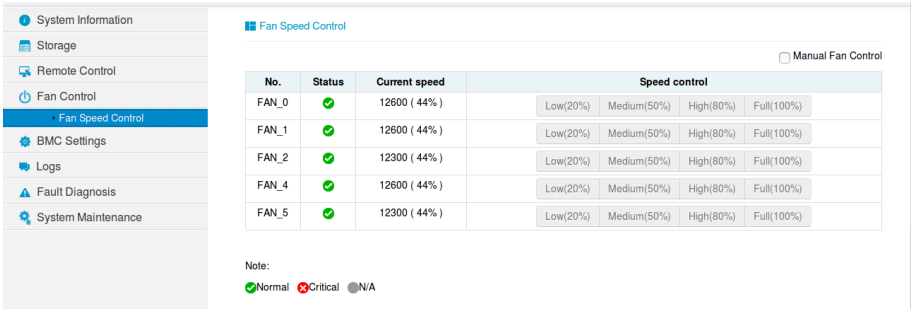
5.6 Fan

Select “Fan” on the navigation tree to open the fan interface. It contains the interfaces of fan speed control, as shown in the following figures.

● Fan speed control: Contains fan status, current speed and speed control function.

Note: Fan speed control contains the following speed levels:

- Low: About 20% duty ratio
- Medium: About 50% duty ratio
- High: About 80% duty ratio
- Full: 100% duty ratio



5.7 BMC Settings

Select “BMC Settings” on the navigation tree to open the BMC Settings interface. It contains the interfaces of BMC network management, services, NTP settings, SMTP settings, alert settings, Active Directory Settings, LDAP/E-Directory Settings, users, access control, and BMC share NIC switch, as shown in the following figures.

● BMC network management: Contains BMC network (static IP and DHCP), DNS settings and network interface bonding and network link information.

●Services: To configure the BMC’s Web service, KVM service, ssh service, telnet service, etc.

●NTP settings: To set the BMC time, which has two methods:

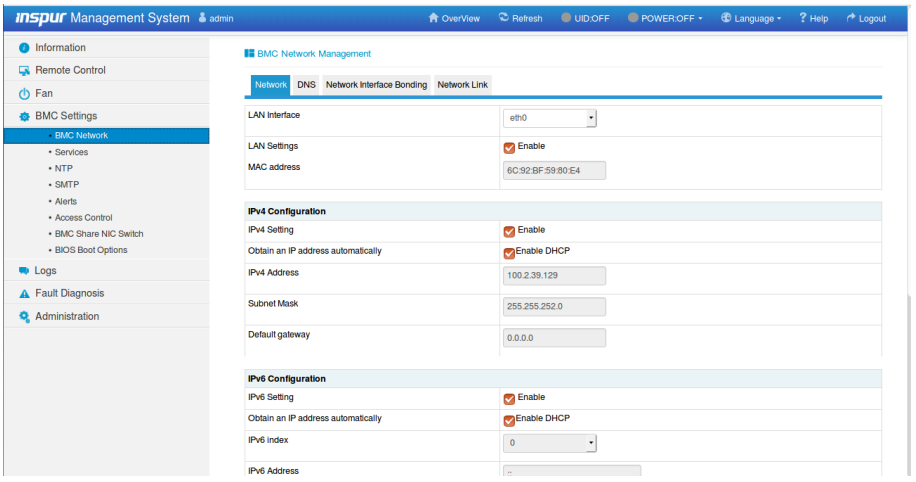
- Synchronize from NTP server.
- Sets time manually.

●SMTP settings: To set the SMTP server information related to alert.

●Alert settings: To set the alert event filtering and alert targets of BMC management module.

●Active Directory Settings: The displayed table shows any configured Role Groups and the available slots. You can modify, add or delete role groups from here.

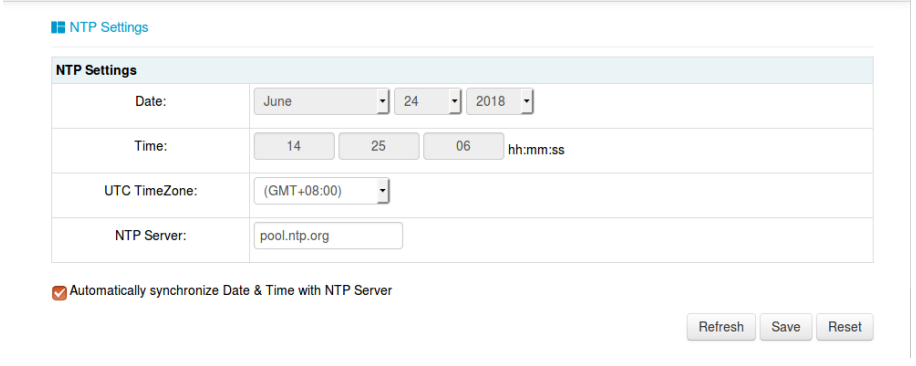
- LDAP/E-Directory Settings: Displayed table shows any configured Role Groups and available slots. You can modify or add/delete role groups from here.
- Users: Through the user settings interface, you can manage the BMC's account, including adding users, deleting users, modifying user passwords.
- Access control: To set IP address fields accessible to BMC.
- BMC share NIC switch: Contains NCSI type switch, NCSI mode switch and channel switch.



Services

#	Service Name	Current State	Interfaces	Nonsecure Port	Secure Port	Timeout(s)	Maximum Sessions	Active Sessions
1	web	Active	both	80	443	1800	20	2
2	kvm	Active	both	7578	7582	1800	4	0
3	cd-media	Active	both	5120	5124	N/A	4	0
4	fd-media	Active	both	5122	5126	N/A	4	0
5	hd-media	Active	both	5123	5127	N/A	4	0
6	ssh	Active	N/A	N/A	22	600	N/A	0
7	telnet	Inactive	N/A	23	N/A	600	N/A	0
8	solssh	Inactive	N/A	52123	N/A	60	N/A	0

⚠ **Note:** Web, kvm, cd-media, fd-media and hd-media services are enabled by default. Ssh, telnet and solssh services are disabled by default.



SMTP Settings

LAN Channel	Dedicated
Sender Email	user@bmc.com

Primary SMTP Server	
SMTP Support	☑ Enable
SMTP Server Names	bmc.com
SMTP Server IP Address	192.168.0.20
Port	25
SMTP Server Authentication	☑
Username	user
Password	

Alert Settings

SNMP Trap Configure	
Trap Version	v1
Event Severity	All
Community	public
Username	
Engine ID(Hex)	
Authentication and password	NONE
Privacy and password	NONE
System Name	
System ID	
Host Location	
Contact	

User Management

Local User Password Rules	
Password Complexity Check	○ Enabled ◉ Disabled

Number of configured users: 1

UserID	Username	UserAccess	Network Privilege	Email ID
1	Administrator	Enabled	Administrator	~
2	~	~	~	~
3	~	~	~	~
4	~	~	~	~
5	~	~	~	~
6	~	~	~	~
7	~	~	~	~
8	~	~	~	~
9	~	~	~	~
10	~	~	~	~
11	~	~	~	~
12	~	~	~	~
13	~	~	~	~

Active Directory Settings

The 'Active Directory' is currently disabled. To enable Active Directory and configure its settings. Click on 'Advanced Settings' button.

Advanced Settings

The list below shows the current list of configured Role Groups. If you would like to delete or modify a role group, select the name in the list and press Delete Role Group or Modify Role Group. To add a new Role Group, select an unconfigured slot and press Add Role Group.

Role Group ID	Group Name	Group Domain	Group Privilege
1	~	~	~
2	~	~	~
3	~	~	~
4	~	~	~
5	~	~	~

Add Role Group | Modify Role Group | Delete Role Group

LDAP/E-Directory Settings

LDAP/E-Directory is currently disabled. To enable LDAP/E-Directory and configure its settings. Click on 'Advanced Settings' button.

Advanced Settings

The list below shows the current list of configured Role Groups. If you would like to delete or modify a role group, select the name in the list and press Delete Role Group or Modify Role Group. To add a new Role Group, select an unconfigured slot and press Add Role Group.

Role Group ID	Group Name	Group Search Base	Group Privilege
1	~	~	~
2	~	~	~
3	~	~	~
4	~	~	~
5	~	~	~

Add Role Group | Modify Role Group | Delete Role Group

IP Access Control

IP Access Control	
IP Access Control	Disabled. All IP will Accepted to this Device.
Add IP Accept Entry	IP: To ADD Date Time, Start: Y M D H M 00 S Date Time, Stop : Y M D H M 00 S
Current IP Accept Entry List	

Enable IP Entry List

BMC Share NIC Switch

Enable BMC Share NIC	Enable

NOTE: BMC should be reboot to enable switched share NIC!

Share NIC Switch	
Share NIC Switch	Outboard NIC

Save | Reset

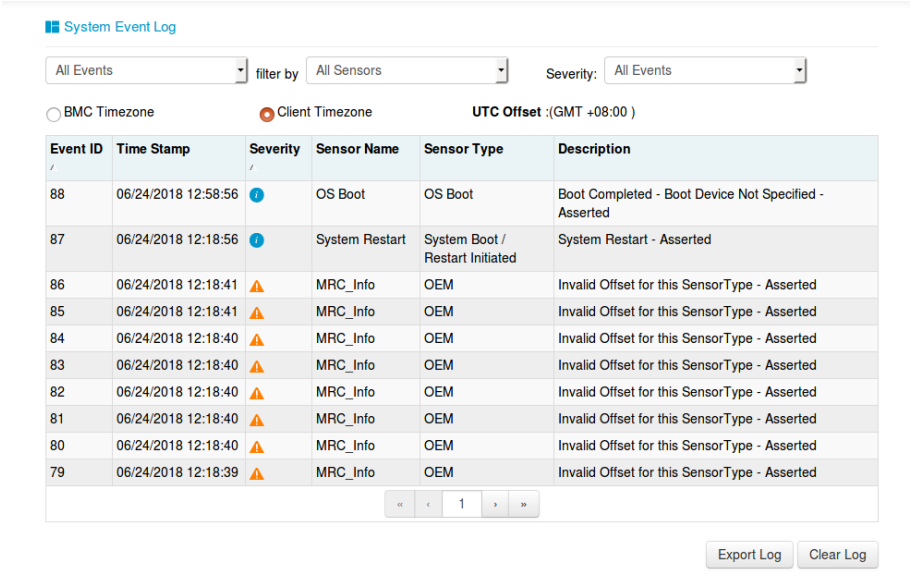
Network Interface Switch	
Management Network Mode Switch	Auto Failover / Manual Switch
Channel Number	0

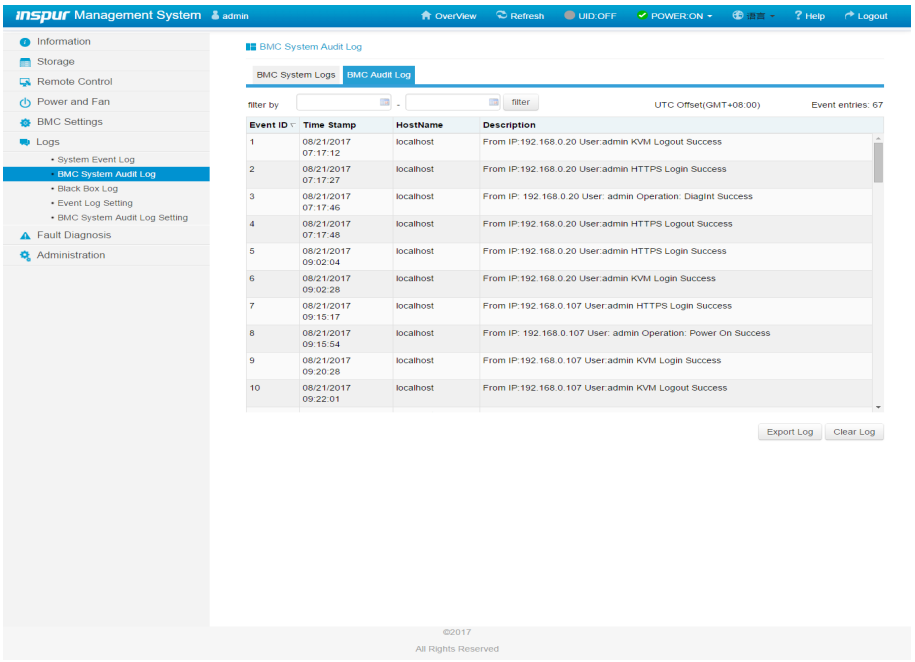
Save | Reset

5.8 Logs

Select “Logs” on the navigation tree to open the related log interface. It contains the interfaces of system event log, BMC system audit log, black box log, event log setting and system and audit log settings, as shown in the following figures.

- System event log: Displays various event logs generated by the server.
- BMC system audit log: Displays system logs and audit logs of BMC.
- Black box log: Used to import fault logs.
- Event log setting: To set the BMC log storage policy:
  - Linear strategy: To clear all logs after log storage is full and record again.
  - Circular strategy: To record circularly after log record is full.
- System and audit log settings: To set the log type, file size and other information of BMC system audit logs.





Black Box Log

Black Box Log	
Log Selection	blackbox.log

Export Log

Event Log Setting

Event Log Setting	
Current Event Log Policy	Circular Policy
System Event Log Policy Options	○ Linear Policy ◉ Circular Policy

Save Reset

System and Audit Log Settings

System and Audit Log Settings	
System Log	☑ Enable
Log Type	◉ Local Log ○ Remote Log
File Size (in bytes)	50000
Rotate Count	0
Server Address	
Server Port	0
Audit Log	☑ Enable

Save Reset

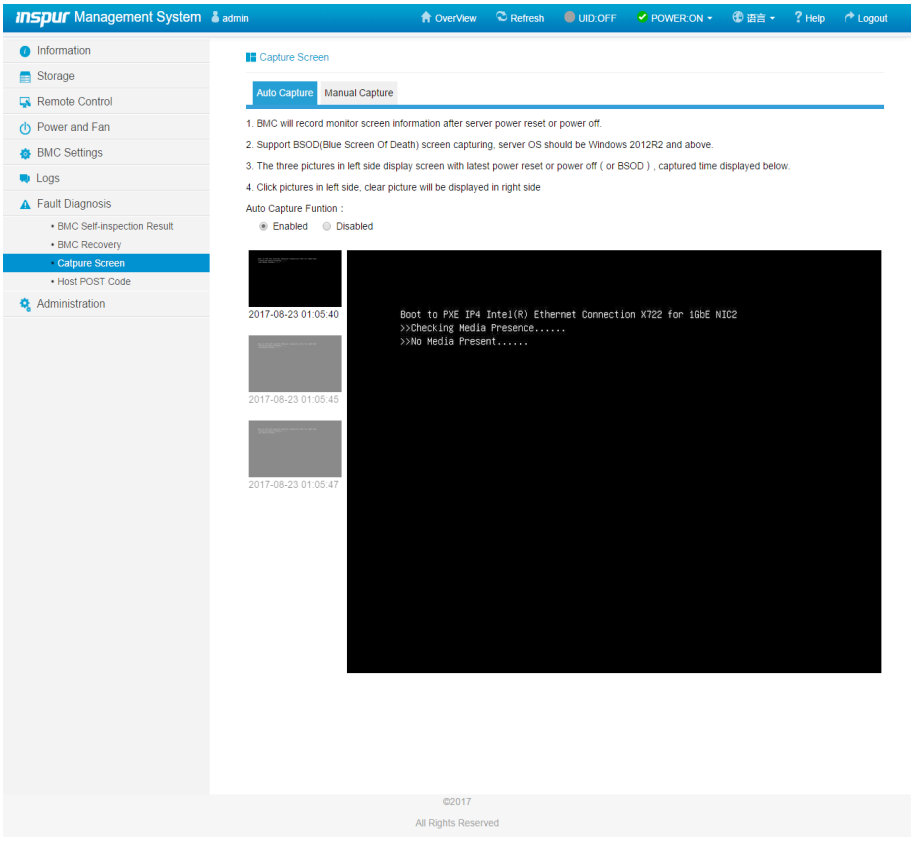
5.9 Fault Diagnosis

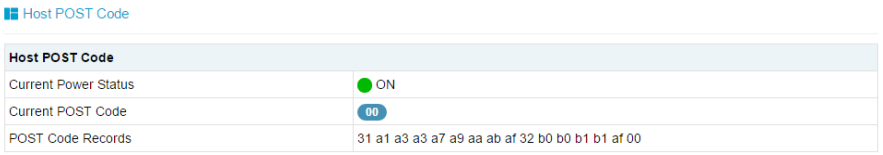
Select “Fault Diagnosis” on the navigation tree to open the fault diagnosis interface. It contains the interfaces of BMC self-inspection result, BMC recovery, capture screen and host POST code, as shown in the following figures.

- BMC recovery: Contains two functions of BMC warm reset and KVM service restart.
- Capture screen: Used to record the information on the last screen at system crash.

Note: Support BSOD (Blue Screen Of Death) screen capturing, server OS should be Windows 2012R2 and above.

- Host POST code: Displays POST code during system startup.




Host POST Code

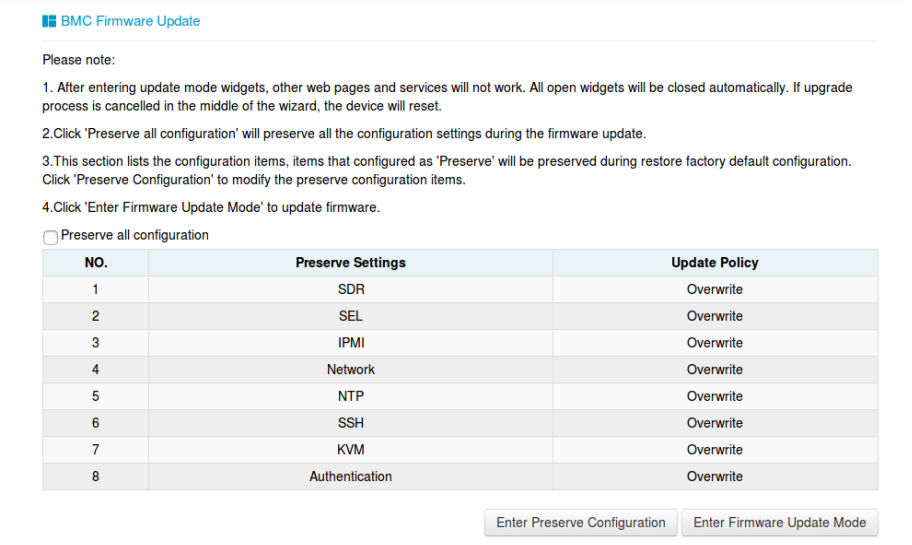
Host POST Code	
Current Power Status	ON
Current POST Code	00
POST Code Records	31 a1 a3 a3 a7 a9 aa ab af 32 b0 b0 b1 b1 af 00

5.10 System Maintenance

Select “System Maintenance” on the navigation tree to open the system maintenance interface. It contains the interfaces of BMC firmware update, BIOS firmware update and restore factory defaults, as shown in the following figures.

- BMC firmware update: To update BMC FW via BMC Web interface.
- BIOS firmware update: To update BIOS FW via BMC Web interface.
- Restore factory defaults: To restore BMC’s configuration to factory state.
- System Administrator: To configure the System Administrator configuration.

Note: BMC supports the force reset operation via the Reset button on the rear of the chassis, and supports the force factory reset operation via the jumper on the motherboard.


BMC Firmware Update

Please note:

1. After entering update mode widgets, other web pages and services will not work. All open widgets will be closed automatically. If upgrade process is cancelled in the middle of the wizard, the device will reset.

2.Click 'Preserve all configuration' will preserve all the configuration settings during the firmware update.

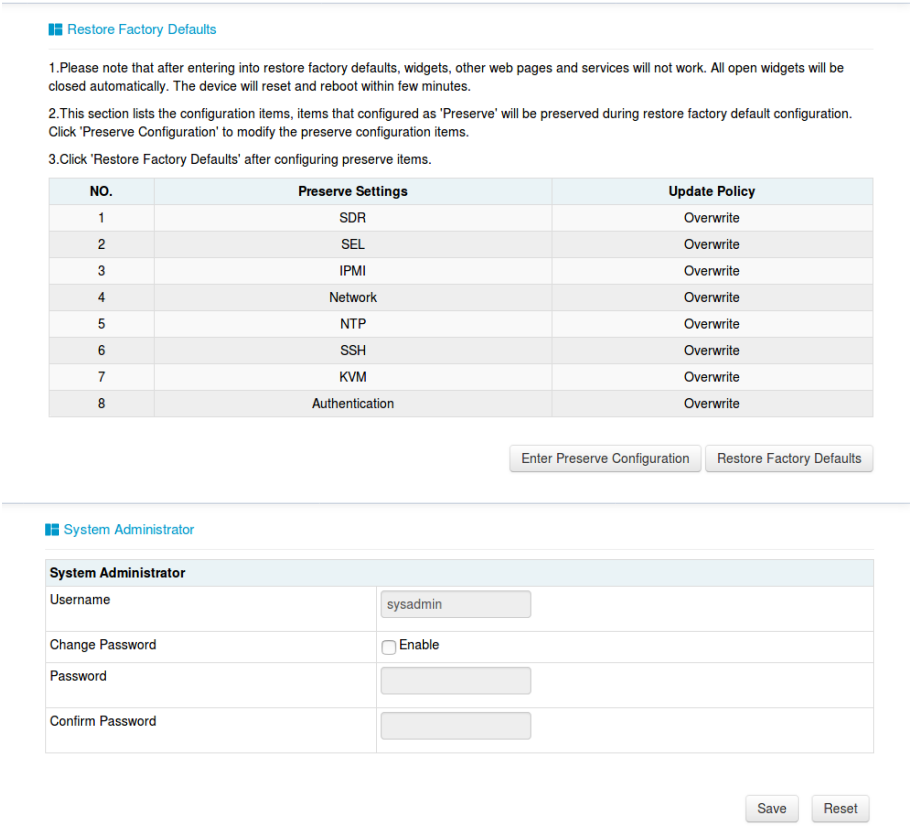
3.This section lists the configuration items, items that configured as 'Preserve' will be preserved during restore factory default configuration. Click 'Preserve Configuration' to modify the preserve configuration items.

4.Click 'Enter Firmware Update Mode' to update firmware.

Preserve all configuration

NO.	Preserve Settings	Update Policy
1	SDR	Overwrite
2	SEL	Overwrite
3	IPMI	Overwrite
4	Network	Overwrite
5	NTP	Overwrite
6	SSH	Overwrite
7	KVM	Overwrite
8	Authentication	Overwrite

Enter Preserve Configuration | Enter Firmware Update Mode



5.11 Service & Protocol

The services or protocols supported by BMC include RCMP+, Http/Https, KVM, cd-media, fd-media, hd-media, ssh, and telnet. Users can choose to enable or disable these services, as well as configure the port number, session timeout and the maximum sessions.

Service	Use	DefaultState	Non-secure Port Number	Secure Port Number	Default Port Number	Timeout(s)	Max. Sessions
RMCP+	IPMI	Enable	623	N/A	N/A	1800	20
Http/Https	WEB interface	Enable	80(Http)	443(Https)	443(Https)	1800	20
KVM	Console redirection	Enable	7578	7582	7578	1800	4
cd-media	Virtual media	Enable	5120	5124	5120	N/A	4
fd-media	Virtual media	Enable	5122	5126	5122	N/A	4
hd-media	Virtual media	Enable	5123	5127	5123	N/A	4
ssh	ssh	Disable	N/A	22	22	600	N/A
telnet	telnet	Disable	23	N/A	23	600	N/A

Notes:

1. Http/Https timeout, if there is no page request within the timeout period, the page session will be deleted and the new page request will not be responded. If the page does

not update automatically, the page will be logged out when you switch the page or refresh the page.

2. Telnet is a non-secure protocol, if you do not use it, it is recommended to disable it.

5.12 User Management

5.12.1 IPMI User

BMC supports IPMI2.0 user models, and supports up to 16 users. Multiple users can login simultaneously. User permissions include administrator, operator, user, OEM exclusive and no access.

User list:

User ID	User Name	Password	State	Default Permission
User 1	admin	admin	Enable	Administrator
User 2- 16	Undefined	Undefined	Disable	Administrator

IPMI user permissions, please refer to the IPMI2.0 specification.

User Permission	Supported Operations
Administrator	Read/Write
Operator	Read
User	Read
No access	None

User name

- The user name is a string of 1 to 16 letters and numbers, including '-', '_', '@'.
- Must begin with a letter.
- Case sensitive.
- Special characters are not allowed, such as ',', '.', ':', ';', ' '(space), '/', '\\', '(', ')', etc.

Password

- When the password complexity check is disabled, the password must be at least 1 character long.
- When the password complexity check is enabled, the password must contain special characters, upper and lower letters and numbers, at least 8 characters long.
- The maximum length of the password is 16 characters.
- By default, the password complexity check is disabled. For security reasons, we strongly recommend that you enable this function.
- The password expiration can be set to a range of 0 to 90 days, and 0 means permanent.

This function is disabled by default, and we strongly recommend that you enable this function for security reasons. If this function is enabled, the password needs to be changed before expiration. If the password expires, you will need to disable this function in the operating system via the OEM's IPMI command.

- Login failed retry count: Retry count can be set to a number between 0 and 5. Lock time: The time setting range is 5 ~ 60 minutes. This function is disabled by default, and we strongly recommend that you enable this function for security reasons.
- Password history: It can be set to a range of 0 ~ 5. This function is disabled by default. If this function is enabled, the password can not be set to the used password (the last N passwords).

5.12.2 System User

System user refers to the BMC root user in Linux operating system. Users can login to BMC via ssh/telnet.

User name: sysadmin (unchangeable)

Default password: superuser

User name and password security

- The user name is fixed and can not be modified.
- The password must contain 8 characters at least.
- The password must contain special characters, upper and lower letters, and numbers.
- No space is allowed.
- At most 64 characters are allowed.

5.13 BMC Firmware Update

5.13.1 Firmware Integrity Check

Each firmware image can generate MD5 check code (Hash.exe) through the MD5 tool. Before updating the firmware, MD5 tool must be used to check the image's integrity to ensure that the firmware image file is correct.

5.13.2 WEB Update

The BMC firmware can be updated through the management interface. BMC firmware update is configured with watchdog, to avoid that the program stays in the update mode and fails to restore when an exception occurs, and the watchdog time is 20 minutes. When entering the flash mode, the watchdog will be activated, it will automatically reset BMC

after 20 minutes timeout. When the image starts to flash, the watchdog timeout will be updated to 20 minutes again.

Supports dual-image firmware update

When updating the BMC firmware, the user can specify the image to update, you can choose:

- Image 1
- Image 2
- Alternate image
- Dual images (default)

Note:

The firmware upgrade process is a critical operation, once you enter the update mode and choose to cancel the firmware update operation, the BMC must reboot, which means that you must close the browser and login to the BMC again before any other action can be performed.

It defaults to use the higher version of the two images, which you can modify through the interface.

Firmware update steps:

- Go to the update page.
- Choose the image file, and click Upload button to upload the file. BMC will enter the update mode after the file is uploaded. IPMI service will stop, and BMC will check the image's size, which should be 32M, and check the image's integrity to ensure it is the BMC image.

If the check fails, BMC will stop the update and reboot.

- Check the image version and the existed image version, after confirmation, click Update button to start the update.

5.14 Time Zone Table

Name of Time Zone	Time
Dateline Standard Time	(GMT-12:00) International Date Line West
Samoa Standard Time	(GMT-11:00) Midway Island, Samoa
Hawaiian Standard Time	(GMT-10:00) Hawaii
Alaskan Standard Time	(GMT-09:00) Alaska
Pacific Standard Time	(GMT-08:00) Pacific Time (US and Canada); Tijuana
Mountain Standard Time	(GMT-07:00) Mountain Time (US and Canada)
Mexico Standard Time 2	(GMT-07:00) Chihuahua, La Paz, Mazatlan
U.S. Mountain Standard Time	(GMT-07:00) Arizona
Central Standard Time	(GMT-06:00) Central Time (US and Canada
Canada Central Standard Time	(GMT-06:00) Saskatchewan
Mexico Standard Time	(GMT-06:00) Guadalajara, Mexico City, Monterrey
Central America Standard Time	(GMT-06:00) Central America
Eastern Standard Time	(GMT-05:00) Eastern Time (US and Canada)
U.S. Eastern Standard Time	(GMT-05:00) Indiana (East)
S.A. Pacific Standard Time	(GMT-05:00) Bogota, Lima, Quito
Atlantic Standard Time	(GMT-04:00) Atlantic Time (Canada)
S.A. Western Standard Time	(GMT-04:00) Caracas, La Paz
Pacific S.A. Standard Time	(GMT-04:00) Santiago
Newfoundland and Labrador Standard Time	(GMT-03:30) Newfoundland and Labrador
E. South America Standard Time	(GMT-03:00) Brasilia
S.A. Eastern Standard Time	(GMT-03:00) Buenos Aires, Georgetown
Greenland Standard Time	(GMT-03:00) Greenland
Mid-Atlantic Standard Time	(GMT-02:00) Mid-Atlantic
Azores Standard Time	(GMT-01:00) Azores
Cape Verde Standard Time	(GMT-01:00) Cape Verde Islands
GMT Standard Time	(GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
Greenwich Standard Time	(GMT) Casablanca, Monrovia
Central Europe Standard Time	(GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
Central European Standard Time	(GMT+01:00) Sarajevo, Skopje, Warsaw, Zagreb
Romance Standard Time	(GMT+01:00) Brussels, Copenhagen, Madrid, Paris
W. Europe Standard Time	(GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
W. Central Africa Standard Time	(GMT+01:00) West Central Africa
E. Europe Standard Time	(GMT+02:00) Bucharest
Egypt Standard Time	(GMT+02:00) Cairo
FLE Standard Time	(GMT+02:00) Helsinki, Kiev, Riga, Sofia, Tallinn, Vilnius
GTB Standard Time	(GMT+02:00) Athens, Istanbul, Minsk

Israel Standard Time	(GMT+02:00) Jerusalem
South Africa Standard Time	(GMT+02:00) Harare, Pretoria
Russian Standard Time	(GMT+03:00) Moscow, St. Petersburg, Volgograd
Arab Standard Time	(GMT+03:00) Kuwait, Riyadh
E. Africa Standard Time	(GMT+03:00) Nairobi
Arabic Standard Time	(GMT+03:00) Baghdad
Iran Standard Time	(GMT+03:30) Tehran
Arabian Standard Time	(GMT+04:00) Abu Dhabi, Muscat
Caucasus Standard Time	(GMT+04:00) Baku, Tbilisi, Yerevan
Transitional Islamic State of Afghanistan Standard Time	(GMT+04:30) Kabul
Ekaterinburg Standard Time	(GMT+05:00) Ekaterinburg
West Asia Standard Time	(GMT+05:00) Islamabad, Karachi, Tashkent
India Standard Time	(GMT+05:30) Chennai, Kolkata, Mumbai, New Delhi
Nepal Standard Time	(GMT+05:45) Kathmandu
Central Asia Standard Time	(GMT+06:00) Astana, Dhaka
Sri Lanka Standard Time	(GMT+06:00) Sri Jayawardenepura
N. Central Asia Standard Time	(GMT+06:00) Almaty, Novosibirsk
Myanmar Standard Time	(GMT+06:30) Yangon Rangoon
S.E. Asia Standard Time	(GMT+07:00) Bangkok, Hanoi, Jakarta
North Asia Standard Time	(GMT+07:00) Krasnoyarsk
China Standard Time	(GMT+08:00) Beijing, Chongqing, Hong Kong SAR, Urumqi
Singapore Standard Time	(GMT+08:00) Kuala Lumpur, Singapore
Taipei Standard Time	(GMT+08:00) Taipei
W. Australia Standard Time	(GMT+08:00) Perth
North Asia East Standard Time	(GMT+08:00) Irkutsk, Ulaanbaatar
Korea Standard Time	(GMT+09:00) Seoul
Tokyo Standard Time	(GMT+09:00) Osaka, Sapporo, Tokyo
Yakutsk Standard Time	(GMT+09:00) Yakutsk
A.U.S. Central Standard Time	(GMT+09:30) Darwin
Cen. Australia Standard Time	(GMT+09:30) Adelaide
A.U.S. Eastern Standard Time	(GMT+10:00) Canberra, Melbourne, Sydney
E. Australia Standard Time	(GMT+10:00) Brisbane
Tasmania Standard Time	(GMT+10:00) Hobart
Vladivostok Standard Time	(GMT+10:00) Vladivostok
West Pacific Standard Time	(GMT+10:00) Guam, Port Moresby
Central Pacific Standard Time	(GMT+11:00) Magadan, Solomon Islands, New Caledonia
Fiji Islands Standard Time	(GMT+12:00) Fiji Islands, Kamchatka, Marshall Islands
New Zealand Standard Time	(GMT+12:00) Auckland, Wellington
Tonga Standard Time	(GMT+13:00) Nuku'alofa

6 Common Faults, Diagnosis and Troubleshooting

This chapter introduces the common server faults, as well as corresponding diagnosis and troubleshooting suggestions.

6.1 Hardware Problems

1) Power-on failure at startup

Description: After pressing the power button, the LED (power 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 cord 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, login 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.

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.

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.

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 mainboard 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.

6.2 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) The memory capacity is abnormal

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.

7 Battery Replacement

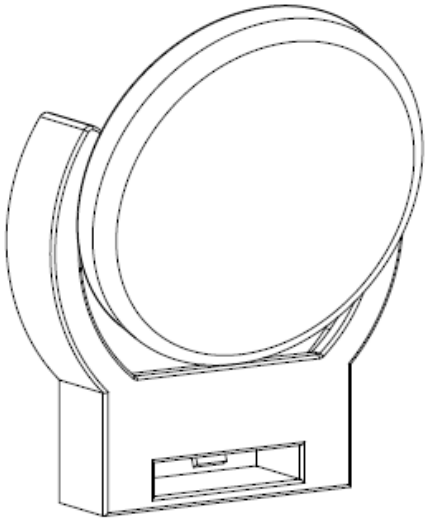
If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock.

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 full-length expansion board retainer if any full-length expansion boards are installed.
4. Remove the PCI riser cage.
5. Remove the air baffle.
6. Remove the battery.



To replace the component, reverse the removal procedure.

For more information about battery replacement or proper disposal, contact Inspur Customer Service.

8 Regulatory Compliance Notices

8.1 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.

8.2 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.

8.2.1 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.

8.3 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.

8.4 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.

9 Electrostatic Discharge

9.1 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.

9.2 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.

10 Warranty

10.1 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.

10.2 Warranty Service

10.2.1 Service Overview

Type	Duration
Remote Services	3 years
RMA Services	3 years

10.2.2Warranty 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.

10.3 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.