Edition: 1
June 2016

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 to be performed by experienced technicians only.

Target Audience

This manual mainly adapts to the following personnel:

- Technical support engineers
- Product maintenance engineers

It is suggested that server maintenance operation shall be carried out by professional engineers with related server knowledge via referring to this manual.

Warnings:

TThis manual introduces the server's technical features, system installation and setup, which will help the user to 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 contact Inspur 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.

4.Please use the driver shipped with the server or provided in Inspur official website , if you use non-Inspur driver, it may cause compatibility issues and affect the normal use of the product, Inspur will not assume any responsibility or liability.

The manufacturer 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.

Table of Contents

1 Safety Introduction

⚠ Warning: the following warnings show that there are potential dangers that may cause property loss, personal injury or death:

1. The power supply equipment in the system may generate high voltage and dangerous electrical energy and thus cause personal injury. Please do not dismount the cover of the host or to dismount and replace any component in the system by yourself, unless otherwise informed by Inspur; only maintenance technicians trained by Inspur have the right to disassemble the cover of the host, dismount and replace the internal components.
2. Please connect the equipment to appropriate power supply, and the power should be supplied by external power supply which is indicated on the rated input label. To prevent your equipment from damages caused by momentary spike or plunge of the voltage, please use relevant voltage stabilizing equipment or uninterruptible power supply equipment.
3. If extended cables are needed, please use the three-core cables matched with correct earthed plug, and check the ratings of the extended cables to make sure that the sum of rated current of all products inserted into the extended cables do not exceed 80% of the limits of the rated currents of the extended cables.
4. Please be sure to use the supplied power supply component, such as power lines, power socket (if supplied with the equipment) etc. For the safety of equipment and the user, do not replace randomly power cables or plugs.
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 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 the earthing pin of power lines and do not use the patch plug or the earthing pin unplugged with cables. In case of the earthing conductors not installed and it is uncertain whether there are appropriate earthing protections, please do not operate or use the equipment. Contact and consult with the electrician.

6. To avoid short circuit of internal components and fire or electric shock hazards, please do not fill any object into the open pores of the system.
7. Please place the system far away from the cooling plate and at the place with heat sources, and be sure not to block the air vents.
8. Be sure not to scatter food or liquid in the system or on other components, and do not use the product in humid and dusty environment.
9. The replacement of batteries with those of another model may cause explosion. When replacement of batteries is required, please consult first the manufacturer and choose batteries of the same or a similar model recommended by the manufacturer. Do not dismount, extrude and pink the batteries or make the external connection point short circuit, and do not expose them in the environment over 60°C. Never throw them into fire or water. Please do not try to open or repair the batteries, and be sure to reasonably deal with the flat batteries and do not put the fl at batteries, the circuit boards that may include the batteries and other components with other wastes. For relevant battery recovery, please contact the local waste recovery and treatment mechanism.
10. Before installing equipment in the chassis, please install front and side supporting feet on the independent chassis; for cabinet connecting with other chassis, it shall install the front supporting foot first. If you fail to install correspondingly the supporting foot before installing equipment in the chassis, it may cause the cabinet to turn over in some cases, and thus may cause personal injury. Therefore, it is necessary to install supporting feet before installing equipment in the chassis. After installing the equipment and other components in the chassis, it can only pull out one component from the cabinet through its sliding component at one time. Pulling out several components at the same time may lead the cabinet to turn over and cause serious personal injury.
11. Please do not move the chassis independently. Considering the height and weight of the chassis, at least two people are needed to complete its movement.
12. Please do not carry out direct contact operation on power copper busbar when the cabinet is powered on, and it is prohibited to carry out direct short circuit of power copper busbar.
13. The product is Grade A product, and in the living environment, it may cause radio interference. In such case, it may need the user to take feasible measures for the

interference.

⚠ Note: In order to help you use the equipment, the following considerations can help avoid the occurrence of problems that may damage the components or cause data loss etc.

1. In case of the following cases, please unplug the power line plug of products from the power socket and contact customer service department of Inspur:
   1) The power cables, extended cables or power plugs are damaged.
   2) The products get wet by water.
   3) The products have fallen off or been damaged.
   4) Objects fall into the products.
   5) When operating according to the operation instructions, the products cannot function normally.
2. If the system becomes damp, please dispose according to the following steps:
   1) Switch off the power supplies of the system and the equipment, disconnect them with the power socket, wait for 10 to 20 minutes, and then open the cover of the host.
   2) Move the equipment to the ventilation place to dry the system at least for 24 hours and make sure that the system is fully dried.
   3) Close the cover of the host, re-connect the system to the power socket, and then start the equipment.
   4) In case of operation failure or abnormal situation, please contact Inspur and get technical support.
3. Pay attention to the position of the system cables and power cables, wire them in places not to be stepped on or knocked down and ensure not to place other objectives on the cables.
4. Before dismounting the cover of host or contacting the internal components, you shall cool down the equipment first; to avoid damaging the main-board, please power off the system and wait for 5 seconds, and then dismount the components from the main-board or disconnect the connection of peripheral equipment of the system.
5. If there are modulator-demodulator, telecommunication or local area network options in the equipment, please pay attention to the following matters:

1) In case of thunder and lightning weather, please do not connect or use the modulator-demodulator. Otherwise, it may be subject to lightning strike.
2) Never connect or use modulator-demodulator in moist environment.
3) Never insert the modulator-demodulator or telephone cables to the socket of network interface controller (NIC).
4) Before unpacking the product package, contacting or installing internal components or contacting un-insulated cables or jacks of the modulator-demodulator, please disconnect the modulator-demodulator cables.

6. In order to prevent the electrostatic discharge from damaging the electronic components in the equipment, please pay attention to the following matters:
   1) You shall conduct off the static electricity on the body before dismounting or contacting any electronic component in the equipment. You can conduct off the static electricity on the body by contacting the metal earthing objects (such as the unpainted metal surface on the chassis) to prevent the static electricity on the body from conducting itself to the sensitive components.
   2) For electrostatic sensitive components not ready to be installed for application, please do not take them out from the antistatic package materials.
   3) During the work, please touch the earthing conductor or the unpainted metal surface on the cabinet regularly to conduct off the static electricity on the body that may damage the internal components.
7. When dismounting the internal components with the approval of Inspur, please pay attention to the following matters:
   1) Switch off the system power supply and disconnect the cables, including disconnecting any connection of the system. When disconnecting the cables, please grab the connector of cables and plug it out, and never pull the cables.
   2) Before dismounting the cover of cabinet or touching the internal components, the products need to be cooled down.
   3) Before dismounting and touching any electronic component in the equipment, you shall conduct off the static electricity on the body by touching the metal earthingobjectives.
   4) During the dismounting process, the operation shall not be too big, so as to

prevent damage to the components or scratching of the arms.

5) Carefully deal with the components and plug-in cards, and please never touch, the components or connection points on the plug-in cards. When taking the plug-in cards or components, you should grab the edges of the plug-in cards or components or their metal fixed supports.

8. During the process of cabinet installation and application, please pay attention to the following matters:

1) After the installation of cabinet is finished, please ensure that the supporting feet have been fixed to the rack and supported to the ground, and all weight of the rack have been fell onto the ground.
2) It shall install into the cabinet according to the sequences from the bottom to the top, and first install the heaviest component.
3) When pulling out the components from the cabinet, it shall apply force slightly to ensure the cabinet to keep balance and stabilization.
4) When pressing down the release latch of the sliding rail of components and sliding in or out, please be careful, as the sliding rail may hurt your figures.
5) Never make the AC power branch circuit in the cabinet overload. The sum of cabinet load shall not exceed 80% of the ratings of branch circuits.
6) Ensure that components in the cabinet have good ventilation.
7) When repairing components in the cabinet, never step on any other components.

2 Product Specifications

2.1 Introduction

NF5166M4 is a 1U high-density storage server, supporting up to 2 Intel XEON E5-26**V4 processors, 16 DDR4 DIMMs, 12 3.5-inch hot-plug SAS/SATA hard disks, 4 2.5-inch hot-plug SSDs, and 2 M.2 SSDs of 2280 specification; there are 2 1GbE network ports on the motherboard; supporting OCP NIC slot; the system uses 700W 1+1 redundant power supply.

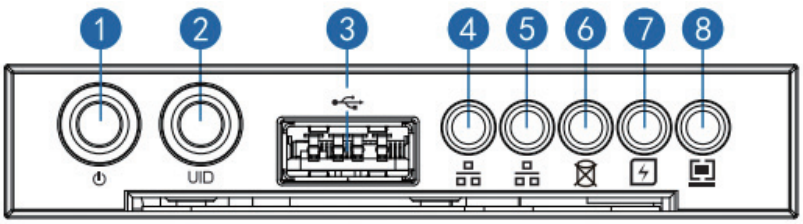
2.2 Features and Specifications

Processor	
Processor type	Intel 2-socket XEON E5-2600V4 series (up to 2 135w processors)
Processor interface	Socket-R3 (2)
Chipset	
Chipset type	PCH C612 (Wellsburg)
Memory	
Memory type	DDR4 ECC RDIMM/LRDIMM
Memory slot Qty.	16
Total memory capacity	Support up to 512GB (32G per DIMM)
I/O interface	
USB interface	2 rear USB 2.0 interfaces, 1 front USB 2.0 interface
Display interface	1 rear VGA interface
Serial Interface	1 rear serial interface
ID LED interface	1 ID LED (blue) and button
Display controller	
Controller type	Integrated in Aspeed2400 chip, support up to 1280*1024 resolution
SAS backplane	
SAS backplane	The internal SAS backplane supports hot-plug SAS/SATA HDDs. The front SAS backplane supports hot-plug SSD HDDs.
Management chip	
Management chip	Integrate 1 independent 1000Mbps network interface, special for IPMI remote management.
NIC	
NIC controller	1 onboard Intel I350 dual-port Gigabit NIC, provide 2 1000M adaptive RJ45 network interfaces; support 1 external network daughter card.

PCI expansion slot	
PCI expansion slot	2 onboard PCI Express 3.0 x8 slots (non-standard interfaces, used for supporting network daughter card and SAS card)
HDD	
HDD type	Support up to 4 front 2.5-inch SSD HDDs, 12 internal 3.5-inch SAS/SATA HDDs or 2.5-inch SAS HDDs, and 2 M.2 SSD HDDs.
External memory driver	
USB drive	Optional USB drive
Power supply	
Specifications	700W and above output power; 1+1 redundancy; 2 power modules; support PMBus power supply, realize Node Manager 3.0 function
Power input	Please refer to the nameplate label on the host
Physical specifications	
Package size	W(width)721mm; H(height)279mm; D(depth)1168mm
Host size	W(width)447mm; H(height)43mm; D(depth)900mm
Weight	Full configuration Host weight: 30kg Gross weight:41kg (it includes: Host + Packing box + Rail + Parts box)
Environment parameter	
Operating environment temperature	10℃ -35℃
Storage and transport temperature	-40℃ -55℃
Operating humidity	35% -80% relative humidity
Storage and transport humidity	20% -93% (40℃) relative humidity

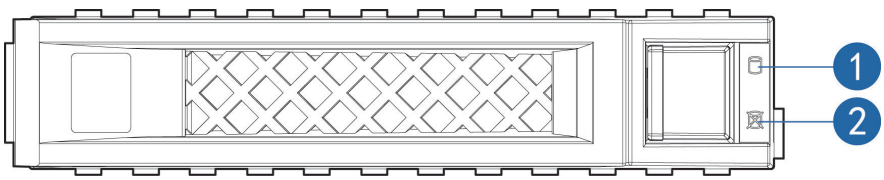
2.3 Front Panel

2.3.1 Buttons and LEDs on the Front Panel



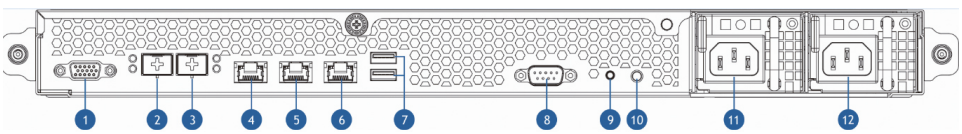
No.	Name
1	Server switch button
2	ID light and button
3	USB interface
4	NI0 status LED
5	NI1 status LED
6	HDD fault LED
7	Power fault LED
8	System fault LED

2.3.2 LEDs on the HDD Bracket



No.	Name	Description
1	HDD activity status LED	Steady green: normal Blinking green: HDD is going on read-write activity
2	HDD fault alarm LED	Steady red: HDD fails Steady blue: HDD locating Steady blue: RAID Rebuilding

2.4 Rear Panel

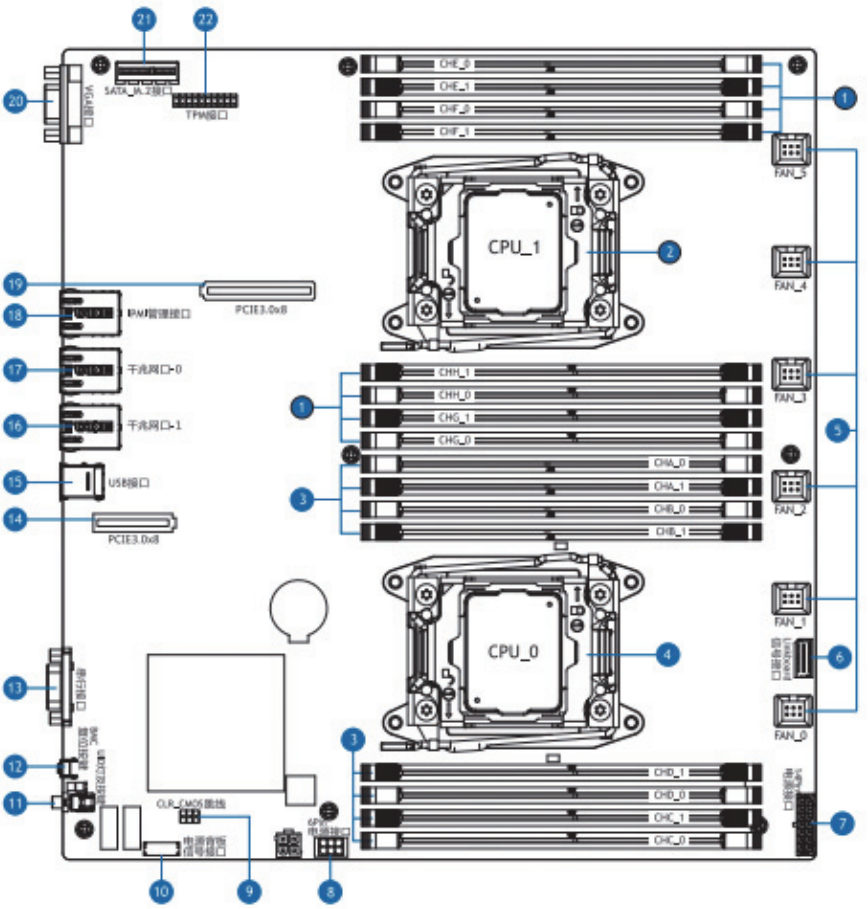


No.	Name
1	VGA interface
2	10 GbE port 1
3	10 GbE port 0
4	IPMI management interface
5	GbE port 0
6	GbE port 1
7	USB port
8	Serial interface
9	BMC reset button
10	UID LED and button
11	PSU1
12	PSU0

Note: according to system settings, the external 10 Gigabit NIC has a higher priority than Gigabit NIC.

For example: if the server is configured with an external dual-port 10 Gigabit NIC, the priority is 10 GbE port0> 10 GbE port1> GbE port0> GbE port1.

2.5 Motherboard Layout



No.	Name
1	DIMMs (corresponding to CPU1)
2	CPU1
3	DIMMs (corresponding to CPU0)
4	CPU0
5	System fan interface (6)
6	Linkboard signal interface
7	14pin power interface
8	6pin power interface
9	CLR_CMOS jumper

No.	Name
10	Power backplane signal interface
11	UID LED and button
12	BMC Reset button
13	Serial interface
14	PCIE3.0 X8 slots
15	USB port (2)
16	GbE port 1
17	GbE port 0
18	IPMI management port
19	PCIE3.0 X8 slots
20	VGA interface
21	SATA_M.2 interface
22	TPM interface

2.6 CLR_CMOS Jumper Introductions

See [2. 5 Motherboard Layout] for jumper positions.

Jumper No.	Name	Jumper Functions
CLR_CMOS	CMOS clear jumper	Short-circuit pin1-2, normal status; short-circuit pin 2-3, clear CMOS.

Note:

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

3 BIOS Setup

This chapter introduces how to configure BIOS. 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 parameters and hardware parameters can be adjusted through special setup procedure. BIOS has a great impact on the system booting and running, setting parameters improperly may cause conflicts among hardware resources, or degrade the system running 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 arbitrarily.

Notes:

1. Before changing the BIOS setup, please record the corresponding original setup. Hence when there are operating problems in the system due to the option altered, the setup can revert to the previous state.
2. Ordinarily the factory default settings are the optimal settings. Don't try to alter the parameters before you understand their denotations.
3. The common settings are introduced in detail in this chapter. The less referred options during using are simply explained or not.
4. The BIOS content varies according to different configurations of the products; hence the detailed introduction is elided.

3.1 System BIOS Setup Methods

Power on the server, system starts to boot, when the following content appears below Inspur logo on the screen:

"Press <DEL> to SETUP or <TAB> to POST or <F12> to PXE Boot.", press [DEL] button; when "Entering Setup..." appears in the lower right corner, it will enter system BIOS configuration later, and you could select options in BIOS main menu using arrow buttons to enter sub-menu.

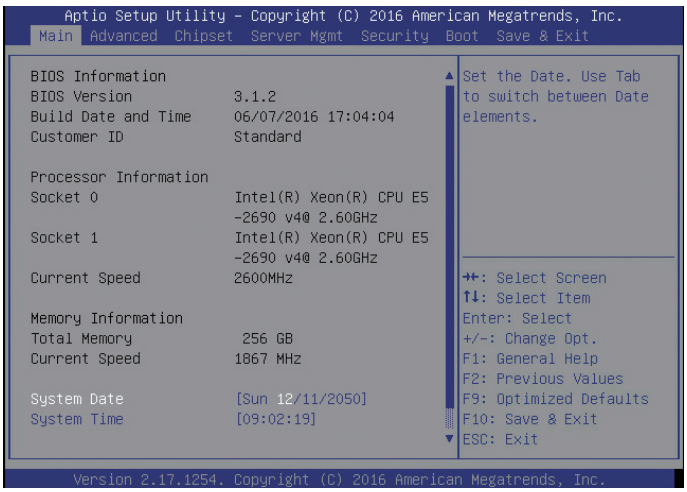
⚠ Note: Options in grey are not available. Options with symbol " ▶ " have a sub-menu.

Control key instruction table

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

3.2 BIOS Settings

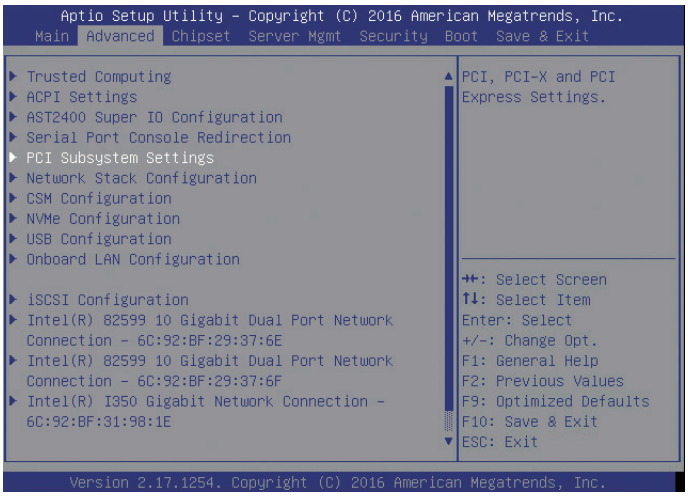
3.2.1 Main Menu



Main Interface Instruction Table

Interface Parameters	Function Des cription
BIOS Information	BIOS information
BIOS Version	BIOS version information
Build Date and Time	BIOS build date and time
Customer ID	Customer ID
Processor Information	Processor information
Socket 0	CPU0 model information
Socket 1	CPU1 model information
Current Speed	CPU current speed
Memory Information	Memory information
Total Memory	Memory total memory
Current Speed	Memory current speed
System Date	Display and set system date Use <Tab> or <Enter> to switch between options of the system date and time, directly input the number or use +/- keys to change the value (press + key once, the value will increase by 1, press - key once, the value will decrease by 1)
System Time	Display and set system time Use <Tab> or <Enter> to switch between options of the system date and time, directly input the number or use +/- keys to change the value (press + key once, the value will increase by 1, press - key once, the value will decrease by 1)

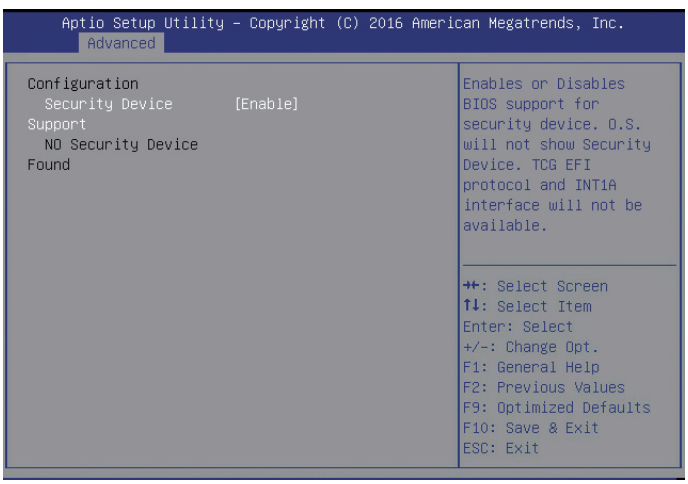
3.2.2 Advanced Menu



Advanced Interface Instruction Table

Interface Parameters	Function Description
Trusted Computing	Trusted computing configuration
ACPI Settings	Advanced configuration and power interface settings
AST2400 Super IO Configuration	AST2400 I/O chip parameter configuration
Serial Port Console Redirection	Serial port console redirection settings
PCI Subsystem Settings	PCI subsystem settings
Network Stack Configuration	Network stack configuration
CSM Configuration	CMS configuration
NVMe Configuration	NVMe configuration
USB Configuration	USB configuration
Onboard LAN Configuration	Onboard network card configuration
iSCSI Configuration	iSCSI configuration
Intel® I350 Gigabit Network Connection	Intel® I350 GbE NIC connection settings

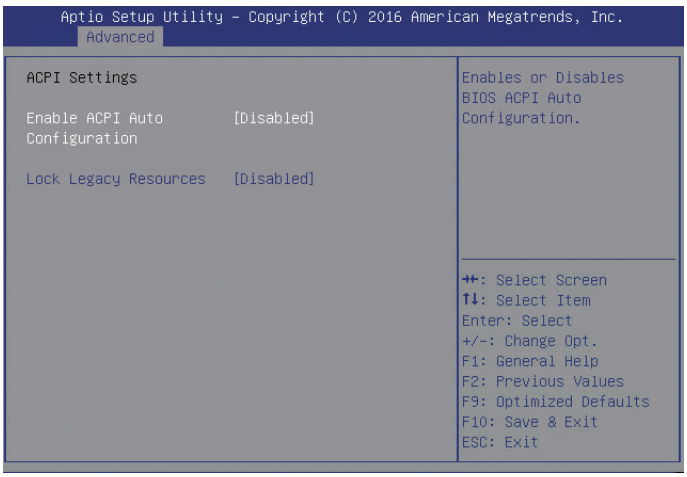
3.2.2.1 Trusted Computing



Trusted Computing Interface Instruction Table

Interface Parameters	Function Description	Default
Security Device Support	Security device support on/off settings, option parameters: Enabled Disabled BIOS supports TPM TCG version 1.2/2.0. BIOS supports TPM module through TPM software binding, if the software binding validation fails, BIOS will record the error to the SEL.	Enabled

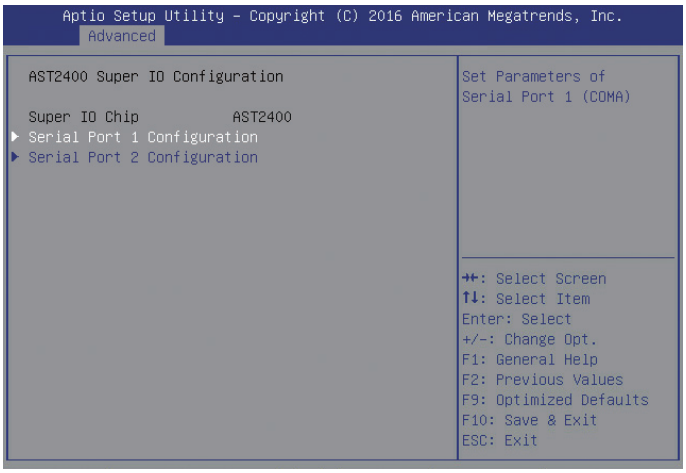
3.2.2.2 ACPI Settings



Advanced Interface Instruction Table

Interface Parameters	Function Description	Default
Enable ACPI Auto Configuration	ACPI auto configuration on/off settings, option parameters: Enabled Disabled If enabled, the Lock Legacy Resources will be hidden, and manual modification is not allowed.	Disabled
Lock Legacy Resources	Lock legacy resources on/off settings, option parameters: Enabled Disabled If enabled, OS will lock the device's legacy resources.	Disabled

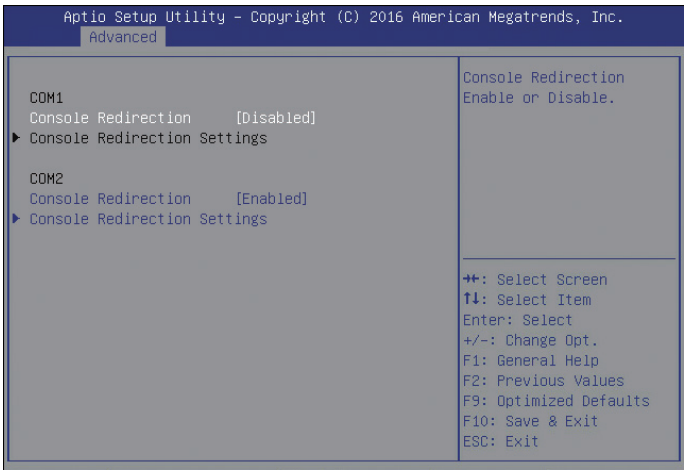
3.2.2.3 AST2400 Super IO Configuration



AST2400 Super IO Configuration Interface Instruction Table

Interface Parameters	Function Description
Super IO Chip	Display the super I/O chip that the motherboard uses currently
Serial Port 1 Configuration	Serial port 1 configuration, the configuration interface provides this serial port on/off control and resource adjustment functions. The resource adjustment function can manually adjust the IO PORT and IRQ number that COM PORT uses.
Serial Port 2 Configuration	Serial port 2 configuration, the configuration interface provides this serial port on/off control and resource adjustment functions. The resource adjustment function can manually adjust the IO PORT and IRQ number that COM PORT uses.

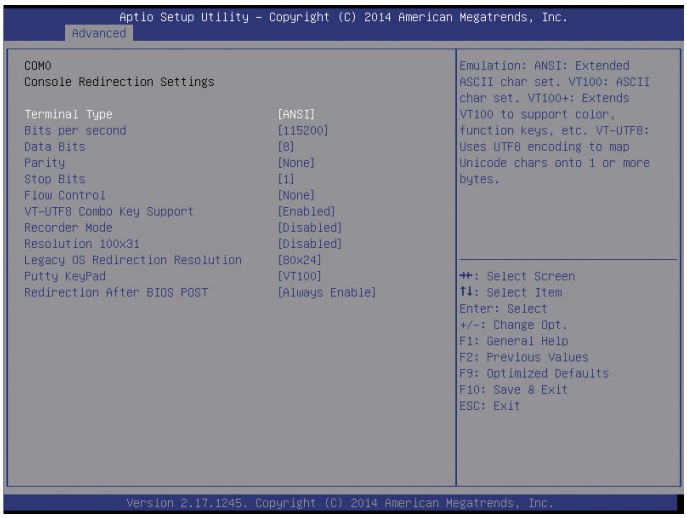
3.2.2.4 Serial Port Console Redirection



Serial Port Console Redirection Interface Instruction Table

Interface Parameters	Function Description	Default
Console Redirection	Console redirection on/off settings, option parameters : Enabled Disabled	Disabled
Console Redirection Settings	Console redirection parameter settings	--

3.2.2.4.1 Console Redirection Settings



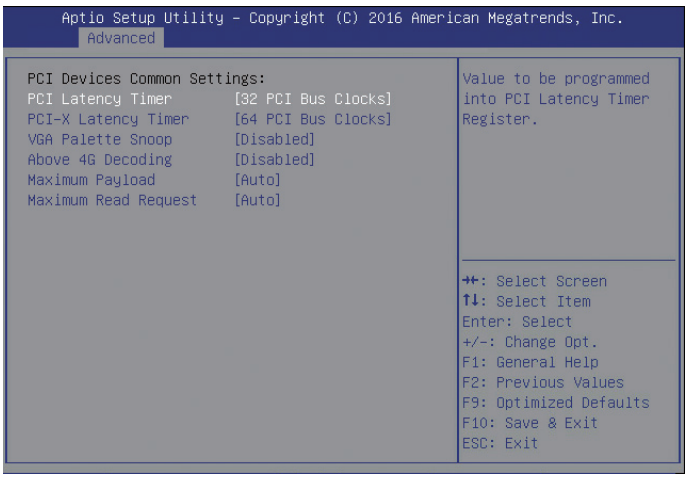
When the Console Redirection option is set to [Enabled], the Console Redirection Settings menu will appear.

Console Redirection Settings Interface Introduction

Interface Parameters	Function Description	Default
Terminal Type	Terminal type settings, option parameters: VT100 VT100+ VT-UTF8 ANSI	ANSI
Bits per second	Bits per second settings, option parameters: 9600 19200 38400 57600 115200	115200

Data Bits	Data bits width settings, option parameters: 7 8	8
Parity	Parity settings, option parameters: None (no parity) Even (even parity) Odd (odd parity) Mark (odd-even check) Space (memory parity check)	None
Stop Bits	Stop bits settings, option parameters: 1 2	1
Flow Control	Flow control settings, option parameters: None Hardware RTS/CTS	None
VT-UTF8 Combo Key Support	VT-UTF8 combo key support settings	Enabled
Recorder Mode	Recorder mode on/off settings	Disabled
Resolution 100×31	Extension terminal resolution 100×31 on/off settings	Disabled
Legacy OS Redirection Resolution	Legacy OS redirection resolution settings, option parameters: 80×24 80×25	80×24
Putty KeyPad	Putty function keys and keyboard settings, option parameters: VT100 LINUX XTERMR6 SCO ESCN VT400	VT100
Redirection After BIOS POST	Redirection settings after BIOS post, option parameters: Always Enabled BootLoader	Always Enabled

3.2.2.5 PCI Subsystem Settings

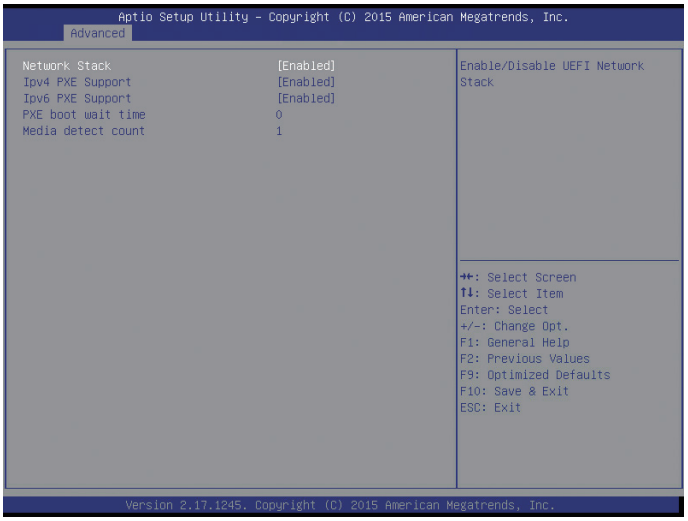


PCI Subsystem Settings Interface Instruction Table

Interface Parameters	Function Description	Default
PCI Latency Timer	PCI device latency timer settings, this is used to set the time that each PCI device can occupy the bus, option parameters: 32 PCI Bus Clocks 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	32 PCI Bus Clocks
PCI-X Latency Timer	PCI-X device latency timer settings, option parameters: 32 PCI Bus Clocks 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	64 PCI Bus Clocks
VGA Palette Snoop	VGA palette snoop on/off settings, option parameters: Enabled Disabled	Disabled
Above 4G Decoding	4G above memory access control on/off settings, option parameters: Enabled Disabled Enable or disable above 4G decoding function	Disabled

3.2.2.6 Network Stack Configuration

Network Stack Configuration interface is used to set the related options of UEFI pre-boot network.

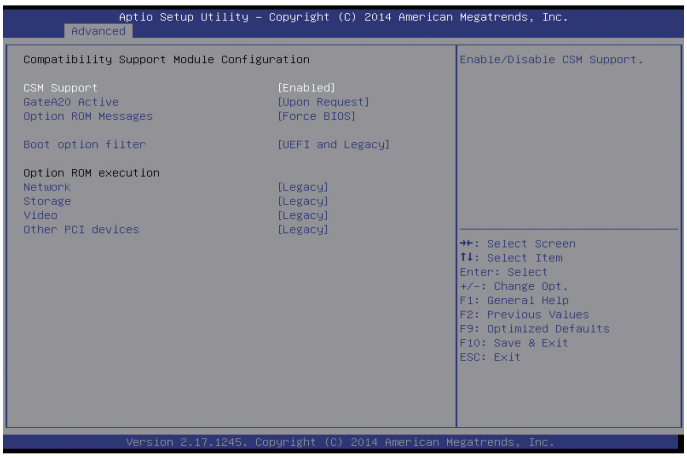


Network Stack Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Network Stack	Network stack on/off settings, option parameters: Enabled Disabled The following options are controlled by this option, only this option is enabled, the following options will be displayed and settable.	Disabled
IPv4 PXE Support	IPv4 PXE support on/off settings, option parameters: Enabled Disabled	Enabled
IPv6 PXE Support	IPv6 PXE support on/off settings, option parameters: Enabled Disabled	Enabled
PXE boot wait time	Set wait time, pressing ESC key can suspend PXE boot.	0
Media detect count	Set PXE media detect count	1

3.2.2.7 CSM Configuration

CSM Configuration interface is used to set the related options of compatible module.

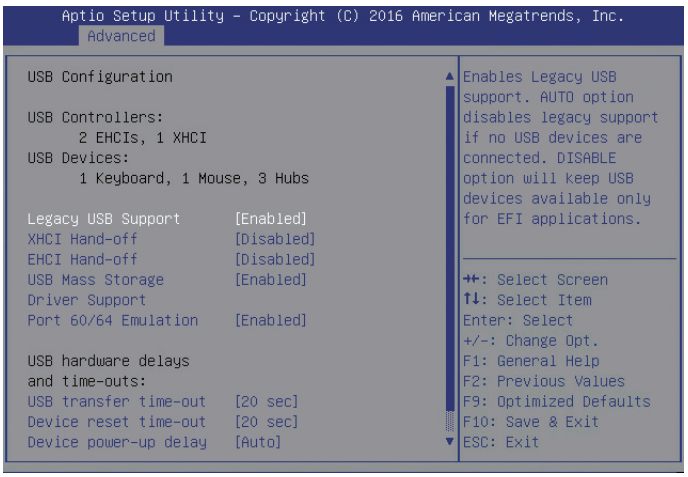


CSM Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
CSM Support	CSM support on/off settings	Enabled
GateA20 Active	A20 address wire control mode settings, option parameters: Upon Request Always A20 is an address wire, which can control the system how to access memory spaces that are more than 1MB.	Upon Request
Option Rom Messages	Option Rom messages display mode settings, option parameters: Force BIOS: forced display BIOS information Keep Current: keep current state Option Rom: no information displayed	Force BIOS
Boot option filter	Boot option filter settings, to control Legal and UEFI Option Rom's boot strategy, option parameters: UEFI and Legacy UEFI only Legacy only	UEFI and Legacy
Option ROM execution	Option Rom execution mode	---
Network	NIC Option Rom execution mode settings, option parameters: Legacy UEFI	Legacy
Storage	Storage device Option Rom execution mode settings, option parameters: Legacy UEFI	Legacy
Video	Video device Option Rom execution mode settings, option parameters: Legacy UEFI	Legacy
Other PCI devices	Other PCI devices Option Rom execution mode settings, option parameters: Legacy UEFI	Legacy

3.2.2.8 USB Configuration

USB Configuration interface is used to set USB related options.



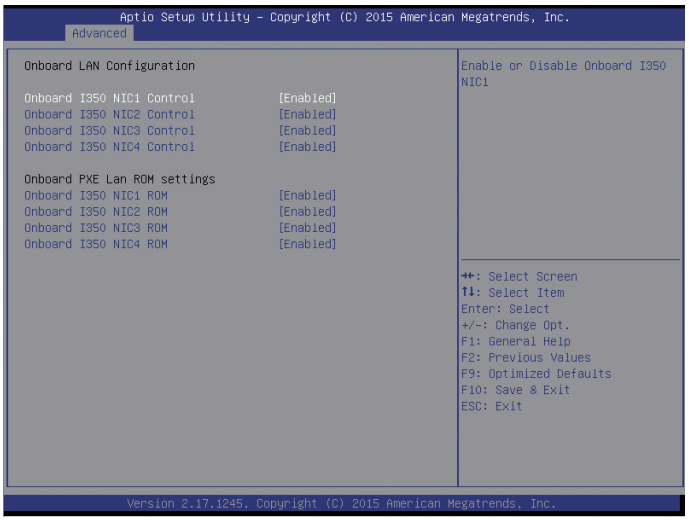
USB Interface Instruction Table

Interface Parameters	Function Description	Default
USB Devices	Current USB devices information	--
Legacy USB Support	Legacy USB support on/off settings, option parameters: Enabled Disabled	Enabled
XHCI Hand-off	Enable or disable XHCI hand-off function, option parameters: Enabled Disabled For the operating systems that do not support XHCI (USB3.0) function, enabling XHCI hand-off function can realize the support for XHCI.	Enabled
EHCI Hand-off	Enable or disable EHCI hand-off function, option parameters: Enabled Disabled For the operating systems that do not support EHCI (USB2.0) function, enabling EHCI hand-off function can realize the support for EHCI.	Disabled
USB Mass Storage Driver Support	USB mass storage driver support on/off settings, option parameters: Enabled Disabled	Enabled
Port 60/64 Emulation	USB port 60/64 emulation on/off settings, option parameters: Enabled Disabled	Enabled

USB Hardware Delay and Time-outs	USB hardware delay and time-outs settings	--
USB Transfer Time-out	USB transfer time-out settings, option parameters: 1 sec 5 sec 10 sec 20 sec	20 sec
Device Reset Time-out	USB high-capacity devices reset time-out settings, option parameters: 10 sec 20 sec 30 sec 40 sec	20 sec
Device Power-up Delay	Device power-up delay settings, option parameters: Auto Manual	Auto
Device Power-up Delay in Seconds	Only when the Device power-up delay option is set to Manual, this option will be displayed and it is used to set device power-up delay time, set range is 1-40s.	5

3.2.2.9 Onboard LAN Configuration

Onboard LAN Configuration is used to set the related options of onboard NIC. The options on this interface vary with different onboard NICs, the specific model will prevail.

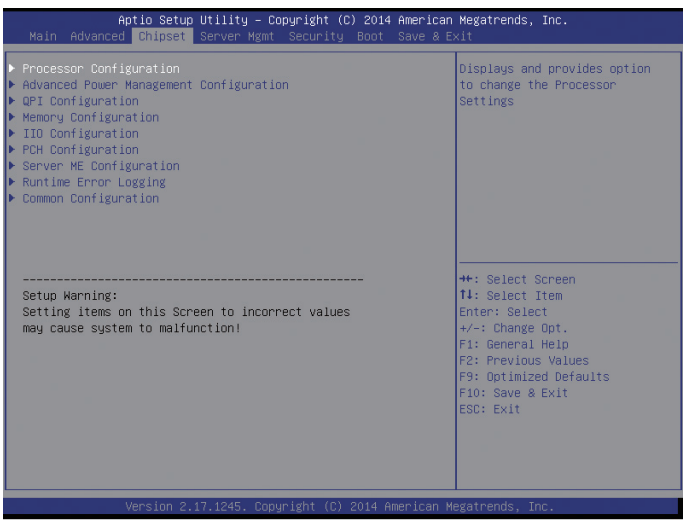


Onboard LAN Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Onboard NIC1 Control	Onboard NIC1 on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC2 Control	Onboard NIC2 on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC3 Control	Onboard NIC3 on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC4 Control	Onboard NIC4 on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC1 ROM	Onboard NIC1 PXE Oprom on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC2 ROM	Onboard NIC2 PXE Oprom on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC3 ROM	Onboard NIC3 PXE Oprom on/off settings, option parameters: Enabled Disabled	Enabled
Onboard NIC4 ROM	Onboard NIC4 PXE Oprom on/off settings, option parameters: Enabled Disabled	Enabled

3.2.3 Chipset

Chipset interface includes the information of CPU, QPI, memory, PCH, ME and other devices. Users can manage these devices through this interface.

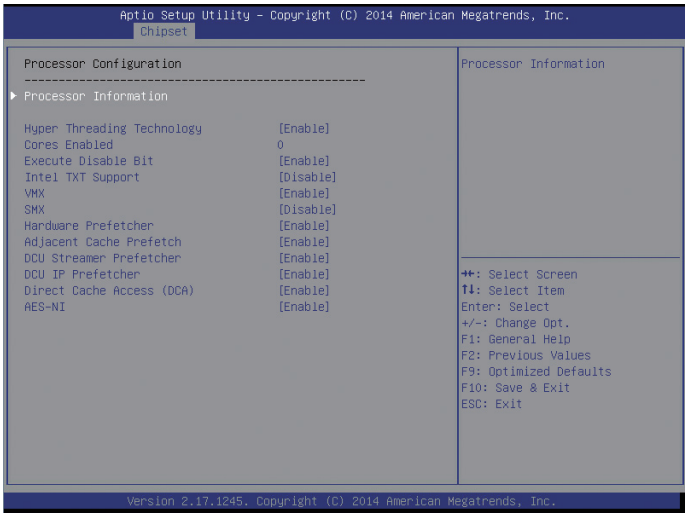


Chipset Interface Instruction Table

Interface Parameters	Function Description
Processor Configuration	Processor configuration
Advanced Power Management Configuration	Advanced power management configuration
QPI Configuration	QPI configuration
Memory Configuration	Memory configuration
IIO Configuration	IIO configuration
PCH Configuration	PCH configuration
Server ME Configuration	Server ME configuration
Runtime Error Logging	Runtime error logging configuration
Common Configuration	Common options configuration

3.2.3.1 Processor Configuration

Processor Configuration is used to set the related options of processor.



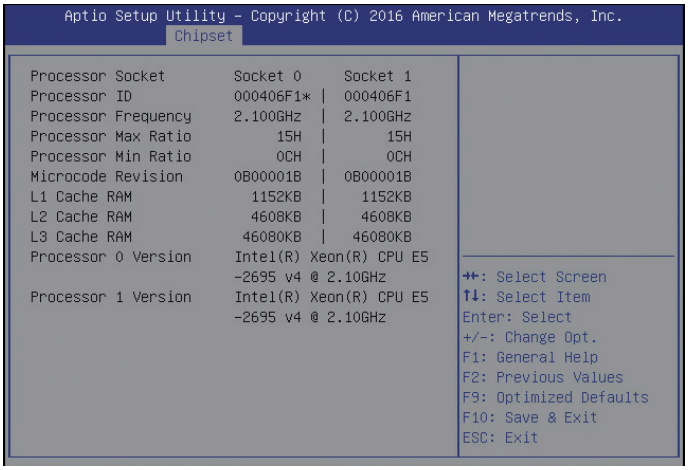
Processor Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Processor Information	Processor information submenu, display processor detailed information.	--
Hyper Threading Technology	Hyper threading technology settings, option parameters: Enabled Disabled	Enabled
Core Enabled	Number of CPU cores settings, input the number of CPU cores to be enabled. The default valued is 0, which means enabling all CPU cores.	0

Execute Disable Bit	Execute Disable Bit on/off settings, option parameters: Enabled Disabled	Enabled
Intel TXT Support	Intel TXT support on/off settings, option parameters: Enabled Disabled	Disabled
VMX	Intel VMX on/off settings, option parameters: Enabled Disabled	Enabled
SMX	SMX on/off settings, option parameters: Enabled Disabled	Disabled
Hardware Prefetcher	Hardware prefetcher on/off settings, option parameters: Enabled Disabled Before CPU processing instructions or data, it will prefetch these instructions or data from memory to L2 cache, to shorten the amount of time reading memory takes, to help eliminate potential bottlenecks, to improve system performance.	Enabled
Adjacent Cache Prefetch	Adjacent cache prefetch on/off settings, option parameters: Enabled Disabled If this function is enabled, when computer reading data, it will intelligently consider the adjacent data is needed as well, and it will prefetch these data during processing, to speed up the reading process.	Enabled
DCU Streamer Prefetcher	DCU streamer prefetcher on/off settings, option parameters: Enabled Disabled This function can prefetch CPU data to shorten the data reading time.	Enabled
DCU IP Prefectcher	DCU IP prefectcher on/off settings, option parameters: Enabled Disabled This function can judge from the history whether there is data to prefetch, to shorten the data reading time.	Enabled
Direct Cache Access (DCA)	Direct cache access on/off settings, option parameters: Enabled Disabled DCA is a system-level driver, it can directly put the data from IO device into CPU cache to improve the network IO performance.	Enabled
AES-NI	AES instruction on/off settings, option parameters: Enabled Disabled This menu is mainly used to control whether CPU supports AES instructions, which are used to support fast and secure encryption and decryption.	Enabled

3.2.3.1.1 Processor Information

Processor Information interface displays the detailed information of the current motherboard processor.

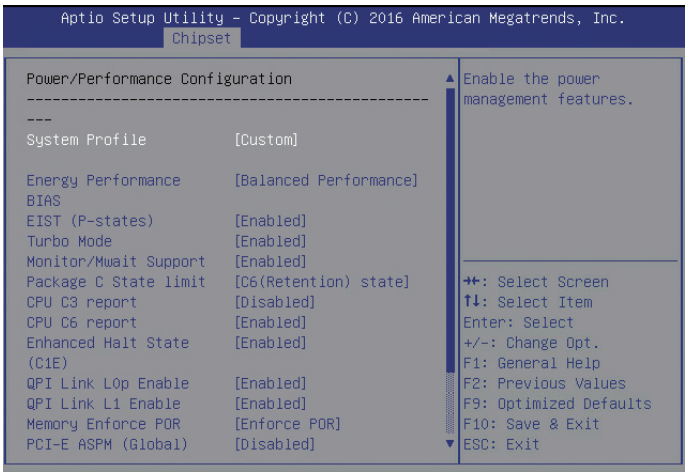


Processor Information Interface Instruction Table

Interface Parameters	Function Description
Processor Socket	Processor socket No.
Processor ID	Processor ID
Processor Frequency	Processor frequency
Processor Max Ratio	Processor max ratio
Processor Min Ratio	Processor min ratio
Microcode Revision	Microcode revision, display the CPU microcode revision information
L1 Cache RAM	L1 cache RAM capacity
L2 Cache RAM	L2 cache RAM capacity
L3 Cache RAM	L3 cache RAM capacity
Processor 0 Version	Processor 0 version information
Processor 1 Version	Processor 1 version information

3.2.3.2 Power/Performance Configuration

Power/Performance Configuration interface is used to set the related options of CPU power management.

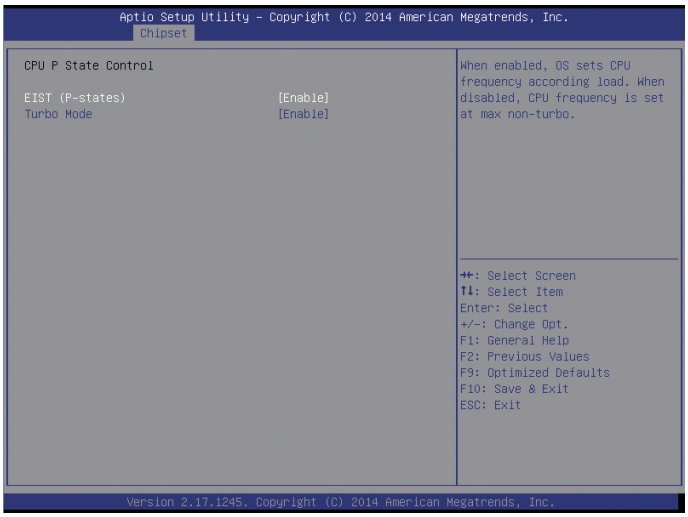


Advanced Power Management Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Power Technology	Power management policy settings, option parameters: Energy efficient Disabled Custom	Energy Efficient
CPU P State Control	CPU P state control setting submenu, only when the Power Technology is set to Custom, this option can be changed manually.	--
CPU C State Control	CPU C state control setting submenu, only when the Power Technology is set to Custom, this option can be changed manually.	--
Energy Performance Tuning	CPU performance and energy tuning submenu	--
DRAM RAPL Configuration	A configuration submenu of displaying and controlling the memory power consumption	--

3.2.3.2.1. CPU P State Control

CPU P State Control interface is used to set the options related with CPU P state; it will be enabled when Power Technology is set to [Custom], controlling EIST on-off and Turbo mode.

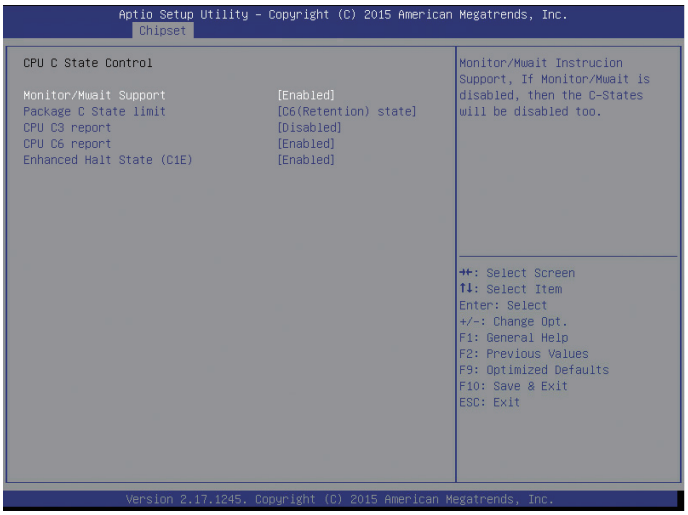


CPU P State Control Interface Instruction Table

Interface Parameters	Function Description	Default
EIST(P-states)	EIST on/off settings, option parameters: Enabled Disabled EIST allows the CPU to adjust its voltage and frequency dynamically according to the different demands on power consumption and performance.	Enabled
Turbo Mode	Turbo mode on/off settings, option parameters: Enabled Disabled Enabling Turbo Mode, system can close some idle cores through analyzing the current CPU loading condition, and allocate resources to the working cores, which can make them operating on a higher frequency and improve their performance; on the contrary, when more cores are needed, system can enable the corresponding cores dynamically and adjust the frequency intelligently.	Enabled

3.2.3.2.2 CPU C State Control

CPU C State Control interface is used to set the options related with CPU C state; it will be enabled when Power Technology is set to [Custom], controlling the power consumption when CPU is in idle state.

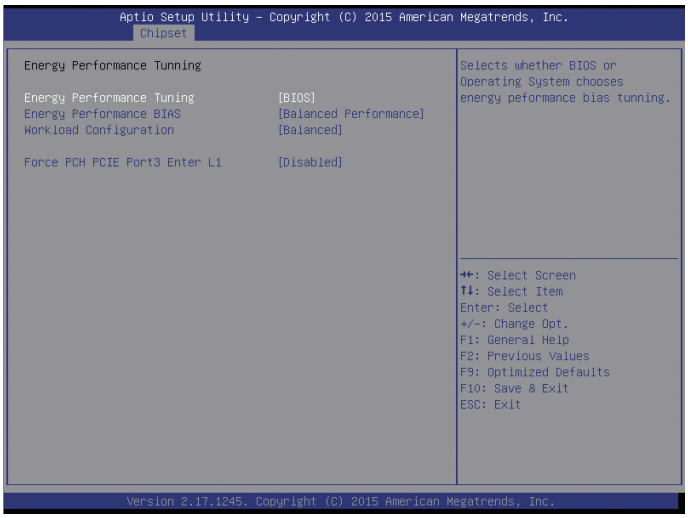


CPU C State Control Interface Instruction Table

Interface Parameters	Function Description	Default
Monitor/Mwait Support	CPU Monitor/Mwait support on/off settings, option parameters: Enabled Disabled	Enabled
Package C State limit	C state limit settings, option parameters: C0/C1 state C2 state C6 (non retention) state C6 (Retention) state	C6 (Retention) state
CPU C3 report	Report CPU C3 state to OS on/off settings, option parameters: Enabled Disabled	Disabled
CPU C6 report	Report CPU C6 state to OS on/off settings, option parameters: Enabled Disabled	Enabled
Enhanced Halt State (C1E)	C1E on/off settings, option parameters: Enabled Disabled	Enabled

3. 2.3.2.3 Energy Performance Tuning

Energy Performance Tuning interface is used to set the options related with CPU performance and energy saving tuning.

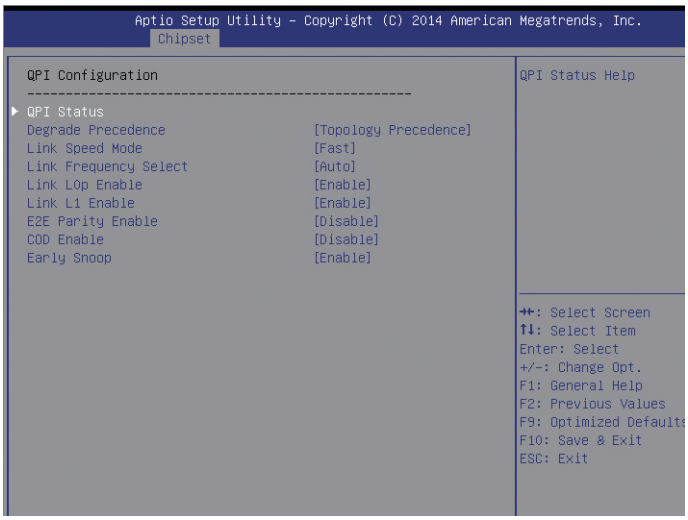


Energy Performance Tuning Interface Instruction Table

Interface Parameters	Function Description	Default
Energy Performance Tuning	Energy performance tuning settings, option parameters: BIOS OS	BIOS
Energy Performance BIAS	Energy performance BIAS settings, option parameters: Performance Balanced Performance Balanced Power Power	Balanced Performance
Workload Configuration	Workload configuration settings: option parameters: Balanced I/O sensitive	Balanced
Force PCH PCIE Port3 Enter L1	Force PCH PCIE Port3 Enter L1 settings, option parameters: Enabled Disabled	Disabled

3.2.3.3 QPI Configuration

QPI Configuration interface is used to set the options related with QPI.

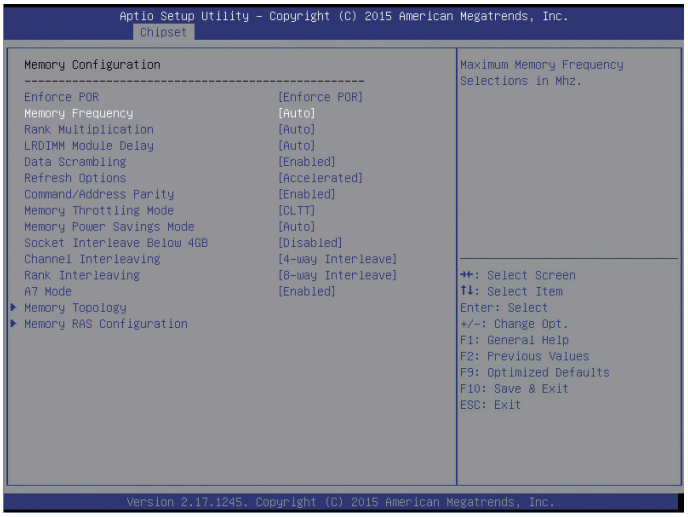


QPI Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
QPI Status	QPI status submenu, to display the current QPI status	--
Degrade Precedence	Degrade precedence settings, option parameters: Topology Precedence Feature Precedence When the system settings conflict, select Topology Precedence to reduce Feature, or select Feature Precedence to reduce Topology.	Topology Precedence
Link Speed Mode	Link speed mode settings, option parameters: Fast Slow	Fast
Link Frequency Select	Link frequency select settings, option parameters: Auto 6.4 GT/s 8.0 GT/s 9.6 GT/s Auto Limited	Auto
Link L0p Enable	Link L0p enable settings, option parameters: Enabled Disabled Link power saving mode setting, set when the bandwidth is half of the peak bandwidth.	Enabled
Link L1 Enable	Link L1 enable settings, option parameters: Enabled Disabled When the system is very idle, close QPI link.	Enabled
E2E Parity Enable	E2E parity enable settings, option parameters: Enabled Disabled	Disabled
COD Enable	COD enable settings, option parameters: Enabled Disabled	Disabled
Early Snoop	Early snoop enable settings, option parameters: Enabled Disabled	Enabled

3.2.3.4 Memory Configuration

Memory Configuration interface is used to set the options related with memory.



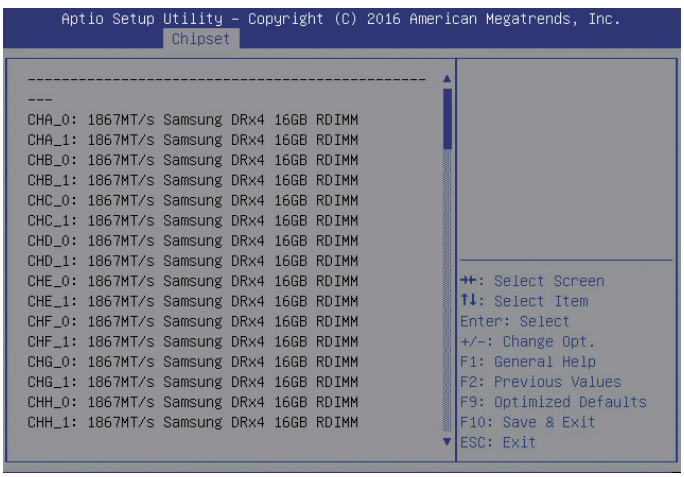
Memory Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Enforce POR	Enforce POR settings, option parameters: Enforce POR Disabled Enforce Stretch Goals	Enforce POR
Memory Frequency	Memory frequency settings, option parameters: Auto 1333 1600 1887 2133	Auto
Rank Multiplication	Rank multiplication settings, option parameters: Auto Enabled	Auto
LRIMM Module Delay	LRDIMM module delay settings, option parameters: Disabled Auto	Auto
Data Scrambling	Data scrambling settings, option parameters: Enabled Disabled	Enabled
Refresh Options	Refresh mode settings, option parameters: Accelerated 2x Refresh	Accelerated
Command/Address Parity	DDR4 command/address parity on/off settings, option parameters: Enabled Disabled	Enabled

Memory Throttling Mode	Memory throttling mode settings, option parameters: Disabled OLTT: open loop thermal throttling CLTT: closed loop thermal throttling	CLTT
Memory Power Savings Mode	Memory power savings mode settings, option parameters: Auto Disabled	Auto
Socket Interleave Below 4GB	Socket interleave below 4GB settings, option parameters: Disabled Enabled	Disabled
Channel Interleaving	Channel interleaving settings, option parameters: 1-way Interleave 2-way Interleave 3-way Interleave 4-way Interleave	4-way Interleave
Rank Interleaving	Rank interleaving settings, option parameters: 1-way Interleave 2-way Interleave 4-way Interleave 8-way Interleave	8-way Interleave
A7 Mode	A7 mode on/off settings, option parameters: Disabled Enabled Most of system topologies adopt A7 mode, because it can gain a higher bandwidth than standard A6 mode.	Enabled
Memory Topology	Memory topology submenu	--
Memory RAS Configuration	Memory RAS configuration submenu	--

3.2.3.4.1 Memory Topology

Memory Topology interface mainly displays the detailed motherboard information.

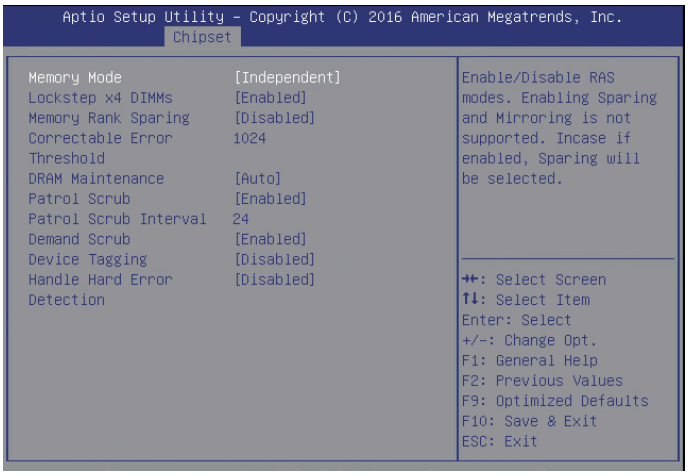


Memory Topology Interface Instruction Table

Parameters	Function description
CHA_1-1867MT/S Samsung DRx4 16GB RDIMM	Memory location information, frequency, manufacturer, Rank amount, capacity, etc.

3.2.3.4.2 Memory RAS Configuration

Memory RAS Configuration interface is used to set the options related with memory RAS features.



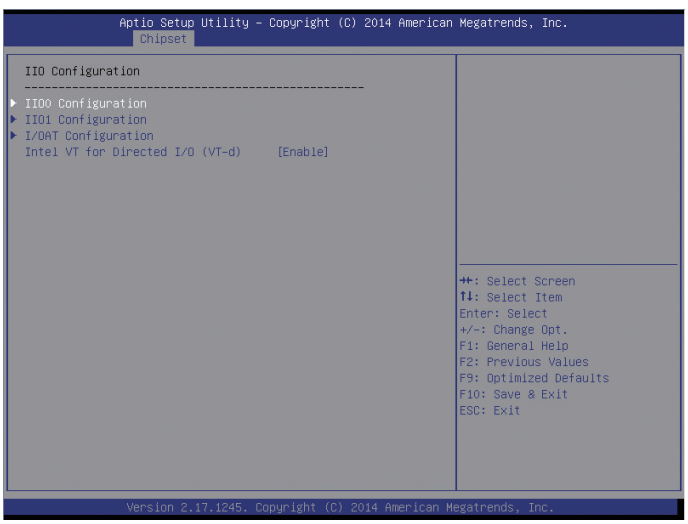
Memory RAS Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Memory Mode	Memory mode settings, option parameters: Independent Mirroring LockStep Independent mode: memory mutually independent Mirroring mode: Channel-Channel standby, the total memory capacity reduces by half. LockStep mode: multiple memory channels synchronize precisely, and process the same instructions at the same time; the total memory capacity keeps unchanged.	Independent
Lockstep X4 DIMMs	X4 DIMMs Lockstep on/off settings, option parameters: Disabled Enabled	Enabled
Memory Rank Sparing	Memory Rank sparing on/off settings, option parameters: Disabled Enabled If set to Enabled, 1 Rank of memory channels will be used for sparing, and memory channels capacity will reduce by 1 Rank.	Disabled

Correctable Error Threshold	Correctable error threshold settings, manual input, and the range is 1-32767.	512
DRAM Maintenance	DRAM maintenance settings, option parameters: Auto Manual Disabled	Auto
Patrol Scrub	Patrol scrub on/off settings, option parameters: Disabled Enabled	Enabled
Patrol Scrub Interval	Patrol scrub interval settings; the unit is hour, and the range is 0-24.	24
Demand Scrub	Demand scrub on/off settings, option parameters: Disabled Enabled	Enabled
Device Tagging	Device tagging on/off settings, option parameters: Disabled Enabled If this option is enabled, when the correctable errors exceeds the threshold, ECC chips will replace the disabled data chips, which will lead to the memory loses ECC 1bit correcting function, and can only check errors.	Disabled

3.2.3.5 IIO Configuration

IIO Configuration interface is used to configure PCIe slots.

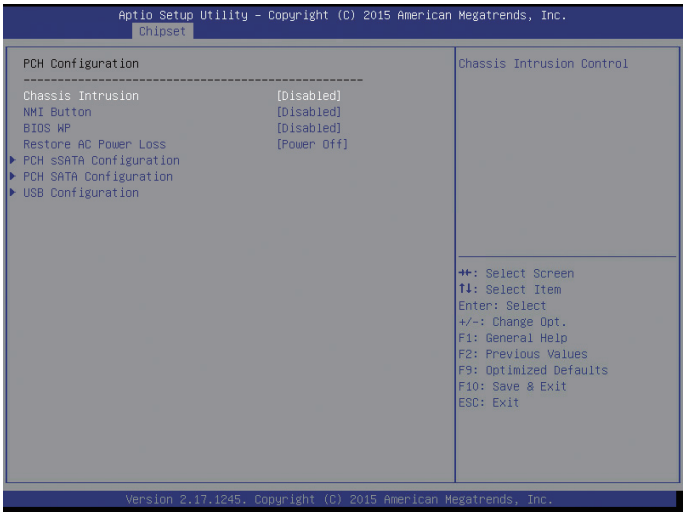


IIO Configuration Interface Instruction Table

Interface Parameters	Function Description
IIO0 Configuration	IIO0 configuration sub-menu, used to set link speed of PCIE device of CPU0, and PCI-E ASPM support on/off settings
IIO1 Configuration	IIO1 configuration sub-menu, used to set link speed of PCIE device of CPU1, and PCI-E ASPM support on/off settings
I/OAT Configuration	Intel I/O acceleration technology configuration sub-menu
Intel VT for Directed I/O (VT-d)	Intel VT-d on/off settings, option parameters: Disabled Enabled (default)

3.2.3.6 PCH Configuration

PCH Configuration interface is used to configure PCH, including PCH devices configuration, HDD interface configuration, USB configuration, etc.



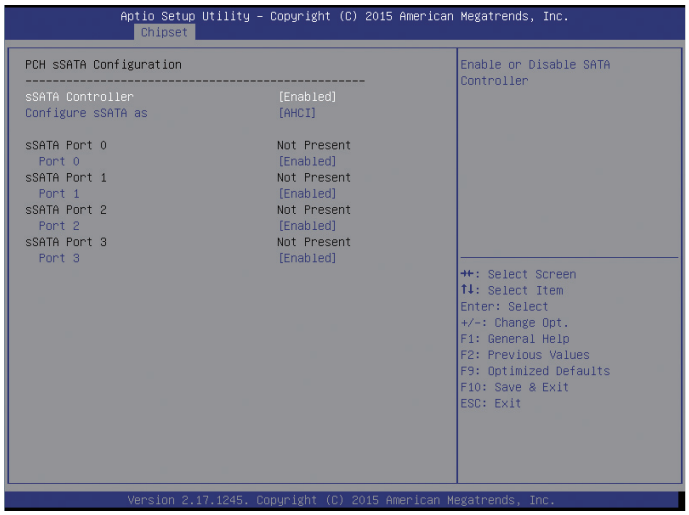
PCH Configuration Interface Instruction Table

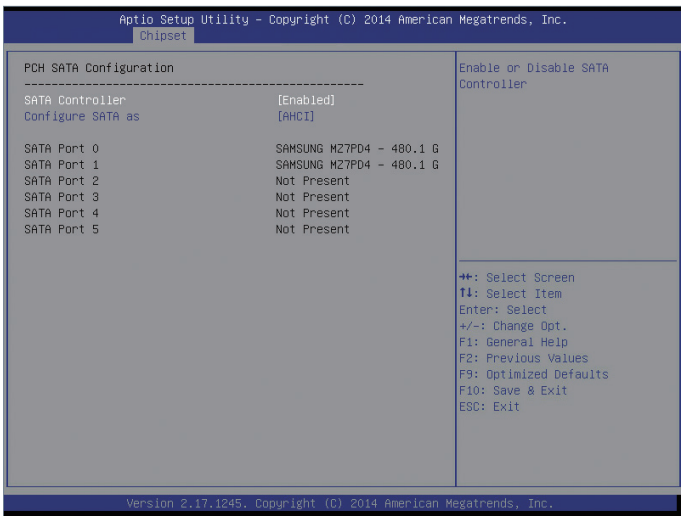
Interface Parameters	Function Description	Default
Chassis Intrusion	Chassis intrusion detection settings, option parameters: Disabled Enabled Reset Status	Disabled
NMI Button	NMI button on/off settings, option parameters: Disabled Enabled	Disabled

BIOS WP	BIOS write protect on/off settings, option parameters: Disabled Enabled	Disabled
Restore AC Power Loss	AC power-on status settings, option parameters: Power On Power Off Last State	Power Off
PCH sSATA Configuration	PCH sSATA configuration submenu	--
PCH SATA Configuration	PCH SATA configuration submenu	--
USB Configuration	USB configuration submenu	--

3.2.3.6.1 PCH sSATA/SATA Configuration

PCH sSATA Configuration and PCH SATA Configuration interfaces are used to configure the onboard sSATA and SATA ports. Taking PCH SATA Configuration menu as an example, introduce onboard SATA-port HDD configuration, while PCH sSATA Configuration is similar to this, which will not be repeated here.





PCH SATA Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
SATA Controller	SATA controller on/off settings, option parameters: Disabled Enabled	Enabled
Configure SATA as	SATA mode settings, option parameters: AHCI RAID	AHCI
SATA Port 0/1/2/3/4/5	Information of HDDs connected to onboard SATA port 0/1/2/3/4/5	

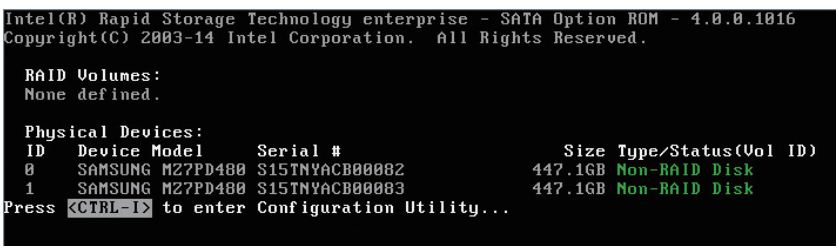
SATA RAID mode configuration

Set the option of Configure SATA as to [RAID], press F10 to save settings, and system restarts.

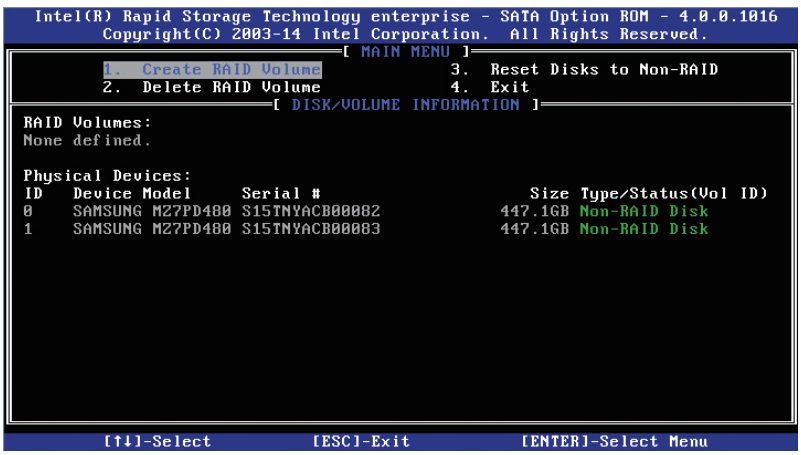
During system startup, the following content will appear on the screen:

Press<CTRL-I> to enter Configuration Utility…

Meanwhile, press [Ctrl] and [I] synchronously to enter SATA RAID configuration interface, as shown in the following figure.



After entering SATA RAID configuration interface, menu list information, information of HDDs connected to SATA controller (HDD ID, type, capacity as well as whether the HDD is a volume member, etc.), existed RAID volume information (including volume ID, name, RAID level, capacity, status, bootable or not) will be displayed.



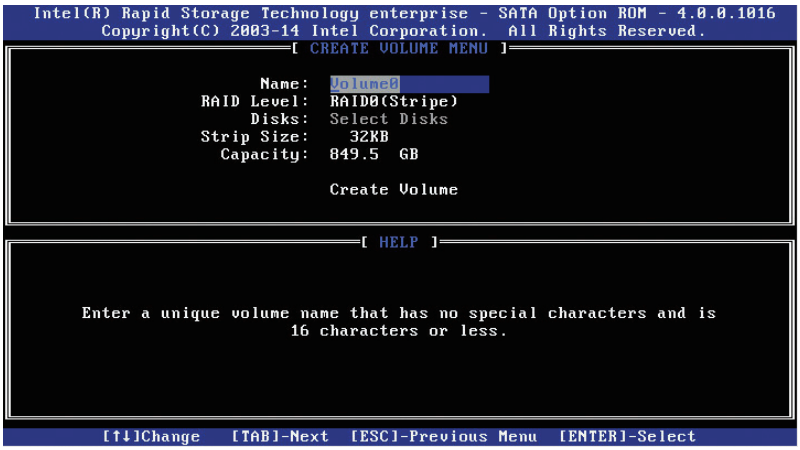
Key	Description
↑↓	Used to move cursor between different menus or to change values of menu options.
TAB	To select the next menu option.
Enter	To select a menu.
Esc	To exit menu or return to the previous menu from sub-menu.

SATA RAID configuration interface has the following 4 executable menus:

Create RAID Volume	To create an RAID volume.
Delete RAID Volume	To delete an existed RAID volume.
Reset Disks to Non-RAID	To reset HDDs in RAID volume, and to restore them to non-RAID status.
Exit	To exit SATA Host RAID configuration interface.

a) Create RAID Volume Menu

After entering SATA RAID configuration interface, you could use up and down arrows to select this menu, then press [Enter] to create an RAID volume menu, or directly enter the number before the menu to create an RAID volume menu, for other menu operations are similar, so it will not be repeated here. An instance of Create RAID Volume is as shown in the following figure:



Create RAID menu operation instructions

Name	Please enter a volume label name less than 16 characters without containing any special characters.
RAID Level	Please select RAID volume level, if no volume has been created at present, there're four volume levels of RAID0 (Stripe), RAID1 (Mirror), RAID10 (RAID0+1) and RAID5 (Parity) for selection, please select according to actual requirements. RAID0: This RAID volume is allowed to be made on 2 or above hard disks. RAID1: This RAID volume is allowed to be made on 2 hard disks. RAID10: This RAID volume is allowed to be made on 4 hard disks, which is only available when hard disk quantity is 4 or above. RAID5 (Parity): This RAID volume is allowed to be made on 3 or above hard disks.
Disks	Select hard disks to make RAID volume, press enter after this option is selected, system will enter hard disk selection interface, please select hard disks to make RAID volume through using space key accordingly, and then press enter to return to volume create menu.
Strip Size	Please select strip size, only RAID0 and RAID5 volumes could select this option.
Capacity	Set volume capacity, and the default value is the max. volume capacity.

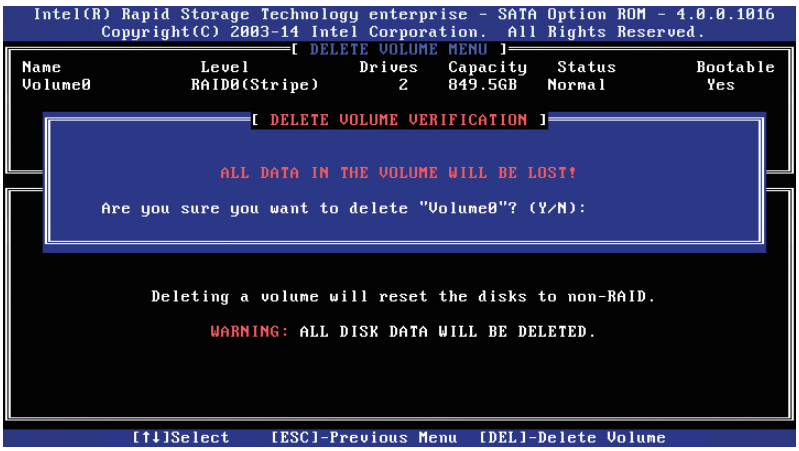
After completing the above configuration, please select [Create Volume], and press enter, system prompts: "WARNING: ALL DATA ON THE SELECTED DISKS WILL BE LOST. Are you sure you want to create this volume ?(Y/N):".

To create an RAID volume, please enter "Y", a volume will be created, and all data on the selected disk will be lost.

Otherwise, please enter "N", to exit volume creation.

Here we enter "Y" to create an RAID volume, after creation completed, return to SATA Host RAID configuration main interface, and the created RAID volume will be displayed in RAID volume.

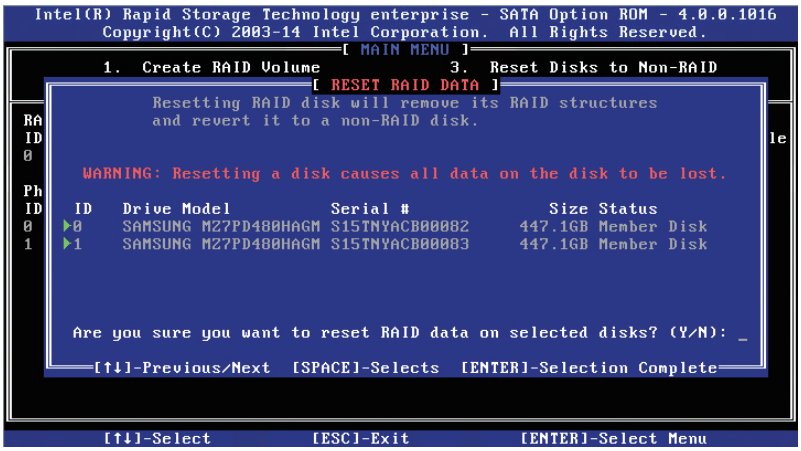
b) Delete RAID Volume Menu



After entering Delete RAID Volume menu, system prompts: “Deleting a volume will reset the disks to non-RAID. Warning: ALL DISKS DATA WILL BE DELETED.”.

To delete an RAID volume, please press [DEL], system prompts: “ALL DATA IN THE VOLUME WILL BE LOST!” again. Are you sure you want to delete “Volume*”?(Y/N):”, to delete this RAID volume, please enter “Y”, to cancel deletion of this RAID volume, please enter “N”.

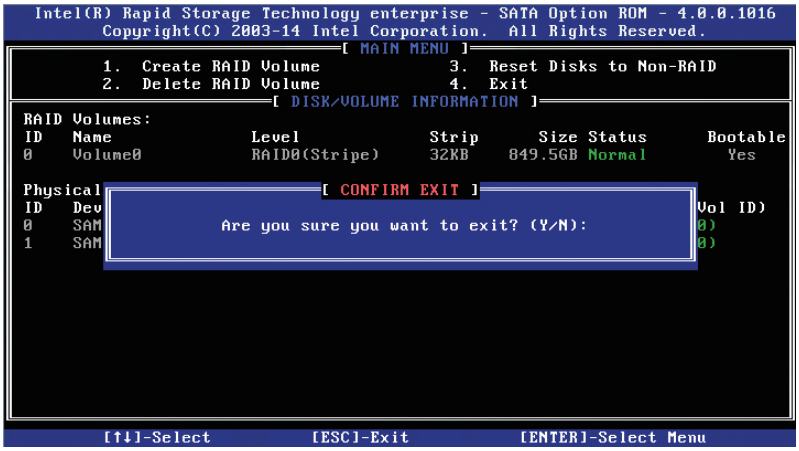
c) Reset Disks to Non-RAID Menu



After entering Reset Disks to Non-RAID menu, system will display all hard disks in RAID volume, please select the hard disk to reset using the space key according to actual demand, and then press enter to reset the hard disk, system prompts “Are you sure you want to reset RAID data on selected disks? (Y/N)” again, enter “Y” or

“N” according to prompt. It is to be noted that, during resetting hard disk, data on this disk will all be lost, meanwhile, this disk will not belong to RAID volume any more.

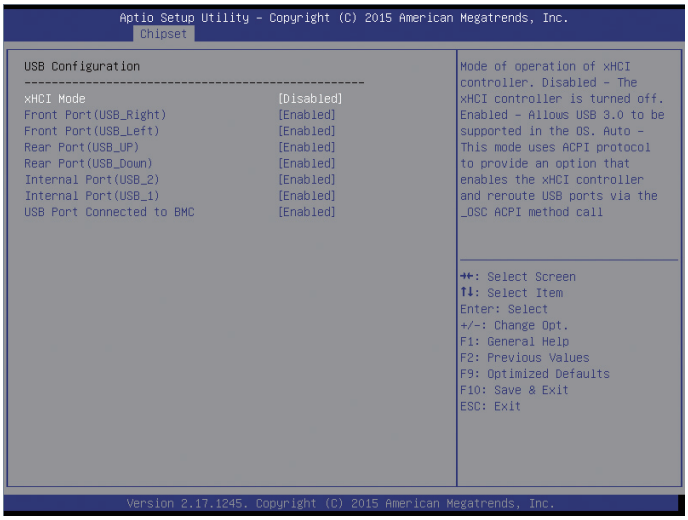
d) Exit Menu



System prompts: “Are you sure you want to exit? (Y/N):”, enter “Y”, to exit SAS RAID configuration interface, enter “N”, to cancel exit operation.

3.2.3.7 USB Configuration

USB Configuration interface is used to configure the onboard USB ports.

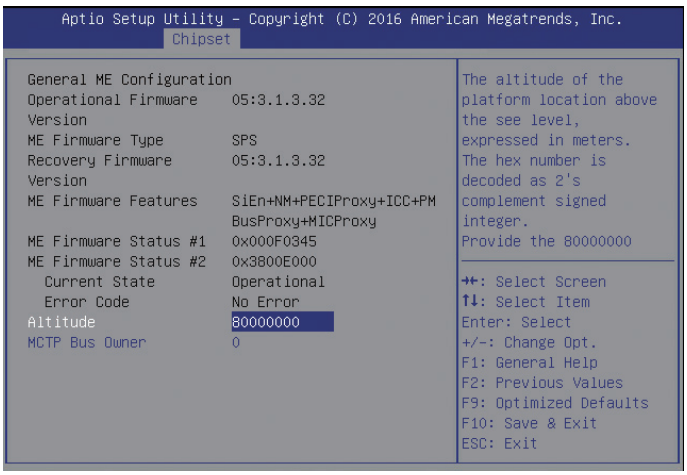


USB Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
xHCI Mode	XHCI controller on/off settings, option parameters: Auto Enabled Disabled If enabled, USB3.0 is supported.	Disabled
Front Port(USB_ Right)	Front port (USB_Right) on/off settings, option parameters: Disabled Enabled	Enabled
Front Port(USB_ Left)	Front port (USB_Left) on/off settings, option parameters: Disabled Enabled	Enabled
Rear Port(USB_Up)	Rear port (USB_ Up) on/off settings, option parameters: Disabled Enabled	Enabled
Rear Port(USB_ Down)	Rear port (USB_ Down) on/off settings, option parameters: Disabled Enabled	Enabled
Internal Port(USB_2)	Internal port (USB_2) on/off settings, option parameters: Disabled Enabled	Enabled
Internal Port(USB_1)	Internal port (USB_1) on/off settings, option parameters: Disabled Enabled	Enabled
USB Port Connected to BMC	On/off settings of USB port connected to BMC, option parameters: Disabled Enabled	Enabled

3.2.3.8 Server ME Configuration

Server ME Configuration is used to display the server ME information and set the relevant options.

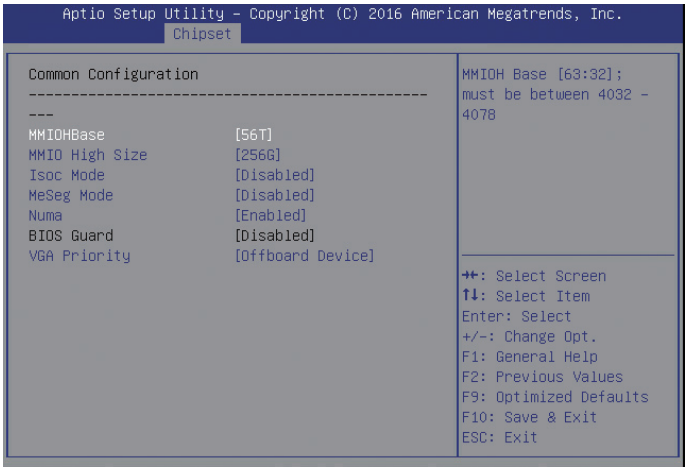


Server ME Configuration Interface Instruction Table

Interface Parameters	Function Description
Operational Firmware Version	Operational ME firmware version
Recovery Firmware Version	Recovery ME firmware version
ME Firmware Features	ME firmware features information
ME Firmware Status #1	ME FW status value #1
ME Firmware Status #2	ME FW status value #2
Current State	Current state
Error code	ME FW error code

3.2.3.9 Common Configuration

Common Configuration interface is used to set the common options.



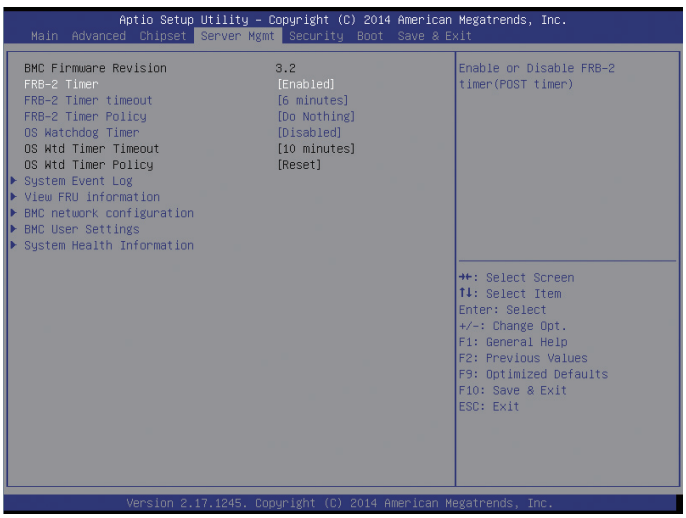
Common Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
MMIOH Base	MMIO base address settings, option parameters: 56T 40T 24T 16T 4T 2T	56T
MMIO High Size	MMIO high size settings, option parameters: 256G 128G 512G 1024G	256G
Isoc Mode	Isoc mode on/off settings, option parameters: Disabled Enabled	Disabled

MeSeg Mode	MeSeg mode on/off settings, option parameters: Disabled Enabled	Disabled
Numa	Numa on/off settings, option parameters: Disabled Enabled	Enabled
BIOS Guard	BIOS guard on/off settings, option parameters: Disabled Enabled	Disabled
VGA Priority	VGA priority settings, option parameters: Onboard Device: onboard device takes precedence Offboard Device: external device takes precedence	Offboard Device

3.2.4 Server Mgmt

Server Mgmt interface is used to set the options related with server management, including watchdog, BMC network settings, BMC user settings, system health information, etc.



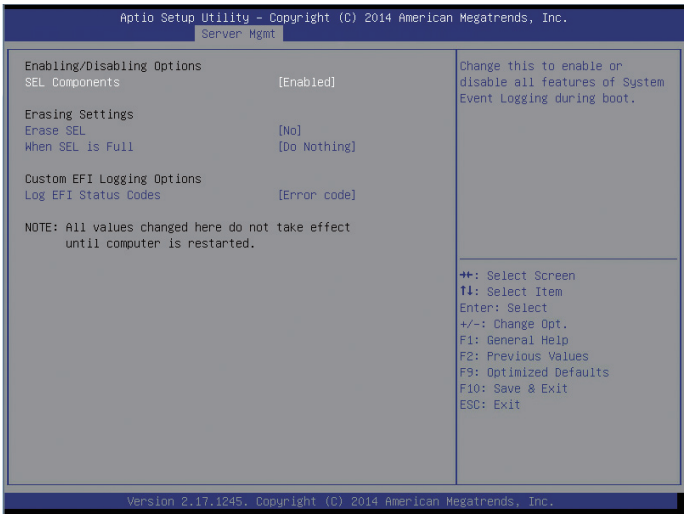
Server Mgmt Interface Instruction Table

Interface Parameters	Function Description	Default
BMC Firmware Version	Current motherboard BMC firmware version	--
FRB-2 Timer	FRB-2 timer on/off settings, option parameters: Enabled Disabled	Enabled
FRB-2 Timer Timeout	FRB-2 timer timeout settings, option parameters: 3 minutes 4 minutes 5 minutes 6 minutes	6 minutes

FRB-2 Timer Policy	FRB-2 timer policy settings, option parameters: Do Nothing Reset Power Down Power Cycle	Do Nothing
OS Watchdog Timer	OS watchdog timer settings, option parameters: Enabled Disabled	Disabled
OS Wtd Timer Timeout	OS Wtd timer timeout settings, option parameters: 5 minutes 10 minutes 15 minutes 20 minutes	10minutes
OS Wtd Timer Policy	OS Wtd timer policy settings, option parameters: Do Nothing Reset Power Down Power Cycle	Reset
System Event Log	System event log submenu	--
View FRU Information	View FRU information submenu	--
BMC Network Configuration	BMC network configuration submenu	--
BMC User Settings	BMC user settings submenu	--
System Health Information	System health information submenu	--

3.2.4.1 System Event Log

System Event Log interface is used to set the options related with system event logs.

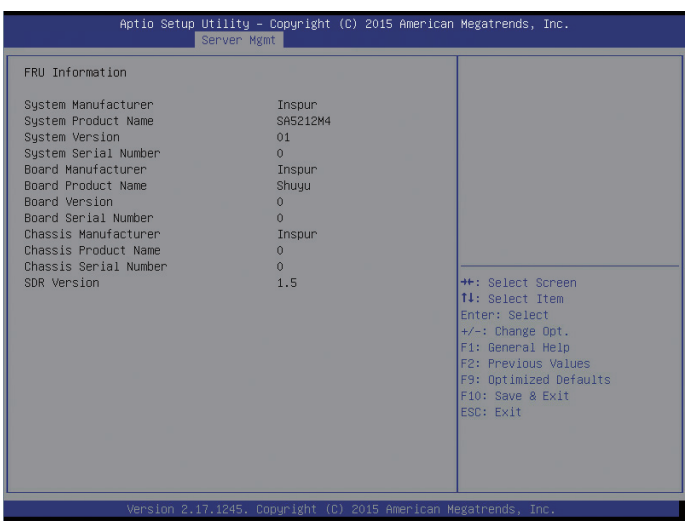


System Event log Interface Instruction Table

Interface Parameters	Function Description	Default
SEL Components	System event log settings, option parameters: Disabled Enabled	Enabled
Erase SEL	Erase SEL settings, option parameters: No Yes,On next reset Yes,On every reset	No
When SEL is Full	Operation settings when SEL is full, option parameters: Do Nothing Erase Immediately	Do Nothing
Log EFI Staus Codes	Log EFI staus codes settings, option parameters: Disabled Both: error code and process code Error code Progress code	Error code

3.2.4.2 View FRU Information

View FRU Information interface is used to display the BMC FRU information read by BIOS. Every time system resets, BMC will interact with BMC to keep the synchronous update of FRU information.

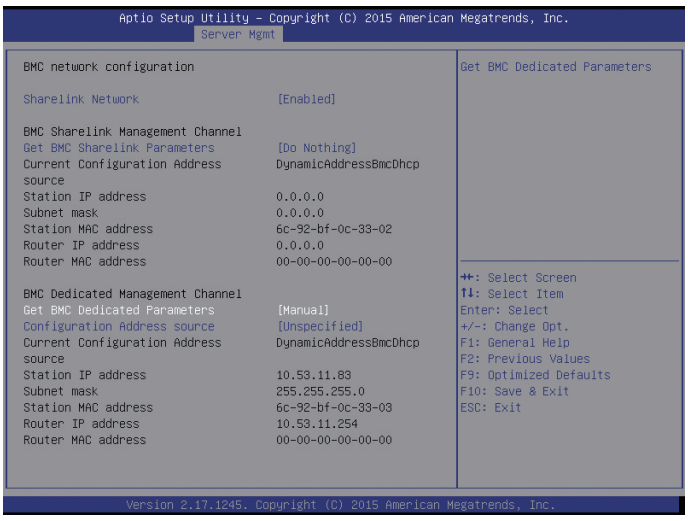


View FRU Information Interface Instruction Table

Interface Parameters	Function Description
System Manufacturer	System manufacturer
System Product Name	System product name
System Version	System version
System Serial Number	System serial number
Board Manufacturer	Board manufacturer
Board Product Name	Board product name
Board Version	Board version
Board Serial Number	Board serial number
Chassis Manufacturer	Chassis manufacturer
Chassis Product Name	Chassis product name
Chassis Serial Number	Chassis serial number
SDR Version	SDR version

3.2.4.3 BMC Network Configuration

BMC network configuration interface is used to configure BMC network through BIOS.



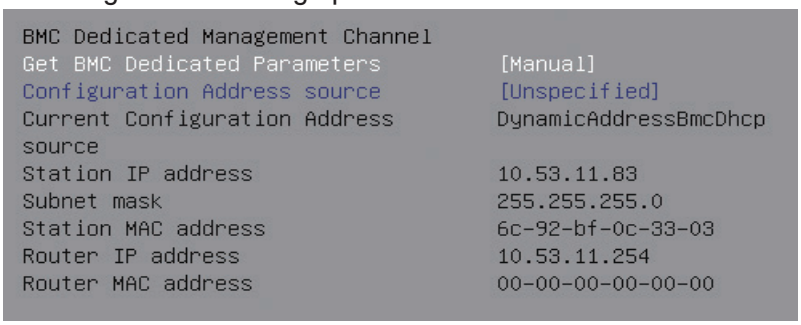
BMC Network Configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Sharelink Network	BMC Sharelink on/off settings, option parameters: Enabled Disabled Take effect immediately after successful setting.	Enabled
Get BMC Sharelink/ Dedicated Parameters	Get BMC sharelink/dedicated parameters settings, option parameters: Do Nothing Auto Manual	Do Nothing
Configuration Address Source	Configure BMC network state parameters, option parameters: Unspecified: will not change BMC network parameters Static: static BMC network parameters settings DynamicBmcDhcp: dynamically gain BMC network parameters	Unspecified
Current Configuration Address	Current BMC configuration address status	--
Station IP Address	Station IP address	--
Subnet Mask	Subnet mask	--
Station MAC Address	Station MAC address	--
Router IP Address	Router IP address	--
Router MAC Address	Router MAC address	--

Next how to manually set the BMC network parameters will be introduced.

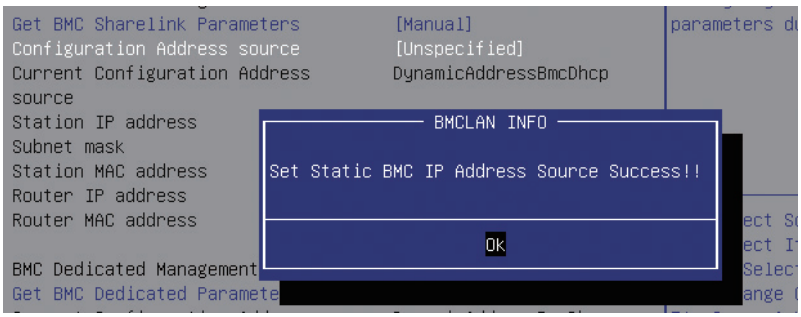
Taking BMC dedicated port as an example, as shown in the following figure, when Get BMC Dedicated Parameters is set to [Manual], Configuration Address Source option will be displayed.

Note: please make sure that the BMC management port has been connected with network when using Manual setting option.

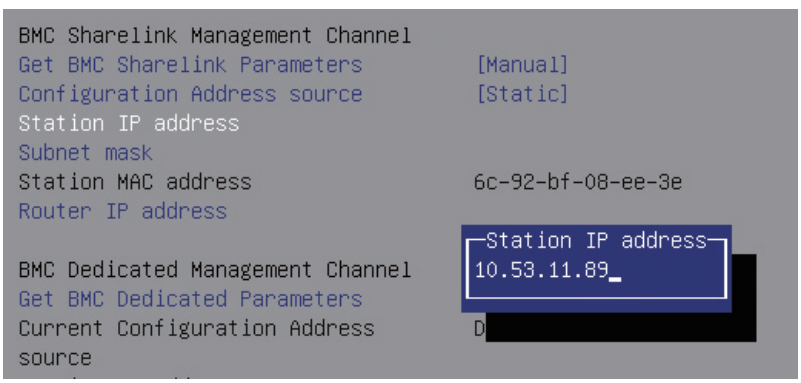


1) Set static BMC network parameters

Set the Configuration Address Source option to [Static], if the setting is successful, it will prompt “Set Static BMC IP Address Source Success!!”, and BMC network will become static immediately.



Select the Station IP Address option, and press Enter, the Station IP Address window will pop up, manually enter the Static IP to set, after configuration is completed, press Enter to confirm, and an example is as shown in the following figure:



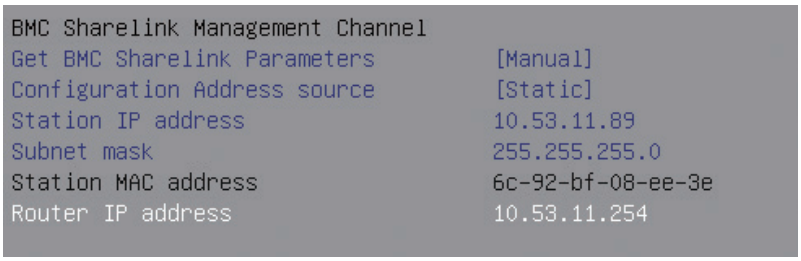
If the setting succeeds, it will prompt “Set Static BMC Station IP OK!!!”, and the setting takes effect immediately.

If the setting fails, it will prompt “Set Static BMC Station IP Fail!!!”;

If the IP doesn’t change, it will prompt “Static BMC Station IP Not Change!!!”;

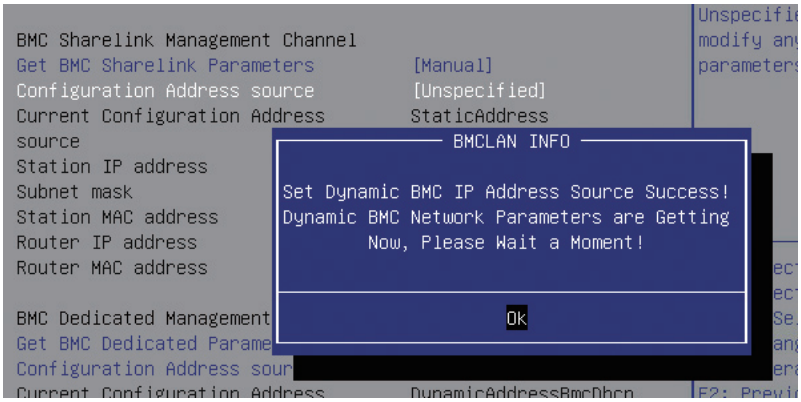
If the input IP is invalid, it will prompt “Invalid Station IP Entered!!!”, and assign 0.0.0.0 to the IP address. This assignment just changes the IP address in BIOS setup interface, and does not send IPMI command to change the BMC IP.

The setting prompts of Subnet mask and Router IP address are similar with those of Station IP address, and will not be repeated here. After setup, BMC network parameters will take effect, users can login the BMC Web interface to operate.

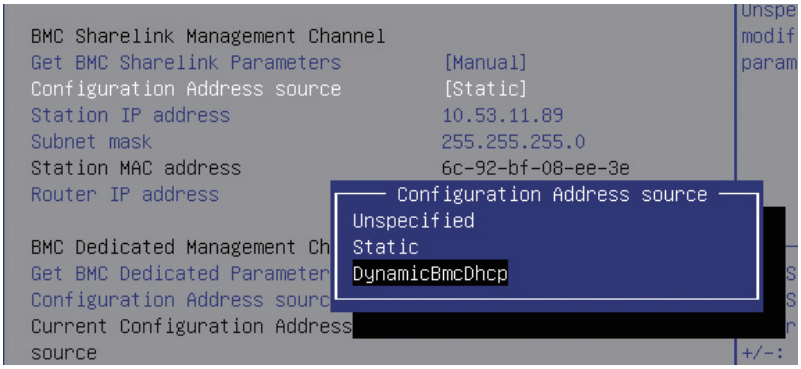


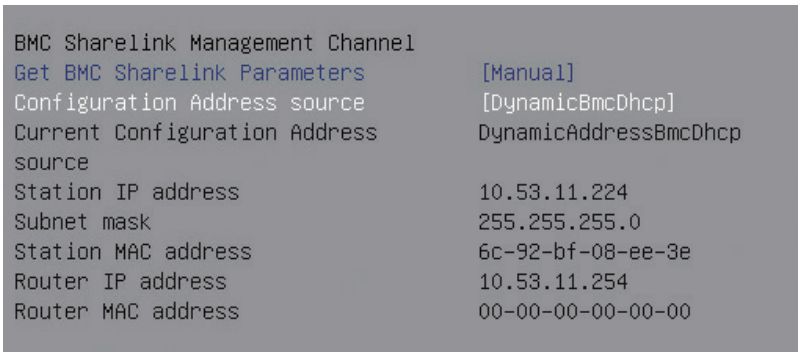
2) Set dynamic BMC network parameters

Set the Configuration Address Source option to [DynamicBmcDhcp], if the setting is successful, it will 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:



The setting needs a period of time to take effect, it’s suggested to wait for about 30s, that is, after pressing Enter, normally system will stay on the following interface for about 30s; when the dynamic network takes effect, it will prompt “Get Dynamic BMC Dhcp Success!!”





Note: the immediate effect of options in BIOS Setup interface is realized through calling Callback function, and only the options in BIOS Setup interface are changed, the Callback function will be called to process, and otherwise, it will not take effect. For example, if you want to automatically get BMC parameters again, you need to set Get BMC Sharelink Parameters to [Do Nothing] or [Manual], and then set it to [Auto], the function will take effect.

3.2.4.4 BMC User Settings

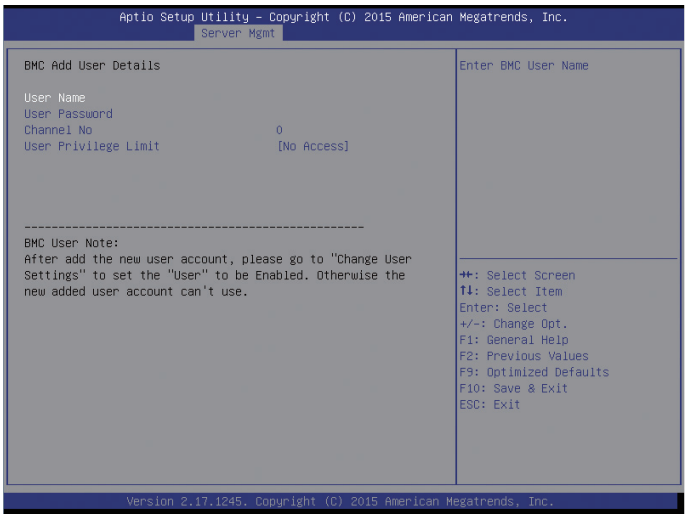
BMC User Settings interface is used to configure BMC user through BIOS.

BMC User Settings Interface Instruction Table

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

3.2.4.4.1 Add User

Add User interface is used to add a BMC user through BIOS, after addition, it will take effect immediately, and the user will be added into the BMC user list.



Add User Interface Instruction Table

Interface Parameters	Function Description	Default
User Name	User name settings	--
User Password	User password settings	--
Channel NO	BMC channel settings, need to be set to1 or 8	0
User Privilege Limit	User privilege settings, option parameters: No Access User Operator Administrator	No Access

Specific operations are as follows:

a、Select the User Name option, press Enter, the User Name box will pop up, input the user name to set, after configuration is completed, press Enter to confirm.

b、Select the User Password option, press Enter, the User Password box will pop up, input the user password to set, the password length is 1-16 characters; press Enter, Confirm New User Password box, input the new password again, and press enter to confirm. If the input password is invalid or the two passwords you entered do not match, it will prompt “Invalid Password”.

c、Channel NO is set to 1 or 8.

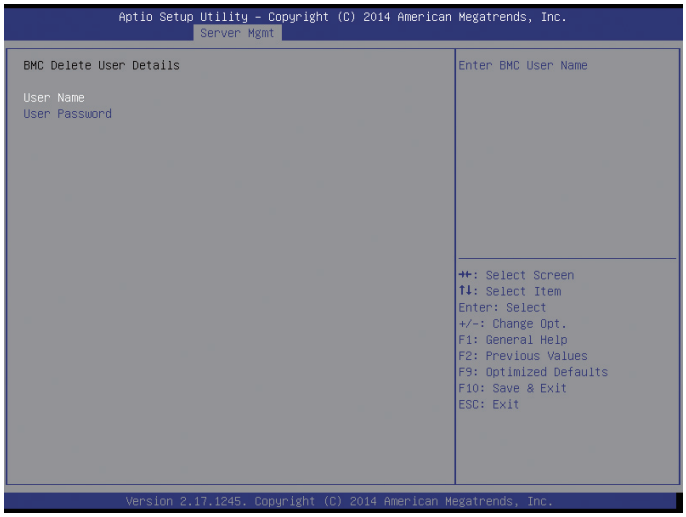
d、 User Privilege Limit option, set privilege for the new user, after

configuration is completed, press Enter, the BMC USER SETTINGS INFO box will pop up, when system prompts “Set User Access Command Passed”, press Enter to confirm, the new user is added successfully, and takes effect immediately.

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

3.2.4.4.2 Delete User

Delete User interface is used to delete a BMC user through BIOS, after deletion, it will take effect immediately, and this user can not login to the BMC Web interface.



Delete User Interface Instruction Table

Interface Parameters	Function Description
User Name	The user name to delete
User Password	The user password to delete

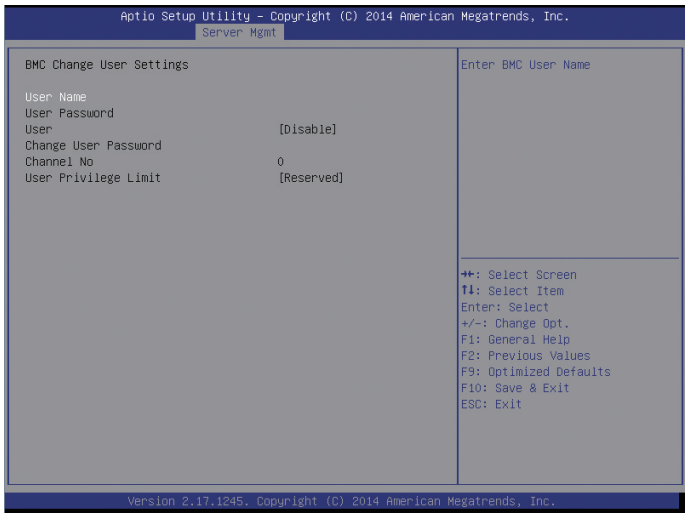
Specific operations are as follows:

a、Select the User Name option, press Enter, the User Name box will pop up, manually enter the user name to delete, and press Enter to confirm.

b、Select the User Password option, press Enter, the User Password box will pop up, manually enter the user password to delete, press Enter to confirm, and the BMC USER SETTINGS INFO prompt will pop up, if the entered password is correct, it will prompt ““User Deleted!!!”, the deletion will take effect immediately, and this user can not login to BMC Web interface any more.

3.2.4.4.3 Change User Settings

Change User Settings interface is used to change the user's name, password and other user settings.



Change User Settings Interface Instruction Table

Interface Parameters	Function Description	Default
User Name	The user name that needs to change	--
User Password	The user password that needs to change	--
User	User privilege on/off settings, option parameters: Disabled Enabled	Disabled
Change User Password	Change user password	--
Channel NO	BMC channel settings, set to 1or 8	0
User Privilege Limit	Change user privilege settings, option parameters: No Access User Operator Administrator	No Access

Specific operation steps:

a、Select the User Name option, press Enter, the User Name box will pop up, manually enter the user name to modify, after configuration is completed, press Enter to confirm.

b、Select the User Password option, press Enter, the User Password box will pop up, manually enter the user password, and press Enter to confirm. If the input password is correct, the gray option below User Password will

become blue and operable. If the input password is wrong, it will prompt "User Password Not Matched!"

c、Select the User option, and set it to [Enable] or [Disable].

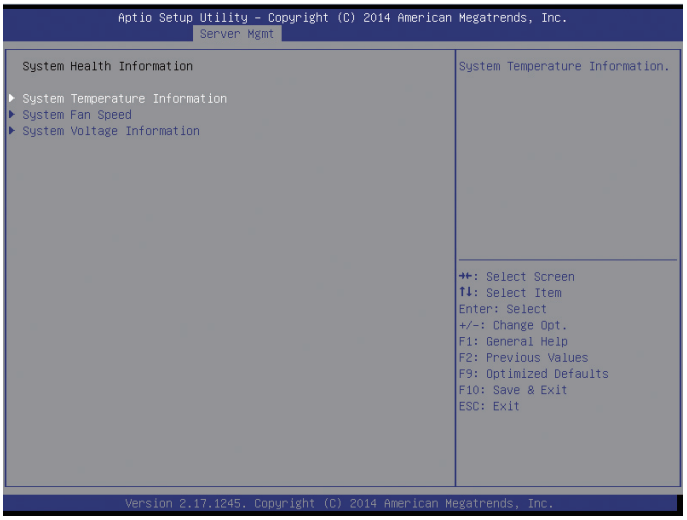
d、Select the Change User Password option, to change user password.

e、Channel NO is set to 1 or 8.

f、User Privilege Limit option, could change user's privilege, after configuration is completed, press Enter, the BMC USER SETTINGS INFO prompt will pop up, when system prompts "Set User Access Command Passed", press Enter to confirm, the user settings information is changed successfully.

3.2.4.5 System Health Information

System Health Information interface is used to get the current system health information through BMC with real-time update.

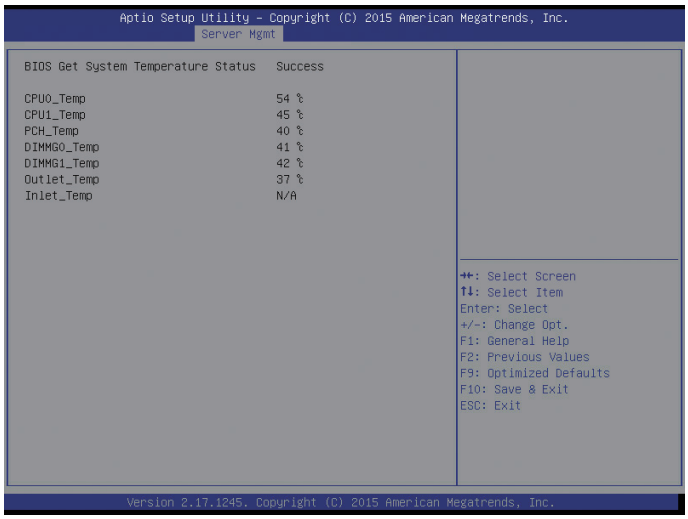


System Health Information Interface Instruction Table

Interface Parameters	Function Description
System Temperature Information	System temperature information sub-menu
System Fan Speed	System fan speed sub-menu
System Voltage Information	System voltage information sub-menu

1) System Temperature Information

System Temperature Information interface is used to display the current system temperature information gained by BIOS through MBC with real-time update.

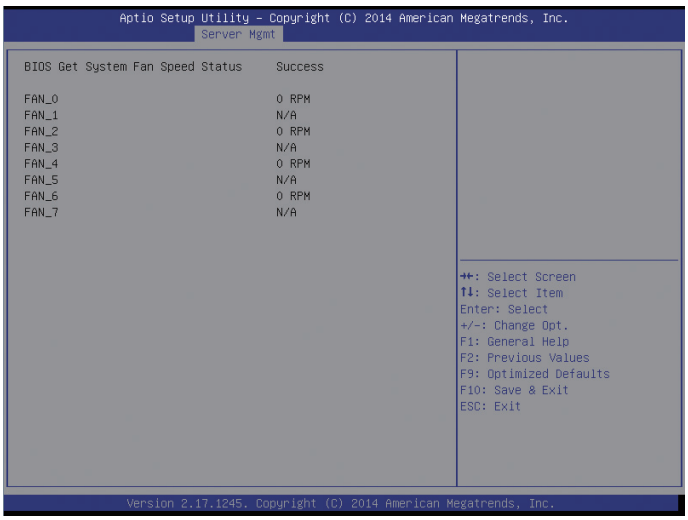


System Temperature Information Interface Instruction Table

Interface Parameters	Function Description
BIOS Get System Temperature Status	BIOS get system temperature status
CPU0_Temp	CPU0 temperature
CPU1_Temp	CPU1 temperature
PCH_Temp	PCH temperature
DIMMG0_Temp	DIMMG0 temperature
DIMMG1_Temp	DIMMG1 temperature
Outlet_Temp	Outlet temperature
Inlet_Temp	Inlet temperature

2) System Fan Speed

System Fan Speed Information interface is used to display the current system fan speed information gained by BIOS through MBC, with real-time update.

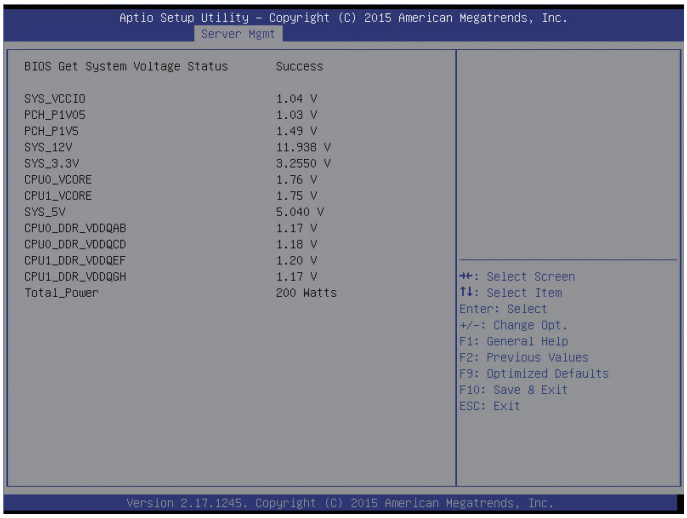


System Fan Speed Interface Instruction Table

Interface Parameters	Function Description
BIOS Get System Fan Speed Status	BIOS get system fan speed status
FAN_0/1/2/3/4/5/6/7	The current fan speed of each system fan

3) System Voltage Information

System Voltage Information interface is used to display the current system voltage information gained by BIOS through MBC, with real-time update.

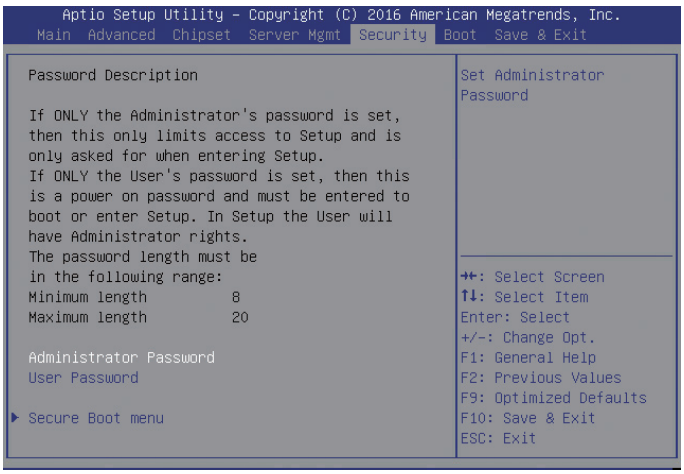


System Voltage Information Interface Instruction Table

Interface Parameters	Function Description
BIOS Get System Voltage Status	BIOS get system voltage status
SYS_VCCIO	System VCCIO voltage
PCH_P1V05	PCH P1V05 voltage
PCH_ P1V5	PCH P1V5 voltage
SYS_12V	System 12V voltage
SYS_3.3V	System 3.3V voltage
CPU0_VCORE	CPU0 VCORE voltage
CPU1_VCORE	CPU1 VCORE voltage
SYS_5V	System 5V voltage
CPU0_DDR_VDDQAB	VDDQ voltage of CPU0 memory channel AB
CPU0_DDR_VDDQCD	VDDQ voltage of CPU0 memory channel CD
CPU1_DDR_VDDQEF	VDDQ voltage of CPU1 memory channel EF
CPU1_DDR_VDDQGH	VDDQ voltage of CPU1 memory channel gh
Total Power	Total power

3.2.5 Security Menu

Security interface is used to set administrator and user's password.

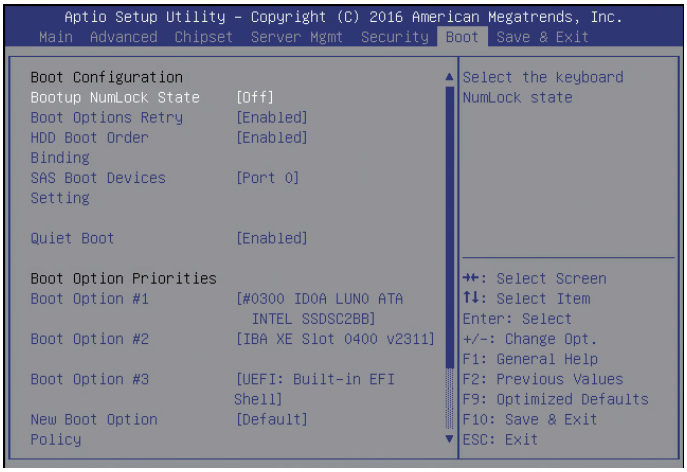


Security Interface Instruction Table

Interface Parameters	Function Description
Administrator Password	Create a password for administrator
User Password	Create a password for normal user

3.2.6 Boot

Boot interface is used to set the options related with boot, including boot mode, boot priority, boot process, etc.

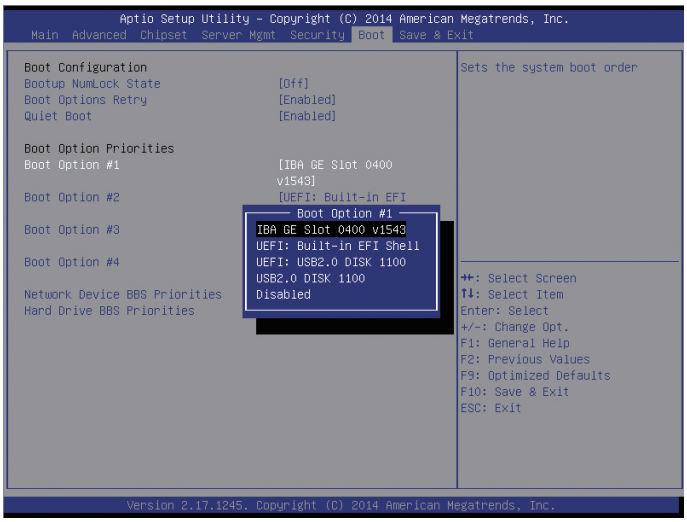


Boot configuration Interface Instruction Table

Interface Parameters	Function Description	Default
Bootup NumLock State	NumLock state settings during bootup, option parameters: On Off	Off
Boot Options Retry	Boot options retry settings, option parameters: Enabled Disabled	Enabled
Quiet Boot	Quite boot on/off setting, option parameters: Enabled Disabled If enabled, the boot Logo is the one set by the manufacturer, if disabled, the boot logo is Post interface.	Enabled
Boot Option Priorities Boot Option #X	Boot option priority settings	--
Hard Driver BBS Priorities	Hard disk device BBS priority settings	--
Network Device BBS Priorities	Network device BBS priority settings	--

Operation method to set BIOS boot:

Enter Boot menu, move the cursor to Boot option #X through up and down arrows to select, and set system boot priorities, X is 1, 2, 3 etc., while an example is as shown in the following figure:

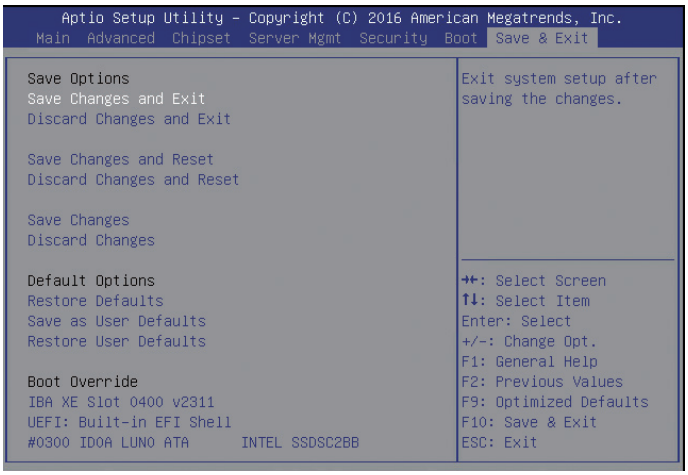


Taking Boot option #1 as an example, you could set the first boot device for the system: Move the cursor to Boot option #1, and press Enter, the boot options for selection will pop up: i.e. IBA GE slot 0400 v1543, UEFI: Built-in EFI Shell, UEFI:

USB2.O DISK 1100, USB2.O DISK 1100 etc., select one through up and down keys, i.e. USB2.O DISK 1100, and press Enter, to select USB DOS disk as the first boot device for the system.

3.2.7 Save & Exit

Save & Exit interface is used to set the options related with saving BIOS parameter modification and exiting.



Save & Exit Interface Instruction Table

Interface Parameters	Function Description
Save Changes and Exit	To save changes and exit
Discard Changes and Exit	To discard changes and exit
Save Changes and Reset	To save changes and reset
Discard Changes and Reset	To discard changes and reset
Save Changes	To save changes
Discard Changes	To discard changes
Restore Defaults	To restore defaults
Save as user Defaults	To save as user defaults
Restore user Defaults	To restore user defaults
Boot Override	To reload boot device, you could select all boot devices in the following.

3.3 BIOS Update

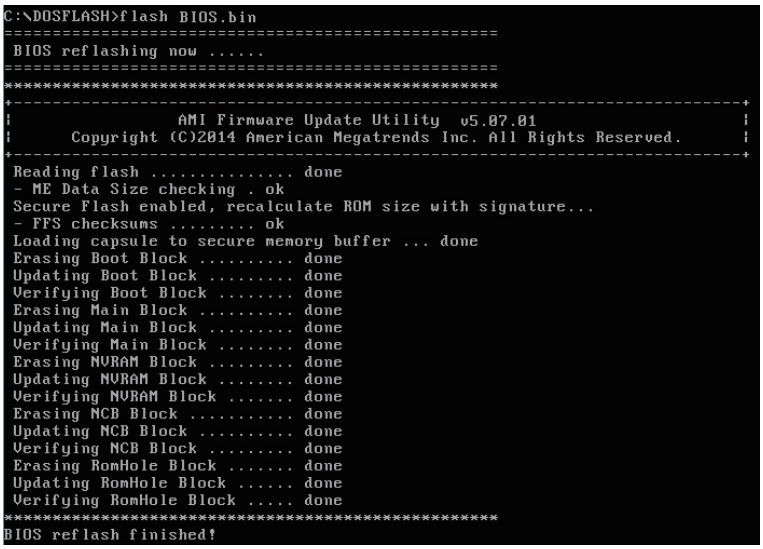
For BIOS update, you could select to update under DOS or OS. Here is the detailed introduction of BIOS update under DOS and Linux system.

3.3.1 Update BIOS under DOS

To update BIOS under DOS, it needs to use DOSFlash toolkit, which can be used to update 8M BIOS file and 16M BIOS+ME file.

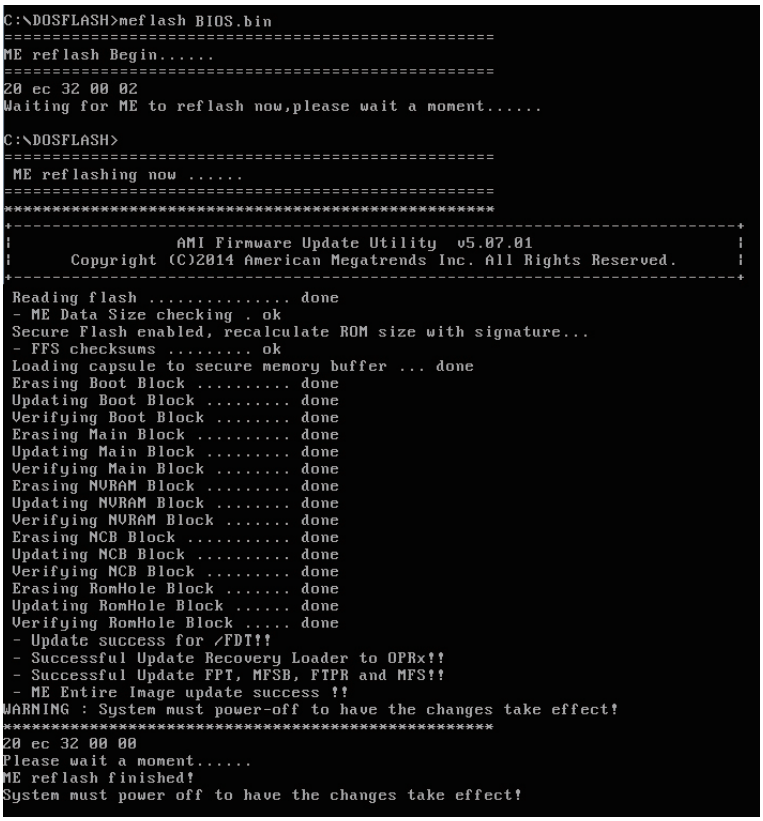
Operation steps:

1. Copy the DOSFlash toolkit containing BIOS bin files for update into DOS boot disk, and start the system to enter DOS.
2. Open DOSFlash folder, Flash.bat is the script used to update 8M BIOS, MEflash.bat is the script used to update 16M BIOS+ME.
3. If there is no change of ME, only update BIOS. Execute the command: flash BIOS.bin, and BIOS.bin is the BIOS file to be updated. The flash process is as shown in the following figure:



Note: it is suggested to shut down the system first and then startup, after the flash is completed.

If ME is changed, it needs to update BIOS version and ME. Execute the command: meflash BIOS.bin. The flash process is as shown in the following figure:



Note: after the flash is completed, please power off the system, make sure there is no residual electricity on the motherboard, and then power it on and start the system. Users can judge whether there is residual electricity on the motherboard through the status of motherboard UID light. Press UID light button, if UID light is illuminated, there is residual electricity on the motherboard; otherwise, there is no residual electricity on the motherboard.

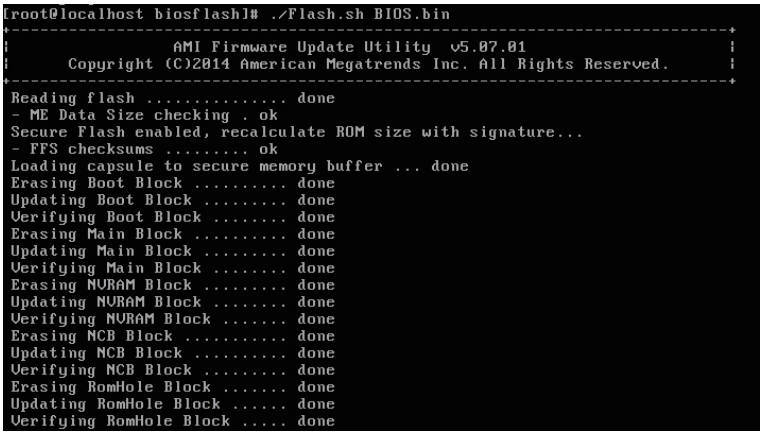
3.3.2 Update BIOS under Linux

To update BIOS under Linux, it needs to use lnxflash toolkit, which can be used to update 8M BIOS file and 16M BIOS+ME file.

Operation steps:

1. Copy the lnxflash toolkit containing BIOS bin files for update into under Linux system.
2. Open lnxflash folder, Flash.sh is the script used to update 8M BIOS, MEflash.sh is the script used to update 16M BIOS+ME.
3. If there is no change of ME, only update BIOS. Execute the command: ./Flash.sh BIOS.bin, and BIOS.bin is the BIOS file to be updated. The flash process is

as shown in the following figure:

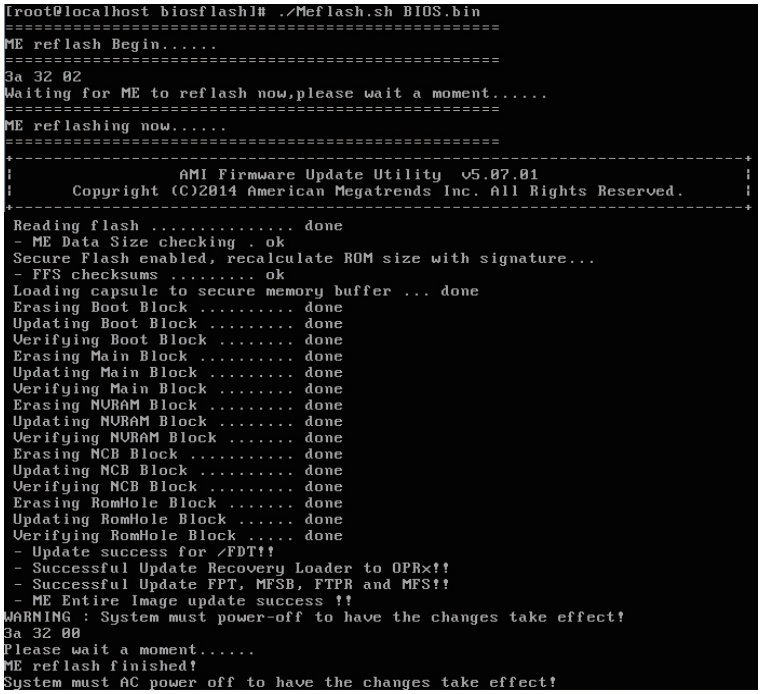


Note: it is suggested to shut down the system first and then startup, after the flash is completed.

4. If ME is changed, it needs to update BIOS version and ME. And it needs to start IPMI service, execute the command: service ipmi start.

Meflash script integrates the IPMI command that can disconnect BMC and ME communication, so it needs to start IPMI service first, to make sure that the ME flash process will not be affected by BMC and ME communication.

5. To update BIOS version and ME, execute the command: ./Meflash.sh BIOS.bin. The flash process is shown as follows:



Note: after the flash is completed, please power off the system, make sure there is no residual electricity on the motherboard, and then power it on and start the system. Users can judge whether there is residual electricity on the motherboard through the status of motherboard UID light. Press UID light button, if UID light is illuminated, there is residual electricity on the motherboard; otherwise, there is no residual electricity on the motherboard.

In addition, it needs to run lnxflash tool under root, and lnxflash tool needs the support of driver, the system needs to be installed with gcc package and Kernel source, otherwise, the driver can be generated.

Another method is generating the driver file (amifldrv_mod.o) under the system that has the same kernel. And then copy it into the lnxflash toolkit. Each time Kernel updates, the driver should be generated again. Specific operations are as follows:

#./afulnx_64 /MAKEDRV

Or

#./afulnx_64 /MAKEDRV KERNEL=/lib/modules/$(uname -r)/build

Through the following command, users can check whether the current Kernel version and the one in amifldrv_mod.o file are consistent or not.

```
#uname -r
# modinfo amifdrv_mod.o
```

4 BMC Settings

4.1 Introduction

This chapter introduces specifications abided by the management software and main functions.

BMC is a control unit for server management, which is compatible with management standard IPMI2.0 specification in server industry.

It mainly realizes the following functions:

- Remote control:

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

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

- Warning management

  Report warning message in real time, and carry out corresponding solutions according to the information.

- State monitoring

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

- Device information management

  Provide device version, model and asset information.

- Heat dissipation control

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

- Support IPMITool tool management

  Support the command operation sent by IPMITool, you could download IPMITool by yourself.

- Support WEB interface management

  Provide a friendly and visual interface management, you could quickly complete configuration and query tasks via simple clicking on the interface.

- Support account centralized management

  Support to store accounts in Active Directory server, direct authentication process to server, and realize management system login with domain accounts.

  Protocols supported by BMC: RMCP, RMCP+, SNMPv1, SNMPv2c, SNMPv3, SNMP Trap v1, SNMP Trap v2c, SNMP Trap v3, HTTP, HTTPS, SMTP, SSL, SSH, TFTP, Telnet, DHCP, LDAP, DDNS.

4.2 Functional Modules

This chapter introduces BMC module composition as well as functions of these modules.

BMC is mainly composed of IPMI module, command line module, remote control module, WEB module, and SNMP module.

- Command module realizes the calling of IPMI module. User realizes the operation on IPMI module via command lines.
- WEB module realizes daily management on server in the form of visual interface via calling IPMI commands, and WEB module has integrated functions of KVM and virtual media.

4.2.1 IPMI Module

IPMI module realizes management on server system according to IPMI2.0 standard.

Functions realized by IPMI module include:

- System real-time monitoring
  It could realize alarming report, alarming indication and start system self-protection, when there's any fault detected.
- System remote control
  It could realize management requirements such as remote power-on/off, and business system reset via command lines and Web.

4.2.2 Command Line Module

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.

4.2.3 Remote Control Module

Remote control module includes:

- KVM Over IP: It means a management method that user carries out monitoring and control on remote devices via using local video, keyboard and mouse at client, to operate remote devices in a real-time way.
- 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 internet. To use the remote control function, the client should have the corresponding version of browser and Java runtime environment.

4.2.4 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.

4.3 Web Interface Introduction

About this chapter

Introduce the detailed information of BMC Web interfaces.

4.3.1 Welcome to Use BMC Intelligent Management System Online Help

BMC intelligent management system (hereinafter referred to as BMC system) is a piece of software aimed at server system monitoring and management.

Main features of BMC system:

- Provide excellent user experience
  BMC system provides visualized and easy-to-operate graphical interfaces, which facilitates you to perform interactive operations.
- Provide efficient management and maintenance
  BMC system provides remote management and hardware detection functions, which facilitate you to access, detect and manage the server at any time.
- Provide high-security system access

BMC system provides abundant management interface, and adopts high-security encryption algorithm on all interfaces.

4.3.2 Getting Started

4.3.2.1 System Introduction

Function introduction:

BMC system is a server remote management system. BMC system is compatible with IPMI2.0 specification, which is the management standard in server industry. It supports the redirection of mouse, keyboard and video, text console redirection, remote virtual media, highly reliable hardware detection and management function. BMC system provides a rich set of management functions, main functions are as follows:

- Abundant management interfaces
  Provide Intelligent Platform Management Interface (IPMI), Hypertext Transfer Protocol Secure (HTTPS), Simple Network Management Protocol (SNMP) and Web Service Management Protocol, meeting the various system integration requirements.
- Fully compatible with IPMI1.5/IPMI 2.0
  Provide standard management interfaces, which can be integrated with other standard management system.
- Fault detection and alarm management
  Fault detection and alarm management can ensure the reliable operation of equipment.
- Virtual KVM (Keyboard, Video and Mouse) and virtual media
  Provide convenient remote maintenance methods.
- User interface based on Web interface
  Set and query quickly through simple interface operations.
- Screen capture when system crashes
  Provide system assistance for fault analysis.
- Support DNS/LDAP
  Domain management and directory service simplifies the server's management network.
- Support intelligent power management
  Power capping technology can improve the deployment density.

Menus and function description

Menus in BMC Web interface and their functions are shown in the following table:

First-level menu	Second-level menu	Function description
System information	Asset information	Provide the basic information of the whole system, including CPU, memory, PCIE devices, HDD backplane, onboard NIC and power supply unit.
	Hardware monitor	Provide the detection information of threshold sensor and the status information of discrete sensor.
	System device status	Provide the information of backplane HDD state and onboard NIC.
	BIOS setup options	Provide the setting information of CUP, memory and boot options in BIOS menu.
	FRU information	Provide system serial number and manufacturer information.
	History record	Provide the history of system inlet air temperature and total power consumption.
Remote control	Console redirection (KVM)	Enable KVM console.
	Server power control	Control server power on/off/reset.
	Server location	Turn on/off system UID light
	Configure remote session	Enable/disable KVM encryption function, set the virtual media attach mode.
	Virtual media devices	Set the number of floppy devices, CD/DVD and HDDs.
	Mouse mode settings	Set the mouse mode according to different operating systems.
Power supply and fan	Power supply monitor	Monitor the power supply module presence status, working condition, temperature, input/output power, firmware version and other information.
	Power supply configure	Configure power supply Active/Standby status.
	Fan speed control	Display fan speed information, support manual fan control mode.
BMC configuration	BMC network management	Provide configuring BMC network, DNS and network interface bonding function.
	Services	Enable/disable KVM, Web, SSH services, configure service port.
	NTP settings	Configure BMC time and zone.
	SMTP settings	Configure SMTP service.
	Alert settings	Configure SNMP Trap alert.
	Active directory settings	Enable/configure active directory.
	LDAP/E-Directory settings	Enable/configure LDAP.
	User management	BMC user management function.
	IP access control	Set IP address fields accessible to BMC.
	BMC shared NIC switch	Provide BMC shared NIC selection and switch functions.

Logs	System event log	Provide system log viewing and export functions.
	BMC system audit log	View BMC system logs, login/logout the system, and other operations on audit logs.
	Black box log	Provide black box logs download function.
	Event log setting	Set event log record strategy.
	BMC system audit log settings	Enable/disable audit log record, set log length and log server options.
Fault diagnosis	BMC recovery	Reset BMC/KVM service.
	Capture screen	Record the information on the last screen at system crash.
	Host POST code	Provide the BIOS POST code during system startup.
System maintenance	BMC firmware update	Provide BMC firmware update function.
	BIOS firmware update	Provide BIOS firmware update function.
	Restore factory defaults	Restore to factory settings.
	System administrator	Change the administrator password.

Icons

Icon	Description
	System general information
	Refresh this page
	Query help information about this page
	Switch language
	Log out
	Critical alarm information
	Warning information
	Information
	Normal
	Power-on/present state
	Power-off/absent state
	Not support

4.3.2.2 Basic Operations

Switch the interface language

In the login interface, click the language button in the top right corner to switch the interface language-English/Chinese.

View system general information

In the login interface, click the general information button, it will display the server running state, quick start tasks, BMC information, firmware version information and the recent event logs information.

View the online help information

In the login interface, click the help button in the top right corner to view the online help information.

Log out the system

In the login interface, click the logout button in the top right corner to log out the system.

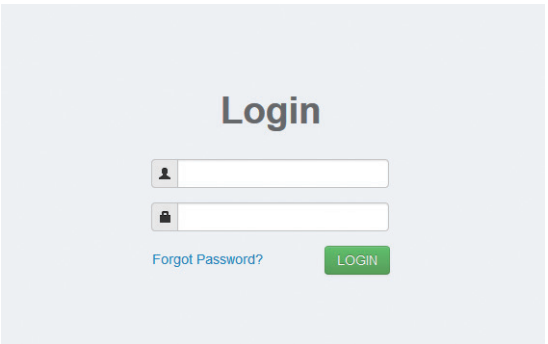
Refresh the page

In the login interface, click the refresh button in the top right corner to refresh this page.

4.3.2.3 User Login

Function introduction

Through using “Login” interface, you can login to BMC interface.



Parameter description

Parameters	Description
Username	The name of user that logins to the BMC Note: Default username: admin, default password: admin. It is suggested to change the default password after the first login.
Password	The password of logged in user. To ensure safety, users should change the password regularly.

4.3.3 System Information

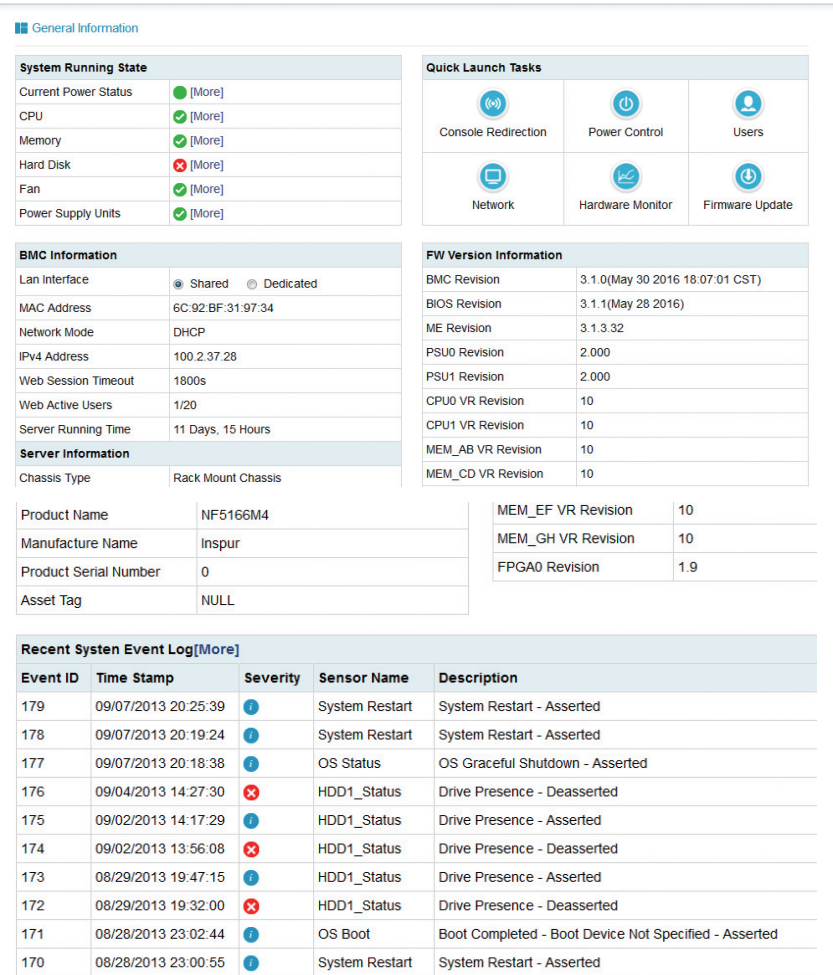
4.3.3.1 General Information

Function introduction

Through general information interface, you can get the basic information of the server and quick entries of common operations.

Interface description

Select “General Information” in the main interface to display this interface. The interface has 5 functional areas, as shown in the following figure.



No.	Functional area	Displayed information
1	System running state	Provide the server running state, including: ● Current power status ● CPU ● Memory ● Hard disk ● Fan ● Power supply units
2	Quick launch tasks	Provide quick launch task entries, including: ● Console redirection ● Power control ● Users ● Network ● Hardware monitor ● Firmware update
3	BMC information	Provide the basic BMC information, including: ● LAN interface ● MAC address ● Network mode ● IP address ● Web session timeout ● Web active users ● Server running time ● Chassis type ● Product name ● Manufacturer ● Product serial number ● Asset tag
4	FW version information	Provide system FW version information, including: ● BMC revision ● BIOS revision ● ME FW revision ● PSU FW revision ● CPU VR revision ● Memory VR revision ● FPGA revision
5	Recent system event log	Provide the recent system event log records, including: ● Event ID ● Time stamp ● Severity ● Sensor name ● Description

4.3.3.2 Asset Information

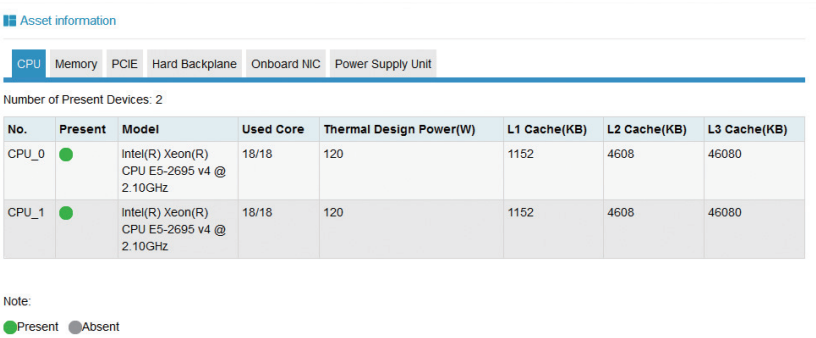
Function introduction

Through asset information interface, you can view the information of the server's

CPU, memory, PCIE, HDD backplane, onboard NIC and power supply unit.

Interface description

In the navigation tree on the left side of the main interface, select general information, and then click asset information, the asset information interface will be displayed.



Parameter description

CPU information description table

Parameter	Description
Present	CPU present information
Model	CPU model
Used core	Number of used cores
Thermal design power	CPU thermal design power
L1 cache	CPU L1 cache size
L2 cache	CPU L2 cache size
L3 cache	CPU L3 cache size

Memory information description table

Parameter	Description
Present	Memory present information
Belong to	Indicate which CPU this memory belongs to
Manufacturer	Memory manufacturer
Serial number	Memory serial number
Capacity	Memory capacity
Speed	Memory speed

PCIE information description table

Parameter	Description
Motherboard position	PCIE device's position on the motherboard
Present	Present information
Connection type	Connection type
Riser card	Riser card slot when connected through riser card
Device type	Device type
Manufacturer (ID)	Manufacturer ID information
Device (ID)	Device ID information
Rated bandwidth	Rated bandwidth
Rated speed	Rated speed

Front HDD backplane information description table

Parameter	Description
Present	Present information
Port quantity	Port quantity of the HDD backplane
HDD quantity	HDD quantity supported by HDD backplane

Onboard NIC information description table

Parameter	Description
Physical NIC No.	NIC No.
Manufacturer No.	NIC manufacturer information
Product model	NIC model information
Mac address	Mac address information
IP address	IP address information

PSU information description table

Parameter	Description
Present	PSU present information
Manufacturer	PSU manufacturer information
Model	PSU model
Serial number	PSU serial number
Rated power	PSU rated power
Firmware version	PSU firmware version

Note: to gain the PSU information, the PSU needs to support PMBUS.

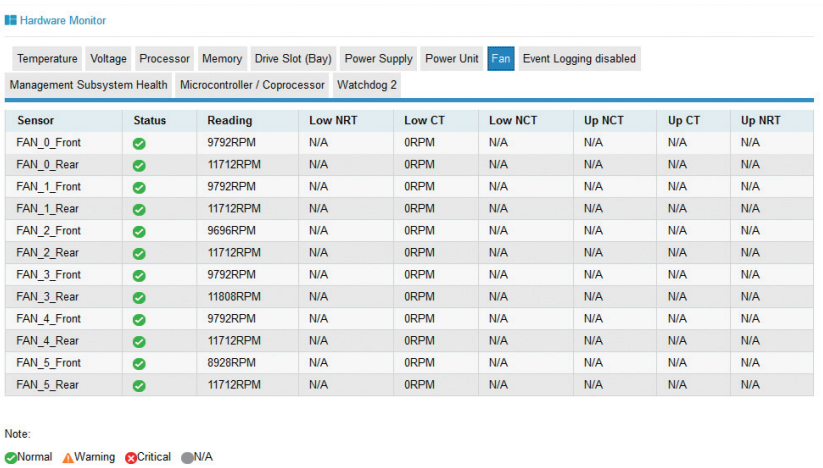
4.3.3.3 Hardware Monitor

Function introduction

Through hardware monitor interface, you can view the information of temperature sensor, voltage monitoring, processor/memory status, drive slot, power supply monitoring, power unit status, fan speed, disabled event logging, management subsystem health, microcontroller/coprocessor and watchdog.

Interface description

In the navigation tree on the left side of the main interface, select system information, click hardware monitor to display this interface.



Parameter description

Sensor page information

Parameter	Description
Sensor	Sensor name, sensor is a module that monitors all kinds of indexes of the server, and it can be a logical module or a physical module.
Status	Sensor status, including 4 status: normal, warning, serious warning, not available
Reading	Index information monitored by sensor, if it is N/A, it means the sensor fails to monitor the index. Threshold sensor reading: Index reading collected by threshold sensor Discrete sensor reading: For example, 0X8000, defined according to IPMI specification, adopting hexadecimal values to represent the current sensor information.
Low NRT	The low threshold value that the sensor generates nonreversible warnings
Low CT	The low threshold value that the sensor generates critical warnings
Low NCT	The low threshold value that the sensor generates non-critical warnings
Up NCT	The up threshold value that the sensor generates non-critical warnings
Up CT	The up threshold value that the sensor generates critical warnings
Up NRT	The up threshold value that the sensor generates nonreversible warnings

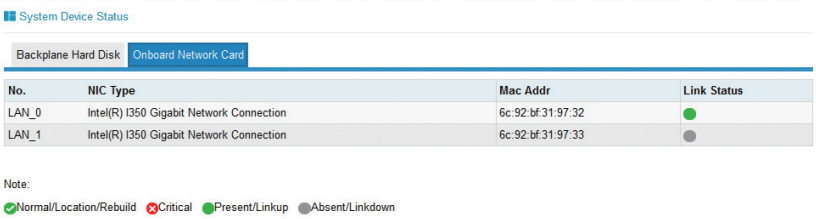
4.3.3.4 Device Status

Function introduction

Through the device status page, you can view the system HDD status and onboard NIC status.

Interface description

In the navigation tree on the left side of the main interface, click device status to display this interface.



Parameter description

Backplane HDD information

Parameter	Description
No.	HDD No.
Present	HDD present information
Status	HDD status information, including normal and failure two status.
Location	HDD in location state or not
Rebuild	HDD in rebuilt state or not

Onboard NIC information

Parameter	Description
No.	NIC No.
NIC type	NIC type information
Mac address	NIC Mac address information
Link status	NIC connected status

4.3.3.5 BIOS Options

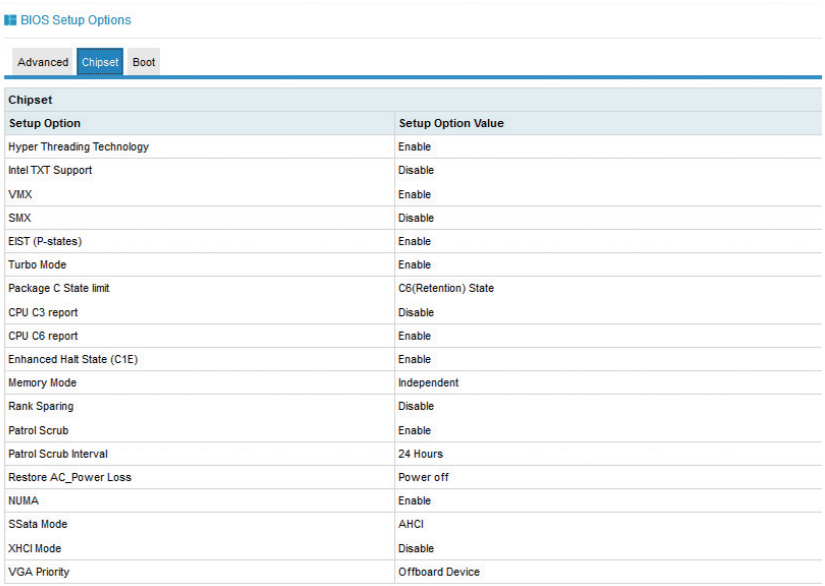
Function introduction

Through BIOS options interface, you can view the option setting information in BIOS menu.

Interface introduction

In the navigation tree on the left side of the main interface, select system information,

click BIOS options to display BIOS option information.



Chipset	
Setup Option	**Setup Option Value**
Hyper Threading Technology	Enable
Intel TXT Support	Disable
VMX	Enable
SMX	Disable
EIST (P-states)	Enable
Turbo Mode	Enable
Package C State limit	C6(Retention) State
CPU C3 report	Disable
CPU C6 report	Enable
Enhanced Halt State (C1E)	Enable
Memory Mode	Independent
Rank Sparing	Disable
Patrol Scrub	Enable
Patrol Scrub Interval	24 Hours
Restore AC_Power Loss	Power off
NUMA	Enable
SSata Mode	AHCI
XHCI Mode	Disable
VGA Priority	Offboard Device

Parameter description

Parameter	Description
Setup option	Option name in Setup menu
Setup option value	Option value in Setup menu

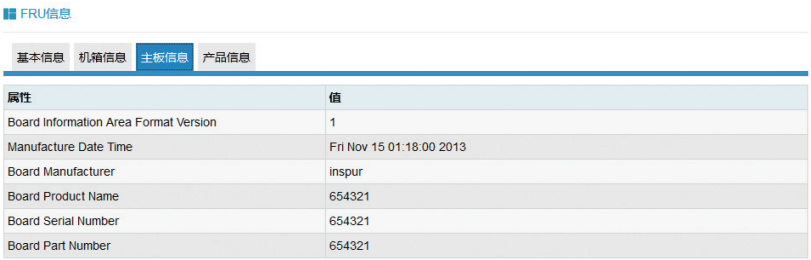
4.3.3.6 FRU Information

Function introduction

Through FRU interface, you can view the machine's manufacturer, serial number and other information.

Interface description

In the navigation tree on the left side of the main interface, select system information, click FRU information to display the system FRU information.



属性	值
Board Information Area Format Version	1
Manufacture Date Time	Fri Nov 15 01:18:00 2013
Board Manufacturer	inspur
Board Product Name	654321
Board Serial Number	654321
Board Part Number	654321

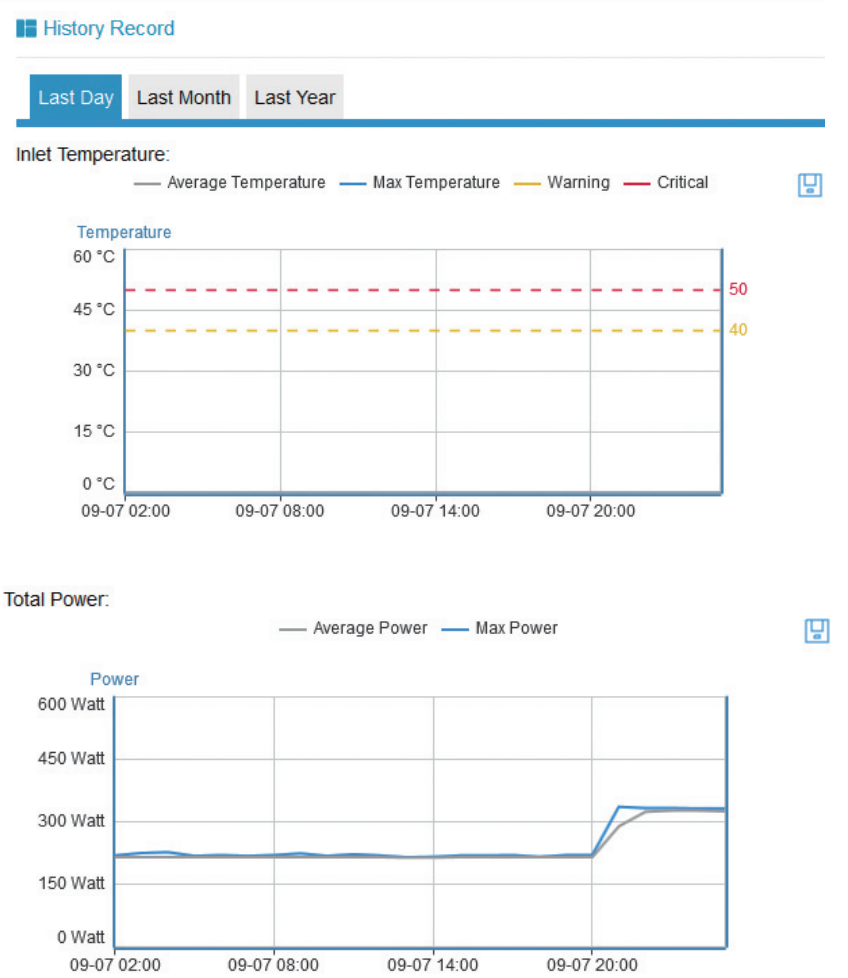
4.3.3.7 History

Function introduction

Through this interface, you can view the power recording curve and inlet air temperature recording curve of the last day, last month and last year.

Interface description

In the navigation tree on the left side of the main interface, select system information, click history to show this interface.



4.3.5 Remote Control

4.3.5.1 Console Redirection (KVM)

Function introduction

Through the function provided by the remote console redirection interface, you can

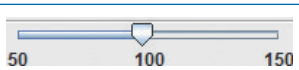
connect to the server remotely to control and manage the server.

- You can perform remote operations on the server through using the local PC's keyboard and mouse.
- You can map the local ISO file, disk, and floppy disk to the remote server through the network; from the server's perspective, the usage of virtual drive is the same with the device inserted into the server.

Notes:

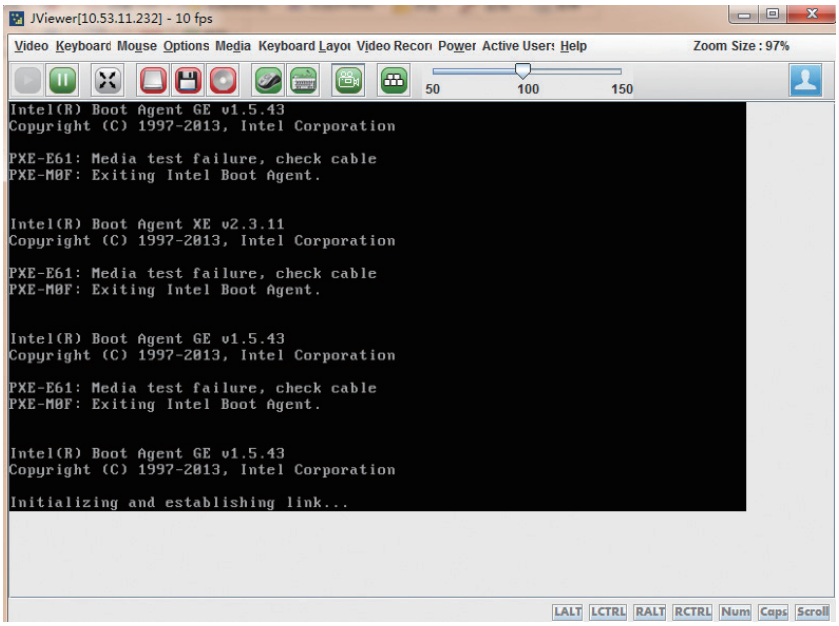
- The local PC media can be the local floppy drive or optical drive, and can also be the image file of floppy disk or optical disk saved in the local PC.
- If the JAVA runtime environment doesn't meet the requirement, you can download from: http://www.oracle.com/technetwork/java/javase/downloads/index.html

Buttons in KVM window and their functions:

Button	Description
	Pause the redirection function
	Full screen mode status indication
	HD/USB redirection status indication
	Floppy redirection status indication
	CD/DVD redirection status indication
	Display the mouse
	Display the soft keyboard
	Video recording function
	Hotkey
	Screen scaling

Interface description

In the navigation tree on the left side of the main interface, select remote control, click console redirection (KVM) to display the interface; click KVM Over IP button to display KVM main interface.



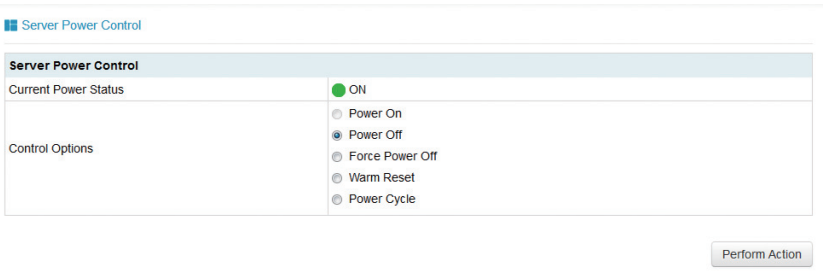
4.3.5.2 Server Power Control

Function introduction

Through this interface, you can perform power on-off operations on the server.

Interface description

In the navigation tree on the left side of the main interface, select remote control, and then select server power control to display this interface.



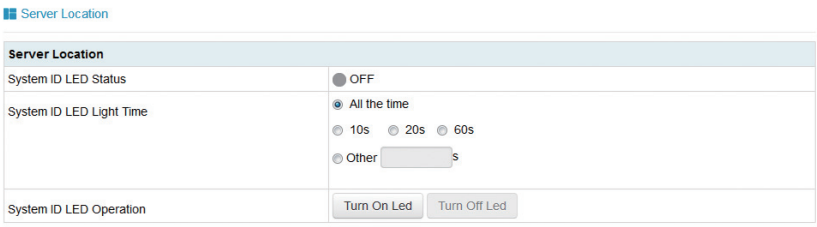
4.3.5.3 Server Location

Function introduction

Through this interface, you can light up or turn off the server UID light, to locate the server's position.

Interface introduction

In the navigation tree on the left side of the main interface, select remote control, and then select server location, you can light up or turn off the server UID light, to locate the server's position.



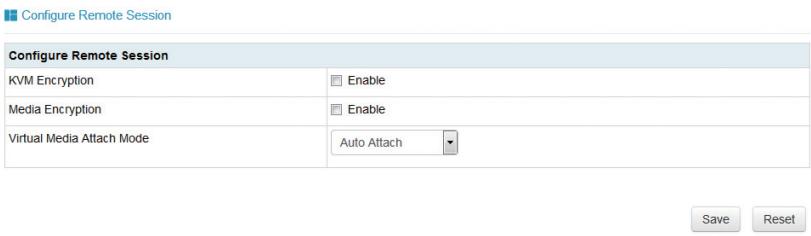
4.3.5.4 Remote Session Settings

Function introduction

Through this interface, you can enable data transmission encryption and virtual media encryption functions.

Interface description

In the navigation tree on the left side of the main interface, select remote control, and then select remote session settings, you can configure the remote session.



Note: for security reasons, it is suggested to enable KVM encryption and media encryption.

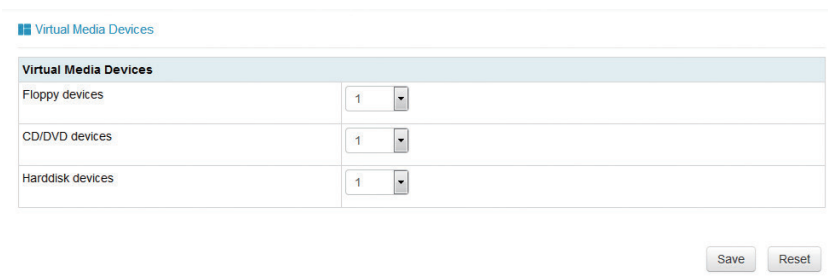
4.3.5.5 Virtual Media Devices

Function introduction

Through this interface, you can set the amount of virtual floppy disk, virtual CD/DVD, and virtual hard disk.

Interface description

In the navigation tree on the left side of the main interface, select remote control, and then select virtual media settings to set it.



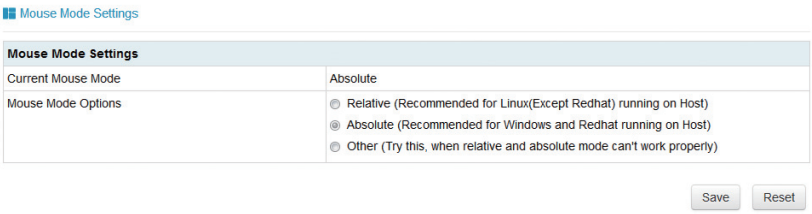
4.3.5.6 Mouse Mode Settings

Function introduction

Through this interface, you can set the mouse mode according to the different operating systems of the Host end.

Interface description

In the navigation tree on the left side of the main interface, select remote control, and then select mouse mode settings.



4.3.6 Power Supply and Fan

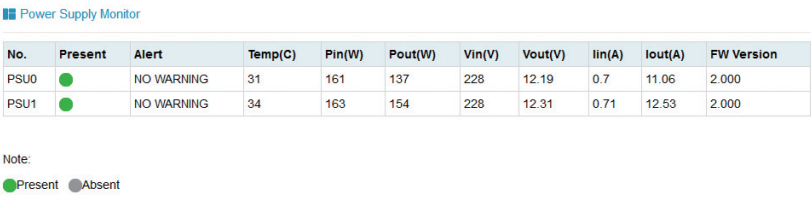
4.3.6.1 Power Supply Monitor

Function introduction

Through this interface, you can view the presence status, alert status, temperature, input power, output power, input voltage, output voltage, input current, output current and firmware version of the power supply.

Interface description

In the navigation tree on the left side of the main interface, select power supply and fan, select power supply monitor, you can view the power supply's related information.



4.3.6.2 Power Supply Configure

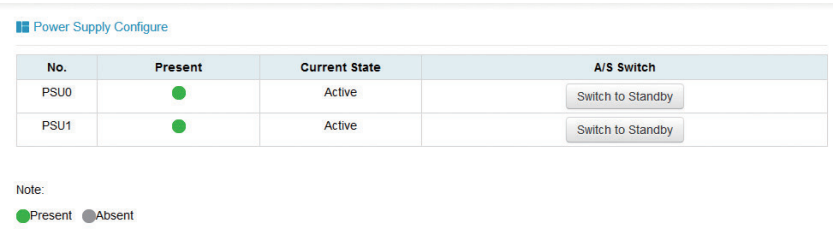
Function introduction

Through this interface, you can configure the working mode of the power supply module.

Interface description

In the navigation tree on the left side of the main interface, select power supply and fan, select power supply configure, you can set the working mode of the power

supply module.



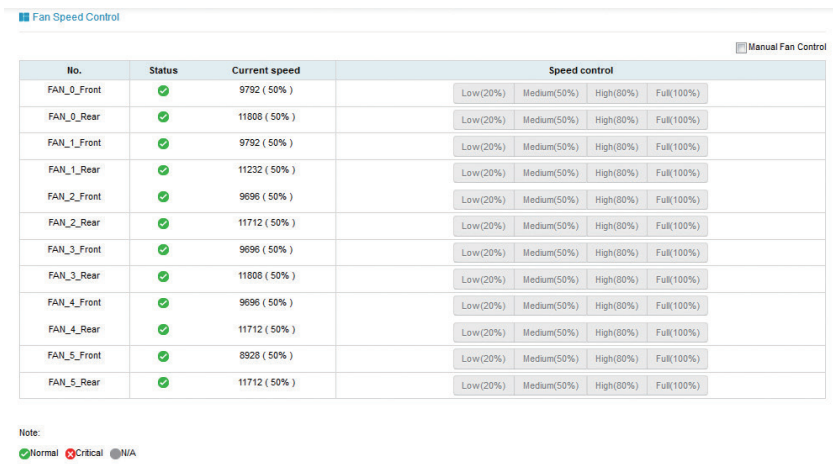
4.3.6.3 Fan Speed Control

Function introduction

Through this interface, you can view the fan speed, and can switch the fan control mode to manual control, and control the fan speed at 4 levels, including low (20% duty ratio), medium (50% duty ratio), high (80% duty ratio), and full (100% duty ratio).

Interface description

In the navigation tree on the left side of the main interface, select power supply and fan, select fan speed control, you can view/control the fan speed.



4.3.7 BMC Configuration

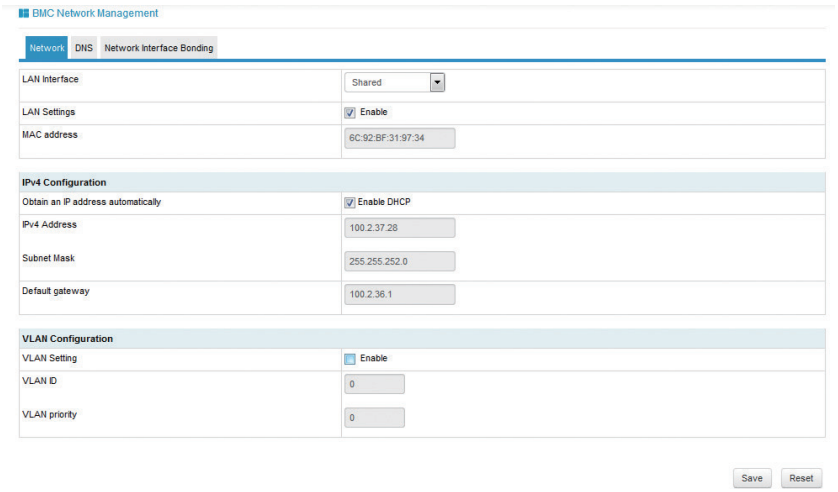
4.3.7.1 BMC Network Management

Function introduction

Through this interface, you can configure the BMC network.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select BMC network, and you can configure the BMC network.



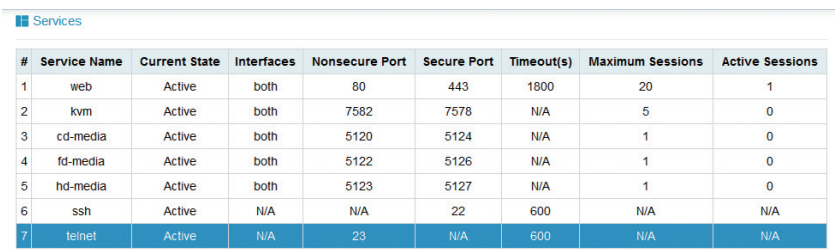
4.3.7.2 Services

Function introduction

Through this interface, you can enable/disable WEB/KVM/SSH services and configure the service port.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select services, you can enable/disable WEB/KVM/SSH services.



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

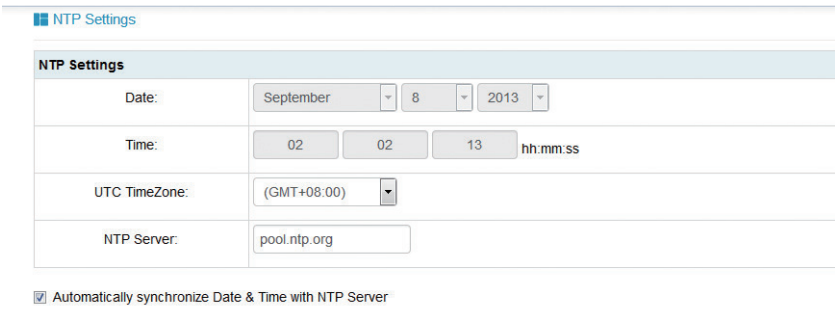
4.3.7.3 NTP Settings

Function introduction

Through this interface, you can set BMC time and timezone, and can also sync time from the NTP server.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select NTP settings, you can set BMC time and timezone, and can also sync time from the NTP server.



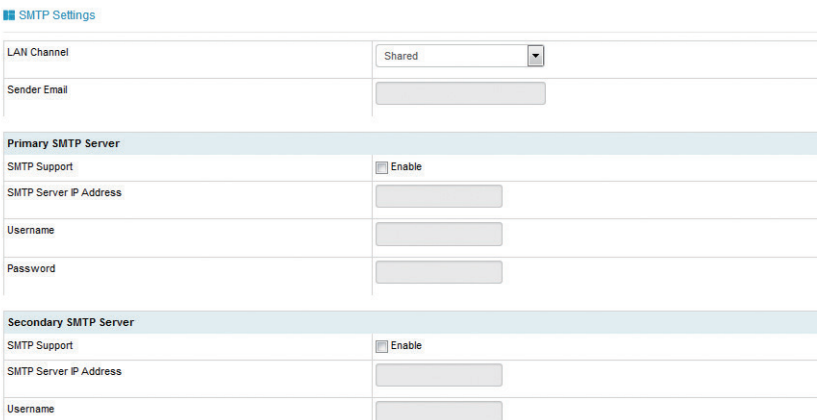
4.3.7.4 SMTP Settings

Function introduction

Through this interface, you can set the IP address, sender email address, username and password of the SMTP server.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select SMTP settings, you can set SMTP server address and other information.



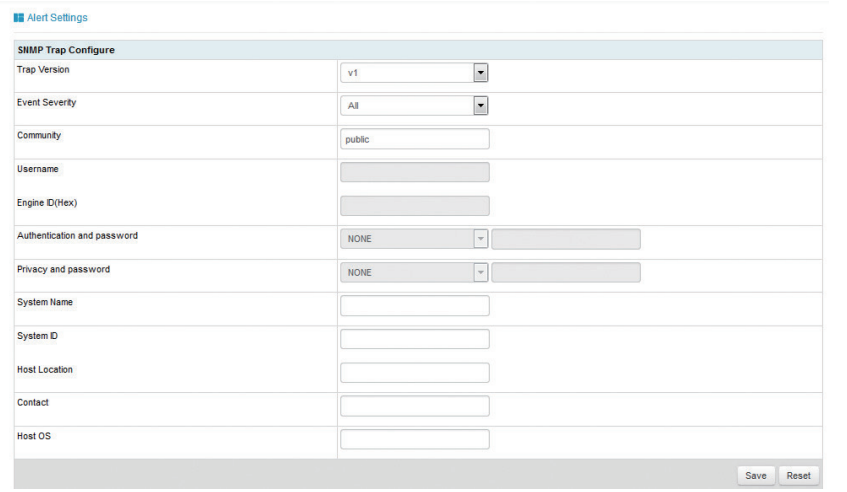
4.3.7.5 Alert Settings

Function introduction

Through this interface, you can set the BMC system sends alert information to the third party server in Trap packet.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select alert settings to display this interface.



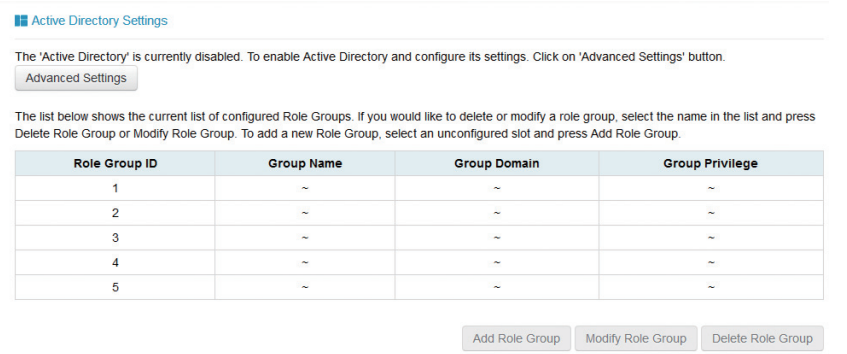
4.3.7.6 Active Directory Settings

Function introduction

Through this interface, you can add, modify or delete the role group, and can enable/ disable the active directory.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select active directory settings to display this interface.



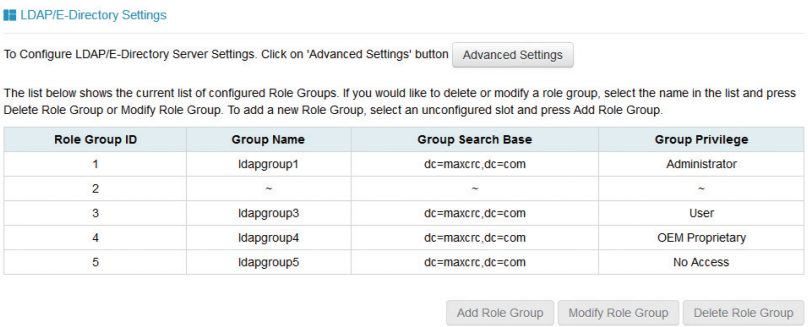
4.3.7.7 LDAP/E-Directory

Function introduction

Through this interface, you can enable or disable the LDAP and configure the related options.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select LDAP/E-Directory to display this interface.



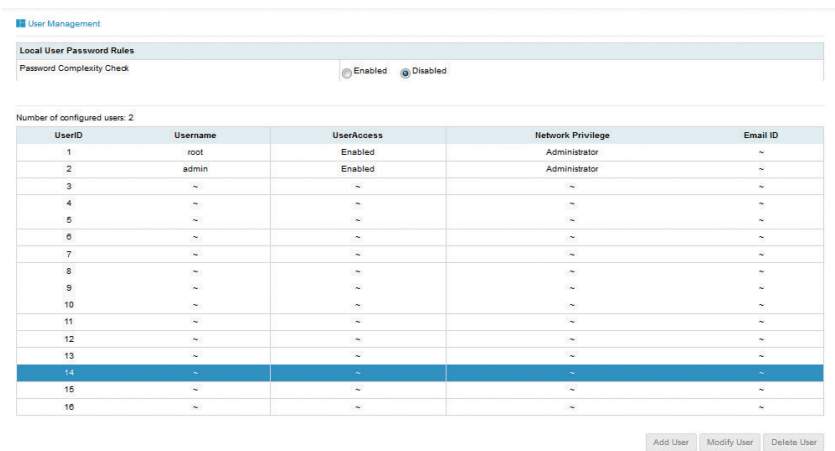
4.3.7.8 User Management

Function introduction

Through this interface, you can manage the BMC account, including add a user, delete a user and modify user password.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select user management to display this interface.



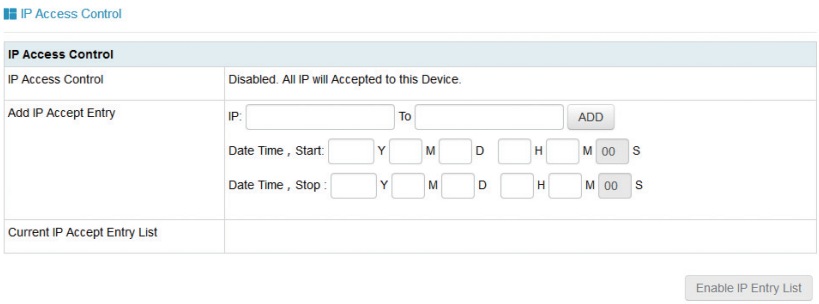
4.3.7.9 IP Access Control

Function introduction

Through this interface, you can set an IP address field or a time period that can be accessible to BMC.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select IP access control to display this interface.



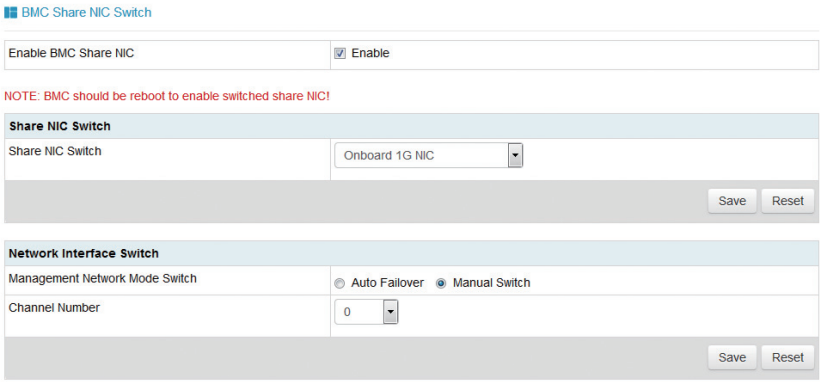
4.3.7.10 BMC Share NIC Switch

Function introduction

Through this interface, you can enable BMC shared network, select onboard NIC or external NIC, and set the network interface switch mode.

Interface description

In the navigation tree on the left side of the main interface, select BMC configuration, select BMC share NIC switch to display this interface.



4.3.8 Logs

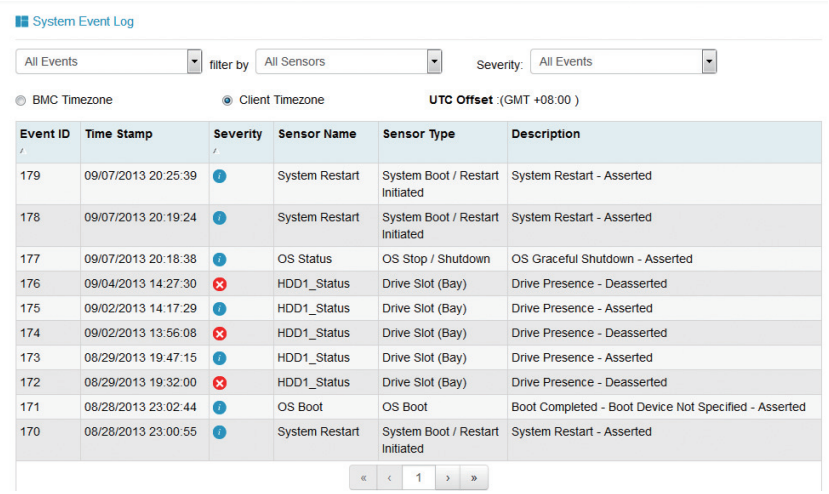
4.3.8.1 System Event Log

Function introduction

Through this interface, you can view system SEL log information.

Interface description

In the navigation tree on the left side of the main interface, select logs, select system event log to display this interface.



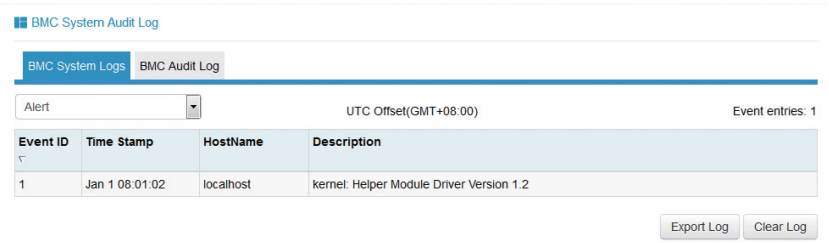
4.3.8.2 BMC System Audit Log

Function introduction

Through this interface, you can view the audit logs and login/logout logs of BMC system.

Interface description

In the navigation tree on the left side of the main interface, select logs, select BMC system audit log to display this interface.



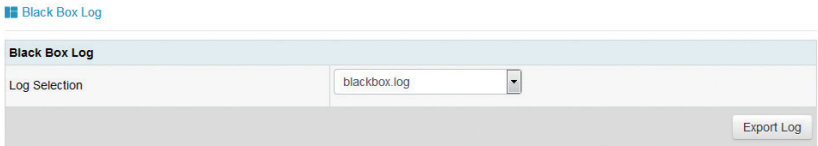
4.3.8.3 Black Box Log

Function introduction

Through this interface, you can export the black box log recorded by BMC for system fault analysis.

Interface description

In the navigation tree on the left side of the main interface, select logs, select black box log to display this interface.



Note:

BMC has no black box log parsing function. When the server has a failure, you can export the black box logs and send them to Inspur service staff, they can assist you in analyzing and solving the problem.

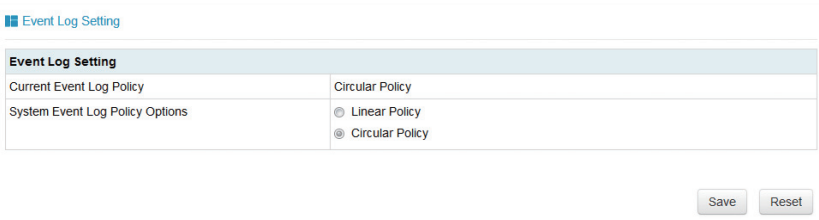
4.3.8.4 Event Log Setting

Function introduction

Through this interface, you can set the system event log policy.

Interface description

In the navigation tree on the left side of the main interface, select logs, select event log setting to display this interface.



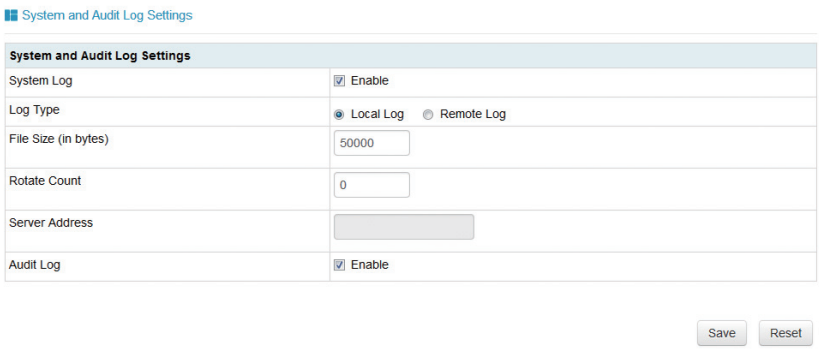
4.3.8.5 BMC System and Audit Log Settings

Function introduction

Through this interface, you can set the BMC audit log policy.

Interface description

In the navigation tree on the left side of the main interface, select logs, select BMC system and audit log settings to display this interface.



4.3.9 Fault Diagnosis

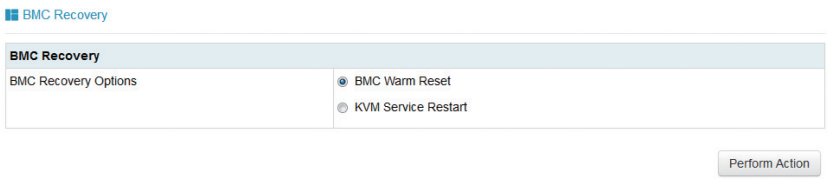
4.3.9.1 BMC Recovery

Function introduction

Through this interface, you can reset BMC or KVM service.

Interface description

In the navigation tree on the left side of the main interface, select fault diagnosis, select BMC recovery to display this interface.



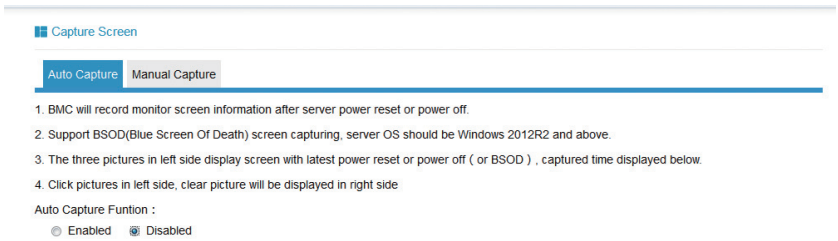
4.3.9.2 Capture Screen

Function introduction

Through this interface, you can view the last frame image captured by BMC automatically before signal interrupt.

Interface description

In the navigation tree on the left side of the main interface, select fault diagnosis, select capture screen to display this interface.



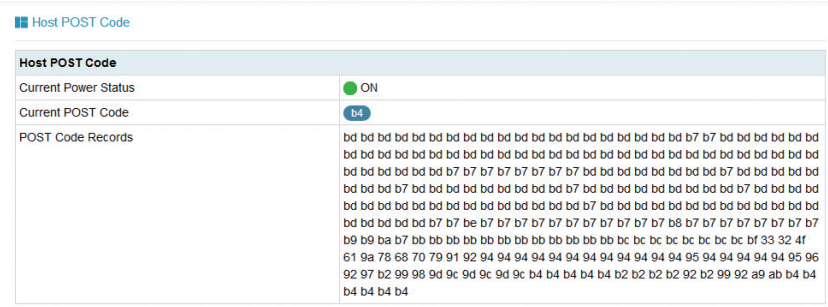
4.3.9.3 Host POST Code

Function introduction

Through this interface, you can view the current BIOS Post Code and its history.

Interface description

In the navigation tree on the left side of the main interface, select fault diagnosis, select host POST code to display the interface.



4.3.10 System Maintenance

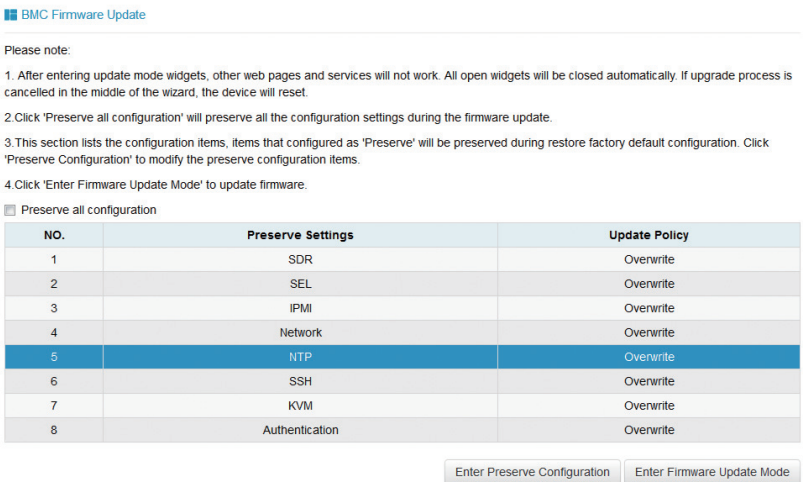
4.3.10.1 BMC Firmware Update

Function introduction

Through this interface, you can update the BMC firmware.

Interface description

In the navigation tree on the left side of the main interface, select system maintenance, select BMC firmware update to display this interface.



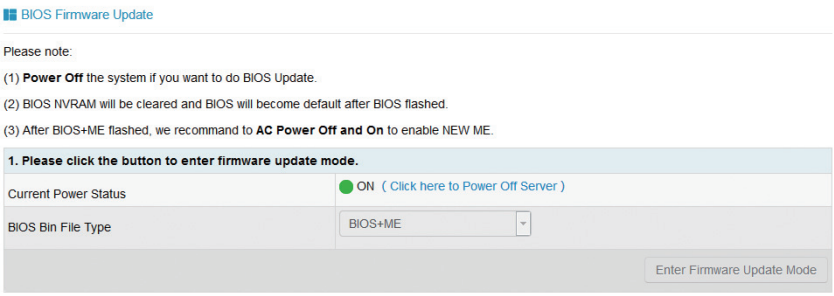
4.3.10.2 BIOS Firmware Update

Function introduction

Through this interface, you can update the BIOS firmware.

Interface description

In the navigation tree on the left side of the main interface, select system maintenance, select BIOS firmware update to display this interface.



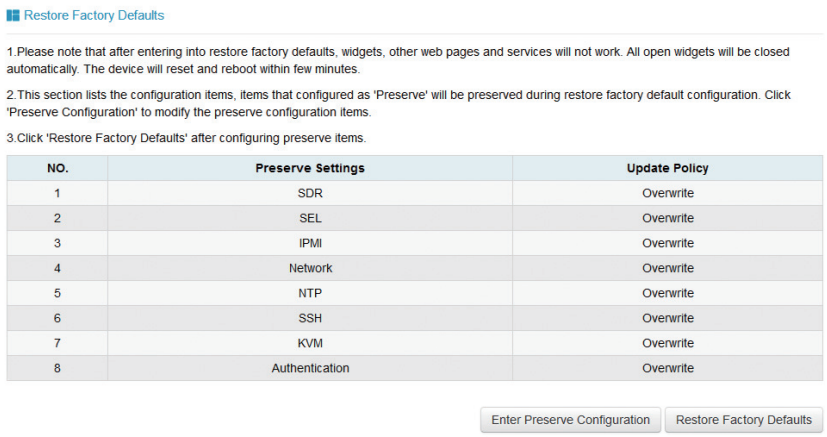
4.3.10.3 Restore Factory Defaults

Function introduction

Through this interface, you can restore the BMC to factory settings.

Interface description

In the navigation tree on the left side of the main interface, select system maintenance, select restore factory defaults to display this interface.



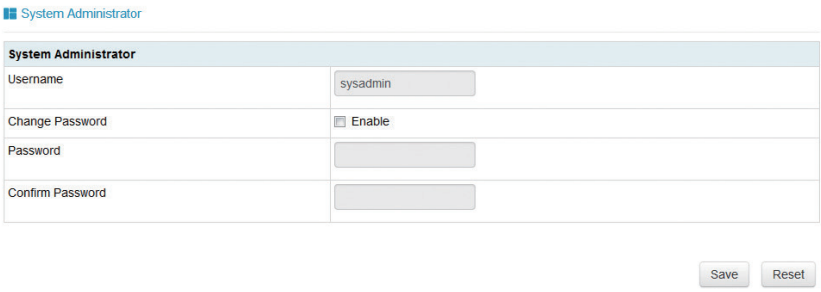
4.3.10.4 System Administrator

Function introduction

Through this interface, you can change the administrator’s password.

Interface description

In the navigation tree on the left side of the main interface, select system maintenance, select system administrator to display this interface.



4.4 Command Line Introduction

About this chapter

It introduces how to log in BMC command line and the commands supported by BMC.

4.4.1 Command Line Introduction

Introduce the command line functions and help information.

4.4.1.1 Command Line Functions

The command line provides the following functions:

- Network information query and configuration
- Sensor information query
- FRU information query
- User query and setting
- BMC information query and control
- Fan query and control
- PSU information query and control
- Update BMC firmware
- Diagnostic information
- SOL function
- Location function

4.4.1.2 Help

BMC command line has help function. Input help/command+help during using, the command line will automatically suggest the parameter and format of the command line to help you complete the command.

For example:

Input help under a command prompt to display the command set supported by the command line.

```
              >> smashclp <<
////////////////////////////////////////////
smashclp cli tool version 1.0
Enter 'help' for a list of built-in commands
////////////////////////////////////////////

/smashclp> help
Built-in command:
-------------------
ipconfig:       get or set network parameters, please enter <ipconfig --help> for more information
sensor  :       get or set sensor parameters, please enter <sensor --help> for more information
fru     :       get or set fru parameters, please enter <fru --help> for more information
chassis :       get or set chassis parameters, please enter <chassis --help> for more information
user    :       get or set user parameters, please enter <user --help> for more information
mc      :       get or set mc parameters, please enter <mc --help> for more information
fan     :       get or set fan parameters, please enter <fan --help> for more information
psu     :       get or set psu parameters, please enter <psu --help> for more information
update  :       firmware update operator, please enter <update --help> for more information
diagnose:       BMC diagnose function, please enter <diagnose --help> for more information
sol     :       sol (text redirection) function, please enter <sol --help> for more information
id      :       id get identify function, please enter <id --help> for more information
exit    :       exit the command line
```

Input a specific command+help, it will display the help information of this command, such as:

```
/smashclp> ipconfig --help
ipconfig commands:
    ipconfig <option1> [<option2> [<parameter2>]] [<option3> [<parameter3>]...] [interface]
    option1:
      --help     show help information
      ?          show help information
      --get      get network information
      for example : ipconfig --get [<option2>] [<option3>..] [interface]
      --set      set network information
      for example : ipconfig --set <option2> <parameter2> [<option3> <parameter3>...] <interface>
    option2..n:
      --ipsrc <source>
      static = address manually configured to be static
      dhcp   = address obtained by BMC running dhcp
      if <source> option <dhcp>,can not option other options and parameters
      --ipaddr  [<x.x.x.x>]   set or get IP address
      --netmask [<x.x.x.x>]   set or get IP netmask
      --gateway [<x.x.x.x>]   set or get IP gateway
      --macaddr               get MAC address, this only support --get
    interface:
      interface not specify is getting all network information, only support --get
      eth0     get or set eth0 network information
      eth1     get or set eth1 network information
      bond0    get or set bond0 network information
```

4.4.2 Login Command Line

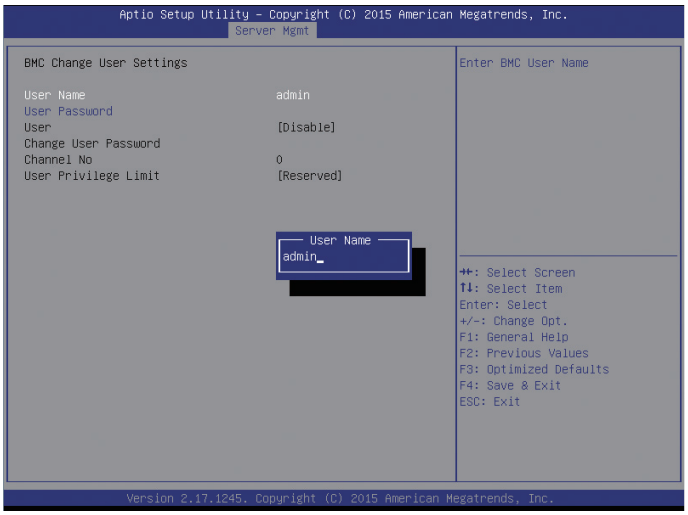
4.4.2.1 Change the Default User Password through BIOS

Step 1: Reboot the server.

Step 2: During boot process, press “Del” according to the prompt information on the interface to enter BIOS setting interface.

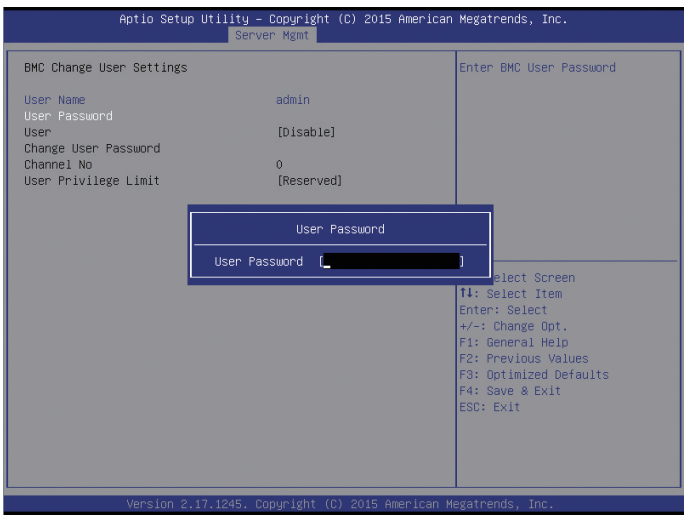
Step 3: Select “Server Mgmt” -> “BMC User Setting” -> “Change User Settings”.

Step 4: Select “User Name” and input the user name.



Step 5: Press “Enter” after inputting the user name.

Step 6: Select User Password, and press “Enter”, as shown in the following picture:



Step 7: After inputting the password, press “Enter” to save it.

4.4.2.2 Confirm the Management Port IP Address

Method introduction

There are the following methods of confirming the management port IP address:

- Query through BIOS, set IP address

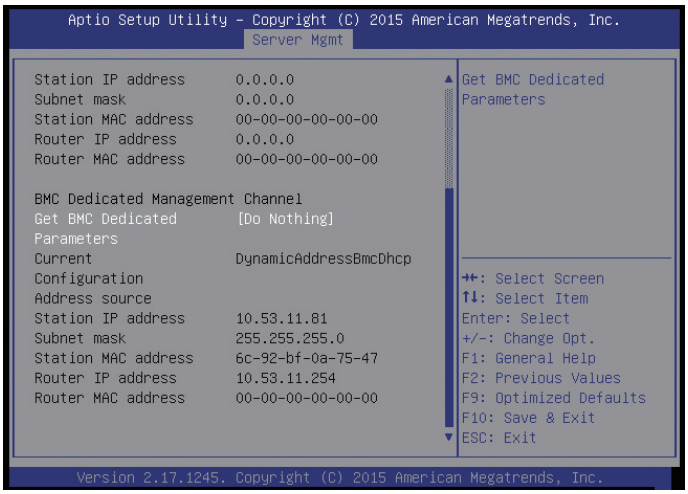
Query through BIOS and set IP address

Step 1: Reboot the server.

Step 2: During boot process, press “Del” according to the prompt information on the

interface to enter BIOS setting interface.

Step 3: Select “Server Mgmt”-> “BMC network configuration”, the interface will display the BMC network configuration information.



4.4.2.3 Login BMC Command Line

Introduce the method of BMC command line login.

Precondition

Notices when logging in BMC command line:

- Make sure that the configuration terminal has been connected with the server’s management port with network cable, and the IP address of the configuration terminal and the IP address of the server management port should be in the same segment.
- Make sure that the SSH/Telnet service of the server BMC is enabled.

Login method

- SSH
- Telnet

Login through SSH

There are the following 2 cases when logging in the command line through SSH protocol:

- The client uses Linux operating system:
  - Connect the configuration terminal with the server’s management port.
  - Input ssh ipaddr in the terminal tool (such as Shell) to login the command line.
- The client uses Windows operating system:
  - Download and install the client communication tool of SSH protocol.

- Connect the configuration terminal with the server's management port.
- Input the management port IP address, user name and password in the client communication tool to login the BMC command line.

Login through Telnet

Login through Telnet is not safe, and BMC doesn't support this login method. If it needs to login through Telnet, please enable the Telnet service in the BMC Web interface first.

There are the following 2 cases when logging in the command line through Telnet protocol:

- The client uses Linux operating system:
  - Connect the configuration terminal with the server's management port.
  - Input telnet ipaddr in the terminal tool (such as Shell) to login the command line.
- The client uses Windows operating system:
  - Connect the configuration terminal with the server's management port.
  - Input telnet ipaddr in the terminal tool (such as Shell) to login the command line.

4.4.3 Network Commands

Introduce the query and setting method of BMC network commands.

4.4.3.1 Query IP Information of BMC Management Port

Command function

Query IP information of BMC management port.

Command format

Ipconfig -get <interface>

Parameter description

Parameter	Parameter description	Value
interface	Network interface	eth0/eth1/bond0

For example:

Get the network information of the network interface eth0.

```
/smashclp> ipconfig --get eth0
     eth0
          IP Address Source  :  dhcp
          IP Address         :  0.0.0.0
          Subnet Mask        :  0.0.0.0
          Default Gateway IP :  0.0.0.0
          MAC Address        :  6C:92:BF:0A:75:46
/smashclp>
```

4.4.3.2 Set the Network Information of BMC Management Port

Command function

Set the network information of BMC management port

Command format

Ipconfig -set <option><interface>

Parameter description

Parameter	Parameter description	Value
Option	Parameter	● ipsrc ● Static: static IP address ● DHCP: obtain IP address dynamically ● ipaddr ipsrc: the set IP address when static is selected ● netmask ipsrc: the set Netmask when static is selected ● gateway ipsrc: the set gateway when static is selected
Interface	Network interface	eth0/eth1/bond0

For example:

```
/smashclp> ipconfig  --set --ipsrc dhcp eth0
command_ip_parame.NetParam = 2.
IP Parameters Set OK! Please Wait 30s for validate.
/smashclp>
```

4.4.3.3 Sensor Information Display

Command function

Display all the sensor information

Command format

Sensor -list

For example

```
/smashclp> sensor --list
sensor name      | num | value     | unit       | status | lnr       | lc        | lnc       | unc       | uc        | unr
CPU0_Temp        | 19h | 64.000    | degrees C  | ok     | na        | na        | na        | 102.000   | 112.000   | na
CPU1_Temp        | 1Ah | na        | degrees C  | na     | na        | na        | na        | 102.000   | 112.000   | na
PCH_Temp         | 1Dh | 38.000    | degrees C  | ok     | na        | na        | na        | 100.000   | 110.000   | na
DIMMG0_Temp      | 1Eh | 32.000    | degrees C  | ok     | na        | na        | na        | 95.000    | 105.000   | na
DIMMG1_Temp      | 1Fh | na        | degrees C  | na     | na        | na        | na        | 95.000    | 105.000   | na
Inlet_Temp       | 02h | na        | degrees C  | na     | na        | na        | na        | 40.000    | 50.000    | na
Outlet_Temp      | 00h | na        | degrees C  | na     | na        | na        | na        | na        | na        | na
SYS0_Temp        | 01h | na        | degrees C  | na     | na        | na        | na        | na        | na        | na
SYS1_Temp        | 03h | na        | degrees C  | na     | na        | na        | na        | na        | na        | na
HDD0_REAR_Temp   | 04h | na        | degrees C  | na     | na        | na        | na        | 60.000    | 70.000    | na
HDD1_REAR_Temp   | 0Bh | na        | degrees C  | na     | na        | na        | na        | 60.000    | 70.000    | na
RAID_Temp        | 20h | na        | degrees C  | na     | na        | na        | na        | na        | na        | na
RISER0_Temp      | 05h | na        | degrees C  | na     | na        | na        | na        | na        | na        | na
RISER1_Temp      | 06h | na        | degrees C  | na     | na        | na        | na        | na        | na        | na
GPU0_Temp        | 07h | na        | degrees C  | na     | na        | na        | na        | 82.000    | 92.000    | na
GPU1_Temp        | 08h | na        | degrees C  | na     | na        | na        | na        | 82.000    | 92.000    | na
MIC0_Temp        | 09h | na        | degrees C  | na     | na        | na        | na        | 104.000   | 114.000   | na
MIC1_Temp        | 0Ah | na        | degrees C  | na     | na        | na        | na        | 104.000   | 114.000   | na
SYS_VCCIO        | 40h | 1.030     | Volts      | ok     | 0.690     | 0.770     | 0.850     | 1.170     | 1.250     | 1.330
```

4.4.3.4 FRU Information Acquisition

Command function

Get FRU information

Command format

fru -get <option>

Parameter descriptio

Parameter	Parameter description	Value
CT	Chassis Type	CT
CPN	Chassis Part Number	CPN
CS	Chassis Serial	CS
CE	Chassis Extra	CE
BD	Board Mfg Data	BD
BM	Board Mfg	BM
BP	Board Product	BP
BS	Board Serial	BS
BN	Board Part Number	BN
PM	Product Manufacturer	PM
PN	Product Name	PN
PPN	Product Part Number	PPN
PV	Product Version	PV
PS	Product Serial	PS
PAT	Product Asset Tag	PAT
all	ALL FRU INFO	all

For example

```
/smashclp> fru --get all
 Chassis Type          : Rack Mount Chassis
 Chassis Part Number   : 0
 Chassis Serial        : 0
 Chassis Extra         : NULL
 Board Mfg Date        : Mon Sep  8 22:17:00 2014
 Board Mfg             : Inspur
 Board Product         : Baotu
 Board Serial          : 0
 Board Part Number     : 0
 Product Manufacturer  : Inspur
 Product Name          : NF5280M4
 Product Part Number   : 0
 Product Version       : 123
 Product Serial        : inspur123456
 Product Asset Tag     : inspur123456
/smashclp>
```

4.4.3.5 FRU Information Modification

Command function

Modify FRU field information

Command format

fru -set <Option><Value>

Parameter description

Parameter	Parameter description	Value
Option	FRU field to be set	Refer to FRU field description (table 3-1)
Value	Value to be set	

For example

```
/smashclp> fru --set  BS 0001
Update FRU information Success!
/smashclp> fru --get  BS
 Board Serial          : 0001
/smashclp>
```

4.4.3.6 Chassis Information Acquisition

Command function

Get Chassis information

Command format

Chassis -get <option><parameter>

Parameter description

Parameter	Parameter description	Value
Option	Object to obtain	● power : the host power status ● identify UID light status
Parameter	Parameter information	Status: status information

For example

```
/smashclp> chassis --get power  status
The host status is on
/smashclp> chassis --get identify  status
The UID status is off
/smashclp>
```

4.4.3.7 Chassis Control

Command function

Control the chassis startup/shutdown and UID light on/off

Command format

chassis -set<option><parameter>

Parameter description

Parameter	Parameter description	Value
Option	Operation object	● power ● identify
Parameter	Parameter value	● on: only work on power object, power on ● off: work on power and identify objects, power off ● force: work on identify object, make the UID light steady on

For example

```
/smashclp> chassis --set power  on
Power status successfully.
/smashclp> chassis --get power  status
The host status is on
/smashclp> chassis --set identify  force
Identify UID successfully.
/smashclp> chassis --get identify  status
The UID status is on
/smashclp>
```

4.4.3.8 View User Information

Command function

View the user information

Command format

user --list

For example

```
/smashclp> user  --list
ID  Name             Channel Priv Limit
1   root             ADMINISTRATOR
2   admin            ADMINISTRATOR
3                    NO ACCESS
4                    NO ACCESS
5                    NO ACCESS
6                    NO ACCESS
7                    NO ACCESS
8                    NO ACCESS
9                    NO ACCESS
10                   NO ACCESS
11                   NO ACCESS
12                   NO ACCESS
13                   NO ACCESS
14                   NO ACCESS
15                   NO ACCESS
16                   NO ACCESS
/smashclp>
```

4.4.3.9 Add or Delete a User

Command function

Add or delete a user

Command format

user -id<id> --name<username> --passwd<userpasswd> --priv<priv>

Parameter description

Parameter	Parameter description	Value
id	User id	Number of 1-16
name	User name	User name
passwd	User password	User password
priv	User privilege code	● 2: USER privilege ● 3: OPERATOR privilege ● 4: ADMINISTRATOR privilege

For example

```
/smashclp> user --id 3 --name ben --passwd 123456 --priv 3
The user set successfully!
/smashclp> user --del 3
The user set successfully!
/smashclp>
```

4.4.3.10 BMC Version Acquisition

Command function

Get BMC version information

Command format

mc -get version

For example

```
/smashclp> mc --get version
Device ID                 : 32
Device Revision           : 1
Firmware Revision         : 4.10.0
IPMI Version              : 2.0
/smashclp>
```

4.4.3.11 BMC Reset

Command function

Control BMC reset, control BMC Web service and KVM service reset.

Command format

mc -set <option>reset

Parameter description

Parameter	Parameter description	Value
Option	Operation object	● bmc: bmc system ● kvm: kvm service of bmc system ● webgo: web service of bmc system

For example

```
/smashclp> mc --set webgo reset
MC reset OK!
/smashclp>
```

4.4.3.12 Fan Reading Acquisition

Command function

Get system fan readings

Command format

fan -get fanlevel

For example

```
/smashclp> fan --get fanlevel
ID  Status  SpeedPercent  SpeedRPM
0    NA          0          0 PRM
1    NA          0          0 PRM
2    NA          0          0 PRM
3    NA          0          0 PRM
4    NA          0          0 PRM
5    NA          0          0 PRM
6    NA          0          0 PRM
7    NA          0          0 PRM
/smashclp>
```

4.4.3.13 Fan Speed Setting

Command function

Set the fan speed manually

Command format

fan -set fanlevel<fanid><duty>

Parameter description

Parameter	Parameter description	Value
fanid	Fan ID	0, 1, 2, 3....
duty	Duty ratio	Percentage

For example

```
/smashclp> fan --set fanmode 1
Set fanmode successfully.
/smashclp> fan --set fanlevel 1 60
Set fanlevel successfully.
```

4.4.3.14 PSU Information Acquisition

Command function

Get the PSU information

Command format

psu --get psuinfo

For example

```
/smashclp> psu --get psuinfo
PSU Asset Info:
ID | Mfr ID          | Mfr Model       | Serail Number   | FW Ver
0  | N/A             | N/A             | N/A             | 1.000
1  | N/A             | N/A             | N/A             | N/A
PSU Monitor Info:
ID | Status | Alert | Temp(C) | Pin(W) | Pout(W) | Vin(V) | Vout(V) | Iin(A) | Iout(A)
0  |Activate| OK    | 29      | 57     | 37      | 233    | 12.33   | 0.26   | 3.00
1  | N/A    | N/A   | N/A     | N/A    | N/A     | N/A    | N/A     | N/A    | N/A
/smashclp>
```

4.4.3.15 PSU Mode Setting

Command function

Set the PSU mode

Command format

psu --set psumode <psuid><mode>

Parameter description

Parameter	Parameter description	Value
psuid	PSU ID	0, 1, 2...
mode	PSU mode	● 0: activate ● 1: standby

For example

```
/smashclp> psu --set psumode 0 1
Set psumode failed.
/smashclp>
```

4.4.3.16 Update BMC and BIOS Firmware

Command function

Update BMC or BIOS firmware

Command format

update <target> <tftpserverip> <imgfile> <param>

Parameter description

Parameter	Parameter description	Value
target	Target to update	bmc or bios
tftpserverip	Tftp server IP address	
imgfile	Image file name	
param	Parameter	● --preserve : only used to update BMC, keep the BMC configuration information ● --me: only used to update BIOS, and update ME at the same time.

For example

```
/smashclp> update bmc 10.53.11.99 rom.ima --preserve
```

4.4.3.17 Diagnose Function

Command function

Get the diagnostic log information to assist in fault location.

Command format

diagnose <option><param>

Parameter description

Parameter	Parameter description	Value
option	Diagnose command (object)	● ls: list the files ● cat: view the file content ● last: view the recent file content ● ifconfig: view network information ● ethtool: view NIC information ● ps: view process information ● top: view top information ● dmesg: view dmesg information ● netstat: view network connection information
param	Object to view	only works on ls and cat commands ● ncml :bmc service configuration information ● log: system log ● cpuinfo: cpu information ● meminfo: memory information ● slabinfo: slab information ● versioninfo: version information

For example

```
/smashclp> diagnose cat meminfo
MemTotal:         215668 kB
MemFree:          135376 kB
Buffers:           11308 kB
Cached:            22932 kB
SwapCached:            0 kB
Active:            32452 kB
Inactive:          19068 kB
Active(anon):      17692 kB
Inactive(anon):        0 kB
Active(file):      14760 kB
Inactive(file):    19068 kB
Unevictable:           0 kB
Mlocked:               0 kB
SwapTotal:             0 kB
SwapFree:              0 kB
Dirty:                 0 kB
Writeback:             0 kB
```

4.4.3.18 Enable SOL

Command function

Start SOL

Command format

sol --start

For example

```
/smashclp> sol --start
```

4.4.3.19 ID Command

Command function

Display serial number information

Command format

id --<option>

Parameter description

Parameter	Parameter description	Value
option	ID object	● sn serinal number ● uuid

For example

```
/smashclp> id --uuid
6c92bf071b1e8d030010d21df8cb3a2b
/smashclp> id
Type and Model    Serial No         UUID
--------------    ---------         ----
NF5280M4          inspur123456      6c92bf071b1e8d030010d21df8cb3a2b
/smashclp>
```

4.5 Time Zone Table

Time Zone	Countries and Regions
GMT-12:00	West Date Line
GMT-11:00	Appiah, Niue, Pago Pago, Midway
GMT-10:00	Fakaofo, Rarotonga, the island of Tahiti, Johnston, Hawaii
GMT-09:30	Marquesas
GMT-09:00	Alaska, Gambier Islands
GMT-08:00	Pacific Time (USA and Canada), Pitcairn, Whitehorse, Tijuana, Vancouver
GMT-07:00	Mountain Time (USA and Canada), Edmonton, Hermosillo, the Tao gave birth to Crick, Chihuahua, Yellowknife, Arizona, Mazatlan
GMT-06:00	Central Time (USA and Canada), Belize, Costa Rica, Easter Island, Galapagos Islands, Salvatore, Guatemala, Managua, Mexico City, Regina, Winnipeg
GMT-05:00	Eastern Time (USA and Canada), Panama, Bogota, Toronto, Grand Turk Island, Montreal, Iqaluit, Guayaquil, Havana, the Cayman Islands, Leo Brown Cu, Lima, Nassau, Port au Prince, Jamaica
GMT-04:00	Atlantic Time (Canada), Aruba, Anguilla, Antigua, Babado J, Bermuda, Puerto Rico, Bo Avesta, Campo Grande, Halifax City, Dominica, Grenada, Guadeloupe, Guyana, Caracas, Curacao, Cuiaba, Labasse, Martinique, Manaus, Montserrat, Palmer, Santiago, Santo Domingo, St. Kitts, St Lucia, St. Thomas, Vincent, STANLEY, Thule, Tortora, Porto Velho, port of Spain, Asuncion
GMT-03:30	St. Louis
GMT-03:00	Aragua ina, Belem, Buenos Aires, Fortaleza, Geert Holob, cayenne, Recife, Lutheran, Maceio, Montevideo, Miquelon Island, Paramaribo, Salvatore, St. Paul
GMT-02:00	South Georgia, Noronha
GMT-01:00	Cape Verde, Si kolle SBI Sander, Azores
GMT+00:00	Abidjan, Accra, Bamako, Banjul, Laayoune, Bissau, Dakar, Dublin, Freetown, Greenland, the Canary Islands, Casablanca, Conakry, Reykjavik, Lisbon, London, Monrovia, Nouakchott, Saint Lome, how beautiful, St. Helena, Ouagadougou
GMT+01:00	Algiers, Amsterdam, Andorra, Oslo, Paris, Berlin, Bangui, Porto Novo, Budapest, Brazzaville, Brussels, Tirana, Douala, Ndjamena, Copenhagen, Warsaw, Kinshasa, Lagos, Liebe Weil, Luxemburg, Luanda, Rome, Madrid, Malta, Monaco, Niamey, Stockholm, Guinea, Zurich, Tunisia, Vaduz, Vienna, Windhoek, Ceuta, Gibraltar

GMT+02:00	Amman, Beirut, Bucharest, Blantyre, Bujumbura, Damascus, Tripoli, Harare, Habo Roney, Helsinki, Kiev, Kigali, Kihine U, Cairo, Gaza, Riga, Lubumbashi, Lusaka, Maputo, Minsk, Kaliningrad, Maseru, Mbabane, Nicosia, Sofia, Tallinn, Tel Aviv, Vilnius, Athens, Istanbul, Johannesburg
GMT+03:00	Antananarivo, Baghdad, Bahrain, Dar Es Salaam, Djibouti, Qatar, ha Khartoum, Kampala, Comoros, Kuwait, Mayotte, Riyadh, Mogadishu, Moscow, Nairobi, Addisababa, Aden, Showa
GMT+03:30	Newfoundland
GMT+04:00	Baku, Dubai, Tbilisi, Reunion Island, Mahe, Muscat, Mauritius, Samarra, Ye Liewan
GMT+04:30	Kabul
GMT+05:00	Aktau Aktobe, Ashkhabad, Karachi, Dushanbe, Kell islands, Maldives, Kelang, Yekaterinburg, Tashkent
GMT+05:30	Colombo, India
GMT+06:00	Ala Mutu, Bishkek, Chagos, Dhaka, Mo Sen, Omsk, Novosibirsk, Thimphu, Vostok
GMT+06:30	The Coco Islands, Yangon
GMT+07:00	Davies, Hanoi, Phnom Penh, Khovd, Bangkok, Lasinuoyaersike, Christmas Island, Vientiane, Jakarta
GMT+08:00	Macao, Kuala Lumpur, Manila, Ilkuts J, Casey, Macassar, Taipei, Brunei, Ulan Bator, Perth, Singapore, Beijing, Hongkong, China
GMT+09:00	Chaya Pla, Dili, Tokyo, Yakutsk, Palau, Pyongyang, Qiao Bashan, Seoul
GMT+09:30	Adelaide, Darwin
GMT+10:00	Di Mundi Weil, Brisbane, Hobart, Melbourne, Sydney, Guam, Port Moresby, Yuzhno-Sakhalinsk, Saipan, Truc
GMT+11:00	Efate, Ponape Island, Guadalcanal, Kosrae, Magadan, Noumea
GMT+11:30	Nuo Fuke
GMT+12:00	Oakland, Funafuti, Kwajalein, Majuro, Pietro Pavlov's Kamchatka, Tarawa Island, Wallis, Wake Island, Nauru, Fiji
GMT+13:00	Nukualofa

4.6 Key Features

Key Features	Inspur
	Grantley (sBMC3)
Interfaces/Standards	
IPMI2.0	√
DCMI1.5	√
Web-based GUI	√
Smash-Lite command line	√
Telnet	√
SSH	√
Network Time Protocol	√
Connectivity	
Shared NIC	√
Dedicated NIC	√
VLAN tagging	√
IPV4	√
IPV6	√
DHCP	√
Dynamic DNS	√
Security	
Role-based authority	√
Local users	√
SSL encryption	√
IP blocking	√
Directory services(AD,LDAP)	√
Remote Presence	
Power control	√
Boot control	√
Serial-over-LAN	√
Virtual Media	√
Virtual Console	√
Virtual Console collaboration(5 users)	√

Text-based remote console via SSH	√
Power & Thermal	
Real-time Power graphing	√
Power capping	√[1]
Temperature monitoring	√
Temperature graphing	√
Health Monitoring	
Full agent-free monitoring	√
SNMPV1,V2,and V3(traps and gets)	√
Email Alerting	√
Fan monitoring	√
Power Supply monitoring	√
Memory monitoring	√
CPU monitoring	√
RAID monitoring	√[2]
HD monitoring(enclosure)	√[2]
Diagnostics, Service, & Logging	
Crash screen capture	√
Boot capture	√
Manual reset for BMC	√
OS watchdog	√
System Event Log	√
Remote Syslog	√
Audit Log	√
Update	
Remote agent-free Update	√
Web-based Update	√
CLI-based Update	√

[1]Feature available via IPMI, not Web GUI

[2]Not full Support

5 Hardware Maintenance

5.1 Tool Preparation

- Necessary tools are shown in the following table.

Tool List

Illustration	Name	Description
	Phillips Screwdriver	Used to fix bolts.
	Anti-static Wrist Strap	Used to contact or operate devices and apparatus, to prevent electrostatic discharge.
	Anti-static Gloves	Used to plug in single board, hand-held single board or other precision instruments, to prevent electrostatic discharge.

5.2 Parts Replacement

Special tips: Except hot-swappable parts (i.e. hot-swappable disk drives), all part replacements could only be carried out with power disconnected.

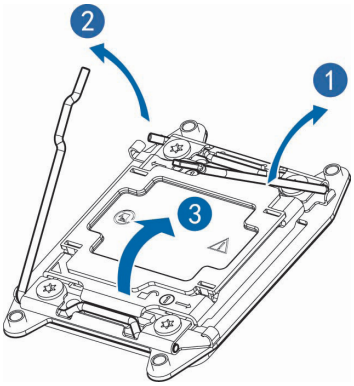
5.2.1 Processor Replacement

During installing and replacing CPU, please pay attention to the following issues:

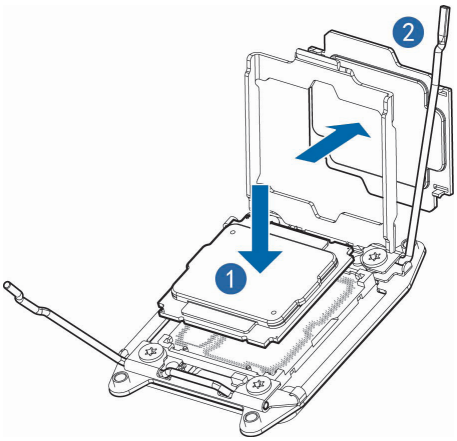
- If installing two CPUs, type of these two CPUs shall be the same.
- When only one CPU is to be installed, please operate according to the following requirements:
  1) This CPU has to be installed on CPU0's socket, and see [Motherboard Diagram] for CPU position.

2) It is not allowed to dismantle the protective cover on socket1 without CPU1 installed.

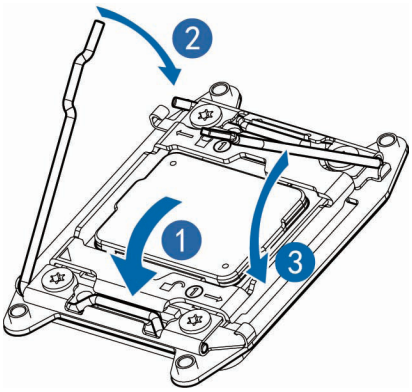
Step 1: Lift the two socket clips to open the load plate.



Step 2: Insert the CPU into the CPU socket, and remove the CPU socket cover.



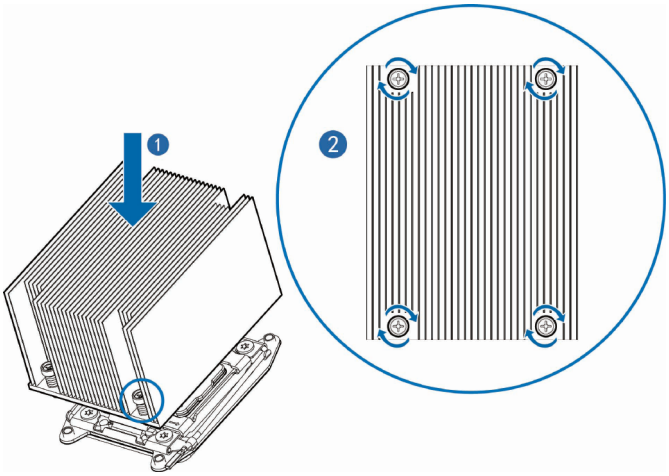
Step 3: Lower the CPU load plate, and then secure it with the two socket clips.



Step 4: Fix the CPU heatsink on top of CPU, and tighten the screws on the heatsink.

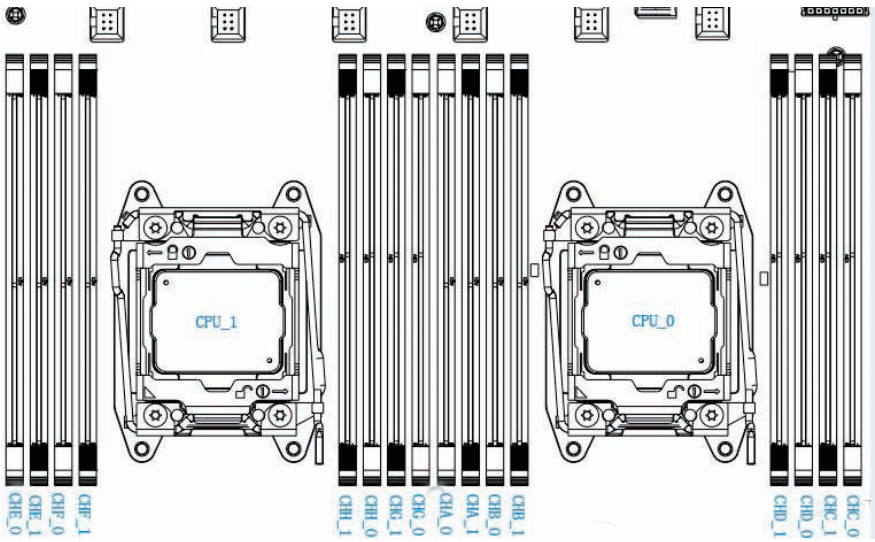
Notes:

- It is required to coat thermal grease evenly onto the contact position between CPU heatsink and CPU.
- The direction of CPU heatsink fins should be identical with the system inlet/ outlet direction.
- When securing the CPU heatsink, it is required to tighten two diagonal screws first, and then tighten the other two screws.



5.2.2 Memory Replacement

- Memory slot layout is as shown in the following figure:



- Memory installation principle:

  Only memory of the same type could be used in the same machine. Detailed

memory installation and combination principles are as follows:

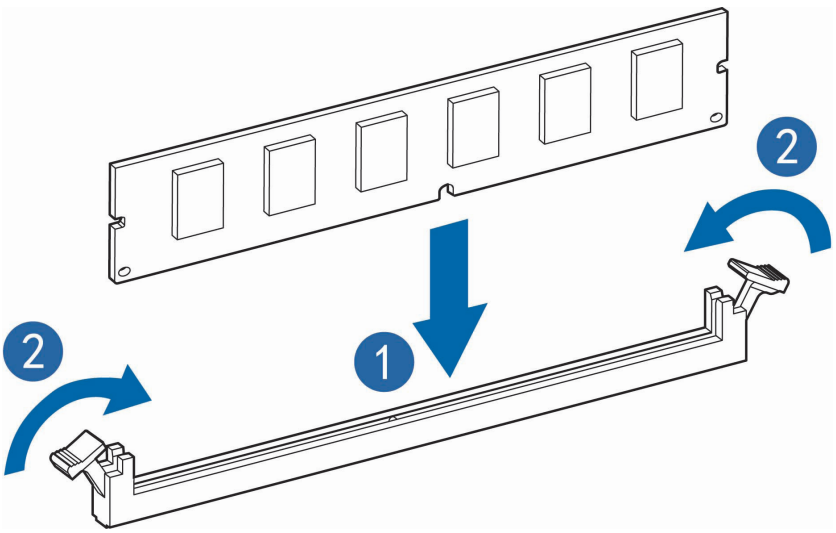
a、The white slot shall take the priority, while CPU1 memory shall be symmetrically installed with CPU0 memory.

b、For single CPU, memory shall follow the screen printed sequence: CHA-0, CHB-0, CHC-0, CHD-0, CHA-1…

c、For dual CPUs, CPU0 position memory shall follow the screen printed sequence: CHA-0, CHB-0, CHC-0, CHD-0…; CPU1 memory shall be symmetrically installed with CPU0 memory: CHG-0, CHH-0, CHE-0, CHF-0 …

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

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

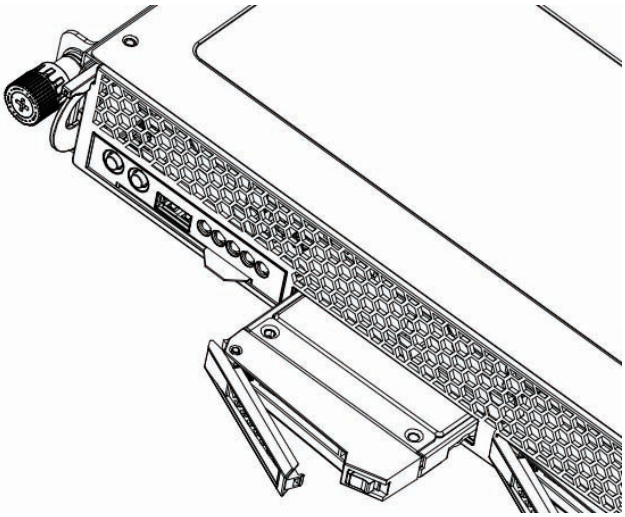


5.2.3 HDD Replacement

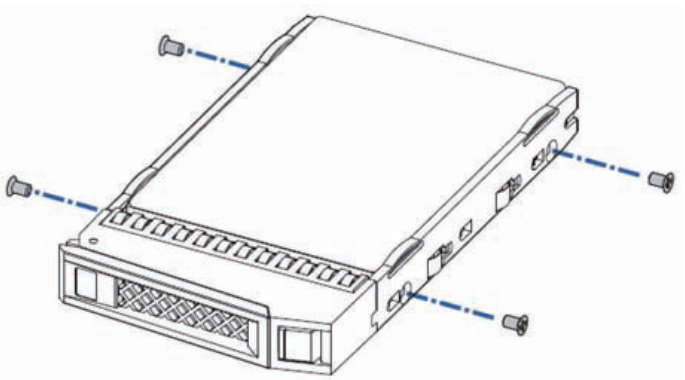
Front HDD replacement

Step 1: Press the HDD panel button.

Step 2: The lever on HDD tray pops up automatically, pull outwards and remove the HDD tray.



Step 3: Use four screws to fix the hard drive into the tray.

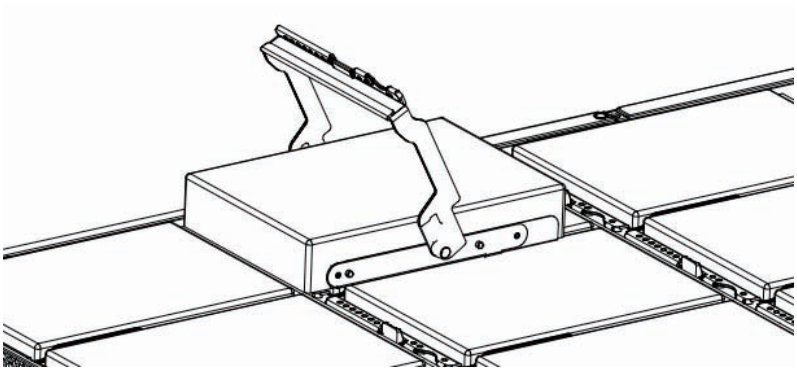


Step 4: Install the hard drive into the chassis, and lock the hard drive lever firmly.

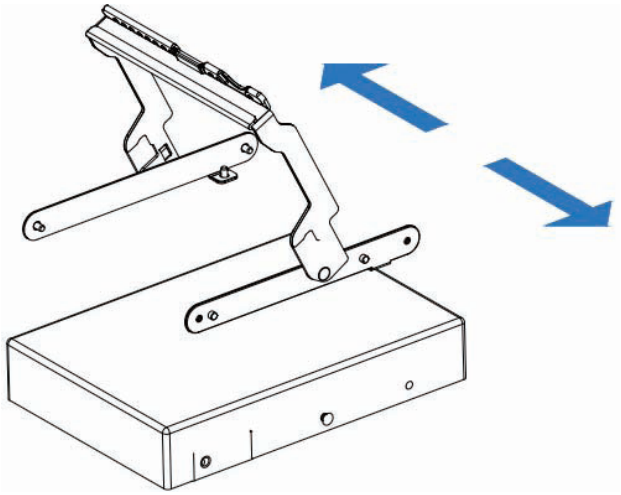
Internal HDD replacement

Step 1: Press the button on HDD tray.

Step 2: The lever on HDD tray pops up automatically, pull upwards and remove the HDD tray.

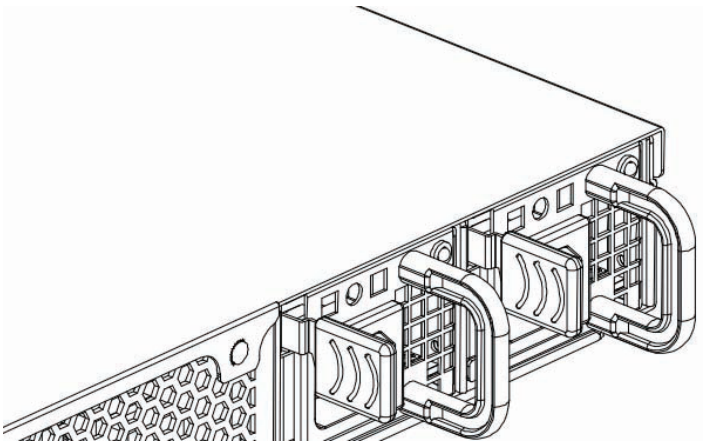


Step 3: Open the HDD tray in the direction indicated by the arrows, and take out the HDD.



5.2.4 PSU Replacement

Step 1: Press the clip and hold the handle, pull the PSU outwards.



Step 2: Remove the PSU horizontally with even force.

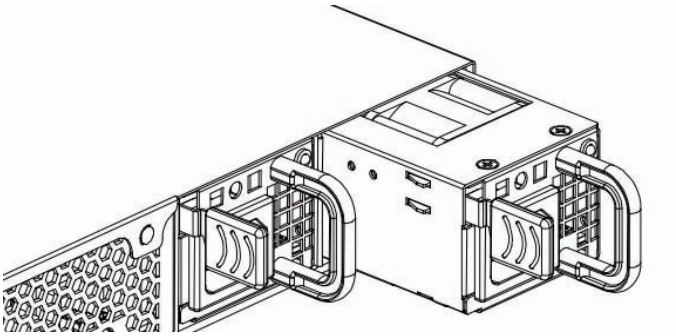


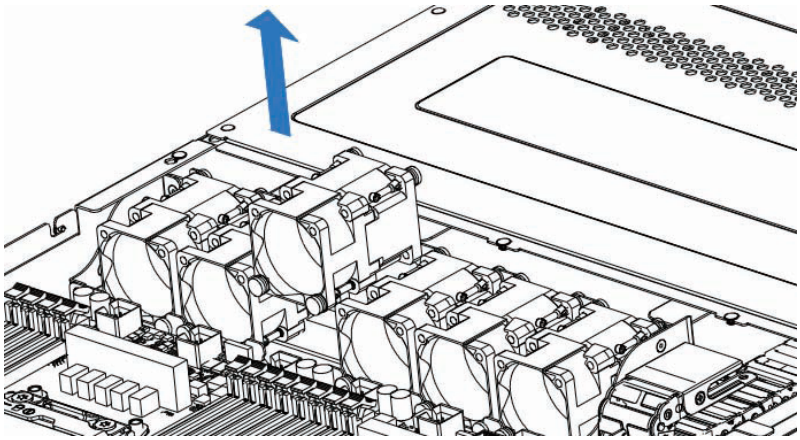
Figure 3: Install the PSU.

Push the new PSU into the chassis along slide, until a “click” sound is heard, the PSU is totally inserted into the chassis, and could not move any more.

5.2.5 System Fan Replacement

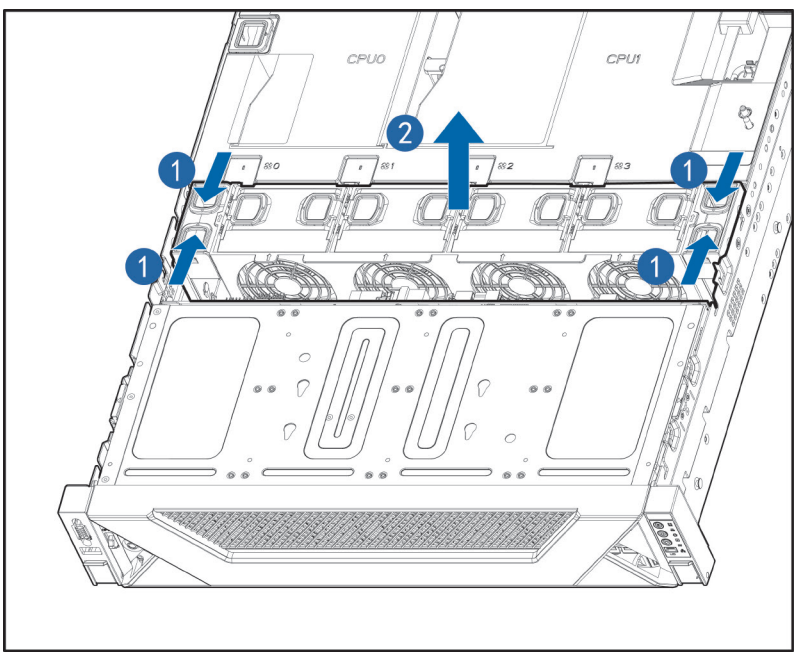
Remove single fan.

Hold the both sides of the single fan bracket, and vertically remove the single fan upwards.



Step 2: Complete removal of system fan bracket.

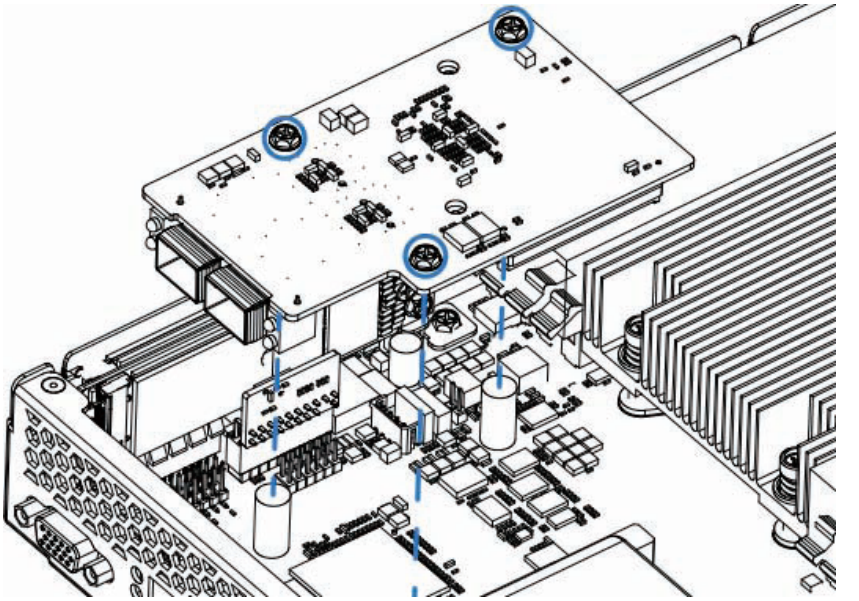
Hold buckles on both ends of the fan bracket, and vertically remove system fan bracket upwards.



5.2.6 External Card Replacement

Align the three screws holes on the external card with the studs, and tighten them with 3 screws.

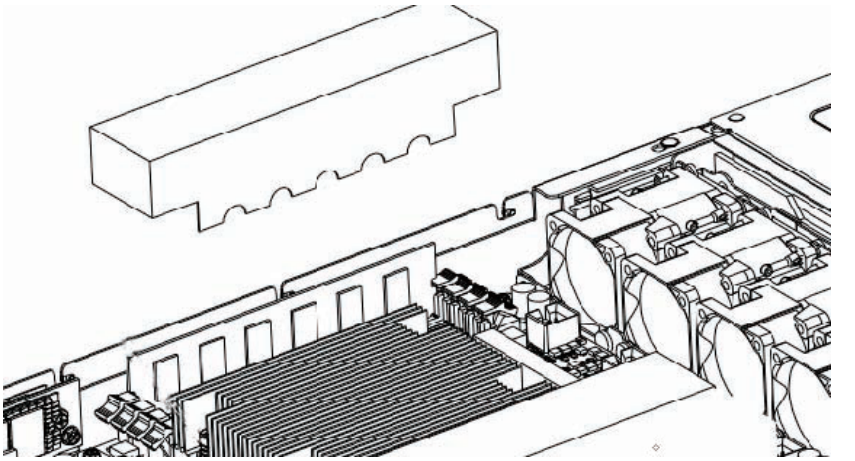
Note: To install the network card, it needs to remove the cover of the corresponding slots on the chassis rear window first.



5.2.7 Air Duct Replacement

Step 1: Open the upper cover of the chassis.

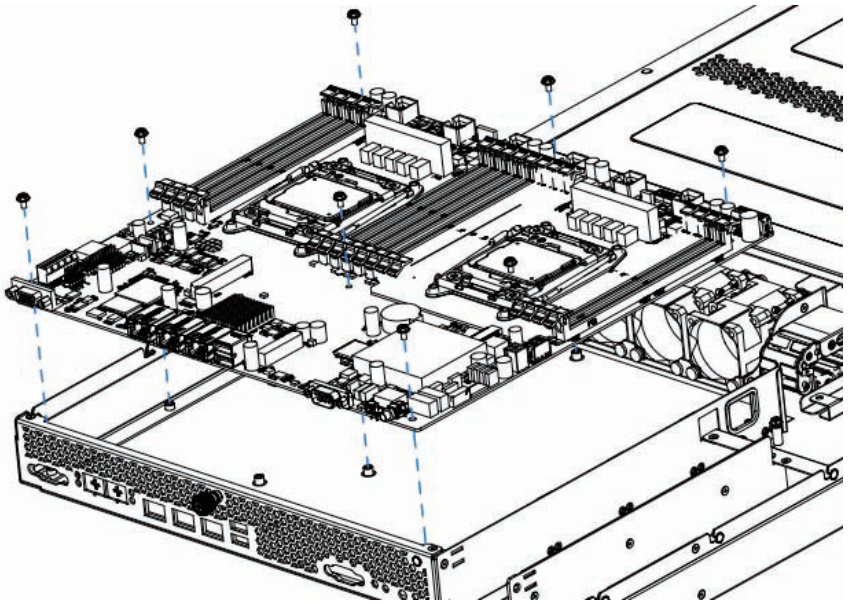
Step 2: Press and hold the both sides of the air duct, and then vertically remove the air duct upwards.



5.2.8 Motherboard Replacement

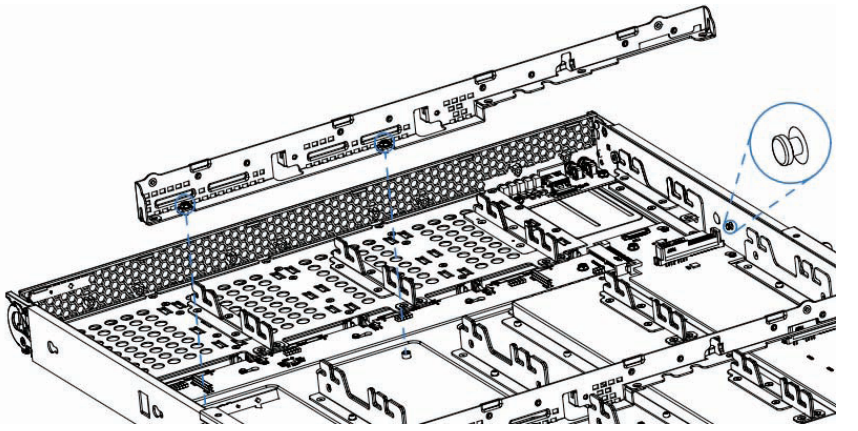
Step 1: Dismantle all parts and cables connected to the motherboard.

Step 2: Remove all the screws on the motherboard, and vertically remove the motherboard upwards.

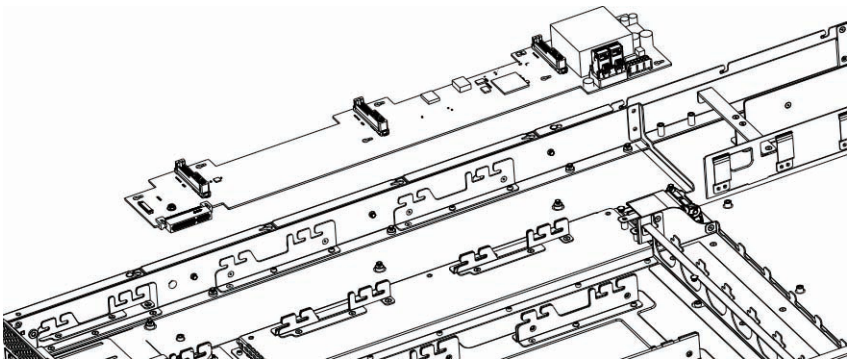


5.2.9 Expander Backplane Replacement

Step 1: Remove the internal HDD backplane bracket. Remove the screws on the bracket, and vertically remove the bracket away from the hardy holes. Use the same way to remove the other two brackets.



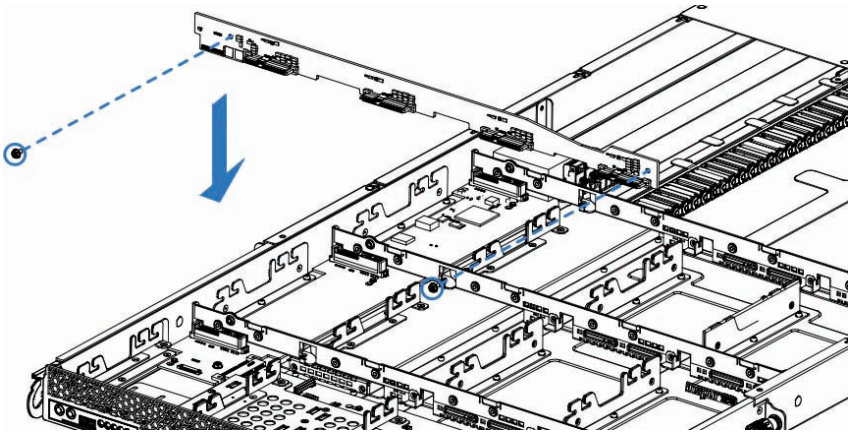
Step 2: Align the hardy holes on the expander backplane with the rivets in the chassis, install the expander card into the chassis, and use screws to fix.



5.2.10 Internal HDD Backplane Replacement

Step 1: Align the connecting fingers of the internal HDD backplane with the slots of the expander backplane, and align the three metal parts of the internal HDD backplane with the three slots on the chassis.

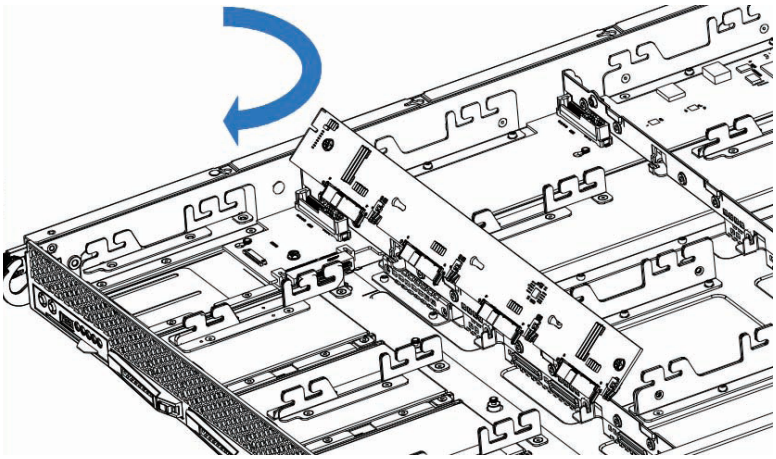
Step 2: Vertically install the backplane into the chassis, use two screws to fix.



Step 3: Repeat step 1 and step 2 to install the other two internal HDD backplane.

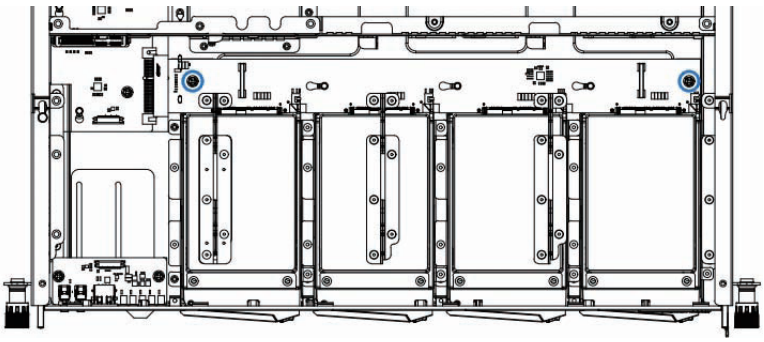
5.2.11 Front HDD Backplane Replacement

Step 1: Align the hardy holes on the front HDD backplane with the rivets in the chassis, and place the backplane in the chassis as shown in the following figure.



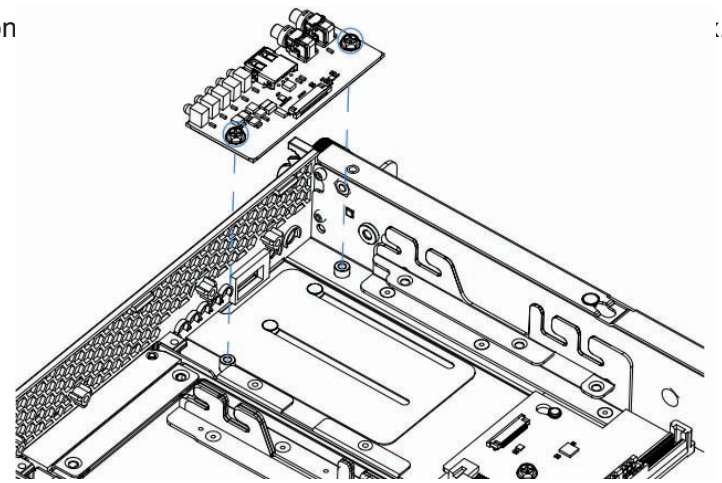
Step 2: Align the connecting fingers of the backplane with the slots of the expander backplane, move the HDD backplane left to insert it into the expander backplane slots.

Step 3: Use



5.2.12 Front Control Panel Replacement

Step: Align the screw holes on the front control panel with the studs in the chassis, install the fron



6 Common Faults, Diagnosis and Troubleshooting

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

6.1 Common Faults

1) No power after startup

After the machine is connected with power cable, no power is provided for the machine while pressing the On/Off button; the indicator does not light up after power on.

2) Power module indicator off or red indicator on

The machine is under normal operation, but a certain power module indicator is off or red indicator is on.

3) No display after power on

No information appeared on the display after power on via pressing On/Off button.

4) Front panel indicator is off

All front panel indicators are off after power on.

5) Front panel status indicator alarms

The machine is under normal operation, but status indicator gives an alarm.

6) Blank screen of the display

Blank screen occurs during using the display.

7) Abnormal display

Image dithering, rolling or warping occurs during using the display.

8) Abnormal display of memory capacity

The operating system shows that memory capacity is inconsistent with physical memory capacity.

9) Keyboard and mouse are not available

Neither keyboard nor mouse could be operated normally.

10) USB interface problem

Introduce solutions when failing to use USB interface.

6.2 Diagnosis and Troubleshooting Instructions

1) Diagnosis and troubleshooting on power-on failure at startup

Description: After pressing the power button, server front control panel indicator (power-on status indicator, hard drive status indicator) is off, meanwhile, no KVM (display) output is displayed, and server chassis fan does not rotate.

Operation steps:

a、Verify whether power supply is normal or not: if power module indicator is on, it indicates normal power supply; if power module indicator is off, please check if power supply is normal;

b、If power supply is normal, plug in and off the power module again to test, and then power on for verification;

c、If there's a machine and a power module of the same type, you could change the power module to test whether there's a power module fault;

d、If above operations could not solve the problem, please contact Inspur customer service.

2) Power module indicator off or red indicator on

Description: The machine is under normal operation, but a certain power module indicator is off or the red light is on.

Operation steps:

a、Firstly check whether all power cables are normal, and plug in power cables again;

b、If the fault still exists, plug in and off the power module again;

c、If shutdown is allowed, you could exchange these 2 power modules, to judge whether it is a power module fault.

d、If above operations could not solve the problem, please contact Inspur customer service.

3) No display after power on

Description: After pressing the power button, server front control panel indicator is on, but there's no output on the display.

Operation steps:

a、Firstly check whether the display is connected normally with the server's VGA port;

b、Test on another display;

c.、If above operations could not solve the problem, please contact Inspur customer service.

4) Front panel status indicator alarms

Description: The server is under normal operation, but system status indicator on front control panel flashes or the red indicator is on.

Operation steps:

Please check whether all power module indicators are steadily green, if so, you can login BMC web interface to collect logs, and contact Inspur customer service.

5) Memory capacity incomplete

Description: Memory capacity viewed via the operating system does not correspond with physical memory capacity.

Operation steps:

a、Ensure all memories of correct type have been correctly installed in place.

b、Enter BIOS setup to view memory capacity, if it could be completely identified in BIOS setup, this may lie in the limitation on memory capacity set by the operating system. Otherwise, please contact Inspur customer service.

6) Keyboard and mouse are not available

Description: Neither keyboard nor mouse could be operated normally.

Operation steps:

a、Make sure the keyboard or mouse has been connected correctly and firmly.

b、Test other parts to verify whether it is a mouse or keyboard fault.

c、Retest the machine via power on/off.

d、Reboot and enter cmos or raid configuration interface to test keyboard or mouse performance, when tested in a non-system situation, if keyboard or mouse performance turns out to be normal, a system fault could be

considered; if keyboard or mouse fault still exists, a mainboard interface fault could be considered, and you could call Inspur technical hotline for support.

7) USB interface problem

Description: Unable to use devices with a USB interface.

Operation steps:

a、Make sure the operating system on server supports USB devices.

b、Make sure 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 connecting to other hosts.

e、If the USB device is normal when connecting to other hosts, the server may be abnormal, please call Inspur technical hotline for support; if the USB device turns out to be abnormal when connecting to other hosts, please replace the USB device.

7 Certifications & Standards

This chapter introduces the certifications achieved by this product and standards it complies with.

- USA FCC declaration

  Introduce FCC standards abided by the product

- CE declaration of EU

  Introduce CE standards abided by the product

- China CCC

  Introduce CCC standards abided by the product

- China Environmental Labeling

  Introduce China environmental labeling standards abided by the product.

7.1 USA FCC Declaration

This chapter introduces the FCC standards abided by the product.

It is regulated in Subpart B, Part 15 of 47 CFR by Federal Communications Commission of the United States that users of this product shall pay attention to the following issues:

Annotations: This device has been tested and complies with regulations related to Class A digital devices in Part 15 of FCC rules. Main purpose of these limitations is to provide reasonable protection while operating such devices in business districts, to avoid harmful disturbance. This device may produce, use and emit RF energy; if installation or usage is carried out not according to instructions, harmful disturbance may be caused on radio communication. Operating this device in residential areas may cause harmful disturbance, in this case, the user will be responsible for all costs arisen from correcting disturbance.

If the user carries out change or correction not expressly indicated by our company, it may cause the device failing to comply with FCC Class A requirements, and exempted from its authorization to operate this device.

7.2 CE Declaration of EU

This chapter introduces the CE standards abided by this product.

This is a Class A product. In the residential environment, this product may cause radio disturbance, in this case, the user will be asked to adopt certain appropriate measures.

7.3 China CCC

This chapter introduces the CCC standards abided by this product.

This product is a Class A product. In the residential environment, it may cause radio disturbance, in this case, the user is required to adopt practicable precautions against its disturbance.

7.4 China Environmental Labeling

This product complies with China environmental labeling criteria.

For environmental protection and resources recycling, this product and its packaging material can be recycled. The resource recovery rate of this product is designed to be no less than 80%, and the resource recycling and regeneration rate is no less than 70%. At the end of PLC (product life cycle), please do not mix with other wastes, you could consult the local retailer or local government sector for recycling methods and place, and also could contact our customer service for recovery processing.

Table of Hazardous Substances' Name & Content

Part Name	Hazardous Substances					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Chassis	×	○	○	○	○	○
Motherboard	×	○	○	○	○	○
Memory	○	○	○	○	○	○
Hard Drive	○	○	○	○	○	○
Power Supply	×	○	○	○	○	○
Power Cable	○	○	○	○	○	○
USB Flash Disk	×	○	○	○	○	○
Optical Drive	×	○	○	○	○	○
External NIC	×	○	○	○	○	○
External Memory Card	○	○	○	○	○	○
Connection Board	×	○	○	○	○	○
Data Cable	×	○	○	○	○	○
Keyboard	×	○	○	○	○	○
Mouse	×	○	○	○	○	○
CPU	×	○	○	○	○	○
Processor Heatsink	×	○	○	○	○	○
Rail	○	○	○	○	○	○
Printed Matter	○	○	○	○	○	○
CD	○	○	○	○	○	○
Packing Box	○	○	○	○	○	○
Packing Pad	○	○	○	○	○	○
Packing Plastic Bag	○	○	○	○	○	○

Instructions:

1. This table is compiled based on the provisions of SJ/T 11364.
2. ○: Indicates that the content of the hazardous substance in all homogenous materials of this part is below the limitation requirement as described in GB/T 26572.
3. ×: Indicates that the content of the hazardous substance in at least one homogenous material of this part is above the limitation requirement as described in GB/T 26572.
4. All the above parts are possible configuration parts in product, for actual product configuration please refer to the configuration label.

Global Limited Warranty and Technical Support

Hardware limited warranty

1. General terms

This Inspur Hardware Limited Warranty gives you, the customer, express limited warranty rights from Inspur, the manufacturer. In addition, you may also have other legal rights under applicable local low or special written agreement with Inspur.

Inspur makes no other express warranty or condition whether written or oral and Inspur expressly disclaims all warranties and conditions not stated in this limited warranty. To the extent allowed by the local low of jurisdictions outside the People's Republic of China, Inspur disclaims all implied warranties or conditions, including any implied warranties or conditions of merchantability, merchantable quality and fitness for a particular purpose. For all transactions occurring in the People's Republic of China, any implied warranty or condition of merchantability, satisfactory quality, or fitness for a particular purpose is limited to the duration of the express warranty set forth above. Some states or countries do not allow a limitation on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages for consumer products. In such states or countries, some exclusion or limitation of this limited warranty may not apply to you.

The Limited Warranty terms contained in this statement, except to the extent lawfully permitted, do not exclude, restrict or modify but are in addition to the mandatory statutory rights applicable to the sale of this product to you.

This Limited Warranty is applicable in all countries and may be enforced in any country or region where Inspur or its authorized service providers offer warranty service for the same product model number subject to the terms and conditions set forth in this Limited Warranty.

Under the Inspur Global Limited Warranty program, products purchased in one country/region may be transferred to another country/region, where Inspur or its

authorized service providers offer warranty service for the same product model number, without voiding the warranty. Warranty terms, service availability, and service response time may vary from country/region to country/region. Standard warranty service response time is subject to change due to local parts availability. Your Inspur authorized service provider can provide you with details.

Inspur is not responsible for any tariffs or duties that may be incurred in transferring the products. Transfer of the products may be covered by export controls issued by the Peoples' Republic of China or other governments.

This Limited Warranty applies only to Inspur-branded hardware products (collectively referred to in this Limited Warranty as "Inspur Hardware Products") sold by or leased from Inspur, authorized resellers, or country distributors (collectively referred to in this Limited Warranty as "Inspur"). The term "Inspur Hardware Product" is limited to the hardware components and required firmware. The term "Inspur Hardware Product" does not include any software applications or programs, non-Inspur products, or non-Inspur branded peripherals. All non -Inspur products or non-Inspur branded peripherals eternal to the Inspur Hardware Product- such as external storage subsystem, displays, printers and other peripherals – are provides "AS IS" without Inspur warranty. However, non-Inspur manufacturers and suppliers or publishers may provide their own warranties directly to you.

Inspur warrants that the Inspur Hardware Products that you have purchased or leased from Inspur are free from detects in material or workmanship under normal use during the Limited Warranty Period. The Limited Warranty Period starts on the date of purchase or lease from Inspur. Your dated sales or delivery receipt, showing the date of purchase or lease of the product, is your proof of the purchase or lease date. You may be required to provide proof of purchase or lease as a condition of receiving warranty service. You are entitled to hardware warranty service according to the terms and conditions of this document if a repair to your Inspur Hardware Product is required within the Limited Warranty Period.

Unless otherwise stated, and to the extent permitted by local law, new Inspur

Hardware Products may be manufactured using new materials or new and used materials equivalent to new in performance and reliability. Inspur may repair or replace Inspur Hardware Products with the following products:

(a) New or previously used products or parts equivalent to new in performance and reliability;

(b) Equivalent products to an original product that has been discontinued.

Replacement parts are warranted to be the free from detects in material or workmanship for ninety (90) days or, for the remainder of the Limited Warranty Period of the Inspur Hardware Product they are replacing or in which they are installed, whichever is longer.

During the Limited Warranty Period, Inspur will, at its discretion, repair or replace any defective component. All component parts or hardware products removed under this Limited Warranty become the property of Inspur. In the unlikely event that your Inspur Hardware Product has recurring failures, Inspur, at its sole discretion, may elect to provide you with a replacement unit of Inspur's choosing that is the same or equivalent to your Inspur Hardware Product in performance. This is your exclusive remedy for defective products.

2. Exclusions

Inspur does not warrant that the operation of this product will be uninterrupted or error-free. Inspur is not responsible for damage that occurs as a result of your failure to follow this instructions intended for the Inspur Hardware Product.

This Limited Warranty does not apply to expendable or consumable parts and does not extend to any product from which the serial number has been removed or that has been damaged or rendered defective:

(1) As a result of accident, misuse, abuse, contamination, improper or inadequate maintenance or calibration or other external causes;

(2) By operation outside the usage parameters stated in the user documentation that shipped with the product;

(3) By software, interfacing, parts or supplies not supplied by Inspur;

(4) Improper side preparation or maintenance;

(5) Virus infection;

(6) Loss or damage in transit;

(7) By modification or service by anyone other than Inspur, Inspur authorized provider, or your own installation of Inspur-approved parts if available for your product in the servicing country or region.

Inspur is not responsible for damage to or loss of any programs, data, or removable storage media. Inspur is not responsible for the restoration or reinstallation of any programs or data other than software installed by Inspur when the product is manufactured.

Inspur is not responsible for any interoperability or compatibility issues that may arise when (1) products, software, or options not supported by Inspur are used; (2) configurations not supported by Inspur are used; (3) parts intended for one system are installed in another system of different make or model.

3. Exclusive remedy

To the extent allowed by applicable local law, these terms and conditions constitute the complete and exclusive warranty agreement between you and Inspur regarding the Inspur hardware product you have purchased or leased. These terms and conditions supersede any prior agreements or representations – including representations made in Inspur sales literature or advice given to you by Inspur or an agent or employee of Inspur – that may have been made in connection with your purchase or lease of the Inspur hardware product. No change to the conditions of this Limited Warranty is valid unless it is made in writing and signed by an authorized representative of Inspur.

4. Limitation of liability

Except as indicated above, in no event will Inspur be liable for any damages caused by the product or the failure of the product to perform, including any lost profits or savings, business interruption, lass of data, lost revenue, loss of use, or any other commercial or economic loss of any kind, or special, incidental, or consequential

damages. Inspur is not liable for any claim made by a third party of made by you for a third party.

This limitation of liability applies whether damages are sought, or a claim made, under this limited warranty or as a tort claim (including negligence and strict product liability), a contract claim, or any other claim. This limitation of liability cannot be waived or amended by any person. This limitation of liability will be effective even if you have advised Inspur or an authorized representative of Inspur of the possibility of any such damages or even if such possibility were reasonably foreseeable. This limitation of liability, however, will not apply to claims for personal injury.

This Limited Warranty gives you specific legal rights. You may also have other rights that may vary from state to state or from country to country. You are advised to consult applicable state or country laws for a full determination of your rights.

5. Customer responsibilities

To enable Inspur to provide the best possible support and service during the Limited Warranty Period, you will be required to:

(1) Maintain a proper and adequate environment, and use the Inspur Hardware Product in accordance with the instructions furnished.

(2) Verify configurations, load most recent firmware, install software patches, run Inspur diagnostic and utilities, and implement temporary procedures or workarounds provided by Inspur while Inspur works on permanent solutions.

(3) Allow Inspur to keep resident on your systems or sites certain system and network diagnosis and maintenance tools to facilitate the performance of warranty support (collectively referred to as “Proprietary Service Tools); Proprietary Service Tools are and remain the sole and exclusive property of Inspur. Additionally, you will:

- Use the Proprietary Service Tools only during the applicable warranty period and only as allowed by Inspur
- Install, maintain, and support Proprietary Service Tools, including any required updates and patches
- Provide remote connectivity through an Inspur-approved communications line, if

required

- Assist Inspur in running the Proprietary Service Tools
- Use the electronic data transfer capability to inform Inspur of events identified by the software
- Purchase Inspur-specified remote connection hardware for systems with remote diagnosis service, if required
- Return the Proprietary Service Tools or allow Inspur to remove these Proprietary Service Tools upon termination of warranty support
- Not sell, transfer, assign, pledge, or in any way encumber or convey the Proprietary Service Tools

(4) In some cases, Inspur may require additional software such as drivers and agents to be loaded on your system in order to take advantage of these support solutions and capabilities.

(5) Use Inspur remote support solutions where applicable. Inspur strongly encourages you to use available support technologies provided by Inspur. If you choose not to deploy available remote support capabilities, you may incur additional costs due to increased support resource requirements.

(6) Cooperate with Inspur attempting to resolve the problem over the telephone. This may involve performing routine diagnostic procedures, installing additional software updates or patches, removing third-party options, and/or substituting options.

(7) Make periodic backup copies of your files, data, or programs stored on your hard drive or other storage devices as a precaution against possible failures, alteration, or loss. Before returning any Inspur Hardware Product for warranty support, back up your files, data, and programs, and remove any confidential, proprietary, or personal information.

(8) Maintain a procedure to reconstruct your lost or altered files, data, or programs that is not dependent on the Inspur Hardware Product under warranty support.

(9) Notify Inspur if you use Inspur Hardware Products in an environment that poses a potential health or safety hazard to Inspur employees or subcontractors. Inspur may require you to maintain such products under Inspur supervision and may postpone warranty service until you remedy such hazards.

(10) Perform additional tasks as defined within each type of warranty service listed below and any other actions that Inspur may reasonably request in order to best

perform the warranty support.

How to obtain warranty service

If there are any issues that are difficult to solve or can not be settled by yourself during routine maintenance or troubleshooting, please ask for technical support from Inspur.

1. Preparations before contacting Inspur

For better solutions, it is suggested to make the following preparations before asking for technical support from Inspur.

1.1 Collect necessary fault information

- Client name and address
- Contact name and phone number
- Host serial number of the failure equipment
- Occurrence time of the fault
- Detailed description of the fault
- Device type and software version
- Measures taken after the fault and results
- Problem level and expected solution time

1.2 Necessary debugging preparations

When turning to Inspur for technical support, Inspur technical support engineers may help you carry out some operations, to further collect fault information or make troubleshooting directly, so please collect necessary fault information before turning to technical support, and prepare tools such as screwdriver, screws, serial cable and Ethernet cable, etc. which may be useful.

2. How to contact Inspur

2.1 Global English call center

Inspur servers' global after-sale service hotline: 8448600011

North America customers can directly dial this number.

Customers in other regions need to dial 1 before this number, that is, 18448600011.

2.2 Service email

Email: serversupport@inspur.com

In order to handle customer problems in a more efficient way, please send an email to us according to the following mail format.

Company Name	XX city, XX province
Contact Information	Name Mobile/Phone (Ext.)
Machine Serial No.	21xxxxxxx or 8000xxxxx
Problem or Fault Description	Description content
Attachments	Fault pictures or log files.

2.3 Web service

Inspur official website: http://en.inspur.com

Types of warranty service

Listed below are the types of warranty services that may be applicable to the Inspur Hardware Product you have purchased. For more details, refer to the “Limited warranty period” section.

Customer Replacement Unit (CRU) service

Inspur products are designed with many Customer Replacement Unit (CRU) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during this diagnosis period, Inspur identifies that the repair can be accomplished by the use of a CRU part, Inspur will ship that part directly to you for replacement. There are two categories of CRU parts:

(1) Parts for which customer self repair is mandatory. If you request Inspur to replace these parts, you will be charged for the travel and labor costs of this service.
(2) Parts for which customer self repair is optional.

If assistance is required, you can contact Inspur through the methods mentioned above, a technician will help you over the telephone. Inspur specifies in the materials shipped with a replacement part whether a defective part must be returned to Inspur. In cases where it is required to return the defective part to Inspur, you must ship the defective part back to Inspur with a defined period of time, normally fifteen (15) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in Inspur billing you for the replacement.

CRU and on-site service

Your Inspur Limited Warranty may include an on-site warranty service. Under the terms of on-site service, if Inspur ultimately determines that an on-site service call is required to repair a defect, the call will be scheduled during standard office hours unless otherwise stated for the Inspur Hardware Product you purchased. Standard office hours are typically 08:00 to 17:00, Monday through Friday, but may vary with local business practices.

In order to receive on-site support, you must:

(1) Have a representative present when Inspur provides warranty services at your site.
(2) Notify Inspur if products are being used in an environment which poses a potential health or safety hazard to Inspur employees or subcontractors.
(3) Subject to its reasonable security requirements, provide Inspur with sufficient, free, and safe access to and use of all facilities, information, and systems determined necessary by Inspur to provide timely support.
(4) Ensure that all manufacturers labels (such as serial numbers) are in place, accessible, and legible.
(5) Maintain an environment consistent with product specifications and supported configuration.

CRU and customer carry-in or mail-in service

At Inspur's discretion you will receive CRU service or you will deliver or mail as

Inspur specifies (prepaid unless Inspur specifies otherwise) the failing machine suitably packaged to a location Inspur designates. After Inspur has repaired or exchanged the machine, Inspur will make it available for your collection or, for Mail-in Service, Inspur will return it you at Inspur's expense, unless Inspur specifies otherwise. You are responsible for its installation and verification of operation.

Limited warranty period

The Limited Warranty Period for an Inspur Hardware Product is a specified, fixed period commencing on the date of purchase. The date on your sales receipt is the date of purchase unless Inspur or your reseller informs you otherwise in writing. If the time interval between the date of purchase and the date of manufacture is more than 3 months, the warranty period begins on the date of 3 months after the date of manufacture.

Inspur provides 3-year limited warranty of main parts and on-site labor.
Note: Mouses, keyboards, optical drives, fans, and cables are 1 year parts; chassis and its accessories (chassis lock, key, panel, etc.), delivery attached documentation and CDs, floppy disks, power cables and packing materials are not under warranty.

Contacting Inspur

If your product fails during the Limited Warranty Period and the suggestions in the product documentation do not solve the problem, you can receive support by doing the following:
Visit Inspur Website at http://en.inspur.com

Inspur servers' global after-sale service hotline: 8448600011
North America customers can directly dial this number.
Customers in other regions need to dial 1 before this number, that is, 18448600011.

Be sure to have the following information available before you call Inspur support provider:

- Product serial number, model name, and model number
- Applicable error messages
- Add-on options
- Operating system
- Third-party hardware or software
- Detailed questions