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Basic Knowledge on Servers

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Objectives

- Upon completion of this course, you will be proficient in:
 - Basic concept of server
 - Key server components
 - Technologies for interworking between servers and storage devices
 - Technologies for interworking between servers and networks



Contents

1. Basic Concept of Server
2. Key Server Components
3. Technologies for Interworking Between Servers and Storage Devices
4. Technologies for Interworking Between Servers and Networks



1. Basic Concept of Server

1.1 What Is a Server?

1.2 Server Overview

1.3 Physical Structure of a Server

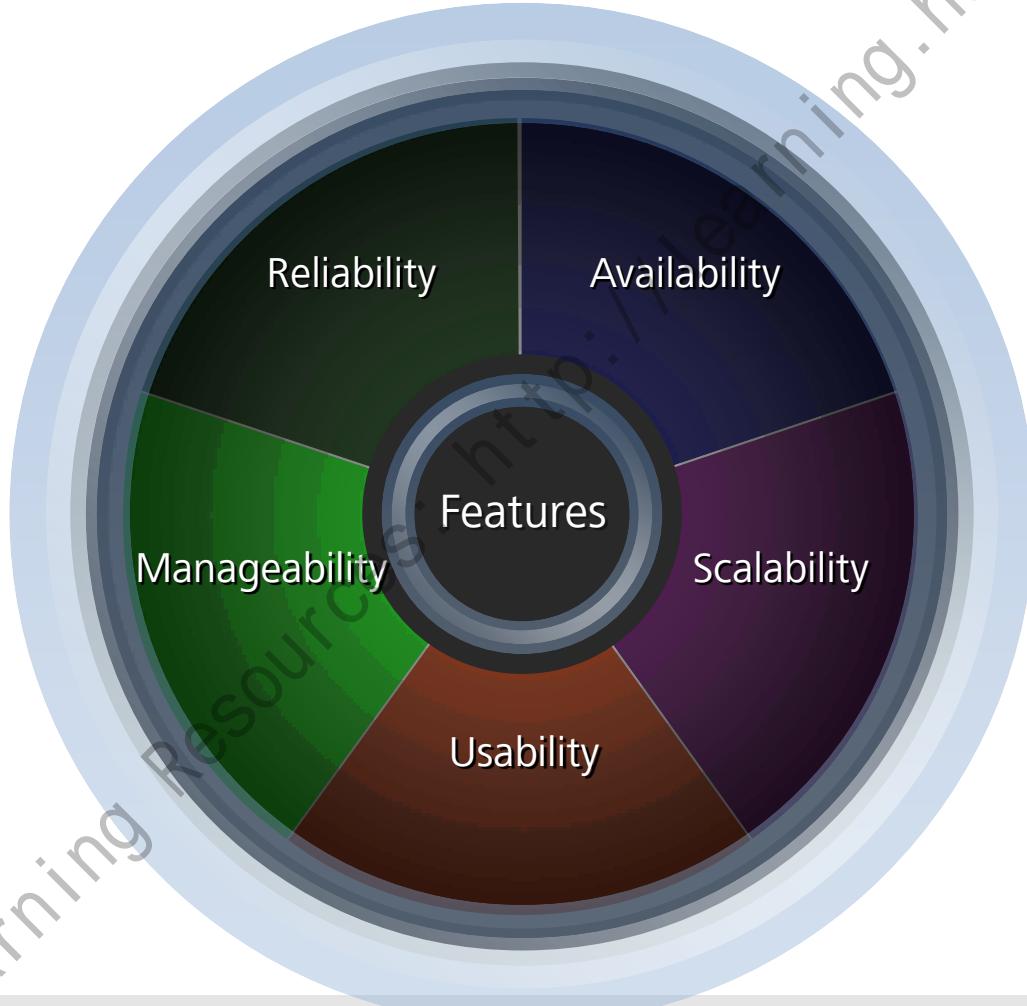
1.4 Software Framework of a Server System

What Is a Server?

- A server refers to a high-performance computer that provides various services on the network.

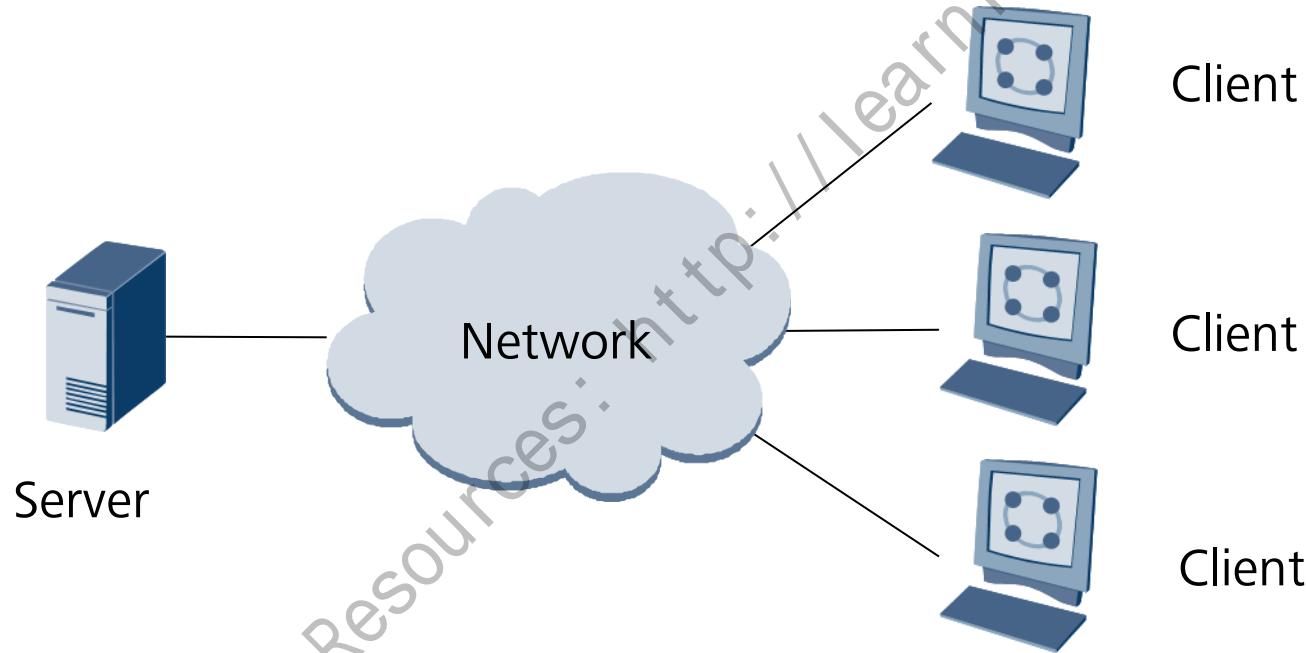


Server Features



Server Application Model

- Client/Server (C/S) structure





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Server Classification Based on Hardware Forms

Tower server



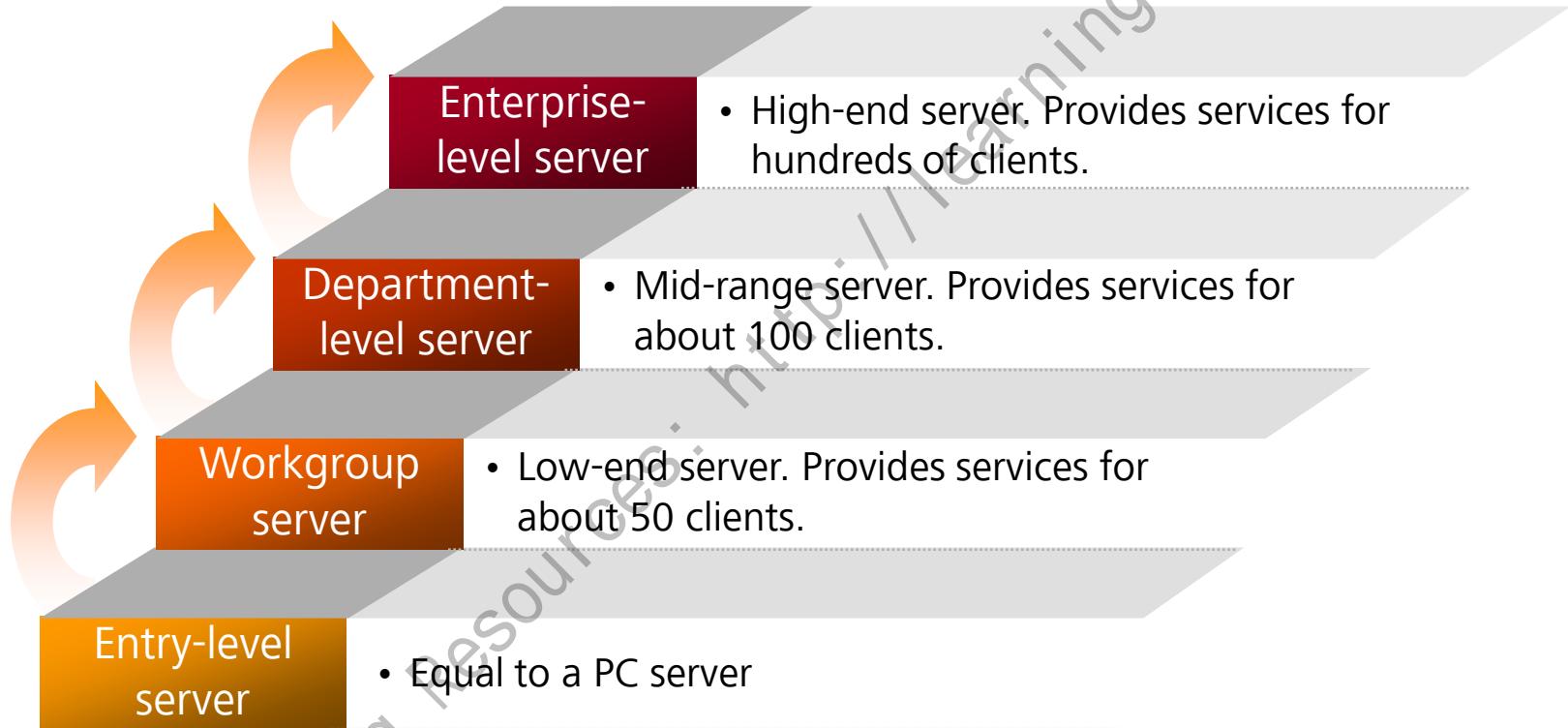
Rack server



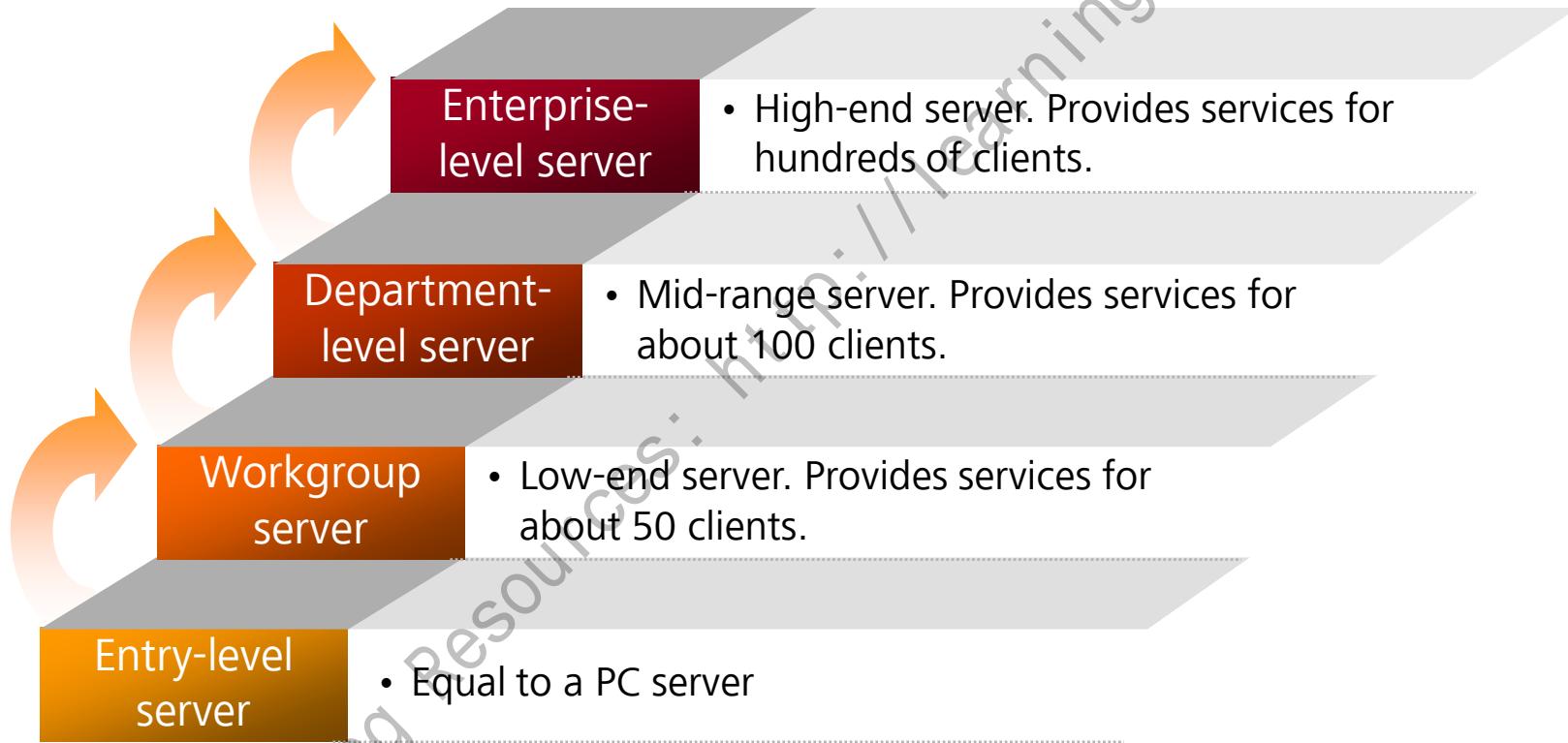
Blade server



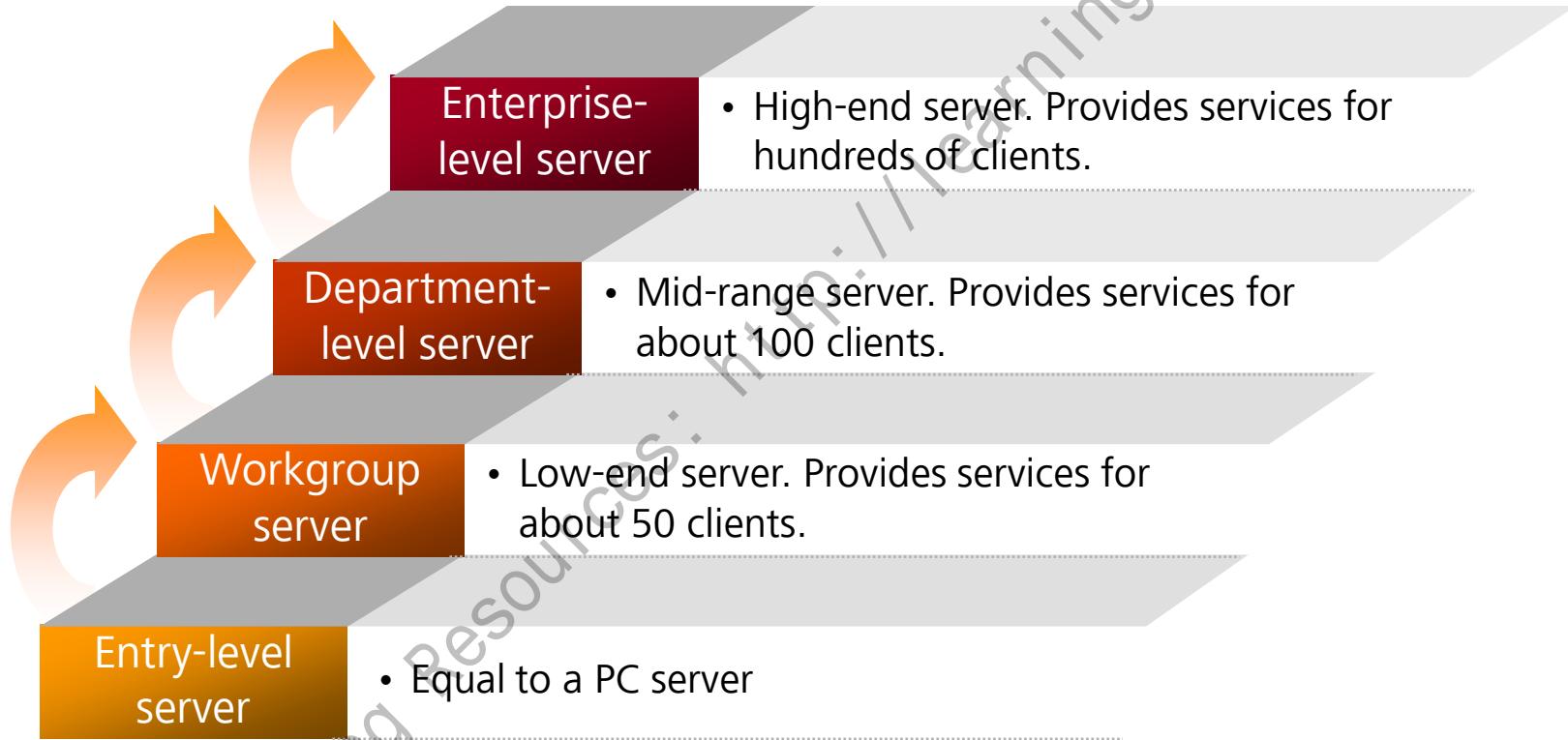
Server Classification Based on the Service Scale



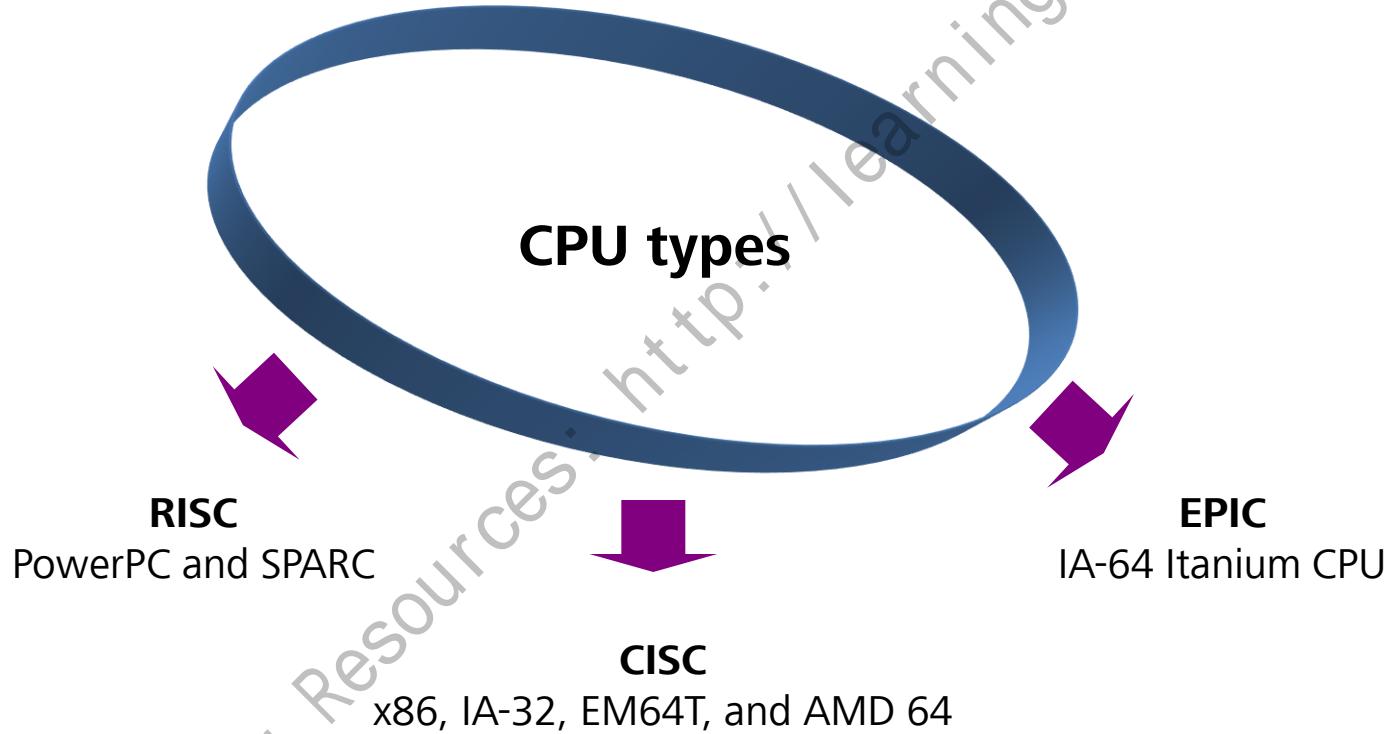
Server Classification Based on the Service Scale



Server Classification Based on the Service Scale



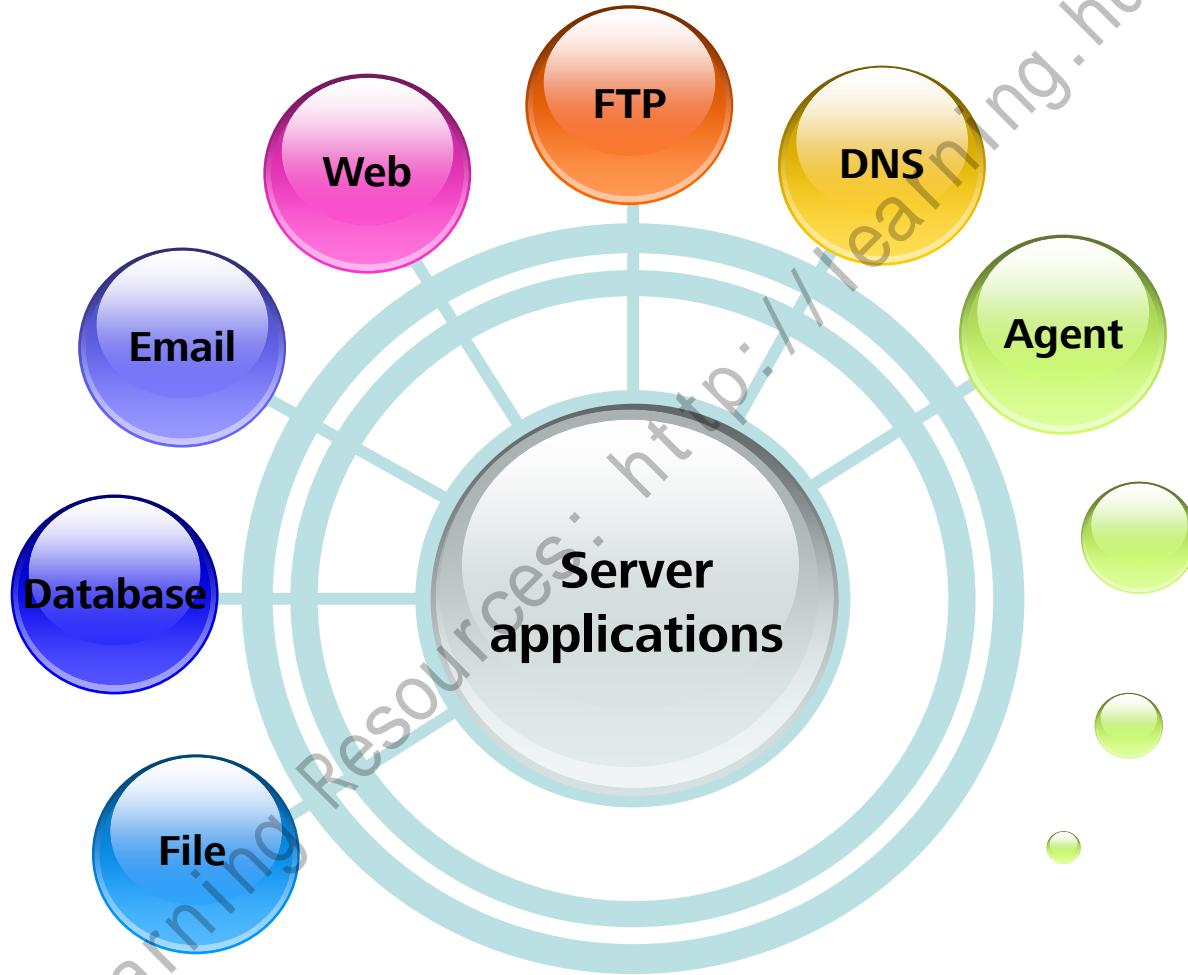
Server Classification Based on CPU



Differences Between Server and PC

Item	Server	PC
Computing capability	High (multiple CPUs)	Low (a single CPU)
Storage capability	Large capacity and scalability	Small capacity and difficult to expand
Number of users	Multiple	1
How to use	Network access	Keyboard, video, and mouse (KVM)
Operation duration	24/7 hours	Several hours
Collaborative work	Cluster	A machine
Component redundancy	Power supply unit (PSU) and fan	No redundancy
System monitoring	Intelligent Platform Management Interface (IPMI)	No monitoring

Server Applications





1. Basic Concept of Server

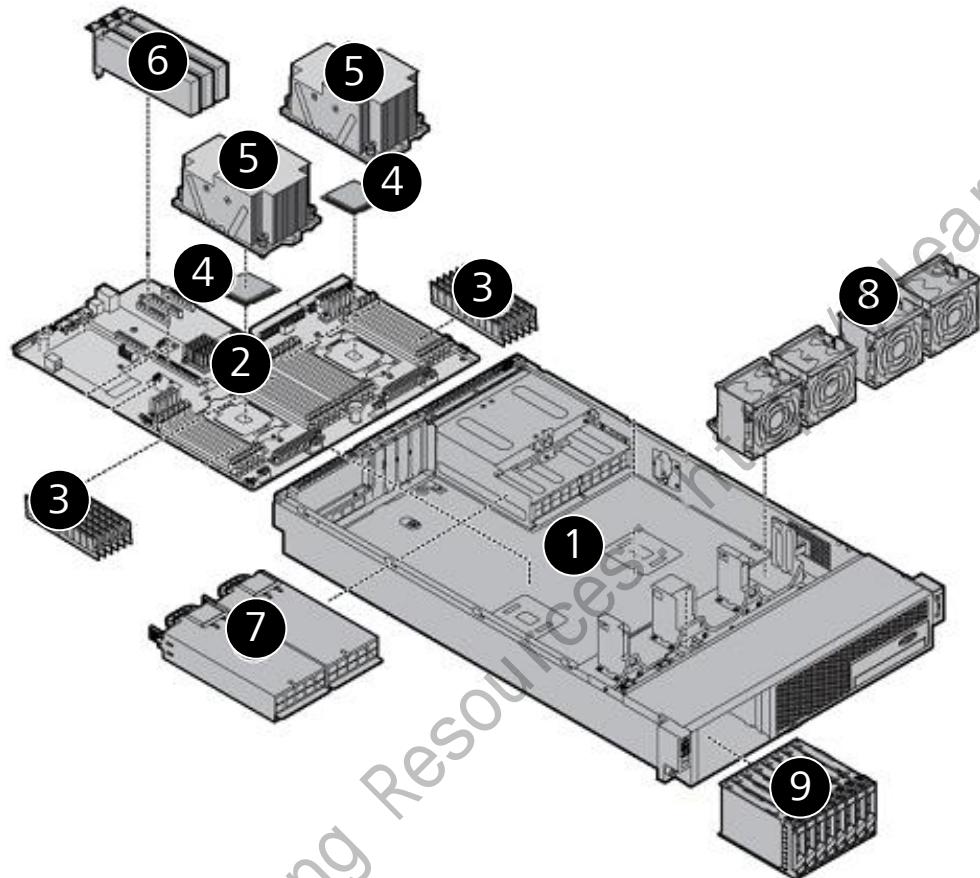
1.1 What Is a Server?

1.2 Server Overview

1.3 Physical Structure of a Server

1.4 Software Framework of a Server System

Server Hardware



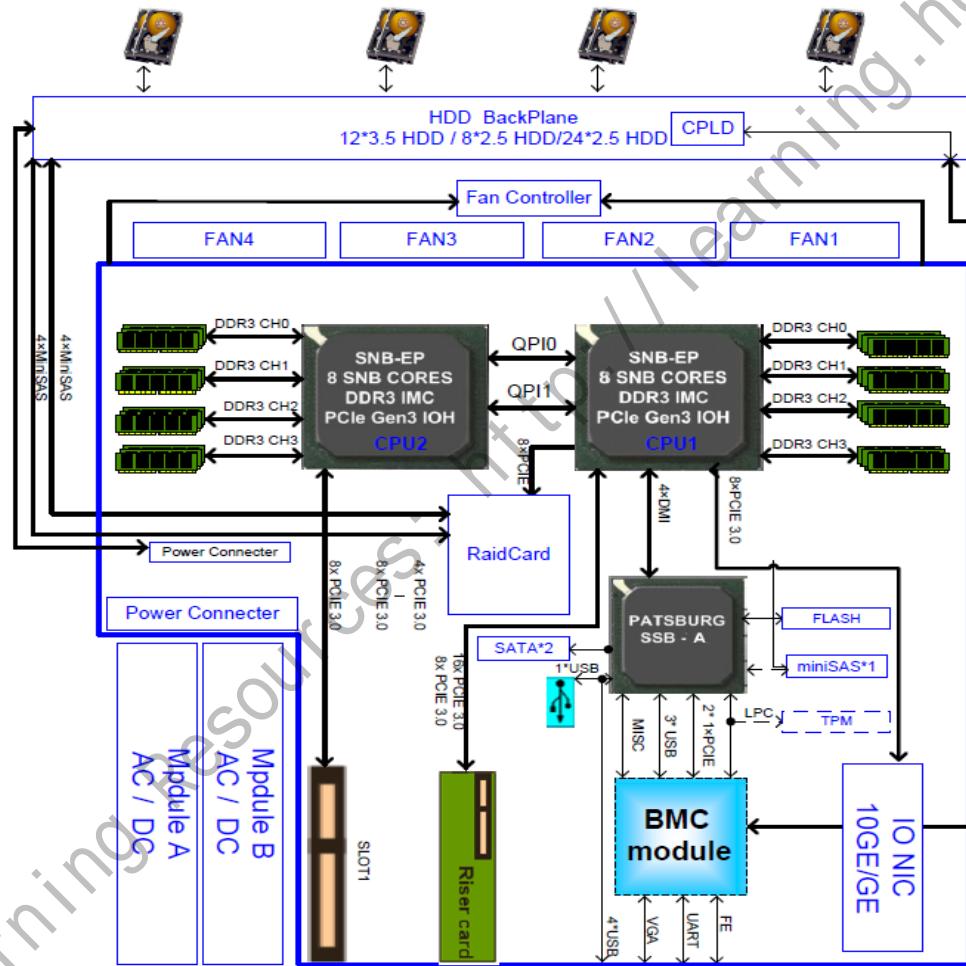
Huawei RH2288 server hardware

- 1 Chassis
- 2 Mainboard
- 3 DIMM
- 4 CPU
- 5 CPU heat sink
- 6 PCIe card
- 7 PSU
- 8 Fan
- 9 Hard disk

Core Server Components



Logical Architecture of a Server





1. Basic Concept of Server

1.1 What Is a Server?

1.2 Server Overview

1.3 Physical Structure of a Server

1.4 Software Framework of a Server System

BMC

- The baseboard management controller (BMC) is an intelligent management controller in the IPMI architecture.
- The BMC provides the following functions:
 - Provides access through the system serial port.
 - Records fault logs and sends SNMP alarms.
 - Accesses system event logs (SELs) and sensor conditions.
 - Controls the power-on and power-off.
 - Is independent of the system PSU or work status.

Virtual KVM

- Servers are operated and controlled by remotely connecting to the port, just like using the keyboard, video, and mouse (KVM) to connect to the server.

The screenshot shows a server management interface with a sidebar and a main content area. The sidebar contains the following menu items:

- Overview
- System Information
- Remote Control** (highlighted)
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Download Data
- Configuration

The main content area has a title bar "Remote Control" and a sub-section "Remote Control". It displays two tables of properties:

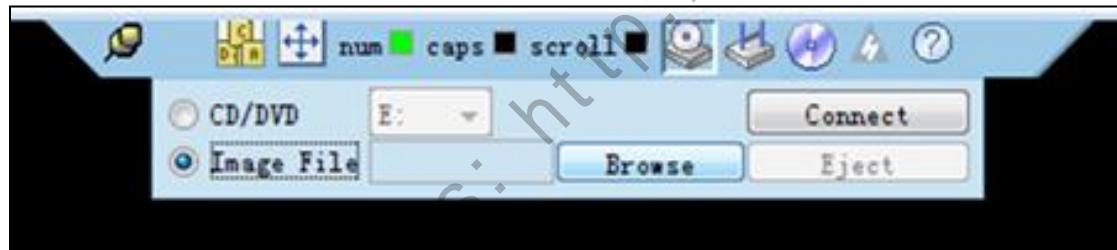
KVM Properties	
Maximum Sessions	2
Active Sessions	0

Virtual Media Properties	
Maximum Sessions	1
Active Sessions	0

At the bottom of the content area is a link: [Remote Virtual Console \(requiring JRE\)](#).

Virtual Media

- The virtual media virtualize a physical DVD-ROM drive of a client or the ISO file into a built-in server drive.





2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

2.5 PCIe Interfaces and Applications

2.6 Functions and Development of BIOS

2.7 Functions and Development of BMC and Chassis Management

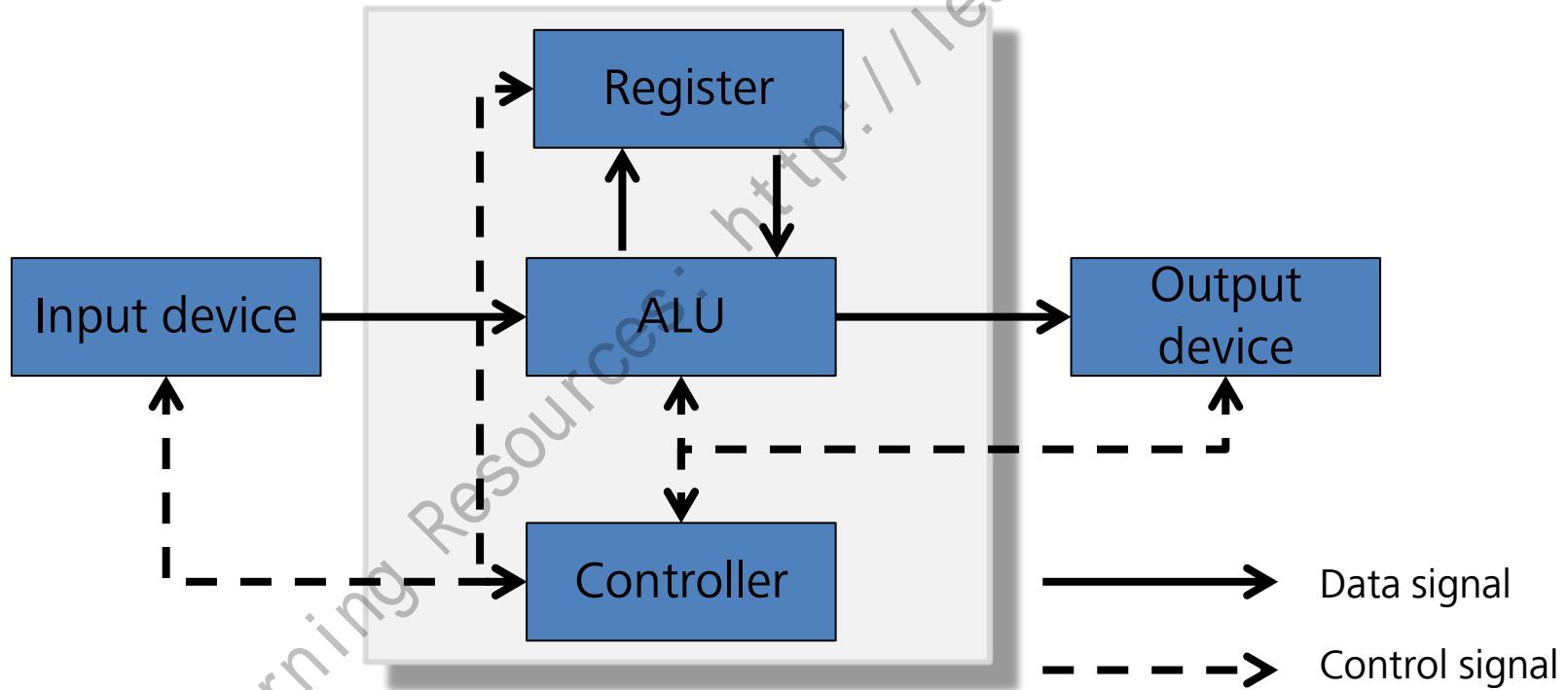
CPU

- The CPU is the computing and control cores of a computer.
- The CPU, internal storage, and input/output device are core components of a computer.
- The CPU is used to interpret computer instructions and process computer software data.



CPU Composition

- The CPU consists of the arithmetic logical unit (ALU), controller, register, and bus.



CPU Frequency

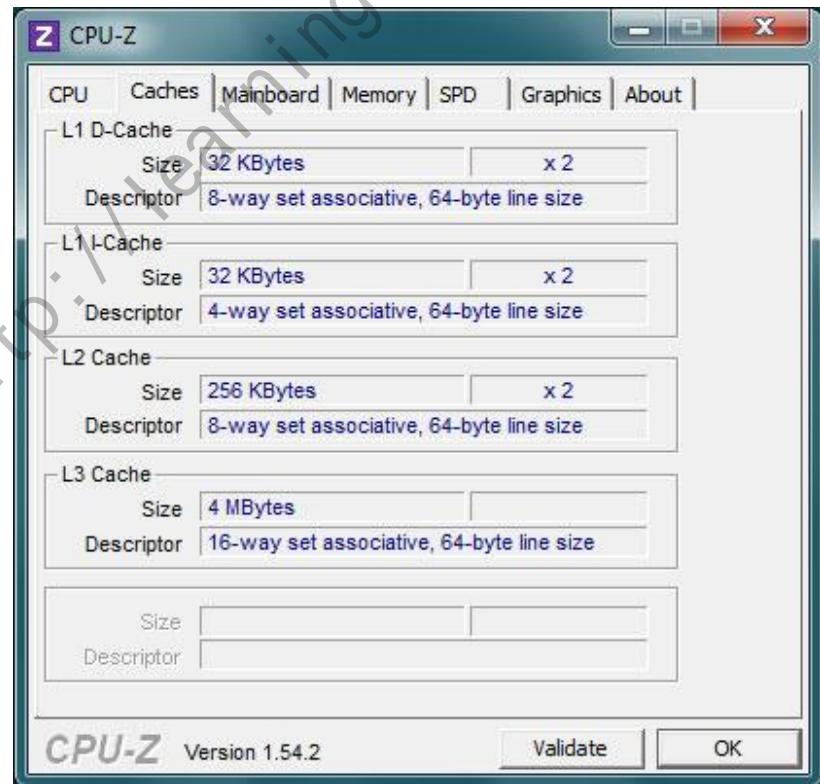
- CPU dominant frequency
 - The dominant frequency also refers to clock speed. It uses unit MHz or GHz to indicate the frequency at which a CPU computes and processes data.
- CPU external frequency
 - The external frequency is the reference frequency of the CPU, measured in MHz. The CPU external frequency determines the running speed of the main board.
- Bus frequency
 - The bus frequency directly affects the speed of data exchange between a CPU and a DIMM.
- The multiplication factor is the proportion between the dominant frequency and external frequency.

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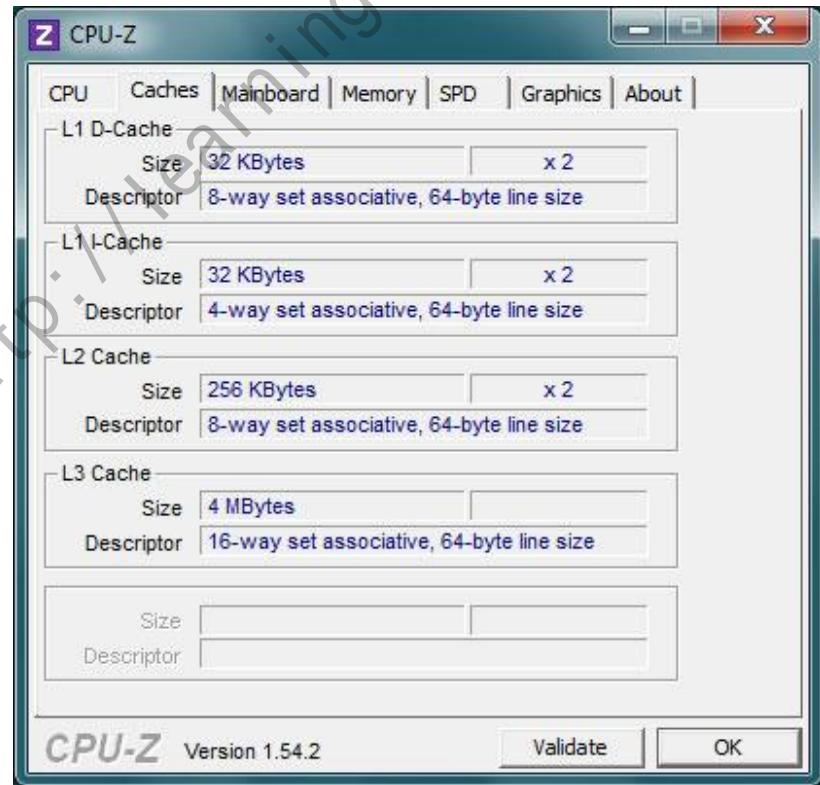
CPU Cache

- L1 cache
 - The L1 cache includes data cache and instruction cache.
- L2 cache
 - There are internal and external L2 caches.
- L3 cache
 - The external L3 cache is replaced with the built-in L3 cache.



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CPU Instruction Set

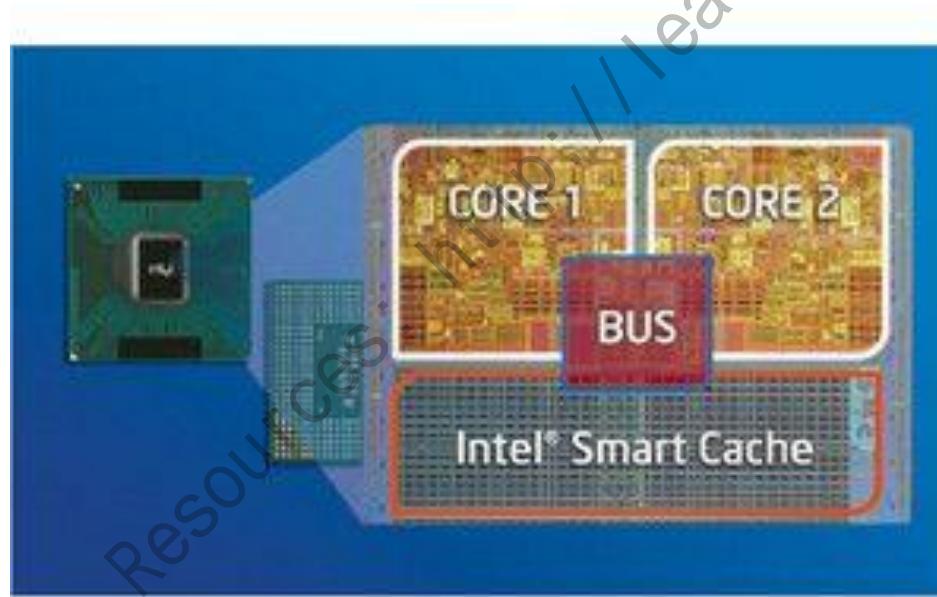
- Complex Instruction Set Computing (CISC)
 - The x86 architecture CPU uses this instruction set.
- Reduced Instruction Set Computing (RISC)
 - RISC is developed based on the CISC instruction system.
- Explicitly parallel instruction computing (EPIC)
 - The Intel Itanium CPU uses the EPIC technology.

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Multi-Core CPU

- A multi-core CPU is a CPU with two or more independent computing engines (kernels).





2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

2.5 PCIe Interfaces and Applications

2.6 Functions and Development of BIOS

2.7 Functions and Development of BMC and Chassis Management

DIMM

- The memory is also known as the internal storage. It is used to store CPU computing data and exchange data between the memory and the external storage (such as hard disks).
- The DIMM, one of important computer components, communicates with the CPU.
- Memory performance has great impacts on computers because all computer program operating is implemented in the DIMM.
- The DIMM consists of the memory chip, circuit card, and edge connector.



Introduction to the Mainstream DIMM Vendors

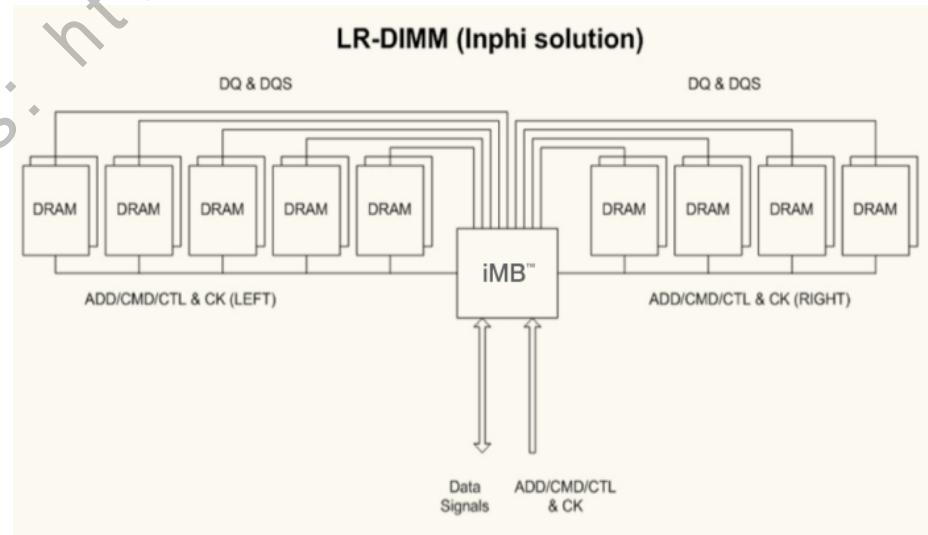
Vendor	Country	Factory Location	Feature
Samsung	South Korea	Xi'an	High quality and high price
SK Hynix	South Korea	Wuxi	Good quality and reasonable price
Micron	The United States	Chengdu	Support for customization of DIMMs with a depth 1.5 times of the depth of common DIMMs
Ramaxel	China mainland	Shenzhen and Dongguan	A module's supplier that provides a competitive price
Kingston	Taiwan	Taiwan	A module's supplier

Three major dynamic random access memory (DRAM) vendors: Samsung, SK Hynix, and Micron
Module's suppliers: Kingston and Ramaxel purchase DRAM particles to manufacture DIMMs.

DIMM Types

Type	Full Name	Feature	Application Scenario
UDIMM	Unbuffered DIMM	There is no buffer chip.	Low-end CPU platform
RDIMM	Registered DIMM	The address control signal is sent to the Register chip through the DRAM chip.	Mainstream scenarios
LRDIMM	Load-reduced DIMM	Both data and address control signals pass through the Register chip.	Large-capacity scenarios

* If the CPU platform uses the 4 GB, 8 GB, or 16 GB memory, persuade customers to use RDIMM; if the CPU platform uses the 32 GB or 64 GB memory, persuade customers to use LRDIMM. This can improve the system memory capacity.



DIMM Type:UDIMM

- Unbuffered dual in-line memory module (UDIMM): The address and control signals of the controller are directly sent to the DIMM.
 - Servers often use UDIMMs with a temperature sensor and the error checking and correcting (ECC) function.
 - Servers that use UDIMM: X6000JDM (XH310 v2 and XH311 v2)

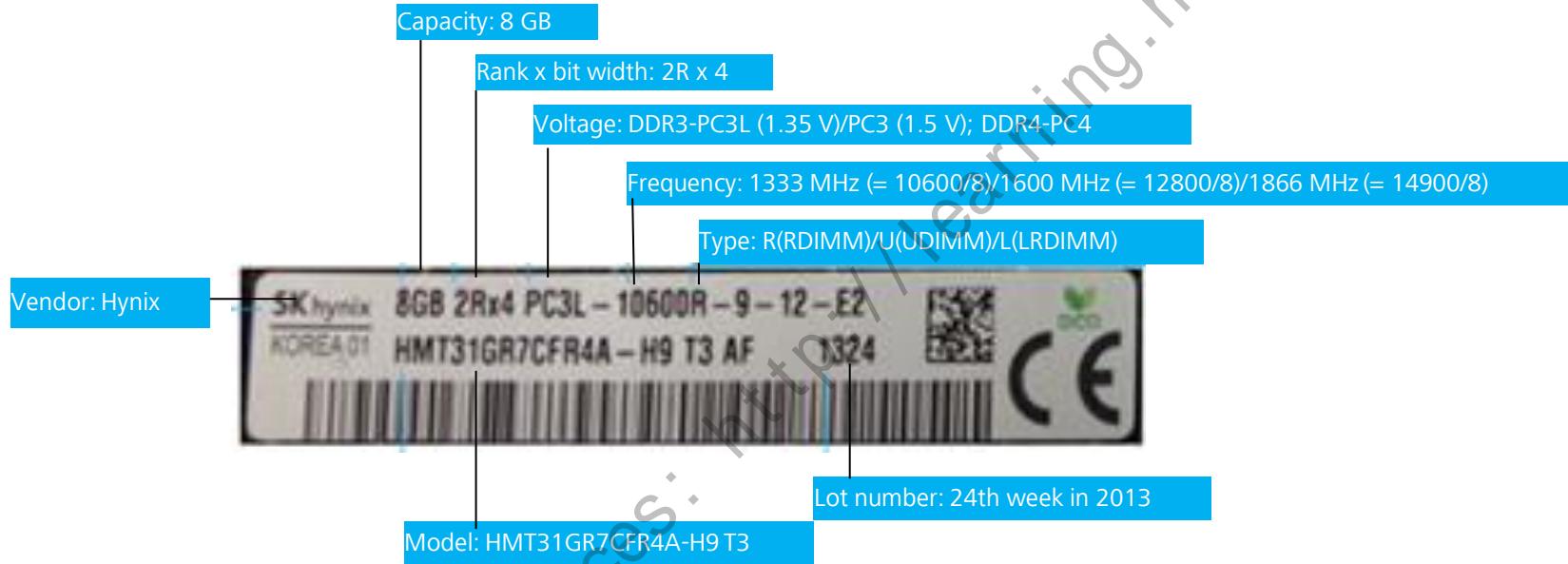
DIMM Type: RDIMM

- Registered dual in-line memory module (RDIMM): The address and control signals of the controller are sent to the DRAM chip through the Register. The clock signals of the controller are sent to the DRAM chip through the PLL.
- The RDIMM has the following features:
 - Memory capacity: 4 GB, 8 GB, 16 GB, and 32 GB
 - When four-rank RDIMMs are used, only 1/2 DPC configuration is supported. 3 DPC configuration (each channel of the Intel CPU supports a maximum of eight Ranks) is not supported.

DIMM Type: LRDIMM

- LRDIMM: LRDIMM is an abbreviation for load-reduced DIMM.
- The LRDIMM has the following features:
 - Memory capacity: 32 GB and 64 GB
 - LRDIMM supports more than eight Ranks for a channel. This feature can improve the system memory capacity.

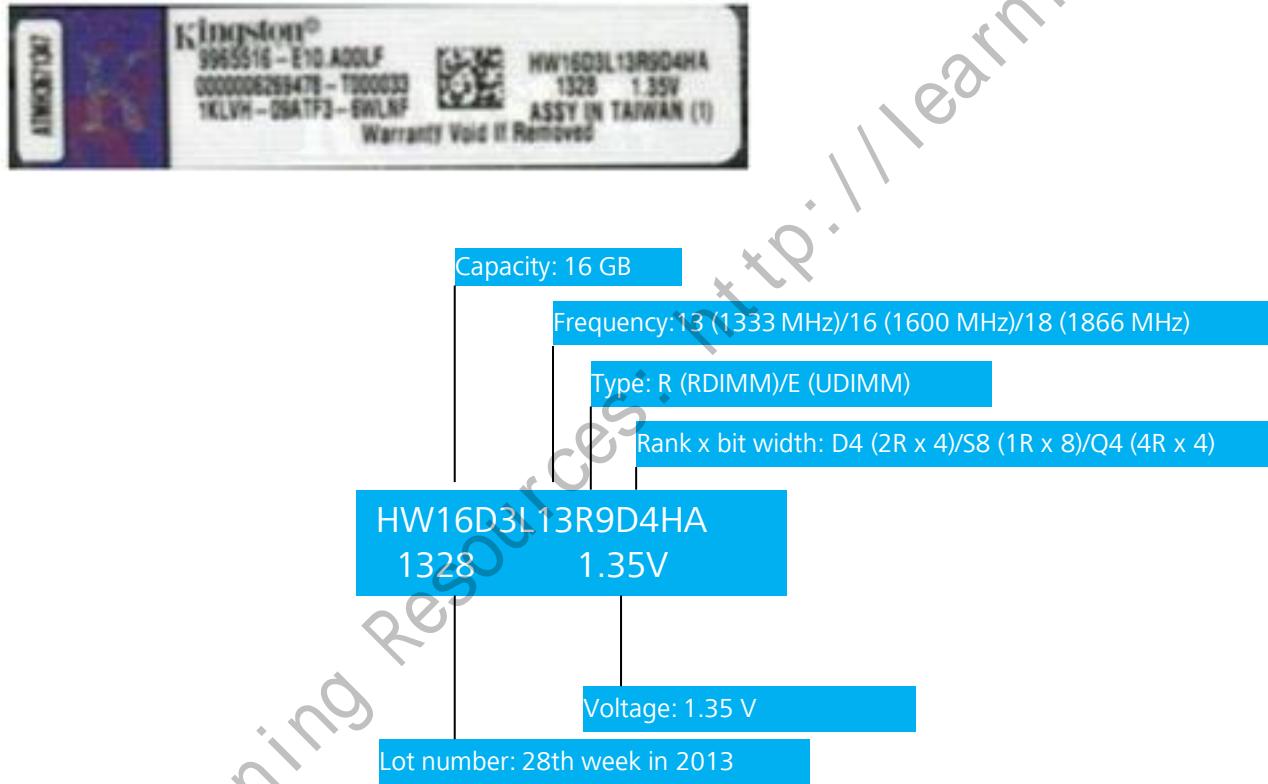
DIMM Card Specifications Identification Method



- * The identification method applies to DIMM cards manufactured by Samsung, SK Hynix, Micron, and Ramaxel.
- * A larger number of memory chips indicates better performance (in theory, x4 has better performance than x8).
- * A larger number of ranks indicates better performance.

DIMM Card Specifications Identification Method

- Method of identifying a Kingston DIMM card:



DIMM Capacity Calculation

- DIMM capacity (unit: byte) = Memory chip capacity x Number of memory chips/8:
 - Memory chip capacity (unit: bit) = Addressing space x Bit width of memory chips
 - Number of memory chips = Number of ranks x (64/Bit width of memory chips)
- Example:

If the DIMM specification is: 8 GB with 2 ranks x 8 PC3L-12800R

Then: DIMM capacity 8 GB = $(4 \text{ GB} \times 16)/8$

Memory chip capacity = 4 GB

Number of memory chips = $2 \times 64/8 = 16$
- Question:

Is there a DIMM card with 16 GB 2 ranks x 8?

DIMM Configuration Rules

- Insert DIMMs from the channel that is the farthest away from the CPU to achieve optimal performance.

CPU ^o	DIMM Installation Sequence ^o
CPU1 ^o	1A1, 1B1, 1C1, 1D1, 1A2, 1B2, 1C2, 1D2, 1A3, 1B3, 1C3, 1D3 ^o
CPU1 and CPU2 ^o	1A1, 2A1, 1B1, 2B1, 1C1, 2C1, 1D1, 2D1, 1A2, 2A2, 1B2, 2B2, 1C2, 2C2, 1D2, 2D2, 1A3, 2A3, 1B3, 2B3, 1C3, 2C3, 1D3, 2D3 ^o

- [Huawei Server DIMM Configuration Assistant](#)



Operating Frequency During DIMM Configuration

- CPU E5-2400 POR (UDIMM):

Maximum operating frequency when
ECC UDIMM 2DPC* is configured:
1066 MHz

Ranks Per DIMM & Data Width	Memory Capacity Per DIMM ¹	Speed (MT/s) and Voltage Validated by Slot Per Channel (SPC) and DIMM Per Channel (DPC) ^{2, 3}							
		1 Slot Per Channel		2 Slots Per Channel					
		1DPC		1DPC		2DPC			
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V		
SRx8 Non-ECC	1GB	2GB	4GB	n/a	1066, 1333	n/a	1066, 1333	n/a	1066
DRx8 Non-ECC	2GB	4GB	8GB	n/a	1066, 1333	n/a	1066, 1333	n/a	1066
SRx16 Non-ECC	512MB	1GB	2GB	n/a	1066, 1333	n/a	1066, 1333	n/a	1066
SRx8 ECC	1GB	2GB	4GB	1066,1333	1066, 1333	1066,1333	1066, 1333,	1066	1066
DRx8 ECC	2GB	4GB	8GB	1066,1333	1066, 1333	1066,1333	1066, 1333	1066	1066

Operating Frequency During DIMM Configuration

- CPU E5-2400 RDIMM:

Maximum operating frequency when DRx8 2DPC 1.35v is configured: 1333 MHz

Ranks Per DIMM and Data Width	Memory Capacity Per DIMM ¹	Speed (MT/s) and Voltage Validated by Slot Per Channel (SPC) and DIMM Per Channel (DPC) ^{2, 3, 4}					
		1 Slot Per Channel		2 Slots Per Channel			
		1DPC		1DPC		2DPC	
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
SRx8	1GB	2GB	4GB	1066,1333	1066,1333, 1600	1066,1333	1066,1333, 1600
DRx8	2GB	4GB	8GB	1066,1333	1066,1333, 1600	1066,1333	1066,1333, 1600
SRx4	2GB	4GB	8GB	1066,1333	1066,1333, 1600	1066,1333	1066,1333, 1600
DRx4	4GB	8GB	16GB	1066,1333	1066,1333, 1600	1066,1333	1066,1333, 1600
QRx4	8GB,	16GB	32GB	800	800	800	800
QRx8	4GB	8GB	16GB	800	800	800	800

* If the operating frequency 1600 MHz is required, use a DIMM that uses the 1.5 V voltage.

Operating Frequency During DIMM Configuration

- CPU E5-2400 LRDIMM:

Ranks Per DIMM and Data Width ¹	Memory Capacity Per DIMM ²	Speed (MT/s) and Voltage Validated by Slot Per Channel (SPC) and DIMM Per Channel (DPC) ^{3, 4, 5}						
		1 Slot Per Channel		2 Slot Per Channel				
		1DPC		1DPC		2DPC		
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	
QRx4 (DDP) ⁶	16GB	32GB	1066	1066, 1333	1066	1066, 1333	1066	1066
QRx8 (P) ⁶	8GB	16GB	1066	1066, 1333	1066	1066, 1333	1066	1066

Operating Frequency During DIMM Configuration

- CPU E5-2600/4600 SNB POR (RDIMM):

3DPC supports only 1.5 V.
Maximum operating frequency: 1066 MHz

Ranks Per DIMM and Data Width	Memory Capacity Per DIMM ¹	Speed (MT/s) and Voltage Validated by Slot Per Channel (SPC) and DIMM Per Channel (DPC) ^{2, 3, 4}											
		1 Slot Per Channel		2 Slots Per Channel				3 Slots Per Channel					
		1DPC		1DPC		2DPC		1DPC		2DPC		3DPC	
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
SRx8	1GB	2GB	4GB	1066, 1333 1600	n/a	800, 1066							
DRx8	2GB	4GB	8GB	1066, 1333 1600	n/a	800, 1066							
SRx4	2GB	4GB	8GB	1066, 1333 1600	n/a	800, 1066							
DRx4	4GB	8GB	16GB	1066, 1333 1600	n/a	800, 1066							
QRx4	8GB	16GB	32GB	800	1066	800	1066	800	800	800	1066	800	n/a
QRx8	4GB	8GB	16GB	800	1066	800	1066	800	800	800	1066	800	n/a

* When a 3DPC 1.35 V DIMM is configured on the SNB platform, the system working voltage is automatically changed to 1.5 V. The DIMM is compatible with the two voltages.

Operating Frequency During DIMM Configuration

- CPU E5-2600 v2 IVB POR (RDIMM):

Maximum operating frequency when IVB 1.5 V 1DPC is configured: 1866 MHz*

Ranks Per DIMM & Data Width	Memory Capacity Per DIMM [1]			RDIMM Speed (MT / s) and Voltage Validated for Short Length PDG by Slot Per Channel (SPC) and DIMM Per Channel (DPC) [2,3,4]											
				1 Slot per Channel		2 Slots per Channel				3 Slots per Channel					
				1 DPC		1 DPC		2 DPC		1 DPC		2 DPC		3 DPC	
	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V
SRx8	1GB	2GB	4GB	1066, 1333, 1600 1866	1066, 1333, 1600, 1866	800	800, 1066								
DRx8	2GB	4GB	8GB	1066, 1333, 1600 1866	1066, 1333, 1600, 1866	800	800, 1066								
SRx4	2GB	4GB	8GB	1066, 1333, 1600 1866	1066, 1333, 1600, 1866	800	800, 1066								
DRx4	4GB	8GB	16GB	1066, 1333, 1600 1866	1066, 1333, 1600, 1866	800	800, 1066								
QRx8	4GB	8GB	16GB	800	800, 1066	800	800, 1066	800	800	800	800, 1066	800	800		
QRx4	8GB	16GB	32GB	800	800, 1066	800	800, 1066	800	800	800	800, 1066	800	800		

* The DIMM controller must also be configured to support the 1866 MHz CPU, such as E5-2697 v2. In addition, R&D engineers are developing 2DPC@1866. 2DPC can also support 1866 MHz in the future.

Operating Frequency During DIMM Configuration

- CPU E5-2600/4600 POR (LRDIMM):

Ranks Per DIMM and Data Width ¹	Memory Capacity Per DIMM ²	Speed (MT/s) and Voltage Validated by Slot Per Channel (SPC) and DIMM Per Channel (DPC) ^{3, 4, 5, 6}							
		1 Slot Per Channel		2 Slots Per Channel		3 Slots Per Channel			
		1DPC		1DPC and 2DPC		1DPC and 2DPC		3DPC	
		1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
QRx4 (DDP) ⁷	16GB	32GB	1066, 1333	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066
QRx8 (P) ⁷	8GB	16GB	1066, 1333	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066

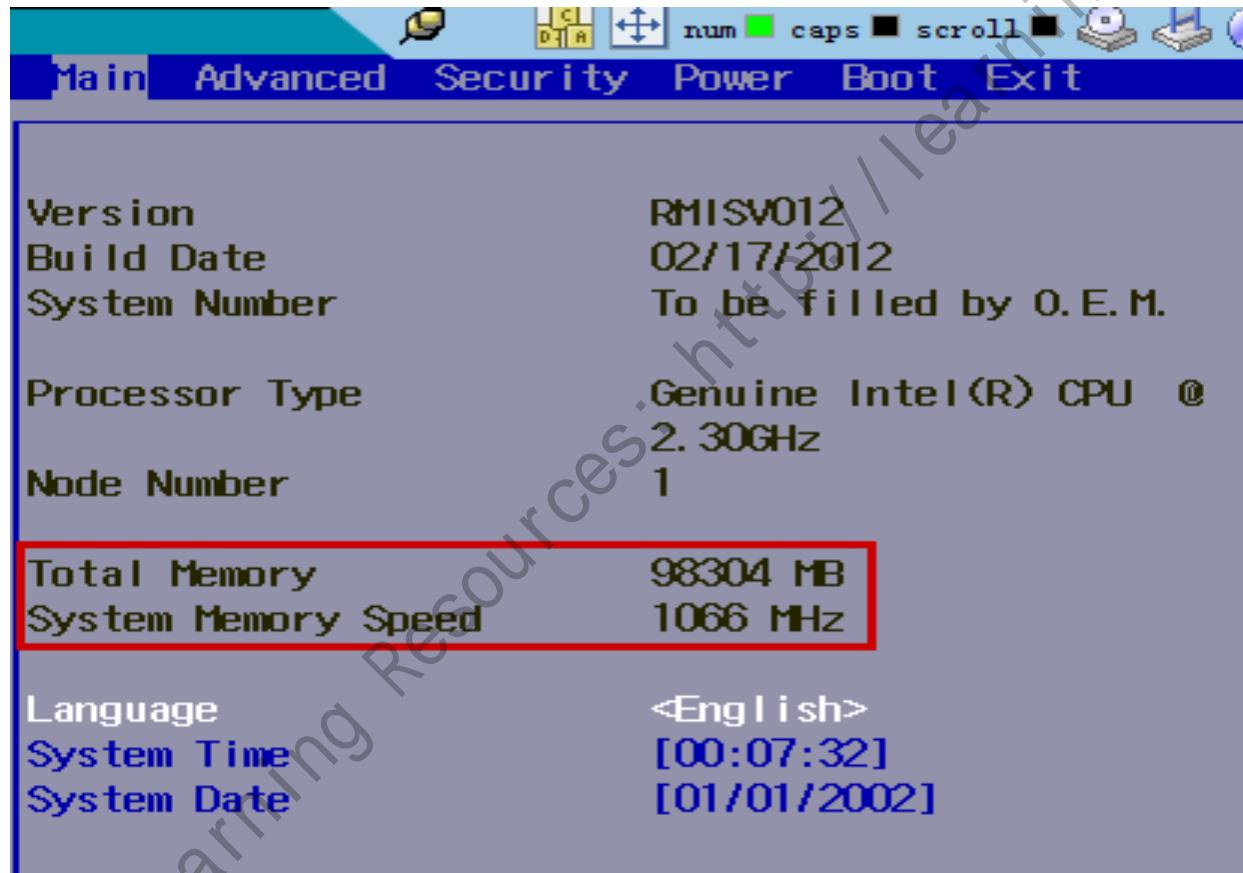
View the DIMM Operating Capacity, Voltage, and Frequency

- Use the Serial Over LAN (SOL) function to save the system serial port logs and search "DDR3-" or "DDR-4". Save the logs as follows:
- Run the ipmitool tool in the Windows environment, configure the BMC IP address and BMC password, connect to the server network port, and save the serial port logs.

	Socket 0	Socket 1	Socket 2	Socket 3	System
Active Memory	96GB	96GB	N/A	N/A	192GB
DDR3 Freq					DDR3-1333
Ch0 CL-RCD-RP-CMD					
Ch1 CL-RCD-RP-CMD	9-9-9-1n	9-9-9-1n			
Ch2 CL-RCD-RP-CMD	9-9-9-1n	9-9-9-1n			
Ch3 CL-RCD-RP-CMD	9-9-9-1n	9-9-9-1n			
DDR3 Vdd					1.35v
ECC Checking					On
Patrol/Demand Scrub					On / Off
RAS Mode					Indep
Paging Policy					Adapt Open
Data Scrambling					Off

View the DIMM Operating Capacity, Voltage, and Frequency

- You can also view the DIMM capacity and operating frequency in the BIOS.



View the DIMM Operating Capacity, Voltage, and Frequency

- You can query the nominal frequency by running **dmicode -t memory** in the Linux environment.

Locator: DIMM002

Bank Locator: BRANCH 0 CHANNEL 0 DIMM 2

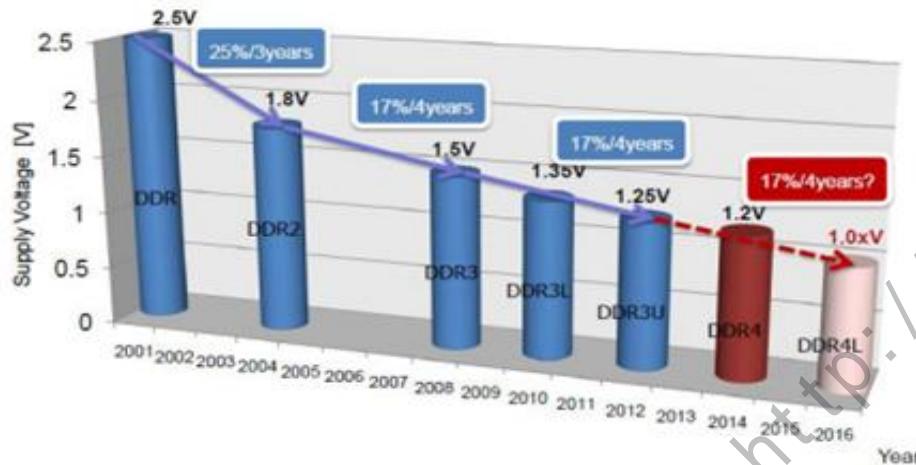
Type: <OUT OF SPEC>

Type Detail: Synchronous

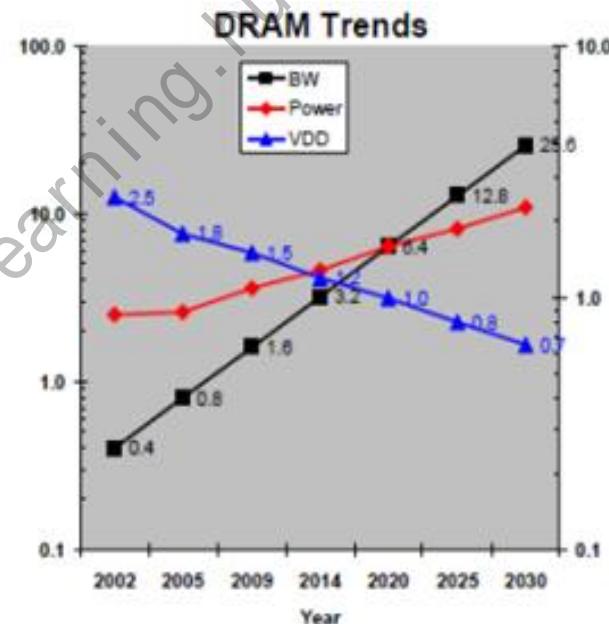
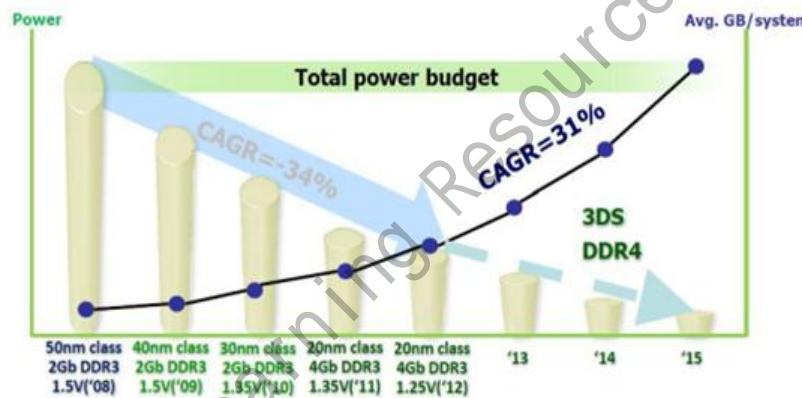
Speed: 1867 MHz (0.5 ns)

- You can query the nominal frequency on the BMC Web page (the frequency queried on the R1 platform is the actual operating frequency).

DIMM Evolution



Voltage: DDR3 (1.5 V) → DDR3L (1.35 V) → DDR4 (1.2 V)



Evolution trends:

- Increasing capacity (4 GB → 8 GB → 16 GB → 32 GB → 64 GB)
- Reducing voltage (1.5V → 1.35 V → 1.2 V)
- Increasing frequency (1333 MHz → 1600 MHz → 1866 MHz → 2133 MHz → 2400 MHz)



2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

2.5 PCIe Interfaces and Applications

2.6 Functions and Development of BIOS

2.7 Functions and Development of BMC and Chassis Management

Hard Disk Vendors

HDD vendors



Seagate



HGST

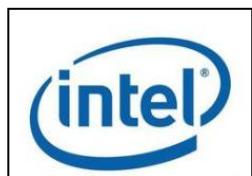


Western Digital



Toshiba

SSD vendors



Intel



Samsung



Micron



Sandisk



HGST



Toshiba



Seagate



Huawei

Hard Disk Classification Based on Port Type



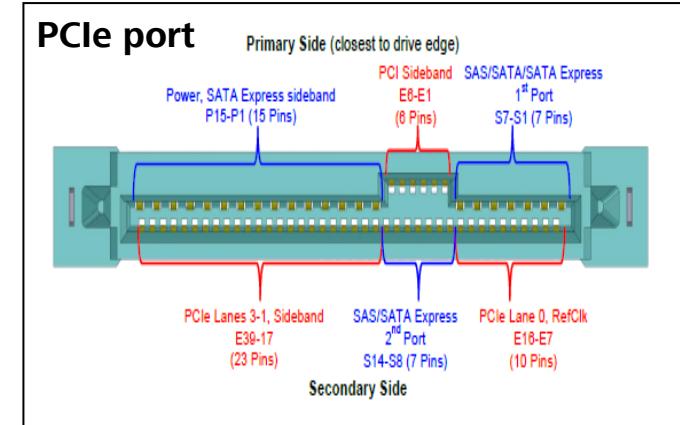
SATA port



SAS port

Maximum transmission rates of the SAS and SATA ports

Protocol Version \ Port Type	1.0	2.0	3.0
SAS	3 Gbit/s	6 Gbit/s	12 Gbit/s
SATA	1.5 Gbit/s	3 Gbit/s	6 Gbit/s



Hard Disk Classification Based on Hard Disk Size

- HDD disk size, that is, the disc diameter, can be 1 inch, 1.8 inches, 2.5 inches, 3.5 inches, or 5.25 inches. The SSD does not have a disc, but the size is consistent with that of the HDD.
- HDD sizes
 - The size of mainstream hard disks is 3.5 inches or 2.5 inches. The size of HDDs manufactured by different vendors is within the tolerance.
 - 3.5-inch: Large Form Factor (LFF); H x W =147 mm x 101.85 mm (5.79 in. x 4.01 in.). The depth of a 3.5-inch enterprise-level hard disk is usually 26.1 mm (1.03 in.).
 - 2.5-inch: Small Form Factor (SFF); H x W =100.45 mm x 69.85 mm (3.95 in. x 2.75 in.). The depth of a 2.5-inch enterprise-level hard disk is usually 15 mm (0.59 in.).



Comparison between 2.5-inch and 3.5-inch HDDs

Hard Disk Classification Based on Hard Disk Size

- SSD sizes
 - The size of mainstream solid state disks is 2.5 inches. The size of SSDs manufactured by different vendors has little difference.
 - 2.5-inch: SFF; H x W = 100.45 mm x 69.85 mm (3.95 in. x 2.75 in.). The depth of an SSD can be 7 mm (0.28 in.), 9.5 mm (0.37 in.), or 15 mm (0.59 in.). Vendors can design different SSD depths, but the depth does not exceed 15 mm (0.59 in.).

Hard Disk Key Indicators

- Hard disk capacity (volume)
- Rotational speed
- Average access time*
- Date transfer rate
- Input/output operations per second (IOPS)

Capacity Comparison Between HDDs and SSDs

HDD

The capacity of NL SAS/SATA SSDs is an integer multiple of 250 GB. The mainstream capacity includes the following:
500/1000 GB for 2.5-inch HDDs
1/2/3/4/6 TB for 3.5-inch HDDs

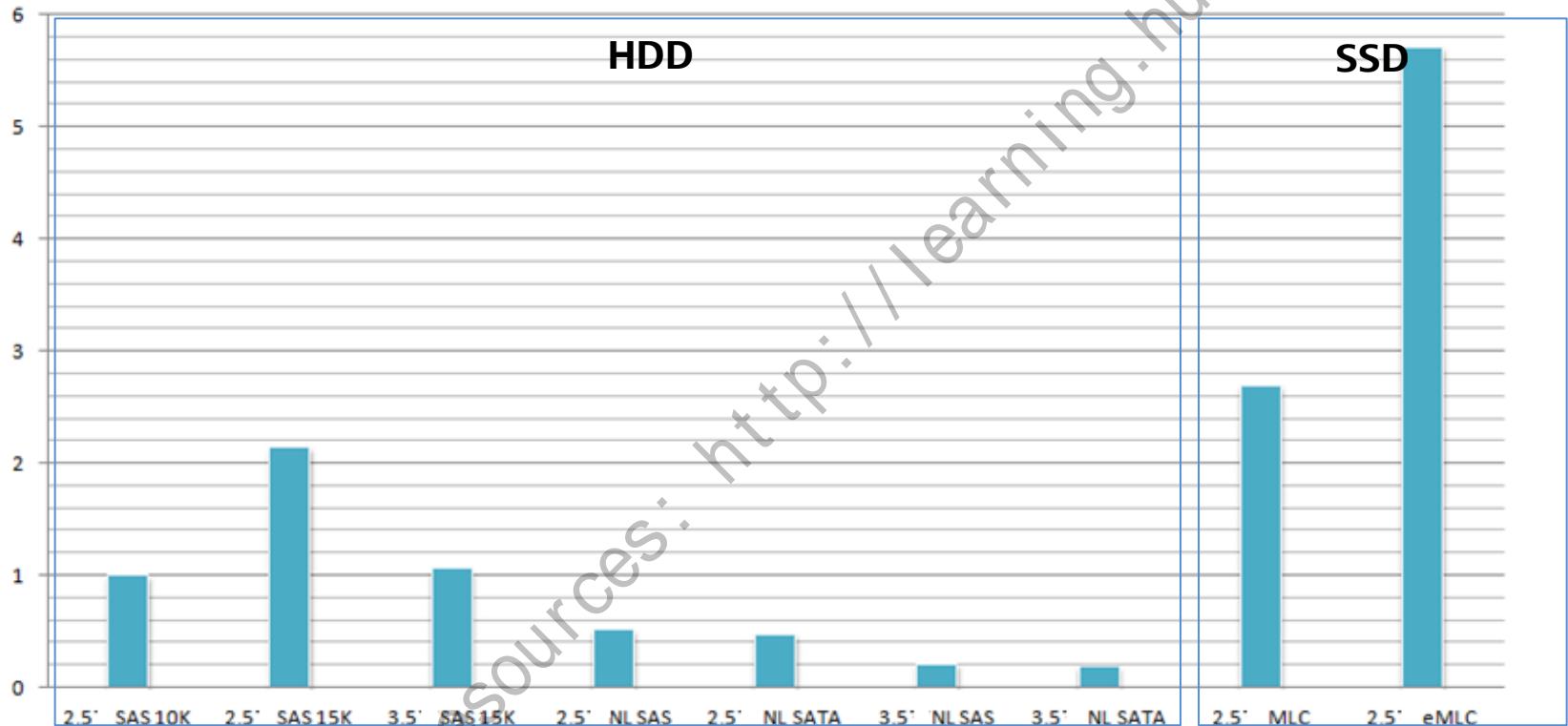
The capacity of 10K/15K SAS SSDs is an integer multiple of 300 GB. The mainstream capacity includes the following:
300/600/900/1200 GB for 2.5-inch HDDs
300/600 GB (only for 15K HDDs, manufacture discontinued in 2014) for 3.5-inch HDDs

SSD

The capacity of the SSDs varies greatly depending on the vendor.
The MLC SSD supports the following capacity:
80/128/160/**240**/256/300/**480**/512/600/800/**960** GB (the values in red are the mainstream capacity.)
The eMLC SSD supports the following capacity:
100/200/400/800/1600 GB
MLC/eMLC SSDs are widely used in the enterprise market. TLC is not widely used due to low lifecycle, and SLC is not widely used due to high costs.

Tips: Select an appropriate capacity based on the number of slots and service requirements.

Cost Comparison Between HDDs and SSDs



\$/GB cost comparison (2.5-inch 10K SAS is used as an example)

Note: This figure does not show the specific price, but shows the general proportion between \$ and GB.

Power Consumption Comparison Between HDDs and SSDs

Disk Type	Average Power Consumption (W)					
	10K SAS HDD (300/600/900/1200 GB)	15K SAS HDD (300 GB)	2.5 NL SAS/SATA HDD (1 TB)	3.5 NL SAS/SATA HDD	MLC SSD	eMLC SSD
Power consumption	300 GB: 6.85 600 GB: 7.33 900 GB: 7.93 1200 GB: 8.02	7.9	6.4/5.2	1 TB: 8.93/9.06 2 TB: 9.59/9.42 3 TB: 10.72/11.27 4 T: 11.86/11.27	240 GB: 2.9 480 GB: 4.3 800 GB: 5	200 GB: 4.4 400 GB: 5.4 800 GB: 6.0

Performance Comparison Between HDDs and SSDs

Item	IOPS (4K)						
	10K SAS HDD	15K SAS HDD	2.5 NL SAS/SATA HDD	3.5 NL SAS/SATA HDD	MLC SSD	eMLC SATA SSD	eMLC SAS SSD
Random read	330	420	200	180	72000	70000	140000
Random write	330	420	200	180	15000	36000	65000

The IOPS in the table is obtained from the full-disk performance test results.

Item	Max Sustained Data Transfer Rate (Mbit/s)						
	10K SAS HDD	15K SAS HDD	2.5 NL SAS/SATA HDD	3.5 NL SAS/SATA HDD	MLC SSD	eMLC SATA SSD	eMLC SAS SSD
Sequential read	200	240	110	180	500	500	1024
Sequential write	200	240	110	180	420	450	702

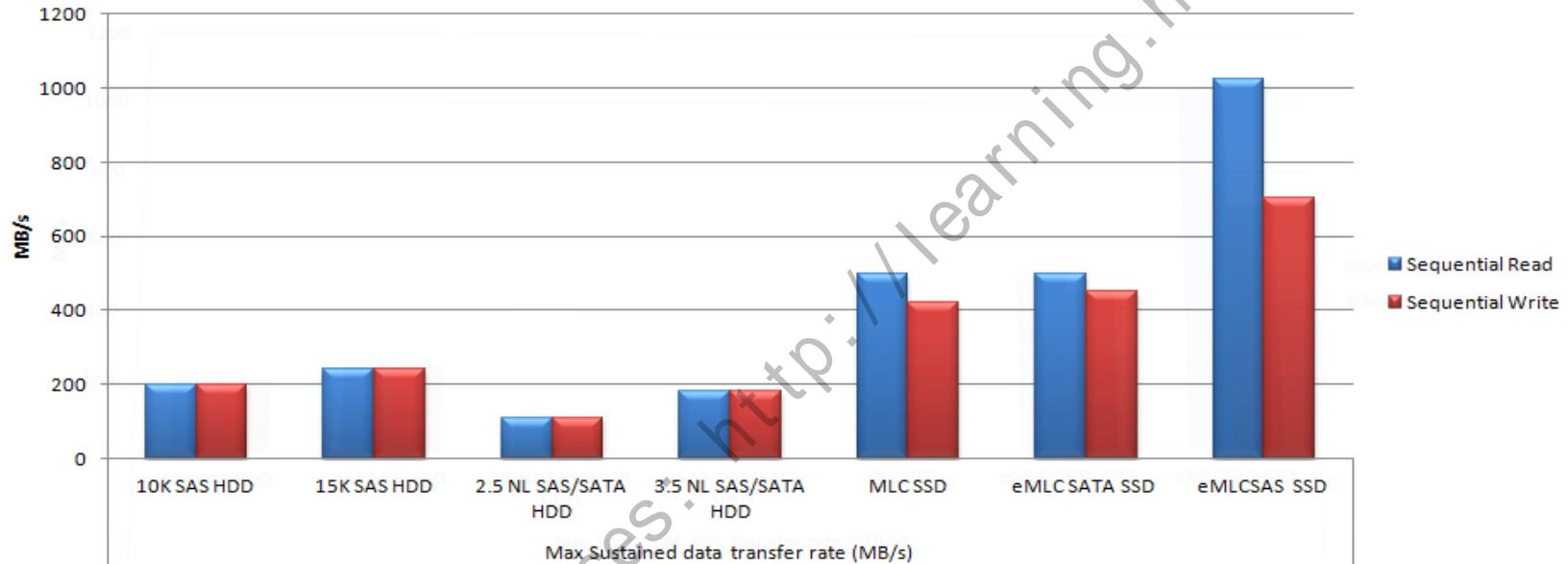
Performance Comparison Between HDDs and SSDs

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	10K SAS HDD	15K SAS HDD	2.5 NL SAS/SATA HDD	3.5 NL SAS/SATA HDD	MLC SSD	eMLC SATA SSD	eMLC SAS SSD
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Sequential read	200	240	110	180	500	500	1024
Sequential write	200	240	110	180	420	450	702

Performance Comparison Between HDDs and SSDs



Item	10K SAS	15K SAS	NL SAS/SATA	SSD
Latency (read/write)	3.6/4.1 ms	2.7/3.0 ms	8.5/9.5 ms	50/65 μ s

Life and Reliability Comparison

Item	HDD	SSD
Life	Magnetic head loading: 60,000 times	P/E: TLC: 500 times MLC: 3000 times eMLC: 20,000 times SLC: 100,000 times
MTBF	10K/15K SAS: 2 million hours NL SAS/SATA: 1.2 –1.4 million hours	2 million hours
UBER	$1/10^{15}$	$1/10^{17}$
Operational vibration	≤ 500 Hz: 0.25 Gs	≤ 700 Hz: 2.17 Grms
Impact	Operation: 40 Gs/2 ms Non-operation: 300 Gs/2 ms	1000 Gs/0.5 ms
Operating temperature	10K/15K SAS: 5–55 °C (41–131 °F) NL SAS/SATA: 5–60 °C (41–140 °F)	0–70 °C (32–158 °F)
Non-operating temperature	-40–70 °C (-40–158 °F)	-55–95 °C (-67–203 °F)
Humidity	Operation: 5%–95% RH (non-condensing) Non-operation: 5%–95% RH (non-condensing)	Operation: 5%–95% RH Non-operation: 5%–95% RH
Altitude	Operation: -304.8–3048 m (-999.99–9999.89 ft.) Non-operation: -304.8–12,192 m (-999.99–39999.51 ft.)	Operation: -304.8–3048 m (-999.99–9999.89 ft.) Non-operation: -304.8–12,192 m (-999.99–39999.51 ft.)

Hard Disk Classification Based on Service Type

- HDDs are classified into the following types according to the service applications:
 - Enterprise-level performance HDDs
 - Enterprise-Level capacity HDDs
 - Enterprise-level cloud disks
 - Consumer disks
- SSDs are classified into the following types according to the service applications and flash media:
 - Read-intensive
 - Mainstream
 - Write-intensive

Hard Disk Classification Based on Service Type

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 - Enterprise-level performance HDDs
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2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

2.5 PCIe Interfaces and Applications

2.6 Functions and Development of BIOS

2.7 Functions and Development of BMC and Chassis Management

RAID Introduction - Definition

Redundant array of independent disks (RAID) is a technology that combines multiple disk drive components into a logical unit for the purposes of write/write performance improvement and data redundancy.

RAID is classified into different RAID levels based on the combination mode.

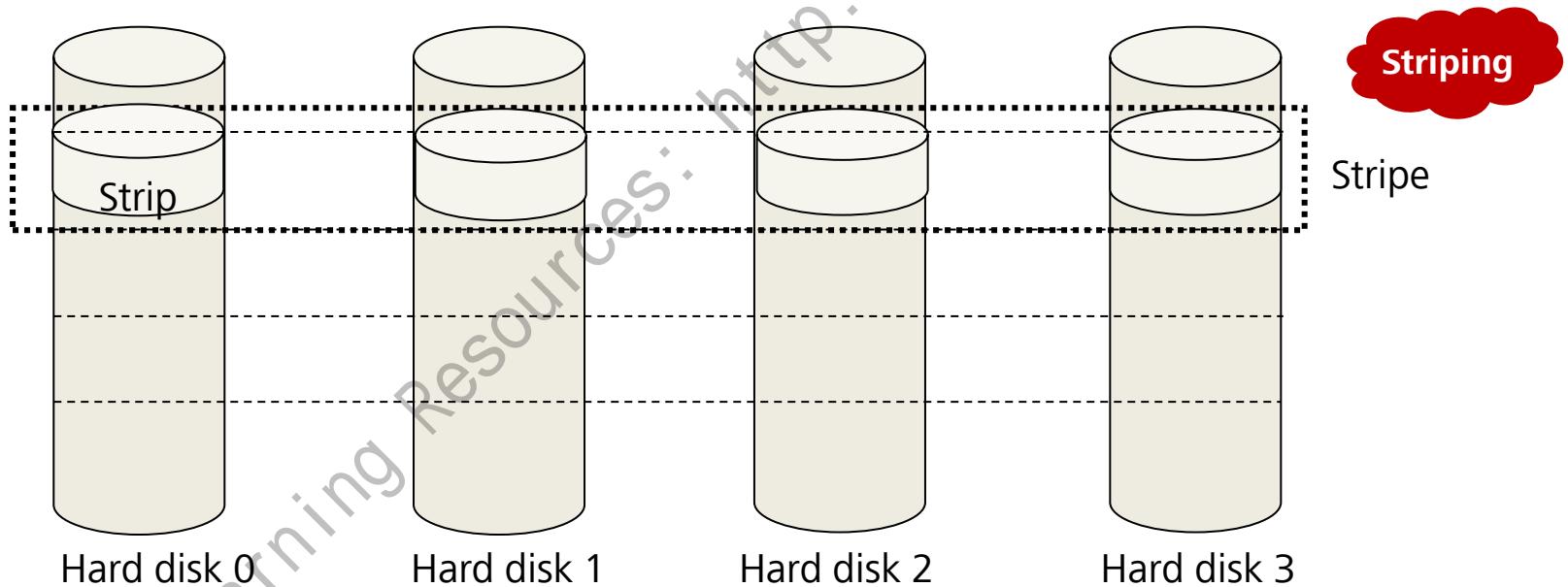
RAID 0	Consists of striping, without parity
RAID 1	Consists of mirroring, without parity
RAID 3	Consists of striping with dedicated parity
RAID 5	Consists of striping with distributed parity
RAID 6	Consists of striping with double distributed parity

Two different RAID levels can be combined into a new RAID level.

RAID 0+1	Consists of striping and mirroring; performs RAID 0 and then RAID 1
RAID 10	Similar to RAID 0+1 except that RAID 1 is performed before RAID 0
RAID 50	Performs RAID 5 and then RAID 0, which improves the performance of RAID 5

RAID Introduction - Data Organization

- Data organization form
 - **Strip:** A partition is divided into consecutively addressed blocks with the same size. A strip is such a block. A strip is also known as a stripe element.
 - **Stripe:** A stripe is a collection of strips with the same numbers on multiple disk drivers in the same disk array.

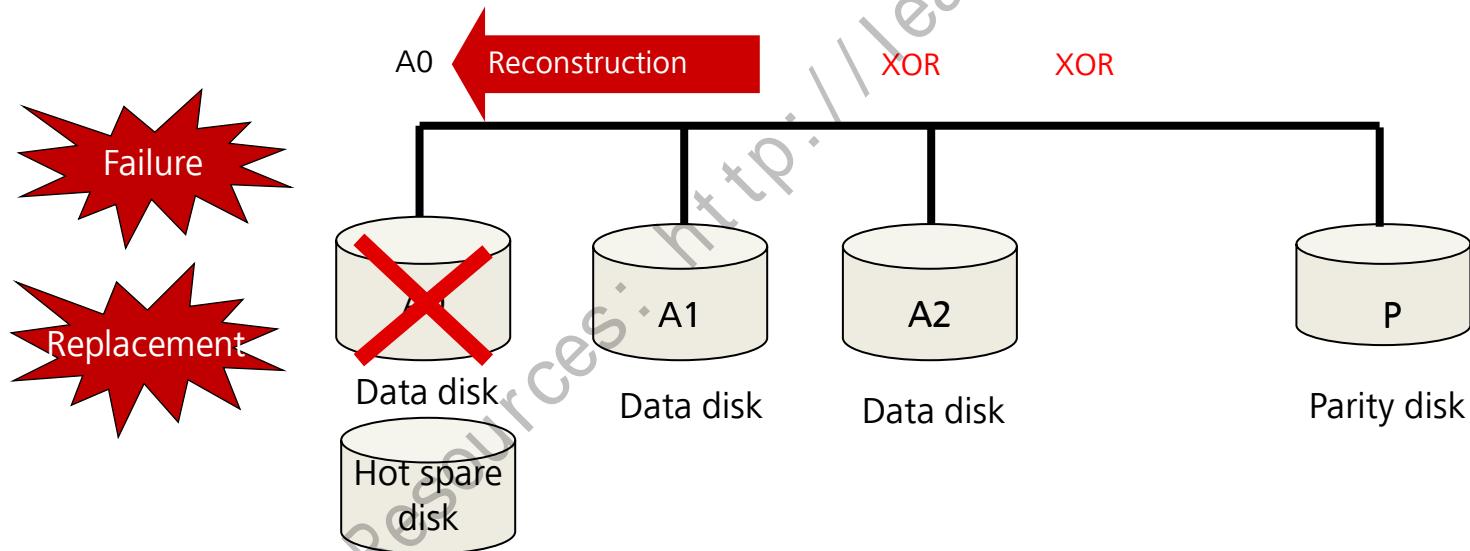


RAID Introduction - Hot Spare and Reconstruction

- Definition of hot spare:
 - A hot spare is used as a failover mechanism. The hot spare disk is active and connected as part of a working system. When a hard disk in the RAID group fails, the hot spare disk is switched into operation to ensure the RAID system redundancy.
- Hot spare types:
 - Global: The spare hard disk is shared by all redundant RAID groups in the system.
 - Dedicated: The spare hard disk is dedicated to use by a specific redundant RAID group in the system.

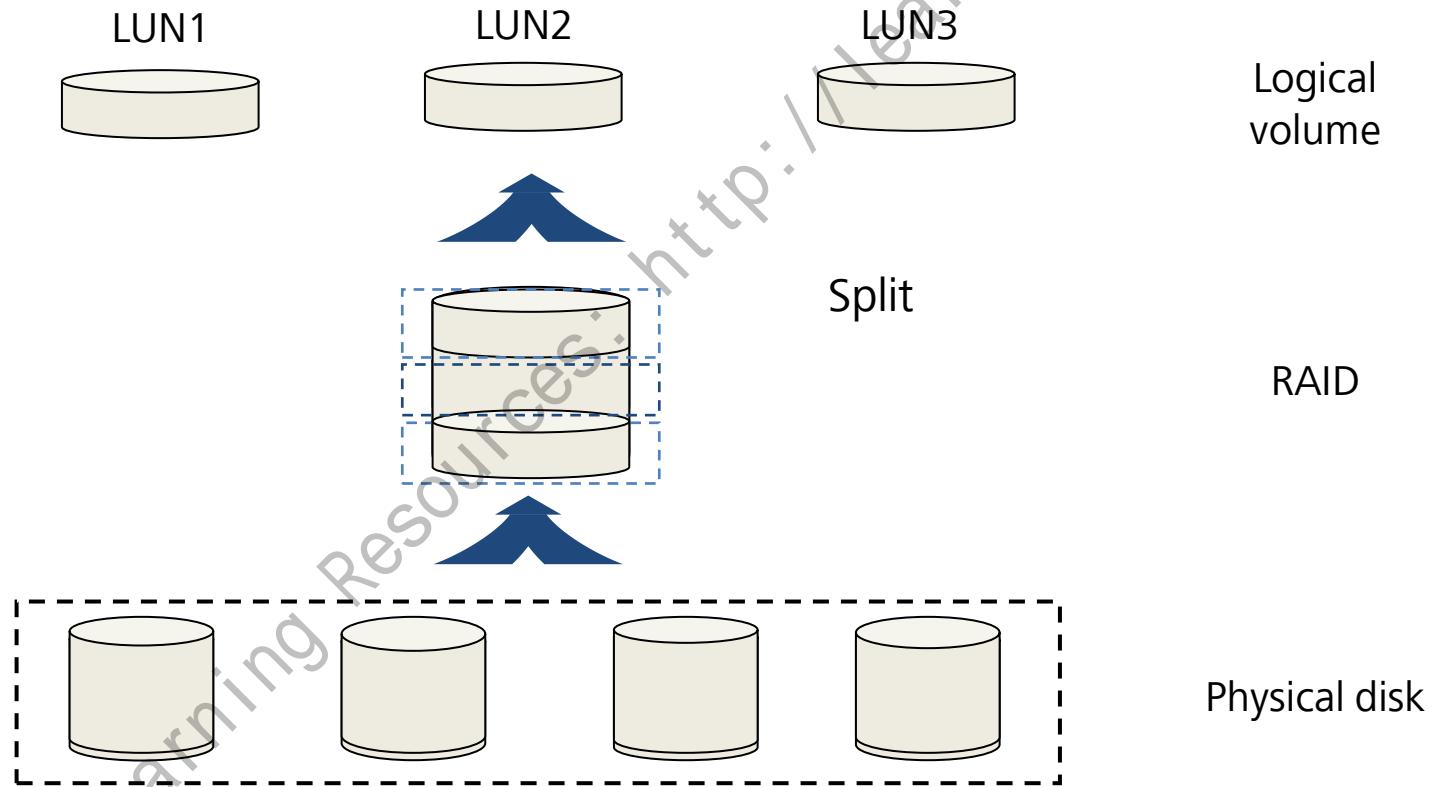
RAID Introduction - Hot Spare and Reconstruction

- Reconstruction



RAID Introduction - Logical Volume

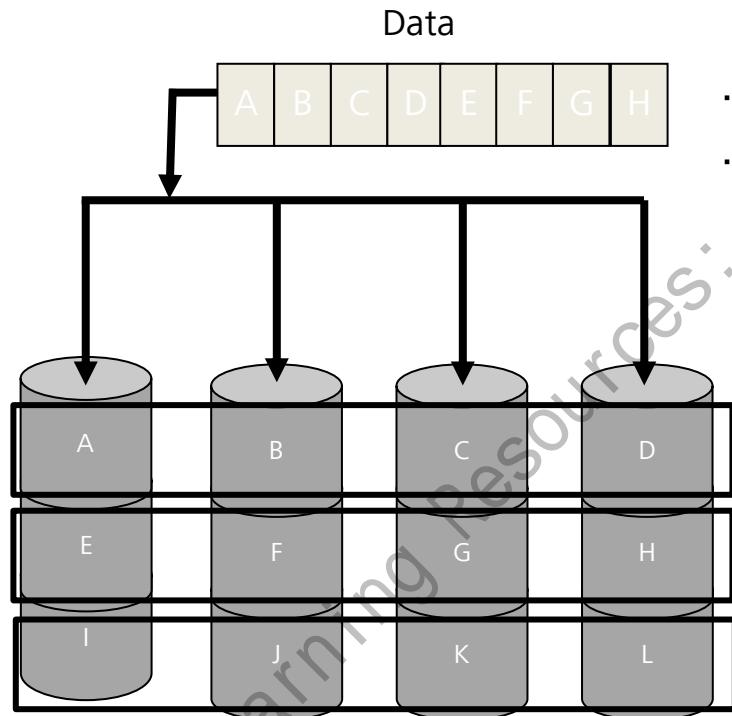
- One or multiple logical volumes can be created for RAID based on the specified capacity. A logical volume is identified by logical unit number (LUN).



RAID Levels - RAID 0 and RAID 1

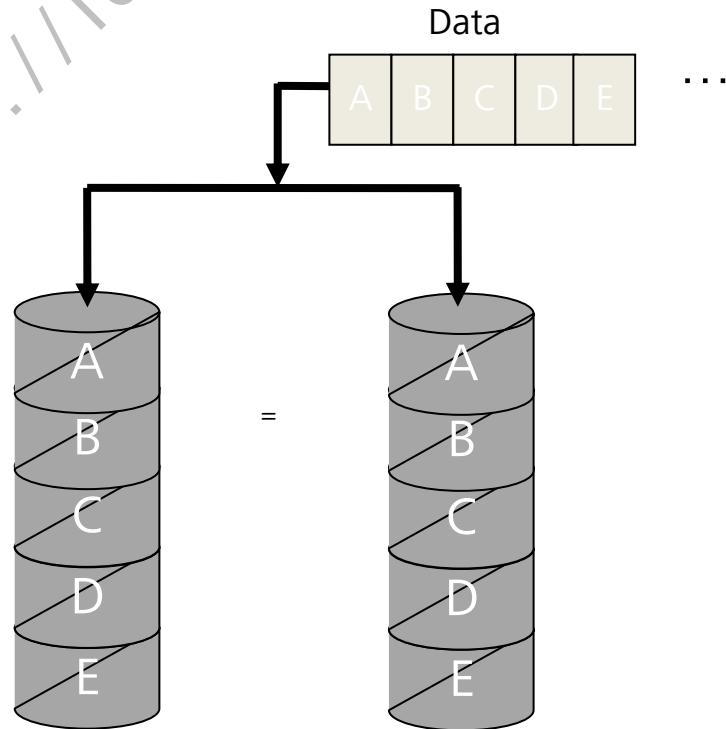
RAID 0

RAID 0 consists of striping without fault tolerance. Data of the RAID group is evenly distributed on all hard disks in stripe form.



RAID 1

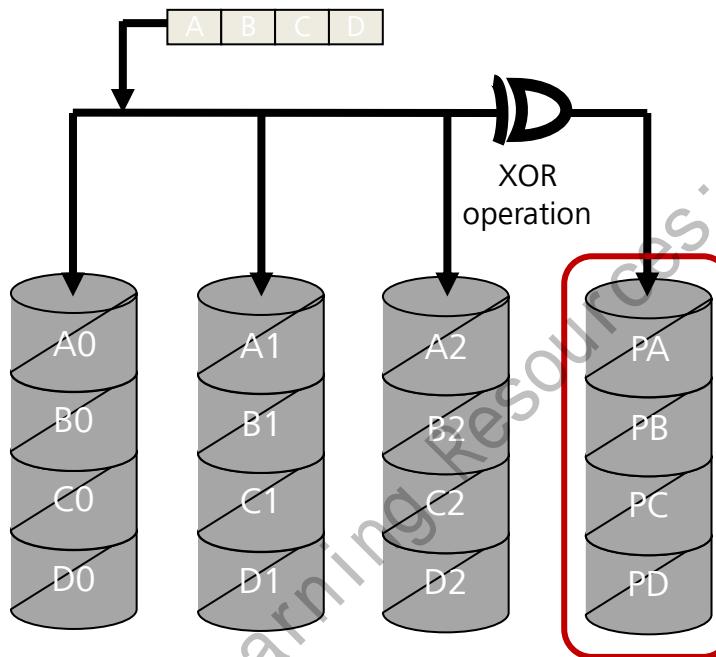
RAID 1 is also called mirroring. Data is written identically to the active hard disk and mirrored hard disks.



RAID Levels - RAID 3 and RAID 5

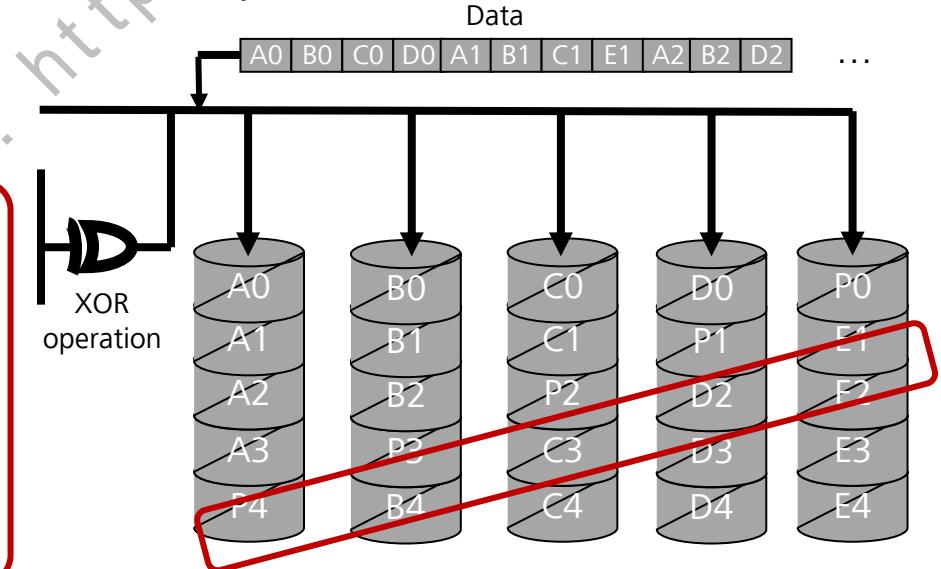
RAID 3

RAID 3 consists of striping with dedicated parity. Data is striped on data disks, and parity data is stored on a dedicated parity hard disk.

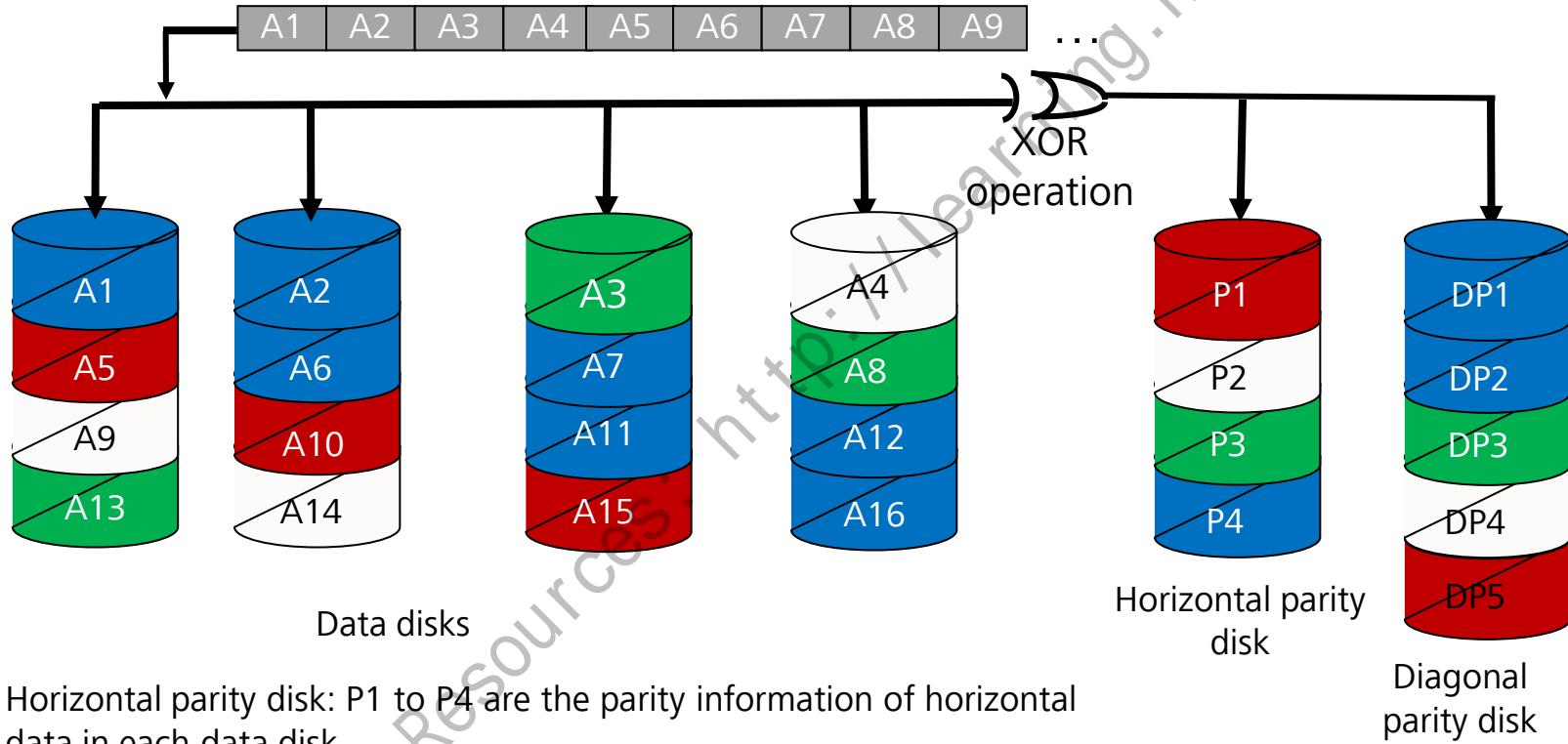


RAID 5

RAID 5 is similar to RAID 3 except that parity information is evenly distributed among data disks. RAID member hard disks store both the data and the parity information, and data blocks and corresponding parity information are stored on different hard disks. RAID 5 is one of the most commonly used RAID levels.



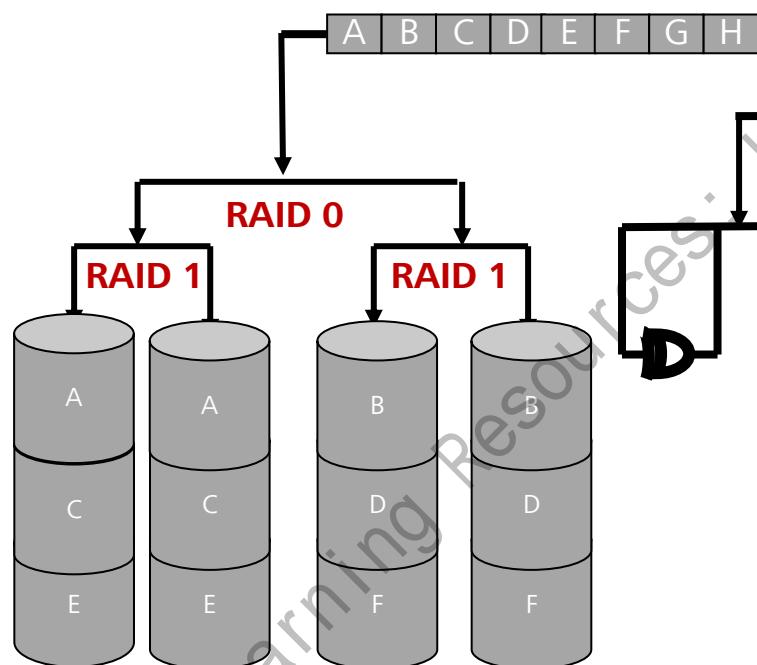
RAID Levels - RAID 6 Implementation



Combined RAID Levels - RAID 10 and RAID 50

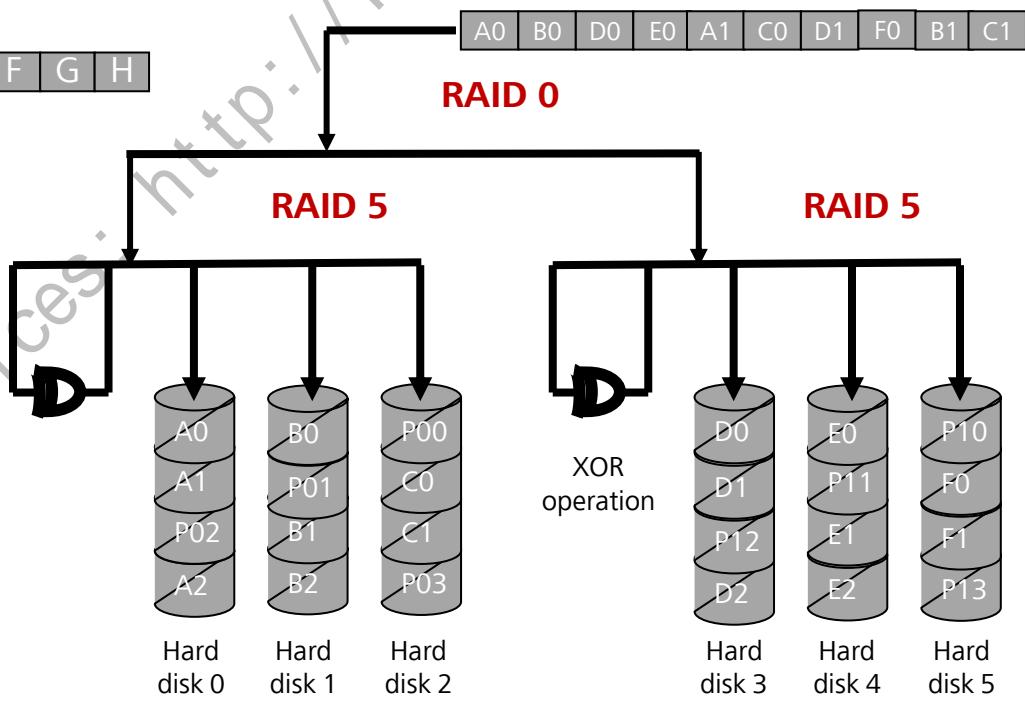
RAID 10

RAID 10 is a two-level combination of mirroring and striping. The first level is the RAID 1 mirror pair, and the second level is RAID 0. RAID 10 is widely used.



RAID 50

RAID 50 is a two-level combination. The first level is the RAID 5 mirror pair, and the second level is RAID 0.

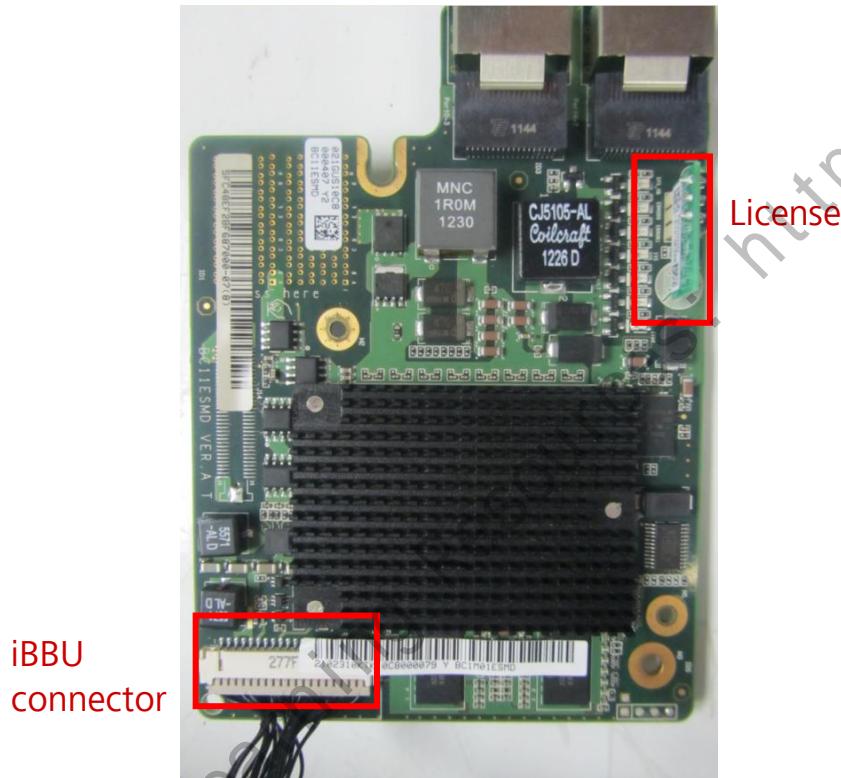


Comparison Between Common RAID Levels

RAID Level	RAID 0	RAID 1	RAID 5	RAID 6	RAID 10
Reliability	Lowest	High	Better than medium	Highest	High
Redundancy type	None	Mirror	Parity	Parity	Mirror
Available space	100%	50%	(N-1)/N	(N-2)/N	50%
Performance	Highest	Lowest	Better than medium	Better than medium	High

RAID Controller Card Appearance

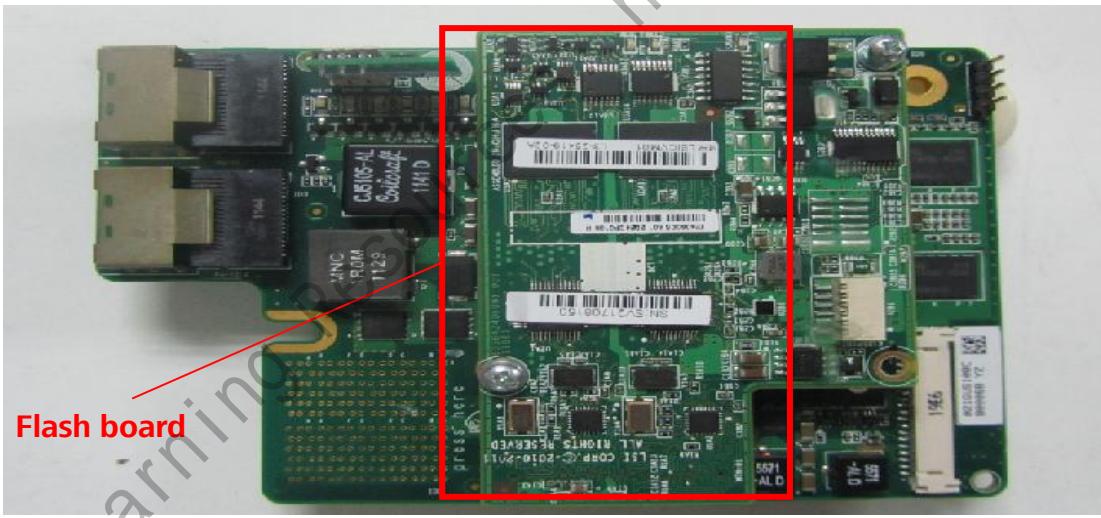
This figure shows the LSI2208 card appearance. An LSI2208 card supports iBBU or SuperCAP for data protection in the case of a power-off.



LSI2308 card appearance

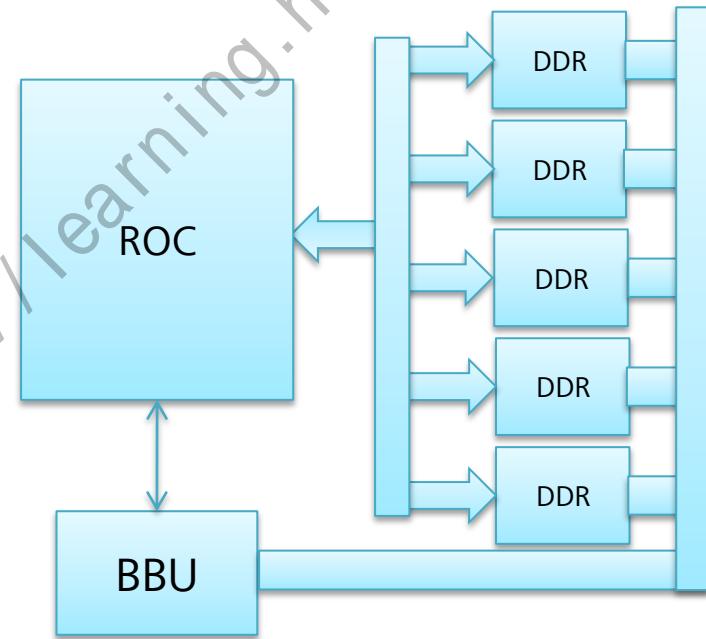


iBBU and SuperCAP Appearance



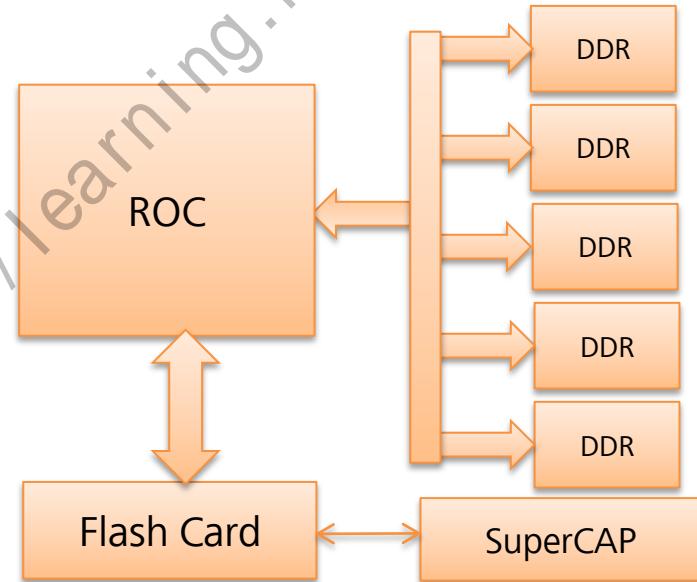
Cache Protection Principles of RAID Controller Cards

- Battery solution
 - When the system is powered off unexpectedly, data in the DDR is still stored in the DDR.
 - The backup battery unit (BBU) supplies power to the DDR to ensure that the self-refresh function of the DDR is normal.
 - The data is stored for a limited period, which is usually 48 hours to 72 hours.
 - During working, the battery needs to be discharged periodically, which affects performance for about 4 hours to 9 hours.
 - The chemical characteristics of a battery determine that the battery life is greatly affected by the environment.

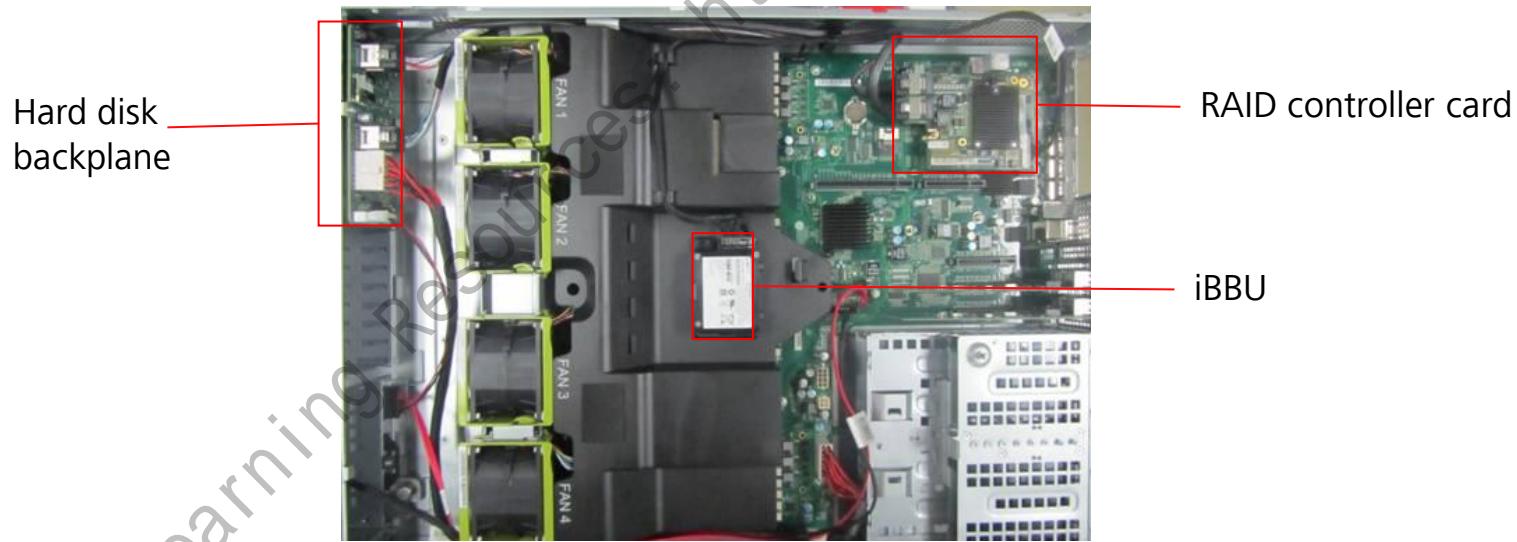


Cache Protection Principles of RAID Controller Cards

- SuperCAP solution
 - After the system is powered off unexpectedly, data is transferred from the DDR to the Nand flash in the flash card.
 - The SuperCAP supplies power to the controller, DDR, and flash card to ensure that data can be transferred to the flash card.
 - After the data transfer is complete, the SuperCAP does not need to be charged. Data can be stored permanently.
 - The SuperCAP can be charged or discharged in a short period, which has little impact on system performance.
 - During working, the capacitor capacity decreases continuously, but the capacity can ensure the normal working in the entire life cycle.



RAID Cards Connecting to Hard Disks





2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

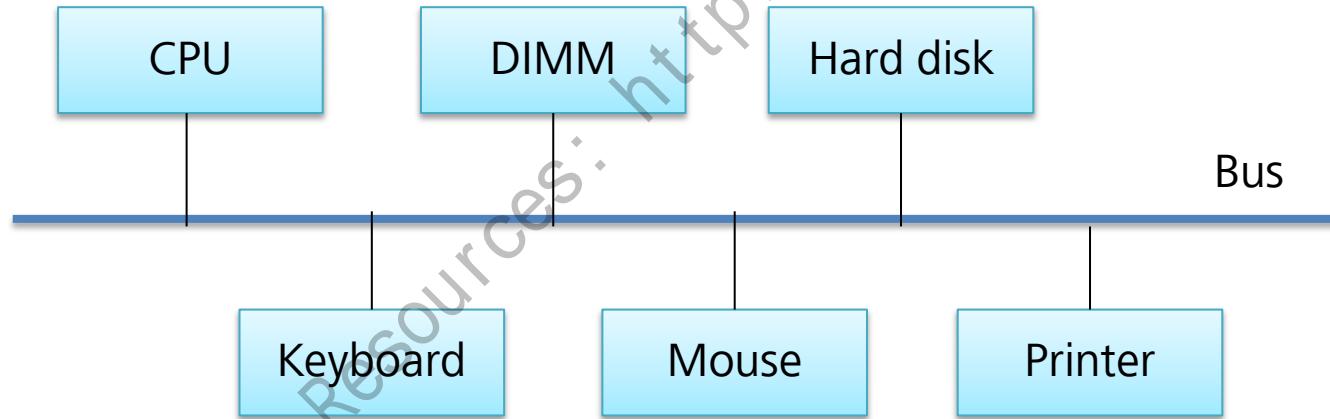
2.5 PCIe Interfaces and Application

2.6 Functions and Development of BIOS

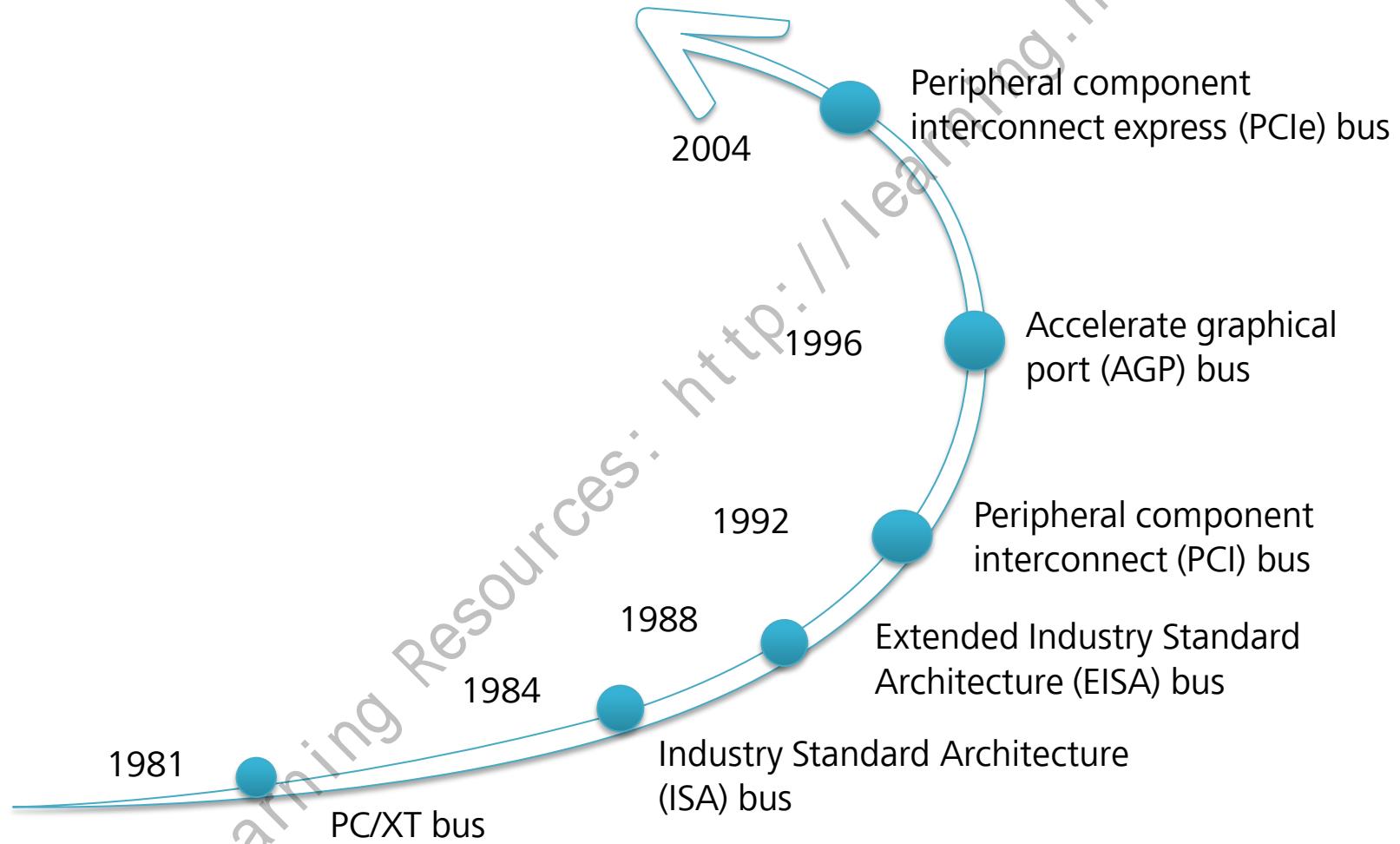
2.7 Functions and Development of BMC and Chassis Management

Bus

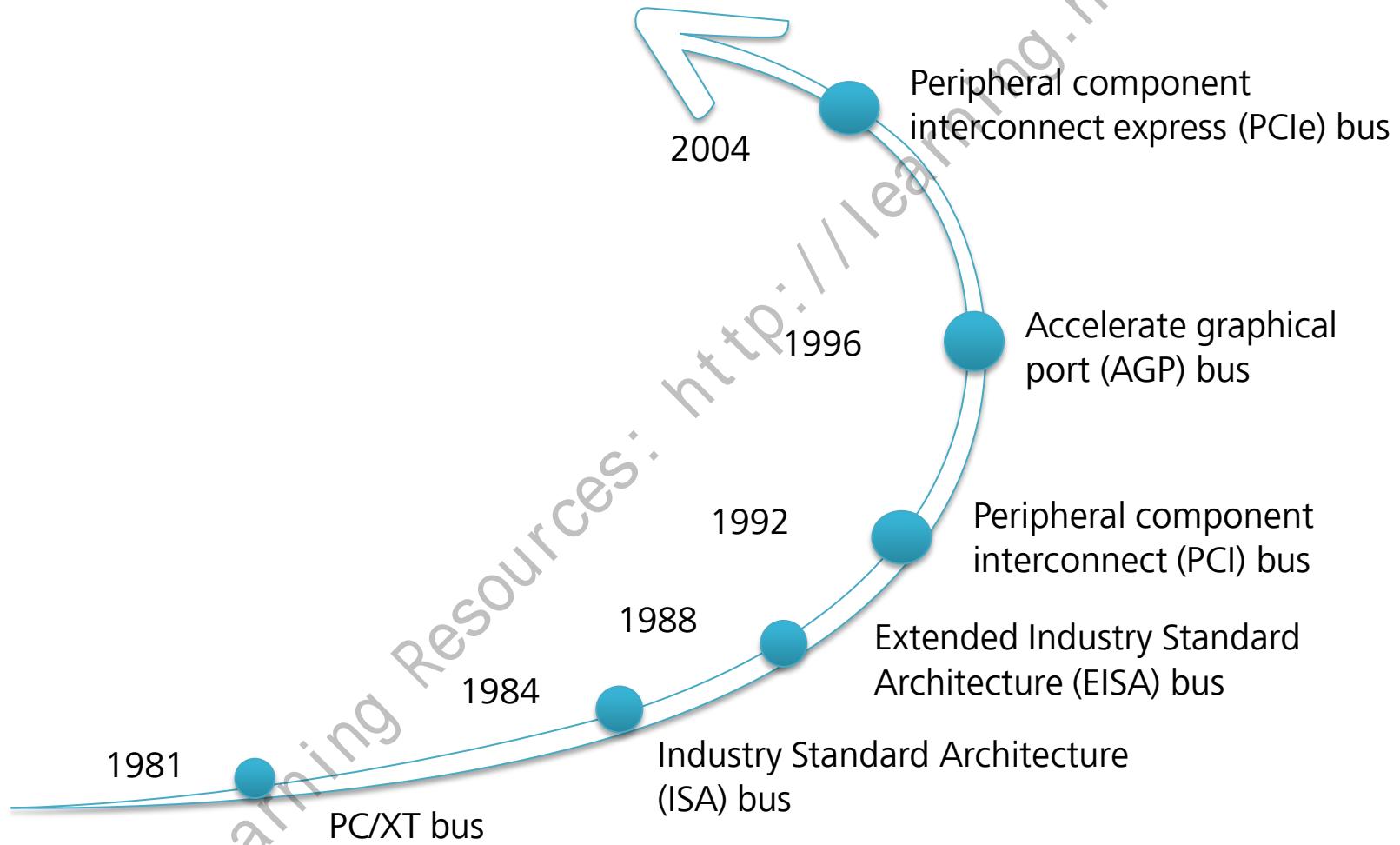
- The bus is a public communication channel for information transmission between functional components of a computer.



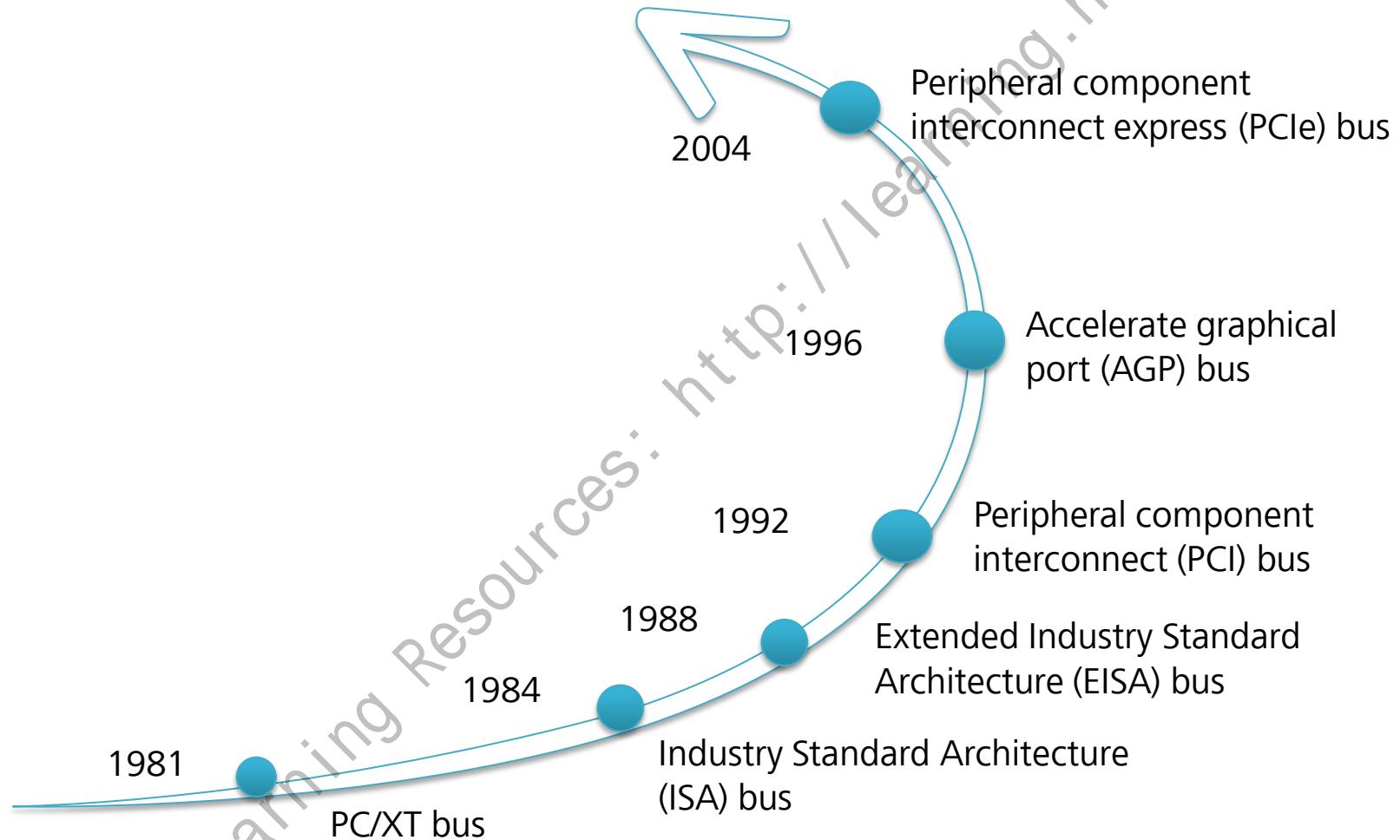
Bus Technology Development



Bus Technology Development



Bus Technology Development



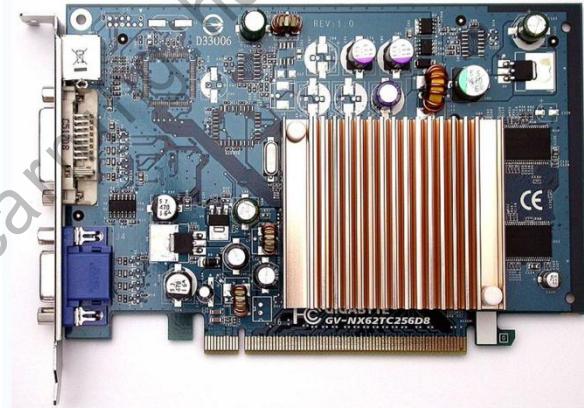
PCIe Bus Technology

Specifications	Total Number of Pins	Number of Pins in the Main Port Area	Total Length	Length of the Main Port Area	Bus Width	Operating Frequency	Transmission Rate
PCI-E 1X	36	14	25 mm (0.98 in.)	7.65 mm (0.30 in.)	8-bit	2.5 GHz	512 Mbit/s (duplex)
PCI-E 4X	64	42	39 mm (1.54 in.)	21.65 mm (0.85 in.)	8-bit	2.5 GHz	2.0 Gbit/s (duplex)
PCI-E 8X	98	76	56 mm (2.20 in.)	38.65 mm (1.52 in.)	8-bit	2.5 GHz	4.0 Gbit/s (duplex)
PCI-E 16X	164	142	89 mm (3.50 in.)	71.65 mm (2.82 in.)	8-bit	2.5 GHz	8.0 Gbit/s (duplex)

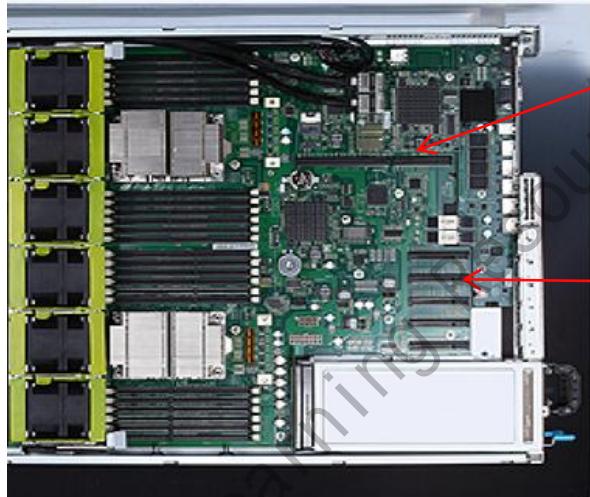
Appearance of PCIe Slots and Cards



PCIe X1 card



PCIe X16 card



Multiple PCIe
slots can be
extended.

PCIe X8 slot





2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

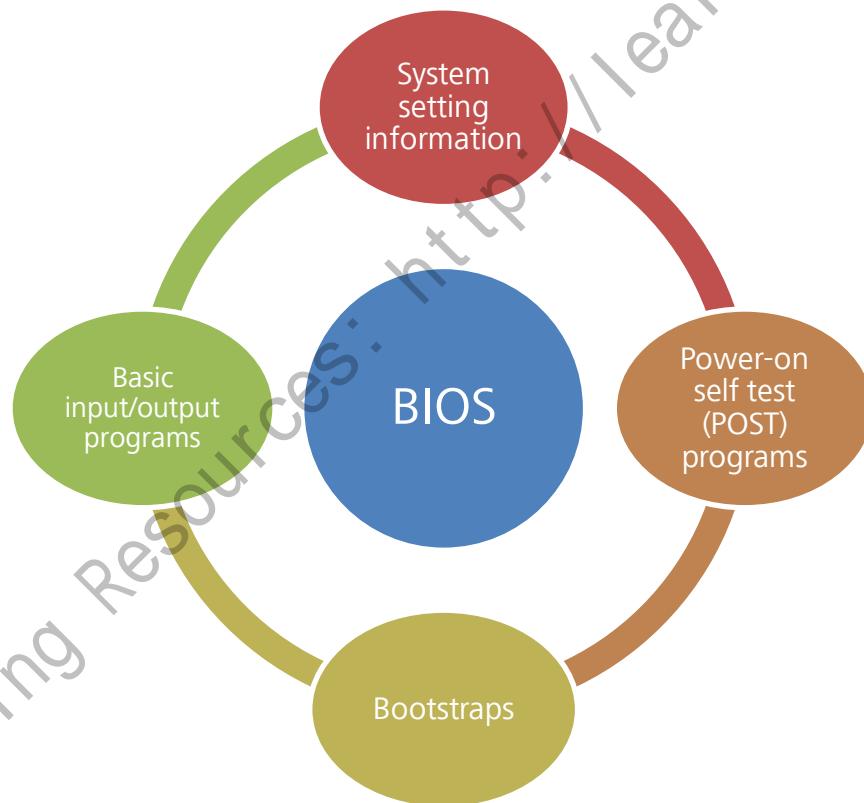
2.5 PCIe Interfaces and Applications

2.6 Functions and Development of BIOS

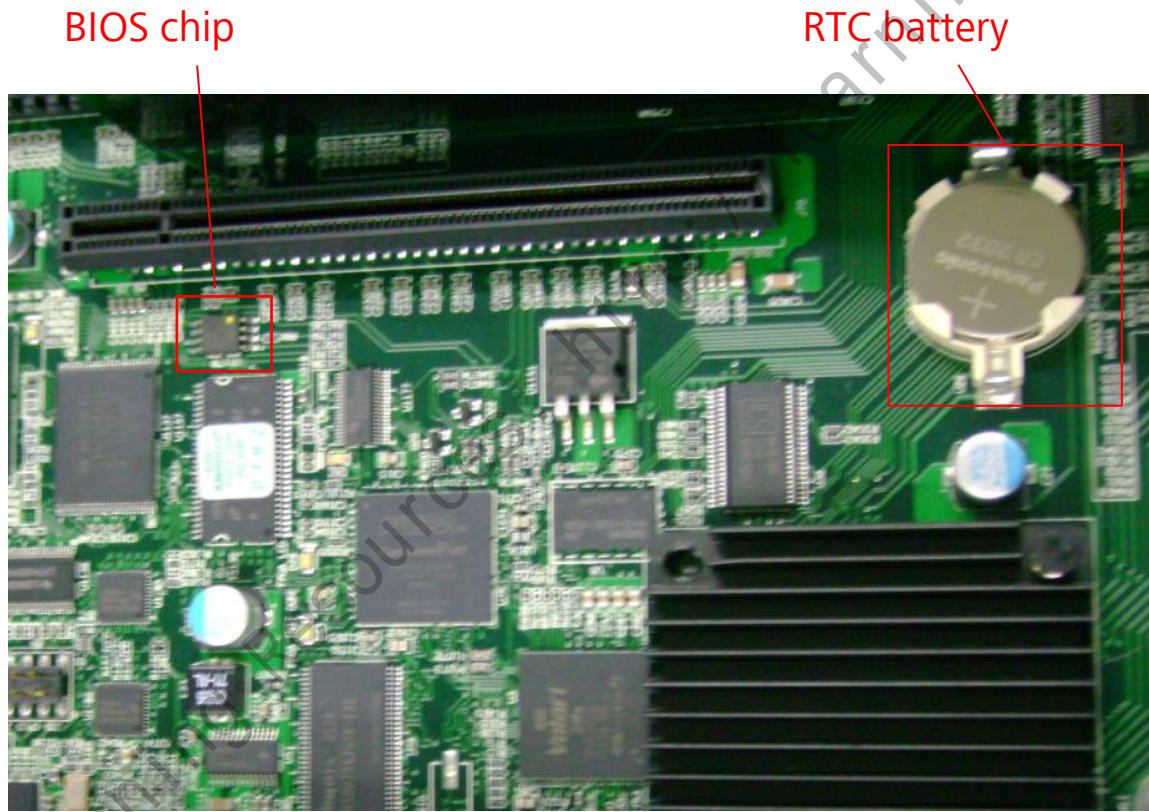
2.7 Functions and Development of BMC and Chassis Management

What is the BIOS?

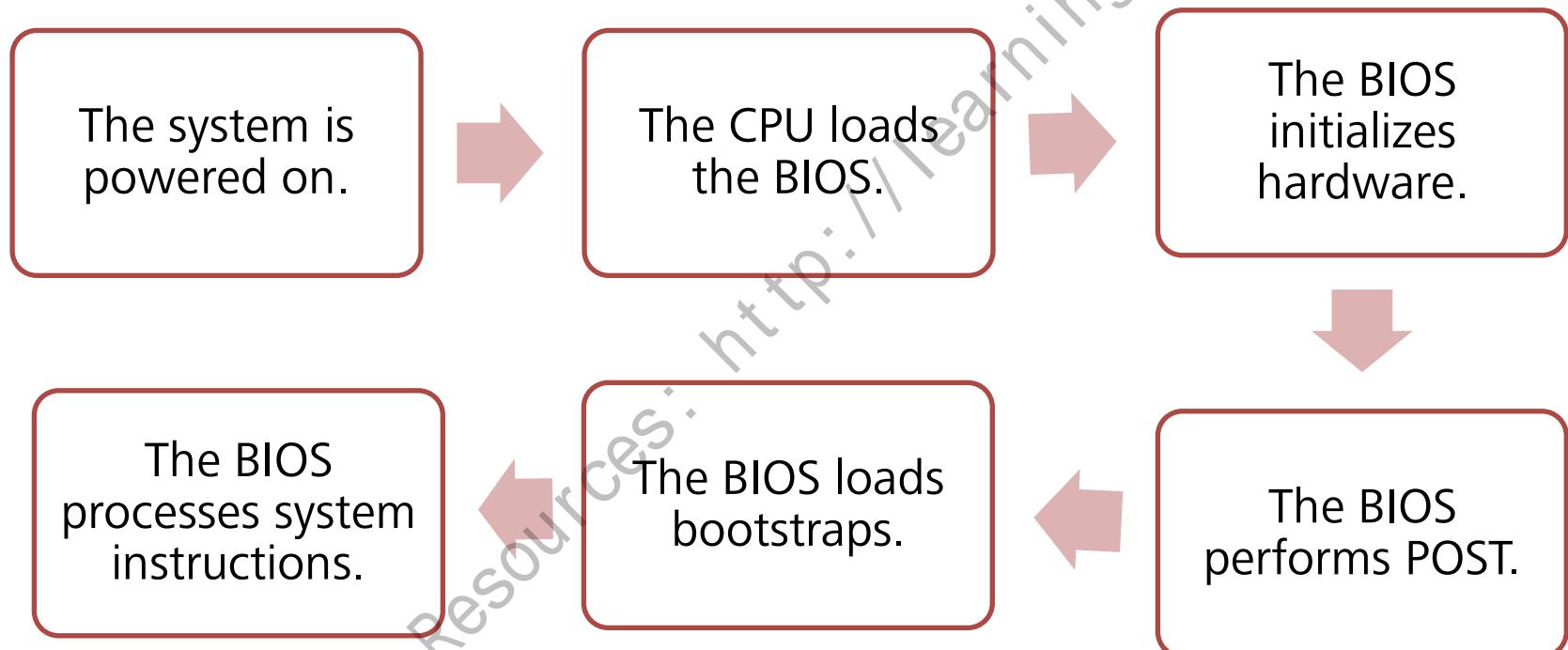
- BOIS is short for basic input/output system (BIOS).
- BIOS is the firmware stored on a ROM chip on the computer motherboard.



What is the BIOS?

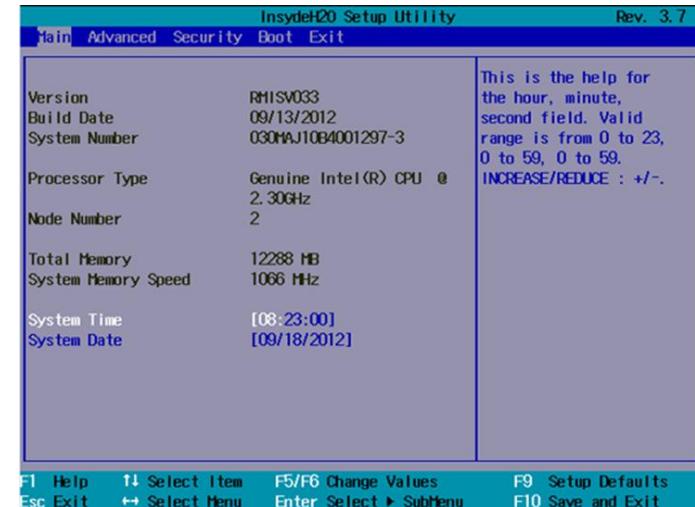


Working Process of the BIOS



CMOS and RTC

- The CMOS is a component that stores BIOS parameters.
 - As the BIOS content increases, many optional setup items are provided to meet the requirements for compatibility between hardware and software.
 - The BIOS provides a user interface to allow users to configure the items and saves the configuration in the CMOS RAM. The RTC battery supplies power to the CMOS RAM to ensure that the content in the CMOS RAM will not be lost after an unexpected device power-off.
- Real-time clock (RTC)
 - The RTC provides a high-precision real-time counter. It is powered by the battery to ensure that the RTC can still count time after the system is powered off.





2. Key Server Components

2.1 CPU Type and Application

2.2 DIMM Type and Application

2.3 Hard Disk Type and Application

2.4 RAID Technology

2.5 PCIe Interfaces and Applications

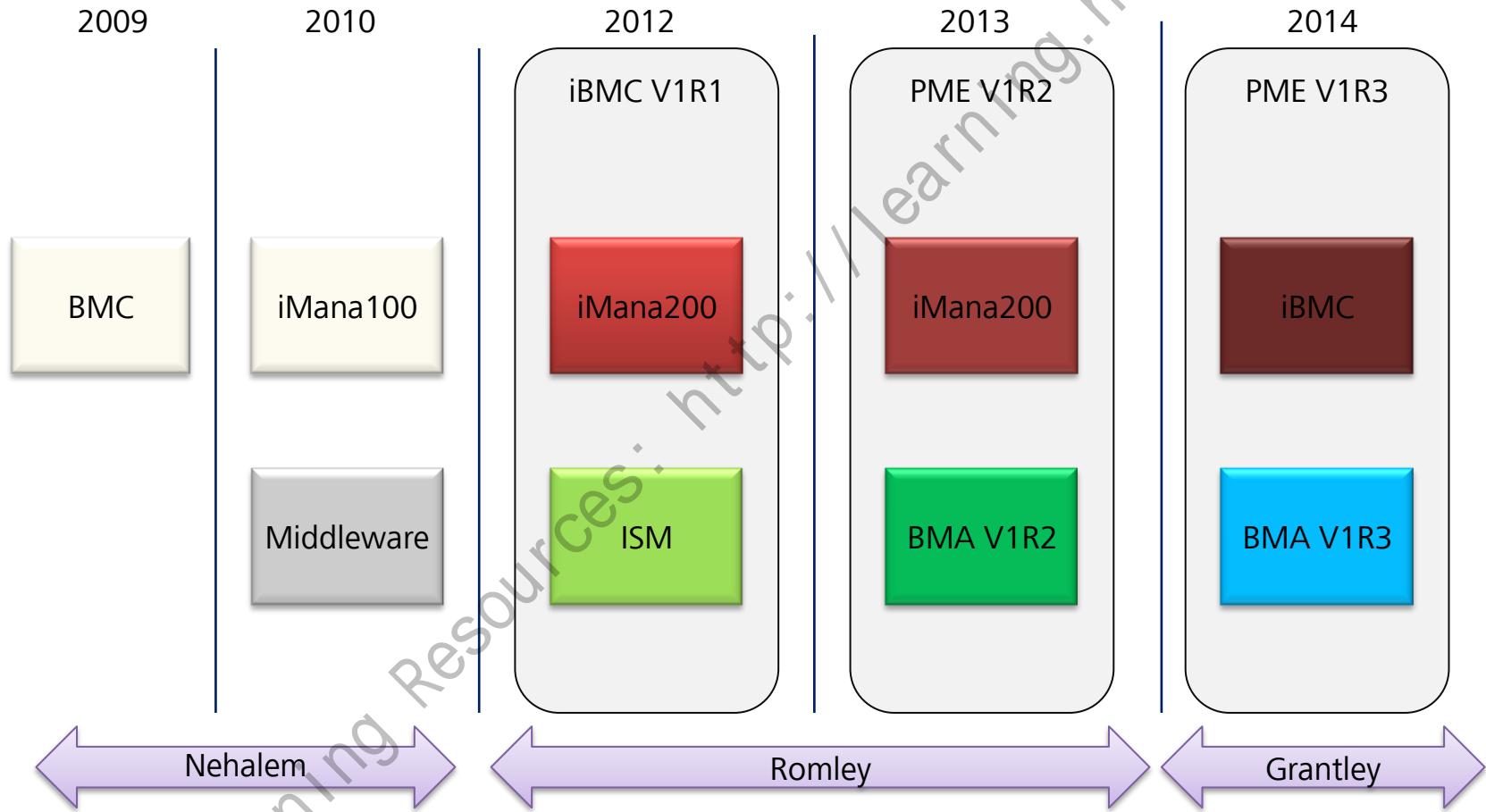
2.6 Functions and Development of BIOS

2.7 Functions and Development of BMC and Chassis Management

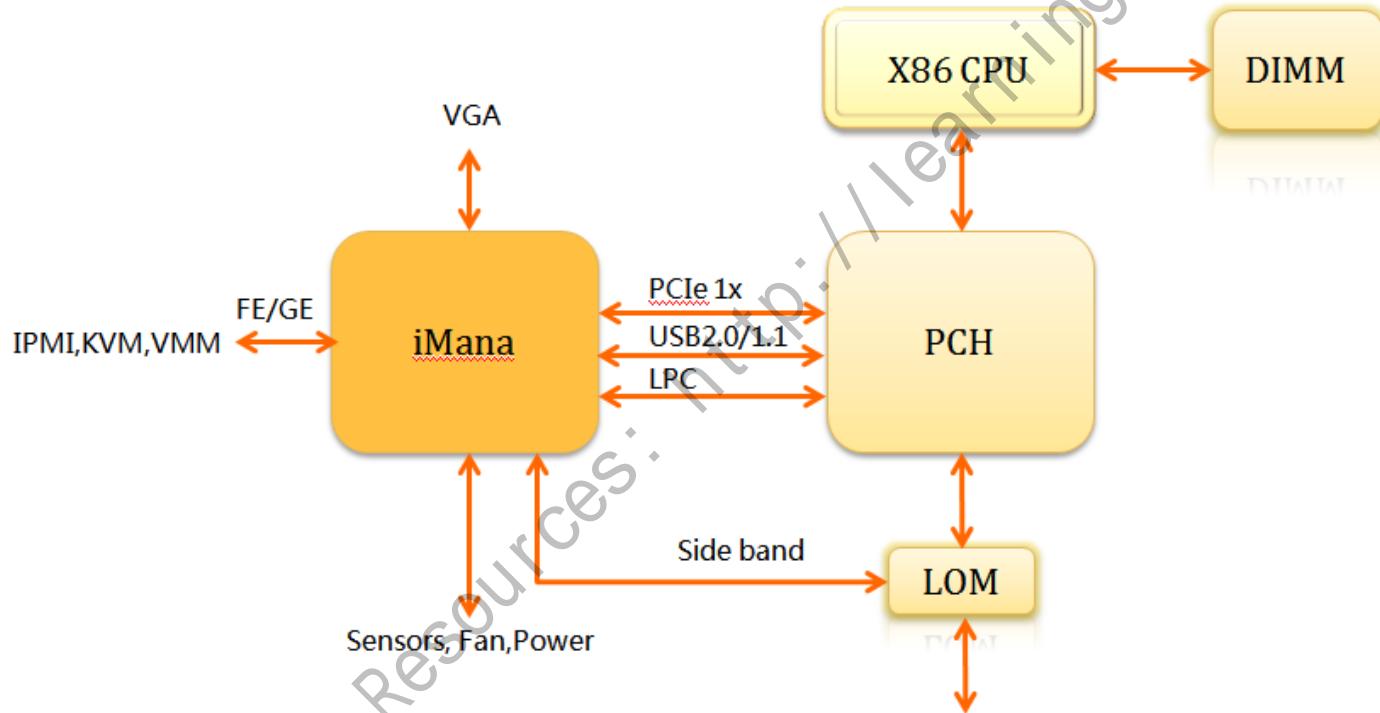
BMC Introduction

The iMana 200 (also known as iBMC in Huawei) is a remote server management system developed by Huawei and Huawei has independent intellectual property rights. The iMana 200 complies with IPMI 2.0 standards and supports various functions, including keyboard, video, and mouse (KVM) redirection, text console redirection, remote virtual media, and hardware monitoring and management.

Management Software Development History

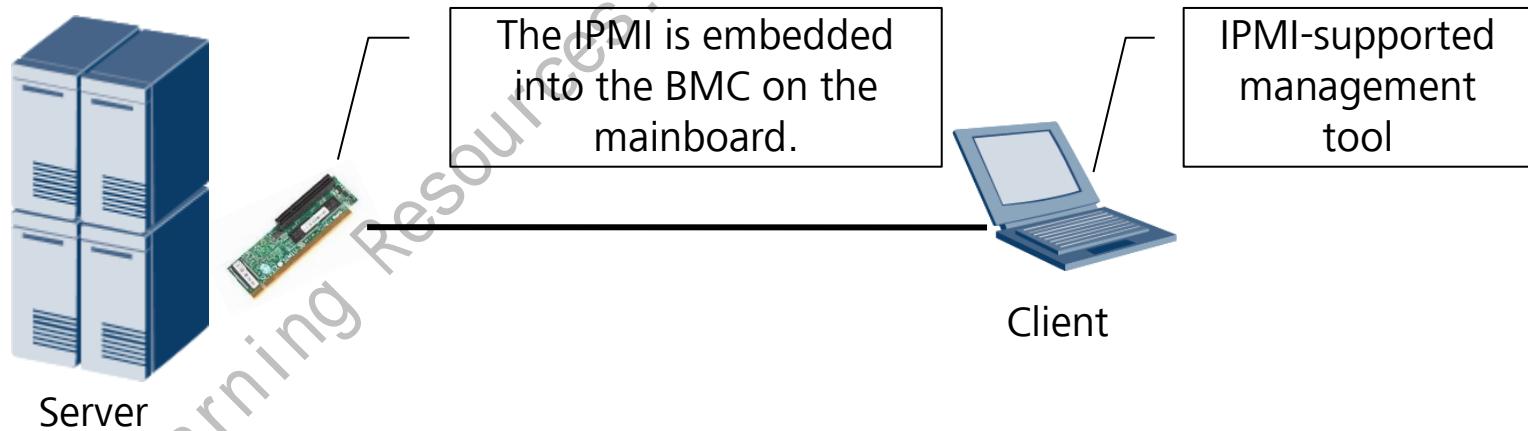


Physical Ports of the BMC

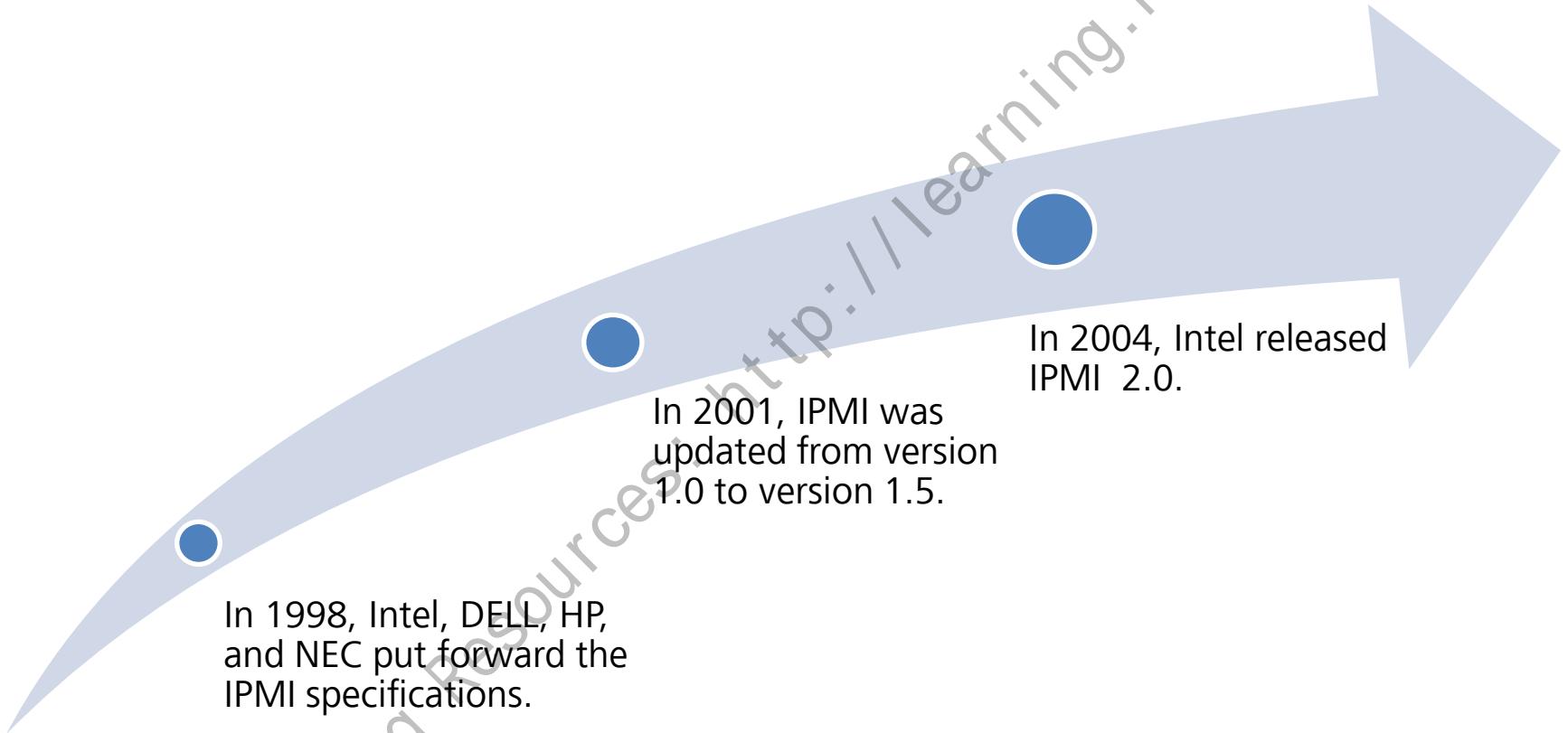


IPMI

- The IPMI is an open-standard hardware management interface specification that defines a specific method for communication of an embedded management subsystem.
- IPMI information is exchanged using the baseboard management controller (BMC). Low-level intelligent hardware management instead of the OS is used for management.



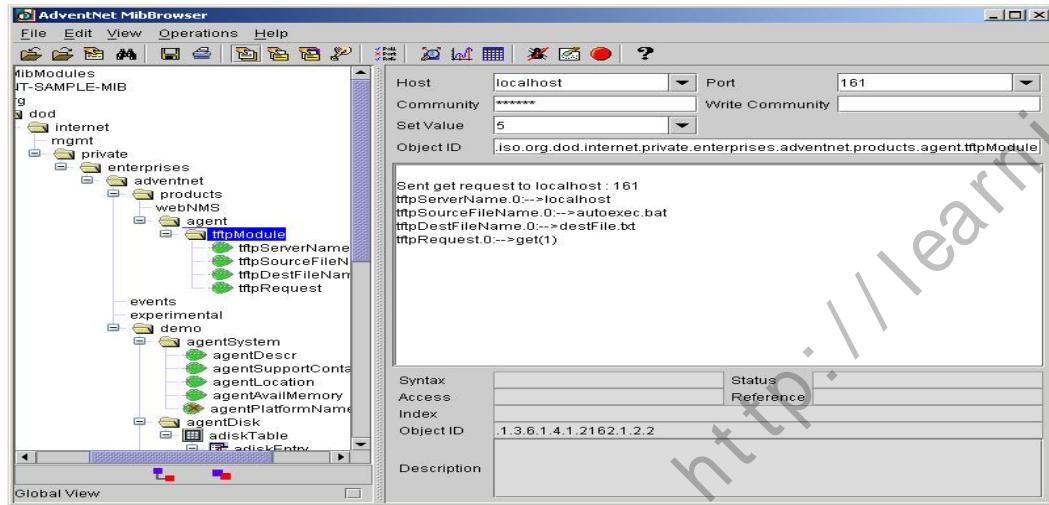
IPMI Development



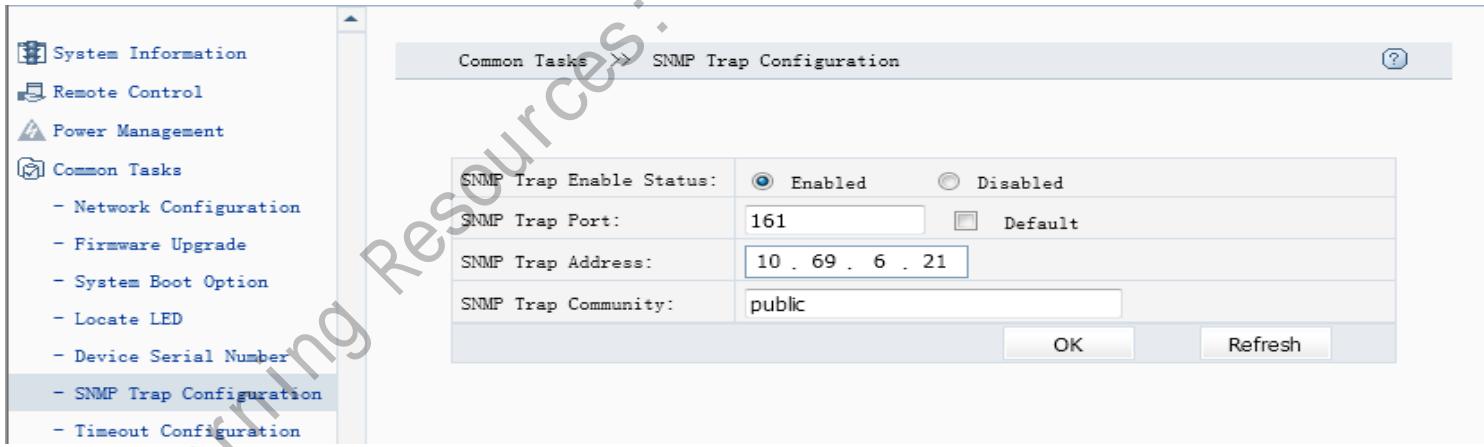
Working Principles of the IPMI

- The BMC is the core of the IPMI.
- The IPMI is independent of the CPU, BIOS, and OS. It is an agent-free management subsystem that runs on the system separately.
- The IPMI provides a standard mode of diagnosis and fault maintenance that is irrelevant to vendors by remotely viewing the boot, OS loader, or emergency management console.
- The enhanced IPMI authentication function secures remote operations.
- The IPMI is not restricted by factors that restrict earlier OS-based management modes.

Management Port (SNMP)



MIB Browser



iBM Software



3. Technologies for Interworking Between Servers and Storage Devices

3.1 Storage-related Network Protocols and Server Access Modes

3.2 Common Networking Types

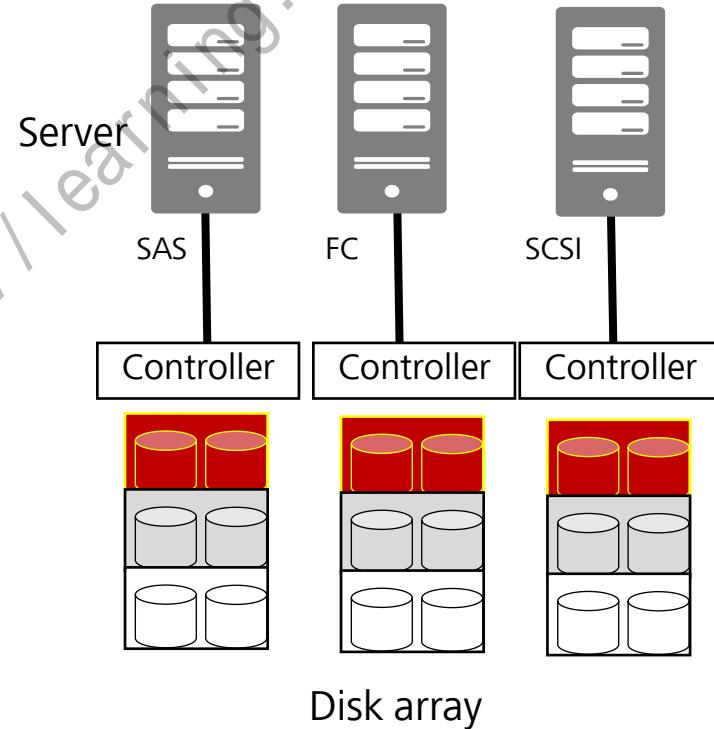
Storage-related Protocols

- Small Computer System Interface (SCSI) protocol
 - SCSI is an interface technology developed for midrange computers and used for connection between hosts and peripheral devices.
- Fiber Channel (FC) protocol
 - FC is used for external connection between servers and shared storage devices, and internal connection between storage controllers and drivers.
- Internet Small Computer Systems Interface (iSCSI) protocol
 - iSCSI is a standard of data block transfer on the TCP/IP. It can also be called SCSI over IP.
- Serial Attached SCSI (SAS) protocol
 - SAS is a serial standard for SCSI bus protocols. It uses the serial technology to improve expansibility and work with SATA disks.

Origin of the DAS

- **Direct attached storage (DAS)**

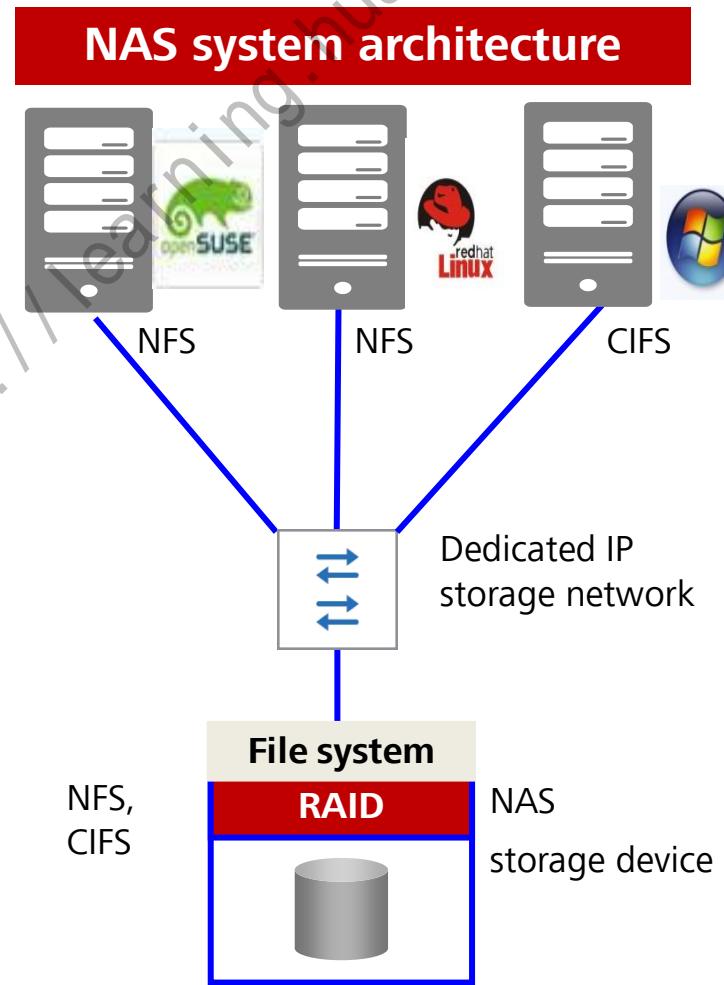
- Time: in the 1970s
- Background: Users have storage requirements because the amount of data increases. Then, the most simple storage architecture, that is, DAS, appeared.
- Connection methods: **FC**, **SCSI**, or **SAS**
- Access mode: In direct connection mode, the connection channels between storage devices and server hosts often use the SCSI.
- Link rate: 20 Mbit/s, 40 Mbit/s, or 80 Mbit/s
- The DAS provides functions such as snapshot and backup.



Origin of the NAS

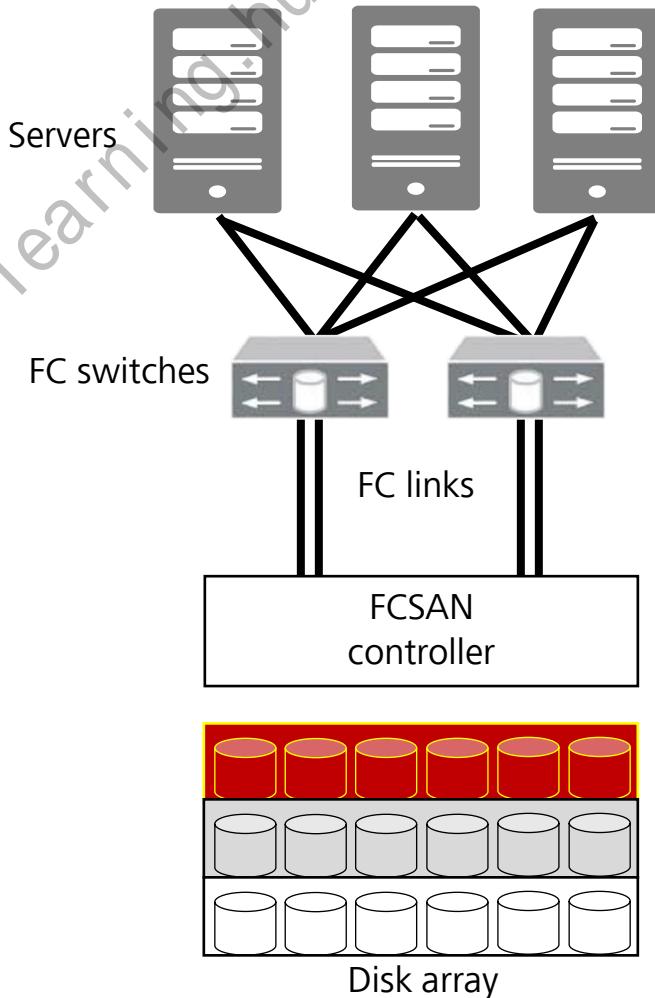
- **Network attached storage (NAS)**

- Time: in the early 1990s
- Background: As the network is developing rapidly, **a large amount of data needs to be shared and exchanged.**
- Dedicated NAS storage devices appeared to function as the core of **data sharing and exchange.**
- Access mode: Multiple front-end servers **share** back-end storage devices. Back-end NAS storage devices share space to front-end hosts using **CIFS** (in a Window system) or **NFS** (in a Linux system). Concurrent read and write **operations** can be performed on the same directory or file.
- **The file system is on back-end storage devices.**
- Link rate: 1 Gbit/s and 10 Gbit/s



Origin of the FCSAN (from the DAS to the FCSAN)

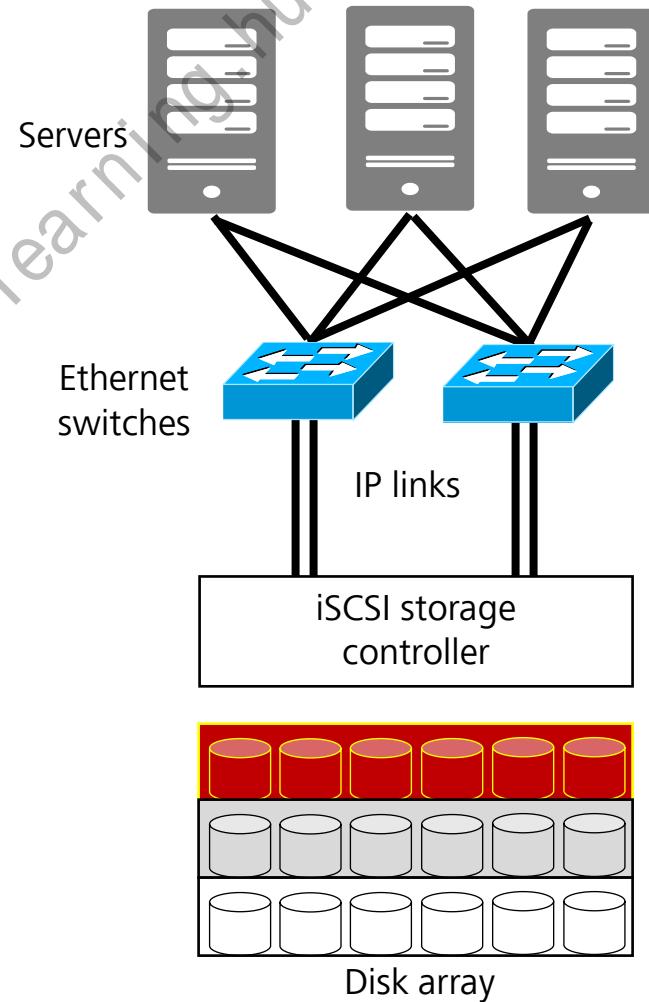
- **Fiber channel storage area network (FCSAN)**
 - Time: in the middle and late 1990s
 - Background: To solve the poor scalability issue of DAS, storage devices are networked to support connection to more than 100 servers.
 - Connection methods: FC optical fiber; dedicated FC switches
 - Access mode: The storage space on the back-end storage device can be divided into multiple LUNs. Each LUN belongs to only one front-end server.
 - Link rate: 2 Gbit/s and 4 Gbit/s
 - The FCSAN provides advanced data protection functions, such as snapshot and disaster recovery.



Origin of the IPSAN (from the FCSAN to the IPSAN)

- **IP storage area network (IPSAN)**

- Time: in 2001
- Background: IPSAN is designed to solve the **price and management** issues of the FCSAN.
- Connection methods: The **Ethernet** is used to connect links and **Ethernet switches** are used.
- Access mode: The storage space on the back-end storage device can be divided into multiple **LUNs**.
Each LUN belongs to only one front-end server.
- Link rate: **1 Gbit/s** and **10 Gbit/s**
- The IPSAN provides advanced data protection functions, such as snapshot and disaster recovery.
- iSCSI is recommended because of:
 - Mature IP network management tools and infrastructure can be used.
 - IP networks are widely used, which can reduce a large number of construction, management, and personnel costs.





3. Technologies for Interworking Between Servers and Storage Devices

3.1 Storage-related Network Protocols and Server Access Modes

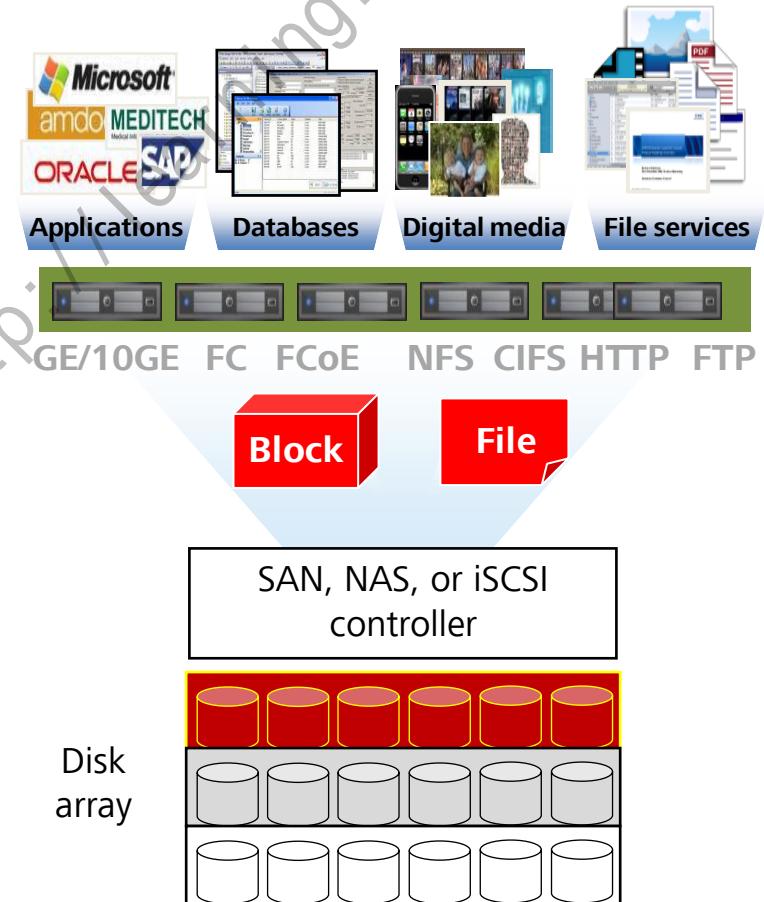
3.2 Common Networking Types

Comparison Between Storage Networking Types

Items	DAS	NAS	SAN	
			FCSAN	IPSAN
Transmission type	SCSI, FC, and SAS	IP	FC	IP
Data type	Block	File	Block	Block
Typical applications	Any	File server	Database applications	Video surveillance
Advantages	Easy to understand Compatibility	Easy to install Low costs	High performance and scalability High availability	High scalability Low costs
Disadvantages	Difficult to manage and limited scalability Low storage space usage	Low performance Unsuitable for certain applications	Expensive and difficult to configure Interoperability problem	Low performance

Combination of NAS and SAN - Unified Storage

- Unified storage: A network storage architecture, which supports both **file-based NAS** storage and **block-based SAN storage**.



Comparison Between Major Storage Protocols

Items	SCSI	FC	iSCSI
Interface technology	SCSI	Fiber channel	IP
Interface type	Parallel	Serial	Serial
Adapter	SCSI card	FC HBA	iSCSI HBA or Ethernet network adapter
Maximum rate	320 Mbit/s	4/8 Gbit/s	1/10 Gbit/s
Management	Simple	Complex	Simple
Compatibility	Good	Poor	Good
Advantages	Independence from hosts Concurrent processing of multiple devices and high bandwidth	High bandwidth, low delay, and long transmission distance	High reliability, high scalability, easy management, standard, no limit on distance, and wide-area storage
Disadvantages	A small number of devices that can be connected and short transmission distance; only one I/O controller, which imposes a risk of single-point faults	High costs, lack of unified standards, and a limited transmission distance	



4. Technologies for Interworking Between Servers and Networks

4.1 Ethernet Protocols

4.2 NIC Bonding

Ethernet Introduction

- Ethernet is a baseband LAN technology developed by Xerox. It uses coaxial cables as the network media and uses the carrier sense multiple access with collision detection (CSMA/CD) mechanism. The data transmission rate reaches 10 Mbit/s.
- Ethernet was designed to meet non-continuous network data transmission requirements, and IEEE 802.3 was formulated based on the original Ethernet technology in 1980. Later, Digital Equipment Corporation, Intel, and Xerox developed Ethernet Version II to be compatible with IEEE 802.3.

Comparison Between Ethernet Networks

Category	Description	Standard
Fast Ethernet (100 Mbit/s)	The fast Ethernet is a high-speed LAN technology. The data transmission rate is 100 Mbit/s. It provides higher network bandwidth for desktop users and servers or server clusters.	IEEE 802.3u
Gigabit Ethernet (GE)	Gigabit Ethernet is an extension of the IEEE 802.3 Ethernet standard. The transmission rate increases by 9 times from 100 Mbit/s in the Ethernet protocol, reaching 1 Gbit/s.	IEEE802.3z (for optical fibers and copper cables) and IEEE802.3ab (for twisted pair cable)
10GE	10GE networks are being deployed and are expected to be deployed on a large scale in the future. New concepts emerged, such as physical Medium Dependent sublayer (PDM). Only optical fibers can be used as network cables, and only the full-duplex mode is supported.	IEEE 802.3ae

MAC Address of the Ethernet

00e0.fc39.8034

1. A MAC address consists of 48 bits and is generally expressed in 12-bit dotted hexadecimal notation.
2. A MAC address is globally unique. The IEEE assigns and manages MAC addresses. Each address consists of two parts, namely, manufacturer identifier (the first 24 bits) and sequence number (the following 24 bits).
3. If each bit of the 48 bits is set to 1, the address is a broadcast address.
4. If the least significant bit of the most significant byte is set to 1, the address is a multicast address.

Do you know why an IP address is not made into a fixed address just like a MAC address?

000000001	10111011	00111010	10111010	10111110	10101000
-----------	----------	----------	----------	----------	----------



The least significant bit is set to 1, indicating a multicast address.

MAC Address of the Ethernet

00e0.fc39.8034

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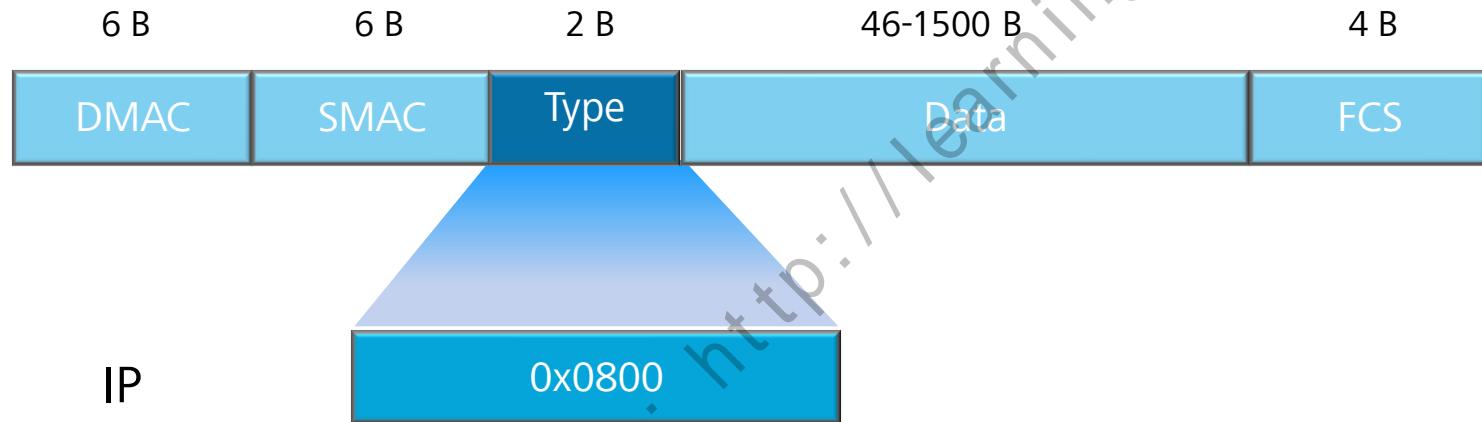
Do you know why an IP address is not made into a fixed address just like a MAC address?

000000001	10111011	00111010	10111010	10111110	10101000
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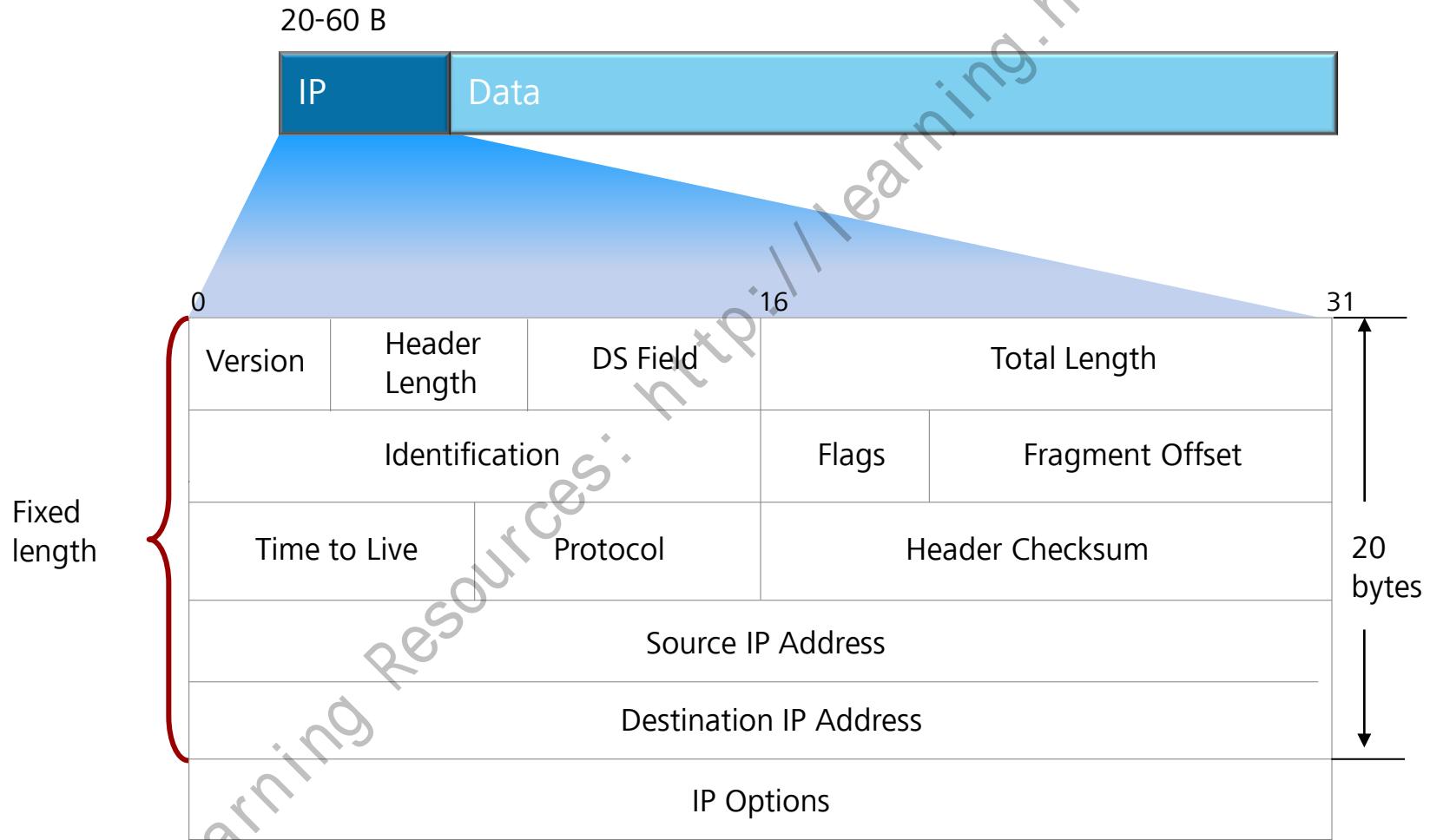
The least significant bit is set to 1, indicating a multicast address.

Upper-Level Protocol Type



- If the value of the Type field in the Ethernet frame is 0x0800, the network-layer protocol of the frame is the IP protocol.

IP Header



IP Addressing



- An IP address consists of a network ID and a host ID.
- An IP address is a 32-bit number, usually expressed in dotted decimal notation.

IP Addressing

Network address

Network ID	Host ID
192.168.1	.0
11000000.10101000.00000001	.00000000

Broadcast address

Network ID	Host ID
192.168.1	.255
11000000.10101000.00000001	11111111

IP Address Classes

0.0.0.0–127.255.255.255

Class A 0 Network ID (8 bits) Host ID (24 bits)

128.0.0.0–191.255.255.255

Class B 10 Network ID (16 bits) Host ID (16 bits)

192.0.0.0–223.255.255.255

Class C 110 Network ID (24 bits) Host ID (8 bits)

224.0.0.0–239.255.255.255

Class D 1110 Multicast

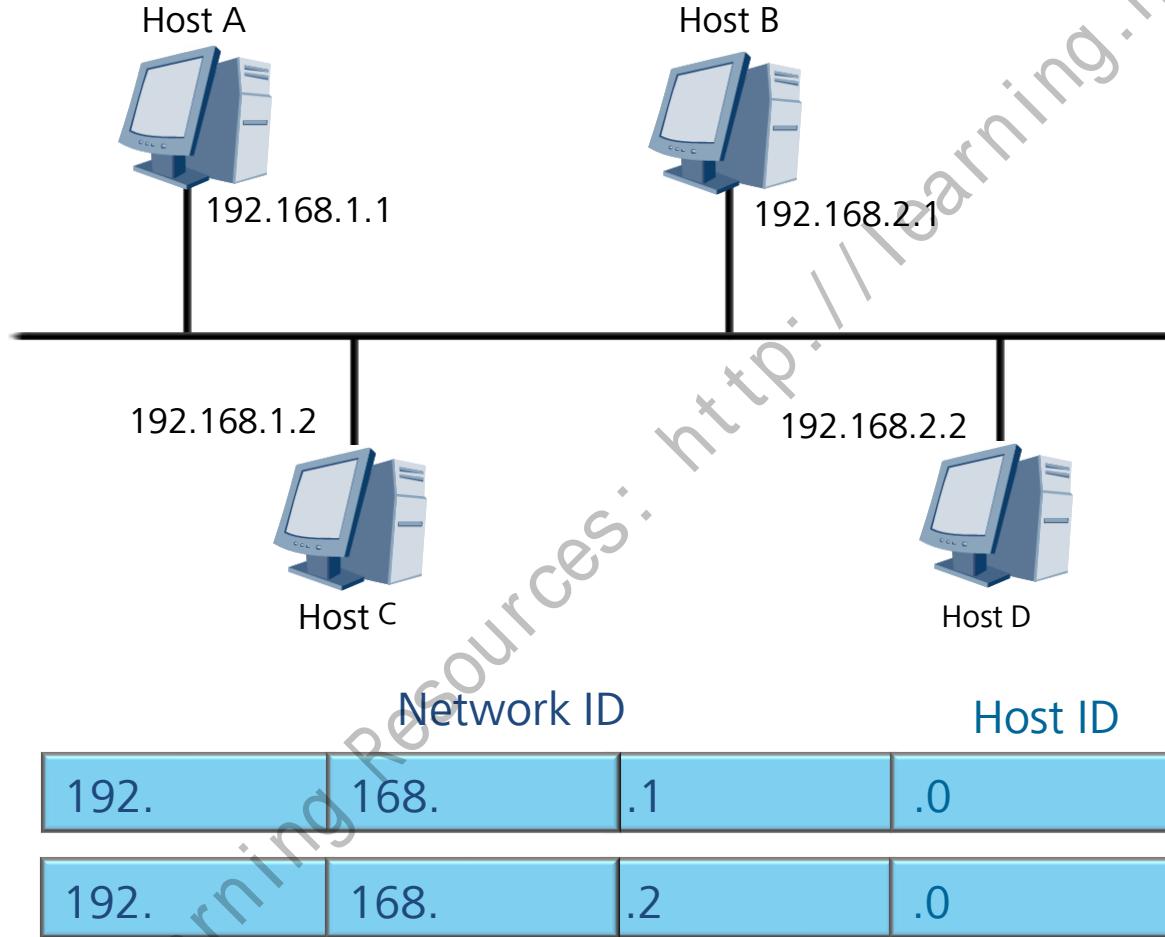
240.0.0.0–255.255.255.255

Class E 1111 Reserved

IP Address Types

- Private IP addresses
 - 10.0.0.0–10.255.255.255
 - 172.16.0.0–172.31.255.255
 - 192.168.0.0–192.168.255.255
- Special IP addresses
 - 127.0.0.0–127.255.255.255
 - 0.0.0.0
 - 255.255.255.255

Network Communications



Subnet Mask

Network ID	Host ID
192.168.1	.0
11000000.10101000.00000001	.00000000

Subnet mask	
255.255.255	.0
11111111.11111111.11111111	.00000000

Default Subnet Mask

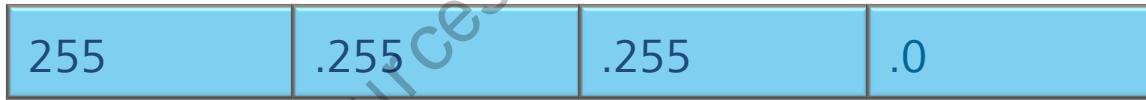
Class A



Class B



Class C



IP Address Planning

IP address	192	.168	.1	.7
Subnet mask	255	.255	.255	.0
	11000000	10101000	00000001	00000111
	11111111	11111111	11111111	00000000
Network address (binary)	11000000	10101000	00000001	00000000
Network address	192	.168	.1	.0
Number of hosts: 2^n	256			
Number of available hosts: $2^n - 2$	254			

IP Address Planning Example

IP address



Subnet mask



Network address



Number of hosts: 2^n

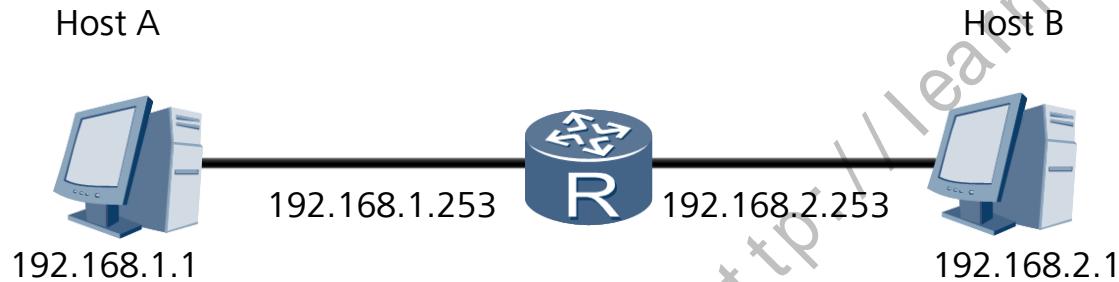


Number of available hosts:
 $2^n - 2$



- Based on the IP address and subnet mask provided, calculate the number of host addresses in the network and the number of available host IP addresses.

Gateway



- A gateway is used to forward data packets between different network segments.



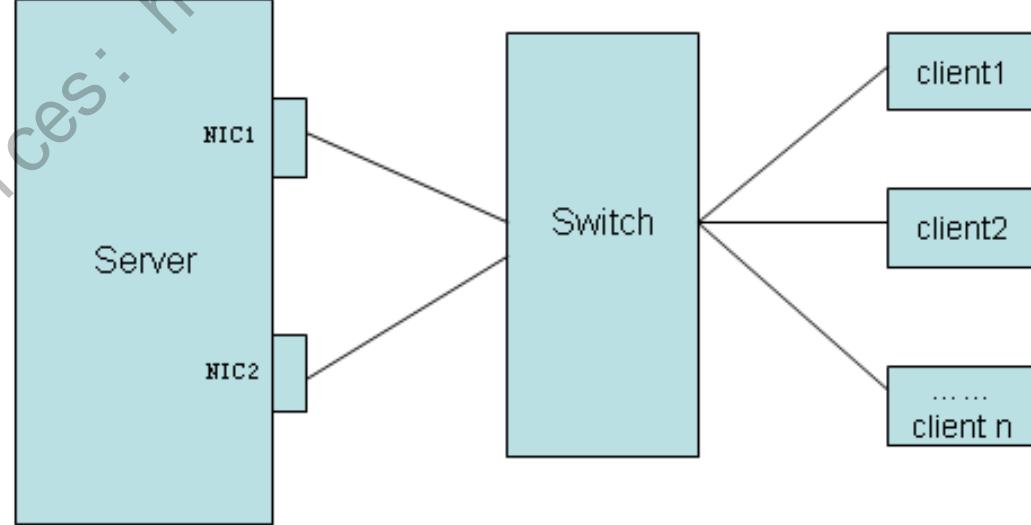
4. Technologies for Interworking Between Servers and Networks

4.1 Ethernet Protocols

4.2 NIC Bonding

Ethernet Networking Application - NIC Bonding

- Server high availability (HA) is essential for enterprise-level IT environment. Network connection HA is especially important for servers. The network interface card (NIC) bonding technology helps ensure network connection HA and enhance network performance for servers.
- NIC bonding provides the following two functions:
 - Redundancy
 - Load balancing



NIC Bonding Modes

- The Bonding driver provides **seven** load balancing modes.
 - balance-rr or 0
 - active-backup or 1
 - balance-xor or 2
 - broadcast or 3
 - 802.3ad or 4
 - balance-tlb or 5
 - balance-alb or 6

NIC Bonding Modes (Continued)

- The Bonding driver provides **seven** load balancing modes.
 - balance-rr or 0
 - active-backup or 1
 - balance-xor or 2
 - broadcast or 3
 - 802.3ad or 4
 - balance-tlb or 5
 - balance-alb or 6



Summary

- Basic Concept of Server
- Key Server Components
- Technologies for Interworking Between Servers and Storage Devices
- Technologies for Interworking Between Servers and Networks

Thank you

[www.huawei.com](http://learning.huawei.com)

Huawei RH Series Rack Servers

[www.huawei.com](http://learning.huawei.com)





Objectives

- Upon completion of this course, you will be proficient in:
 - RH series servers
 - Installation of key components for RH series servers



Contents

- **RH Series Server Overview and Positioning**
- RH Series Server Description
- RH Series Server Applications

Huawei Rack Server Family

1U 2-socket server



RH1288 V2

FusionServer

RH1288 V3

2U 2-socket server



RH2285 V2

RH2288 V2

RH2285H V2

RH2288H V2

RH2288E V2

FusionServer

RH2288 V3

RH2285 V3

2U 4-socket server



RH2485 V2

4U 4-socket server



RH5885 V2-4-socket

FusionServer

RH5885 V3

RH5885H V3

5288 V3

8U 8-socket server



RH5885 V2-8-

socket

FusionServer

RH8100 V3

Huawei Rack Server Series



RH1288 V3
(E5-2600 v3)



RH1288 V2
(E5-2600 v2)



RH1288A V2
(E5-2600 v2)



RH2288 V3
(E5-2600 v3)



RH2288H V3
(E5-2600 v3)



RH2288A V2
(E5-2600 v2)



RH2288H V2
(E5-2600 v2)



5288 V3
(E5-2600 v3)



RH2485 V2
(E5-4600 v2)



RH5885H V3
RH5885 V3
(E7-4800 v2)



RH8100 V3
(E7-8800 v2)

**1U2P
server**

**2U2P
server**

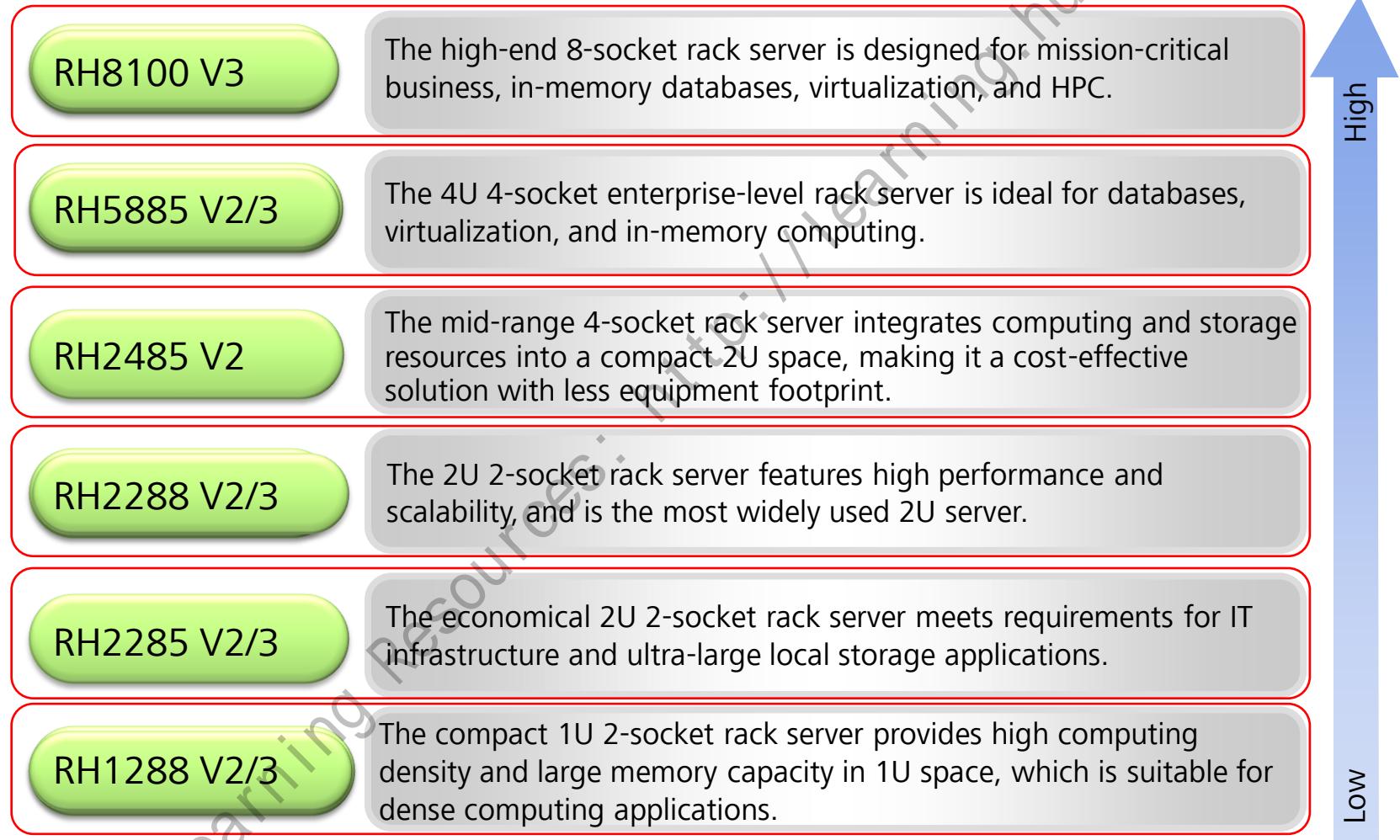
**4U2P
server**

**2U4P
server**

**4U4P
server**

**8U8P
server**

Server Positioning

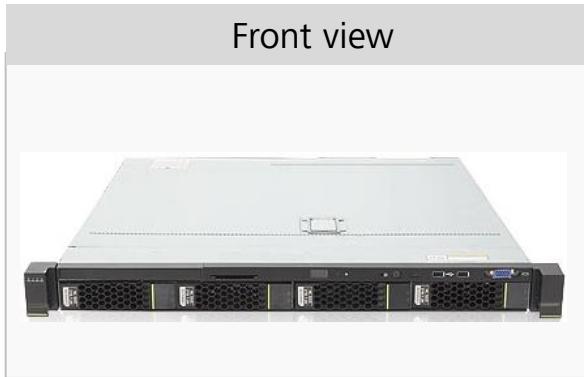




Contents

- RH Series Server Overview and Positioning
- **RH Series Server Description**
 - **RHx2xx(H) V3**
 - 5288 V3
 - RH5885 V3
 - RH8100 V3
- RH Series Server Applications

RH1288 V3 Technical Specifications



Form factor	1U 2-socket rack server
Number of processors	1 or 2
Processor	Intel Xeon E5-2600 v3 series processors
Memory	16 DDR4 RDIMMs/LRDIMMs
Internal storage	8 x 2.5-inch SAS/SATA HDDs or SSDs, or 4 x 3.5-inch SAS/SATA HDDs Flash storage: dual SATA DOMs and dual SD cards
RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 2 GB RAID cache Optional iBBU or supercapacitor RAID state migration, configuration memory, self-diagnosis, and web-based remote configuration
PCIe expansion	Up to 3 PCIe slots
LOM network port	2 or 4 x GE ports, or 2 x 10GE ports
PSU	2 hot-swappable PSUs in 1+1 redundancy mode: <ul style="list-style-type: none">• 460 W/750 W AC/DC PSUs• 800 W -48 V DC PSUs• 1200 W HV DC PSUs
Fan module	5 hot-swappable fan modules in N+1 redundancy mode
Operating temperature	5° C–40° C (41° F–104° F)
Dimensions (H x W x D)	Chassis with 3.5-inch hard disks: 447 mm x 750 mm x 43.6 mm (17.60 in. x 29.53 in. x 1.72 in.) Chassis with 2.5-inch hard disks: 447 mm x 710 mm x 43.6 mm (17.60 in. x 27.95 in. x 1.72 in.)

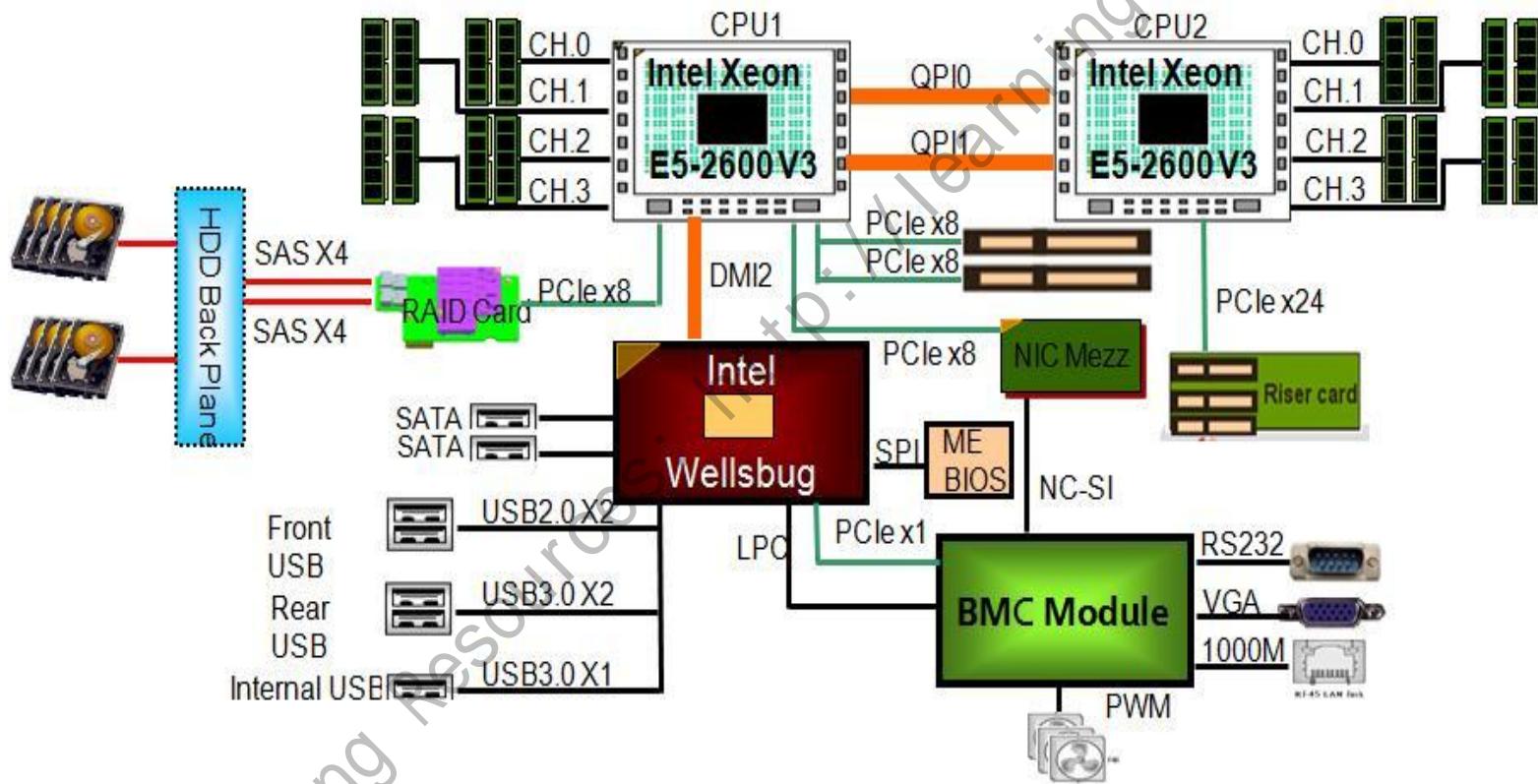
RH2288 V3 Technical Specifications

Front view		Form factor	2U 2-socket rack server
Number of processors	1 or 2	Processor	Intel Xeon E5-2600 v3 series processors
Memory	16 DDR4 RDIMMs/LRDIMMs	Internal storage	8 or 25 x 2.5-inch SAS/SATA HDDs or SSDs, or 10 or 12 x 3.5-inch SATA HDDs Built-in flash storage: dual SATA DOMs and dual SD cards
RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 2 GB RAID cache Optional iBBU or supercapacitor RAID state migration, configuration memory, self-diagnosis, and web-based remote configuration	PCIe expansion	Up to 7 PCIe slots
LOM network port	2 or 4 x GE electrical ports, supporting NC-SI, WOL, and PXE 2 x 10GE optical ports, supporting NC-SI and PXE 2 x 10GE electrical ports, supporting NC-SI, WOL, and PXE	PSU	2 hot-swappable PSUs in 1+1 redundancy mode
Fan module	4 hot-swappable fan modules in N+1 redundancy mode	Operating temperature	5° C–40° C (41° F–104° F)
Dimensions (H x W x D)	Chassis with 3.5-inch hard disks: 447 mm x 748 mm x 86.1 mm (2U) (17.60 in. x 29.45 in. x 3.39 in.) Chassis with 2.5-inch hard disks: 447 mm x 708 mm x 86.1 mm (2U) (17.60 in. x 27.87 in. x 3.39 in.)		

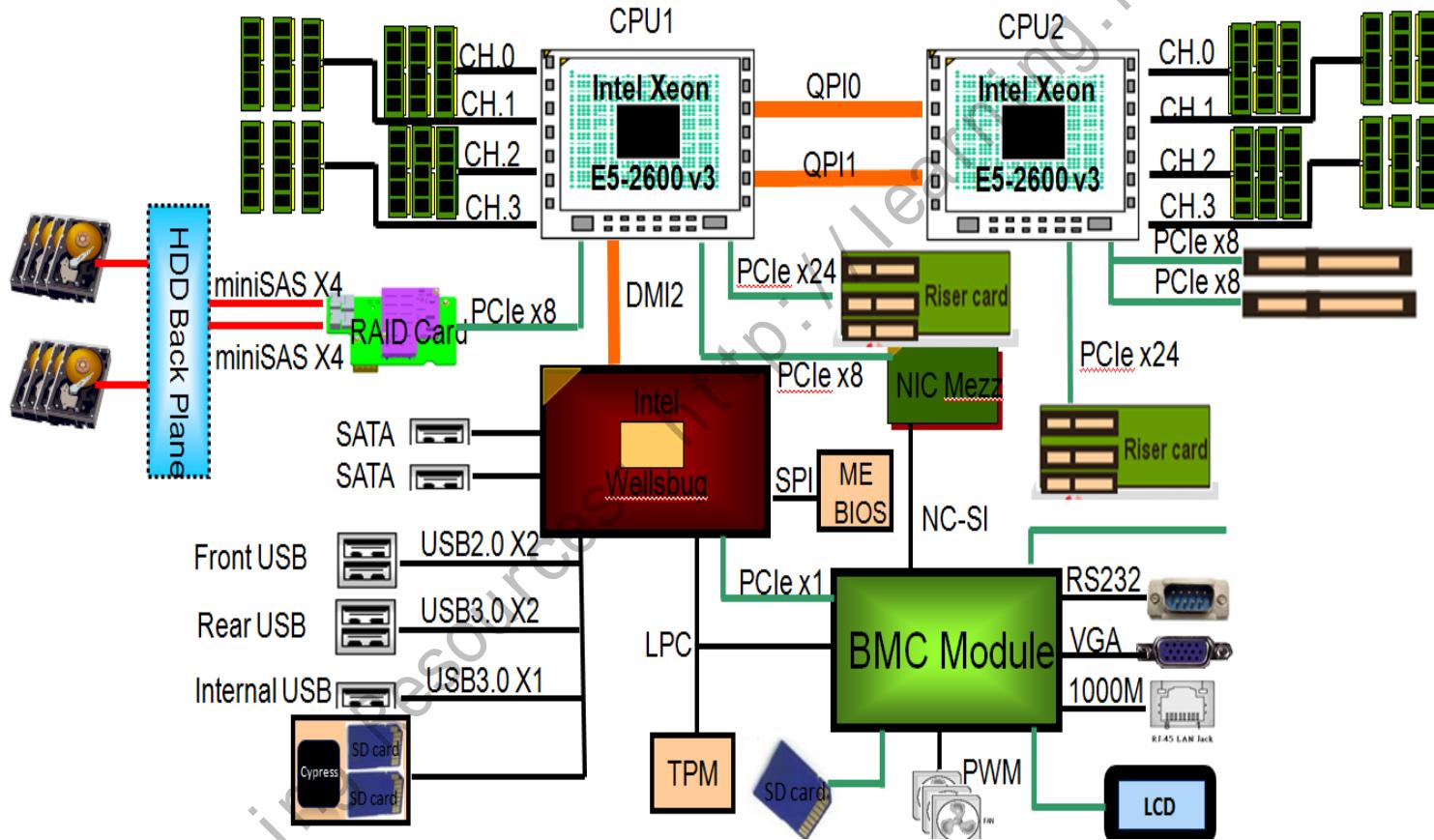
RH2288H V3 Technical Specifications

Front view	Form factor	2U 2-socket rack server
	Number of processors	1 or 2
	Processor	Intel Xeon E5-2600 v3 series processors
	Memory	24 DDR4 RDIMMs/LRDIMMs
	Internal storage	8 or 25 x 2.5-inch SAS/SATA HDDs or SSDs, or 10 or 12 x 3.5-inch SATA HDDs Built-in flash storage: dual SATA DOMs and dual SD cards
	RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 2 GB RAID cache Optional iBBU or supercapacitor RAID state migration, configuration memory, self-diagnosis, and web-based remote configuration
	PCIe expansion	Up to 9 PCIe slots
	LOM network port	2 or 4 x GE electrical ports, supporting NC-SI, WOL, and PXE 2 x 10GE optical ports, supporting NC-SI and PXE 2 x 10GE electrical ports, supporting NC-SI, WOL, and PXE
	PSU	2 hot-swappable PSUs in 1+1 redundancy mode
	Fan module	4 hot-swappable fan modules in N+1 redundancy mode
	Operating temperature	5° C–40° C (41° F–104° F)
	Dimensions (H x W x D)	Chassis with 3.5-inch hard disks: 447 mm x 748 mm x 86.1 mm (2U) (17.60 in. x 29.45 in. x 3.39 in.) Chassis with 2.5-inch hard disks: 447 mm x 708 mm x 86.1 mm (2U) (17.60 in. x 27.87 in. x 3.39 in.)

RH2288 V3 Logical Architecture



RH2288H V3 Logical Architecture



RH2288 V3/RH2288H V3 Front View

- The RH2288 V3 supports five types of hard disk configurations:



8 x 2.5-inch hard disks



24 x 2.5-inch hard disks



25 x 2.5-inch hard disks

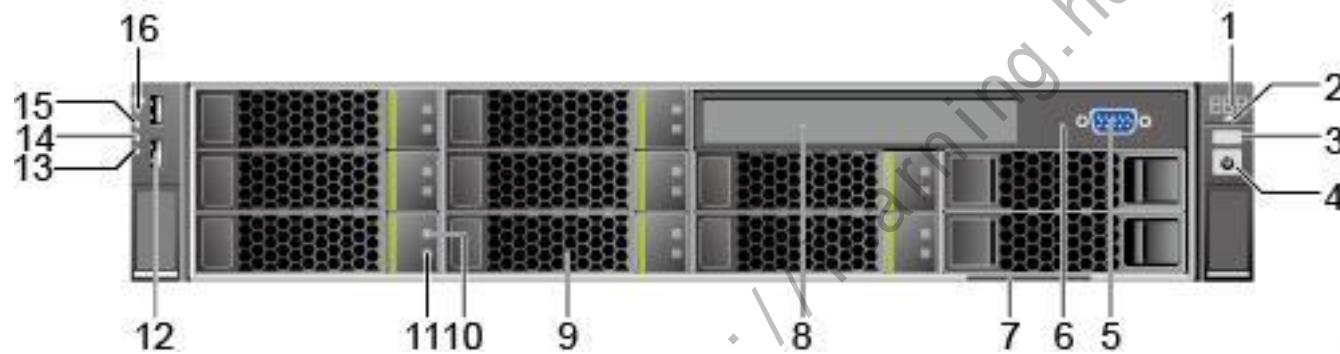
12 x 3.5-inch hard disks



10 x 3.5-inch hard disks

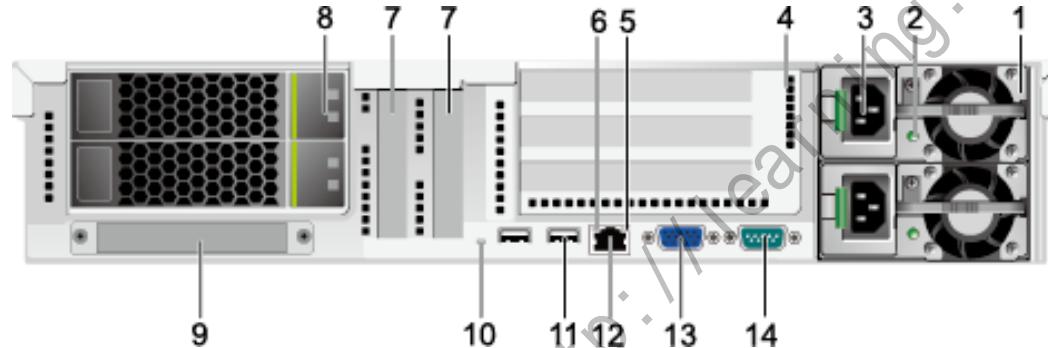


Front View of the RH2288 V3 with 12 Hard Disks



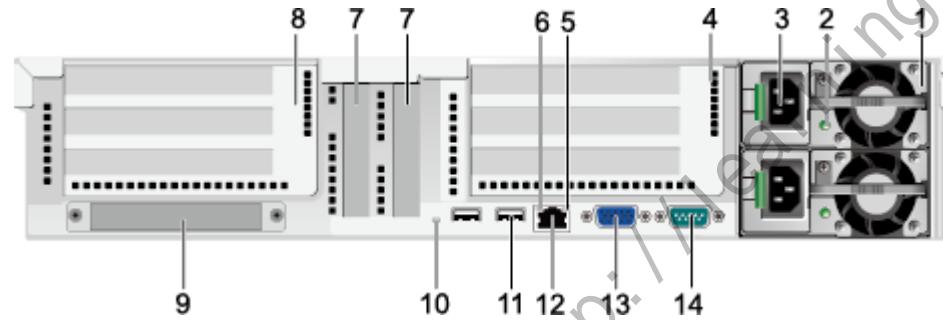
1	Fault diagnosis LED	2	Health status indicator
3	UID button/indicator	4	Power button/indicator
5	VGA port	6	NMI button
7	Customer information label	8	Built-in DVD-ROM drive
9	Hard disks (slots numbered 0 to 7 from top to bottom and from left to right)	10	Hard disk active indicator
11	Hard disk fault indicator	12	USB 2.0 port
13	Ethernet port indicator 4	14	Ethernet port indicator 3
15	Ethernet port indicator 2	16	Ethernet port indicator 1

Rear panel of the RH2288 V3



1	PSU	2	PSU indicator
3	Power socket of a PSU	4	I/O module 2
5	Connection status indicator	6	Data transmission status indicator
7	Onboard standard PCIe slot	8	I/O module 1
9	I/O NIC	10	UID indicator
11	USB 3.0 port	12	Management network port (Mgmt)
13	VGA port	14	Serial port

Rear view of an RH2288H V3



1	PSU	2	PSU indicator
3	Power socket of a PSU	4	I/O module 2
5	Connection status indicator	6	Data transmission status indicator
7	Onboard standard PCIe slot	8	I/O module 1
9	NIC	10	UID indicator
11	USB 3.0 port	12	Management network port (Mgmt)
13	VGA port	14	Serial port

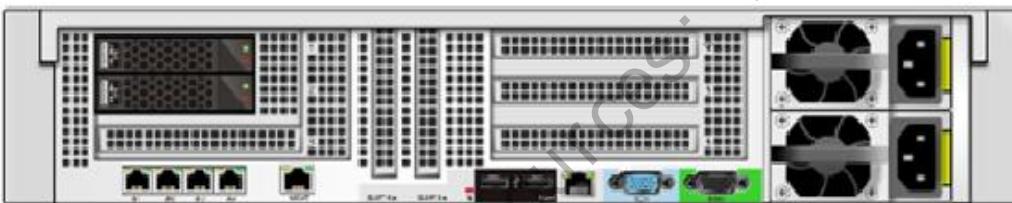
RH2288 V3/RH2288H V3 Rear View



8 or 10 x front hard disks

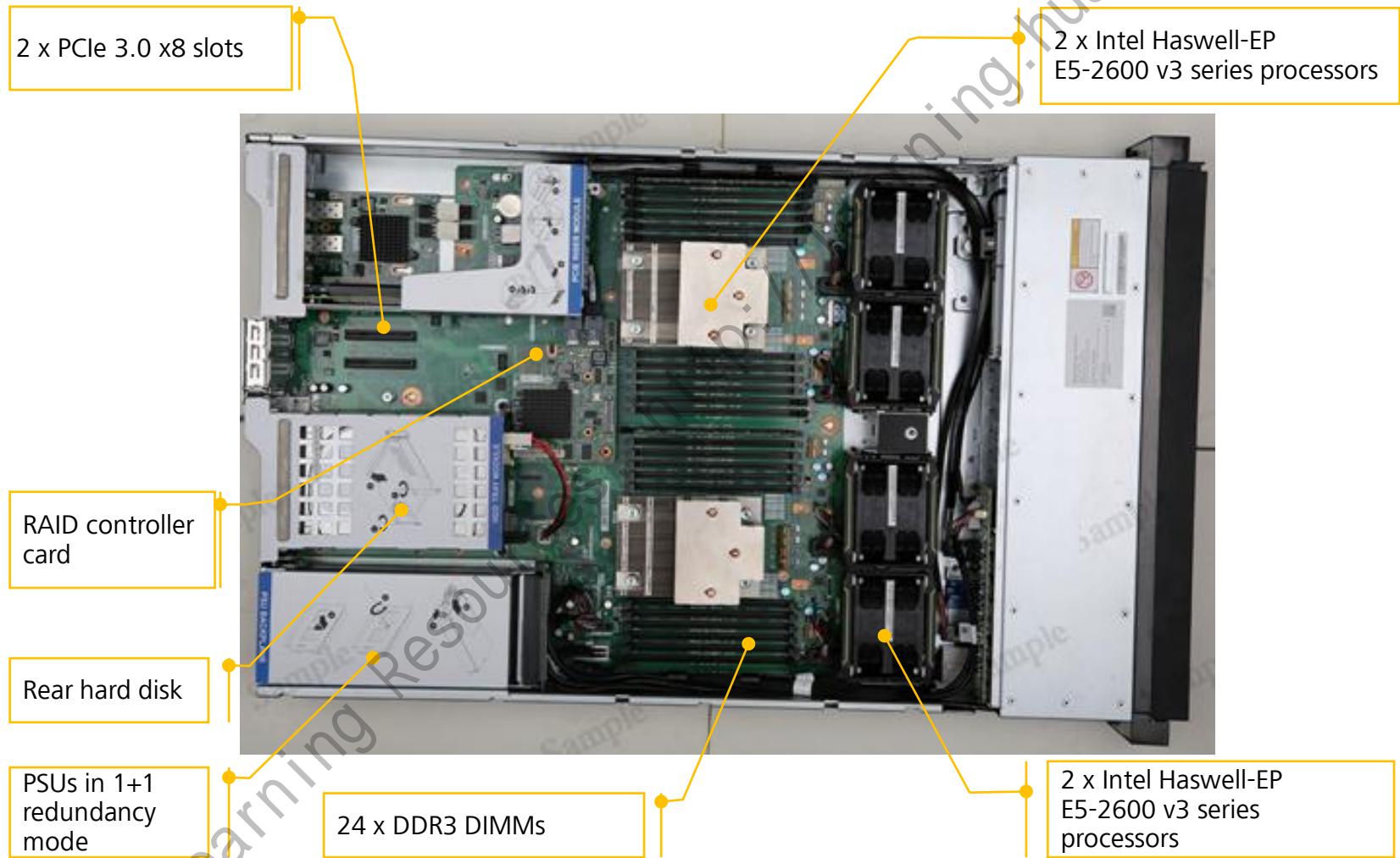


12 or 24 x front hard disks



25 x front hard disks

RH2288H V3 Internal Structure



Specification Comparison Among Three Rack Servers

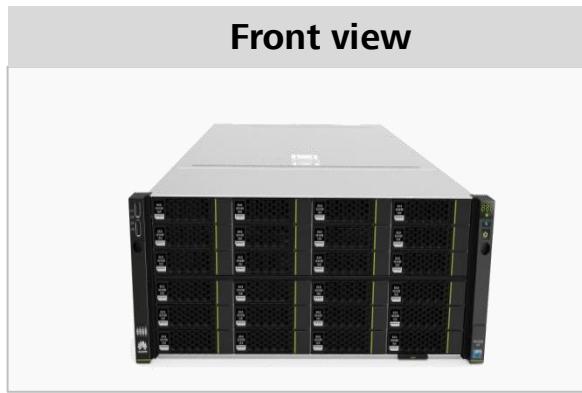
Server Type	RH1288 V3	RH2288 V3	RH2288H V3
CPU Slots	2 x E5-2600 v3	2 x E5-2600 v3	2 x E5-2600 v3
DIMM Slots	16	16	24
HDD Configuration	8 x 2.5" HDDs or 4 x 3.5" HDDs	12*3.5SATA/SAS+4*3.5/4*2.5 SATA/SAS or 25*2.5SATA/SAS+3*3.5/3*2.5 SATA/SAS or 8 x 2.5" HDDs or 10 x 3.5" HDDs	12*3.5SATA/SAS+4*3.5/4*2.5 SATA/SAS or 25*2.5SATA/SAS+3*3.5/3*2.5 SATA/SAS or 8 x 2.5" HDDs or 10 x 3.5" HDDs
Networking on board	2 x GE or 4 x GE or 2 x 10GE	2 x GE or 4 x GE or 2 x 10GE	2 x GE or 4 x GE or 2 x 10GE
USB Ports	5(2 front, 2 back, 1 internal)	5(2 front, 2 back, 1 internal)	5(2 front, 2 back, 1 internal)
PCIe Slots	3 PCIe 3.0	7 PCIe 3.0(1 PCIe x8 FHHL ,1 PCIe x8, 2 PCIe x8 FHFL, 2 lowprofile x8, 1 for RAID)	9 PCIe 3.0(4 PCIe x8 FHFL or 2 PCIe x16 FHFL, 2 PCIe x8 FHHL, 2 lowprofile x8, 1 for RAID)
System Management	Support for vMedia, KVM, and SOL;Compatible with IPMI 2.0, SNMP, and IPv6;Support for Huawei eSight and third-party management software	Support for vMedia, KVM, and SOL;Compatible with IPMI 2.0, SNMP, and IPv6;Support for Huawei eSight and third-party management software	Support for vMedia, KVM, and SOL;Compatible with IPMI 2.0, SNMP, and IPv6;Support for Huawei eSight and third-party management software



Contents

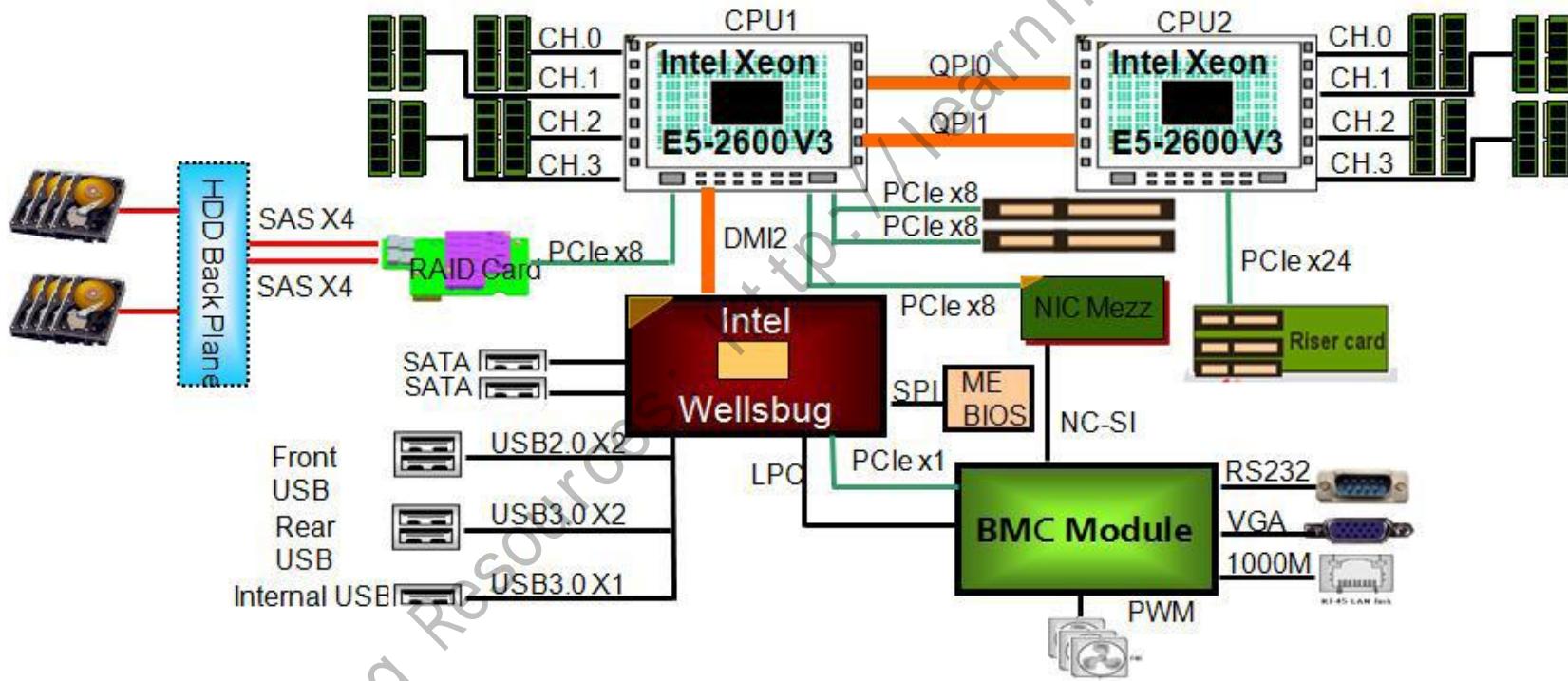
- RH Series Server Overview and Positioning
- **RH Series Server Description**
 - RHx2xx(H) V3
 - **5288 V3**
 - RH5885 V2
 - RH5885 V3
 - RH8100 V3
- RH Series Server Applications

5288 V3 Technical Specifications

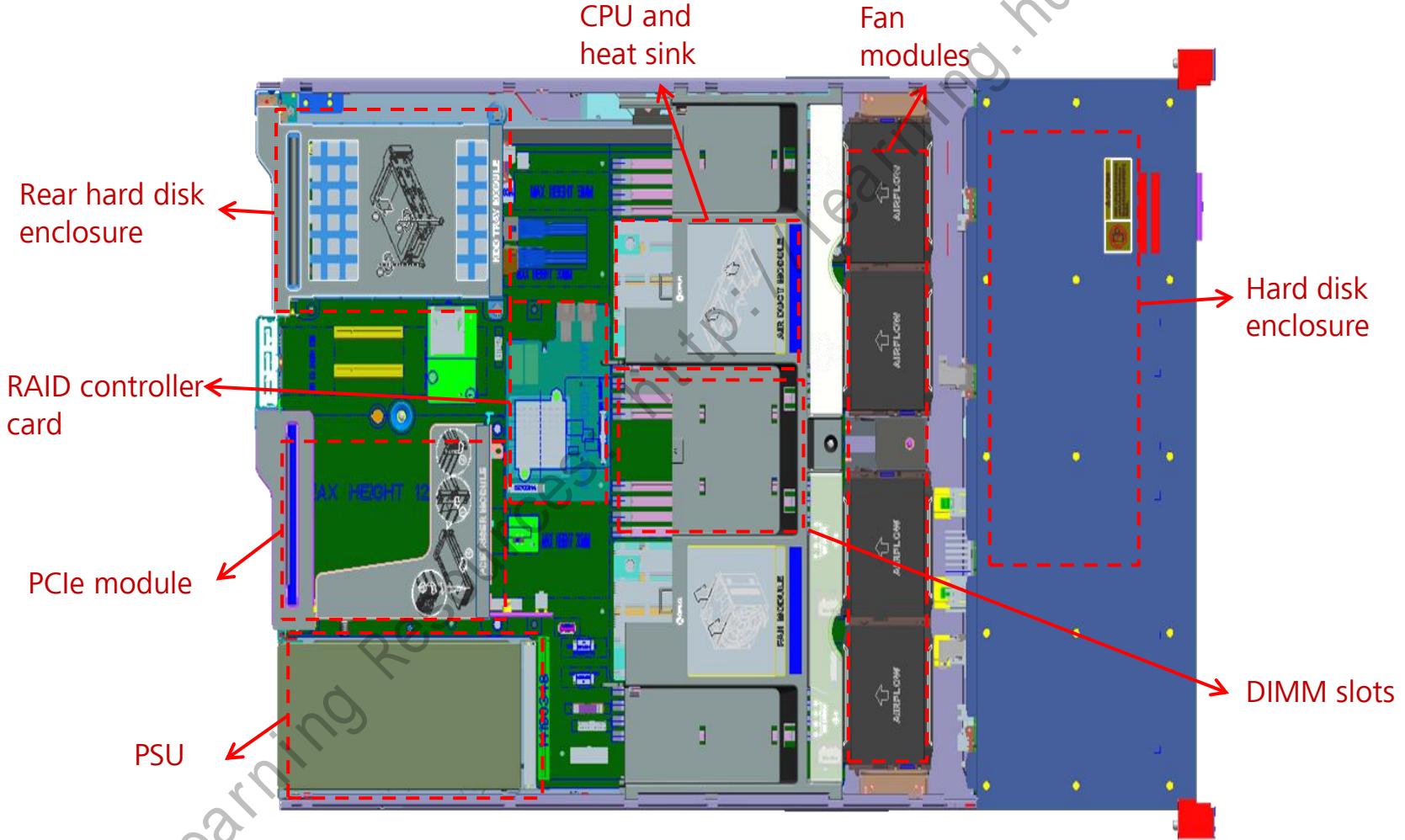


Form factor		4U 2-socket rack server
Number of processors	1 or 2	
Processor	Intel Xeon E5-2600 v3 series processors	
Memory	8 or 16 DDR4 DIMMs/LRDIMMs	
Internal storage	<ul style="list-style-type: none">• 36 x 3.5-inch + 2/4 x 2.5-inch or 3.5-inch hard disks• 24 x 3.5-inch + 2/4 x 2.5-inch or 3.5-inch hard disks• 2 x mini SSDs (SATA DOMs) grouped as a RAID 1 array for the operating system (OS)	
RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 Optional supercapacitor	
PCIe expansion	Up to 6 PCIe slots	
LOM network port	2 or 4 x GE ports, or 2 x 10GE ports	
PSU	Two hot-swappable PSUs in 1+1 redundancy mode	
Fan module	Efficient fan modules in N+1 redundancy mode	
Operating temperature	5°C–40°C	

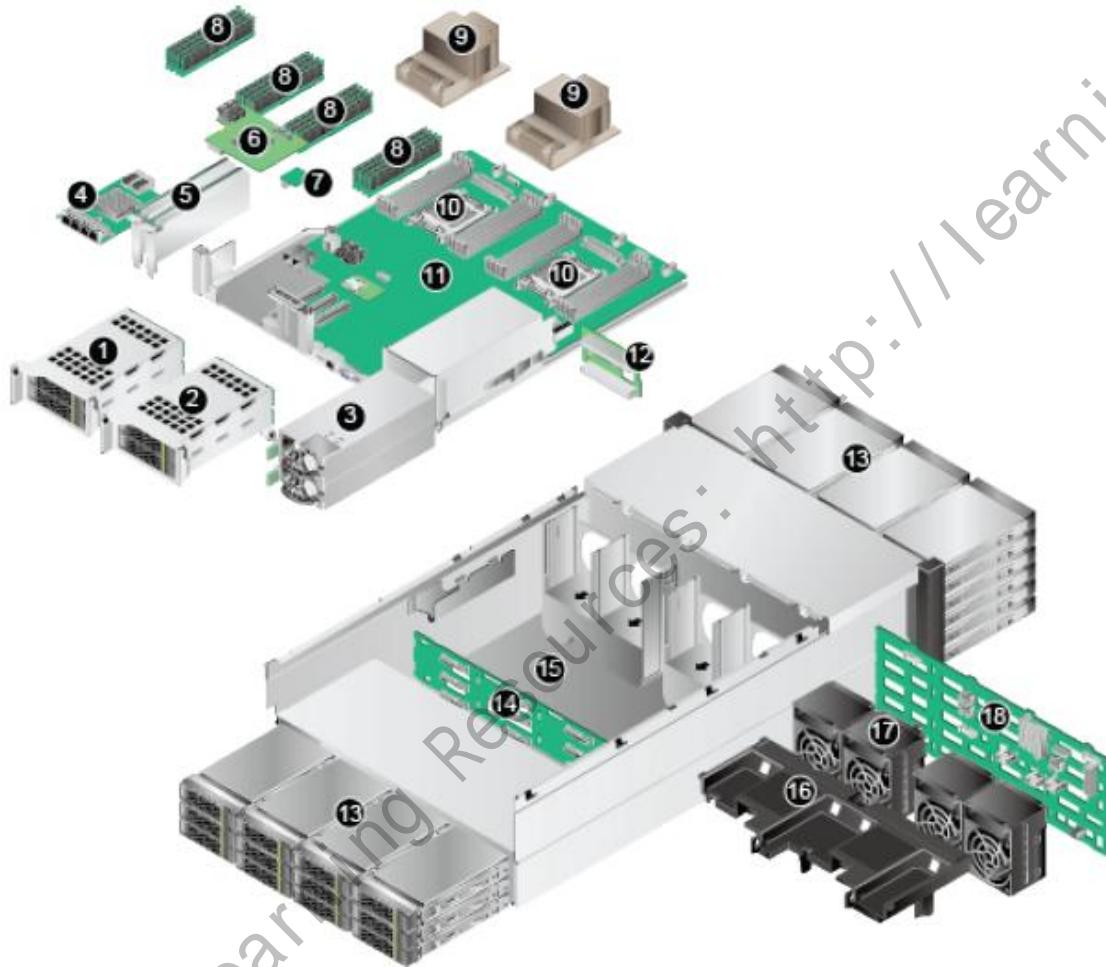
5288 V3 Logical Structure



5288 V3 Internal Structure

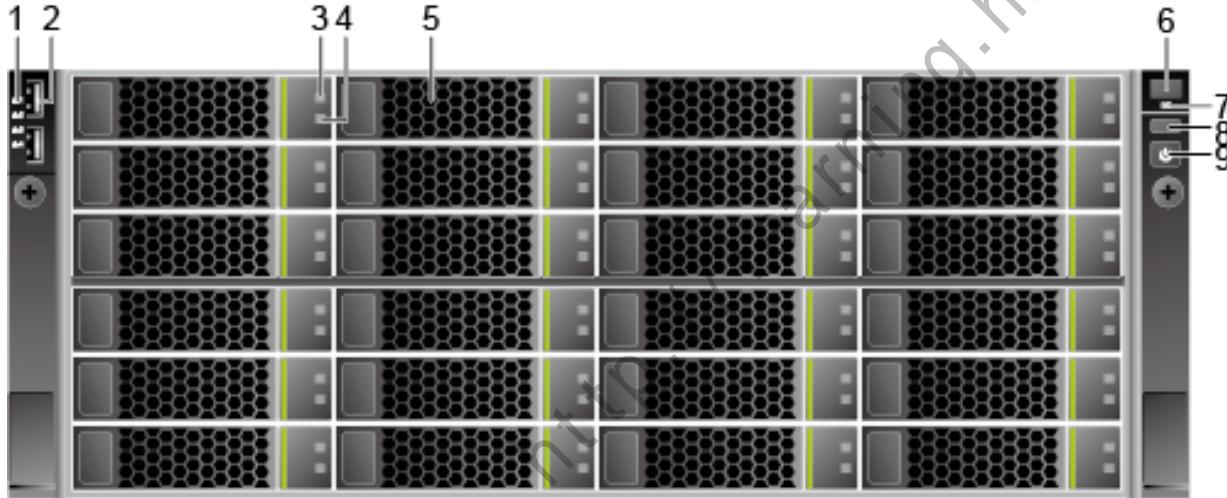


5288 V3 Internal Structure



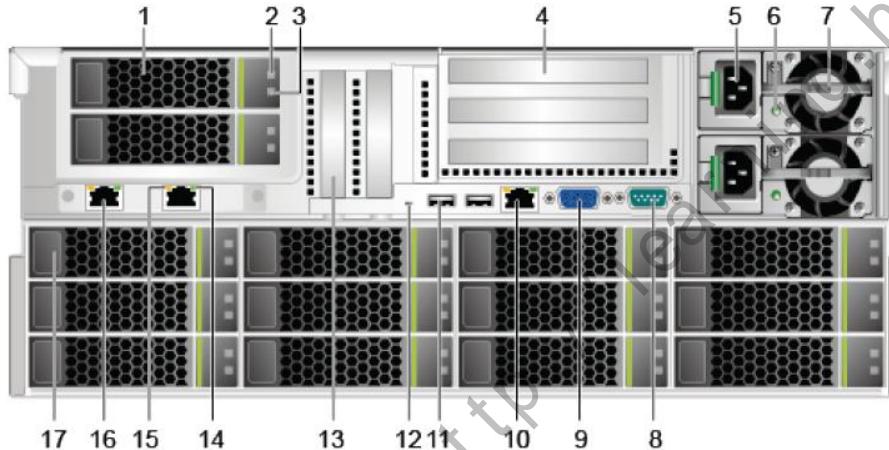
- 1 Rear hard disk module
- 2 I/O module 2 (corresponding to processor 2)
- 3 PSUs 4 LOM
- 5 PCIe card
- 6 RAID controller card
- 7 TPM (optional)
- 8 DIMMs
- 9 Heat sinks
- 10 Processors
- 11 Mainboard
- 12 PSU backplane
- 13 Hard disks
- 14 Rear hard disk backplane for 12 disks
- 15 Chassis
- 16 Air duct
- 17 Fan modules
- 18 Front hard disk backplane

5288 V3 Front View



1	Ethernet port indicator	2	USB 2.0 port
3	Hard disk fault indicator	4	Hard disk active indicator
5	Hard disk	6	Fault diagnosis LED
7	Healthy indicator	8	UID button/indicator
9	Power button/indicator		

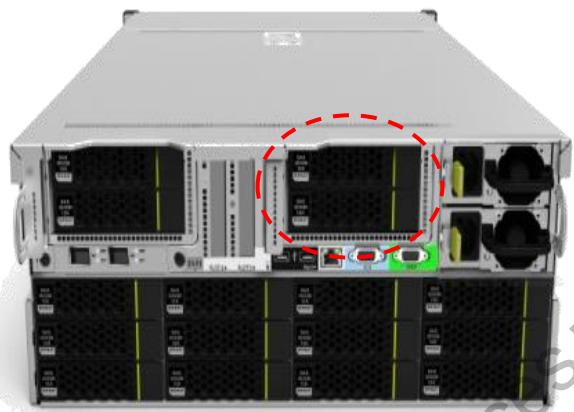
5288 V3 Rear View



1	Rear HDD module	2	Hard disk fault indicator
3	Hard disk active indicator	4	I/O expansion module 2
5	Power socket of a PSU	6	PSU indicator
7	PSU1	8	PSU2
9	Serial port	10	VGA port
11	Management network port (Mgmt)	12	USB 3.0 port
13	USB 3.0 port	14	UID indicator
15	Onboard PCIe slot	16	Onboard PCIe slot
17	Connectivity status indicator	18	Data transmission status indicator
19	GE or 10GE port		

5288 V3 Expansion Modules

Two expansion modules



Optional expansion modules

- Hard disk expansion module (two hard disks)



- PCIe module with three PCIe slots



- PCIe module with two PCIe slots



- Choose expansion modules based on service requirements, which improves flexibility and maximizes ROI.



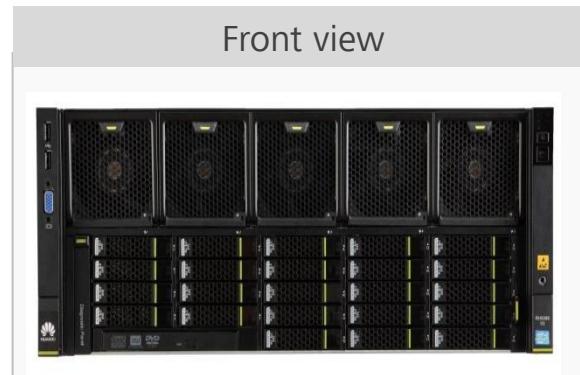
Contents

- RH Series Server Overview and Positioning
- **RH Series Server Description**
 - RHx2xx(H) V3
 - 5288 V3
 - **RH5885 V3**
 - RH8100 V3
- RH Series Server Applications

RH5885 V3 Technical Specifications

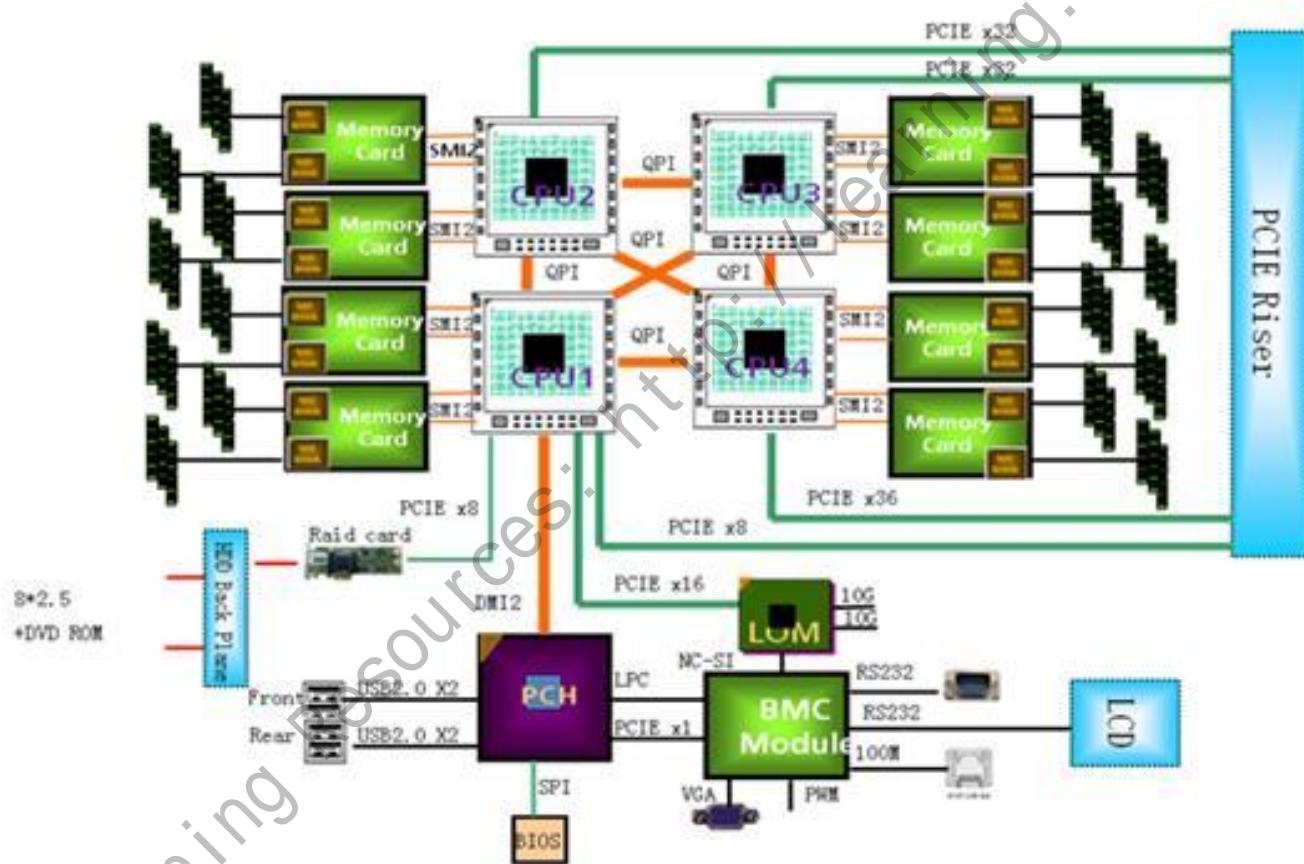
Front view	Form factor
	4U 4-socket rack server
	Number of processors 2 or 4
	Processor Intel® Xeon® E7-4800 v2 series processors Core options: 6, 8, 10, 12, and 15
	Memory 48 DDR3 DIMMs Maximum memory capacity: 3 TB
	Internal storage 8 or 23 x 2.5-inch SAS/SATA HDDs or SSDs Four hard disks can be directly connected to the hard disk backplane through the PCH.
	RAID support RAID 0, 1, 10, 5, 50, 6, and 60 1 GB RAID cache Optional iBBU or supercapacitor for power-on protection
	PCIe expansion Up to 7 PCIe slots
	LOM network port 2 or 4 x GE ports, or 2 x 10GE ports
	PSU PSUs in 1+1 or 2+2 redundancy mode: 220 V or 110 V AC PSUs –48 V DC PSUs
	Fan module 5 hot-swappable fan modules in N+1 redundancy mode, supporting maintenance without opening the chassis
	Operating temperature 5° C–40° C (41° F–104° F)
	Dimensions (H x W x D) 175 mm x 447 mm x 790 mm (6.89 in. x 17.60 in. x 31.10 in.)

RH5885H V3 Technical Specifications

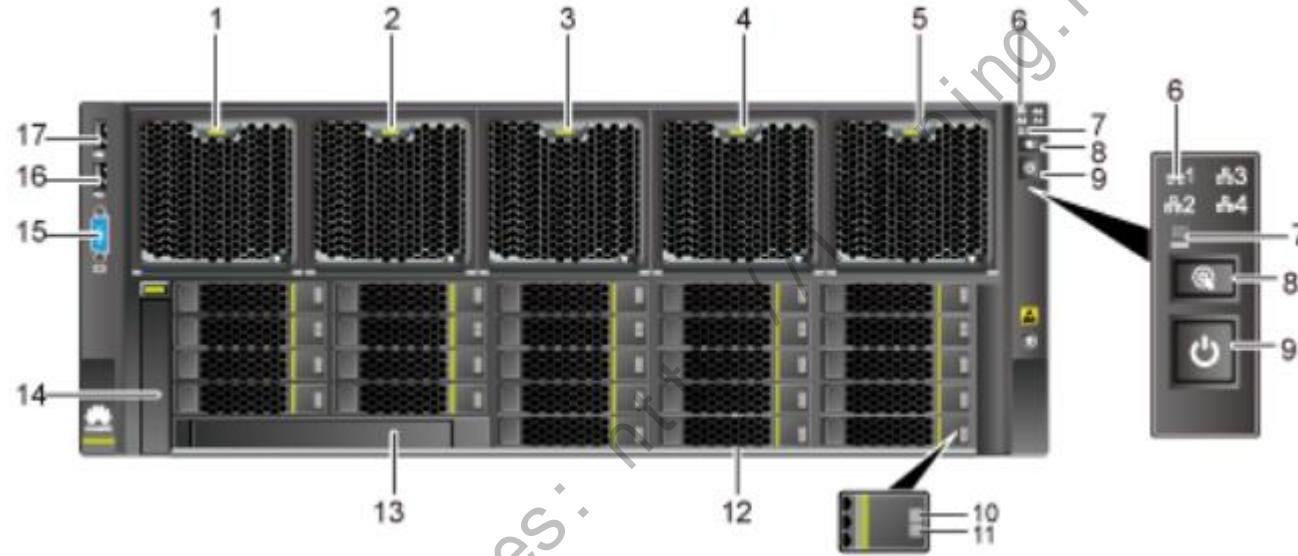


Form factor	4U 4-socket rack server
Number of processors	2 or 4
Processor	Intel® Xeon® E7-4800 v2 series processors Core options: 6, 8, 10, 12, and 15
Memory	96 DDR3 DIMMs Maximum memory capacity: 6 TB
Internal storage	8 or 23 x 2.5-inch SAS/SATA HDDs or SSDs
RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 1 GB RAID cache Optional iBBU or supercapacitor for power-on protection
PCIe expansion	16 PCIe slots Four of them support hot swap and maintenance without opening the chassis.
LOM network port	2 or 4 x GE ports, or 2 x 10GE ports
PSU	PSUs in 1+1 or 2+2 redundancy mode: •220 V or 110 V AC PSUs •-48 V DC PSUs
Fan module	5 hot-swappable fan modules in N+1 redundancy mode, supporting maintenance without opening the chassis
Operating temperature	5° C–40° C (41° F–104° F)
Dimensions (H x W x D)	175 mm x 447 mm x 790 mm (6.89 in. x 17.60 in. x 31.10 in.)

RH5885H V3 Logical Architecture



RH5885(H) V3 Front View



1 Fan module 1

3 Fan module 3

5 Fan module 5

7 Healthy indicator

9 Power button/indicator

11 Hard disk active indicator

2 Fan module 2

4 Fan module 4

6 Network port link indicator

8 UID button/indicator

10 Hard disk fault indicator

12 Hard disk

13 DVD-ROM drive

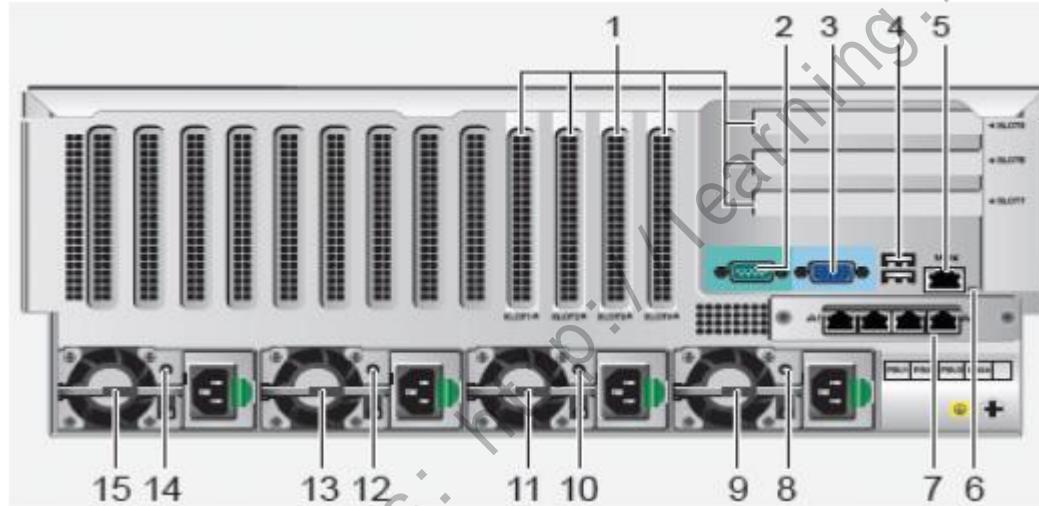
14 LCD

15 VGA port

16 USB port 2

17 USB port 1

RH5885 V3 Rear View

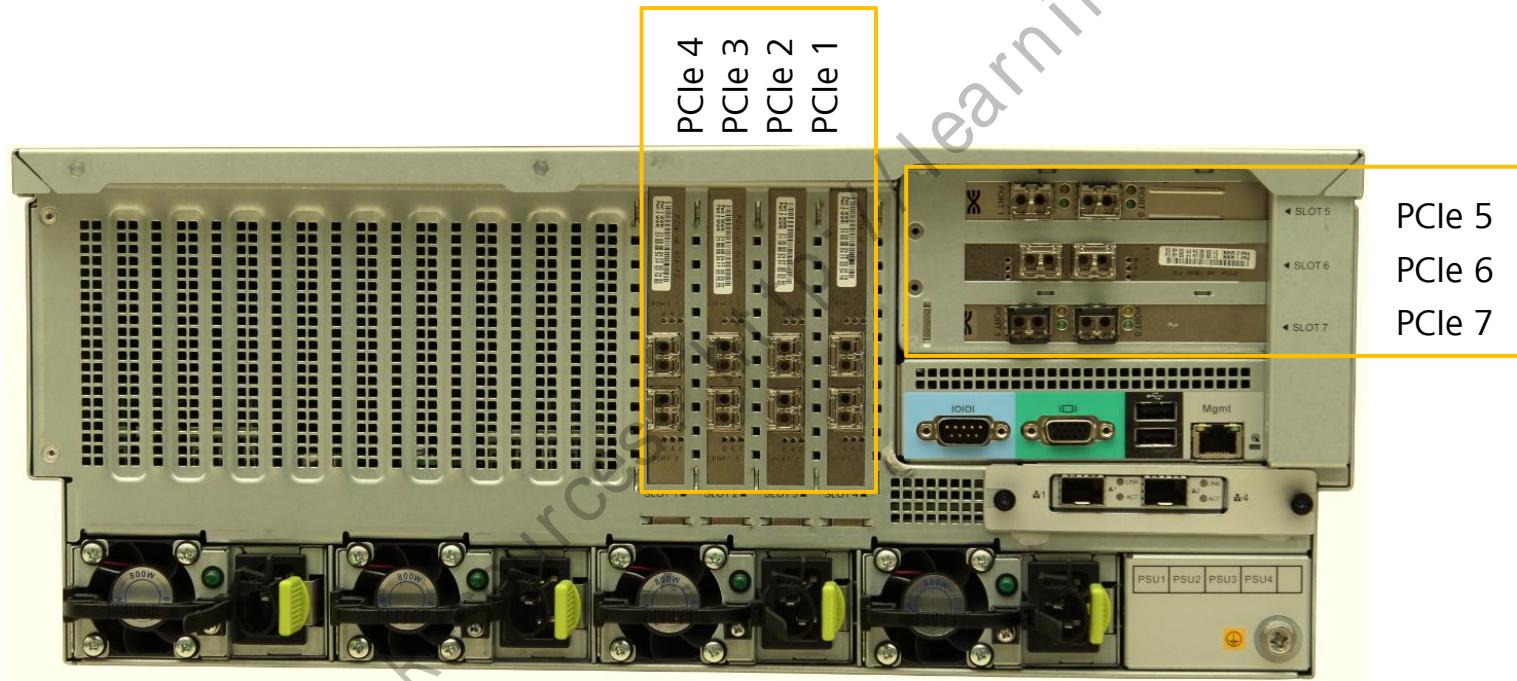


- 1 Standard PCIe card
- 2 Serial port
- 3 VGA port
- 4 USB port
- 5 Management network port

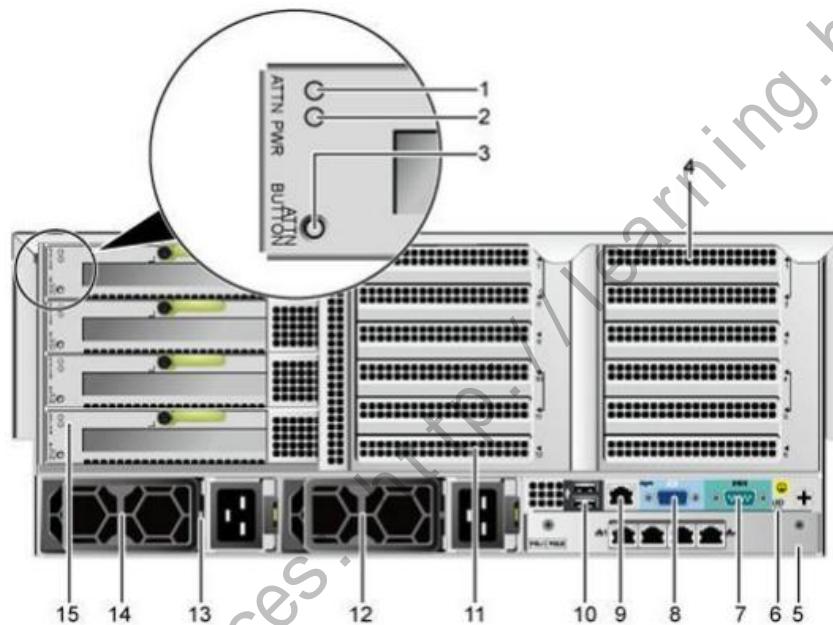
- 6 UID indicator
- 7 LOM network port
- 8 Indicator for PSU 4
- 9 PSU 4
- 10 Indicator for PSU 3

- 11 PSU 3
- 12 Indicator for PSU 2
- 13 PSU 2
- 14 Indicator for PSU 1
- 15 PSU 1

RH5885 V3 Rear View

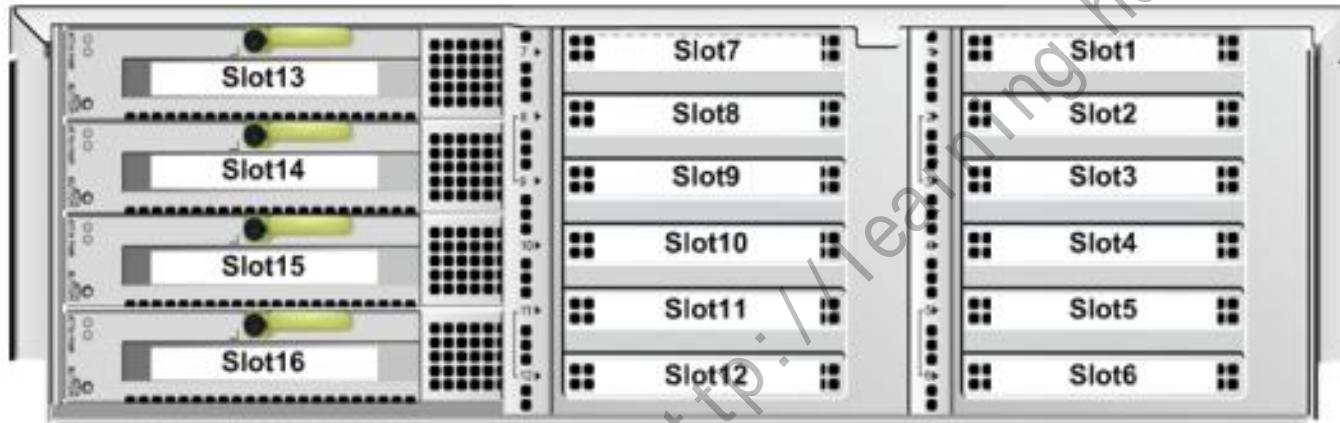


RH5885H V3 Rear View



- | | | |
|--|---|---|
| 1 Hot swap indicator
(on a hot-swappable PCIe card) | 2 Power indicator
(on a hot-swappable PCIe card) | 3 Hot swap button
(on a hot-swappable PCIe card) |
| 4 Standard PCIe riser card 1 | 5 NIC | 6 UID indicator |
| 7 Serial port | 9 BMC management network port | 10 USB port |
| 8 VGA port | 12 PSU 2 | 13 PSU indicator |
| 11 Standard PCIe riser card 2 | 15 Hot-swappable PCIe riser card | |
| 14 PSU 1 | | |

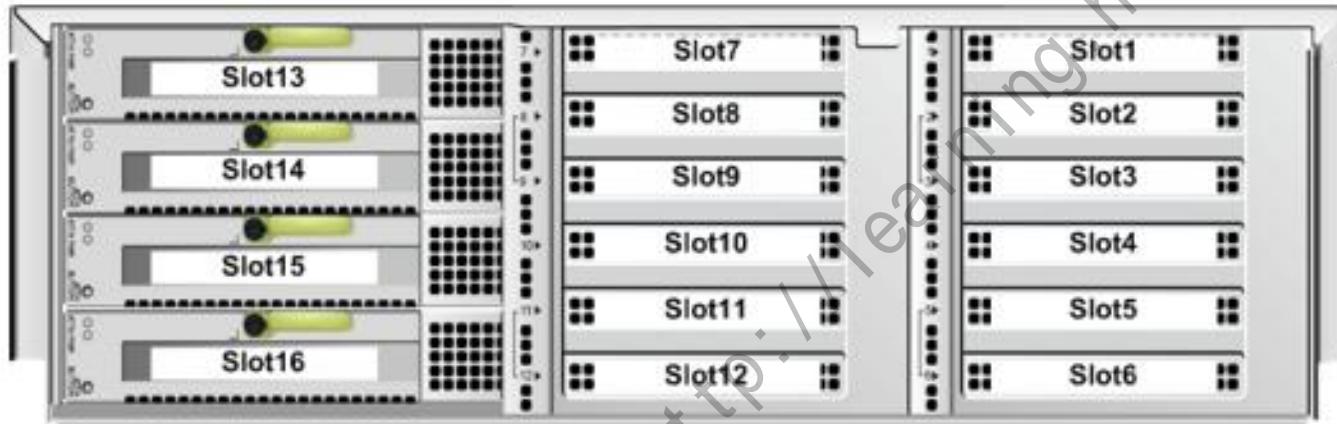
RH5885H V3 PCIe Slots



A hot-swappable PCIe riser card provides PCIe slots 13 to 16. The following table describes the mapping between PCIe slots, processors, and compliant PCIe standards.

PCIe Slot	Processor	PCIe Standard
13	Processor 4	
14	When no processor is installed in socket CPU4, PCIe slots 13 to 16 are unavailable.	PCIe 3.0 x8
15		
16		

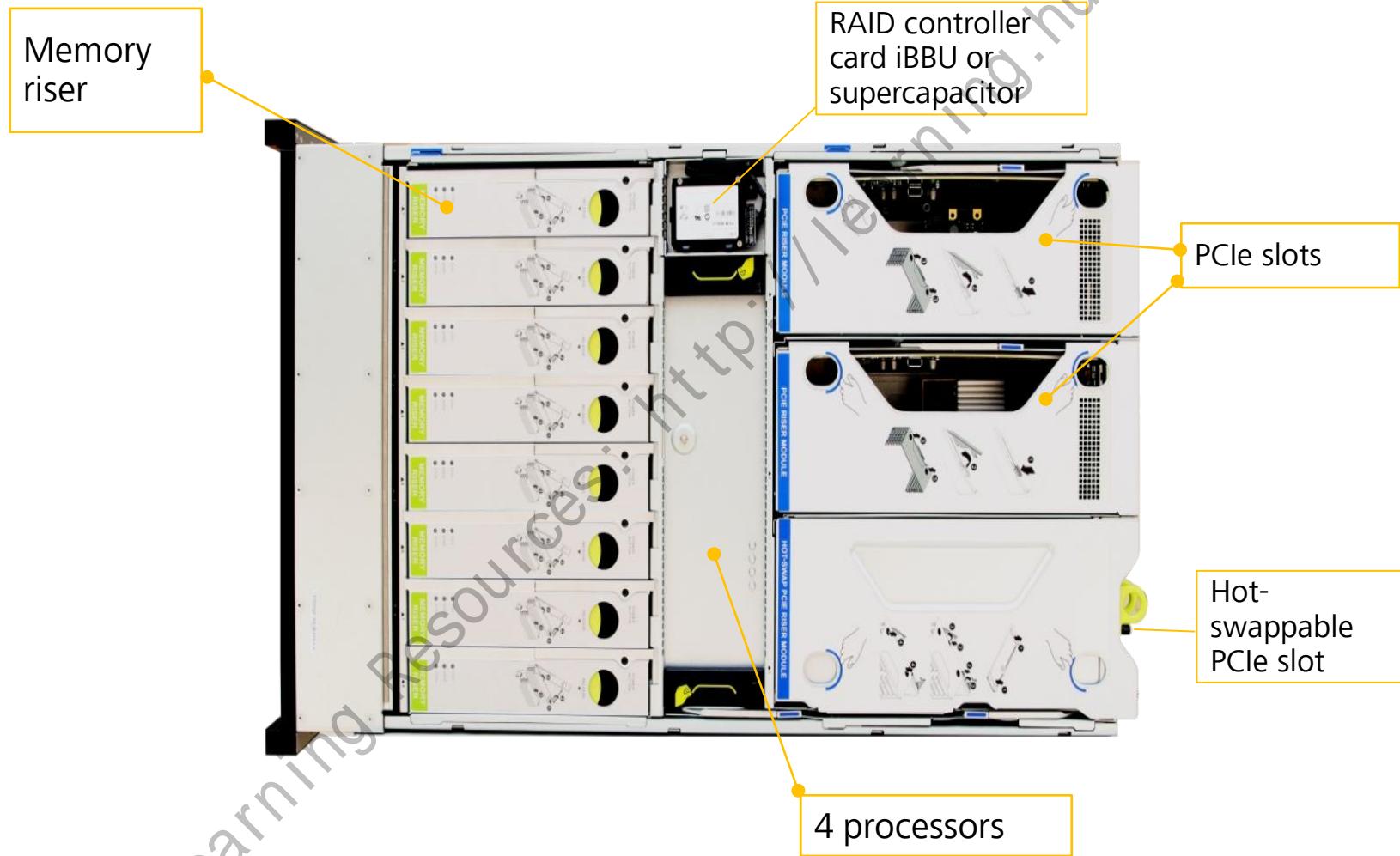
RH5885H V3 PCIe Slots



A hot-swappable PCIe riser card provides PCIe slots 13 to 16. The following table describes the mapping between PCIe slots, processors, and compliant PCIe standards.

PCIe Slot	Processor	PCIe Standard
13		
14	Processor 4	
15	When no processor is installed in socket CPU4, PCIe slots 13 to 16 are unavailable.	PCIe 3.0 x8
16		

RH5885H V3 Top View



RH5885H V3 Memory Riser

As shown in the figure, each processor corresponds to two memory risers:

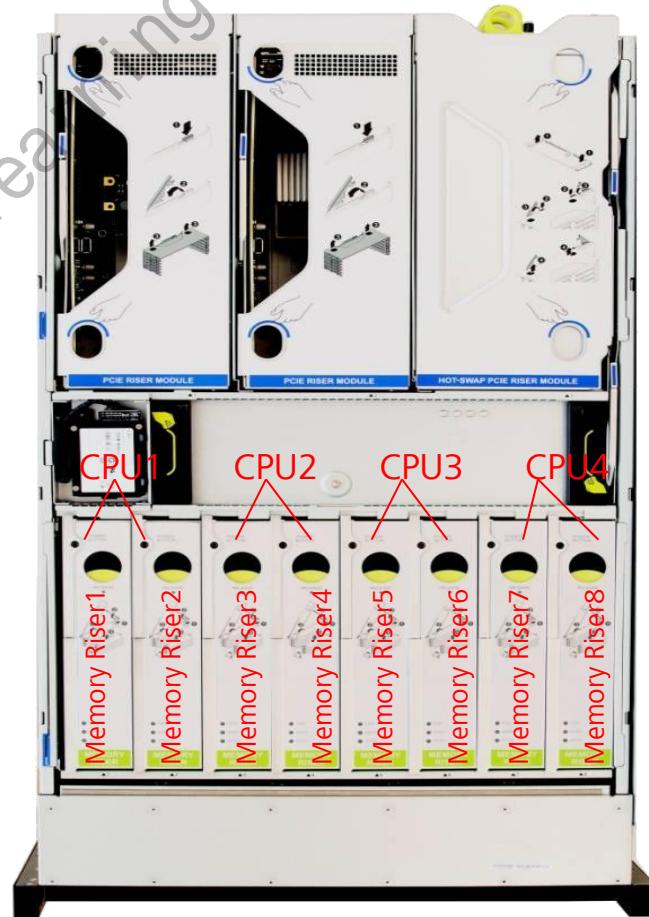
Processor 1 corresponds to memory risers 1 and 2.

Processor 2 corresponds to memory risers 3 and 4.

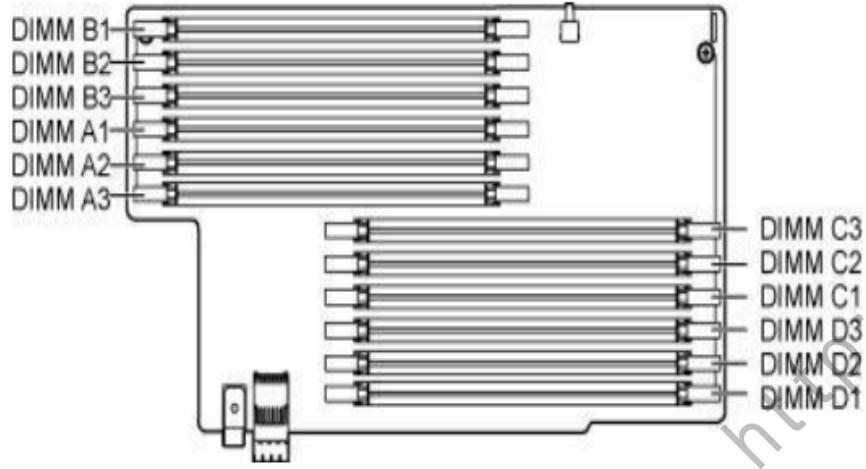
Processor 3 corresponds to memory risers 5 and 6.

Processor 4 corresponds to memory risers 7 and 8.

- If a processor is not installed, you do not need to install the memory risers corresponding to the processor.
For example, if only processor 1 is installed, you can only install two memory risers: 1 and 2.
- Install memory risers in the following sequence:
 - 1 > 3 > 5 > 7 > 2 > 4 > 6 > 8



RH5885H V3 DIMM Configuration Rules



Processor Socket	DIMM Installation Sequence
CPU1, CPU2, CPU3, and CPU4	If only one IDIMM is to be configured, install it in slot A1. If multiple DIMMs are to be configured, install them in the following sequence: A1, B1, C1, D1, A2, B2, C2, D2, A3, B3, C3, and D3

DIMM Configuration Rules

A BC61MRTA memory riser with high specifications supports 1 to 12 DIMMs. The following table lists the specific DIMM configuration rules. A black dot indicates that a DIMM is installed in the specific slot.

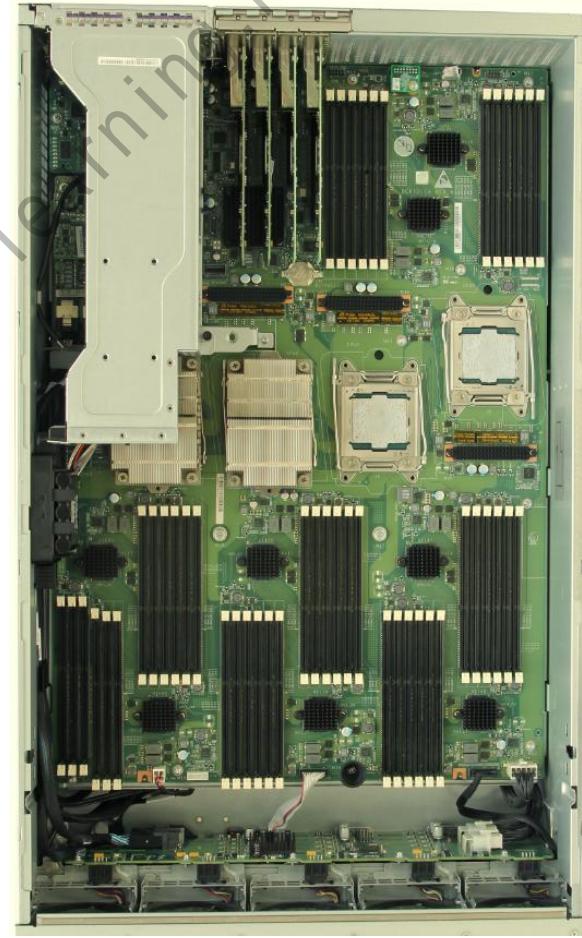
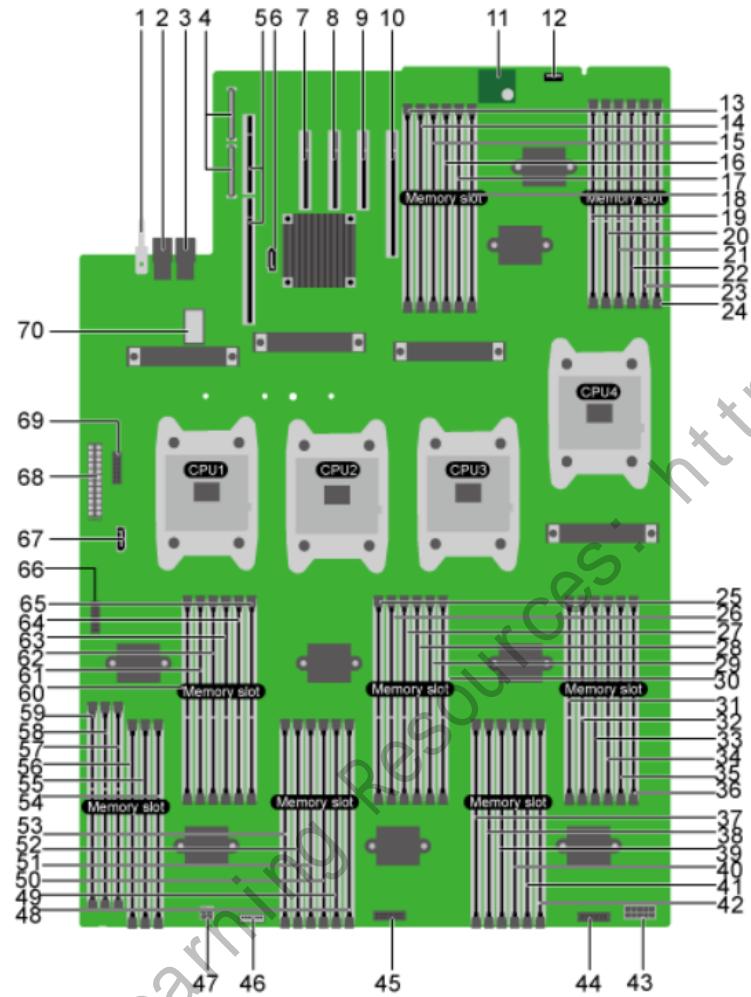
BC 61 MR TA	Memory Channel	Position	Number of DIMMs											
			1	2	3	4	5	6	7	8	9	10	11	12
B	B	B1		●	●	●	●	●	●	●	●	●	●	●
		B2						●	●	●	●	●	●	●
		B3									●	●	●	●
BC 61 MR TA	A	A1	●	●	●	●	●	●	●	●	●	●	●	●
		A2					●	●	●	●	●	●	●	●
		A3								●	●	●	●	●
C	C	C3										●	●	●
		C2							●	●	●	●	●	●
		C1		●	●	●	●	●	●	●	●	●	●	●
D	D	D3												●
		D2								●	●	●	●	●
		D1			●	●	●	●	●	●	●	●	●	●

DIMM Configuration Rules

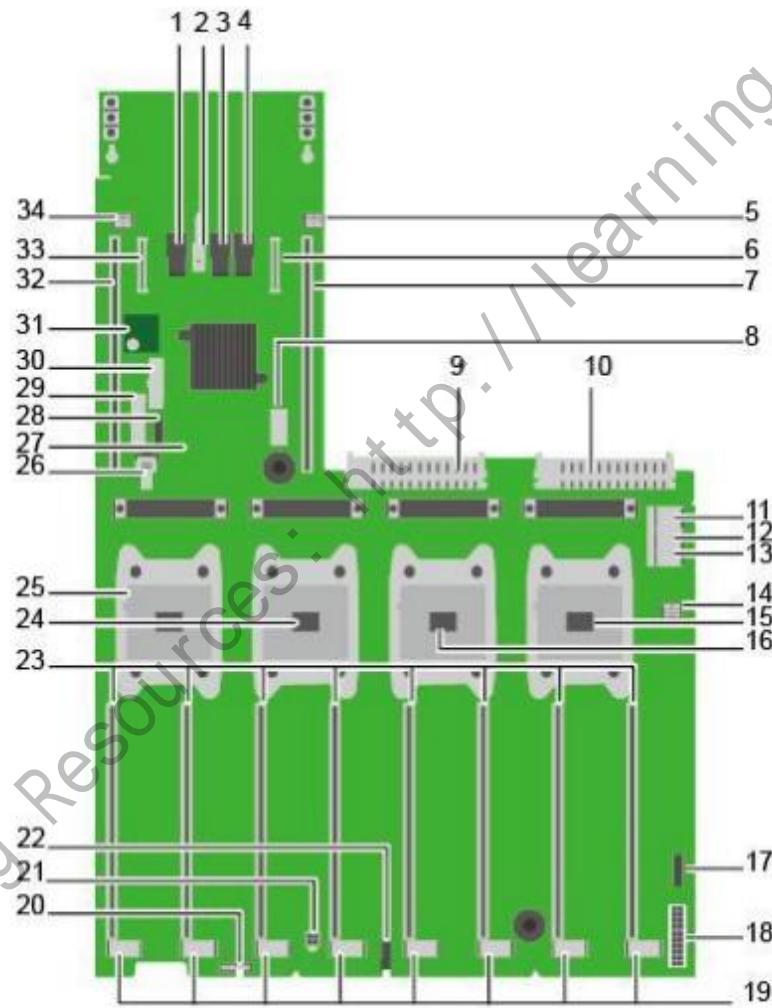
A BC61MRTB memory riser with low specifications supports 1 to 8 DIMMs. The following table lists the specific DIMM configuration rules. A black dot indicates that a DIMM is installed in the specific slot.

	Memory Channel	Position	Number of DIMMs							
			1	2	3	4	5	6	7	8
BC61 MRTB	B	B1		•	•	•	•	•	•	•
		B2						•	•	•
	A	A1	•	•	•	•	•	•	•	•
		A2					•	•	•	•
	C	C2							•	•
		C1			•	•	•	•	•	•
	D	D2								•
		D1				•	•	•	•	•

RH5885 V3 Mainboard Layout



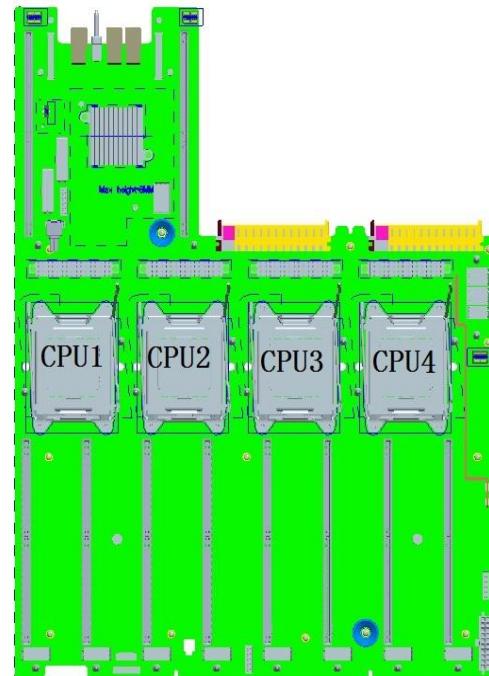
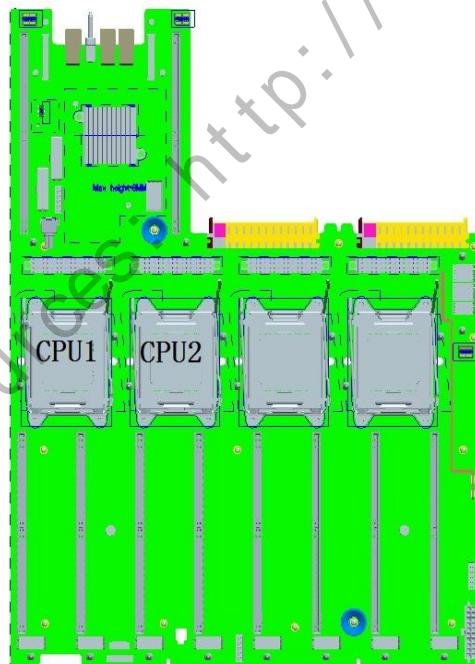
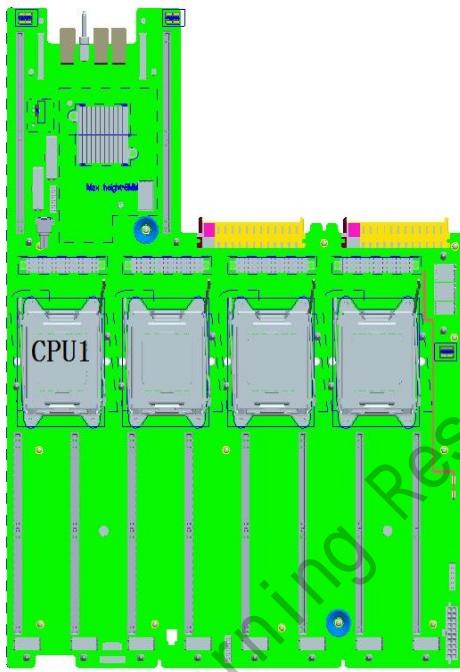
RH5885H V3 Mainboard Layout



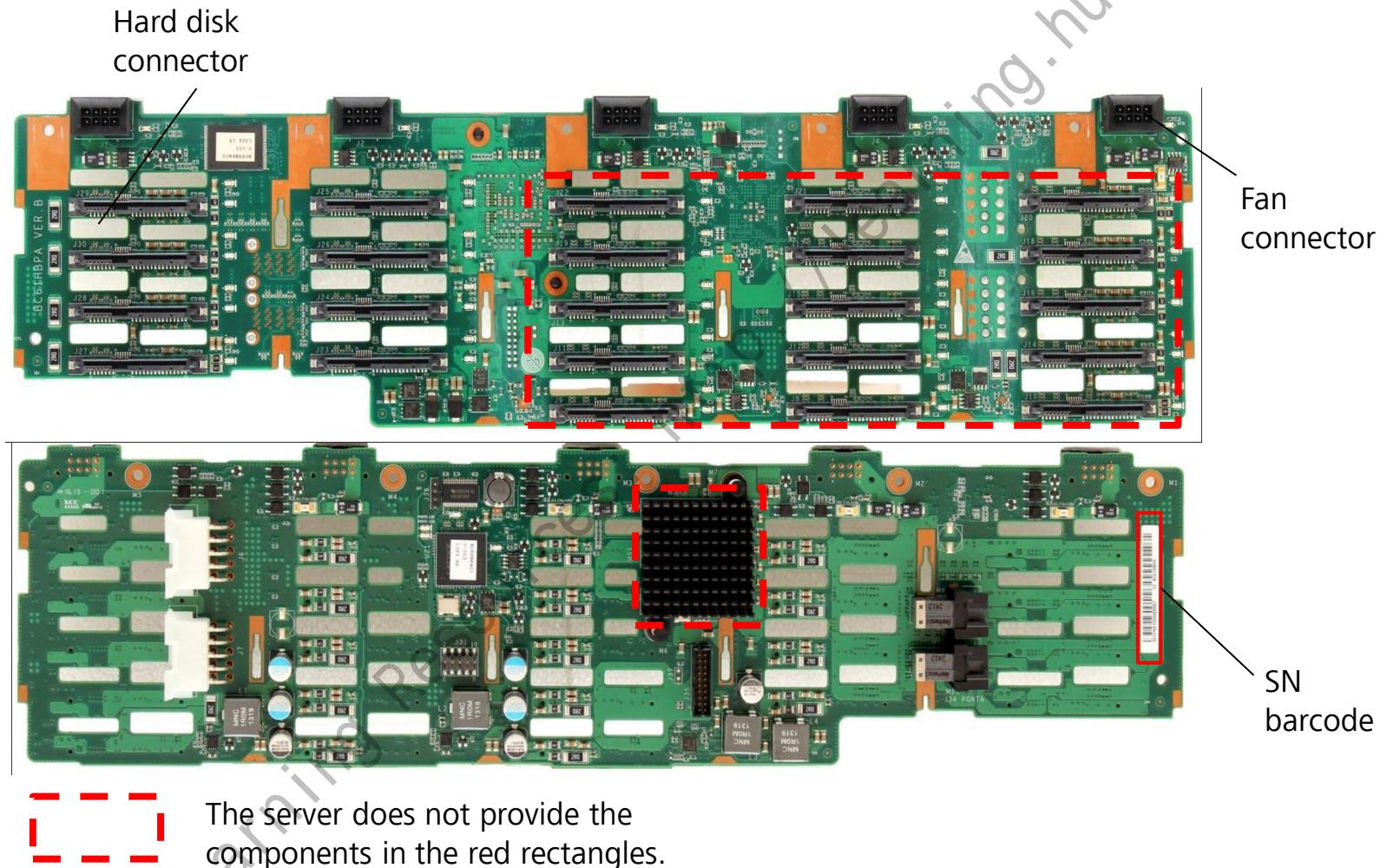
Processor Installation Rules

The RH5885H V3 supports one, two, or four processors.

- If only one processor is to be configured, install it in socket CPU1.
- If two processors are to be configured, install them in sockets CPU1 and CPU2.
- If four processors are to be configured, install them in sockets from CPU1 to CPU4.



RH5885(H) V3 Hard Disk Backplane



RH5885(H) V3 LCD

The LCD on the front panel provides the following functions:

- Monitors the installation status and running status of server components.
- Queries alarms and fault information to locate faults.
- Sets an IP address for the server.



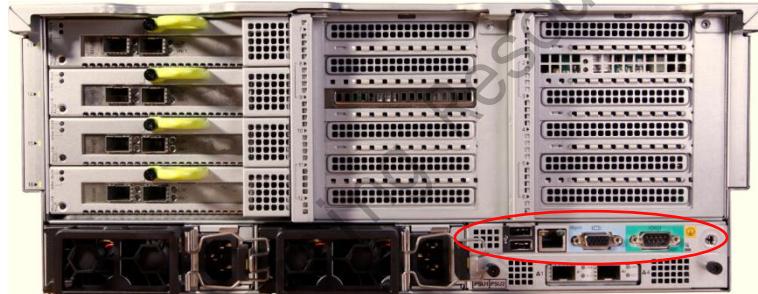
The screenshots illustrate the LCD's functionality:

- Screenshot 1:** Shows the main monitoring interface with various status indicators for components like Board, CPU, Memory, HDD, PS, FAN, RAID Card, PCIe, TEMP, VRD, Link, and Others.
- Screenshot 2:** Shows the "Setting" menu for the Management Port. It includes tabs for Status, Monitor, Info., and Setting. Under the Setting tab, the "Mgmt Port" section is active, showing "Enable: ON", "MAC: 00-18-82-00-6655", and an "IPv4" configuration section. The "IPv4" section includes fields for "IP Mode" (Static), "IP Addr" (192.168.0.174), "Subnet Mask" (255.255.255.0), and "Default GnatWay" (192.168.0.174).
- Screenshot 3:** A close-up view of the "IPv4 Addr" field set to "192.168.0.15". Below it is a numeric keypad for entering the IP address, with buttons for numbers 0-9, a decimal point, and a backspace key.

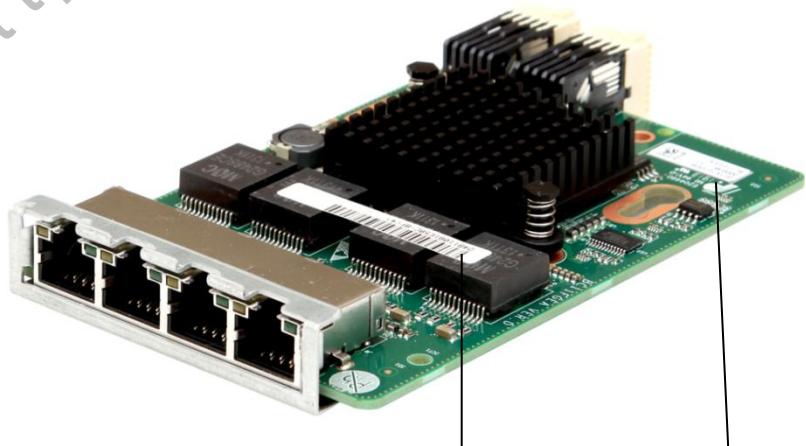
BMC Card

The BMC card is installed on the mainboard and provides the following functions:

- Manages and monitors the server.
- Supports the KVM function.
- Supports the SOL redirection function.
- Supports the online upgrades of the BIOS, FPGA, and CPLD.
- Provides one VGA port, two USB ports, one 10/100Base-T management network port, and one serial port (system serial port by default).



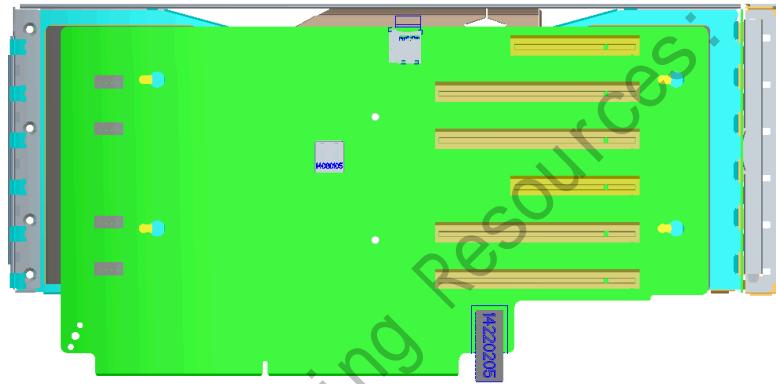
LOM



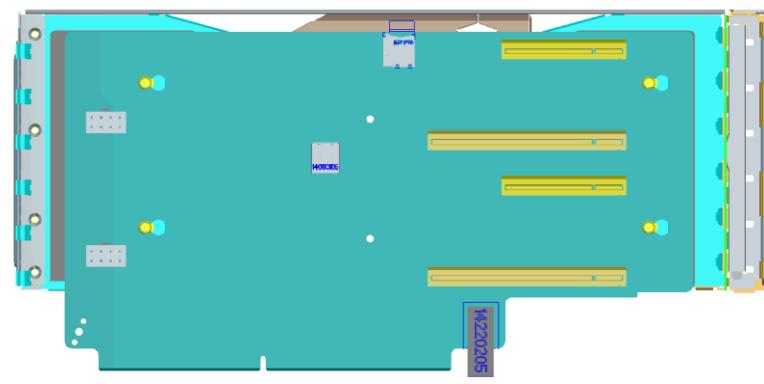
MAC
address

SN
barcode

Riser Card

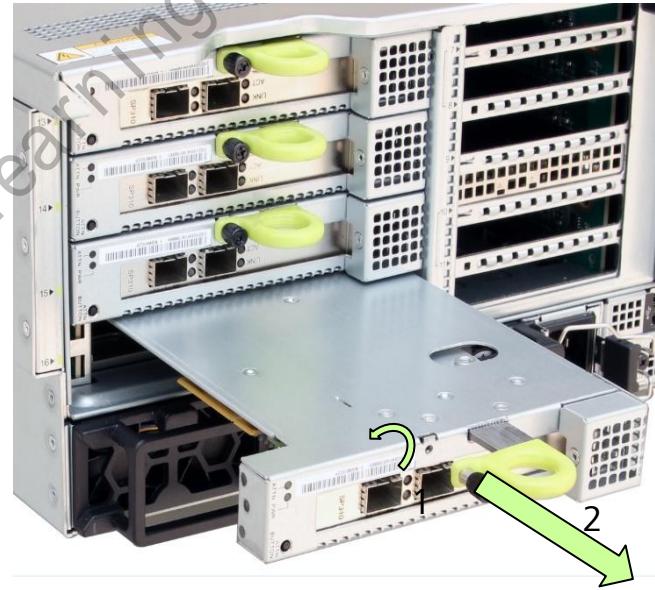
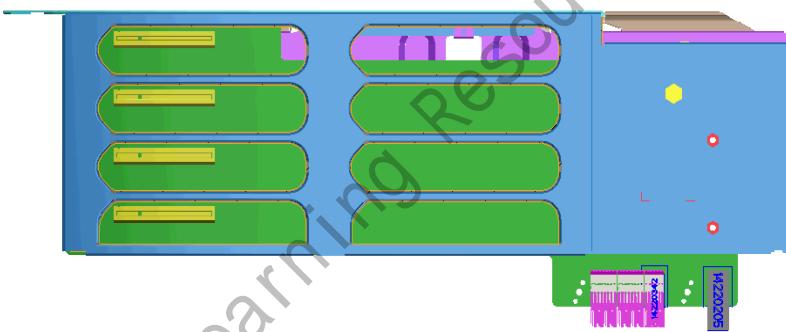
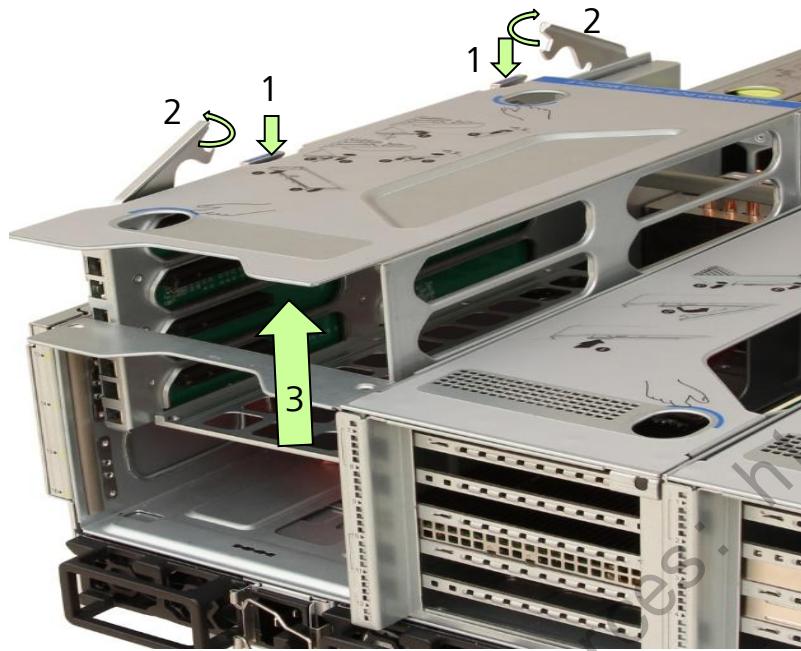


PCIe x8 riser card



PCIe x16 riser card

Hot-Swappable Riser Card





Contents

- RH Series Server Overview and Positioning
- **RH Series Server Description**
 - RHx2xx(H) V3
 - 5885 V3
 - RH5885 V3
 - **RH8100 V3**
- RH Series Server Applications

RH8100 V3 Technical Specifications

Front view	Form factor	8U 8-socket rack server
	Number of processors	4 or 8
	Processor	Intel Xeon E7-8800 v2 series processors
	Memory	192 DDR3 DIMMs Maximum memory capacity: 12 TB
	Internal storage	12 or 24 x 2.5-inch SAS/SATA HDDs or SSDs
	RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 2 GB RAID cache Optional iBBU or supercapacitor for power-on protection
	PCIe expansion	Up to 16 PCIe slots
	LOM network port	8 x GE ports, 4 x 10GE ports, or 4 x GE + 2 x 10GE ports
	PSU	PSUs in 1+1 or 2+2 redundancy mode: 220 V or 110 V AC PSUs -48 V DC PSUs
Rear view	Fan module	8 hot-swappable fan modules in N+1 redundancy mode, supporting maintenance without opening the chassis
	Operating temperature	5° C–40° C (41° F–104° F)
	Dimensions (H x W x D)	352 mm x 447 mm x 855 mm (13.86 in. x 17.60 in. x 33.66 in.)

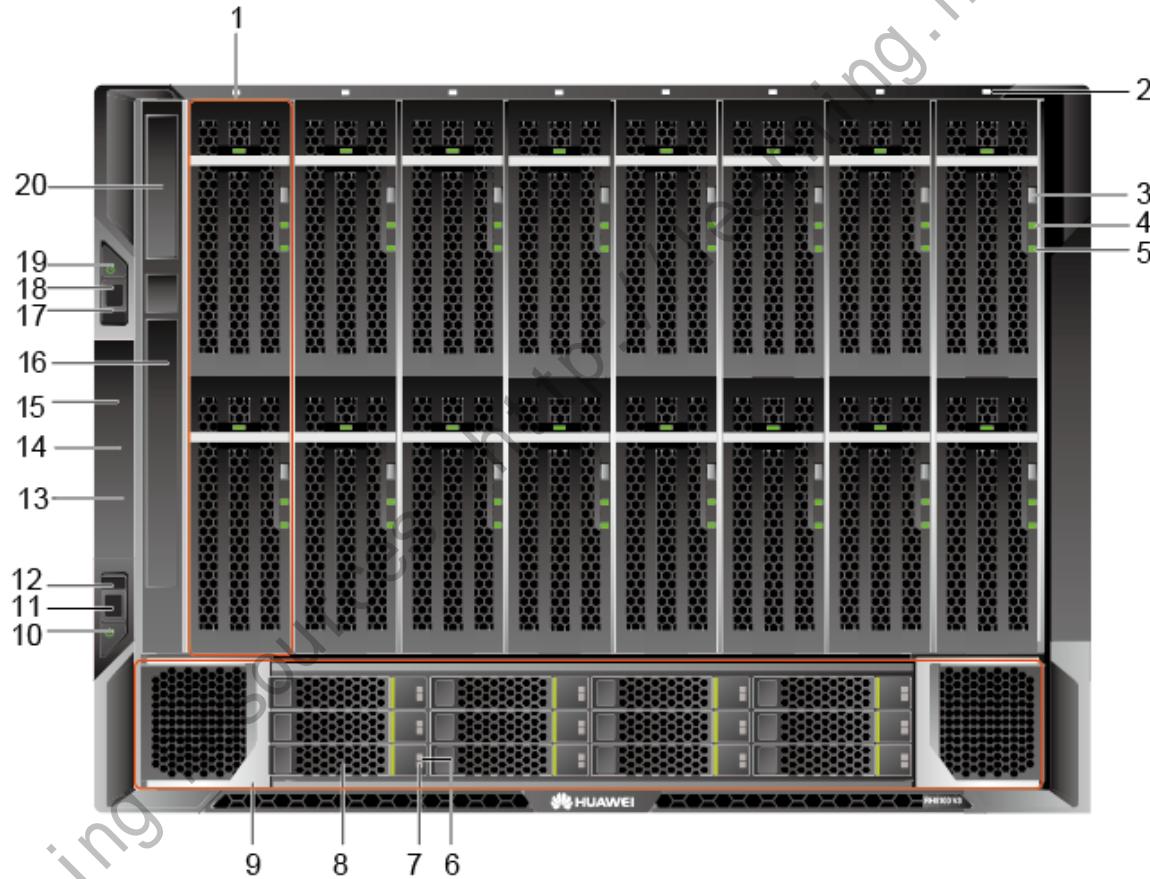
RH8100 V3 Appearance



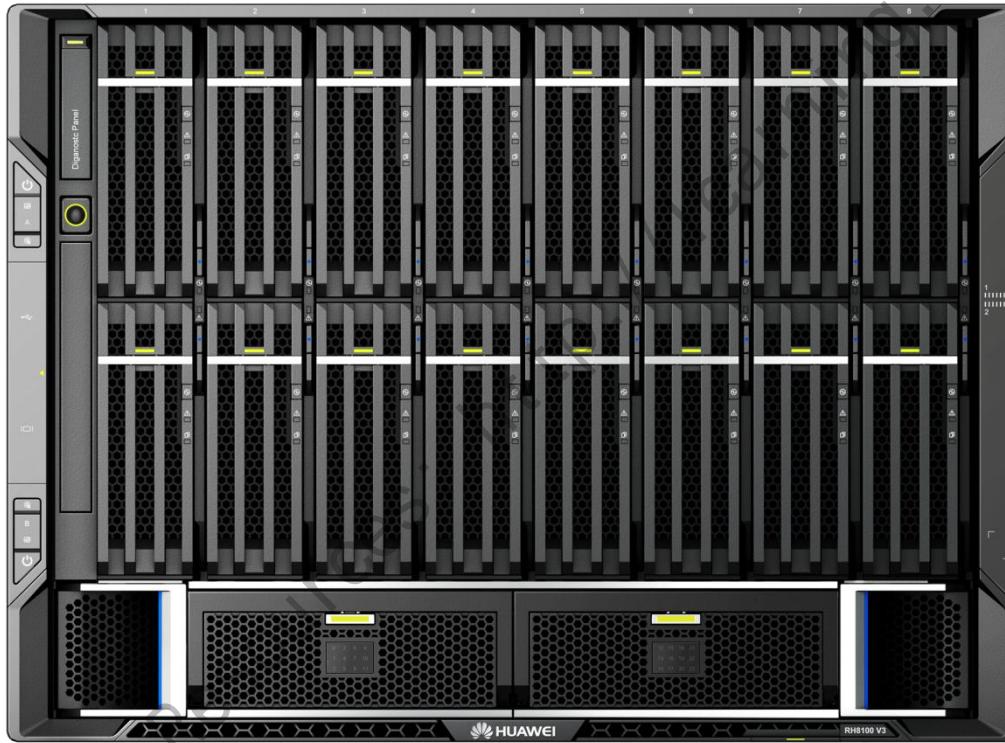
The RH8100 V3 supports two models of front I/O modules:

- Front I/O module of model A (FM-A) delivers balanced performance. FM-A provides hard disks, RAID controller cards, and up to six standard PCIe slots (provided by a PCIe riser card). The six PCIe slots can accommodate PCIe SSDs and GPUs, but cannot accommodate cards that require connections to external cables, such as NICs, HBAs, and IB cards.
- Front I/O module of model B (FM-B) delivers enhanced storage. FM-B provides only hard disks and RAID controller cards, without any standard PCIe slot.

Front View of the RH8100 V3 with FM-A

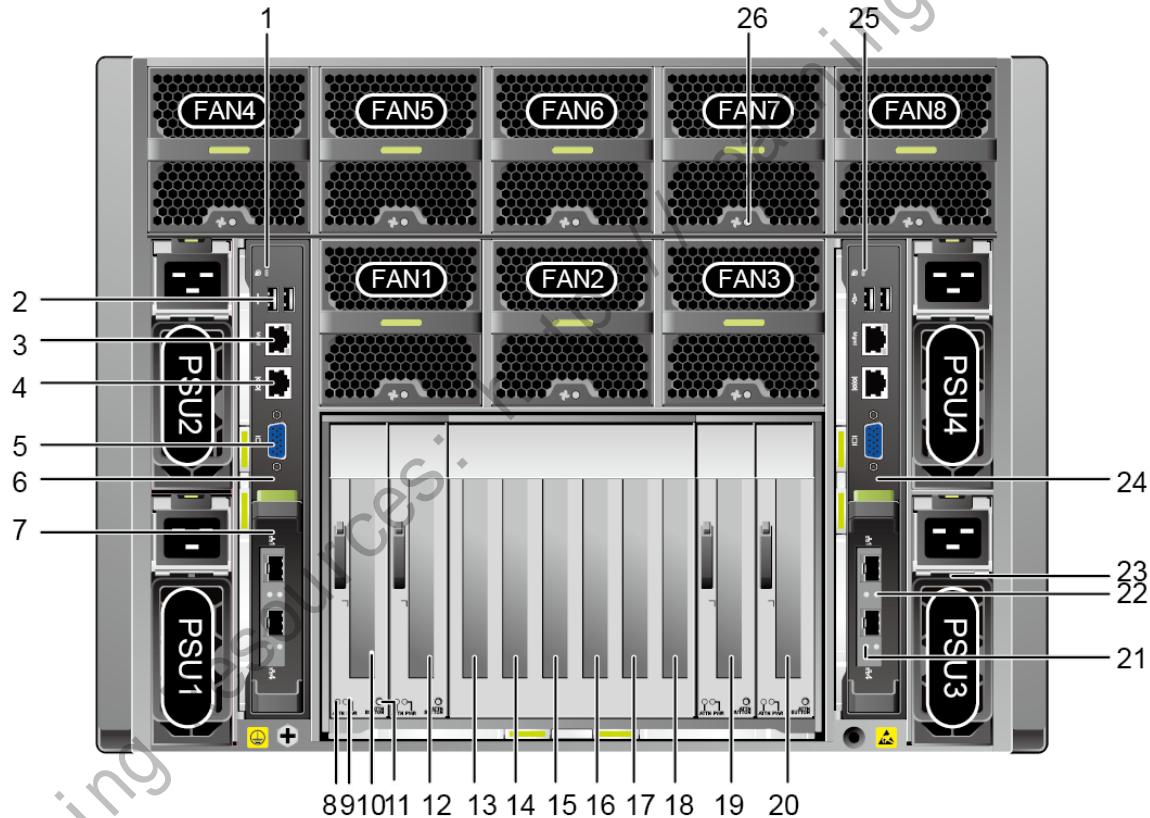


Front View of the RH8100 V3 with FM-B

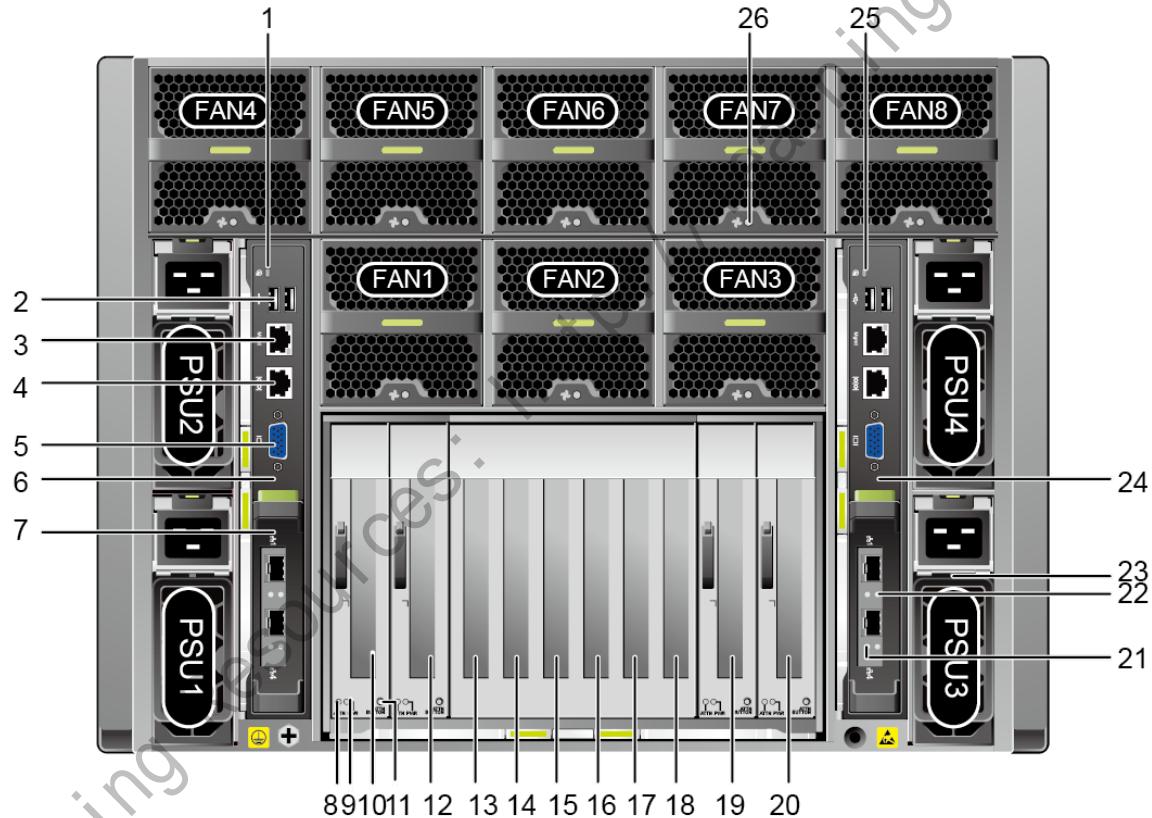


FM-B consists of two disk trays. Each tray provides 12 x 2.5-inch hard disk slots. FM-B provides up to 24 hard disk slots.

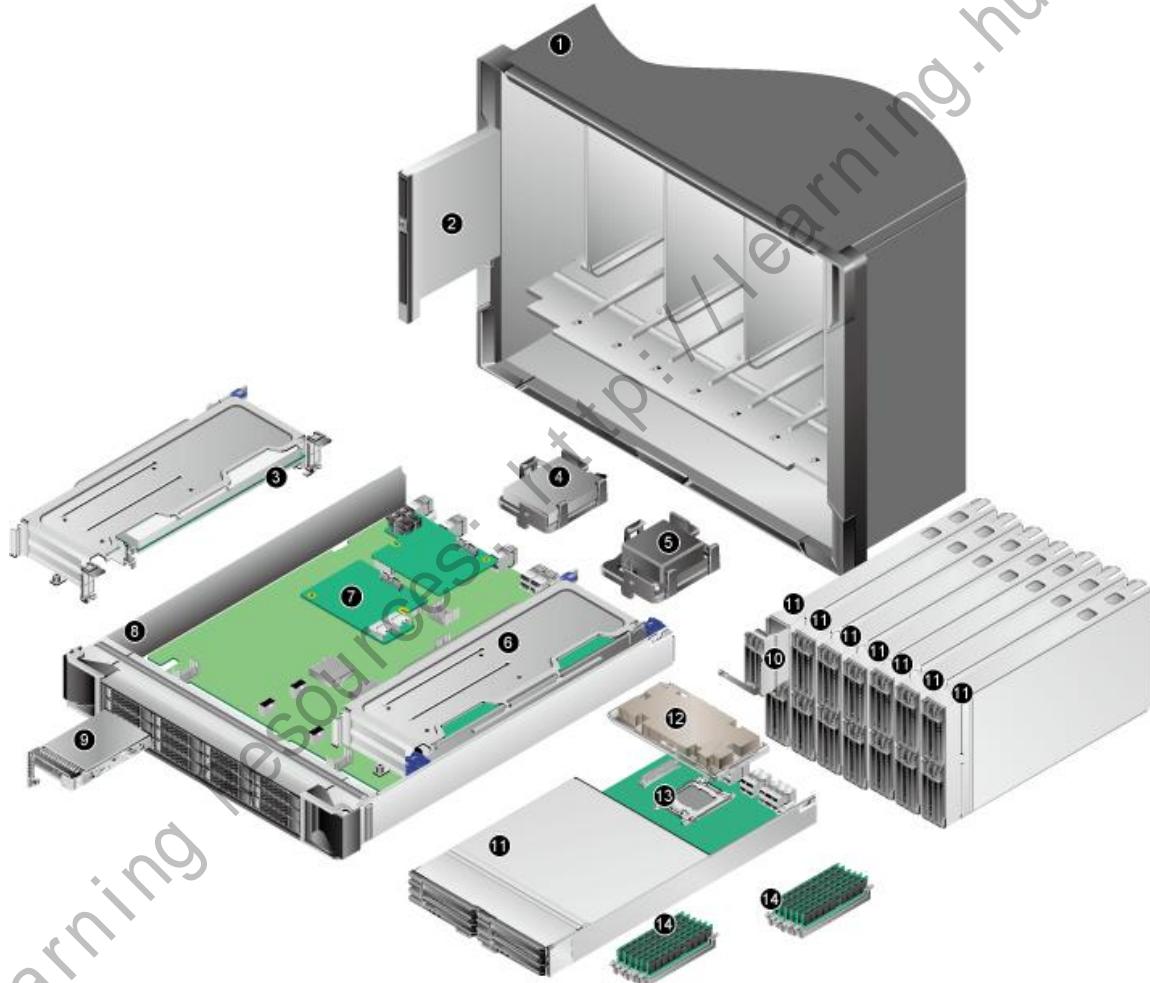
RH8100 V3 Rear View



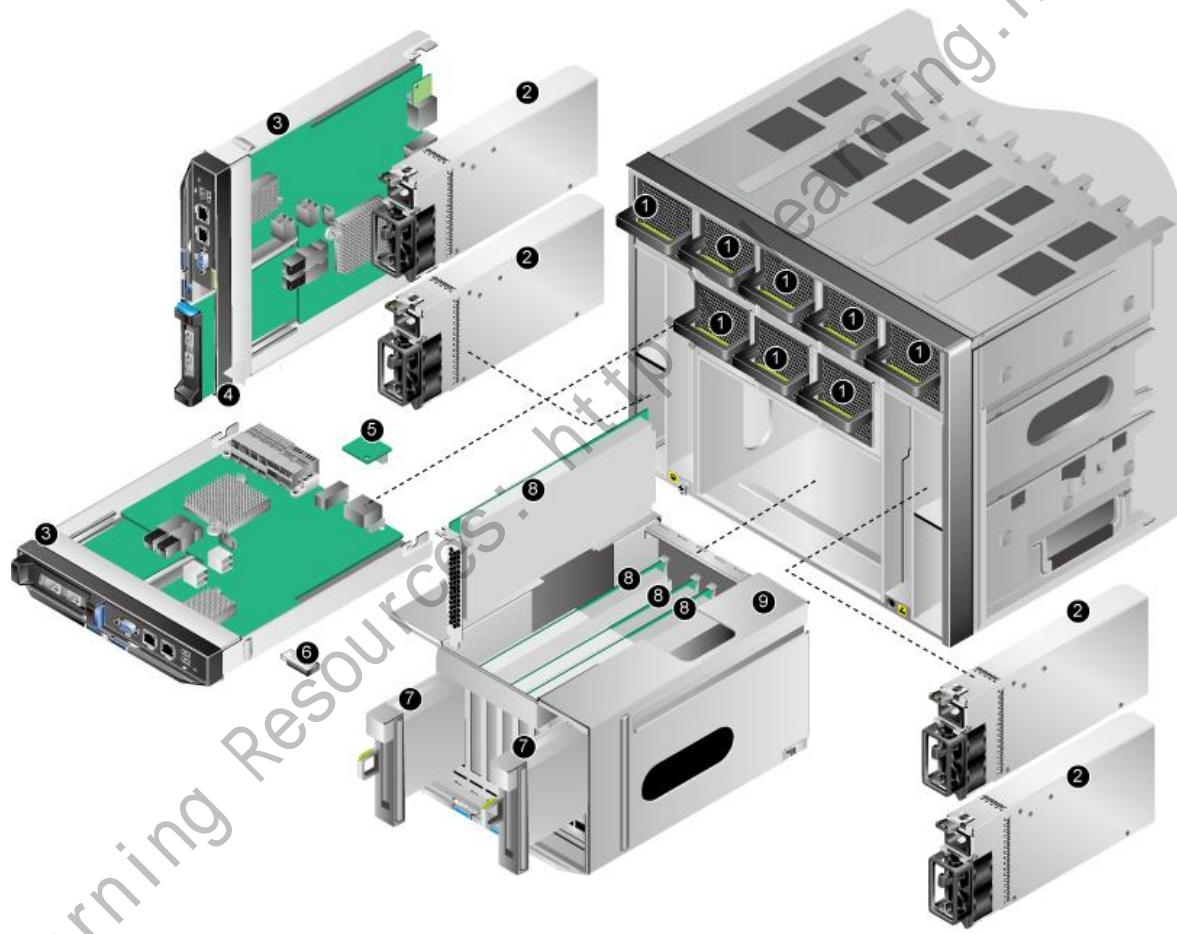
RH8100 V3 Rear View



RH8100 V3 Components (Front View)



RH8100 V3 Components (Rear View)



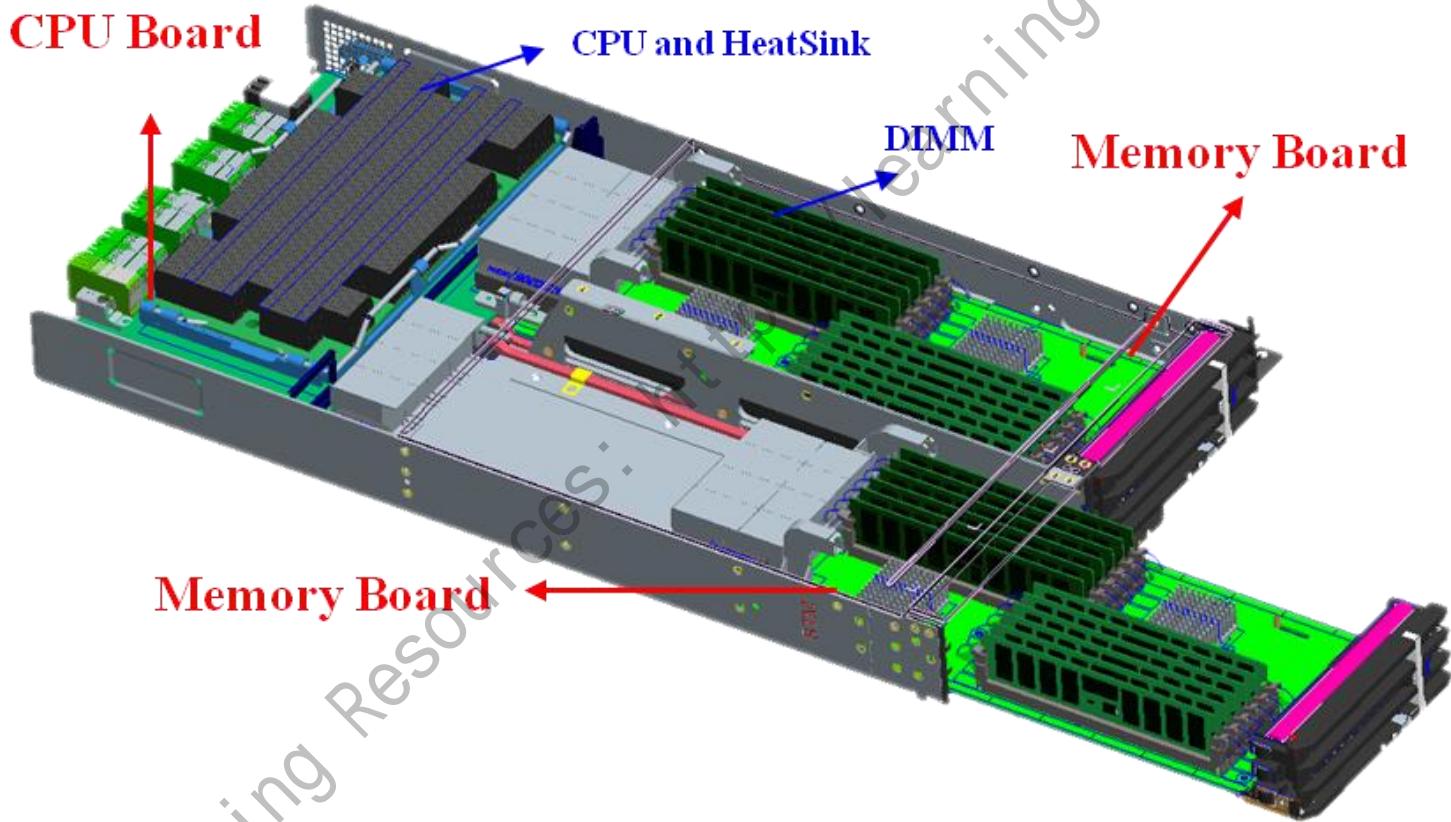
RH8100 V3 Components (Front View)

No.	Name	Description
1	Chassis	A chassis houses and protects all components.
2	DVD-ROM drive and LCD	This module consists of a DVD-ROM drive for installing an OS and a touch LCD.
3	PCIe card	This card is installed on a PCIe riser card. The front I/O module supports PCIe 3.0 x8 and PCIe 3.0 x16 cards, for example, Huawei ES3000 PCIe SSDs and GPUs.
4	iBBU	The iBBU provides power-off protection for the RAID controller card with the LSISAS2208 chip. Note: You can use either an iBBU or a supercapacitor to provide power-off protection for the configured RAID controller card.
5	Supercapacitor	The supercapacitor provides power-off protection for the RAID controller card with the LSISAS2208 or LSISAS3108 chip.
6	PCIe riser card	FM-A provides two PCIe riser cards. Each riser card provides two standard PCIe 3.0 x8 slots and one standard PCIe 3.0 x16 slot.
7	RAID controller card	One or two RAID controller cards of the same model
8	FM-A	This module provides hard disks, RAID controller cards, standard PCIe riser cards, PCIe cards, iBBUs, and supercapacitors. The PCIe slots on FM-A can accommodate PCIe SSDs and GPUs, but do not accommodate cards that require connections to external cables, such as NICs, FC HBAs, and IB cards.
9	Hard disk	Hot-swappable 2.5-inch hard disks
10	Memory board	A CPU module supports a maximum of two memory boards. Each memory board provides 12 or 8 DIMM slots. The server provides a maximum of 192 DDR3 DIMMs.
11	CPU module	A CPU module is used to install a memory board and processor. The CPU modules are numbered 1 to 8 from left to right. In dual-system mode, CPU modules 1 to 4 belong to system A and CPU modules 5 to 8 belong to system B.
12	Heat sink	A heat sink adopts fool-proofing design and cools a processor. The processor on each compute node is configured with one heat sink.
13	Processor	Each CPU module provides only one Intel® Xeon® E7-8800 v2 series processor.
14	DIMM	Each DDR3 DIMM provides a maximum of 64 GB memory capacity. The server provides a maximum of 12 TB memory capacity, and supports 1066, 1333, or 1600 MHz DIMMs. (Note: It is estimated that 64 GB DIMMs will be sold in Q1 2015.)

RH8100 V3 Components (Rear View)

No.	Name	Description
1	Fan module	The fan modules are hot-swappable, and dissipate heat for the server. If one fan module is faulty, the adjacent fan modules run at full speed to ensure optimal heat dissipation for the server.
2	PSU	The RH8100 V3 provides four DC or AC PSUs in 2+2 redundancy mode: <ul style="list-style-type: none">• AC PSUs: convert AC power into DC power for the RH8100 V3.• DC PSUs: convert DC power into 12 V DC power for the RH8100 V3.
3	HFC	An HFC provides an Intel PCH, out-of-band management system, USB port, management network port, serial port, and VGA port, and consists of the TPM, LOM, and USB flash drive.
4	LOM	The RH8100 V3 supports one GE NIC to provide two or four GE ports or one 10GE NIC to provide two 10GE ports. Both types of NICs support NC-SI.
5	TPM (optional)	A TPM is a security solution that complies with the Trusted Computing Group (TCG) standards. It prevents viruses or unauthorized operations, enhancing the platform security.
6	USB flash drive	A USB flash driver provides a maximum of 8 GB storage capacity.
7	Hot-swappable PCIe card	The rear I/O module supports two hot-swappable PCIe 3.0 x8 cards and two hot-swappable PCIe 3.0 x16 cards.
8	Non-hot-swappable PCIe card	The rear I/O module supports six non-hot-swappable PCIe 3.0 x8 cards.
9	Rear I/O module	The rear I/O module supports four hot-swappable PCIe cards and six non-hot-swappable PCIe cards.

CPU Module

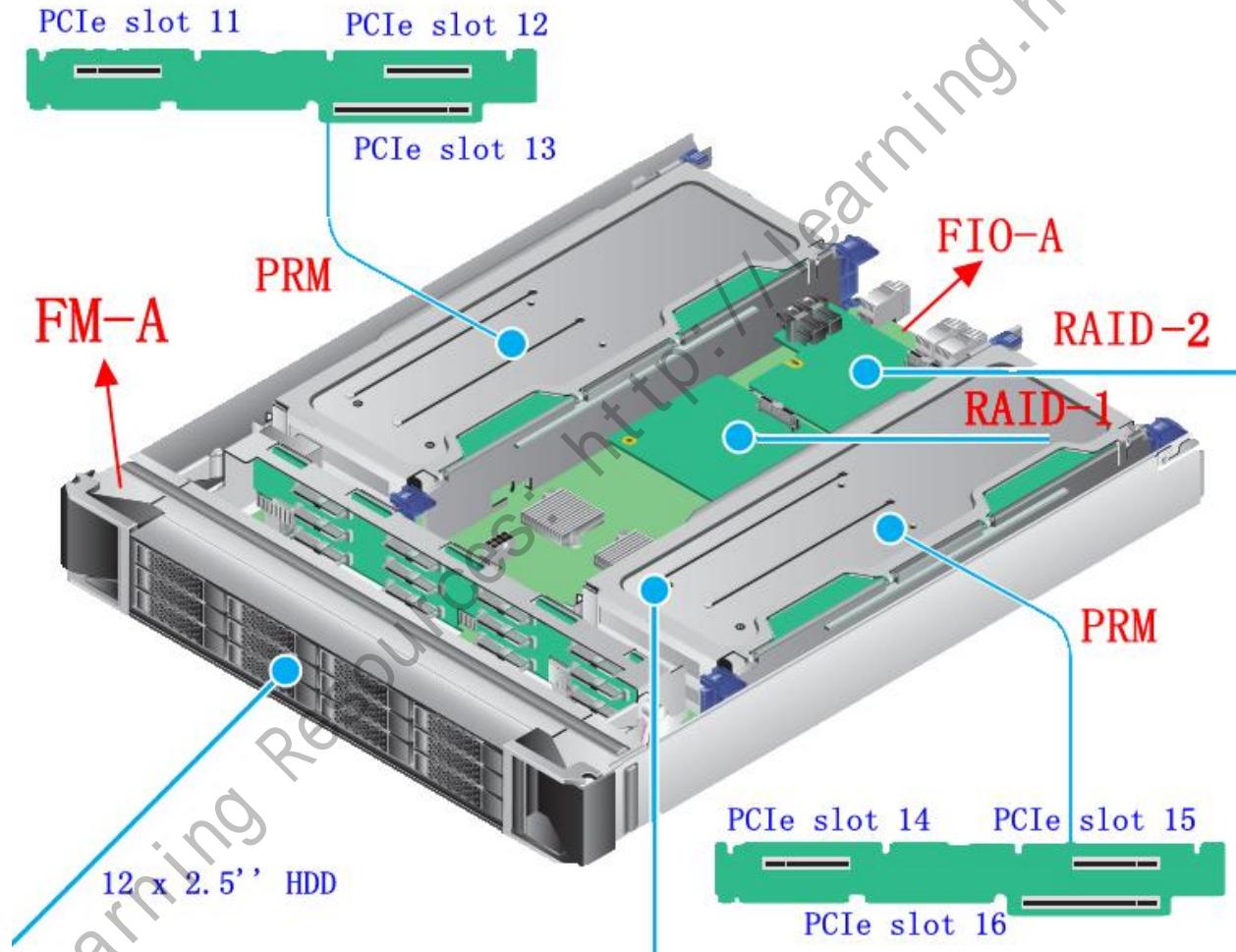


RH8100 V3 Front I/O Module

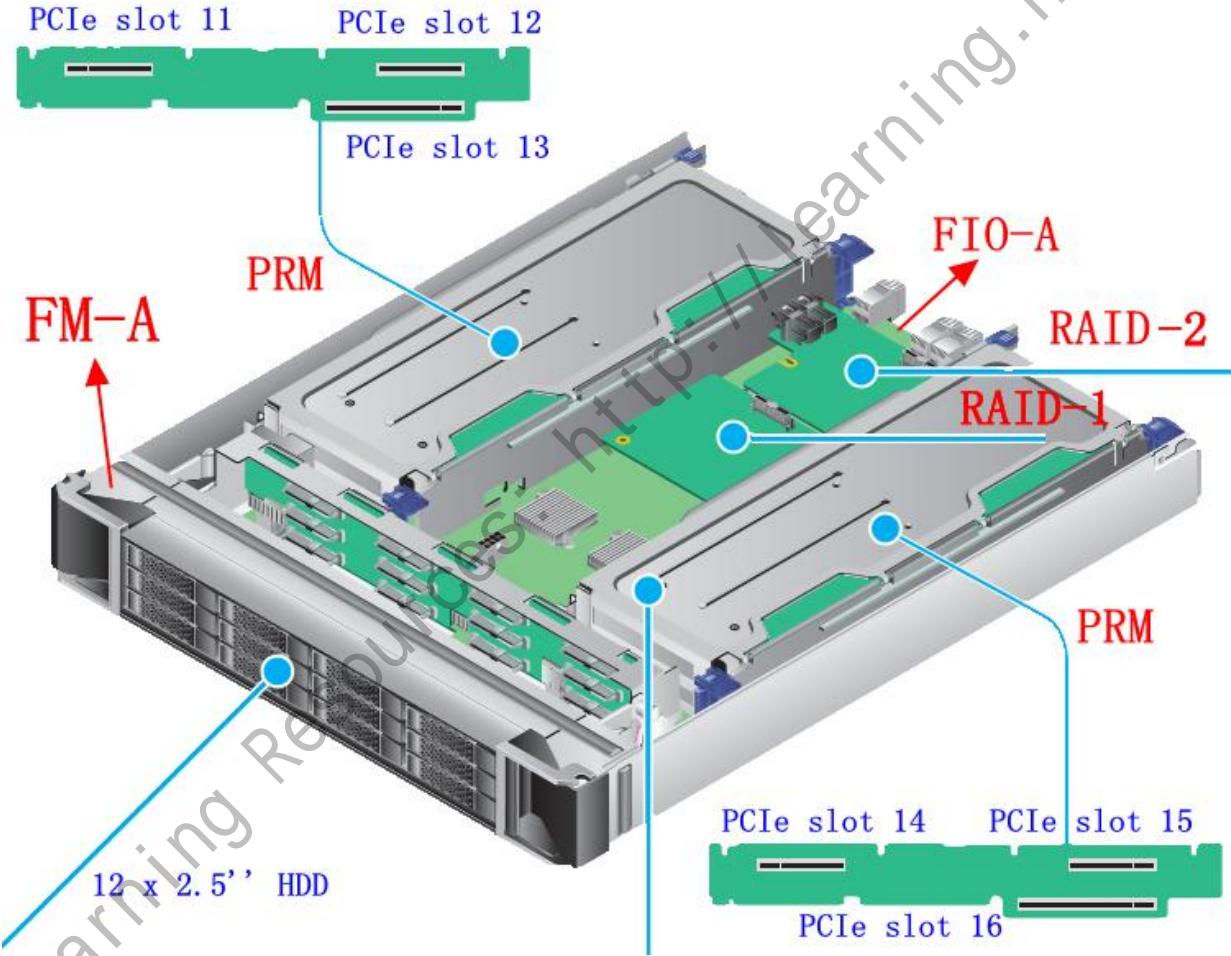
The RH8100 V3 supports two models of front I/O modules. You can choose one based on site requirements.

- FM-A with balanced performance
 - One or two RAID controller cards
 - 12 HDDs
 - Up to two PCIe riser cards
 - Each card supports three standard PCIe 3.0 slots.
- FM-B with enhanced storage
 - One or two RAID controller cards
 - Up to 24 hard disks

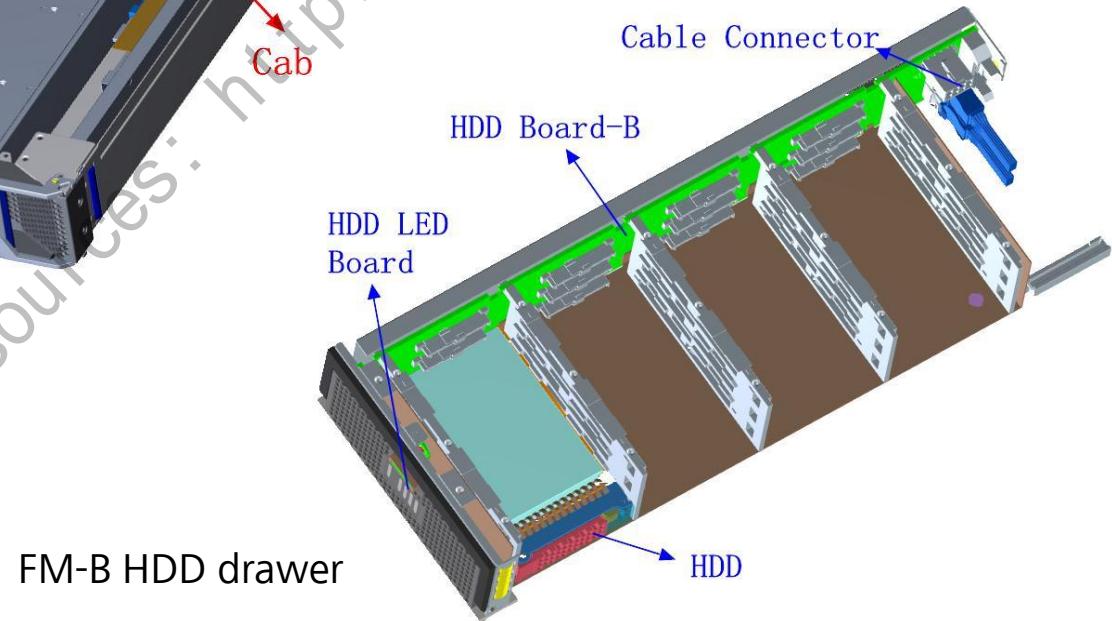
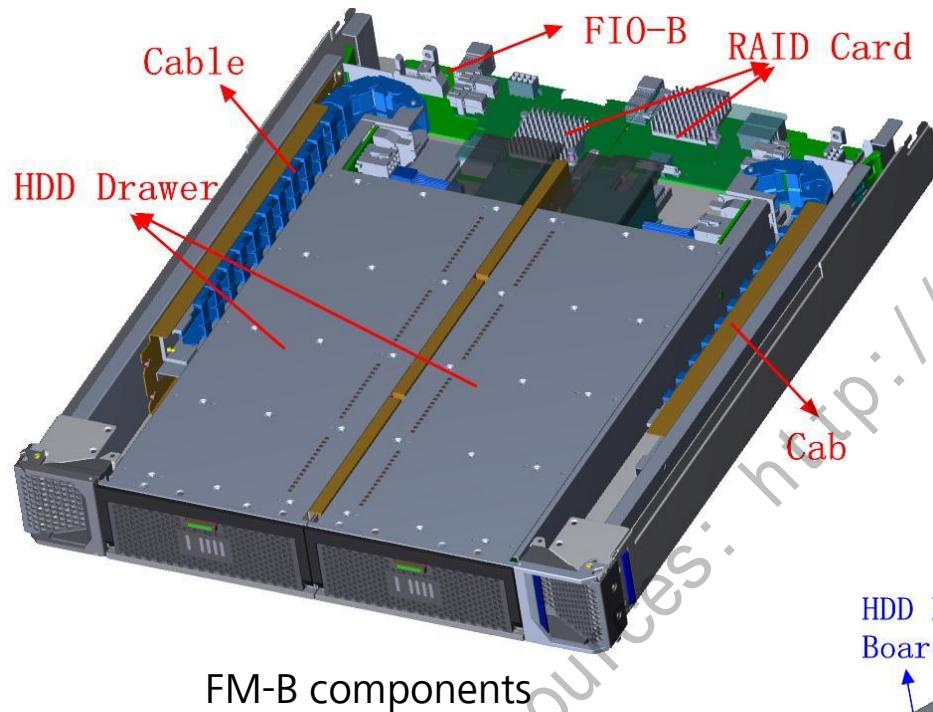
FM-A



FM-A



FM-B

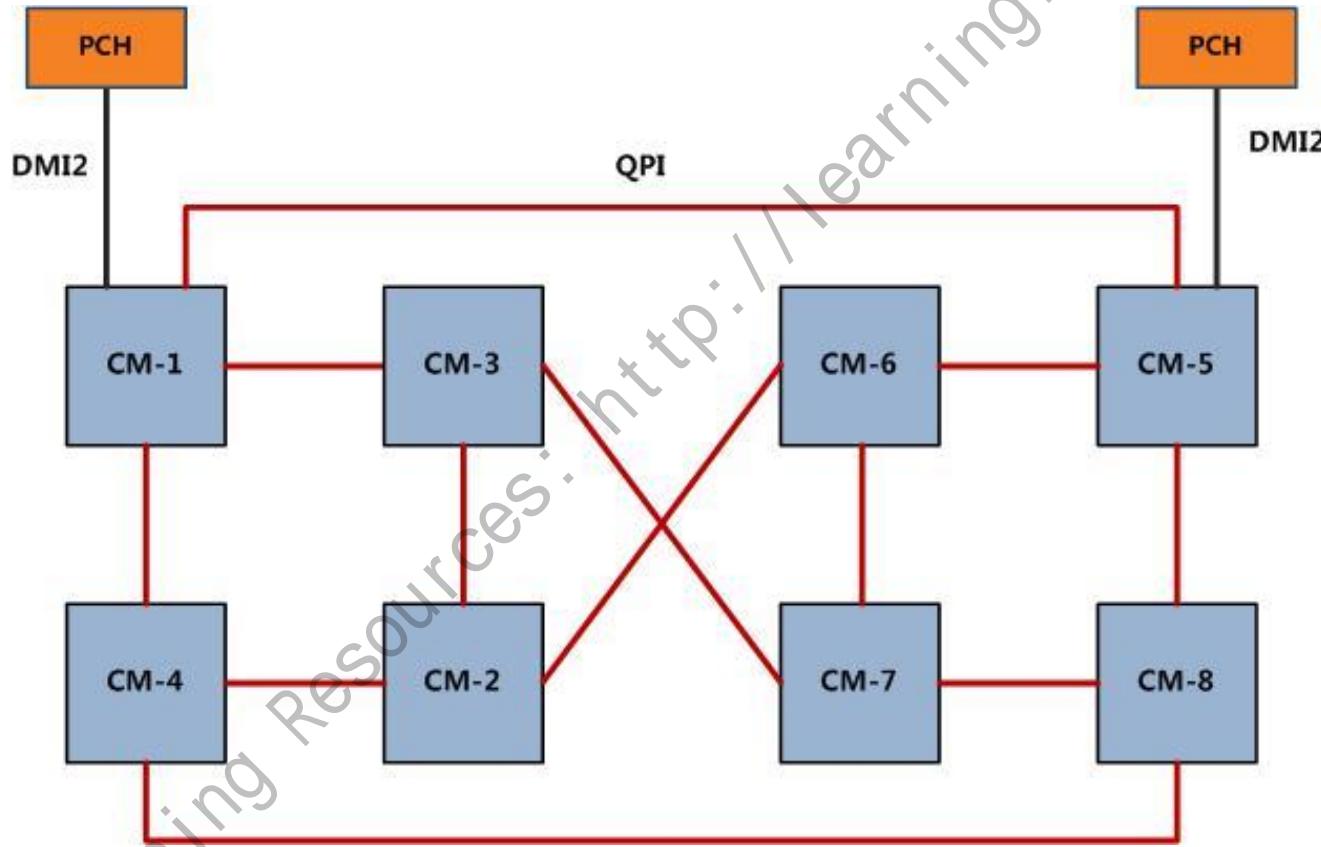


RH8100 V3 Logical Architecture

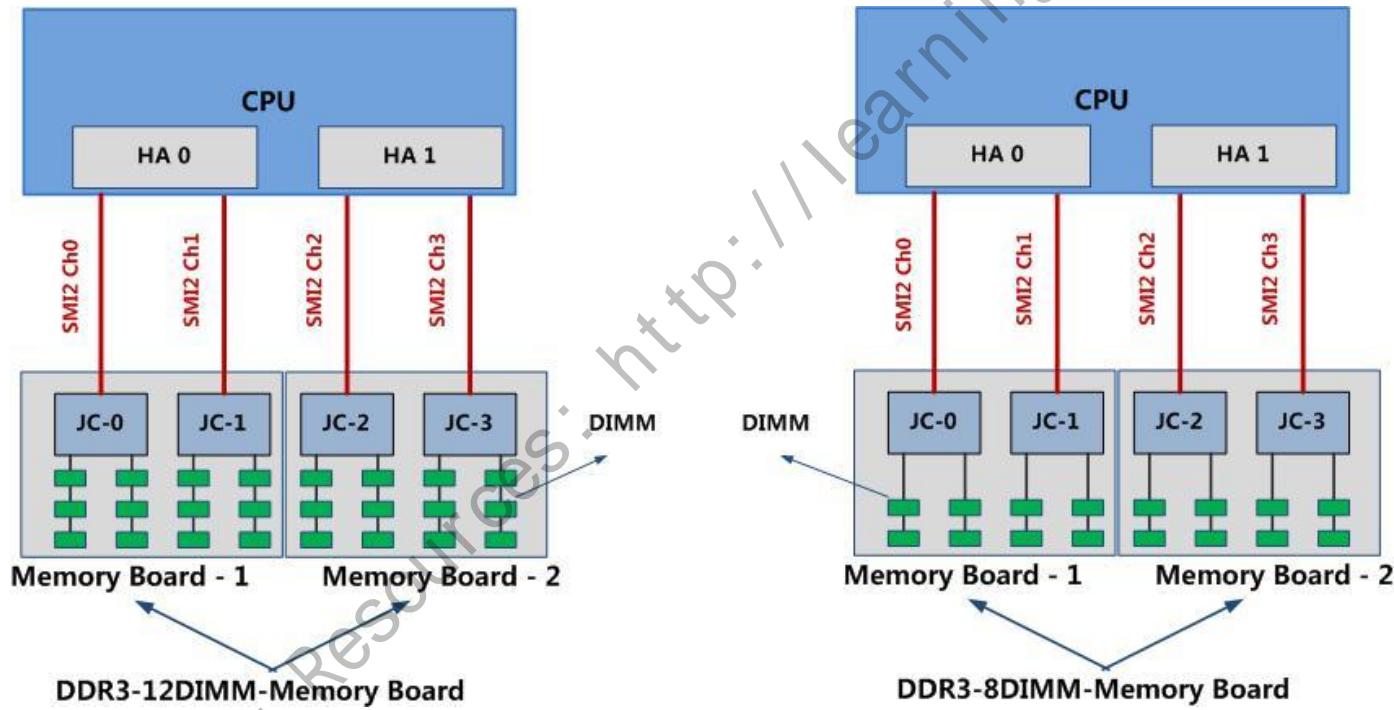
The RH8100 V3 logically consists of the following modules:

- System chassis module
- CPU modules
- Front I/O module
- Rear I/O module
- HFCs
- PSUs
- Fan modules

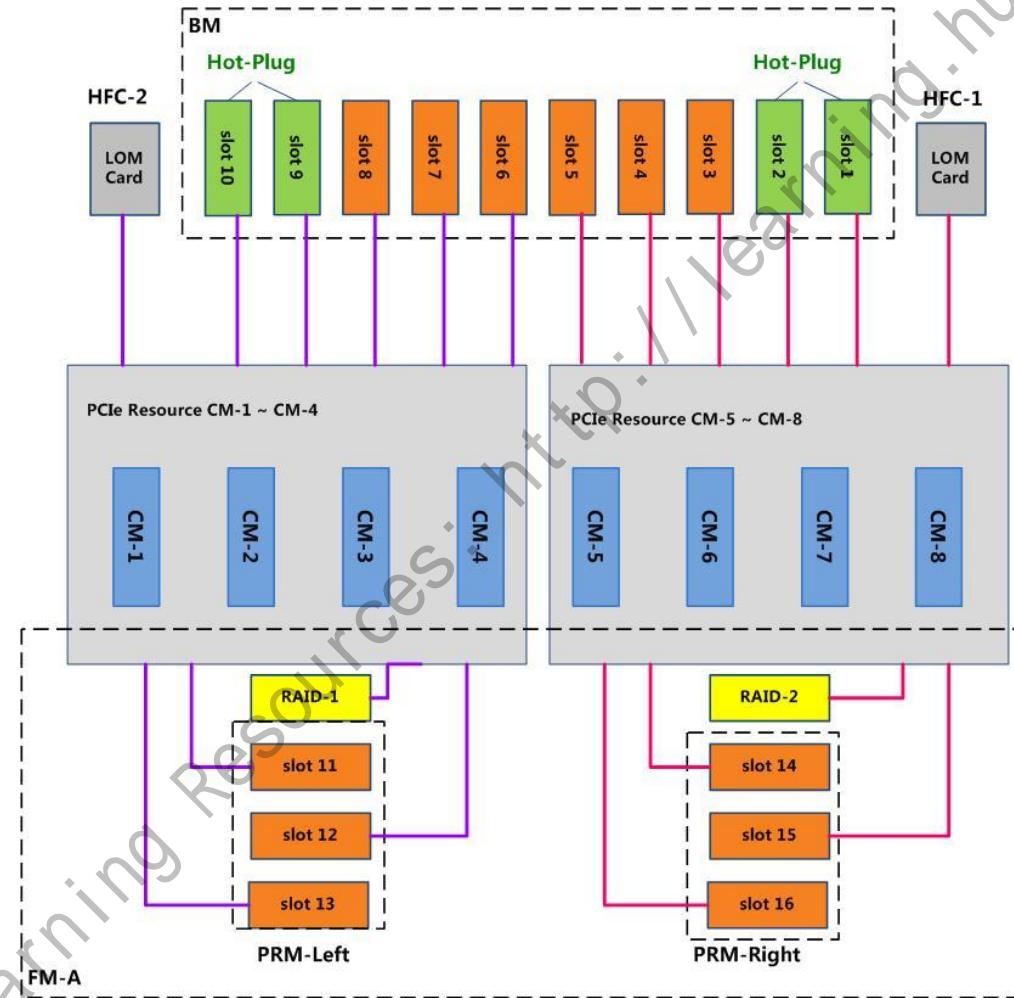
RH8100 V3 QPI Topology



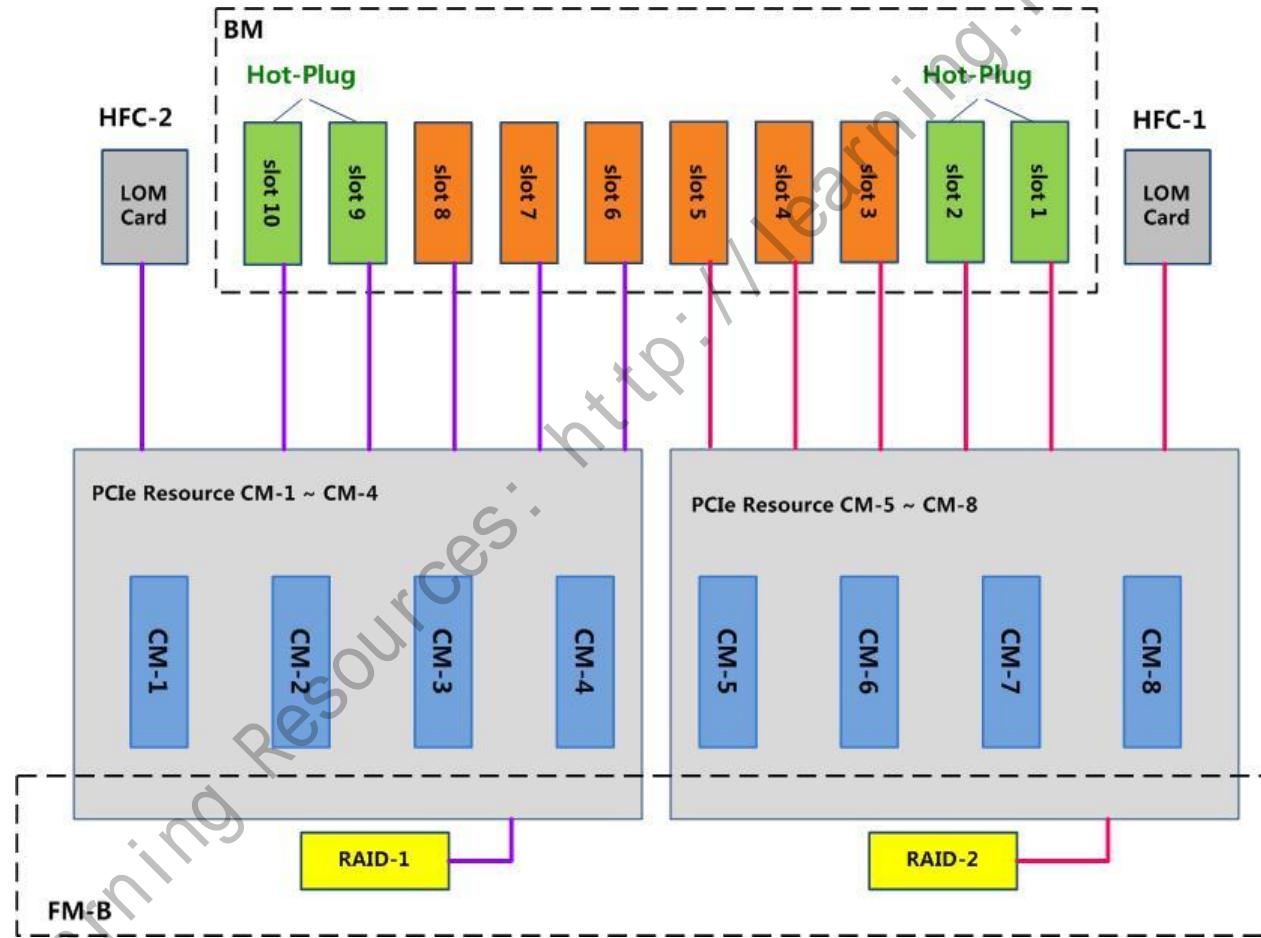
Memory Subsystem Topology



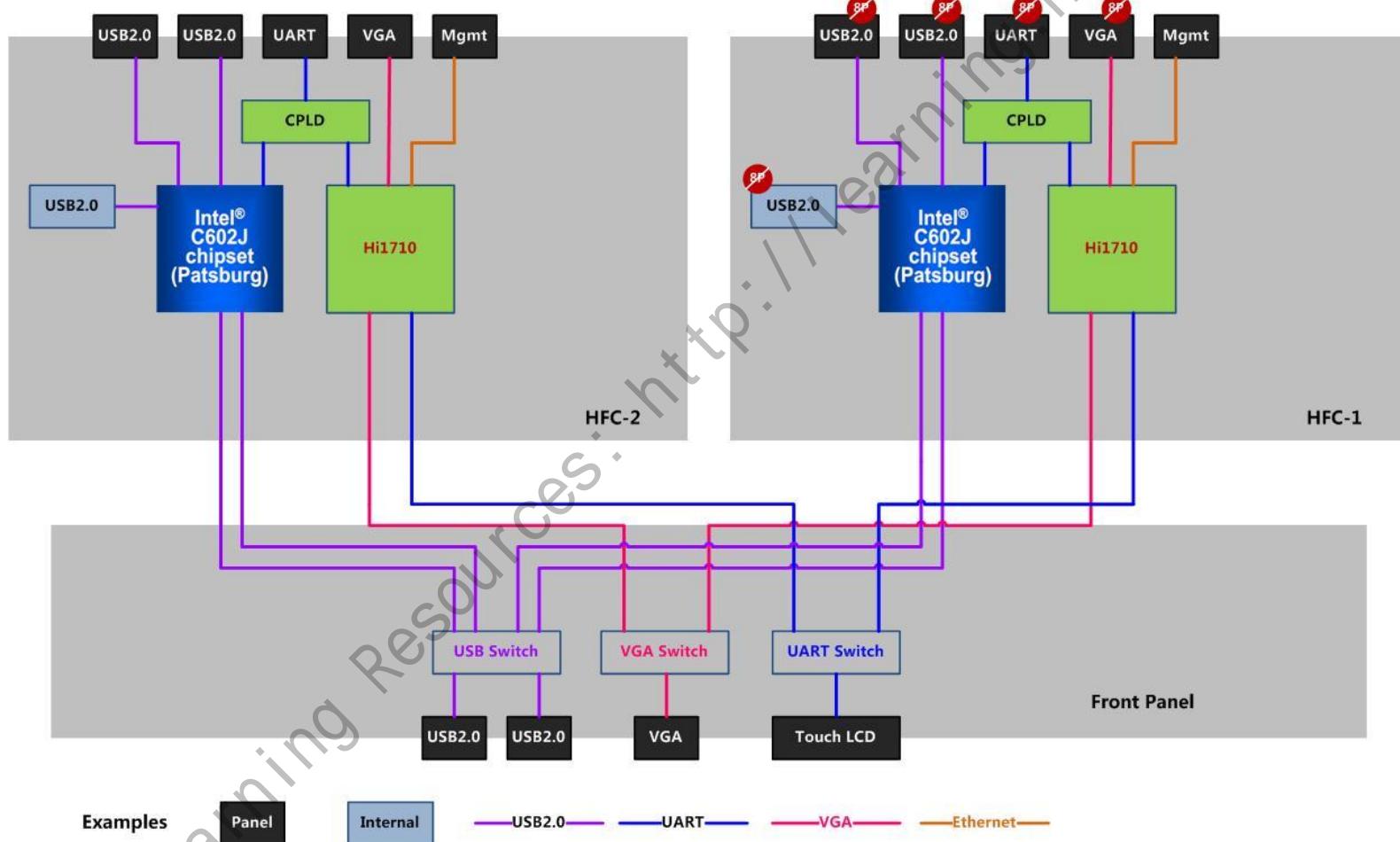
RH8100 V3 PCIe Topology (FM-A)



RH8100 V3 PCIe Topology (FM-B)



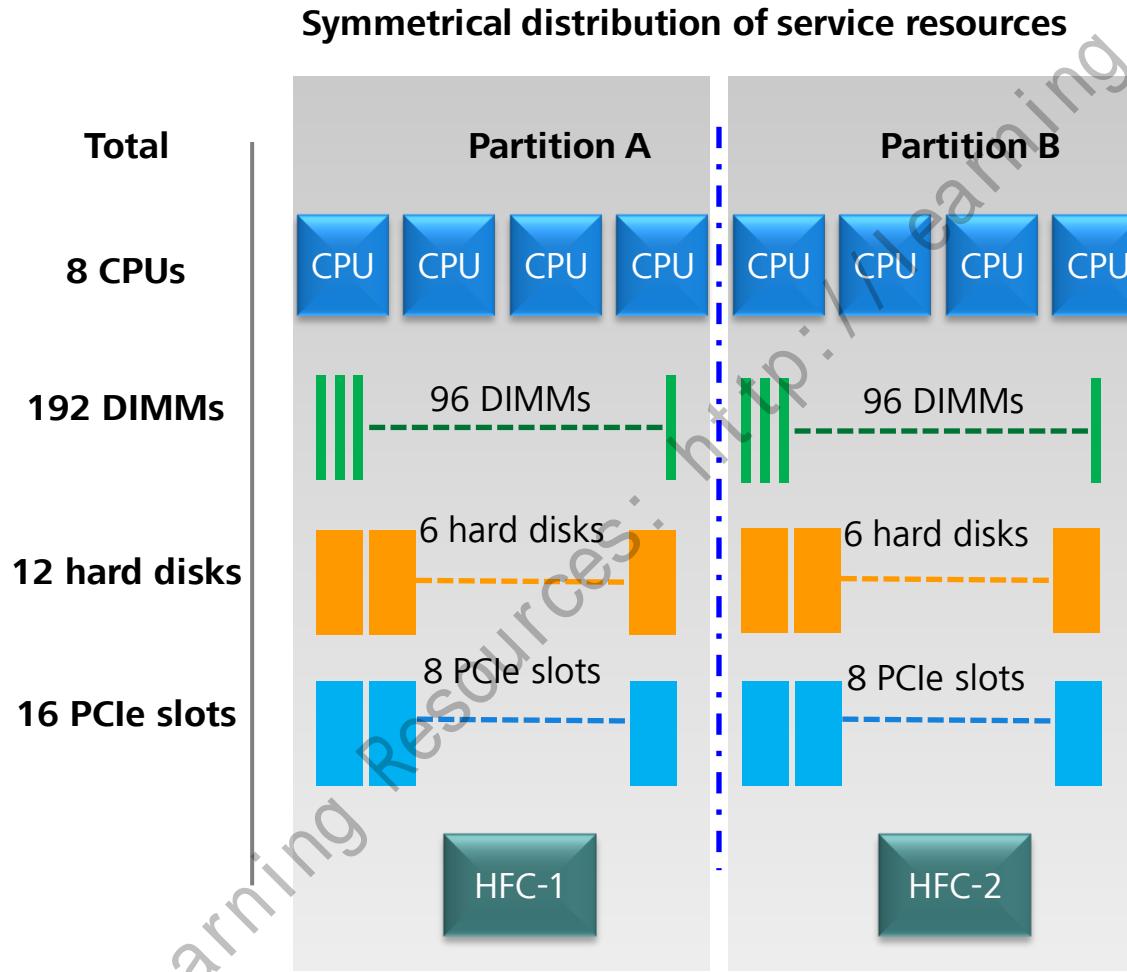
Topologies of Other Ports on the RH8100 V3



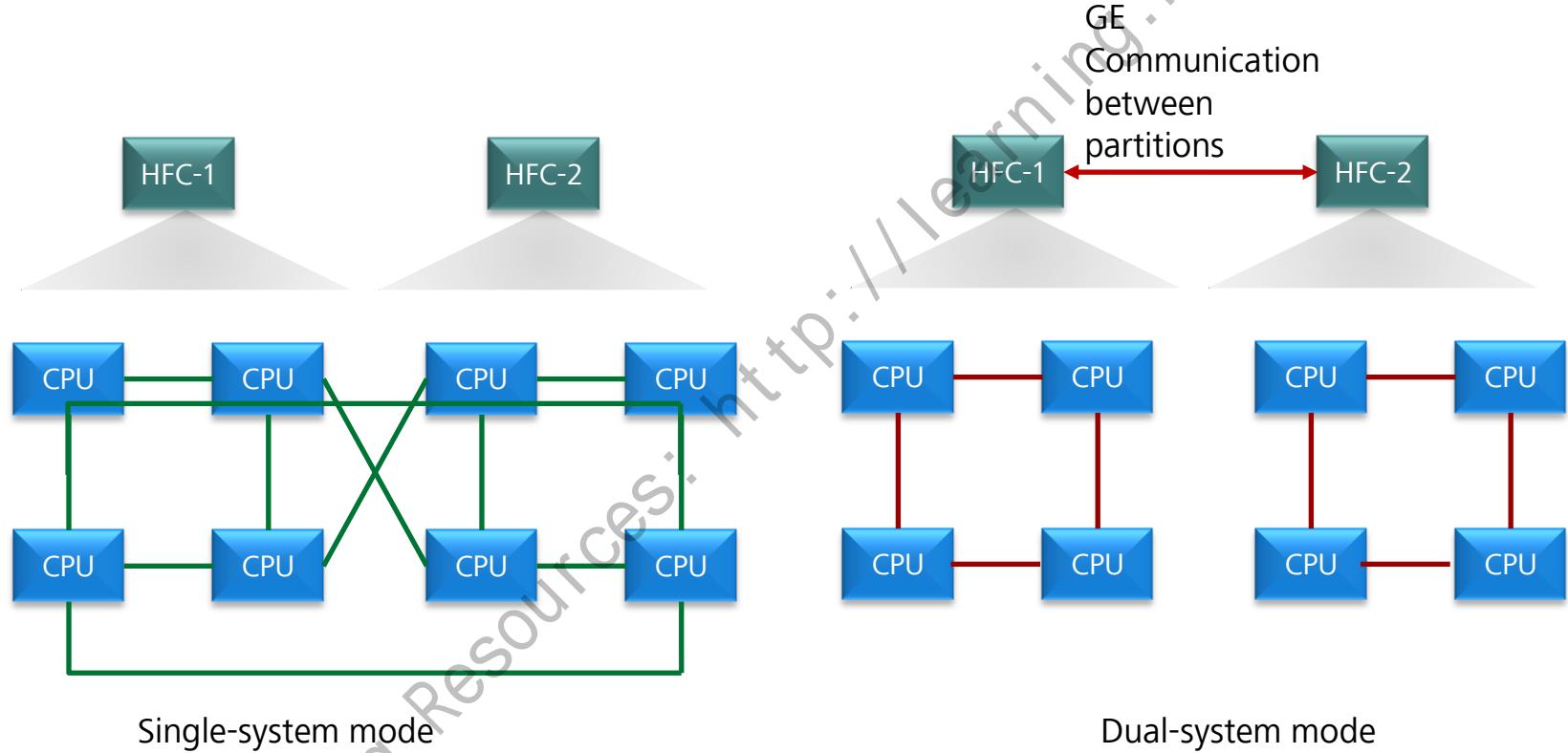
FusionPar Technology

- The key to FusionPar is to change the interconnection topology between processors through interworking between the iBMC and BIOS.
- The RH8100 V3 can operate in single-system or dual-system mode.
 - In single-system mode, the eight processors on the RH8100 V3 are in the same QPI topology.
 - In dual-system mode, the eight processors are divided into two groups. The four processors in each group are in one QPI topology.
- In short, the processors connected over the QPI link are in one partition.
- The RH8100 V3 employs the Huawei FusionPar technology to implement the hard partitioning function.

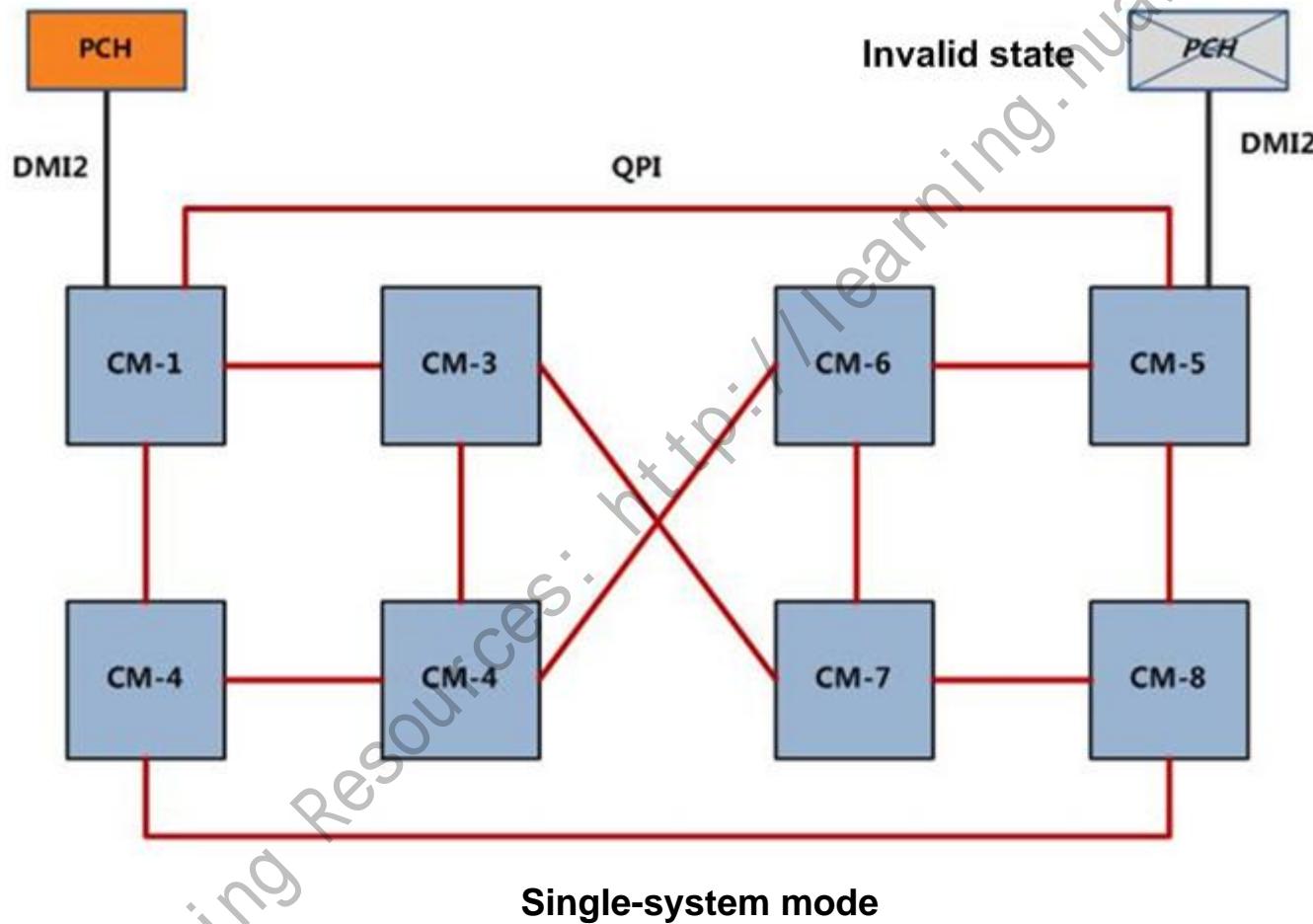
FusionPar Technology



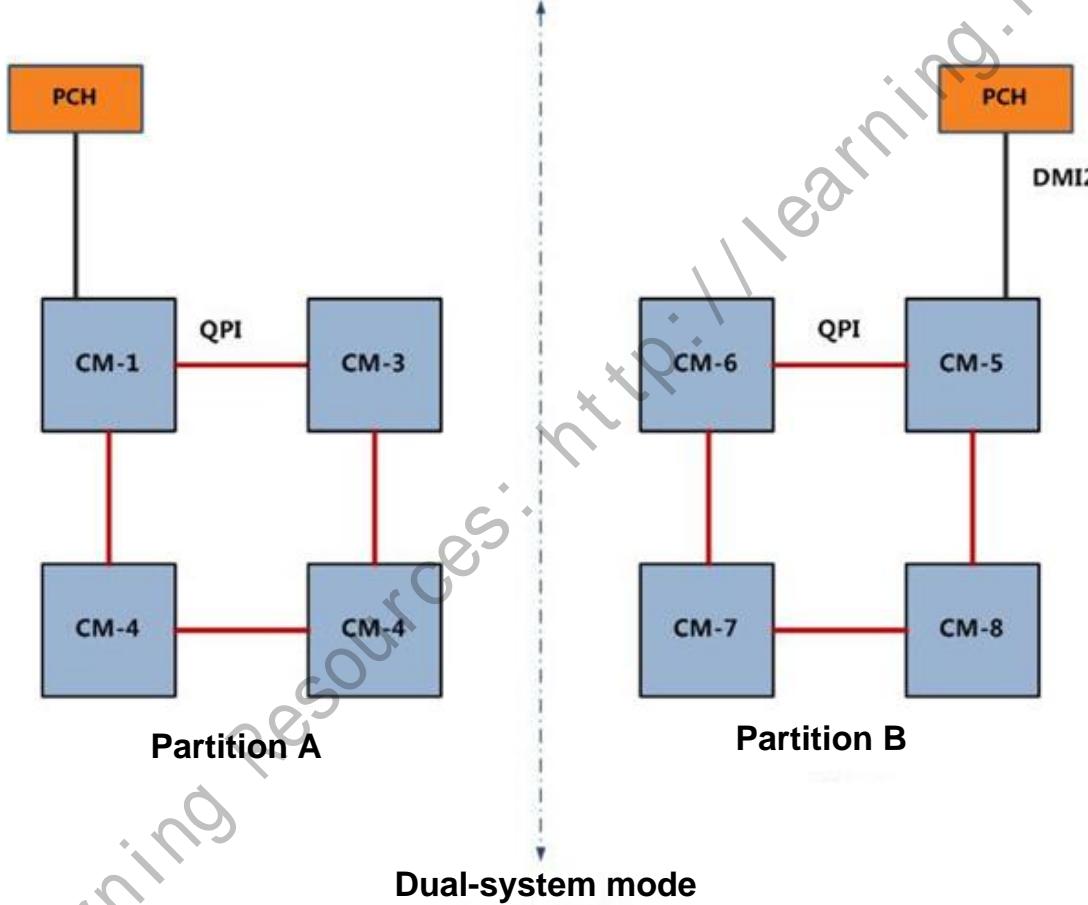
Hard Partitioning — Huawei FusionPar



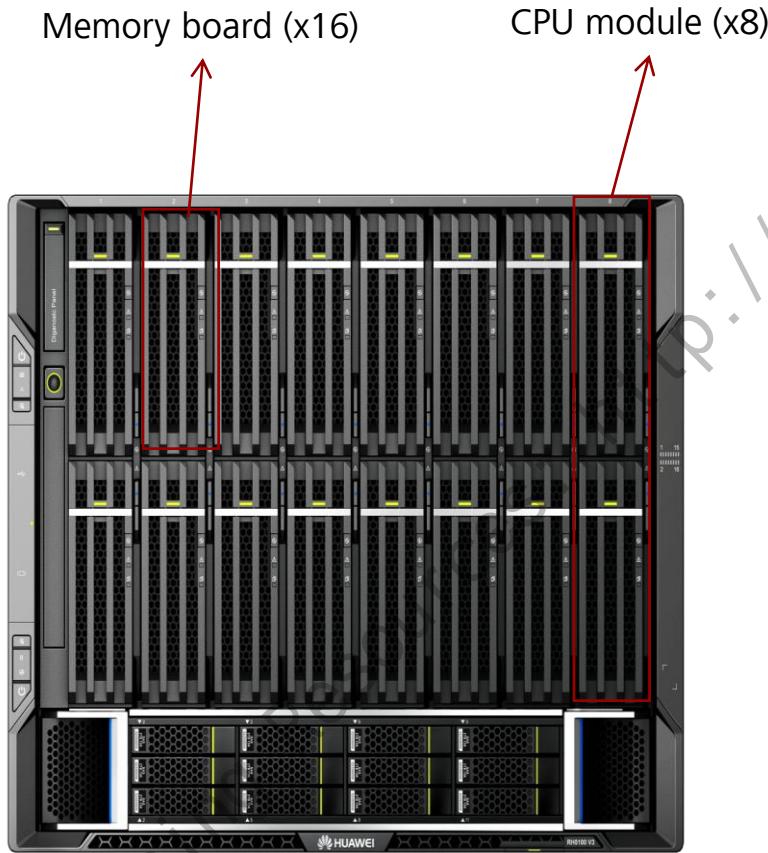
QPI Topology in Single-System Mode



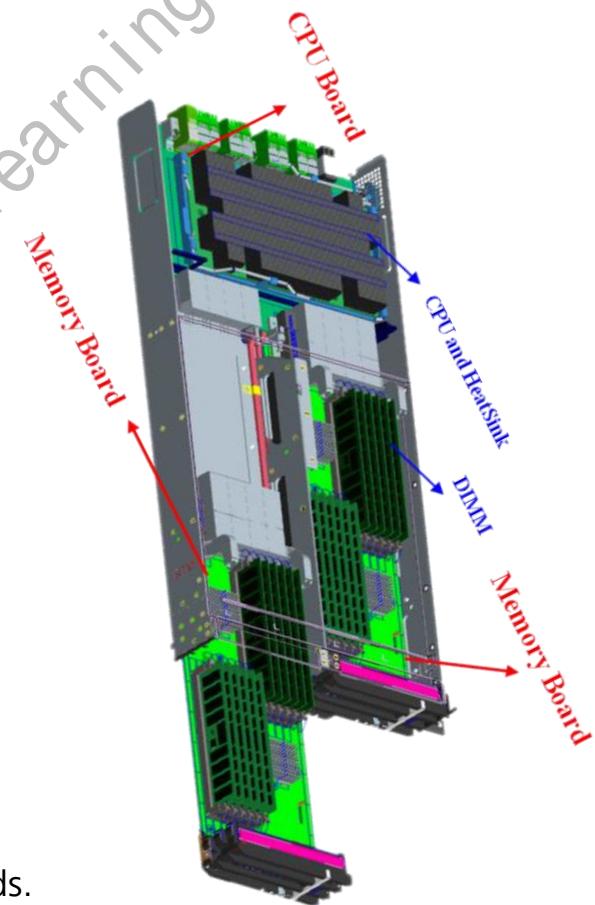
QPI Topology in Dual-System Mode



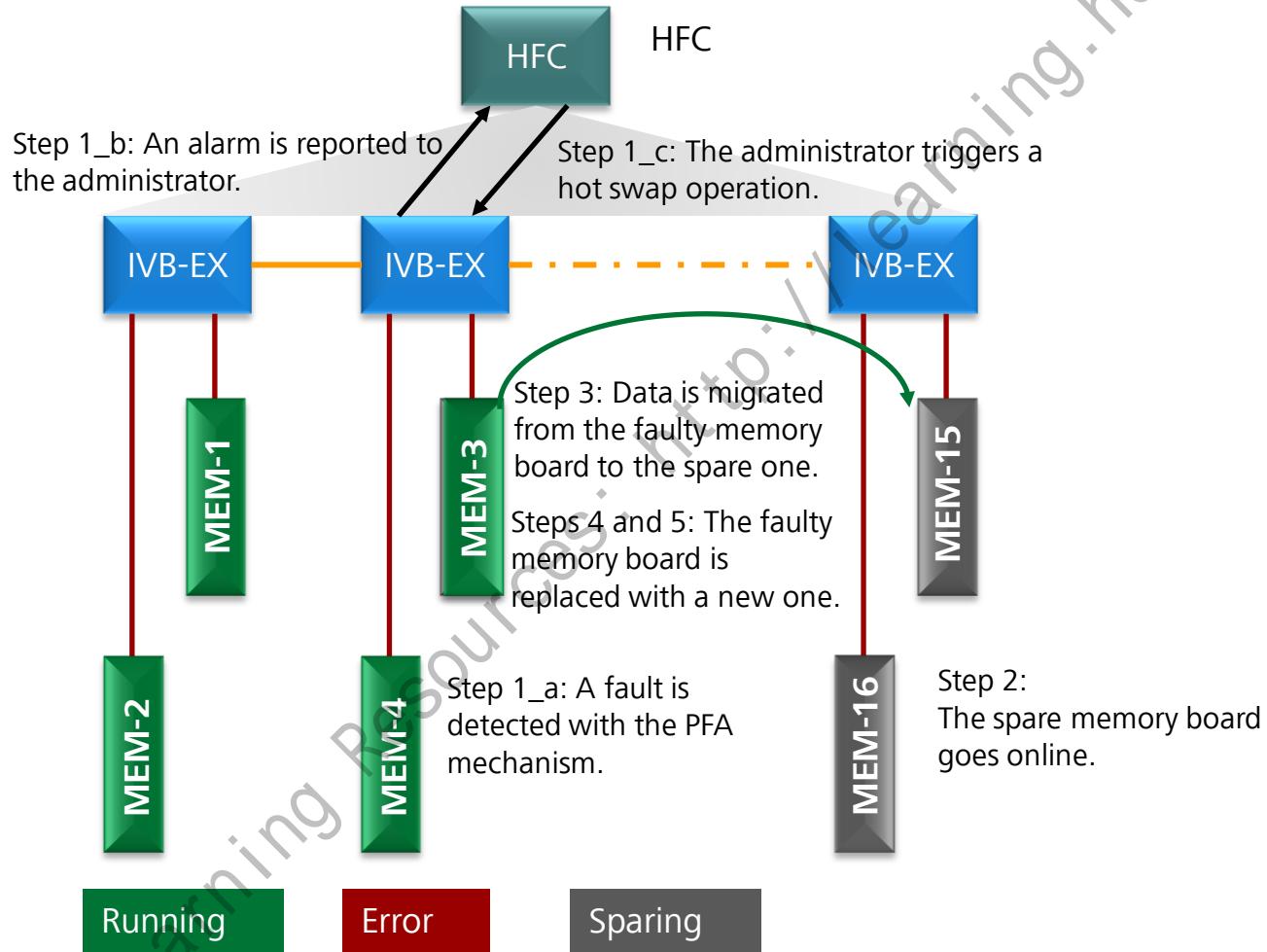
Memory Board Hot Swap



Each CPU module provides two memory boards.



Memory Board Hot Swap



RH8100 V3 CPU Configuration Rules

- The RH8100 V3 supports four or eight Intel® Xeon® E7-8800 v2 series CPUs.
- A server must use CPUs of the same model.

No.	BOM Number	Description
1	41020482	X86 series,LGA2011,2300MHz,1.2V,64bit,105000mW,IvyBridge EX Xeon E7-8850 v2,12Core,IT Product Dedicated
2	41020481	X86 series,LGA2011,3000MHz,1.2V,64bit,130000mW,IvyBridge EX Xeon E7-8857 v2,12Core,IT Product Dedicated
3	41020480	X86 series,LGA2011,2300MHz,1.2V,64bit,130000mW,IvyBridge EX Xeon E7-8870 v2,15Core,IT Product Dedicated
4	41020477	X86 series,LGA2011,2200MHz,1.2V,64bit,105000mW,IvyBridge EX Xeon E7-8880L v2,15Core,IT Product Dedicated
5	41020479	X86 series,LGA2011,2500MHz,1.2V,64bit,130000mW,IvyBridge EX Xeon E7-8880 v2,15Core,IT Product Dedicated
6	41020476	X86 series,LGA2011,2800MHz,1.2V,64bit,155000mW,IvyBridge EX Xeon E7-8890 v2,15Core,IT Product Dedicated
7	41020475	X86 series,LGA2011,3200MHz,1.2V,64bit,155000mW,IvyBridge EX Xeon E7-8891 v2,10Core,IT Product Dedicated
8	41020474	X86 series,LGA2011,3400MHz,1.2V,64bit,155000mW,IvyBridge EX Xeon E7-8893 v2,6Core,IT Product Dedicated

RH8100 V3 DIMM Configuration Rules

Memory board compatibility

BOM Number	Description	Maximum Number of Memory Boards	Maximum Number of DIMMs
03022LAR	Manufactured Board,RH8100 V3,BC61MPTA,memory board-DDR3-12DIMM	16	192
03022VQR	Manufactured Board,RH8100 V3,BC61MPTB,memory board-DDR3-8DIMM	16	128

DIMM compatibility

BOM Number	Description	Maximum Number of DIMMs Supported
06200123	Memory Module,DDR3 RDIMM,8GB,240PIN,1.25ns,1600000KHz,1.35V,ECC,2 Rank(512M*8bit),Height 30mm	192 (24 DIMMs per CPU)
06200139	Memory Module,DDR3 RDIMM,8GB, 240pin,1.25ns, 1600000KHz,1.5V,ECC,2Rank (512M*8bit), height 30mm	192 (24 DIMMs per CPU)
06200161	Memory Module,DDR3 RDIMM,16GB,240pin,1.25ns,1600000KHz,1.35V,ECC,2Rank(1G*4bit),Height 30mm	192 (24 DIMMs per CPU)
06200172	Memory Module,DDR3 RDIMM,16GB,240pin,1.1ns,1866000KHz,1.5V,ECC,2Rank(1G*4bit),Height 30mm	192 (24 DIMMs per CPU)
06200137	Memory Module,DDR3 LRDIMM,32GB,240pin,1.5ns,1333000KHz,1.35V,ECC,4Rank(1G*4bit),Height 30mm	192 (24 DIMMs per CPU)
06200169	Memory Module,DDR3 RDIMM,8GB,240pin,1.1ns,1866000KHz,1.5V,ECC,2Rank(512M*8bit),Height 30mm	192 (24 DIMMs per CPU)

RH8100 V3 DIMM Configuration Rules

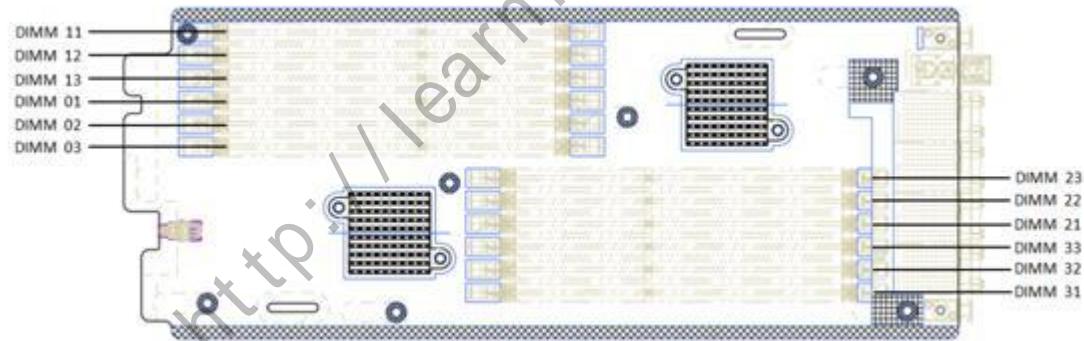
Maximum memory speeds

DIMM Properties						RH8100 V3 Operating Voltage/Speed					
BOM Number	Type	Rank	Capacity	Maximum Speed (MT/s)	Rated Voltage (V)	High-Performance Mode			RAS Mode		
						1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC
06200123	RDIMM	2	8 GB	1600	1.35	1.35/1333	1.35/1066	1.5/1066	1.35/1333	1.35/1066	1.5/1066
06200139	RDIMM	2	8 GB	1600	1.5	1.5 /1333	1.5 /1333	1.5 /1066	1.5 /1333	1.5 /1333	1.5 /1066
06200169	RDIMM	2	8 GB	1866	1.5	1.5 /1333	1.5 /1333	1.5 /1066	1.5 /1333	1.5 /1333	1.5 /1066
06200161	RDIMM	2	16 GB	1600	1.35	1.35/1333	1.35/1066	1.5 /1066	1.35/1333	1.35/1066	1.5/1066
06200172	RDIMM	2	16 GB	1866	1.5	1.5 /1333	1.5 /1333	1.5 /1066	1.5 /1333	1.5 /1333	1.5 /1066
06200137	LRDIMM	4	32 GB	1333	1.35	1.35/1333	1.35/1333	1.5 /1333	1.35/1333	1.35/1333	1.5/1333

RH8100 V3 DIMM Configuration Rules

Memory channel compositions

Memory Channel	Composition
Channel 0	DIMM 01
	DIMM 02
	DIMM 03
Channel 1	DIMM 11
	DIMM 12
	DIMM 13
Channel 2	DIMM 21
	DIMM 22
	DIMM 23
Channel 3	DIMM 31
	DIMM 32
	DIMM 33



DIMM installation sequence (DDR3-12DIMM-memory board)

The figure above shows the installation positions of 12 DDR3 DIMMs on a memory board. On a memory riser that supports eight DDR3 DIMMs, DIMM slots 03, 13, 23, and 33 are vacant.

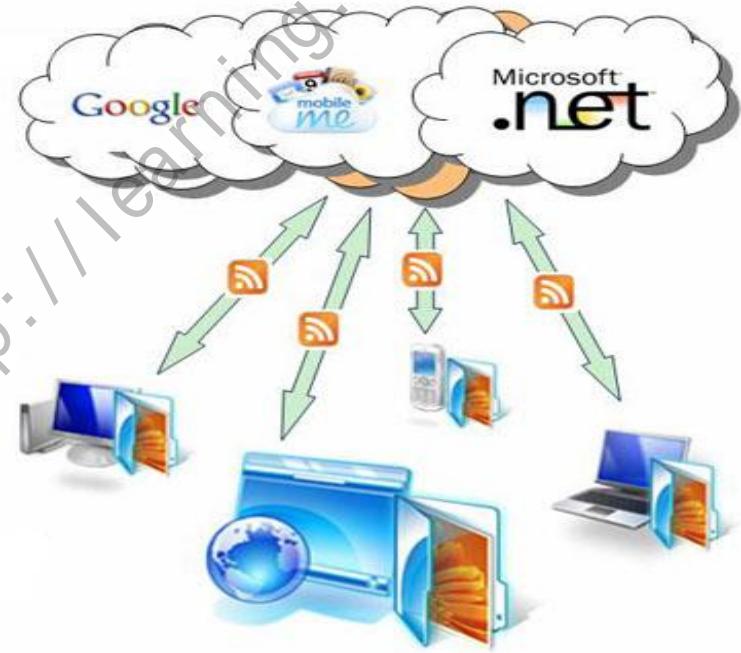


Contents

- RH Series Server Overview and Positioning
- RH Series Server Description
- **RH Series Server Applications**

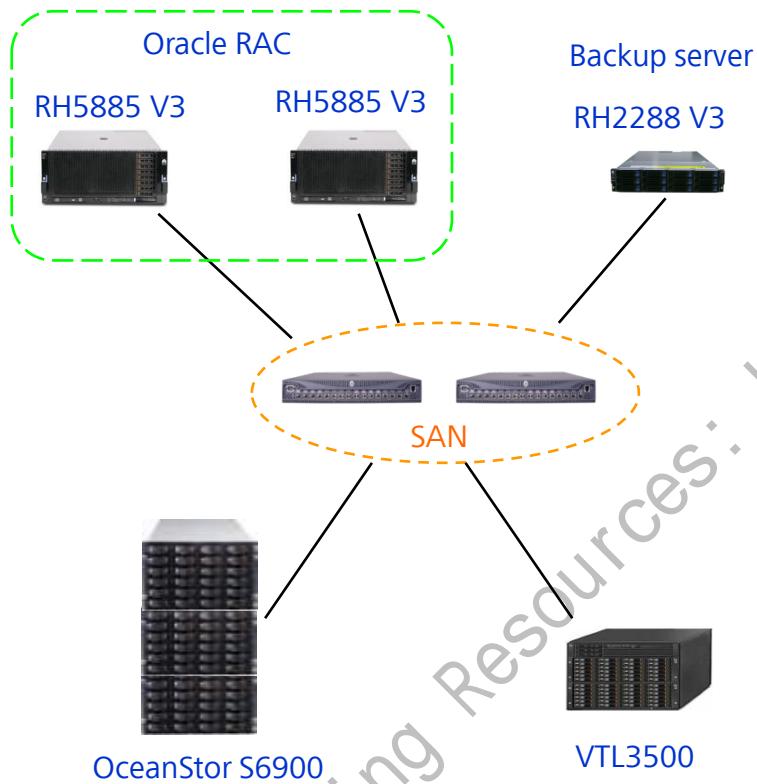
RH2288 V3: Cloud Computing Platform

- Customer challenges
 - High-performance compute nodes
 - High-speed Ethernet
 - Large memory capacity per VM
 - Large storage capacity per node
 - Unified maintenance for multiple nodes
 - Easy to use and maintain
 - Custom services (customer assets management, open APIs, and optimized performance)



This solution uses the RH2288 V3 to build a cloud computing platform featuring high-performance computing, high-speed network, and large-capacity storage, which meets cloud computing requirements while reducing the TCO.

RH5885 V3 Database HA and Backup Solution



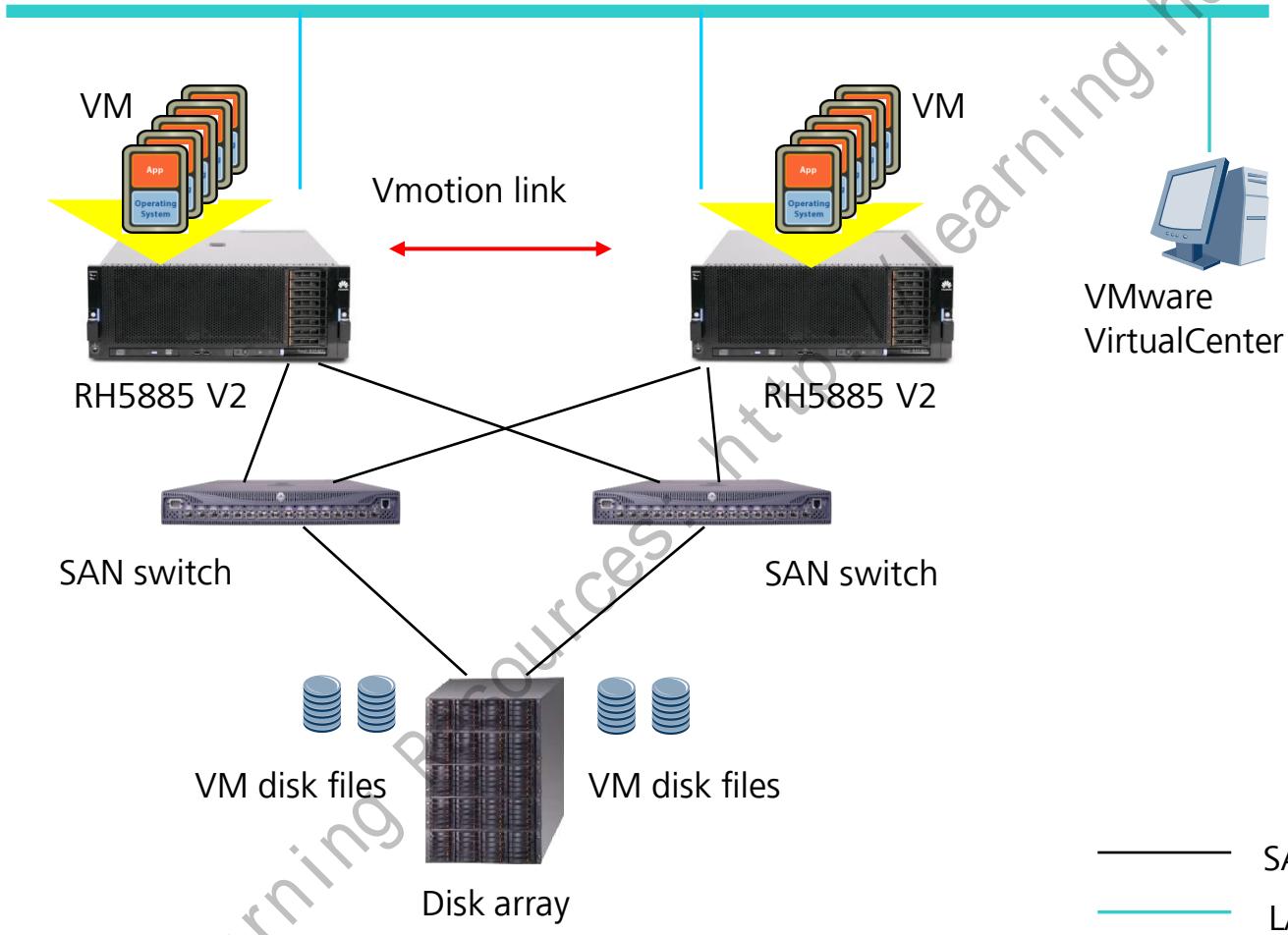
Solution overview

- The RH5885 V2 is an optimal choice for mission-critical business, for example, database applications. Its excellent performance maximizes database functionality, its high reliability ensures stable operating of the service platform, and its high scalability flexibly meets requirements for enterprise service growth.
- The storage backup platform with the RH2285 V2, S6900, and VTL3500 ensures security of enterprises' core data.

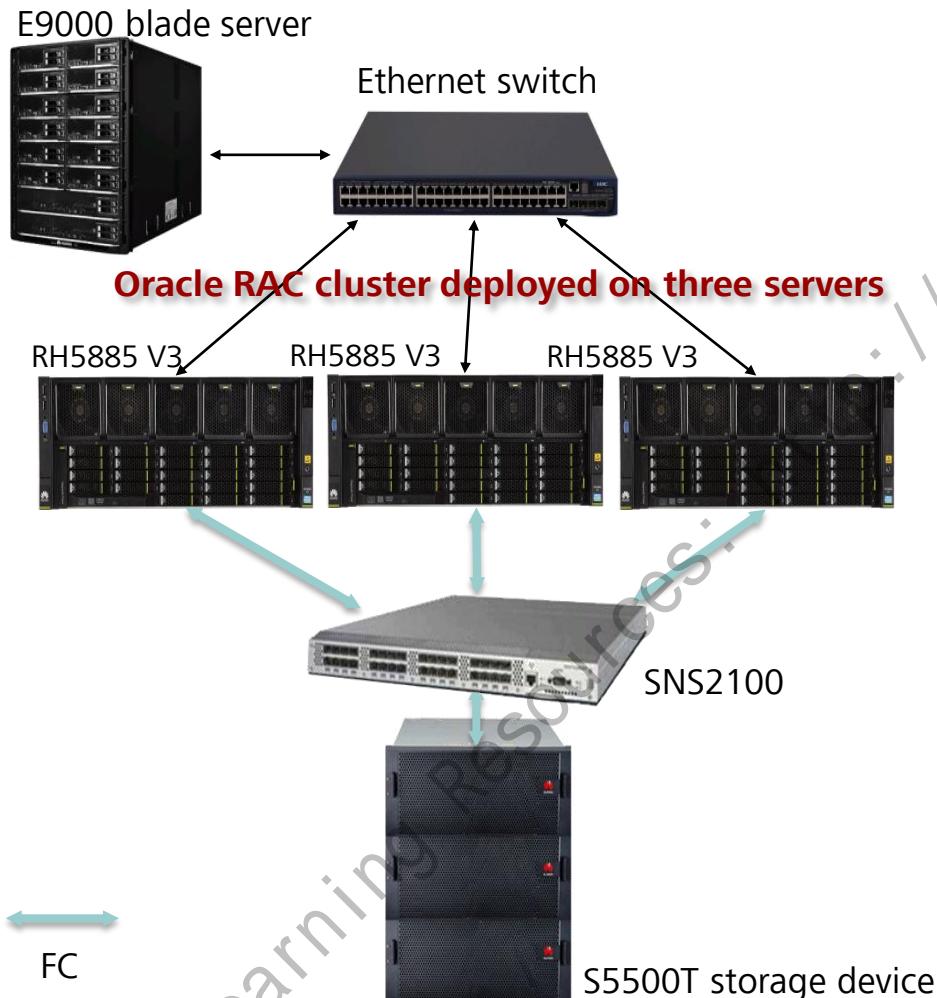
Typical configuration

- Hardware
 - RH5885 V2 (4 x E7-4820 processors, 64 GB memory capacity): 2
 - RH2285 V2 (2 x XE5-2420 processors, 16 GB memory): 1
 - SAN switch: 2
 - Huawei OceanStor S6900: 1
 - Huawei VTL3500: 1
- Software
 - SUSE Enterprise Linux10
 - Oracle database
 - Oracle RAC cluster software

RH5885 V2 Virtualization Consolidation Solution



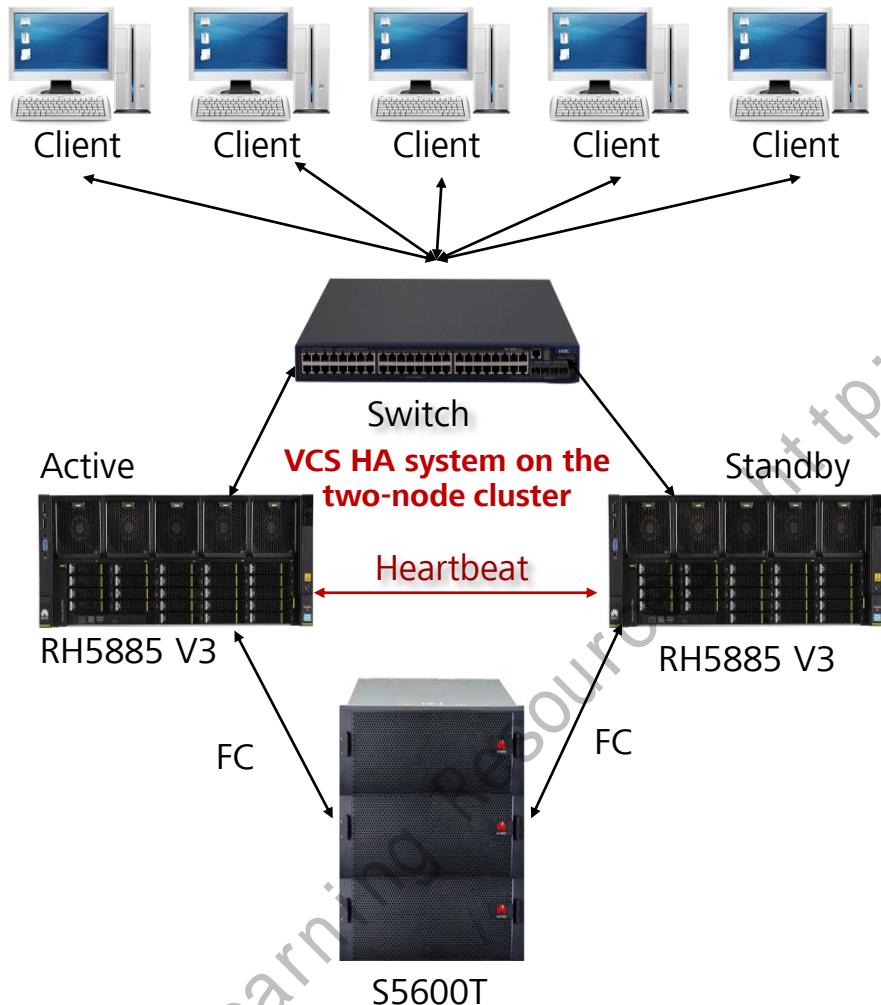
Oracle RAC HA Cluster Solution



Software	Configuration
Oracle relational database	Oracle R2 RDBMS
Oracle RAC cluster system	Oracle Cluster
Distributed cluster	Oracle Coherence
Middleware	Oracle WebLogic

Hardware	Function
3 x RH5885	Database servers
1 x E9000	Weblogic middleware
1 x S5500T	SAN storage device
1 x SNS2100	FC switch
1 x S5300	Ethernet switch

Mission-Critical Business — HA-based DR and Backup



Software	Configuration
OS	Red Hat Enterprise Linux
Database	Oracle 11.g R2
HA system	VCS: Storage Foundation and High Availability Solutions

Hardware	Configuration
Processor	4 x Intel E7-4870 v2
DIMM	512 GB DDR3
Hard disk	8 x 900 GB SAS
NIC	4 x GE ports
HBA	2 x 8G FC
Storage	Huawei OceanStor S5600T

Mission-Critical Business — Large-Scale Enterprise ERP

Client



Application server



Hardware configuration and OS

Processor	E7-4830 v2 10-core
DIMM	DDR3 256 GB
NIC	4 x GE ports
OS	Oracle Enterprise Linux Server

Software configuration

Middleware	Kingdee Apusic 5.0
ERP	Kingdee EAS 6.0
Database connection type	JDBC

SAP HANA Appliance

Huawei SAP HANA Appliance

- Uses Huawei's latest 4-socket rack server with E7 processors.
- Supports various memory configurations and scale out.
- Adopts the latest SSD technology to address SAP HANA loads.
- Uses the in-memory database based on row and column storage.
- Supports SQL and MDX.
- Uses embedded analysis and prediction functions.



SAP HANA appliance hardware configuration

Server:

- Huawei RH5885H V3 4-socket server

Processor:

- Intel® Xeon® E7-4890 v2
- 4 processor sockets

DIMM:

- 1024 GB DDR3 (64 x 16 GB)

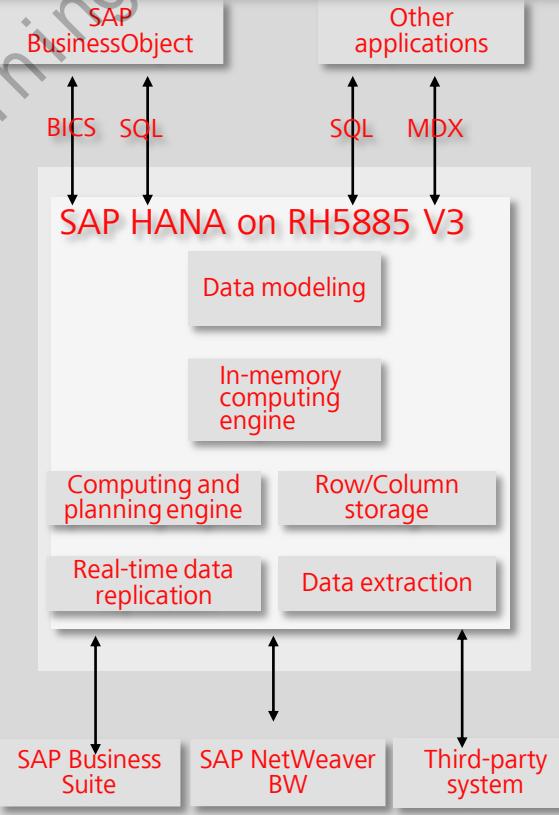
Storage:

- Logs: 2 x ES3000 800 GB
- 16 x 900 GB SAS disks

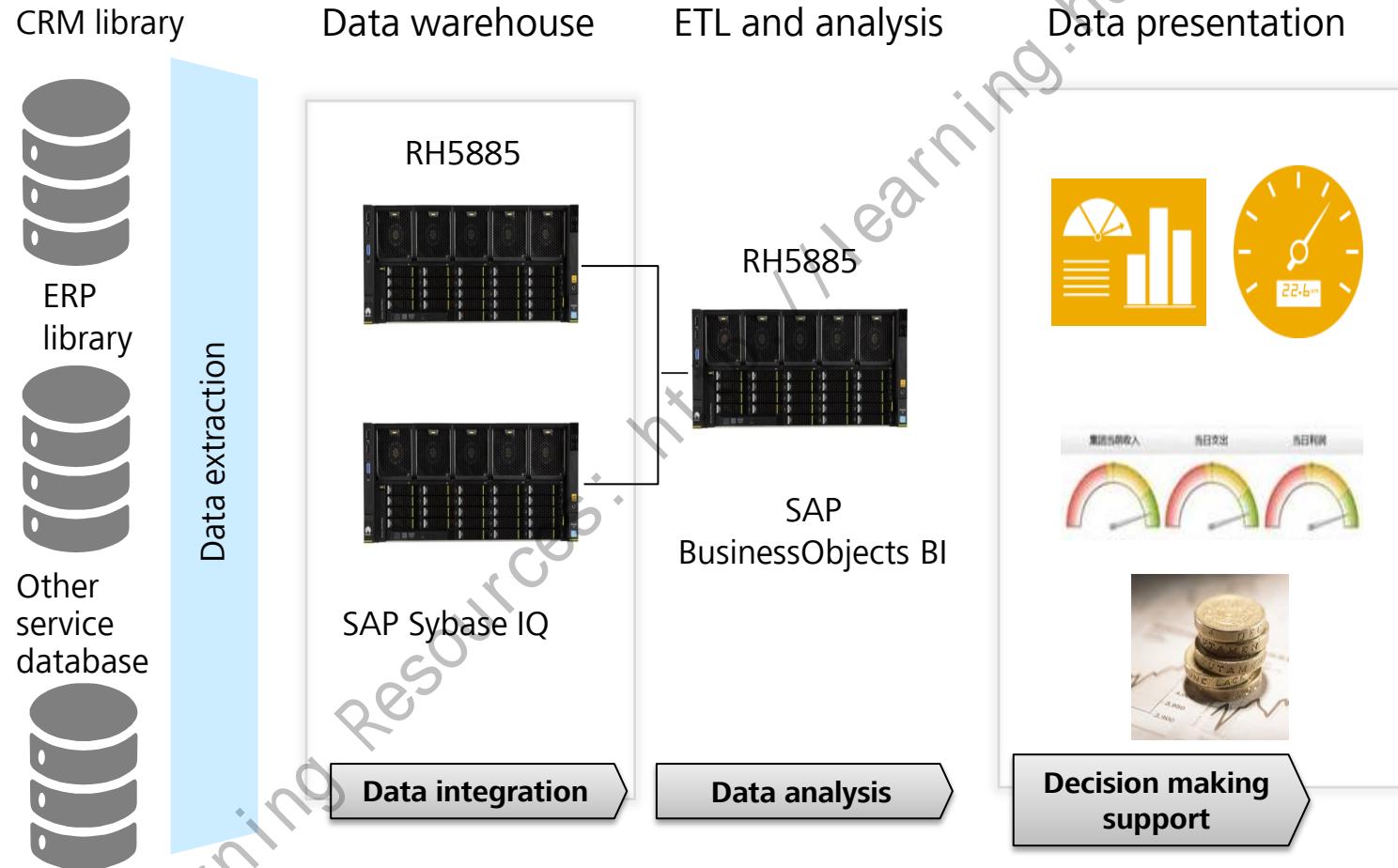
Network:

10GE NIC

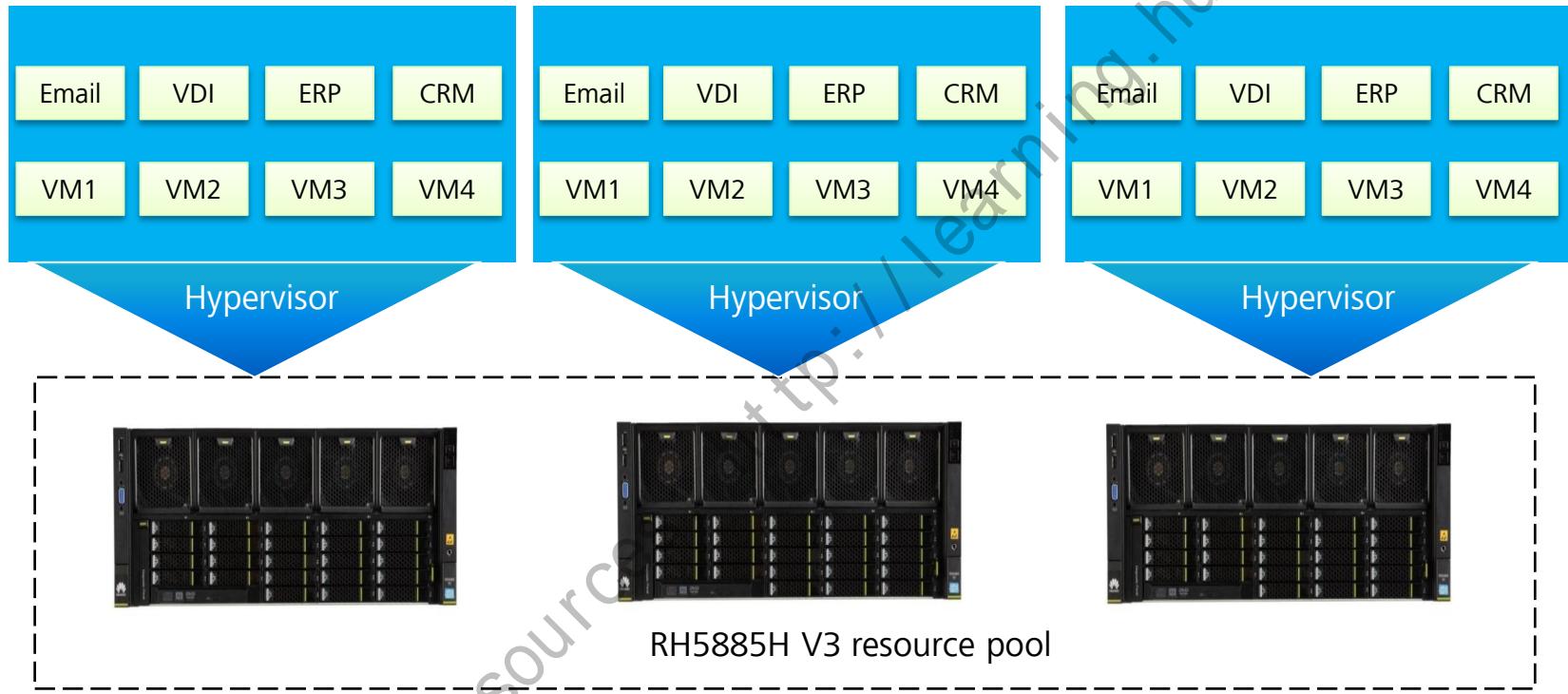
Logical architecture



Mission-Critical Business — BI



Virtual Resource Pool Platform



- An RH5885H V3 supports up to 60 computing cores, 120 concurrent threads, and 6 TB memory capacity, providing sufficient resources.
- This platform supports large-scale virtualization or virtualization for mission-critical business, suitable for services that require high performance of a single VM.



Summary

- RH series server overview and positioning
- RH series server description, including the structures, and components
- Typical applications of RH series servers



Questions

1. What are Huawei RH series servers? How do you distinguish these servers?
2. What are the three typical configurations for the RH2285 V2/2288 V2 and what is included in these configurations?
3. Please describe the RH2488 V2/5885 V2 server hardware structure.
4. What RAID controller cards and RAID levels do Huawei RH series servers support?



Exercises

- True or false questions
 1. The RH2285 V2 and RH2288 V2 are 2U 2-socket servers. (T or F)
 2. Two 2.5-inch hard disks used as system partitions are installed at the rear of the RH2285 V2. This improves data security and reliability, and expands data storage capacity. (T or F)
- Multiple-choice questions
 1. Which of the following RH series servers support hot swap of PCIe cards? ()
 - A. RH2488 V2
 - B. RH5885 V2
 - C. RH5885 V3
 - D. RH8100 V3

Thank you

[www.huawei.com](http://learning.huawei.com)

Huawei X Series

High-Density Server

[www.huawei.com](http://learning.huawei.com/e)





Objectives

Upon completion of this course, you will be proficient in:

- ❑ Huawei X series server models, functions and application scenarios
- ❑ Huawei X6000 server hardware specs and structure
- ❑ Huawei X6000 server nodes
- ❑ Huawei X6800 server hardware specs and structure
- ❑ Huawei X8000 server hardware specs and structure



Contents

- 1. Overview of Huawei High-Density Servers**
2. Huawei X6000 Server
3. Huawei X6800 Server
4. Huawei X8000 Server

Challenges Presented by Cloud Computing



Challenges Presented by Mass Data

Various

Individual and enterprise APPs, videos, social network, applications, ERPs, cloud-based offices, cloud services...

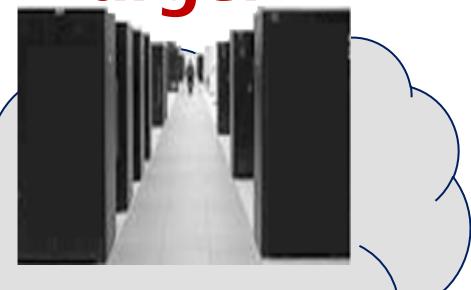


Mass data

In 2020, the global data is expected to reach **40 ZB**;

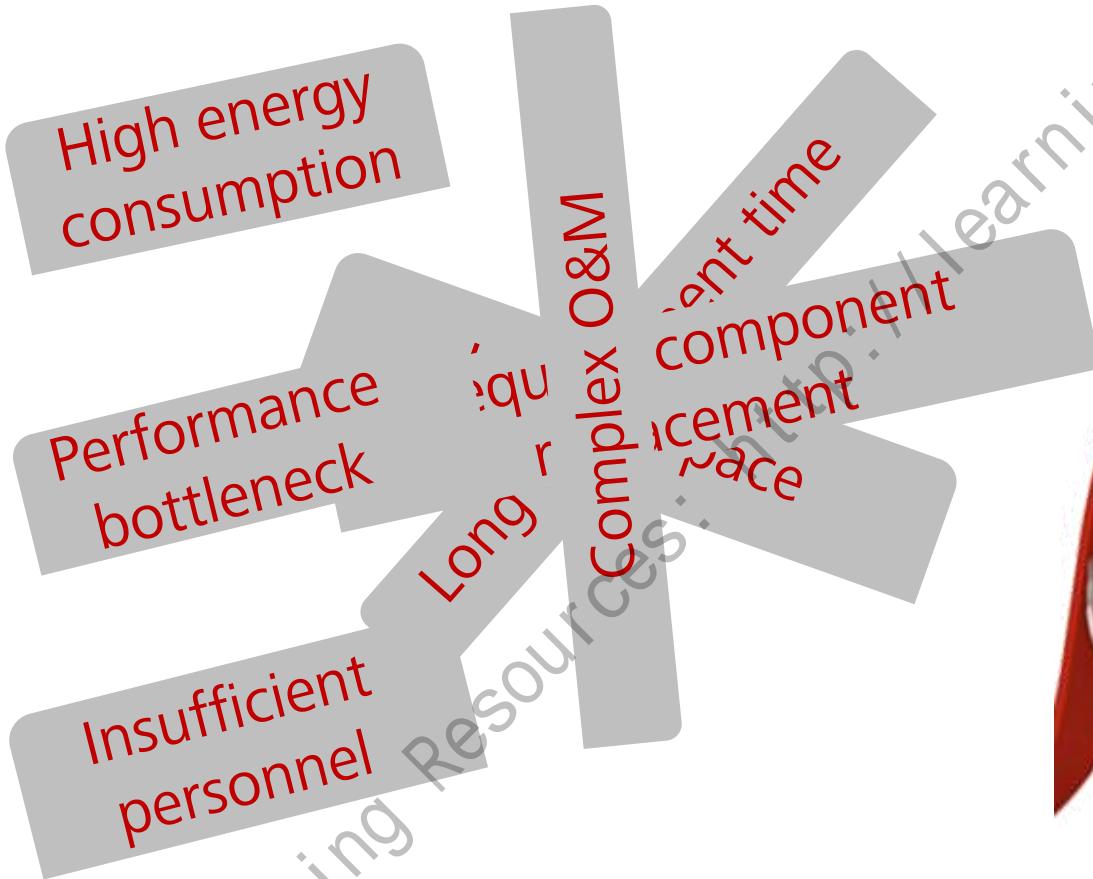
44 times up than that in 2009.

Server deployment scale becomes **larger**



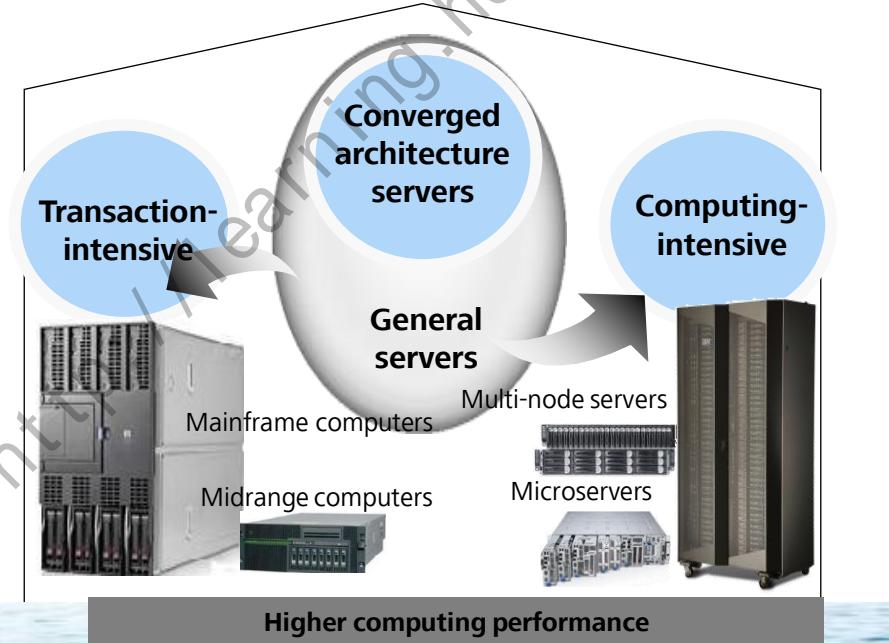
- Support for applications
- Data processing

Challenges for IT

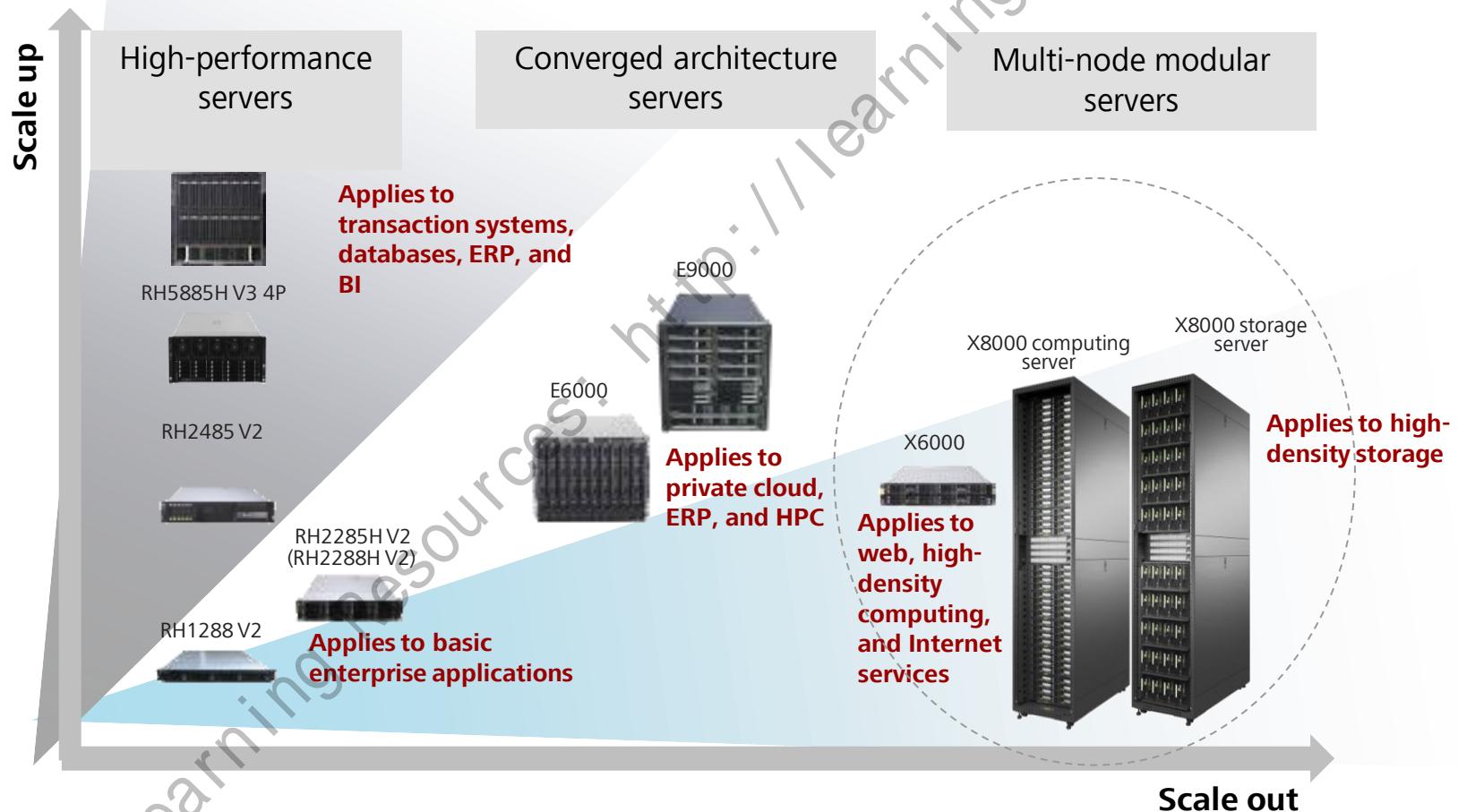


Server Development Trends

- Scale up
- Scale out
- Converged



Huawei Server Family





Contents

1. Overview of Huawei High-Density Servers

2. Huawei X6000 Server

2.1 Introduction to the X6000 Server

2.2 X6000 Server Hardware Structure

3. Huawei X6800 Server

4. Huawei X8000 Server

Huawei High-Density Server: X6000

Highest performance, similar to 4 rack servers

- ✓ Houses up to **8 Processors** in a **2 U space** (**160 Processors** in a rack)
- ✓ Consumes **10% less energy** than rack servers of the same density
- ✓ Reduces deployment time to **1/3**

Ultra-high density

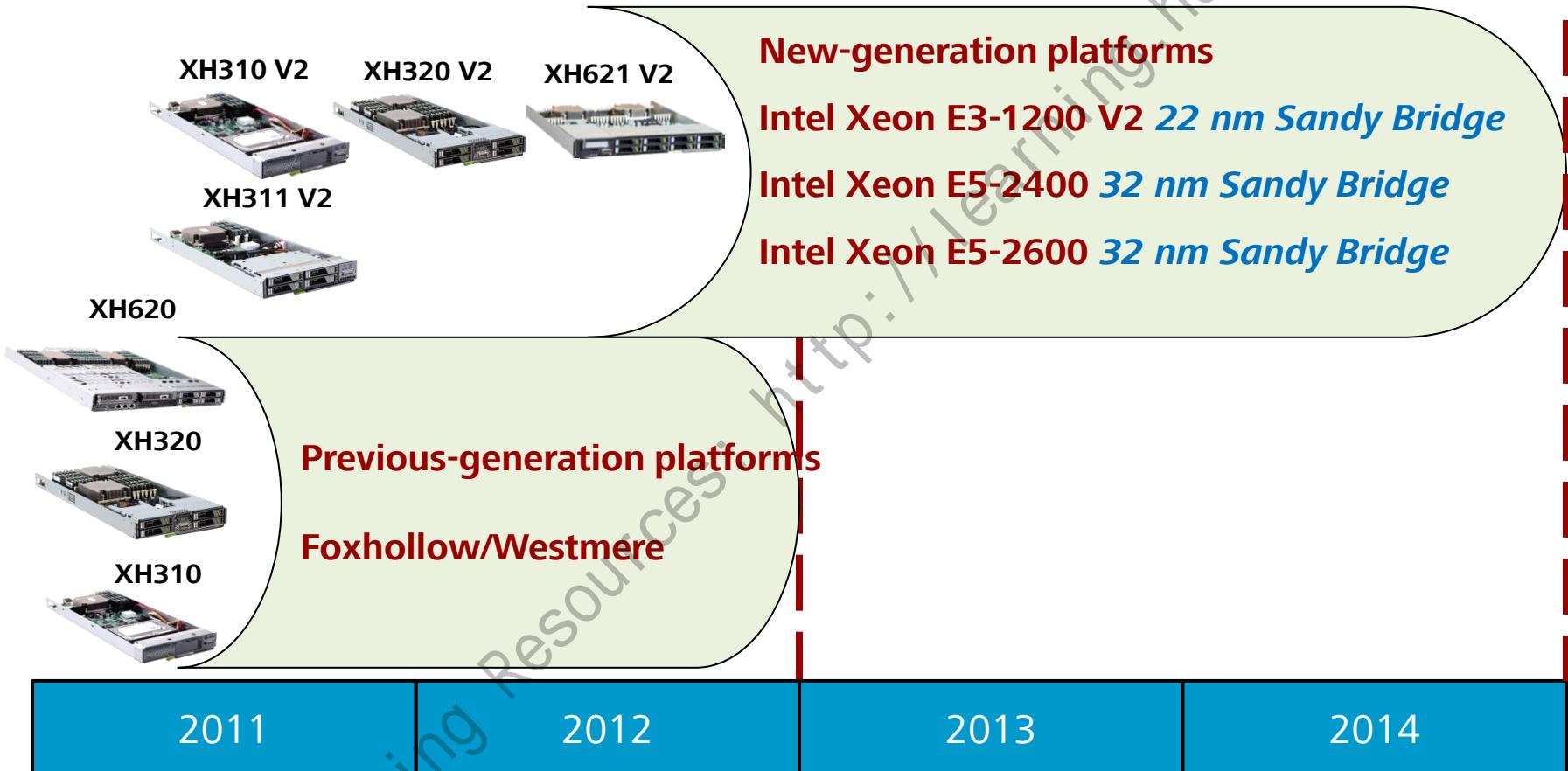
Top energy efficiency

Easy to manage and maintain

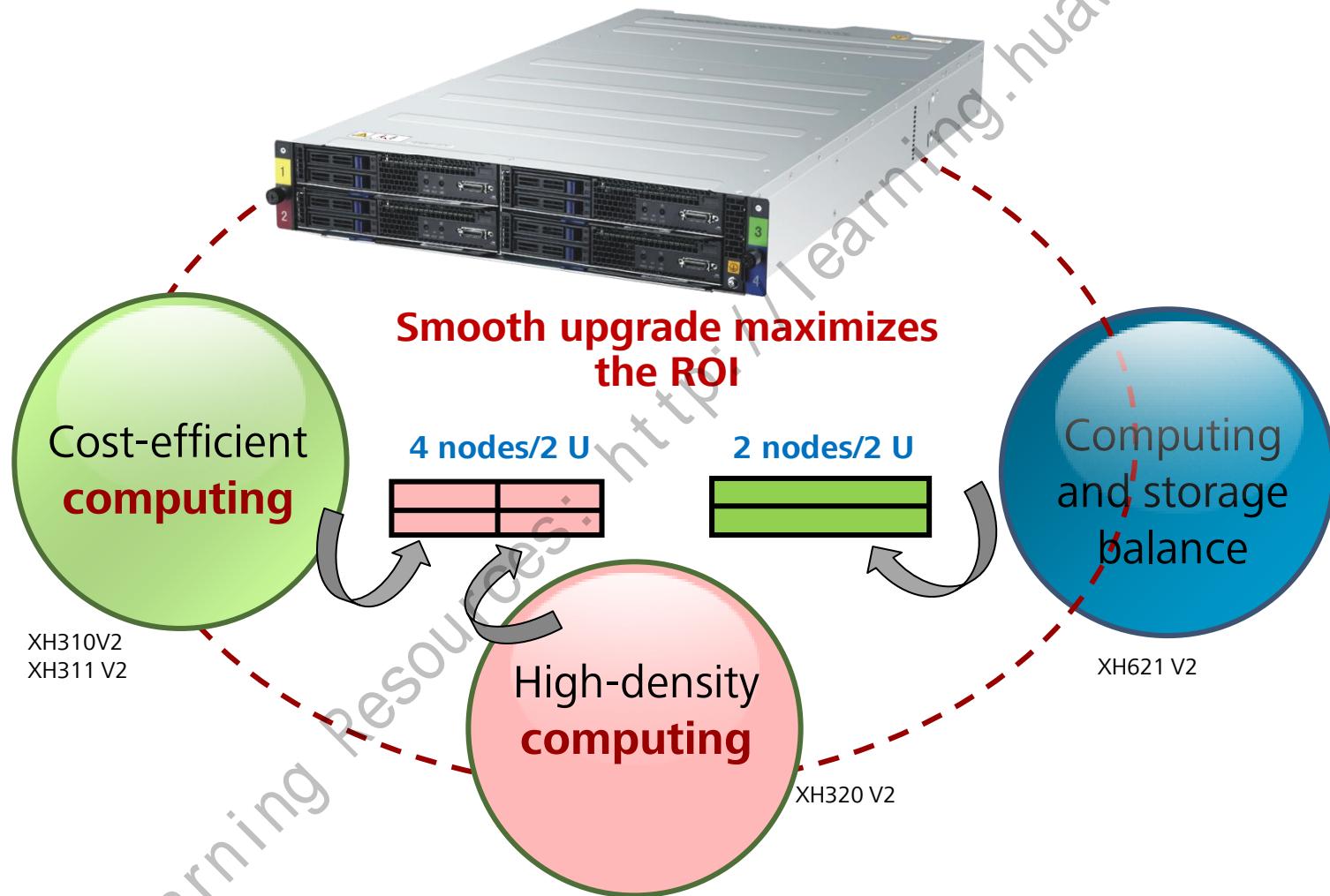
The diagram illustrates the high density of the X6000 server. On the left, a red bracket groups four standard black rack servers. To their right is a single 2U rack blade server, labeled '2 U rack blade server'. The blade server is shown with four slots numbered 1, 2, 3, and 4, each containing a server module. Blue arrows point from the text 'Houses up to 8 Processors' to the blade server's slots, indicating that each slot can hold two processors. A red box highlights the fourth slot (slot 4) of the blade server.

A photograph of a full-height server rack. The rack is filled with multiple server modules, with a red box highlighting one specific module in the middle section. Blue arrows point from the text 'Houses up to 8 Processors' to this highlighted module, emphasizing its high density.

X6000 Node Server Family



X6000 Server Nodes



X6000 Application Scenarios



Cloud computing

Web2.0

Enterprise
informatization

HPC

- ✓ Virtual host
- ✓ Cloud computing
- ✓ Distributed computing

- ✓ Internet search
- ✓ CDN
- ✓ E-commerce
- ✓ Online games and communities

- ✓ Enterprise portal
- ✓ Application middleware
- ✓ Database
- ✓ Branch applications
- ✓ CRM/ERP/SCM

- ✓ Cluster
- ✓ Modeling and simulation
- ✓ Business intelligence

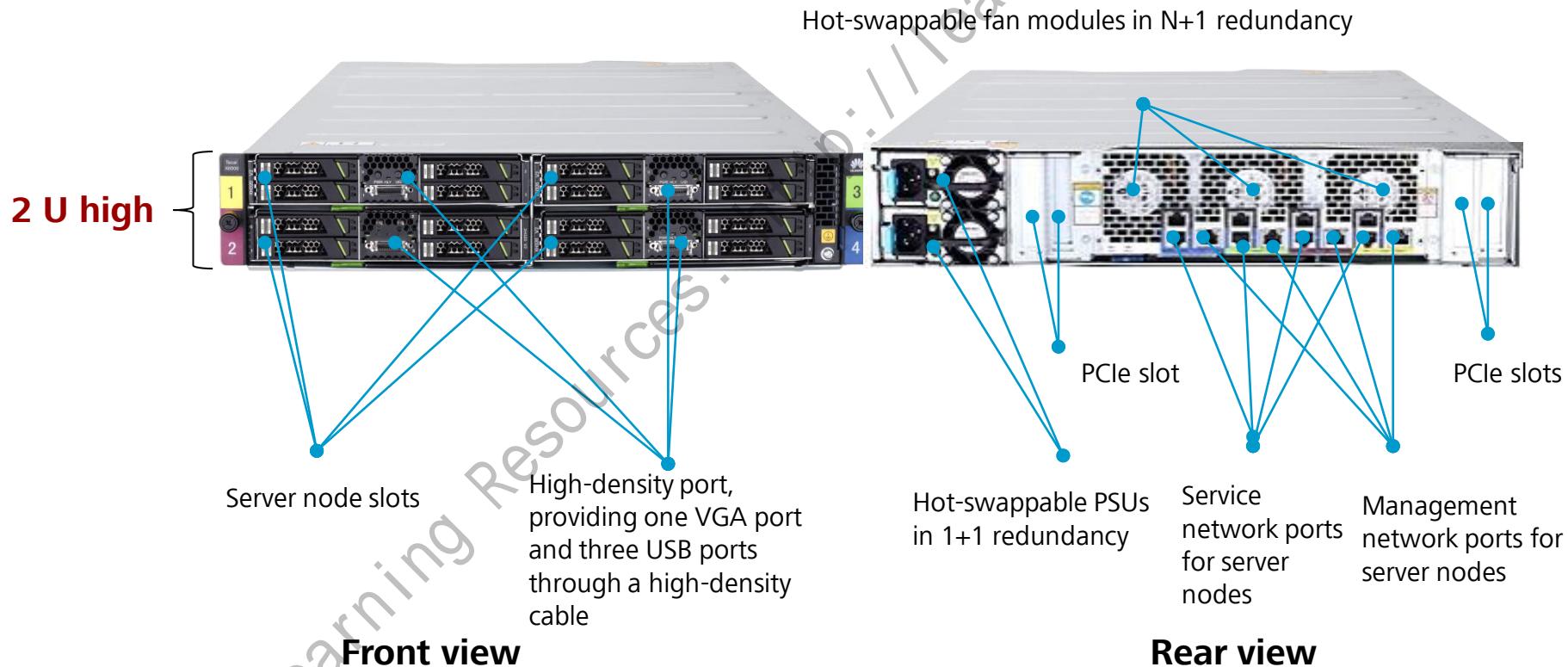


Contents

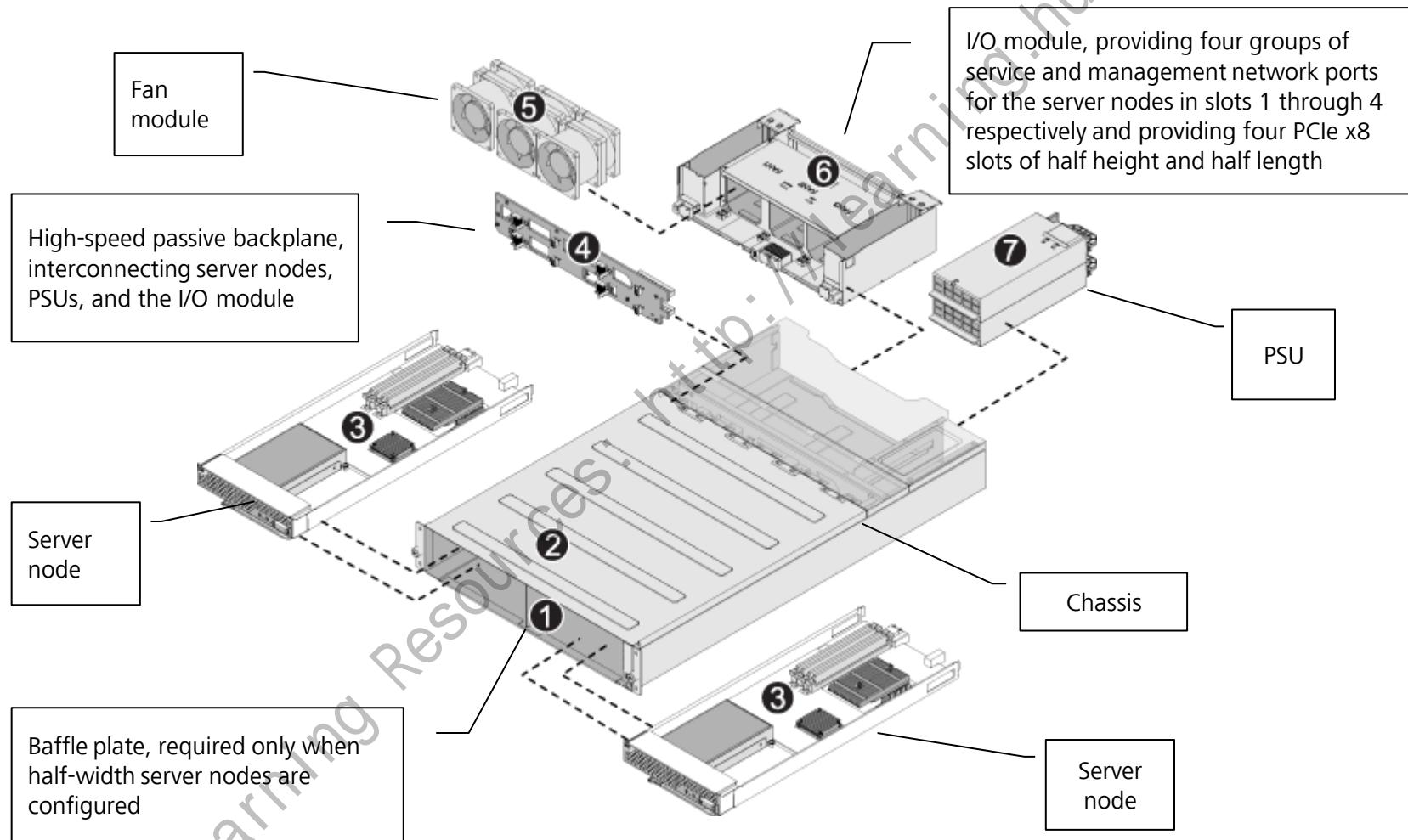
1. Overview of Huawei High-Density Server
2. **Huawei X6000 Server**
 - 2.1 Introduction to the X6000 server
 - 2.2 X6000 Server Hardware Structure**
3. Huawei X6800 Server
4. Huawei X8000 Server

X6000 Appearance

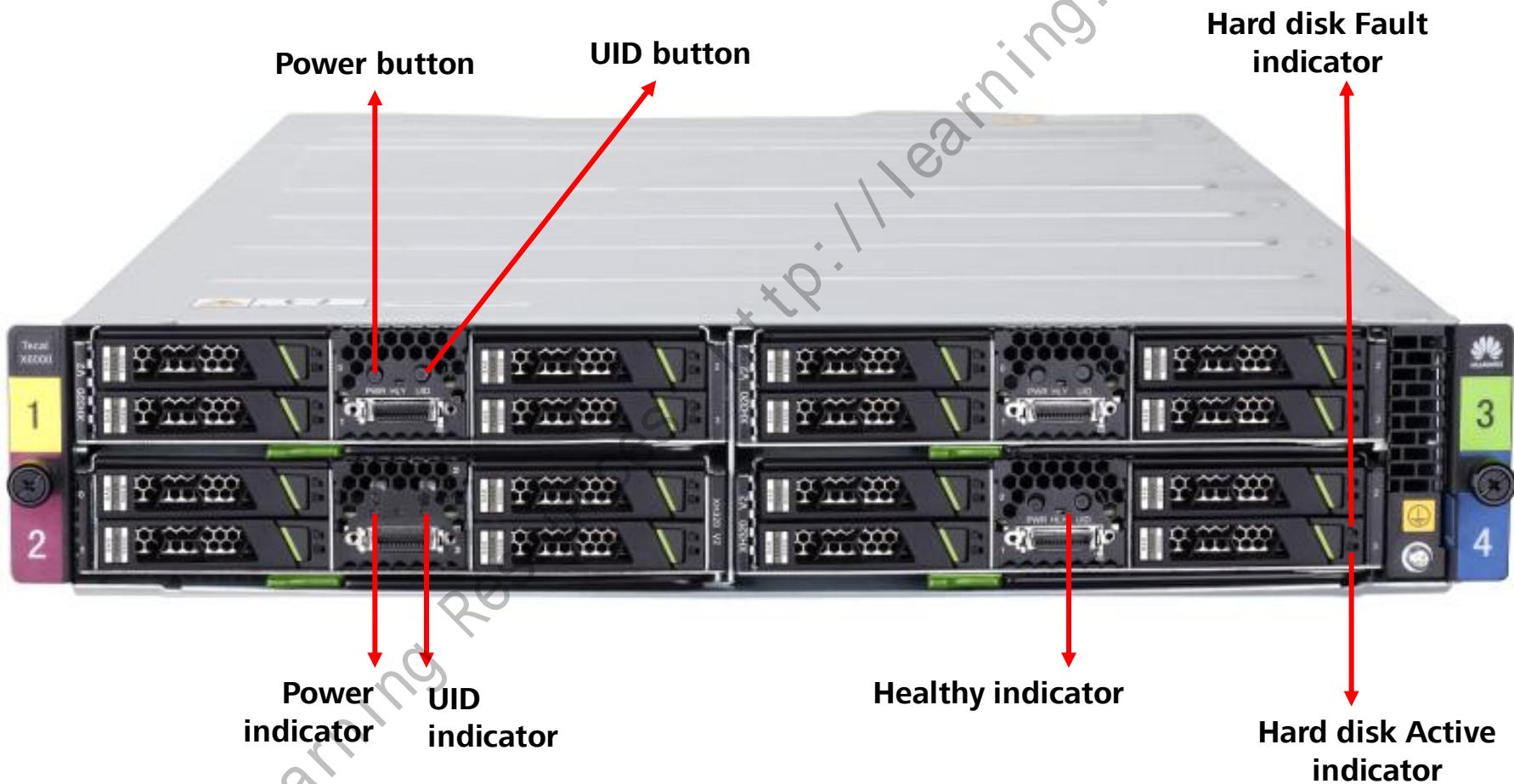
- Supports four half-width or two full-width nodes for flexible configurations in a 2 U chassis.
- Supports redundant PSUs and fan modules and adopts a passive backplane, eliminating single point of failure.



System Structure



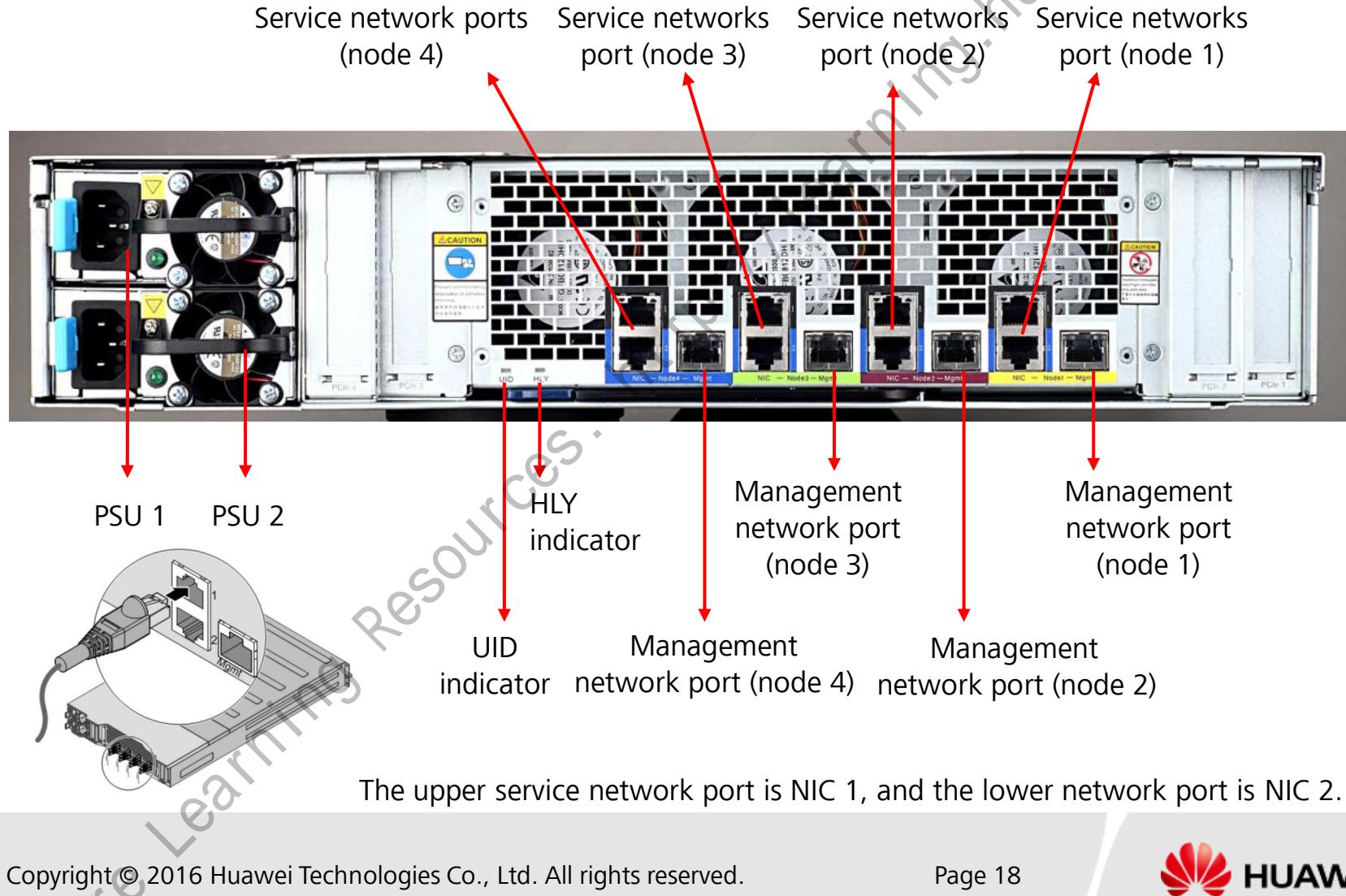
X6000 V2 Server Front Panel



Indicators on the Front Panel

Indicator	Color	State Description
HEALTHY indicator	Red/Green	Off: The server is not powered on.
		Blinking red: An alarm is generated.
		Green: The server is operating properly.
Hard disk active indicator	Green	Steady on: The hard disk is operating properly.
		Blinking: A read/write operation is being performed on the hard disk.
	-	Off: The hard disk is not installed or not installed properly.
Hard disk fault indicator	Yellow	Steady on: The hard disk is faulty.
		Blinking: RAID reconstruction is being performed on the hard disk.
	-	Off: The hard disk is operating properly or is not installed properly.
PWR indicator	Yellow	Blinking: The server is being powered on, and the BMC is being loaded.
		Steady on: The server is in the standby state.
		Off: The server is operating properly.
UID button/indicator	Blue	Steady on: The UID button is pressed.
		Off: The UID button is not pressed.

X6000 V2 Server Rear View



X6000 V2 Server Rear View-Indicators

Indicator	Meaning	Color	State Description
HEALTHY indicator	Health indicator	Red and green	Off: The server is not powered on.
			Blinking red: An alarm is generated.
			Steady green: The server is operating properly.
Power indicator	Power status indicator	Green	Steady on: The power is supplied properly.
		-	Off: No AC power is supplied.
Network port data transmission status indicator	Network port status indicator	Yellow	Blinking: Data is being transmitted.
		-	Off: No data is being transmitted.
Network port connectivity status indicator	Network port status indicator	Green	Steady on: The network connection is normal.
		-	Off: The network is disconnected.
UID indicator	Device location indicator	Blue	Steady on: The UID button is pressed.
		-	Off: The UID button is not pressed.

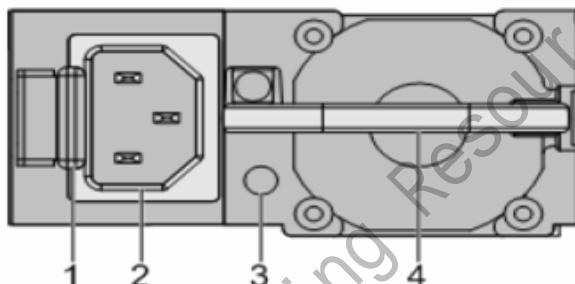
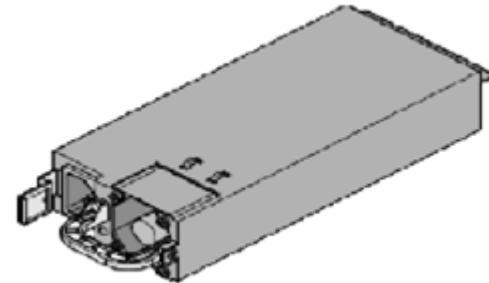
X6000 V2 Server Compatibility List

- *Huawei Tecal Server Compatibility List V2.6* describes the Processors, DIMMs, hard disk controllers, hard disks, OSs, and third-party components supported by Huawei IT servers, and applicable international standards.
- The *Huawei Tecal Server Compatibility List* is updated periodically and available at <http://enterprise.huawei.com/>.

PSU

The power consumption of the X6000 is optimized as follows:

- The X6000 adopts high-efficiency PSUs to supply 12 V power (92% power conversion efficiency) in a centralized manner, decreasing the loss in power conversion.
- Fan modules are deployed for centralized heat dissipation. The system vent ducts are optimized to reduce power consumption in heat dissipation.
- Highly efficient VRD power supplies are used to reduce loss in DC/DC power conversion.



1 Spring 2 Power input port
3 Operating status indicator 4 Handle

Indicator	Color	State	Description
Operating status indicator	Green and red	Off	No AC power is supplied.
		Steady green	The PSU is operating properly.
		Blinking green	The PSU is requesting activation.
		Blinking red	An alarm is generated.

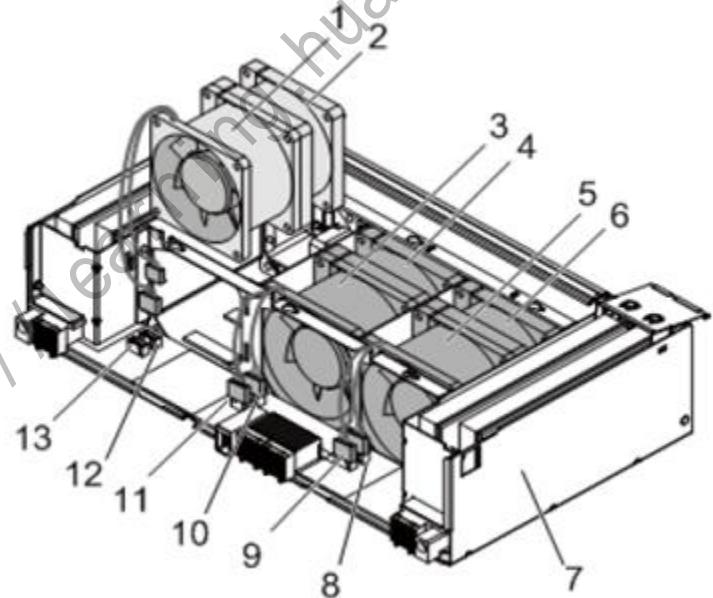
I/O Module

- The I/O module provides an MMC, fan modules, and service and management network ports.
- The MMC communicates with the BMCs on server nodes over the IPMB.
- The MMC performs the following functions:
 - Monitors device installation status and operating status to implement real-time management.
 - Detects and controls the fan speed.
 - Detects the installation status and normal operating signals of PSUs.
 - Queries the output power and alarm information about PSUs.

Indicator	Meaning	Color	State Description
UID indicator	Location indicator	Blue	Steady Blue: The device you are operating is being located.
			Off: The UID button is not pressed.
HLY indicator	Health indicator	Red and green	Steady green: The module is operating properly.
			Off: The module is not powered on.
			Steady red: An alarm is generated.

Fan Module

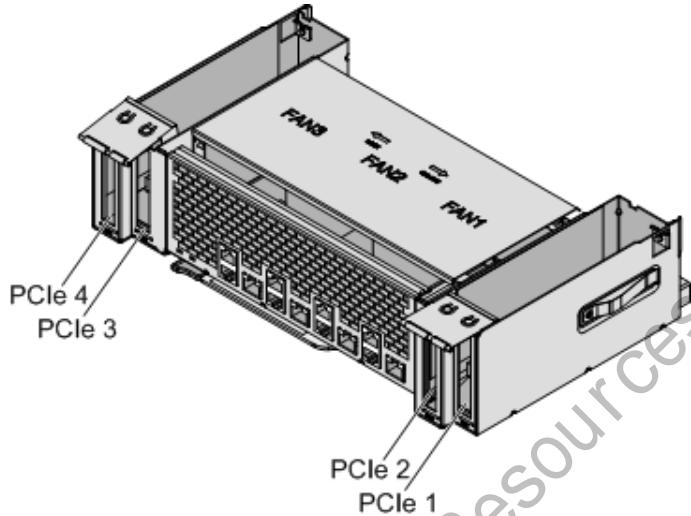
- Three fan modules are configured in 2 + 1 redundancy mode.
- The X6000 adopts the forced air-cooling technology to draw in air from the front and exhaust air from the rear.
- The MMC controls the fan speed based on server node operating status to implement intelligent heat dissipation.



- | | |
|--|----------------------------|
| 1. Fan module 1 (front fan) | 2. Fan module 1 (rear fan) |
| 3. Fan module 2 (front fan) | 4. Fan module 2 (rear fan) |
| 5. Fan module 3 (front fan) | 6. Fan module 3 (rear fan) |
| 7. I/O module | |
| 8. Cable connector for fan module 3 (rear fan) | |
| 9. Cable connector for fan module 3 (front fan) | |
| 10. Cable connector for fan module 2 (rear fan) | |
| 11. Cable connector for fan module 2 (front fan) | |
| 12. Cable connector for fan module 1 (rear fan) | |
| 13. Cable connector for fan module 1 (front fan) | |

PCIe Expansion Slot

- The I/O module provides four PCIe x8 slots for the X6000 server.



PCIe 1	PCIe x8 slot for the server node in slot 1
PCIe 2	PCIe x8 slot for the server node in slot 2
PCIe 3	PCIe x8 slot for the server node in slot 3
PCIe 4	PCIe x8 slot for the server node in slot 4



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4. Huawei X8000 Server

Positioning

The X6800 is oriented towards the following applications:

- **Internet and data center applications**

The X6800 provides a server solution that supports customization, rapid deployment, easy maintenance, and low power consumption.

- **HPC and cloud computing applications**

The X6800 provides a basic hardware platform that features high reliability and virtualization performance.

- **Software-defined storage and big data applications**

The X6800 provides a modular architecture that features high density and supports flexible configuration of computing and storage resources.

Product Highlights

- Flexible Expansion and On-demand Deployment
 - The X6800 uses the architecture that provides high flexibility and scalability.
- High Density and Less Space Used
 - The X6800 provides twice deployment density of a conventional rack server, which greatly improves space utilization in the equipment room.
- Unified Management and Easy Maintenance
 - The X6800 uses the blade server architecture to implement unified management and easy maintenance.
- Shared Architecture and High Energy Efficiency
 - The X6800 shares fan modules and PSUs, which improves energy efficiency.
- Redundancy and Reliability
 - The X6800 uses reliable system architecture to ensure stable, long-term operation.



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XH628 V3 Dual-Socket Storage Node

Exterior of the XH628 V3



Node



Form factor	Dual-slot 2-socket server node
Number of CPUs	One or two
CPU model	Intel Xeon E5-2600 v3
DIMM slot	16 DDR4 DIMM slots, supporting a maximum memory capacity of 1024 GB
Number of hard disks	12 x 3.5" hot-swappable SAS/SATA disks or 2.5" hot-swappable SAS/SATA disks or SSDs, with two 2.5" SATA disks/SSDs for option
LOM network port	(Optional) two GE network ports, four GE network ports, two 10GE optical ports, or two 10GE electrical ports
RAID support	RAID 0, 1, 10, 5, 50, 6, and 60, supporting a supercapacitor
PCIe expansion capacity	Up to five PCIe expansion slots: two front half-height half-length PCIe 3.0 x8 slots, two rear half-height half-length PCIe 3.0 x8 slots, and one RAID controller card. The front PCIe slots and the two 2.5-inch disks cannot be configured at the same time.
Onboard storage medium	Two SATADOMs and one USB flash drive
Front port	One high-density port (one VGA port, three USB 2.0 port, and one serial port), and one GE management network port
Operating temperature	5°C to 40°C
Dimensions (H x W x D)	109 mm x 750 mm x 166 mm

XH622 V3 Dual-Socket 2-Socket I/O Expansion Node

Exterior of the XH622 V3



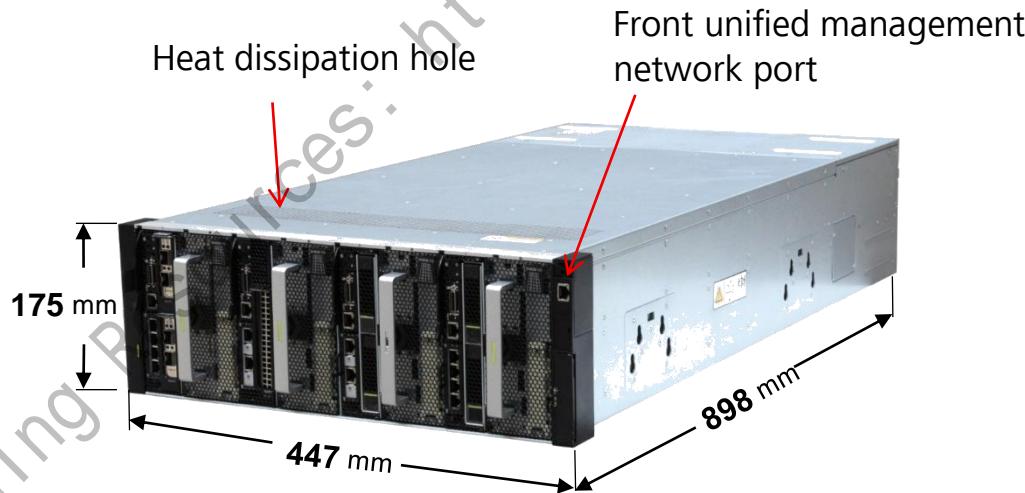
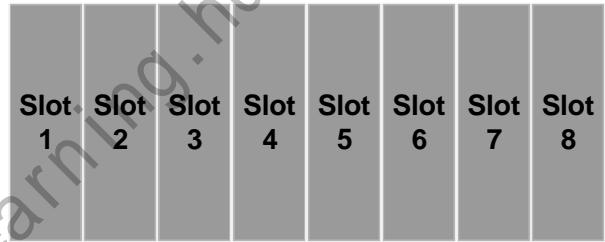
Node



Form factor	Dual-slot 2-socket server node
Number of CPUs	One or two
CPU model	Intel Xeon E5-2600 v3
DIMM slot	16 DDR4 DIMM slots, supporting a maximum memory capacity of 1024 GB
Number of hard disks	Four 2.5-inch SAS/SATA disks or SSDs
LOM network port	(Optional) two GE network ports, four GE network ports, two 10GE optical ports, or two 10GE electrical ports
RAID support	RAID 0, 1, 10, 5, 50, 6, and 60, supporting a supercapacitor
PCIe expansion capacity	Up to five PCIe expansion slots: two built-in double-width, full-height, full-length PCIe 3.0 x16 slots , two rear half-height half-length PCIe 3.0 x8 slots, and one RAID controller card
Onboard storage medium	Two SATADOMs and one USB flash drive
Front port	One high-density port (one VGA port, three USB 2.0 port, and one serial port), and one GE management network port
Operating temperature	5 °C to 40 °C
Dimensions (H x W x D)	109 mm x 680 mm x 166 mm

Chassis

- The X6800 supports 4 dual-slot server nodes in eight slots and will support eight single-slot compute nodes, two four-slot compute nodes, or one eight-slot compute node.



Front View

Front View (eight single-slot server nodes)



Operating status indicator

UID indicator

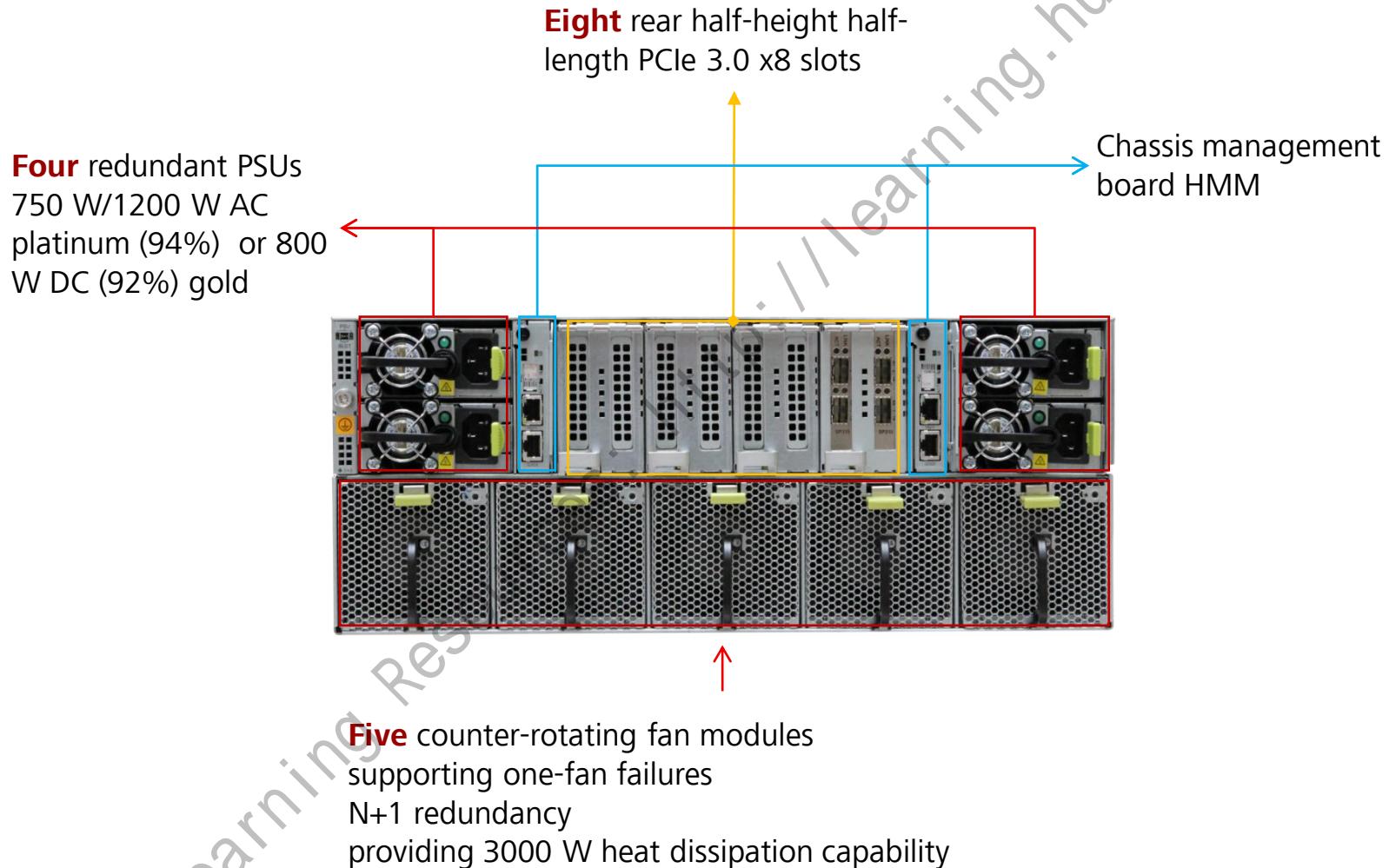
Aggregation management network port

Server node

Front View (4 dual-slot server nodes)



Rear View





Contents

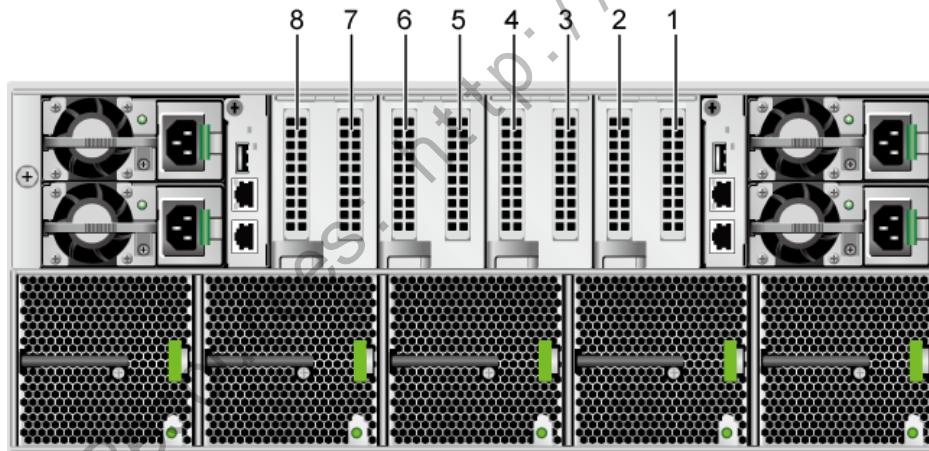
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PCIe

- The I/O module in the rear of the X6800 chassis offers eight standard PCIe x8 slots for installing eight half-height half-length PCIe cards, providing more external ports for each server node.

Mapping between PCIe slots and 4U8 server nodes

PCIe Slot	Server Node
PCIe 1	1
PCIe 2	2
PCIe 3	3
PCIe 4	4
PCIe 5	5
PCIe 6	6
PCIe 7	7
PCIe 8	8



Mapping between PCIe slots and 4U4 server nodes

PCIe Slot	Server Node
PCIe 1	1
PCIe 2	1
PCIe 3	3
PCIe 4	3
PCIe 5	5
PCIe 6	5
PCIe 7	7
PCIe 8	7

Fan Module

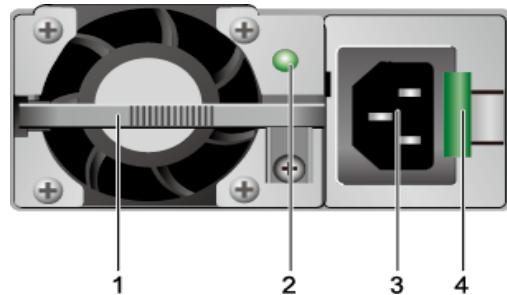
- The X6800 implements forced cooling by drawing in air from the front of the chassis and discharging air through the rear of the chassis. The MM controls the fan speed based on the server node operating status. The X6800 houses five pairs of counter-rotating fans. The heat dissipation is not affected if a single fan is faulty.



Name	Color	State	Description
Fan module operating status indicator	Red and Green	Red	The fan module is faulty.
		Green	The fan module is operating properly.

PSU

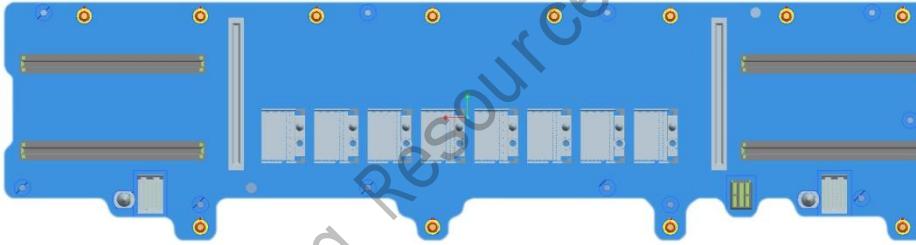
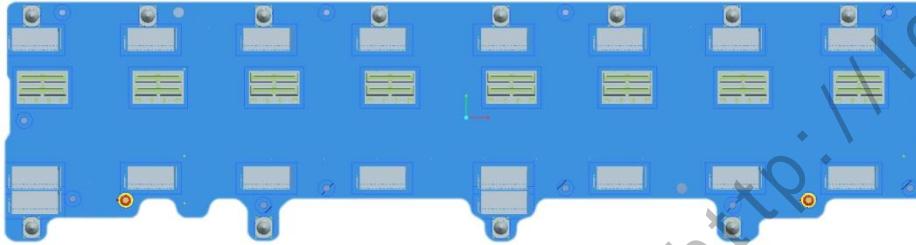
- The X6800 uses four AC or DC PSUs.
- The input voltage range of the PSUs on the X6800 is as follows:
 - AC PSUs: 100 V to 240 V AC (input frequency: 50 Hz or 60 Hz)
 - DC PSUs: -48 V to -60 V DC
 - 380 V HV DC PSUs: 260 V to 400 V DC
 - 240 V HV DC PSUs: 192 V DC to 288 V DC
- The output voltage of the PSUs is 12 V DC.



1	Handle	2	Operating status indicator
3	Power input socket	4	Latch

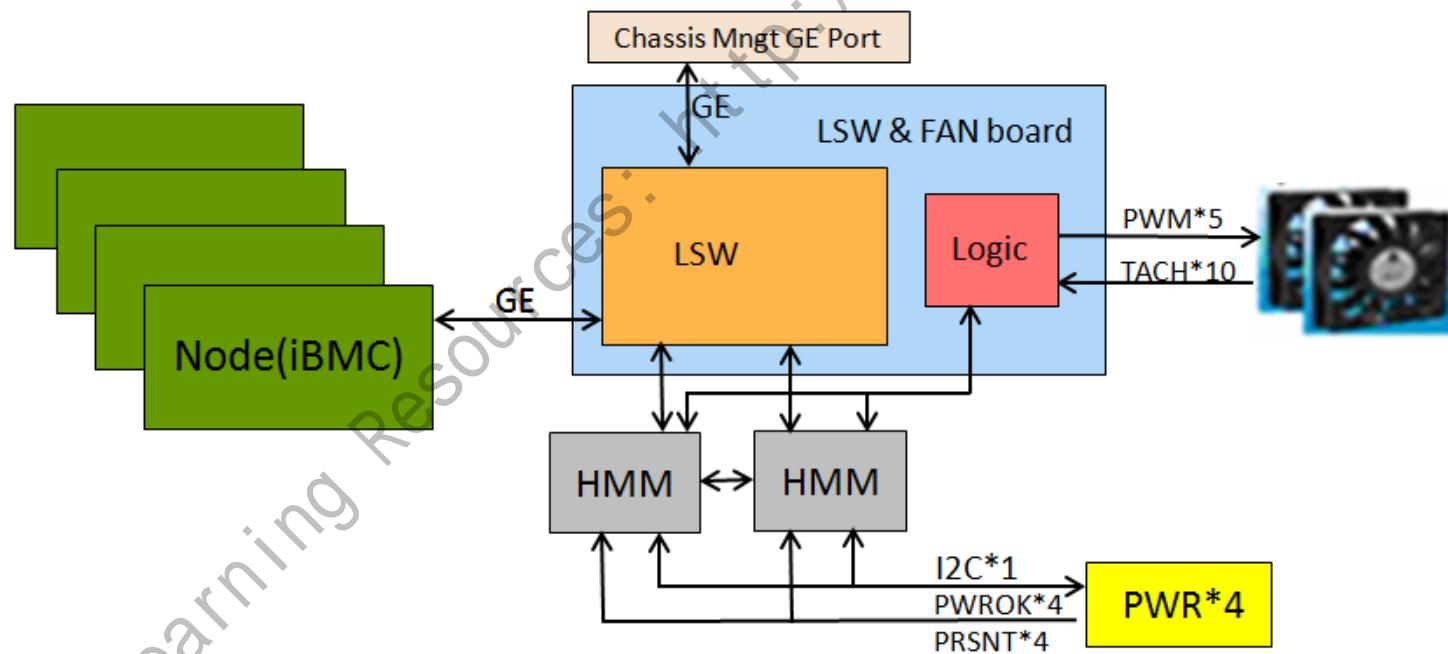
Backplane

- The X6800 uses a passive backplane. The backplane connects server nodes to the HMM, rear I/O transfer board, fan switch board, and PSUs.

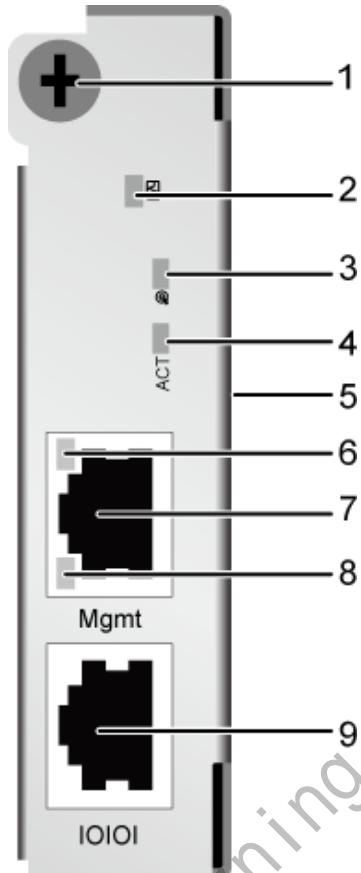


System Management Board and Fan Switch Board

- The X6800 uses the HMMs and fan switch board to perform out-of-band management. The HMMs are hot-swappable and implement temperature monitoring, fan management, power management, and node management. The fan switch board provides fan management ports and system aggregation management functions.



System Management Board and Fan Switch Board



1	Captive screw	2	Operating status indicator
3	UID indicator	4	Active/Standby switchover indicator
5	Handle	6	Management network port link indicator
7	Management network port	8	Management network port active indicator
9	Serial port	-	-



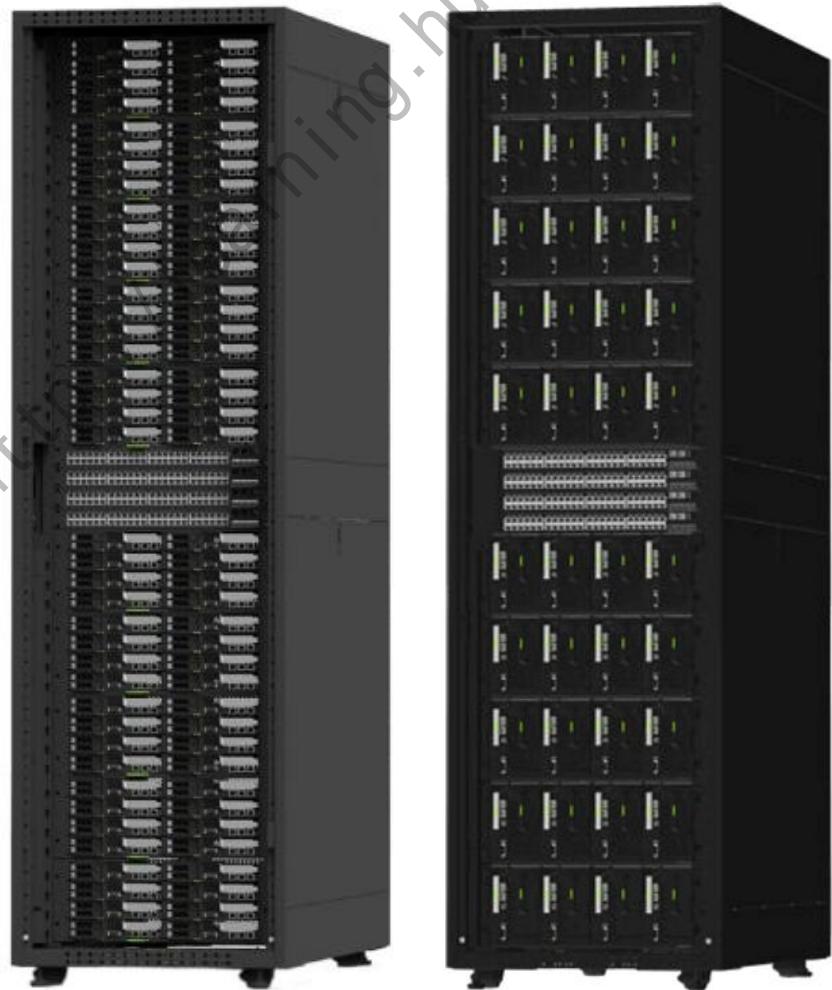
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2. X8000 Server System

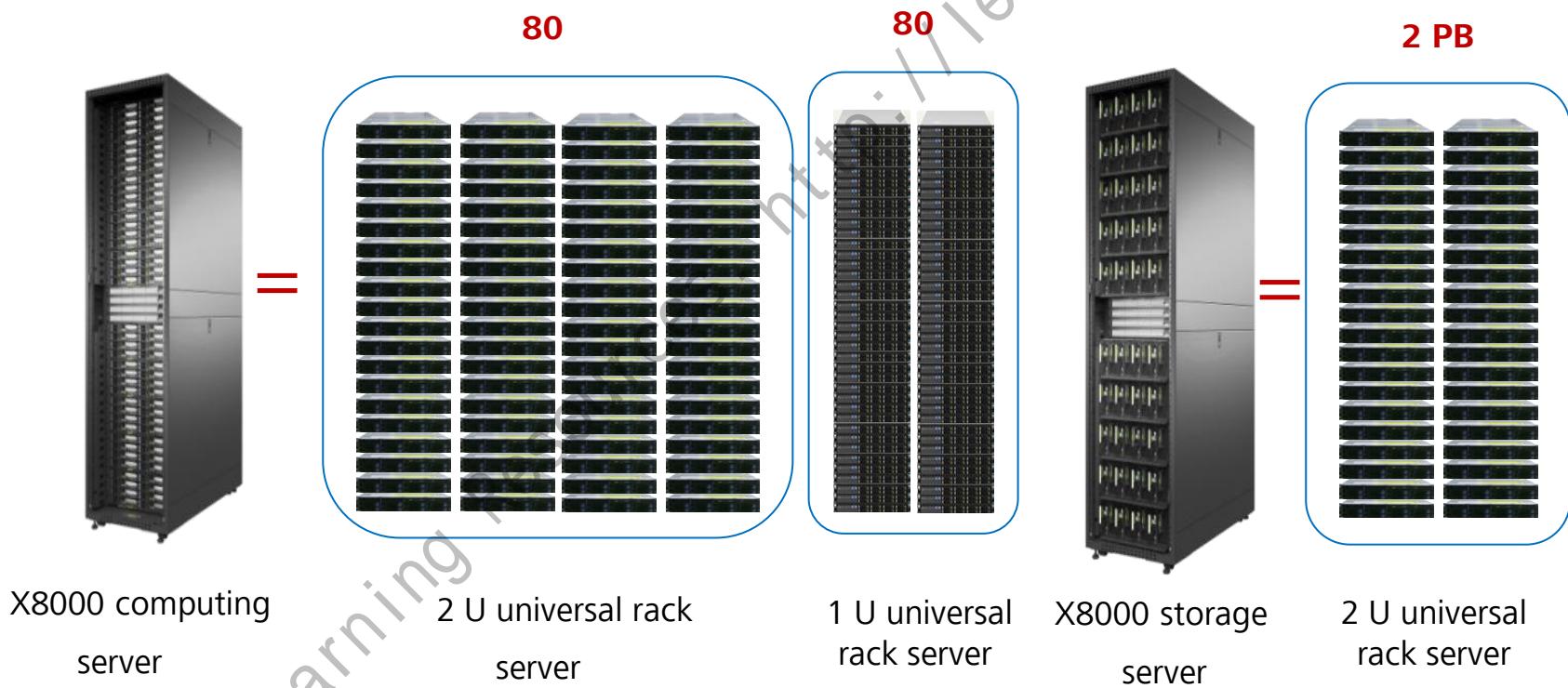
Overview of Huawei X8000 Server

- The X8000 is a high-density cabinet-level server of 44 U.
 $1 \text{ U} = 44.45 \text{ mm (1.75 in.)}$
- A single X8000 cabinet houses a maximum of 80 half-width high performance server nodes.
- The X8000 features high density, powerful computing capability, high energy efficiency, and fast deployment.



Overview of Huawei X8000 Server

Up to **80** compute nodes; **2 PB** storage capacity



X8000 Node Server Family

2013	2014	2015
 DH310 V2 1-socket half-width server node 80 servers  DH320 V2 2-socket half-width server node 160 processors (E5-2400 v2)		 ▼ Scale sales on May 30 DH321 V2 2-socket half-width server node 160 processors (E5-2600 v2)
	 DH628 V2 2-socket 1/4-width server node 2 PB local storage	



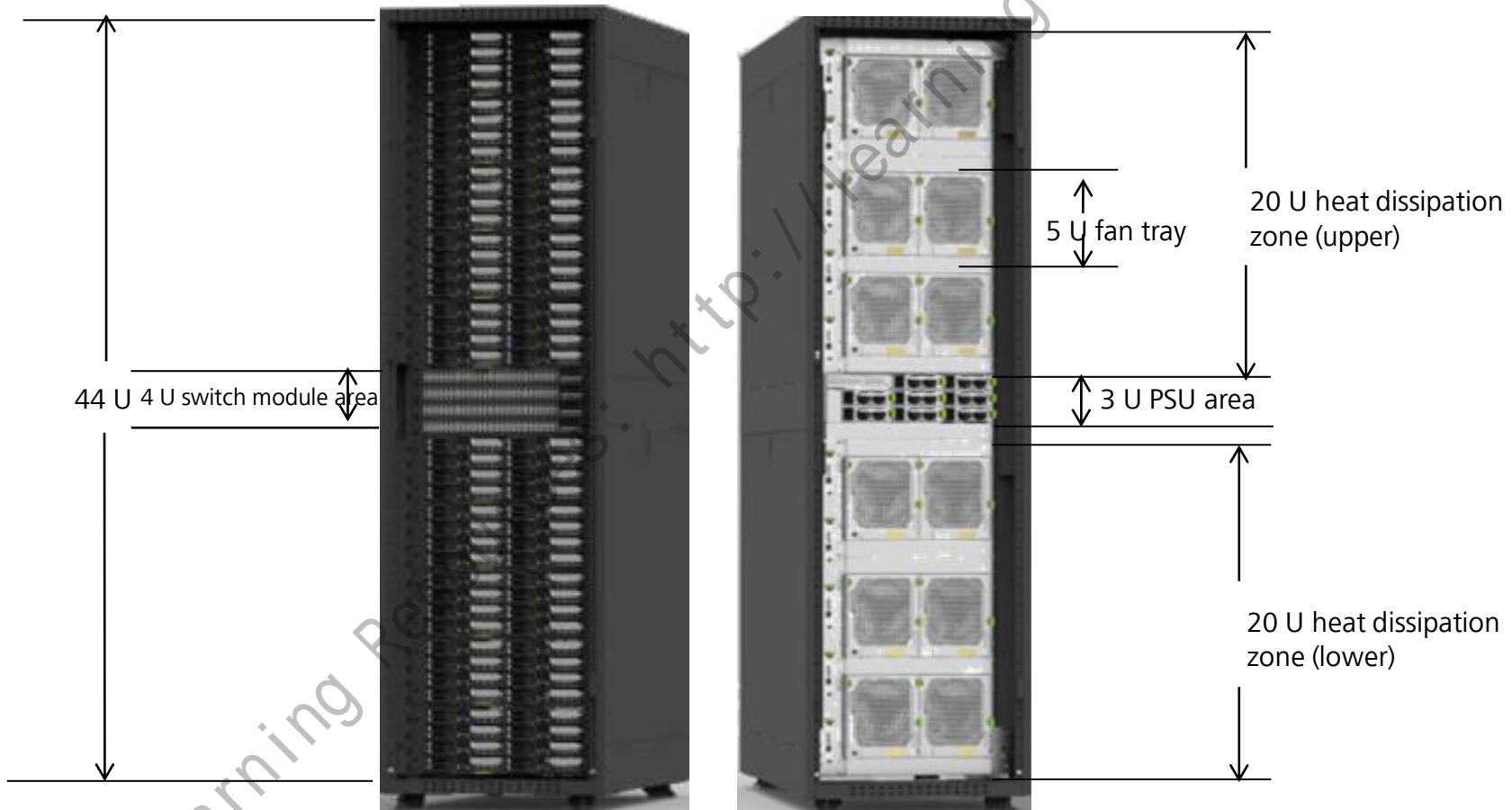
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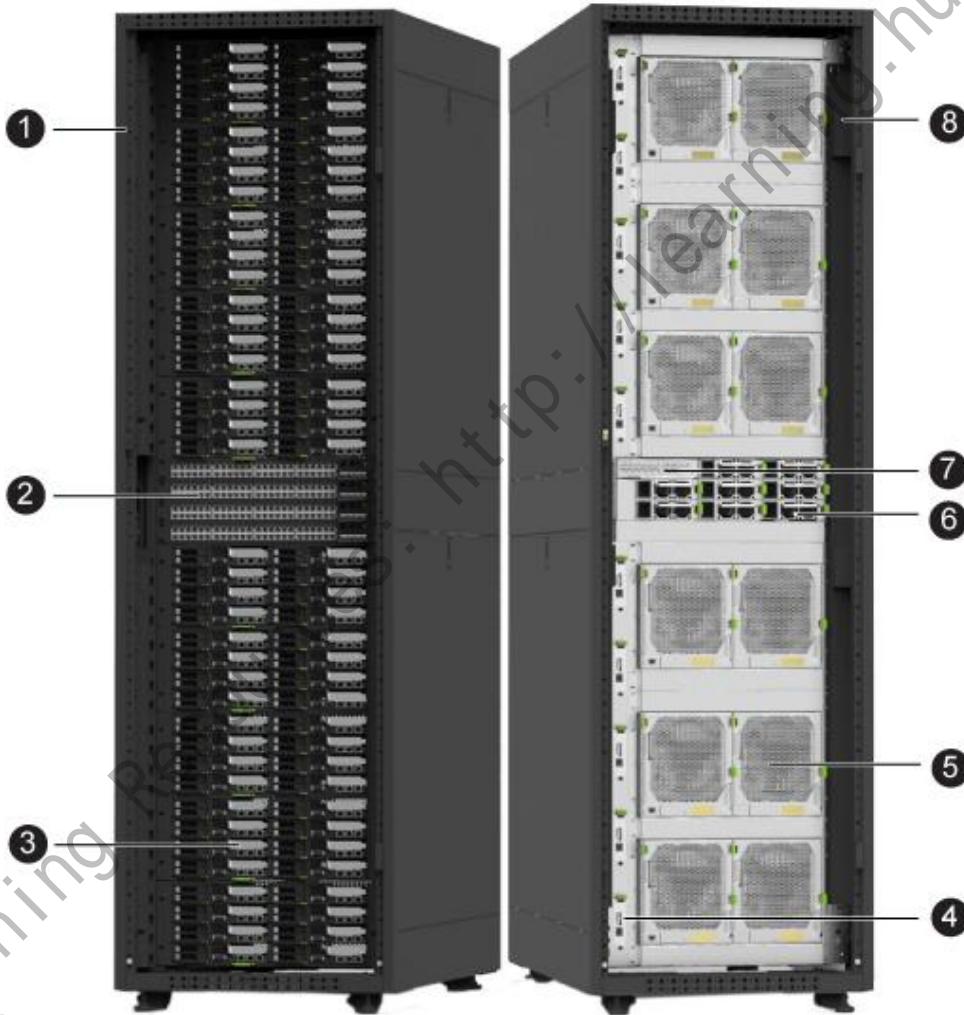
4.1 Overview of Huawei X8000 Server

4.2 X8000 Server System

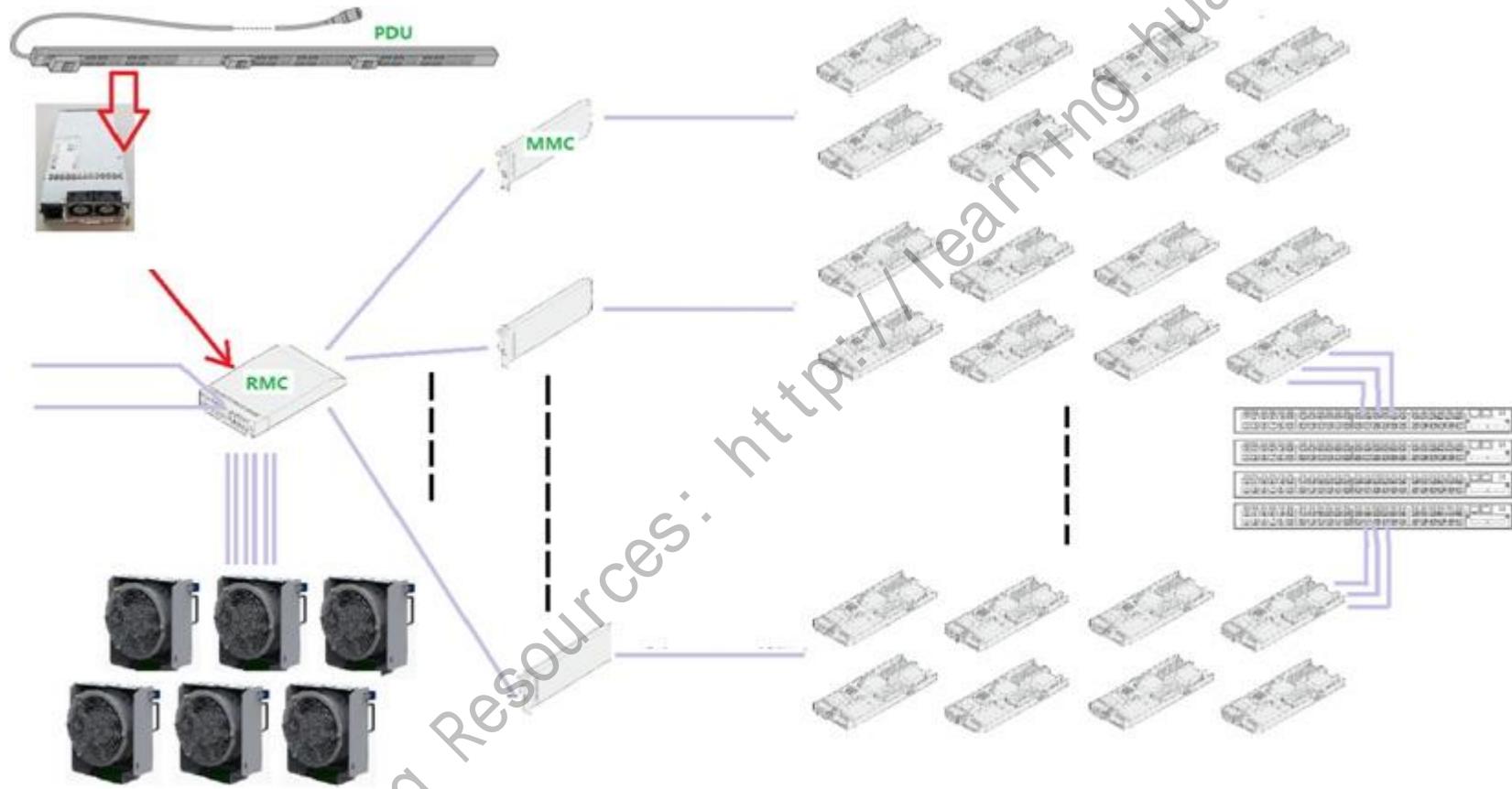
X8000 Server Appearance



X8000 Server Front and Rear View



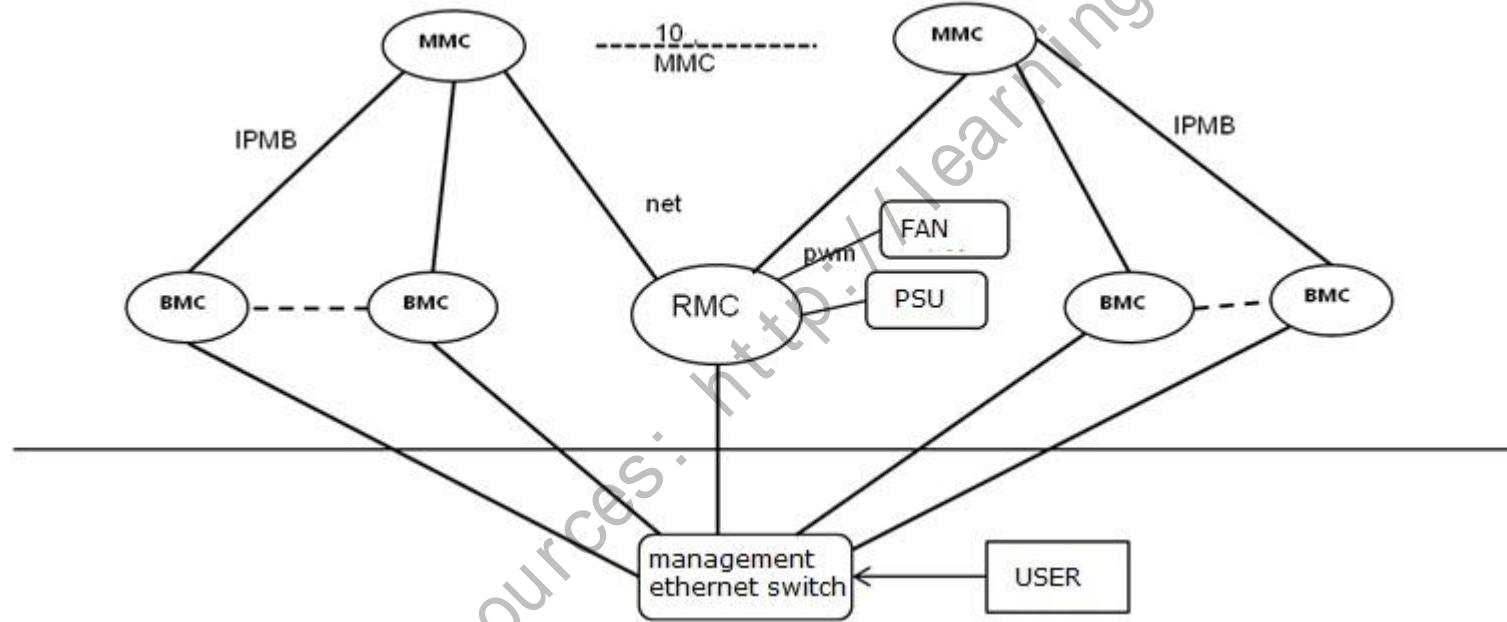
X8000 Server Components



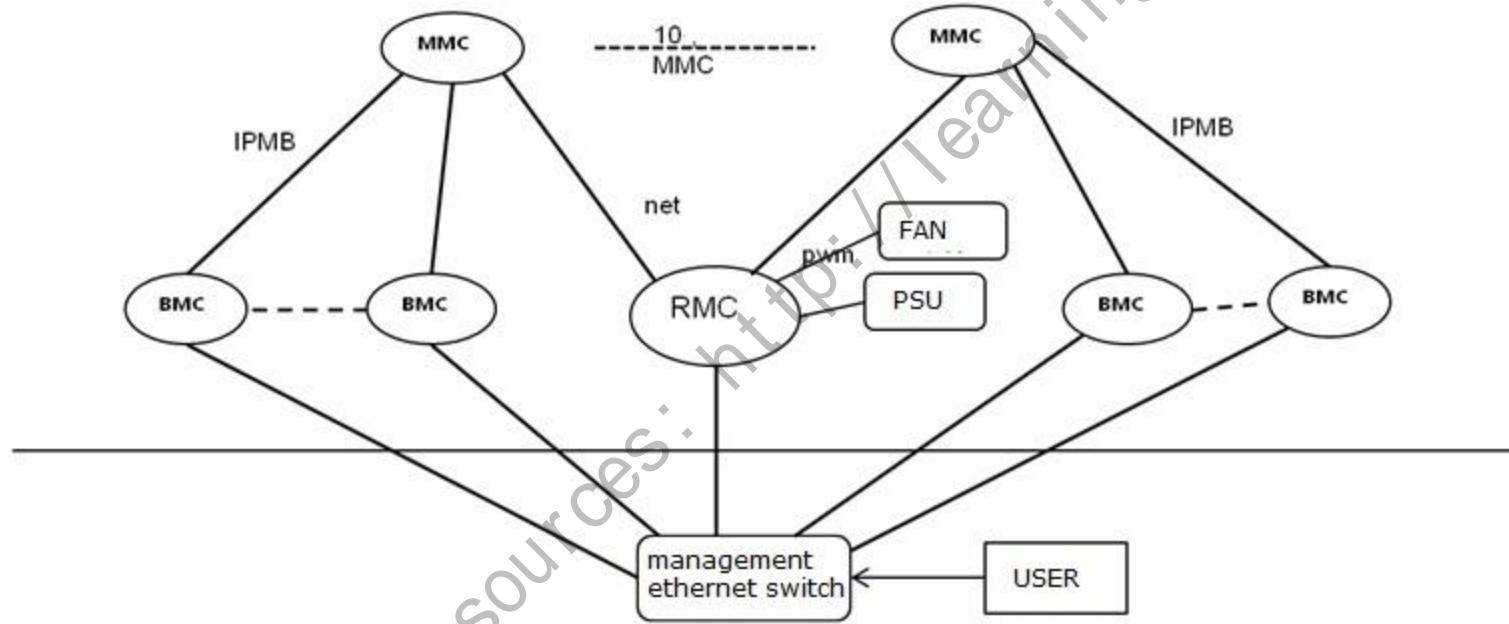
X8000 Server Specifications

Item	Sub-item	Parameters
Mechanical specifications	Dimensions (H x W x D)	2100 mm x 600 mm x 1175 mm (82.68 in. x 23.62 in. x 46.26 in.)
	Internal layout	<ul style="list-style-type: none">• 40 U space for housing 80 half-width server nodes• 4 U space for housing switches
	Weight (net weight)	<ul style="list-style-type: none">• Empty cabinet weight: 163 kg (359.42 lb)• Weight (fully configured with half-width server nodes): 735 kg (1620.68 lb)• Weight (fully configured with 1/4-width server nodes): 1400 kg (3087 lb)
		Packing material weight: Cabinet weight: 125 kg (275.63 lb)
PSU	Rated input voltage range	380 V AC-415 V AC
	Maximum input current	32 A
	Maximum power consumption	14 kW
Environment	Temperature	Operating temperature: 10°C-35°C (50°F-95°F) Storage temperature: -40°C-+65°C (-40°F-+149°F)
	Humidity	Operating humidity: 8% RH to 90% RH (no condensation) Storage humidity: 5% RH to 95% RH (no condensation)
	Operating altitude	≤ 3000 m (9842.4 ft)

X8000 Server Management System



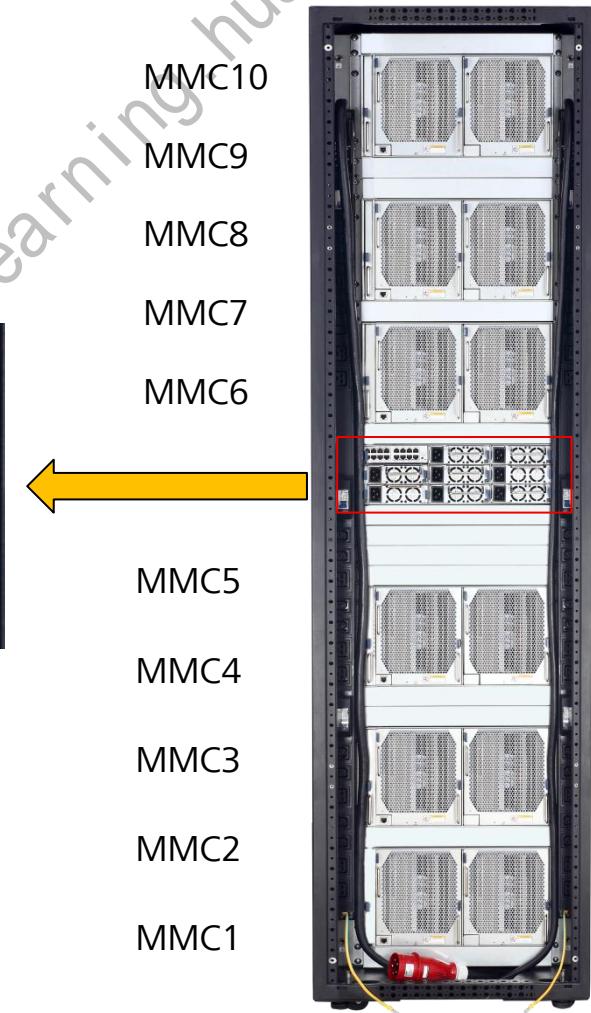
X8000 Server Management System



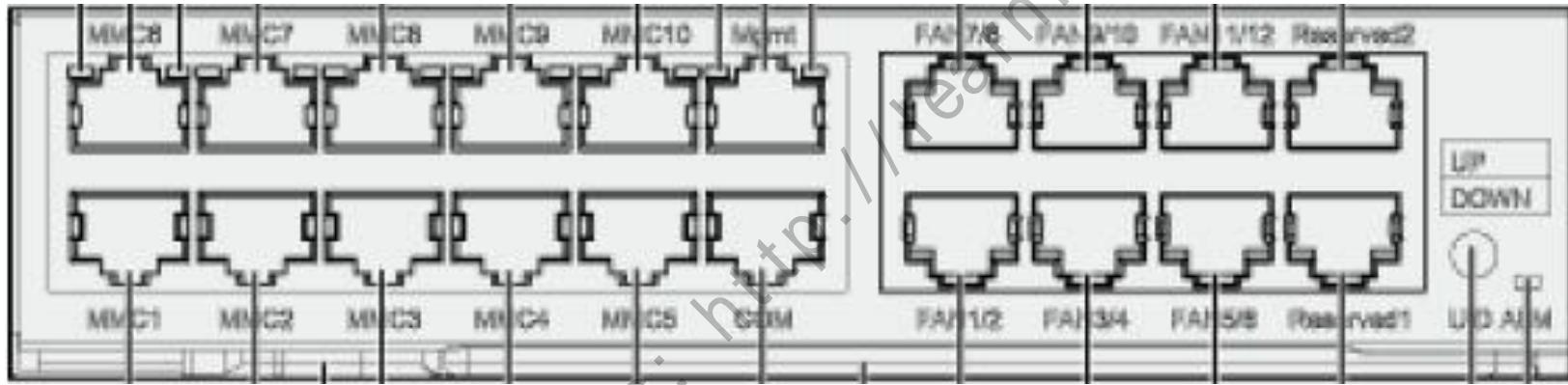
RMC



RMC	PUS7	PSU8
PSU4	PUS5	PSU6
PSU1	PUS2	PUS3



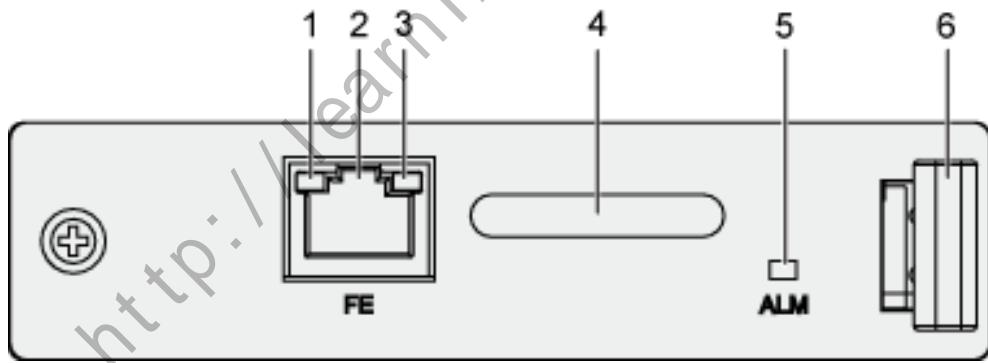
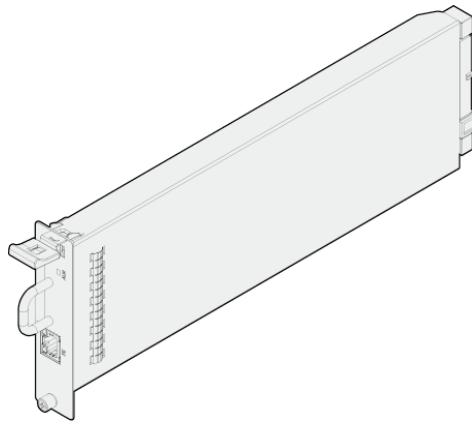
RMC Panel



RMC Indicators

Indicator	Color	State Description
ALM indicator	Red/Green	Blinking red: An alarm is generated. Steady green: The RMC is operating properly. Off: The RMC is not powered on.
UID button/indicator	Blue	Steady on: The UID button is pressed. Off: The UID button is not pressed.
Data transmission status indicator	Yellow	Blinking: Data is being transmitted. Off: No data is being transmitted.
Connection status indicator	Green	Steady on: The network connection is normal. Off: The network is disconnected.
Ethernet port indicator	Green	Steady on: The network connection is normal. Blinking: Data is being transmitted. Off: The network is disconnected.

MMC



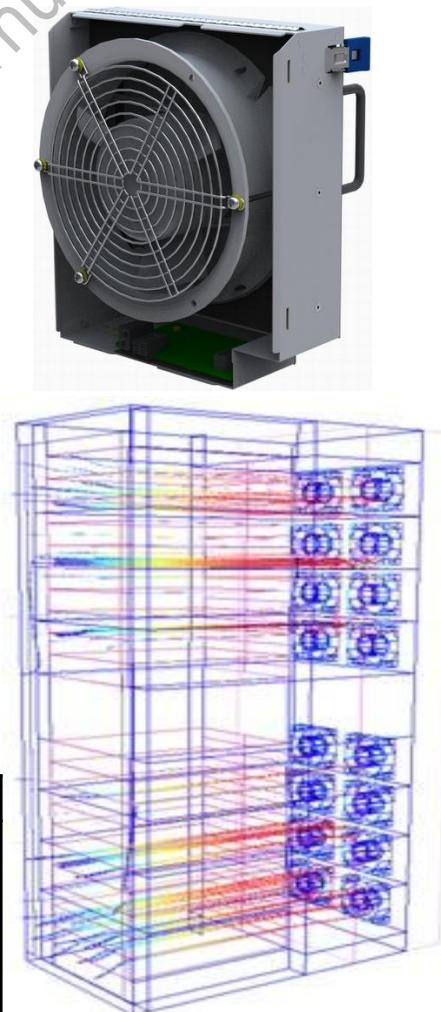
- | | | |
|--------------------------------------|-----------------|-------------------------------|
| 1 Data transmission status indicator | 2 FE port | 3 Connection status indicator |
| 4 Handle | 5 ALM indicator | 6 Spring |

MMC Indicators

Indicator	Color	State Description
ALM indicator	Red/Green	<ul style="list-style-type: none">• Steady green: The MMC is operating properly.• Steady red: The MMC is not properly installed in the rack.• Blinking red at 0.5 Hz: The NIC for the MMC fails.• Blinking red at 1 Hz: The MMC fails to connect to the RMC.
Data transmission status indicator	Yellow	<ul style="list-style-type: none">• Blinking: Data is being transmitted.• Off: No data is being transmitted.
Connection status indicator	Green	<ul style="list-style-type: none">• Steady on: The network connection is normal.• Off: The network is disconnected.

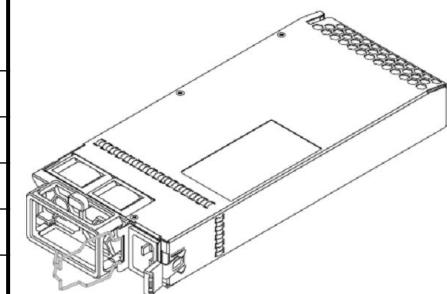
Fan Module

Item	Sub-item	Parameters
Mechanical specifications	Diameter	172 mm (6.77 in.)
	Net weight	0.9 kg (1.98 lb)
Electrical specifications	Input voltage range	7 V DC-15 V DC
	Rated input voltage	12 V DC
	Rated input current	7.3 A
Mechanical properties	Fan speed	6200 r/min
	Maximum airflow	420 CFM
Environment	Operating temperature	-10°C~+70°C (14°F~158°F)
	Operating humidity	5% RH to -90% RH (no condensation)
Indicator	Color	State Description
HLY indicator	Red/Green	<ul style="list-style-type: none">Steady red: The fan module is faulty.Steady green: The fan module is running properly.Off: No power is supplied for the fan module.



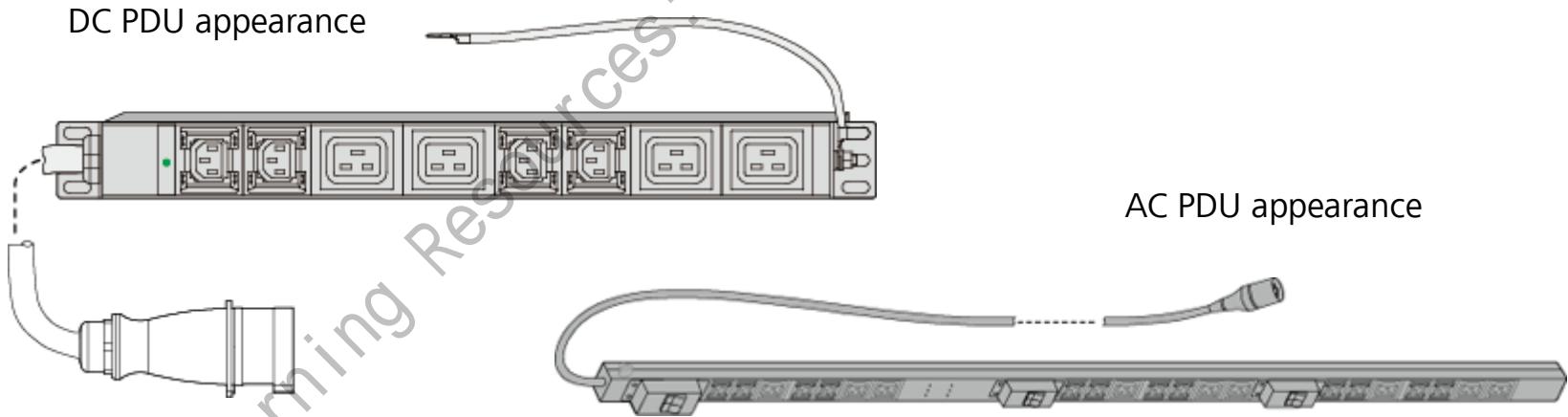
PSU

Item	Sub-item	Parameters
Mechanical specifications	Dimensions (H x W x D)	40.5 mm x 126 mm x 285 mm
	Net weight	2.7 kg
Electrical specifications	Input voltage range	AC voltage: 90 V AC-264 V AC DC voltage: 192 V DC-288 V DC
	Output voltage	12.3 V DC
	Maximum output current	243.9 A
	Maximum output power	3000 W
	Efficiency	≥ 94%
Environment	Long-term operating temperature	-5°C-50°C (23°F-122°F)
	Short-term operating temperature	-5°C-+55°C (23°F-131°F)
	Operating humidity	5% RH to 95% RH (no condensation)
	Operating altitude	4000 m (30°C)/1800 m (50°C)
Indicator	Color	State Description
Power status indicator	Red/Green	<ul style="list-style-type: none"> Steady red: The PSU is faulty. Steady green: The PSU is running properly. Blinking green (at 0.5 Hz): The PSU does not supply 12 V power. Blinking green (at 4 Hz): The PSU is loading software. Off: No power is supplied to the PSU.



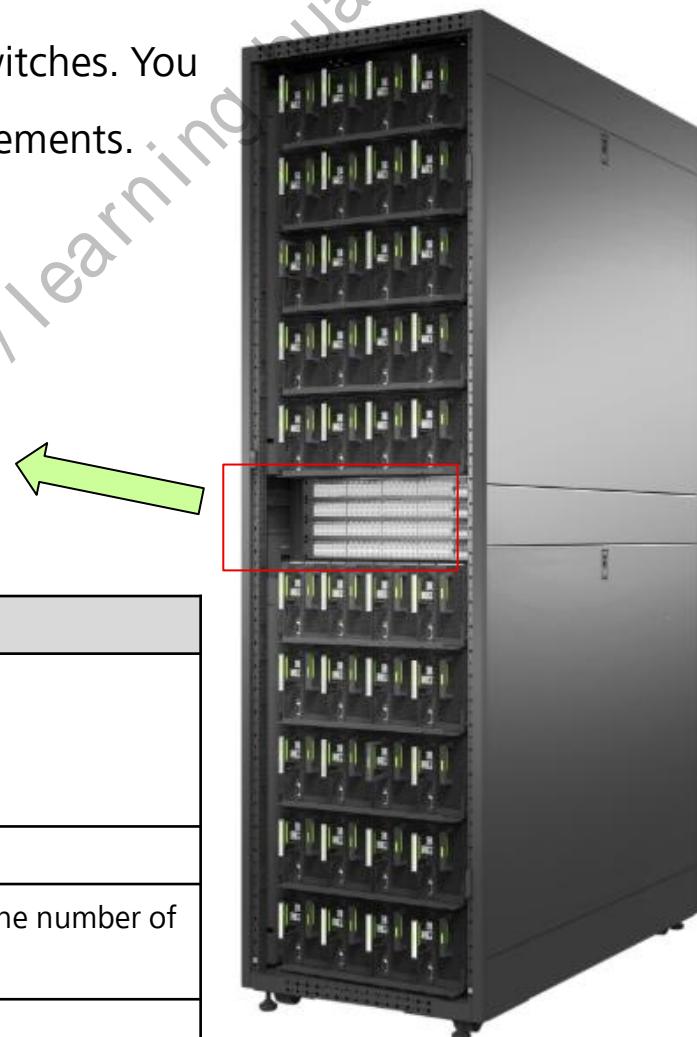
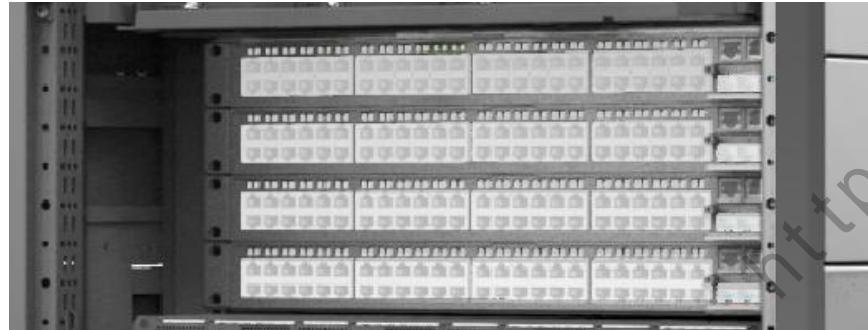
PDU

- The X8000 supports DC and AC PDUs, which supply power for devices, such as PSUs and switches. The PDUs support N+1 redundancy configuration. The maximum power consumption is 12 kW.
- The X8000 supports the following PDU configurations:
 - Two DC PDU32-DC-4/4-Bs and one AC PDU32-3PH-12/9-B.
 - Two AC PDU32-3PH-12/9-Bs.



Switches in the X8000 Cabinet

The X8000 provides a 4 U space for mainstream switches. You can choose switches based on actual service requirements.



Item	Parameters
Dimensions	High: 1 U Depth: 490 mm (19.29 in.) or less Standard 19-inch switch
Power consumption	≤ 200 W
Port	48 ports or more (configured based on the number of nodes)
Input voltage	100 V AC to 240 V AC

X8000 Computing Node Specifications

Item	DH310 V2	DH320 V2	DH321 V2	DH628 V2
Processor	One Intel® Xeon E3-1200 V2 series processor	Up to two Intel® Xeon E5-2400/E5-2400 v2 series processors	Up to two Intel® Ivy Bridge-EP series or Intel® Sandy Bridge-EP series high-performance processors	Up to two Intel® Xeon E5-2400 series processors
Chipset	Intel C200	Intel C602	Intel C604	Intel C602
Memory	<ul style="list-style-type: none">• Up to four DIMM slots;• supports the UDIMM	<ul style="list-style-type: none">• Up to 12 DIMM slots (six DIMMs for each processor);• Supports RDIMMs and LRDIMMs	<ul style="list-style-type: none">• Up to 16 DIMM slots (eight DIMMs for each processor);• Supports RDIMMs and LRDIMMs	<ul style="list-style-type: none">• Up to eight DIMM slots (six DIMMs for each processor);• Supports RDIMMs and LRDIMMs
Local storage	One 3.5" non-hot-swappable SATA HDDs	Up to two hot-swappable 2.5" SAS/SATA HDDs, or SSDs	Up to two hot-swappable 2.5" SAS/SATA HDDs, or SSDs	Up to twelve 2.5" or 3.5" SATA/SAS HDDs and two 2.5" SATA HDDs.
RAID support	Not supported	The RU120 and RU220 RAID controller cards support RAID 0 and 1	Supports the south bridge Platform Controller Hub (PCH) for directly providing SATA ports or an integrated LSISAS2208 controller card for supporting RAID 0 and 1	The RU120 and RU220 RAID controller cards support RAID 0, 1, 5, 6, 10, 50, and 60 with a maximum RAID cache of 1 GB, and support BBUs and supercapacitors.
PCIe expansion slot	Not supported	Provides one half-height half-length standard PCIe slot	The front panel provides one PCIe 1.0/PCIe 2.0/PCIe 3.0 x8 expansion slot.	Provides one full-height half-length PCIe slot for installing Huawei PCIe SSD
Internal USB	N/A	One internal standard USB port and one USB flash card port		
Port	The high-density port on the front panel connects to a cable that provides three USB 2.0 ports and one DB-15 video port			
Dimensions (H x D x W)	41 mm x 540 mm x 210 mm			170 mm x 862 mm x 110 mm
Weight (full configuration)	3.5 kg	4.5 kg	4.7 kg	20 kg



Summary

- Background of Huawei high-density server
- Huawei X series server models, functions and application scenarios
- Huawei X series server hardware structure
- Huawei X series server nodes



Questions

1. What are the features and application scenarios of Huawei X6000 servers?
2. What are the types of Huawei X6000 servers and what are their features?
3. What rules need to be observed when configuring the processors and memory of Huawei X6000 XH320 V2 server node?
4. What advantages does Huawei X8000 server have as compared with common rack servers?

Thank you

[www.huawei.com](http://learning.huawei.com)

Huawei Server Management system

Introduction-iMana

[www.huawei.com](http://learning.huawei.com)





Objectives

- Upon completion of this course, you will be proficient in:
- Basic information about iMana
 - iMana operating environment
 - iMana functions and features
- Basic operations on iMana.
 - Common operation methods of iMana



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- 1. Introduction to iMana**
2. Remote Management

iMana Overview

iMana is a control unit that manages servers in compliance with the Intelligent Platform Management Interface 2.0 (IPMI 2.0) specifications.

The following table describes the functions provided by iMana.

Function	Description
Remote control	Controls servers by using the keyboard, video, and mouse (KVM), serial over LAN (SOL), and virtual media functions.
Alarm management	Receives alarms reported by field replacement units (FRUs) in real time and rectifies faults based on the alarm information.
Status monitoring	Monitors the operating status of FRUs in real time.
Device information management	Allows you to query information about device versions, models, and asset information.
IPMITool	Allows the IPMITool to send commands for remote management.
WebUI-based management	Provides a user-friendly WebUI that allows you to set and query tasks.
Centralized account management	Centrally stores account information on the AD server and directs authentication requests to the AD server, which allows you to use domain accounts to log in to iMana.

Specifications of iMana

Specifications	iMana
Management Chip	ST SPEAR 310 400 MB, ARM9 400 MIPS
Management Interface	IPMI 1.5/2.0, SNMPv1/v2c/v3, CLI, and HTTPS
Remote Maintenance Interface	KVM 8-bit, virtual media, and SOL
Diagnosis	FDM (MCE fault processing system), black box, breakdown screenshots and videos
Security Management	LDAP domain member management and customized account security policy
Power Control	Remote power control, NMI, power capping, dynamic energy savings, and active/standby PSUs
Supported Servers	FusionServer V2 series servers, RH5885 V3 and RH5885H V3 servers

iMana Modules

- iMana consists of :
 - Web module
 - Command line module
 - IPMI module
 - KVM over IP module
 - Virtual media module

Web Module

- The web module integrates with the KVM over IP and virtual media modules and invokes IPMI commands to manage a server on a GUI.
- The web module allows you to use a browser to access the iMana WebUI for server management.

The screenshot shows the iMana 200 WebUI interface. At the top, there's a navigation bar with icons for root, Home, About, Log Out, and system status (0 errors, 0 warnings, 0 critical). On the left is a sidebar with links: Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, and Configuration. The main content area has tabs for Overview, Overview, and System Status. The System Status section shows Device Status as Power On, with CPU, Memory, and HDD all in green (OK). The Common Operations section includes links for Remote Control, Firmware Upgrade, Power Control, Network, and User. Below these are two tables: iMana Information (IP Address: 10.77, Host Name: huawei, Firmware Version: (U4005)5.26, Web Session Timeout: 60 Minutes, Number of Login Users: 1) and System Configuration (Device Serial Number, System Boot Option, Power Restore Policy: Turn On, Graceful Power-off Timeout Period: 600 Seconds, GUID: 075F1A00-38C6-11E3-A326-000000821800). At the bottom, there's a note about scanning status and a legend for OK (green), Minor (yellow), Major (orange), Critical (red), Not installed (grey), and Scanning disabled (light blue).

Command Line Module

- The command line module is used to invoke the IPMI module. You can perform operations on the IPMI module over the iMana CLI.
- iMana provides two commands **ipmcset** and **ipmcget** to invoke the IPMI module for remote management.
- You can log in to the iMana CLI over the management network port using Secure Shell (SSH) or Telnet.

```
root@BMC:/#ipmcget -d version
IPMC          CPU:      SPEAr310
IPMI          Version:   2.0
FPGA          Version:   (U4008) 022
CPLD          Version:   (U38) 022
BIOS          Version:   (U41) V365
Active iMana  Version:   (U4005) 5.26
Active iMana  Built:     17:47:38 Jun 29 2014
Backup iMana  Version:   5.26
Driver         Version:   1.00
Driver         Built:     17:47:46 Jun 29 2014
Uboot         Version:   U-Boot 1.3.5 (Oct 27 2013)
SRCA          BoardID:   0x0130
SRCA          PCB:       .C
RAID CARD    BoardID:   0x0021
RAID CARD    PCB:       .B
MEZZ CARD1   BoardID:   0x0080
MEZZ CARD1   PCB:       .B
IPMB          Address:  0x82
root@BMC:/#
```

IPMI Module

The IPMI module manages servers in compliance with the IPMI 2.0 specifications.

The IPMI module provides the following functions:

- **Real-time system monitoring**

When detecting a fault, the IPMI module reports an alarm, displays alarm information, and enables the self-protection.

- **Remote system control**

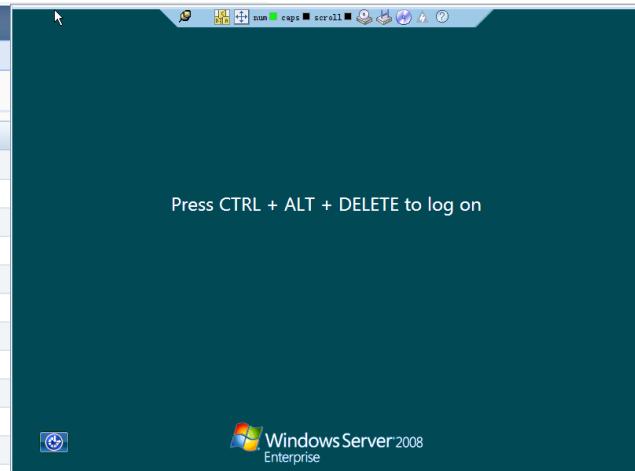
The IPMI module remotely powers on or off a server and resets the service system over the command-line interface (CLI) or web user interface (WebUI).

Events and Logs >> System Events

System Events

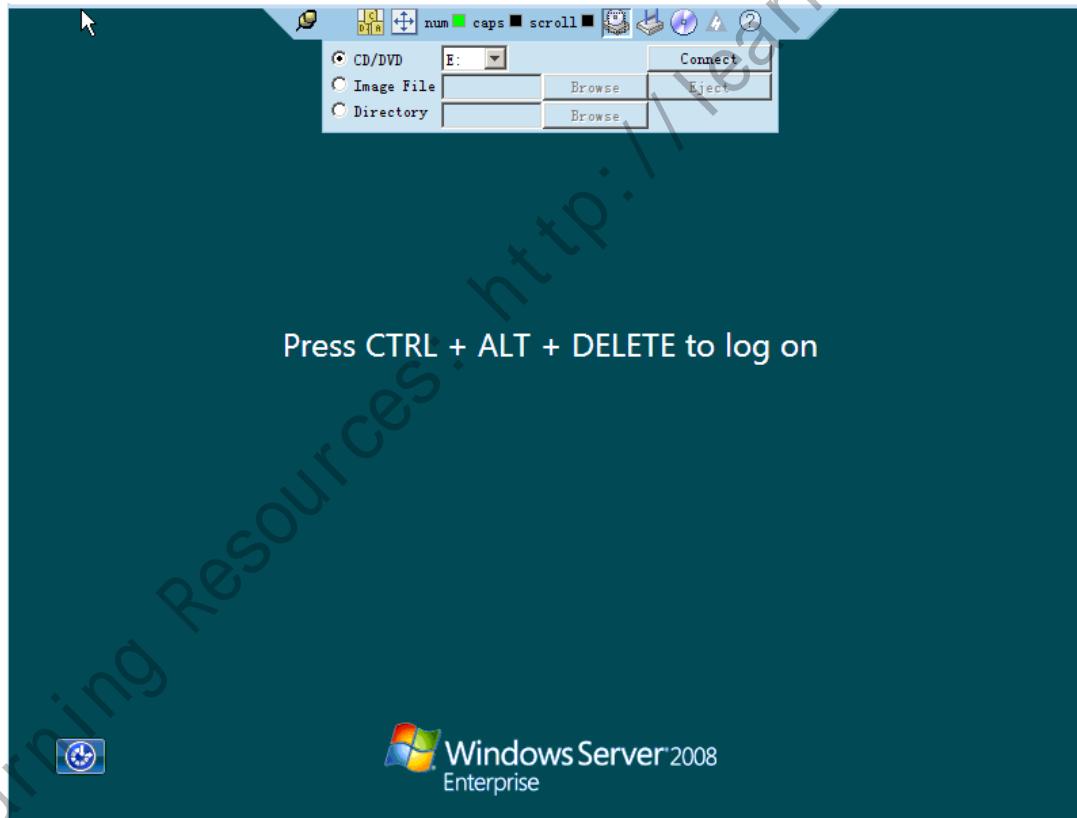
Search

Severity	Generation Time	Sensor	Event Description
✓	2014-11-16 14:09:40	Drive Slot (DISK1)	Hard disk presence
✓	2014-11-16 14:09:40	Drive Slot (DISK0)	Hard disk presence
✓	2014-11-16 14:09:40	Memory (DIMM131)	Presence detected
✓	2014-11-16 14:09:40	Memory (DIMM130)	Presence detected
✓	2014-11-16 14:09:40	Memory (DIMM122)	Presence detected
✓	2014-11-16 14:09:40	Memory (DIMM121)	Presence detected
✓	2014-11-16 14:09:40	Memory (DIMM120)	Presence detected
✓	2014-11-16 14:09:40	Memory (DIMM112)	Presence detected
✓	2014-11-16 14:09:39	Memory (DIMM111)	Presence detected
✓	2014-11-16 14:09:39	Memory (DIMM110)	Presence detected
✓	2014-11-16 14:09:39	Memory (DIMM102)	Presence detected



KVM over IP Module

- The KVM over IP module allows you to use the local keyboard, video, and mouse on the client to monitor and control remote devices in real time.



Virtual Media Module

- iMana allows you to query virtual media status and manage virtual media. The virtual media module provides the following functions:
- **Virtualizing devices**
 - Virtualizes an FDD.
 - Virtualizes a CD-ROM drive.
 - Virtualizes both an FDD and a CD-ROM drive.
- **Creating an image file**
 - The content on a floppy disk or a CD-ROM can be created as an image file and stored on a hard disk.

Note: A floppy disk image file is in IMG format, and a CD-ROM image file is in ISO format.



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1. Introduction to iMana
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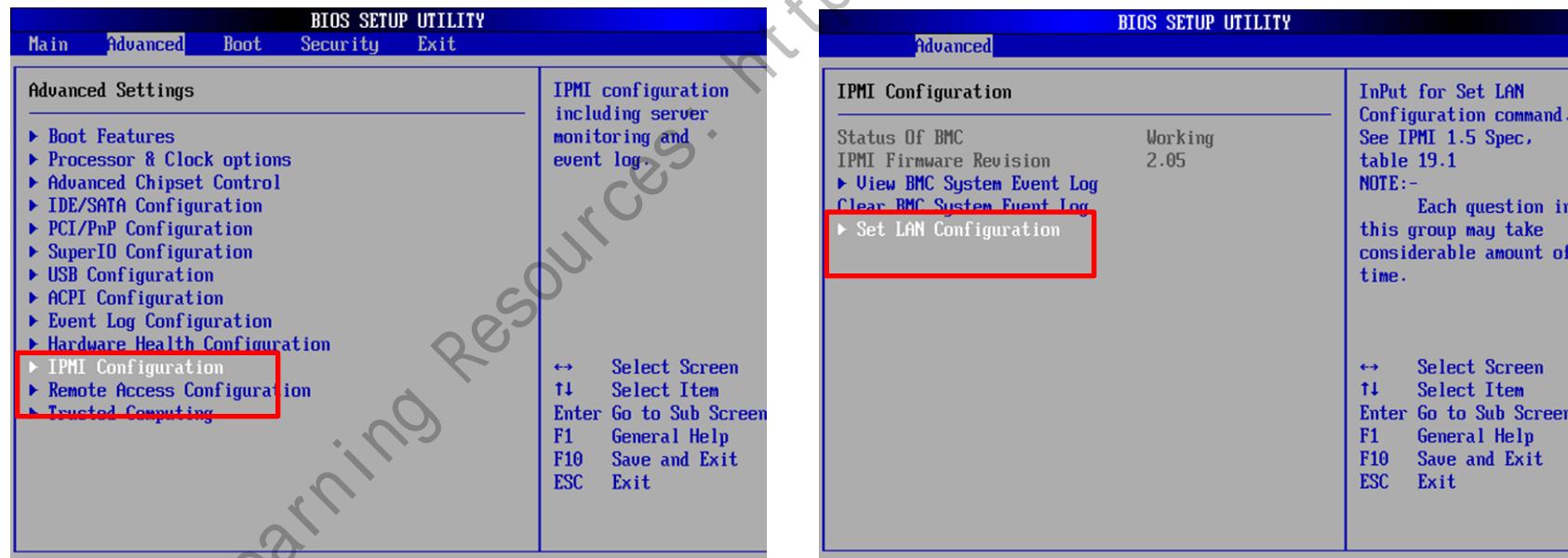
2.1 Querying and Setting the IP Address of the iMana Management Network Port

- 2.2 iMana CLI
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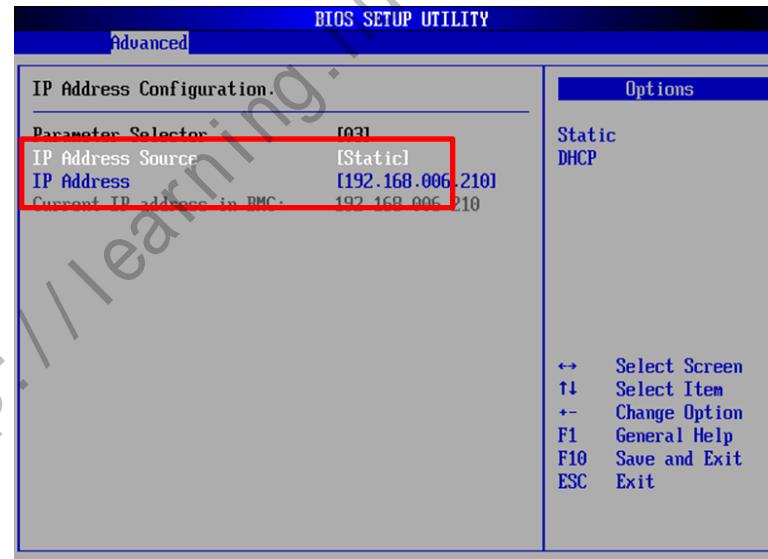
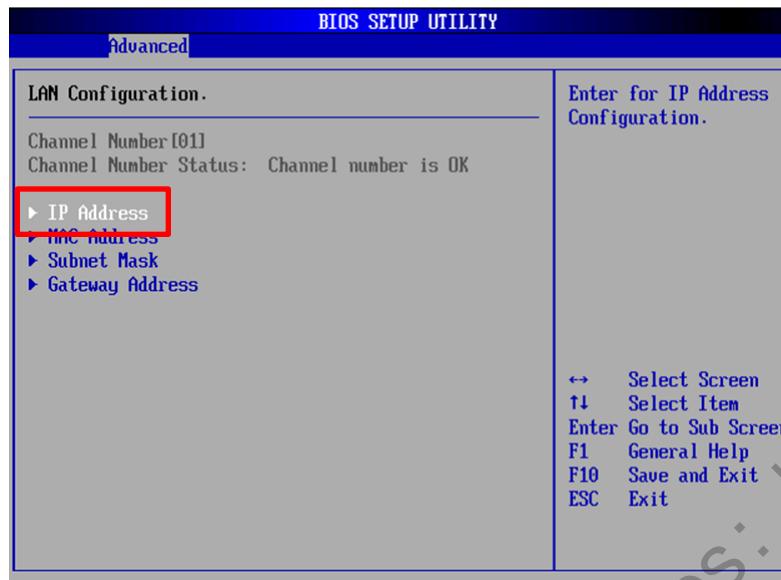
Querying and Setting the IP Address of the iMana Management Network Port (1/2)

Power on the server. During server startup, press **Delete** to enter the BIOS Setup Utility. Choose **Advanced > IPMI Configuration > Set LAN Configuration** (or **IPMI iMana Configuration**). Then view the value of IP Address.

If **IP Source** is set to **Static**, you can manually change the value of IP Address.



Querying and Setting the IP Address of the iMana Management Network Port (2/2)



Default iMana IP addresses:

- Rack server: 192.168.2.100
- Server blades 1 to 10 on an E6000: 10.10.1.101 to 10.10.1.110
- Server nodes on an X6800 : 10.10.1.101 to 10.10.1.108



Contents

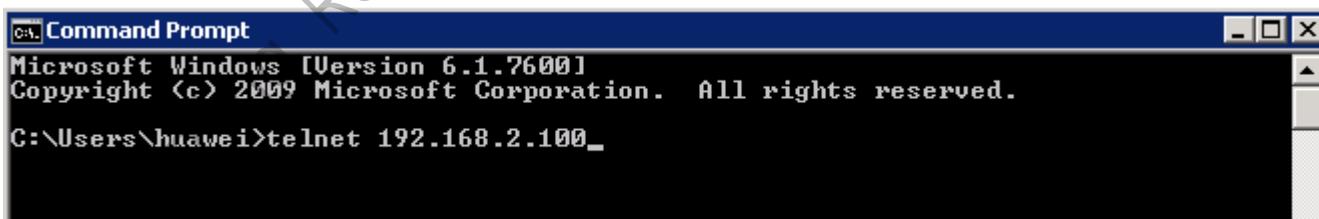
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iMana CLI Overview

- iMana provides two types of commands:
 - Query command: **ipmcget**
The syntax of the ipmcget command is as follows:
ipmcget [-t target] -d dataitem
 - Setting command: **ipmcset**
The syntax of the ipmcset command is as follows:
ipmcset [-t target] -d dataitem -v value
- The parameters of the ipmcget and ipmcset commands are described as follows:
 - []: indicates that the information included in brackets is optional for a command.
 - **-t target**: specifies the target queried or set on a specified device. The target can be a sensor or an indicator.
 - **-d dataitem**: specifies the parameter queried or set on a specific device or a component on the device.
 - **-v value**: specifies the parameter value queried or set on a specific device or a component on the device.

Login to the iMana CLI

- **Login over SSH**
 - **Linux client:** directly run the **ssh *ipaddress*** command in the shell. (In the command, ***ipaddress*** indicates the IP address of the management network port.)
 - **Windows client:** download and install an SSH client communication tool, and enter the IP address of the management network port, user name, and password in this tool. (The default user name and password are both **root**.)
- **Login over Telnet**
 - Connect the configuration terminal network port and the server management network port.
 - In Windows, choose **Start > Run**. In the displayed dialog box, enter **telnet *ipaddress*** and press **Enter** to log in to the CLI. (In the command, ***ipaddress*** indicates the IP address of the management network port.)
- (The default user name is **root** and password is **Huawei12#\$**.)



Common Query Commands

Query the version information of a server.

```
iMana:/>ipmcget -d version
IPMC          CPU:      SPEAr310
IPMI          Version:   2.0
FPGA          Version:   (U1011)030
CPLD          Version:   (U1005)026
BIOS          Version:   (U102)V372
Active iMana  Version:   (U1029)7.06
Active iMana  Built:     17:56:32 Feb 7 2015
Backup iMana  Version:   5.88
Driver         Version:   1.00
Driver         Built:     17:55:48 Feb 7 2015
Uboot         Version:   U-Boot 1.3.9 (Dec 9 2013 - 15:27:12)-SPEAr310
Mainboard     BoardID:   0xaa05
Mainboard     PCB:      .B
RAID CARD    BoardID:   0xaa22
RAID CARD    PCB:      .B
IPMB          Address:  0x84
```

Common Query Commands

Query the system health status.

```
iMana:/>ipmcget -d health  
System in health state.
```

Query system health events.

```
iMana:/>ipmcget -d healthevents  
System in health state.
```

Query information about all FRUs.

```
iMana:/>ipmcget -d fruinfo  
FRU Device Description: Builtin FRU Device (ID 0,  
Mainboard)  
Mfg. Date : 2014/03/13 Thu 23:12:00  
Board Manufacturer : Huawei Technologies Co., Ltd.  
Board Product Name : BC21RCSA0  
Board Serial Number : 030NFLCNE3000727  
Product Manufacturer : Huawei Technologies Co., Ltd.  
Product Name : XH320 V2  
Product Serial Number : 2102300724N0E2001859-3  
Product Asset Tag : -3
```

```
FRU Device Description: Builtin FRU Device (ID 1, I/O  
CARD)  
Mfg. Date : 2014/04/18 Fri 09:50:00  
Board Product Name : BC21IOMA0  
Board Serial Number : 030MAJW0E1000998  
Product Serial Number : 2102300724N0E2001859
```

Common Query Commands

Query the IP address of the iMana management network port.

```
iMana:/>ipmcget -t eth0 -d ipinfo
Mode          : dedicated
IP Address Source : static
IP Address     : 10.215.111.15
Subnet Mask    : 255.255.252.0
Default Gateway IP : 10.215.108.1
MAC Address    : 48:46:FB:01:D5:A2
IPv6 Address Source : static
IPv6 Address 1  : ::
Default Gateway IPv6 : ::
Link-Local Address  :
fe80::4a46:fbff:fe01:d5a2/64
802.1q VLAN ID   : disabled
```

Query the current and historical information about port 80.

The value in brackets is the current information.

```
root@BMC:/#ipmcget -d port80
port80 diagnose code:
00-40-54-09-0A-70-FF-FF--FF-71-76-76-74-76-7C-78
A1-A3-A3-A7-A9-A7-A7-A8-A9-A9-A9-AA-AA
AF-B0-B1-B4-B2-B3-B5-B6--B7-B7-B8-B7-B4-BB-BC-BF
83-83-83-89-89-8A-8B-40--43-4B-4B-41-41-41-41-41
41-41-41-41-41-41-41-41-41-41-41-41-41-41-41-41
41-41-41-41-41-41-41-41-41-41-41-41-41-41-41-41
4D-FF-4E-4F-52-51-54-55--53-5B-59-5A-41-41-41-41
41-41-41-41-41-41-41-41-41-41-41-41-41-41-41-41-5C-5D
A0-41-41-41-41-41-41-41-41-41-41-41-41-41-41-41-41-41
41-41-41-A0-41-41-41-41-41-41-41-41-41-41-41-41-41-41
41-41-41-41-41-41-41-A2-A2-10-11-12-13-14-15-19-1A
1A-1B-1B-19-1A-21-16-23--17-1F-25-18-1D-26-16-17
18-21-23-21-23-23-37-37--21-23-21-23-23-16-17-18
27-28-2A-21-23-21-23-23--27-[29]-00-00-00-00-00-00
```

Common Query Commands

Query system event logs (SELs).

```
root@BMC:/#ipmcget -d sel -v list
34 | 2012/02/03 Fri 09:03:15 | Processor (CPU1 Status) | CPU present | Asserted Ok
33 | 2012/02/03 Fri 09:03:15 | Add-in Card (SAS Card) | Device inserted | Asserted Ok
32 | 2012/02/03 Fri 09:03:15 | IPMB Link State (IPMB Link State) | IPMB-A enabled. IPMP-B
enabled,ch:#0,IPMB-A:Local control state,No failure,IPMB-B:Local control state,No failure |
Asserted Ok
31 | 2012/02/03 Fri 09:03:15 | FRU Hot Swap (FRU Hot Swap) | Transition to M1,cause:By shelf manager
with set FRU activation,fruid:#0 | Asserted Ok
30 | 2012/02/03 Fri 09:03:15 | System ACPI Power State (ACPI State) | S4/S5 state | Asserted Ok
```

Common Setting Commands

Upgrade the BIOS or iMana. (You need to upload the upgrade package of the required version to **/tmp** on iMana before running this command.)

```
ipmcset -d upgrade -v /tmp/*.hpm [option]
root@BMC:/tmp#ipmcset -d upgrade -v /tmp/image.hpm
Please make sure the iMana is working while upgrading!
Updating...
100%
Update successfully.
```

In the command, the values of **option** are as follows:

0: indicates that iMana does not restart after the upgrade.

1: indicates that iMana restarts after the upgrade.

If **option** is not specified in this command, iMana automatically resets by default.

(The setting of **option** is effective only for the iMana upgrade.)

Do not reset the server during the BIOS upgrade. Otherwise, the upgrade fails. You are advised to keep the server in the power-off or starting state during the upgrade process.

Common Setting Commands

Reset iMana.

```
root@BMC:/#ipmcset -d reset
This operation will reboot IPMC system. Continue? [Y/N]:y
Resetting...
```

Delete the CMOS information.

```
root@BMC:/#ipmcset -d clearcmos
WARNING: The operation may have many adverse effects
Do you want to continue?[Y/N]:y
Clear CMOS successfully.
```



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Login to the iMana WebUI

Before using the remote control function, ensure that the OS, web browser, and Java Runtime Environment (JRE) of the required versions have been installed on the client. The following table describes the client software requirements.

OS	Software		Version
Windows XP or Windows 7 32-bit	Browser	Internet Explorer	Internet Explorer 8.0
		Mozilla Firefox	Mozilla Firefox 9.0
		Google Chrome	Chrome 13.0
	JRE		JRE 1.6.0 U25 or later
Red Hat 4.3 or 6.0 64-bit	Browser	Mozilla Firefox	Mozilla Firefox 9.0
	JRE		JRE 1.6.0 U25 or later
Mac	Browser	Safari	Safari 5.1
		Mozilla Firefox	Mozilla Firefox 9.0
	JRE		JRE 1.6.0 U25 or later



Do not frequently click the Forward or Backward button in the browser when you are using the remote management function.

Login to the iMana WebUI

Step 1 Open Internet Explorer, enter the IP address of the iMana management network port in the address box, and press Enter.

Step 2 In the security alert dialog box, click Yes.

Step 3 On the login page, perform the following steps:

1. Select a language.
2. Enter a user name. (The default user name is **root**.)
3. Enter the password. (The default password is **Huawei12#\$**.)
4. Select This iMana or a user domain from the Log on to drop-down list.
5. Click **Log In**.

The iMana WebUI is displayed.

You can click Reset to reset these parameters.

User Name: root
Password:
Log on to: This iMana

Log In Reset

Device Name:	Tecal RH2485 V2
Device Serial Number:	20120712
Product Asset Tag:	AssetTag
iMana Version:	(U1037)3.57
BIOS Version:	(U102)V029
System Status:	Minor
Device Status:	Power Off

Login to the iMana WebUI

- iMana 200 in the upper left corner is the iMana WebUI name for Huawei V2 servers.
- The following figure shows the Overview page for the RH2228H V2 server.

The screenshot shows the iMana 200 WebUI interface. At the top, there's a navigation bar with the HUAWEI logo, 'iMana 200', 'Tech RH2228H V2-12L', and user status ('root'). Below the navigation bar is a header with 'Overview' and a search bar. On the left, a sidebar lists 'Overview', 'System Information', 'Remote Control', 'PS Management', 'Events and Logs', 'Real-time Monitoring', 'Diagnose and Location', 'Download Data', and 'Configuration'. The main content area has three sections: 'System Status' (Device Status: Power On; CPU, Memory, HDD, PS, Fan all green), 'Common Operations' (Remote Control, Firmware Upgrade, Power Control, Network, User), and 'iMana Information' (IP Address: 10.215.1.1, Host Name: 2102310QPD10E5000066, Domain Name: (U1029)5.88, Firmware Version: (U1029)5.88, Web Session Timeout: 5 Minutes, Number of Login Users: 1). There's also a 'System Configuration' section with fields like Device Serial Number, System Boot Option, Power Restore Policy, Graceful Power-off Timeout Period, GUID, and Device Location. At the bottom, there are status indicators for OK (green), Minor (yellow), Major (orange), Critical (red), Not installed (grey), Scanning disabled (grey), and Backup status (green).



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System Information (1/5) -- Firmware Version

In the navigation tree, choose

System Information.

The following options are displayed:

- Firmware Version
- Asset Information
- System Hardware

The Firmware Version page displays the following information:

- iMana Version
- BIOS Version
- Component Name
- Product Name

The screenshot shows the System Information interface with the 'Firmware Version' option selected in the navigation tree. The main content area displays three tables of component information for Mainboard, RAID CARD, and HDD BACKPLANE components.

Mainboard	
iMana Version	(U1037)3.57
CPLD Version	(U1005)004
FPGA Version	(U1042)019
BIOS Version	(U102)v029
Uboot Version	U-Boot 1.3.3 (Jul 20 2012 - 11:26:49)-SPEAr310
PCB Version	.A
Board ID	0xaa03
Board Name	BoardProductName
Device Serial Number	20120712

Component Infomation	
Component Type	Mezz card
Component Name	RAID CARD
PCB Version	.A
Board ID	0xaa22
Board Name	BC11ESMD
Product Name	SAS2208

Component Infomation	
Component Type	Mezz card
Component Name	HDD BACKPLANE
PCB Version	.B

System Information (2/5) -- Asset Information

Version -- Mainboard

The **Mainboard** page displays the following information:

- Board Production Date
- Product Name
- Product Serial Number

The screenshot shows the iMana 200 software interface. The title bar reads "iMana 200 Tecal RH2288H V2-12L". The left sidebar menu includes "Overview", "System Information" (selected), "Firmware Version", "Asset Information" (highlighted in red), "System Hardware", "Remote Control", "PS Management", "Events and Logs", "Real-time Monitoring", "Diagnose and Location", "Download Data", and "Configuration". The main content area has a breadcrumb navigation path: "System Information >> Asset Information >> Mainboard". Below this, there are three tabs: "Mainboard" (selected and highlighted in red), "PS", and "HDD". A table displays asset information with the following data:

Attribute	Value
Board Manufacturer	Huawei Technologies Co., Ltd.
Board Name	BC11SRSG
Board Serial Number	021VTT4ME4002345
Board Part Number	
Board FRU File ID	
Board Production Date	2014/04/15 Tue 14:21:00
Product Manufacturer	Huawei Technologies Co., Ltd.
Product Name	Tecal RH2288H V2
Product Part Number	
Product Version	
Product Serial Number	2102310QPD10E5000066
Product Asset Tag	
Product FRU File ID	

System Information (3/5) -- Asset Information

Version -- PS

The PS page displays the following information:

- Manufacturer
- Model
- Rated Power

The screenshot shows the System Information interface with the following details:

Left Sidebar:

- Overview
- System Information
- Firmware Version
- Asset Information** (highlighted with a red box)
- System Hardware
- Remote Control
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Download Data
- Configuration

Top Navigation: System Information >> Asset Information >> PS

Sub-navigation: Mainboard | **PS** | HDD

Data Tables:

PS 1	
Manufacturer	LTEON
Input Mode	AC
Model	LTEON POWER SUPPLY
Version	01
Rated Power	750 W
Communications Protocol	PSMI

PS 2	
Manufacturer	LTEON
Input Mode	AC
Model	LTEON POWER SUPPLY
Version	01
Rated Power	750 W
Communications Protocol	PSMI

System Information (4/5) -- Asset Information

Version -- HDD

The HDD page allows you to view asset information about detected hard disks in the server.

System Information >> Asset Information >> HDD

Mainboard | PS | HDD

(Hide/display all HDD
(HDD7

Attribute	Value	Attribute	Value
Model Number	ST9300605SS	Vendor	SEAGATE
Serial Number	6XP304ST	Capacity	299GB
Firmware Revision	B002	Speed	10033RPM
Interface Type	SAS	State	UNCONFIGURED GOOD
Rebuild Process	Not In Process		

System Information (5/5) – System Hardware

The System Hardware page displays the following information:

- Product models of CPUs, DIMMs, hard disks, and PSUs
- MAC addresses of LOMs

The screenshot shows the 'System Information' interface with the 'System Hardware' tab selected. The left sidebar lists various monitoring and management options. The main content area displays hardware components categorized by type:

System Hardware	
CPU(4/4)	
CPU 1	Intel(R) Xeon(R) CPU E5-4650 0 @ 2.70GHz
CPU 2	Intel(R) Xeon(R) CPU E5-4650 0 @ 2.70GHz
CPU 3	Intel(R) Xeon(R) CPU E5-4650 0 @ 2.70GHz
CPU 4	Intel(R) Xeon(R) CPU E5-4650 0 @ 2.70GHz
Memory(8/48)	
DIMM000	DIMM000,Ramaxel, 8192 MB, 1332 MHz
DIMM010	DIMM010,Ramaxel, 8192 MB, 1332 MHz
DIMM020	DIMM020,Ramaxel, 8192 MB, 1332 MHz
DIMM030	DIMM030,Ramaxel, 8192 MB, 1332 MHz
DIMM100	DIMM100,Ramaxel, 8192 MB, 1332 MHz
DIMM110	DIMM110,Ramaxel, 8192 MB, 1332 MHz
DIMM120	DIMM120,Ramaxel, 8192 MB, 1332 MHz
DIMM130	DIMM130,Ramaxel, 8192 MB, 1332 MHz
HDD(1/8)	
PS(1/2)	
PS 1	LTEON 1200W SERVER PS
Fan(12/12)	
HDD Backplane(1/1)	
RAID Card(1/1)	
RAID Card	LSI SAS2308
NIC(4/4)	
NIC 1	MAC: 10-1B-54-99-2E-D8

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Remote Control (1/9)

- In the navigation tree, choose Remote Control. Then choose a link mode to open the remote control screen.
- This screen integrates the virtual media and KVM over IP functions.

The screenshot shows the iMana 200 web interface for a Tecal RH2288H V2-12L server. The left sidebar contains a navigation tree with the following items:

- Overview
- System Information
- Remote Control** (highlighted with a red box)
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Download Data
- Configuration

The main content area is titled "Remote Control" and displays two sections: "KVM Properties" and "Virtual Media Properties".

KVM Properties	
Maximum Sessions	2
Active Sessions	0

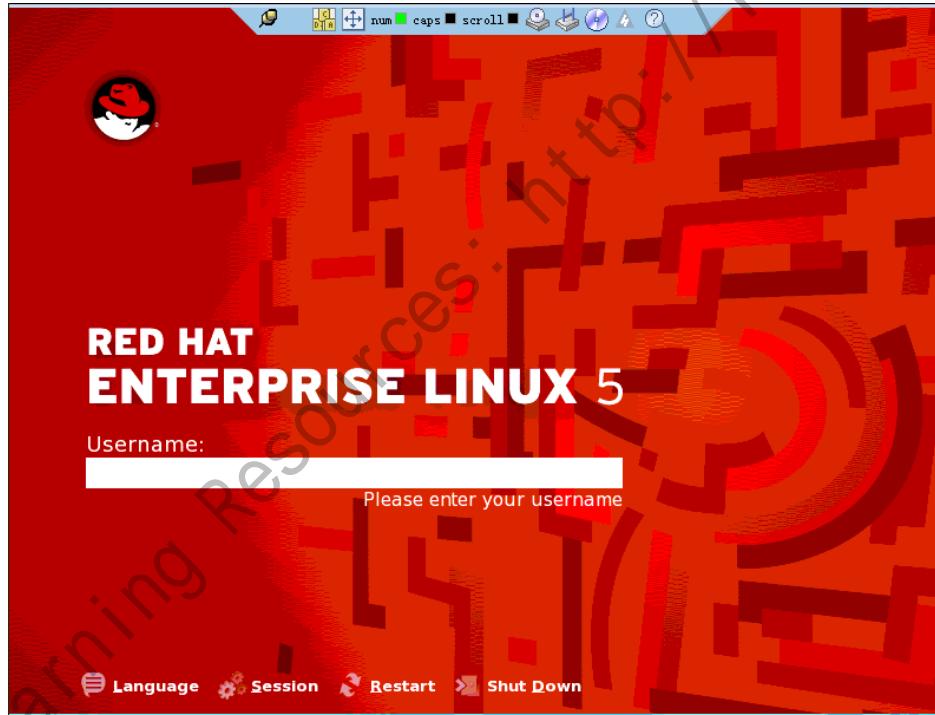
Virtual Media Properties	
Maximum Sessions	1
Active Sessions	0

Below these sections are two links:

- [Remote Virtual Console \(shared mode\)](#)
- [Remote Virtual Console \(private mode\)](#)

Remote Control (2/9)

- On the toolbar, click  .
- The real-time desktop of the controlled device is displayed in full-screen mode.
- In full- or split-screen mode, press **Ctrl+Alt+Shift** to show the toolbar



Remote Control (3/9)

- Press **Ctrl+Alt+Shift** to show the toolbar.
- Icons on the toolbar

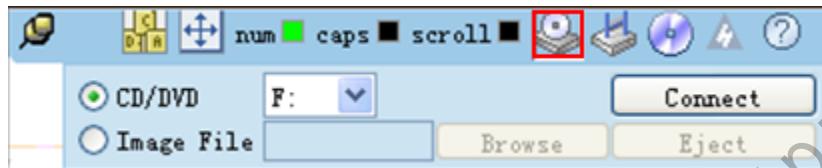


Icon	Function Description
	Send instructions through customized keys.
	Show the real-time desktop of remote devices in full screen mode.
	Create image files.
	Choose the virtual CD-ROM drive.
	Choose the virtual floppy drive.
	Select the power control mode.
	Synchronize the local mouse and remote mouse.
	Display or hide the local mouse.
	Return to the previous interface.

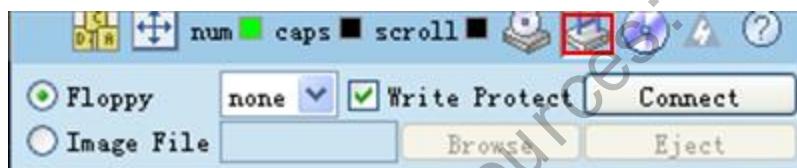
Remote Control (4/9)

The virtual media function includes creating a virtual CD-ROM drive, a virtual FDD, and an image file. Only one user is allowed to use the virtual media function at a time.

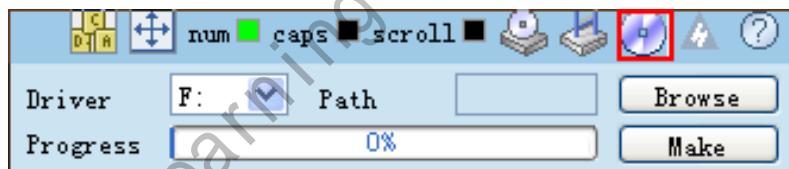
If you select  , create a virtual CD-ROM drive by using the local CD-ROM drive or CD image file on the client.



If you select  , you can create a virtual FDD by using the local FDD or floppy disk image file on the client.



If you select  , you can create a floppy disk or CD image file by using the local FDD or CD-ROM drive on the client.



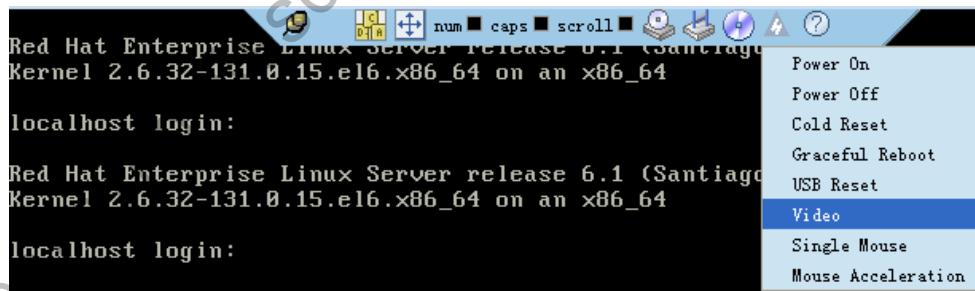
Remote Control (5/9)

- The following table describes the elements related to virtual media.

Virtual Media	Element	Action
Virtual CD-ROM drive	CD/DVD	Select a CD-ROM drive to be virtualized on the client.
	Image File	Enter or select the floppy disk or CD image file to be virtualized on the client.
	Connect/Disconnect	Install or remove a virtual media device on a server.
	Eject/Insert	Eject or insert the floppy disk or DVD virtualized by using an image file.
Virtual FDD	Floppy	Select the FDD to be virtualized on the client.
	Write Protect	Enable or disable the write protection function. Note: Write protection is a protection mechanism that prevents modification or erasure of important data on a device. If write protection is enabled, no data can be written to the device.
	Image File	Select the FDD or CD-ROM drive on the client.
Image file	Path	Enter or select the path to an image file.
	Make/Stop	Start or stop creating an image file.

Remote Control (6/9)

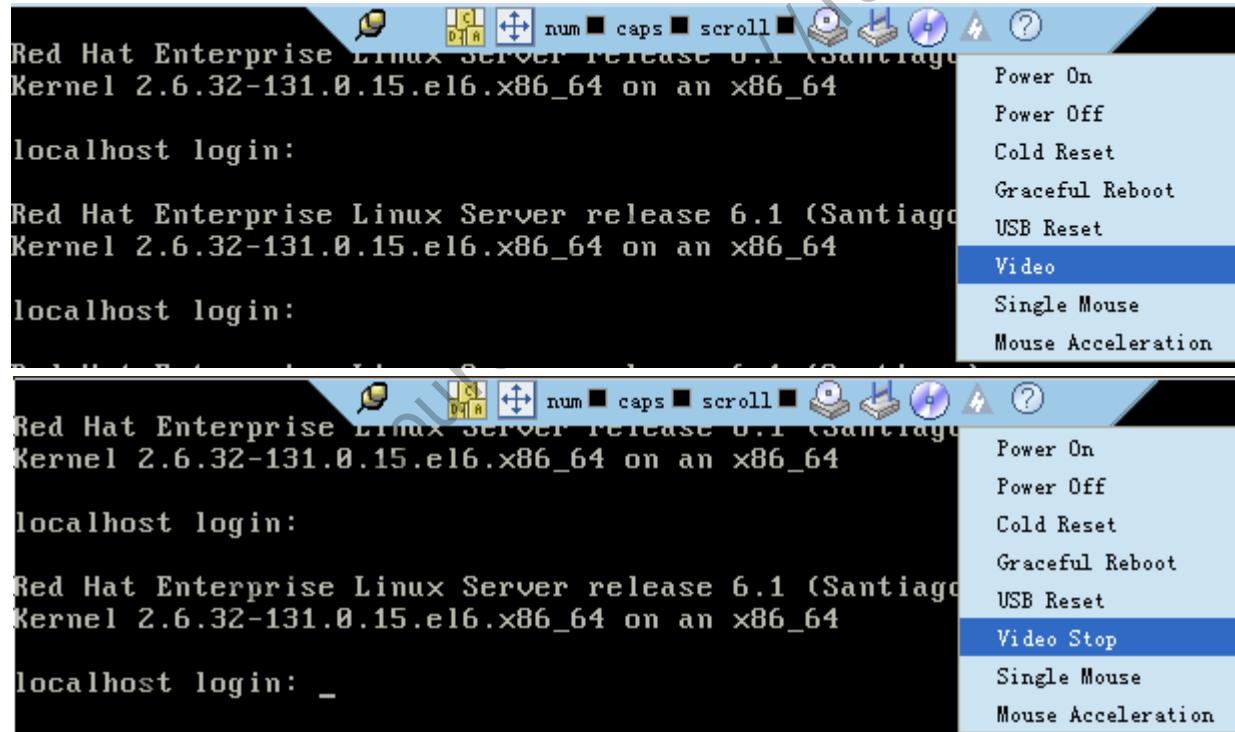
- On the toolbar, click .
- The power control modes include **Power On**, **Power Off**, **Cold Reset**, **Graceful Reboot**, and **USB Reset**.
- Note:
Before you power off, gracefully restart, or perform a cold reset or USB reset on a server, ensure that no service risk exists.
 - Power On**: powers on the server.
 - Power Off**: powers off the server.
 - Cold Reset**: performs a cold reset on the server.
 - Graceful Reboot**: performs soft restart on the server, that is, logs out of the system and then restarts the server.
- USB Reset**: resets the USB keyboard and mouse.



Remote Control (7/9)

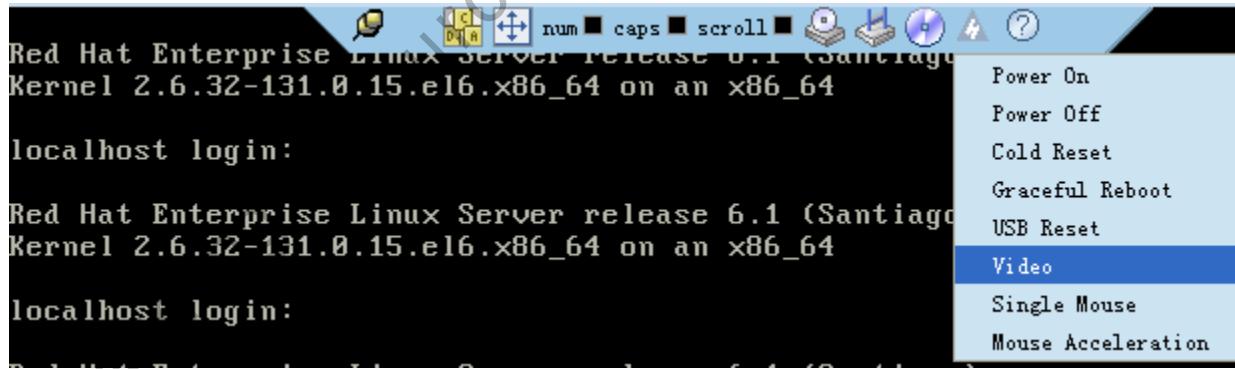
On the toolbar, click  and choose **Video**.

An *.rep video file is recorded for the real-time desktop of the controlled device. In this situation, **Video** changes to **Video Stop**. You can click **Video Stop** to stop video recording. For details about how to play a video file, see "2.3.7 Diagnose and Location (1/3)" on slide 69.



Remote Control (8/9)

- The **Single Mouse** and **Mouse Acceleration** functions are available on the remote control screen. These functions enable synchronization between the local mouse and the remote mouse.
- Single Mouse:** hides the local mouse and shows only the remote mouse when the two mouse devices are not synchronized.
- Mouse Acceleration:** accelerates the remote mouse to synchronize it with the local mouse.
- Mouse acceleration is **unavailable** for a server running **SUSE Linux**. In this situation, you can switch the remote control screen to the full-screen mode, and click  on the toolbar to synchronize the remote mouse with the local mouse.



Remote Control (9/9)

- On the client, you can set a resolution for the controlled device. The maximum resolution is **1280 x 1024**.
- To change the resolution for the controlled device running Windows XP, perform the following steps:
 - Step 1 Right-click on the real-time desktop of the controlled server and choose Properties from the shortcut menu.
 - The Properties dialog box is displayed.
 - Step 2 Click the Settings tab, and drag the Screen resolution slider bar to change the resolution.
 - Step 3 Click OK.
- After that, the remote control screen on the client displays pictures with the new resolution.



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PS Management (1/5) -- Power Control

Parameter	Description
Device Status	Specifies the server status. Value: Power On and Power Off
Power On	Powers on the server.
Forcibly Power Off	Powers off the server forcibly. The server will be powered off within 6 seconds.
Graceful Power Off	The server provides a graceful power-off timeout period for the service system.
Restart	Powers off the server and performs cold reset. The cold reset covers server power-on, self-check, and system initialization.
Graceful Reboot	The server provides the graceful power-off timeout period for the service system
NMI	Triggers an NMI.

PS Management >> Power Control

Power Control

Power-On/Off Control

Device Status:Power On	
Power On	<input type="radio"/>
Forcibly Power Off	<input type="radio"/>
Graceful Power Off	<input type="radio"/>
Restart	<input type="radio"/>
Graceful Reboot	<input type="radio"/>
NMI	<input type="radio"/>

PS Management (2/5) -- Power Statistics

The **Power Statistics** page displays the following power information:

- **Current Power**: indicates the current system power.
- **Peak System Power**: indicates the maximum system power generated since the latest power-on.
- **Average System Power**: indicates the average system power generated since the latest power-on.
- **Consumed Electricity**: indicates the total electricity consumed since the latest power-on.

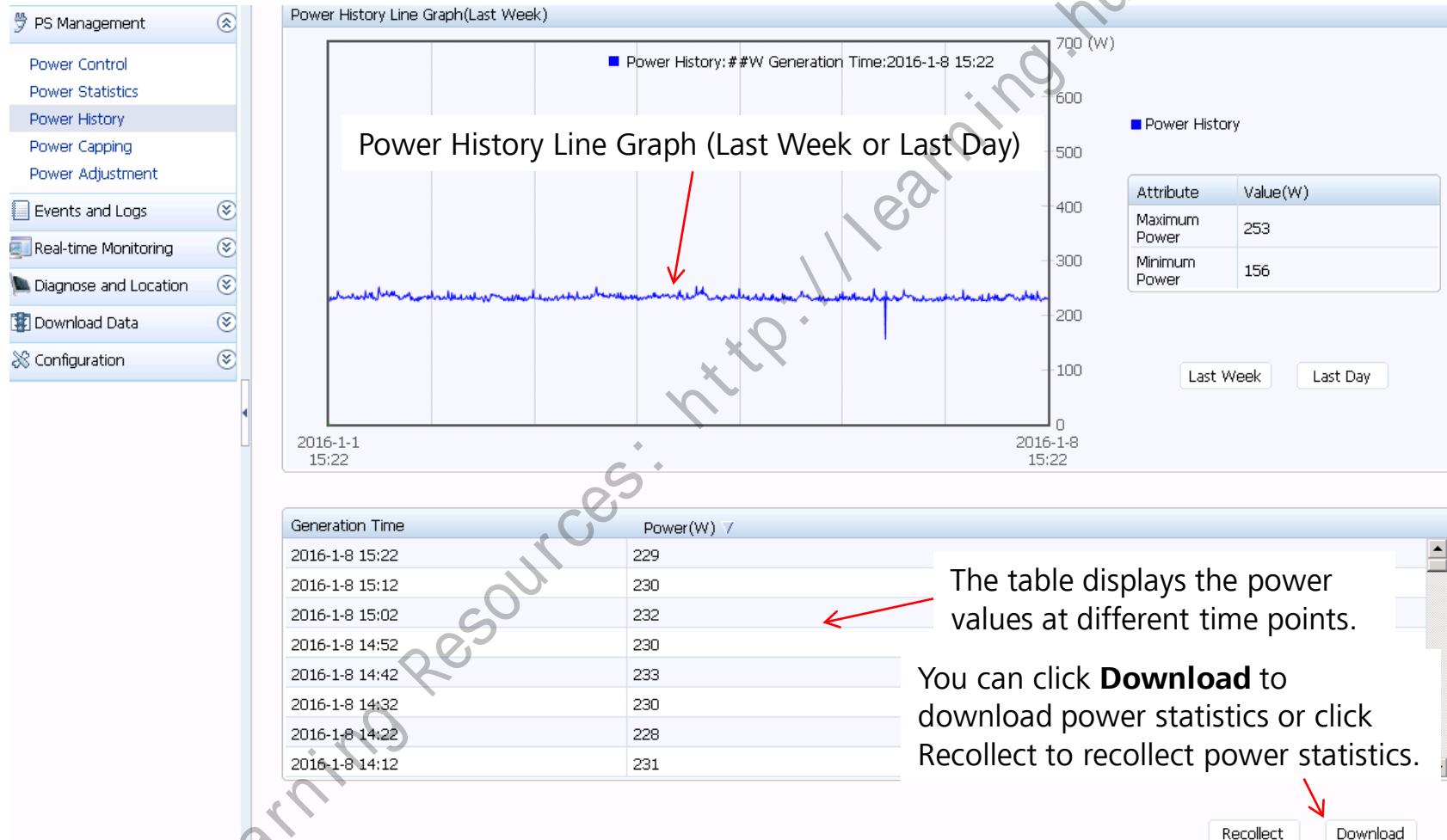
After you click **Recollect**, the system deletes all statistics and recollects statistics about server power immediately.

The screenshot shows the 'PS Management' interface with the 'Power Statistics' tab selected. The left sidebar includes 'Power Control', 'Power History', 'Power Capping', 'Power Adjustment', 'Events and Logs', 'Real-time Monitoring', and 'Diagnose and Location'. The main content area displays two tables of power statistics. The first table shows real-time power usage: Current System Power (215 W), Total CPU power (63 W), and Total memory power (13 W). The second table shows historical statistics: Peak System Power (366 W, start time 1970-01-01 00:01:41, generation time 2014-05-03 08:48:54), Average System Power (180 W, start time 1970-01-01 00:01:41, generation time NA), and Consumed Electricity (2423.468667 kWh, start time 1970-01-01 00:01:41, generation time NA). A red box highlights the first table, and a red button labeled 'Recollect' is located at the bottom right of the second table.

Attribute	Value
Current System Power	215 W
Total CPU power	63 W
Total memory power	13 W

Attribute	Value	Start time	Generation Time
Peak System Power	366 W	1970-01-01 00:01:41	2014-05-03 08:48:54
Average System Power	180 W	1970-01-01 00:01:41	NA
Consumed Electricity	2423.468667 kWh	1970-01-01 00:01:41	NA

PS Management (2/5) -- Power Statistics



PS Management (4/5) -- Power Capping

The **Power Capping** page displays the current system power and allows you to enable or disable the power capping function and set the power upper limit.

In the **Power Capping** area, set the parameters as follows:

- Power Capping State: Click the Enabled or Disabled option button.
- Power Limit: specifies the upper limit of the system power.

PS Management >> Power Capping

Power Capping

Power Capping

Power Capping State	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Current Power	136 W
Power Limit	9999 W Minimum 156W

Follow-up Action After Power Capping Fails

Event log Shut down

OK

PS Management (5/5) -- Power Adjustment

On the **Power Adjustment** page, you can control the system power consumption by setting **P-State** and **T-State**.

- P-State: You can set P-State to adjust the CPU working frequency.
- T-State: You can set T-State to adjust the CPU duty cycle.

The screenshot shows the 'PS Management' interface with the 'Power Adjustment' tab selected. On the left, there is a navigation menu with options like 'Remote Control', 'PS Management', 'Power Control', 'Power Statistics', 'Power History', 'Power Capping', and 'Power Adjustment'. The 'Power Adjustment' option is highlighted. The main content area has a note section with three points: 1. You can set P-State to adjust the CPU working frequency. 2. You can set T-State to adjust the duty cycle of CPU working duration. Changing T-State deteriorates CPU performance. 3. After the host resets, P-State and T-State are restored to the default values P0 and T0 respectively. Below the note is a 'CPU Power Adjustment' section with dropdown menus for 'P-State' (set to P2) and 'T-State' (set to T0).



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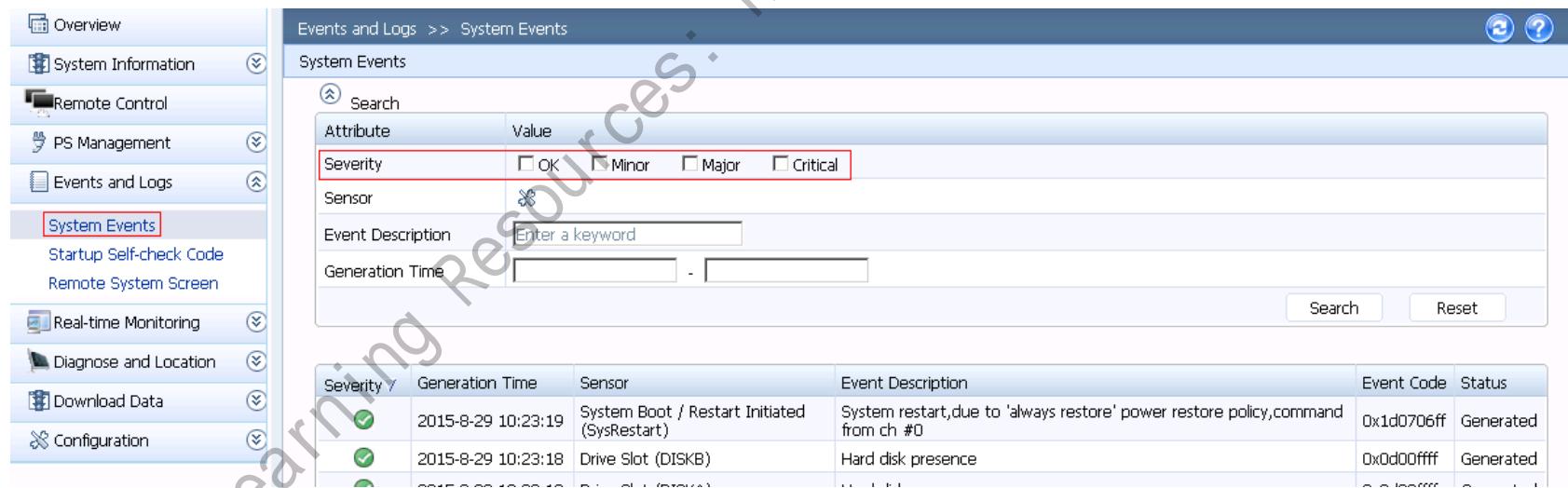
Events and Logs (1/4)

System events are iMana logs.

You can click  to expand the search area.

The search result can be narrowed by **severity**, **sensor**, **event description** and **generation time**.

Only a user in the administrator or operator group has permission to delete all SELs at a time by clicking **Clear**.

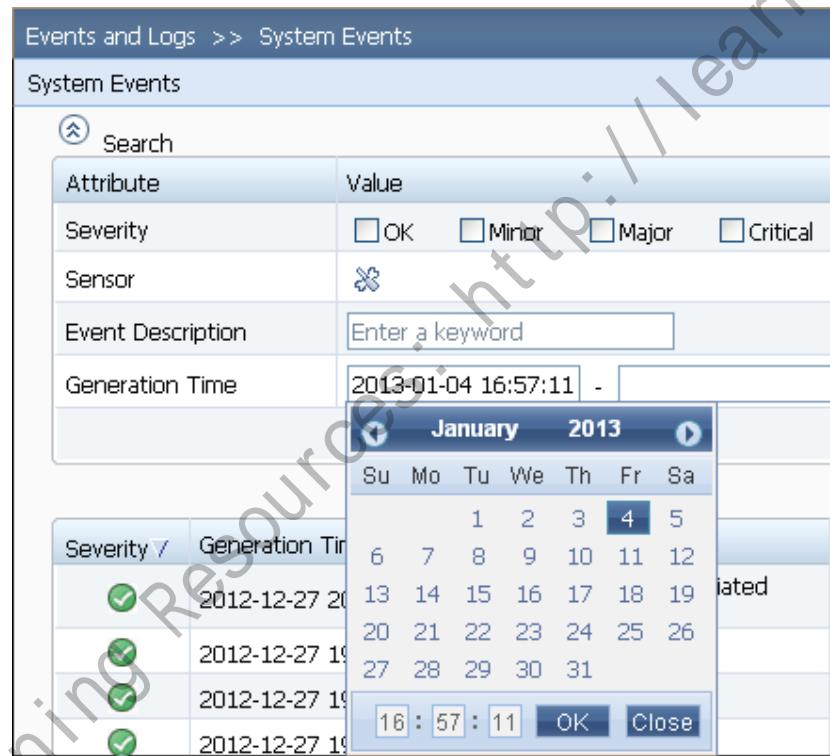


The screenshot shows the iMana software interface for managing system events. On the left is a navigation sidebar with various tabs: Overview, System Information, Remote Control, PS Management, Events and Logs, System Events (which is selected and highlighted in red), Startup Self-check Code, Remote System Screen, Real-time Monitoring, Diagnose and Location, Download Data, and Configuration. The main content area is titled 'Events and Logs >> System Events' and contains a 'System Events' section. This section includes a 'Search' button, a table for filtering by 'Attribute' and 'Value', and fields for 'Severity' (with checkboxes for OK, Minor, Major, and Critical), 'Sensor' (with a dropdown menu), 'Event Description' (with a text input field), and 'Generation Time' (with two date input fields). Below these search controls is a table displaying actual event logs. The table has columns for Severity (with a green checkmark icon), Generation Time, Sensor, Event Description, Event Code, and Status. There are three entries in the table:

Severity	Generation Time	Sensor	Event Description	Event Code	Status
	2015-8-29 10:23:19	System Boot / Restart Initiated (SysRestart)	System restart,due to 'always restore' power restore policy,command from ch #0	0x1d0706ff	Generated
	2015-8-29 10:23:18	Drive Slot (DISKB)	Hard disk presence	0x0d00ffff	Generated
	2015-8-29 10:23:18	Processor (CPU)	Processor status	0x0000ffff	Generated

Events and Logs (2/4)

The value of **Generation Time** is in the format of *year-month-day hour-minute-second*. To set **Generation Time**, you need to select the time by clicking the calendar icon.



vents and Logs (3/4)

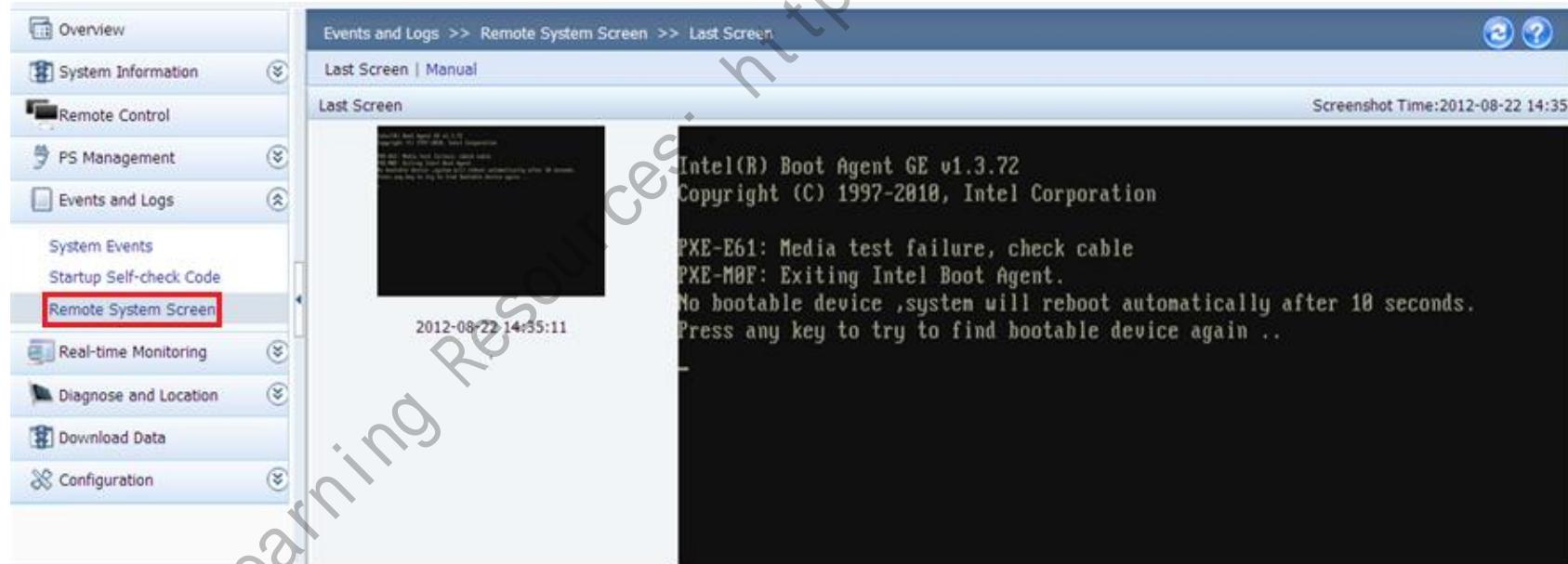
Startup self-check code, also called 80 code, is the startup debug code of the BIOS generated during the power-on process.

Events and Logs (4/4)

The last screen is saved when the system stops responding, encounters a power failure, or restarts.

The **Last Screen** page displays the screenshot captured before the latest video interruption and the video interruption time.

The three thumbnails on the left show the system screenshots captured before the latest three video interruptions.





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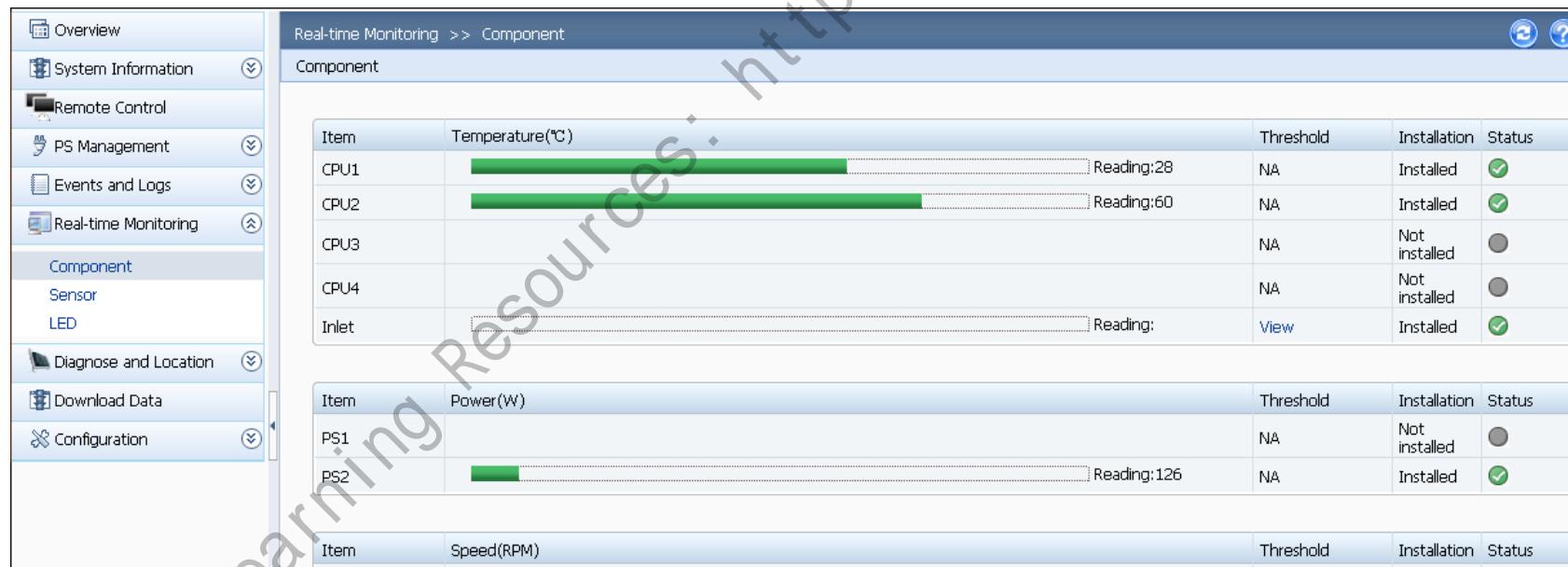
2.3.7 Diagnose and Location

2.3.8 Download Data

2.3.9 Configuration

Real-time Monitoring (1/3)

- In the navigation tree, choose Real-time Monitoring.
- The following options are displayed:
 - Component
 - Sensor
 - LED



Real-time Monitoring (2/3)

The Sensor page displays information about all sensors, including the sensor name, current value, unit, and alarm thresholds.

The screenshot shows a monitoring interface with a sidebar on the left and a main content area on the right. The sidebar contains navigation links for Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring (selected), Component, Sensor (selected), LED, Diagnose and Location, Download Data, and Configuration. The main content area has a title 'Real-time Monitoring >> Sensor' and a table titled 'Sensor'. The table has columns for Sensor, Current Value, Unit, Lower Critical, Lower Major, Lower Minor, Upper Minor, Upper Major, and Upper Critical. The data rows include various sensors like CPU1 Core Rem, CPU2 Core Rem, CPU3 Core Rem, CPU4 Core Rem, CPU1 DTS, CPU2 DTS, CPU3 DTS, CPU4 DTS, Inlet Temp, IO Temp, CPU1 Prochot, CPU2 Prochot, CPU3 Prochot, CPU4 Prochot, Power1, Power2, FAN1 F Speed, FAN1 R Speed, FAN2 F Speed, FAN2 R Speed, FAN3 F Speed, and FAN3 R Speed, along with their respective values and units.

Sensor	Current Value	Unit	Lower Critical	Lower Major	Lower Minor	Upper Minor	Upper Major	Upper Critical
CPU1 Core Rem	28.00	°C	NA	NA	NA	NA	NA	NA
CPU2 Core Rem	62.00	°C	NA	NA	NA	NA	NA	NA
CPU3 Core Rem		°C	NA	NA	NA	NA	NA	NA
CPU4 Core Rem		°C	NA	NA	NA	NA	NA	NA
CPU1 DTS	-63.00	°C	NA	NA	NA	NA	-3.00	NA
CPU2 DTS	-29.00	°C	NA	NA	NA	NA	-3.00	NA
CPU3 DTS		°C	NA	NA	NA	NA	-3.00	NA
CPU4 DTS		°C	NA	NA	NA	NA	-3.00	NA
Inlet Temp		°C	NA	NA	NA	42.00	44.00	46.00
IO Temp	22.00	°C	NA	NA	NA	NA	NA	NA
CPU1 Prochot	30.00	°C	NA	NA	NA	NA	90.00	NA
CPU2 Prochot	30.00	°C	NA	NA	NA	NA	90.00	NA
CPU3 Prochot		°C	NA	NA	NA	NA	90.00	NA
CPU4 Prochot		°C	NA	NA	NA	NA	90.00	NA
Power1	0.00	W	NA	NA	NA	NA	NA	NA
Power2	126.00	W	NA	NA	NA	NA	NA	NA
FAN1 F Speed	0.00	RPM	NA	NA	NA	NA	NA	NA
FAN1 R Speed	0.00	RPM	NA	NA	NA	NA	NA	NA
FAN2 F Speed	0.00	RPM	NA	NA	NA	NA	NA	NA
FAN2 R Speed	0.00	RPM	NA	NA	NA	NA	NA	NA
FAN3 F Speed	0.00	RPM	NA	NA	NA	NA	NA	NA
FAN3 R Speed	0.00	RPM	NA	NA	NA	NA	NA	NA

Real-time Monitoring (3/3)

The **LED** page displays indicator information, including the indicator name, status, supported colors, and default colors for the local control and override states.

Only a user in **the administrator** or **operator** group has permission to click an indicator name to set the indicator status, including the blinking interval (including the turn-off time and turn-on time), test duration, color, and status (on or off).

The screenshot shows a web-based management interface for real-time monitoring. On the left is a navigation sidebar with the following items:

- Overview
- System Information
- Remote Control
- PS Management
- Events and Logs
- Real-time Monitoring
- Component
- Sensor
- LED** (highlighted in blue)
- Diagnose and Location
- Download Data
- Configuration

The main content area has a title bar "Real-time Monitoring >> LED" and a sub-section "LED". Below this is a table with the following data:

LED	Status	Supported Color	Default Color(Local Control)	Default Color(Override State)
HLY(led2)	Local Control,Blinking,Red,50,50	Red,Green	Green	Green
UID(oem1)	Local Control,Off	Blue	Blue	Blue



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Diagnose and Location (1/3)

The **Video Play** page provides a link for you to play and cut videos.

Click **Video Play Console**.

The video playback console screen is displayed.

On this screen, you can play back and cut a video file in a specific format.

You can use the video recording function on the remote control screen along with the video playback function, which facilitates device maintenance and troubleshooting.

The screenshot shows the 'Diagnose and Location' interface with a sidebar and a main content area. The sidebar contains the following items:

- Overview
- System Information
- Remote Control
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Video Play** (highlighted in blue)
- Device Location
- Download Data
- Configuration

The main content area has a title bar 'Diagnose and Location >> Video Play' and a sub-section 'Video Play'. Below this, there is a note section with the following text:

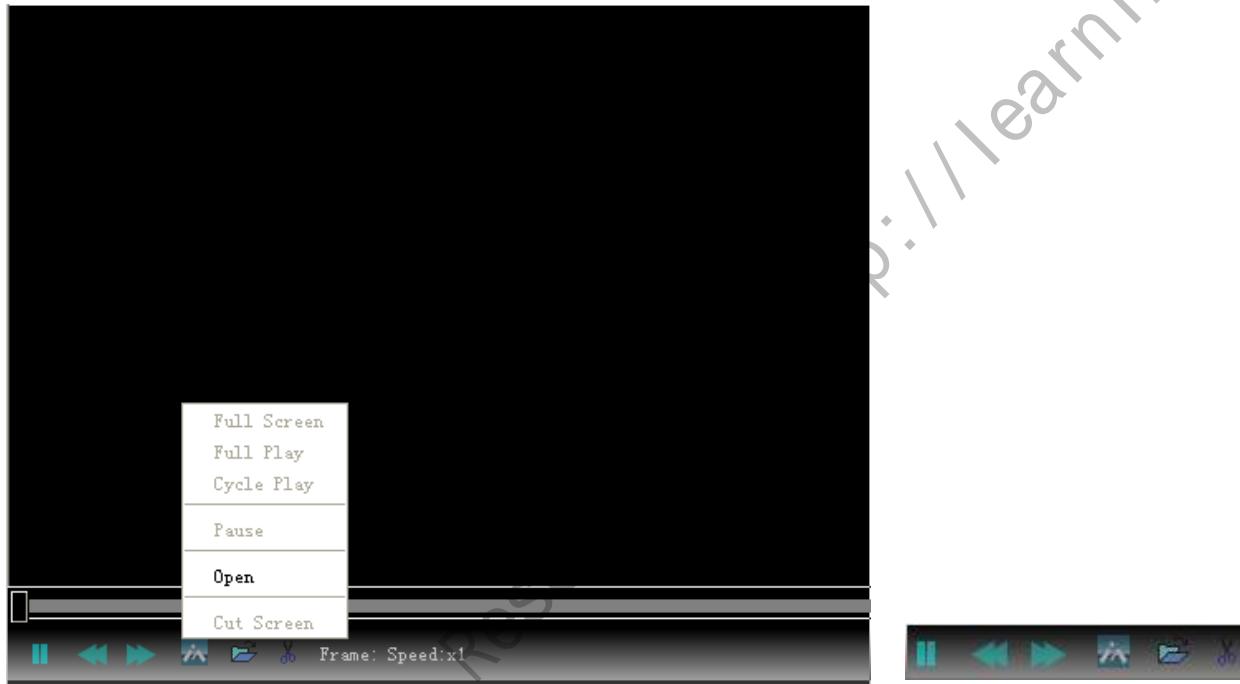
Note:

1. The video play console is used to play videos offline only but not take videos or play videos online;
2. To play the server exception video, download the video file to a directory that the player can access, and then play the video.

At the bottom of the note section is a link '[Video Play Console](#)'.

Diagnose and Location (2/3)

The following figure shows the video playback console screen. Only *.rep video files can be played.



The icons on the toolbar at the bottom of the screen are **Pause**, **Rewind**, **Fast Forward**, **Main Menu**, **Open**, and **Cut Screen** from left to right.

The items on **Main Menu** include **Full Screen**, **Full Play**, **Cycle Play**, **Pause**, **Open**, and **Cut Screen**.

Diagnose and Location (3/3)

- The UID indicator is used to locate a server.
- It has three states.
- It can be turned on remotely or by pressing the UID button.

The screenshot shows the 'Device Location' section of the 'Diagnose and Location' interface. On the left, there's a navigation sidebar with icons for Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location (selected), Video Play, Device Location (sub-selected), Download Data, and Configuration. The main panel title is 'Diagnose and Location >> Device Location'. Below it, under 'Device Location', is a 'UID LED Control' section. This section includes a 'UID LED State' dropdown menu with three options: 'Steady On', 'Temporary On [] Seconds', and 'Off' (which is selected). A large watermark reading 'Pre-Learning Resources: http://learning.huawei.com/e...' is diagonally across the page.



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Download Data

The **Download Data** page displays SEL information and black box data and allows you to download the data.

The **SEL Files** area displays the name of an SEL file, which records SEL information.

The **Black Box Data** area displays the name and size of a black box file, which records kernel information when the system crashes.

The screenshot shows the 'Download Data' page with a sidebar menu on the left containing links like Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, and Configuration. The main content area has a header 'Download Data' with two sections: 'SEL Files' and 'Black Box Data'. The 'SEL Files' section shows a table with one row: File Name (sel.tar) and Operation (Download). The 'Black Box Data' section shows a table with one row: File Name (blackbox.tar), File Size(Bytes) (16778752), and Operation (Download).

SEL Files		Operation
File Name	sel.tar	<input type="button" value="Download"/>

File Name	File Size(Bytes)	Operation
blackbox.tar	16778752	<input type="button" value="Download"/>



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Configuration -Network

- The **Management Network Port** page allows you to set the IP address, subnet mask, and default gateway of the iMana management network port.

The screenshot shows the 'Management Network Port' configuration page. On the left is a navigation tree under 'Network'. The main area has tabs for 'Management Network Port', 'DNS', 'Host Name', and 'NTP'. It includes sections for 'Network Port Setting' (Port Mode: Dedicated, Host Port dropdown), 'VLAN' (Enabled checked, VLAN ID: 0), and 'IPv4' (IP Address: 10.215.111.1, Subnet Mask: 255.255.252.0, Default Gateway: 10.215.108.1). A watermark 'Pre Learning Resources: http://learning.huawei.com/e...' is diagonally across the page.

Port Mode	Dedicated
Host Port	(dropdown)
Enabled	<input checked="" type="checkbox"/>
VLAN ID	0
IP Address	10.215.111.1
Subnet Mask	255.255.252.0
Default Gateway	10.215.108.1
MAC Address	78-D7-52-9B-5F-4B

Configuration -Network

- On the **DNS** page, you can set **DNS Bound Network Port** and the mode for obtaining DNS information.
- DNS information can be automatically obtained or manually configured.
- If you click **Manually Obtain DNS Information**, you need to set **Domain Name**, **Primary DNS Server**, and **Secondary DNS Server**.

The screenshot shows the network configuration interface of a Huawei device. The left sidebar has a 'Network' section with a red box around it. The main window title is 'Configuration >> Network >> DNS'. Below the title, there are tabs: 'Management Network Port', 'DNS' (which is highlighted with a red box), 'Host Name', and 'NTP'. The 'DNS Configuration' section contains three radio buttons: 'Automatically Obtain IPv4 DNS Information', 'Automatically Obtain IPv6 DNS Information', and 'Manually Obtain DNS Information'. The third option is selected. Below this are three input fields: 'Domain Name', 'Primary DNS Server', and 'Secondary DNS Server', all of which are currently empty.

Configuration -Network

On the **Host Name** page, only a user in the administrator or operator group has permission to set **Host Name**. The value of **Host Name** can contain a maximum of 22 characters.

The screenshot shows the network management interface of a Huawei device. The left sidebar contains a navigation menu with the following items:

- Overview
- System Information
- Remote Control
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Download Data
- Configuration
- Network (highlighted with a red border)
- User

The main content area displays the "Host Name" configuration page. The breadcrumb navigation at the top shows: Configuration >> Network >> Host Name. Below the breadcrumb, there are tabs: Management Network Port, DNS, Host Name (which is highlighted with a red border), and NTP. A table with one row is shown, containing the "Host Name" field which is also highlighted with a red border and contains the value "2102310QPD10E5000066".

Configuration -Network

- The **NTP** page allows you to set the mode for obtaining Network Time Protocol (NTP) information.
- NTP supports both Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6) addresses.
- BH622 V2 and BH640 V2 does not support NTP.

The screenshot shows the configuration menu of a Huawei device. The left sidebar lists various management options: Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, Configuration, Network, and User. The 'Network' option is currently selected and highlighted with a red border. The main content area displays the 'NTP Configuration' settings. The title bar indicates the path: Configuration >> Network >> NTP. Below the title, there are tabs for Management Network Port, DNS, Host Name, and NTP, with the NTP tab being the active one. The 'NTP Configuration' section contains three radio button options: 'NTP Enable' (unchecked), 'Automatically Obtain IPv4 NTP Information' (selected), 'Automatically Obtain IPv6 NTP Information' (unchecked), and 'Manually Obtain NTP Information' (unchecked). Below these options are two input fields: 'Primary NTP Server' and 'Secondary NTP Server', each with a corresponding empty text input box.

Configuration -User

- In the navigation tree, choose **Configuration > User**. The options are as follows:
 - Local User
 - LDAP
 - Login User

The screenshot shows the Huawei Configuration interface. The left sidebar contains a navigation tree with the following items:

- Overview
- System Information
- Remote Control
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Download Data
- Configuration
- Network
- User (selected)
- System Configuration
- Firmware Upgrade
- Log and Alarm
- Service
- Detailed Configurations

The main content area displays the "Local User" configuration page. The title bar says "Configuration >> User >> Local User". Below it are three tabs: "Local User" (selected), "LDAP", and "Login User".

The "Basic Properties" section contains a checkbox labeled "Enable Password Complexity".

The "User List" table has the following columns: User ID, User Name, User Group, and Operation.

User ID	User Name	User Group	Operation
1	anonymous		
2	root	Administrator	*
3	ADMIN	Administrator	*
4			*
5			*
6			*
7			*
8			*

Configuration -User

- The **Local User** page allows you to view and manage the users that have logged in to the iMana.

The screenshot shows the iMana web interface. On the left, there is a vertical navigation menu with the following items:

- Overview
- System Information
- Remote Control
- PS Management
- Events and Logs
- Real-time Monitoring
- Diagnose and Location
- Download Data
- Configuration
- Network
- User

The "User" item is highlighted with a red box. The main content area has a title bar: "Configuration >> User >> Local User". Below the title bar, there are three tabs: "Local User" (which is selected and highlighted with a red box), "LDAP", and "Login User". The main content is a table titled "Local User" with the following columns: User ID, User Name, User Group, Password Validity Period(Day), and Login Rule. The table contains the following data:

User ID	User Name	User Group	Password Validity Period(Day)	Login Rule
1				
2	root	Administrator	Valid	
3				
4				
5				
6				
7				

Configuration -User

- User Login Rule
 - Time Range
 - IP Range
 - MAC Range

Login Rule	Enable	Time Range	IP Range	MAC Range
Rule1	<input type="checkbox"/>	<input type="text"/> - <input type="text"/>	<input type="text"/>	<input type="text"/>
Rule2	<input type="checkbox"/>	<input type="text"/> - <input type="text"/>	<input type="text"/>	<input type="text"/>
Rule3	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Description:

Time: The time range can be in the format of YYYY-MM-DD HH:MM, YYYY-MM-DD, or HH:MM. The start time format must be the same as the end time format.

IP: The IP address range can be in the format of xxx.xxx.xxx.xxx or xxx.xxx.xxx.xxx/mask. xxx.xxx.xxx.xxx is a single IP address, xxx.xxx.xxx.xxx/mask is an IP address range and the value of mask is an integer ranging from 1 to 32.

MAC: The MAC address range can be in the format of xxxx:xx:xx or xxxx:xxxx:xxxx. xxxx:xx:xx must be the first three parts of MAC addresses, and xxxx:xxxx:xxxx is a complete MAC address.

Configuration -User

- The **LDAP** page allows you to view and set the information about Lightweight Directory Application Protocol (LDAP) users.

The screenshot shows the 'Configuration >> User >> LDAP' page. The 'LDAP' tab is selected. The interface includes a toolbar with icons for back, forward, search, and help, and navigation links for Local User, LDAP, and Login User.

Common Settings:

LDAP State	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Enable Certificate Verification	<input type="checkbox"/>
LDAP Port	636
Domain Controller Address	0.0.0.0
User Domain	CN=Users,DC=ldap,DC=imana,DC=com

Group Settings:

Role Group	Group Name	Group Domain	Rule	Group Privilege
Role Group1	Group0	CN=group0,DC=ldap,DC=imana,DC=com	<input type="checkbox"/> Rule1 <input type="checkbox"/> Rule2 <input type="checkbox"/> Rule3	Common User
Role Group2			<input type="checkbox"/> Rule1 <input type="checkbox"/> Rule2 <input type="checkbox"/> Rule3	Common User
Role Group3			<input type="checkbox"/> Rule1 <input type="checkbox"/> Rule2 <input type="checkbox"/> Rule3	Common User
Role Group4			<input type="checkbox"/> Rule1 <input type="checkbox"/> Rule2 <input type="checkbox"/> Rule3	Common User
Role Group5			<input type="checkbox"/> Rule1 <input type="checkbox"/> Rule2 <input type="checkbox"/> Rule3	Common User

Configuration -User

- The **Login User** page allows you to view the information about the users that have logged in to iMana and deregister these users.
- Only the user that belongs to the administrator group has permission to deregister other users that have logged in to iMana.

Configuration >> User >> Login User

Local User | LDAP | Login User

User Name	Login Mode	Login IP Address	Login Time	Log Out
root	GUI	192.168.252.242	2012-07-24 07:26:46	N/A
root	CLI	192.168.44.44	2012-07-24 03:56:26	

Configuration -System Configuration

In the navigation tree, choose **Configuration > System Configuration**.

The following options are displayed:

- Power Restore Policy
- System Boot Option
- Graceful Power-off Timeout Period

The screenshot shows the System Configuration interface with the following details:

- Navigation Tree:** Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, Configuration, Network, User, **System Configuration** (highlighted with a red border).
- Breadcrumb:** Configuration >> System Configuration >> Power Restore Policy
- Toolbar:** Power Restore Policy, System Boot Option, Graceful Power-off Timeout Peri, Show Summary, Device Location (the last two are combined into a single button)
- Content Area:** Power Restore Policy table with three rows:

Power Restore Policy	
Stay Off	<input type="radio"/>
Restore Previous State	<input type="radio"/>
Turn On	<input checked="" type="radio"/>

Configuration -System Configuration

- The **System Boot Option** page allows you to specify the system boot option.
- The setting takes effect **once only**.

Configuration >> System Configuration >> System Boot Option

Power Restore Policy | System Boot Option | Graceful Power-off Timeout Period | Show Summary | Device Location

System Boot Option	
HDD	<input type="radio"/>
CD/DVD	<input type="radio"/>
Floppy/primary removable media	<input type="radio"/>
PXE	<input type="radio"/>
No override	<input type="radio"/>

OK

Configuration -System Configuration

- The value of **Graceful Power-off Timeout Period** is an integer ranging from 10 to 1800, in seconds. The default value is **180**.

This screenshot shows the 'Graceful Power-off Timeout Period' configuration page. The top navigation bar includes links for Configuration, System Configuration, Graceful Power-off Timeout Period, Power Restore Policy, System Boot Option, Show Summary, and Device Location. The 'Graceful Power-off Timeout Period' link is highlighted with a red box. Below the navigation is a table with two columns: 'Attribute' and 'Value'. The 'Attribute' row contains 'Graceful Power-off Timeout Period'. The 'Value' row contains a text input field with '0', a unit indicator 'Seconds', and a 'Default' checkbox.

Attribute	Value
Graceful Power-off Timeout Period	0 Seconds <input type="checkbox"/> Default

- Specify whether to display summary information on the login page.

This screenshot shows the 'Show Summary' configuration page. The top navigation bar includes links for Configuration, System Configuration, Show Summary, Power Restore Policy, System Boot Option, Graceful Power-off Timeout Period, Show Summary, and Device Location. The 'Show Summary' link is highlighted with a red box. Below the navigation is a table with two columns: 'Attribute' and 'Value'. The 'Attribute' row contains 'Show the summary on the login page'. The 'Value' row contains two radio buttons: 'Show' (selected) and 'Hide'.

Attribute	Value
Show the summary on the login page	<input checked="" type="radio"/> Show <input type="radio"/> Hide

Configuration -Firmware Upgrade

The **Firmware Upgrade** page allows you to view the iMana and BIOS versions, and upload an upgrade file to upgrade the iMana or BIOS.

- iMana
 - Twice
 - Restart iMana
- BIOS
 - Once
 - Restart OS

The screenshot shows the 'Firmware Upgrade' configuration page. At the top, there's a note section with the following points:

- 1. Do not power off the server or restart the iMana during the firmware upgrade.
- 2. If the firmware fails to upgrade, check whether the iMana memory capacity is sufficient and the upgrade file is correct.
- 3. Upgrade BIOS firmware, system needs two minutes of preparation time.
- 4. Do not shut down or restart the OS during a BIOS upgrade.

Below the note is a table showing current and backup image versions:

Item	Current Image Version	Backup Image Version
iMana Version	(U41)5.88	5.88
BIOS Version	(U102)V372	
Image Switch Over	<input type="radio"/>	
Restart the iMana	<input type="radio"/>	

An 'OK' button is located at the bottom right of this section.

Below the table is another configuration panel titled 'Firmware Upgrade' with the following fields:

- Upgrade File Name:
- Take-effect Mode: Note: The take-effect mode applies only to the iMana.
-

Configuration -Log and Alarm

In the navigation tree, choose **Configuration > Log and Alarm**.

The options are as follows:

- Trap
- Email

Configuration >> Log and Alarm >> Trap

Trap | Email

Common Attributes

Trap State	<input checked="" type="checkbox"/>
Alarm Severity	<input type="radio"/> Critical <input checked="" type="radio"/> Major <input type="radio"/> Minor <input type="radio"/> All

SNMP Trap Attributes

Version	<input checked="" type="radio"/> V1 <input type="radio"/> V2C
Community Name	public

Item	Enabled	Trap IP Address	Trap Port	Alarm Format	Test
Trap 1	<input type="checkbox"/>	192.168.1.1	162	<input type="checkbox"/> Default	Time,Sensor,Event,Severity,Event Code <input type="button" value="Test"/>
Trap 2	<input type="checkbox"/>	192.168.1.2	162	<input type="checkbox"/> Default	Time,Sensor,Event,Severity,Event Code <input type="button" value="Test"/>
Trap 3	<input type="checkbox"/>	192.168.1.3	162	<input type="checkbox"/> Default	Time,Sensor,Event,Severity,Event Code <input type="button" value="Test"/>
Trap 4	<input type="checkbox"/>	192.168.1.4	162	<input type="checkbox"/> Default	Time,Sensor,Event,Severity,Event Code <input type="button" value="Test"/>

Configuration -Log and Alarm

- The **Email** page allows users to send emails to target mailboxes. The emails with alarm messages and events are sent to target mailboxes through a Simple Mail Transfer Protocol (SMTP) server.

The screenshot shows the NMS interface with the following details:

- Left Sidebar:** Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, Configuration (selected), Network, User, System Configuration, Firmware Upgrade, Log and Alarm (selected), Service, Detailed Configurations.
- Current View:** Configuration > Log and Alarm > Email
- Trap | Email** tab is selected.
- Configuration Table:**

Attribute	Value
SMTP Enabled	<input type="checkbox"/>
SMTP Server	192.168.2.1
Authentication	<input checked="" type="checkbox"/> Do not need authentication User Name: root Password: <input type="checkbox"/> Change
Alarm Severity	<input type="radio"/> Critical <input type="radio"/> Major <input checked="" type="radio"/> Minor <input type="radio"/> All
- Notification Table:**

Attribute	Enabled	Send To	Remarks	Test
Notification 1	<input type="checkbox"/>			<input type="checkbox"/> Test
Notification 2	<input type="checkbox"/>			<input type="checkbox"/> Test
Notification 3	<input type="checkbox"/>			<input type="checkbox"/> Test
Notification 4	<input type="checkbox"/>			<input type="checkbox"/> Test
- Advanced Settings:**
 - Email Template:** Title: server alert, Addition: Host Name, Board Serial Number, Product Asset Tag.
 - Sent From: huawei server

Configuration -Service

The **Web Server** area displays Web Server information, including **Maximum Sessions**, **Active Sessions**, and **Timeout Period**. Only a user in the administrator or operator group has permission to set **Timeout Period** and click **OK**.

The screenshot shows the 'Service' configuration page. At the top, there are fields for 'Maximum Sessions' (set to 4), 'Active Sessions' (set to 1), and 'Timeout Period' (set to 5 Minutes). Below this is a table titled 'Services Configuration' listing various services with their enabled status, port numbers, and VMM ports:

Services	Enabled	Port Number	VMM
FTP	<input checked="" type="checkbox"/>	Port 21	<input type="checkbox"/> Default
SSH	<input checked="" type="checkbox"/>	Port 22	<input type="checkbox"/> Default
Telnet	<input checked="" type="checkbox"/>	Port 23	<input type="checkbox"/> Default
Remote Control	<input checked="" type="checkbox"/>	KVM 2198	<input type="checkbox"/> Default
WS-MAN	<input checked="" type="checkbox"/>	HTTP 5985	<input type="checkbox"/> Default
SNMP Agent	<input checked="" type="checkbox"/>	Port 161	<input type="checkbox"/> Default
Web Server	<input checked="" type="checkbox"/>	HTTP 80	<input type="checkbox"/> Default
IPMI LAN	<input checked="" type="checkbox"/>	Port 1 623	<input type="checkbox"/> Default
			Port 2 664

Configuration -System Resource

- The **System Resource** page allows you to set the threshold for the server resource usage.
- If the actual resource usage exceeds the threshold, the system generates an alarm so that users can understand the resource usage and determine the policy for using the resources.

The screenshot shows a software interface for managing system resources. On the left, a sidebar lists various monitoring and management functions: Overview, System Information, Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, Configuration, Network, User, System Configuration, Firmware Upgrade, Log and Alarm, Service, System Resource (which is selected and highlighted in red), and Detailed Configurations. The main panel is titled "Configuration >> System Resource" and "System Resource". It contains a note stating "You need to install BMA on the system to support this function." Below the note is a table with two columns: "Resource" and "Usage Threshold". The table rows are: CPU Usage (threshold 100 %), Memory Usage (threshold 100 %), and Disk Usage (threshold 100 %). All three rows are highlighted with a red border.

Resource	Usage Threshold
CPU Usage	100 %
Memory Usage	100 %
Disk Usage	100 %

Configuration -Detailed Configurations

- The **Detailed Configurations** page allows you to view all server configuration information.

The screenshot shows the 'Detailed Configurations' page under the 'Configuration' menu. The left sidebar lists various monitoring and management options. The main content area displays three tables of configuration data:

Attribute	Value
Port Mode	Dedicated
Host Port	
VLAN	Disabled
VLAN ID	0

Attribute	Value
iMana IPv4 address	10.215.111.1
Subnet Mask	255.255.252.0
Default Gateway	10.215.108.1
IP Mode	Static
MAC Address	78-D7-52-9B-5F-4B

Attribute	Value
iMana IPv6 address	::



Summary

- What is iMana
- iMana Modules
- iMana Operating Environment
- Querying and Setting the IP Address of the iMana Management Network Port
- iMana CLI
- iMana WebUI

Thank you

[www.huawei.com](http://learning.huawei.com)

Huawei Server Management System introduction-iBMC

[www.huawei.com](http://learning.huawei.com/e)





Objectives

- Upon completion of this course, you will be proficient in:
 - iBMC functions
 - iBMC GUI operations
 - iBMC CLI operations



Contents

- **Introduction to iBMC**
- iBMC GUI Introduction
- iBMC CLI Introduction

iBMC Introduction

- The Intelligent Baseboard Management Controller (iBMC) is a control unit used to manage servers. Complies with the management specification Intelligent Platform Management Interface 2.0 (IPMI2.0) of the server field.
- The iBMC provides the following functions:
 - Remote control
 - Alarm management
 - Status monitoring
 - Device information management
 - Heat dissipation control
 - IPMItool for device management
 - Support for management over the WebUI
 - Centralized account management

iBMC Specifications

Specifications	iBMC
Management Chip	Huawei Hi1710
	800 MB, ARM11 2,000 DMIPS
Management Interface	IPMI 1.5/2.0, SNMPv1/v2c/v3, CLI, and HTTPS
Remote Maintenance Interface	KVM 32-bit true color, virtual media, and SOL
Diagnosis	FDM (MCE fault processing system), black box, breakdown screenshots and videos
Security Management	LDAP domain member management and customized account security policy
Power Control	Remote power control, NMI, power capping, dynamic energy savings, and active/standby PSUs
Supported Servers	FusionServer V3 series servers, RH1288A V2 and RH2288A V2 servers

iBMC Introduction

- The iBMC contains:
 - IPMI module
 - Command line module
 - Remote control module
 - Web module
 - LCD module
 - SNMP module.



Contents

- Introduction to iBMC
- **iBMC GUI Introduction**
- iBMC CLI Introduction

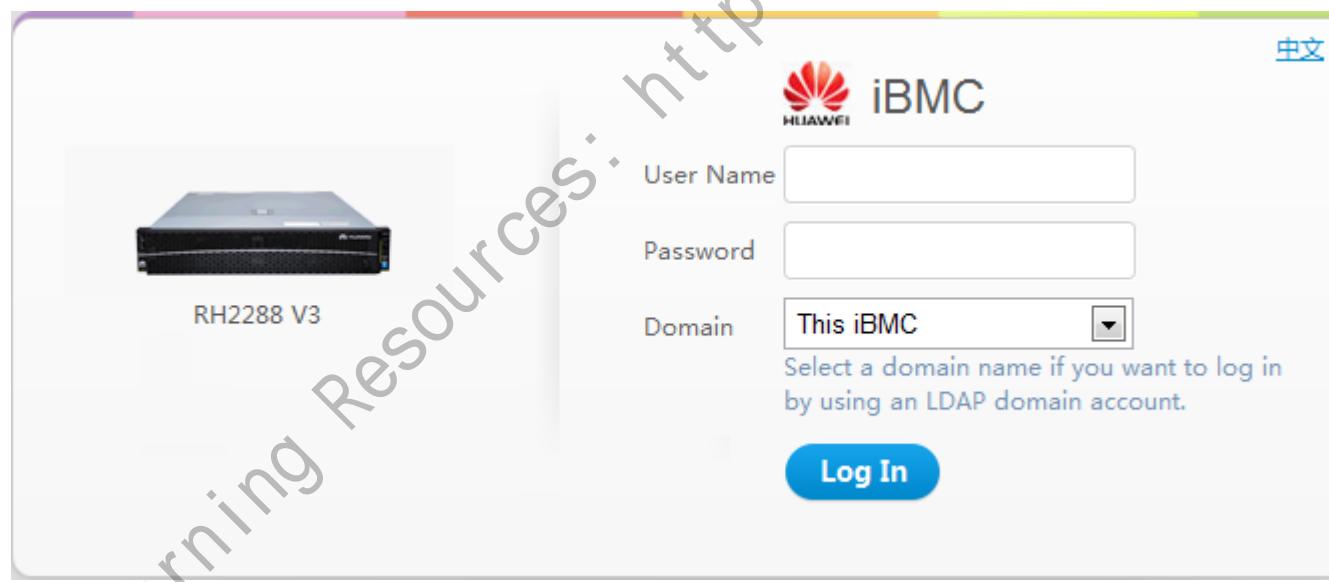
Login iBMC(1/3)

- Software requirements

OS	Software		Version
Windows 7 32-bit Windows 7 64-bit	Browser	Internet Explorer	Internet Explorer 8.0/10.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
	JRE		JRE 1.6.0 U25 JRE 1.7.0 U40
	Web browser	Internet Explorer	Internet Explorer 10.0/11.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
Windows Server 2008 R2 64-bit	Web browser	JRE	JRE 1.6.0 U25 JRE 1.7.0 U40
		Internet Explorer	Internet Explorer 8.0/10.0/11.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
	JRE		JRE 1.6.0 U25 JRE 1.7.0 U40

Login iBMC(2/3)

- Open a web browser, enter ***https://IP address of the iBMC management network port.***
- On the login page, enter the **user name** and **password** for login.
- Select **This iBMC** from the **Domain** drop-down list.



Login iBMC(3/3)

- iBMC Main Page after Login

The screenshot shows the iBMC main page after login. At the top, there is a navigation bar with tabs: Information (highlighted in blue), Alarm & SEL, Diagnosis, Power, Config, System, and Remote. To the right of the tabs are three status indicators: Critical Alarms (0), Major Alarms (5), and Minor Alarms (0). Further right are user authentication (root), language selection (Chinese), and a Logout button.

The main content area is titled "Information Summary". On the left, there is a sidebar with links: Information Summary (highlighted in blue), Component Info, Real-Time Monitoring, and Sensor. The main content area displays "Basic Info" with the following details:

System Name:	RH2288H V3	Product Serial Number	
IP Address:	192.168.72.6	iBMC Firmware Version:	(U25)1.26
BIOS Firmware Version:	(U47)1.26	GUID:	296CBB4C-1DD2-11B2-B0A8-0018E1C5D8...
Maximum Number of Web Sessions:	4	Number of Online Users:	1 (Web : 1, CLI : 0)

On the right side of the main content area, there are three status boxes:

- Critical Alarms: 0 (green)
- Major Alarms: 5 (red)
- Minor Alarms: 0 (grey)

Below these status boxes are three indicator status boxes:

- Power State: Green (green dot)
- Health Indicator Status: Red (red dot)
- UID Indicator Status: Grey (grey dot)

At the bottom of the main content area, there are two sections: "Virtual Buttons" and "UID".

Virtual Buttons: Power Button section with buttons: Power On (highlighted in blue), Power Off, and Forcibly Power Off. A note says: "To power on or power off the server, press the power button. To forcibly power off the server, hold down the power button for 5 seconds. Forcible power-off may damage system data."

UID: UID section with buttons: Turn On, Turn Off, and Blink. A note says: "The UID indicator helps locate a server."

Information Summary(1/2)

- The **Information Summary** page allows you to obtain **basic information** about the server, virtual buttons, and common operation shortcuts.

Information Summary

Basic Info

System Name : RH2288 V3	Product Serial Number
IP Address: 128.5.122.88	iBMC Firmware Version: (U25)1.03
BIOS Firmware Version: (U47)1.11	GUID: 3AF6572E-D21D-B211-8C6A-212118821...
Maximum Number of Web Sessions: 4	Number of Online Users: 1 (Web : 1, CLI : 0)

1

Critical Alarms 0 Power State

Major Alarms 0 Health Indicator Status

Minor Alarms 0 UID Indicator Status

Information Summary(2/2)

Virtual Buttons 2

Power Button: Power On Power Off Forcibly Power Off

Power Off: The server OS boots the power-off process, and data is saved before the server is powered off. Forcibly Power Off: The iBMC forcibly powers off a server, which may cause data loss.

UID: Turn On Turn Off Blink

The UID indicator helps locate a server

Common Operation Shortcuts 3

User Settings Network Settings Power Control Firmware Upgrade One-Click Info Collection Restore Factory Settings KVM

Energy Saving Statistics 4

Energy saving rate **5%**

Saves power by **0.324** kWh

Reduces carbon emission by **0.323** kg

Information Summary(2/2)

Virtual Buttons 2

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Energy Saving Statistics 4

Energy saving rate **5%**

Saves power by **0.324** kWh

Reduces carbon emission by **0.323** kg

Component Info

- The **Component Info** page allows you to view information about the server product, mainboard, and components.

Component Info

Product Info

Board Name	RH2288 V3
Product Serial Number	
Product Asset Tag	

Mainboard Info

NIC

Processor(1/2)

Memory(1/24)

Raid Card(0/1)

Riser Card(0/2)

HDD Backplane(0/1)

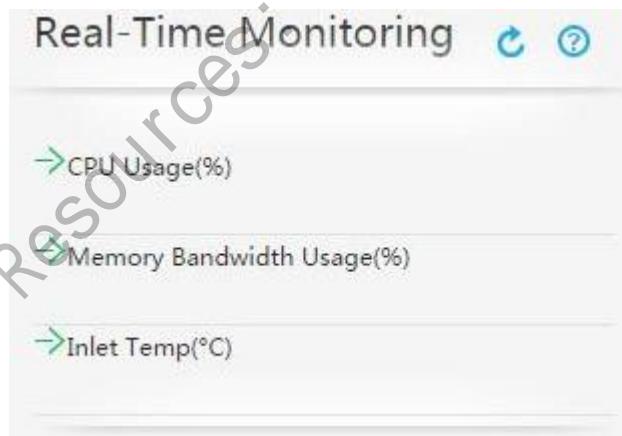
Fan(1/4)

PCIe Card(0/2)

Power Supply(1/2)

Real-Time Monitoring

- The **Real-Time Monitoring** page allows you to view the following information:
 - CPU usage of the latest one hour(The RH8100 V3 does not support this function)
 - Memory bandwidth usage of the latest one hour(The RH8100 V3 does not support this function)
 - Historical data about the air inlet temperature



Sensor

- The **Sensor** page allows you to view information about all sensors.

Sensor

Threshold Sensor

Search:

Sensor ▾	Current Value	Critical Lower...	Major Lower T...	Minor Lower T...	Minor Upper...	Major Upper...	Critical Upper...	Unit	Status
Inlet Temp	N/A	N/A	N/A	N/A	42	44	N/A	°C	N/A
Outlet Temp	31	N/A	N/A	N/A	N/A	N/A	N/A	°C	ok
PCH Temp	33	N/A	N/A	N/A	90	N/A	N/A	°C	ok
CPU1 Core R...	48	N/A	N/A	N/A	N/A	N/A	N/A	°C	ok
CPU2 Core R...	N/A	N/A	N/A	N/A	N/A	N/A	N/A	°C	N/A
CPU1 DTS	-55	N/A	N/A	N/A	-1	N/A	N/A	N/A	ok
CPU2 DTS	N/A	N/A	N/A	N/A	-1	N/A	N/A	N/A	N/A
CPU1 Prochot	30	N/A	N/A	N/A	N/A	90	N/A	°C	ok
CPU2 Prochot	N/A	N/A	N/A	N/A	N/A	90	N/A	°C	N/A
CPU1 VDDQ...	36	N/A	N/A	N/A	120	N/A	N/A	°C	ok

Total Records: 33 [1](#) [2](#) [3](#) [4](#) [>](#) Go [1](#) [▶](#)

Current Alarms

- The **Current Alarms** page allows you to view active alarms that have not been cleared.

Current Alarms

↻ ?

MainBoard A major alarm is generated.			Deduct 6 points	
Severity	ID	Sensor	Event Description	Generation Time
	1	HDD Backplane	Incorrect cable connected/Incorrect interconnection	2013-08-10 Saturday 17:09:25
	2	FAN1 F Presence	Device Removed / Device Absent	2013-08-10 Saturday 17:09:26
	3	FAN1 R Presence	Device Removed / Device Absent	2013-08-10 Saturday 17:09:26
	4	FAN2 F Presence	Device Removed / Device Absent	2013-08-10 Saturday 17:09:26
	5	FAN2 R Presence	Device Removed / Device Absent	2013-08-10 Saturday 17:09:26
	6	FAN4 F Presence	Device Removed / Device Absent	2013-08-10 Saturday 17:09:27
	7	FAN4 R Presence	Device Removed / Device Absent	2013-08-10 Saturday 17:09:27
	8	Mngmnt Health	Sensor access degraded or unavailable, Sensor is Inlet Temp	2013-08-10 Saturday 17:10:31

Events Logs

- The **Events Logs** page allows you to view and search for events, and download and delete all events.

Events Logs

Search Criteria

Severity: All Critical Major Minor Normal

Event Source: All CPU CPUMemory Dimm MainBoard Fan PcieCard RaidCard Disk InnerHddCard Lom
 PowerSupply

Generation Time: -

Merge Event: OFF After you enable this function, you can click → to view the generation time of each alarm.

Severity	ID	Event Source	Sensor	Event Description	Generation Time	Status
	940	Lom	Eth3 Link Down	Slot is Disabled	2015-07-25 16:21:46	Deasserted
	939	Lom	Eth3 Link Down	Slot is Disabled	2015-07-25 16:21:25	Asserted
	938	DiskInner3	DISKD	In Failed Array	2015-07-22 15:24:30	Asserted

Alarm Setting

- The **Alarm Setting** page allows you to perform the following operations:
 - Configure iBMC to send alarms, events, and trap properties to a third-party server by trap.
 - To notify the users, send alarms and events generated by the server to specified mailboxes by email over a Simple Mail Transfer Protocol (SMTP) server.

Alarm Setting

Alarm Trap Notification Settings

Trap Function: ON

Set Trap Properties

V1 V2C V3 SNMPv1 is enabled by default. Users are advised to use SNMPv3.

Choose Trap V3 User:

Trap Mode: OID Event Code

Trap Server Identity: Board Serial Number Product Asset Tag Host Name

Community Name: The value can contain a maximum of 18 characters except spaces.

Confirm Community Name:



Play Back

- The **Play Back** page allows you to perform the following operations:
 - Play a video file, recorded for the real-time desktop of the server, stored on the local PC.
 - Capture a picture during the playback of a video file.
 - Play a video file that the server automatically records.



Screenshot

- The **Screenshot** page allows you to perform the following operations:
 - When restarted or powered off, the server automatically saves the last screenshot.
 - Capture screenshots for the real-time desktop anytime.

Last Screen

When restarted or powered off, the server automatically saves the last screenshot.
The three thumbnails on the left show the system screenshots captured before the latest three restart and power-off. The time when the screenshot was taken is displayed below a thumbnail.
You can click a thumbnail for a larger image. By default, the system displays the latest system screenshot in a larger image.

Screen Enable: Disable Enable

System will find bootable device automatically after 5 seconds
Broadcom UNDI PXE-2.1 v16.8.0
Copyright (C) 2000-2014 Broadcom Corporation
Copyright (C) 1997-2000 Intel Corporation
All rights reserved.
PXE-E61: Media test failure, check cable
PXE-M0F: Exiting Broadcom PXE ROM.
No bootable device
System will find bootable device automatically after 5 seconds
Broadcom UNDI PXE-2.1 v16.8.0
Copyright (C) 2000-2014 Broadcom Corporation
Copyright (C) 1997-2000 Intel Corporation

Black Box

- The **Black Box** page allows you to download data from the black box memory when the black box function is enabled.
- A black box consists of memory and fault monitoring software.

Black Box

Download BlackBox Data

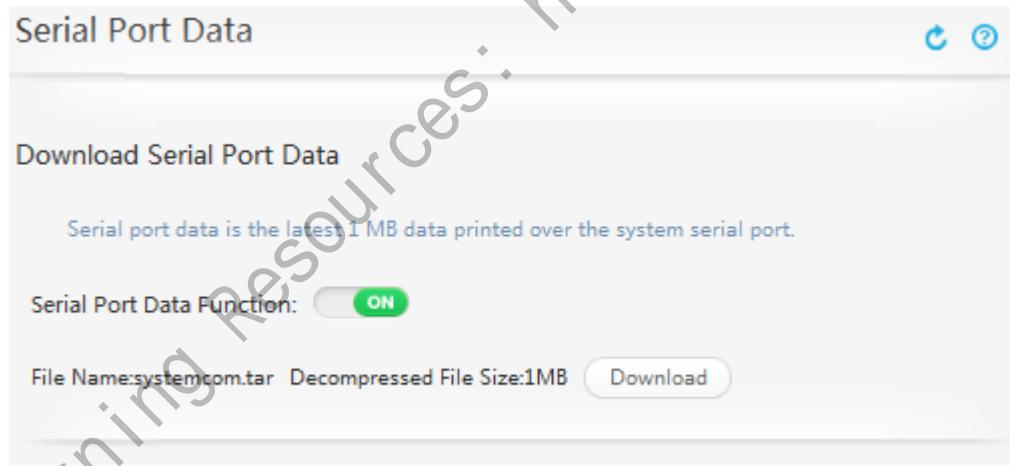
The black box memory is a built-in storage chip for recording fault information, which is independent of hard disks on the server. You need to install the black box fault monitoring software in the OS to use the black box function. Enable or disable the black box function using the following button. The configuration takes effect after the system restarts.

Blackbox Function: OFF

File Name:blackbox.tar File Size:4MB [Download](#)

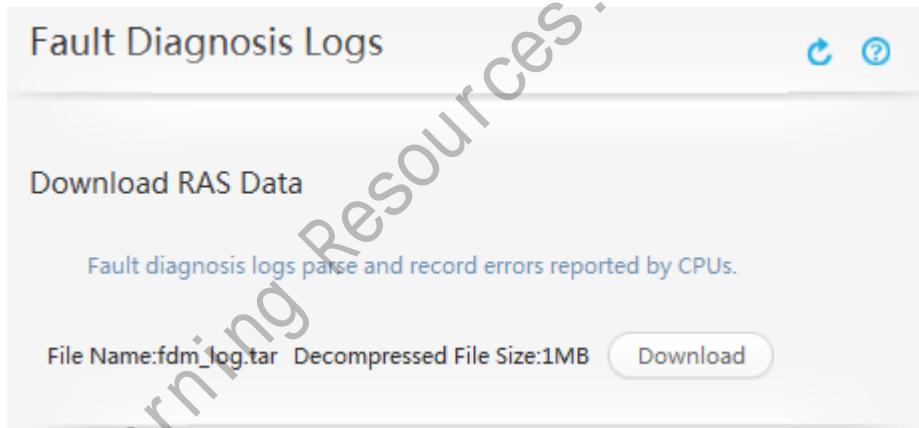
Serial Port Data

- The **Serial Port Data** page allows you to enable or disable the function for downloading data over the serial port, and download the latest 1 MB data printed over the serial port.
- The serial port data function is enabled by default.



Fault Diagnosis Logs

- The **Fault Diagnosis Logs** page allows you to download error records reported by CPUs.
- The function for downloading error records is enabled by default. You can enable or disable **FDM** in the BIOS to enable or disable this function.
 - The path where the FDM parameter is located varies by BIOSs. Romley BIOS: **Advanced > RAS Configuration > FDM**
 - Brickland BIOS: **Advanced > Runtime Error Logging > FDM**
 - Grantley BIOS: **Advanced > System Event Log > FDM**



Fault Diagnosis Logs

Download RAS Data

Fault diagnosis logs parse and record errors reported by CPUs.

File Name:fdm_log.tar Decompressed File Size:1MB

Download

Memory Hot-swap(Only the RH8100 V3)

- The **Memory Hot-swap** page allows you to hot-swap dual in-line memory modules (DIMMs) and monitor the hot swap process.



Power Control

- The **Power Control** page allows you to perform the following operations:
 - Power on, power off, or reset a server, power off and then power on a server, or trigger the operating system (OS) to generate a non-maskable interrupt (NMI).
 - Set the power restore policy for a server.

Power Control

Virtual Power Button

Current Device Status: Power On

Power On

Power Off If you press the power button, the OS on the server controls the power-off process.

Power-off Timeout Period: **OFF**

Forcibly Power Off If you hold down the power button for 5 seconds to forcibly power off the server, system data may be damaged.

Reset The system restarts immediately. The reset operation is invalid when the server is powered off. This operation will affect the power progress.

Power

- The **Power** page allows you to perform the following operations:
 - View information about the server power.
 - Enable or disable the power capping function, set the power capping value, and action taken if power capping fails.
 - View the historical average power and peak power line charts of the latest week or day, view the power data obtained at each sampling time, and re-collect statistics about server power. The system obtains server power data at an interval of 10 minutes.

Current Status

The lower limit for power capping is the recommended minimum value. If the lower limit is a very small value, power capping may fail.

Statistical Start Time: **2014-01-01 00:00:06**

Current Power: **709.7 BTU/h** Average Power: **679.0 BTU/h** Total Consumed Power: **1784858.3 BTU**

Peak Power: **1050.9 BTU/h** Peak Time: **2015-04-03 14:12:37**

Current CPU Power: **0.0 BTU/h** Current Memory Power: **0.0 BTU/h**

Energy Saving Settings

- The **Energy Saving Settings** page allows you to set an energy saving policy for the server.

Energy Saving Settings

Power Adjustment

You can control the system power consumption by setting the CPU P-state and T-state.

P-state: You can set the P-state to adjust the CPU working frequency.

T-state: You can set the T-state to adjust the CPU duty cycle.

The number of P-states and the number of T-states vary according to the CPU model.

1. Adjust the CPU working frequency.



Among P-states, P0 indicates the maximum CPU working frequency. P1, P2, and P3 indicate the CPU working frequency, power consumption, and system performance in descending order.

2. Adjust the CPU duty cycle.



Among T-states, T0 indicates the maximum CPU duty cycle. T1, T2, and T3 indicate the CPU duty cycle, power consumption, and system performance in descending order.

User Settings

- The **User Settings** page allows you to perform the following operations:
 - View and manage users for logging in to iBMC.
 - View and configure user security hardening rules for the iBMC.
 - View and configure Lightweight Directory Access Protocol (LDAP) user information.

Local User

You can add a maximum of 16 users. The system has only one default user, who has administrator rights. The default user name is root.

Password Complexity Check: Disable Enable The function also checks the complexity of SNMPv1, SNMPv2 and SNMP trap community names.

Password expired time: Range 0~3650 means no limit

Login User in Emergencies: Specifies the user who can log in to the iBMC irrespective of the password validity period or login rules.

Disable history password: The value range is 0~50 indicates no restricted

Account Locking: Invalid Login Attempts Locking Duration (minutes)

Login Rule:

Rule1	time	-	IP	MAC	<input type="button" value="OFF"/>
Rule2	time	-	IP	MAC	<input type="button" value="OFF"/>
Rule3	time	-	IP	MAC	<input type="button" value="OFF"/>

Network Settings

- The **NetWork Settings** page allows you to perform the following operations:
 - Set a host name for the server.
 - Set the mode and IP address of the management network port on the server
 - Set the mode for obtaining domain name system (DNS) information.
 - Set VLANs.

1. Config iBMC Host Name

Server Name: huawei

Save

2. Select Network Port Mode

Fixed: specifies a dedicated, aggregation, onboard, or PCIe network port as the iBMC management network port. Automatic: it selects a network port based on network port connection status. Select check boxes to specify network ports for automatic selection. If selects a management network port in the following priority: dedicated network port > onboard network port > PCIe network selected manually or automatically, the management and service network ports share a physical network port. You are advised to select a management network port for security purposes if Fixed or Automatic is selected and an onboard or PCIe network port is configured.

Select Mode: Fixed Automatic

Specify Management Network Port: Select a management network port

Dedicated Network Port	LOM	PCIE extern Port
<input checked="" type="radio"/> eth2	<input type="radio"/> Port1 <input type="radio"/> Port2 <input checked="" type="radio"/> Port3 <input checked="" type="radio"/> Port4	

Port Settings

- The **Port Settings** page allows you to view and set system service information.

Port Settings

Enabling the FTP,Telnet,HTTP,RMCP functions may reduce system security. Exercise caution when enabling these functions.

FTP:	<input type="button" value="OFF"/>	Port: 21	<input type="button" value="Restore Defaults"/>
SSH:	<input checked="" type="button" value="ON"/>	Port: 22	<input type="button" value="Restore Defaults"/>
Telnet:	<input type="button" value="OFF"/>	Port: 23	<input type="button" value="Restore Defaults"/>
SNMP Agent:	<input checked="" type="button" value="ON"/>	Port: 161	<input type="button" value="Restore Defaults"/>
KVM:	<input checked="" type="button" value="ON"/>	Port: 2198	<input type="button" value="Restore Defaults"/>
VMM:	<input checked="" type="button" value="ON"/>	Port: 8208	<input type="button" value="Restore Defaults"/>
Video:	<input checked="" type="button" value="ON"/>	Port: 2199	<input type="button" value="Restore Defaults"/>
Web Server(http):	<input checked="" type="button" value="ON"/>	HTTP: 80	<input type="button" value="Restore Defaults"/>
Web Server(https):	<input checked="" type="button" value="ON"/>	HTTPS: 443	<input type="button" value="Restore Defaults"/>
IPMI LAN:	<input type="button" value="OFF"/>	Port 1: 623	<input type="button" value="Restore Defaults"/>
IPMI LAN(RMCP+):	<input checked="" type="button" value="ON"/>	Port 2: 664	<input type="button" value="Restore Defaults"/>

RMCP+ and RMCP share ports. After you set ports for RMCP, RMCP+ also uses the ports.

System Settings

- The **System Settings** page allows you to perform the following operations:
 - View and set Simple Network Management Protocol (SNMP) information.
 - View and set the web server timeout period.
 - View and set the system time zone.
 - Set alarm thresholds and enable or disable the user management function on the service side.
 - View and set device locations.

Only administrators and operators have permission to configure system settings. Common users have only permission to view system settings.

1. Set SNMP Version SNMPv3 is enabled by default and cannot be disabled. Enabling SNMPv1 and SNMPv2c may reduce system security. Exercise caution when enabling these services.

V1 V2C V3

Read-Only Community:

The value can contain a maximum of 32 characters except spaces.

Confirm Community:

Read/Write Community:

The value can contain a maximum of 32 characters except spaces.

Confirm Community:

SNMP V3 AuthProtocol:

 SHA1

MD5 may cause security risks. You are advised to use SHA.

SNMP V3 PrivProtocol:

 AES

DES may cause security risks. You are advised to use AES.

Boot Option

- The **Boot Option** page allows you to set the first boot option for the operating system (OS) on the server.

Boot Option

The setting takes effect only once.
After the server restarts, the first boot option is restored to the default value specified in the BIOS.

Hard disk	<input type="radio"/>
DVD-ROM drive	<input type="radio"/>
FDD/Removable device	<input type="radio"/>
PXE	<input type="radio"/>
BIOS Setup	<input type="radio"/>
Not configured	<input type="radio"/>

Save

SSL Certificate

- The **SSL Certificate** page allows you to view Secure Sockets Layer (SSL) certificate information, customize SSL information, and import a new certificate.

SSL Certificate

SSL Certificate Information

Issued To	CN=Server, OU=IT, O=Huawei, L=ShenZhen, S=GuangDong, C=CN
Issued By	CN=Server, OU=IT, O=Huawei, L=ShenZhen, S=GuangDong, C=CN
Valid From	Jul 25 2014 GMT
Valid To	Jul 22 2024 GMT
Serial Number	07

Customize

Operation Logs

- The **Operation Logs** page allows you to view and download logs recorded during system operating, including information about system startup, status transition, and setting operations performed by users on iBMC.

Operation Logs					
Download Operation Logs					
ID	Time	Interface	User	IP address	Info
316	2015-07-28 15:23:32	WEB	root	192.168.2.156	root(192.168.2.156) login successfully
315	2015-07-24 17:54:29	WEB	root	192.168.2.156	root(192.168.2.156) logout successfully
314	2015-07-24 12:47:41	WEB	root	192.168.2.156	root(192.168.2.156) login successfully
313	2015-07-22 18:55:56	KVM_VMM	root	192.168.2.156	Disconnect KVM successfully
312	2015-07-22 15:22:24	IPMI	N/A	HOST	Set file (options.ini) changed flag to (no changed) successfully
311	2015-07-22 15:22:24	IPMI	N/A	HOST	Set power restore policy to (no changed) successfully
310	2015-07-22 15:22:13	IPMI	N/A	HOST	Set watchdog timer to (RAW02-00-00-00-b8-0b) successfully
309	2015-07-22 15:22:08	KVM_VMM	root	192.168.2.156	Set FRU0 to reset successfully
308	2015-07-22 13:23:27	WEB	root	192.168.2.156	root(192.168.2.156) logout successfully
307	2015-07-22 11:56:43	KVM_VMM	root	192.168.2.156	Set mouse synchronize model successfully
Total Records: 316					
					
		Go		<input type="text" value="1"/>	

Run Logs

- The **Run Logs** page allows you to view run logs, which are recorded when iBMC fails to execute a policy to manage the server. The failures include the following:
 - Logs recording failures to execute power-on policies.
 - Logs recording power capping failures.
 - Logs recording events that the power capping lower limit is higher than the power capping value.
 - Logs recording failures to send emails over the Simple Mail Transfer Protocol (SMTP).
 - Logs recording watchdog timeout errors, failures to power off or reset the server, or power cycle failures.
 - RAS logs

Time	Level	Info
No data available in table		
Total Records: 0	<	1

Security Logs

- The **Security Logs** page allows you to view and download information about iBMC login and logout over a serial port, Secure Shell (SSH), Telnet, or FTP and about setting operations.

Security Logs

Download Security Logs

ID	Time	Interface	Host	Info
428	Feb 15 08:18:33	xinetd[1744]	iBMC	EXIT: ssh pid=11717 duration=206(sec)
427	Feb 15 08:18:33	sshd[11717]	iBMC	pam_unix(sshd:session): session closed for user root
426	Feb 15 08:15:09	sshd[11717]	iBMC	pam_unix(sshd:session): session opened for user root by (uid=0)
425	Feb 15 08:15:09	sshd[11717]	iBMC	Accepted keyboard-interactive/pam for root from 128.5.144.223 port 54573 ssh2
424	Feb 15 08:15:07	sshd[11717]	iBMC	error: Could not load host key: /etc/ssh/ssh_host_ed25519_key
423	Feb 15 08:15:07	xinetd[1744]	iBMC	START: ssh pid=11717 from=:ffff:128.5.144.223
422	Feb 15 08:01:17	xinetd[1744]	iBMC	EXIT: ssh pid=9839 duration=127(sec)
421	Feb 15 08:01:17	sshd[9839]	iBMC	pam_unix(sshd:session): session closed for user root
420	Feb 15 07:59:12	sshd[9839]	iBMC	pam_unix(sshd:session): session opened for user root by (uid=0)
419	Feb 15 07:59:12	sshd[9839]	iBMC	Accepted keyboard-interactive/pam for root from 128.5.144.223 port 54484 ssh2

Total Records: 428

1 2 3 4 5 ... 42 43 > Go 1 >

Work Records

- The **Work Records** page allows you to add and view working records.

The screenshot shows the 'Work Records' page with a single entry. The entry details are:

- User: root
- IP: 128.5.197.71
- Date: 2013-08-11 22:58:31
- Action: set the system parameter
- Icon: A green pencil icon followed by a red X icon.

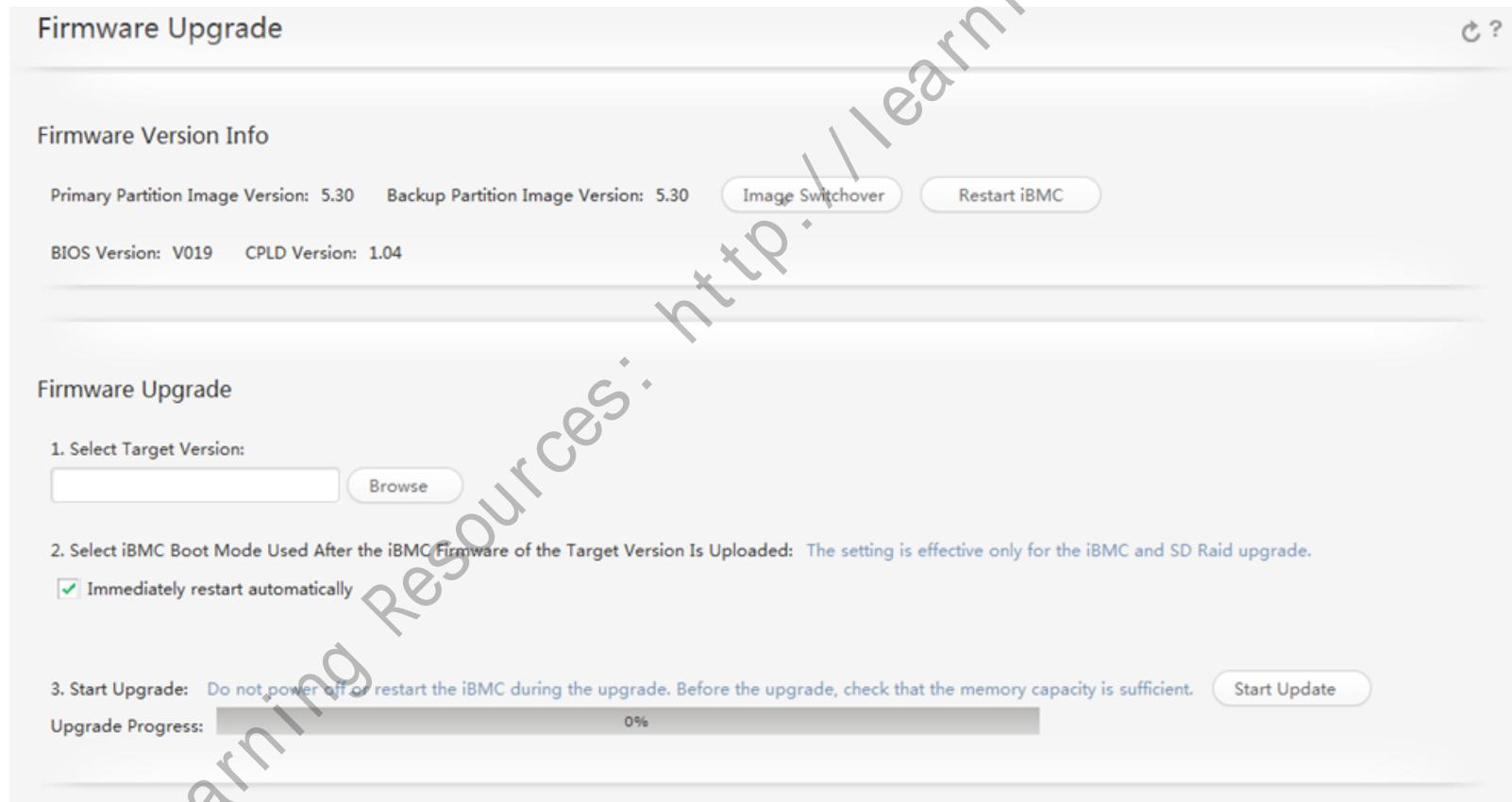
Online User

- The **Online User** page allows you to view the users who have logged in to iBMC and log out these users. Only a user in the administrator group has permission to log out other users.

User Name	Login Method	Login IP Address	Login Time	Logout
root	GUI	128.5.197.71	2013-08-11 22:49:34	N/A

Firmware Upgrade

- The **Firmware Upgrade** page allows you to view version information, restart iBMC, perform an image switchover, and upgrade firmware.



Firmware Upgrade

Firmware Version Info

Primary Partition Image Version: 5.30 Backup Partition Image Version: 5.30 [Image Switchover](#) [Restart iBMC](#)

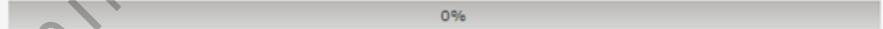
BIOS Version: V019 CPLD Version: 1.04

Firmware Upgrade

1. Select Target Version:
 [Browse](#)

2. Select iBMC Boot Mode Used After the iBMC Firmware of the Target Version Is Uploaded: The setting is effective only for the iBMC and SD Raid upgrade.
 Immediately restart automatically

3. Start Upgrade: *Do not power off or restart the iBMC during the upgrade. Before the upgrade, check that the memory capacity is sufficient.* [Start Update](#)

Upgrade Progress:  0%

Remote

- The **Remote** page allows you to view the maximum number of sessions and the number of activated sessions for the keyboard, video, and mouse (KVM) and virtual media, and access the server operating system (OS) by using the Remote Virtual Console.

Virtual Media Properties

Maximum Number of Virtual Media Sessions: 1

Number of Activated Sessions: 0

Delete Current Link: [Delete](#)

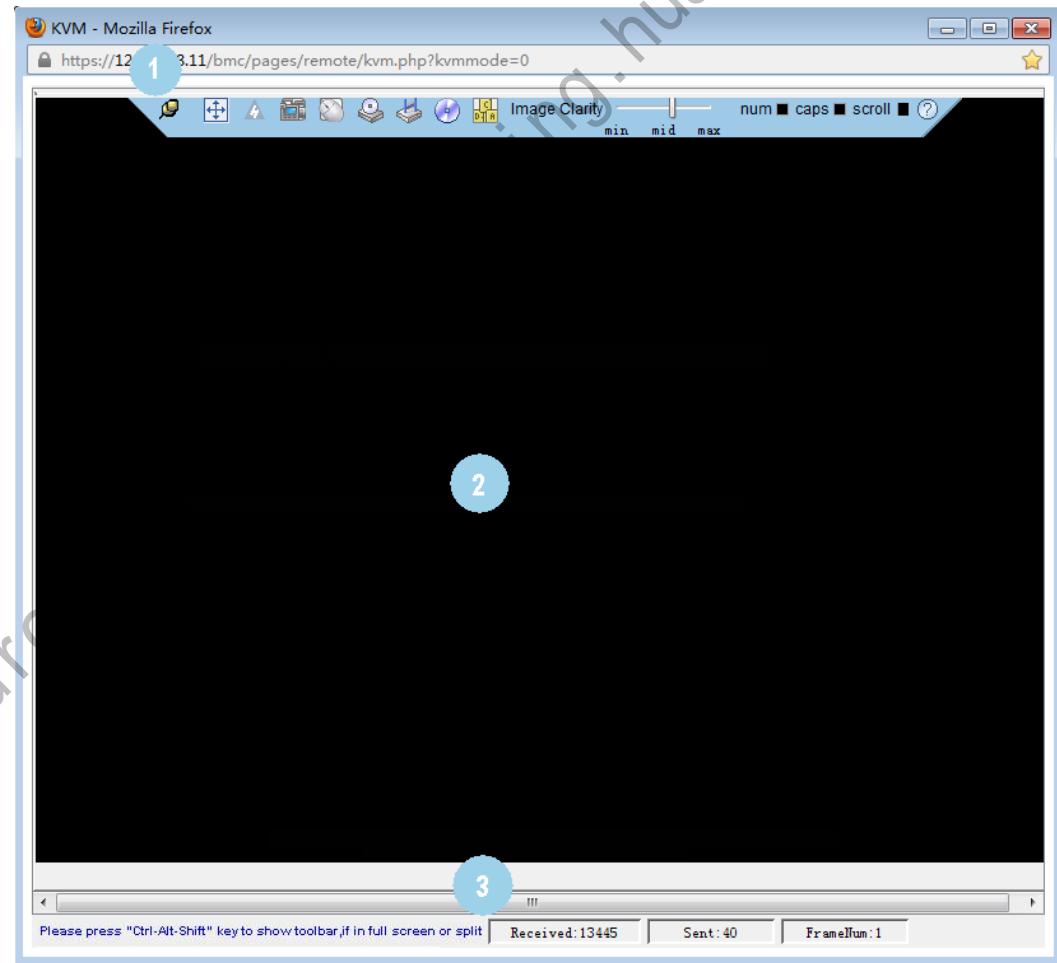
Remote Connection

[Remote Virtual Console \(Shared Mode\)](#)

[Remote Virtual Console \(Private Mode\)](#)

Remote

- On the menu bar, choose **Remote**. On the **Remote** page, click **Remote Virtual Console (shared mode)** or **Remote Virtual Console (private mode)**. The KVM screen is displayed.





Contents

- Introduction to iBMC
- iBMC GUI Introduction
- **iBMC CLI Introduction**

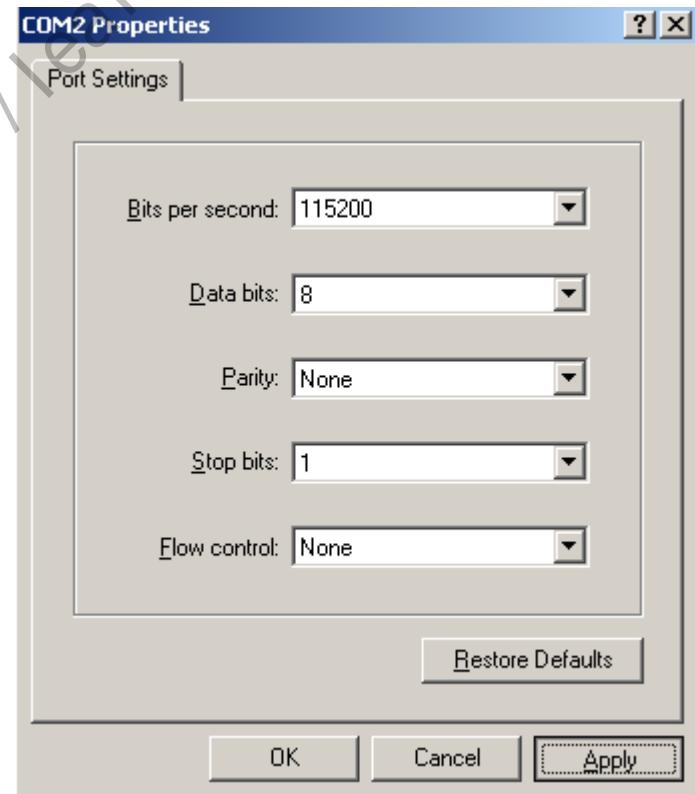
iBMC CLI Overview

- The commonly used commands of the iBMC are classified into two types:
 - Query command **ipmcget**
The syntax of **ipmcget** is as follows:
ipmcget [-t target] -d dataitem [-v value]
 - Setting command **ipmcset**
The syntax of **ipmcset** is as follows:
ipmcset [-t target] -d dataitem [-v value]
- The parameters of **ipmcget** and **ipmcset** are described as follows:
 - []: indicates that the information included is optional for each command.
 - **-t target**: gets, sets a target on the operated device. The target can be a sensor or an indicator.
 - **-d dataitem**: gets, sets the specific properties of the operated device or of the components on the operated device.
 - **-v value**: gets, sets the parameter values of the components on the operated device.

Login to the iBMC CLI

- **Login Modes**

- ❑ SSH
- ❑ Telnet
 - By default, iBMC does not support Telnet login.
 - Need to enable the Telnet service on the web user interface (WebUI) of iBMC.
- ❑ Local serial port
 - Baud rate: 115200
 - Data bits: 8
 - Parity check: none
 - Stop bit: 1
 - Flow control: none



Common Query Commands (1/6)

- Query the version information of a server

```
iBMC:/>ipmcget -d version
----- iBMC INFO -----
IPMC      CPU:      Hi1710
IPMI      Version:   2.0
CPLD      Version:   (U46)1.07
Active iBMC Version:   (U25)1.26
Active iBMC Built:    21:22:40 Dec 23 2014
Backup iBMC Version:   1.26
SDK       Version:   1.47
SDK       Built:     08:28:02 Dec 19 2014
Active Uboot Version:  1.1.32 (Dec 19 2014 - 08:28:26)
Backup Uboot Version:  1.1.32 (Dec 19 2014 - 08:28:26)
----- Product INFO -----
Product    ID:      0x0001
Product    Name:    RH2288H
Product    Version:  V3
BIOS      Version:  (U47)1.26
----- Mother Board INFO -----
Mainboard  BoardID:  0x000d
Mainboard  PCB:     .B
----- NIC INFO -----
SM210      BoardID:  0x0014
SM210      PCB:     .A
-----
iBMC:/>
```

Common Query Commands (2/6)

- Query the system health status.

```
iBMC:/>ipmcget -d health
```

System Events:

5 major events.

```
iBMC:/>
```

- Query system health events.

```
iBMC:/>ipmcget -d healthevents
```

Event Num	Event Time	Entity Name	Sensor Name	Alarm level	Event Desc
1	2015-06-23 Tuesday 08:37:09	MainBoard connected/Incorrect interconnection	SAS Cable	Major	Incorrect cable
2	2015-07-22 Wednesday 15:24:29	DiskInner0	DISKA	Major	Hard disk drive fault
3	2015-07-22 Wednesday 15:24:29	DiskInner1	DISKB	Major	Hard disk drive fault
4	2015-07-22 Wednesday 15:24:30	DiskInner2	DISKC	Major	In Failed Array
5	2015-07-22 Wednesday 15:24:30	DiskInner3	DISKD	Major	In Failed Array

```
iBMC:/>
```

Common Query Commands (3/6)

- Query information about all FRUs

```
iBMC:/>ipmcget -d fruinfo
```

FRU Device Description : Builtin FRU Device (ID 0, Mainboard)

Board Mfg. Date : 2015/01/26 Mon 10:14:00

Board Manufacturer : Huawei Technologies Co., Ltd.

Board Product Name : BC11HGSA

Board Serial Number : 022HLV10F1000278

Board FRU File ID : 1.26

Product Manufacturer : Huawei Technologies Co., Ltd.

Product Name : RH2288H V3

Product FRU File ID : 1.26

FRU Device Description : Builtin FRU Device (ID 1, BC61ESMQ)

Board Mfg. Date : 2015/03/11 Wed 02:43:00

Board Manufacturer : Huawei Technologies Co., Ltd.

Board Product Name : BC61ESMQ

Board Serial Number : 022KXR10F3000143

Product Manufacturer : Huawei Technologies Co., Ltd.

Common Query Commands (4/6)

- Query the IP address of the iBMC management network port.

```
iBMC:/->ipmcget -d ipinfo
EthGroup ID      : 1
Net Mode        : Manual
Net Type        : Dedicated
IPv4 Information :
IP Mode         : static
IP Address      : 192.168.72.6
Subnet Mask     : 255.255.255.0
Default Gateway : 192.168.72.254
MAC Address     : 74:a0:63:fb:d5:d3
IPv6 Information :
IPv6 Mode       : static
IPv6 Address    :
Default Gateway IPv6 :
Link-Local Address : fe80::76a0:63ff:feff:d5d3/64
VLAN Information :
VLAN State      : disabled

iBMC:/->
```

Common Query Commands (5/6)

- Query the current and historical information about port 80.
 - The value in brackets is the current information.

Common Query Commands (6/6)

- Query system event logs (SELs).

SEL id	SEL Time	Sensor Name	Status	Alarm level	SEL Description
940	2015-07-25 16:21:46	Eth3 Link Down	Deasserted	Normal	Slot is Disabled
939	2015-07-25 16:21:25	Eth3 Link Down	Asserted	Normal	Slot is Disabled
938	2015-07-22 15:24:30	DISKD	Asserted	Major	In Failed Array
937	2015-07-22 15:24:30	DISKC	Asserted	Major	In Failed Array
936	2015-07-22 15:24:29	DISKB	Asserted	Major	Hard disk drive fault
935	2015-07-22 15:24:29	DISKA	Asserted	Major	Hard disk drive fault
934	2015-07-22 15:22:19	DISKD	Deasserted	Major	In Failed Array
933	2015-07-22 15:22:19	DISKC	Deasserted	Major	In Failed Array
932	2015-07-22 15:22:19	DISKB	Deasserted	Major	Hard disk drive fault
931	2015-07-22 15:22:19	DISKA	Deasserted	Major	Hard disk drive fault
930	2015-07-22 15:22:08	SysRestart	Asserted	Normal	System Restart [Chassis control][LOCAL]
929	2015-07-22 11:26:35	DISKD	Asserted	Major	In Failed Array
928	2015-07-22 11:26:35	DISKC	Asserted	Major	In Failed Array
927	2015-07-22 11:26:35	DISKB	Asserted	Major	Hard disk drive fault
926	2015-07-22 11:26:35	DISKA	Asserted	Major	Hard disk drive fault
925	2015-07-22 11:24:24	DISKD	Deasserted	Major	In Failed Array
924	2015-07-22 11:24:24	DISKC	Deasserted	Major	In Failed Array
923	2015-07-22 11:24:24	DISKB	Deasserted	Major	Hard disk drive fault
922	2015-07-22 11:24:24	DISKA	Deasserted	Major	Hard disk drive fault
921	2015-07-22 11:24:13	SysRestart	Asserted	Normal	System Restart [Chassis control][LOCAL]

Common Setting Commands(1/2)

- Upload the upgrade file to a specific directory on the target server using a file transfer tool, and perform the upgrade on the iBMC command-line interface (CLI).

```
iBMC:/> ipmcset -d upgrade -v /tmp/image.hpm
```

Please make sure the iBMC is working while upgrading!

Updating...

100%

Update successfully.

Common Setting Commands(2/2)

- Restart the iBMC system.

```
iBMC:/->ipmcset -d reset
```

This operation will reboot iBMC system. Continue? [Y/N]:**y**
Resetting...

- Restore the BIOS factory defaults on the server.

```
iBMC:/->ipmcset -d clearcmos
```

WARNING: The operation may have many adverse effects.
Do you want to continue?[Y/N]:**y**
Clear CMOS successfully.



Summary

- iBMC functions, component and specifications
- iBMC GUI operations
- iBMC CLI operations



Questions

1. Does the iBMC system works rely on the OS?
2. How many images does iBMC firmware has?



Exercises

- True or false questions
 1. The iBMC supports both the GUI and CLI. (T or F)
- Multiple-choice questions
 1. You can set the iBMC management network port IP in : ()
 - A. iBMC Web UI
 - B. iBMC CLI
 - C. BIOS
 - D. LCD

Thank you

[www.huawei.com](http://learning.huawei.com)

Huawei Server Tools

[www.huawei.com](http://learning.huawei.com)





Objectives

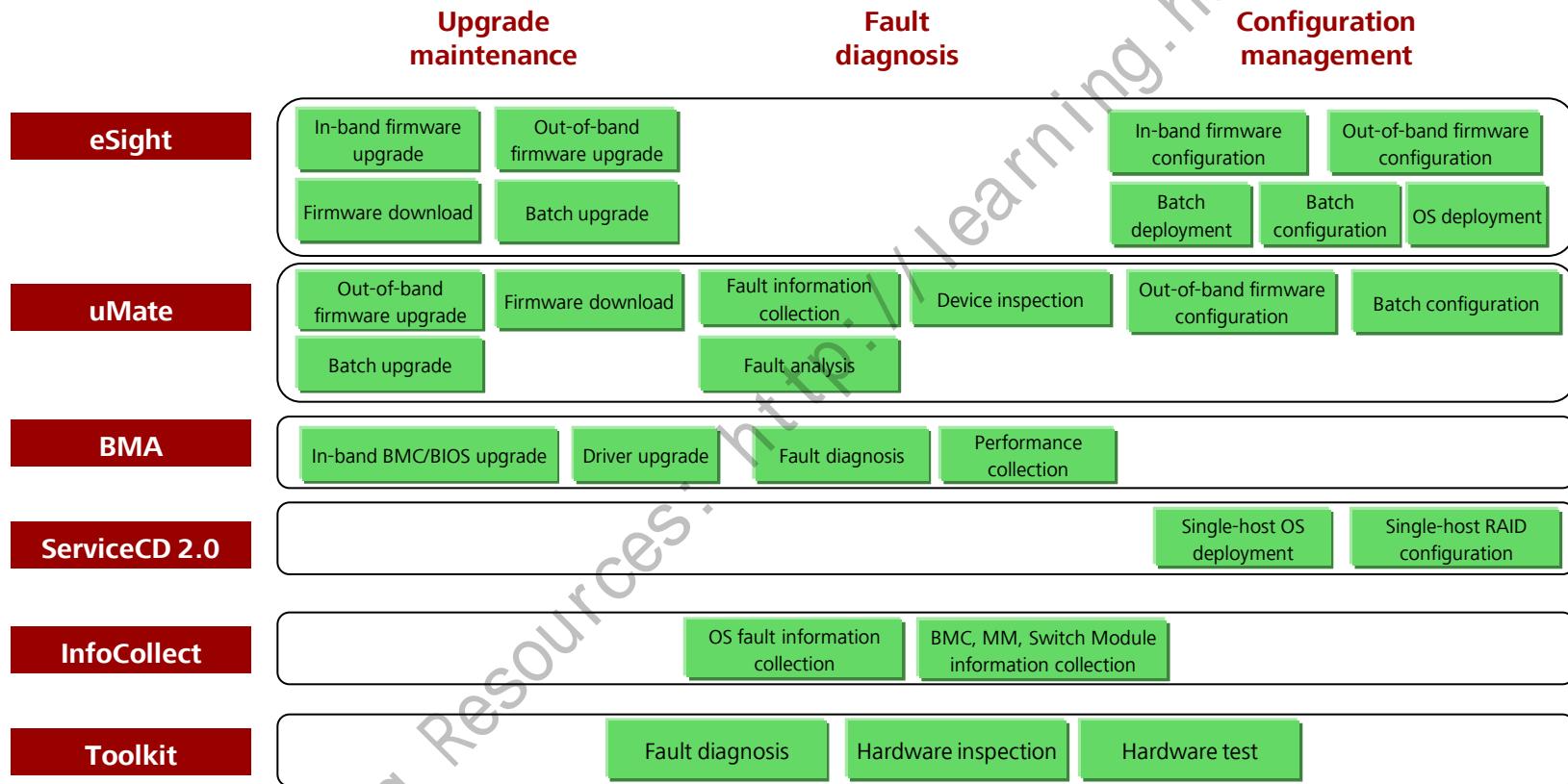
- Upon completion of this course, you will be proficient in:
 - Huawei server tool system
 - Huawei server tool usage methods



Contents

- 1. Huawei Server Tool System**
2. Toolkit
3. uMate
4. ServiceCD 2.0
5. iBMA
6. InfoCollect
7. Blade Server Tools
8. Other Tools

Huawei Server Tool Capabilities





Contents

1. Huawei Server Tool System
2. FTK
3. uMate
4. ServiceCD 2.0
5. iBMA
6. InfoCollect
7. Blade Server Tools
8. Other Tools

FTK Overview

- FTK stands for FusionServer Tools Toolkit.
 - FTK is a server maintenance toolkit intended for professionals who have basic server O&M knowledge.

```
+-----+
|          Huawei FusionServer Tools
|          Toolkit V101
+-----+
| 1. Auto Diagnose
| 2. Display Hardware Information
| 3. Hardware Inspect
| 4. CPU Test
| 5. Memory Test
| 6. HardDisk Test
| 7. RAID Card Log collect
| 8. Make Bootable USB Disk
| s. Save Result To USB Disk
| c. Command Line
|
| R/r . Reboot
| P/p . Poweroff
+-----+
| Fri Feb  6 04:32:07 CST 2015
+-----+
| Please input your choice:
```

FTK Overview

- FTK provides the following functions:
 - Incorporates a Linux boot ROM system to provide common system commands for use in the offline state.
 - Supports automatic diagnosis by providing comprehensive hardware health diagnosis and configuration verification.
 - Prints hardware configuration information.
 - Provides CPU, hard disk, and memory tests.
 - Supports RAID configuration on a server.
 - Creates a bootable USB flash drive for easy O&M.

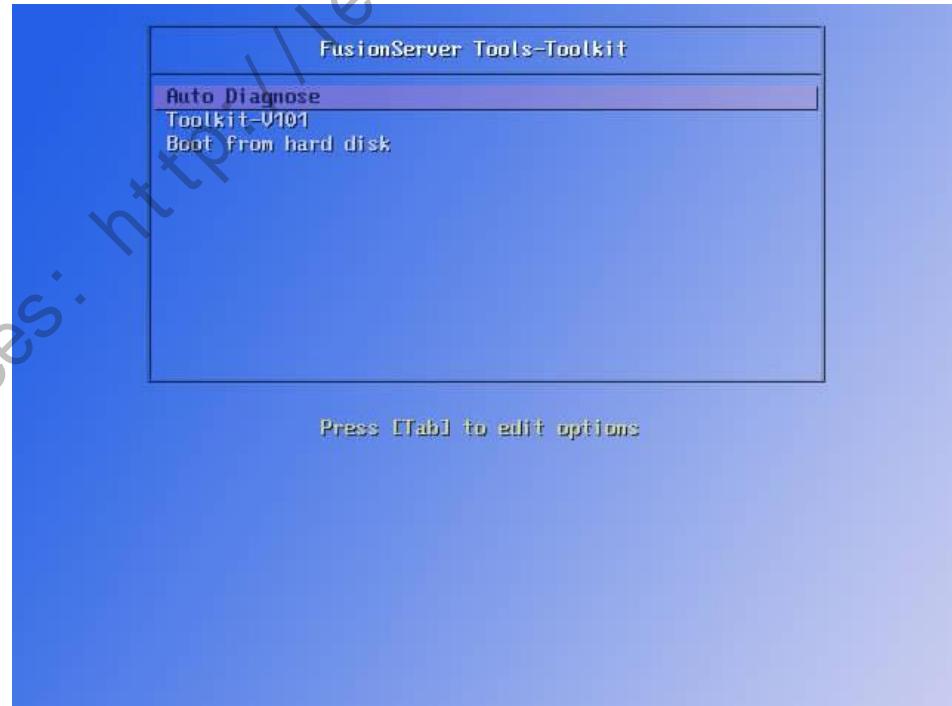
Obtaining FTK

- How to download software
 - Log in to <http://support.huawei.com/enterprise> and choose **Support > Downloads > IT > FusionServer > Solution and Software > FusionServer Tools.**

Soft Type	Others	Software Name	Size	Release Date	Downloads	Download
		FusionServer Tools-InfoCollect V107.zip	80.43MB	2016/01/12	0	
		A tool for collecting Windows logs&Linux Logs , BMC logs , MM logs,Ethernet fabric plane logs in E9000 blade server.				
		FusionServer Tools-ServiceCD2.0-V109.zip	1.06GB	2016/01/12	0	
		Config RAID,Helps you install OSs, including Windows Server, SLES, Red Hat, VMware ESXi, and CentOS				
		FusionServer Tools-Toolkit-V108.zip	260.68MB	2016/01/12	0	
		*FTK is developed for professional personnel to perform server operation and maintenance.				
		FusionServer Tools-uMate-Linux-V115.tar.gz	179.51MB	2016/01/12	0	
		In the Linux operating system, for batch inspection, log collection, upgrade firmware, BIOS configuration, BMC configuration, HMM configuration, the power control operation.				
		FusionServer Tools-uMate-Win-V115.zip	210.59MB	2016/01/12	0	
		In the Windows operating system, for batch inspection, log collection, upgrade firmware, BIOS configuration, BMC configuration, HMM configuration, the power control operation.				

Using FTK

- Download the Toolkit package (**FusionServer Tools-Toolkit-Vxxx.zip**) of the latest version, and decompress it to obtain the ISO file. Mount the ISO file to the virtual DVD drive by using the KVM, boot from the DVD drive, and access the tool.
 - **[Auto Diagnose]**: performs the automatic detection function. It is the default boot option, used for automatic inspection of configuration and hardware status.
 - **[Toolkit]**: provides common maintenance tools. If you select [Toolkit] and press Enter, the function menu is displayed.
 - **[Boot from hard disk]**: boots from a hard disk.



Using FTK

- Select **Toolkit** and press **Enter**. The function selection menu is displayed.

```
+-----+
|                                         Huawei FusionServer Tools
|                                         Toolkit V101
+-----+
| 1. Auto Diagnose
| 2. Display Hardware Information
| 3. Hardware Inspect
| 4. CPU Test
| 5. Memory Test
| 6. HardDisk Test
| 7. RAID Card Log collect
| 8. Make Bootable USB Disk
| s. Save Result To USB Disk
| c. Command Line
|
| R/r . Reboot
| P/p . Poweroff
+-----+
| Fri Feb  6 04:32:07 CST 2015
+-----+
Please input your choice:
```

FTK Functions — Performing Automatic Diagnosis

- The automatic diagnosis function automatically checks hardware status and configuration.

Check Item	Check Content	Check Failure Condition
SN	Whether a serial number is burnt into a product	The read content is empty or "To be filled by O.E.M."
BIOS	Firmware version information	The read content is empty.
BMC	Critical, major, and minor alarms	Alarms are generated.
CPU	CPU information	CPU information fails to be read.
Memory	Memory configuration	The number of DIMMs is less than the number of CPUs.
RAID controller card	Basic information	RAID controller card information fails to be read.
Battery backup unit (BBU)	BBU status	The BBU is faulty and needs to be replaced.
RTC battery	RTC battery status	The RTC battery is abnormal.
SAS cable	SAS cable connection status	The SAS cables are reversely connected.
Machine check exception (MCE)	MCE log analysis	MCE logs are generated for FTK.
Hard disk	Read function and status of hard disks	An error occurs when the system is reading data from the hard disk.
NIC	Firmware information and MAC address	A MAC address is 00:00:00:00:00:00 or ff:ff:ff:ff:ff, or conflicts with another one.
Power supply unit (PSU)	PSU status	A PSU is abnormal.
Fan module	Fan module status	A fan module is abnormal.

FTK Functions — Performing Automatic Diagnosis

- Test Result
 - After automatic diagnosis is complete, enter **Y** to save run logs to a specified USB flash drive.
 - Enter the USB flash drive letter in the format of **/dev/sdx** as prompted, and press **Enter**. Run logs are automatically saved to the root directory of the USB flash drive.
 - Before inserting a USB flash drive into a server, back up the data in the USB flash drive and format it to FAT32, which is a common partition format for USB flash drives.

```
The operation results are stored in the dir:/home/Project/FTK/log/inspect.log.  
Store result to USB(Y/N):y  
Please Select USB device(/dev/sdb1):/dev/sdb1
```

FTK Functions — Testing CPUs

- Test CPU stability by simulating massive I/O accesses to the CPU.
- The test duration is configurable (in minutes), and must be longer than 5 minutes.
- The displayed information is the test result.

```
| 4. CPU Test
| 5. Memory Test
| 6. HardDisk Test
| 7. RAID Card Log collect
| 8. Make Bootable USB Disk
| s. Save Result To USB Disk
| c. Command Line
|
| R/r . Reboot
| P/p . Poweroff
+-----+
|Fri Feb  6 16:43:45 CST 2015
+-----+
Please input your choice:4
CPU check select,this takes at least 5 minutes!!!
Please input the test time(minutes):5
  cpu use %0
  current free is %100
stress: info: [17093] dispatching hogs: 24 cpu, 0 io, 0 vm, 0 hdd
stress: info: [17093] successful run completed in 300s
  cpu test .....Pass
Press any key to continue ... █
```

FTK Functions — Testing Memory

- Perform a long-term memory stress test, capture bit errors and fully test the memory with write 0 and 1, or 8/16-bit write.
- Enter **1** to select **quicktest**. The test duration is several minutes to dozens of minutes.
- Enter **2** to select **fulltest**. The test duration is more than four hours.
- The displayed information is the test result.

```
Please input your choice:5
Memory check select!
  memory burn test.....start
Please choose test mode(Input 1 to quicktest; Input 2 to fulltest) => 1

  Memory stress test start, please waits until end...
[=====] 100%
mem burn test loop 45, Test end..
dos2unix: converting file meminfo.txt to UNIX format ...
Dimm000  Ramaxel  0x40159E33  RMS6031EC64FAF133
Dimm010  Ramaxel  0x40A49D33  RMS6031EC64FAF133
Dimm100  Ramaxel  0x40109E33  RMS6031EC64FAF133
Dimm110  Ramaxel  0x40BB9C33  RMS6031EC64FAF133
  memory burn test.....pass
Press any key to continue ... █
```

FTK Functions — Testing Hard Disks

- Score hard disks by using Huawei's unique hard disk scoring algorithm.
FTK can score only hard disks on a server with only one RAID controller card.
- Scoring a hard disk has no impact on data on the disk.
- The displayed information is the test result.
- The test fails if a hard disk has a low score.

```
| R/r . Reboot  
| P/p . Poweroff  
|-----+  
| Fri Feb  6 16:51:00 CST 2015  
+-----+  
Please input your choice:6  
HardDisk Test select!  
/dev/sda Check ..... PASS  
/dev/sdb Check ..... PASS
```

FTK Functions — Collecting RAID Controller Card Logs

- On the function menu, enter **7** and press **Enter** to collect RAID controller card logs.

```
| R/r . Reboot  
| P/p . Power Off  
+-----  
|Thu Apr 23 18:39:07 CST 2015  
+-----  
Please input your choice:?  
RAID card log collection may take several minutes, please wait...  
Product Name      : SAS2208  
.2208log/  
.2208log/utest_dmesg  
.2208log/MegaSAS.log  
.2208log/bbu  
.2208log/alilog  
.2208log/pdlist  
.2208log/adpinfo  
.2208log/ldinfo  
.2208log/smartlog  
RAID card log collection end!  
Log are stored in the dir:/home/Project/FTK/log  
Press <Enter> to continue ...
```

Log save path

FTK CLI Mode

- Run common Linux commands for easy O&M.
 - Obtain the current BIOS configuration.
 - Configure the BIOS for the server.
 - Upgrade the RAID controller card firmware.
 - Obtain the **ipmitool.exe** file.

```
+-----+
|                               Huawei FusionServer Tools
|                               Toolkit V101
|
|-----|
| 1. Auto Diagnose
| 2. Display Hardware Information
| 3. Hardware Inspect
| 4. CPU Test
| 5. Memory Test
| 6. HardDisk Test
| 7. RAID Card Log collect
| 8. Make Bootable USB Disk
| s. Save Result To USB Disk
| c. Command Line
|
| R/r . Reboot
| P/p . Poweroff
|
|-----|
| Fri Feb  6 18:48:42 CST 2015
+-----+
Please input your choice:c
```

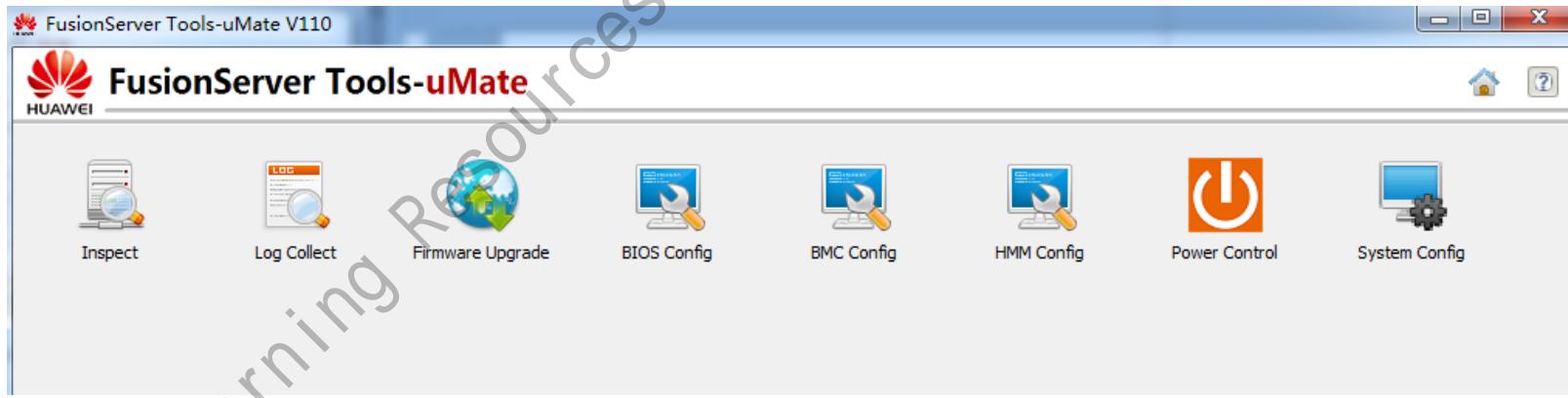


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uMate Overview

- uMate performs batch server routine maintenance tasks, including:
Server inspection, BMC log collection, firmware upgrade, BIOS configuration, BMC configuration, MM configuration, power control, and system configuration (See the figure below.)
- For details about the servers supported by uMate, see the uMate user guide.



Preparing to Use uMate

- Console requirements
 - To use the uMate GUI, you are advised to install Windows or SUSE Linux Enterprise Server (SLES) 11 SP1 or later on the console.
 - To use the uMate CLI, install Windows or Linux on the console.
- Preparations
 - Before using uMate, obtain the following server information:
 - BMC IP address, user name, and password of each rack server
 - IP address of the active MM, and user name and password of each blade server
 - IP address segments and **root** user passwords of all the target servers if you want to perform batch operations
 - Ensure that the target servers are on the same LAN as uMate.

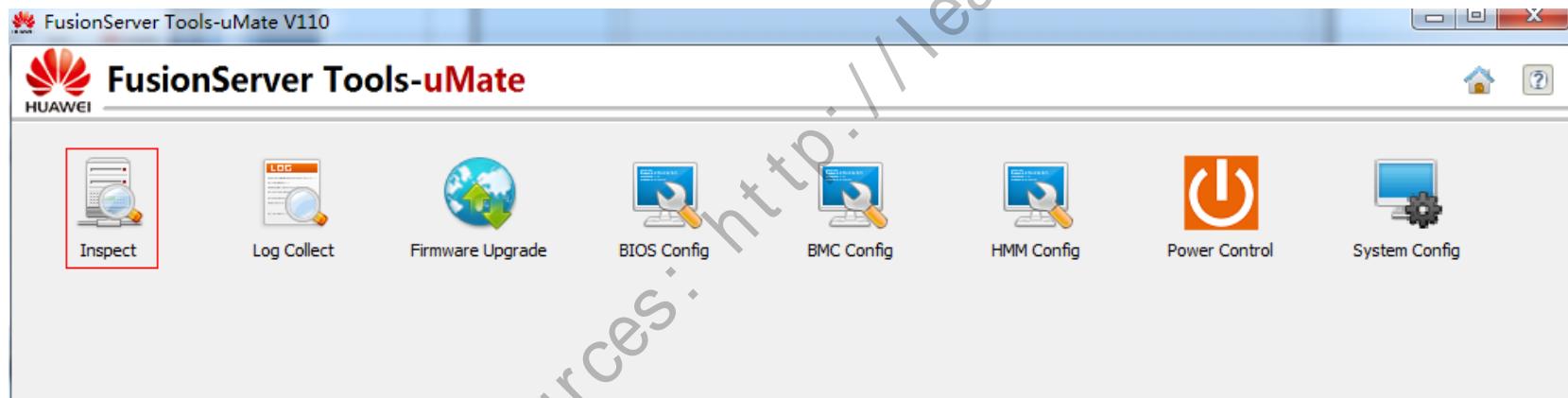
Obtaining uMate (Windows)

- Download uMate for Windows.
 - Log in to <http://support.huawei.com/enterprise> and choose **Support > Downloads > IT > FusionServer > Solution and Software > FusionServer Tools.**
 - Download the **FusionServer Tools-uMate-Win-Vxx.zip** file.

Soft Type	<input type="checkbox"/> Others	Software Name	Size	Release Date	Downloads	Download
		FusionServer Tools-InfoCollect V107.zip A tool for collecting Windows logs&Linux Logs , BMC logs , MM logs,Ethernet fabric plane logs in E9000 blade server.	80.43MB	2016/01/12	0	
		FusionServer Tools-ServiceCD2.0-V109.zip Config RAID,Helps you install OSs, including Windows Server, SLES, Red Hat, VMware ESXi, and CentOS	1.06GB	2016/01/12	0	
		FusionServer Tools-Toolkit-V108.zip "FTK is developed for professional personnel to perform server operation and maintenance.	260.68MB	2016/01/12	0	
		FusionServer Tools-uMate-Linux-V115.tar.gz In the Linux operating system, for batch inspection, log collection, upgrade firmware, BIOS configuration, BMC configuration, HMM configuration, the power control operation.	179.51MB	2016/01/12	0	
		FusionServer Tools-uMate-Win-V115.zip In the Windows operating system, for batch inspection, log collection, upgrade firmware, BIOS configuration, BMC configuration, HMM configuration, the power control operation.	210.59MB	2016/01/12	0	

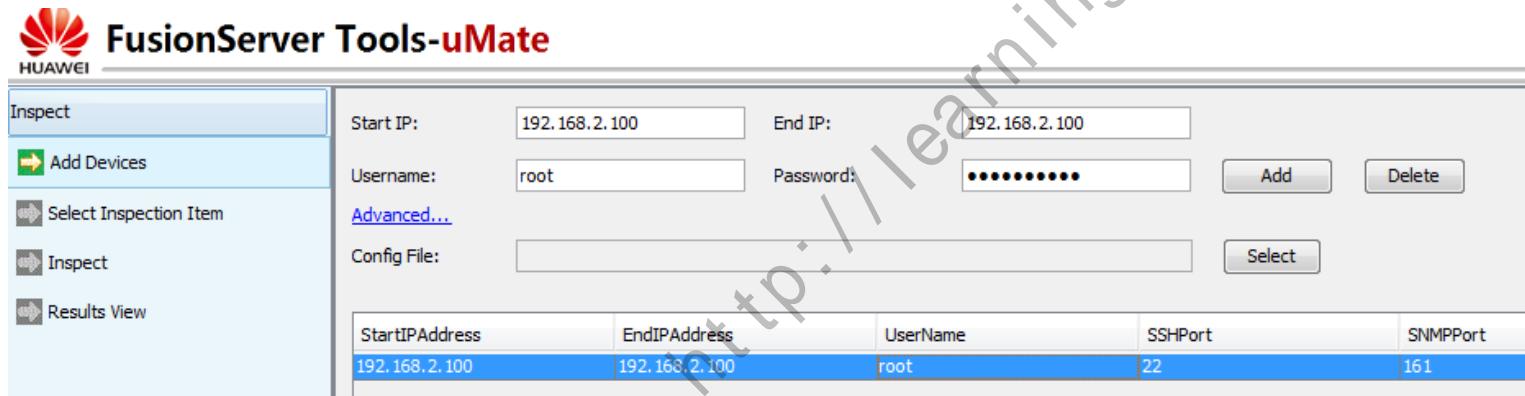
uMate Functions — Inspecting Servers (GUI)

- Go to the uMate directory and double-click the **uMate.exe** file. The uMate main window is displayed, as shown in the figure below.

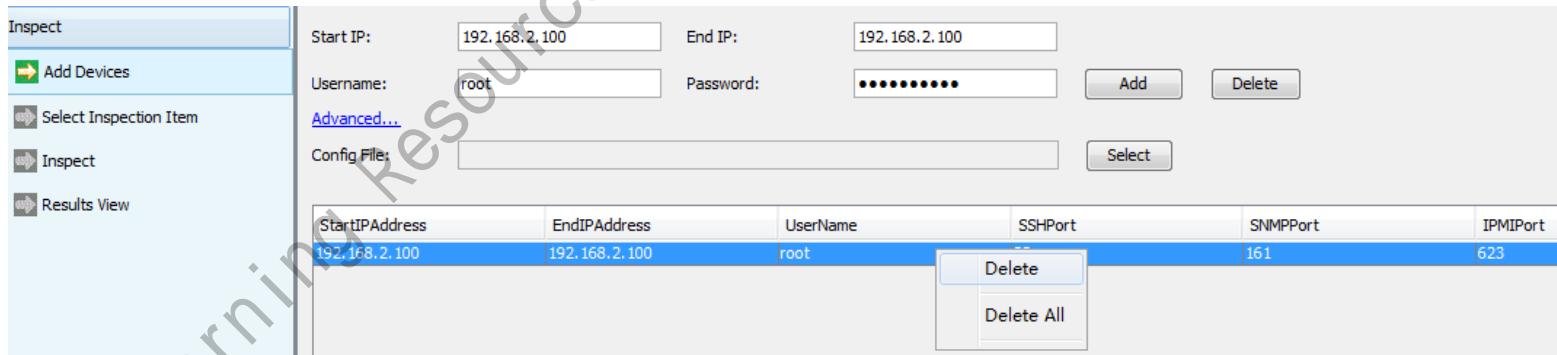


uMate Functions — Inspecting Servers (GUI)

- Add servers.



- Delete servers.



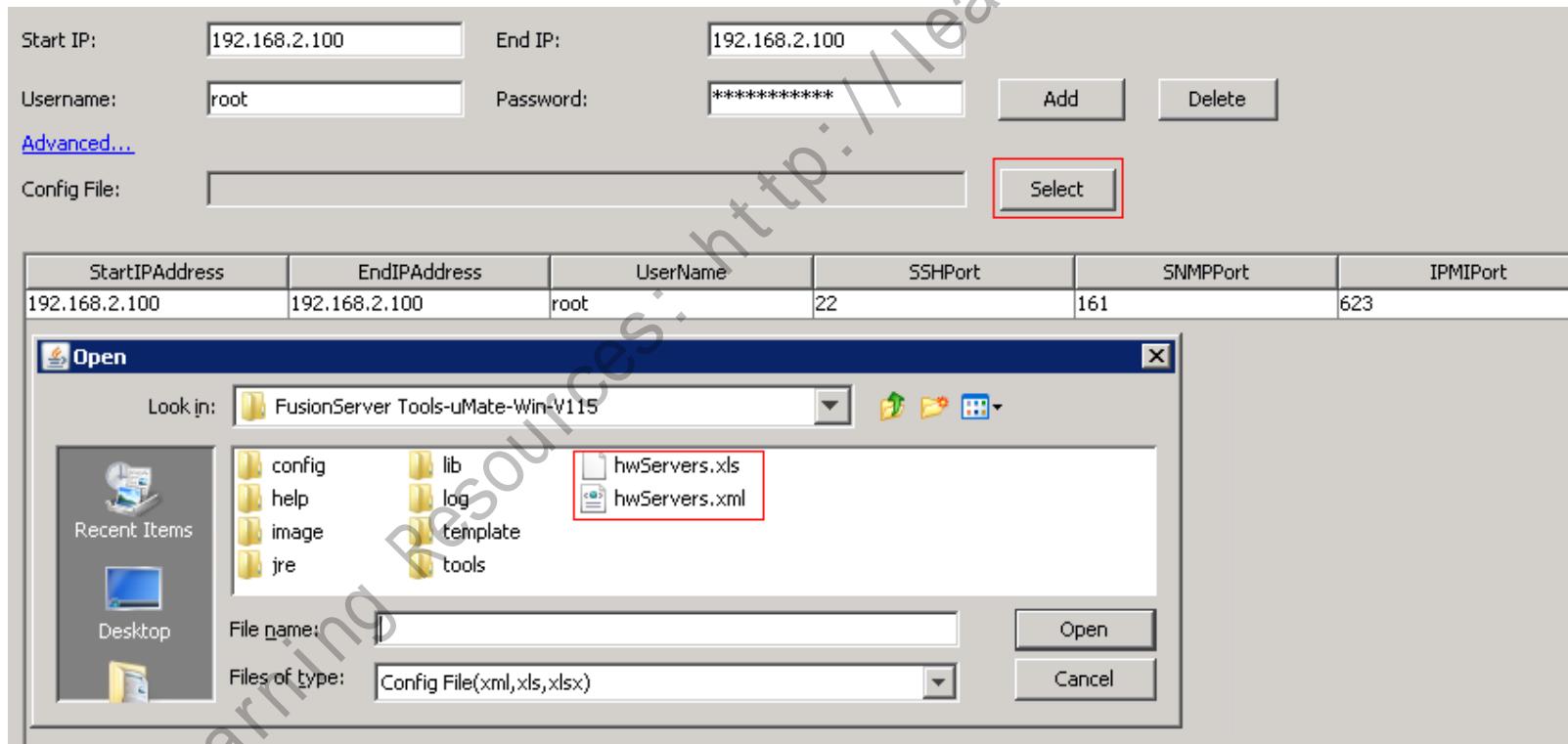
uMate Functions — Inspecting Servers (GUI)

- Parameter description

Parameter	Description	Remarks
Start IP	Specifies the start IP address of servers.	
End IP	Specifies the end IP address of servers.	The first two octets in the value of End IP must be the same as those in the value of Start IP . For example, the value of Start IP is 192.168.2.1 , and the value of End IP is 192.168.5.254 .
Username	Specifies the BMC user name.	The default user is root . You can also enter information about another user who has administrator rights.
Password	Specifies the user password.	
Write Community	Specifies the read-write community name.	Set this parameter only for SNMPv1 or SNMPv2c.
Retain the default values for the following parameters in most cases.		
IPMI Port	Specifies the Intelligent Platform Management Interface (IPMI) port number.	The default value is 623 .
SNMP Port	Specifies the Simple Network Management Protocol (SNMP) port number.	The default value is 161 .
SSH Port	Specifies the Secure Shell (SSH) port number.	The default value is 22 .

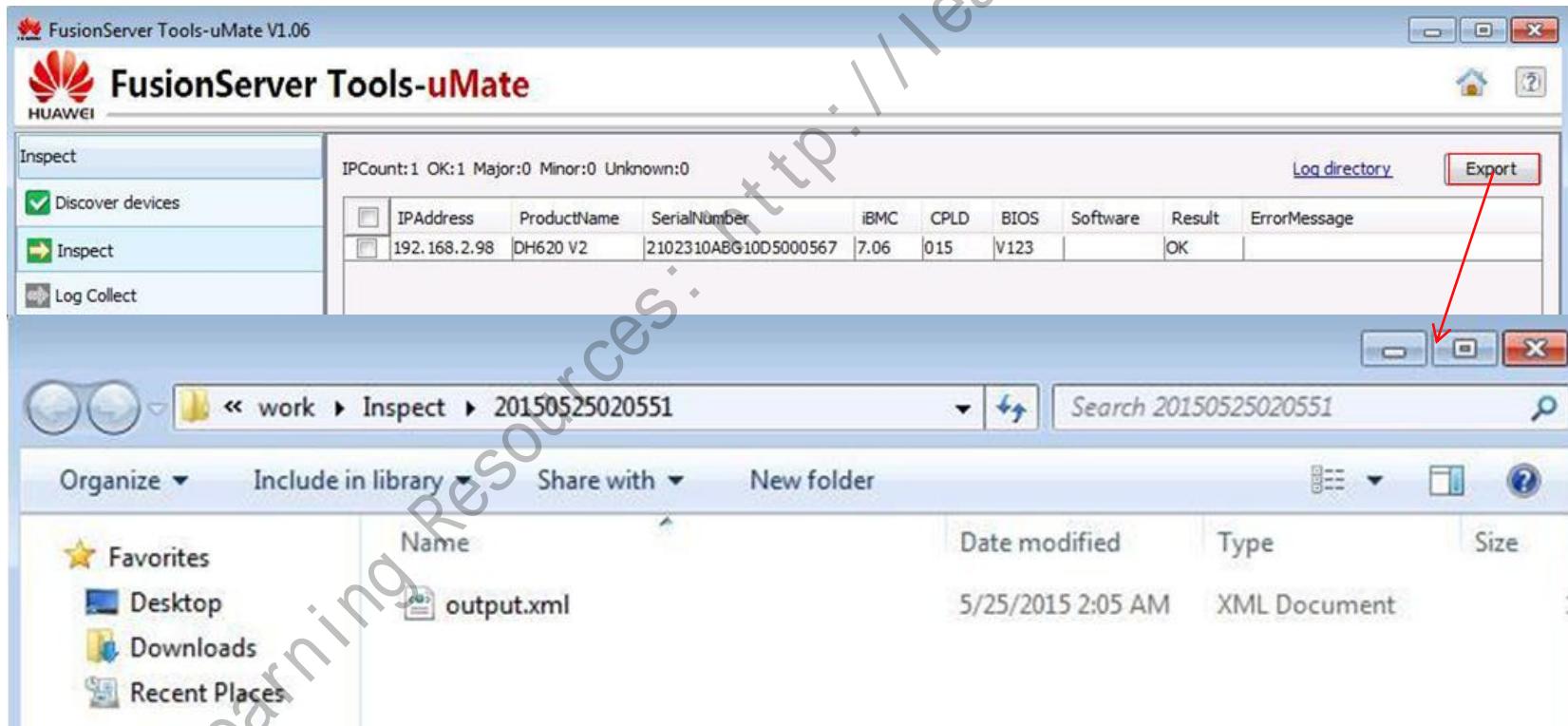
uMate Functions — Inspecting Servers (GUI)

- To inspect multiple servers with different BMC passwords at a time, you are advised to use a configuration file.
- uMate supports an .xls or .xml configuration file.



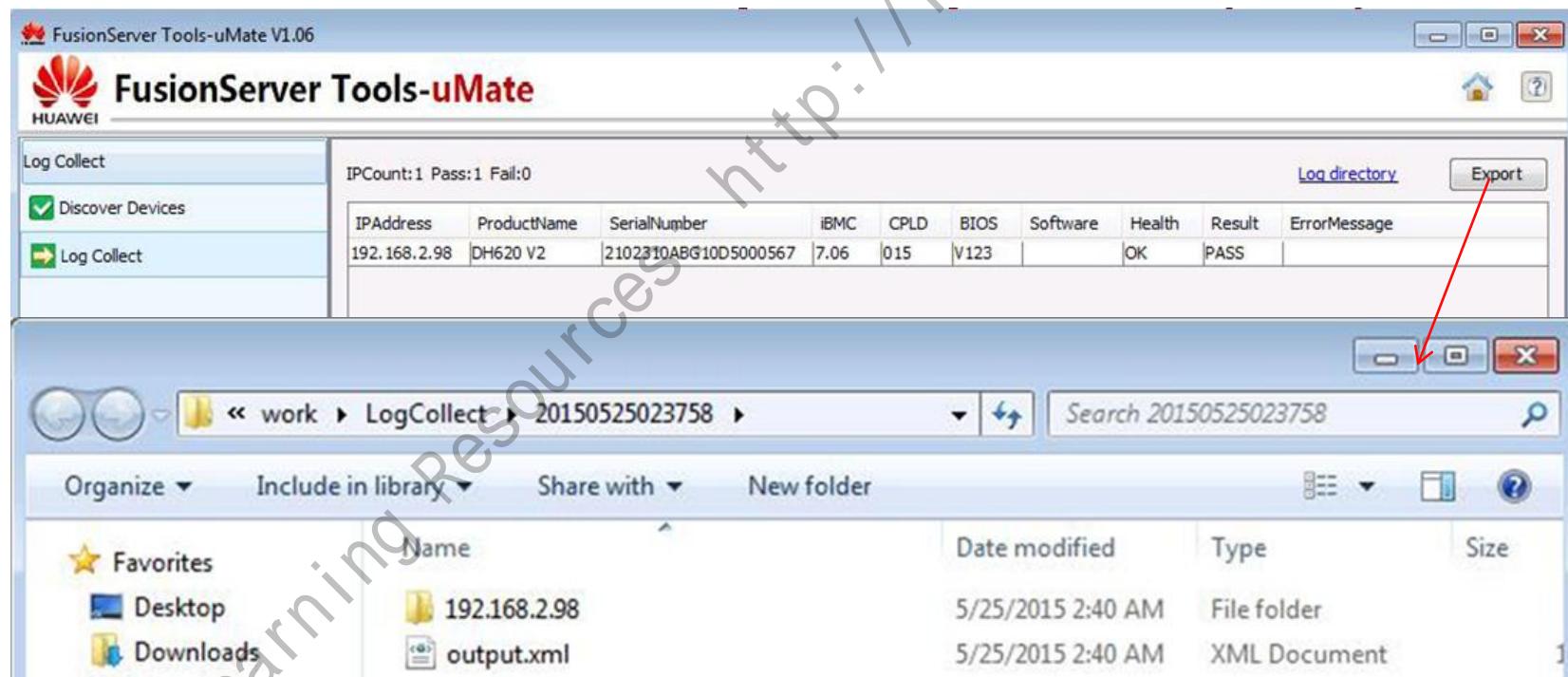
uMate Functions — Inspecting Servers (GUI)

- After the inspection is complete, an inspection report is generated, as shown in the figure below.
- You can export the inspection result by the “Export” button.



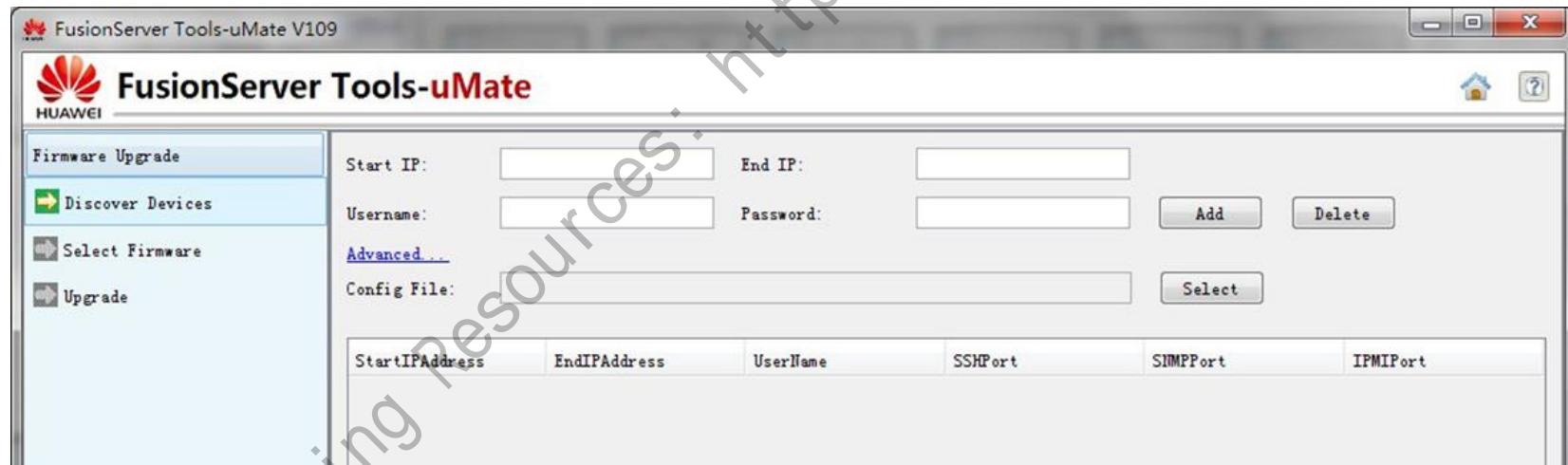
uMate Functions — Inspecting Servers (GUI)

- After servers are inspected, you are advised to collect logs for the servers whose values of **Result** are **Major** or **Minor**.
- The method of adding servers for collecting logs is the same as that of adding servers to be inspected.



uMate Functions — Upgrading Server Firmware (GUI)

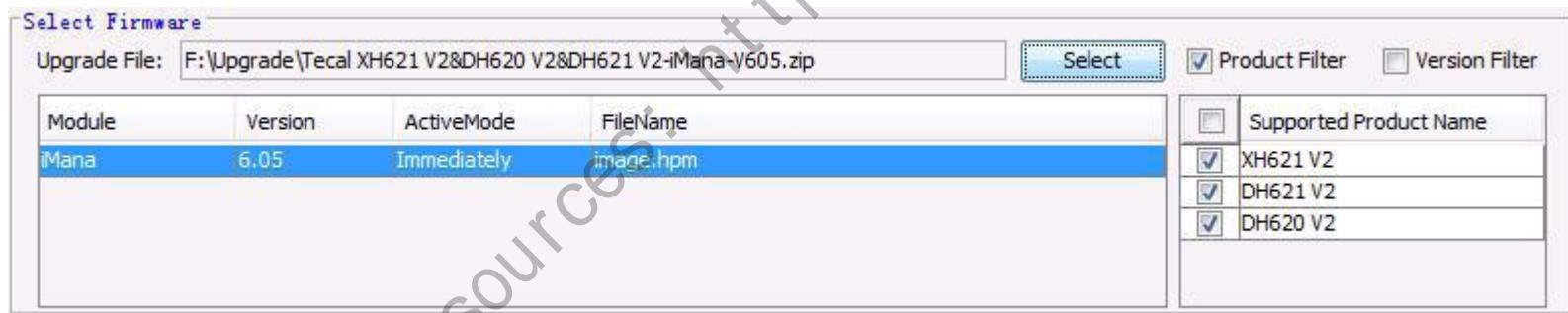
- Before using uMate, check whether uMate supports the server to be upgraded.
- In the uMate main window, choose **Firmware Upgrade**.
- The method of adding servers for upgrading firmware is the same as that of adding servers to be inspected.



uMate Functions — Upgrading Server Firmware (GUI)

- .zip upgrade file

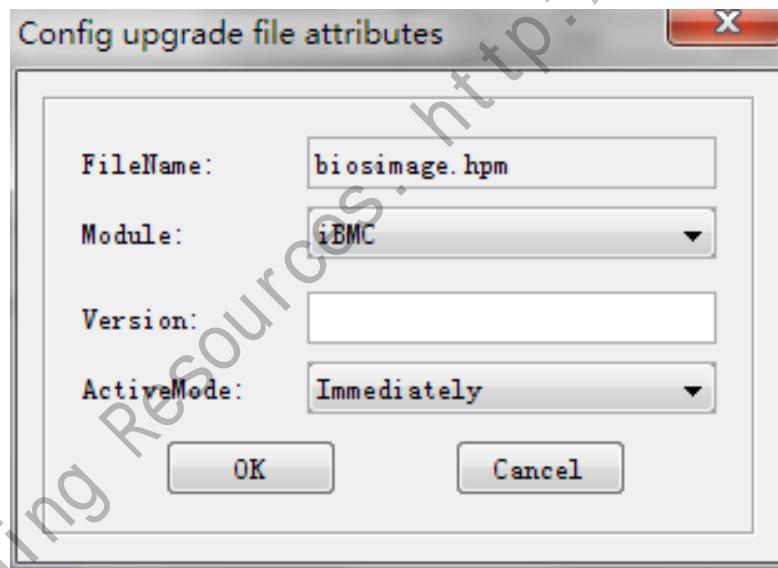
After you select a .zip upgrade file, uMate parses the **version.xml** file in the .zip file, and displays the upgrade file information and supported server names, as shown in the figure below.



uMate Functions — Upgrading Server Firmware (GUI)

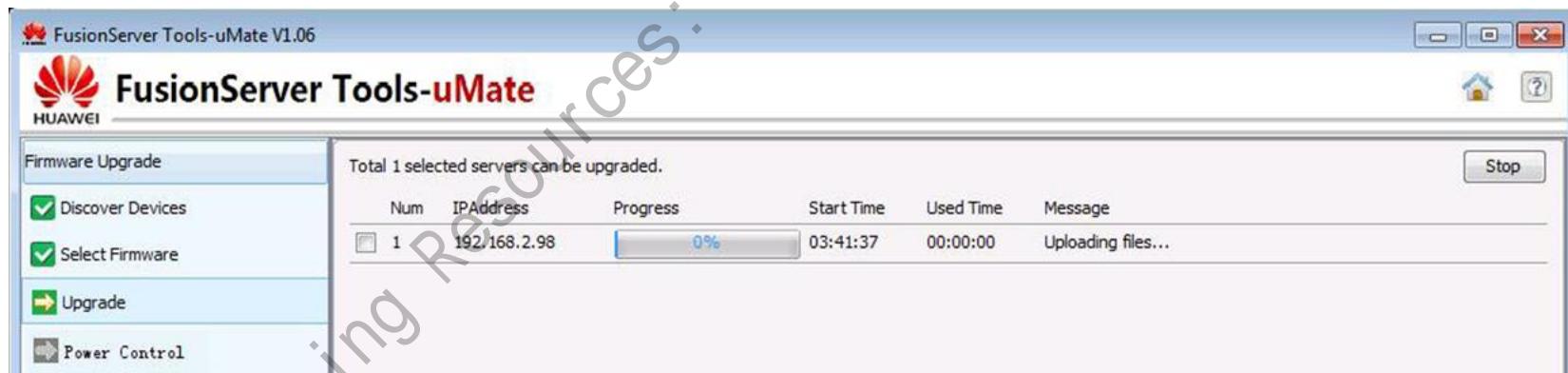
- .hpm upgrade file

After you select an .hpm upgrade file, the dialog box for configuring upgrade file properties is displayed, as shown in the figure below.



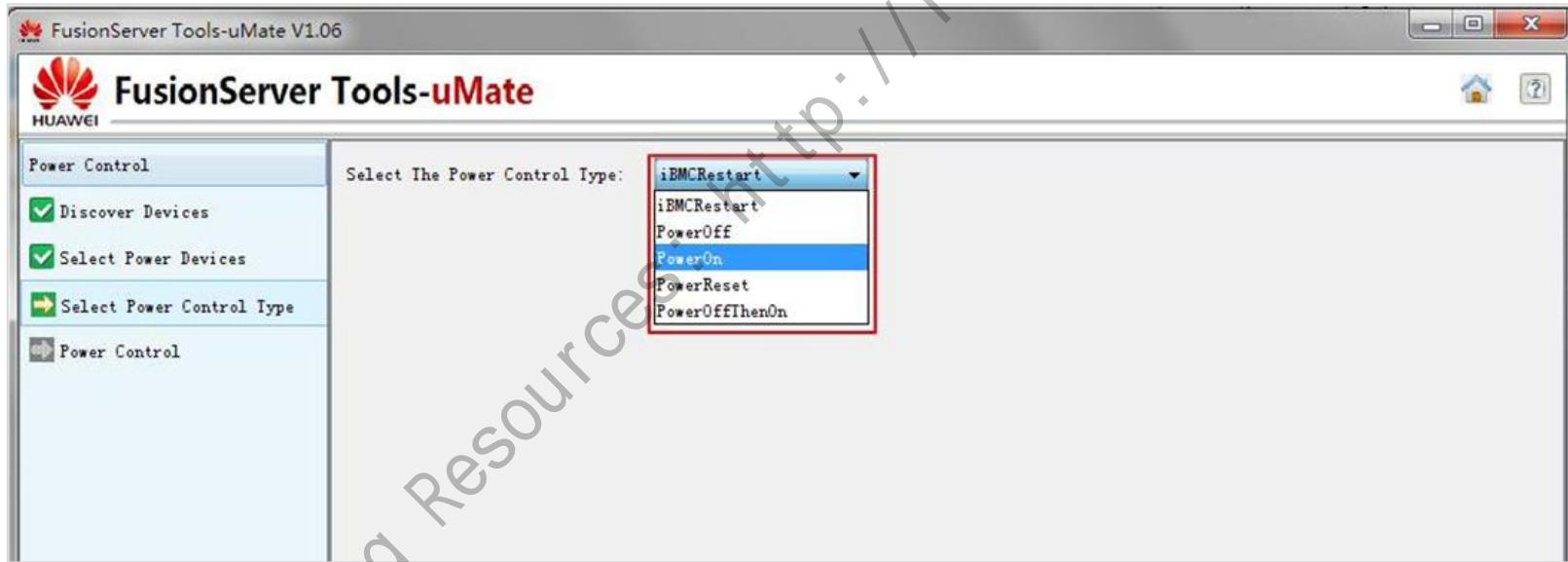
uMate Functions — Upgrading Server Firmware (GUI)

- Select the **Product Filter** check box. uMate filters the server discovery list based on the selected product name, as shown in the left figure below.
- Select the **Version Filter** check box. uMate filters out the servers with the same firmware version, as shown in the left figure below. If you deselect the **Version Filter** check box, uMate does not filter out the servers with the same firmware version.
- Select the servers to be upgraded and click **Next** in the lower right corner. uMate starts to upgrade the server firmware, and the **Upgrade Task** tab page is displayed.
- A BIOS upgrade may cause the loss of BIOS configuration.



uMate Functions — Performing Power Control (GUI)

- Perform batch power control over servers, for example, reset the BMC, power on, power off, or reset the system, or power off and then power on the system.
- The power control function is integrated into the **Firmware Upgrade** function.





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8. Other Tools

ServiceCD 2.0 Overview

- ServiceCD 2.0 is a new intelligent server boot DVD that provides OS installation and RAID configuration functions.
- ServiceCD 2.0 has the following features:
 - Helps users install Windows Server, SLES, Red Hat Enterprise Linux (RHEL), and VMware ESXi, and install drivers required by detected hardware.
 - Provides consistent, wizard-based installation processes.
 - Provides RAID configuration.
The unified RAID configuration UI supports various RAID controller cards.

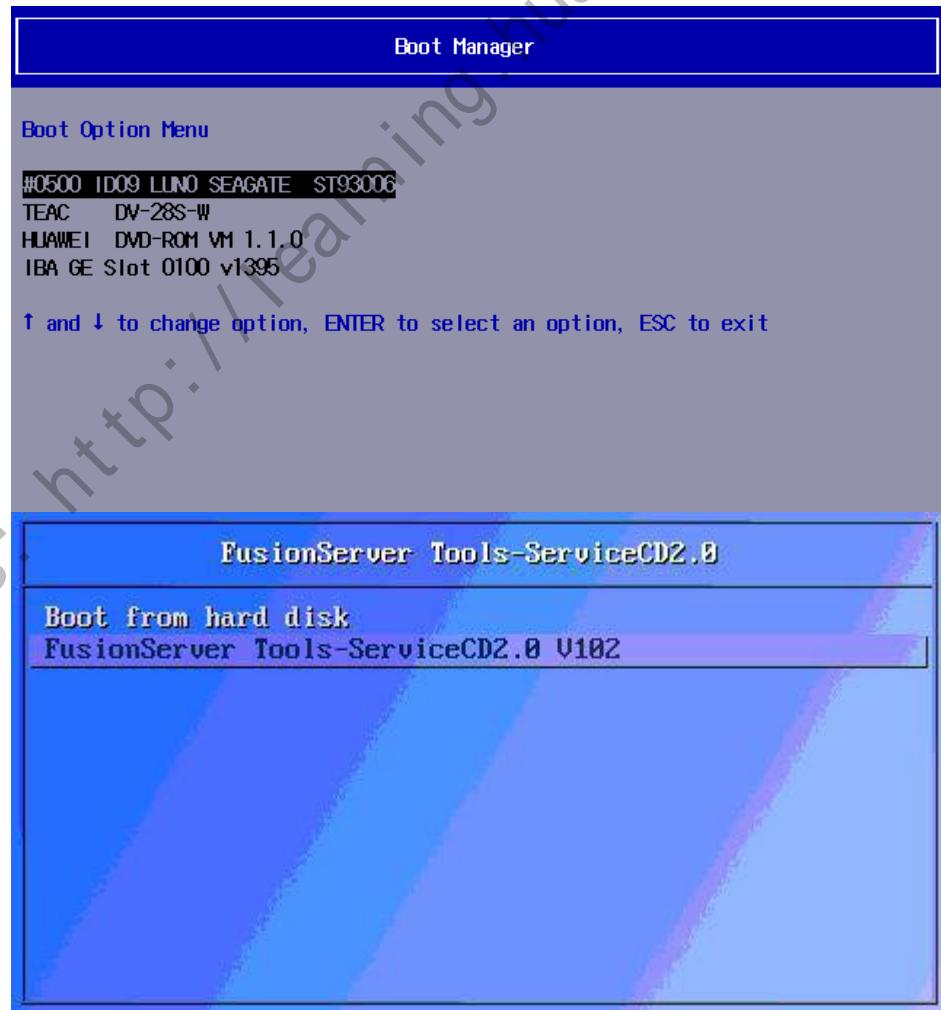
Obtaining ServiceCD 2.0

- How to download software
 - Log in to <http://support.huawei.com/enterprise> and choose **Support**
 > **Downloads > IT > FusionServer > Solution and Software > FusionServer Tools.**

Soft Type	Others	Software Name	Size	Release Date	Downloads	Download
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		FusionServer Tools-ServiceCD2.0-V109.zip Config RAID,Helps you install OSs, including Windows Server, SLES, Red Hat, VMware ESXi, and CentOS	1.06GB	2016/01/12	0	 Download
		FusionServer Tools-Toolkit-V108.zip "FTK is developed for professional personnel to perform server operation and maintenance.	260.68MB	2016/01/12	0	 Download
		FusionServer Tools-uMate-Linux-V115.tar.gz In the Linux operating system, for batch inspection, log collection, upgrade firmware, BIOS configuration, BMC configuration, HMM configuration, the power control operation.	179.51MB	2016/01/12	0	 Download
		FusionServer Tools-uMate-Win-V115.zip In the Windows operating system, for batch inspection, log collection, upgrade firmware, BIOS configuration, BMC configuration, HMM configuration, the power control operation.	210.59MB	2016/01/12	0	 Download

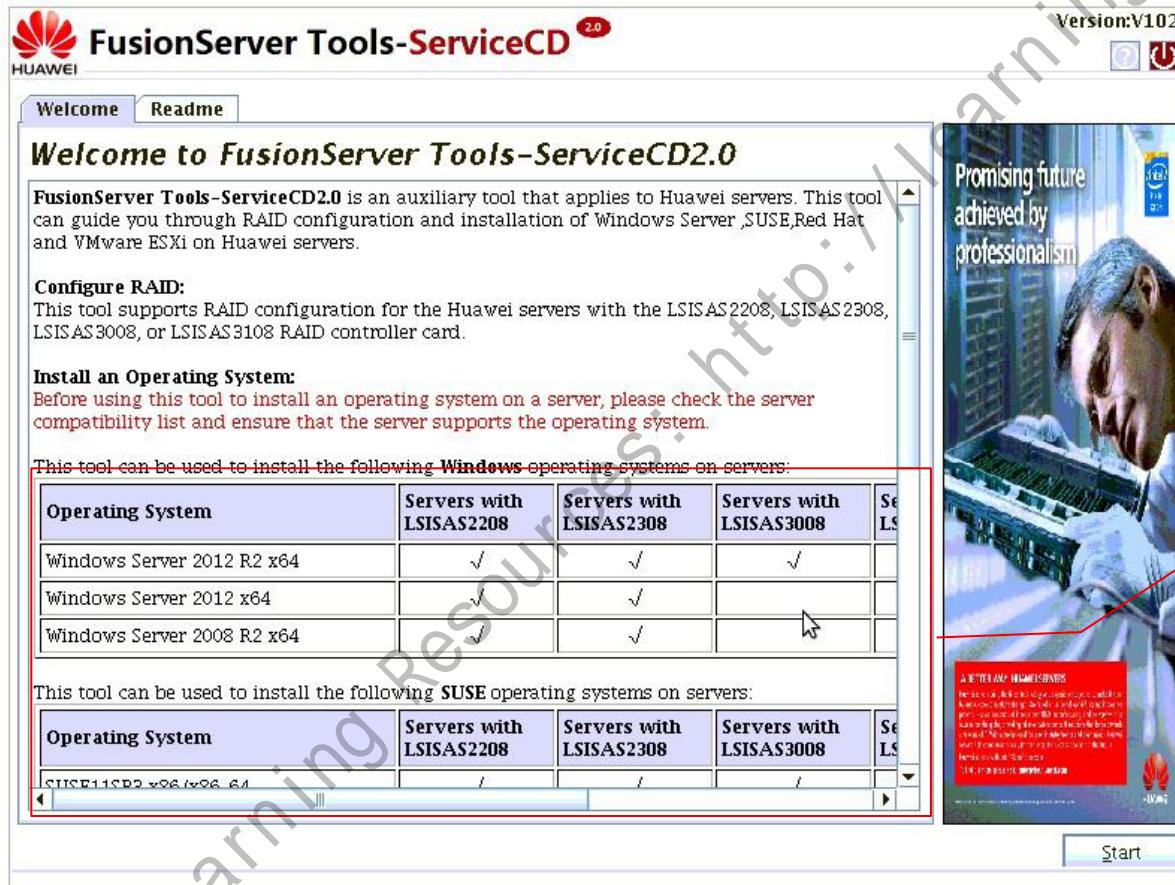
Using ServiceCD 2.0

- Before using ServiceCD 2.0, you need to be familiar with the hardware models and OS versions supported by ServiceCD 2.0.
- Download the ServiceCD 2.0 image file and mount the file by using the virtual KVM.
- Boot from the DVD to start the tool.
- Select **FusionServer Tools-ServiceCD2.0 Vxxx** and press **Enter**.
The system starts to load ServiceCD 2.0.



Using ServiceCD 2.0

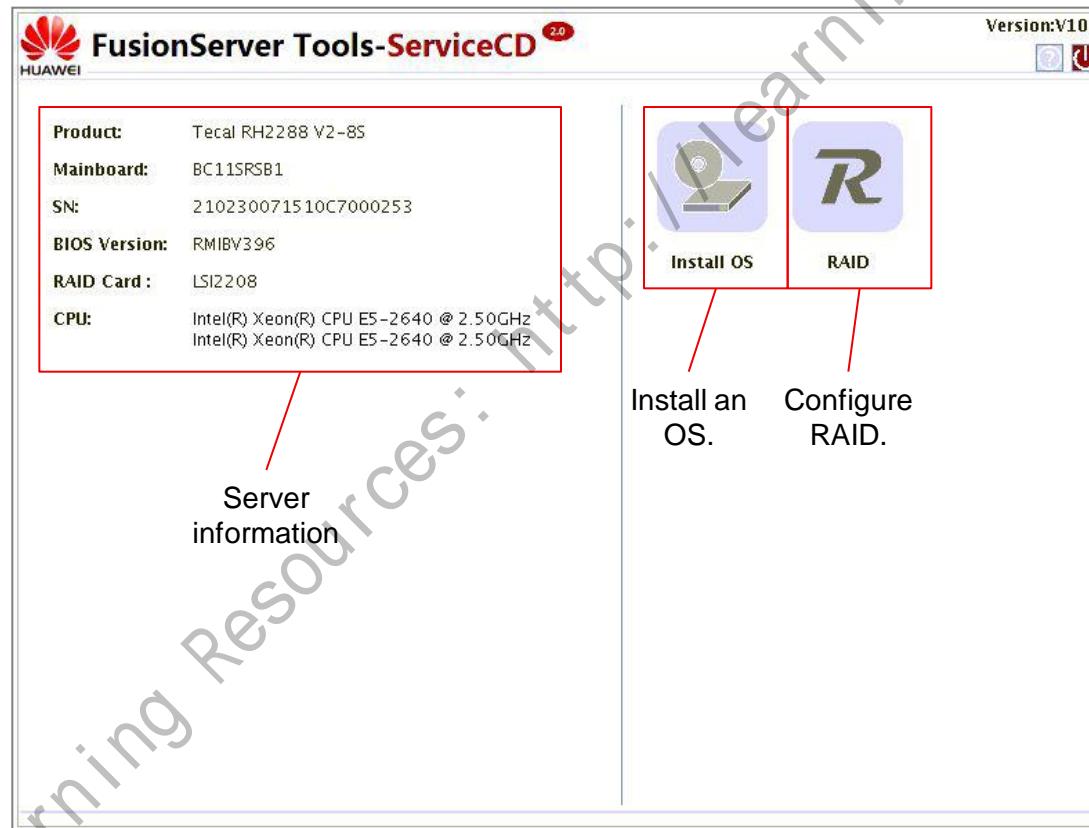
- ServiceCD 2.0 welcome window



View the hardware models and OS versions supported by ServiceCD 2.0.

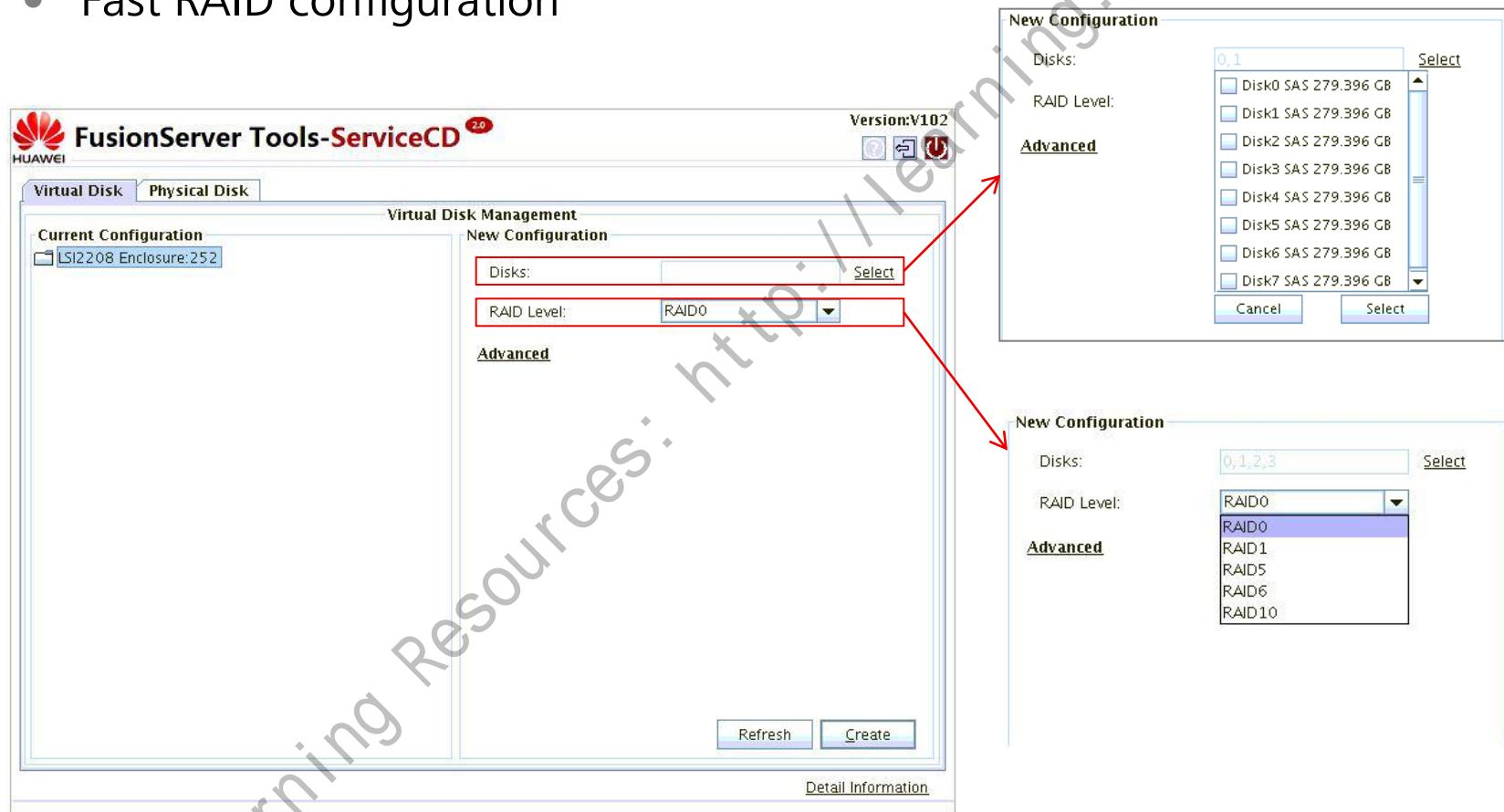
Using ServiceCD 2.0

- ServiceCD 2.0 function window



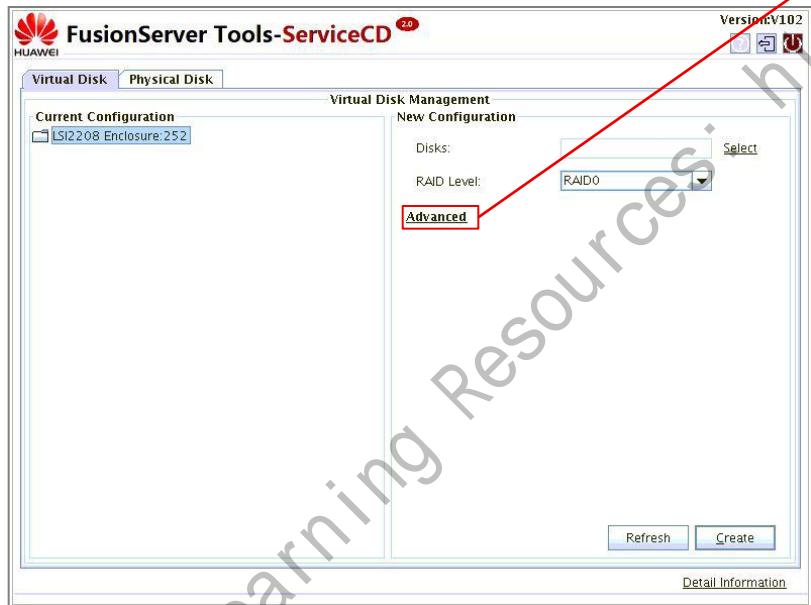
Using ServiceCD 2.0

- Fast RAID configuration



Using ServiceCD 2.0

- Advanced RAID configuration



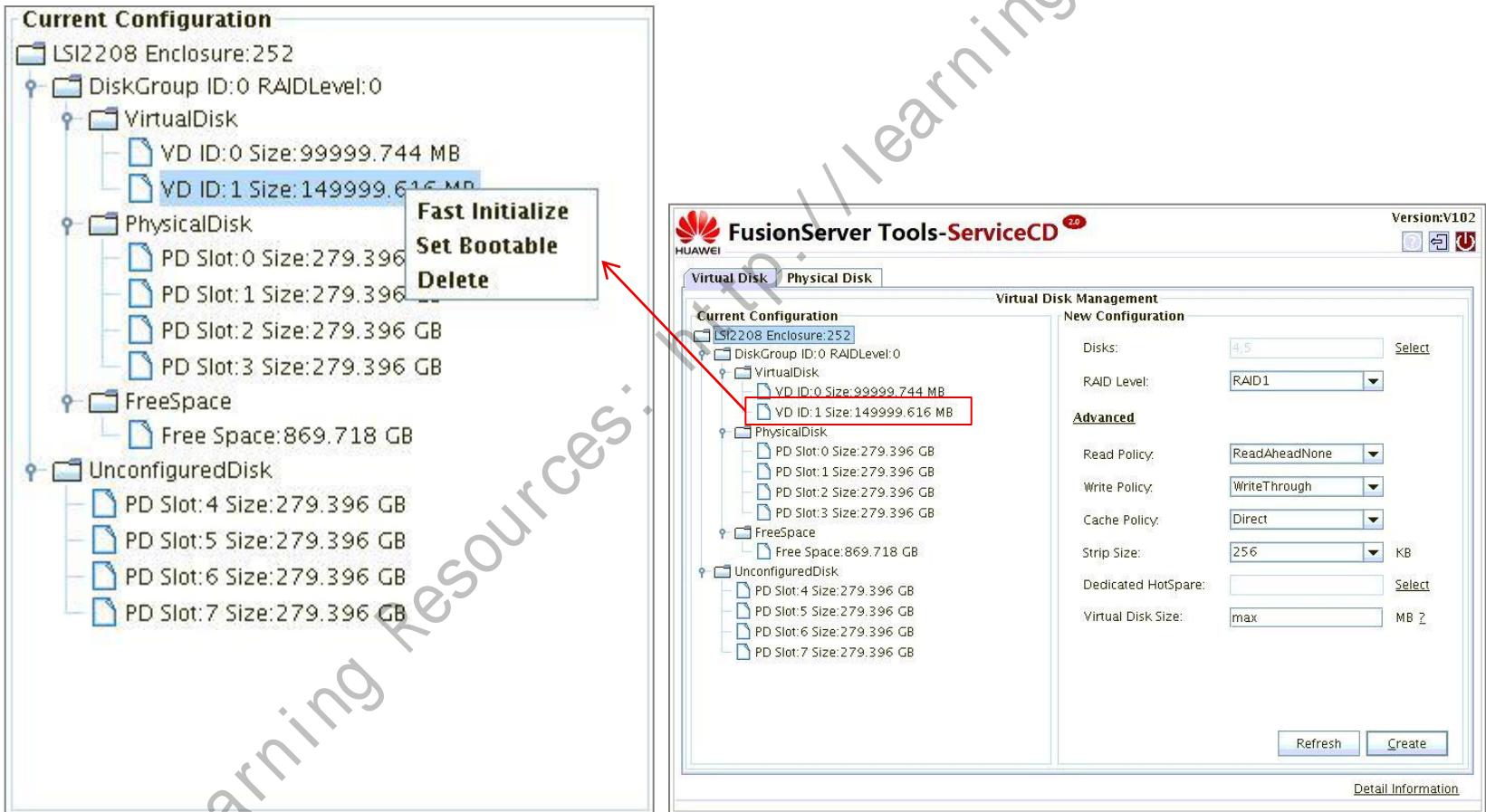
New Configuration

Disks:	0,1,2,3	Select
RAID Level:	RAID10	
<u>Advanced</u>		
Read Policy:	ReadAheadNone	
Write Policy:	WriteThrough	
Cache Policy:	Direct	
Strip Size:	256	KB
Dedicated HotSpare:	4	Select
Virtual Disk Size:	100000,150000	MB ?

Advanced options are available only for the LSISAS2208 and LSISAS3108 controller cards but unavailable for the LSISAS2308 and LSISAS3008 controller cards.

Using ServiceCD 2.0

- Fast initialization of logical disks





Contents

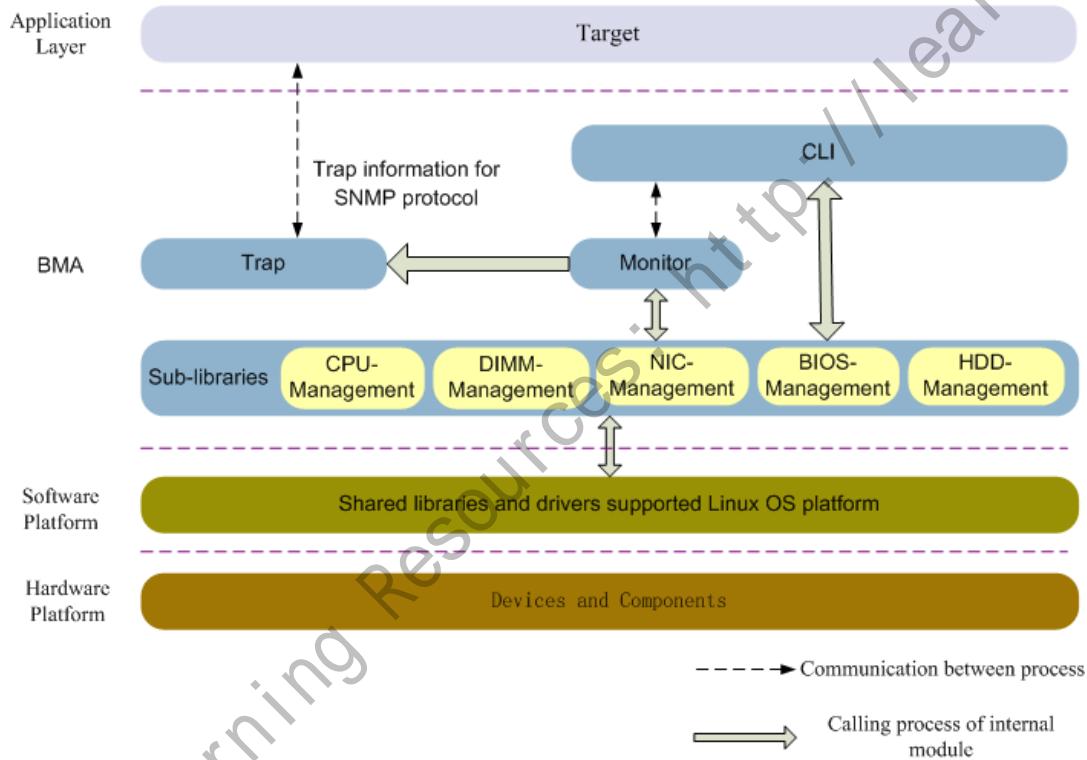
1. Huawei Server Tool System
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iBMA Overview

- iBMA is a piece of in-band management software for Huawei servers.
- iBMA enables you to manage and monitor server components, such as CPUs, hard disks, DIMMs, NICs, and BIOSs.
- iBMA functions:
 - Promptly detects the installation status and changes of components.
 - Promptly monitors component status.
 - Promptly captures, reports, and stores alarms and events.
 - Manages and operates hardware devices.
 - Provides the CLI for easy management.

iBMA Logical Architecture

- iBMA consists of the CLI module, monitor module, trap module, and sub-libraries that manage CPUs, DIMMs, NICs, BIOSs, and hard disks.



iBMA Functions

- CPU management
 - Obtains information about each CPU, including the CPU model, CPU frequency, external clock frequency, number of CPU cores, number of enabled cores, number of threads, and socket ID.
 - Checks for correctable CPU MCEs based on device files provided by the OS in **/dev/mcelog**, and reports alarms when detecting exceptions. Reports major MCEs to the OS kernel for handling.

iBMA Functions

- DIMM management
 - Queries information about each DIMM, including the slot number, voltage, model, capacity, serial number, and manufacturer.
 - Checks for DIMM error checking and correcting (ECC) exceptions, and reports alarms when detecting exceptions.
 - Supports online diagnosis of DDR3 registered DIMMs (RDIMMs).

iBMA Functions

- Hard disk management
 - Queries the model and firmware version of each RAID controller card.
 - Obtains information about each RAID battery, including the battery type, serial number, designed capacity, current capacity, designed voltage, current voltage, current, status, number of charges and discharges, and manufacturer.
 - Obtains information about each hard disk, including the disk capacity, manufacturer, type, serial number, and slot number.
 - Obtains the RAID levels and status (normal, degraded, or offline) of RAID logical disks, slot numbers of physical disks in each RAID array, and mapping between OS drive letters and RAID arrays.
 - Supports hard disk assessment, background short and extended self-test, and self-test record query.
 - Monitors physical disk status (online or offline) and self-monitoring, analysis and reporting (SMART) information, and reports alarms when detecting exceptions.

iBMA Functions

- NIC management
 - Obtains basic information about each NIC, including the manufacturer, model, firmware version, driver name, and driver version.
 - Obtains the status of each network port, including the Peripheral Component Interconnect Express (PCIe) device number, working rate, duplex status, auto-negotiation mode, and link status.

iBMA Functions

- BIOS management
 - Queries the BIOS vendor, version number, and release date.
 - Reads and modifies BIOS configuration.
 - Upgrades the BIOS. BIOS configuration remains unchanged after an upgrade.

iBMA Functions

- Black box
 - Records exception information when the system crashes, and allows you to view the recorded information by running commands.

Installing iBMA

- You can install iBMA on Windows or Linux. For details about the installation method, see the iBMA user guide.
- To install iBMA on Windows, perform the following steps:
 - Enable the iBMC black box function.
 - Install Framework 4.0.
 - Run the wBMAService installation program.

Common iBMA Functions

- iBMA on Linux provides the following functions on the CLI:
 - Diagnoses hard disk faults.
 - Views hard disk diagnosis records.
 - Monitors the SMART status of hard disks.
 - Monitors DIMM ECC status.
 - Queries platform MCE events.
 - Queries black box events.



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InfoCollect Tool Functions and Features

- FusionServer Tools InfoCollect (InfoCollect for short) is used to collect server log files for locating server faults.
- InfoCollect collects the following log files:
 - Linux log files of servers
 - Windows log files of servers
 - Baseboard management controller (BMC) log files of servers
 - Management module log files of blade servers
 - Fabric plane log files of E9000 Ethernet switch modules

Specifications

- InfoCollect specifications for collecting OS log files

Feature	Specifications
Supported products	Huawei V2 and V3 servers
Linux log file collection	Supported mainstream Linux 64-bit operating systems (OSs): <ul style="list-style-type: none">Red Hat Enterprise Linux (RHEL) 6.4, 6.5, and 6.6 64-bitSUSE Linux Enterprise Server (SLES) 11.1, 11.2, 11.3 64-bitCentOS 6.4, 6.5, and 6.6 64-bit
Windows log file collection	Supported Windows OSs: <ul style="list-style-type: none">Windows Server 2008 32-bit and 64-bitWindows Server 2012 and Windows Server 2012 R2

Specifications

- InfoCollect specifications for collecting BMC, management module, and switch module log files.

Feature	Specifications
BMC log file collection	Supported Huawei servers: <ul style="list-style-type: none">Rack servers, for example, RH2288H V3High-density server nodes, for example, XH628 V3
Management module log file collection	Supported management modules of E9000 blade servers: <ul style="list-style-type: none">MM910
Switch module log file collection	Supported E9000 Ethernet switch modules: <ul style="list-style-type: none">CX310/CX311/CX312CX910/CX911/CX912

Precautions for Using InfoCollect

- Only professionals are qualified to use InfoCollect. You are advised to use the latest version of InfoCollect.
- Before using InfoCollect, introduce this tool to the customer.
- Before performing any maintenance operations by using InfoCollect, obtain written authorization from the customer. Unauthorized operations are forbidden.
- Before transmitting fault locating data out of the customer's network, obtain written authorization from the customer.
- Use InfoCollect in accordance with the local applicable laws and regulations.
- After fault diagnosis, delete local log files.
- Before using InfoCollect, you are advised to back up key data.

Obtaining Version Files

- To obtain the latest version, log in to <http://e.huawei.com>, and choose **Support > Downloads > IT > FusionServer > Solution and Software > FusionServer Tools**.
- Click  to download the InfoCollect package.
- Decompress the package to obtain the folder shown in below.

Name	Date modified	Type	Size
 InfoCollect_BMC_MM_Switch	1/13/2016 9:20 AM	File folder	
 FusionServer Tools V100R002 InfoCollect User Guide 07.pdf	1/8/2016 5:31 AM	Firefox HTML Docu...	1,247 KB
 FusionServer Tools V100R002 InfoCollect 用户指南 07.pdf	1/7/2016 6:58 PM	Firefox HTML Docu...	1,449 KB
 InfoCollect_Linux.zip	1/13/2016 9:34 AM	好压 ZIP 压缩文件	5,572 KB
 InfoCollect_Windows.zip	1/13/2016 9:34 AM	好压 ZIP 压缩文件	40,544 KB

Uploading the Tool

- Before collecting Linux log files from a server, upload the **InfoCollect_Linux.tar.gz** file to the server using the SSH client.
- The path where the tool is located cannot contain spaces.



Collecting Linux Log Files

- InfoCollect_Linux.tar.gz allows you to collect Linux log files by simply clicking the mouse.
- For the log files that can be collected and the collection commands please refer to the *FusionServer Tools Vxxx InfoCollect User Guide xx*

Module	Log File	Collection Command	File Description
Common	version.txt	This file comes with InfoCollect.	InfoCollect version and release time
	filelist.txt	This file is generated by InfoCollect.	List of collected files
BIOS	version_bios.txt	dmidecode -t bios	BIOS version
BMC	fru.txt	ipmitool fru list	Field replaceable unit (FRU) information
	bmc_lan.txt	ipmitool lan print 1	BMC NIC information
	mc_info.txt	ipmitool mc info	BMC version
	sensor.csv	ipmitool sensor list	All sensor information
	sdr.csv	ipmitool sdr list	Sensor data record (SDR) log file

Collecting Linux Log Files

- Conditions
 - The server for which you want to collect log files is a Huawei V2 or V3 server. (InfoCollect applies only to Huawei V2 and V3 servers.)
 - The InfoCollect_Linux.tar.gz file has been uploaded to the target server.
 - You have logged in to Linux as a user with an ID of 0, for example, root.
 - You have backed up key data, and checked the CPU usage, memory usage, and available disk space to ensure that InfoCollect is operating properly.

Querying user information

```
RH2288A:/home # whoami  
root  
RH2288A:/home # id  
uid=0(root) gid=0(root) groups=0(root),105(sfcb)
```

Collecting Linux Log Files

- Procedure

Step1 Check that the **InfoCollect_Linux.tar.gz** file has been uploaded.

Step2 Run the **tar -zxvf InfoCollect_Linux.tar.gz** command on the OS to decompress the **InfoCollect_Linux.tar.gz** file.

```
[root@localhost home]# ls  
InfoCollect_Linux.tar.gz  
[root@localhost home]# tar -zxvf InfoCollect_Linux.tar.gz
```

Step3 Run the **cd InfoCollect_Linux** command.

```
[root@localhost home]# ls  
InfoCollect_Linux  InfoCollect_Linux.tar.gz  
[root@localhost home]# cd InfoCollect_Linux
```

Step4 (Optional) Specify the log files to be collected.

Modify the **config.ini** file in the **InfoCollect** directory to specify the log files to be collected.

Collecting Linux Log Files

Change the value of **flag** to specify whether to collect a log file. InfoCollect collects all log files by default.

Confirm the log files to be collected. If you do not want to collect a log file, set **flag to no**.

Modular	filename	flag	description
bios	version_bios.txt	yes	BIOS version
bmc	fru.txt	yes	FRU component information
bmc	mc_info.txt	yes	BMC version
bmc	sensor.csv	yes	Sensor information
bmc	sdr.csv	yes	SDR log files
bmc	sel.csv	yes	BMC SEL log files
bmc	time.txt	yes	BMC, BIOS, and OS time

Step5 Collect log files.

Run the **./infoCollect.sh** command.

```
[root@localhost InfoCollect_Linux]# ls  
infoCollect.sh modules  
[root@localhost InfoCollect_Linux]# ./infoCollect.sh
```

Collecting Linux Log Files

The collection process will last several minutes.

- Supported mainstream Linux 64-bit operating systems (OSS):
RedHat/CentOS 6.4 ~ 6.6 x64
SLES 11.1 ~ 11.3 x64
- Only professionals are qualified to use this tool.
- Before performing any maintenance operations by using this tool, obtain authorization from the customer.
- Before transmitting fault locating data out of the customer's network, obtain written authorized from the customer.
- Use the latest version:
<http://e.huawei.com>, and choose Support>Downloads>IT>FusionServer>Solution and Software>FusionServer Tools.

```
=====
[bios]...                                Done
[bmc]...                                 Done
[cpu]...                                 Done
[disk]...                                Done
[driver]...                             Done
[hba]...                                 Done
[mainboard]...                           Done
[memory]...                            Done
[nic]...                                 Done
Collect [sasraaidlog.txt] ..... please wait █
```

Collecting Linux Log Files

Step6 If the information shown in Figure below is displayed after log file collection is complete, manually collect crash files to your local computer.

```
==[ DONE ]=====
Log file Dir: /InfoCollect_Linux/abc_20151228_063036.tar.gz
Log file size: 15M
Log file md5sum: 765afeed27793f59fc86386b9b3f0200
Please collect crash files[/var/crash] manually.
=====
```

Compare the content of the collected filelist.txt file with the content shown below to check whether all required log files are collected. You can filter and compress log files.

```
bios Dir file list:
1 bios/version_bios.txt

bmc Dir file list:
1 bmc/time.txt
2 bmc/fru.txt
3 bmc/sdr.csv
4 bmc/version_cpld.txt
5 bmc/sensor.csv
6 bmc/mc_info.txt
7 bmc/bmc_lan.txt
8 bmc/sel.csv

cpu Dir file list:
1 cpu/cpu_dmidecode.txt
2 cpu/cpuinfo.txt
```

```
disk Dir file list:
1 disk/parted_disk.txt
2 disk/sys_block.txt
3 disk/smartctl_hdd.txt
4 disk/hwdiag_hdd.txt

driver Dir file list:
1 driver/lsmod.txt
2 driver/modinfo.txt
```

Collecting Windows Log Files

- InfoCollect_Windows.zip allows you to collect Windows log files by simply clicking the mouse.
- For the log files that can be collected and the collection commands please refer to the *FusionServer Tools Vxxx InfoCollect User Guide xx*

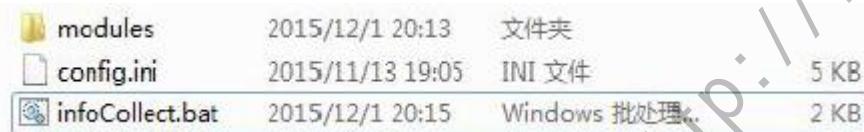
Module	Log File	Collection Command	File Description
Common	version.txt	This file comes with InfoCollect.	InfoCollect version and release time
	filelist.txt	This file is generated by InfoCollect.	List of collected files
CPU	cpuinfo.txt	wmic cpu list full	CPU information
Disk	physicaldisk.txt	wmic diskdrive list full	Physical disk information
	logicaldisk.csv	wmic logicaldisk list full	Logical disk information
	volume.csv	wmic volume list full	Volume information

Collecting Windows Log Files

- Conditions
 - The server for which you want to collect log files is a Huawei V2 or V3 server. (InfoCollect)
 - applies only to Huawei V2 and V3 servers.)
 - The **InfoCollect_Windows.zip file has been uploaded to the target server.**
 - You have logged in to Windows as an administrator.
 - You have backed up key data, and checked the CPU usage, memory usage, and available disk
 - space to ensure that InfoCollect is operating properly.

Collecting Windows Log Files

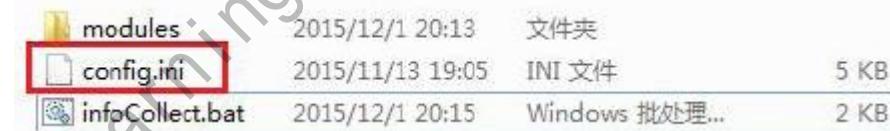
- Procedure
 - **Step 1** Decompress the InfoCollect_Windows.zip file.
 - **Step 2** Run the *cd InfoCollect_Windows* command.



- **Step 3** (Optional) Specify the log files to be collected.

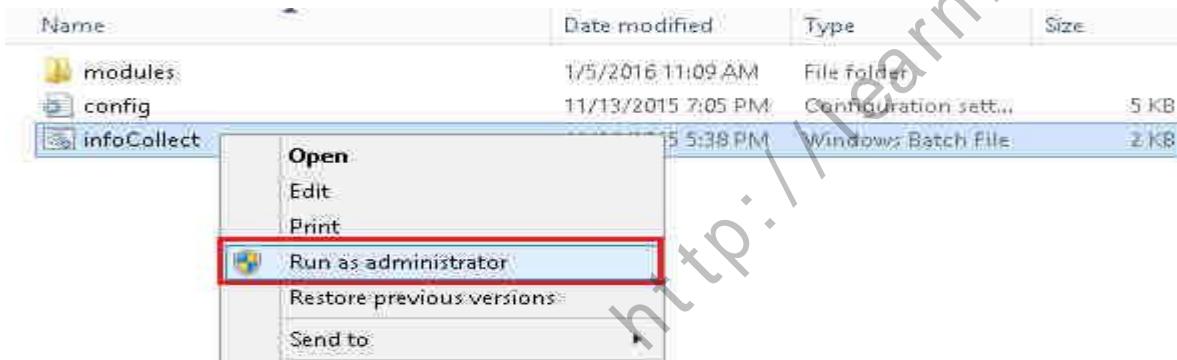
Modify the config.ini configuration file in the InfoCollect directory to specify the log files to be collected.

You are advised to check the log files to be collected. If you do not want to collect a log file, set **flag** to **no**.



Collecting Windows Log Files

- **Step 4** Right-click the infoCollect.bat file and choose Run as administrator from the shortcut menu.



- **Step 5** If the information shown in Figure below is displayed after log file collection is complete, manually collect crash files to your local computer.

```
Log file Dir: E:\InfoCollect_Windows\ Server -20151201-211130.zip
Log file size: 10.31MB
Log file md5sum:d38573c18c2b5d8a5b3a4f4cea72cf19
There are crash files in the C:\Windows\MEMORY.DMP, please collect these files manually
There are crash files in the C:\Windows\Minidump, please collect these files manually
```

Collecting Windows Log Files

- Step 6 Compare the content of the collected filelist.txt file with the content shown in Figure below to check whether all required log files are collected. You can filter and compress log files.

```
filelist.txt
1 cpu Dir file list:
2     1 cpu\cpuinfo.txt
3
4 disk Dir file list:
5     1 disk\cdrom.txt
6     2 disk\diskquota.txt
7     3 disk\logicaldisk.csv
8     4 disk\partition.txt
9     5 disk\physicaldisk.txt
10    6 disk\volume.csv
11
12 driver Dir file list:
13     1 driver\drivernodes.txt
14     2 driver\driverquery.csv
15     3 driver\drivers.txt
17 mainboard Dir file list:
18     1 mainboard\baseboard.csv
19     2 mainboard\bioslist.csv
20     3 mainboard\csproduct.csv
21
22 memory Dir file list:
23     1 memory\devicememoryaddress.txt
24     2 memory\dmachannel.txt
25     3 memory\memcache.txt
26     4 memory\memorychip.txt
27     5 memory\memphysical.csv
28     6 memory\pagefile.txt
```

Collecting BMC/MM or E9000 Switch Log Files

- Conditions
 - The server for which you want to collect log files is a Huawei V2 or V3 server. (InfoCollect applies only to Huawei V2 and V3 servers.)
 - The InfoCollect directory has sufficient available disk space for storing collected log files.
 - Collect the log files of management modules and switch modules during off-peak hours to minimize the impact on services.

Collecting BMC/MM or E9000 Switch Log Files

- Procedure

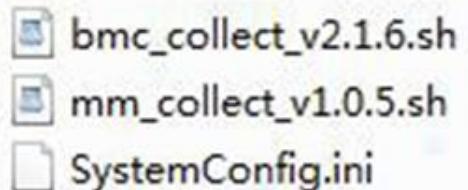
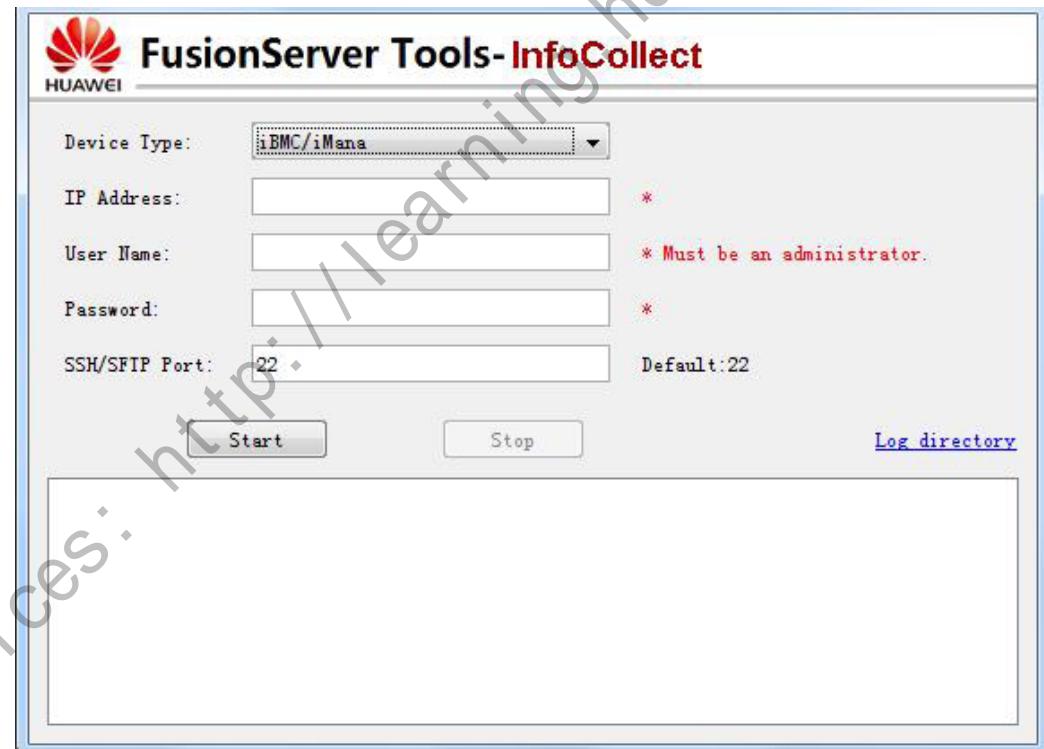
Step 1 Go to the InfoCollect_BMC_MM_Switch folder.

名称	修改日期	类型	大小
config	2015/12/23 21:22	文件夹	
image	2015/12/23 21:26	文件夹	
jre	2015/12/23 15:22	文件夹	
lib	2015/12/23 15:19	文件夹	
tools	2015/12/23 15:19	文件夹	
bin	2015/12/23 21:45	文件	970 KB
InfoCollect.exe	2015/12/18 11:51	应用程序	445 KB

Step 2 Double-click the infoCollect.exe file to run InfoCollect.

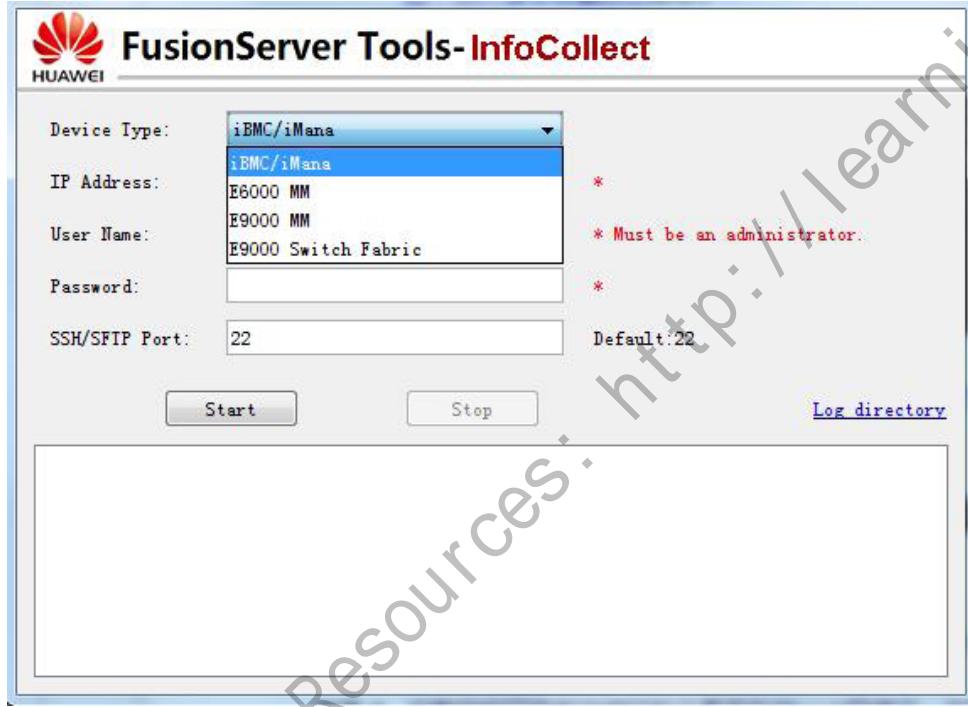
Collecting BMC/MM or E9000 Switch Log Files

1. Set **User Name** to an administrator (for example, root) for collecting log files.
2. To collect log files by using InfoCollect, you need to set only **IP Address**, **User Name**, and **Password**. To configure advanced settings, go to the config folder and modify the **SystemConfig.ini** file
3. Use the text editor to open the **SystemConfig.ini** file.



Collecting BMC/MM or E9000 Switch Log Files

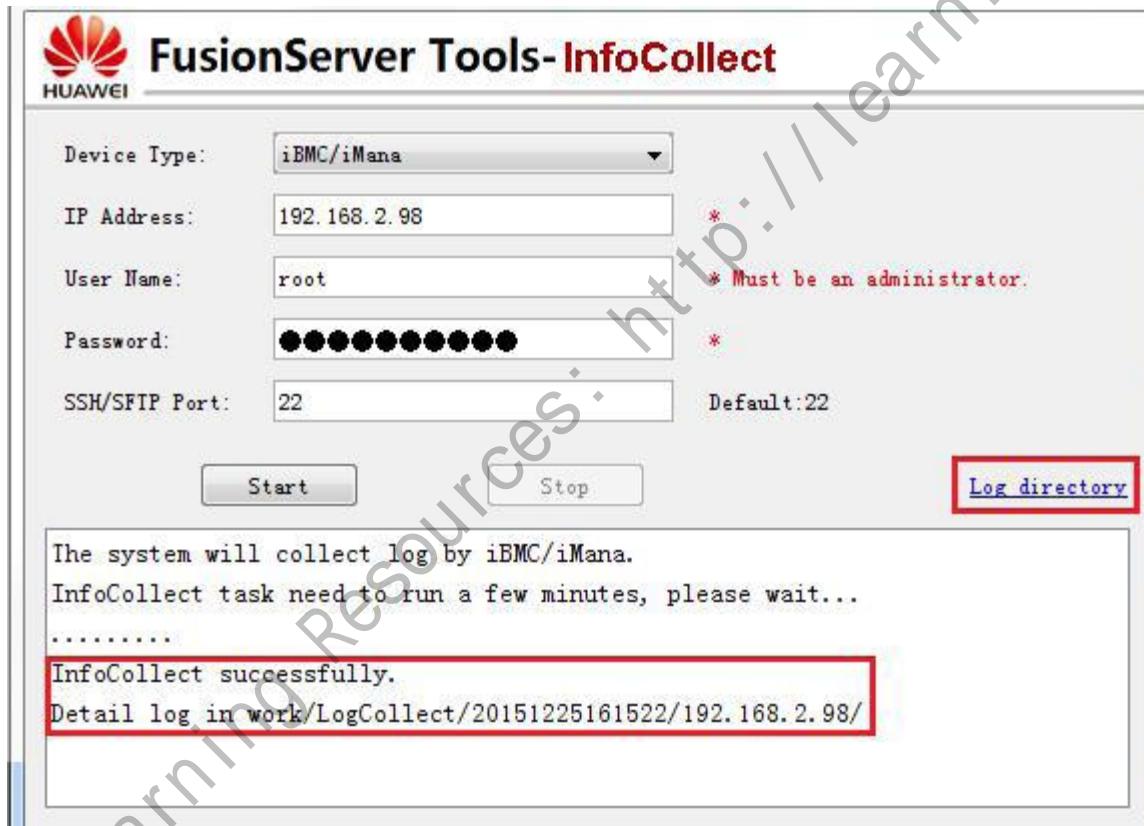
Step 3 Select an option from the Device Type drop-down list.



Step 4 Set IP Address to the IP address of the target device (BMC, management module, or E9000 switch module Fabric plane), set User Name, Password, and SSH/SFTP Port (22 by default). Click **Start** to collect log files.

Collecting BMC/MM or E9000 Switch Log Files

Step 5 After log file collection is complete, the message "InfoCollect successfully" is displayed.



Collecting BMC/MM or E9000 Switch Log Files

Step 6 Click Log directory to go to the log directory.

Name	Date modified	Type	Size
4846FB01D452 20160113024823.tar.gz	1/13/2016 9:43 AM	好压 GZ 压缩文件	311 KB

ESN **Collection Time**

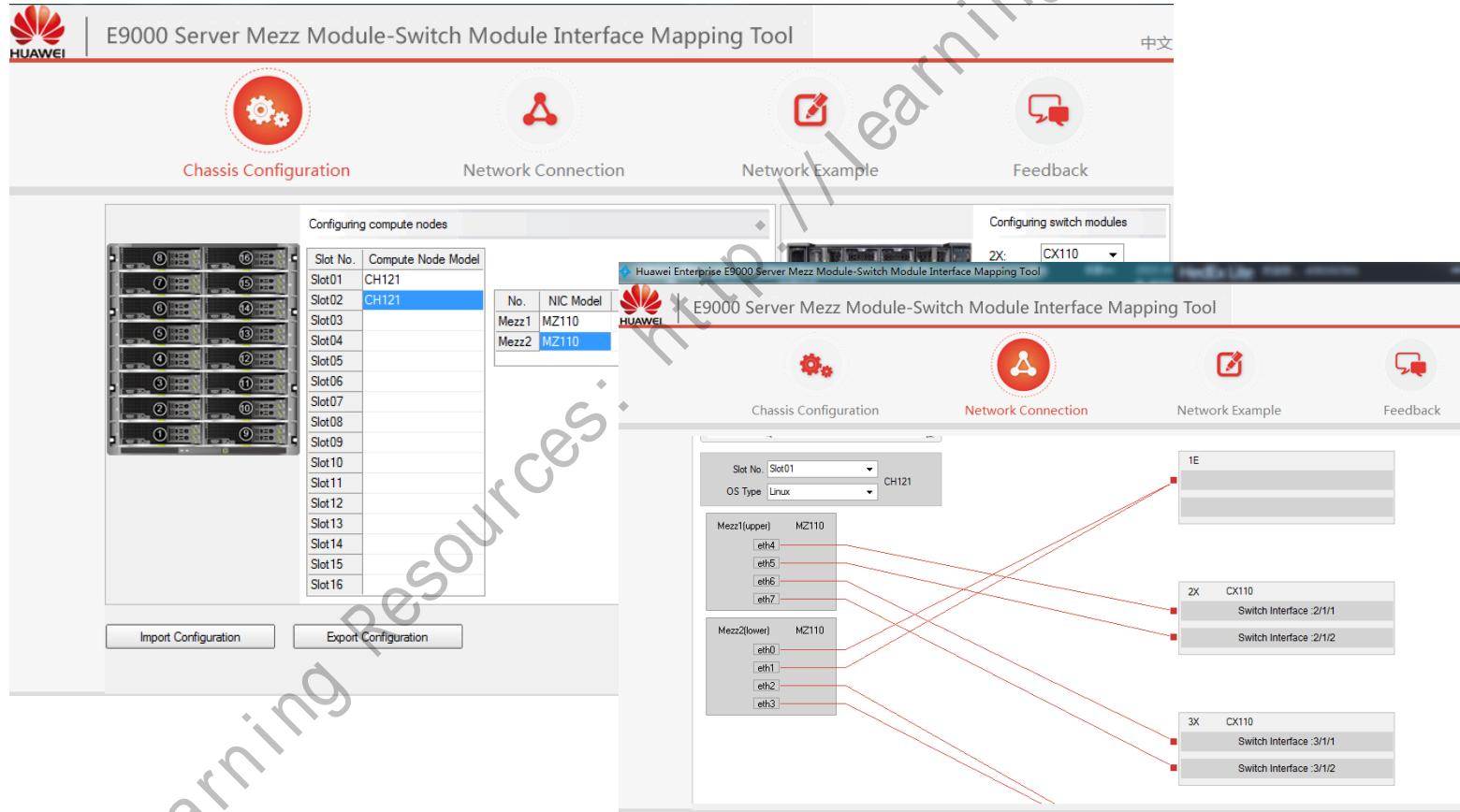


Contents

1. Huawei Server Tool System
2. FTK
3. uMate
4. ServiceCD 2.0
5. iBMA
6. InfoCollect
- 7. Blade Server Tools**
8. Other Tools

E9000 Networking Assistant

- E9000 Server Mezz Card-Switch Module Interface Mapping Tool.



E9000 Switch Centralized Management Configuration Tool: easyLink

- easyLink helps you in switch configuration for E9000 switch modules.
- The centralized switch management configuration function allows you to configure network settings of switch modules and network interface card (NIC) modules.
- For its usage methods, see *MM910 Management Module User Guide*.

The screenshot shows the HMM Web interface with the following details:

- Header:** Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans, Alarm Monitoring, System Management (Independent Chassis), root, Help.
- Left Navigation Tree:** Stateless Computing Management, Profile Management, MAC Address Pool Management, **easyLink Configuration** (selected), Switch Centralized Management (under easyLink Configuration), Configuration Wizard, Switch Configuration, NIC Profile.
- Breadcrumbs:** Stateless Computing > easyLink Configuration > Switch Centralized Management.
- Buttons:** Edit, Help.
- Content Area:** A warning message box contains:
 - If the switch centralized management function is enabled for the first time (ON), you are advised to click Configuration Wizard on the left navigation tree, and follow the wizard to create and deliver profile
 - When the switch centralized management function is enabled (ON), the IP address of management network port and gateway and subnet mask on the 10GE switching plane can be set only with the switch configuration
 - When the switch centralized management function is enabled (ON), the save operation performed on the Fabric plane does not synchronize the configurations to the HMM. Switch configuration uses the data configured in switch policies that associate with the HMM
- Switch Centralized Management Configuration:** ON.



Contents

1. Huawei Server Tool System
2. FTK
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5. iBMA
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7. Blade Server Tools
- 8. Other Tools**

Huawei Server DIMM Configuration Assistant

- Online tool for viewing DIMM positions on a server
 - Online tool, free from download and installation
 - Customized server configuration
 - Graphical display
 - Configuration result printout and local storage
- Tool link:
<http://support.huawei.com/onlinetool/datums/dimmtool/index.jsp>

Huawei Server DIMM Configuration Assistant

 Enterprise Huawei Server DIMM Configuration Assistant

DIMM Configuration Feedback

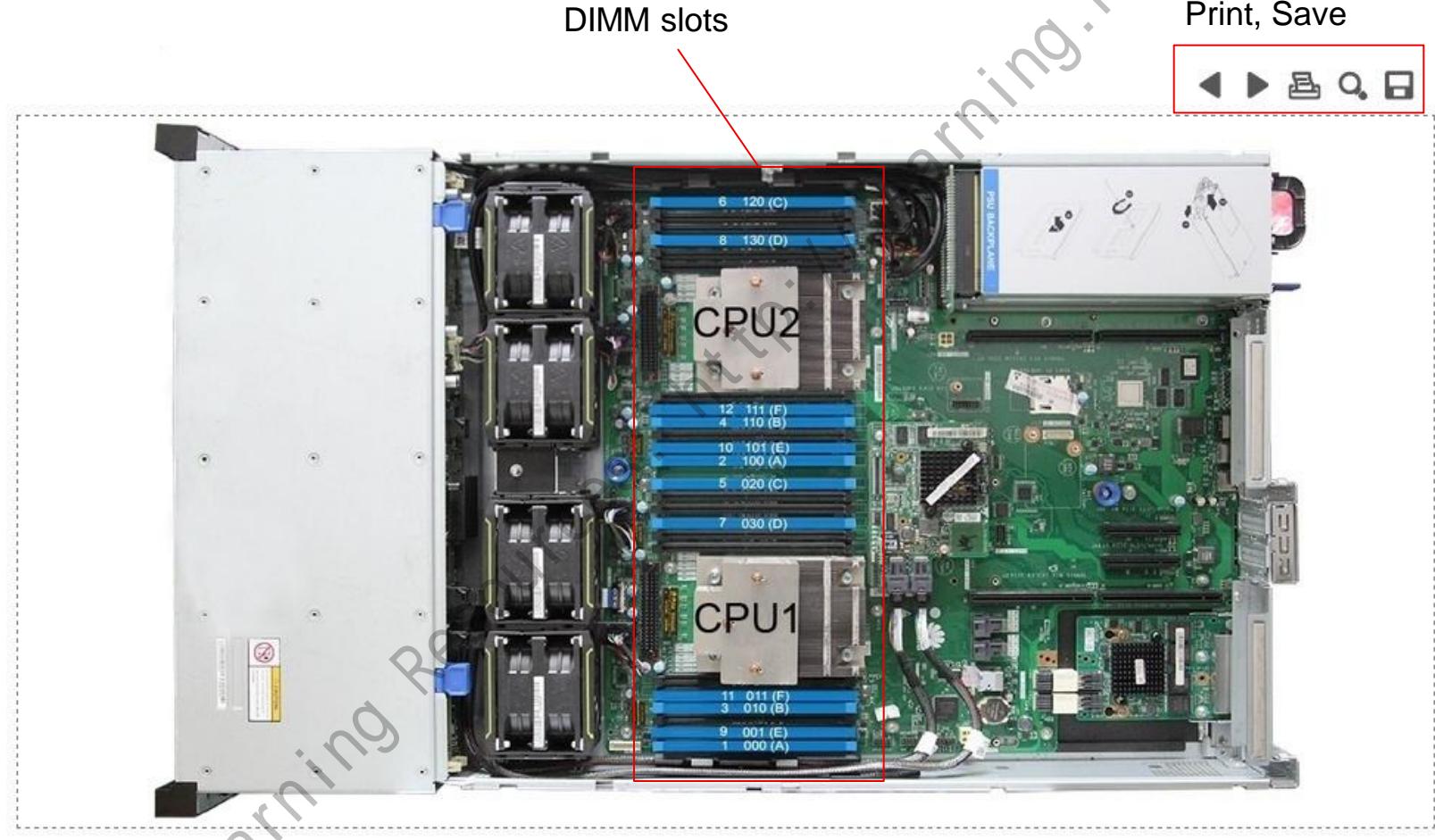
Select server configuration

Product name:	RH1288 V3
CPU:	2
DIMM:	12

Installation sequence
If only CPU 1 is installed, install DIMMs in slots 000(A), 010(B), 020(C), 030(D), 001(E), 011(F), 021(G), and then 031(H) in sequence.
If CPUs 1 and 2 are installed, install DIMMs in slots 000(A), 100(A), 010(B), 110(B), 020(C), 120(C), 030(D), 130(D), 001(E), 101(E), 011(F), 111(F), 021(G), 121(G), 031(H), and then 131 (H) in sequence.

DIMM configuration rules

Huawei Server DIMM Configuration Assistant



Huawei Server Compatibility Checker

- Online tool for checking Huawei server compatibility
 - OS compatibility
 - Parts compatibility
- <http://support.huawei.com/onlinetoolsweb/ftca/en>

The screenshot shows the Huawei Server Compatibility Checker web interface. At the top left is the Huawei logo. To its right is the title "Huawei Server Compatibility Checker". On the far right is a link to "中文" (Chinese). Below the title is a navigation bar with two tabs: "Search OSs" (highlighted in red) and "Search Parts". Underneath the navigation bar is a section labeled "* Product Model" with a dropdown menu. To the right of this is a table with four rows, each containing a "Part" name and two dropdown menus for "Type" and "Model". The rows are: "CPU", "+ Mezz Card", "+ RAID Card", and "4K Disks". At the bottom right of the form are two buttons: "Reset" and "Search".

Part	Type	Model
CPU	<input type="button" value="▼"/>	<input type="button" value="▼"/>
+ Mezz Card	<input type="button" value="▼"/>	<input type="button" value="▼"/>
+ RAID Card	<input type="button" value="▼"/>	<input type="button" value="▼"/>
4K Disks	<input type="button" value="▼"/>	<input type="button" value="▼"/>

Huawei Server Compatibility Checker

- OS compatibility checking

The screenshot shows the Huawei Server Compatibility Checker interface. At the top, there are two search bars: "Search OSs" and "Search Parts". Below them is a section titled "* Product Model" containing a dropdown menu set to "RH2288H V3". This section is highlighted with a red box and has a red arrow pointing to it from the text "Set server spec". To the right of this is a table with columns "Part", "Type", and "Model", listing components like CPU, Mezz Card, RAID Card, and 4K Disks. A large red arrow points down from the "Results" text to the table of OS compatibility results.

OS	Description	Certification	Drivers	Notes
CentOS 6.5	CentOS Linux 6 Update 5 Server for Intel EM64T	Link		Note5;
CentOS 6.6	CentOS Linux 6 Update 6 Server for Intel EM64T	Link		Note5;
CentOS 7.0	CentOS Linux 7 Server for Intel EM64T	Link		Note5;
CentOS 7.1	CentOS Linux 7 Update 1 Server for Intel EM64T	Link		Note5;

Huawei Server Compatibility Checker

- OS compatibility checking

OSs				
OS	Description	Certification	Drivers	Notes
CentOS 6.5	CentOS Linux 6 Update 5 Server for Intel EM64T		Link	Note5;
CentOS 6.6	CentOS Linux 6 Update 6 Server for Intel EM64T		Link	Note5;
CentOS 7.0	CentOS Linux 7 Server for Intel EM64T		Link	Note5;
CentOS 7.1	CentOS Linux 7 Update 1 Server for Intel EM64T		Link	Note5;
RHEL 6.5	Red Hat Enterprise Linux 6 Update 5 Server for Intel EM64T	Link	Link	Note5;
RHEL 6.6	Red Hat Enterprise Linux 6 Update 6 Server for Intel EM64T		Link	Note5;
RHEL 7.0	Red Hat Enterprise Linux 7 Server for Intel EM64T	Link	Link	Note5;
RHEL 7.1	Red Hat Enterprise Linux 7 Update 1 Server for Intel EM64T		Link	Note5;
SLES 11.3	SUSE Linux Enterprise Server 11 Service Pack 3 for Intel EM64T	Link	Link	Note5;
SLES 12.0	SUSE Linux Enterprise Server 12 for AMD64 & Intel64	Link	Link	Note5;
Vmware ESXi 5.5.2	Vmware ESXi 5.5 update2		Link	Note5;
Vmware ESXi 6.0	Vmware ESXi 6.0		Link	Note5;
Windows 2012	Microsoft Windows Server 2012		Link	Note1;Note5;
Windows 2012 R2	Microsoft Windows Server 2012 R2		Link	Note1;Note5;

Notes:

1. Install an OS by using the ServiceCD
5. Install an OS directly when config LSI3108 raid card

Install method

Huawei Server Compatibility Checker

- Parts compatibility checking

The screenshot shows the 'Search Parts' tab of the compatibility checker. It includes fields for 'Product Model' (RH2288 V3), 'Part Type' (PCIe Card), and 'PCIE Card Type' (GPU). A red arrow points from the text 'Select server and part you want to check' to the 'Product Model' field. Another red arrow points from the text 'PCIe Cards' to the table header. The table below lists one compatible part: a Quadro K2000 GPU.

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Drivers	Notes
06320062	Official	GPU	Quadro K2000	Video Card, GPU-Quadro K2000, 2GB Memory/ 64GB/s Bandwidth/ PCIE 2.0 X1 6-10DE-0FFE 0E1B-2,51.1W/ Single Slot/ActiveCooling, Chinese and English doc, Configuration sheet, Enterprise Computing Used	NA	GK107	NVIDIA	Link	Note1; Note20; Note24;

Notes:

1. Please download drivers from third-party official websites ,and take the OS compatibility information released by third-party vendors as standard.
20. Install Redhat system with basic driver video mode
24. Shipment with the server is not supported for this GPU.



Summary

1. Huawei server tool system
2. FTK
3. uMate
4. ServiceCD 2.0
5. iBMA
6. InfoCollect
7. Blade server tool
8. Memory configuration assistant
9. Compatibility Checker



Exercises

- True or false questions
 1. FTK is a single server tool. It cannot execute batch operations. (T or F)
 2. uMate can upgrade server firmware in batches. (T or F)

- Multiple-choice question

Which of the following tools can collect server RAID controller card logs? ()

- A. uMate
- B. FTK
- C. Service CD
- D. iBMA

Thank you

[www.huawei.com](http://learning.huawei.com)

Hardware Installation and Cable Connection of Huawei Servers

[www.huawei.com](http://learning.huawei.com)





Objectives

- Upon completion of this course, you will be proficient in the installation process and installation methods of servers, including installation preparations, installation planning, cabinet and chassis installation, cable connection, device power-on, and status check.
- After hardware is successfully installed, you can perform configurations according to the course *Huawei Server Configuration and Deployment*.



Contents

- 1. Checking Before Installation**
2. Hardware Installation
3. Cable Connection
4. Server Power-on

Items Need to Be Checked

- Site device configurations
- Racks
- PDUs
- PSUs and power cables
- Guide rails

Preparing for Checking

- Understand site **device configurations** such the number and models of blades and switch modules.
- Prepare **checking tools** including a ruler, level instrument, measuring tape, set square, and mechanical pencil.
- Print the data tables required for the project checking to record data during the checking.
- Confirm the checking time and unloading time with related personnel at the site. (Transportation with large trucks are restricted in some cities.)

Preparing for Checking- Device Configurations

1	S0011980	E9000		3	
1.1		Basic configurations for a chassis			
	02300742	IT1K01E9000H	Backplane Subrack,OSCA,IT1K01E9000,OSCA-H 12U high-powered integrative module	1	3
	03054675	IT1DSMMA0000	OSCA,IT11SMMA00,MM910,Shelf Management Module A	2	6
	03030QEJ	IT0E01FAN000	OSCA,IT0E01FAN,OSCA FAN BOX	14	42
	02310LKL	IT1MPowerM00	Function Module,EPW3000-12A-IT1MPWRM,3000W platinum AC power supply module,Commercial Computer Only	6	18
1.2		Switch module			
	03054716	IT1DXCUA0100	Finished Board Unit,OSCA,IT11XCUA01,CX911,16*10GE Optical Port,8*8G FC Port,Multi-Plane Switch Module	2	6
1.3		Optical module			
1.3.1		Multimode optical module			
	02310VEK	SFP-8.5G-LCMM	Function Module,E6000,SFP-8.5G-LCMM,Optical Transceiver,SFP+, 850nm, 8.5G, -8.2dBm to -1.3dBm,-11.2dBm,LC,MMF,0.15km	16	48
	02310VEF	SFP-10G-LCMM	Function Module,E6000,SFP-10G-LCMM,Optical transceiver,SFP+,850nm,10Gb/s,-7.3 to -1dBm,-9.9dBm,LC, MM,0.3km	14	42
1.4		Cable and auxiliary device			
	21240817	EGUIDERO5	Cabinet and chassis attachment,DKBA41503721.ASM,Sheetmetal,4U Static Rail Kit,OSCA	1	3
	06020088	NDVDRWU00	DVDRW-CD 24X/DVD 8X,USB2.0,External,USB 2.0 5V power	1	3

Power and number of PSUs

Models and number of switch modules

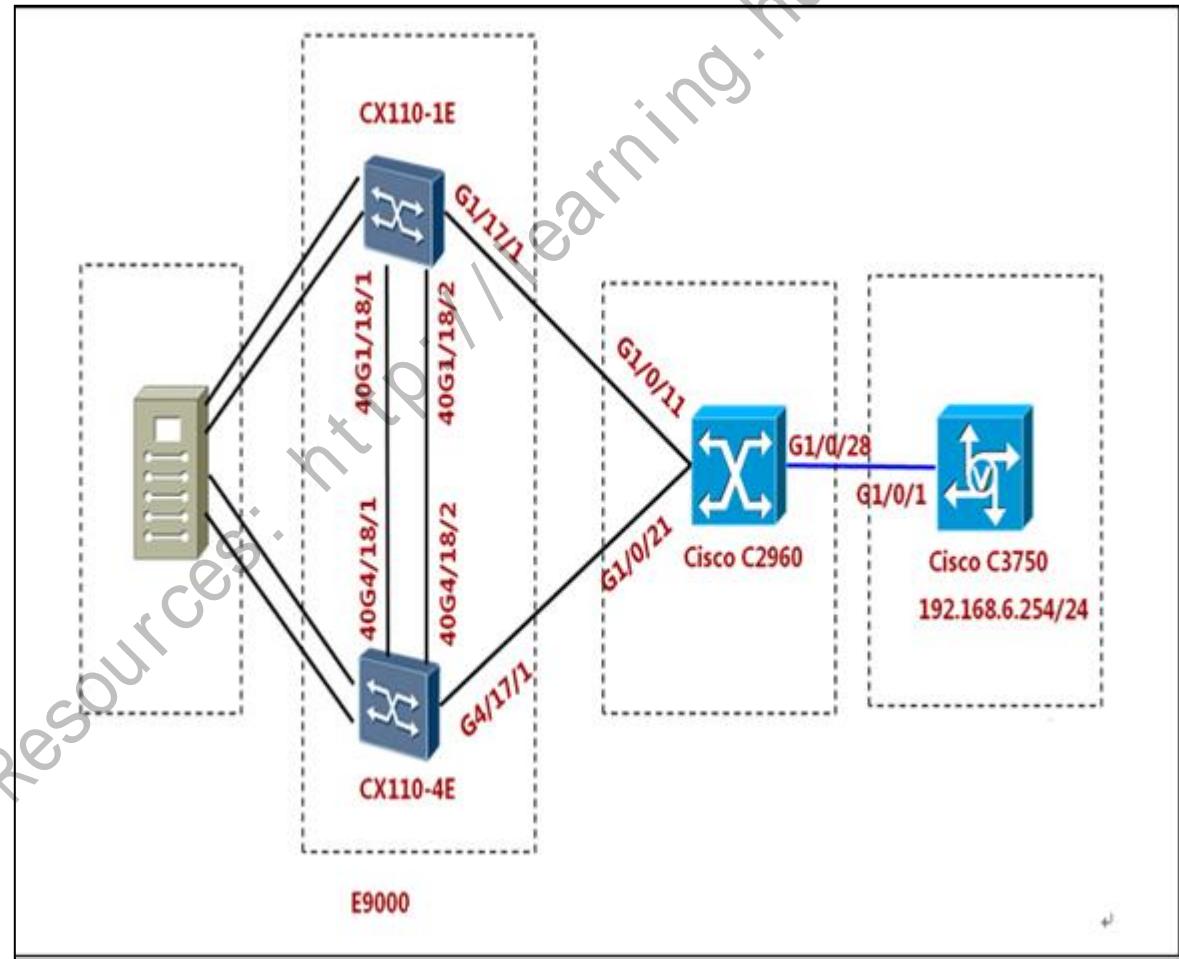
Models and number of optical modules

Preparing for Checking- Device Configurations

1	S0011980	E9000		2		
1.1		Basic blade configuration				
1.1.1		Main board				
	03030QMF	IT1DSRCD03	Finished Board,OSCA,IT11SRCD03,Romley,4P,48DIMM Compute Node,CH240	1	2	Number and models of blades
1.1.2		SandyBridge EP 4S CPU				CPU model
	41020350	EX86XE504	X86 series-FCLGA2011-2200MHz-0.9V-64bit-95000mW-SandyBridge EP 4S Xeon E5-4607, 6Core,ECP Dedicated	4	8	
1.1.3		DIMM				Types and number of hard disks
	06200107	N00DDR317	Memory Module,DDR3 RDIMM,16GB, 240PIN,1.5ns,1333000KHz,1.35V,ECC,all product,2Rank(1Gx4bit),Height 30mm	6	12	
1.1.4		Hard disk with ejector levers				RAID controller card type
	02310KPR	N0SASHD06	Function Module,Server,HardDisk,300GB-SAS-10000rpm-2.5"-16M-Hot-Swappable-Built-In-Front Panel	2	4	
1.1.5		RAID controller card and other accessories				
	03021FTX	BC0MESMCE 600	Manufactured Board,Tecal E6000,BC01ESMC,RU120 SAS/SATA RAID Card,RAID0,1,10,1E,0 Cache(LSI2308),Board ID 0X21,2*2	1	2	
1.1.6		NIC				Types and number of mezz cards
	03021SHM	IT1DMXEA00 00	Manufactured Board,OSCA,IT11MXEA,MZ910,2*10GE,2*8G FC Port Mezzanine Card,PCIE 3.0 X8-Vendor ID 10DF-Device ID E220 E260 E200-4-Board ID 0X81,2*2	1	2	

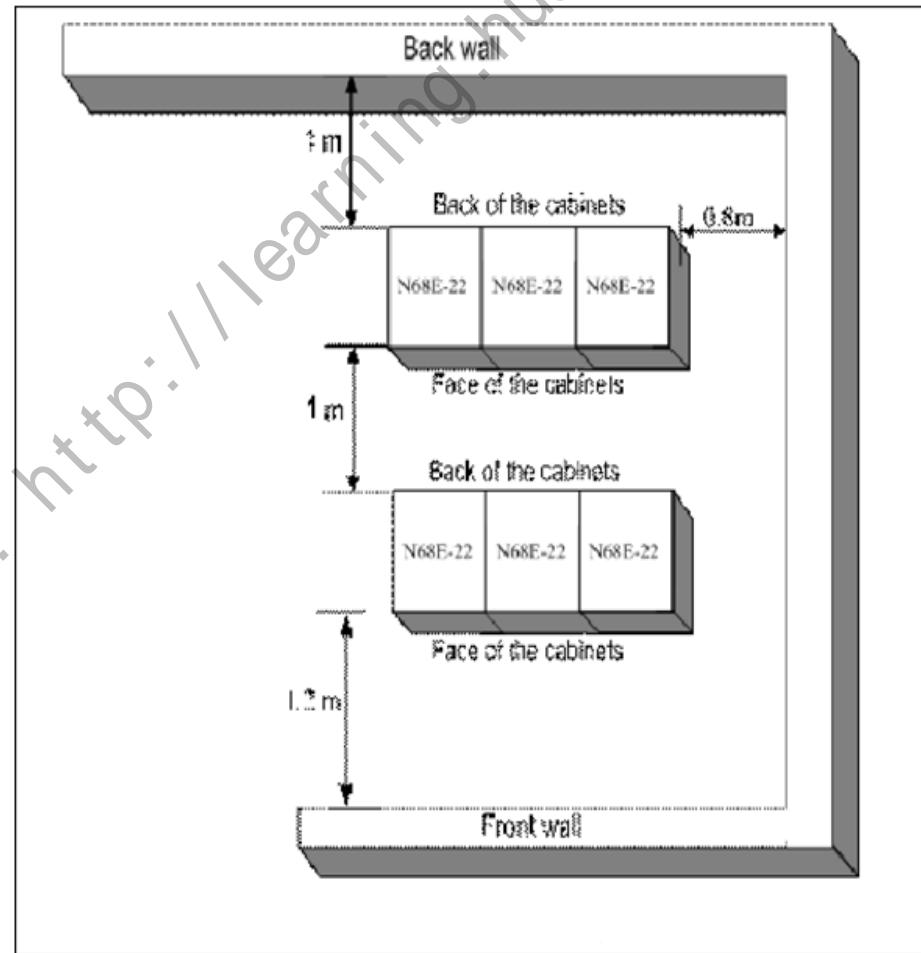
Preparing for Checking-Networking Diagram

Obtain the networking diagram



Key Point (1): Distances Measurement

- Ensure that all necessary distances are measured.
- **Suggestions**
 - Attach a customer's equipment room layout, understand the positions of Huawei servers and of cutover servers.
 - Measure all necessary distances.
 - Add the description about specifications of air breakers for PSUs.



Key Point (2)-Dimensions and Weight

- E9000 blade server

Category	Item	Specifications
Physical specifications	Dimensions (H x W x D)	<ul style="list-style-type: none">Chassis: 530.6 mm x 442 mm x 840 mm (20.89 in. x 17.40 in. x 33.07 in.)PSU: 40.5 mm x 126 mm x 285 mm (1.59 in. x 4.96 in. x 11.22 in.)Fan module: 84 mm x 82 mm x 296.3 mm (3.31 in. x 3.23 in. x 11.66 in.)
	Rack dimensions (H x W x D)	<ul style="list-style-type: none">2000 mm x 600 mm x 1200 mm (78.74 in. x 23.62 in. x 47.24 in.)Distance between rack columns: 689 mm (27.13 in.) to 929 mm (36.57 in.) <p>NOTE: The distance between rack columns must be less than 840 mm (33.07 in.), and the space for routing cables and installing power distribution units (PDUs) must be reserved.</p>
	Color	Black
	Weight	<p>Net:</p> <ul style="list-style-type: none">Empty chassis (including midplane): 60 kg (132.30 lb)Fully configured with compute nodes: 220 kg (485.10 lb)Fully configured with storage nodes: 300 kg (661.50 lb) <p>Packing materials:</p> <ul style="list-style-type: none">Chassis packing materials: 30 kg (66.15 lb)Half-width node packing materials: 2.3 kg (5.07 lb)Full-width node packing materials: 3.6 kg (7.94 lb)
	Floor bearing capacity	The weight of a single E9000 chassis is about 300 kg, and the weight of a rack without any chassis is about 200 kg (441.00 lb). A rack occupies an area of 1.44 m ² (15.50 ft ²). The following lists requirements for the floor bearing capacity based on the weight of a rack that has different chassis configurations: <ul style="list-style-type: none">One E9000 chassis: 347.2 kg/m²Two E9000 chassis: 555.5 kg/m²Three E9000 chassis: 763.9 kg/m²

Rack(1)

Rack Height (U)	Power Input	Recommended	BOM Number	BOM Number Description	Number of PDUs	PDU Description	Power Distribution Capability
42U rack	Two 32 A@200 V to -240 V single-phase AC power inputs	*Recommended	02113809	Cabinet, FusionCube, FC0B00OSCA, Integrative Cabinet (AC 220 V or 380 V Import)	2	02231DUN FusionCube2.0 AC cabinet optional installation package (each package contains one 32 A@220 V single-phase half-length PDU with the BOM number 02120765).	<ul style="list-style-type: none">1. Supports two 32 A@220 V single-phase power inputs.2. Supports a maximum power of 6000 W per rack in N+N redundancy mode and a maximum of 9000 W per rack in N+1 redundancy mode.3. Supports a maximum of four E9000 AC PSUs.4. The power distribution is scalable to four power inputs, and the power consumption of the entire rack also increases.
42U rack	Four 32 A@200 V to -240 V single-phase AC power inputs	*Recommended	02113809	Cabinet, FusionCube, FC0B00OSCA, Integrative Cabinet (AC 220 V or 380 V Import)	4	02231DUN FusionCube2.0 AC cabinet optional installation package (each package contains one 32 A@220 V single-phase half-length PDU with the BOM number 02120765).	<ul style="list-style-type: none">1. Supports four 32 A@220 V single-phase power inputs.2. Supports a maximum power of 12,000 W per rack in N+N redundancy mode and a maximum of 18,000 W per rack in N+1 redundancy mode.3. Supports a maximum of eight E9000 AC PSUs.4. The power distribution is not scalable.

Rack (2)

Rack Height (U)	Power Input	Recommended	BOM Number	BOM Number Description	Number of PDUs	PDU Description	Power Distribution Capability
42U rack	Two 32 A@346 V-415 V three-phase AC power inputs	*Recommended	02113809	Cabinet, FusionCube, FC0B00OSCA, Integrative Cabinet (AC 220 V or 380 V Import)	2	32 A@380 V three-phase 1.7 m-long AC PDU with the BOM number 02120644	<ul style="list-style-type: none"> 1. Supports two 32 A@380 V three-phase power inputs. 2. Supports a maximum power of 18,000 W per rack in N+N redundancy mode and 30,000 W per rack in N+1 redundancy mode. 3. Supports a maximum of 12 E9000 AC PSUs. 4. The power distribution is not scalable.
42U rack	Two 32 A@200 V-240 V single-phase AC power inputs	It is not recommended because of limited power distribution capacity. It is not recommended when the E9000 is independently sold. This may be involved when the E9000 is sold along with other servers.	02113693	DC Solution, DC0B01DCUD S, Data Centre High density Cabinet (2*AC 220 V Import)	2	32 A@220 V single-phase 1.7 m long PDU with the BOM number 02120627	<ul style="list-style-type: none"> 1. Supports two 32 A@220 V single-phase power inputs. 2. Supports a maximum power of 6000 W per rack in N+N redundancy mode and a maximum of 9000 W per rack in N+1 redundancy mode. 3. Supports a maximum of four E9000 AC PSUs. 4. The power distribution is not scalable.
42U rack	240 V HV DC power input	The customer provides racks and PDUs.		The customer provides cabinets and PDUs.			
42U rack	Other power input	Not recommended because the default delivery does not support.		Persuade the customer to choose any of the former three power distribution schemes. If the customer chooses other schemes, contact Huawei R&D for technical support.			

Key Point (3): Electrical Specifications

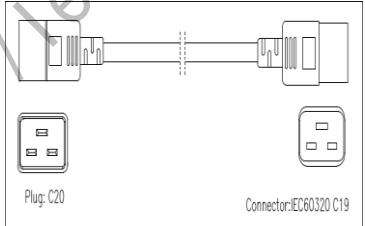
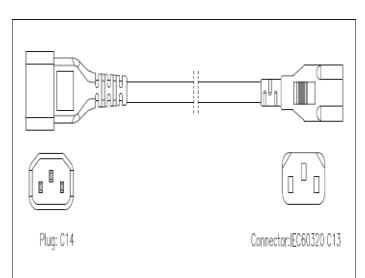
- **E9000 blade server**

PSU input specifications	Input voltage	<ul style="list-style-type: none">• DC PSU: -48 V DC to -60 V DC• AC PSU: 100 V AC to 130 V AC, 200 V AC to 220 V AC and 220 V AC to 240 V AC, 50 Hz or 60 Hz
	Maximum input current	<ul style="list-style-type: none">• 3000 W AC PSU: 16 A• 2000 W AC PSU: 10 A• 2500 W DC PSU: 80 A <p>NOTE:</p> <ul style="list-style-type: none">• The 3000 W AC PSU uses the internal fuse of 30 A.• The 2000 W AC PSU uses the internal fuse of 20 A.• The 2500 W DC PSU uses the internal fuse of 100 A.
PSU output specifications	Output voltage	12.3 V DC
Power	PSU rated power	A chassis houses a maximum of six PSUs. The following information lists the rated power of each type of PSU: <ul style="list-style-type: none">• 3000 W AC PSU:<ul style="list-style-type: none">■ 1200 W (for 100 V AC to 130 V AC input)■ 2500 W (for 200 V AC to 220 V AC input)■ 3000 W (for 220 V AC to 240 V AC input)• 2000 W AC PSU:<ul style="list-style-type: none">■ 800 W (for 100 V AC to 130 V AC input)■ 1800 W (for 200 V AC to 220 V AC input)■ 2000 W (for 220 V AC to 240 V AC input)• 2500 W DC PSU: 2500 W (for -48 V DC to -60 V DC input)

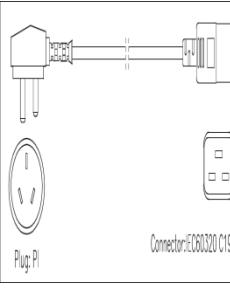
Power Specification

Category	Item	E9000 3000 W AC PSU	E9000 2000 W AC PSU	E9000 2500 W DC PSU
Output electrical specifications	Output voltage	12.3 V DC	12.3 V DC	12.3 V DC
	Maximum output current	243.9 A	162.6 A	203.3 A
	Maximum output power	3000 W	2000 W	2500 W
Specifications for different voltage ranges	220 V AC–240 V AC 50 Hz/60 Hz	Maximum output power: 3000 W Maximum input current: 16 A	Maximum output power: 2000 W Maximum input current: 10 A	----
	200 V AC–220 V AC 50 Hz/60 Hz	Maximum output power: 2500 W Maximum input current: 16 A	Maximum output power: 1800 W Maximum input current: 10 A	----
	100 V AC–130 V AC 50 Hz/60 Hz	Maximum output power: 1200 W Maximum input current: 16 A	Maximum output power: 800 W Maximum input current: 10 A	----
	205 V to 288 V HV DC	Maximum power: 3000 W Maximum input current: 16 A	----	----
	192 V to 204 V HV DC	Maximum output power: 2500 W Maximum input current: 16 A	----	----
	220 V to 288 V HV DC	----	Maximum output power: 2000 W Maximum input current: 10 A	----
	192 V to 220 V HV DC	----	Maximum output power: 1800 W Maximum input current: 10 A	----

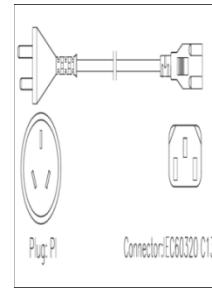
PDU Power Cable

PDU Cable Current Specific ations	PSU	Country/Region	PDU Socket Type	PDU Socket Picture	Cable Connect or for the PDU Socket	Picture of the Cable Connector for the PDU Socket	Cable Picture	Picture of the PSU Socket (C19/C13)	Remarks
16 A	300 0 W AC PSU	Global	IEC6032 0 C19		IEC60320 C20				Authentication requirements for C19/16 A PDU power cables (with the same connector) vary with regions. Therefore, select the region on the UniSTAR configurator.
10 A	200 0 W AC PSU	Global	IEC6032 0 C13		IEC60320 C14				Authentication requirements for C13/10 A PDU power cables (with the same connector) vary with regions. Therefore, select the region on the UniSTAR configurator.

16 A Cable for a Through-Wall Socket

Current Specifications	PSU	Country/Region	Through-Wall Socket Type	Through-Wall Socket Picture	Cable Connector for the Through-Wall Socket	Picture of the Cable Connector for the Through-Wall Socket	Cable Picture	Picture of the Cable Connector for the PSU (C19)	Remarks
16 A	3000 W AC PSU	China	National standard		National standard		 Plug P Connector ECG320 C19		

10 A Cable for a Through-Wall Socket

Current Specifications	PSU	Country /Region	Through-Wall Socket Type	Through-Wall Socket Picture	Cable Connector for the Through-Wall Socket	Picture of the Cable Connector for the Through-Wall Socket	Cable Picture	Picture of the Cable Connector for the PSU (C13)	Remarks
10 A	2000 W AC PSU	China	National standard		National standard				

Key Point (4): Temperature and Humidity

- E9000 blade server

Environmental specifications	<p>Temperature</p> <p>Chassis:</p> <ul style="list-style-type: none">Operating temperature: 5°C to 40°C (41°F to 104°F)Storage temperature: -40°C to +70°C (-40°F to +158°F) <p>PSU:</p> <ul style="list-style-type: none">Operating temperature: 0°C to 50°C (32°F to 122°F)Storage temperature: -40°C to +85°C (-40°F to +185°F) <p>Fan module:</p> <ul style="list-style-type: none">Operating temperature: 0°C to 55°C (32°F to 131°F)Storage temperature: -40°C to +85°C (-40°F to +185°F)
Temperature change rate	15°C/h (27°F/h)
Humidity	<ul style="list-style-type: none">Operating humidity: 5% RH to 85% RH (non-condensing)Storage humidity: 5% RH to 95% RH (non-condensing)
Altitude	<ul style="list-style-type: none">CH140 compute node 900 m (2952.72 ft) at 35°C (95°F)Other modules 900 m (2952.72 ft) at 40°C (104°F) <p>When the device is used in an altitude of 900 m to 1800 m, the operating temperature decreases by 1°C (1.8°F) as the altitude increases by 300 m (984.24 ft).</p>
Noise	78 dB
Heat dissipation per slot	<ul style="list-style-type: none">Computer node slot:<ul style="list-style-type: none">35°C (95°F)<ul style="list-style-type: none">Half-width slot: 900 WFull-width slot: 1800 W40°C (104°F)<ul style="list-style-type: none">Half-width slot: 700 WFull-width slot: 1400 WSwitch module slot: 280 WManagement module slot: 80 W

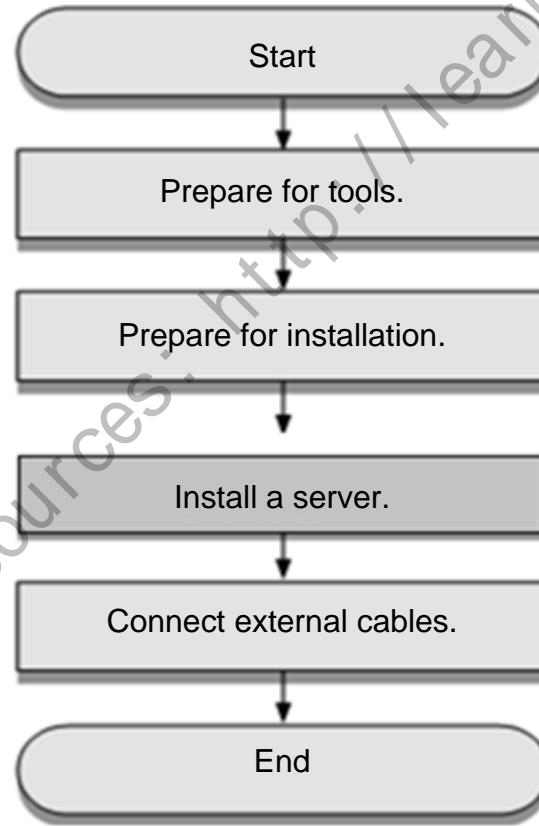


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- 2. Hardware Installation**
3. Cable Connection
4. Server Power-on

Installation Process

- The installation process provides a guidance for you to easily complete installation of a server.



Installation Preparations

- **[Checking tools]** The following tool must be prepared for installation:

Tool	Name	Description
	Floating nut mounting bar	Used to guide floating nuts to the holes in the mounting bars of a rack.
	Phillips screwdriver	Used to tighten screws.
	Diagonal pliers	Used to cut insulation tubes and cable ties.
	Measuring tape	Used to measure distance.
	Multimeter	Used to measure resistance and voltage and to check circuits close status.
	Electrostatic discharge (ESD) wrist strap	Used to prevent ESD damage when you touch or operate devices or components.
	ESD gloves	Used to prevent ESD damage when you insert, remove, and hold a mainboard or hold a precision device.
	Cable tie	Used to bundle cables.
	Ladder	Used to perform operations at heights

[Checking air break switches]

To protect the devices connected by air break switches against the unexpected power-off caused by the power outage of storage devices, ensure that the air break switches use the following specification:

AC power supply: 16 A

[Checking materials]

Check all materials required for the installation according to the packing list.

Tip: The packing list is attached to the surface of the carton.

Installing a Cabinet

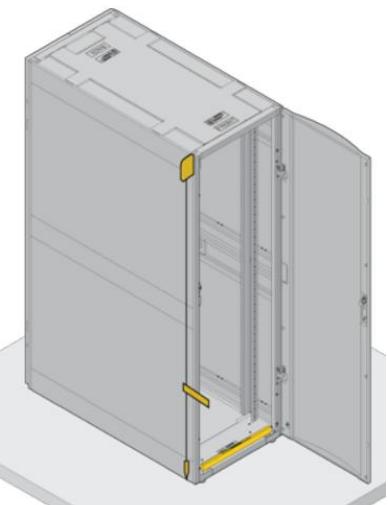
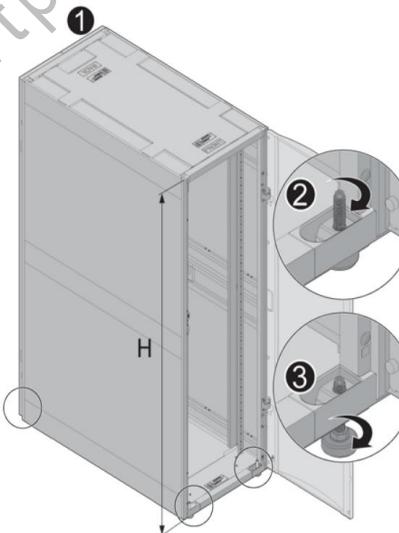
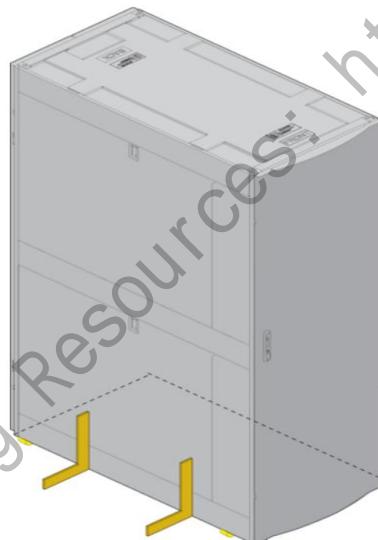
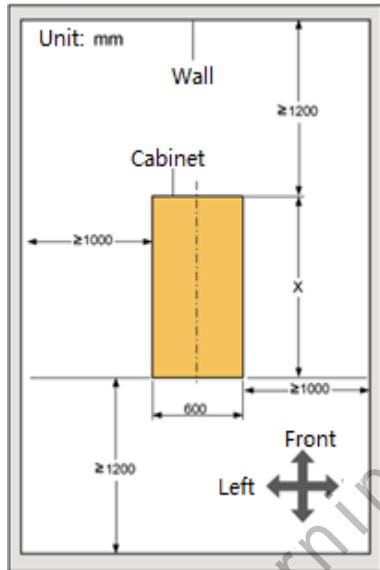
- The cabinet installation process includes locating a cabinet, placing a cabinet, fixing a cabinet, and leveling a cabinet.
If a cabinet has been installed on site, skip this operation.

1. Locate a cabinet.

2. Place a cabinet.

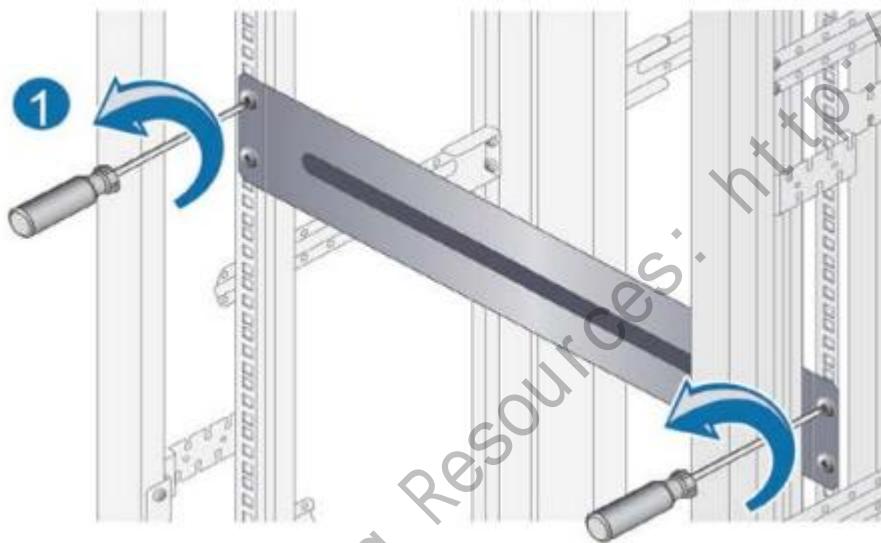
3. Fix a cabinet.

4. Level a cabinet.

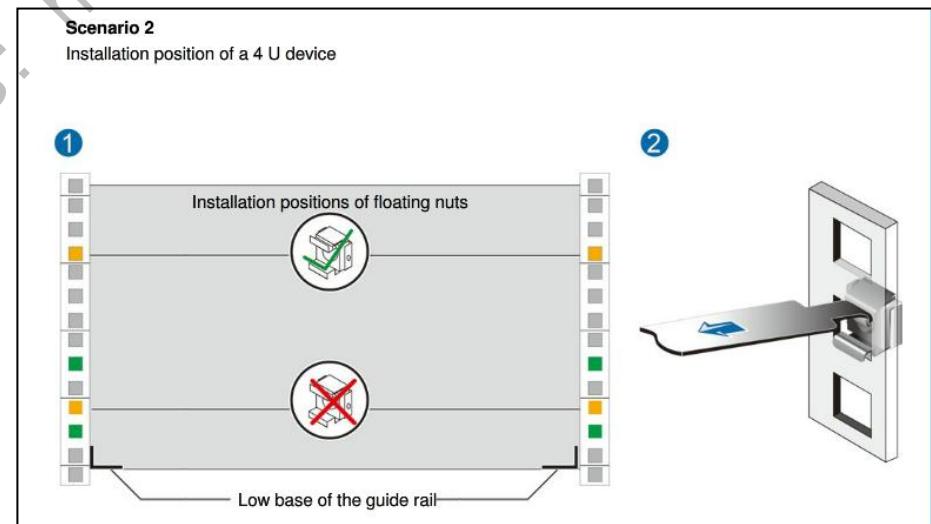
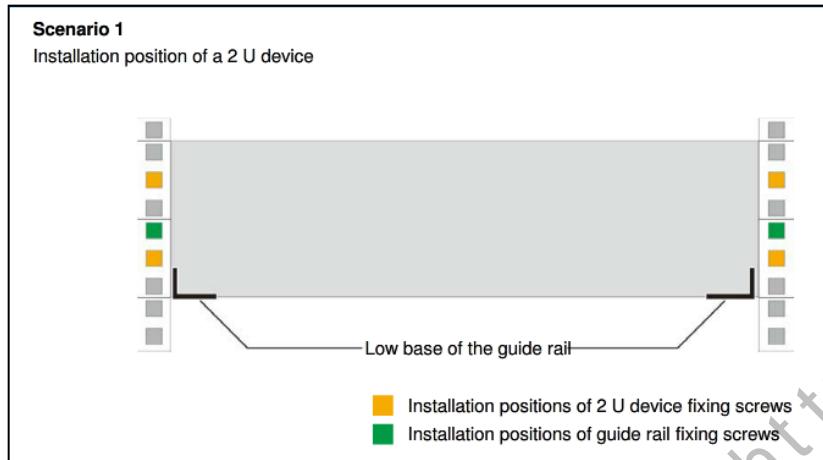


Removing the Filler Panel from a Cabinet

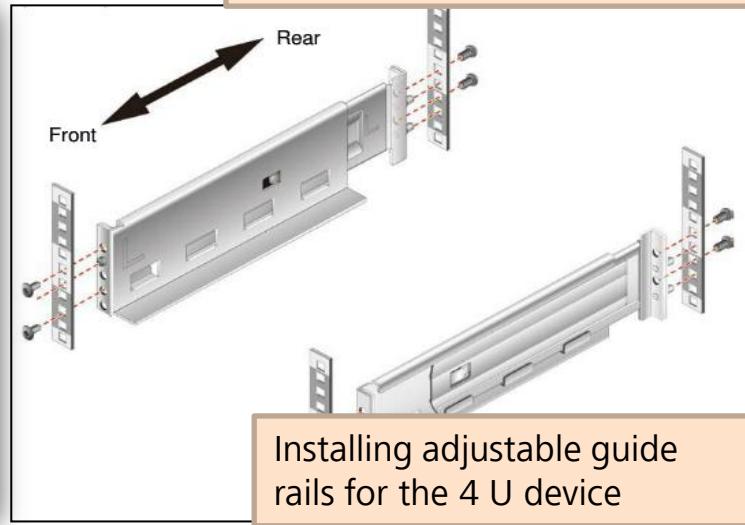
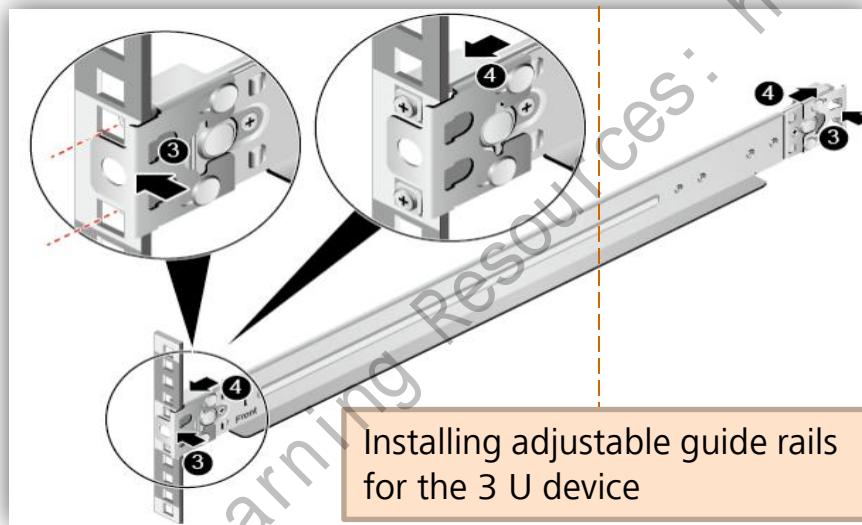
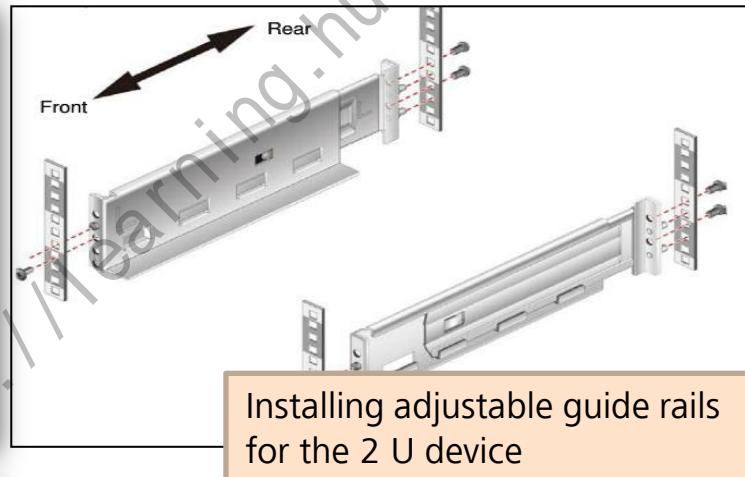
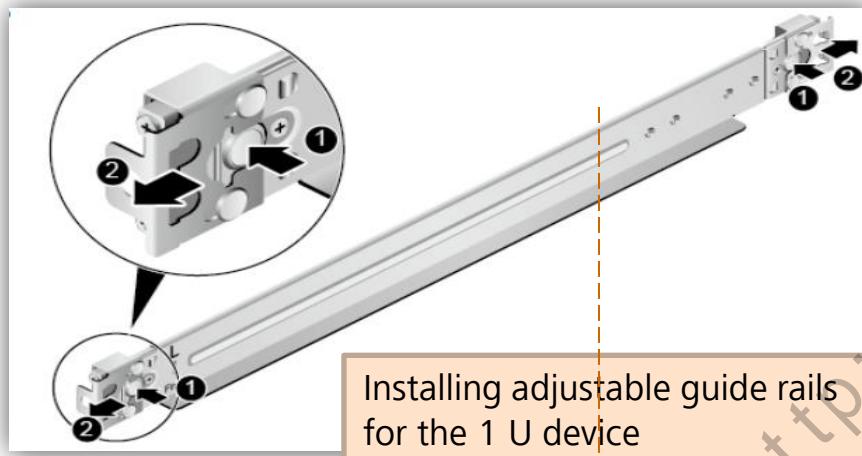
1. Use a screwdriver to loosen the fastening screws on the filler panel and remove the floating nut on the original position of the filler panel.
2. Use a floating mounting bar to remove the floating nut on the original position of the filler panel.



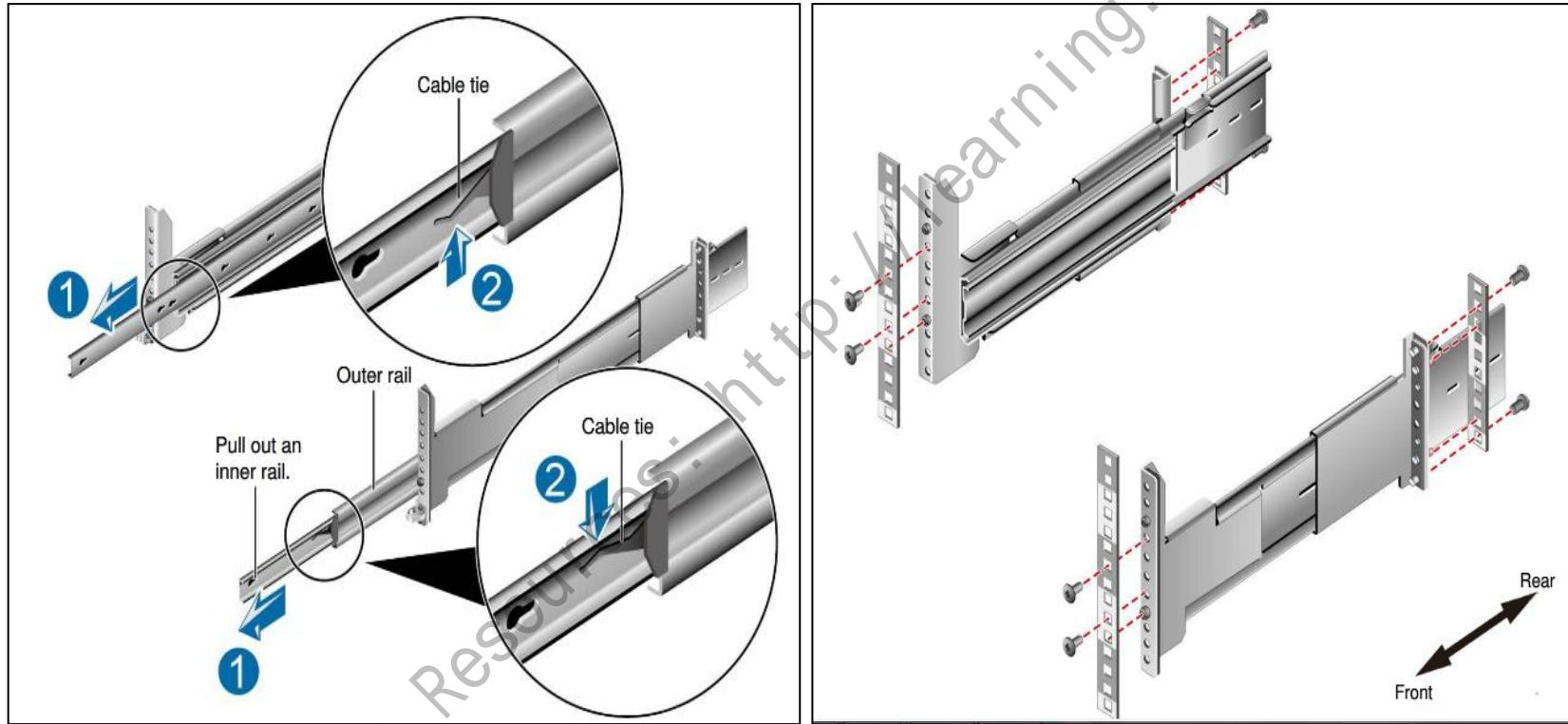
Locating the Installation Position Using an Installation Template



Installing a Server on the Adjustable Guide Rails (1)



Installing a Server on the Adjustable Guide Rails (2)

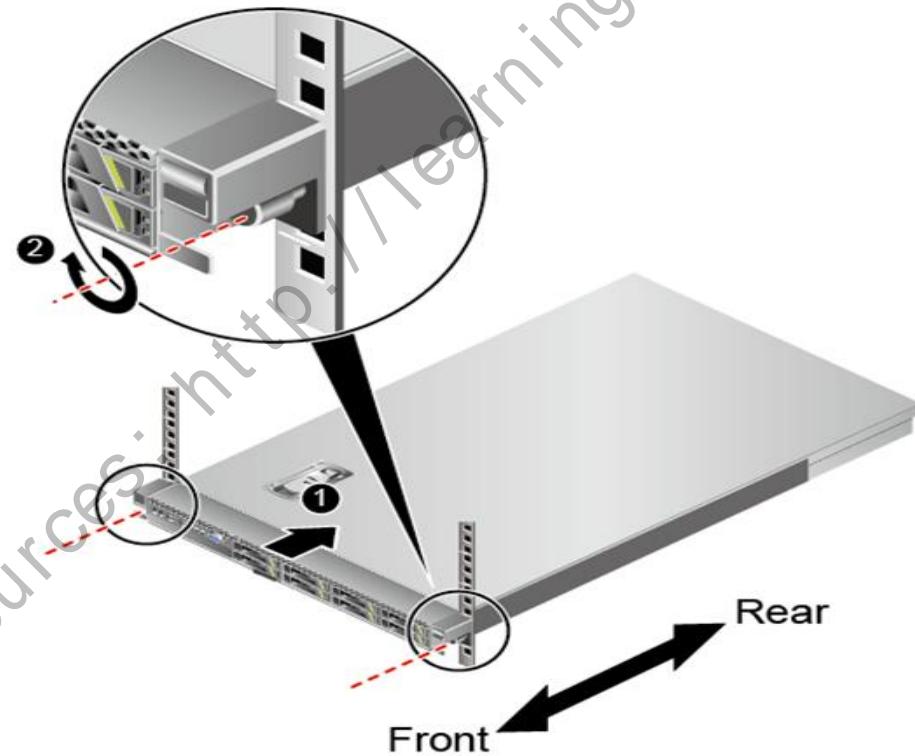


For details, see the *Installation Guide* of the related product.

Installing a Server

Caution:

- Arrange for at least three persons to carry and install an enclosure to avoid personal injury or device damage.
- Servers must be installed on adjustable guide rails. Do not stack servers as this may damage them.



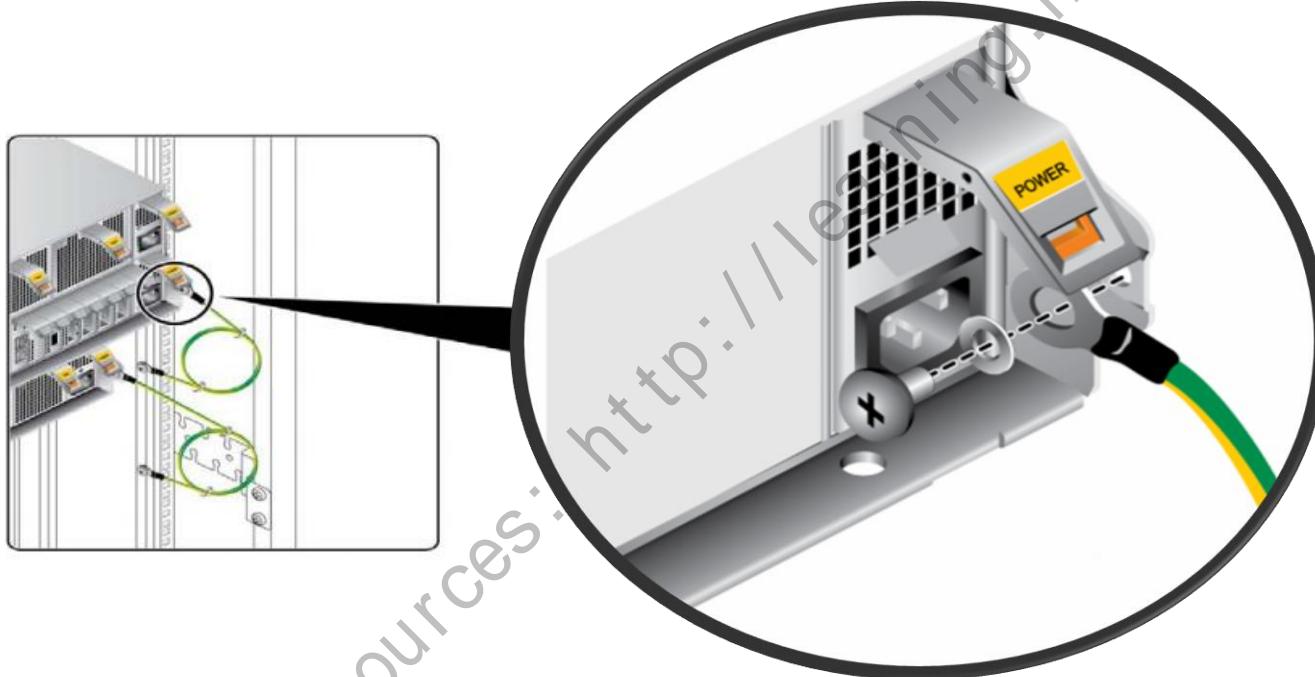
Here, RH1228 V2 is used as an example. For details about other models, see the *Installation Guide* or *Multimedia*.



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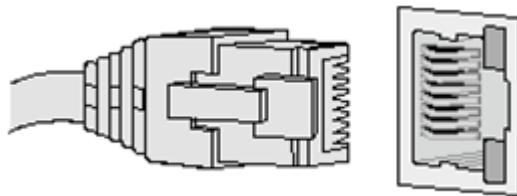
Connecting a Ground Cable



Devices installed in a cabinet must be grounded to prevent device damages caused by static electricity discharge or dangers caused by unexpected electric leakage.

A ground cable can be installed at both the left and rights sides of a server. Install the ground cable to only one side of the device.

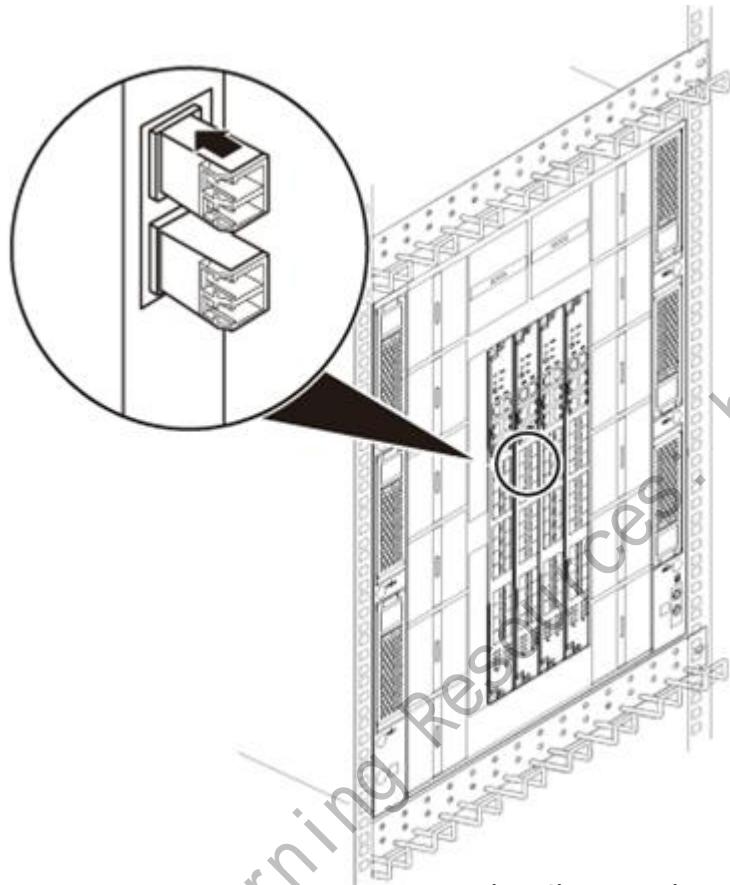
Connecting a Network Cable



1. Check the new network cable model.
2. Number the new network cable.
3. Route the new network cable.
4. Connect the new network cable.
5. Connect the other end of the network cable to the peer network port.
6. Check that the new network cable is operating properly.
7. Bind the new network cable with other cables.

For details, see the *Installation Guide* of the related product.

Connecting a Fiber Cable

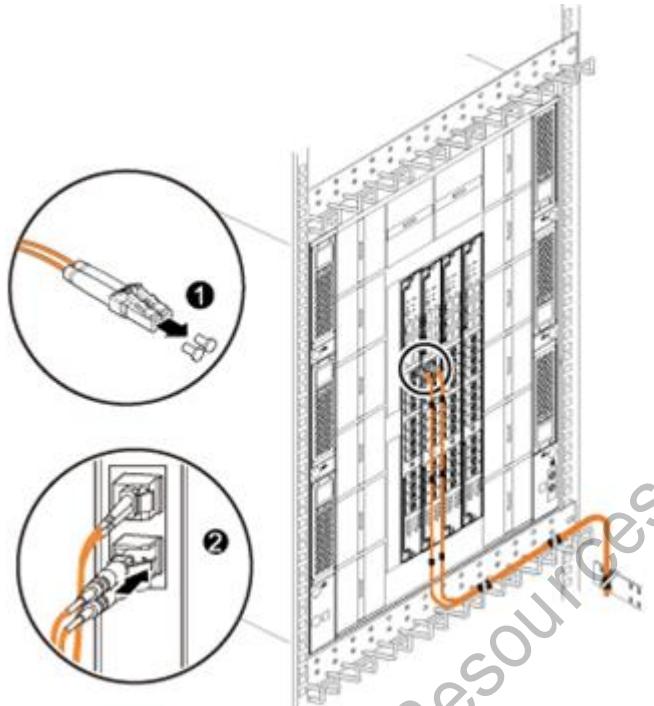


Installing an optical module

1. Determine the optical module type and the optical port to be connected based on the site requirements.
2. Insert the optical module into the optical port until the optical module is locked.

For details, see the *Installation Guide* of the related product.

Connecting an Optical Fiber

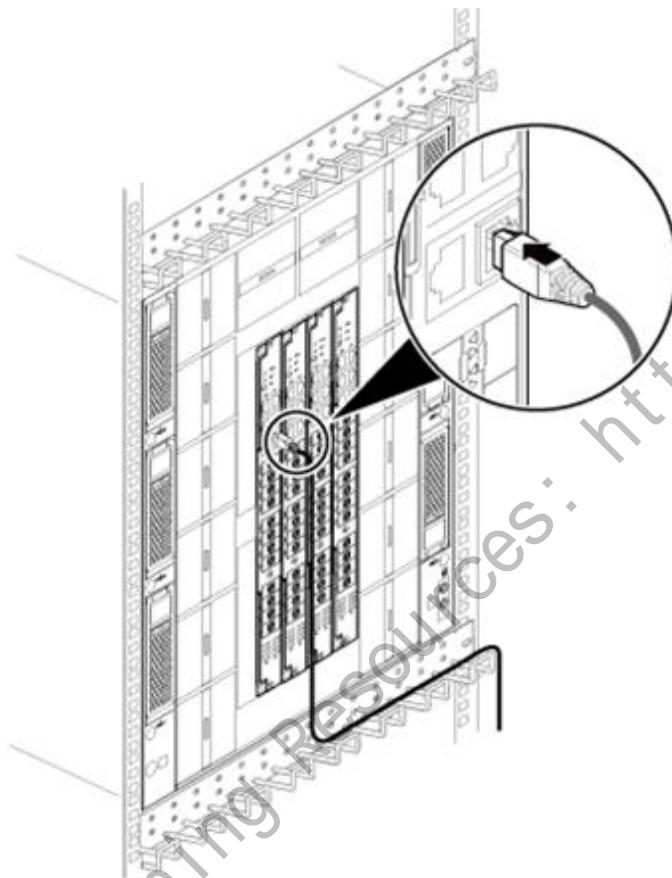


Connecting an optical fiber

1. Remove the dust-proof cap from the optical fiber, as shown in step ① in this figure.
2. Insert the optical fiber into the optical module, as shown in step ② in this figure.

For details, see the *Installation Guide* of the related product.

Connecting a GE Cable or Serial Cable

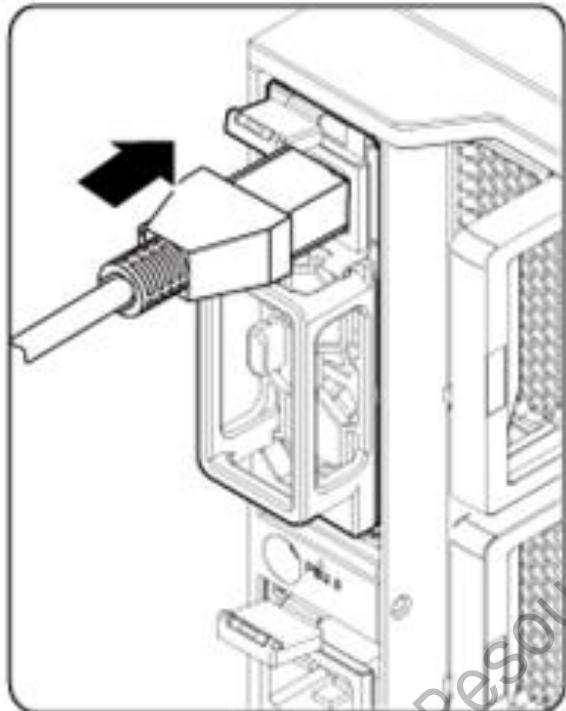


Connect a GE cable or serial cable, as shown in this figure.

The serial port and GE electrical port are standard RJ-45 ports, which are installed in the same way.

For details, see the *Installation Guide* of the related product.

Connecting an AC Power Cable

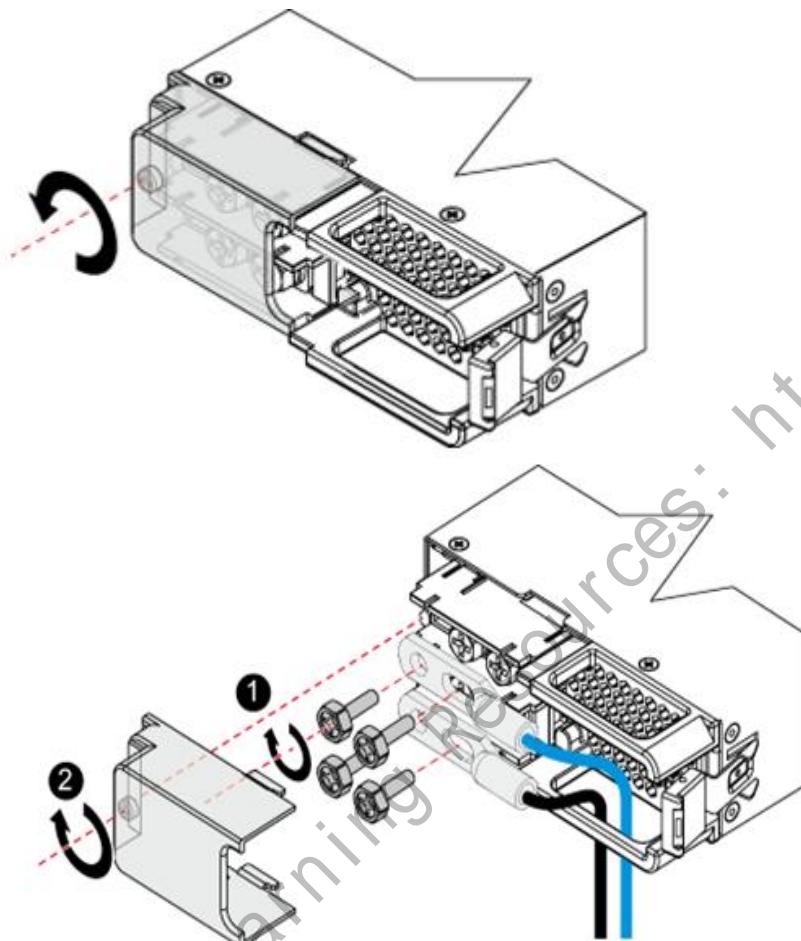


1. Insert one end of a power cable into a power supply port in the shelf, as shown in this figure.
2. Connect the other end of the power cable to the power port of the PDU according to the power cable connection rule of the chassis.

Caution:

Do not connect multiple power modules to the same air break switch.

Connecting a DC Power Cable



1. Remove the protective cover of the DC power module, as shown in this figure.
2. Connect the OT terminal of the negative electrode to the terminal NEG(-) of the PSU, and connect the OT terminal of the positive electrode to the terminal RTN(+) of the PSU, as shown in step ①.
3. Install the protective cover on the DC power module, as shown in step ②.
4. Connect the other end of the power cable to the power port of the PDU according to the power cable connection rule of the chassis.

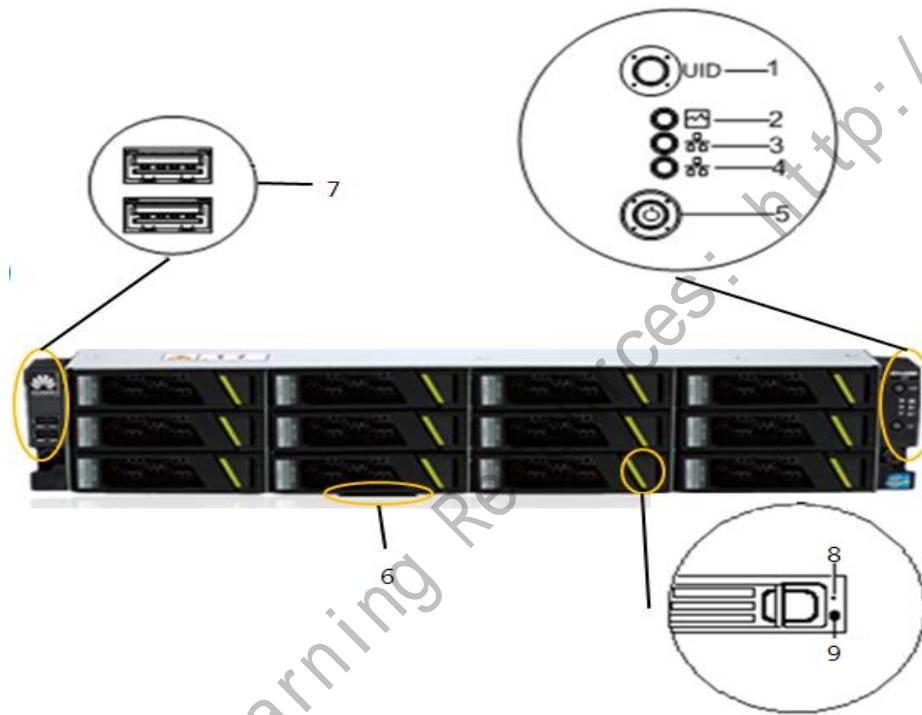


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Power-on Overview

Correct power-on sequence: Switch on the power switches of external power supplies connecting to all the devices -> Power on the PSU -> Power on the server



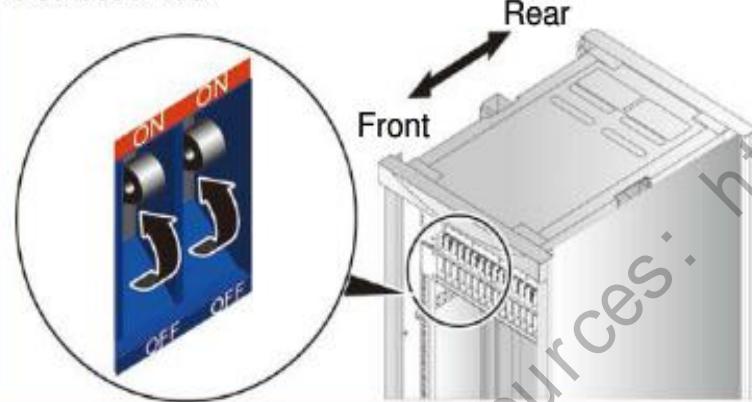
To avoid electric shocks, do not wear an ESD wrist strap when powering on the server.

A power-on process takes 5 to 10 minutes. When the power indicator on the controller enclosure stops blinking, the power-on process is complete. This figure uses RH2288 as an example. The number 5 indicates the power switch/indicator.

Turning on External Power Supplies

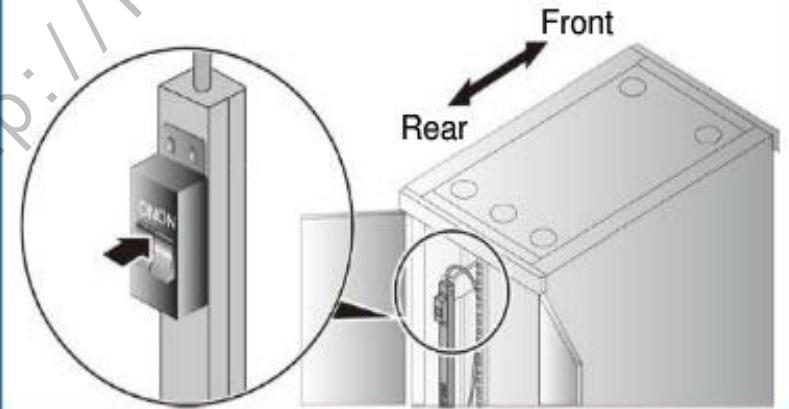
If the external power supply is the power distribution box:

Scenario 1 Turn on the switches of the power distribution box



If the external power supply is the PDU:

Scenario 2 Turn on the switch of the PDU



Powering on the Server

- If the PSU is properly installed but not powered on:
 - Power on the PSU. The server is powered on together with the PSU.
- If the PSU is powered on and the server works in the standby state:
 - Power on the server by using the power switch on the front panel.
 - In remote management mode, power on the server using the iBMC command line.
In the management software command line, run **ipmcset -d powerstate -v 1** to power on the server.
 - In other modes, power on the server by using the interface provided by the iBMC WebUI. Expand the navigation tree on the left and choose **PS Management > Power Control > Power On > OK** to power on the server.

Checking the Power-on Status

- According to the following specification, check that the server has powered on and is running correctly by observing status of indicators.

Power button/indicator	Yellow and green	<ul style="list-style-type: none">Steady green: The system is properly powered on.Blinking yellow at 1 Hz: The iMana is being started or the power button is locked.Steady yellow: The system is in the standby state.Off: The server is not powered on.
------------------------	------------------	---

- If any alarm indicator is on, the server is faulty and you need to troubleshoot the fault. Refer to the troubleshooting manual for rectification suggestions.
- If the power indicator is not steady green, contact Huawei technical support engineers.



Summary

1. Checking Before Installation
2. Hardware Installation
3. Cable Connection
4. Server Power-on

Thank you

[www.huawei.com](http://learning.huawei.com)

Huawei Server Configuration and Deployment

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Objectives

- Upon completion of this course, you will be proficient in:
 - Configuring iBMC for Huawei servers
 - Configuring BIOS for Huawei servers
 - Planning and Configuring RAID group for Huawei servers
 - Installing OS to Huawei servers



Contents

- **iBMC Operation**
- Common Tasks of BISO Setting
- RAID Configuration
- OS Installation
- LCD Operation

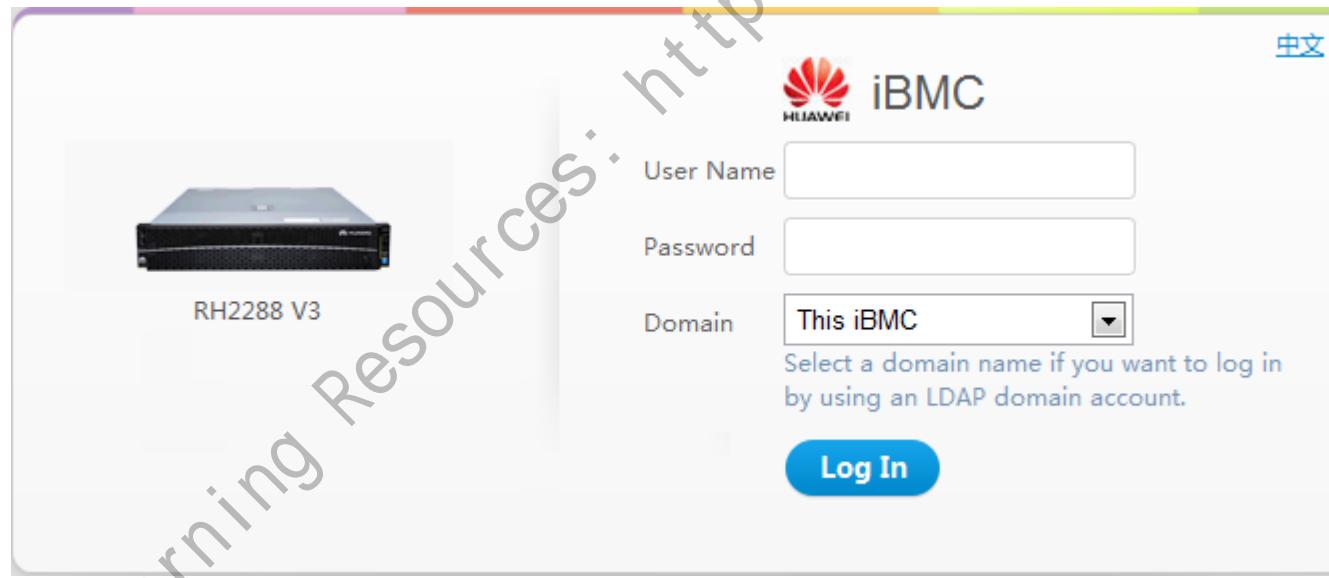
Login iBMC(1/3)

- Requirements

OS	Software		Version
Windows 7 32-bit Windows 7 64-bit	Browser	Internet Explorer	Internet Explorer 8.0/10.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
	JRE		JRE 1.6.0 U25 JRE 1.7.0 U40
	Web browser	Internet Explorer	Internet Explorer 10.0/11.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
Windows 8 32-bit Windows 8 64-bit	JRE		JRE 1.6.0 U25 JRE 1.7.0 U40
	Web browser	Internet Explorer	Internet Explorer 8.0/10.0/11.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
	JRE		JRE 1.6.0 U25 JRE 1.7.0 U40
Windows Server 2008 R2 64-bit	Web browser	Internet Explorer	Internet Explorer 8.0/10.0/11.0
		Mozilla Firefox	Mozilla Firefox 9.0/23.0
		Google Chrome	Chrome 13.0/31.0
	JRE		JRE 1.6.0 U25 JRE 1.7.0 U40

Login iBMC(2/3)

- Open a web browser, enter ***https://IP address of the iBMC management network port.***
- On the login page, enter the **user name** and **password** for login.
- Select **This iBMC** from the **Domain** drop-down list.



Login iBMC(3/3)

- iBMC Main Page after Login

The screenshot shows the iBMC main page after login. The top navigation bar includes links for Information, Alarm & SEL, Diagnosis, Power, Config, System, and Remote. It also displays user information (root), language (Chinese), and a Logout button. A status summary at the top right shows 0 Critical Alarms, 5 Major Alarms, and 0 Minor Alarms.

Information Summary

Basic Info

System Name:	RH2288H V3	Product Serial Number	
IP Address:	192.168.72.6	iBMC Firmware Version:	(U25)1.26
BIOS Firmware Version:	(U47)1.26	GUID:	296CBB4C-1DD2-11B2-B0A8-0018E1C5D8...
Maximum Number of Web Sessions:	4	Number of Online Users:	1 (Web : 1, CLI : 0)

Critical Alarms: 0 | **Power State**: ●

Major Alarms: 5 | **Health Indicator Status**: ●

Minor Alarms: 0 | **UID Indicator Status**: ●

Virtual Buttons

Power Button: Power On Power Off Forcibly Power Off To power on or power off the server, press the power button. To forcibly power off the server, hold down the power button for 5 seconds. Forcible power-off may damage system data.

UID: Turn On Turn Off Blink The UID indicator helps locate a server

User Settings

- The **User Settings** page allows you to perform the following operations:
 - View and manage users for logging in to iBMC.
 - View and configure user security hardening rules for the iBMC.
 - View and configure Lightweight Directory Access Protocol (LDAP) user information.

Local User

You can add a maximum of 16 users. The system has only one default user, who has administrator rights. The default user name is root.

Password Complexity Check: Disable Enable The function also checks the complexity of SNMPv1, SNMPv2, and SNMP trap community names.

Password expired time: 0 Range 0~365,0 means no limit

Login User in Emergencies: [NULL] Specifies the user who can log in to the iBMC irrespective of the password validity period or login rules.

Disable history password: 0 The value range is 0~5,0 indicates no restricted

Account Locking: 5 Invalid Login Attempts 5 Locking Duration (minutes)

Login Rule:

Rule1	time	-	IP	MAC	<input type="button" value="OFF"/>
Rule2	time	-	IP	MAC	<input type="button" value="OFF"/>
Rule3	time	-	IP	MAC	<input type="button" value="OFF"/>

Network Settings

- The **NetWork Settings** page allows you to perform the following operations:
 - Set a host name for the server.
 - Set the mode and IP address of the management network port on the server
 - Set the mode for obtaining domain name system (DNS) information.
 - Set VLANs.

1. Config iBMC Host Name

Server Name:

2. Select Network Port Mode

Fixed: specifies a dedicated, aggregation, onboard, or PCIe network port as the iBMC management network port. Automatic: it selects a management network port based on network port connection status. Select check boxes to specify network ports for automatic selection. If selects a management network port in the following priority: dedicated network port > onboard network port > PCIe network selected manually or automatically, the management and service network ports share a physical network port. You are advised to select a management network port for security purposes if Fixed or Automatic is selected and an onboard or PCIe network port is configured.

Select Mode: Fixed Automatic

Specify Management Network Port: [Select a management network port](#)

Dedicated Network Port	LOM	PCIE extern Port
<input checked="" type="radio"/> eth2	<input type="radio"/> Port1 <input type="radio"/> Port2 <input checked="" type="radio"/> Port3 <input type="radio"/> Port4	

Port Settings

- The **Port Settings** page allows you to view and set system service information.

Port Settings

Enabling the FTP,Telnet,HTTP,RMCP functions may reduce system security. Exercise caution when enabling these functions.

FTP:	<input type="button" value="OFF"/>	Port: 21	<input type="button" value="Restore Defaults"/>
SSH:	<input checked="" type="button" value="ON"/>	Port: 22	<input type="button" value="Restore Defaults"/>
Telnet:	<input type="button" value="OFF"/>	Port: 23	<input type="button" value="Restore Defaults"/>
SNMP Agent:	<input checked="" type="button" value="ON"/>	Port: 161	<input type="button" value="Restore Defaults"/>
KVM:	<input checked="" type="button" value="ON"/>	Port: 2198	<input type="button" value="Restore Defaults"/>
VMM:	<input checked="" type="button" value="ON"/>	Port: 8208	<input type="button" value="Restore Defaults"/>
Video:	<input checked="" type="button" value="ON"/>	Port: 2199	<input type="button" value="Restore Defaults"/>
Web Server(http):	<input checked="" type="button" value="ON"/>	HTTP: 80	<input type="button" value="Restore Defaults"/>
Web Server(https):	<input checked="" type="button" value="ON"/>	HTTPS: 443	<input type="button" value="Restore Defaults"/>
IPMI LAN:	<input type="button" value="OFF"/>	Port 1: 623	<input type="button" value="Restore Defaults"/>
IPMI LAN(RMCP+):	<input checked="" type="button" value="ON"/>	Port 2: 664	<input type="button" value="Restore Defaults"/>

RMCP+ and RMCP share ports. After you set ports for RMCP, RMCP+ also uses the ports.



System Settings

- The **System Settings** page allows you to perform the following operations:
 - View and set Simple Network Management Protocol (SNMP) information.
 - View and set the web server timeout period.
 - View and set the system time zone.
 - Set alarm thresholds and enable or disable the user management function on the service side.
 - View and set device locations.

Only administrators and operators have permission to configure system settings. Common users have only permission to view system settings.

1. Set SNMP Version. SNMPv3 is enabled by default and cannot be disabled. Enabling SNMPv1 and SNMPv2c may reduce system security. Exercise caution when enabling these services.

V1 V2C V3

Read-Only Community: The value can contain a maximum of 32 characters except spaces.

Confirm Community:

Read/Write Community: The value can contain a maximum of 32 characters except spaces.

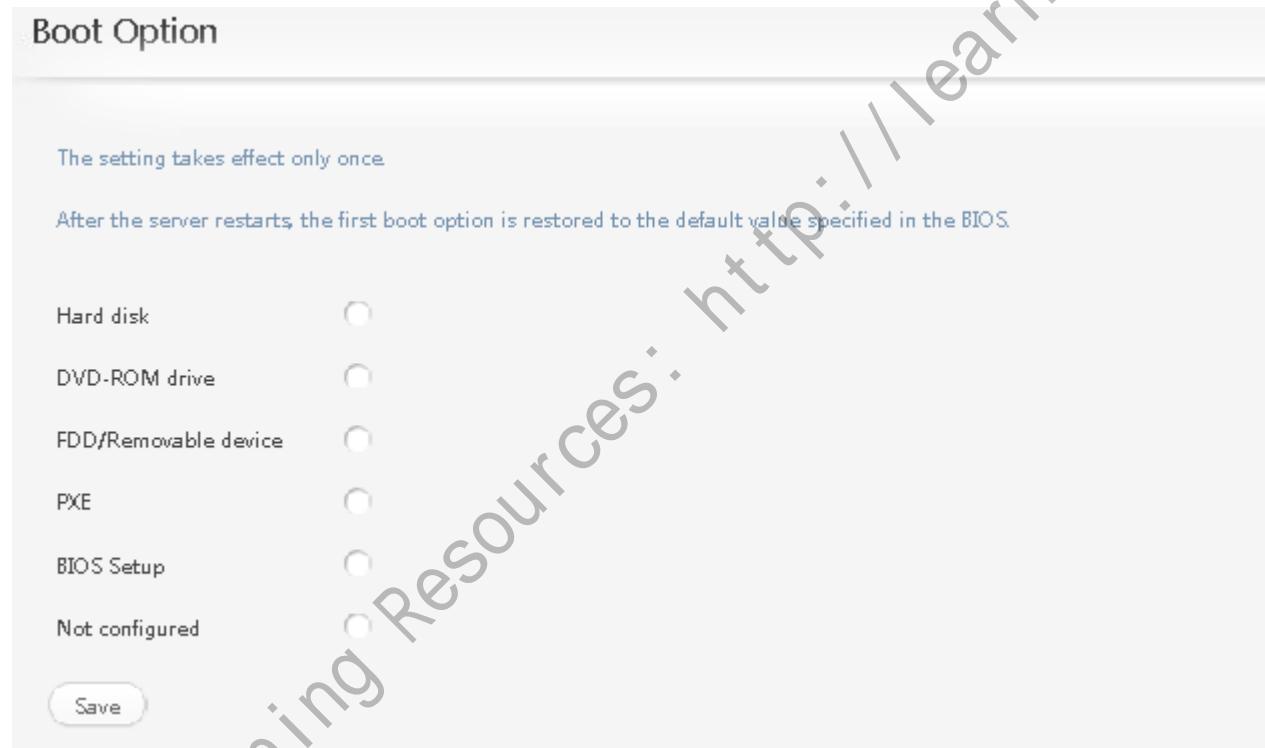
Confirm Community:

SNMP V3 AuthProtocol: MD5 may cause security risks. You are advised to use SHA.

SNMP V3 PrivProtocol: DES may cause security risks. You are advised to use AES.

Boot Option

- The **Boot Option** page allows you to set the first boot option for the operating system (OS) on the server.



Remote

- The **Remote** page allows you to view the maximum number of sessions and the number of activated sessions for the keyboard, video, and mouse (KVM) and virtual media, and access the server operating system (OS) by using the Remote Virtual Console.

Virtual Media Properties

Maximum Number of Virtual Media Sessions:1

Number of Activated Sessions:0

Delete Current Link: [Delete](#)

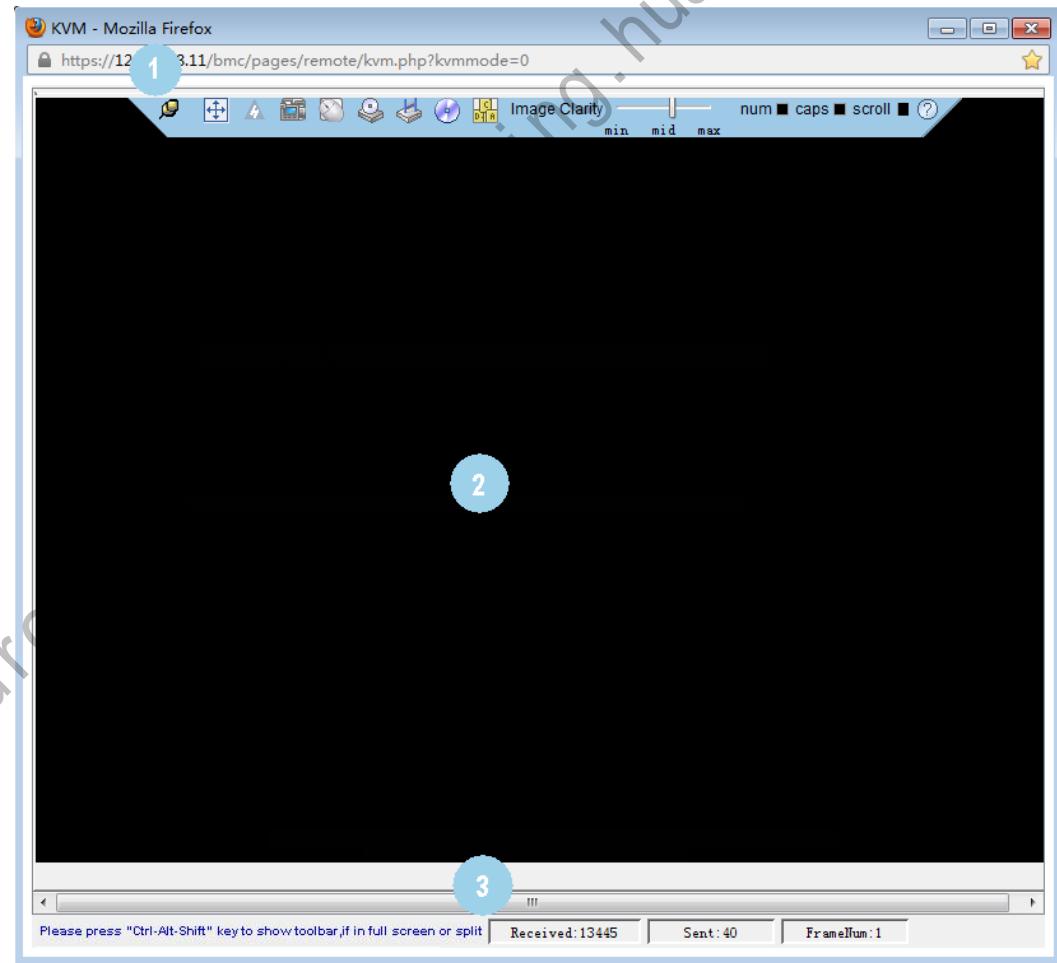
Remote Connection

[Remote Virtual Console \(Shared Mode\)](#)

[Remote Virtual Console \(Private Mode\)](#)

Remote

- On the menu bar, choose **Remote**. On the **Remote** page, click **Remote Virtual Console (shared mode)** or **Remote Virtual Console (private mode)**. The KVM screen is displayed.



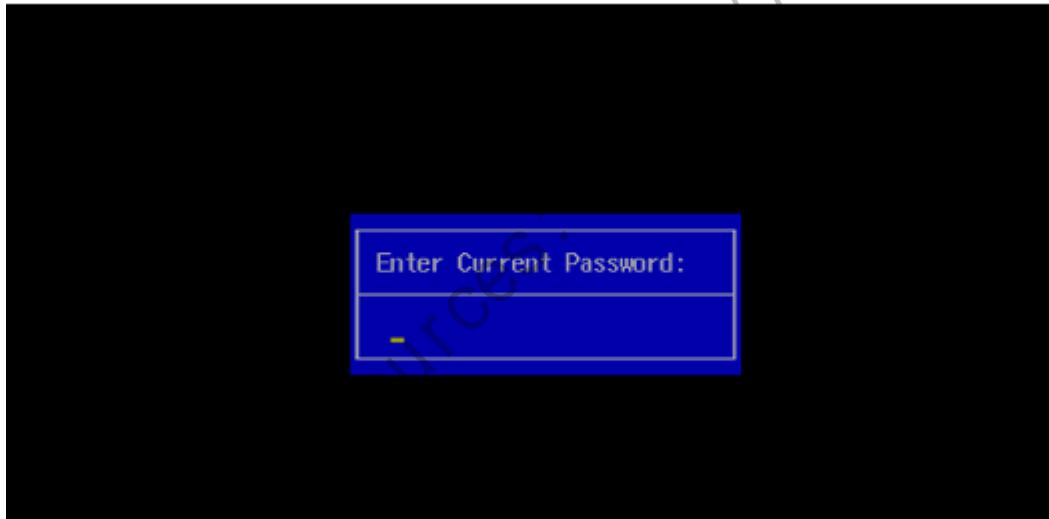


Contents

- iBMC Operation
- **Common Tasks of BISO Setting**
- RAID Configuration
- OS Installation
- LCD Operation

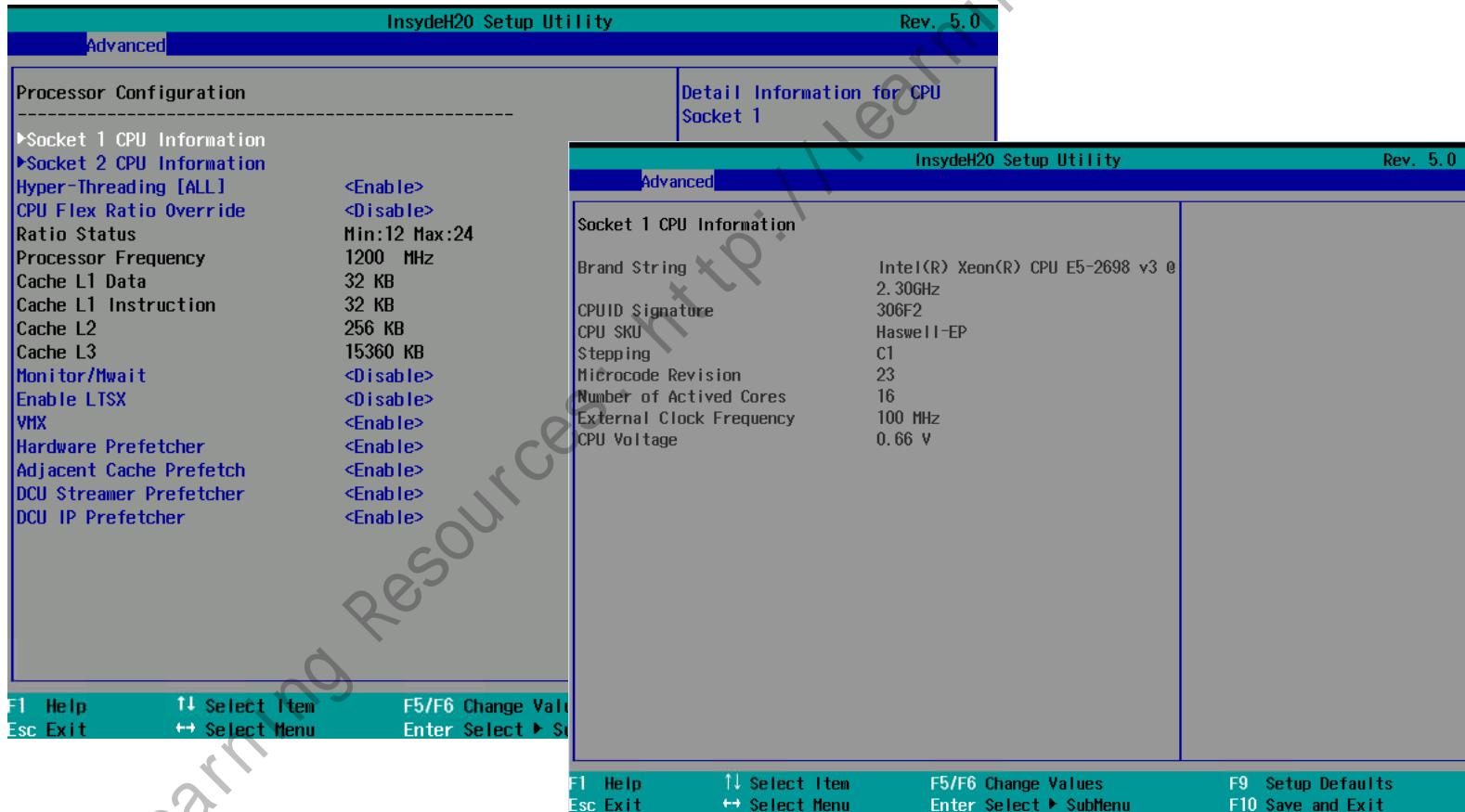
Entering the BIOS

- Upon server startup, press **DEL** within 3 seconds when prompted until the **BIOS Setup Utility** screen is displayed.
- Enter the password. The default password is **Huawei12#\$**.



Querying CPU Information

- Choose **Advanced > Intel RC Group > Processor Configuration** and press **Enter**.
- Select **Socket x CPU Information** and press **Enter**.



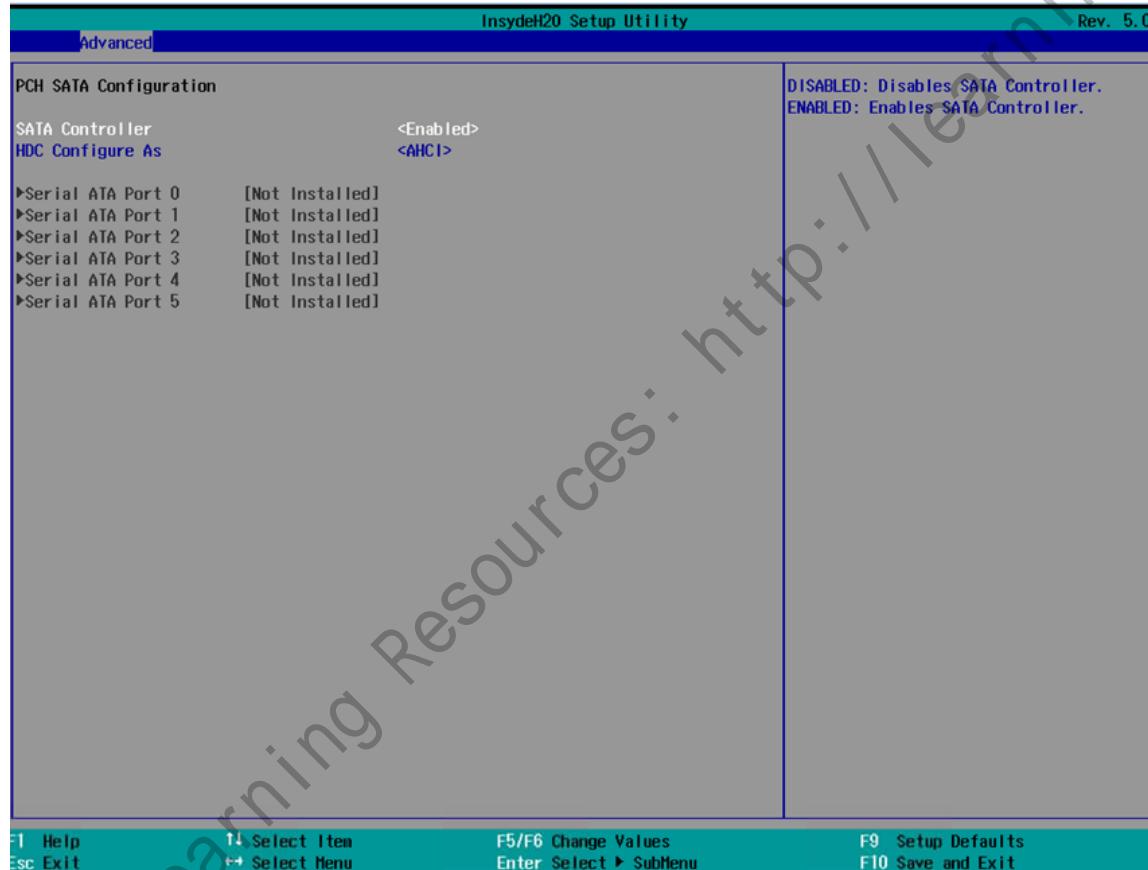
Querying Memory Information

- Select the **Main** tab.
- Choose **Advanced > Memory Topology** and press **Enter**.



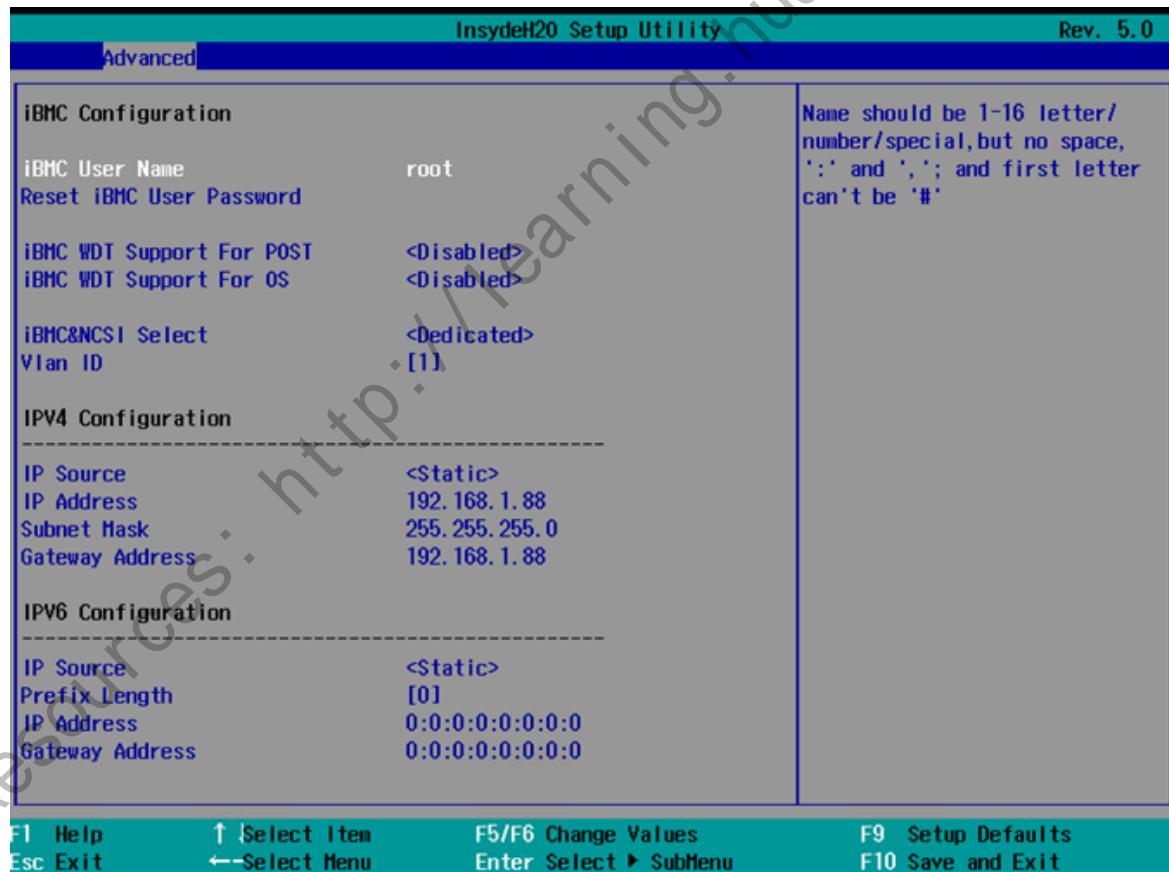
Querying Hard Disk Information

- Choose **Advanced > PCH SATA Configuration** and press **Enter**.
- Select **Serial ATA Port x** and press **Enter**.



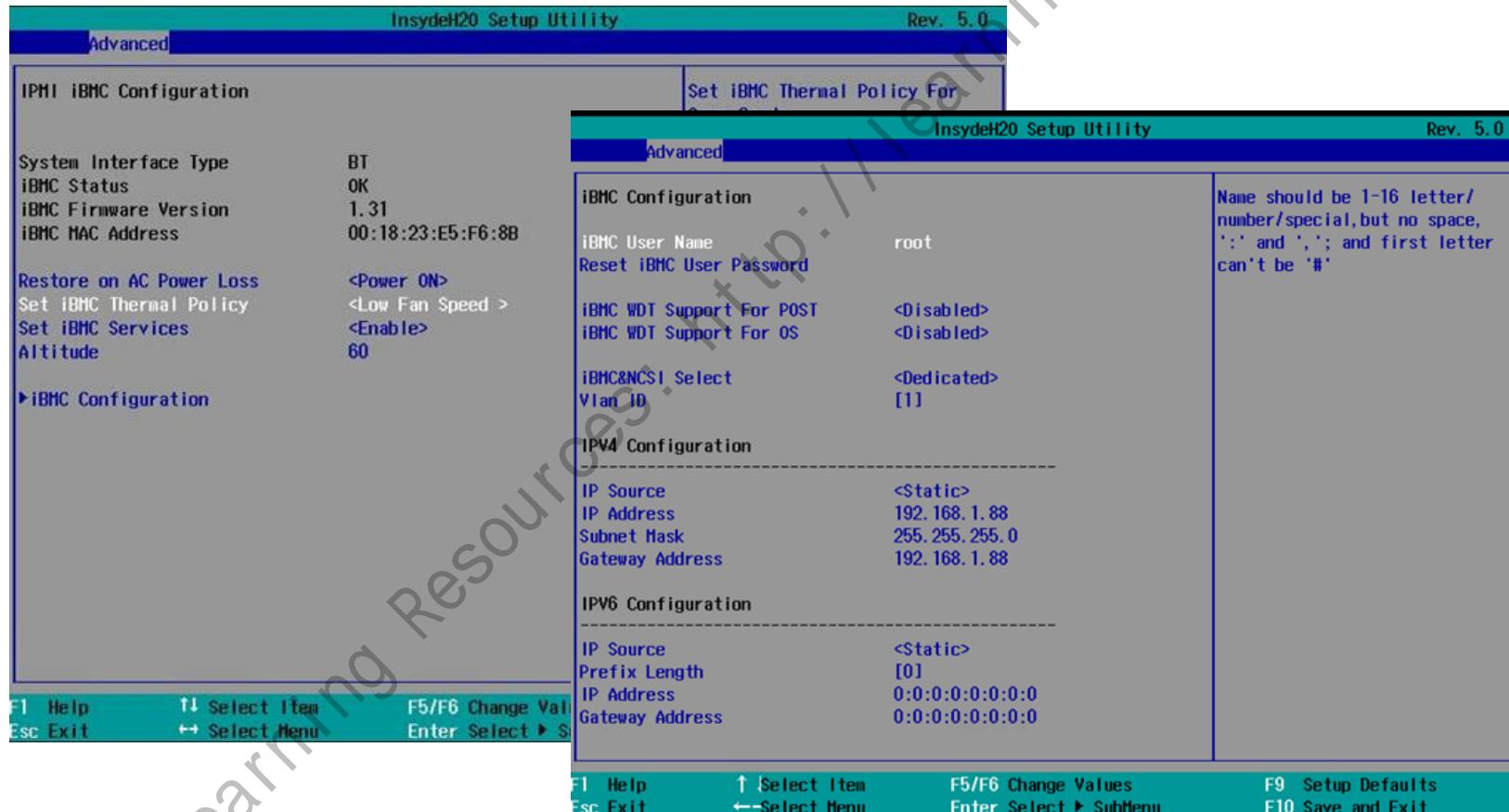
Querying the IP Address of the iBMC Network Port

- Choose **Advanced > IPMI iBMC Configuration** and press **Enter**. The **IPMI iBMC Configuration** screen is displayed.
- Select **iBMC Configuration** and press **Enter**. The **iBMC Configuration** screen is displayed, showing information about the IP address of the iBMC network port.



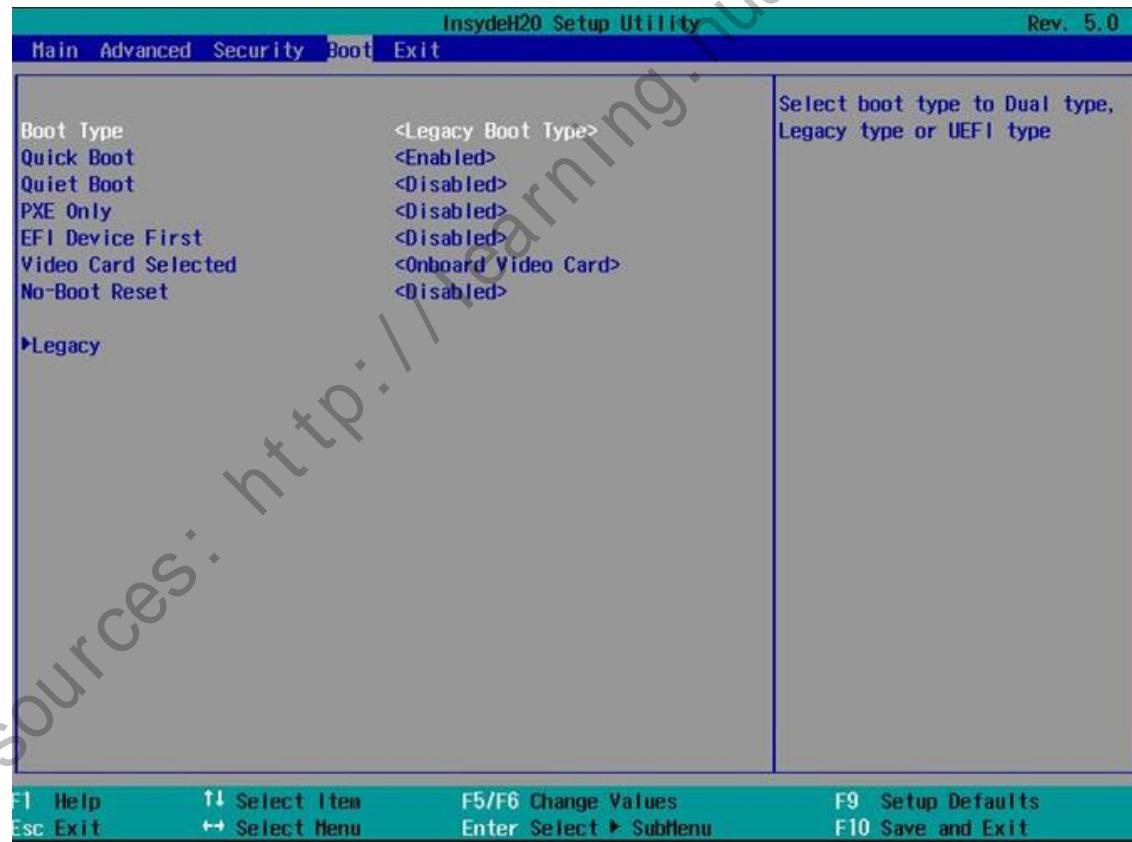
Configuring iBMC Network Information

- Choose **Advanced > IPMI iBMC Configuration** and press **Enter**.
- Select **iBMC Configuration** and press **Enter**.



Setting the Server Boot Mode

- Choose **Boot > Boot Type** and press **Enter**.
- In the displayed dialog box, select **Dual Boot Type** or **Legacy Boot Type**, and press **Enter**.
- Choose **Legacy > Boot Type Order** and press **Enter**.
- Select a boot option, and press **F5** or **F6** to change the boot priority.





Contents

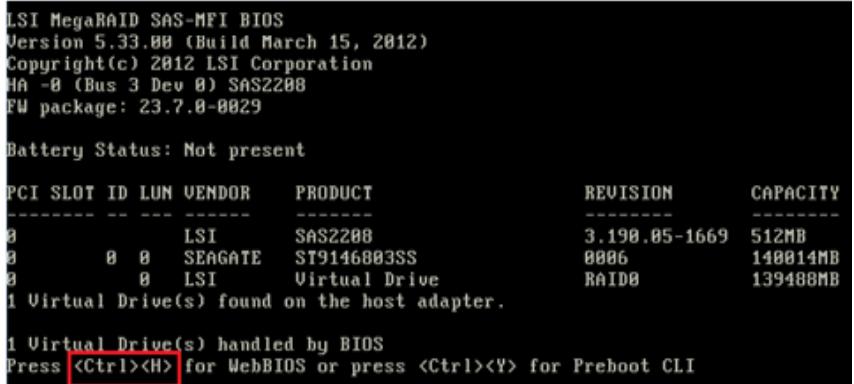
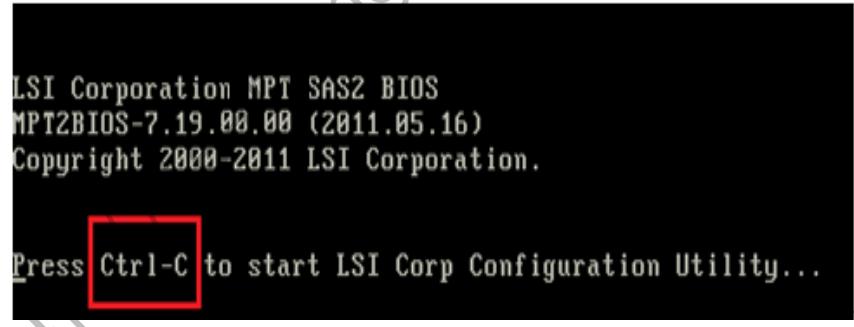
- iBMC Operation
- Common Tasks of BISO Setting
- **RAID Configuration**
- OS Installation
- LCD Operation

RAID Level Overview

RAID Level	Typical Application Scenario
RAID 0	A scenario requiring high read/write speed but low security, such as graphics workstations
RAID 1	A scenario requiring random data writes and high security, such as servers and database storage
RAID 3	A scenario requiring continuous data transfer and high security, such as video editing and large-scale database storage
RAID 5/6	A scenario requiring random data transfer and high security, such as finance and database storage
RAID 10	A scenario featuring massive data and requiring high security, such as banking and finance

RAID Controller Card Chip Models

- Identify the RAID controller card chip model based on the information displayed in the BIOS boot phase:
 - For the LSISAS2308 RAID controller card, the message "Press Ctrl-C to Start LSI Corp Configuration Utility..." is displayed during the BIOS boot phase.
 - For the LSISAS2208 RAID controller card, the message "Press <Ctrl><H> for WebBIOS or press <Ctrl><Y> for Preboot CLI" is displayed during the BIOS boot phase.



RAID Controller Card Chip Models

- Identify the RAID controller card chip model based on the information on the **System Hardware** page of iBMC.

The screenshot shows the iMana 200 interface for the CH220 system. The left sidebar menu includes Overview, System Information (selected), Firmware Version, Asset Information, System Hardware (selected), Remote Control, PS Management, Events and Logs, Real-time Monitoring, Diagnose and Location, Download Data, and Configuration. The main content area displays the System Information >> System Hardware page. Under Device(Configured Number/Maximum Number), it lists CPU(2/2), Memory(8/24), HDD(2/2), and RAID Card(1/1). The RAID Card entry is highlighted with a red box, showing RAID Card LSI SAS2308.

Device	Description
RAID Card	LSI SAS2308

Introduction to LSISAS2208 RAID Controller

- The LSISAS2208 controller card provides the following functions:
 - Supports RAID **0, 1, 5, 6, 10, 50, and 60** to ensure data security.
 - Provides the **PCIe x8 port** with a maximum bandwidth of **8 Gbit/s**.
 - Provides a cache capacity of **512 MB or 1 GB** to support fast read and write operations.
 - Provides eight 6 Gbit/s **SAS or SATA** ports.
 - Supports SAS or SATA hard disks, or solid-state drives (SSDs).
 - Supports **hot swap** for hard disks.
 - Connects to a maximum of 256 expansion devices. A Huawei server supports a maximum of **26** hard disks.
 - Supports **online capacity expansion**.
 - Supports **online RAID level migration**.
 - Supports multi-stripe choice.
 - Quickly initializes a RAID group.

Introduction to LSISAS2208 RAID Controller

- Supports daemon data consistency verification.
- Supports hard disk daemon medium inspection and repair.
- Complies with DDF specifications.
- Supports S.M.A.R.T.
- Supports global and dedicated hot spare disks.
- Supports automatic reconstruction of a hot spare disk.
- Supports emergent hot spare disks.
- Supports SES and SGPIO for external management.
- Supports 64 logical drivers (LDs) with the maximum capacity of 64 TB .

Introduction to LSISAS2208 RAID Controller

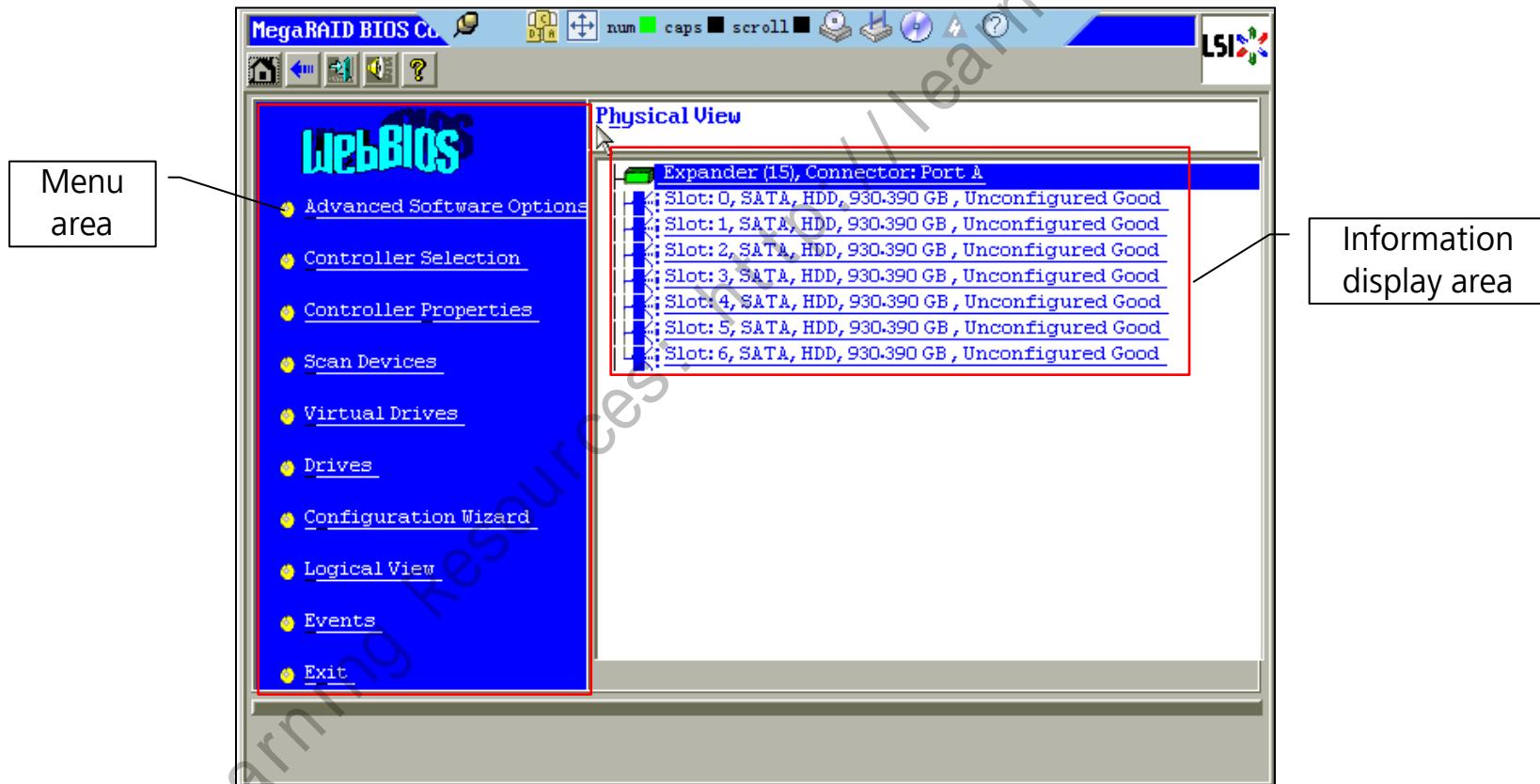
- Supported RAID levels and quantity of hard disks

RAID Level	Number of Hard Disks	Maximum Number of Failed Disks
RAID 0	The value is an integer ranging from 1 to 32.	0
RAID 1	2 to 32	Number of hard disks/2
RAID 5	3 to 32	1
RAID 6	3 to 32	2
RAID 10	4 to 128	Number of spans
RAID 50	6 to 128 (2 to 8 RAID 5 groups)	Number of spans
RAID 60	6 to 128 (2 to 8 RAID 6 groups)	Number of spans x 2

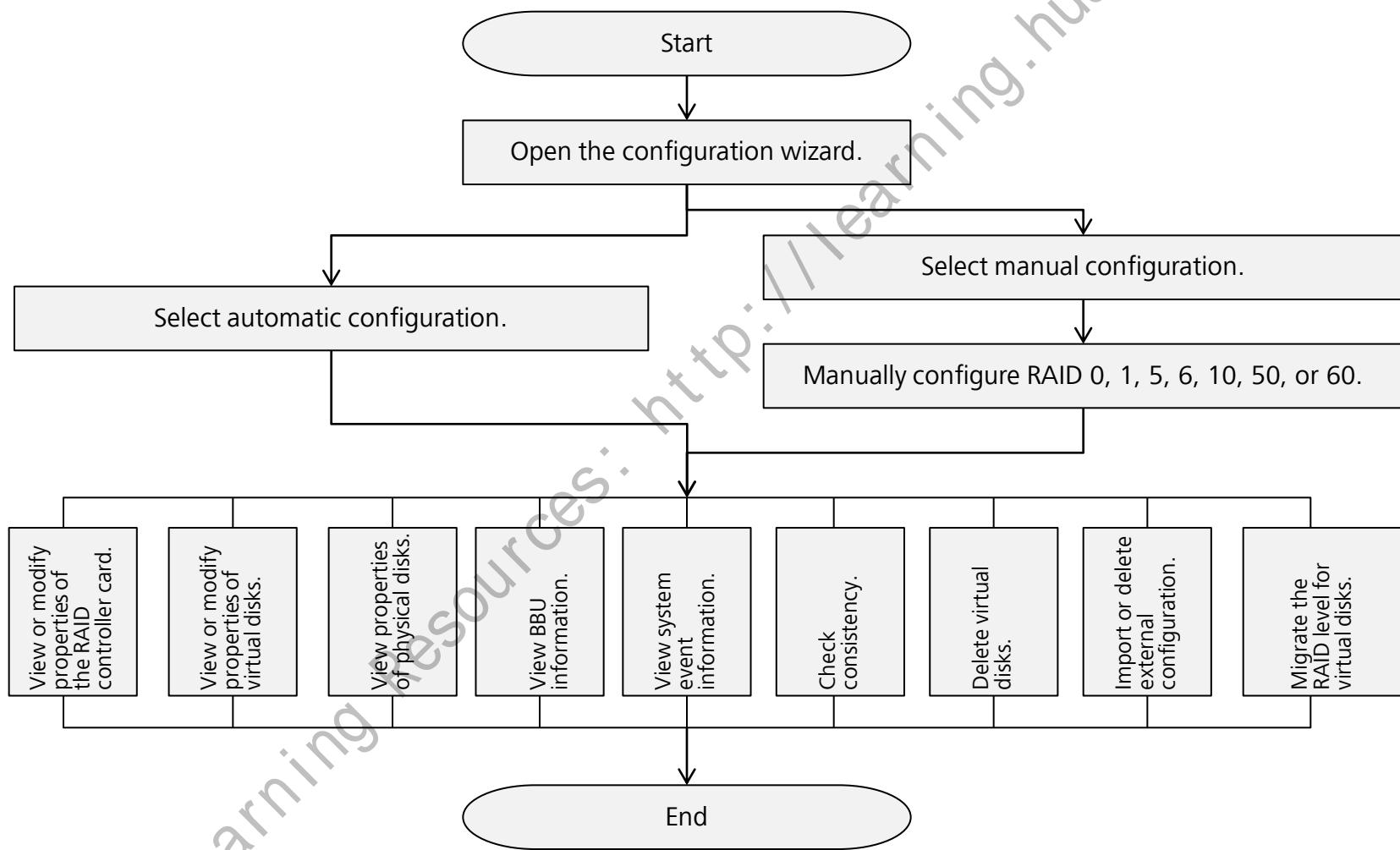
- The system does not support the scenario that adjacent hard disks in a RAID group fail.
- Each span of RAID 10 and RAID 50 allows at most one bad disk.
- Each span of RAID 60 allows at most two bad disks.

LSISAS2208 Configuration Method

- During server startup, press **Ctrl+H** when the message " Press <Ctrl><H> for WebBIOS or press <Ctrl><Y> for Preboot CLI" is displayed.

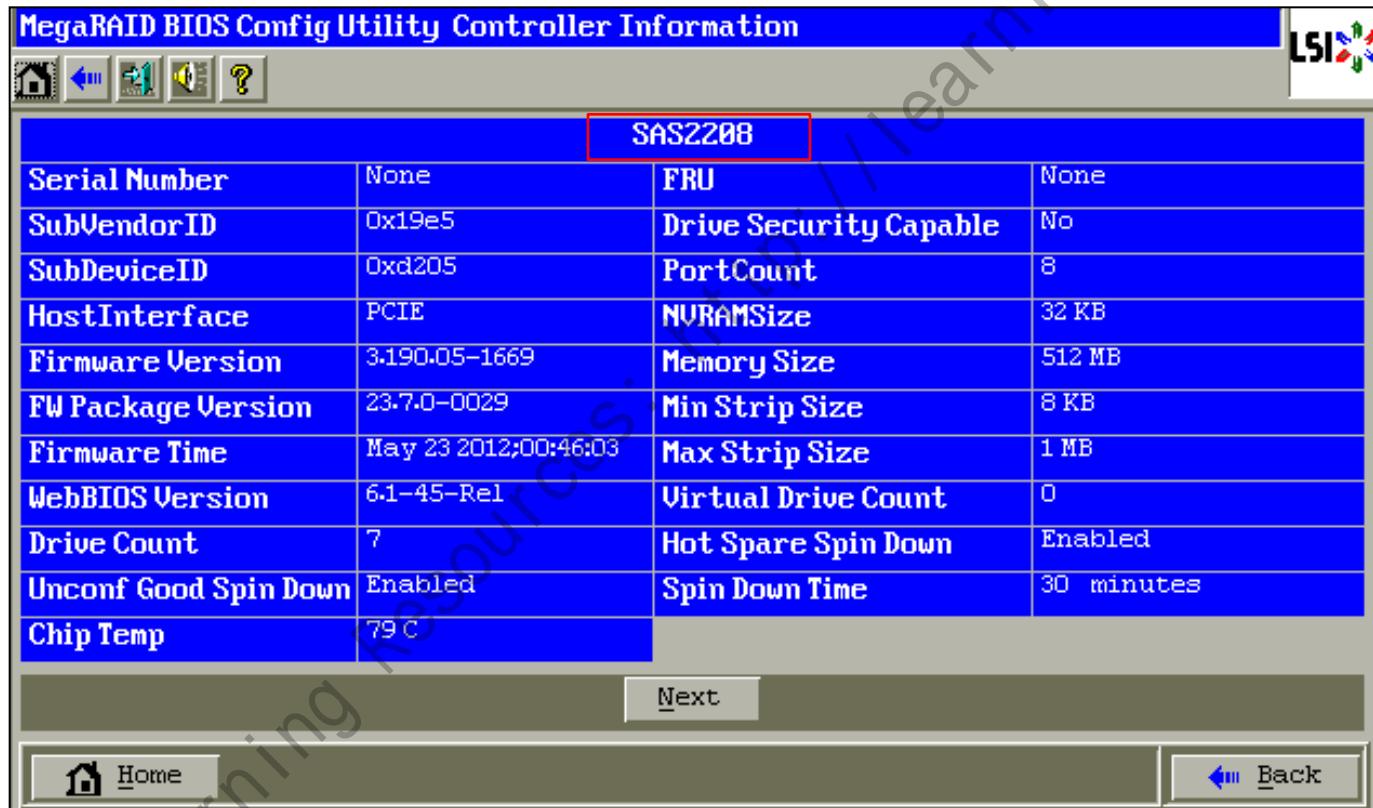


LSISAS2208 Configuration Process

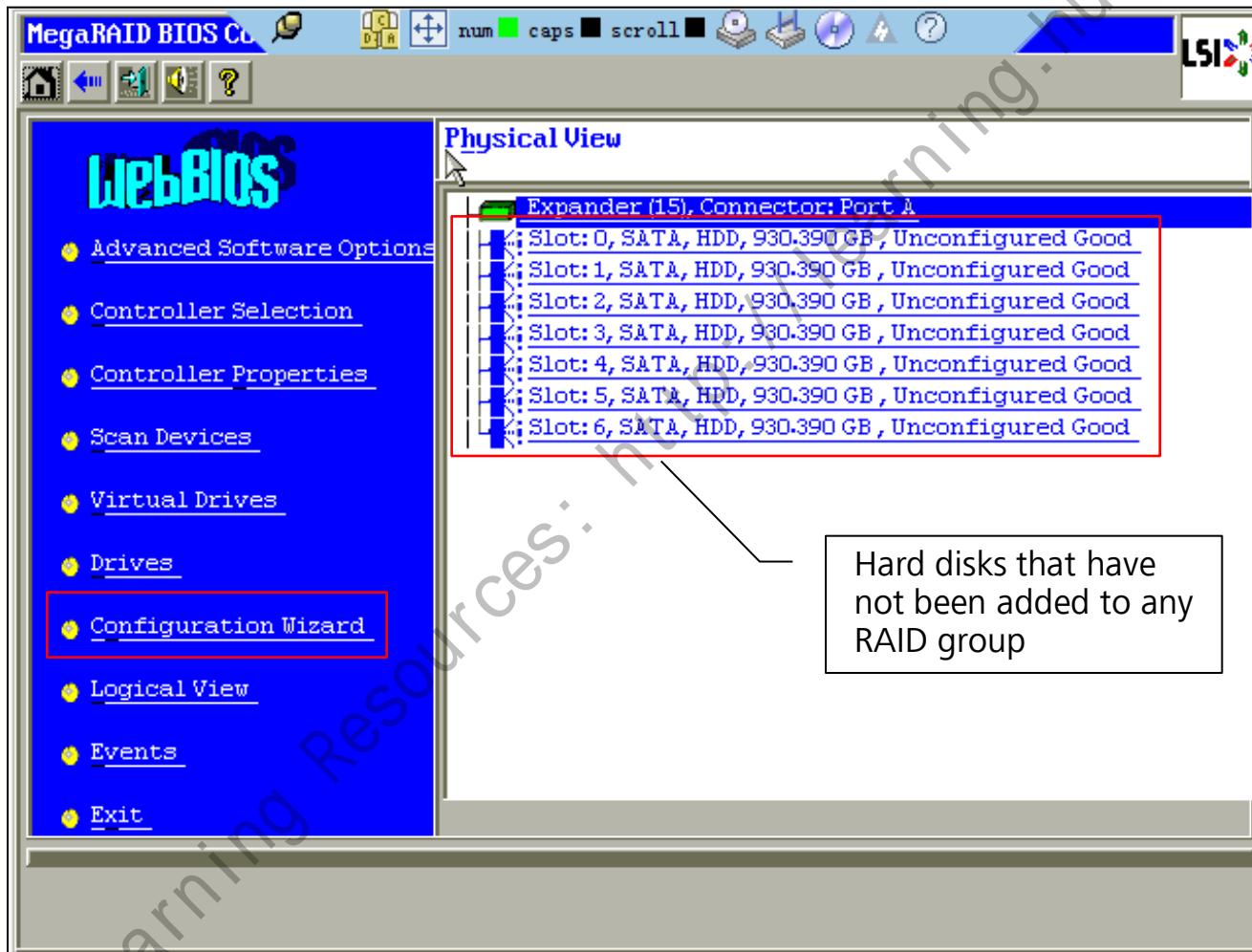


LSISAS2208 Information

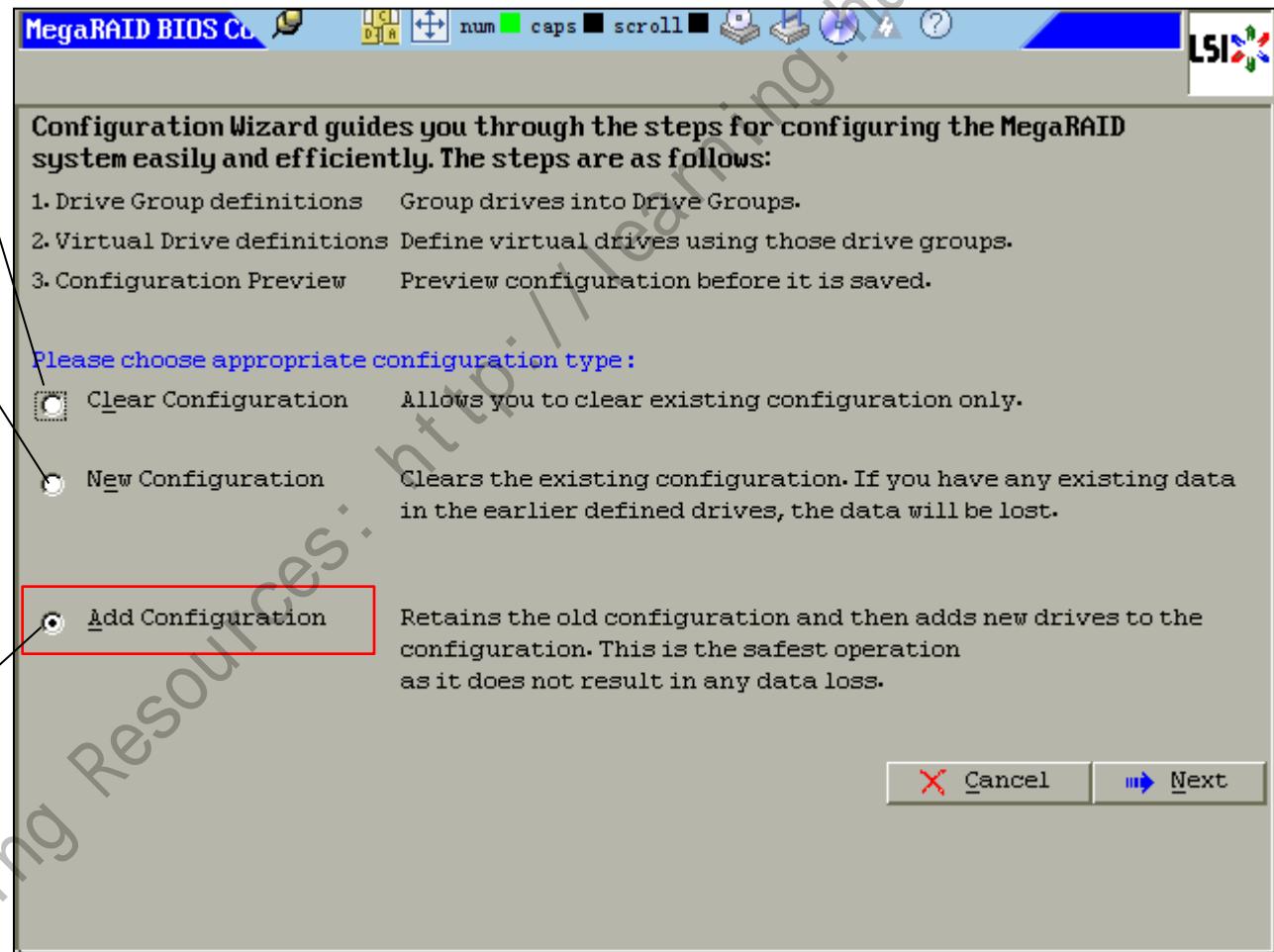
- Information about an LSISAS2208 RAID controller card



LSISAS2208 Configuration Wizard



Selecting a Configuration Type



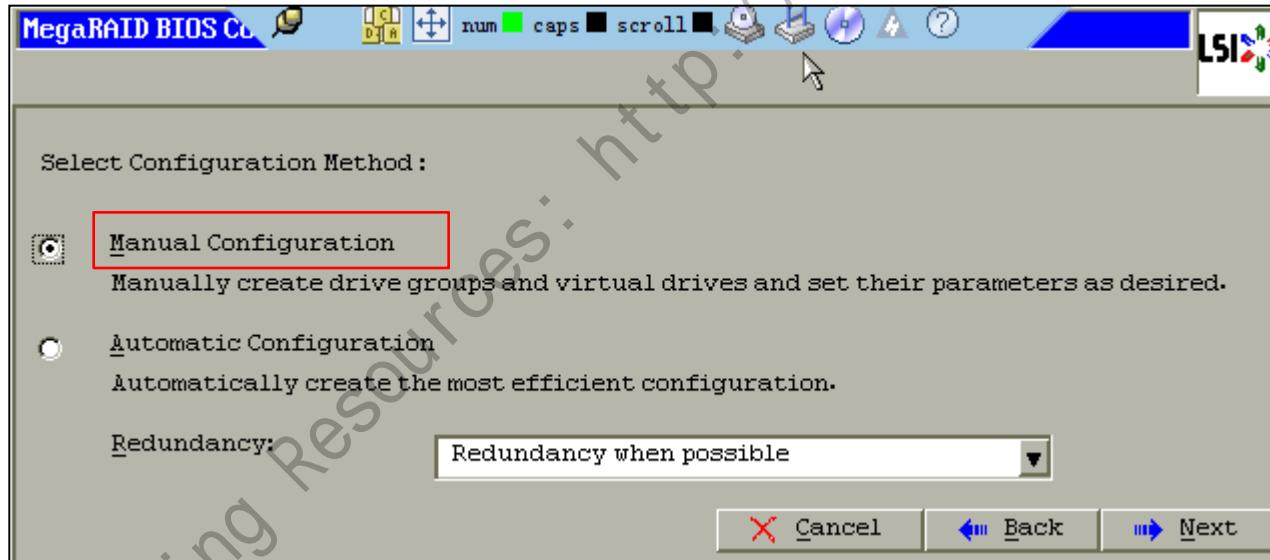
Clear existing configuration.

Clear existing configuration and create new configuration.

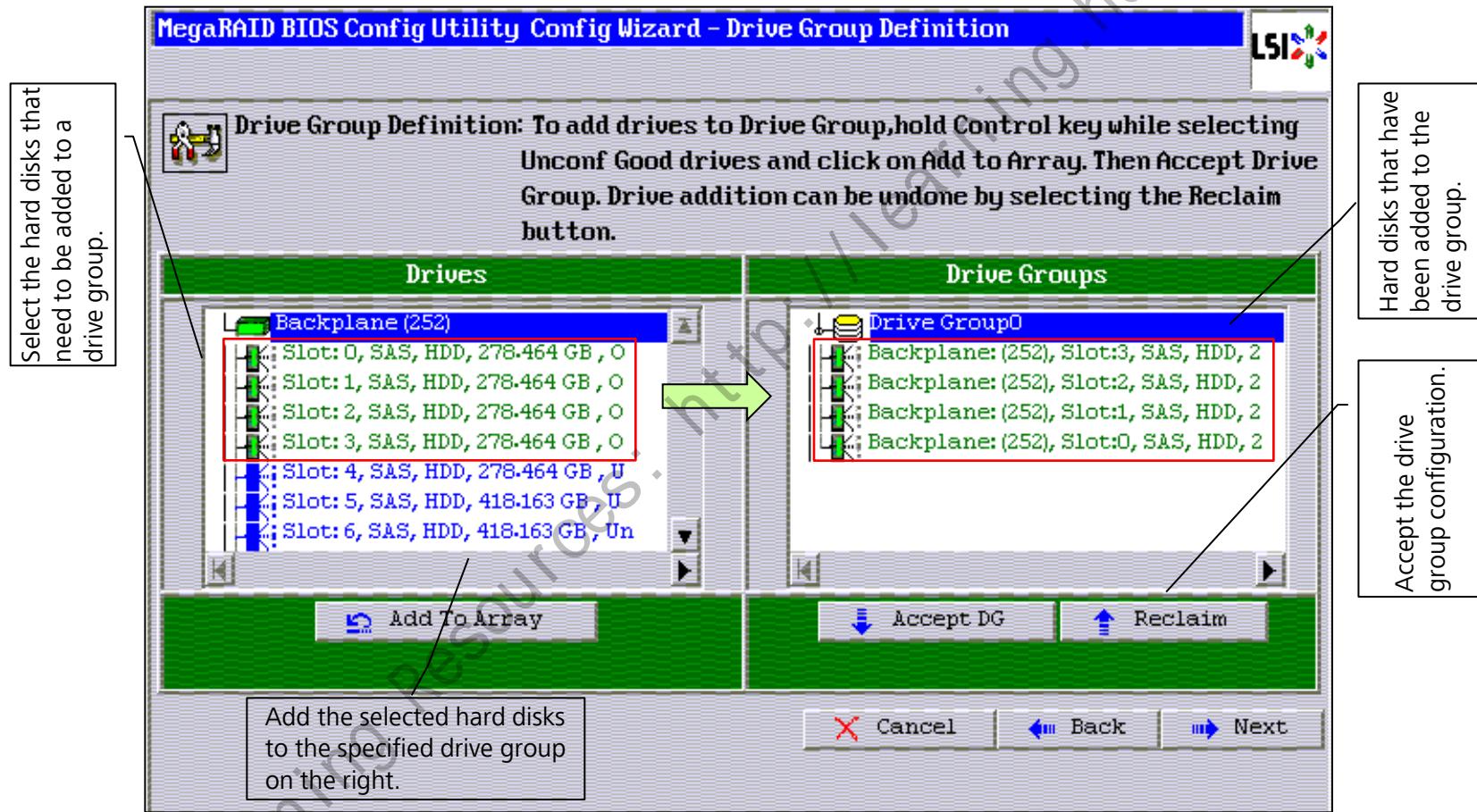
Retain existing configuration and add new storage devices.

Selecting a Configuration Method

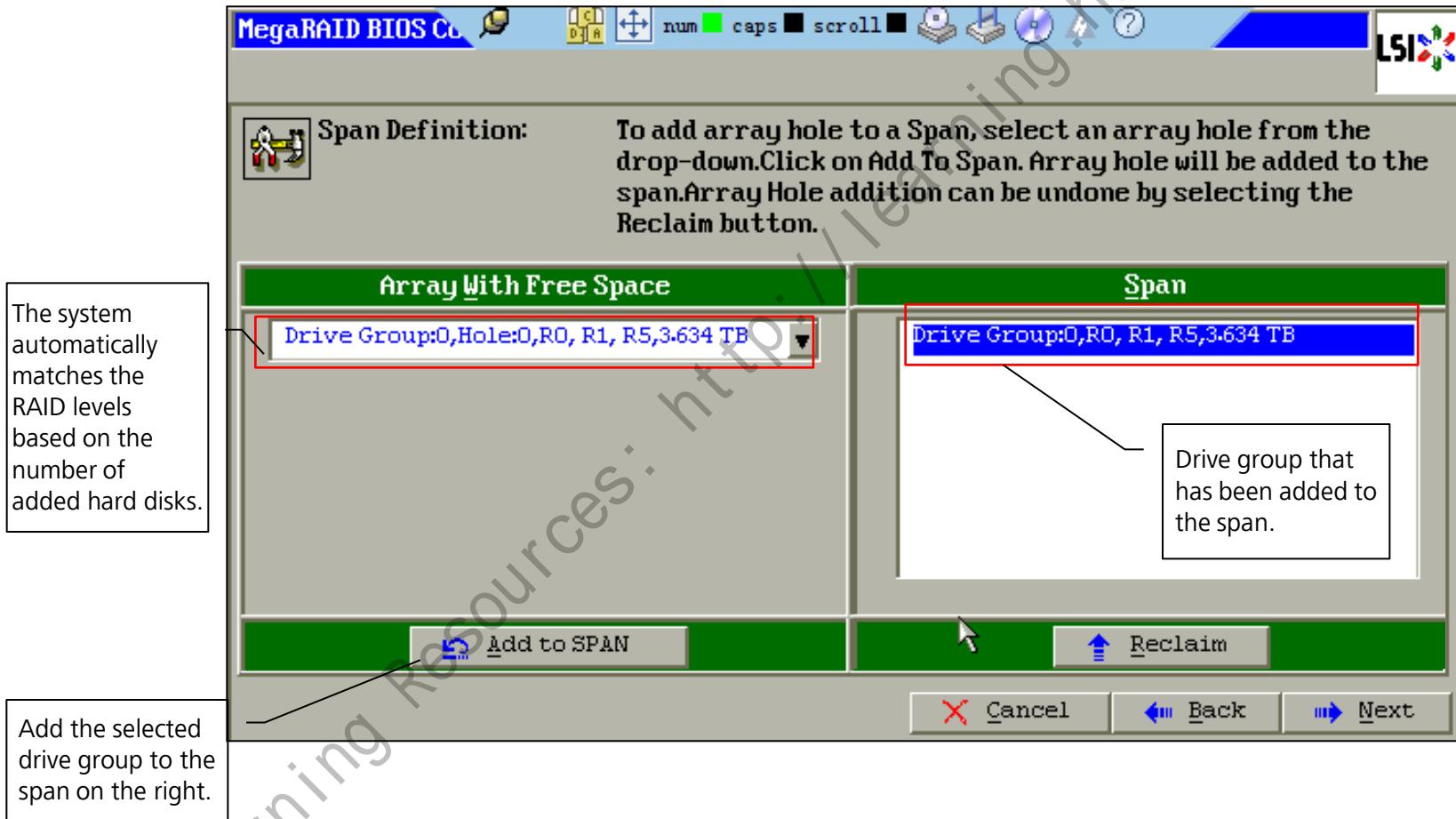
- **Manual Configuration:** Manually configure RAID based on site requirements.
- **Automatic Configuration:** The system automatically creates an optimal RAID configuration.



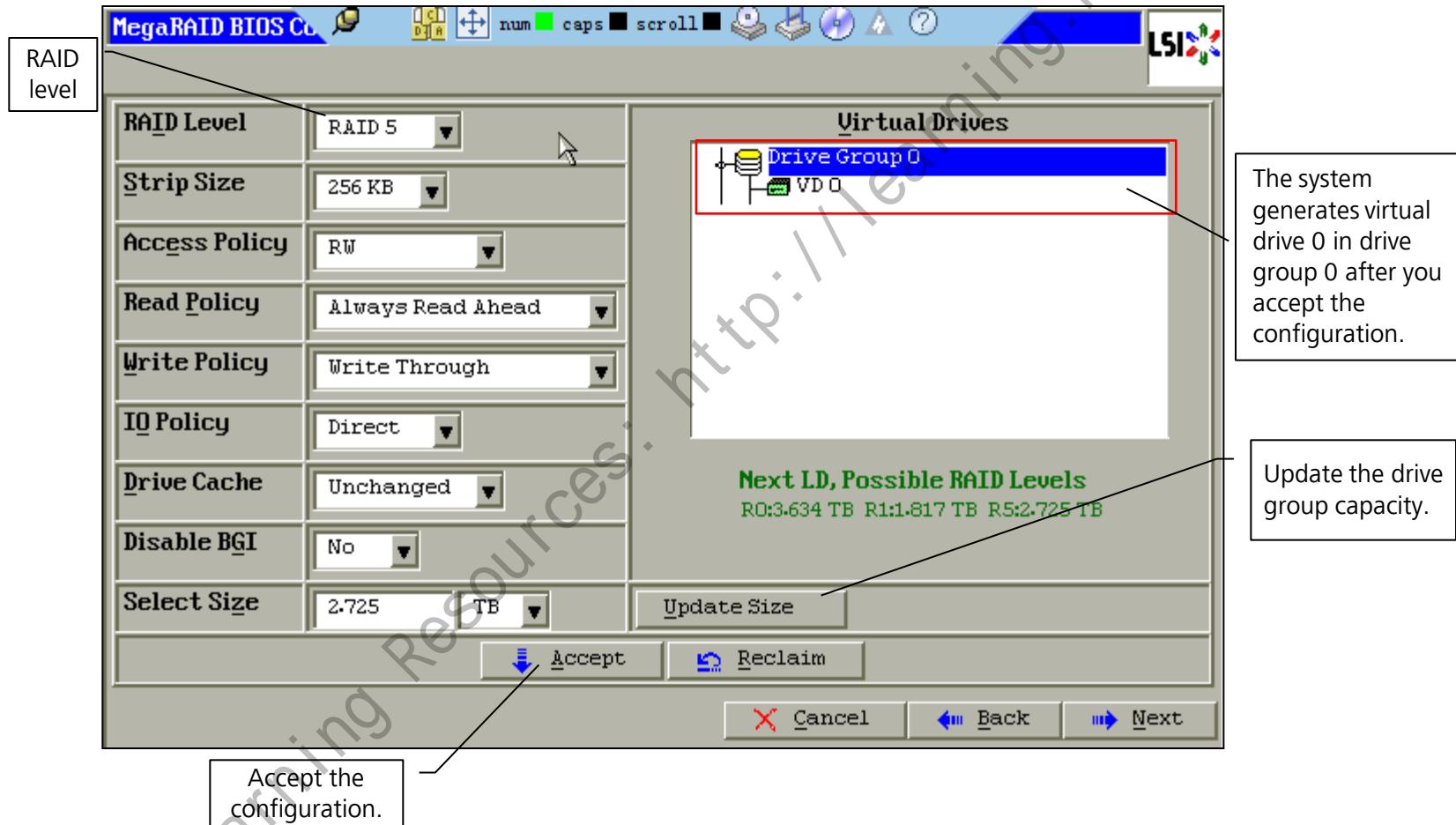
Configuring a Driver Group



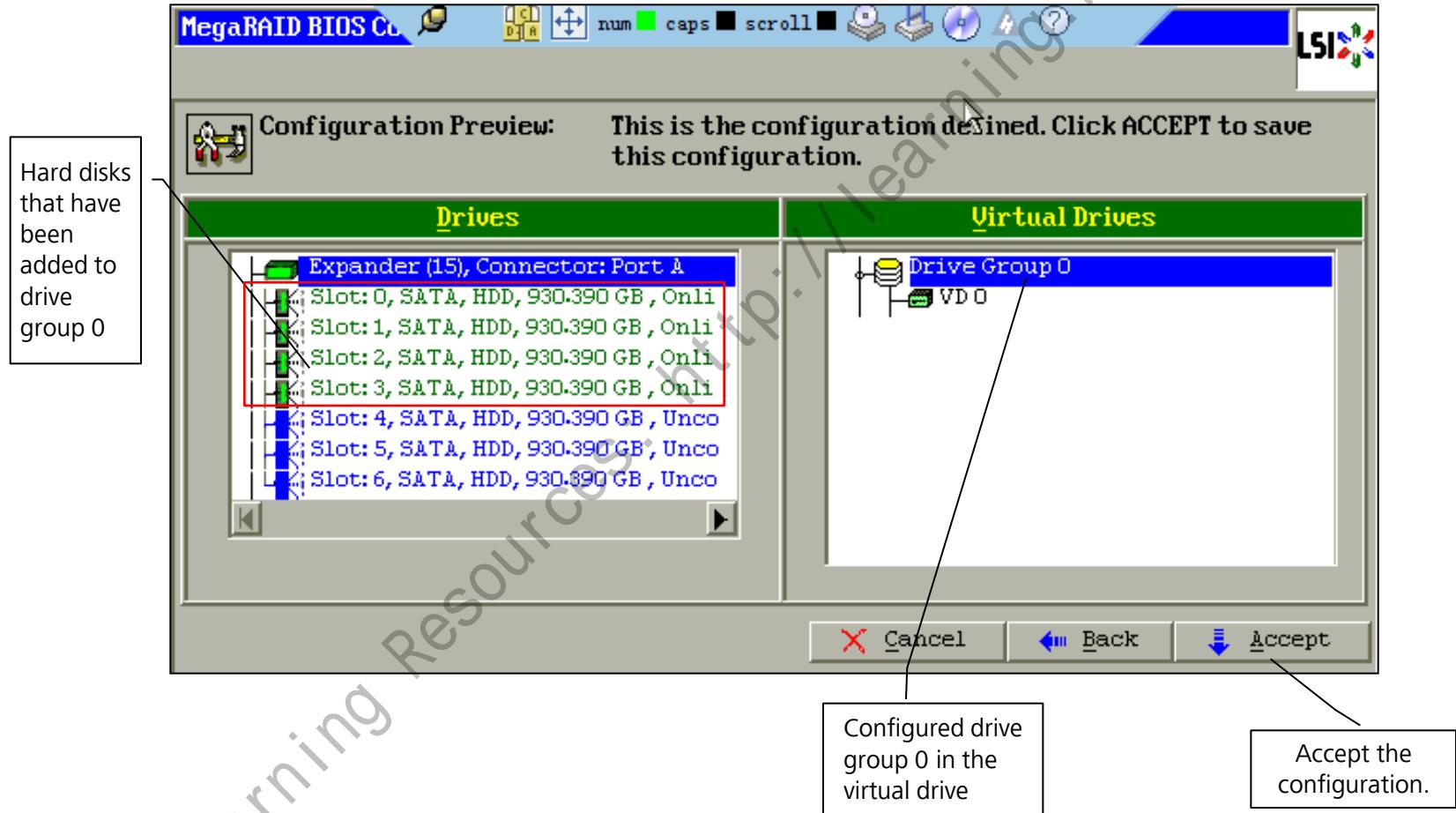
Adding a Drive Group to the Span



Generating Virtual Drive 0



Confirming Virtual Drive 0

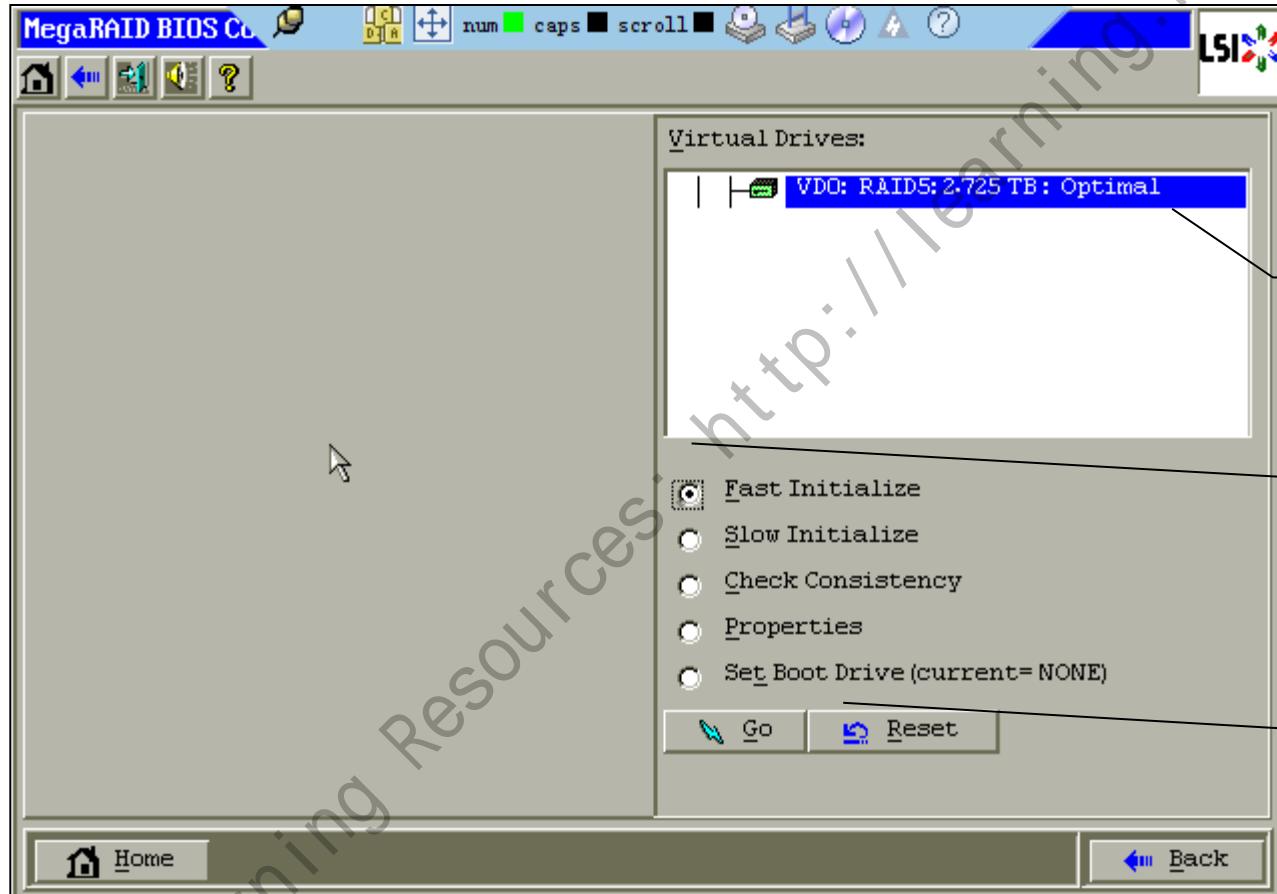


Configuring SSD Caching



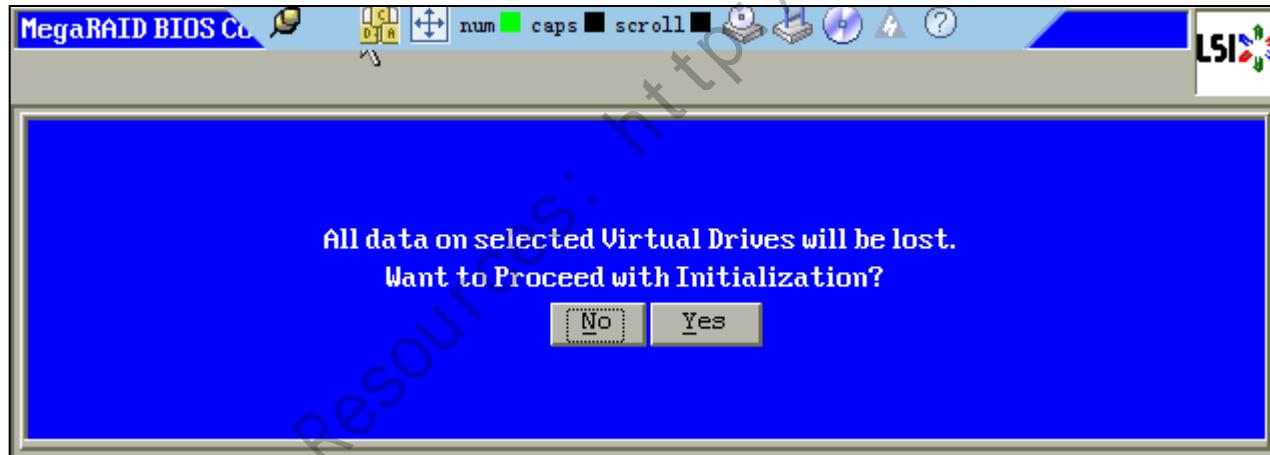
Click **Cancel** if no SSD caching configuration is available.

Initializing Virtual Drive 0



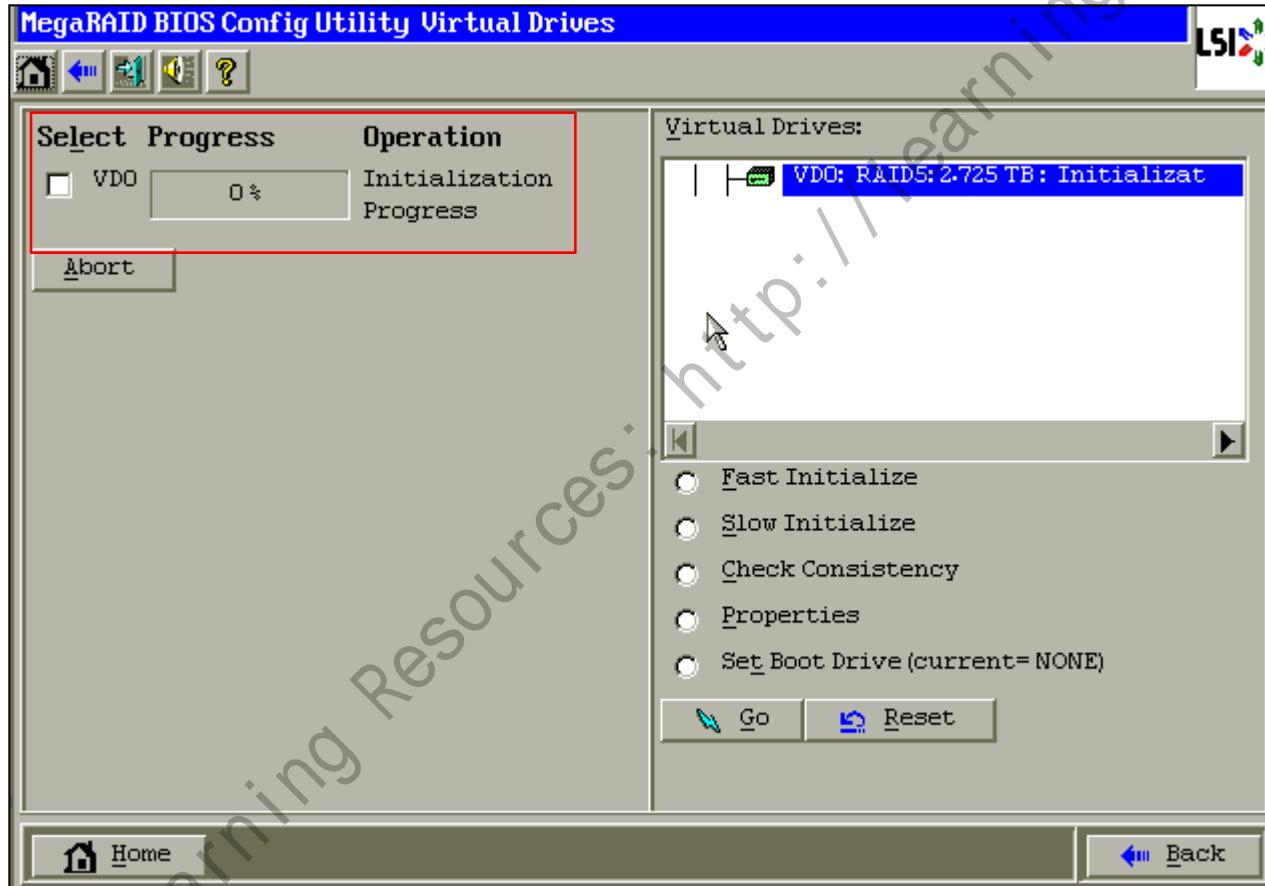
Initializing Virtual Drive 0

- Initialization deletes all data from the virtual drive.
- If the following message is displayed, select **Yes** and press **Enter**.

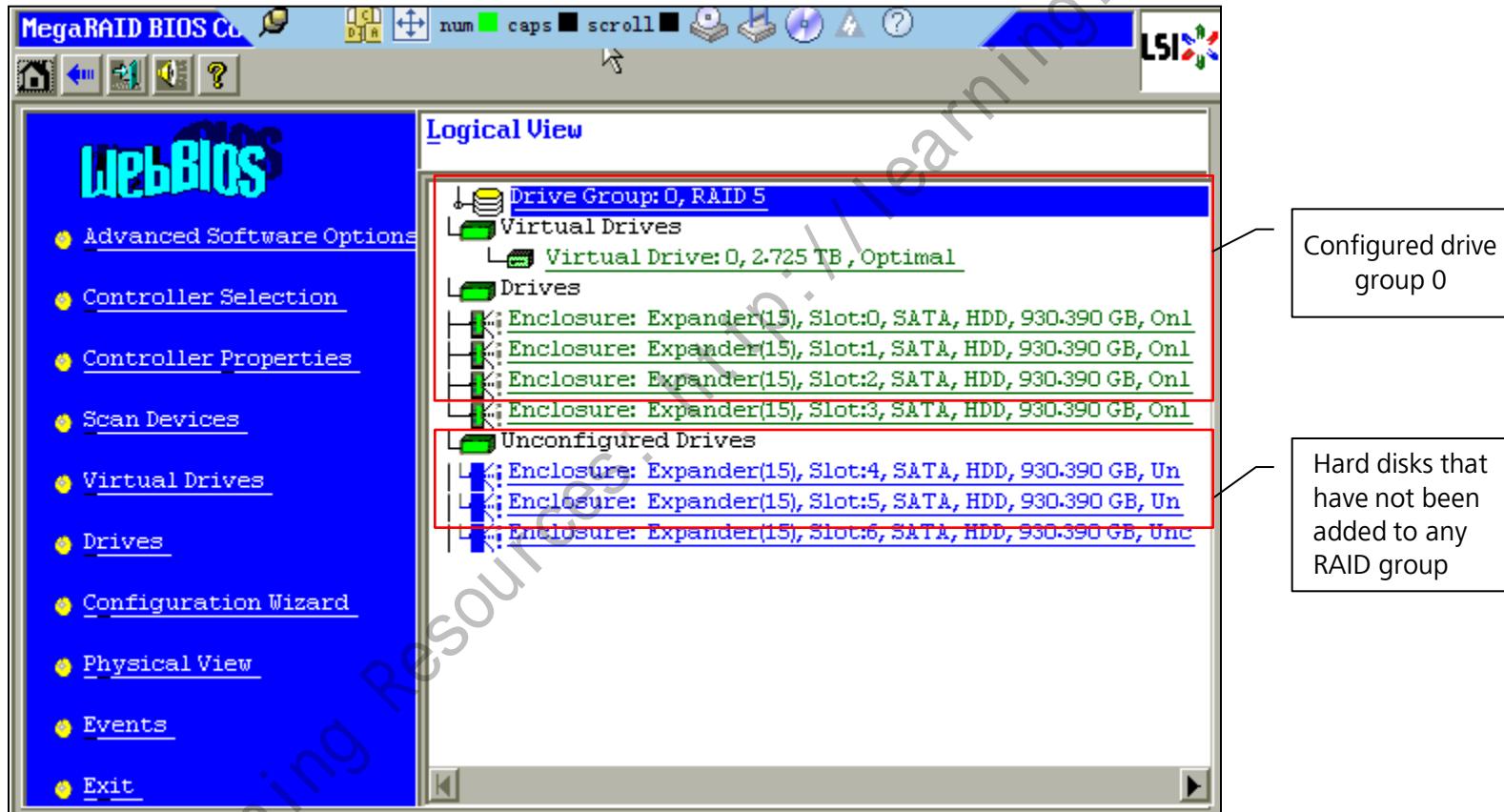


Initializing Virtual Drive 0

- Initialization progress



Finishing RAID Configuration



Introduction to LSISAS2308 RAID Controller

- The LSISAS2308 controller card has the following functions:
 - Supports RAID **0, 1, 1E, and 10** to ensure data security.
 - Provides the PCIe x8 port with a maximum bandwidth of **8 Gbit/s**.
 - Provides eight **SAS or SATA** ports for hard disk storage.
 - Connects to a maximum of 256 expansion devices. A Huawei server supports a maximum of **26** hard disks.
 - Supports SAS or SATA hard disks, or solid-state drives (SSDs).
 - Supports **hot swap** for hard disks.
 - Supports **dormancy** for hard disks.

Introduction to LSISAS2308 RAID Controller

- Supported RAID levels and quantity of hard disks

RAID Level	Number of Hard Disks	Maximum Number of Failed Disks
RAID 0	2 to 10	0
RAID 1	2	1
RAID 10	4 to 10	Number of hard disks/2
RAID 1E	3 to 9	(Number of hard disks - 1)/2

- The system does not support the scenario that adjacent hard disks in a RAID group fail.

RAID Configuration — Configuring the LSISAS2308 Controller Card

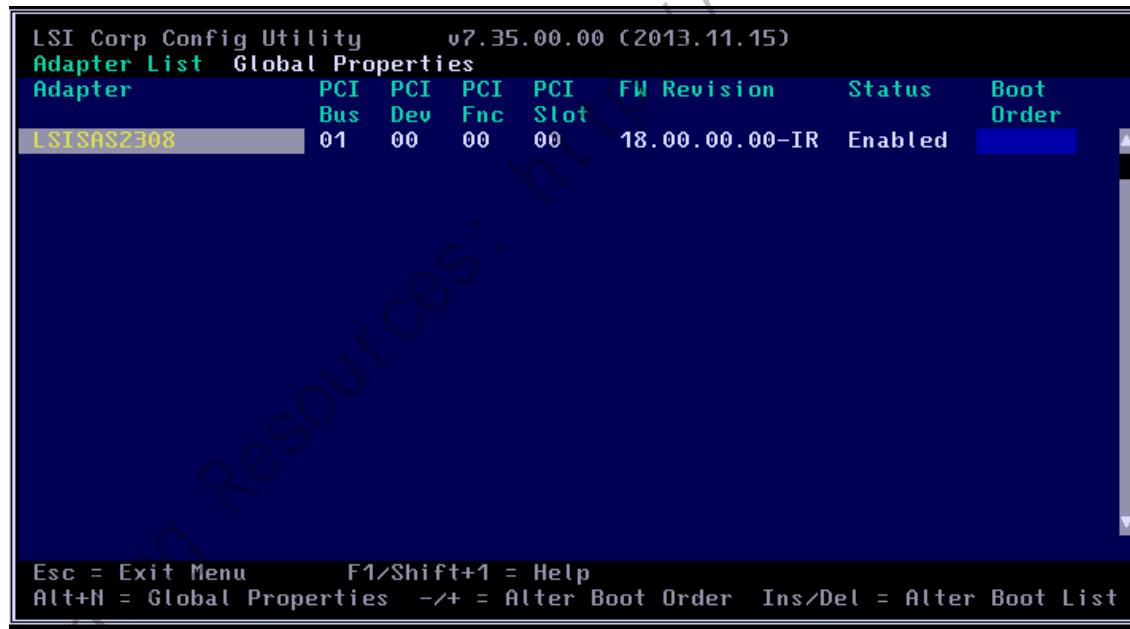
Press **Ctrl+C** when the message "Press Ctrl-C to Start LSI Corp Configuration Utility..." is displayed upon server startup.



RAID Configuration — Configuring the LSISAS2308 Controller Card

The message "Please wait, invoking SAS Configuration Utility..." is displayed.

After the system self-check is complete, the CU home screen is displayed, as shown in the following figure.



Introduction to LSISAS3008 RAID Controller

- The LSISAS3008 controller card provides the following functions:
 - Supports RAID 0, 1, 1E, and 10 to ensure data security.
 - Supports the PCIe x8 port with a maximum bandwidth of 8 Gbit/s.
 - Provides eight SAS or SATA ports for hard disk storage.
 - Connects to a maximum of 256 expansion devices. A Huawei server supports a maximum of 26 hard disks.
 - Supports SAS or SATA hard disks, or solid-state drives (SSDs).
 - Supports hot swap for hard disks.
 - Supports dormancy for hard disks.

Introduction to LSISAS3008 RAID Controller

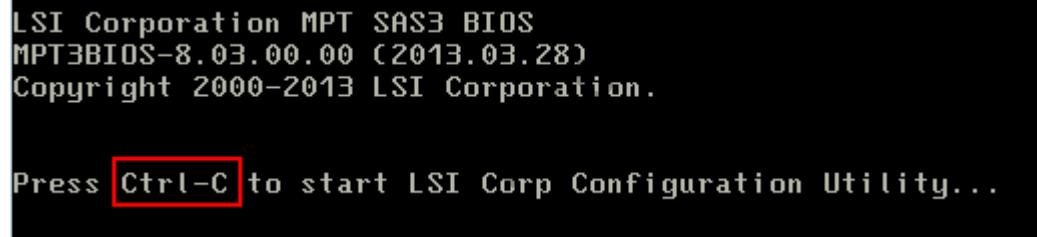
- Supported RAID levels and quantity of hard disks

RAID Level	Number of Hard Disks	Maximum Number of Failed Disks
RAID 0	2 to 10	0
RAID 1	2	1
RAID 10	4 to 10	Number of hard disks/2
RAID 1E	3 to 9	(Number of hard disks - 1)/2

- The system does not support the scenario that adjacent hard disks in a RAID group fail.

Configuring the LSISAS3008 Controller Card

Step 1 Press **Ctrl+C** when the message "Press Ctrl-C to Start LSI Corp Configuration Utility..." is displayed upon server startup.

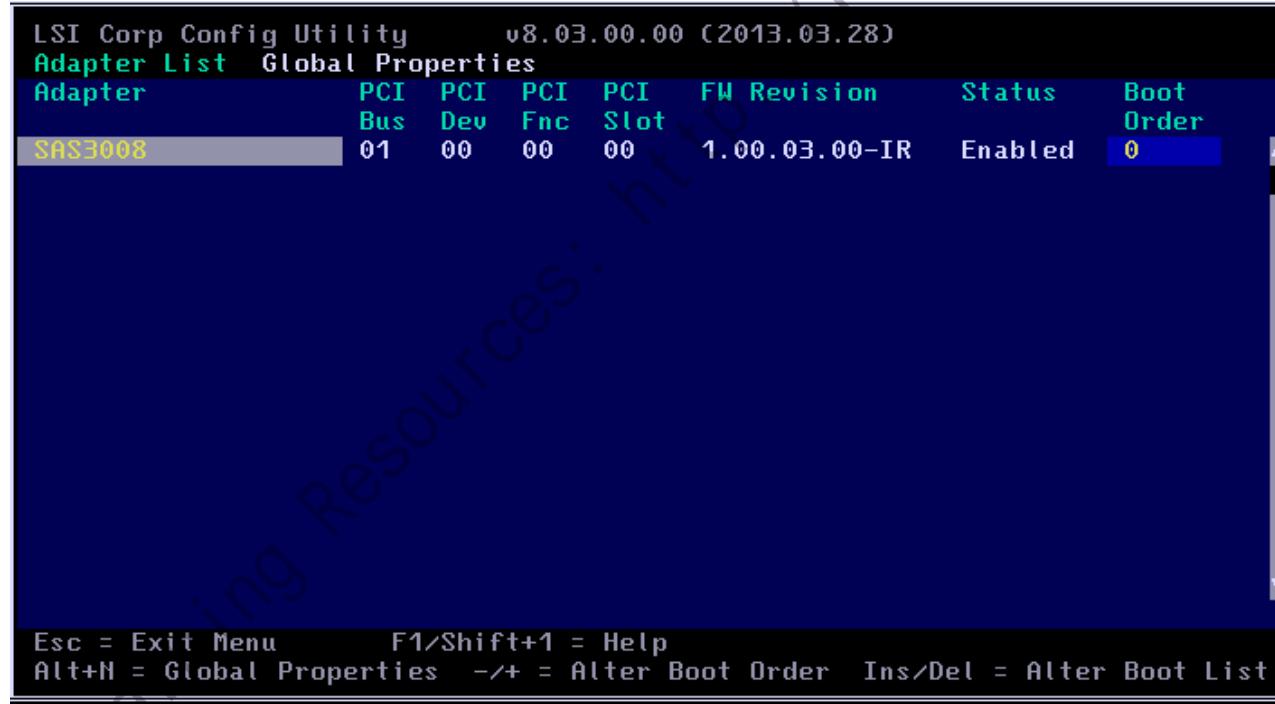


Configuring the LSISAS3008 Controller Card

The message "Please wait, invoking SAS Configuration Utility..." is displayed.

After the system self-check is complete, the CU home screen is displayed, as shown in the following figure.

Note: You can press **Alt+N** to view the global properties of the RAID controller card.



Configuring the LSISAS3008 Controller Card

Step 2 On the CU home screen, select the LSISAS3008 controller card and press **Enter**.

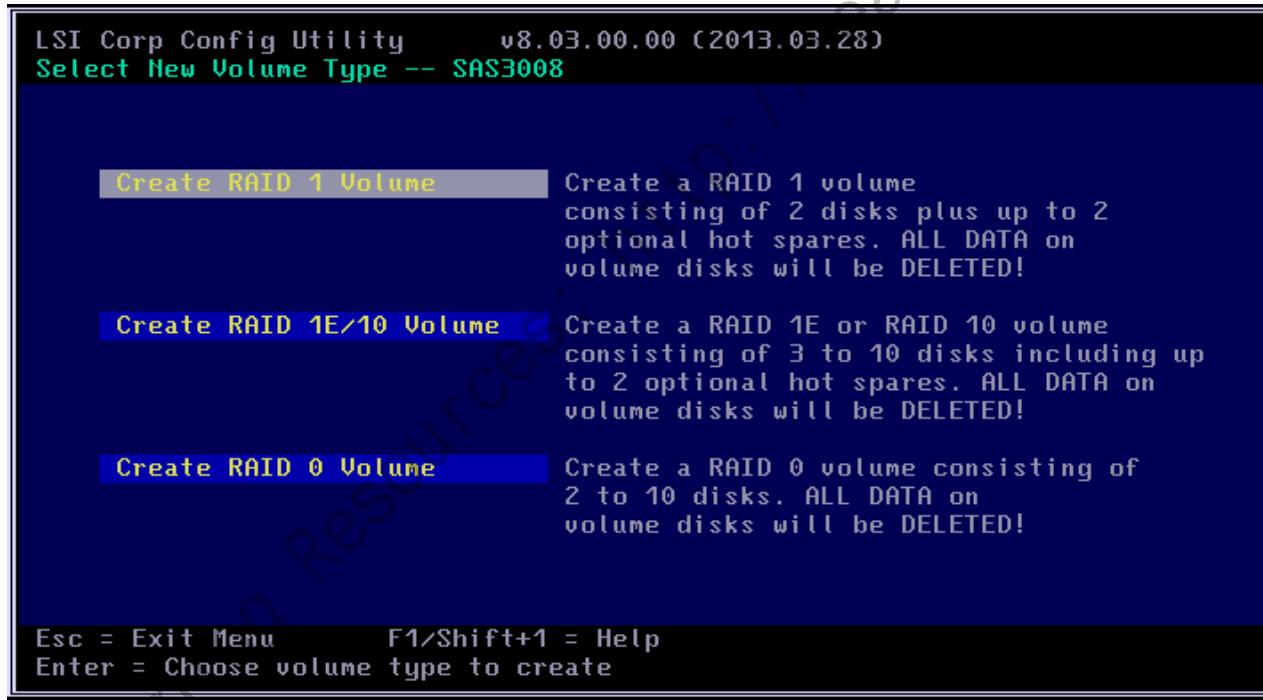
The **Adapter Properties** screen is displayed, as shown in the following figure.



Configuring the LSISAS3008 Controller Card

Step 3 Select **RAID Properties** and press **Enter**.

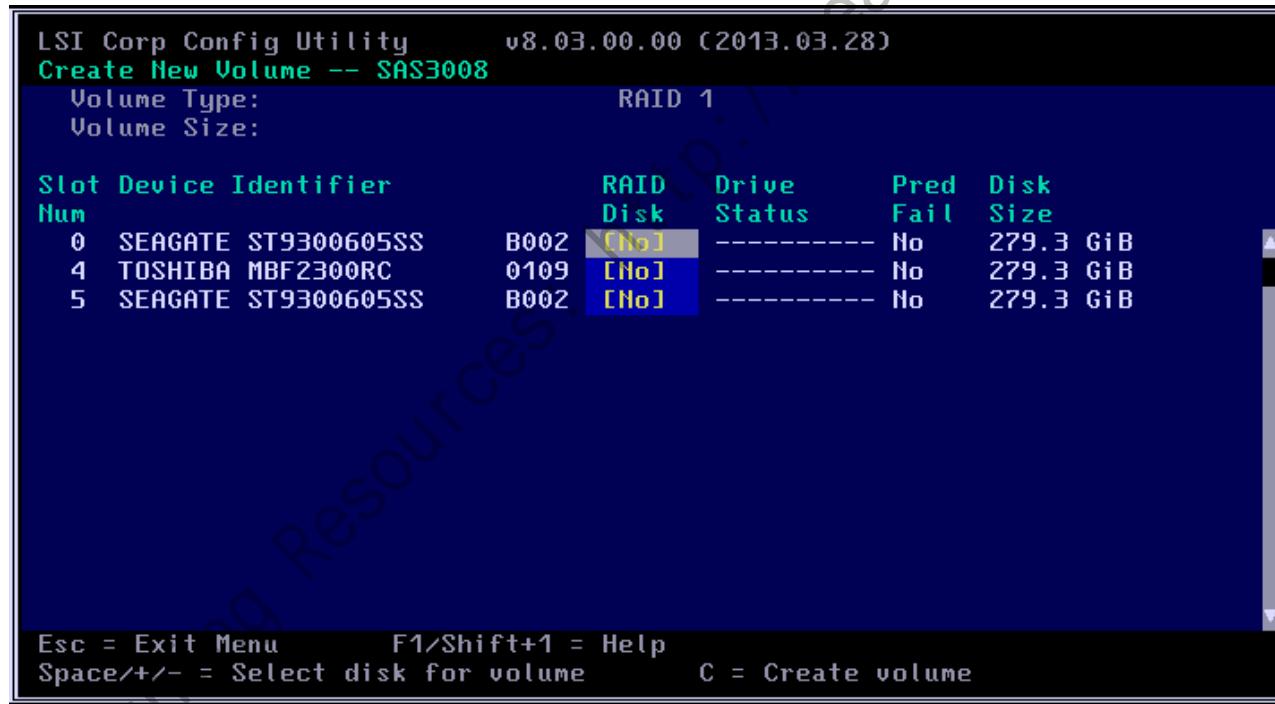
The **Select New Volume Type** screen is displayed, as shown in the following figure.



Configuring the LSISAS3008 Controller Card

Step 4 Select **Create RAID 1 Volume** and press **Enter**.

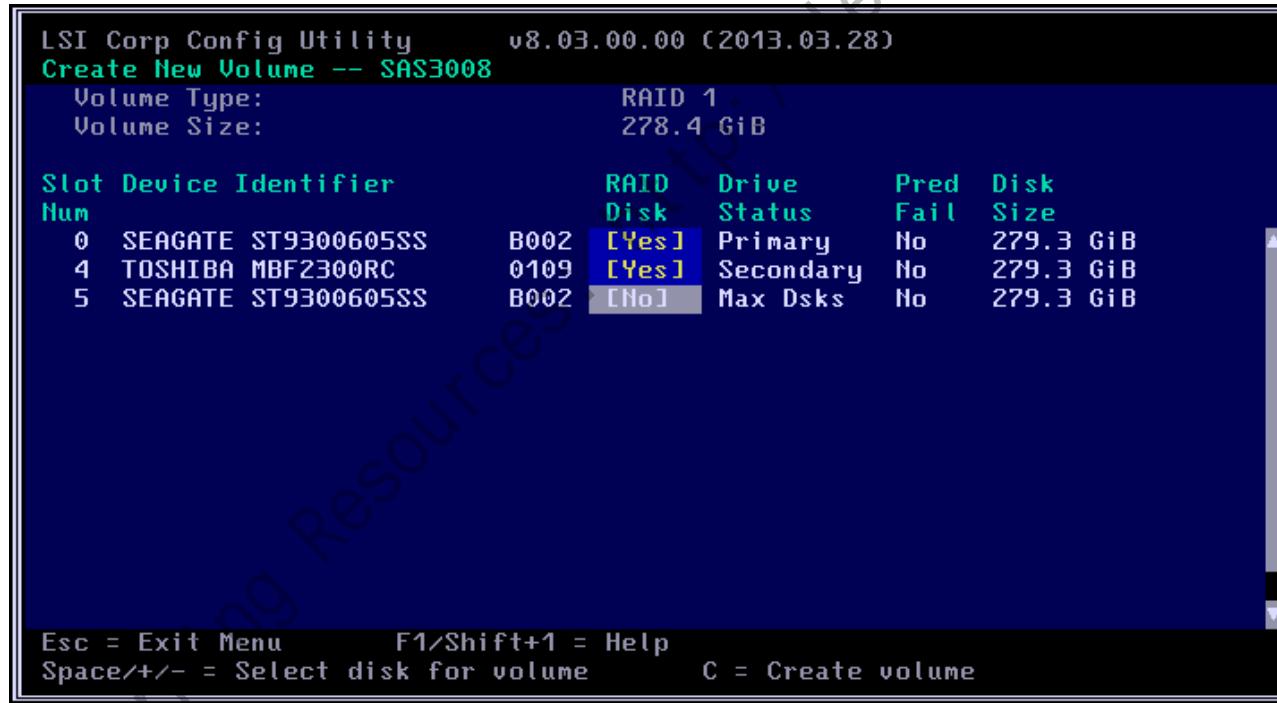
The **Create New Volume** screen is displayed, as shown in the following figure.



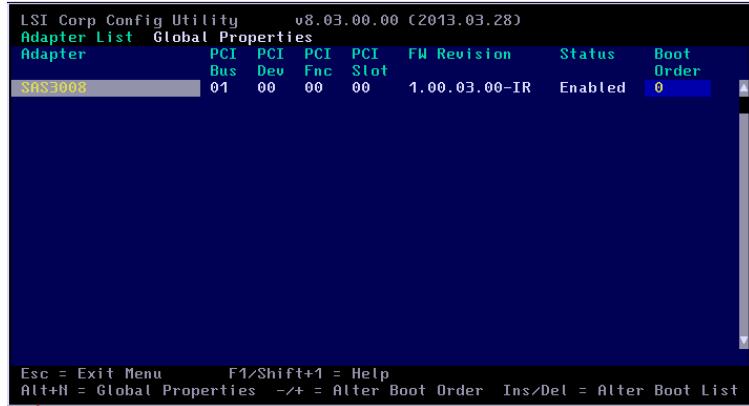
Configuring the LSISAS3008 Controller Card

Step 5 Add hard disks to a RAID group.

Specify the hard disks that you want to add to the RAID group by using the -, +, or space key in the **RAID Disk** column. See the following figure.

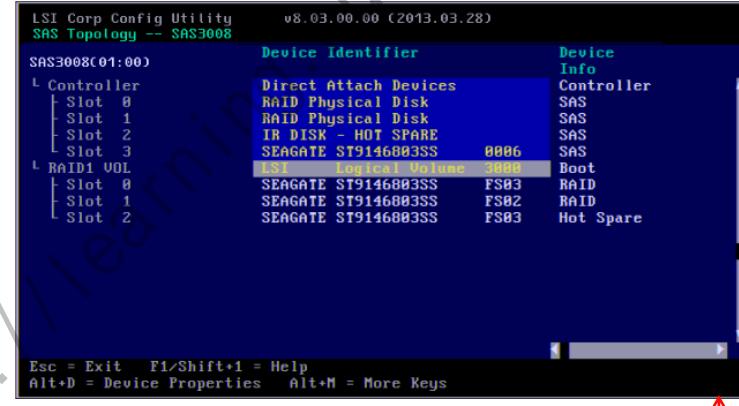
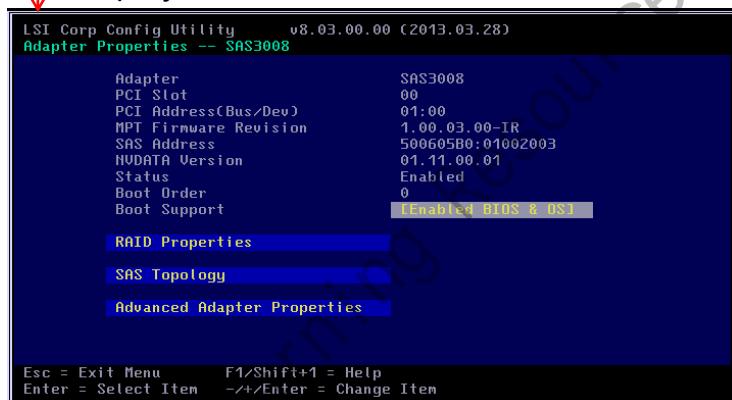


Configuring the LSISAS3008 Controller Card



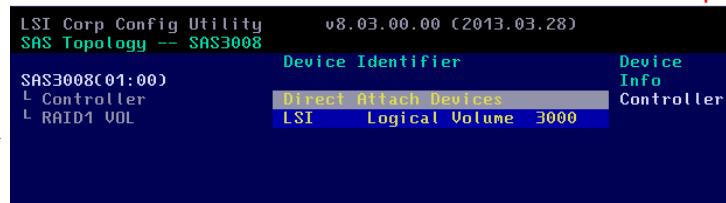
Step 6 On the CU home screen, select the LSISAS3008 controller card and press **Enter**.

The **Adapter Properties** screen is displayed.



Step 8 Select an item to be viewed and press **Enter**.

Step 9 Press **Alt+B** to set the selected device as the first boot option.
After the setting, **Boot** is displayed for the device in the **Device Info** column.



Step 7 Select **SAS Topology** and press **Enter**.
The **SAS Topology** screen is displayed.

Introduction to LSISAS3108 RAID Controller

- The LSISAS3108 controller card has the following functions:
 - Supports RAID 0, 1, 5, 6, 10, 50, and 60 to ensure data security.
 - Supports the PCIe x8 port with a maximum bandwidth of 8 Gbit/s for single lane.
 - Provides a cache capacity of 1 GB or 2 GB to support fast read and write operations.
 - Provides eight 12 Gbit/s SAS ports or 6 Gbit/s SATA ports.
 - Supports SAS hard disks, SATA hard disks, or SATA solid-state drives (SSDs).
 - Supports hot swap for hard disks.
 - Supports online capacity expansion.
 - Supports RAID level migration.
 - Supports multi-stripe choice. The maximum stripe size can be 1 MB.
 - Quickly initializes a RAID group.

Introduction to LSISAS3108 RAID Controller

- Supports daemon data consistency verification.
- Supports hard disk daemon medium inspection and repair.
- Complies with DDF specifications.
- Supports S.M.A.R.T.
- Supports global and dedicated hot spare disks.
- Supports automatic reconstruction of a hot spare disk.
- Supports emergent hot spare disks.
- Supports SES and SGPIO for external management.
- Supports Databolt™.
- Supports 64 logical drivers (LDs) with the maximum capacity of 64 TB.
- Supports the power save function for hard disks.
- Connects to a maximum of 256 expansion devices. A Huawei server supports a maximum of 32 hard disks.

Introduction to LSISAS3108 RAID Controller

- Supported RAID levels and quantity of hard disks

RAID Level	Number of Hard Disks	Maximum Number of Failed Disks
RAID 0	2 to 32	0
RAID 1	2 to 32	Number of hard disks/2
RAID 5	3 to 32	1
RAID 6	3 to 32	2
RAID 10	4 to 32	Number of spans
RAID 50	6 to 32 (2 to 8 RAID 5 groups)	Number of spans
RAID 60	6 to 32 (2 to 8 RAID 6 groups)	Number of spans x 2

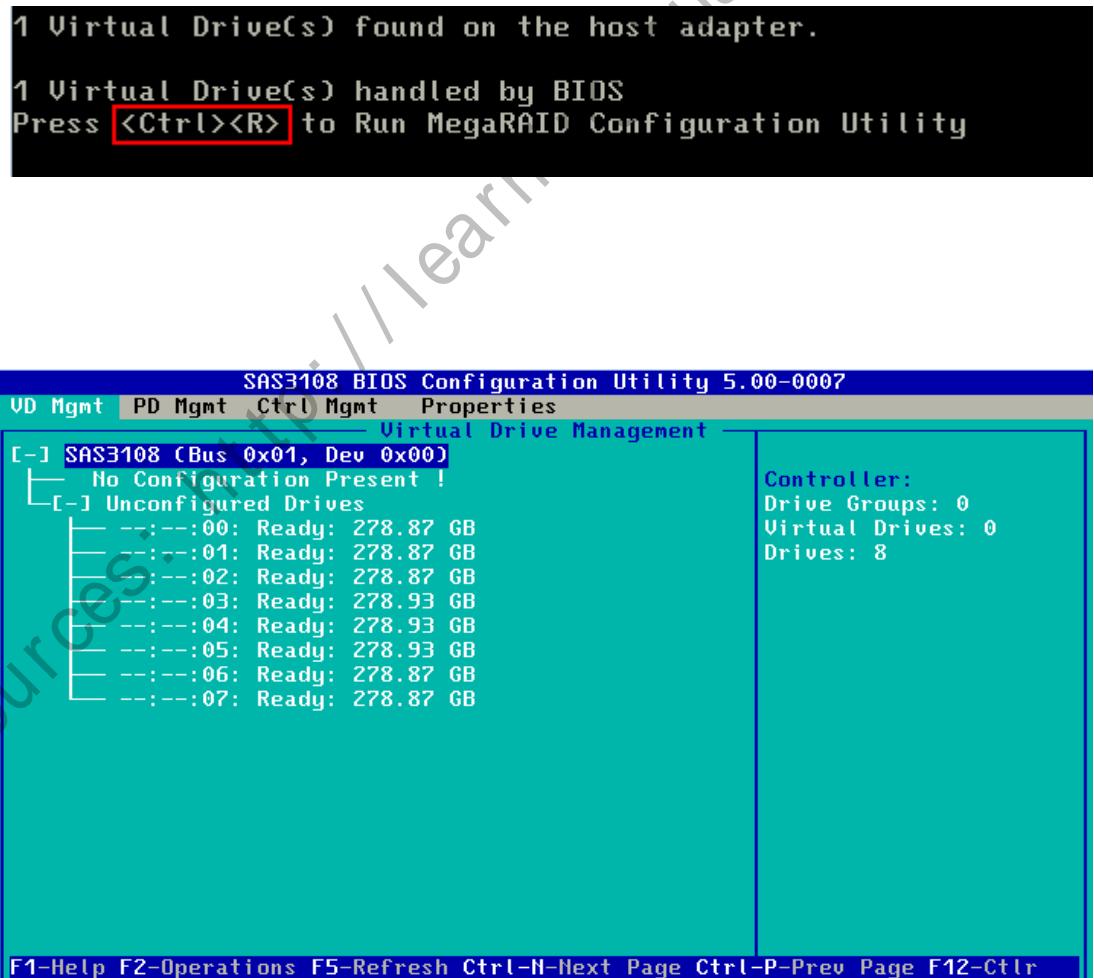
- The system does not support the scenario that adjacent hard disks in a RAID group fail.
- Each span of RAID 10 and RAID 50 allows at most one bad disk.
- Each span of RAID 60 allows at most two bad disks.

Configuring the LSISAS3108 Controller Card

Step1: Enter SAS3108 BIOS Configuration Utility

Press **Ctrl+R** when the message "Press <Ctrl><R> to Run MegaRAID Configuration Utility" is displayed upon server startup.

The SAS3108 BIOS Configuration Utility screen is displayed, as shown in the right figure.



Configuring the LSISAS3108 Controller Card

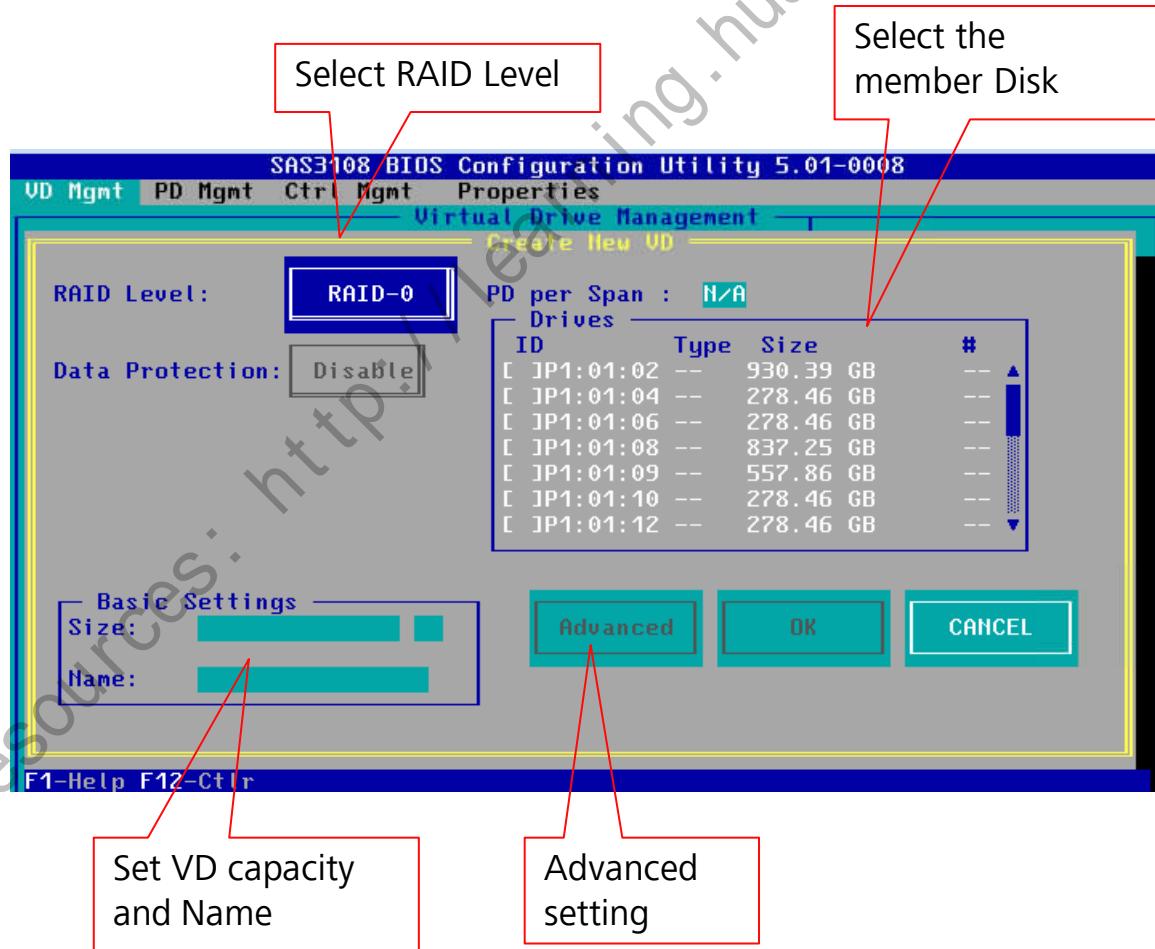
Step2: Creating a RAID

Move the cursor to

SAS3108 (Bus 0x01, Dev

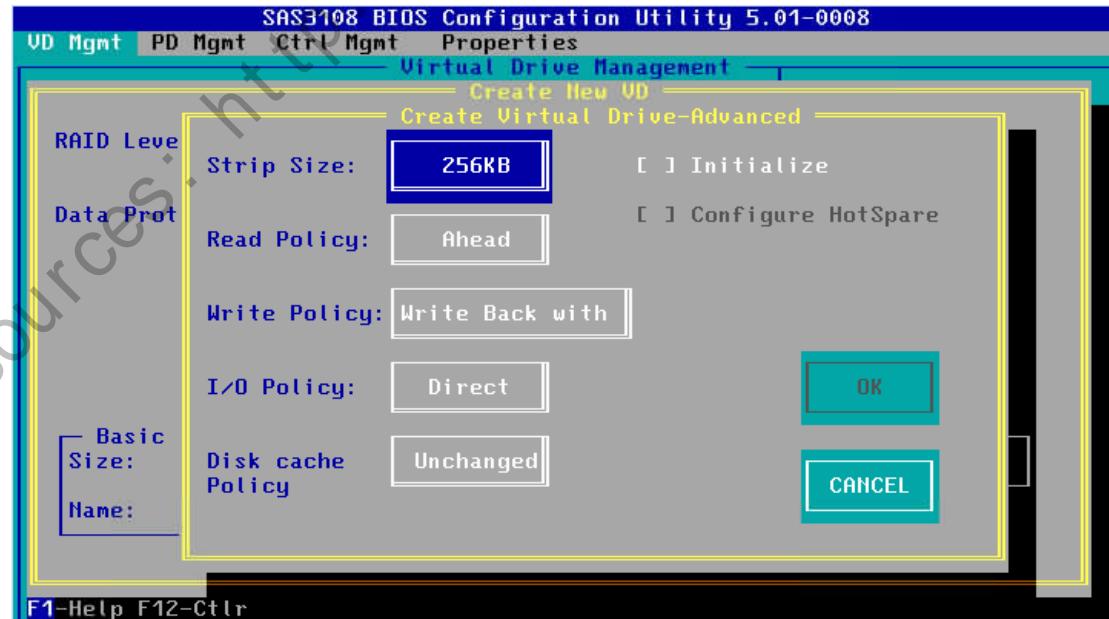
0x00) by pressing ↑ and ↓.

Press **F2** and select **Create Virtual Drive** from the displayed screen, and then press **Enter**.



Configuring the LSISAS3108 Controller Card

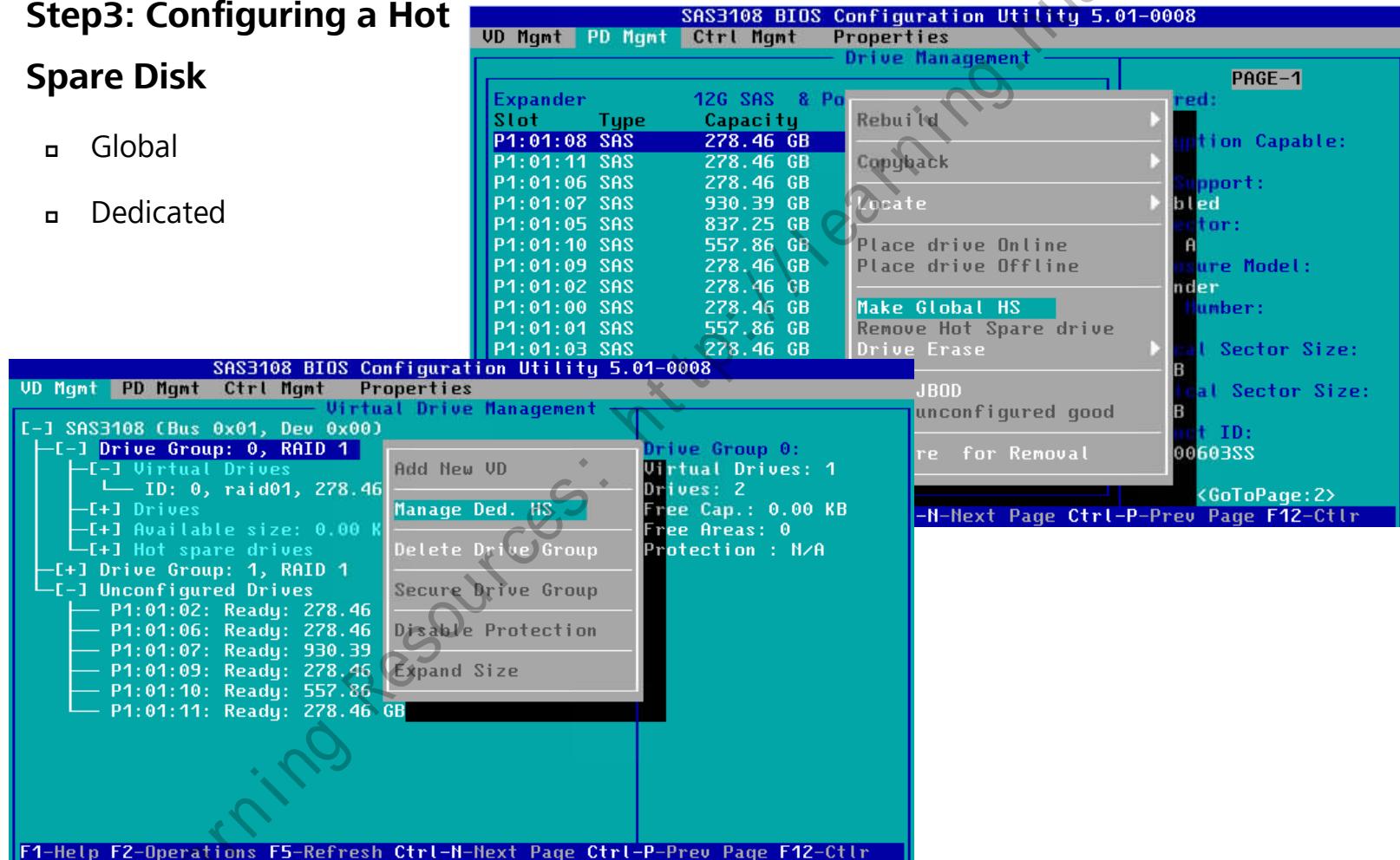
- Strip Size
 - Specifies the size of a data strip on each hard disk.
- Read Policy
 - Normal
 - Ahead:
- Write Policy
 - Write Back
 - Write Through
 - Write Back with BBU
- I/O Policy
 - Direct
 - Cached:
- Disk cache Policy
 - Enable
 - Disable
 - Unchanged
- Initialize
 - After **Initialize** is selected, the initialization is performed quickly and automatically after the RAID is created.



Configuring the LSISAS3108 Controller Card

- Step3: Configuring a Hot Spare Disk

- Global
- Dedicated



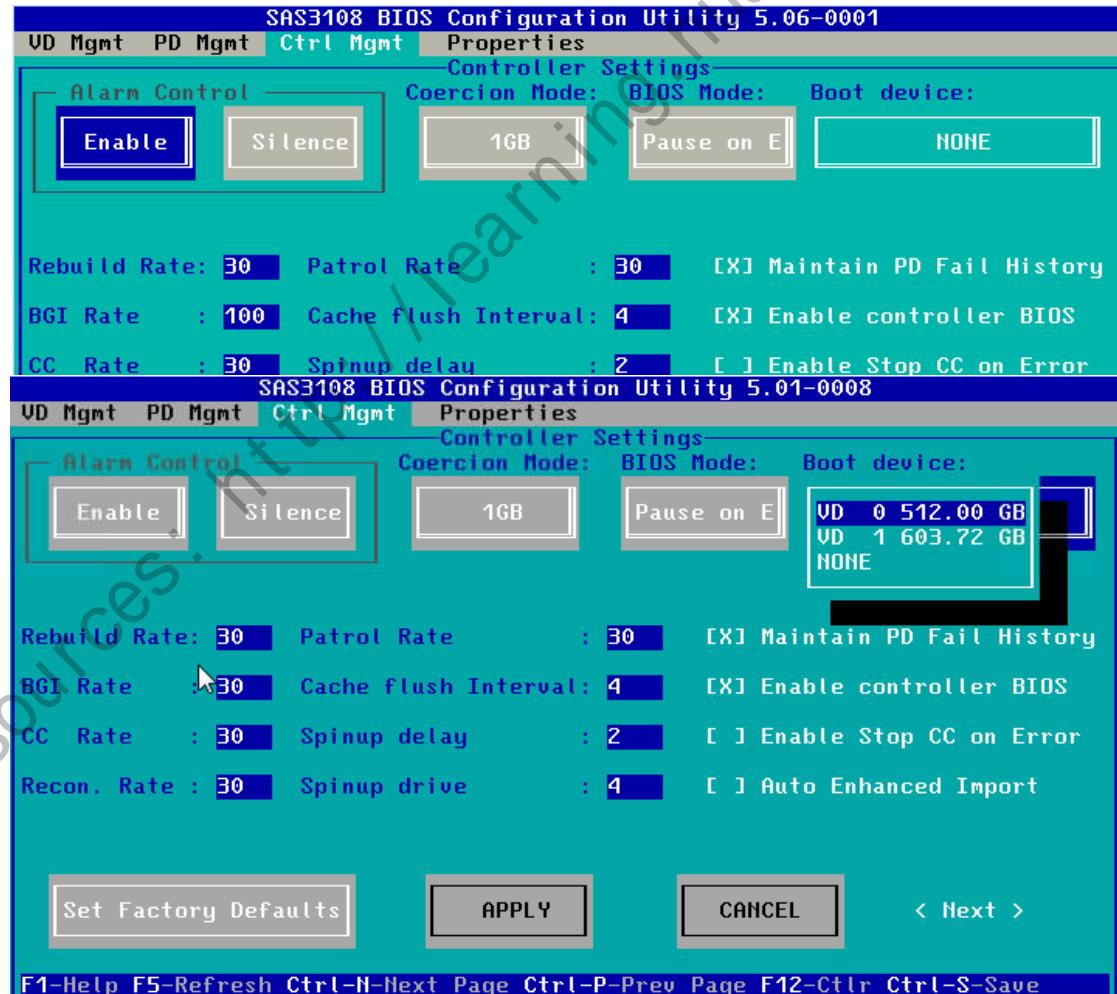
Configuring the LSISAS3108 Controller Card

Step4: Set Boot device

1. Press **Ctrl+N**.

The Ctrl Mgmt tab is displayed.

2. Select Boot device by pressing ↓ , press **Enter**.
3. Select one **VD** which will be used to install the OS, press **Enter**.



Introduction to SoftRAID

- SoftRAID specifications

Item	Description
Chip	Intel PCH
Number of supported RAID groups	8
Hard disk type	SATA-HDD or SATA-SSD, supporting mixed configuration
Port	Six 3 Gbit/s SATA ports
Other features	<ul style="list-style-type: none">• Global hot spare disks supported• Only 64 KB stripes supported

Introduction to SoftRAID

- Supported RAID levels and quantity of hard disks

RAID Level	Number of Hard Disks	Maximum Number of Failed Disks
RAID 0	1 to 6	0
RAID 1	2	1
RAID 5	3 to 6	1
RAID 10	4 to 6	Number of spans One failed disk is permitted in each span.

- The system does not support the scenario that adjacent hard disks in a RAID group fail.

Configuring the SoftRAID

- To configure the SoftRAID, set the working mode of the hard disk controller in the BIOS to **RAID**.
 - On the Romley platform, choose **Advanced > IDE Configuration** and set **HDC Configure As** to **RAID**.
 - On the Brickland platform, choose **IntelRCSsetup > PCH Configuration > PCH SATA Configuration**, and set **Configure SATA as** to **RAID**.
 - On the Grantley platform, choose **Advanced > PCH SATA Configuration** and set **HDC Configure As** to **RAID**.

Configuring the SoftRAID

- Press **Ctrl+M** when the message "Press Ctrl-M or Enter to run LSI Software RAID Setup Utility" is displayed upon server startup.

```
LSI MegaRAID Software RAID BIOS Version A.11.04101256R
LSI SATA RAID Found at PCI Bus No:00 Dev No:1F
SAS/SATA RAID key is Detected.

Device present at port 0    ST91000640NS          953357MB
Device present at port 1    ST9500620NS          476428MB
Device present at port 2    ST91000640NS          953357MB
Device present at port 3    INTEL SSDSC2BA200G3    190270MB
Device present at port 4    INTEL SSDSA2M160G2GC    152115MB
Device present at port 5    INTEL SSDSC2BA400G3    381042MB

02 Virtual drive(s) Configured.
Array#      Mode        Stripe Size   No.Of Stripes   DriveSize  Status
00          RAID 0      64KB           01            204800MB  Online
01          RAID 5      64KB           05            606536MB  Online
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.
```

- If the message "SAS/SATA RAID key is Detected" is displayed upon server startup (see the figure above), **a RAID key is inserted and the SoftRAID supports RAID 0, 1, 10 and 5.**
- If no RAID key is inserted, the SoftRAID supports only RAID 0, 1, and 10.**

Configuring the SoftRAID

The Management Menu is displayed, as shown in the following figure.

----End

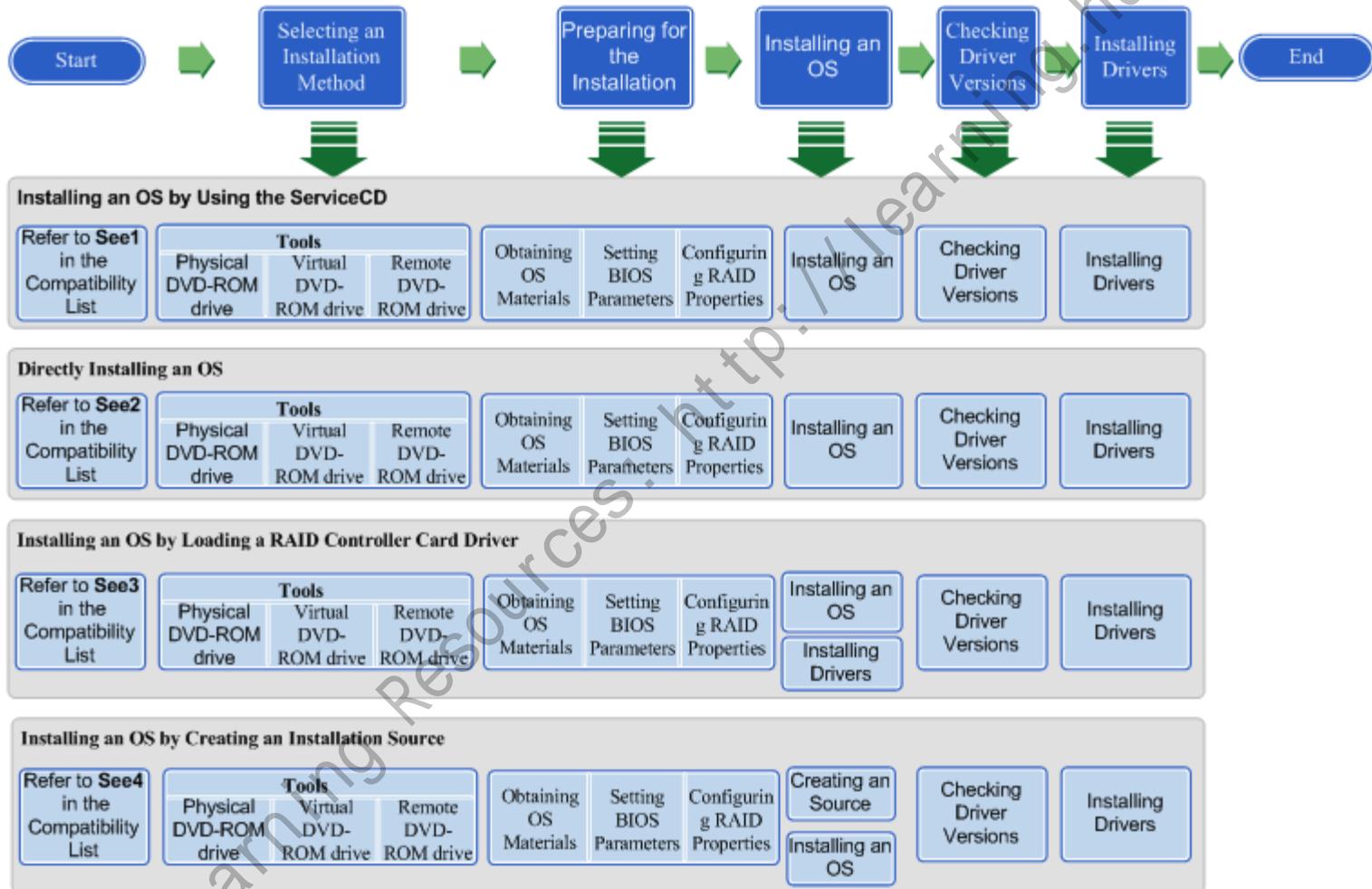




Contents

- iBMC Operation
- Common Tasks of BISO Setting
- RAID Configuration
- **OS Installation**
- LCD Operation

Installation Process



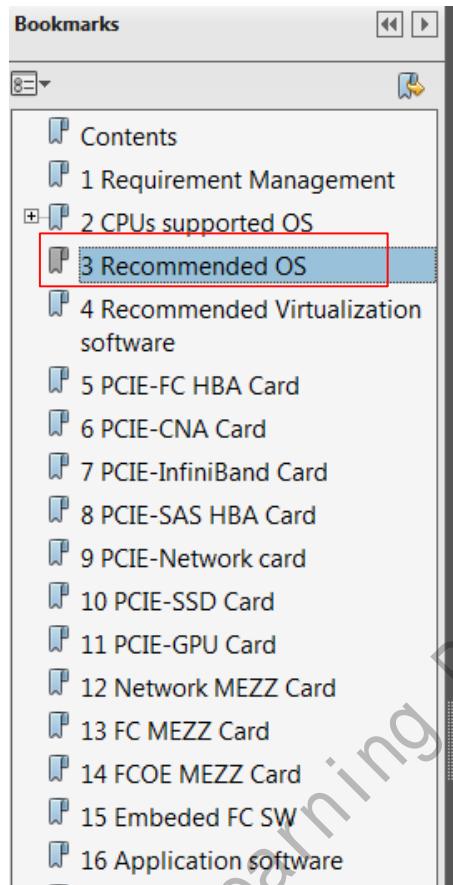
Selecting an Installation Method

- Select an installation method by referring to the server compatibility list.
 - Log in to the [Huawei Enterprise support website](#).
 - On the menu bar, choose **Products & Solutions > Products > Servers**.
 - On the **Servers** page, click [FusionServer RH2288 V3 Rack Server](#) under **RH Series Rack Servers list**.
 - Download the compatibility list.

The screenshot shows a product page for the FusionServer RH2288 V3 Rack Server. At the top right is a red 'Download Full Spec' button. Below it is a large 'DownLoad More Information' button. At the bottom, there are three download links: 'FusionServer RH2288 V3 Rack Server Brochure', 'FusionServer RH2288 V3 Rack Server White Paper', and 'FusionServer RH2288 V3 Server Compatibility List'. The 'Compatibility List' link is highlighted with a red border.

Selecting an Installation Method

- Seeⁿ in the **Remark** column indicates the OS installation method.



Version	Description	Remarks
Windows 2008 R2 SP1	Microsoft Windows Server 2008 R2 SP1 64bit Windows Certification URL: Link	See ¹ See ⁵
Windows 2012	Microsoft Windows Server 2012 64bit Windows Certification URL: Link	See ¹ See ⁵
Windows 2012 R2	Microsoft Windows Server 2012 R2 64bit Windows Certification URL: Link	See ¹ See ⁵
SLES 11.3	SUSE Linux Enterprise Server 11 Service Pack 3 for x86/Intel EM64T Suse Certification URL: Link	See ² See ⁵
RHEL 6U5	Red Hat Enterprise Linux 6 Update 5 Server for x86/Intel EM64T Red Hat Certification URL: Link	See ² See ⁵
RHEL 6U6	Red Hat Enterprise Linux 6 Update 6 Server for Intel EM64T	See ² See ⁵
RHEL 7.0	Red Hat Enterprise Linux 7 Server for Intel EM64T Red Hat Certification URL: Link	See ² See ⁵

OS Installation Methods



ServiceCD



DVD



Image file



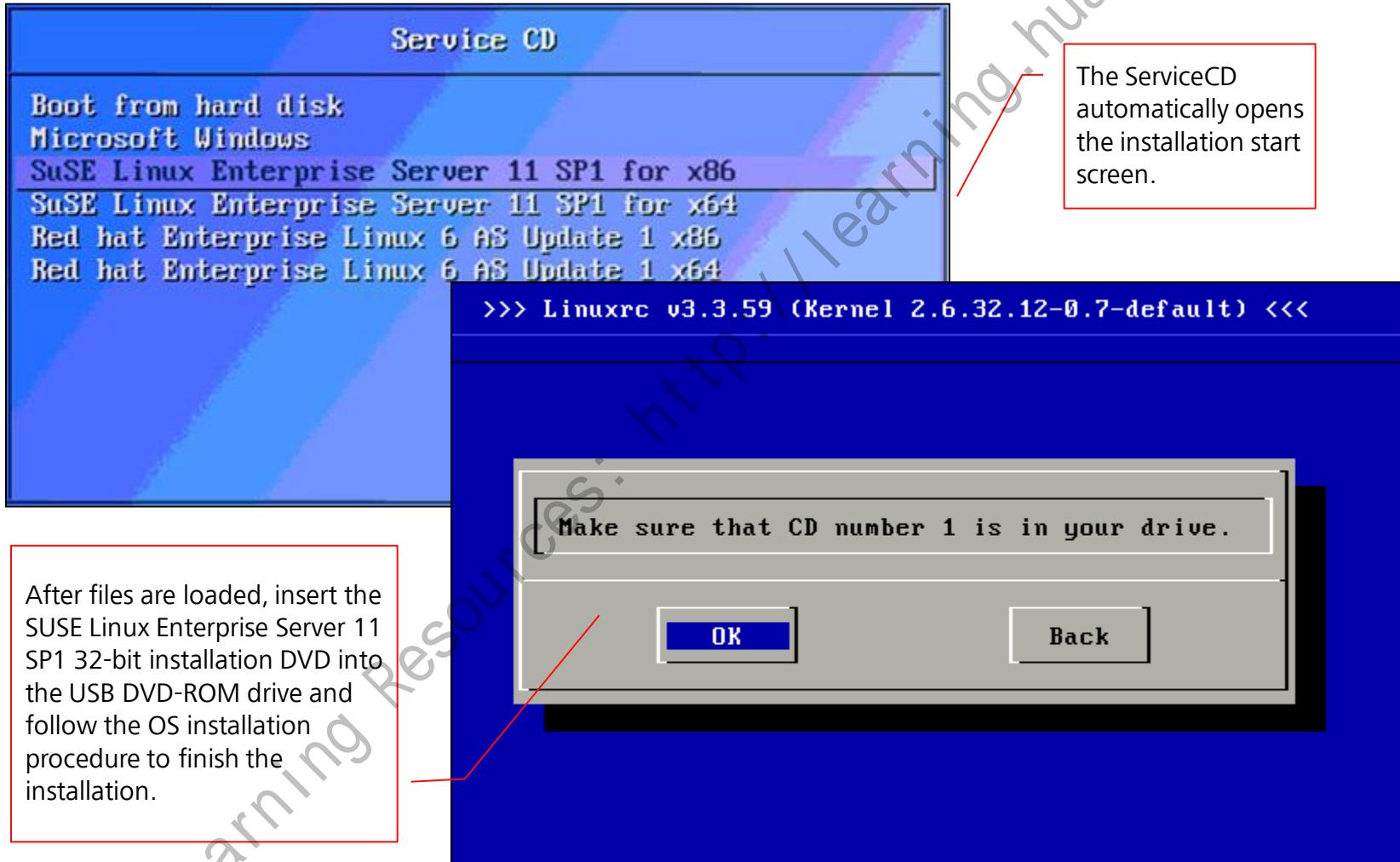
PXE

**Installation
methods**

ServiceCD-based Installation Method

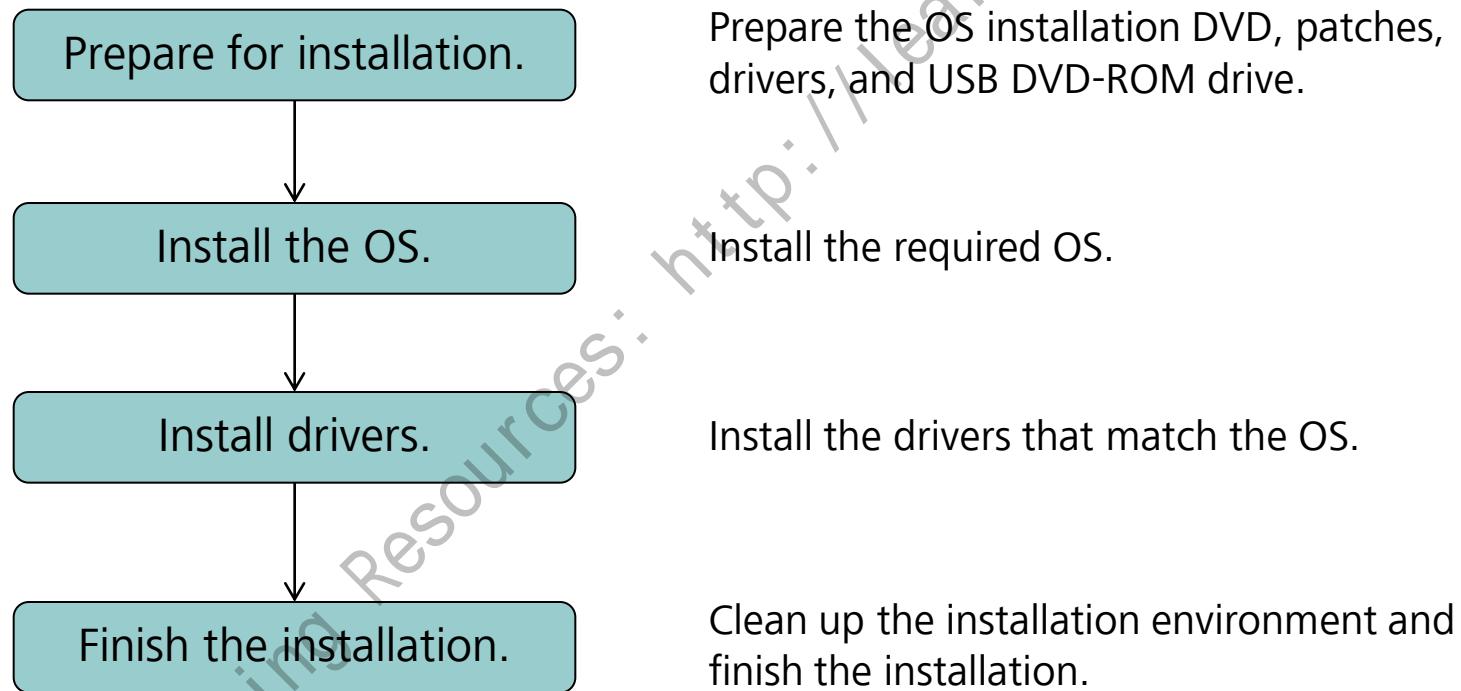
- ServiceCD functions
 - By automatically booting the installation of OSs, drivers, and patches, the ServiceCD minimizes human-machine interactions and shortens the local installation time.
- ServiceCD features
 - Helps users install standard OSs and provides the drivers required by detected hardware.
 - Minimizes the number of restarts required during hardware configuration and local OS installation.
 - Provides consistent, wizard-based installation processes.

ServiceCD-based Installation Procedure



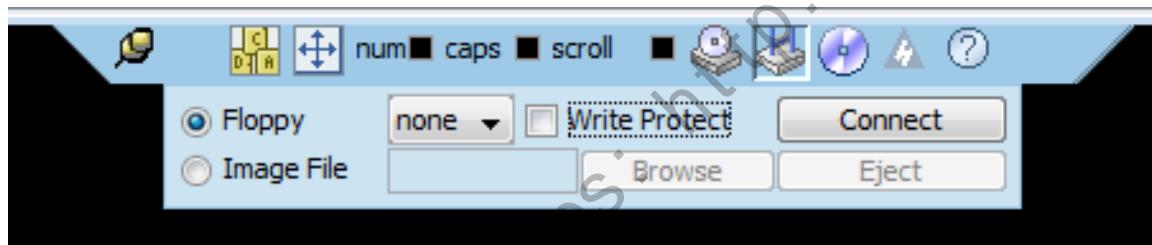
DVD-based Installation Procedure

- You need to install drivers for the RAID controller card and NIC when installing the OS by using the DVD.



DVD-based Installation — SLES

1. Start the BIOS and choose to boot from the DVD-ROM drive.
2. Press **F6** on the initial installation screen and choose **Yes** from the displayed menu to mount the virtual drive image file.
3. Mount the image file for the RAID controller card driver using the virtual media function on the remote control screen of iBMC.



4. On the driver loading screen, select the virtual DVD-ROM drive or virtual floppy disk drive, select **OK**, and press **Enter**.
5. After the driver is successfully installed and the hard disk model is displayed, select **Back** and press **Enter**. Then reload the OS DVD to proceed with OS installation.

Image File-based Installation Method

- Image file
 - An image file is a single file composed of a series of files in a specific format. An image file requires a virtual DVD-ROM drive or a virtual floppy disk drive to decompress.
 - iBMC on a rack server provides the remote control function.
 - The following figure shows the Virtual Console screen. The Virtual Console provides the virtual DVD-ROM drive or virtual floppy disk drive required by an image file.

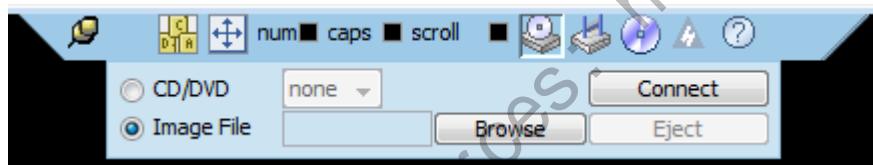
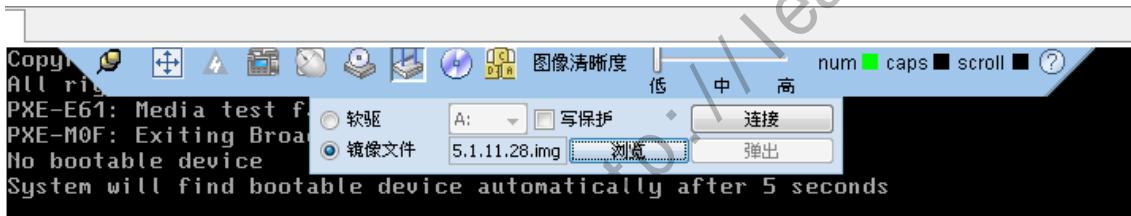


Image File-based Installation — Preparations

- Obtain a Windows PC or laptop, which is used to access the server.
- Configure network settings for the server to ensure that the terminal can access the server.
- Configure RAID for the server.
- Obtain the Linux image file.
- Download the driver image file.

Image File-based Installation — SLES

1. Mount the OS image file to the virtual DVD-ROM drive on the remote control screen of iBMC, as shown in the following figure.
 - a. Select **Image File** and click **Browse**.
 - b. In the **Open** dialog box, select the .iso file and click **Open**.
 - c. On the remote control screen, click **Connect**.



2. Restart the server, press **F11** during server restart, select **HUAWEI DVD-ROM VM 1.1.0**, and press **Enter**.



Image File-based Installation — SLES

3. Press **F6** on the initial installation screen and choose **Yes** from the displayed menu.
4. Select **Installation** and press **Enter**.
5. Select the RAID controller card chip model.
6. Mount the image file for the RAID controller card driver to the virtual DVD-ROM drive or virtual floppy disk drive.

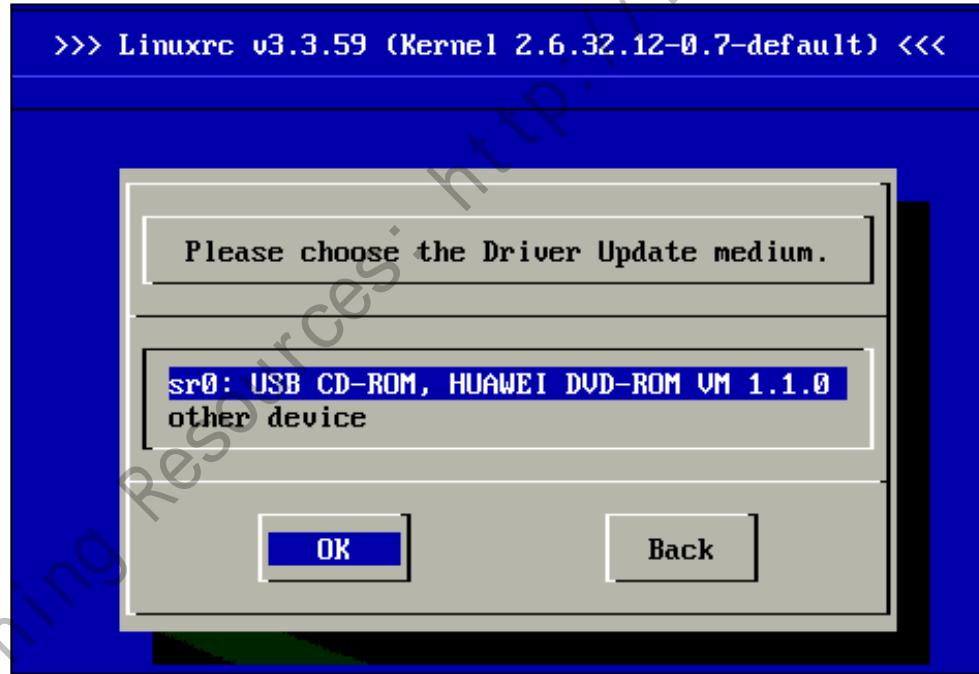


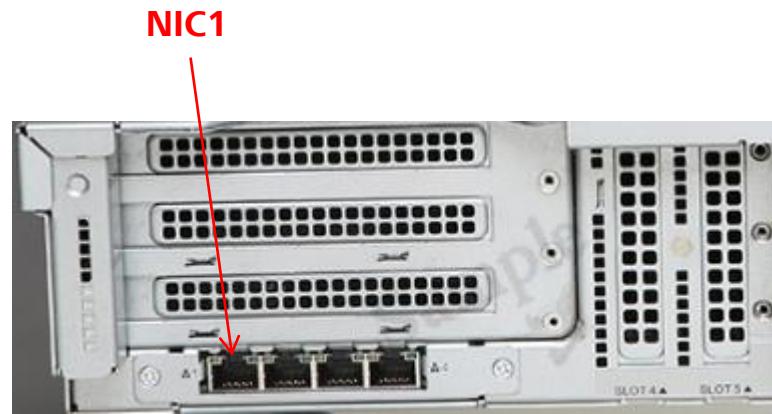
Image File-based Installation — SLES

7. Wait until the RAID controller card driver is automatically installed.
8. On the screen shown in the following figure, select **OK** and press **Enter** to start OS installation.
Finish the installation by following the OS installation procedure. After the OS is installed, install the NIC driver using the previously described method.



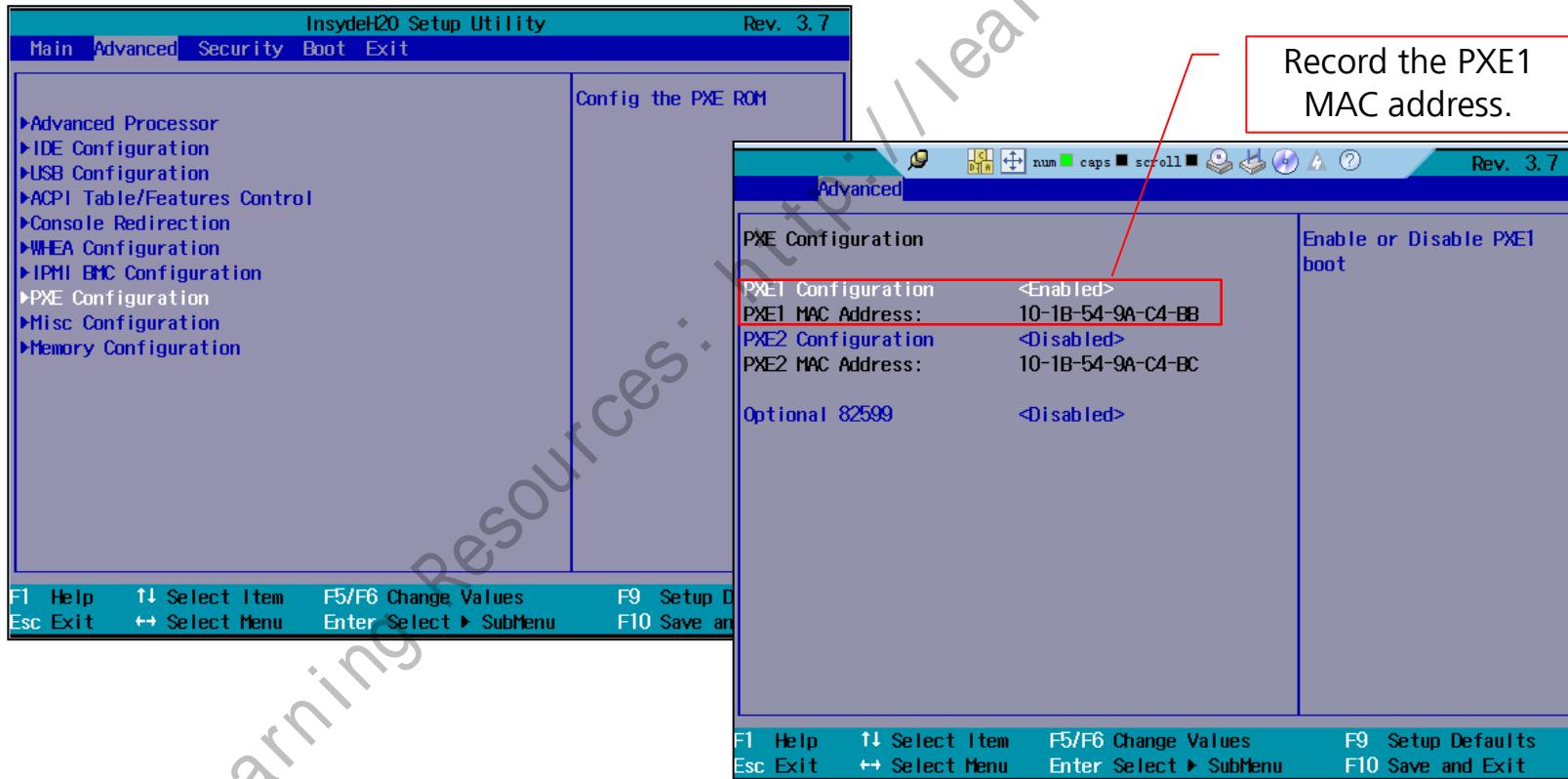
PXE-based Installation Method

- Preboot Execute Environment (PXE)
 - PXE is a technology that enables computers to boot from the network.
 - The PXE works in client/server mode. The PXE client obtains an IP address from the DHCP server and downloads the OS from the remote server using TFTP.
 - You can install OSs only on one or more servers using PXE and configure the other servers to boot from PXE.
- Connect one end of a network cable to the NIC1 port on the server where the OS is to be installed and the other end to the remote server, and ensure that the network communication is normal.



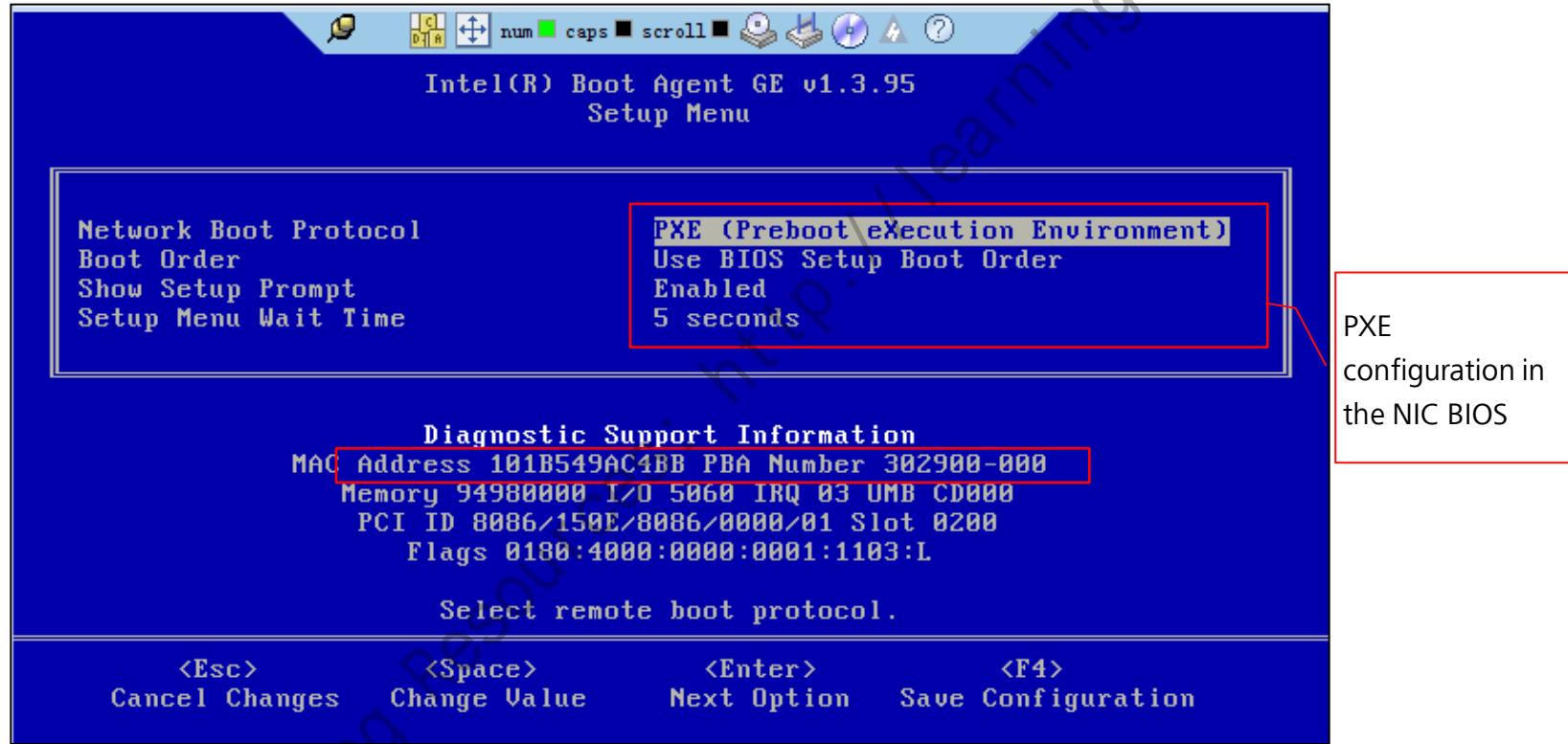
PXE Configuration in the BIOS

1. In the BIOS Setup Utility, choose **Advanced > PXE Configuration**, and press **Enter**.
2. On the **PXE Configuration** screen, set **PXE1 Configuration** to **Enabled** and other parameters to **Disabled**, and press **F10** to save the settings and restart the server.



NIC PXE Configuration

During startup, press **Ctrl+S** as prompted to open the NIC BIOS configuration screen.



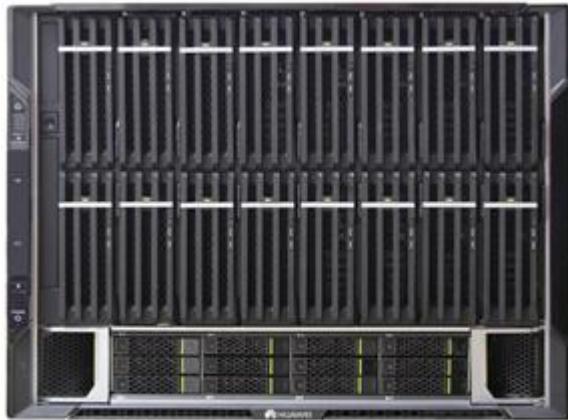


Contents

- iBMC Operation
- Common Tasks of BISO Setting
- RAID Configuration
- OS Installation
- **LCD Operation**

Servers with LCD

- The following servers are configured with a LCD.



RH8100 V3



RH5885 V3



RH5885 V3

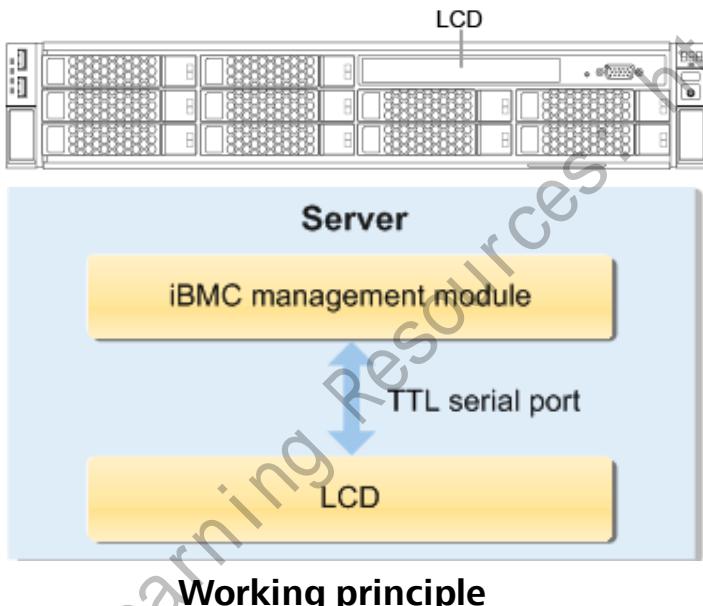


RH2288(H) V3



LCD Functions

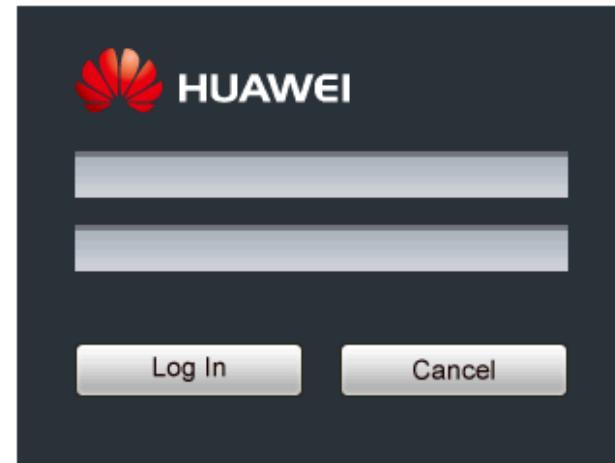
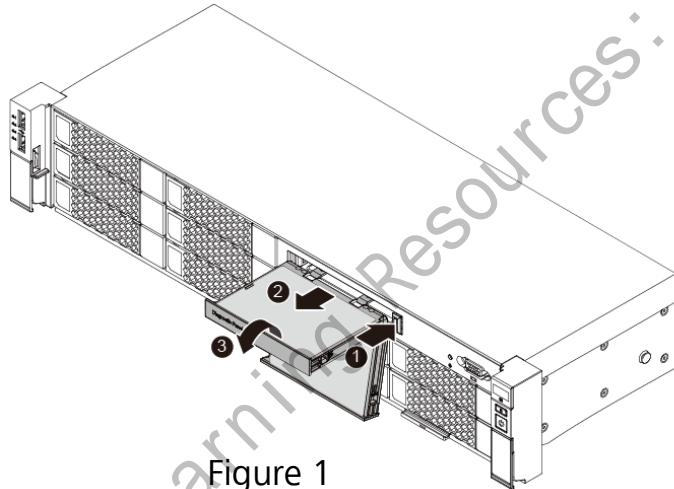
- Function of a LCD
 - Installation status of server components
 - Running status of server components
 - Set the IP address of the iBMC



LCD Screen

Opening an LCD

- Locate the LCD installation position on the Top right-hand corner of the front server panel
- Press the spring on the LCD. See step (1) in Figure 1.
- Pull out the LCD from the server completely (the spindle shows up). See step (2) in Figure 1.
- Rotate the LCD to a place for better viewing. See step (3) in Figure 1.
- Click any place on the LCD screen using your fingernail or a touch pen.
- The LCD is activated, and a login screen shown in Figure 2 is displayed.
- Enter the iBMC user name and password, and tap **Log In**.



Querying the Status and Alarms of Components

- On the LCD screen, click the **Status** tab
- Different color indicates different status



Color	Status
A solid green horizontal bar.	Indicates that the component is working properly.
A solid yellow horizontal bar.	Indicates that a minor alarm is generated on the component.
A solid orange horizontal bar.	Indicates that a major alarm is generated on the component.
A solid red horizontal bar.	Indicates that a critical alarm is generated on the component.
A solid grey horizontal bar.	Indicates that the component is not installed.

Viewing Component Temperature

- On the liquid crystal display (LCD), click the **Monitor** tab.

CPU 1	Indicates the operating temperature of CPU 1	CPU 2	Indicates the operating temperature of CPU 2
Power	Indicates the operating power of the server	Inlet Temp	Indicates the air inlet temperature

Viewing Server Information

- On the liquid crystal display (LCD), click the **Info.** Tab to view the following information:
 - IP address and of the iBMC management network port
 - MAC address of the iBMC management network port
 - MAC addresses of host network ports
 - Device serial numbers
 - Asset information
 - Firmware version

Mgmt Port	Basic Info	Version
Host MAC1: 55-8B-1C-74-C9-85		
Host MAC2: 89-FF-FF-F7-D4-95		
Host MAC3: 00-6A-00-6A-00-6A		
Host MAC4: 00-F8-7D-83-F8-45		
Device SN: 020NSL1095800079		
Asset Tag: product asset tag		

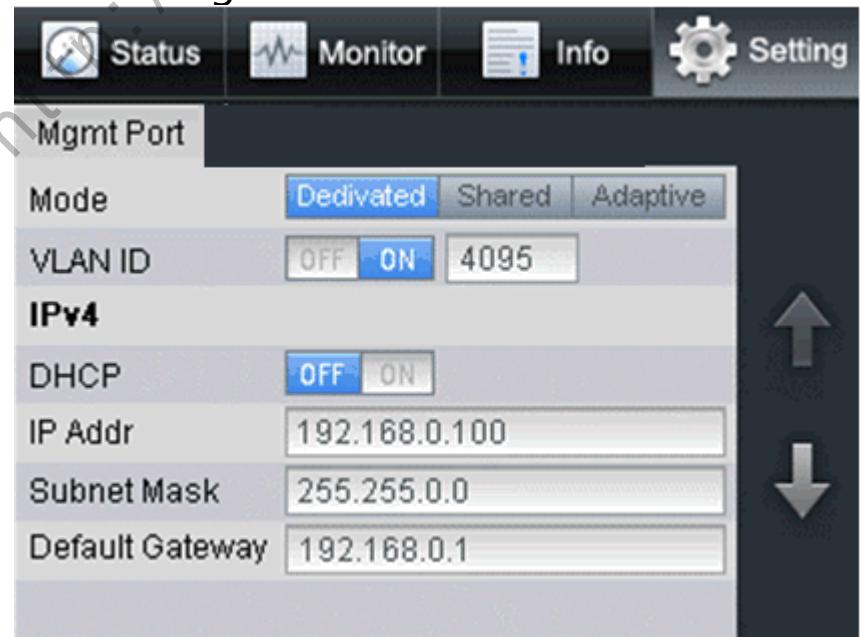
Mgmt Port	Basic Info	Version
Mode:	Automatic	
VLAN ID:	1	
MAC:	00-18-82-00-6655	
IPv4		
IP Mode:	Static	
IP Addr:	192.168.0.174	
Subnet Mask:	255.255.255.0	
Default GtWay:	192.168.0.174	

Mgmt Port	Basic Info	Version
Active iBMC	(U6)5.38	
BIOS	(U117)V019	
CPLD	(U1098/U1102)009	
LCD	(J61)014	

Setting the IP Address for the Management Network Port

- This IP address can be a dynamic or static IP address.
- Changing the IP address will result Web and CLP in the disconnection from the iBMC.
- This operation does not affect services running on the server.
- **Procedure**

- On the liquid crystal display (LCD), click the Setting tab.
 - Click the Mgmt Port tab
 - Set the IP address of the management network port





Summary

- Huawei server iBMC basic operation
- Huawei server BISO setting
- Huawei server RAID configuration
- Huawei server OS installation
- Huawei LCD Operation



Questions

1. Does the iBMC system works rely on the OS?
2. How many images does iBMC firmware has?



Exercises

- True or false questions
 1. The iBMC supports both the GUI and CLI. (T or F)
 2. All RH V3 servers support RAM hot-swap. (T or F)
- Multiple-choice questions
 1. Which OS can be directly installed to the RH2288 V3 ? ()
A. SLES11.3 B. RHEL 6U6 C. RHEL 7.0 D. Windows 2012
 1. You can set the iBMC management network port IP in : ()
A. iBMC Web UI
B. iBMC CLI
C. BIOS
D. LCD

Thank you

[www.huawei.com](http://learning.huawei.com)

E9000 Converged Infrastructure Blade Server Introduction

[www.huawei.com](http://learning.huawei.com/e9000)





Objectives

- Upon completion of this course, you will learn about the following:
 - E9000 position, highlights and application scenarios
 - E9000 hardware system architecture and features
 - E9000 hardware components



Contents

- 1. E9000 Overview**
2. E9000 Hardware Architecture
3. E9000 Components

E9000 Positioning

The E9000 is a **high-performance, high-end** enterprise server designed **for elastic computing** and **telecom computing**. The server **converges** computing, storage, and network resources to support operator- and enterprise-level high-end core applications.



The highlights of E9000

Highest Computing Density

- One chassis supports **32*2P nodes**, **64*Romley EP 130W CPU**
- Maximum floating point performance **16.5TFlops**
- Every node supports **8 memory channels**, leading memory bandwidth

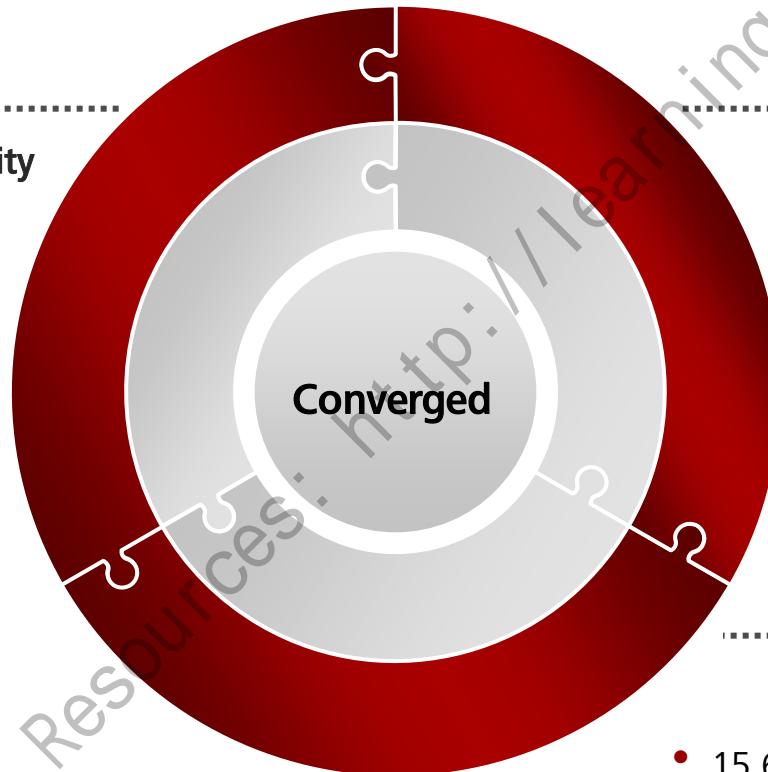
Flops: Floating-point Operations Per Second

Highest Storage Density

- E9000 CH222 (Full width) support 15*2.5 inch HDDs
- Single-frame support 120*2.5 inch HDDs , the biggest memory capacity in one chassis

Converged network and flexible networking

- 15.6T midplane switch capacity , support maximum 128*10GE ports and evolution to 40GE and 100GE
- Support Ethernet , IB , FC ports, flexible networking



The highlights of E9000

Highest Computing Density

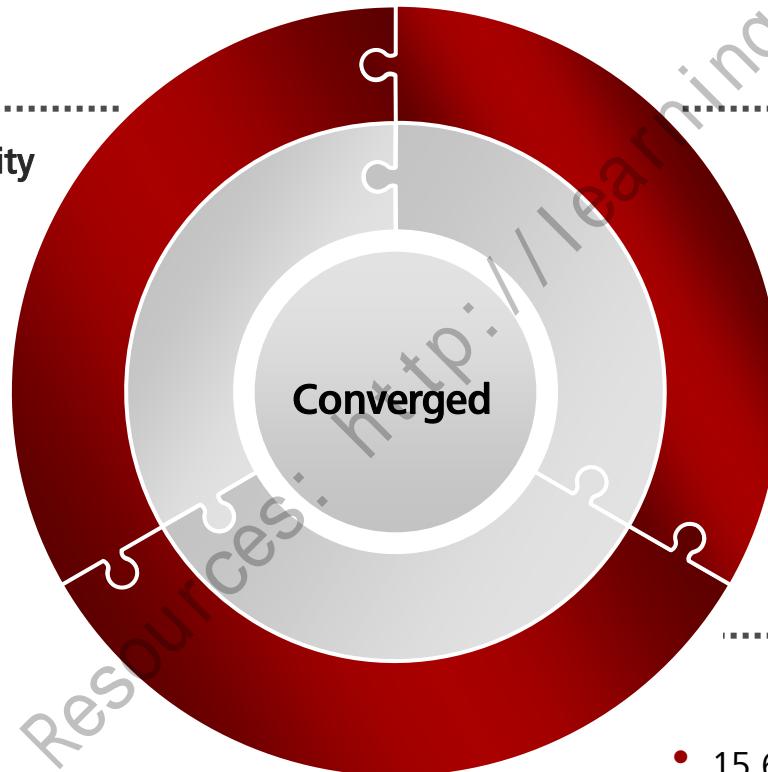
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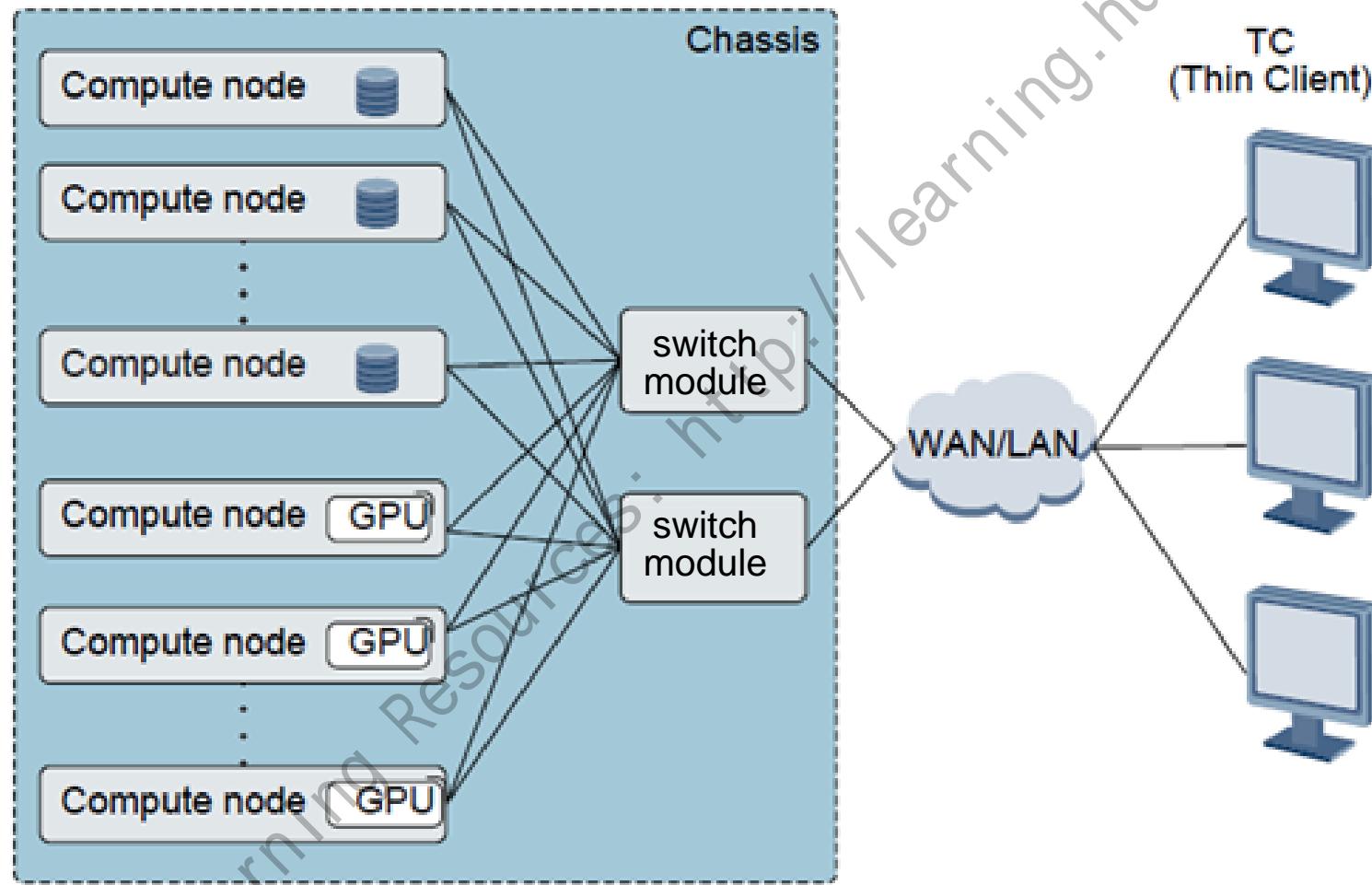
E9000 Product Panorama

Chassis	
	
E9000 chassis <ul style="list-style-type: none">Adopts the modular design for compute nodes, storage nodes, switch modules, fan modules, and power supply modules12U high chassis, providing 8 full width or 16 half width slotsSupport next 3 generation Intel processorsSupport evolution of next decade network technology	

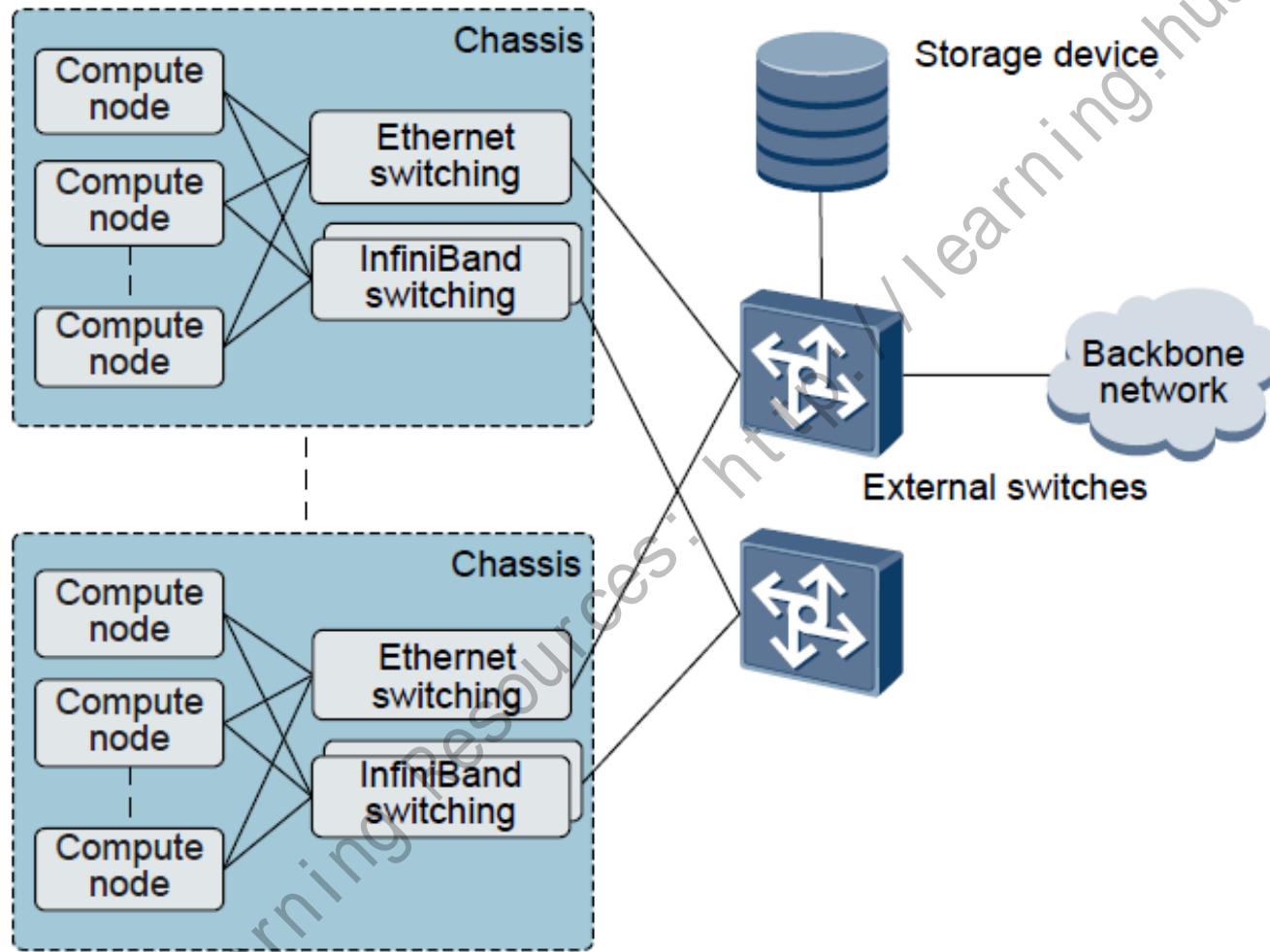
Computing node							
CH121 CH121V3	CH140 CH140V3	CH220 CH220V3	CH221	CH222 CH222V3	CH226V3	CH240	CH242V3
							
HW 2S Node High density Large memory	HW 2*2P Twin Node Ultra high density High performance	FW IO Expansion Node Large memory Strong expansion	FW IO Expansion Node Large memory Strong expansion	FW Storage Node Large memory Ultra large storage	FW 4P Node High performance Ultra large storage	FW 4P Node High performance Ultra large memory	FW 4P E7 v2 Node High performance Strong Expansion

Switch module							
CX110/CX111	CX116	CX310/CX312	CX311	CX317	CX610	CX911 CX912/CX915	CX210
							
GE switch module	GE pass-thru module	10GE converged switch module	10GE/FCoE converged switch module	10GE pass-thru module	QDR/FDR switch module	10GE/FC Multiplane switch module	8G FC switch module

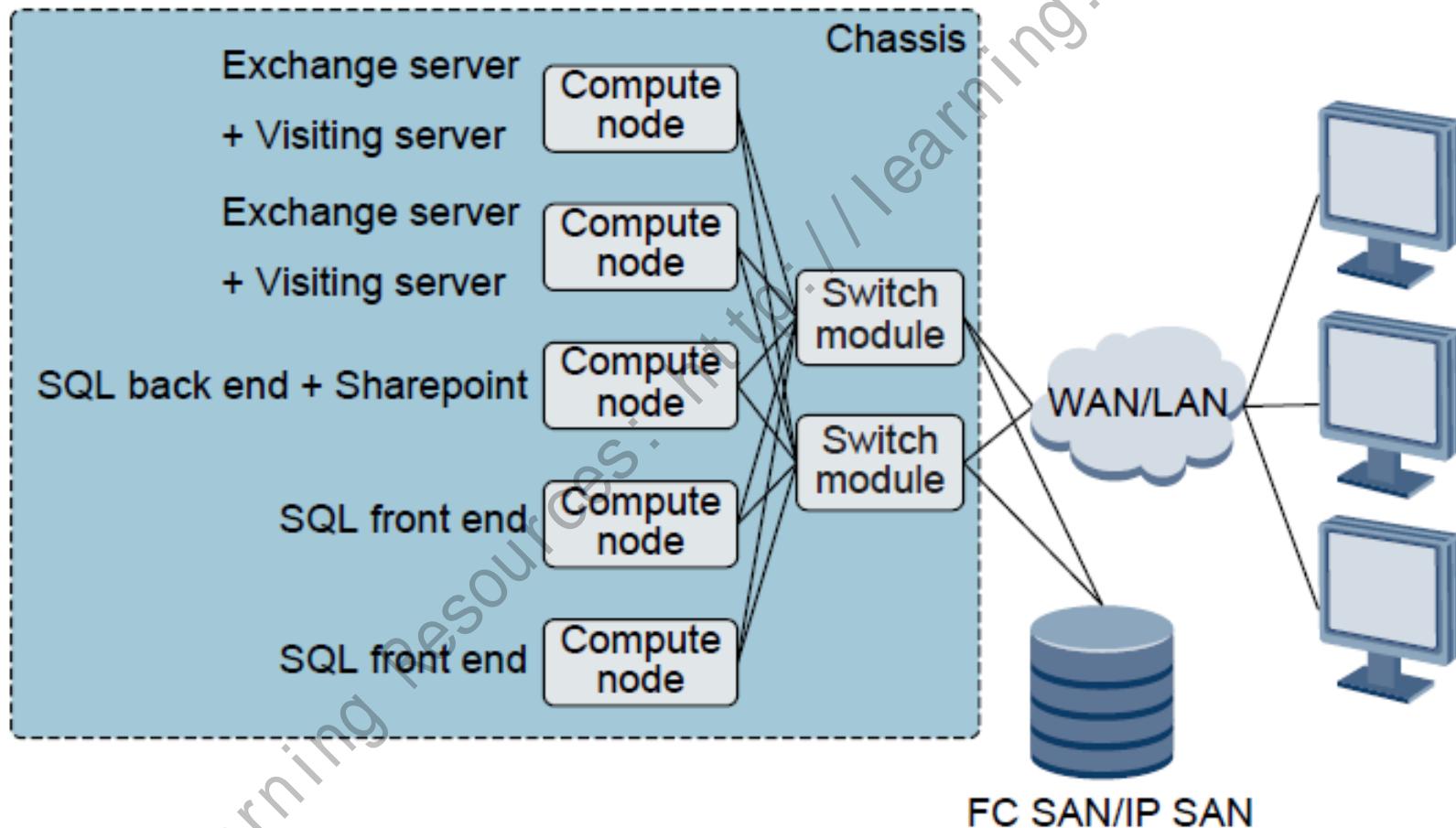
E9000 in Desktop Cloud Application Scenarios



E9000 in High-Performance Computing Application Scenarios



E9000 in Traditional IT Application Scenarios





Contents

1. E9000 Overview
- 2. E9000 Hardware Architecture**
3. E9000 Components

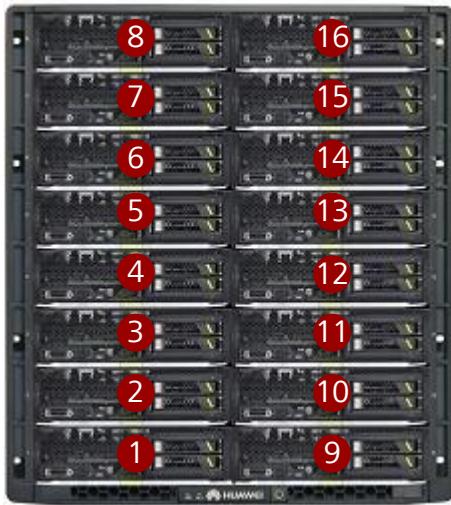
E9000 Chassis Appearance



Item	Specifications
Dimensions (H x W x D)	530mm x 442 mm x 840 mm (20.87 in. x 17.40 in. x 33.07)
Color	Black
Weight	<ul style="list-style-type: none">Empty chassis (including midplane): 72 kg (158.73 lb)Fully configured with compute nodes: 220 kg (485.02 lb)Fully configured with storage nodes: 300 kg (661.39 lb)
Rated input voltage	220 V AC 48 V DC
Rated input current	<ul style="list-style-type: none">3000 W AC PSU: 16 A2000 W AC PSU: 10 A2500 W DC PSU: 63 A
Rated power consumption	9000 W to 15000 W

Front View of the E9000 Chassis

CH121/CH140



Half-width slot numbering

CH240/CH242/CH242 V3



Full-width slot numbering 1

CH220/CH221/CH222



Full-width slot numbering 2

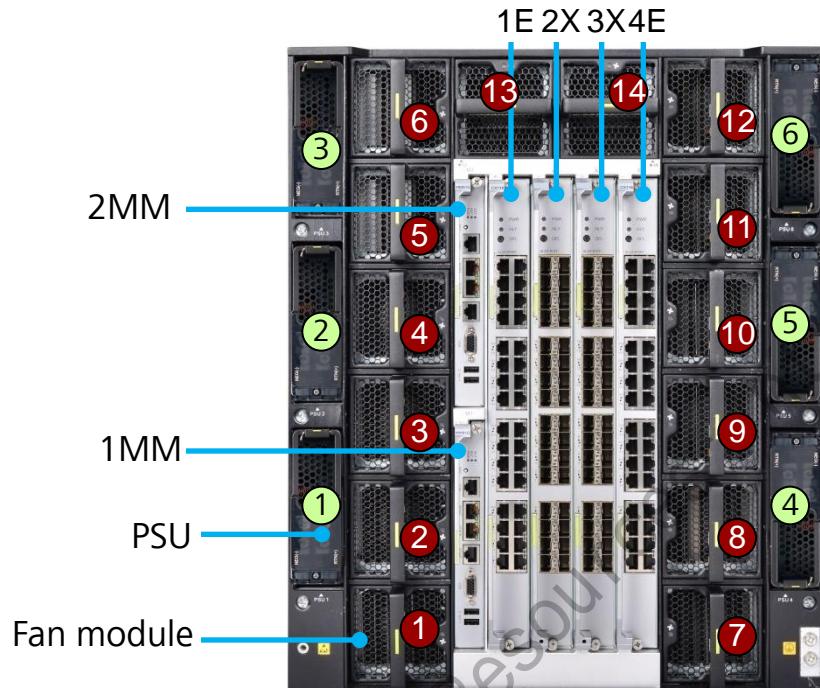
Front slots support 16 half-width or 8 full-width compute nodes.

Full-width slot numbering varies according to compute node types as follows:

The CH240 , CH242, and CH242 V3 full-width compute nodes are installed in slots 1 to 8.

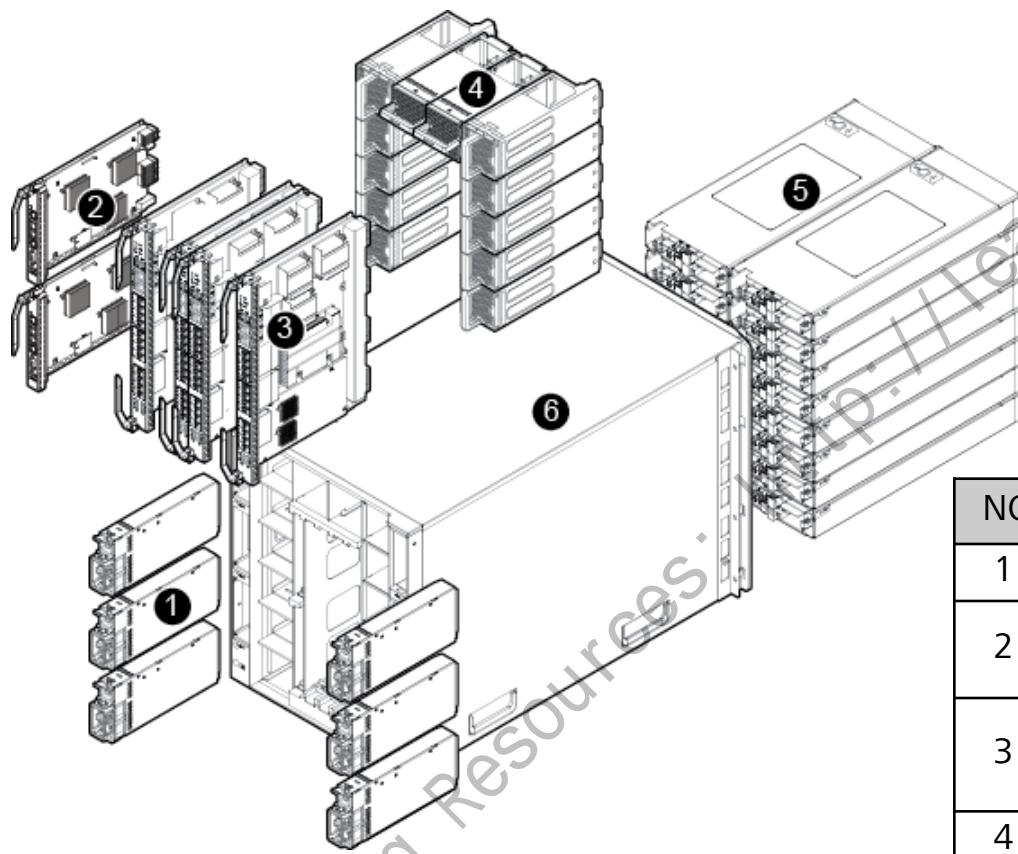
The CH220, CH221, CH222 full-width compute nodes are installed in slots 9 to 16. Those full-width compute nodes are expanded from the CH121

Rear View of the E9000 Chassis



Identification	Description
1MM /2MM	Two chassis management modules are configured in active/standby mode.
1E/2X/3X/4E	Two pairs of switch modules or I/O modules are configured.
Fan module	Fourteen fan modules are configured.
PSU	Six PSUs are configured in N+N redundancy mode.

Components of the E9000 Chassis



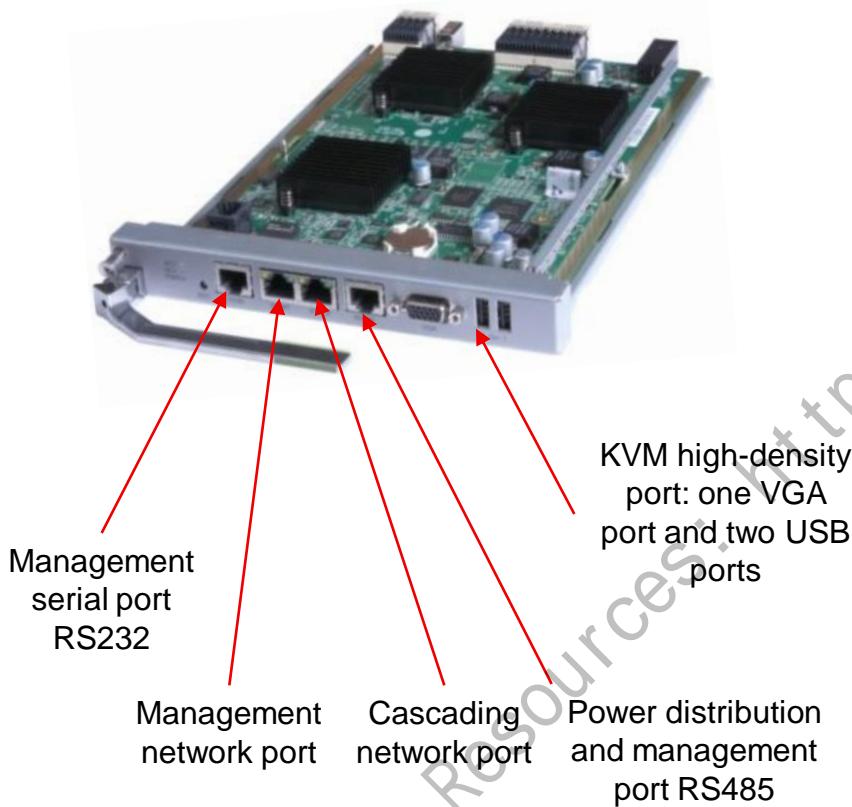
NO	Module name	Quantity
1	Power supply units	6
2	Management modules	2
3	Switch or Pass through modules	4
4	Fan modules	14
5	Compute nodes	16
6	Chassis	1



Contents

1. E9000 Overview
2. E9000 Hardware Architecture
- 3. E9000 Components**

MM910 Management Module



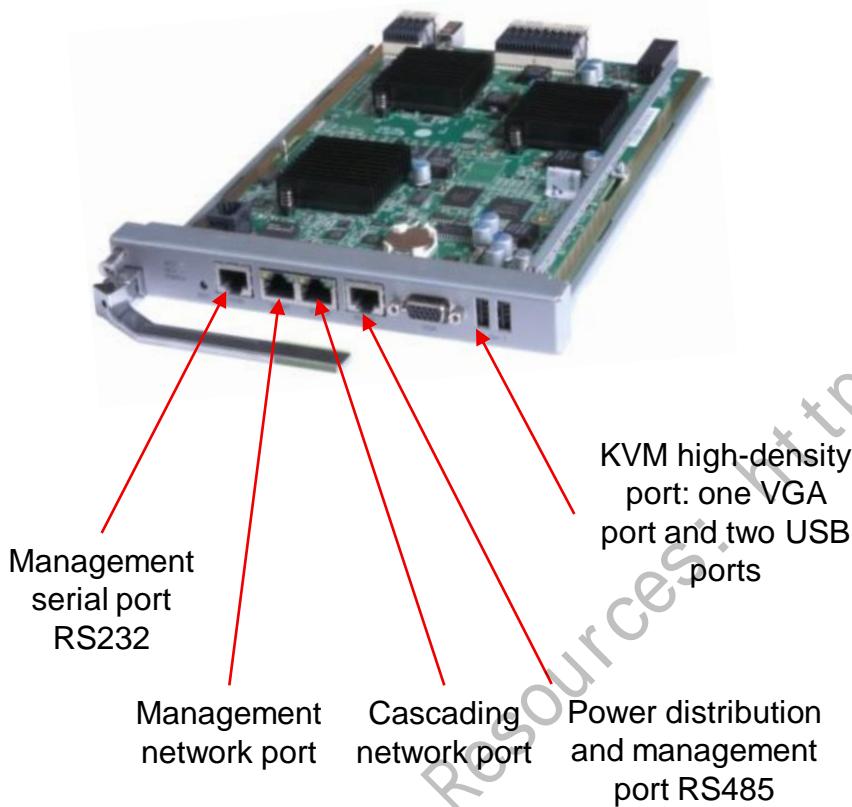
Installation slots:

- Slots 1MM and 2MM
- Two MM910s work in active/standby mode.

Features:

- Manages chassis components, sensors, and events.
- Supports intelligent fan speed adjustment.
- Provides SNMP interfaces for chassis management.
- Supports KVM over IP and centralized KVM display.
- Supports management over the CLI or WebUI.

MM910 Management Module



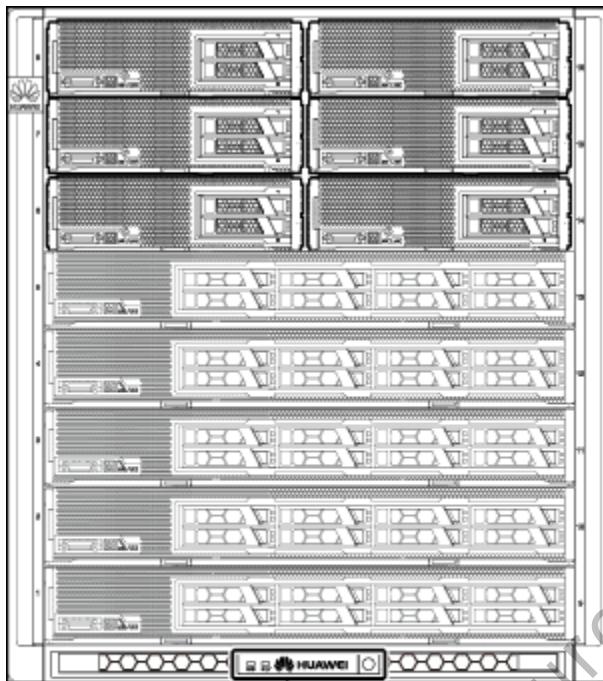
Installation slots:

- Slots 1MM and 2MM
- Two MM910s work in active/standby mode.

Features:

- Manages chassis components, sensors, and events.
- Supports intelligent fan speed adjustment.
- Provides SNMP interfaces for chassis management.
- Supports KVM over IP and centralized KVM display.
- Supports management over the CLI or WebUI.

Chassis Display



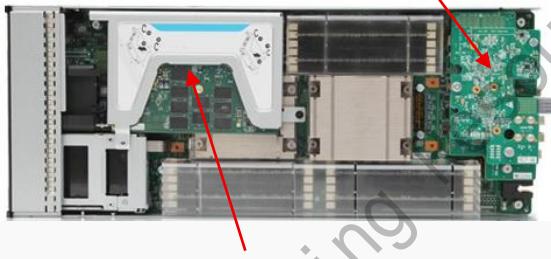
Position of the display in the chassis

- The chassis display feature allows you to:
 - View chassis information, such as the location and name.
 - View installation status and alarm information about compute nodes, PSUs, and fan modules.
 - Configure IP addresses for management modules.
 - Configure chassis power capping.

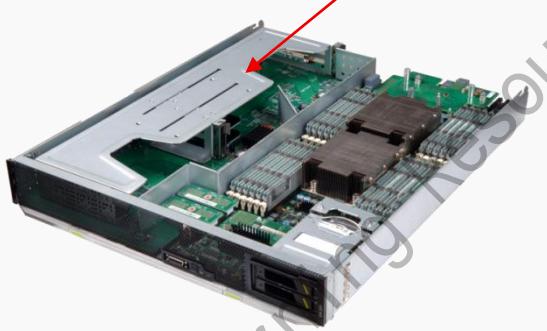
CH121 Half-Width Computing Node

Front view	Form factor	Description
 High Density Prot	Number of CPUs	1 or 2
	Processor model	Intel Xeon E5-2600 or E5-2600 v2 Series CPU Supports 80 W, 95 W, and 135 W processors.
	Number of DIMMs	24 DDR3 DIMMs, providing a maximum capacity of 768G
Isometric view	Number of HDDs	2 2.5 inch SSDs or SAS/SATA HDDs
 Mezz Card	RAID support	RAID 0 and 1 provided by LSISAS2308 RAID controller card.*
	PCIe expansion	2 PCIe x16 MEZZ modules 1 standard PCIe x8 full-height half-length card
	Operating systems supported	Microsoft Windows Server 2008/2012 Red Hat Enterprise Linux SUSE Linux Enterprise Server Citrix XenServer VMware ESX.....

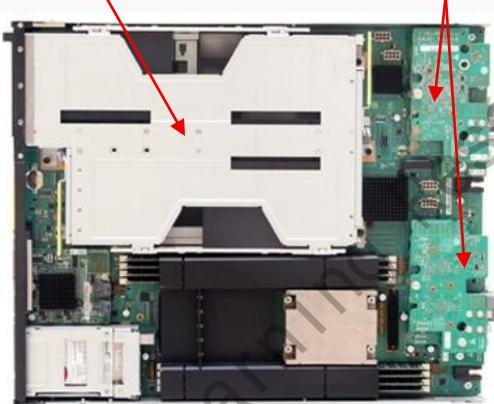
CH121V3 Half-Width Compute Node

Front View	Form factor	Description
	Number of processors	1 or 2
	Processor model	Intel® Xeon® E5-2600 v3 series
	Number of DIMMs	24 DDR4 DIMMs, providing a maximum memory capacity of 1.5 TB
Isometric view	Number of hard disks	2 x 2.5" SSDs, SAS HDDs, or SATA HDDs, supporting 2 x PCIe SSD HDDs
	Built-in Storage	2 x SATA DOM 2 x Micro SD cards (Raid1), supporting hot swap without opening the chassis cover 1 x USB 3.0 Disk
	RAID support	RAID 0 and 1
	PCIe expansion	2 PCIe x16 mezz modules 1 standard PCIe x16 full-height half-length card

CH220/CH221 Full-Width Computing Node

Front View	Form factor	Full-width 2-socket compute node
	Number of processors	1 or 2
	Processor model	Intel® Xeon® E5-2600 v3 series
	Number of DIMMs	16 DDR4 DIMMs, providing a maximum memory capacity of 1 TB
	Number of hard disks	2 x 2.5" SSDs, SAS HDDs, or SATA HDDs, supporting 2 x PCIe SSD HDDs
	Built-in Storage	2 x SATA DOM 2 x Micro SD cards (Raid1), supporting hot swap without opening the chassis cover 1 x USB 3.0 Disk
	RAID support	RAID 0 and 1
	PCIe expansion	2 PCIe x16 + 2 PCIe x8 mezz modules, supporting six standard PCIe cards. The following configuration modes are supported: a. 6 full-height half-length single-slots b. 1 full-height full-length dual-slot and four full-height half-length single-slots c. 2 full-height full-length dual-slots

CH220V3 Full-Width Computing Node

Front View	Form factor	Full-width 2-socket compute node
	Number of processors	1 or 2
	Processor model	Intel® Xeon® E5-2600 v3 series
	Number of DIMMs	16 DDR4 DIMMs, providing a maximum memory capacity of 1 TB
	Number of hard disks	2 x 2.5" SSDs, SAS HDDs, or SATA HDDs, supporting 2 x PCIe SSD HDDs
TopView	Built-in Storage	2 x SATA DOM 2 x Micro SD cards (Raid1), supporting hot swap without opening the chassis cover 1 x USB 3.0 Disk
	RAID support	RAID 0 and 1
	PCIe expansion	2 PCIe x16 + 2 PCIe x8 mezz modules, supporting six standard PCIe cards. The following configuration modes are supported: a. 6 full-height half-length single-slots b. 1 full-height full-length dual-slot and four full-height half-length single-slots c. 2 full-height full-length dual-slots

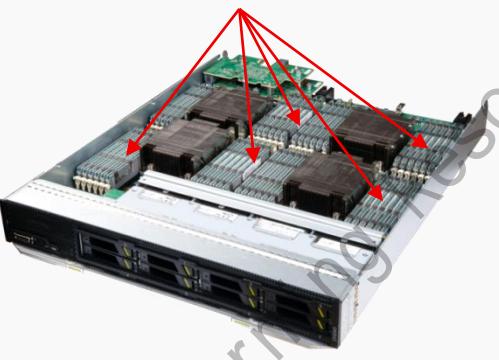
CH222 Full-Width Computing Node

Top View	Item	CH222 Storage Expansion Compute Node
	Form factor	Full-width 2-socket compute node
	Number of processors	1 or 2
	Processor model	Intel® Xeon® E5-2600 and E5-2600 V2 series
	Number of DIMMs	24 DDR3 DIMMs, providing a maximum memory capacity of 768 GB
	Number of hard disks	15 x 2.5" SAS/SATA HDDs or SSDs
Isometric view	RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 with a 512 MB/1 GB RAID cache
 2.5 inch HDDs	PCIe expansion	2 PCIe x16 mezz modules 1 standard PCIe x8 full-height half-length card
	Operating systems supported	Microsoft Windows Server 2008 R2 Enterprise/Standard Edition 32/64bit Red Hat Enterprise Linux SUSE Linux Enterprise Server Citrix XenServer VMware ESX

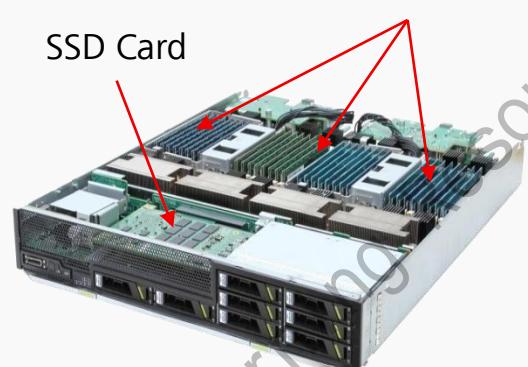
CH222V3 Full-Width Computing Node

Front View	Form factor	Full-width 2-socket compute node
	Number of processors	1 or 2
	Processor model	Intel® Xeon® E5-2600 v3 series
	Number of DIMMs	24 DDR4 DIMMs, providing a maximum memory capacity of 1.5 TB (64 GB per DIMM)
	Number of hard disks	15 x 2.5" SSDs, SAS HDDs, or SATA HDDs
 2.5 inch HDDs	Built-in Storage	2 x SATA DOM 2 x Micro SD cards (Raid1), supporting hot swap without opening the chassis cover 1 x USB 3.0 Disk
	RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 512 MB/1 GB RAID cache
	PCIe expansion	2 PCIe x16 mezz modules 1 standard PCIe x16 full-height half-length card

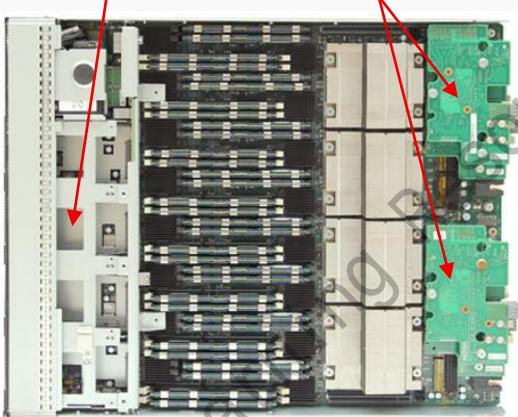
CH240 Full-Width Computing Node

Front View	Item	CH240 Compute Node
	Form factor	Full-width 4-socket compute node
	Number of processors	2 or 4
	Processor model	Intel® Xeon® E5-4600 or E5-4600 v2 series 4-core, 6-core, 8-core, 10-core and 12-core processors series Core options: 4, 6, 8, 10, 12
Isometric view	Number of DIMMs	48 DDR3 DIMMs, providing a maximum memory capacity of 1.5 TB
	Number of hard disks	8 x 2.5" SAS/SATA HDDs or SSDs
	RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 with a 512 MB/1 GB RAID cache
	PCIe expansion	2 PCIe x16 mezz modules

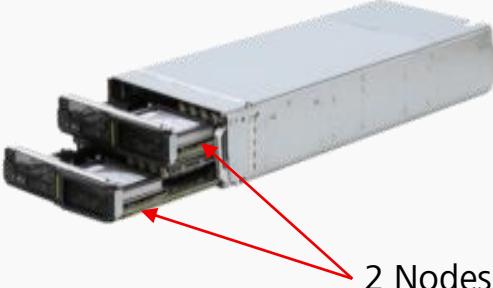
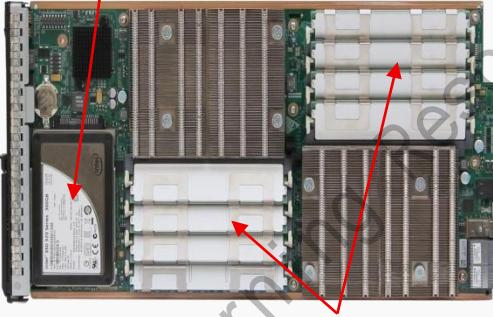
CH242 Full-Width Computing Node

Front View	Item	CH242 Compute Node
	Form factor	Full-width 4-socket compute node
	Number of processors	2 or 4
	Processor model	Intel® Xeon® E7-4800 series
	Number of DIMMs	32 DDR3 DIMMs, up to 1 TB
	Number of hard disks	8 x 2.5" SAS/SATA HDDs, or SSDs
	RAID support	RAID 0, 1, 10, 5, 50, 6, and 60 with a 1 GB RAID cache
	PCIe expansion	4 PCIe x8 mezz modules 1 standard PCIe x8 full-height half-length card
	Operating systems supported	Microsoft Windows Server 2008 R2 Enterprise/Standard Edition 32/64bit Red Hat Enterprise Linux SUSE Linux Enterprise Server Citrix XenServer VMware ESX

CH242V3 Full-Width Computing Node

Front View	Item	CH242 Compute Node
	Form Factor	Full-width 4-socket compute node
	Number of Processors	2 or 4
	Processor Model	Intel® Xeon® E7-4800 series 8-core, 10-core, and 15-core processors
Top View	Item	CH242 Compute Node
	Number of DIMMs	32 DDR3 DIMMs, 32 channels, 1600Hz
	Number of hard disks	Eight(CH242 V3-8HDD) or 4(CH242 V3-4HDD) 2.5" SAS/SATA HDDs, or SSDs
	RAID support	RAID0/1/10/5/50/6/60, 1GB RAID Cache
	PCIe Expansion	4 PCIe x16 MEZZ modules CH242 V3-4HDD supports two FHHL PCIe cards, when the two built-in PCIe slots are used, some DIMM slots cannot be used. CH242 V3-4HDD version supports one more FH3/4L PCIe card.

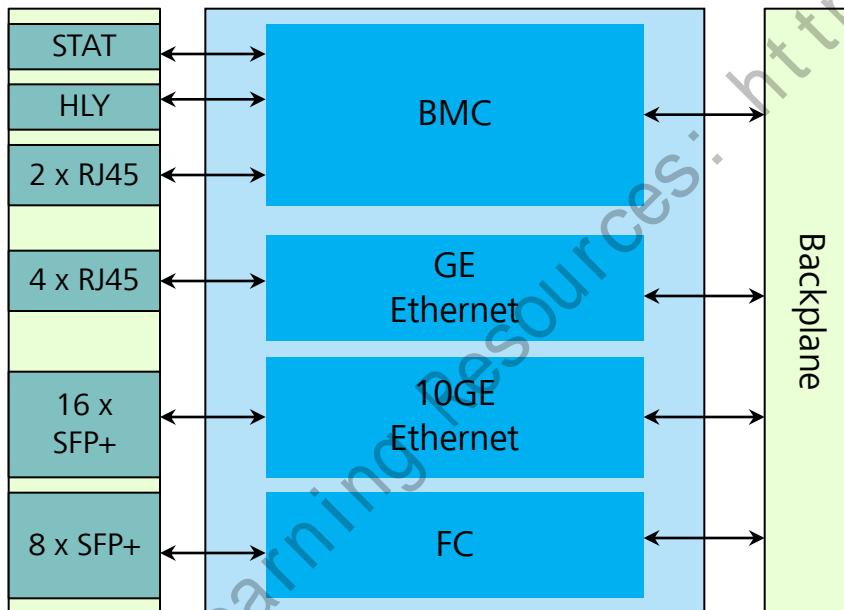
CH140 Half-Width Computing Node

Isometric view	Item	CH140 Compute Node
 2 Nodes	Form factor	Two 2-socket compute nodes in a half-width slot
	Number of processors	4
	Processor model	Intel® Xeon® E5-2600 and E5-2600 V2 series
	Number of DIMMs	8 DDR3 DIMMs for each 2-socket compute node, up to 512 GB in a half-width slot
Top View	Number of hard disks	One 2.5" SSD for each 2-socket compute node
 1*2.5inch HDD SSD 2*4DIMMs	PCIe expansion	2 PCIe x8 mezz module for each 2-socket compute node
	Operating systems supported	Microsoft Windows Server 2008 R2 Enterprise/Standard Edition 32/64bit Red Hat Enterprise Linux SUSE Linux Enterprise Server Citrix XenServer VMware ESX

E9000 I/O Module Overview

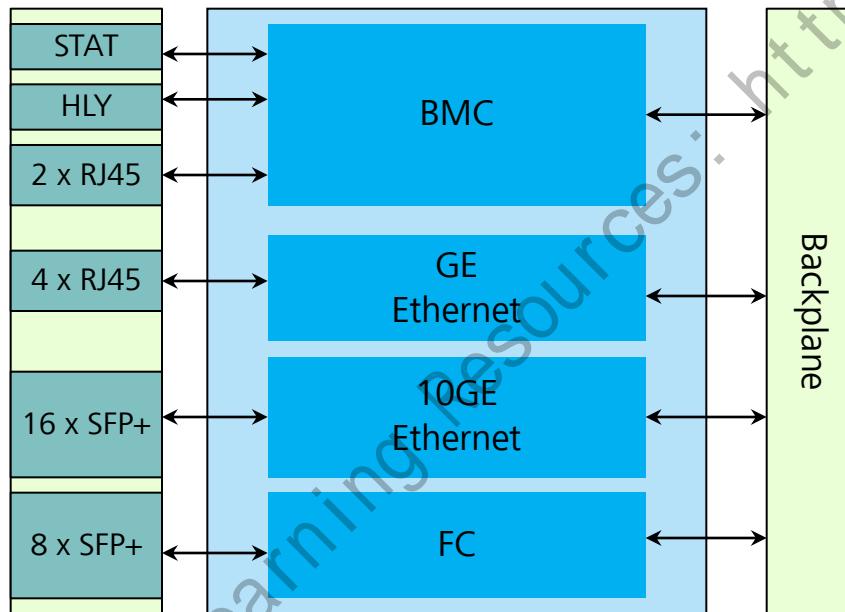
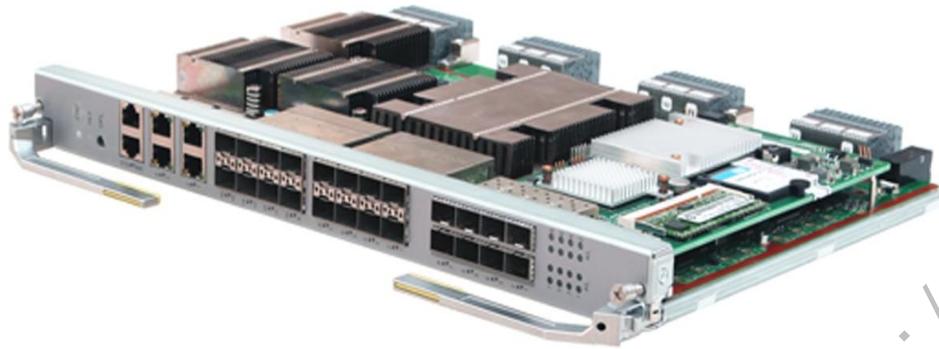
Type	Mode		
GE	CX110	CX111	CX116
FC		CX210-8G	
10GE/FCoE Converge Switch Module	CX310	CX311	CX312
Infiniband QDR/FDR		CX611	
Multi-plane Switch Module	CX911/CX912		CX915

CX911 Switch Module



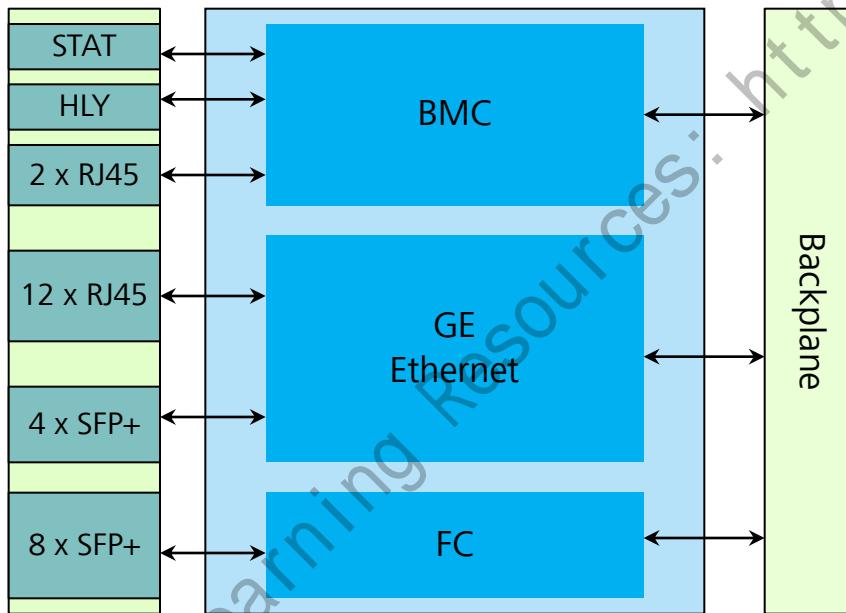
- Uplink port
 - 4 x GE + 16 x 10GE + 8 x 8G FC
- Downlink port
 - 16 x GE + 32 x 10GE + 16 x 8G FC/FCoE
- Backplane direct links
 - 2 x 40GE ports (can be used as stacked or interconnection channels)
- 10GE switching plane
 - L2/L3/stacking/FSB/TRILL/VRP/IPv6
- FC switching plane
 - MX510: ODM Qlogic
 - Connects the FC switch and storage device in full switch and NPV mode.
- Delivery-attached MEZZ card: MZ910. Slots 1-12 are FCoE, and slots 13-16 are FC.
- The GE switching plane is unavailable.

CX912 Switch Module



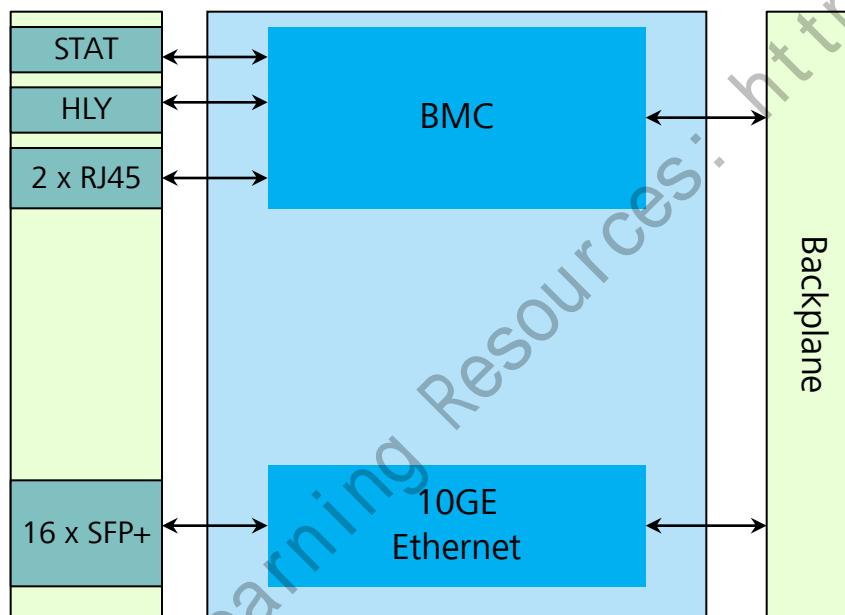
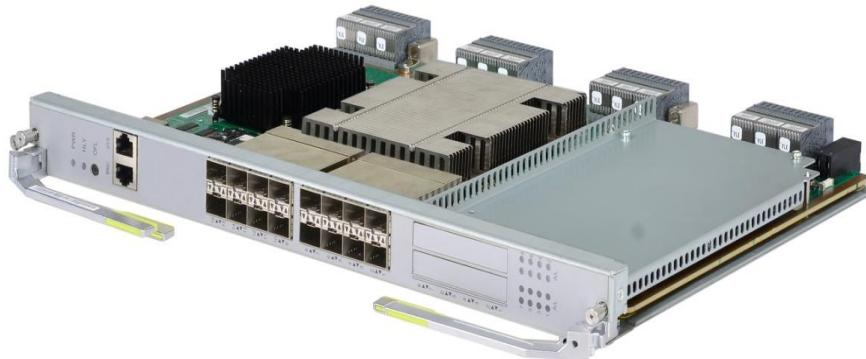
- Uplink port
 - 4 x GE + 16 x 10GE + 8 x 8G FC
- Downlink port
 - 16 x GE + 32 x 10GE + 16 x 8G FC/FCoE
- Backplane direct links
 - 2 x 40GE ports (can be used as stacked or interconnection channels)
- 10GE switching plane
 - L2/L3/stacking/FSB/TRILL/VRRP/IPv6
- FC switching plane
 - MX210: ODM Brocade
 - Connects the FC switch and storage device in AG (NPV) and Native (Switch) mode.
- Delivery-attached MEZZ card: MZ910. All ports connected to the blades are FC.
- The GE switching plane is unavailable.

CX915 Switch Module



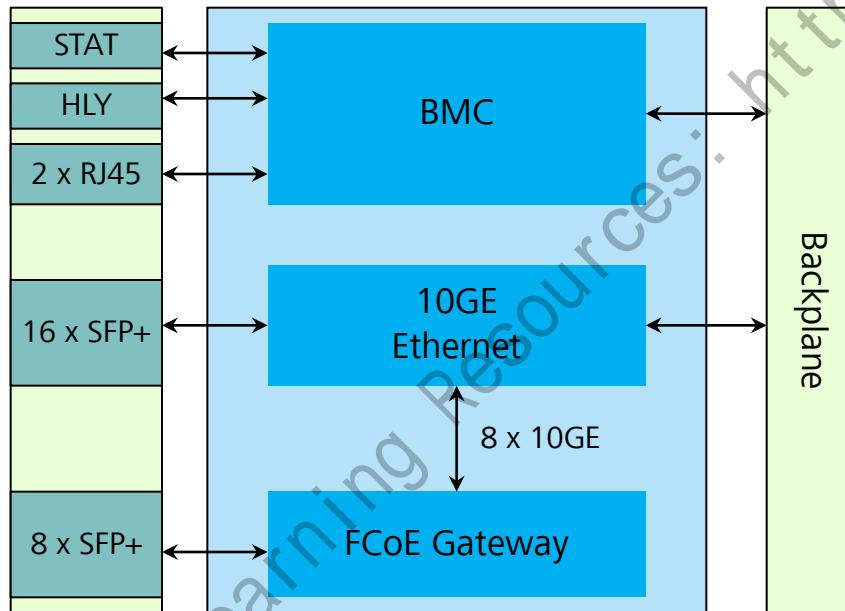
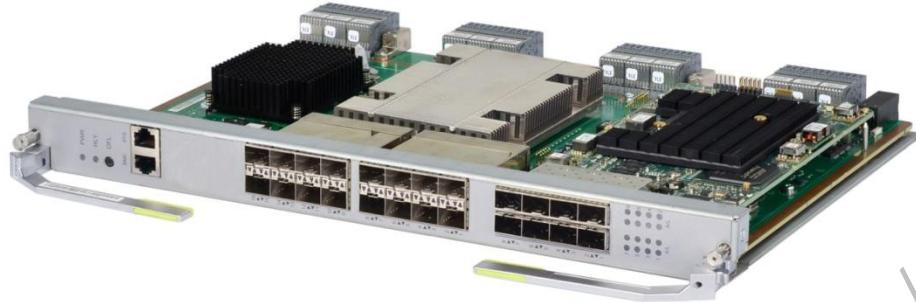
- Uplink port
 - 12 x GE + 4 x 10GE + 8 x 8G FC
- Downlink port
 - 32 x GE + 16 x 8G FC/FCoE
- Backplane direct links
 - NO (only the 10GE port on the panel can be used in a stack)
- GE switching plane
 - L2/L3/stacking/FSB/TRILL/VRRP/IPv6
- FC switching plane
 - MX510: ODM Qlogic
 - Connects the FC switch and storage device in full switch and NPV mode.
- Delivery-attached MEZZ card: MZ910. Slots 1-12 are FCoE, and slots 13-16 are FC.

CX310 Switch Module



- Uplink port
 - 16 x 10GE
- Downlink port
 - 32 x 10GE
- Backplane direct links
 - 1 x 40GE port (can be used as stacked or interconnection channels)
- GE switching plane
 - L2/L3/stacking/FSB/TRILL/VRRP/IPv6
 - 4 x 10GE ports on the panel (for example ports 1/2/3/4 or 5/6/7/8) can be configured as 1 x 40GE port.
- Delivery-attached MEZZ card:
MZ510/MZ512/MZ311.

CX311 Switch Module



Uplink port

- 16 x 10GE + 8 x 8G FC

Downlink port

- 32 x 10GE

Backplane direct links

- 1 x 40GE port (can be used as stacked or interconnection channels)

- 10GE switching plane

- L2/L3/stacking/FSB/TRILL/VRRP/IPv6

- 4 x 10GE ports on the panel (for example ports 1/2/3/4 or 5/6/7/8) can be configured as 1 x 40GE port.

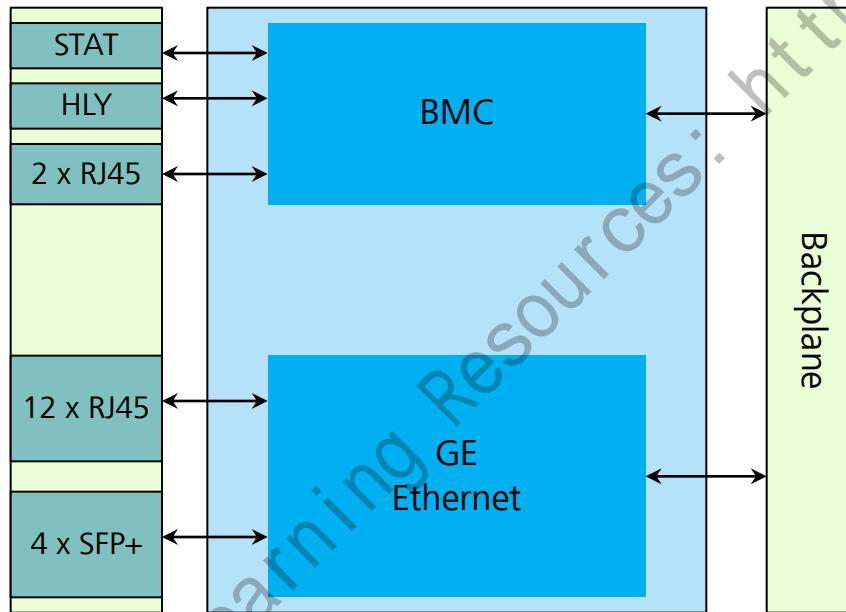
- FC switching plane

- MX510: ODM Brocade

- Connects the FC switch and storage device in AG (NPV) and Native (Switch) mode.

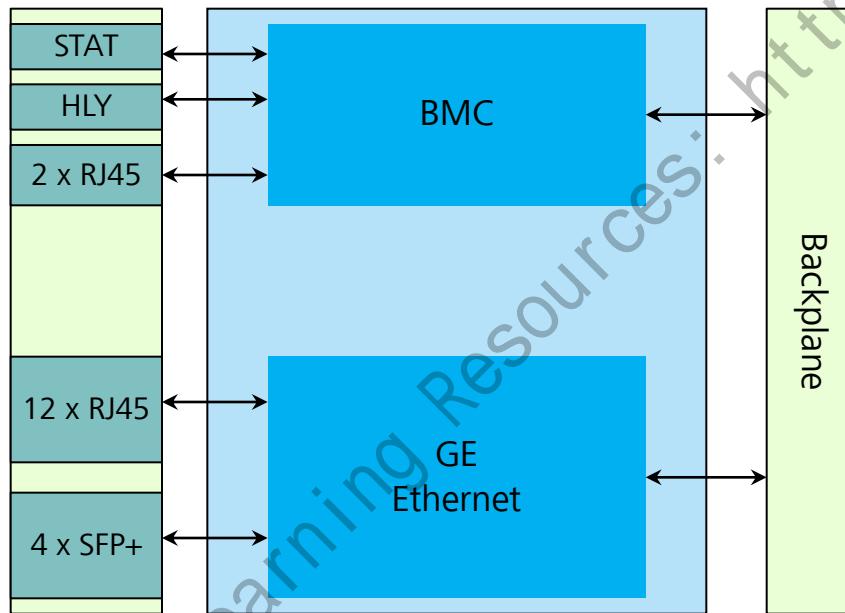
- Delivery-attached MEZZ card: MZ510/MZ512

CX110 Switch Module



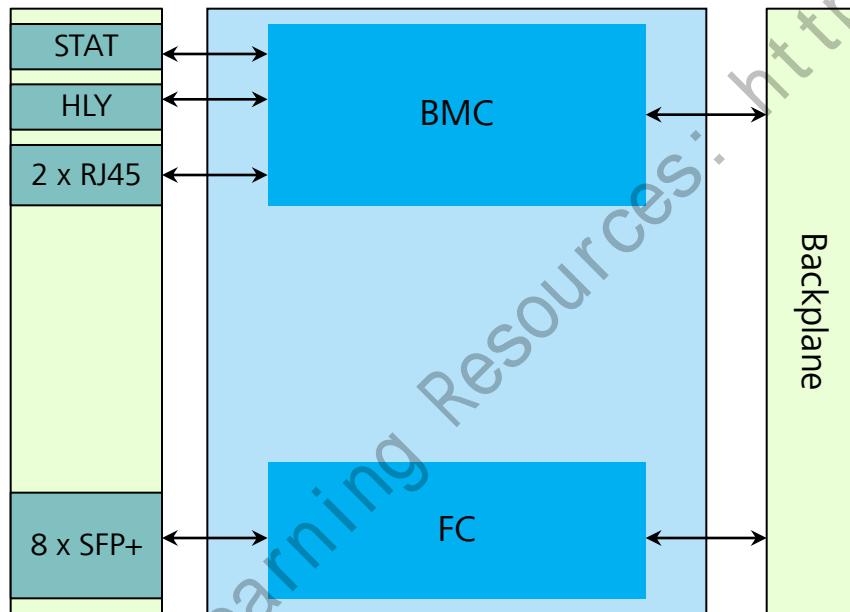
- Uplink port
 - 12 x GE + 4 x 10GE
- Downlink port
 - 32 x GE
- Backplane direct links
 - 2 x 40GE port (can be used as stacked or interconnection channels)
- GE switching plane
 - L2/L3/stacking/TRILL/VRP/IPv6
- Delivery-attached MEZZ card:
MZ110/MZ111

CX111 Switch Module



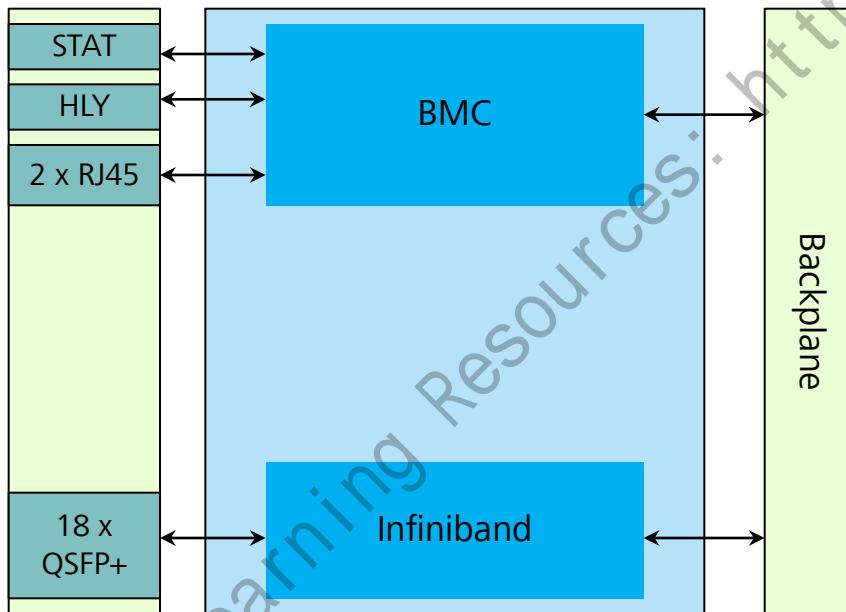
- Uplink port
 - 12 x GE + 4 x 10GE
- Downlink port
 - 32 x GE
- Backplane direct links
 - NO (only the 10GE port on the panel can be used in a stack)
- GE switching plane
 - L2/L3/stacking/VRRP/IPv6
- Delivery-attached MEZZ card:
MZ110/MZ111

CX210 Switch Module



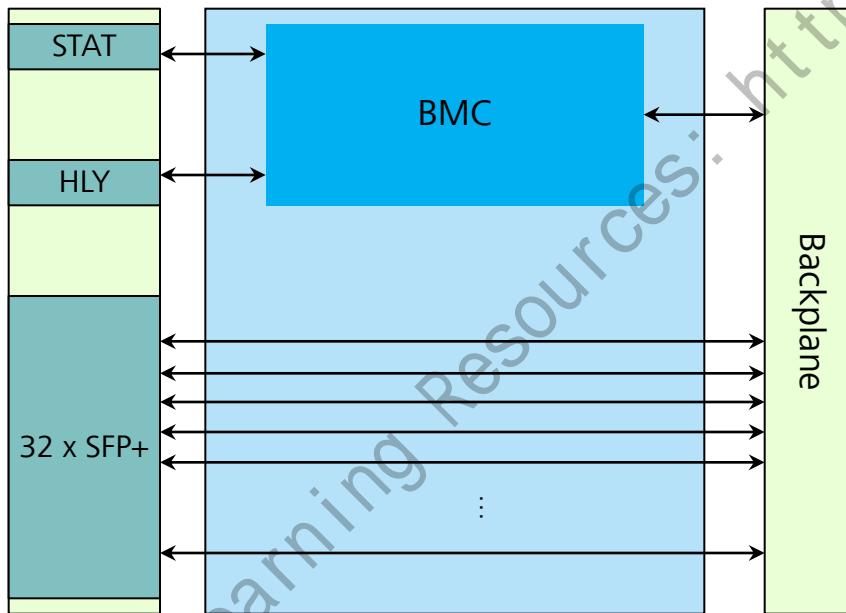
- Uplink port
 - 8 x 8G FC
- Downlink port
 - 16 x 8G FC
- Backplane direct links
 - N/A
- FC switching plane
 - MX210: ODM Brocade
 - Connects the FC switch and storage device in AG (NPV) and Native (Switch) mode.
- Delivery-attached MEZZ card: MZ910.
All ports connected to the blades are FC.
- the 10GE port of the MZ910 is unavailable.

CX611 Switch Module



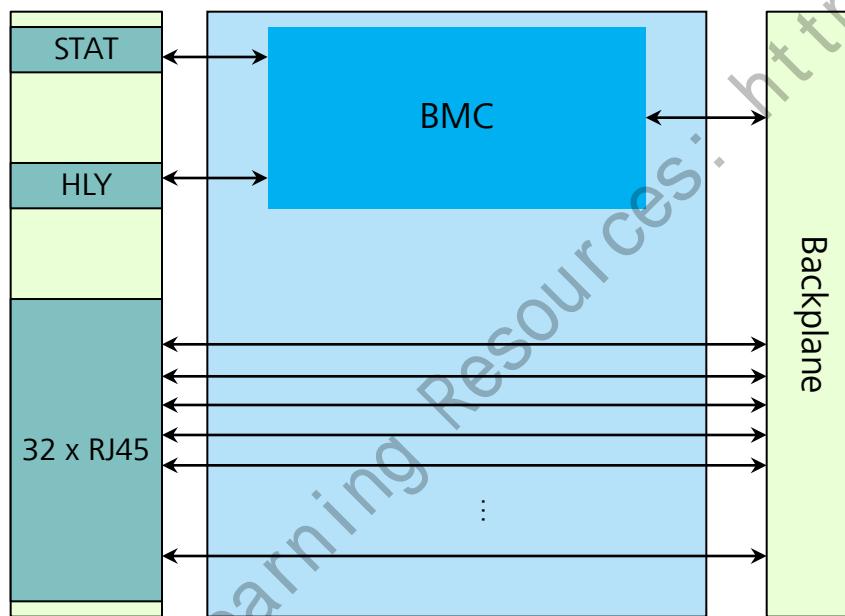
- Uplink port
 - 18 x 40/46G IB
- Downlink port
 - 16 x 40/56G IB
- Backplane direct links
 - N/A
- It is suitable for high-bandwidth and low-latency applications, such as the HPC cluster and high-performance distributed file system.
- Delivery-attached MEZZ card: MZ611

CX317 Pass-Through Module



- Uplink port
 - 32 x 10GE
- Downlink port
 - 32 x 10GE
- Backplane direct links
 - N/A
- Delivery-attached MEZZ card:
MZ510/MZ512/MZ311

CX116 Pass-Through Module

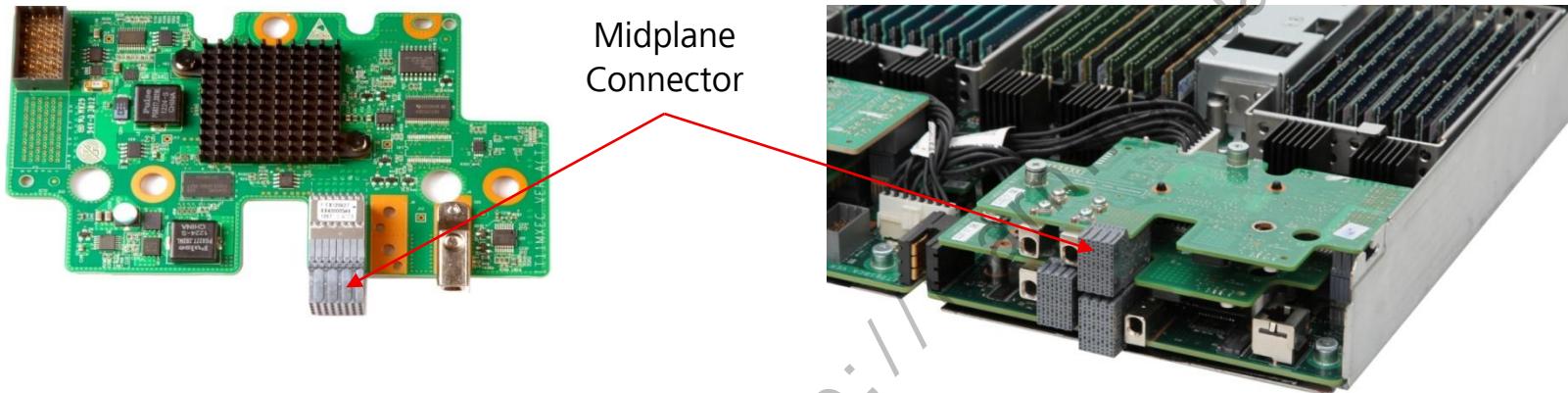


- Uplink port
 - 32 x GE
- Downlink port
 - 32 x GE
- Backplane direct links
 - N/A
- Delivery-attached MEZZ card:
MZ110/MZ111

Switch Modules

	Module Type	Up Links	Interconnect links	FC Modules
CX911	Multi-Plane	Ethernet : 16x10GE FC : 8x8G FC	2*40GE	MX510 : Qlogic
CX912	Multi-Plane	Ethernet : 16x10GE FC : 8x8G FC	2*40GE	MX210 : Brocade
CX915	Multi-Plane	Ethernet : 12xGE+4x10GE FC : 8x8G FC	NO	MX510 : Qlogic
CX310	Converged	Ethernet : 16x10GE	1*40GE	NA
CX311	Converged	Ethernet : 16x10GE FC : 8x8G FC	1*40GE	MX510 : Qlogic
CX210	FC(8G)	FC : 8x8G FC	NA	MX210 : Brocade
CX110	Ethernet	Ethernet : 12xGE+4x10GE	2*40GE	NA
CX111	Ethernet	Ethernet : 12xGE+4x10GE	NO	NA
CX611	InfiniBand	InfiniBand : 18x40G/56G	NA	NA

MEZZ Card



Category	Model	Number of Ports	Description
GE mezz module	MZ110	2*2*GE, PCIe2.0 x4	
	MZ111	2*2*GE, PCIe2.0 x2	
CAN mezz module	MZ510	2*10GE, PCIe2.0 x8	Supports configuration for the multi-PF, PF bandwidth, and VLAN, and supports FCoE/NIC.
	MZ512	2*2*10GE, 2*PCIe2.0 x8	Supports configuration for the multi-PF, PF bandwidth, and VLAN, and supports FCoE/NIC.
Multi-plane mezz module	MZ910	2*10GE+2*8G/10FCoE, PCIe3.0 x8	
ROCE NIC	MZ311	2*2*10GE, 2*PCIe3.0 x8	Supports the ROCE feature.
IB mezz module	MZ610	2*QDR 40G, PCIe3.0 x8	
	MZ611	2*FDR 56G, PCIe3.0 x8	

Applicable to IO Modules and MEZZ Card

Category	IO Modules	MEZZ Cards	
GE Switch Module	CX110	MZ110	4*GE
	CX111	MZ110	4*GE
Converged Switch Module	CX310	MZ510	2*10GE CNA
		MZ512	2* (2*10GE) CNA
	CX311	MZ510	2*10GE CNA
		MZ512	2* (2*10GE) CNA
Multi-plane Switch Module	CX911	MZ910	2*10GE+2*8Gb FC/10Gb FCoE
	CX912	MZ910	2*10GE+2*8Gb FC/10Gb FCoE
	CX915	MZ910	2*10GE+2*8Gb FC/10Gb FCoE
FC Switch Module	CX210	MZ910	2*10GE+2*8Gb FC/10Gb FCoE
InfiniBand Switch Module	CX611	MZ610	2*40G QDR
		MZ611	2*56G FDR
Pass-Through Module	CX116	MZ110	4*GE
	CX317	MZ510	2*10GE CNA
		MZ512	2* (2*10GE) CNA

Feature List

	CX911	CX912	CX915	CX310	CX311	CX210	CX110	CX111
iStack	YES	YES	YES	YES	YES	N/A	YES	YES
Number of stack devices (1)	4	4	4	4	4	N/A	4	4
Backplane direct links(2)	2*40GE	2*40GE	NO	1*40GE	1*40GE	N/A	2*40GE	NO
FSB/DCBX	YES	YES	NO	YES	YES	N/A	NO	NO
TRILL	YES	YES	YES	YES	YES	N/A	YES	NO
SmartLink/Monitor Link	YES	YES	YES	YES	YES	N/A	YES	YES
IPv6	YES	YES	YES	YES	YES	N/A	YES	YES
BFD/VRRP	YES	YES	YES	YES	YES	N/A	YES	YES
NPV	YES	YES	YES	N/A	YES	YES	N/A	N/A
ISL Trunking (3)	NO	NO	NO	N/A	NO	YES	N/A	N/A

1. A stack system contains a maximum of four switch modules, which are either intra-chassis or inter-chassis.
2. There is no direct link through the backplanes between slots 1E and 4E, and between slots 2X and 3X in the CX915 and CX111. Only the 10GE ports on the panel are used for stacking devices by connecting to optical fibres.
3. The ISL Trunking can be connected only to the Brocade FC switch with a separate License.

Power Module

Power Module List

Code	Mode	Description
02310LKL	EPW3000-12A	3000W AC Power Module for E9000 Server
02310PTH	EPW2000-12A	2000W AC Power Module for E9000 Server
02310LHN	TPS2500-12D	2500W DC Power Module for E9000 Server



3000W AC
Power Module



2000W AC
Power Module



2500W DC
Power Module

EPW3000-12A PSU Specification

Category	Item	Specifications
Model	PSU model	EPW3000-12A
Physical specifications	Dimensions (H x W x D)	40.5 mm x 126 mm x 285 mm (1.59 in. x 4.96 in. x 11.22 in.)
	Net weight	2.5 kg (5.51 lb)
Electrical specifications	Rated input voltage	AC: 100 V to 240 V DC: 240 V
	Input operating voltage range	AC: 90 V to 264 V DC: 192 V to 288 V
	Input frequency (AC)	45 Hz to 66 Hz
	Maximum input current	16 A
	Output voltage	12.3 V DC
	Maximum output current	243.9 A
	Maximum output power	3000 W
	Efficiency	≥ 94.6%
Environmental requirements	Operating temperature	-5° C to +50° C (23° F to 122° F) for the maximum output power 3000 W; 51° C to 60° C for the output power of 2500 W or lower
	Operating humidity	5% to 95% RH (non-condensing)
	Altitude	Between 3000 m (13123.20 ft) at 30°C (86°F) and 1800 m (5905.44 ft) at 50°C (122° F)

EPW3000-12A PSU Specification

Category	Item	Specifications
Model	PSU model	EPW2000-12A
Physical specifications	Dimensions (H x W x D)	40.5 mm x 126 mm x 285 mm (1.59 in. x 4.96 in. x 11.22 in.)
	Net weight	2.5 kg (5.51 lb)
Electrical specifications	Rated input voltage	AC: 100 V to 240 V DC: 240 V
	Input operating voltage range	AC: 90 V to 264 V DC: 192 V to 288 V
	Input frequency (AC)	45 Hz to 66 Hz
	Maximum input current	10 A
	Output voltage	12.3 V DC
	Maximum output current	162.6 A
	Maximum output power	2000 W
	Efficiency	94.5%
Environmental requirements	Operating temperature	-5° C to +60° C (23° F to 140° F) for the maximum output power 2000 W
	Operating humidity	5% to 95% RH (non-condensing)
	Altitude	Between 3000 m (13123.20 ft) at 30°C (86°F) and 1800 m (5905.44 ft) at 60°C (140° F)

TPS 2500-12D PSU



2500 W PSU panel



TPS2500-12D

电源额定值 POWER RATING:

Input: ≈ 48 - 60 V; 80 A Max

Output: ≈ 12.3 V; 203.5 A

Voltage and current information on the nameplate

TPS 2500-12D PSU Specification

Category	Item	Specifications
Model	PSU model	TPS2500-12D
Physical specifications	Dimensions (H x W x D)	40.5 mm x 126 mm x 285 mm (1.59 in. x 4.96 in. x 11.22 in.)
	Net weight	2.5 kg (5.51 lb)
Electrical specifications	Rated input voltage	-48 V DC to -60 V DC
	Input operating voltage range	-38 V DC to -72 V DC
	Maximum input current	80 A
	Output voltage	12.3 V DC
	Maximum output current	203.3 A
	Maximum output power	2500 W
	Efficiency	≥ 93%
Environmental requirements	Operating temperature	-5° C to +50° C
	Operating humidity	5% to 95% RH (non-condensing)
	Altitude	Between 3000 m (13123.20 ft) at 30°C (86°F) and 1800 m (5905.44 ft) at 50°C (122° F)



Summary

- E9000 Positioning and Application Scenarios
- E9000 Hardware Architecture
- E9000 Components

How to Obtain Help

- Huawei Enterprise business website:
 - <http://enterprise.huawei.com/cn/products/itapp/server/index.htm>
 - <http://enterprise.huawei.com/en/products/itapp/server/index.htm>
- Provides the product documents, compatibility lists, product software, and operation guides.
- Huawei service hotline:
 - [Enterprise Service Support](#)
 - <http://support.huawei.com/enterprise/NewsReadAction.action?contentId=NEWS1000000563>
- Provides professional warranty service.
- Huawei Server Information Self-Service Platform:
 - http://enterprise.huawei.com/topic/Self_service_server/knowledge.html
- Provides information about Huawei server installation, investigation, O&M and related tools.

Thank you

[www.huawei.com](http://learning.huawei.com)

E9000 Converged Architecture Blade Server Installation

[www.huawei.com](http://learning.huawei.com/e9000)





Objectives

- Upon completion of this course, you will learn:
 - E9000 Cabinet Installation
 - E9000 Component Installation



Contents

- 1. E9000 Cabinet Installation**
 - 1. Cabinet**
 2. PDU
 3. Power Supply System
 4. Heat Dissipation System
2. E9000 Component Installation

E9000 Cabinet Requirements



General cabinet requirements:

- The cabinet complies with the IEC60297-2 standards. To be specific, the cabinet is 19-inch wide and supports square hole installation. The distance between square holes meets the U-system space requirements.
- A minimum depth is 1 m, and the recommended depth is 1.2 m.
- Distance between rack columns: 689 mm-929 mm
- The recommended height is 2 m (42 U), the minimum height is 1.2 m (24 U)
- Cabinet load capacity:
 - To configure one chassis in a cabinet, the internal load capacity is at least 300 kg (661.50 lb).
 - To configure two chassis in a cabinet, the internal load capacity is at least 600 kg (1323.00 lb).
 - To configure three chassis in a cabinet, the internal load capacity is at least 900 kg (1984.50 lb).

E9000 Cabinet Requirements



General cabinet requirements:

- The cabinet complies with the IEC60297-2 standards. To be specific, the cabinet is 19-inch wide and supports square hole installation. The distance between square holes meets the U-system space requirements.
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- Cabinet load capacity:
 - To configure one chassis in a cabinet, the internal load capacity is at least 300 kg (661.50 lb).
 - To configure two chassis in a cabinet, the internal load capacity is at least 600 kg (1323.00 lb).
 - To configure three chassis in a cabinet, the internal load capacity is at least 900 kg (1984.50 lb).

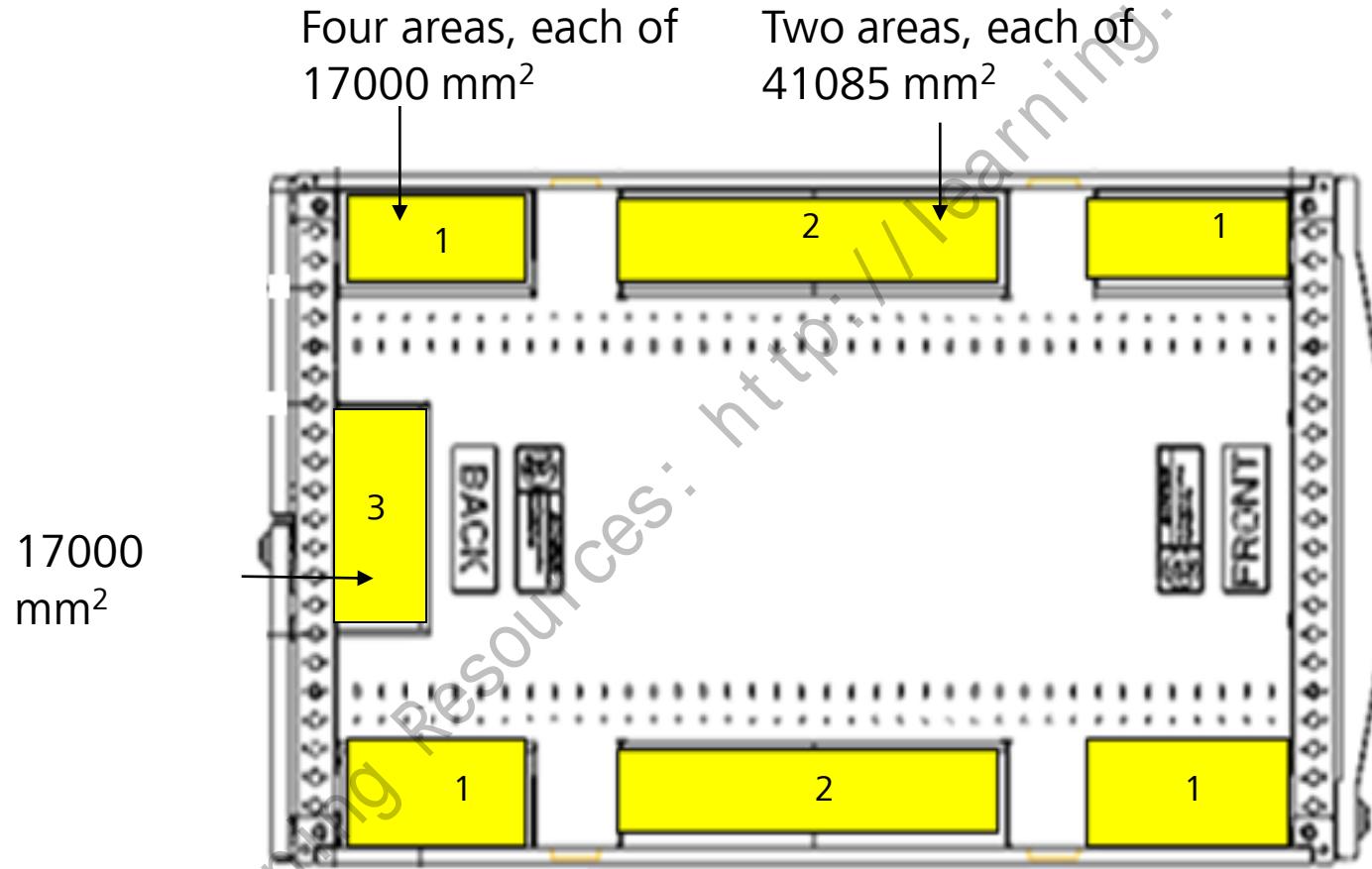
Huawei Delivery-Attached 42 U Cabinet



42 U FR42612/FR42612C cabinet

Category	Item	Specifications
Physical specifications	Color	Black, sand
	Dimensions (H x W x D)	42U, 2000 mm x 600 mm x 1200 mm
	Weight	Empty cabinet: 140 kg
	Load capacity	Static load: 1500 kg Dynamic load: 1000 kg
	Cabinet door	Cabinets with front doors, rear doors, and side panels for delivery Porosity rate for front doors: 67%
	Gradeability	Maximum degree for moving an empty cabinet: 11°
	Wheel diameter	Diameter: 40 mm (1.57 in.); maximum slit width: 20 mm (0.79 in.)
Process specifications	Structure	Assembled by high quality electric galvanized sheets and cold rolled steel sheets with screws
	Modular design	Modular combination structure
	Cable routing	Overhead cabling through holes on the top and underfloor cabling through holes on the bottom
	Installation method	Installed on the concrete floor and electrostatic discharge (ESD) floor

Huawei Delivery-Attached 42 U Cabinet Cable Routing



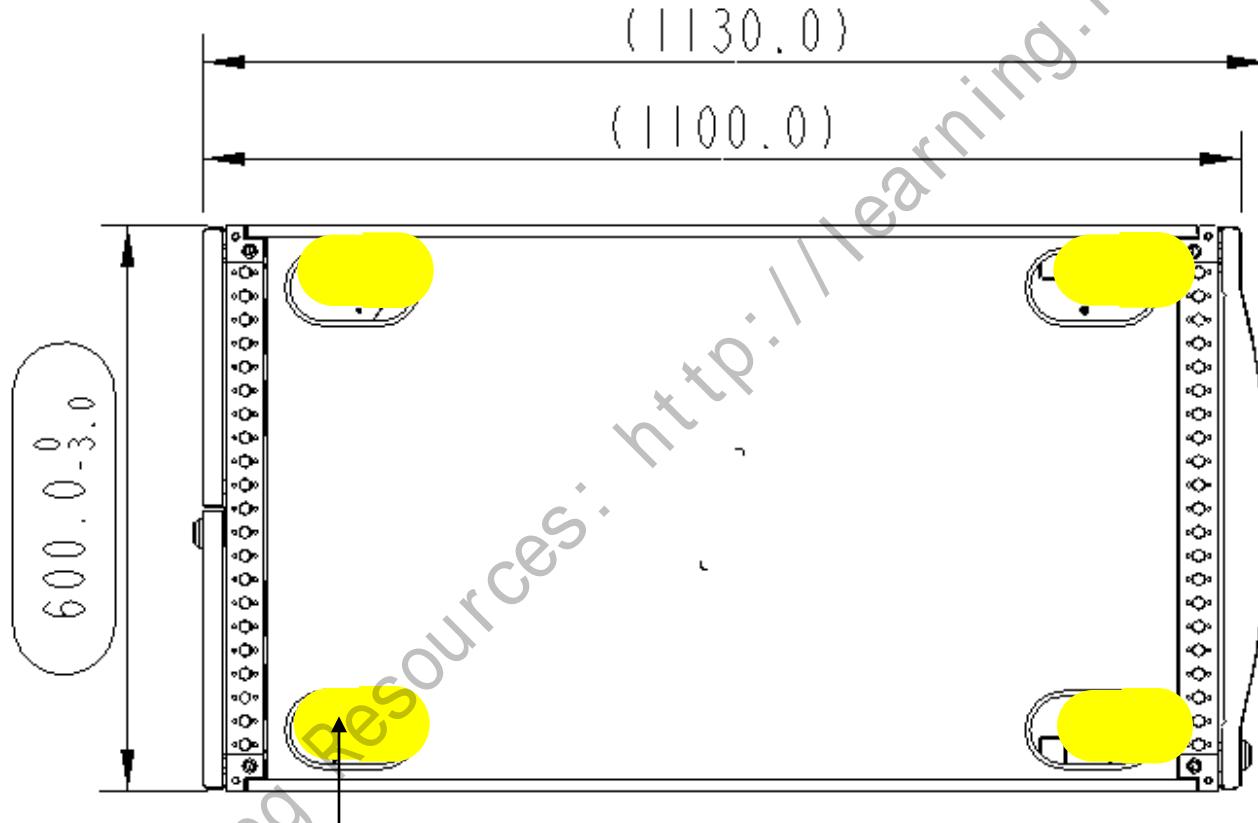
Huawei Delivery-Attached 24 U Cabinet



24U FR24611/FR24611C cabinet

Category	Item	Specifications
Physical specifications	Color	Black, sand
	Dimensions (H x W x D)	24U, 1200 mm x 600 mm x 1100 mm
	Weight	Empty cabinet: 85 kg
	Load capacity	Static load: 1500 kg Dynamic load: 1000 kg
	Cabinet door	Cabinets with front doors, rear doors, and side panels for delivery
	Gradeability	Maximum degree for moving an empty cabinet: 11 °
Process specifications	Wheel diameter	Diameter: 40 mm (1.57 in.); maximum slit width: 20 mm (0.79 in.)
	Structure	Assembled by high quality electric galvanized sheets and cold rolled steel sheets with screws
	Modular design	Modular combination structure
	Cable routing	Overhead cabling through holes on the top and underfloor cabling through holes on the bottom
	Installation method	Installed on the concrete floor and electrostatic discharge (ESD) floor

Huawei Delivery-Attached 24 U Cabinet Cable Routing



Four areas, each of
8391 mm²

Floor Bearing Capacity

- The maximum weight of the E9000 is about 300 kg (661.50 lb), and the weight of an empty rack is about 200 kg (440.92 lb). A rack occupies an area of 1.44 m² (13.56 ft²). The floor bearing capacity requirement varies depending on the number of E9000s configured in a rack:
 - One E9000: 347.2 kg/m²
 - Two E9000s: 555.5 kg/m²
 - Three E9000s: 763.9 kg/m²



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- 1. E9000 Cabinet Installation**
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- 2. E9000 Component Installation**

E9000 PDUs

- Huawei provides five PDUs: 32 A@220 V single-phase, 63 A@220 V single-phase, 16 A@380 V three-phase, 32 A@380 V three-phase, and 30 A@208 V three-phase. The following PDUs are recommended for the E9000:
 - 32 A@220 V single-phase PDU: 02120765

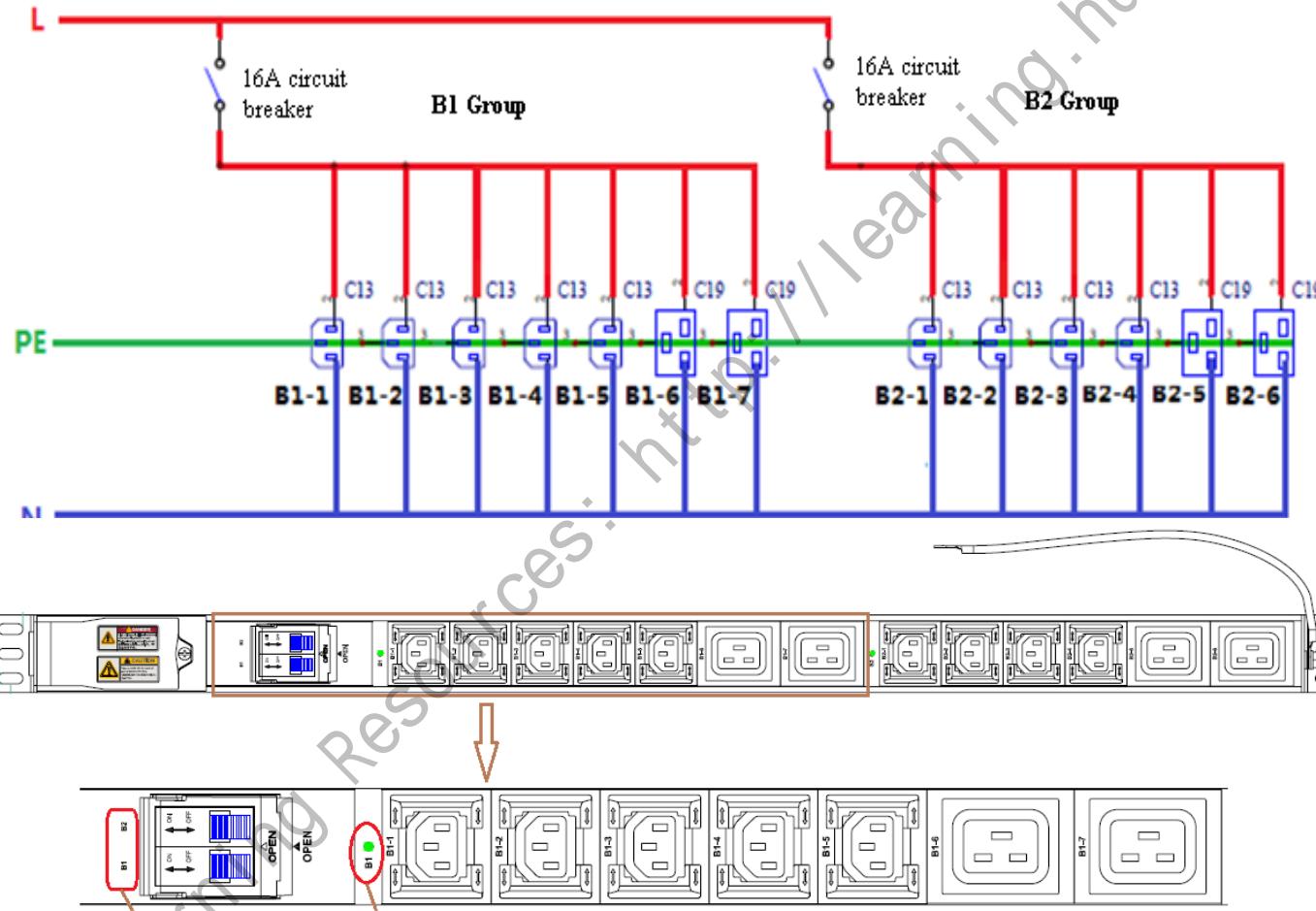


32 A@220 V single-phase PDU: 02120765

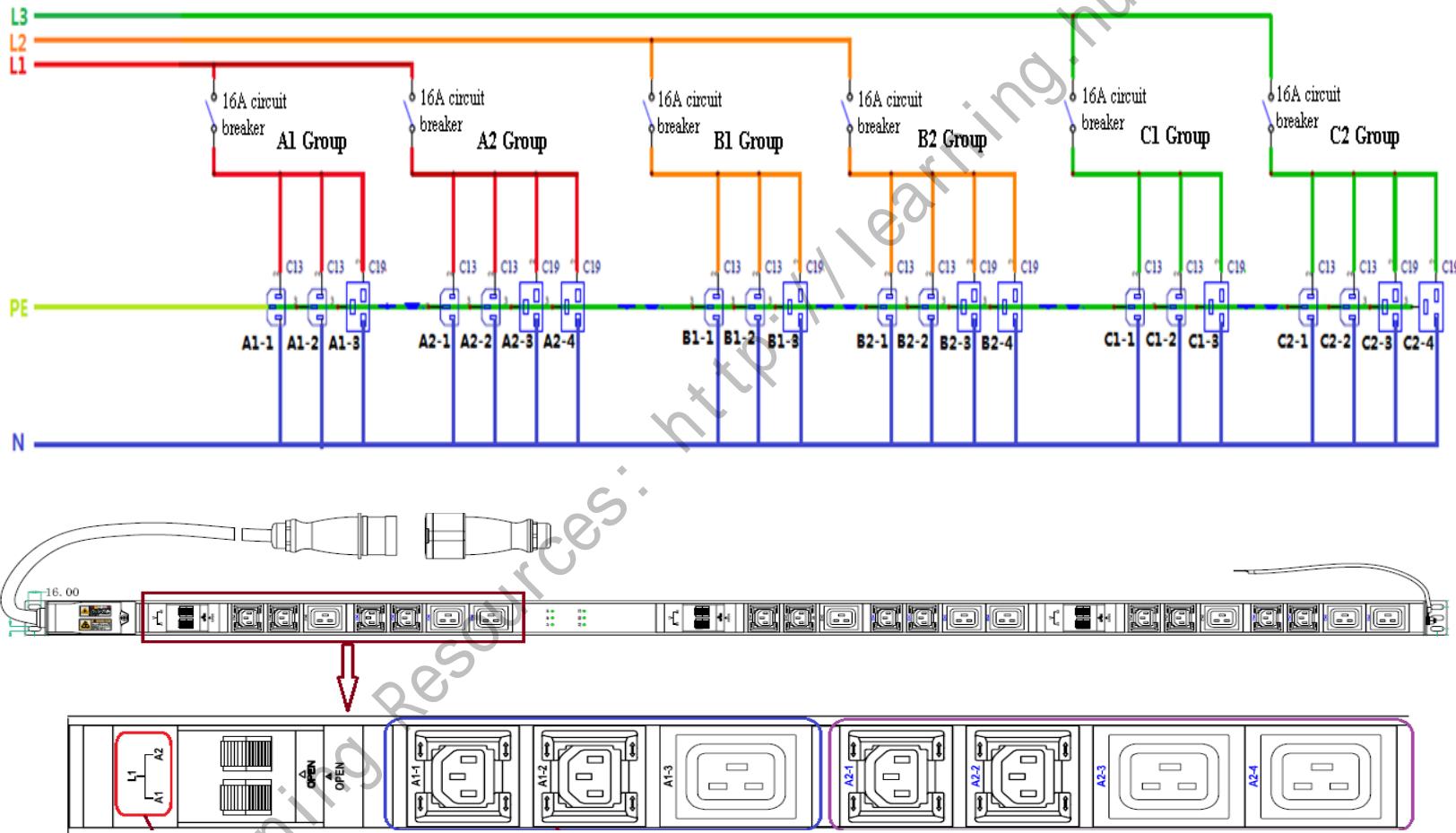


32 A@380 V three-phase PDU: 02120644

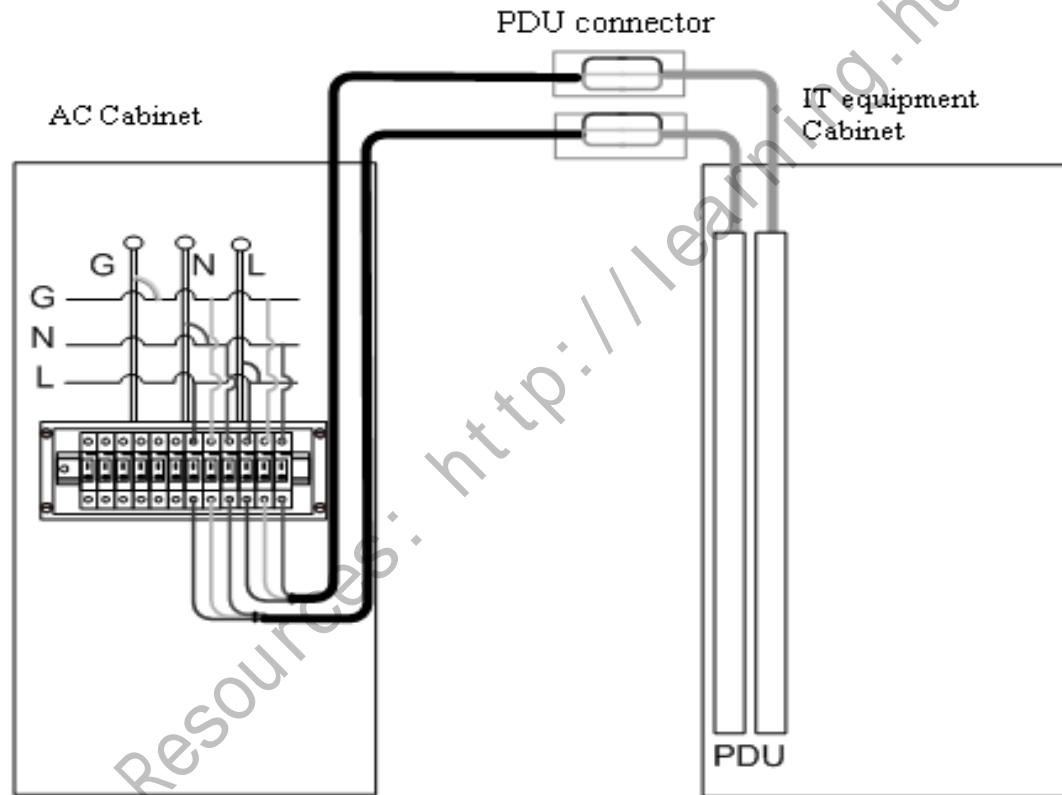
32 A@220 V Single-Phase PDU Power Distribution Groups



32 A@380 V Three-Phase PDU Power Distribution Groups

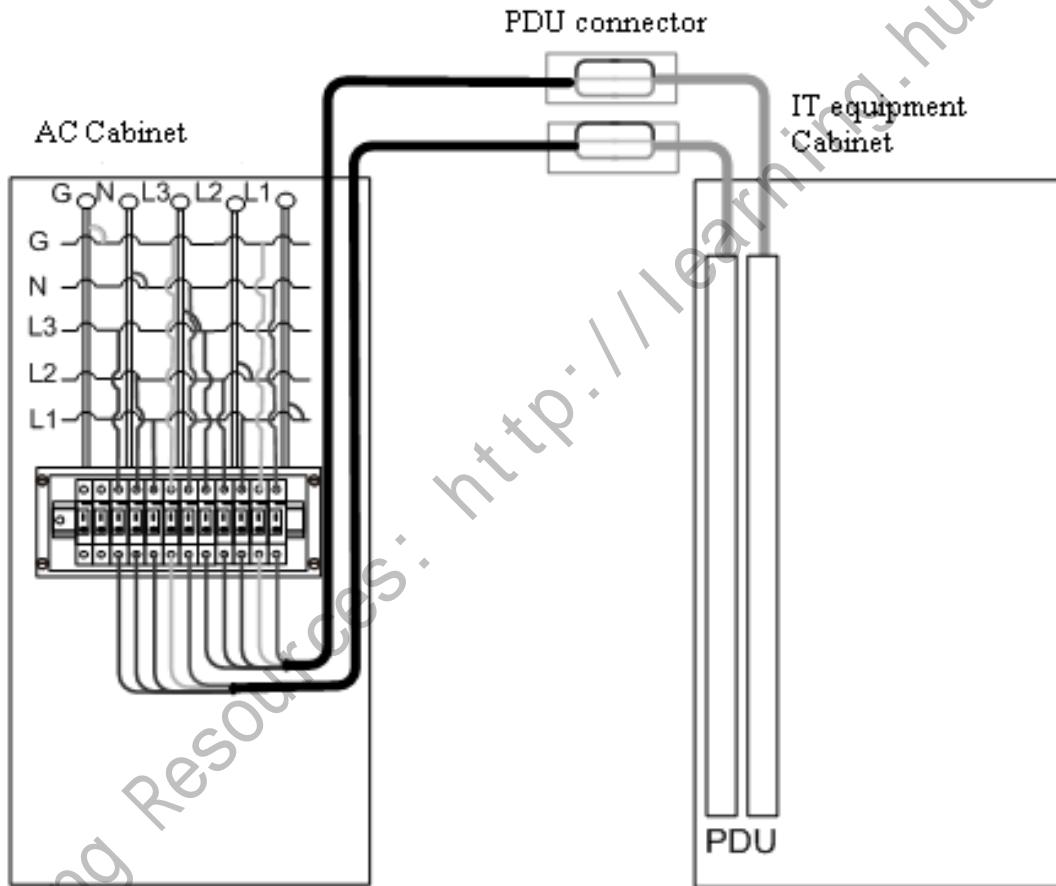


Connecting a Power Cable for a Single-Phase PDU



Connecting a single-phase PDU power cable to the PDF

Connecting a Power Cable for a Three-Phase PDU



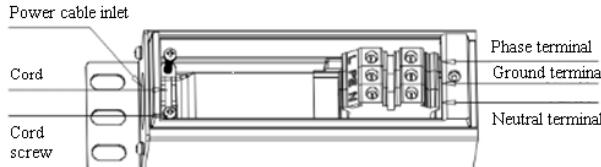
Connecting a three-phase PDU power cable to the PDF

Two Power Supply Input Interfaces for PDUs

IEC industrial connector

Electrical Power System	Current	Input Cable Diameter	Industrial Connector
Single-phase (220 V)	16 A	1 mm ² to 2.5 mm ² three-core cable	
	32 A	2.5 mm ² to 6 mm ² three-core cable	
	63 A	6 mm ² to 16 mm ² three-core cable	
Three-phase (380 V)	16A	1 mm ² to 2.5 mm ² five-core cable	
	32A	2.5 mm ² to 6 mm ² five-core cable	

Junction box terminals

Electrical Power System	Current	Input Cable Diameter	Junction Box Terminal
Single-phase (220 V)	32 A	2.5 mm ² to 6 mm ² three-core cable	 Power cable inlet Cord Cord screw Phase terminal Ground terminal Neutral terminal
Three-phase (380 V)	16 A	1 mm ² to 2.5 mm ² five-core cable	

PDU Installation



Horizontal PDU installed in cabinet



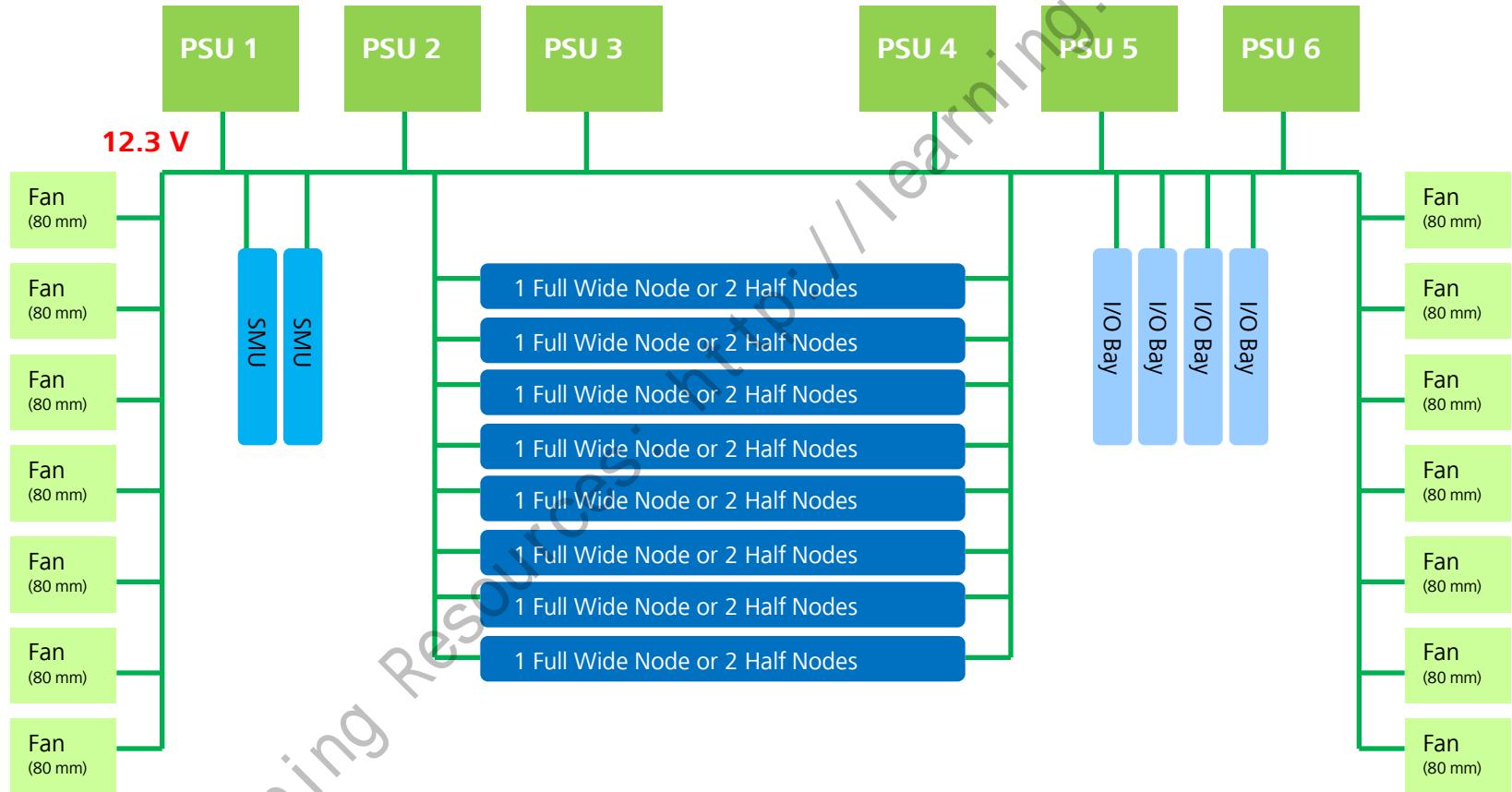
Vertical PDU installed in a cabinet



Contents

- 1. E9000 Cabinet Installation**
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4. Heat Dissipation System
- 2. E9000 Component Installation**

PSU Power Supply Schematic



Maximum Power Consumption of Key E9000 Components

- The system output power in actual application scenarios varies according to the E9000 configurations. Configure PSUs based on the system output power. The following table lists the maximum power consumption of key E9000 components.

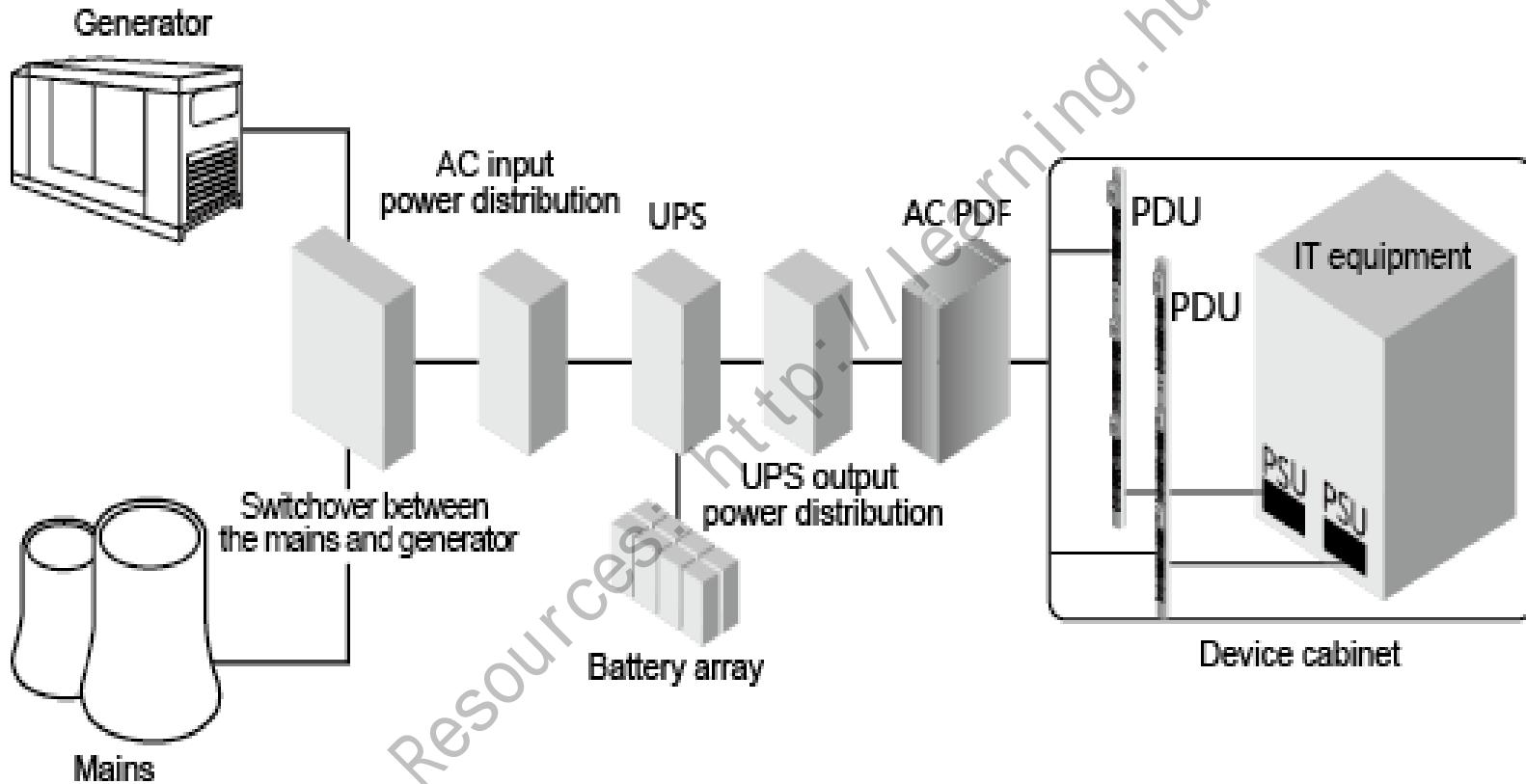
Component	Model	Maximum Power Consumption
Computing nodes	CH121	660 W
	CH220	720 W
	CH221	720 W
	CH222	690 W
	CH240	1020 W
	CH242	1356 W
	CH242 V3	1400 W
	CH243 V3	1400 W
Pass through modules	CX116	27.6 W
	CX317	90 W

Component	Model	Maximum Power Consumption
Switch modules	CX910	168 W
	CX911	252 W
	CX913	192 W
	CX310	132 W
	CX311	204 W
	CX312	156 W
	CX110	96 W
	CX610	144 W
	MM	36 W
Fan module	–	66.9 W

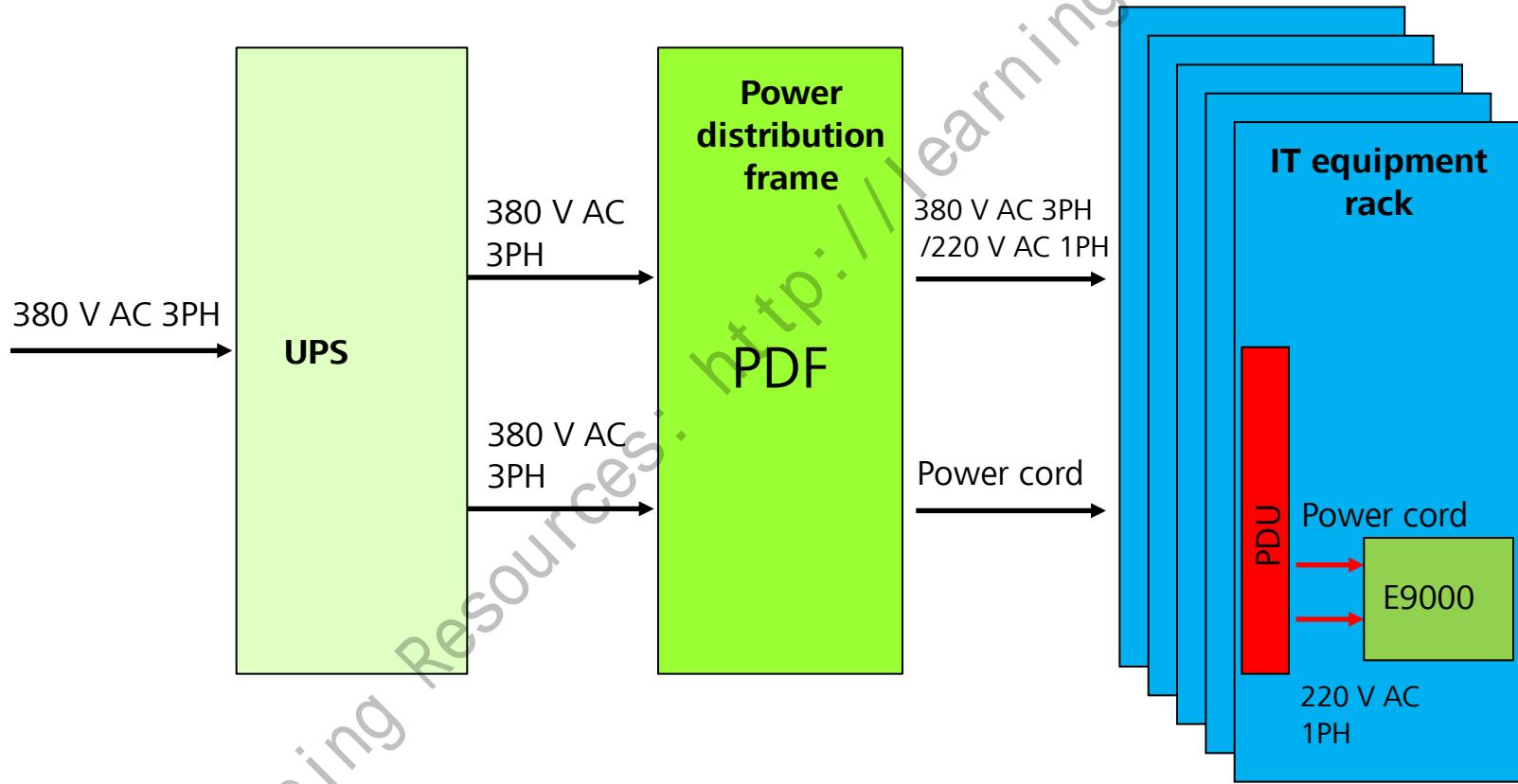
PSU Configuration

Power Range	Redundancy Mode	PSU Quantity	Recommended Slot
P < 3000 W	No redundancy	1	PSU1
3000 W < P < 6000 W	No redundancy	2	PSU1, PSU4
6000 W < P < 9000 W	No redundancy	3	PSU1, PSU2, PSU4
9000 W < P < 12000 W	No redundancy	4	PSU1, PSU2, PSU4, PSU5
12000 W < P < 15000 W	No redundancy	5	PSU1, PSU2, PSU3, PSU4, PSU5
P < 3000 W	1 + 1	2	PSU1, PSU4
3000 W < P < 6000 W	2 + 1	3	PSU1, PSU2, PSU4
6000 W < P < 9000 W	3 + 1	4	PSU1, PSU2, PSU4, PSU5
9000 W < P < 12000 W	4 + 1	5	PSU1, PSU2, PSU3, PSU4, PSU5
12000 W < P < 15000 W	5 + 1	6	PSU1, PSU2, PSU3, PSU4, PSU5, PSU6
3000 W < P < 6000 W	2 + 2	4	PSU1, PSU2, PSU4, PSU5
6000 W < P < 9000 W	3 + 3	6	PSU1, PSU2, PSU3, PSU4, PSU5, PSU6

AC Power Distribution

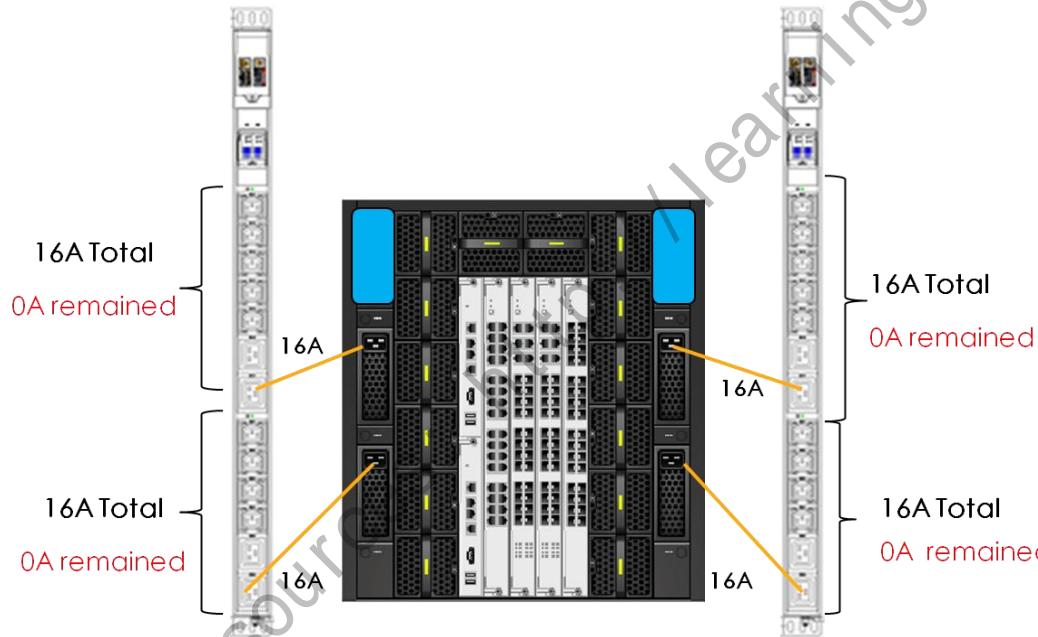


E9000 Power Supply Schematic Diagram with the 380 V AC/220 V AC Voltage



Recommended AC Power Distribution

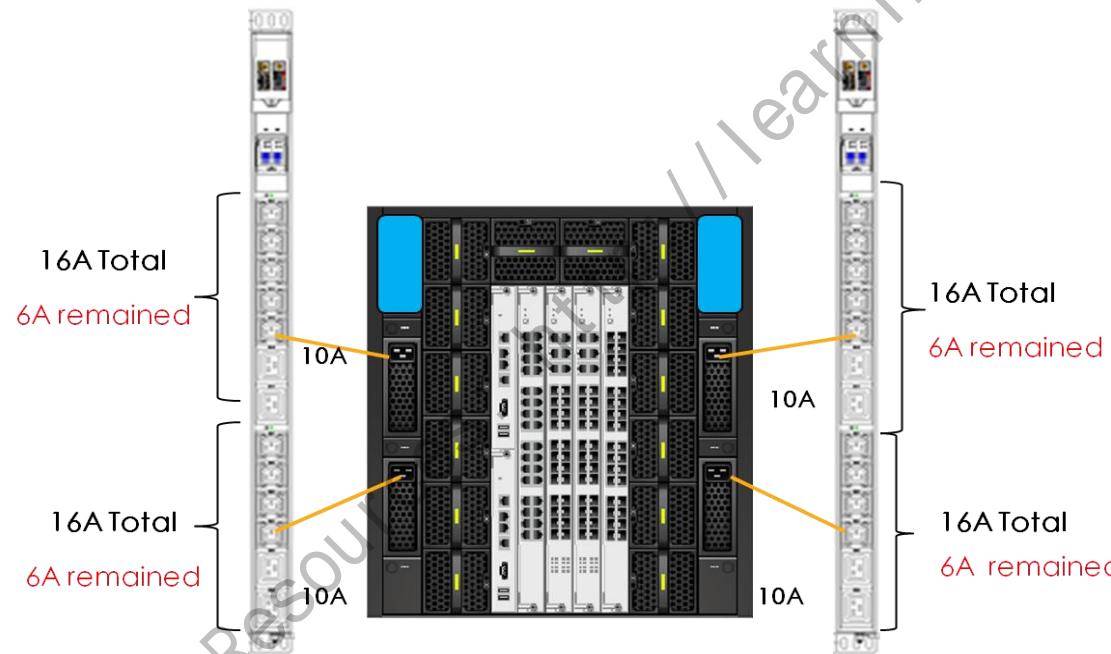
Huawei provides 42 U cabinets and PDUs, two 32 A@200–240 V single-phase power inputs, and power distribution scheme for 3000 W AC PSUs.



PSU Redundancy Mode	Number of PDUs	Maximum Number of 3000 W PSUs (Maximum Current for Each PSU < 16 A)	Theoretical Maximum Power per Cabinet
N + N	1 + 1	$2 + 2 = 4$	6 KW
N + 1	2	$3 + 1 = 4$	9 KW

Recommended AC Power Distribution

Huawei provides 42 U cabinets and PDUs, two 32 A@200–240 V single-phase power inputs, and power distribution scheme for 2000 W AC PSUs.

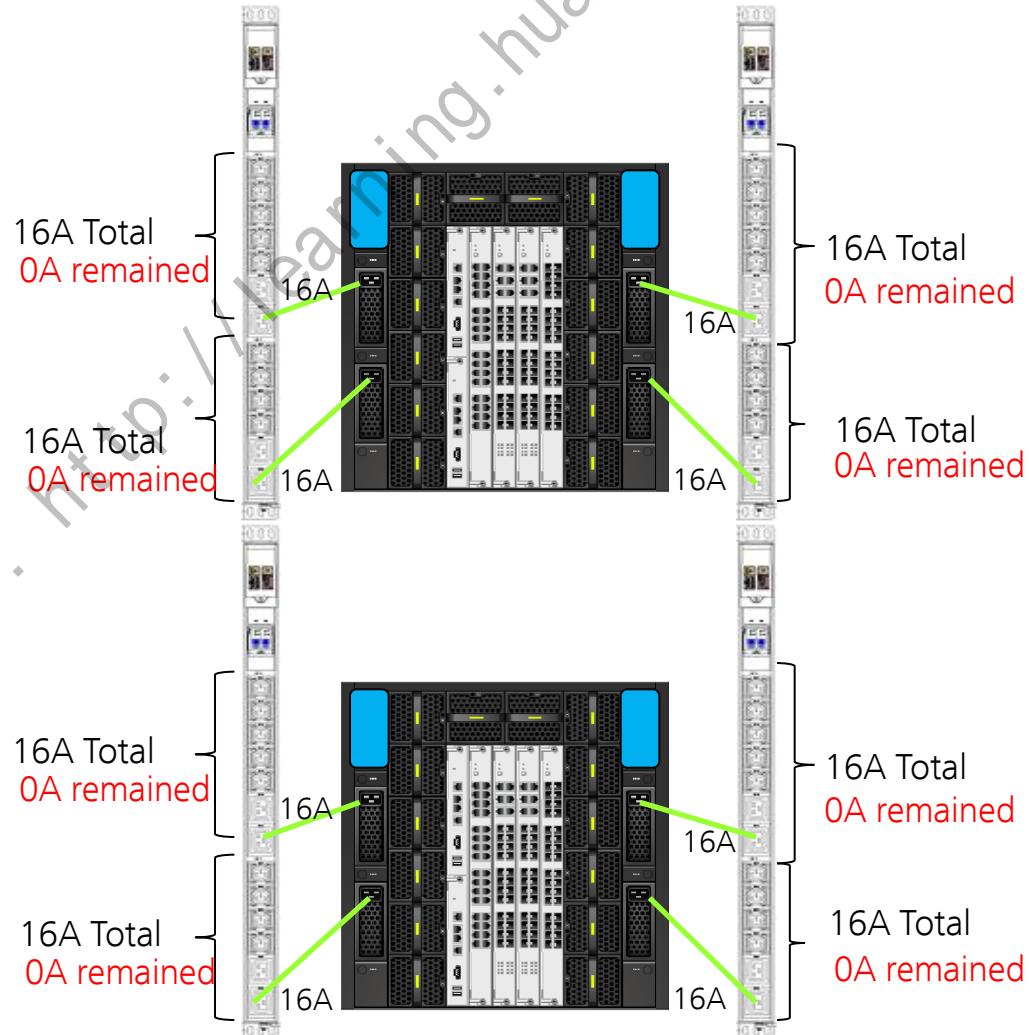


PSU Redundancy Mode	Number of PDUs	Maximum Number of 2000 W PSUs (Maximum Current for Each PSU < 10 A)	Theoretical Maximum Power per Cabinet
N + N	1 + 1	$2 + 2 = 4$	4 KW
N + 1	2	$3 + 1 = 4$	6 KW

Recommended AC Power Distribution

Huawei provides 42 U cabinets and PDUs, four 32 A@200–240 V single-phase power inputs, and power distribution scheme for 3000 W AC PSUs.

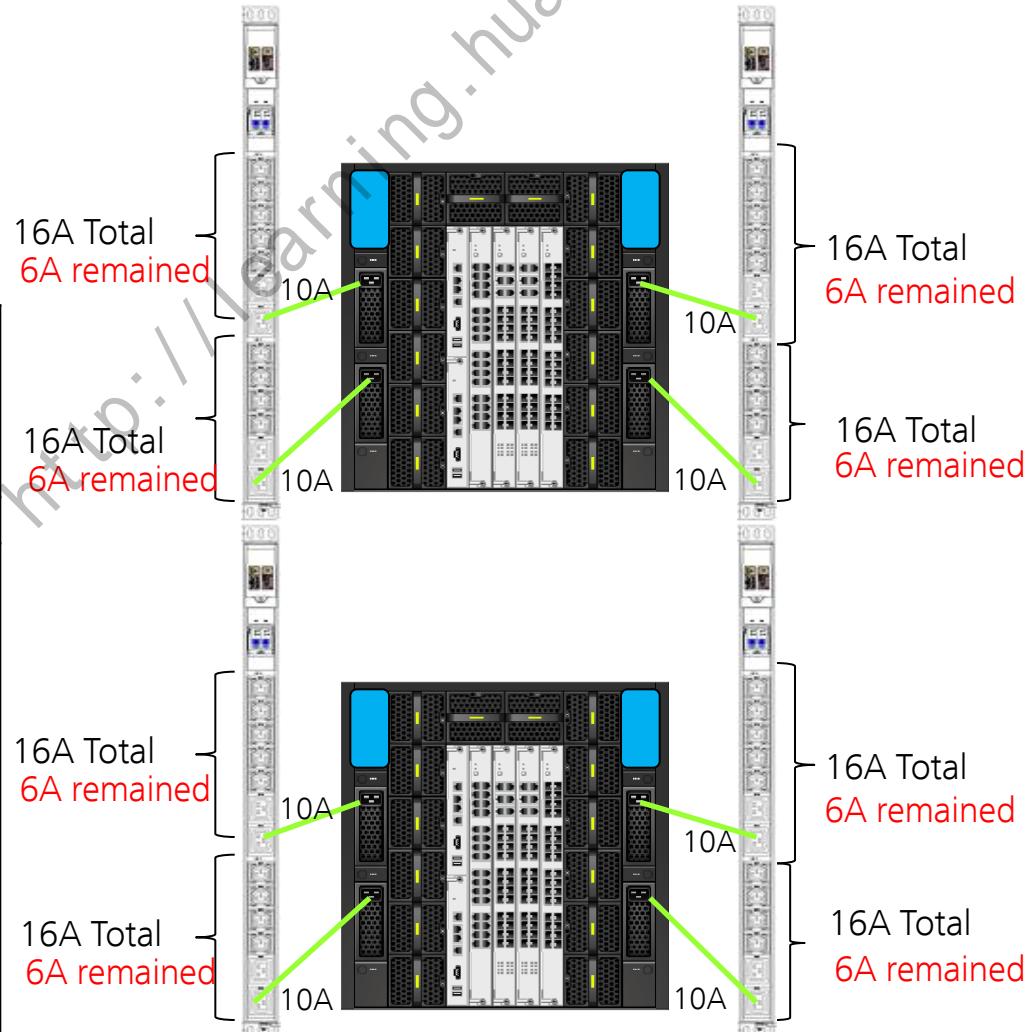
PSU Redundancy Mode	Number of PDUs	Maximum Number of 3000 W PSUs (Maximum Current for Each PSU < 16 A)	Theoretical Maximum Power per Cabinet
N + N	2 + 2	$4 + 4 = 8$	12000 W
N + 1	4	Number of PSUs in the first cabinet + Number of PSUs in the second cabinet = 8 (Each E9000 chassis supports a maximum of six PSUs. The PSUs in each chassis are configured in N + 1 redundancy mode.)	18000 W



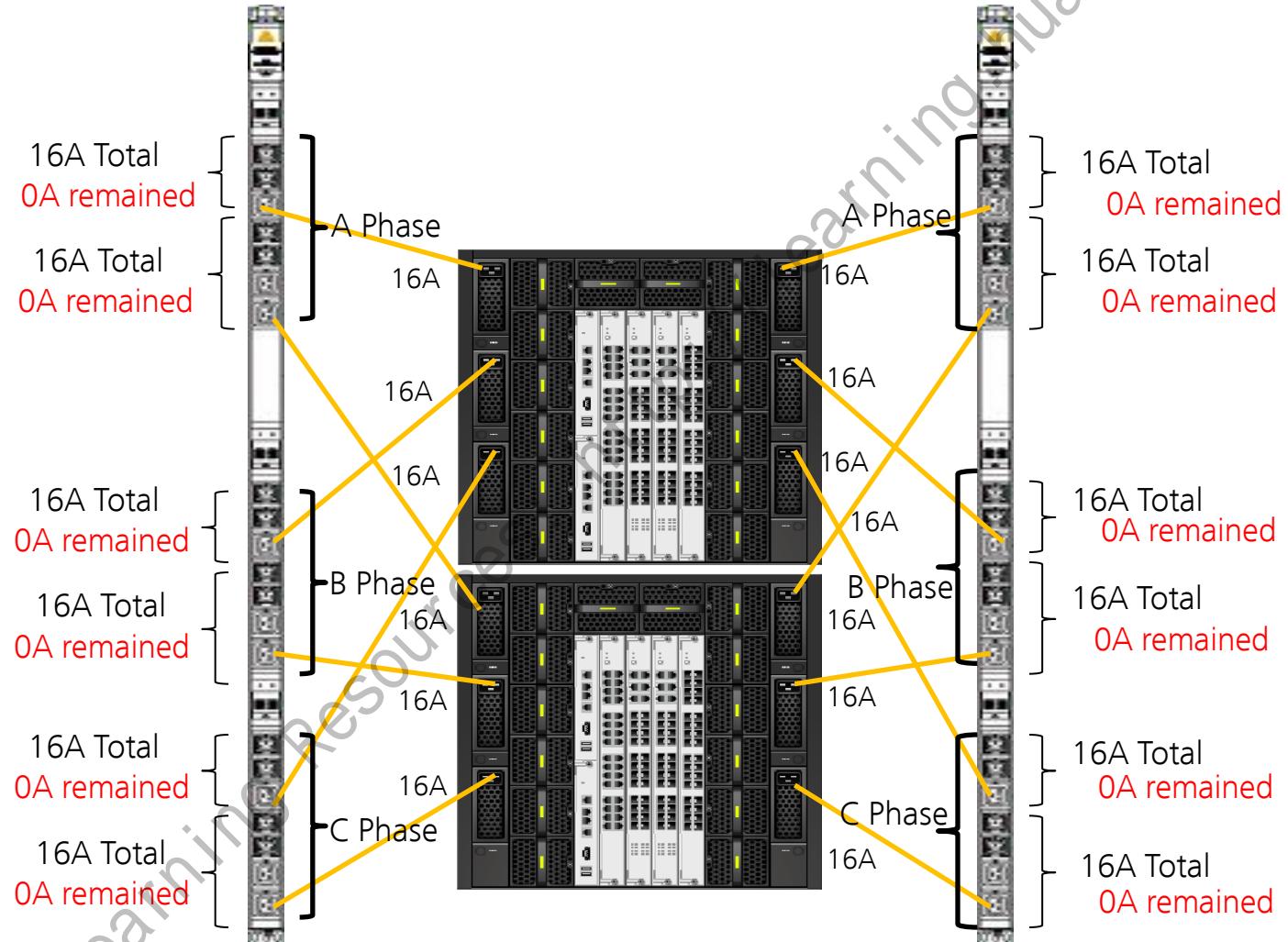
Recommended AC Power Distribution

Huawei provides 42 U cabinets and PDUs, four 32 A@200–240 V single-phase power inputs, and power distribution scheme for 2000 W AC PSUs.

PSU Redundancy Mode	Number of PDUs	Maximum Number of 2000 W PSUs (Maximum Current for Each PSU < 10 A)	Theoretical Maximum Power per Cabinet
N + N	2 + 2	4 + 4 = 8	8000 W
N + 1	4	Number of PSUs in the first cabinet + Number of PSUs in the second cabinet = 8 (Each E9000 chassis supports a maximum of six PSUs. The PSUs in each chassis are configured in N + 1 redundancy mode.)	12000 W



Recommended AC Power Distribution

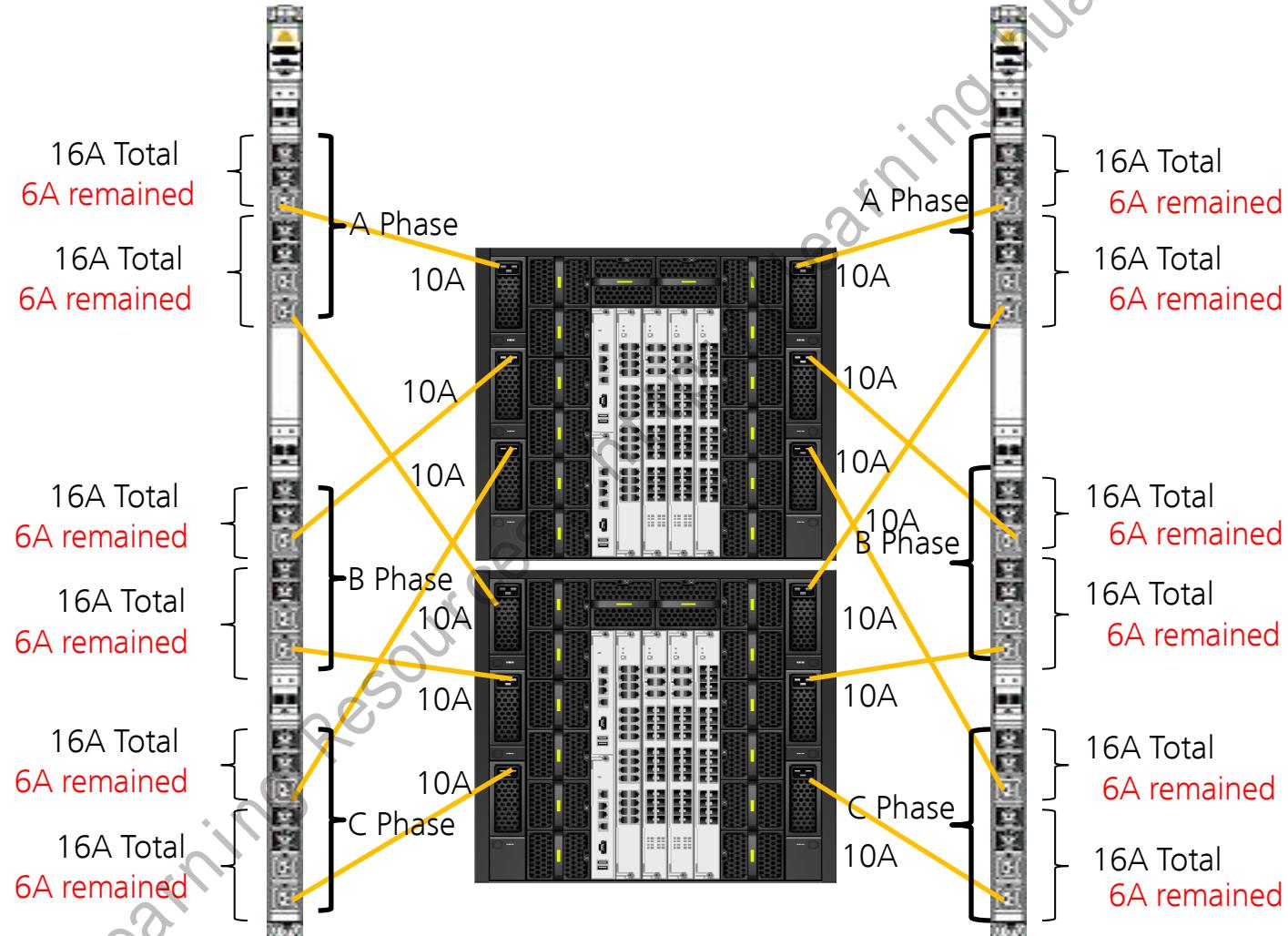


Recommended AC Power Distribution

- Huawei 32 A@380 V PDUs support power distribution groups. Each PDU is divided into three single-phase power distribution inputs, and each phase is divided into two groups. Each group provides a maximum of 16 A@220 V single-phase AC power (with a 16 A circuit breaker). If each PSU is planned with the maximum current of 16 A, each PDU connects to up to six PSUs. Therefore, the number of supported PSUs in a cabinet depends on the number of PDUs. The following table lists the configurations.

PSU Redundancy Mode	Number of PDUs	Maximum Number of 3000 W PSUs (Maximum Current for Each PSU < 16 A)	Theoretical Maximum Power per Cabinet
N + N	1 + 1	$6 + 6 = 12$	18 KW
N + 1	2	Number of PSUs in the first cabinet + Number of PSUs in the second cabinet = 12 or Number of PSUs in the first cabinet + Number of PSUs in the second cabinet + Number of PSUs in the third cabinet = 12 (Each E9000 chassis supports a maximum of six PSUs. The PSUs in each chassis are configured in N + 1 redundancy mode.)	30 KW

Recommended AC Power Distribution

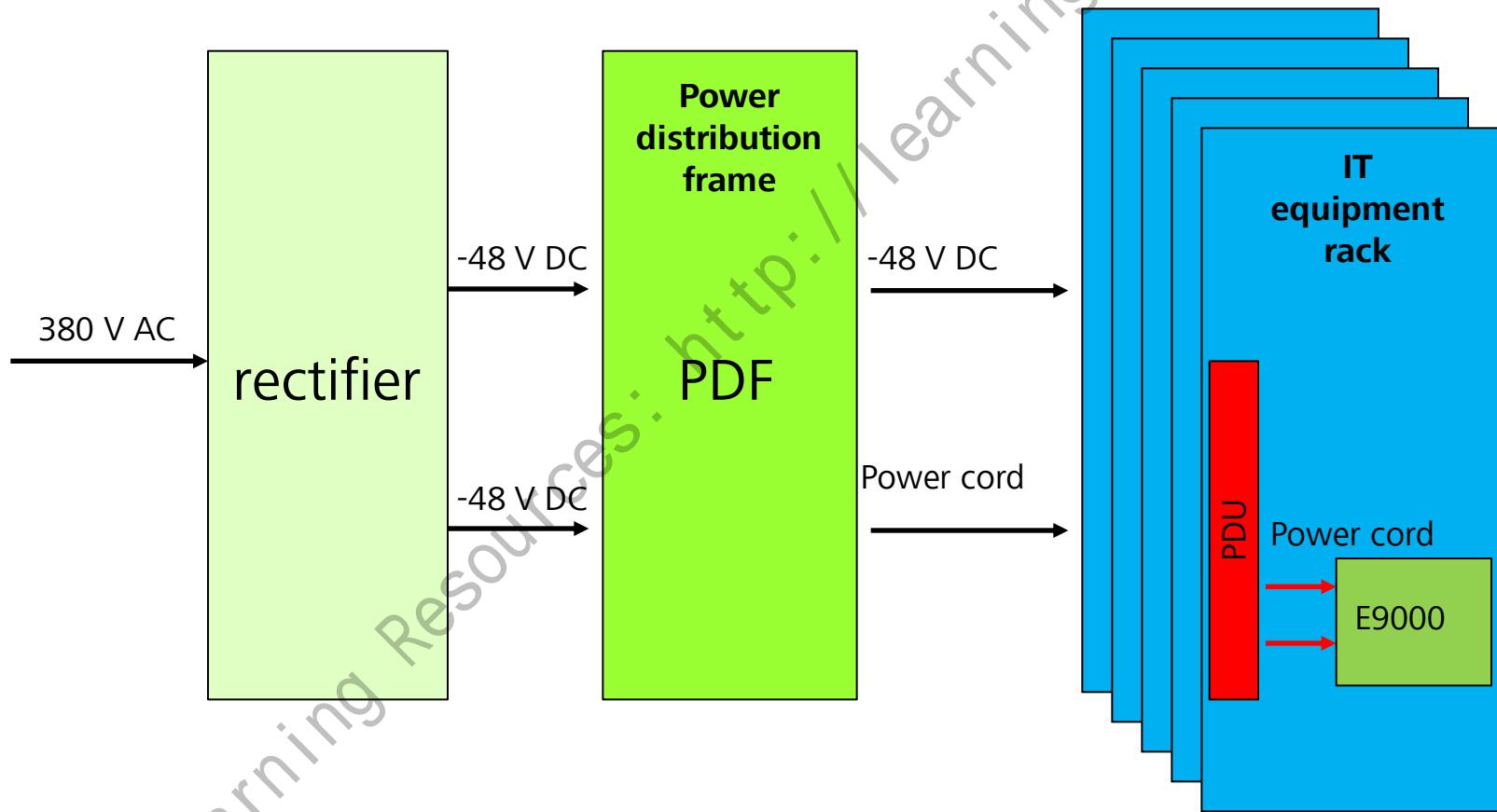


Recommended AC Power Distribution

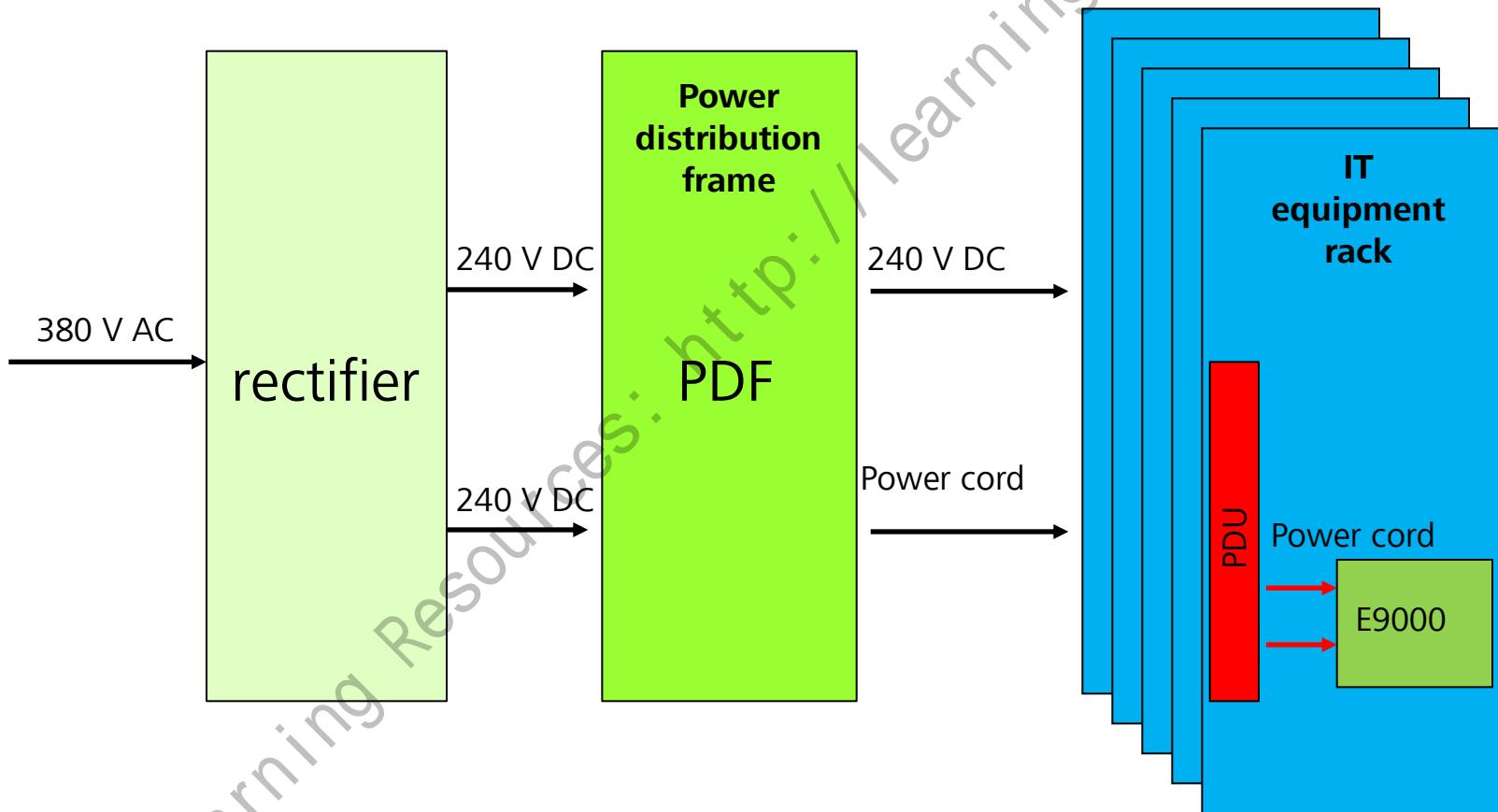
- Huawei 32 A@380 V PDUs support power distribution groups. Each PDU is divided into three single-phase power distribution inputs, and each phase is divided into two groups. Each group provides a maximum of 16 A@220 V single-phase AC power (with a 16 A circuit breaker). If each PSU is planned with the maximum current of 10 A, each PDU connects to up to six PSUs. Therefore, the number of supported PSUs in a cabinet depends on the number of PDUs.

PSU Redundancy Mode	Number of PDUs	Maximum Number of 3000 W PSUs (Maximum Current for Each PSU < 16 A)	Theoretical Maximum Power per Cabinet
N + N	1 + 1	$6 + 6 = 12$	12 KW
N + 1	2	Number of PSUs in the first cabinet + Number of PSUs in the second cabinet = 12 or Number of PSUs in the first cabinet + Number of PSUs in the second cabinet + Number of PSUs in the third cabinet = 12 (Each E9000 chassis supports a maximum of six PSUs. The PSUs in each chassis are configured in N+1 redundancy mode.)	20 KW

-48 V DC Power Supply Schematic



240 V DC Power Supply Schematic



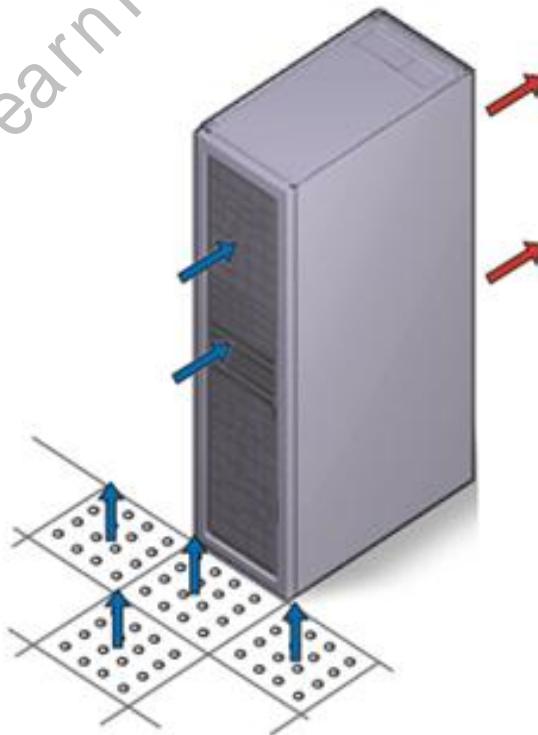


Contents

- 1. E9000 Cabinet Installation**
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- 4. Heat Dissipation System**
- 2. E9000 Component Installation**

Air Supply Requirements in the Equipment Room

- To ensure that the E9000 operates within a proper temperature range, check that the following conditions are met:
 - Sufficient cool air flow passes through the devices.
 - Front-to-rear airflow paths are used. Cool air is drawn in from the front, and hot air exhausts from the rear.
 - The clearance of 914 mm (36 in.) is reserved on the front and rear of the devices.

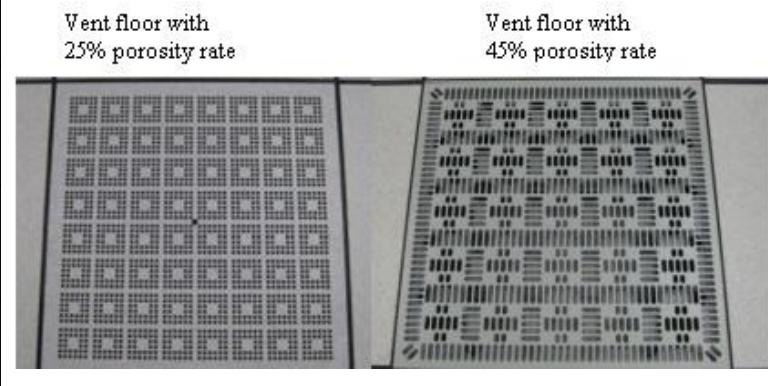


Cooling air flow diagram

Vent Floor Porosity Rate

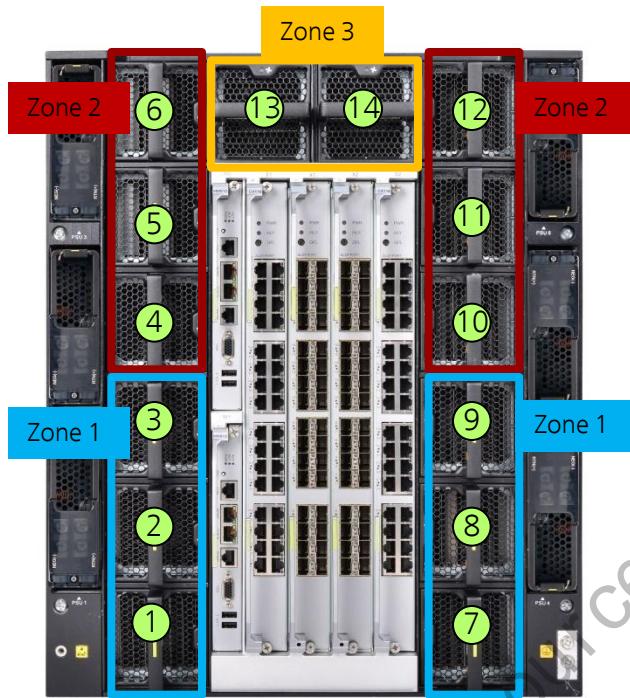
- The following figure shows the vent floors with the porosity rates of 25% and 45% used in the equipment room.
- The following table lists the typical configurations of vent floors depending on the device configurations in a rack.

Maximum Power Consumption/Rack	Air Flow Required	Vent Floor (600 mm x 600 mm)
2.5 KW	365 CFM	One with a porosity rate of 25%
4.5 KW	725 CFM	Two with a porosity rate of 25% and one with a porosity rate of 45%
9 KW	1450 CFM	Four with a porosity rate of 25% and two with a porosity rate of 45%
18 KW	2900 CFM	Four with a porosity rate of 45%
27 KW	4350 CFM	Six with a porosity rate of 45% The independent liquid-cooled scheme is recommended.



Vent floors

Fan Module Configuration Rules



Fan modules are configured based on the following rules:

- When a chassis houses eight or fewer half-width compute nodes or four or fewer full-width compute nodes, install 10 fan modules in slots 1, 2, 3, 4, 7, 8, 9, 10, 13, and 14.
- When a chassis houses more than eight half-width compute nodes or more than four full-width compute nodes, fully configure fan modules in a chassis.
- Fan modules are installed in slots from bottom to top and filler panels are installed in the vacant slots based on the mapping between computing nodes and fan modules.

- The E9000 can be configured with 14 fan modules which are divided into three zones.
- Each fan module contains two fans. Fan modules in each zone support the $N + 1$ redundancy mode. If one fan fails, heat dissipation for the entire system is not affected.



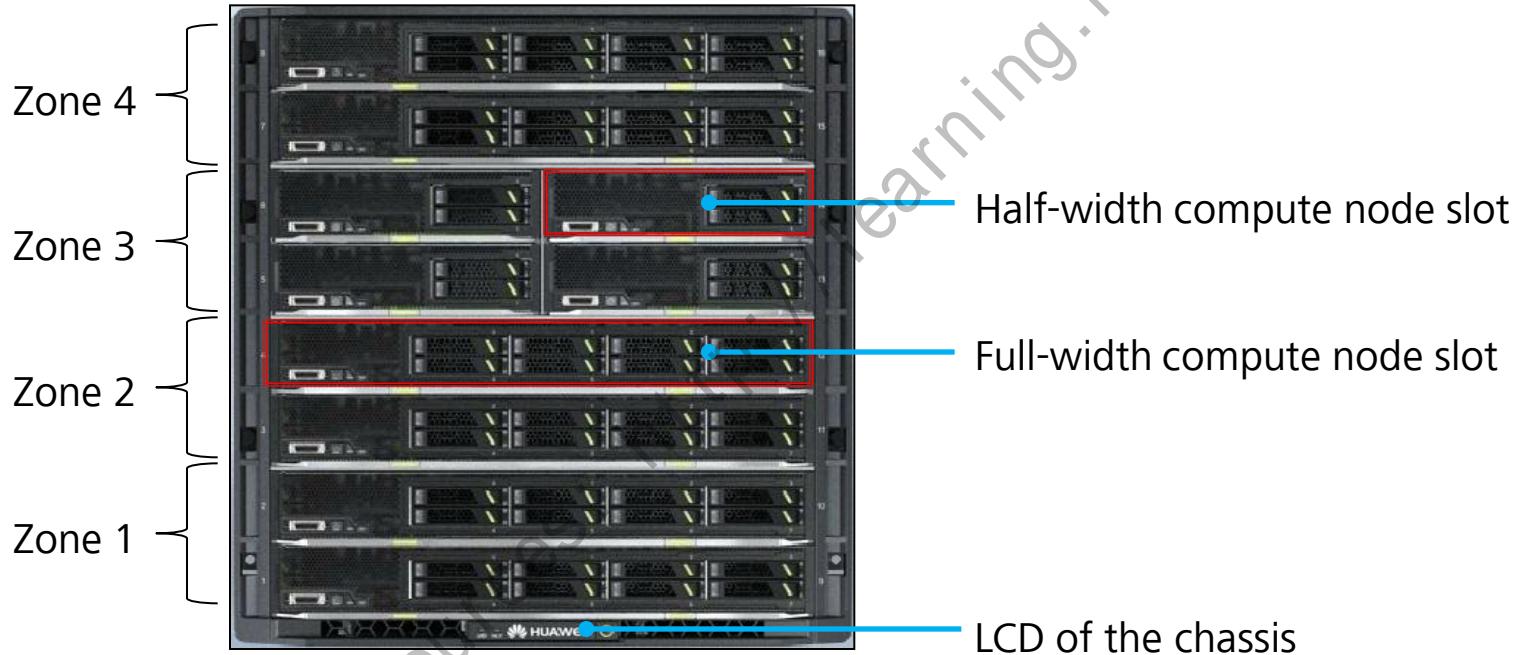
Contents

1. E9000 Cabinet Installation

1. Cabinet
2. PDU
3. Power Supply System
4. Heat Dissipation System

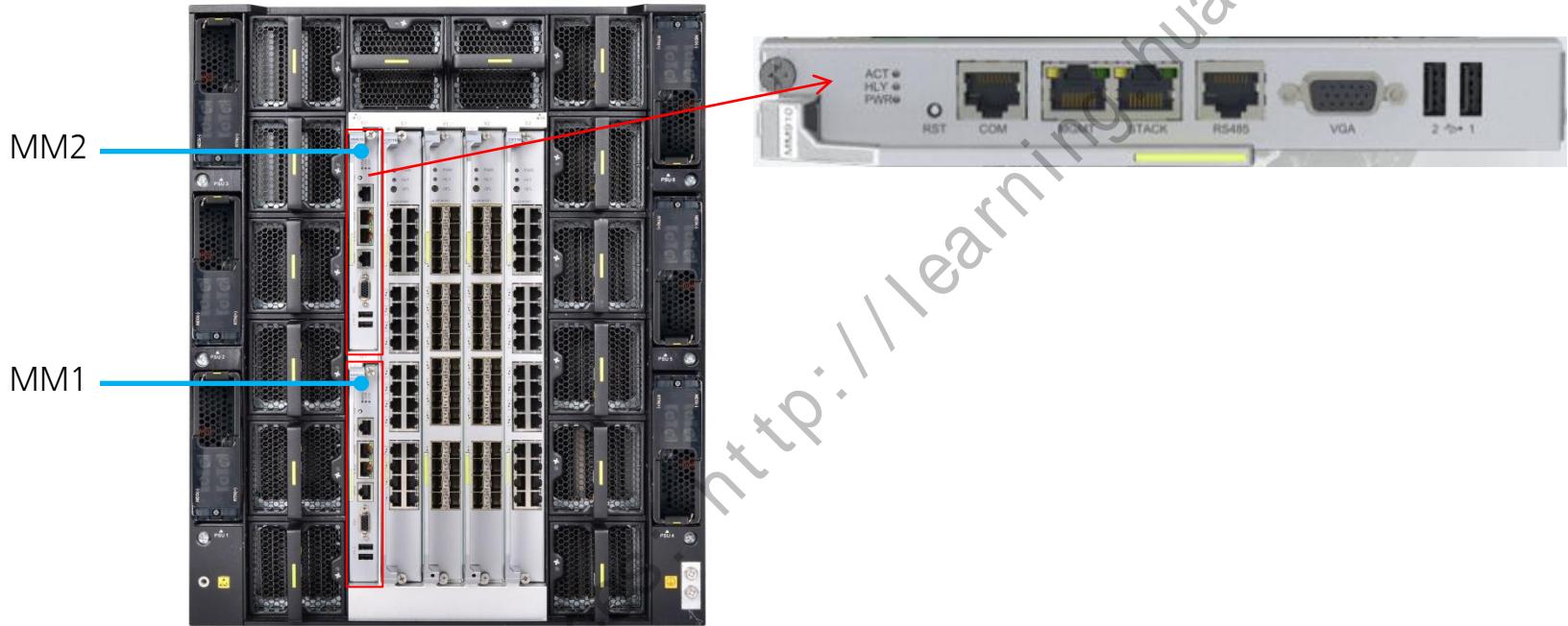
2. E9000 Component Installation

E9000 Blade Installation



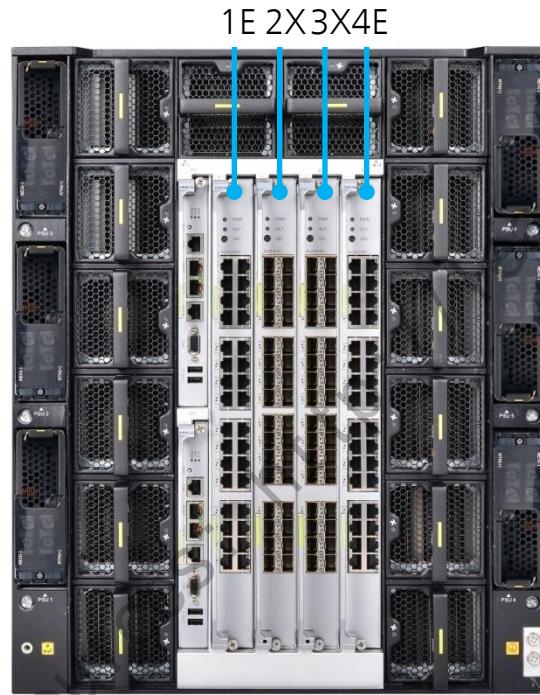
- E9000 front slots are divided into four zones. Full-width and half-width compute nodes cannot be inserted in the same zone.
- Full-width compute nodes are installed in slots from bottom to top.
- Half-width compute nodes are installed in slots from bottom to top. The configuration sequence is as follows: 1, 9, 2, 10, 3, 11, 4, 12, 5, 13, 6, 14, 7, 15, 8, 16.

E9000 MM Installation



- The E9000 can be installed two management modules, which are MM1 and MM2 from bottom to top.
- The working mode of MM1/MM2 is Active/Standby. By default, the working mode of MM1 is Active.
- An active/standby failover may be caused by an abnormal power-off or a management network fault. You can determine the active/standby state based on the ACT indicator.
 - ACT indicator is steady on: Active
 - ACT indicator is steady off: Standby

E9000 Switch/ Pass Through Module Configuration



The E9000 can be configured with four switch/pass through modules. When switch modules are configured together with pass through modules, you are advised to install pass through modules in slots 1E and 4E, and switch modules in slots 2X and 3X for cabling convenience.



Conclusion

1. E9000 cabinet, PDU, power distribution, heat dissipation
2. E9000 component installation

How to Obtain Help

- Huawei Enterprise business website:
 - <http://enterprise.huawei.com/cn/products/itapp/server/index.htm>
 - <http://enterprise.huawei.com/en/products/itapp/server/index.htm>
- Provides the product documents, compatibility lists, product software, and operation guides.
- Huawei service hotline:
 - [Enterprise Service Support](#)
 - <http://support.huawei.com/enterprise/NewsReadAction.action?contentId=NEWS1000000563>
- Provides professional warranty service.
- Huawei Server Information Self-Service Platform:
 - http://enterprise.huawei.com/topic/Self_service_server/knowledge.html
- Provides information about Huawei server installation, investigation, O&M and related tools.

Thank you

[www.huawei.com](http://learning.huawei.com)

E9000 Converged Infrastructure Blade Server Management and Configuration

[www.huawei.com](http://learning.huawei.com/e9000)





Objectives

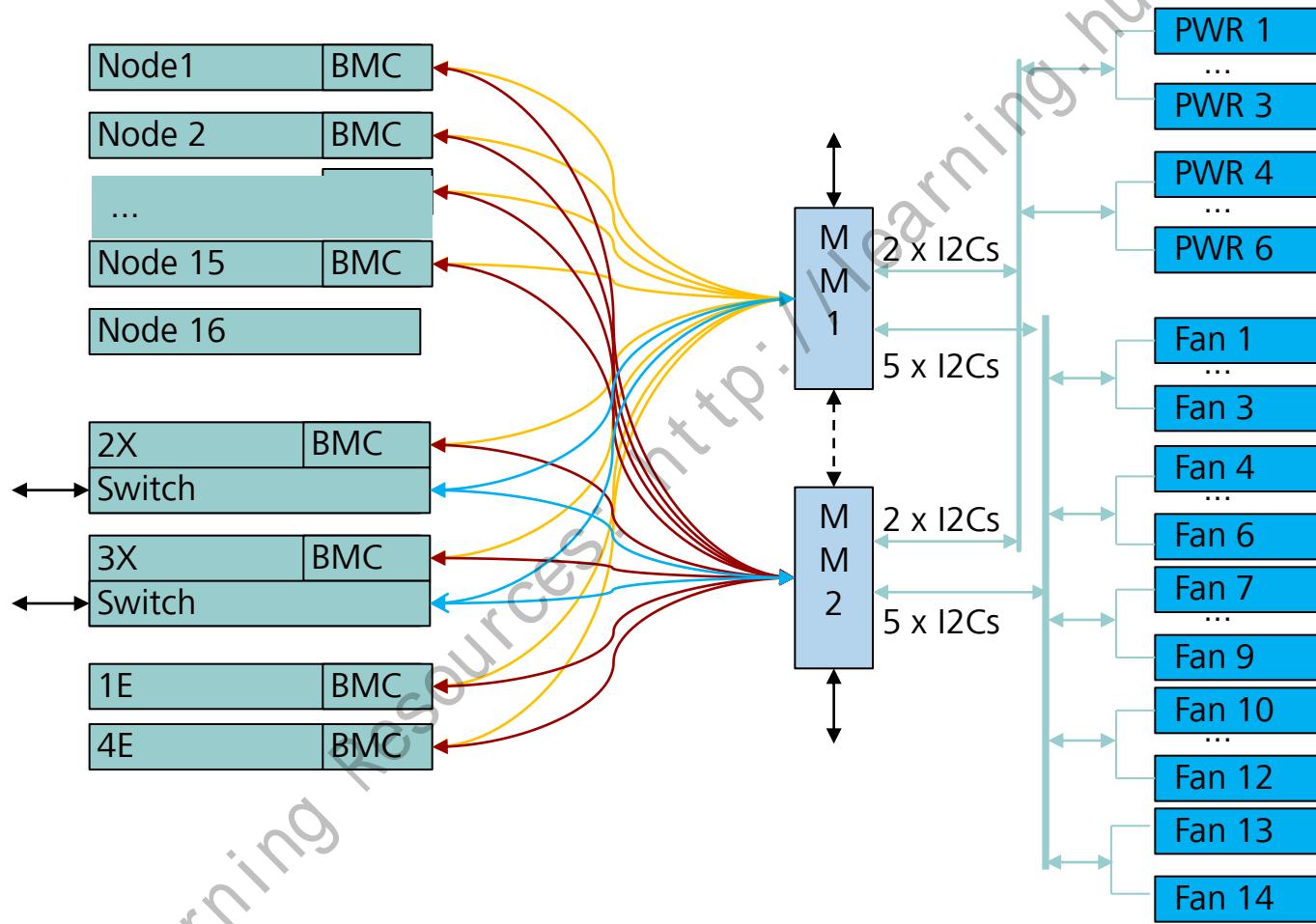
- Upon completion of this course, you will understand the following:
 - Management architecture of the E9000
 - Configuration methods of the E9000



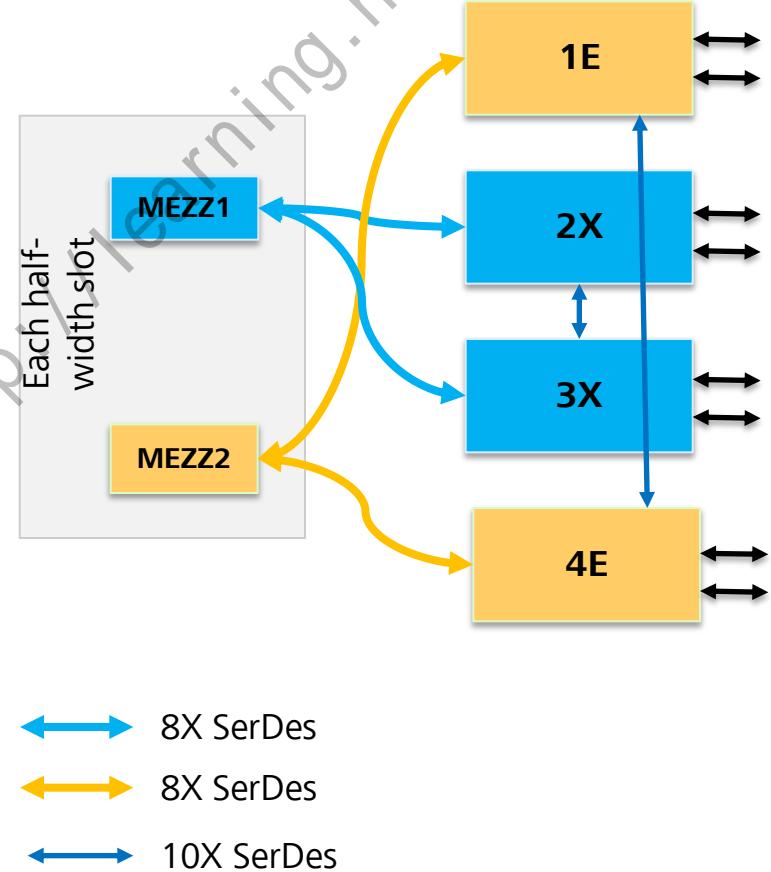
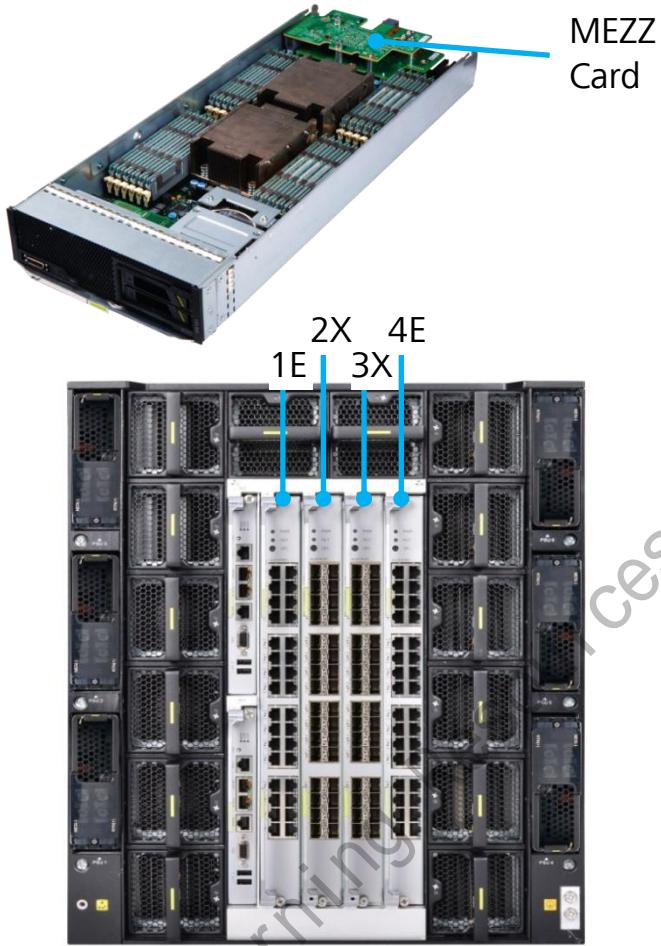
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- 1. E9000 Management Architecture**
2. E9000 Configuration Methods

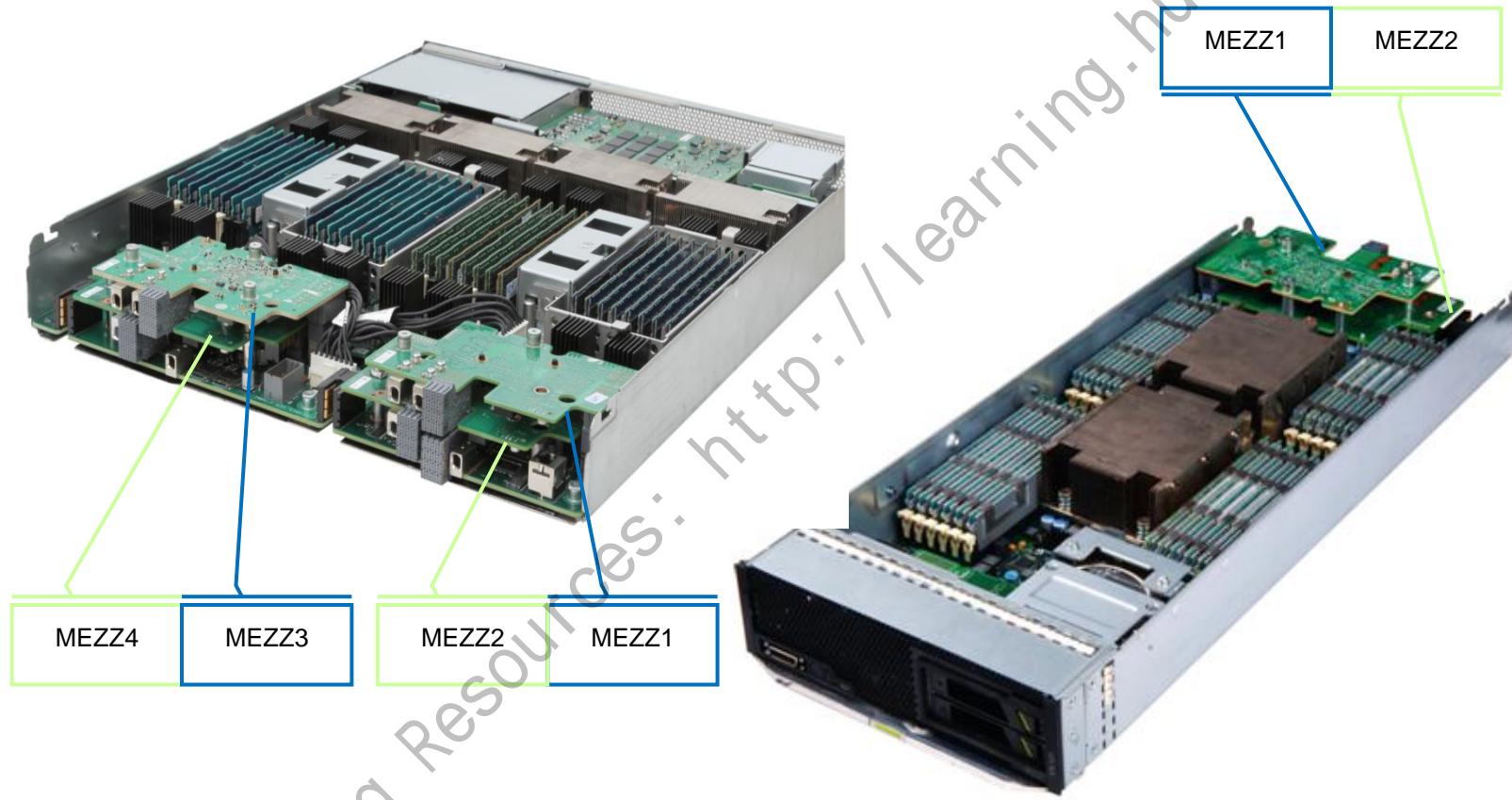
E9000 Management Plane



E9000 Switching Plane

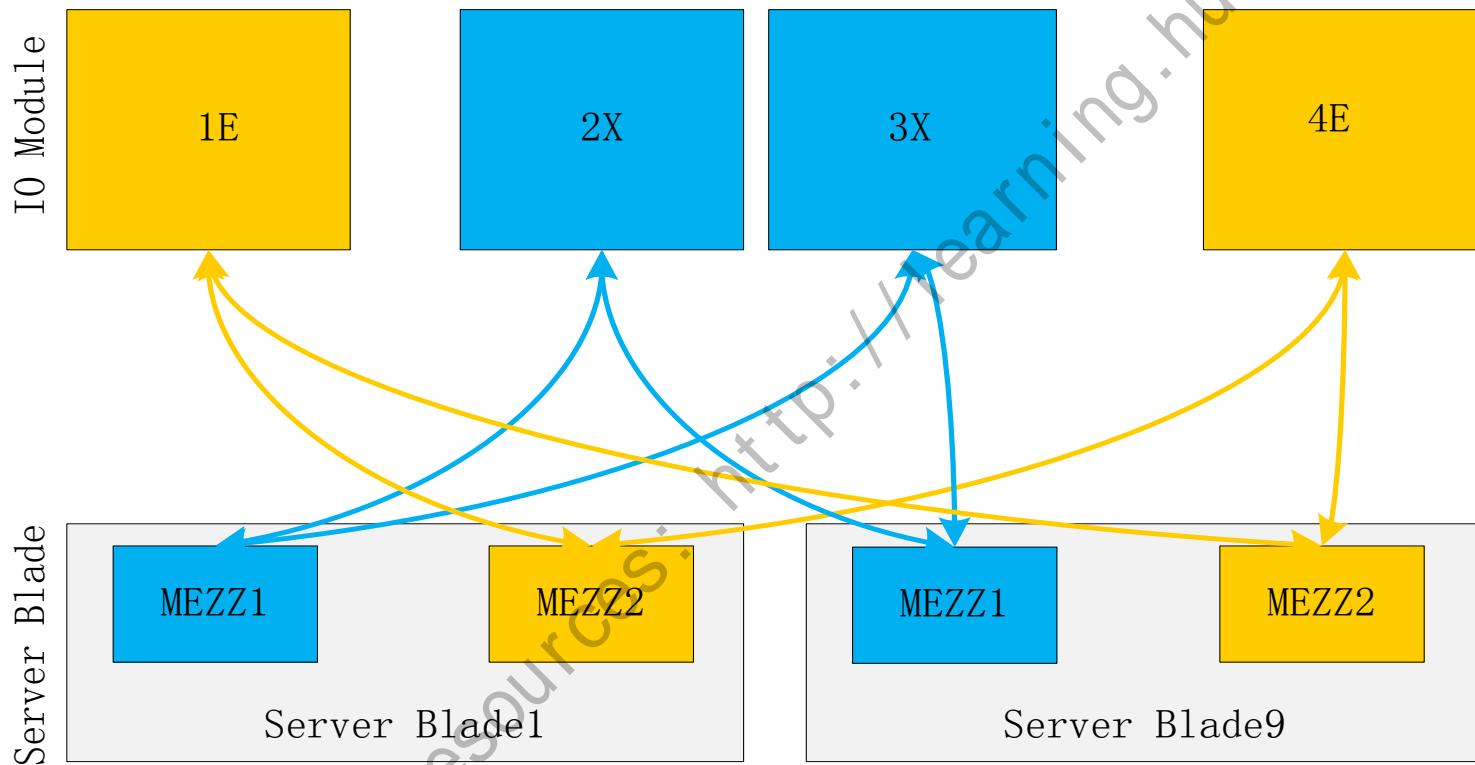


MEZZ Cards



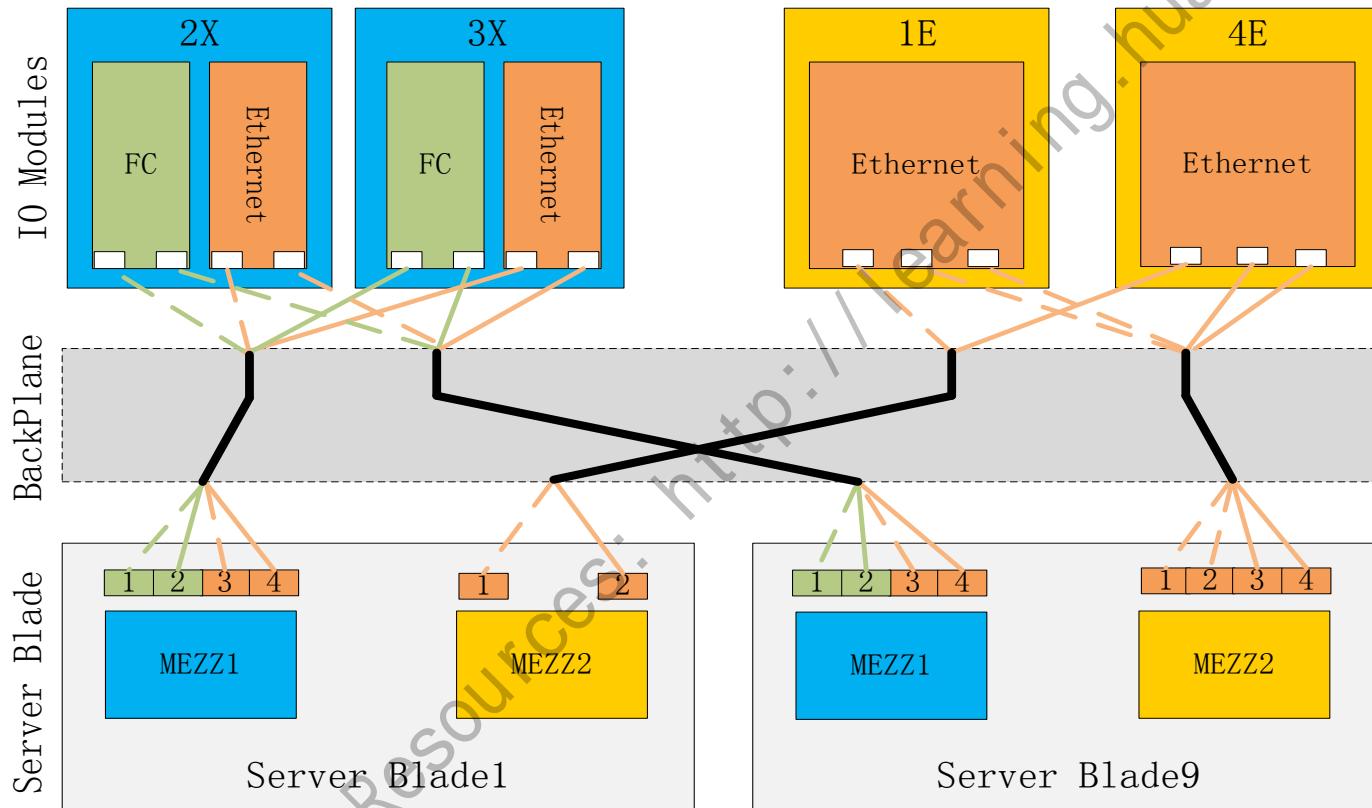
- A full-width blade can house 1/2/4 MEZZ cards, and a half-width blade 1/2 MEZZ cards.

Port Mapping Between MEZZ Cards and IO Modules



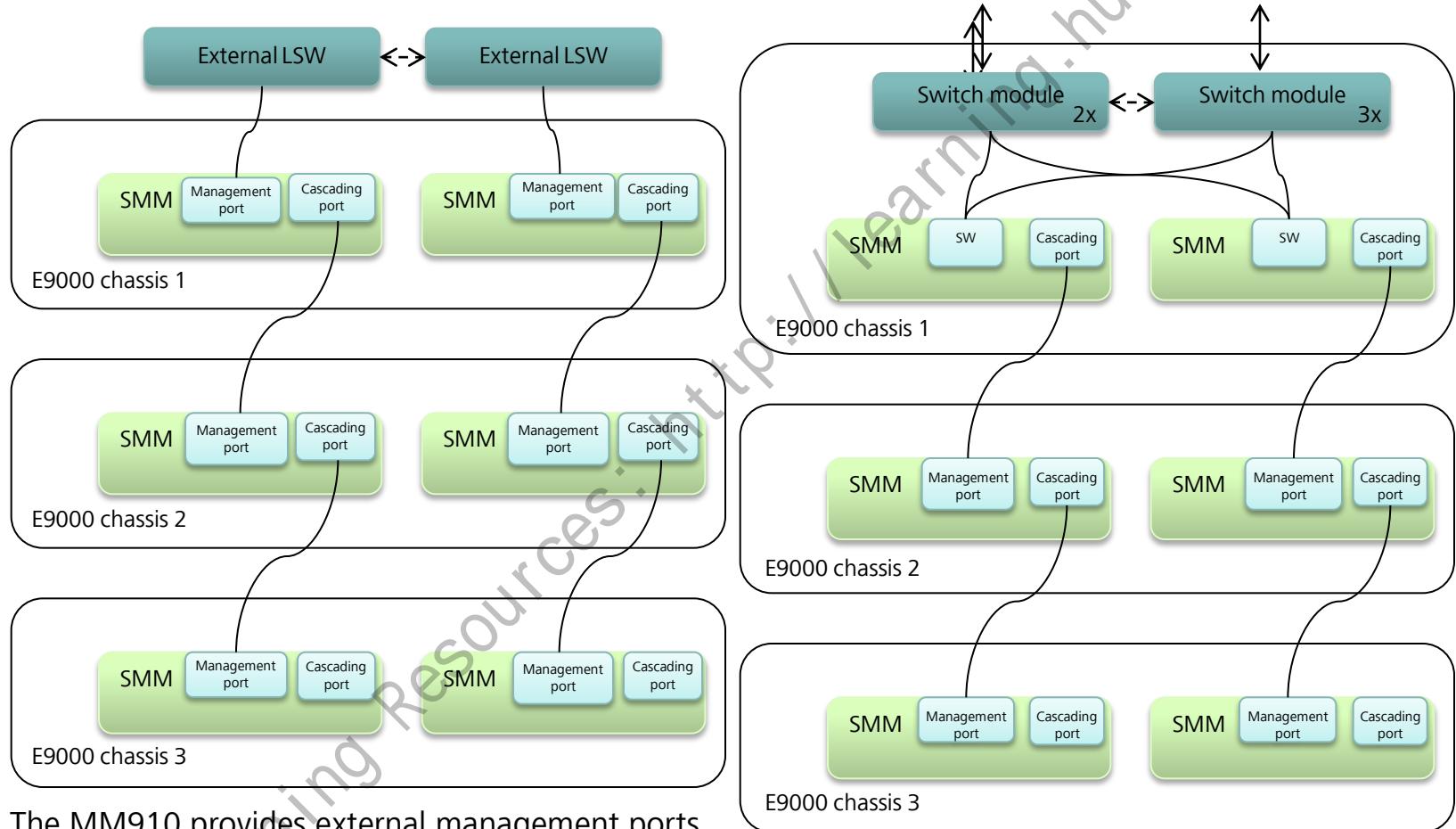
- MEZZ1 on a half-width blade is connected to I/O modules in slots 2X and 3X, and the half-width blade MEZZ2 to I/O modules in slots 1E and 4E.
- MEZZ1 and MEZZ3 (optional) on full-width blades are connected to I/O modules in slots 2X and 3X, and MEZZ2 and MEZZ4(optional) on full-width blades to I/O modules in slots 1E and 4E.

Connections Between the MEZZ Card and IO Module



- MEZZ1 on Blade1 and Blade9 are the FC and Ethernet multi-plane mezz cards, respectively connected to the FC and Ethernet switching planes.
- MEZZ2 on Blade1 is a dual-port mezz card, and MEZZ2 on the Blade9 is a four-port mezz card. Switching slots at 1E and 4E are both connected to two of these ports.

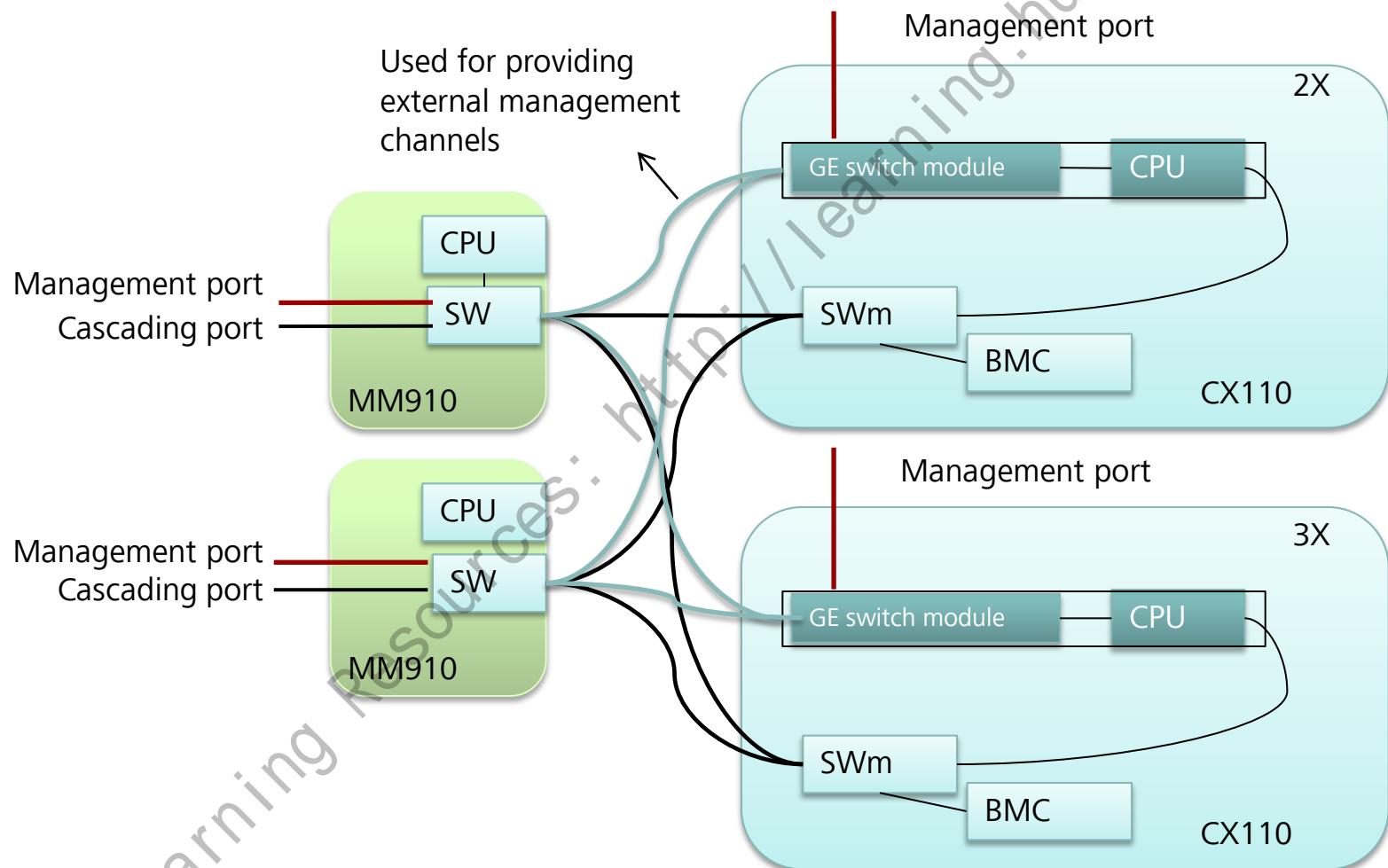
E9000 Chassis Cascading Management



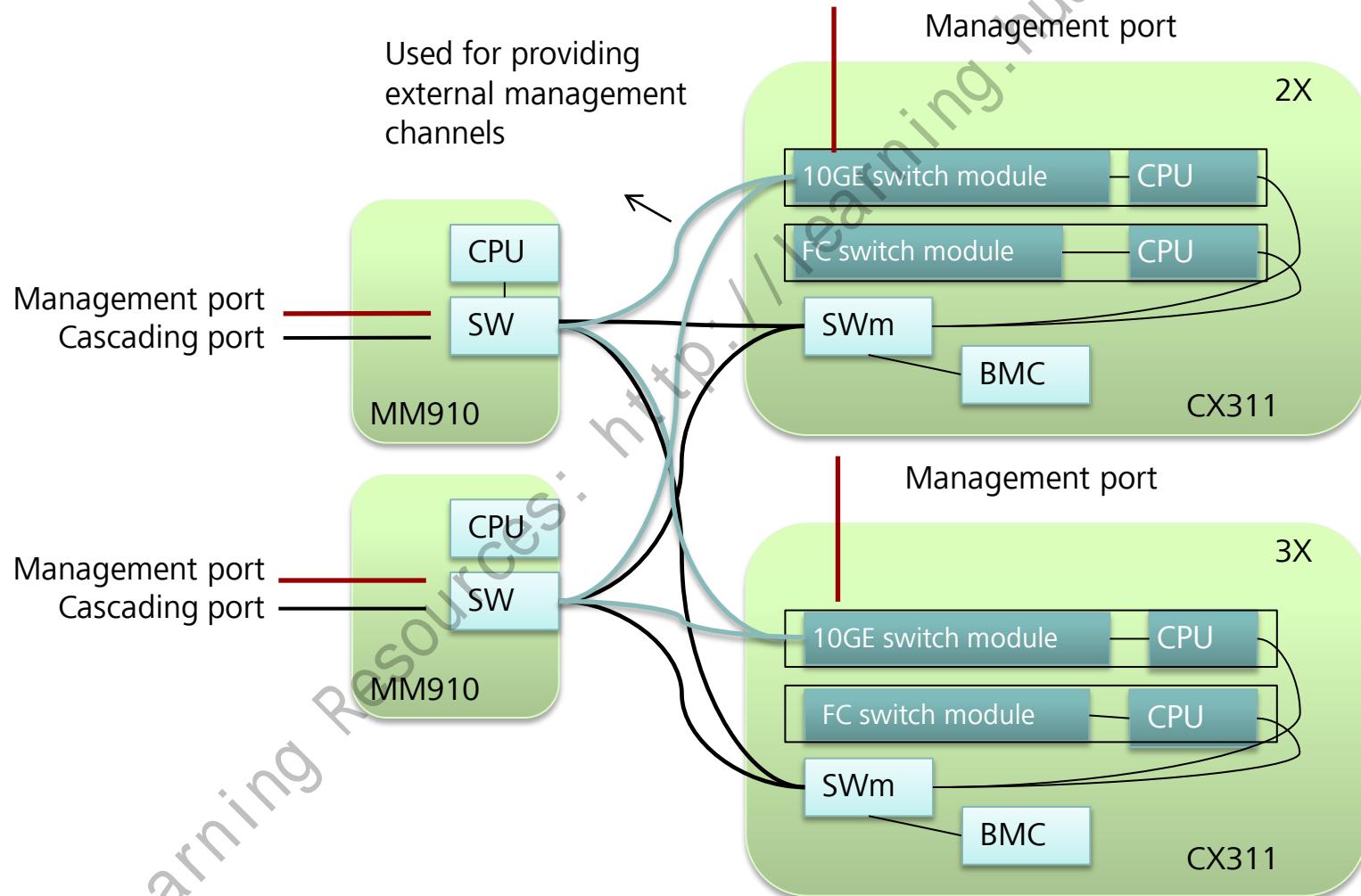
The MM910 provides external management ports.

The switch module provides management ports.

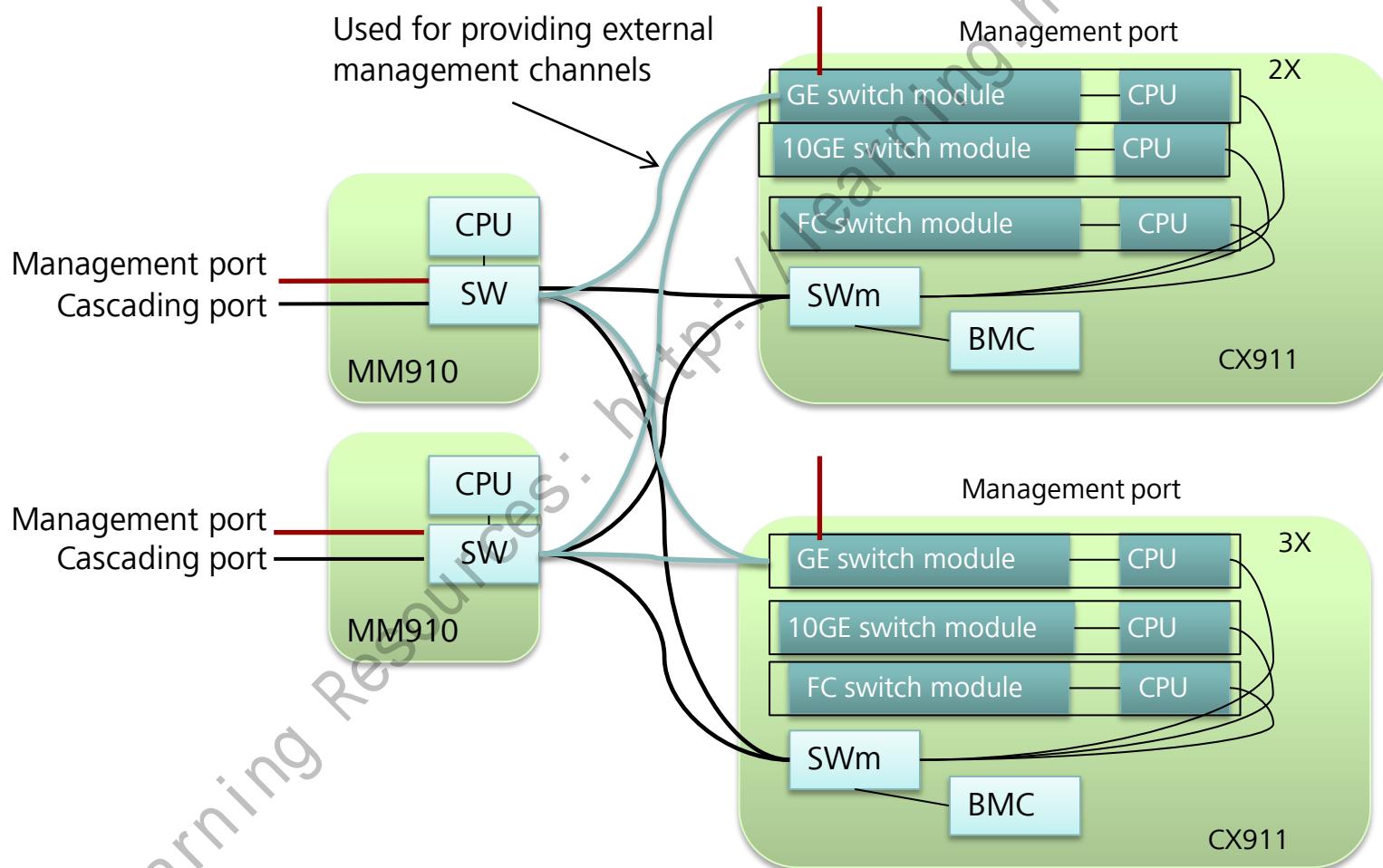
Management Channels Between the MM910 and CX110



Management Channels Between the MM910 and CX311



Management Channels Between the MM910 and CX911





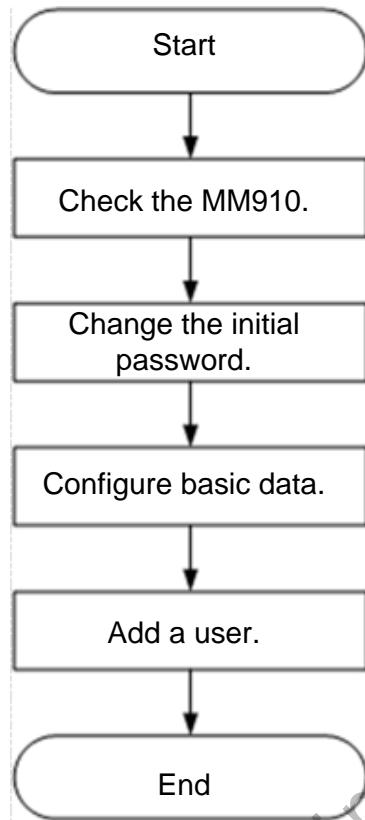
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1. E9000 Management Architecture

2. E9000 Configuration Methods

- 1) Configuring E9000 Management Modules**
- 2) Switch Module Login Modes
- 3) Basic Knowledge for Switch Module Operations
- 4) Configuring E9000 Compute Nodes

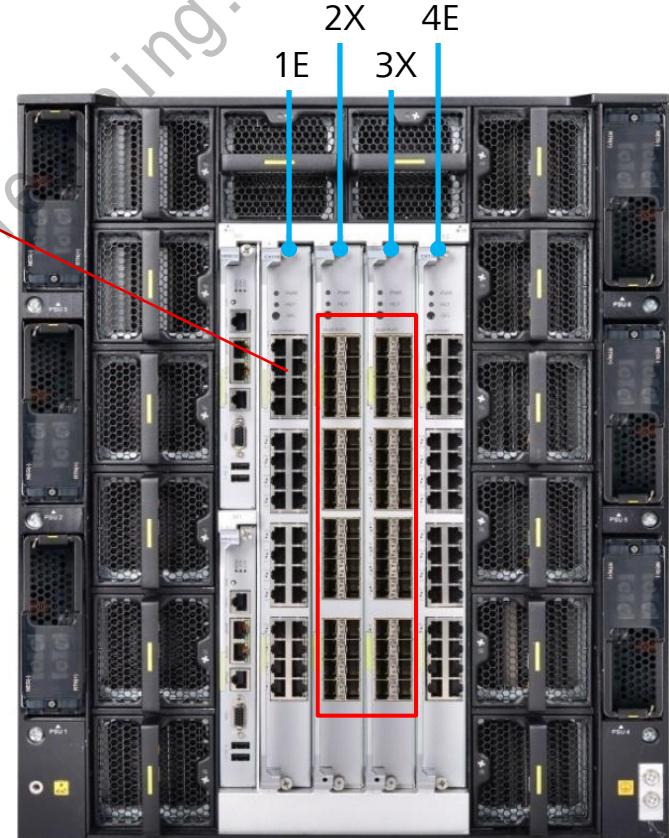
MM910 Configuration Process



Configuration Process	Description
Check the MM910.	<p>View the indicator on the panel and ensure that the MM910 is normal.</p> <p>View the MM910 version and ensure that the version meets the office requirements.</p> <p>Verify the active/standby switchover function of the MM910s.</p>
Change the initial password.	Change the initial password of the default user root on the active MM910 to improve the security of system operation and maintenance.
Configure basic data.	<p>Configure the static IP addresses of the active and standby MM910 management modules.</p> <p>Configure the time zone, Network Time Protocol (NTP) time synchronization, floating IP address, and Simple Network Management Protocol (SNMP) trap message reporting on the active MM910.</p>
Add a user.	Add a user on the active MM910. Then the new user can log in to the operating system (OS) and web user interface (WebUI) of the MM910 to carry out routine maintenance.

MM910 Configuration Modes

- Physical management ports:
 - Serial port
 - Management port (MGNT) on the MM910
 - GE port on the switch board in the slots 2X and 3X
- Management interface:
 - CLI
 - WebUI
- Initial IP address configuration:
 - Configure the initial IP address after login over the serial port.
 - Set the system to obtain the initial IP address automatically (if the DHCP server is configured).
 - Configure the initial IP address through the LCD screen of the chassis.



Default Configuration of Management Modules

Item	Default Configuration
User name and password	<ul style="list-style-type: none">• User name: root• Initial password: Huawei12#\$
Static IP address and subnet mask of the active/standby MM910	<p>The static IP address is the fixed IP address of the MM910, which maps to the IP address of eth0 in the ifconfig command output. You can use the static IP address to log in to the MM910 CLI and WebUI.</p> <p>Static IP address of the MM910:</p> <ul style="list-style-type: none">• 1MM: 192.168.2.1• 2MM: 192.168.2.2• Subnet mask: 255.255.255.0
Floating IP address and subnet mask of the MM910	<p>The floating IP address is used by the MM910 for communicating with an external network, which is fixed to the active MM910. This IP address maps to the IP address of eth0:0 in the ifconfig command output. The floating IP address is still bound to the active MM910 after the active and standby MM910 management modules are switched over.</p> <p>Floating IP address of the MM910:</p> <ul style="list-style-type: none">• Floating IP address: 192.168.2.3 (or 192.1.2.92 in earlier versions)• Subnet mask: 255.255.255.0

Note: The static IP address and floating IP address can be modified through the LCD screen of the chassis.

Configuring the MM910 over CLI

Log in to the CLI by using the HyperTerminal and set the following parameters:

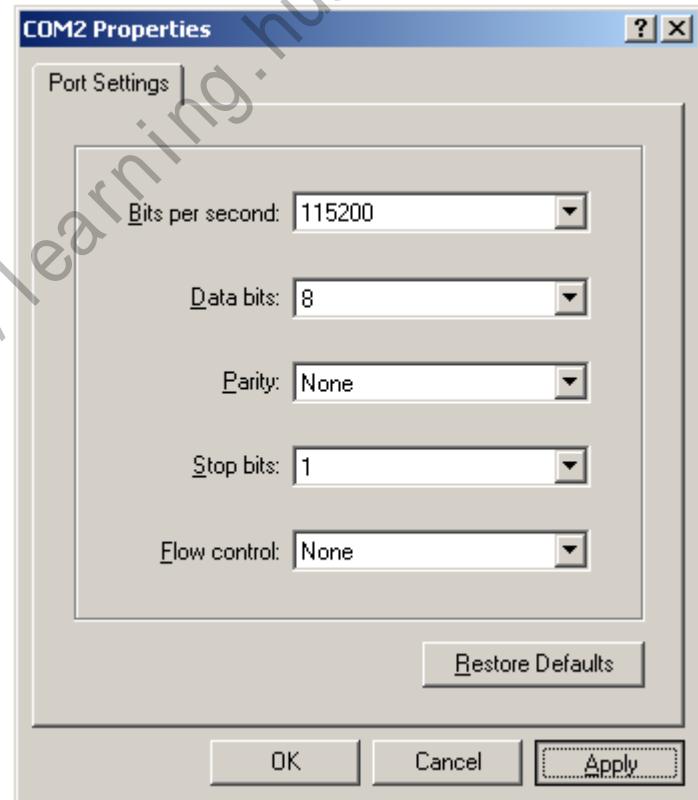
Bit per second: 115200

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None



Basic commands:

- **Query command smmget**

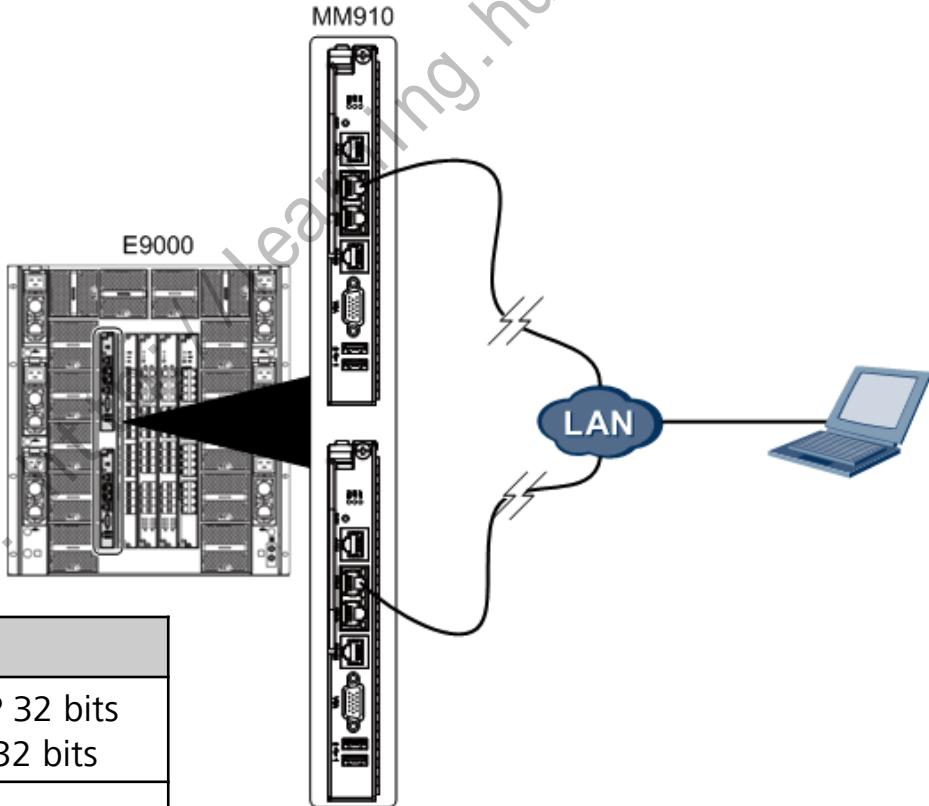
Syntax: **smmget [-h] [-l location] [-t target] -d dataitem**

- **Set command smmset**

Syntax: **smmset [-h] [-l location] [-t target] -d dataitem -v value**

WebUI Login Mode

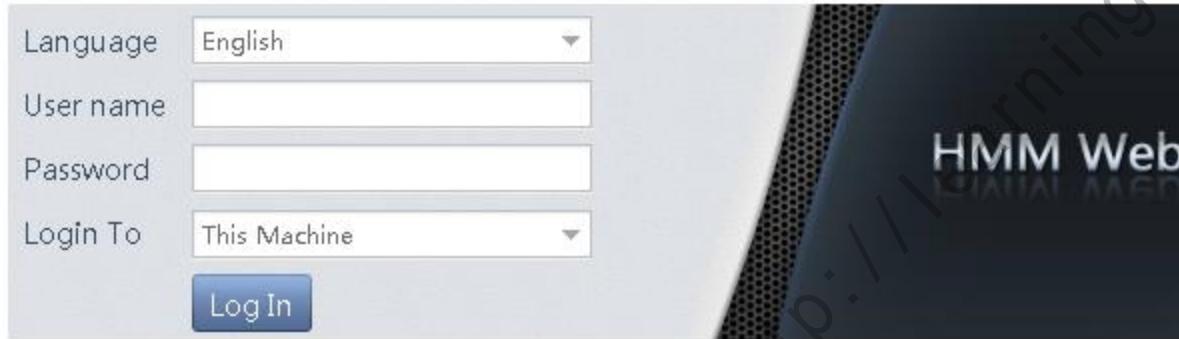
- To log in to the WebUI of the active MM910, enter the floating IP address or the static IP address of the active MM910 in the address bar of the browser.
- To log in to the WebUI of the standby MM910, enter the static IP address of the standby MM910.



Running Environment		Version
Operating system		Windows XP 32 bits Windows 7 32 bits
Browser	Internet Explorer	IE8.0
	Mozilla Firefox	Mozilla Firefox3.0
JRE		JRE1.6 or later

WebUI Login Interface

For the MM910 whose software version is (U54) 2.20 or later:



The image shows a screenshot of the HMM Web login interface. On the left, there is a light gray sidebar containing four input fields: 'Language' (set to English), 'User name', 'Password', and 'Login To' (set to This Machine). Below these fields is a blue 'Log In' button. To the right of the sidebar is a dark blue background with the text 'HMM Web' in white.

For the MM910 whose software version is earlier than (U54) 2.20:



The image shows a screenshot of the HMM Web 1.0 login interface. It features a light gray background with the title 'HMM Web 1.0' at the top. Below the title are four input fields: 'Language' (set to English), 'User name', 'Password', and 'Log on to' (set to This computer). At the bottom of the form are two buttons: 'Log In' and 'Reset'. A note at the bottom left states: '*Internet Explorer 8 (IE8) is recommended.' To the right of the form is a large gray area featuring the red Huawei logo and the word 'HUAWEI' in black capital letters.

WebUI Login Interface

For the MM910 whose software version is (U54) 2.20 or later:

The screenshot displays the HMM Web interface for the MM910 chassis. At the top, there are tabs for Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans, Alarm Monitoring, and System Management. Below these tabs are two views: 'Front view' and 'Rear view'. The 'Front view' shows slots 1 through 32, with Slot 1 highlighted in blue. The 'Rear view' shows various components including fans (Fan1 to Fan14), power supplies (PSU1, PSU2), and backplane modules (MM12, MM13). On the right side, there is a panel for chassis configuration, including fields for Chassis name, location, number, height, backplane type, and LCD UID indicator. A KVM via MM section provides instructions for remote control. At the bottom, there is an 'Alarm List' tab and a table showing an alarm entry for a minor sensor access degradation.

Alarm Severity	Alarm Source	Generated At	Sensor	Event Description
Minor	Slot15	Mon Apr 14 06:19:25 2014	MngmntHealth	Sensor access degraded or unavailable, #6

WebUI Login Interface

For the MM910 whose software version is earlier than (U54) 2.20:

The screenshot shows the HMM Web 1.0 interface for a Huawei MM910. The top navigation bar includes the HUAWEI logo, the title "HMM Web 1.0", and links for Online Help, Home, About, and Logout. It also displays the IP Address (192.168.100.51) and the current user (Login User:root). A status summary at the top right shows 0 critical errors (red), 1 warning (orange), and 0 minor alarms (yellow).

The left sidebar contains navigation links: Basic Information (selected), System Management, Thermal Management, Power Supply Management, Power Capping Management, and Email.

The main content area is titled "Basic Information>>shelf>>Status". It shows a grid of components: shelf, SMM, blade1, blade2, blade3, blade4, blade5, blade6, blade7, blade8, blade9, blade10, swi2, swi3, and swi4. Below this is a navigation bar with tabs: Status (selected), Blades Presence, Shelf Information, and All Versions. An "Alarm" section displays the same 0 errors, 1 warning, and 0 minor alarms as the top status bar. A detailed "Alarms" table is shown, listing one entry: Severity (warning orange triangle), Blade (swi2), Time (Mon Jul 1 15:28:47 2013), Sensor (Fab Heartbeat), and Description (LAN heartbeat Lost). A "Refresh" button is located at the bottom right of the main content area.

Configuring Basic Data Through WebUI

The screenshot shows the HMM Web interface for managing a Huawei chassis. The top navigation bar includes the HUAWEI logo, the title 'HMM Web', and tabs for 'Chassis Information', 'Chassis Settings' (which is highlighted with a red box and yellow circle labeled '1'), and 'Stateless Computing'. The left sidebar has sections for 'Basic Settings' and 'Network Settings'. Under 'Network Settings', the 'MM' node is selected (highlighted with a red box and yellow circle labeled '2'). The main content area displays 'Chassis Settings > Network Settings > MM'. It shows network configuration details:

Static IP address	
DHCP	OFF
IP Address	192.168.2.1
Subnet mask	255.255.255.0
Floating IP address	
IP Address	10.77.194.165
Subnet mask	255.255.254.0
Network Segment for the Management Plane	
IP Address	172.31.0.0
Subnet mask	255.255.0.0
Default Gateway	
Configured gateway	10.77.194.1

A green 'Edit' button is located at the top left of the configuration table (highlighted with a yellow circle labeled '3').

Adding a User Through WebUI

The screenshot shows the HMM Web interface with the following steps highlighted:

1. In the top navigation bar, the "System Management" tab is selected.
2. In the left sidebar under "Account Management", the "MM User Management" option is selected.
3. On the main page, the "New User" button is highlighted with a red box and yellow circle.

The main page displays the following information:

User Name	Belong To	User Gro
root	superdomain	Administr

Total: 1 records

Configuring the MAC Address Pool

The screenshot shows the HMM Web interface for managing a MAC address pool. The top navigation bar includes links for Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans, and Alarm Monitoring. On the left, a sidebar lists Profile Management and MAC Address Pool Management, with MAC Address Pool Management selected. The main content area is titled "Stateless Computing > MAC Address Pool Management". It features two buttons: "Save" (green) and "Clear MAC Address Pool" (grey). Below these are fields for "Start MAC address" (with a placeholder value of "00:0F:E2:35:DC:71" and a note about the value format) and "Number of MAC addresses" (with a placeholder value of "0-512" and a note that "0" clears the pool). A message indicates a failed attempt to obtain data from EEPROM. A search section allows filtering by "All" or a specific MAC address, with a "Query" button. At the bottom, a table displays MAC address information, showing 0 rows and 0 records found.

MAC address	Profile Name	Slot	NIC
10 rows	Total: 0 records		

Generating Configuration Files (Configuration Profile)

The screenshots illustrate the process of generating a configuration profile (Configuration Profile) using the HMM Web interface.

Screenshot 1: Shows the initial state of the Profile Management table. It contains one row named "test" with a "Common profile" type and no associated slot. A "New Profile" dialog is open, prompting for a profile name and type. The "Profile Name" field is empty, and the "Profile Type" radio button is selected for "Common profile".

Screenshot 2: Shows the "Import Profile" dialog. It includes a warning message: "Importing a profile will delete MAC address configurations but retain UUID, WWPN, and WWNN configurations. Modify the UUIDs, WWPNs, and WWNNs to ensure that they are unique." Below the warning, there are two import options: "Import from board" (selected) and "Import from PC". A dropdown menu for "Select Slot" is shown. The "Profile Name" field is empty, and the "Profile Type" radio button is selected for "Common profile".

Screenshot 3: Shows the updated Profile Management table after the profile was imported. The "test" entry now has a status icon. The "Import Profile" dialog is still open, showing the same fields and options as in Screenshot 2.

Configuration Binding

Stateless Computing > Profile Management

New Profile Import Profile Migrate Profile

Profile Name	Profile Type	Associated Slot	Status
12	Common profile	None	
te	Common profile	None	

10 rows Total: 2 records

Select Associated Slot

⚠ If you associate a profile with a slot, the profile file is automatically delivered to the board in the specified slot after the board restarts. If you deassociate a profile from a slot, the board restarts automatically.

Select All

<input type="checkbox"/> Slot 01	<input type="checkbox"/> Slot 02	<input type="checkbox"/> Slot 03	<input type="checkbox"/> Slot 04
<input type="checkbox"/> Slot 05	<input type="checkbox"/> Slot 06	<input type="checkbox"/> Slot 07	<input type="checkbox"/> Slot 08
<input type="checkbox"/> Slot 09	<input type="checkbox"/> Slot 10	<input type="checkbox"/> Slot 11	<input type="checkbox"/> Slot 12
<input type="checkbox"/> Slot 13	<input type="checkbox"/> Slot 14	<input type="checkbox"/> Slot 15	<input type="checkbox"/> Slot 16
<input checked="" type="checkbox"/> Slot 17	<input type="checkbox"/> Slot 18	<input type="checkbox"/> Slot 19	<input type="checkbox"/> Slot 20
<input type="checkbox"/> Slot 21	<input type="checkbox"/> Slot 22	<input type="checkbox"/> Slot 23	<input type="checkbox"/> Slot 24
<input type="checkbox"/> Slot 25	<input type="checkbox"/> Slot 26	<input type="checkbox"/> Slot 27	<input type="checkbox"/> Slot 28
<input type="checkbox"/> Slot 29	<input type="checkbox"/> Slot 30	<input type="checkbox"/> Slot 31	<input type="checkbox"/> Slot 32

OK **Cancel**

Configuration Migration

Stateless Computing > Profile Management

New Profile Import Profile Migrate Profile

Profile Name	Profile Type	Associated Slot	Status	Operation
test	Common profile	None		

10 rows Total: 1 records

Previous Next

Migrate Profile

Exercise caution when doing profile migration, the action will make the board(both source and destination) restart automatically.

Source slot

Destination slot

Power Management

The screenshot displays two main sections of the HMM Web interface:

- Front view:** Shows a diagram of the E9000 chassis front panel with 16 slots labeled Slot1 through Slot16. Most slots are occupied by components, indicated by green checkmarks.
- Rear view:** Shows a diagram of the E9000 chassis rear panel with various ports and components. It includes labels for PSUs (PSU3, PSU4, PSU5, PSU6), fans (Fan1 to Fan12), and service ports (Swi1, Swi2). A detailed view of the rear panel shows ports 1E, 2E, 3E, and 4E, along with SFP and SFP+ modules.
- System Status:** On the right, a summary box for 'Swi2' provides information about the BMC status, fabric status, and product name (CX110). It also indicates that the management channel is connected and the service system is powered on.
- Bottom Navigation:** Includes tabs for 'Alarm List', 'Manufacturing Information', and 'Version Information'. A 'Refresh' button and a status bar showing 0 alarms, 0 warnings, and 0 critical errors are also present.
- PSU Management:** A separate section titled 'PSUs & Fans > PSU Management > PSU Status' shows a table of PSU status. The table has columns for PSU, Real-Time/Rated Power(W), and Status. It lists four PSUs (PSU2, PSU3, PSU5, PSU6) with their respective power levels and alarm status (indicated by red or green icons).

PSU Hibernation

The screenshot shows the HMM Web interface for managing PSU hibernation settings. The top navigation bar includes links for Chassis Information, Chassis Settings, Stateless Computing, **PSUs&Fans**, Alarm Monitoring, and System Management. The main menu on the left under 'PSU Management' includes options for PSU Status, **PSU Hibernation Settings**, Power Capping Settings, Power Control, Historical Power Display, Fan Management, and Fan Status. The 'PSU Hibernation Settings' option is highlighted with a yellow circle labeled '1'. In the center, the current setting is displayed as 'Hibernation' with a value of 'Disabled'. An 'Edit' button is located above this setting. A callout arrow points from the 'Edit' button to a detailed configuration window on the right. This window also has a title bar with Chassis Information and Chassis Settings. It shows the same 'PSU Management' menu on the left. The 'PSU Hibernation Settings' section on the right contains a 'Save' button, a 'Cancel' button, and a 'Hibernation' toggle switch which is set to 'Enabled'. Below it, there is a 'Hibernation mode' section with radio buttons for 'N+1' and 'N+N', where 'N+1' is selected.

Power Capping Settings

The screenshot shows the HMM Web interface for PSU Management. The top navigation bar includes links for Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans (which is highlighted with a yellow circle labeled '1'), Alarm Monitoring, and System Management. The left sidebar has sections for PSU Management (PSU Status, PSU Hibernation Settings, Power Capping Settings, Power Control, Historical Power Display), Fan Management (Fan Status), and a 'More' section. The 'Power Capping Settings' link in the PSU Management section is highlighted with a yellow circle labeled '2'. The main content area displays a warning message: '1. The CH242 compute node does not support the power capping function. Therefore, if you attempt to set the power capping value for a chassis that houses the CH242 compute node, the parameter is too low.' Below this, there are fields for 'Real-time chassis power(W)' (440), 'Chassis power capping' (Off), and 'Chassis Power Capping Value(W)' (0). A large table at the bottom lists power consumption and capping settings for various components:

Component Name	Real-time Power(W)	Power Capping	Power Capping Value(W)
Slot5	10	Off	0

Dispersion Management

The screenshot shows the HMM Web interface for a Huawei E9000 chassis. At the top, there are tabs for Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans, Alarm Monitoring, and System Management. A user bar indicates the current user is 'root' with session information and a status bar showing 0 errors, 0 warnings, and 0 alerts.

The main area displays two views of the chassis:

- Front view:** Shows the front panel with slots labeled Slot1 through Slot16.
- Rear view:** Shows the rear panel with various components and 1U, 2U, 3U, and 4U height labels.

A detailed view of Fan4 is shown on the right, indicating a management channel connected and a fan speed of 46%.

At the bottom, there are links for Alarm List, Manufacturing Information, and Version Information.

This screenshot shows the Fan Management section of the HMM Web interface. The left sidebar includes links for PSU Management, PSU Status, PSU Hibernation Settings, Power Capping Settings, Power Control, Historical Power Display, and Fan Management (selected). The main content area displays a table of fan status:

Fan	Fan Speed	Status
Fan2	30	Normal
Fan4	30	Normal
Fan6	24	Normal
Fan10	25	Normal
Fan13	0	Alarm
Fan14	31	Normal



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2. E9000 Configuration Methods

1) Configuring E9000 Management Modules

2) Switch Module Login Modes

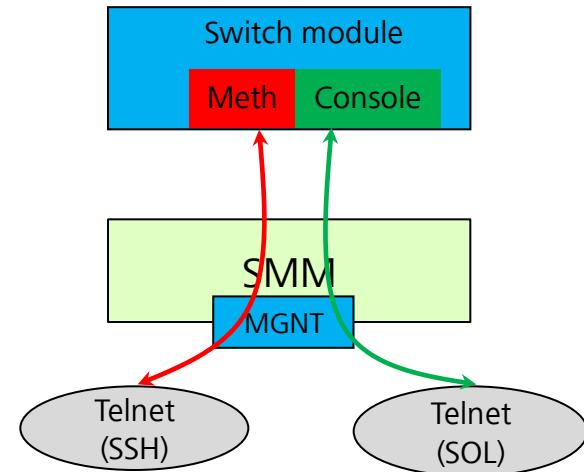
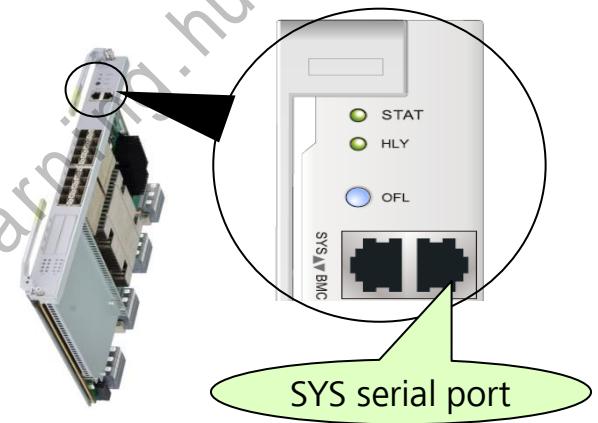
3) Basic Knowledge for Switch Module Operations

4) Configuring E9000 Compute Nodes

Switch Module Login Modes

Use any of the following ways to log in to the CX switch module:

1. Over a serial port (speed: 115200)
 - The panel provides two serial ports.
 - The SYS serial port connects to the Ethernet or FE plane.
 - The BMC serial port is used to log in to the BMC of the switch module.
 - The BMC switches the SYS serial port for the Ethernet plane and FC plane.
2. Over the management network port
 - Configure the IP address of the management port on the switch module through the MM910 or serial port.
 - Log in to the management port on the switch module through the MGNT port on the MM910 in SSH or Telnet mode.
3. Over the SOL
 - Telnet the MM910 floating IP address and port number through the MGNT port on the MM910 to log in to the serial port on the switch module.



Enabling SOL for the MM910

Step 1: Log in to the MM910 CLI, and query whether SOL is enabled for the MM910 (the SOL function is disabled by default).

```
:smmget -I smm -d solenable
```

Information similar to the following is displayed:

If "SOL is enable." is displayed, you can log in over SOL directly.

If "SOL is disable." is displayed, perform step 2.

Step 2: Enable SOL for the MM910.

```
smmset -I smm -d solenable -v enable
```

Information similar to the following is displayed:

Success

Step 3: Restart the MM910.

```
reboot
```

Information similar to the following is displayed:

This command will reboot SMM board. Continue? [Y/N]:

Step 4: Enter **Y**, and press **Enter**.

The active MM910 restarts, and an active/standby failover occurs. The original active MM takes about 2 minutes to restart.

Step 5: Log in to the CLI of the original standby MM910.

Step 6: Perform steps 3 to 6 to restart the original standby MM.

Note: After using the SOL function, run the **smmset -I smm -d solenable -v disable** command to disable SOL, and restart the MM910 to ensure system security.

Using the SOL Function on the MM910

Step 1: Log in over SOL.

On the MM910 CLI, enter the following information:

telnet Floating IP address of the MM910 1101

Information similar to the following is displayed:

```
*=====
*      Welcome to SMM SOL Server
*      Please log in with SMM account and password.
*=====
user name:
```

Step 2: Enter the user name (**root**) and password (default: **Huawei12#\$**) to log in to the MM910.

The CLI for selecting a slot is displayed.

Log in Success!

```
*=====
please input the SOL Blade1~Blade16(1 ~ 16), Swi1~Swi4(33 ~ 36) and COM#(n)
press Ctrl+R to return
*=====
Blade1~Blade16(1 ~ 16)
Swi1~Swi4(33 ~ 36)
Please input your choice:
```

Step 3: Enter the slot number of the compute node or switch module to be connected, for example, **34**, and press **Enter**.

All serial ports on the switch module to be connected are displayed as follows:

```
1 BMCcom      # BMC serial port
2 fabriccom    # Serial port on the 10GE switching plane of the CX9XX/CX3XX switch module or on the GE switching plane on the
               CX11X switch module.
3 basecom      # Serial port on the GE switching plane of the CX9XX switch module.
4 Fccom        # Serial port on the FC switching plane of the CX911/CX311 switch module.
COM#(1 ~ 3)
```

Enter a number corresponding to the required serial port, and press **Ctrl+r** to return to the CLI for selecting the chassis slot.

Default User Names and Passwords for a Switch Module

User Name	Login Mode	Default Password	User Type	User State
N/A	No name is used for the user that logs in to the BMC of the switch module.	Huawei12#\$	Administrative User	Enabled
N/A	Log in to the 10GE switching plane over the SYS serial port on the panel or over SOL.	Huawei12#\$	Administrative User	Enabled
root	Log in to the 10GE switching plane over SSH.	Huawei12#\$	Administrative User	Enabled
admin	Log in to the FC switching plane on the CX311/CX911 switch module over the SYS serial port on the panel, SOL, or SSH.	Huawei12#\$	Administrative User	Enabled

Configuring the Meth IP Address of Switching Modules Through CLI (1/2)

Log in to the MM910 CLI, and set an IP address of the management network port on a switching plane.

```
smmset -l swiN:fruM -d swipcontrol -v ipaddress maskaddress
```

The command parameters are described as follows:

- N indicates the slot number of the current switch module. Its value ranges from 1 to 4, mapping to logical slot numbers 1E, 2X, 3X, and 4E respectively from left to right on the panel.
- M indicates the ID of a switching plane. The value 1 indicates the onboard GE switching plane, 2 indicates the 10GE switching plane, and 3 indicates the FC switching plane.

For example, set the IP address of the management network port on the 10GE switching plane of the switch module in slot 2X to 192.168.102.105, and the subnet mask to 255.255.255.0.

```
root@SMM:/#smmset -l swi2:fru2 -d swipcontrol -v 192.168.102.105 255.255.255.0
```

If the following information is displayed, the setting is successful:

Success

Configuring the Meth IP Address of Switching Modules Through CLI (2/2)

Query the IP address of the management network port to check that the settings take effect.

smmset -I swiN:fruM -d swipcontrol

The command parameters are described as follows:

- N indicates the slot number of the current switch module. Its value ranges from 1 to 4, mapping to logical slot numbers 1E, 2X, 3X, and 4E respectively from left to right on the panel.
- M indicates the ID of a switching plane. The value 1 indicates the onboard GE switching plane, 2 indicates the 10GE switching plane, and 3 indicates the FC switching plane.

For example, query the IP address of the management network port on the 10GE switching plane of the switch module in slot 2X.

root@SMM:/#smmget -I swi2:fru2 -d swipcontrol

Information similar to the following is displayed:

- IP address: 192.168.102.105
- Mask: 255.255.255.0

Configuring Meth Port IP Through WebUI

The screenshot shows the HMM Web interface for managing a switching plane. The main window displays the 'Chassis Settings > Network Settings > Swi' configuration page. A red arrow points from the 'Edit' button in the top-left corner of the main panel down to the 'Edit' button in the bottom-left corner of the modal dialog.

Top Panel (Main Window):

- Header: HMM Web
- Navigation tabs: Chassis Information, Chassis Settings (highlighted), Stateless Computing
- Left sidebar: Basic Settings, Chassis Information, Boot option in BIOS, FC port configuration, Network Settings (selected), MM, Node, Swi (selected).
- Central content: Chassis Settings > Network Settings > Swi. It shows a table with rows for Component Name (Swi1, Swi2, Swi3), Plane (Fabric, Fabric, Fabric), and Management Network Port IP address (10.77.194.138, 10.77.194.138, 10.77.194.138). A yellow circle labeled '1' is on the 'Chassis Settings' tab.

Bottom Panel (Modal Dialog):

- Header: Chassis Settings > Network Settings > Swi
- Content: A warning message: "1. Save: Sets a management network port IP address for a switching plane. The setting will be effective after the switching plane is restarted.
2. Deliver: Lets a switching plane to save all settings including the management network port IP address and then restarts the switching plane." Below it are 'Save' and 'Cancel' buttons.
- Table: Shows the same three rows as the main panel. A yellow circle labeled '5' is on the 'Save' button. A red arrow points from the 'Edit' button in the main panel to this 'Save' button.
- Input field: A text input field for 'Management Network Port IP address' containing '10.77.194.138'. A yellow circle labeled '4' is on this field.

Configuring the FCoE Gateway Module

The Fibre Channel over Ethernet (FCoE) gateway module is installed on a switch module to provide FC channels.

- CX911 (MX510): FC + Ethernet multi-plane switch module
- CX311 (MX510): convergent switch module
- CX912 (MX210): FC + Ethernet multi-plane switch module

Methods for logging in to the FCoE gateway module (for example, MX510):

- Use SOL to log in to the MX510.
- Use the MGNT port on the MM910 to log in to the MX510 in SSH or Telnet mode.



FCoE Gateway

Before login, run the following command on the MM910 CLI to configure the IP address of the MX510:

smmset -l swiN:fruM -d swipcontrol -v ipaddress maskaddress

Parameter	Description	Value
N	Indicates the slot number of a compute node or module.	The value of <i>N</i> ranges from 1 to 4, mapping to the switch module slots.
M	Indicates the ID of a field replaceable unit (FRU).	1 : Base plane 2 : Fabric plane 3 : FCoE card
ipddress	Specifies the IP address to be set for the management network port.	-
maskaddress	Specifies the subnet mask to be set for the management network port.	-

- Use the SSH client to connect to the MX510.

Logging In to the MX510 Module over SOL

1. Log in to the management module and run the following command:
telnet 0 1101
2. Enter the management module login user name and password.
3. Select a switch module by entering a slot number (numbers 33 to 36 map to slots 1E, 2X, 3X, and 4E).
4. Select a serial port on the switch module by entering a port number. The number **4** indicates the FCoE gateway module.
5. Enter the user name and password for logging in to the FCoE gateway module CLI.

The terminal session shows the following steps:

- Step 1:** The user runs a telnet session to the management module at port 1101. The session connects to the SMM SOL Server.
- Step 2:** The user logs in with the SMM account and password.
- Step 3:** The user selects a switch module (slot 35).
- Step 4:** The user selects a serial port (COM#(1 ~ 4):4).
- Step 5:** The user runs the "show about" command to view the system information of the FCoE gateway module.

```
root@SMM:/# telnet 0 1101
Trying 0.0.0.0...
Connected to 0.
Escape character is '^]'.
=====
*   Welcome to SMM SOL Server
*   Please log in with SMM account and password.
*=====

user name:root
PassWord:*****
Log in Success!
=====
please input the SOL Blade1~Blade16(1 ~ 16), SWI#(33-36) and COM#(n)
press Ctrl+R to return
*=====

Blade1~Blade16(1 ~ 16)
SWI(33-36)
Please input your choice:35
1 BMCCom
2 fabricCom
3 baseCom
4 FCCom
COM#(1 ~ 4):4
FCoE_GW: admin> show about
=====
*   Command Line Interface Shell (CLISH)
*   =====
SystemDescription  Huawei FCoE-FC Gateway module
HostName         <undefined>
Eth1IPv4NetworkAddr 192.168.1.41
5  h1IPv6NetworkAddr fe80::2c0:ddff:fe24:2180
MAC1Address      00:c0:dd:24:21:80
WorldWideName    10:00:00:c0:dd:24:21:7f
SerialNumber     2198080446DQCB46F041
SymbolicName    FCoE_GW
ActiveSWVersion  V9.8.0.4.0
ActiveTimestamp   Thu Dec 20 17:46:48 2012
POSTStatus       Passed
SwitchMode       Full Fabric
```

Logging In to the MX510 Module over SOL

```
root@SMM:/# telnet 0 1101
Trying 0.0.0.0...
Connected to 0.
Escape character is '^]'.

*=====
*      Welcome to SMM SOL Server
*      Please log in with SMM account and password.
*=====

user name:root
PassWord:*****
Log in Success!

*=====
please input the SOL Blade1~Blade16(1 ~ 16), SWI#(33-36) and COM#(n)
press Ctrl+R to return
*=====

Blade1~Blade16(1 ~ 16)
Swi(33-36)
Please input your choice:35
1 BMCcom
2 fabriccom
3 basecom
4 FCcom

COM#(1 ~ 4):4
```

- ③ Select a switch module by entering a slot number (numbers 33 to 36 map to slots 1E, 2X, 3X, and 4E).
- ④ Select a serial port on the switch module by entering a port number. The number 4 indicates the FCoE gateway module.
- ⑤ Enter the user name and password for logging in to the FCoE gateway module CLI.

1

① Log in to the MM910 and run the telnet 0.0.0.0 1101 command. Alternatively, log in to the MM910 by telnet the MM910 floating IP address and port 1101.

2

② Enter the management module login user name and password.

3

```
FCoE_GW: admin> show about
```

```
*****
*          Command Line Interface Shell (CLISH)      *
*****
SystemDescription  Huawei FCoE-FC Gateway module
HostName          <undefined>
Eth1IPv4NetworkAddr 192.168.1.41
Eth1IPv6NetworkAddr fe80::2c0:ddff:fe24:2180
MAC1Address        00:c0:dd:24:21:80
WorldWideName      10:00:00:c0:dd:24:21:7f
SerialNumber       2198080446DQCB46F041
SymbolicName       FCoE_GW
ActiveSWVersion    V9.8.0.4.0
ActiveTimestamp     Thu Dec 20 17:46:48 2012
POSTStatus         Passed
SwitchMode         Full Fabric
```



Contents

1. E9000 Management Architecture

2. E9000 Configuration Methods

1) Configuring E9000 Management Modules

2) Switch Module Login Modes

3) Basic Knowledge for Switch Module Operations

4) Configuring E9000 Compute Nodes

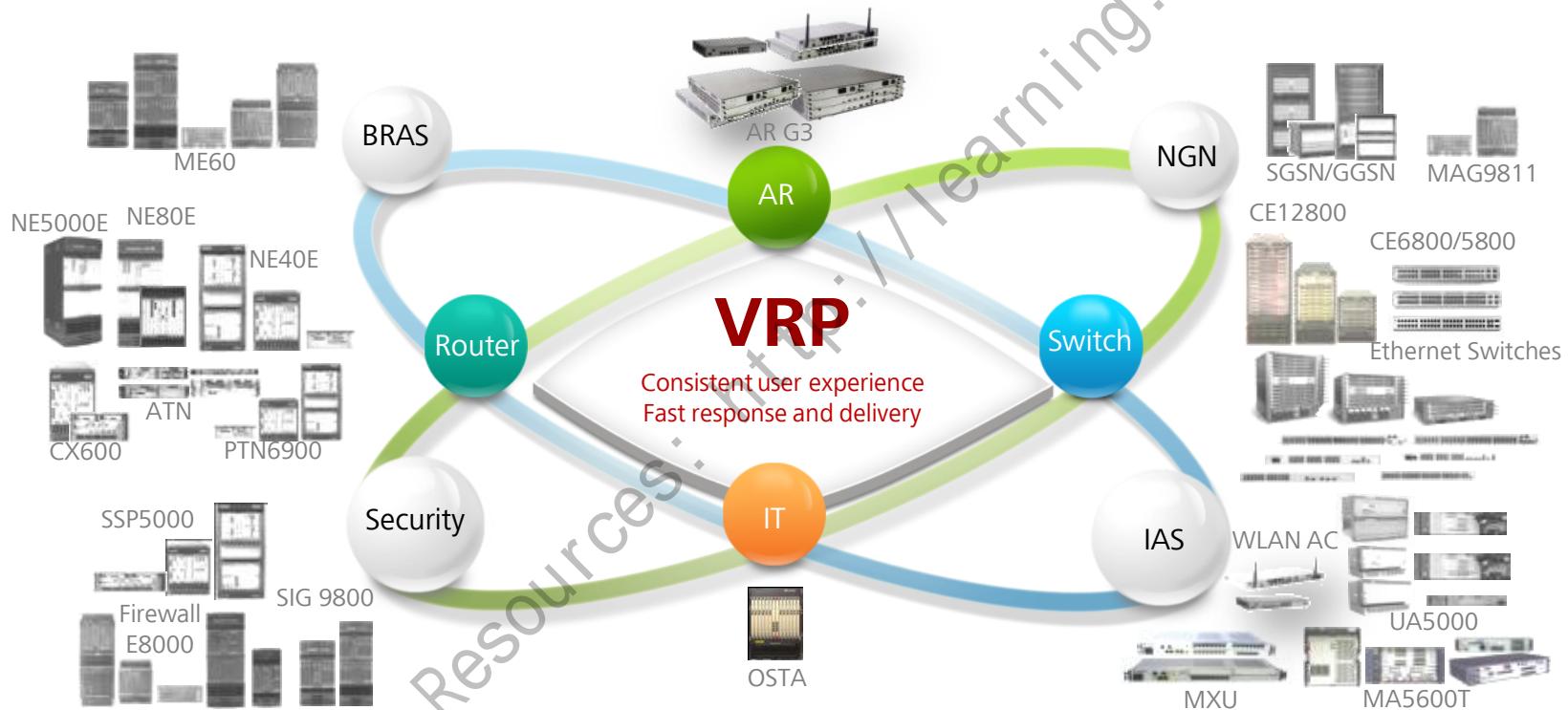
VRP Network Operating System



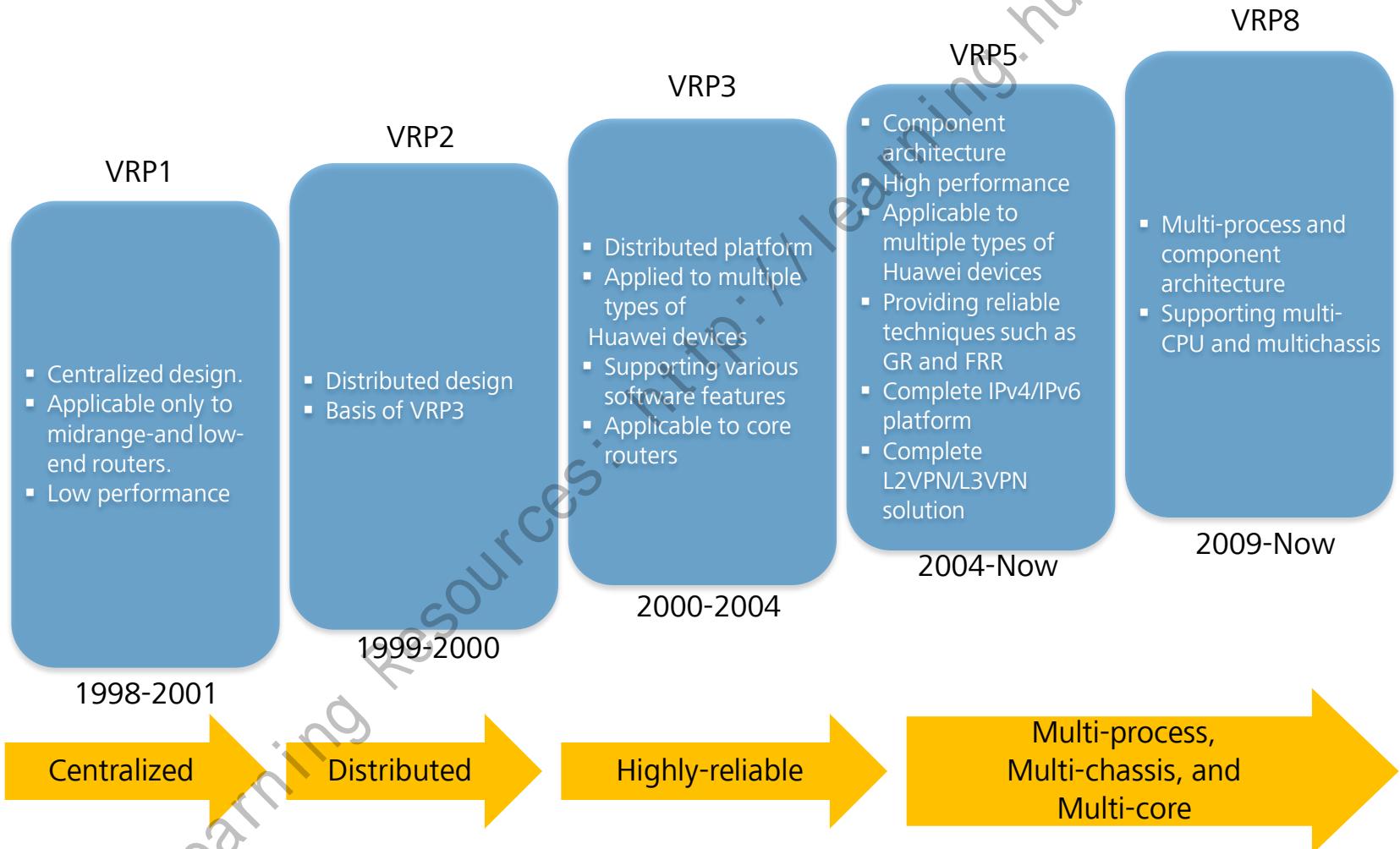
VRP Introduction

- VRP (Versatile Routing Platform) is a network OS running in IP devices, similar to iOS and Windows.
- VRP is the brain of IP devices which constructs the global network.
- VRP has high reliability which ensures IP network secure and stable operation.

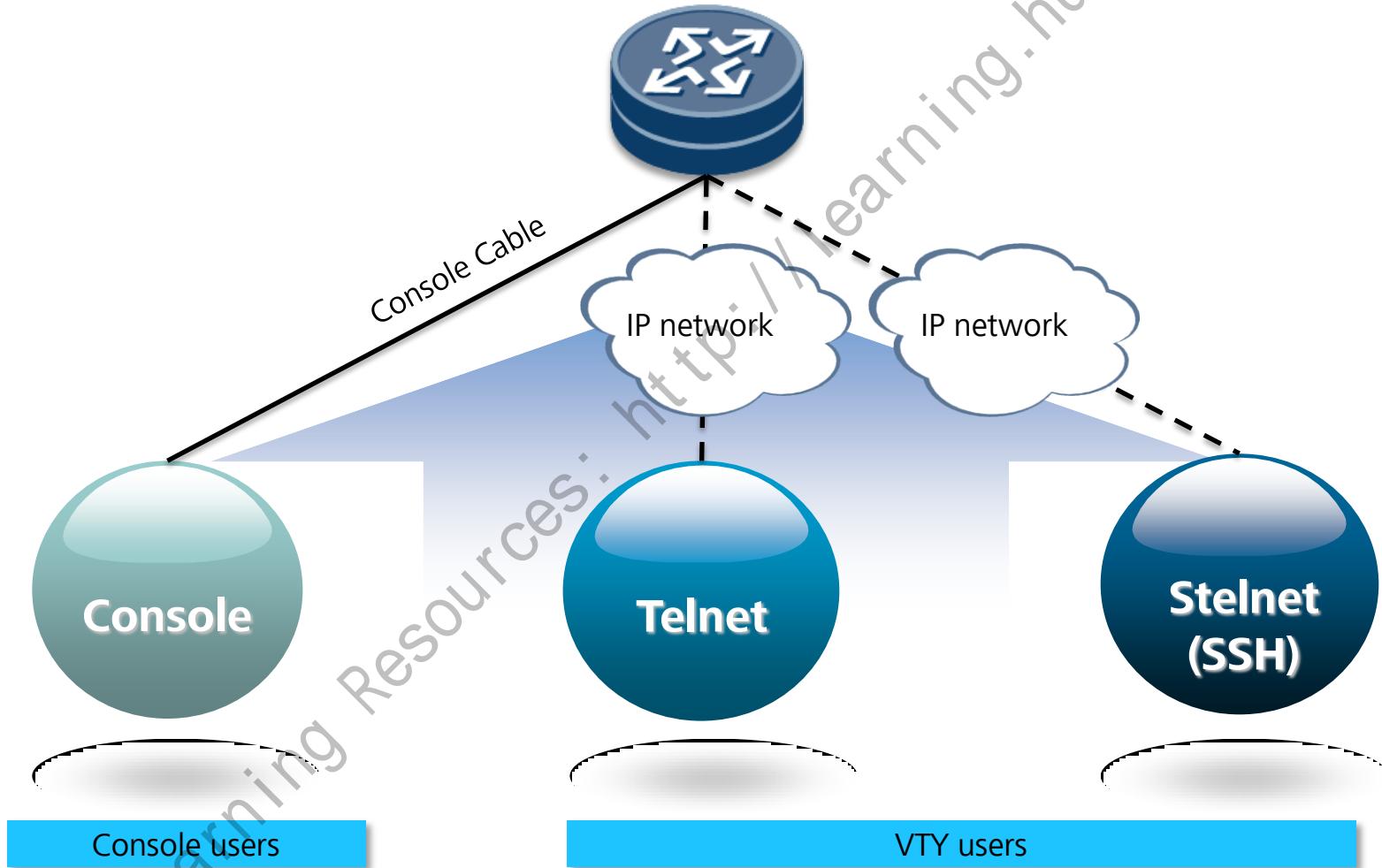
VRP-Heart of Huawei IP Devices



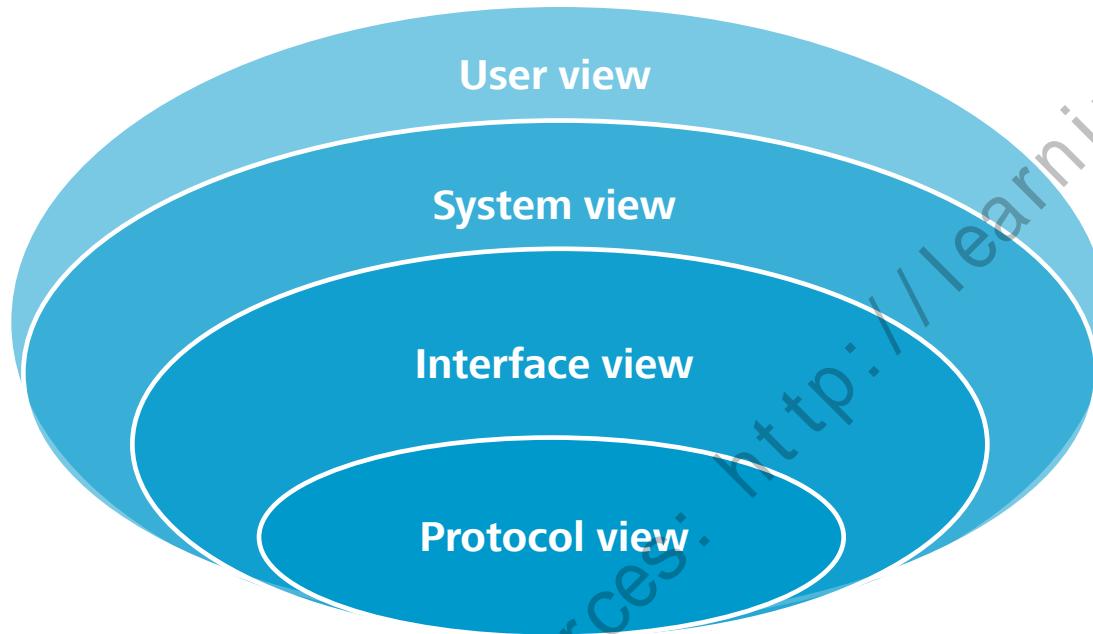
Development of VRP



Device Login



CLI View



Check the running status or other parameters.

Set the system parameters of the device.

Set the interface parameters.

Set the routing protocol parameters.

<Huawei> **system-view**

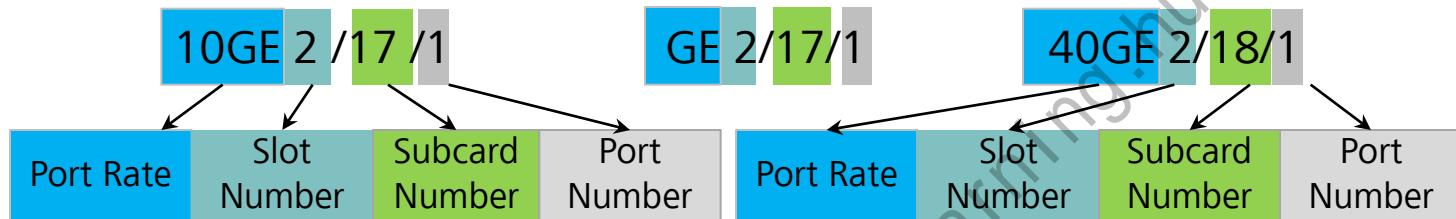
Enter system view, return user view with return command.

[Huawei] **interface 10GE 1/17/1**

[Huawei-10GE1/17/1]

Huawei is the default host name, <> represents the user view, [] represents the system view, and 10GE 1/17/1 is the interface name.

Ethernet Port Naming



Function	Subcard Number	Switch Module Type	Port Rate	Port Type	Number of Ports	Instance
Ethernet ports for connecting to blade servers	1~8	CX9XX	10GE	N/A	1~3	10GE 2/1/1
	9~16		10GE		1~2	
	1~16	CX3XX	10GE		1~2	GE 2/1/1
		CX110	GE		1~2	
Ports on the switch module panel, used for cascading chassis and connecting to an uplink switch	17	CX9XX	10GE	SFP+	1~16	10GE 2/17/1
		CX311	10GE		1~12	GE 2/17/12
		CX110	GE	RJ45	1~12	40GE 2/18/2
Interconnection port between switch boards, used as a stack port generally	18	CX9XX	40GE	N/A	1~2	
		CX311	40GE		1	
		CX110	40GE		1~2	
Port connected to the MM910	19	CX9XX	N/A	N/A	N/A	N/A
		CX3XX	GE	N/A	1~2	GE 2/19/1
		CX110	GE	N/A	1~2	
Expansion port on the panel of the switch module	20	CX9XX	N/A	N/A	N/A	N/A
		CX3XX	N/A	N/A	N/A	10GE 2/20/1
		CX110	10GE	SFP+	1~4	

- Interface rate: GE/10GE/40GE are supported. Slot number: namely the stack ID (1-16), is the slot number of the switch module by default (four slots are, in order, 1/2/3/4), can be changed on the CLI (**stack**).
- The GE plane in the CX9XX is connected to the MM (not the blade), and the 10GE plane in CX9XX is not connected to MM.

Keys on the CLI

Common keys	If the editing buffer is not full, insert the cursor and move it rightwards.
Backspace	Deletes the character right on the left of the cursor. The system does not respond if the cursor has moved to the head of the command.
↑ or Ctrl+P	Obtains the previous history command, if any.
↓ or Ctrl+N	Obtains the next history command, if any. Otherwise, clear the command.
Tab	Enter an incomplete keyword and press Tab, and the help information is displayed automatically.
Ctrl+C	Stops displaying information and executing commands.
Spacebar	Displays the next screen.
Enter	Displays the information in the next line, or run the latest command.

Common Command-line Error Messages

Unrecognized command

The command or keyword is not found.

Wrong parameter

The parameter type is incorrect or the parameter value is invalid.

Incomplete command

The command is incomplete.

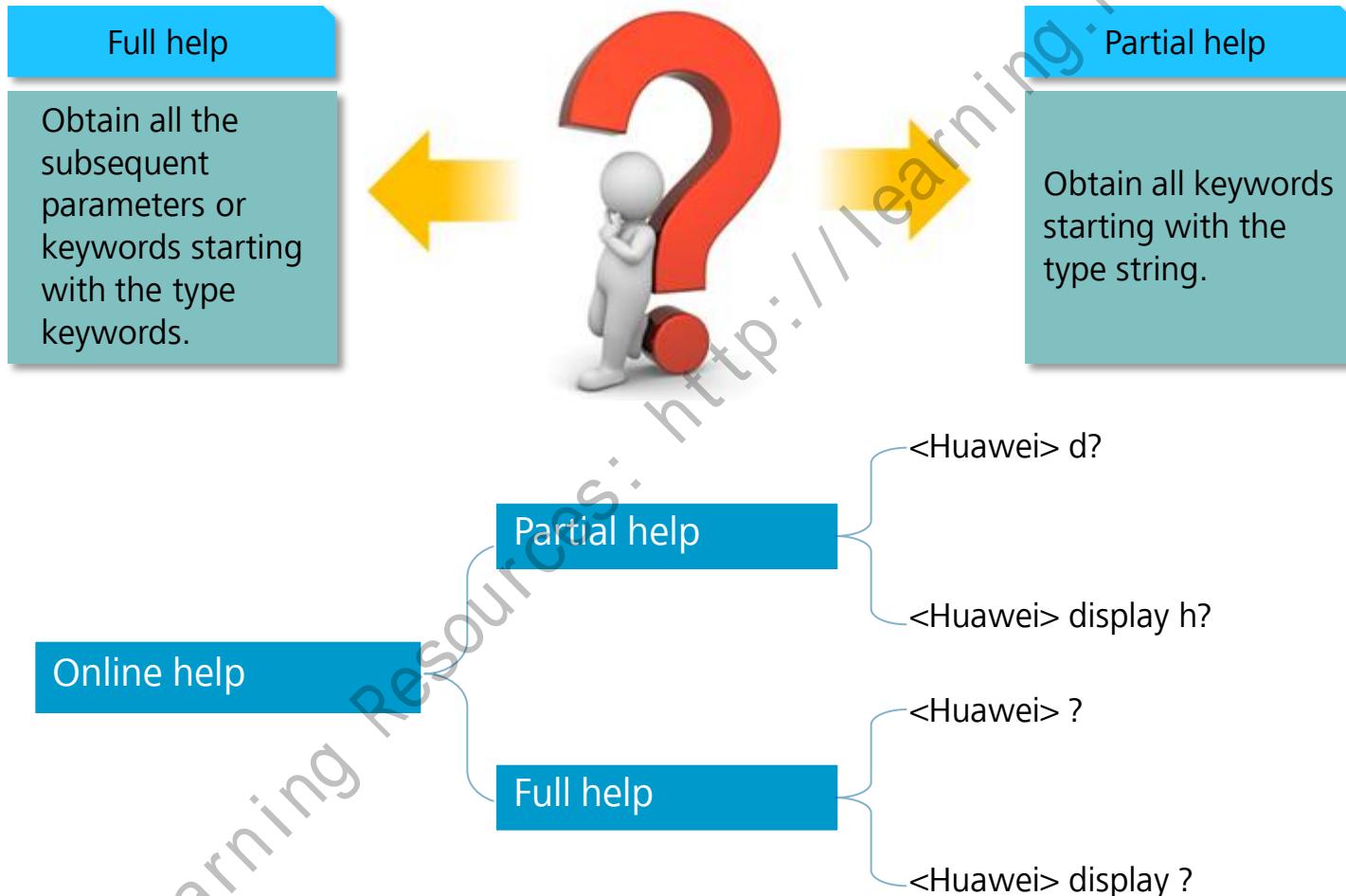
Too many parameters

The entered parameters are excessive.

Ambiguous command

The entered command is ambiguous.

How to Obtain the Command Help



Immediate and Two-Phase Modes

<Huawei> system-view immediately

[Huawei] interface 10GE 2/17/1

[Huawei-10GE2/17/1] port link-type trunk

[Huawei] port trunk allow-pass vlan 100

[Huawei]

Immediate mode (immediately validate after executing the command)

<Huawei> system-view

[~Huawei] interface 10GE 2/17/1

[*Huawei] port link-type trunk

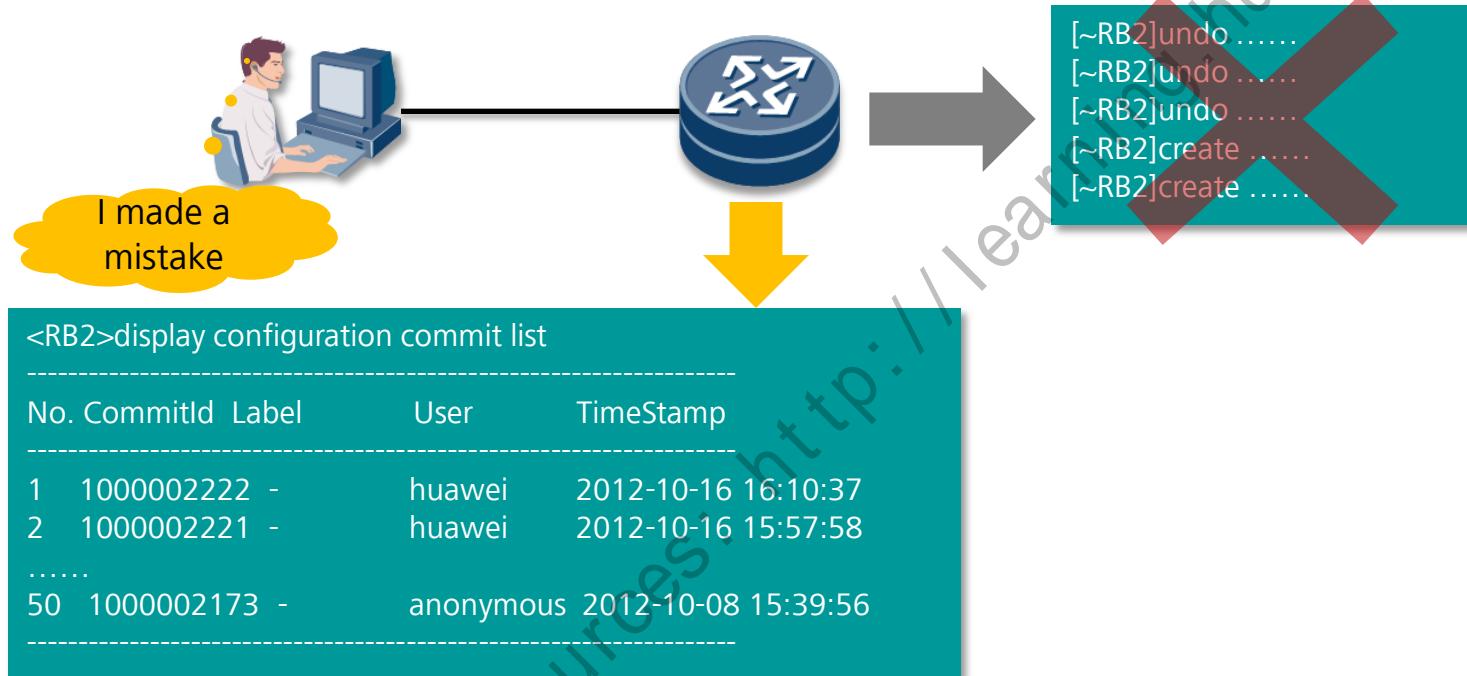
[*Huawei] port trunk allow-pass vlan 100

[*Huawei] commit

[~Huawei]

Two-phase mode (validate after running the **commit** command)

Configuration Rollback



```
<RB2>rollback configuration to commit-id 1000002220  
Warning: This operation will revert configuration changes to the  
previous status. Continue? [Y/N]:y  
Loading rollback changes  
Committing  
Check rollback result  
Configuration rollback succeeded.
```

Saving the Configuration

```
<HUAWEI>save
```

Warning: The current configuration will be written to the device. Continue? [Y/N]:Y

Now saving the current configuration to the slot 4

Info: Save the configuration successfully.

slot 4: generate local config file successfully.

```
<HUAWEI>
```

- Run the **save** command to save all the switch module configurations to the MM910 (obtain the configuration from MM910 during the next startup).
- The configuration file (filename: cfg_local) is also stored in the file system of the switch module.
- The MM910 stores the configuration files (swi1/swi2/swi3/swi4) of four switching slots in the **/common/flash/bladecfg** directory.

Setting Management IP address

Set management IP address of switch module over the Console or SOL:

```
<Huawei> system-view  
[~Huawei] interface Meth 0/0/0  
[~Huawei] ip address 192.168.100.101 255.255.255.0  
[*Huawei] commit
```

Set management IP address of switch module on the MM910 WebUI:

Chassis setting>Network Setting>swi

<input type="checkbox"/>	Component Name	Plane	Management Network Port IP address	Subnet mask
<input type="checkbox"/>	Swi1	Fabric	168.163.100.12	255.255.0.0
<input type="checkbox"/>	Swi2	Base	0.0.0.0	0.0.0.0
<input type="checkbox"/>	Swi2	Fabric	168.163.100.129	255.255.0.0
<input type="checkbox"/>	Swi3	Fabric	168.163.100.131	255.255.0.0
<input type="checkbox"/>	Swi4	Fabric	0.0.0.0	0.0.0.0



Contents

1. E9000 Management Architecture

2. E9000 Configuration Methods

- 1) Configuring E9000 Management Modules
 - 2) Switch Module Login Modes
 - 3) Basic Knowledge for Switch Module Operations
- 4) Configuring E9000 Compute Nodes**

Configuring Compute Nodes

Compute nodes are installed in front slots 1 to 16 of the E9000 chassis.

Perform the following steps to configure compute nodes:

1. Configure the BMC.
2. Configure RAID properties.
3. Configure the BIOS.
4. Install OSs on compute nodes.



Configuring the BMC

Configure the BMC over the MM910 CLI.

Enter the following command line:

smmset -l bladeN -t BMC -d bmcip -v ip mask

N indicates the slot number of the blade.

Configure the BMA over the BMC serial port.

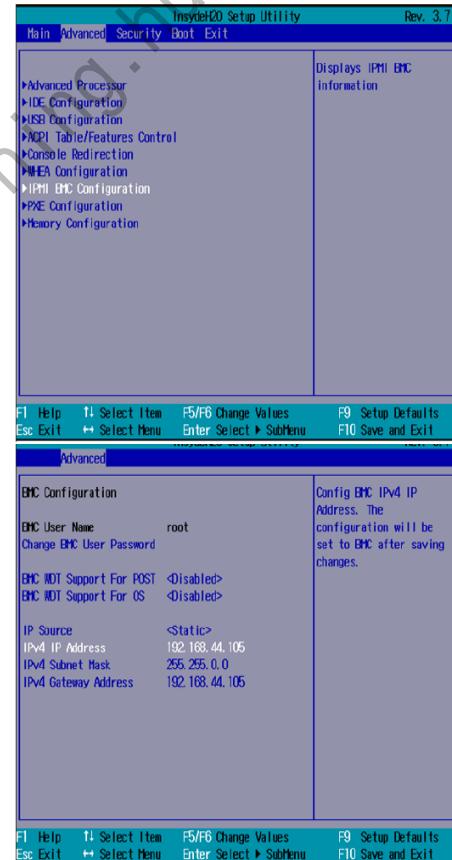
1. Log in to the MM910 CLI and switch the serial port to the BMC.

Set the compute node on slot 16 to execute the command:

smmset -l blade16 -d switchcom -v 4

2. Set an IP address for the management network port:

**ipmcset -t Network port number-d ipaddr -v
BMC IP subnet mask**



Using the local KVM to perform configuration in the BIOS

Configuring the RAID Controller Card and BIOS

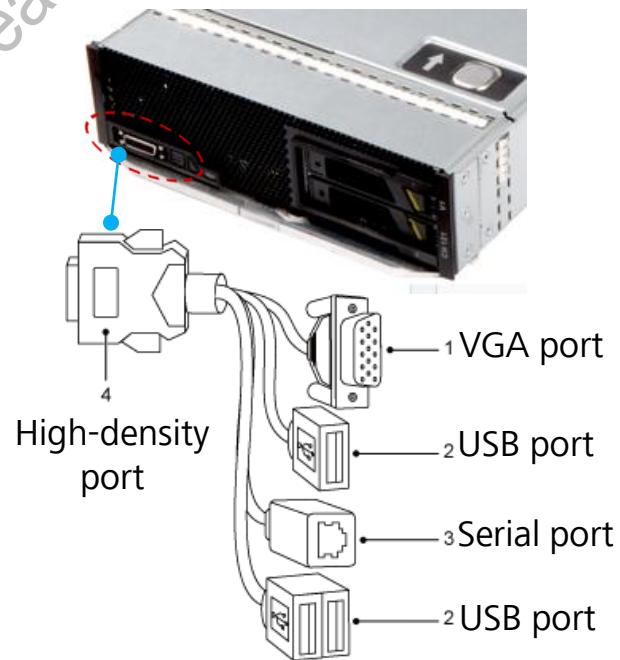
Three methods for configuring the RAID controller card are described as follows:

- Local KVM (high-density connector)
- Local virtual KVM
- Integrated KVM of the MM910
- Remote KVM of the MM910

The screenshot shows the HMM Web interface with the following details:

- Front view:** Shows a rack unit with 18 slots. Slots 4 and 10 are highlighted in green.
- Rear view:** Shows various components including two power supplies (PSU1, PSU2), four fans (Fan3, Fan10, Fan13, Fan14), and a backplane.
- E9000 Summary:**
 - Chassis name: E9000
 - Chassis location: ...
 - Chassis number: 1224
 - Chassis height: 12U
 - Backplane type: IT11BKPB Ver.A
- KVM via MM:**
 - 1. This mode applies to the KVM and VM
 - 2. Both the console for remote control are transmitted between the console and the

Remote KVM page of the MM910

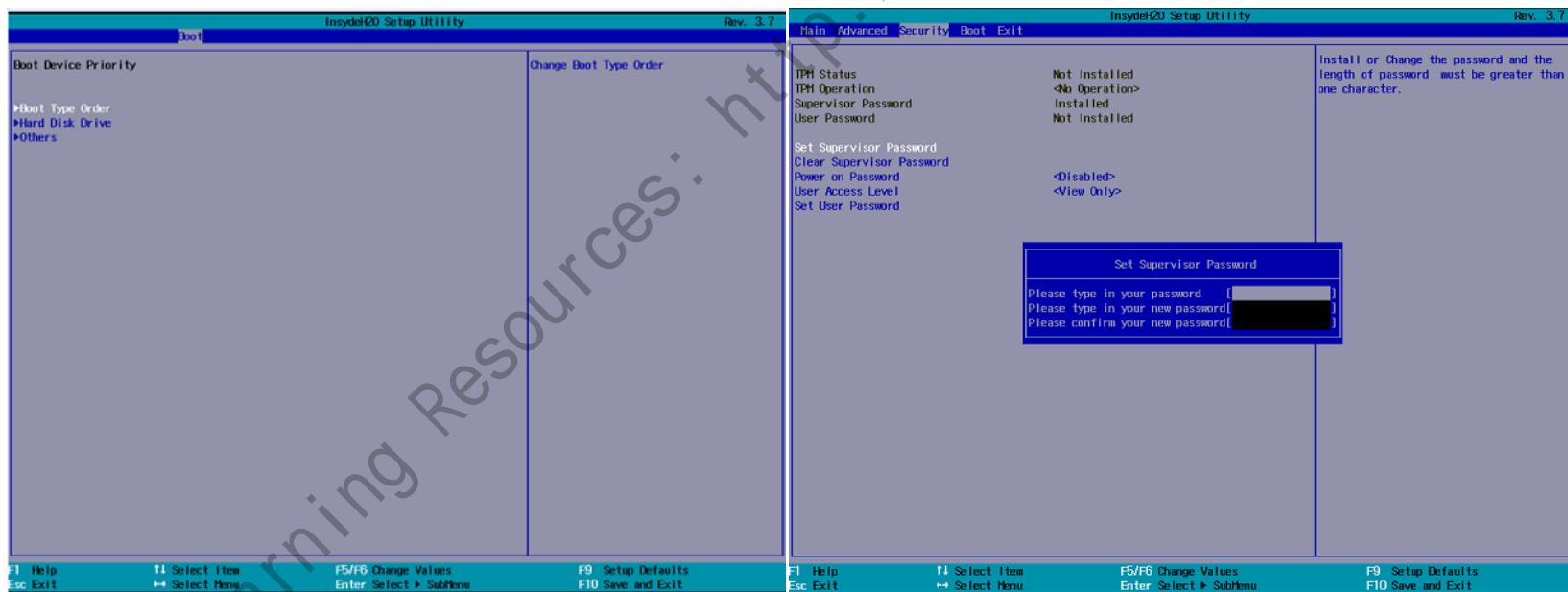


High-density connector of the local KVM

BIOS Configuration

Procedure:

1. Reset a compute node.
2. Press and hold down Delete (remote KVM or local KVM).
3. Enter a user name and password for entering the BIOS screen.
4. Set the server boot mode: hard disk/PXE/DVD
5. Set the BIOS password.

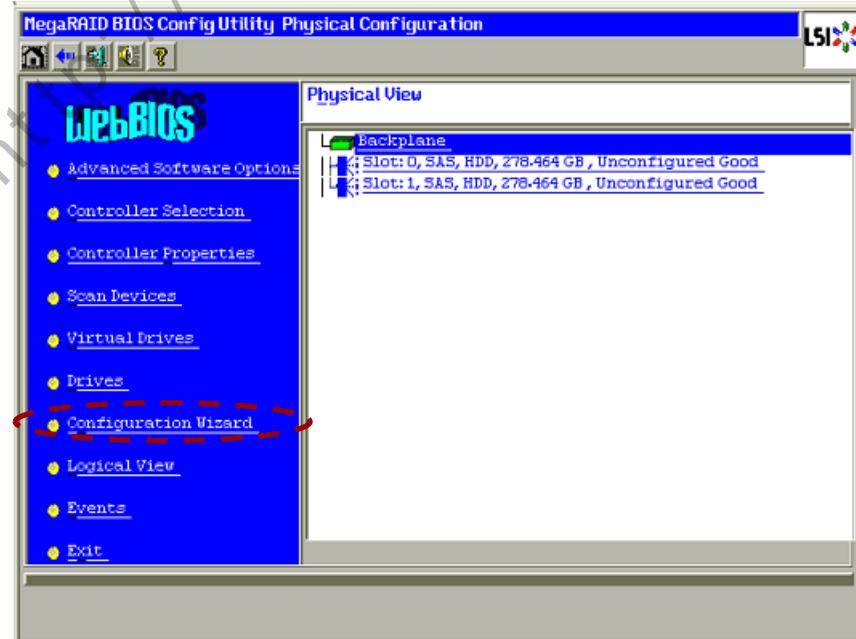


RAID Configuration

Open the RAID configuration user interface (UI),
configure RAID 0 or RAID 1 for the system disk
before OS startup.

Procedure:

1. Reset a compute node.
2. When the following message is displayed,
press **Ctrl+H**.
"Press <Ctrl><H> for WebBIOS or press
<Ctrl><Y> for Preboot CLI"
3. Perform virtual disk configuration as
prompted.
4. Initialize the virtual disk.



Preparations for OS Installation (1/3)

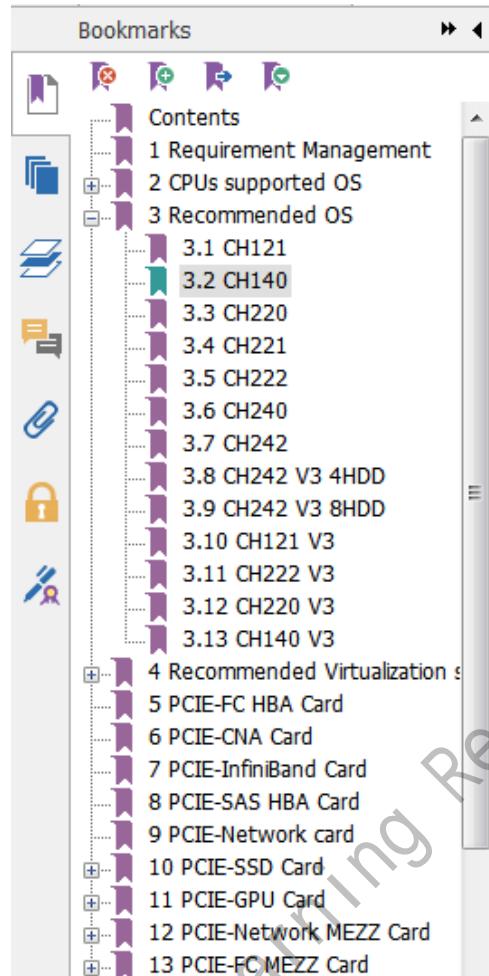
Determine the OS to be installed based on the application requirements and server compatibility list.

Visit <http://enterprise.huawei.com/cn/> and choose **PRODUCTS > Cloud Computing & Data Centers > Servers > Blade Servers** and select a compute node in the blade server list, for example, CH140. Then, click **Compatibility** as shown in the following figure.

The screenshot shows a website navigation bar with the following items: Brochure (PDF), Compatibility (highlighted with a red box), Support (DOC), Software, and Partner Materials. Below the navigation bar, there are three tabs: Features (red), Specification, and Partnership. The main content area is titled "High performance and flexible scalability" and lists the following features:

- Supports two Intel® Xeon® E5-2600 /E5-2600V2 series processors, providing a maximum 12-core, L3 cache of 30 MB and QuickPath Interconnect (QPI) at 8 GT/s; adopts the power consumption adjustment and Turbo acceleration technology to improve performance while reducing power consumption.
- Supports 24 DDR3 DIMMs, with a maximum memory capacity of 768 GB, providing enriched memory resources for memory-intensive applications.
- Supports HUAWEI ES series high-performance PCIe SSD cards, providing superb I/O performance to resolve hard disk I/O bottlenecks.
- Supports high-performance GPUs, improving the graphics processing and floating-point computing performances.

Preparations for OS Installation (2/3)



In the contents of the Compatibility List document, choose **Recommended OS > CH140** to obtain the following compatibility information:

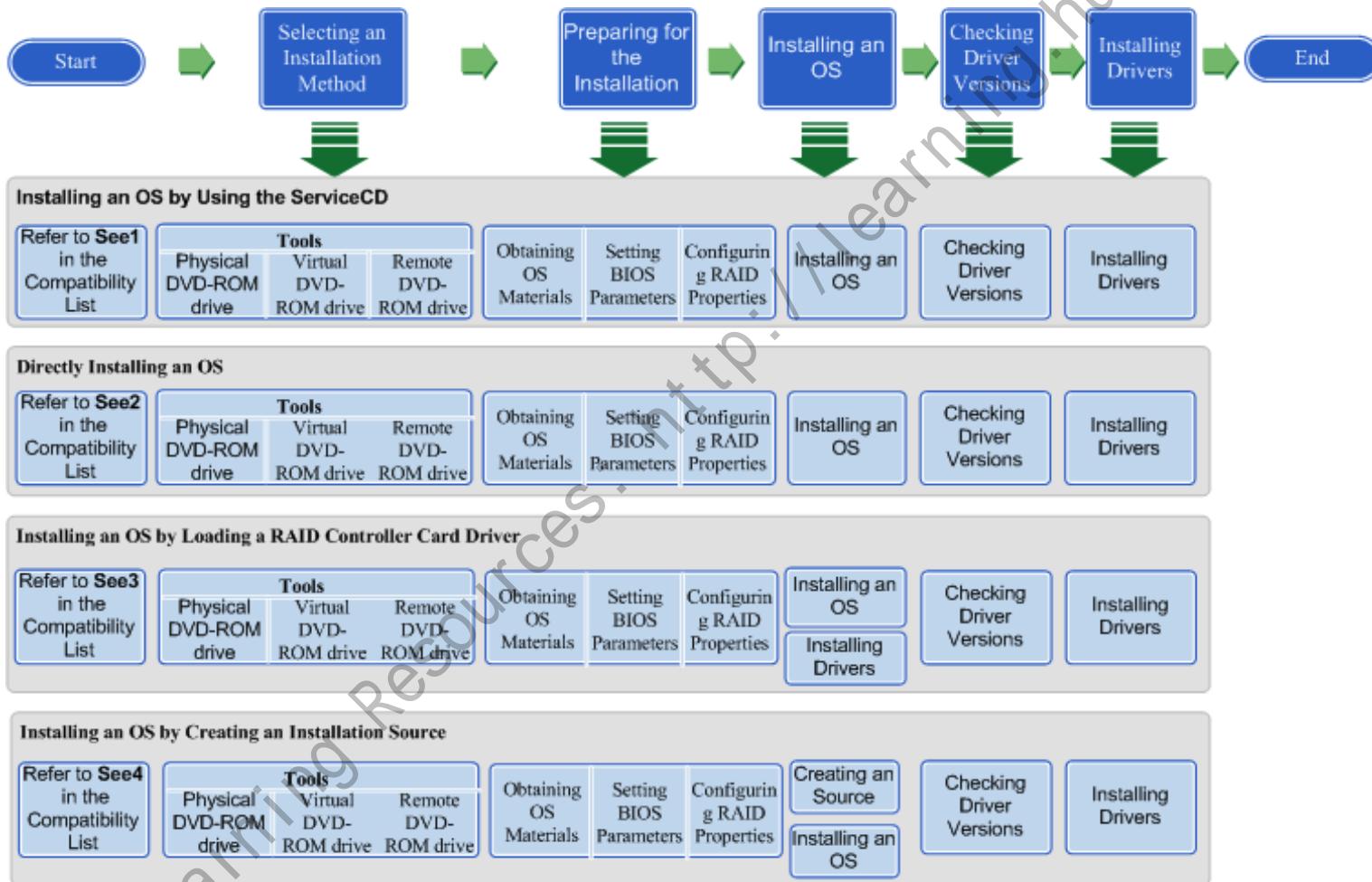
Version	Description	Supported Sandy Bridge (Yes or No)	Supported Ivy Bridge (yes or no)	Remarks
Windows2008 SP2	Microsoft Windows Server 2008 SP2 32bit	Yes	/	See ¹
Windows2008 R2 SP1	Microsoft Windows Server 2008 R2 SP1 64bit	Yes	/	See ¹
SLES 11.2	SUSE Linux Enterprise Server 11 Service Pack 2 for x86/Intel EM64T	Yes	/	See ² See ⁵
SLES 11.3	SUSE Linux Enterprise Server 11 Service Pack 3 for Intel EM64T Suse Certification URL: ?and?	Yes	/	See ² , See ⁵
RHEL 6.1	Red Hat Enterprise Linux 6 Update 4 Server for x86/Intel EM64T	Yes	/	See ¹
RHEL 6.4	Red Hat Enterprise Linux 6 Update 1 Server for x86/Intel EM64T	Yes	/	See ² See ⁵
CentOS 6.2	CentOS Linux 6 Update 2 for x86/Intel EM64T	Yes	/	See ² , See ⁵

Preparations for OS Installation (3/3)

The OSs in the compatibility list are classified into the following types:

SN	Type	Description
1	Recommended OS	The OS recommended by OS vendors for installation. OS vendors will provide genuine after-sale positioning and problem-solving support for this type of OSs.
2	CPUs supported OS	The OS declared by OS vendors to support. OS vendors will provide genuine after-sale positioning for this type of OSs.
3	Other OSs (not included in the compatibility list)	The OS declared by OS vendors not to support. OS vendors will not provide any after-sale positioning support for this type of OSs. Huawei can provide drivers and installation methods to support OS installation but reserves the rights to be responsible for providing after-sale services.

OS Installation Modes

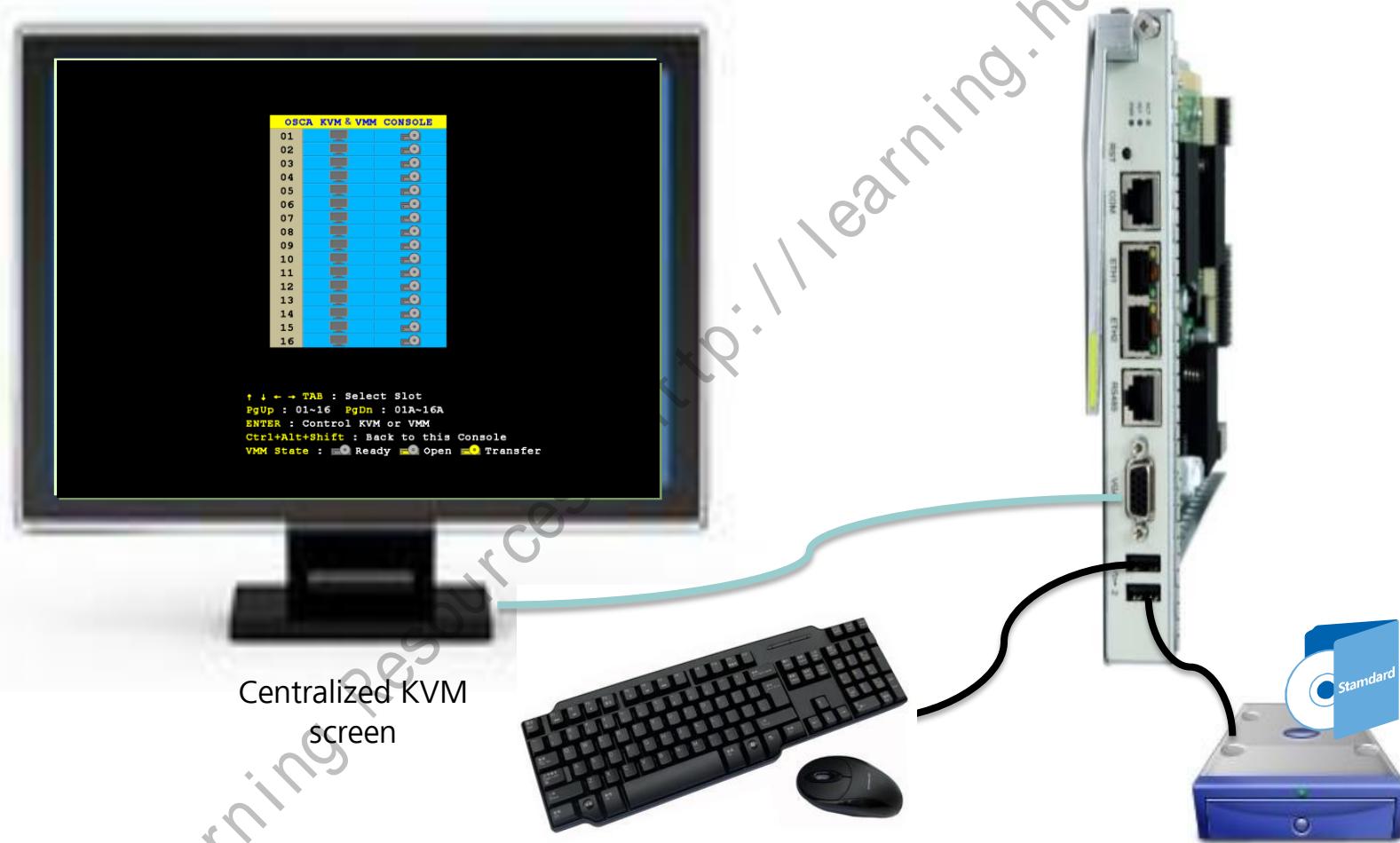


Methods for Obtaining OS Installation Resources

The following table lists the software be obtained for four OS installation modes:

Installation Mode	Software	How to Obtain
Installing an OS by using the ServiceCD	ServiceCD DVD or ISO file	The ServiceCD DVD is delivered with the product. Obtain the Service CD ISO as follows: Visit http://enterprise.huawei.com/cn/ and choose Support > Software > IT > Server > APP Server > FusionServer Tools . Select the latest version and download the package whose software name contains Service CD .
	OS installation DVD or ISO file	The OS installation DVD or ISO file is provided by Huawei or the customer, depending on the contract.
Directly installing an OS	OS installation DVD or ISO file	The OS installation DVD or ISO file is provided by Huawei or the customer, depending on the contract.
	Server driver package	Visit http://enterprise.huawei.com/cn/ and choose Support > Software > IT > server . Select the target server and download the driver package whose software name contains driver .
Installing an OS by loading a RAID controller card driver	OS installation DVD or ISO file	The OS installation DVD or ISO file is provided by Huawei or the customer, depending on the contract.
	Server driver package	Visit http://enterprise.huawei.com/cn/ and choose Support > Software > IT > server . Select the target server and download the driver package whose software name contains driver .
Installing an OS by creating an installation source	OS installation DVD or ISO file	The OS installation DVD or ISO file is provided by Huawei or the customer, depending on the contract.
	Server driver package	Visit http://enterprise.huawei.com/cn/ and choose Support > Software > IT > server . Select the target server and download the driver package whose software name contains driver .

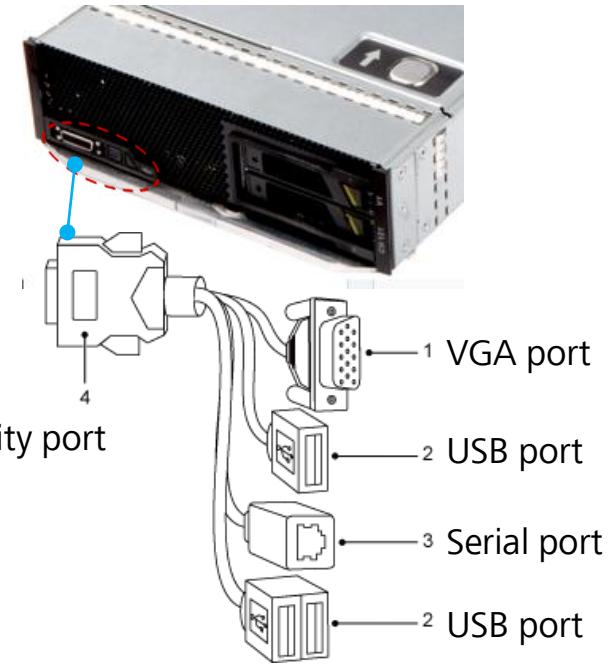
Installation Media - Integrated KVM/Virtual Media for OS Installation



Installation Media - Local DVD for OS Installation

Use a local DVD to install an OS:

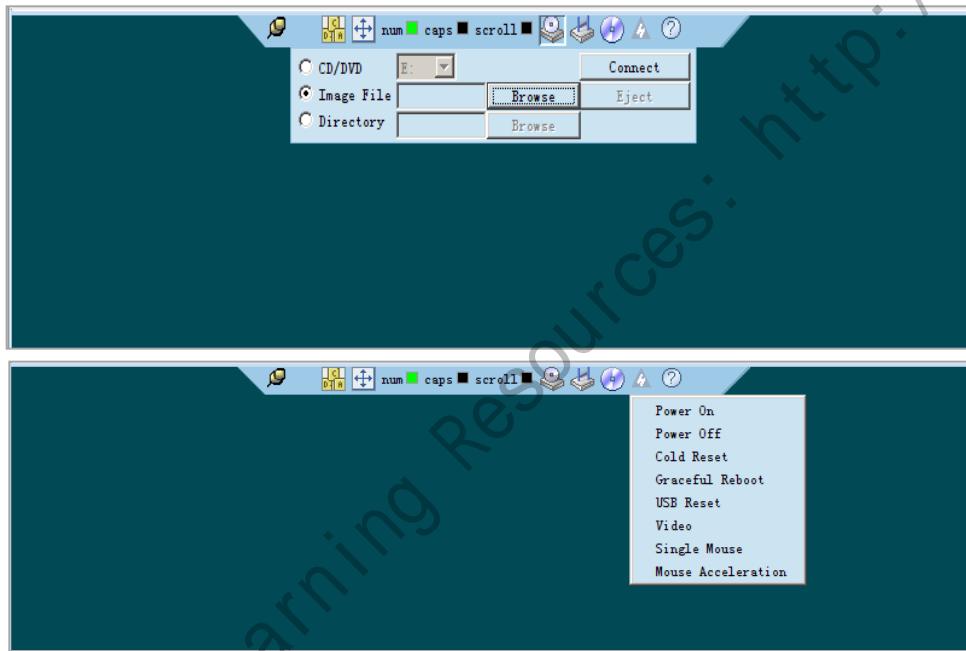
1. Connect the high-density connector to the port on a compute node.
2. Connect a monitor to the VGA port.
3. Connect a mouse, keyboard, USB drive to the USB ports.
4. Enter the BIOS and set the boot mode to DVD.
5. Use the OS disk or ServiceCD for installation.



Installation Media - Image Installation

Install an OS by using an image file:

1. Log in to the local BMC or MM910 over web.
2. Select the remote KVM and load the OS image file (.iso) by using the virtual DVD-ROM drive on the UI.
3. Restart the compute node, and select **HUAWEI DVD-ROM VM 1.1.0** during startup.





Summary

1. Management infrastructure of the E9000
2. Configuration methods for MM modules, switch modules, and compute node of the E9000

How to Obtain Help

- **Huawei Enterprise Business Website:**
- <http://enterprise.huawei.com/cn/products/itapp/server/index.htm>
- <http://enterprise.huawei.com/en/products/itapp/server/index.htm>
- Provides the product documents, compatibility lists, product software, and operation guides.
- **Huawei Service Hotline:**
- [Enterprise Service Support](#)
- <http://support.huawei.com/enterprise/NewsReadAction.action?contentId=NEWS1000000563>
- **Obtain warranty service.**
- **Huawei Server Information Self-Service Platform:**
- http://enterprise.huawei.com/topic/Self_service_server/knowledge.html
- **Obtain the tools and information about installation, survey, and O&M of Huawei servers.**

Thank you

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Introduction to Huawei E9000 Stateless Computing

[www.huawei.com](http://learning.huawei.com)





Objectives

- Upon completion of this course, you will learn about the following:
 - Basic concepts of stateless computing
 - Stateless computing application
 - Stateless computing configuration on E9000

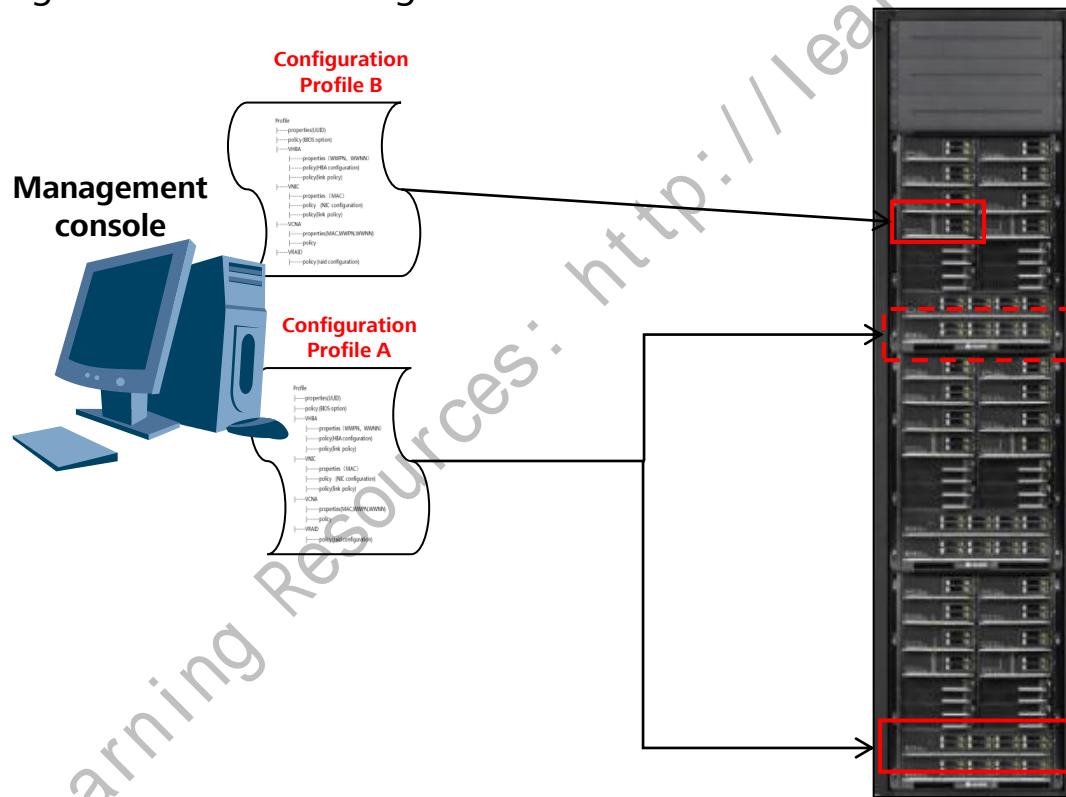


Contents

- 1. Introduction to Stateless Computing**
2. Stateless Computing Application
3. Stateless Computing Configuration on E9000

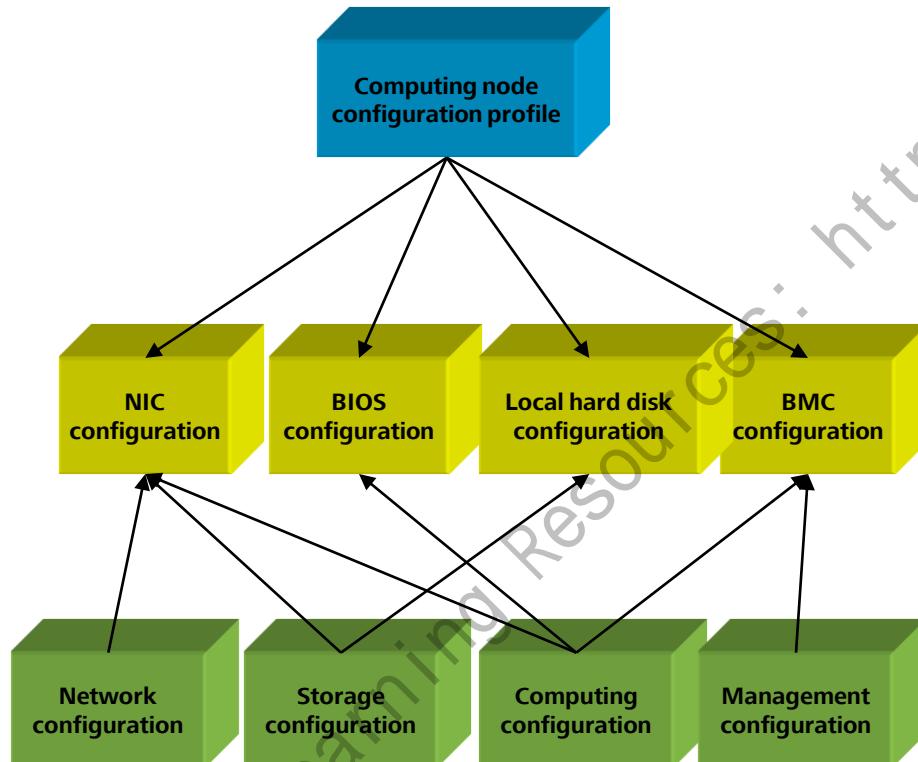
Introduction to Stateless Computing

Stateless computing: Physical attributes of computing servers can be remotely configured, inherited, duplicated, and migrated, ensuring automation of server deployment, replacement, and service migration and achieving server stateless.



Stateless Computing Configuration

Stateless computing configuration includes the configuration of the NIC, BIOS, BMC, and MAC/WWN.



Computing server configuration file:
physical attribute configuration of the
computing server

- Network identity information: MAC address or WWN
- RAID configuration information
- Firmware version
- OS startup mode and sequence and LUN starting
- NIC configuration (VLAN)
- BIOS configuration

E9000 Chassis Stateless Computing Management

The E9000 chassis management module (HMM) supports stateless computing management. No additional device needs to be deployed.

The screenshot shows the HMM Web interface with the following details:

- Header:** HMM Web, Chassis Information, Chassis Settings, Stateless Computing (highlighted), PSUs&Fans, Alarm Monitoring, System Management, root, 0 errors, 0 warnings, 0 alerts.
- Left Sidebar:** Profile Management (selected), MAC Address Pool Management.
- Table:** Stateless Computing > Profile Management, showing two profiles:

Profile Name	Profile Type	Associated Slot	Status	Operation
12	Common profile	None		
test	Common profile	None		
- Modal Dialog:** New Profile, fields: *Profile Name (empty), *Profile Type (radio buttons: Common profile (selected), Custom profile).
- Page Footer:** Copyright © 2015 Huawei Technologies Co., Ltd. All rights reserved.



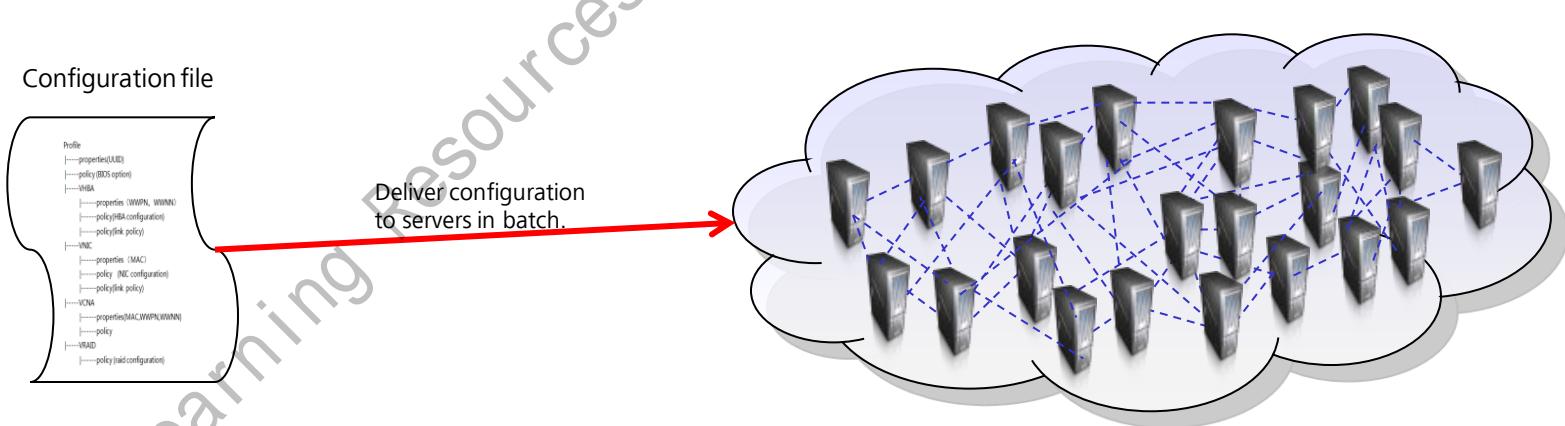
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Application: Configuration Deployment

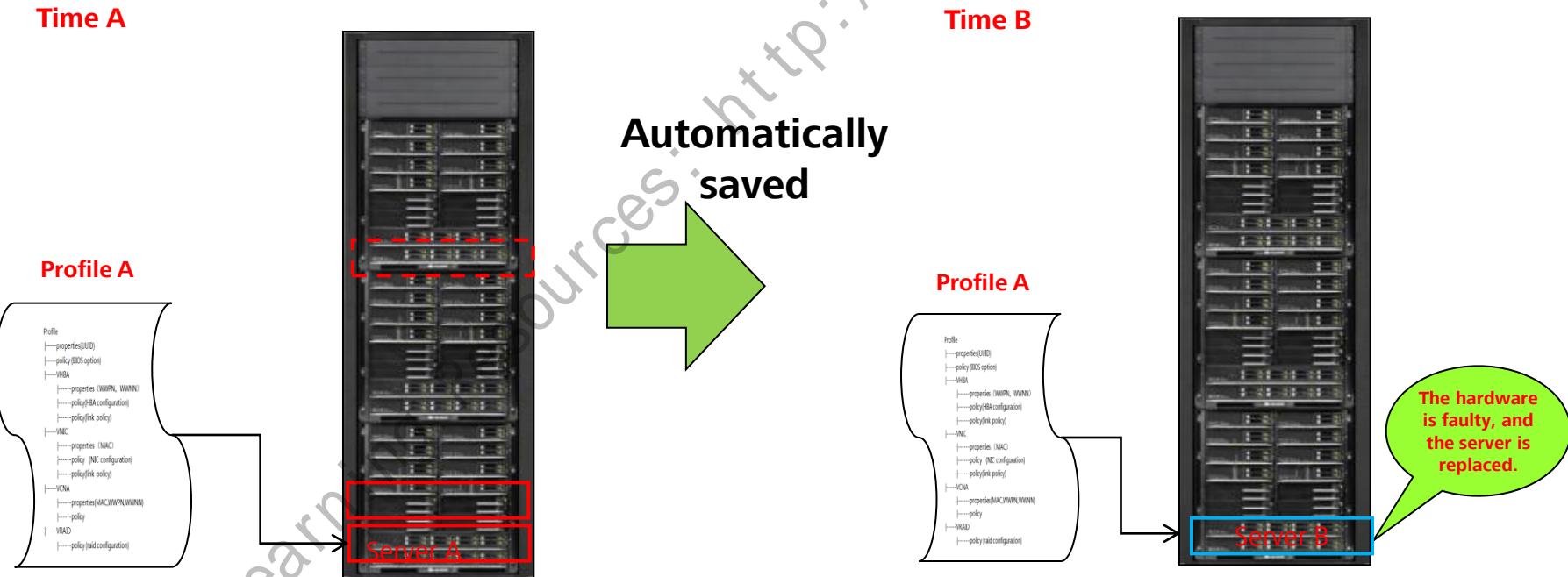
Create configuration files and bind the configuration files to the server for which the configuration is to be delivered. A configuration file can be bound to multiple servers, and the configuration automatically takes effect. In this case, servers do not need to be configured one by one.

Procedure	Manual Operation
Step 1	Create server configuration files.
Step 2	Associate configuration files with servers.



Application: Server Replacement

After a server is faulty and replaced, the original configuration (including the MAC address/WWN, server information, and related storage and network information) is automatically saved, and additional configuration is not required.





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Configuring the MAC Address Pool

The screenshot shows the HMM Web interface for managing a MAC address pool. The top navigation bar includes links for Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans, and Alarm Monitoring. On the left, a sidebar lists Profile Management and MAC Address Pool Management, with the latter being the active tab. The main content area is titled "Stateless Computing > MAC Address Pool Management". It features two buttons: "Save" (green) and "Clear MAC Address Pool". Below these are fields for "Start MAC address" (containing "00:0F:E2:35:DC:71") and "Number of MAC addresses" (containing "0"). A note indicates that the value range is 0-512, where 0 clears the pool. A message below states "Failed to obtain data! (read EEPROM error!)". To the right, it says "Number of MAC addresses: 0". There are dropdown menus for filtering by "All" or "Burnt MAC address segment" and a "Query" button. At the bottom, there's a table header with columns: MAC address, Profile Name, Slot, and NIC. A dropdown menu shows "10 rows" and a message "Total: 0 records".

Generating Configuration Files (Configuration Profile)

The screenshots illustrate the process of generating a configuration profile (Common profile) in the HMM Web interface.

Screenshot 1: Shows the 'Profile Management' page with a single entry: Profile Name 'test', Profile Type 'Common profile', and Associated Slot 'None'. A 'New Profile' dialog is open, prompting for a 'Profile Name' (input field) and 'Profile Type' (radio buttons for 'Common profile' or 'Custom profile').

Screenshot 2: Shows the 'Import Profile' dialog. It includes a warning message about importing profiles deleting MAC address configurations but retaining UUID, WWPN, and WWNN configurations. It has radio buttons for 'Import from board' (selected) and 'Import from PC', and a dropdown for 'Select Slot'.

Screenshot 3: Shows the 'Profile Management' page with the same entry 'test'. An 'Import Profile' dialog is open, containing the same fields as the 'New Profile' dialog. The 'Profile Name' input field is populated with 'test'.

Configuration Binding

Stateless Computing > Profile Management

New Profile Import Profile Migrate Profile

Profile Name	Profile Type	Associated Slot	Status
12	Common profile	None	
to	Common profile	None	

10 rows Total: 2 records

Select Associated Slot

If you associate a profile with a slot, the profile file is automatically delivered to the board in the specified slot after the board restarts. If you deassociate a profile from a slot, the board restarts automatically.

Select All

Slot 01 Slot 02 Slot 03 Slot 04
 Slot 05 Slot 06 Slot 07 Slot 08
 Slot 09 Slot 10 Slot 11 Slot 12
 Slot 13 Slot 14 Slot 15 Slot 16
 Slot 17 Slot 18 Slot 19 Slot 20
 Slot 21 Slot 22 Slot 23 Slot 24
 Slot 25 Slot 26 Slot 27 Slot 28
 Slot 29 Slot 30 Slot 31 Slot 32

OK Cancel

Configuration Migration

Stateless Computing > Profile Management

New Profile Import Profile Migrate Profile

Profile Name	Profile Type	Associated Slot	Status	Operation
test	Common profile	None		

10 rows Total: 1 records [◀ Previous](#) [1](#) [Next ▶](#)

Migrate Profile

Exercise caution when doing profile migration, the action will make the board(both source and destination) restart automatically.

Source slot: Select Slot

Destination slot: Select Slot

OK **Cancel**



Summary

- Basic concepts of stateless computing
- Stateless computing application
- Stateless computing configuration on E9000

How to Obtain Help

Huawei Enterprise business website:

- <http://enterprise.huawei.com/cn/products/itapp/server/index.htm>
- <http://enterprise.huawei.com/en/products/itapp/server/index.htm>
- Provides the product documents, compatibility lists, product software, and operation guides.

Huawei service hotline:

- [Enterprise Service Support](#)
- <http://support.huawei.com/enterprise/NewsReadAction.action?contentId=NEWS1000000563>
- Provides professional warranty service.

Huawei Server Information Self-Service Platform:

- http://enterprise.huawei.com/topic/Self_service_server/knowledge.html
- Provides information about Huawei server installation, investigation, O&M and related tools.

Thank you

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Routine Maintenance and Troubleshooting for Servers

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Objectives

- Upon completion of this course, you will be able to:
 - Know about the routine maintenance and troubleshooting procedures for servers.
 - Know about the roadmap for server fault diagnosis.
 - Know about collecting logs from servers.
 - Know about common troubleshooting methods.
 - Know about replacing server components and replacement precautions.
 - Know about technical support channels.



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2.2 Fault Information Collection Methods

2.3 Troubleshooting Methods

2.4 Component Replacement Procedures and Precautions

2.5 Typical Cases

2.6 Support Channels

Maintenance Preparations - Hardware Maintenance Tools

- Common hardware maintenance tools required for server routine maintenance (prepared in advance)

Tool	Description
Floating mounting bar	Used to guide floating nuts, so that the floating nuts are installed on the cabinet on the holes of the fixed slide.
Screwdriver	Used to tighten or loosen screws and classified into flat-head screwdrivers, Phillips screwdrivers, and socket wrenches.
Diagonal pliers	Used to cut insulation tubes and cable ties.
Multimeter	Used to measure resistance and voltage as well as check conductivity
ESD wrist strap	Used to prevent electronic discharge during operations on devices or components.
ESD gloves	Used to prevent electrostatic discharge during operations on boards or other precision instruments.
Cable tie	Used to secure wire bundles.
Ladder	Used to install devices at heights.
Portable computer (with network cables)	Used to access the managed devices through the management interface or service interface and capture data
Serial cable	DB9 or RJ45 ports are usually available on servers.
Thermometer / hygrometer	Used to monitor the temperature and humidity in the equipment room.

Maintenance Preparations - Software Maintenance Tools

- Common software tools required for server routine maintenance (prepared in advance)

Software Tool	Description
SSH Secure Shell Client	A windows-based open-source software program for remote access to Linux operating system and file transfer between involved hosts
FusionServer Toolkits	A portable test tool sets for hard drive tests, memory tests, SSD tests, BBU tests, and stress tests on servers to be tested
uMate	A tool for remote routine inspections, upgrade server firmware in batch and collections of out-of-band (OOB) logs in batch
Infocollect	A tool for the collecting server fault information including iMana, iBMC, MM and switch modules logs, as well as windows and Linux OS logs.
Winrar	A third-party software (not included) for file compression/decompression
Office	A third-party software (not included) for creating and editing .doc, .docx, .xls, and .xlsx files

Maintenance Preparations - Mandatory Documents

- Mandatory documents before routine maintenance and troubleshooting for servers

Document	Description	How to Obtain
User Guide	User guides for various server models, introducing their structure, specifications, and installation To obtain these documents, follow the instructions in the How to Obtain column.	Enter the following address into the address box of a browser: http://support.huawei.com/enterprise/productsupport?lang=en&pid=9856522&idAbsPath=7919749 9856522, and access the desired directory.
Maintenance Guide	Maintenance guides for various server models, introducing the maintenance of these server models	
Alarm Reference	Alarm references for various server models, introducing the alarms generated by servers that support iMana/MM and corresponding troubleshooting advice	
Equipment Room Specifications	Rules that must be complied with during on-site routine maintenance	This document varies with customers. Ask for this document from your customers.



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Routine Inspection — Significance

- Identify and prevent faults through routine inspection.
 - Learn about the device running status in real time.
 - Identify potential risks in time.
 - Ensure the proper running of devices.
 - Prevent potential faults.

Routine Inspection — Basic Principles

- Use unique IDs or names to identify devices.
- Keep records of the rectification of identified issues.
- Make one change at a time and record the change result.
- Use the tools, resources, and software provided by Huawei.
- Be familiar with updates on OSs and application software.
- Make reliable backup plans.
- Prepare spare parts onsite for replacement in case of faulty parts.
- Save the latest network topology for later troubleshooting.

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Routine Inspection — On-Site Inspection

- On-site inspection covers equipment room environments and device running status.
- The following table lists the safety indicators that are commonly used in inspection of equipment room environments:

Indicator	Description
	Indicates that the marked device is a dangerous power device. To avoid electric shocks, do not open the cover of the device. Warning: All devices with this label may cause electric shocks, and no maintainable components are inside.
	Indicates that the marked device is a dangerous power device. Such a device may cause electric shocks. Do not uncover the device. No maintainable components are inside. Warning: To prevent an electric shock, do not remove the cover of the device!
	Indicates that the temperature of the surface of the marked device is high. Warning: To avoid burns, do not touch the surface until it cools down!
	Indicates that the marked device is a dangerous power device. Any operation on the marked device may cause damages to the device or operator.
	Indicates the external ground point of a device. The two ends of each power cable are connected to different devices. To ensure device operation and safety of operators, connected devices must be safely grounded using the ground point.
	Indicates the internal ground point of a device. The two ends of each power cable are connected to different devices. To ensure device operation and safety of operators, connected devices must be safely grounded using the ground point.
	Indicates an electrostatic sensitive area. Do not touch the device with bare hands. When you operate the device in this area, take antistatic measures, such as wearing an ESD wrist strap or ESD gloves.

Routine Inspection — On-Site Inspection

- The following table describes the check items for an equipment room environment.

No.	Technical Indicator	Expected Result	Inspection Result
1	Operating temperature	10°C to 35°C (41°F to 95°F)	
2	Storage temperature	-40°C to +65°C (-40°F to 149°F)	
3	Temperature change rate	15°C/h (59°F/h)	
4	Operating humidity	8% RH to 90% RH (non-condensing)	
5	Storage humidity	5% RH to 95% RH (non-condensing)	
6	Altitude	≤ 3000 m	
7	PSU	AC power supply: 100 V AC to 240 V AC, 50/60 Hz DC power supply: <ul style="list-style-type: none">Nominal voltage: -48 V DCVoltage range: -38.4 V DC to -57.6 V DC	

Routine Inspection — On-Site Inspection

- Install or remove cables only after obtaining formal authorization from the customer. The following table describes the inspection of server cable layout.

No.	Item	Remarks	Inspection Result
1	General cable layout	Service cables and power cables must be routed along the two sides of a cabinet separately. Check whether the optical fiber is bent slightly or forcibly stretched.	
2	Power cable layout	Power cables must be routed neatly and orderly but not coiled and arranged in the same way as that in the existing cabinets.	
3	Service cable layout	Service cables must be routed neatly and orderly and arranged in the same way as that in the existing cabinets.	
4	Ground cable connection	Servers must be properly grounded.	
5	Cable labeling	Labels must be clearly marked and securely attached.	
6	Power cable connection	Power cables must be securely plugged into the power socket.	
7	Signal cable connection	Signal cables and data cables must be securely connected to devices such as servers and switches.	

Routine Inspection — On-Site Inspection

- The following table describes the inspection of server running status:

No.	Item	Remarks
1	Indicator status	The front and rear panels of Huawei servers provide UID buttons/indicators, HEALTHY indicators, network port indicators, and power buttons/indicators. By observing these indicators, you can diagnose the current status of servers. For details about indicator status descriptions, see server product documentation.
2	iMana health information	Use the onsite management network for inspection or connect a PC to the iMana management network port and log in to the iMana WebUI to query the server health status. For details about related alarms, see the <i>iMana Alarm Reference</i> .
3	Management module (MM) health information	Use the onsite management network for inspection or connect a PC to the active MM and log in to the MM WebUI to query the health status of MMs, server blades, switch modules, PSUs, and fan modules on the blade server. For details about related alarms, see the <i>MM Alarm Reference</i> .

Routine Inspection — On-Site Inspection

- The following table is a template for collecting server inspection information.

Server Inspection List and Maintenance Contacts for XXX Project				
Inspected by/Contact information	Inspection date			
Site address				
Maintenance personnel	Onsite coordinator			
Primary fault coordinator				
Huawei onsite engineers				
Maintenance hotline	Global TAC for enterprises: http://enterprise.huawei.com/en/about/contact/index.htm Global TAC for carriers: 02981770999			
Equipment/board serial number				
Location				
Inspection item	Inspection content	Description	Inspection result	Remarks
HEALTHY indicator (front panel)	System fault indicator status	If the indicator is steady or blinking red, exceptions occur. If the indicator is steady green, the system works normally.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Power button/indicator (front panel)	System power indicator status	If the indicator is steady green, the system is running normally.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Hard disk indicator (front panel)	Hard disk indicator status	If the indicator is steady or blinking green, the hard disk works properly. If the indicator turns yellow or off, exceptions occur.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Power indicator (rear panel)	AC power indicator (PSU) status	If the indicator is steady green, the power supply is normal. If the indicator is off, there is no power input.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Fan module	Fan module status	If loud or abnormal noises are generated by a fan module, exceptions occur. If no abnormal noise is generated by a fan module, it runs normally.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Network cables and other cables	Cable connection status	If network cables and optical fibers are securely installed, the interface indicators are on.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
iMana health information	Health status of the server and alarm information based on iMana reports	Check whether any alarm is generated for the server health status, heat dissipation management, and power supply management.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
MM health information	Health status of blade servers and alarm information based on MM reports	Log in to the MM WebUI and check the health status of the MMs, server blades, switch modules, fan modules, and PSUs and alarm information on the blade server.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Others	Other components	For other hardware exceptions, contact the onsite technical support engineers.	<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal	
Note	For details about indicators, iMana and MM health status, and alarm information, see server product documentation. (The documentation is delivered with the CD-ROM, or you can download it at http://support.huawei.com/enterprise .)			

Routine Inspection — Remote Inspection

- Log in to the server out-of-band management software (iBMC or MM) from a remote client:
 - Using the WebUI
 - Using the CLI

The screenshot shows the iMana 200 management interface. The top navigation bar includes links for root, 首页 (Home), 关于 (About), and 退出 (Logout). The left sidebar menu has collapsed sections for 总体概况, 系统信息, 远程控制, 电源管理, 事件与日志, 实时监控, 诊断与定位, 数据下载, and 配置. The main content area is divided into several panels:

- 总体概况**: Displays system status with a table showing Device Status (上电), CPU (green checkmark), Memory (green checkmark), and Hard Disk (green checkmark).
- 常见操作**: Includes icons for Remote Control, Firmware Upgrade, Power Control, Network, and User.
- iMana信息**: Shows IP Address (10.77.194.131), Hostname (huawei), Firmware Version ((U4005)5.26), Web Session Timeout (60 minutes), and Online User Count (1).
- 系统配置信息**: Shows Device Serial Number, System Boot Options, Power-on Policy (Automatic), Safe Shutdown Timeout (600 seconds), and GUID.

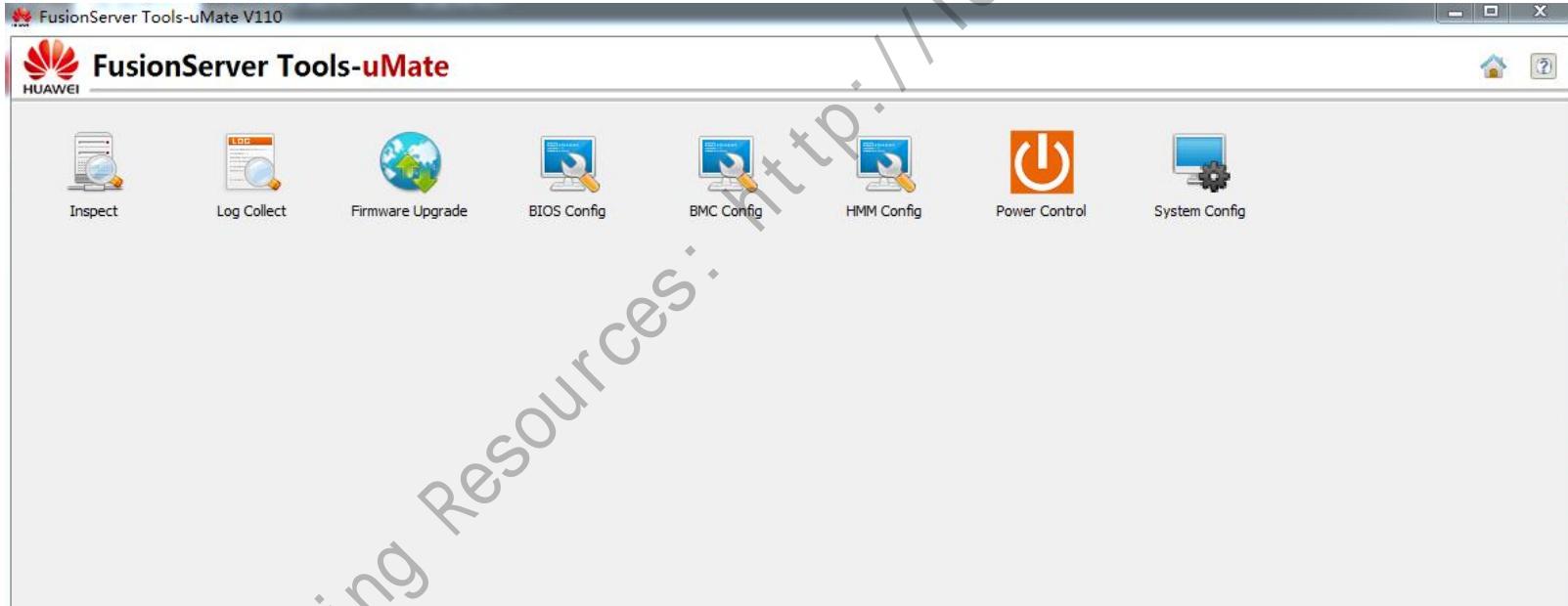
At the bottom, a legend defines six status levels: 正常 (Normal) with a green checkmark, 轻微 (Minor) with a yellow exclamation mark, 严重 (Severe) with a red exclamation mark, 紧急 (Emergency) with a red circle, 不在位 (Absent) with a grey circle, and 禁止扫描 (Scan Prohibited) with a grey circle.

Routine Inspection — Remote Inspection

- Inspects server status using **inspection tools**.
- Huawei inspection tool uMate provides the following features:
 - Provides the GUI by default, and provides the CLI for inspection and log collection.
 - Inspects Huawei-developed servers including V2/V3 rack servers, high-density servers, and E6000/E9000 blade servers using the MM.
 - Exports inspection reports.
 - Collects logs of server BMCs or blade server MMs in batches.
 - Upgrades the firmware of Huawei-developed servers including V2/V3 rack servers, high-density servers, and E6000/E9000 blade servers in batches.
 - Performs batch power control over Huawei-developed servers including V2/V3 rack servers, high-density servers, and E6000/E9000 blade servers.
 - Performs inspection or log collection only on the BMC and MM. After inspection or log collection is complete, uMate deletes the collection script and files. Therefore, inspection or log collection has no impact on services.

Routine Inspection — Remote Inspection

- uMate supports batch server inspection through the GUI or the CLI.





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Software Upgrade

- Server firmware (iBMC/iMana/BIOS/SMM) may need an upgrade when users raise new requirements or exceptions occur. You can upgrade the firmware of the iBMC,iMana, BIOS, or MM using either CLI or GUI:
- To reduce the time consumed in upgrading the firmware of multiple servers, use batch upgrade tools.

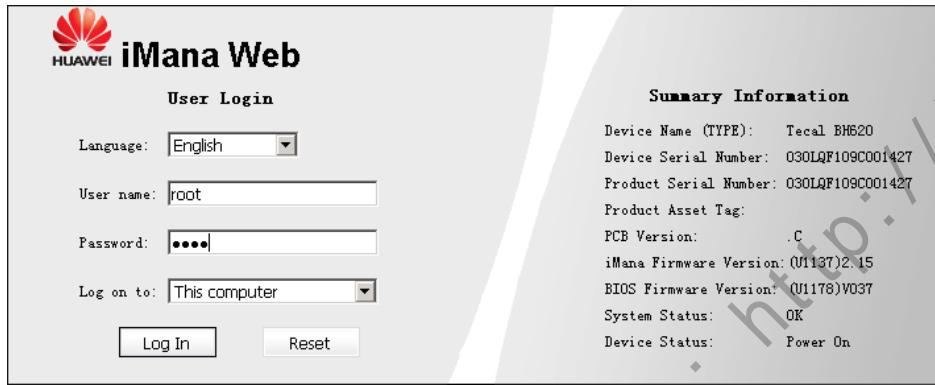
Series	Default IP Address	Subnet Mask	Default User Name	Default Password
RH	192.168.2.100			
BH	10.10.1.101~10.10.1.110		root	root Huawei12#\$
XH	10.10.1.101~10.10.1.104			
MM610M M620	MM1-10.1.2.91 MM2-10.1.2.92 Floating IP address - 10.10.1.31	255.255.255 .0	root	huaweiosta Huawei12#\$
MM910	MM1-192.168.2.1 MM2-192.168.2.2 Floating IP address - 192.168.2.3		root	Huawei12#\$

Software Upgrade

- You can obtain the upgrade package for server firmware (iBMC/iMana/BIOS/MM) as follows:
- Log in to <http://support.huawei.com/enterprise> and choose " Software Download > IT > Server. Then download the upgrade package for the desired software version.
 - The iMana upgrade package for the R1 series is image.tar.gz, and the BIOS upgrade package for the R1 series is bios.tar.gz.
 - The iBMC, iMana upgrade package for the V2 and V3 series is image.hpm, and the BIOS upgrade package for the V2 and V3 series is biosimage.hpm.
 - The MM610 upgrade package for blade servers is BC01SMMA.ulimage, ppc.bz, and mm_fpga.rbf.
 - The MM620 upgrade package for blade servers is ASUP.tar.gz.
 - The MM910 upgrade package for blade servers is MM910-CPLD-Vxxx.hpm and MM910-ManageApp-Vxxx.hpm.

Software Upgrade

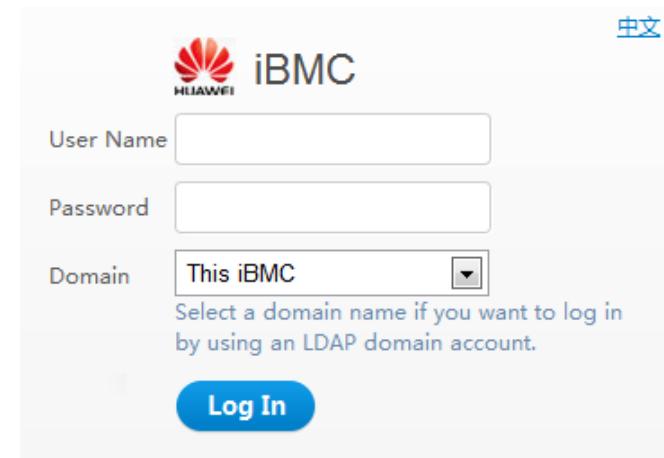
- Use the GUI to upgrade the iMana, iBMC or BIOS, you need to log in to the iMana or BMC Web UI. The following figures show the login pages:



The screenshot shows the "User Login" page of the iMana Web interface. It includes fields for Language (English), User name (root), Password (****), and Log on to (This computer). Below these are "Log In" and "Reset" buttons. To the right, a "Summary Information" section displays device details: Device Name (TYPE): Tecal BH620, Device Serial Number: 030LQF109C001427, Product Serial Number: 030LQF109C001427, Product Asset Tag: .C, PCB Version: .C, iMana Firmware Version: (U1137)2.15, BIOS Firmware Version: (U1178)V037, System Status: OK, and Device Status: Power On.



The screenshot shows the "User Login" page of the iMana 200 interface. It features fields for User Name (root), Password (*****), and Log on to (This iMana). It also includes "Log In" and "Reset" buttons. A "Summary" tab is visible above the login fields. At the bottom, there is a copyright notice: Copyright © Huawei Technologies Co., Ltd. 2011-2012. All rights reserved.



The screenshot shows the "User Name" page of the iBMC interface. It has fields for User Name, Password, and Domain (set to "This iBMC"). A note below states: "Select a domain name if you want to log in by using an LDAP domain account." A prominent blue "Log In" button is at the bottom.

Software Upgrade

- Before logging in to the iMana Web, you can view the firmware versions of the iMana and BIOS on the login page. After logging in to the iMana Web, you can choose System Information > Firmware Versions and view the firmware versions.

Summary Information

Device Name (TYPE): Tecal BH620
Device Serial Number: 030LQF109C001427
Product Serial Number: 030LQF109C001427
Product Asset Tag:
PCB Version: .C
iMana Firmware Version: (U1137)2.15
BIOS Firmware Version: (U1178)V037
System Status: OK
Device Status: Power On

User Login | Summary

Device Name: Tecal RH2288H V2-12L
Device Serial Number: kkkkkkkk
Product Asset Tag:
iMana Version: (U1029)6.05
BIOS Version: (U102)V379
System Status: OK
Device Status: Power On

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iMana Web

System Information 1
- System Status
- FRU Data
- Temperature Monitoring
- Hard Disk Monitoring
- Mainboard Information
Firmware Version Query 2
Main Board
PCB Version .C
Board ID 3 Oxaa00
iMana Firmware Version (U1137)2.15
CPLD Version (U1155)012
FPGA Version (U0075)012
BIOS Firmware Version (U1178)V037
Uboot Version U-Boot 1.2.0.7 (Dec 25 2009 - 22:50:43)
Component Infomation

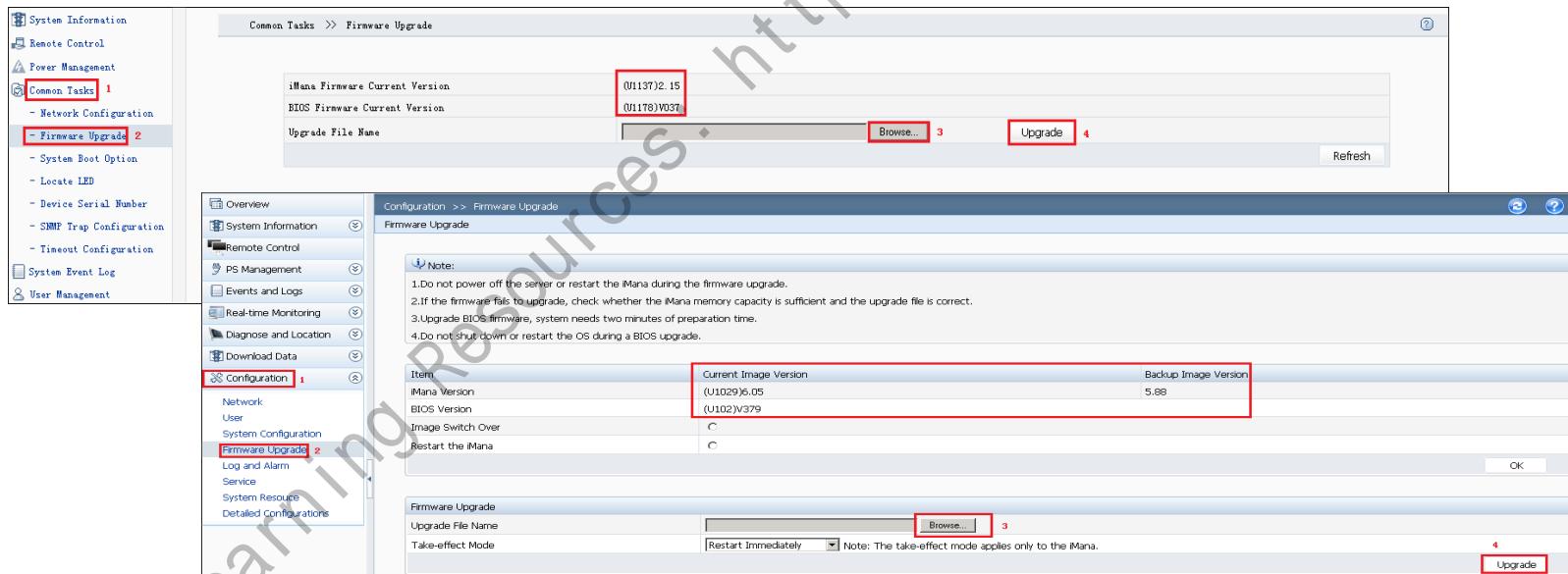
iMana 200
Tecal RH2288H V2-12L

Overview
System Information 1
Firmware Version 2
Asset Information
System Hardware
Remote Control
PS Management
Events and Logs
Real-time Monitoring
Diagnose and Location
Download Data
Configuration

System Information >> Firmware Version >> Mainboard
Mainboard 3
Mainboard
iMana Version (U1029)6.05
CPLD Version (U1005)007
FPGA Version (U1011)029
BIOS Version (U102)V379
Uboot Version U-Boot 1.3.9 (Dec 9 2013 - 15:27:10)-SPEAR310
PCB Version .B
Board ID Oxaa09
Board Name BC11SRSG
Device Serial Number kkkkkkkk

Software Upgrade

- You can upgrade the iMana/BIOS firmware on the GUI as follows:
 - Log in to the iMana Web UI. Choose Common Tasks > Firmware Upgrade for R1 series and Configuration > Firmware Upgrade for V2 series.
 - Browse the firmware upgrade package and then click Upgrade.
- Note: The upgrade of the iMana firmware does not require system reset. However, both the active and standby iMana firmware images must be upgraded. The upgrade of BIOS firmware requires system reset.



Software Upgrade

- On the menu bar, choose **System**. In the navigation tree, choose **Firmware Upgrade**.

The **Firmware Upgrade** page is displayed.

The screenshot shows the 'Firmware Upgrade' page with the following details:

Firmware Version Info

- Primary Partition Image Version: 5.30
- Backup Partition Image Version: 5.30
- Image Switchover
- Restart iBMC

BIOS Version: V019 CPLD Version: 1.04

Firmware Upgrade

1. Select Target Version:
Input field for target version, a 'Browse' button, and a 'Start Update' button.
2. Select iBMC Boot Mode Used After the iBMC Firmware of the Target Version Is Uploaded: The setting is effective only for the iBMC and SD Raid upgrade.
 Immediately restart automatically
3. Start Upgrade: Do not power off or restart the iBMC during the upgrade. Before the upgrade, check that the memory capacity is sufficient.
Upgrade Progress: 0%

Software Upgrade

- You can view the iBMC/iMana/BIOS firmware version using the CLI as follows:
- ipmcget -d version (the command output is as follows:)

```
root@BMC:/#ipmcget -d version
IPMC CPU: SPEAr310
IPMI Version: 2.0
FPGA Version: (U8)027
CPLD Version: (U13)021
BIOS Version: (U10)V170
Active iMana Version: (U48)5.97
Active iMana Built: 15:18:45 Apr 11 2014
Backup iMana Version: 5.97
Driver Version: 1.00
Driver Built: 15:19:02 Apr 11 2014
Uboot Version: U-Boot 1.3.5 (May 24 2012 - 10:48:52)-SPEAr310
Mainboard BoardID: 0xaa04
Mainboard PCB: .A
RAID CARD BoardID: 0xaa21
RAID CARD PCB: .B
IPMB Address: 0x84
```

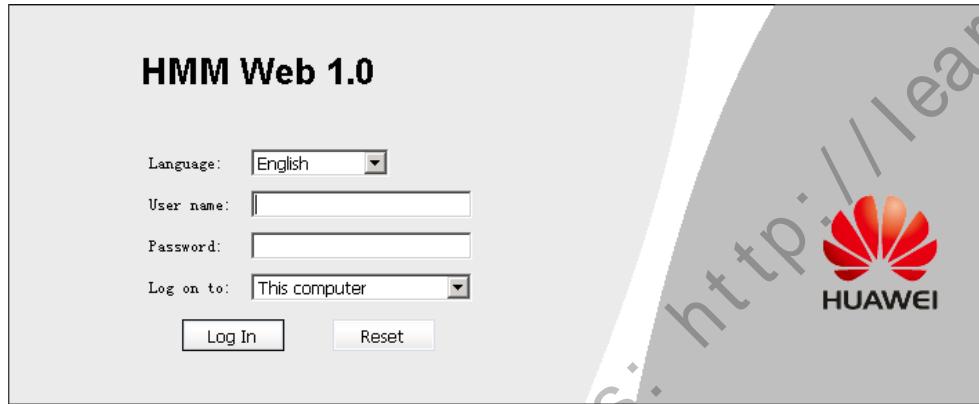
Software Upgrade

- You can upgrade the iBMC/iMana/BIOS firmware on the CLI as follows:
 1. Use the SSH client to upload the upgrade package to the /tmp directory of the iBMC/iMana.
 2. Log in to the iBMC/iMana using the SSH client and run the commands in the following table to perform the upgrade.
- **Note:** The upgrade of the iBMC/iMana firmware does not require system reset. However, both the active and standby iBMC/iMana firmware images must be upgraded. The upgrade of BIOS firmware requires system reset.

Server Series	Firmware	Command	Remark
R1	iMana	ipmcset -d upgrade -v /tmp/image.tar.gz	After being promoted during the upgrade, enter 0 to perform the complete upgrade.
	BIOS	ipmcset -d upgrade -v /tmp/bios.tar.gz	Do not reset the server during the upgrade. Reset the server after the upgrade is complete.
V2 and V3	iMana/iBMC	ipmcset -d upgrade -v /tmp/image.hpm 1	The digit 1 at the end of the command indicates the automatic reset of the iMana/iBMC after the upgrade, and does not take effect for the upgrade of the BIOS firmware.
	BIOS	ipmcset -d upgrade -v /tmp/biosimage.hpm	Do not reset the server during the upgrade. Reset the server after the upgrade is complete.

Software Upgrade

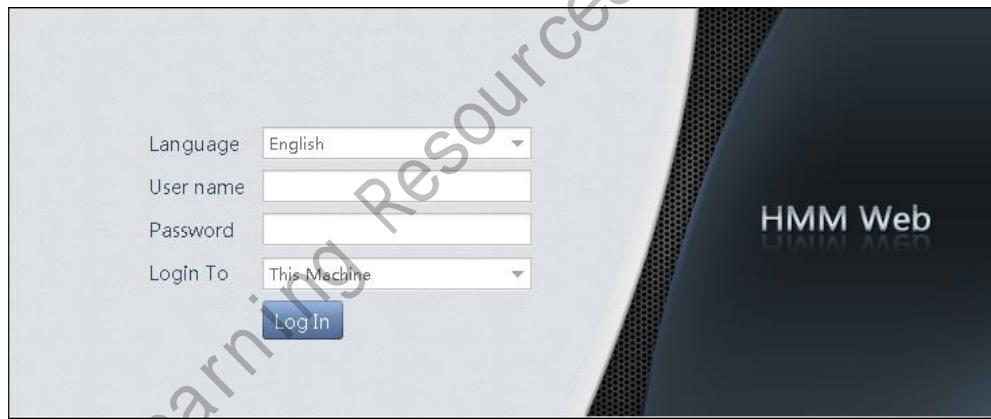
- To upgrade the SMM firmware (MM620/MM910) of blade servers using the GUI, log in to the HMM Web. The following figures show the login pages.



The login page for HMM Web 1.0 features a title bar with the text "HMM Web 1.0". Below it is a large gray area containing a redHuawei logo and the word "HUAWEI". On the left side of this gray area, there is a form with the following fields:

- Language: English (dropdown menu)
- User name: (text input field)
- Password: (text input field)
- Log on to: This computer (dropdown menu)

At the bottom of the form are two buttons: "Log In" and "Reset".



The login page for HMM Web features a title bar with the text "HMM Web". Below it is a dark blue area with a textured pattern. On the left side of this dark blue area, there is a form with the following fields:

- Language: English (dropdown menu)
- User name: (text input field)
- Password: (text input field)
- Login To: This Machine (dropdown menu)

At the bottom of the form is a single "Log In" button.

Software Upgrade

- You can upgrade the firmware of the SMM module (MM620) of a blade server on the GUI as follows:
 - Log in to the HMM Web of the standby MM620 and choose System Management > Firmware Upgrade.
 - Click Browser to select the saved MM620 firmware upgrade package.
 - Click Upgrade to perform the upgrade. After the upgrade is complete, the system prompts you to determine whether to reset the MM module. Select Yes to reset the MM module.
 - Log in to the HMM Web of the standby MM620 and choose System Management > Firmware Upgrade. Check the firmware version to determine whether the upgrade succeeds.
 - Upgrade the active MM620 by referring to the preceding steps.



Software Upgrade

- You can upgrade the firmware of the SMM module (MM910) of a blade server on the GUI as follows:
 1. Log in to the HMM Web of the standby MM910 and choose System Management > Firmware Upgrade > MM.
 2. Click View to view the BIOS firmware version. If the value of BOM Version is equal to or greater than 002, you cannot roll the MM910 firmware back to OSCA V100R001C00SPC150 and earlier versions.
 3. Select the MM module whose firmware is to be upgraded. Click Browser to select the saved CPLD upgrade package.
 4. Click Upgrade to perform the CPLD upgrade. After the upgrade is complete, click OK in the displayed dialog box to restart the MM910 (If both the CPLD and firmware need to be upgraded, click Cancel and reset the MM910 after the firmware is upgraded).

Software Upgrade

- You can upgrade the firmware of the MM module (MM910) of a blade server on the GUI as follows:
 5. Repeat steps 1 through 4 to upgrade the ManagementApp package for the MM910.
 6. Log in to the standby MM910 and run the `cd /tmp/updateflag/` and `ls -l` commands.
If the command output is empty, the data has been synchronized between both MM910 workspaces.
 7. Upgrade the active MM910 by referring to the preceding stepsFor the upgrade of other firmware, refer to the E9000 MM910 Management Module Upgrade Guide

Software Upgrade

- MM910 upgrade GUI for MM

The screenshot shows the HMM Web interface for managing software upgrades. The top navigation bar includes links for Chassis Information, Chassis Settings, Stateless Computing, PSUs&Fans, Alarm Monitoring, and System Management (which is highlighted with a red box). The left sidebar contains links for Log Information, System Logs, Operation Logs, Account Management, User Domain Management, MM User Management, Node User Management, Login Users, LDAP, System Settings, Security Policy, Timezone & NTP, Alarm Email Settings, Firmware upgrade (highlighted with a red box), and MM (highlighted with a red box). The main content area is titled "System Management>Firmware upgrade>MM". It contains the following information:

- Instructions:
 - You can upgrade the firmware, CPLD, and online help.
 - The total capacity of the /tmp directory to which an upgrade file is uploaded is 262144(KB). The available capacity is 261656(KB). To ensure a successful upgrade, it is recommended that the available capacity be at least 2.5 times the size of the upgrade file.
 - After the firmware and CPLD are successfully upgraded, restart the MM for the upgrade to take effect.
 - Do not refresh the page or close the web browser during an upgrade.
 - The MM with an asterisk (*) is the MM to which you have uploaded the upgrade file.
- Upgrade File input field (highlighted with a red box) and "Browse..." button (highlighted with a red box).
- "Upgrade" button (highlighted with a red box) and "Refresh" button.
- Component status table:

Component Name	Component Type	IPMI Module Build	Version	CPLD Version	Progress	Operation
MM1(Active)*	IPMI	2014-08-28 17:18:08	(U54)2.56	(U1082)103 131211	0%	OK

Software Upgrade

- To view the SMM version on the CLI, run the following command:

```
smmget -l smm -d version
SMM Version Information:
Uboot Version: (U54)012
CPLD Version: (U1082)008 121120
PCB Version: SMMA REV B
FPGA Version: (U1049)007 121116
Software Version: (U54)2.0
IPMI Module Built: Mar 14 2013 22:31:44
```

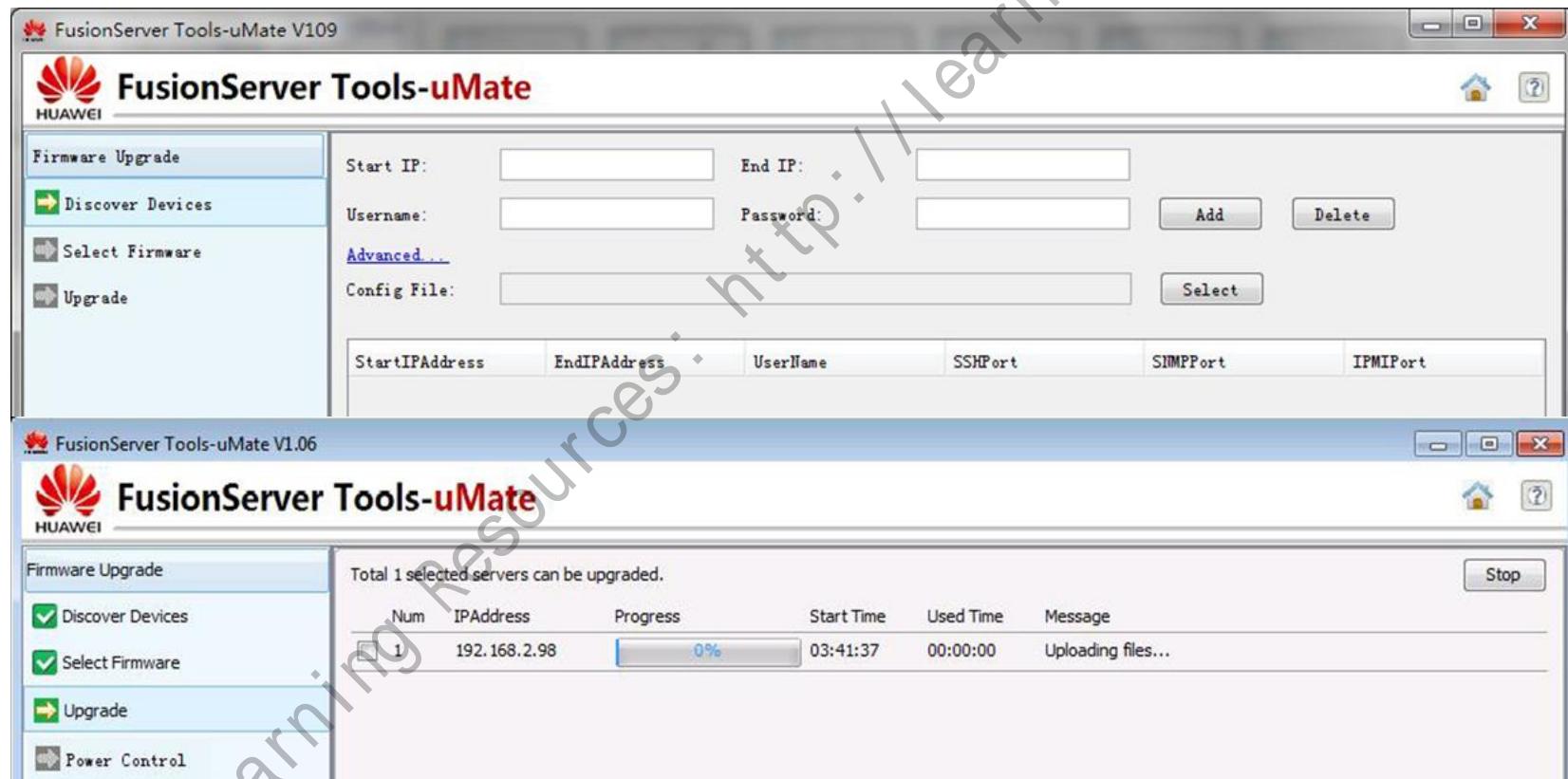
Software Upgrade

- You can upgrade the firmware of the SMM module on a blade server using the static IP address of the SMM module as follows:
 1. Use the SSH client to upload the upgrade package to the /tmp directory of the standby SMM module.
 2. Log in to the standby SMM using the SSH client and run the commands in the following table to perform the upgrade.
 3. Upgrade the active SMM by repeating the preceding steps. For the upgrade of other firmware, refer to the E9000 MM910 Management Module Upgrade Guide

Server Series	Firmware	Command
MM610	BC01SMMA.ulimage ppc.bz mm_fpga.rbf	update BC01SMMA.ulimage update ppc.bz update mm_fpga.rbf reboot
MM620	ASUP.tar.gz	upgradeall ASUP.tar.gz reboot
MM910	MM910-CPLD-Vxxx.hpm MM910-ManageApp-Vxxx.hpm	smmset -l smm -d firmwareupdate -v MM910-CPLD-Vxxx.hpm smmset -l smm -d firmwareupdate -v MM910-ManageApp-Vxxx.hpm reboot cd /tmp/updateflag/ ls -l // If nothing is displayed, synchronization between two workspaces is complete.

Software Upgrade

- To upgrade the iBMC/iMana/BIOS firmware in batches, use the Fusion upgrade tools-uMate. The following figure shows the upgrade interface of the Fusion upgrade tools-uMate.





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1. Routine Maintenance for Servers

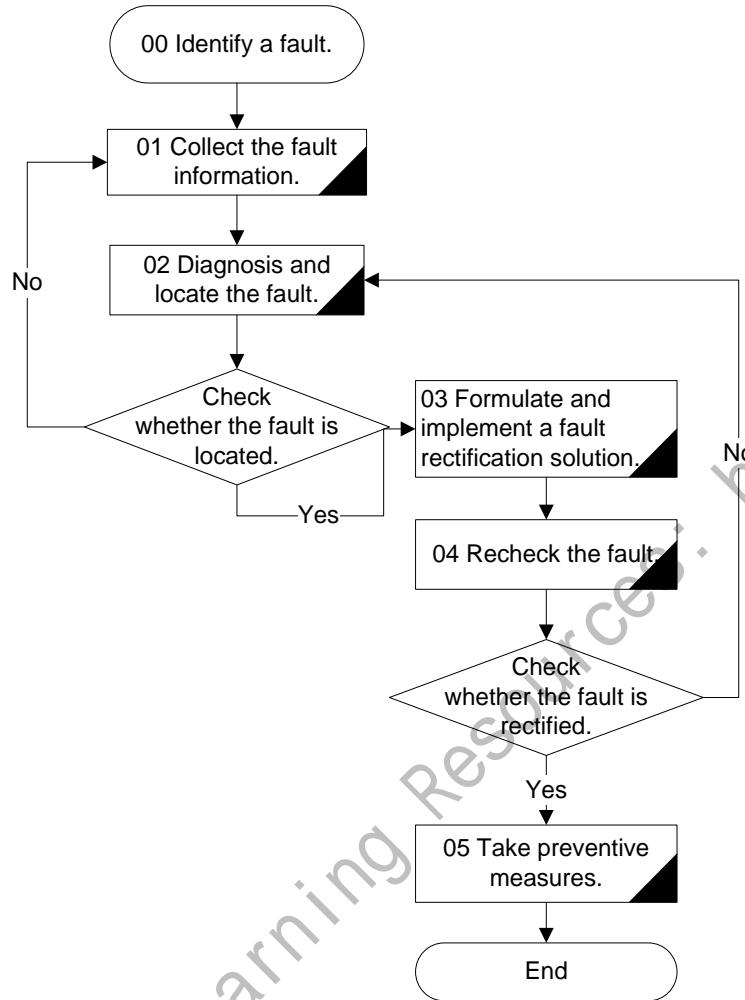
- 1.1 Maintenance Preparations
- 1.2 Routine Inspections
- 1.3 Software Upgrade

2. Server Troubleshooting

2.2 Fault Diagnosis Procedures

- 2.2 Fault Information Collection Methods
- 2.3 Troubleshooting Methods
- 2.4 Component Replacement Procedures and Precautions
- 2.5 Typical Cases
- 2.6 Support Channels

Troubleshooting Process



Step	Description
00	Identify an abnormal device status or function when using or inspecting a device.
01	Collect all information that helps diagnose and locate the fault.
02	Analyze the collected information using reference documents or tools and find out the root cause of the fault based on the fault locating method.
03	Formulate and implement a fault rectification solution based on related processes and specifications.
04	Check the device status and function to determine whether the fault is rectified.
05	Take preventive measures to prevent the same fault from recurring.

Requirements on Troubleshooting Personnel

Troubleshooting personnel must be familiar with:

- Hardware architecture
- Alarm indication signals (AISs) on the front and rear panels
- OS running on the device
- Conditions for normal running of the device
- Device operations
- Method of removing and installing devices and components
- Method of upgrading device software
- Service processes



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2.3 Troubleshooting Methods

2.4 Component Replacement Procedures and Precautions

2.5 Typical Cases

2.6 Support Channels

Collecting Fault Information — Categories

- If a server becomes faulty, collect the following information for fault diagnosis:
 - **Basic fault information** (including the basic information about the customer, NE configuration, and fault symptoms)
 - **Server hardware logs** (using the iMana or MM to collect information about server hardware) for system fault diagnosis.
 - **Service-layer logs** (including OS and service software logs) for the analysis of software-level issues.

Remarks: Information-sensitive countries and cyber-security redline countries need to stick by the sending scope of logs.

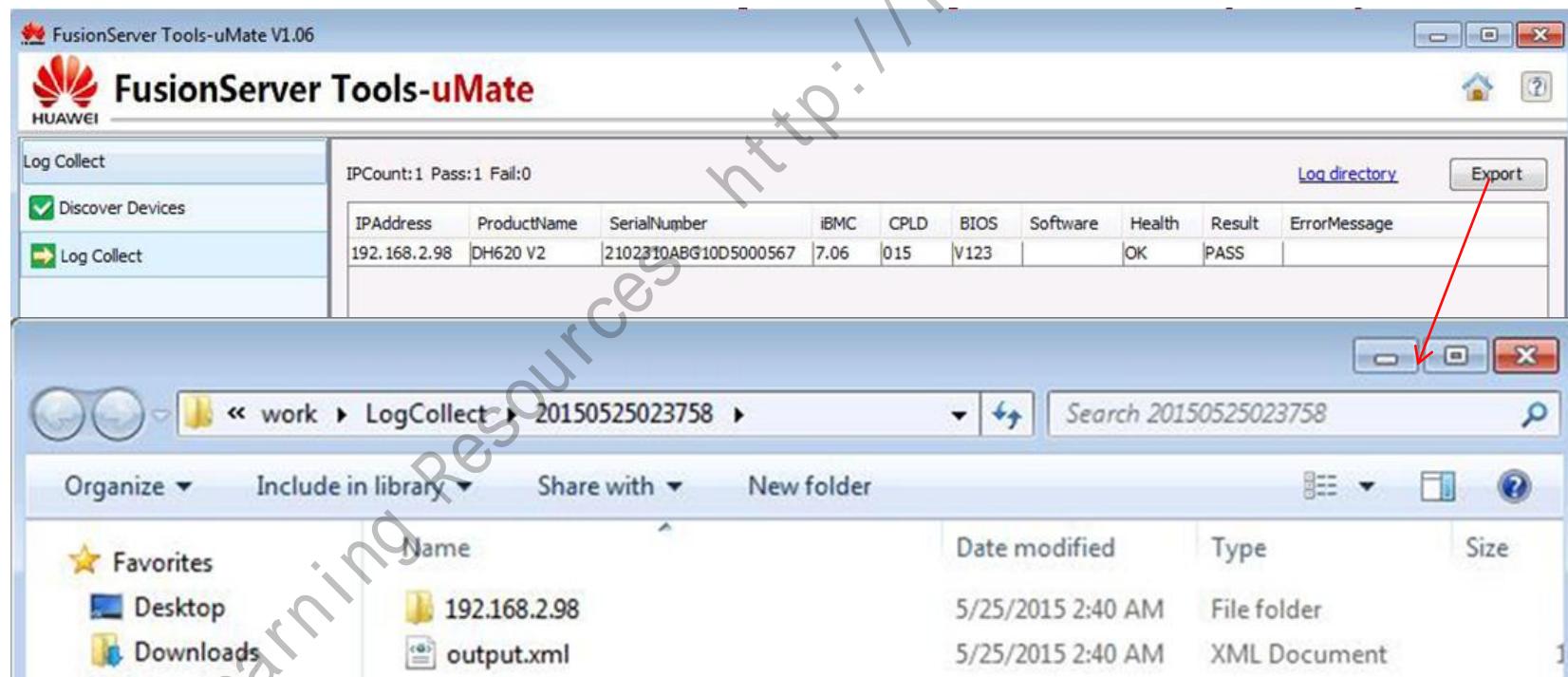
Collecting Fault Information — Basic Fault Information

- The following table is a template for collecting basic server fault information.

Basic Server Fault Information			
Trouble Ticket No.	123456	Receiving Time	YYYY-MM-DD HH:MM:SS
Customer	xxx	Address	xx County/Town/Street, xx City, xx Province
Name	xxx	Contact	Telephone number/Email address
Device Model	RH2285 V2	ESN	2102310XXXXX
Hardware Configuration	CPU, DIMM, RAID controller card, and NIC models	OS and Service Software Version	SLES 11 SP1 64-bit, Oracle 10U2
Fault Occurrence Time	YYYY-MM-DD HH:MM:SS		
Symptom	<i>The system automatically restarts during the installation.</i>		
Operation Before the Fault Occurs	<i>Changed the BIOS hardware dongle.</i>		
Operation After the Fault Occurs and Result	<i>Removed and installed the power cable, and the fault persisted. Replaced the CD-ROM, and the fault persisted. ...</i>		

Collecting Fault Information — Server Hardware Logs

- Use the log collection function of uMate to collect iBMC and MM log information:
 - Using the GUI or the CLI
 - In the Windows or Linux OS

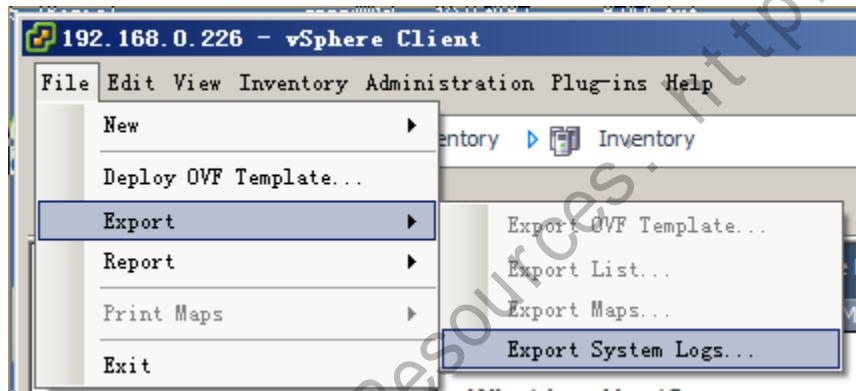


Collecting Fault Information — Service-layer Logs

- Use the log collection function of InfoCollect in Windows or in Linux to collect system log information at the service layer.
- To collect VMware host logs, run the **vm-support** command on the host CLI to generate a log package, as shown in the following figure. Then transfer the log package using WinSCP.

```
~ # vm-support  
12:10:25: Creating /var/tmp/esx-localhost-2013-12-30--12.10.tgz
```

- Or connect the client to an ESXi server, choose **File > Export > Export System Logs**. Click **Next**. Select a save path, click **Next**, and click **Finish**.



- Collect the kernel version and files in **var/log/** for an Ubuntu or Solaris host.
- Use an official tool to collect QLogic host bus adapter (HBA) logs.
- Use an official tool to collect Emulex HBA logs.



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2.5 Support Channels

Fault Locating Rules

- Obtain customers' authorization before performing any operation.
- Before performing any operation, ensure that service data will not be lost or has been backed up.
- From whole to part
 - Check the running environment and network where the device is located.
- From simple to complex
 - Start from simple operation, for example, remove and install a hard disk rather than remove the hard disk backplane.

Fault Locating Methods

- Analyze the collected information.
- Use fault diagnosis tools.
- Refer to fault locating cases.
- Use fault locating methods:
 - Minimum system method
 - Exchange for comparison
 - Adding or decreasing components
- Contact Huawei TAC for help

Alarm Handling

- References
 - Download alarm reference documents from the [Huawei server information self-service platform](#).
 - Clear alarms according to the alarm help.

Product Documentation:

Rack Server product documentation

RH1288A V2 & RH2288A V2:

RH1288A V2 User Guide, RH2288A V2 User Guide, Huawei Servers Troubleshooting

Romley Platform BIOS Parameter Reference, RAID Card User Guide, Server OS Installation Guide, ServiceCD User Guide

Rack Server iBMC User Guide, Rack Server Alarm Handling (iBMC)

Rack Server Communication Matrix (iBMC)

(V2) RH1288 & RH2285 & RH2288 &

RH2285H & RH2288H & RH2288E &

RH2485:

RH1288 V2 User Guide, RH2285 V2 User Guide, RH2288 V2 User Guide, RH2285H V2 User Guide, RH2288H V2 User Guide

RH2288E V2 User Guide, RH2485 V2 User Guide

Huawei Servers Troubleshooting, Romley Platform BIOS Parameter Reference, RAID card User Guide

Server OS Installation Guide, ServiceCD User Guide

iMana User Guide, Rack Server Alarm Handling (iMana)

RH5885 V2:

RH5885 V2 User Guide (4S), RH5885 V2 User Guide (8S), Huawei Servers Troubleshooting

RH5885 V2 Alarm Reference (4S), RH5885 V2 Alarm Reference (8S)

RH5885 V2 iMana Web Alarm Reference, RH5885 V2 iMana User Guide (8S), RH5885 V2 iMana User Guide (4S)

RH5885 BIOS Default Configuration Reference, RAID card User Guide, Server OS Installation Guide, ServiceCD User Guide

(V3) RH1288 & RH2288 & RH2288H:

RH1288 V3 User Guide, RH2288 V3 User Guide, RH2288H V3 User Guide, RH2288H V3 LCD User Guide

Granley platform BIOS Parameter Reference, RAID card User Guide, Huawei Servers Troubleshooting

Server OS Installation Guide, ServiceCD User Guide

Rack Server iBMC User Guide, Rack Server Alarm Handling, and Rack Server Communication Matrix (iBMC)

5288 V3:

5288 V3 User Guide, Huawei Servers Troubleshooting

Granley Platform BIOS Parameter Reference, RAID card User Guide

Alarm Processing

- Alarm syntax

A standard alarm consists of five fields, which are separated by commas (,). The content of each field is a string after each colon (:). The alarm fields are described as follows:

- Time

Time when an alarm is generated, for example, **Time: Thu Apr 3 10:06:04 2009**.

- Sensor

Name of the sensor where an alarm that generates an alarm, for example, **Sensor: Power Temp.**

- Event

Details about an alarm, for example, **Event: high temperature**.

- Assertion

Severity of an alarm, for example, **Assertion: Minor**.

- Event Code

Event code that corresponds to an alarm, for example, **Event Code: 0X010700**.

Alarm Processing

The following is a trap message example:

Time: Thu Apr 3 10:06:04 2008, Sensor: Power Temp, Event: high temperature,
Assertion: Minor, Event Code: 0X010700

The preceding information shows an original alarm identified by keywords. Different network management software displays alarm information in different syntax. For details, see network management software documents.

Error Code Processing

- If a fault occurs in server hardware, an error code is displayed on the fault diagnosis LED on the front panel of a server. This slide describes how to rectify faults if an error code is displayed.
- **Procedure**
 - View the error code on the fault diagnosis LED. For details about the error code, see the table below.
 - Log in to the iBMC WebUI of the server, and locate the alarm corresponding to the error code.
 - Rectify the fault according to alarm handling suggestions.
 - After the fault is rectified, check that the error code disappears on the fault diagnosis LED.

Module	Error Code	Fault Description	Solution
-	--	The server is operating properly.	-
CPU	C01	CPU 1 is abnormal or faulty.	<ul style="list-style-type: none">• ALM-0701FFFF Critical Alarm for CPU Temperature (Thermal Trip) (CPUN Status)• ALM-0700FFFF CAT Error Detected in the x86 OS (CPUN Status)• ALM-0702FFFF CPU Initialization Failed (FRB1/BIST) (CPUN Status)• ALM-0705FFFF Configuration Error for other rack servers (CPUN Status)
	C02	CPU 2 is abnormal or faulty.	<ul style="list-style-type: none">• ALM-0701FFFF Critical Alarm for CPU Temperature (Thermal Trip) (CPUN Status)• ALM-0700FFFF CAT Error Detected in the x86 OS (CPUN Status)• ALM-0702FFFF CPU Initialization Failed (FRB1/BIST) (CPUN Status)• ALM-0705FFFF Configuration Error for other rack servers (CPUN Status)

Log Analysis

- Pay attention to the log information generated before and after fault occurrence time.
- Pay attention to the difference between the system time and the local time.
- Search for the keywords such as Fail and Error.

```
- 1e4 | 2015/03/26 Thu 16:18:44 | Memory (DIMM031) | Configuration error | Deasserted
- 1e3 | 2015/03/26 Thu 16:18:44 | Memory (DIMM021) | Configuration error | Deasserted
- 1e2 | 2015/03/26 Thu 16:18:44 | Slot / Connector #0xf3 | Slot is disabled, #5 | Deasserted
- 1e1 | 2015/03/26 Thu 16:18:44 | Slot / Connector #0xf3 | Slot is disabled, #4 | Deasserted
- 1e0 | 2015/03/26 Thu 16:18:44 | Slot / Connector #0xf3 | Slot is disabled, #3 | Deasserted
```

```
- 10a | 2015/03/23 Mon 15:34:37 | Drive Slot (DISK3) | In Failed Array | Deasserted
- 109 | 2015/03/23 Mon 15:34:26 | Drive Slot (DISK3) | In Failed Array | Asserted - Major
- 108 | 2015/03/23 Mon 15:34:07 | Drive Slot (DISK3) | Hard disk presence | Deasserted
- 107 | 2015/03/23 Mon 15:25:25 | Drive Slot (DISK3) | Hard disk drive fault | Deasserted
- 106 | 2015/03/23 Mon 15:17:43 | Drive Slot (DISK3) | Hard disk drive fault | Asserted - Major
- 105 | 2015/03/23 Mon 15:14:09 | Drive Slot (DISK2) | Hard disk drive fault | Deasserted
```

Expert Diagnosis System of x86 Servers

- The expert diagnosis system of x86 servers is integrated into the BMC management software, in which the log collection and expert analysis processes are simplified to error handling suggestions.

The screenshot shows a web-based interface titled "Diagnose and Location >> Fault Diagnosing". It displays three separate fault entries, each in a table format:

Fault Time	Fault Description
2014-06-07 10:55:49	Error Diagnose: CPU1 fault is doubted as source of this IERR. Error Handling Suggestion: 1. Please shut down system and check this CPU and its socket carefully; 2. Change its socket and power on system again; 3. If IERR still occur and follow with this CPU, then its fault could be confirmed, Please replace it with new one.
2014-06-07 10:55:49	Fault Module: CPU1.CBo/LLC 0 Fault Level: IERR Fault Info: MCACODE:0x110a (Generic cache Level-2 Generic error) MSCODE:0x000c(TOR_TIMEOUT) Fault Description: CPU1 CBo/LLC 0 report IERR error.
2014-06-07 10:55:49	Fault Module: CPU1.Core0.MLC Fault Level: IERR Fault Info: MCACODE:0x0400 (Internal Timer Error) MSCODE:0x0080(MLC Watchdog timer (3-strike) error) Fault Description: CPU1 Core0 MLC report IERR error.

FTK

- **FusionServer Tools Toolkit** (FTK) mainly provides the following functions:
 - Incorporates a Linux bootROM system to provide common system commands for use in the offline state.
 - Supports automatic diagnosis by providing comprehensive hardware health diagnosis and configuration verification.
 - Prints hardware configuration information.
 - Provides CPU, hard disk, and memory tests.
 - Supports RAID configuration on one or more servers at a time.
 - Creates a bootable USB flash drive for easy O&M.

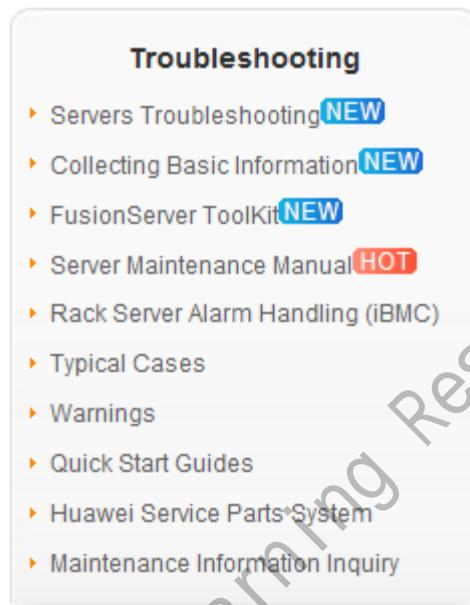
FTK

```
+-----+
|          Huawei FusionServer Tools
|          Toolkit V101
+-----+
1. Auto Diagnose
2. Display Hardware Information
3. Hardware Inspect
4. CPU Test
5. Memory Test
6. HardDisk Test
7. RAID Card Log collect
8. Make Bootable USB Disk
s. Save Result To USB Disk
c. Command Line
R/r . Reboot
P/p . Poweroff
+-----+
Fri Feb  6 16:43:45 CST 2015
+-----+
Please input your choice:4
CPU check select,this takes at least 5 minutes!!!
Please input the test time(minutes):5
cpu use %0
current free is %100
stress: info: [17093] dispatching hogs: 24 cpu, 0 io, 0 vm, 0 hdd
stress: info: [17093] successful run completed in 300s
cpu test .....Pass
Press any key to continue ... █
```

Consulting Troubleshooting Cases

- Common faults probably occur repeatedly. Find out similar troubleshooting cases to help locate and rectify faults.
- For rare faults that are difficult to locate, you can search them in the knowledge base.

[Huawei Server Information Self-Service Platform](#)



[Support > Knowledge Base > IT > FusionServer](#)

The screenshot shows a search interface for "Rack Server" with the following filters:

- Fault Type: All
- Scenarios: All, Troubleshooting Case, Technical Consulting
- Level: All, Typical Cases

Results table:

Sort By:	Date ↓	Rating ↑	Views ↑
All the fans report the faulty status at the same time for RH2288H V2 server	2015/12/13		
RH2285H V2 VMware ESXi 5.5 Purple Screen Error - Hardware Error	2015/11/25		
the target host does not support the virtual machine's current hardware requirements	2015/11/24		
ESXi hosts disconnect from vCenter from time to time and not more be able to manage	2015/11/24		
How to open performance priority for RH2288H-v3 server	2015/11/23		
Event:CAT error detected in the x86 OS, Severity:Assertion Critical, Event	2015/10/20		

Fault Locating Methods

- Minimum system method:
 - Retain the minimum system configuration for system running.
 - Remove all components extended by the user.
 - Add only one component at a time.

Fault Locating Methods

- Exchange for comparison
 - Check whether devices and components in the same batch have the same fault.
 - Check whether a component runs normally on other devices.
 - Check whether an OS and software runs normally on other devices with the same configuration.
 - Check whether a component runs normally in other slots of the same device.

Fault Locating Methods

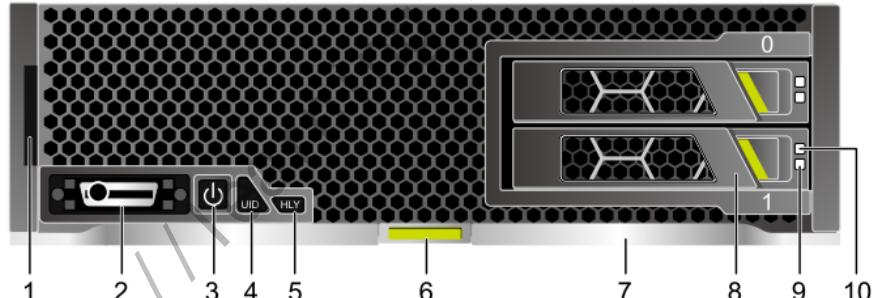
- Adding or decreasing components
 - Use the minimum system method + additional components to locate the faulty component.
 - Decrease components gradually to filter out normal components.

Small But Significant Peripherals

- During fault locating, peripherals such as keyboards, videos, and mice (KVMs) are easily neglected. The KVM of poor quality may cause a server to run abnormally or failed to be powered on.



Indicators on a Compute Node

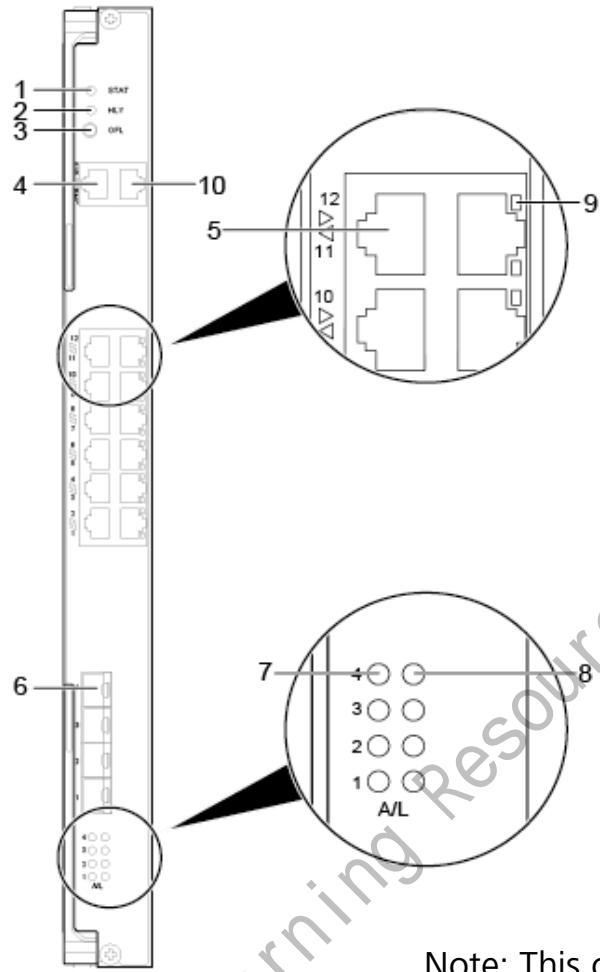


- | | |
|------------------------------|------------------------------|
| 1 Label | 2 High-density port |
| 3 Power button/indicator | 4 UID button/indicator |
| 5 Health indicator | 6 Spring |
| 7 Ejector lever | 8 Hard disk |
| 9 Hard disk active indicator | 10 Hard disk fault indicator |

Status Descriptions for Indicators on a Compute Node

Identifier	Description	Color	Status Description
PWR	Power button/indicator	Yellow and green	<ul style="list-style-type: none">Off: The compute node is not powered on.Blinking yellow: The power supply is locked, and the compute node cannot be powered on. Typically, the power supply for a compute node is unlocked automatically after the iMana on the compute node detects that the compute node is properly installed and communicates with the MM910. The iMana detection takes about 2 minutes.Steady yellow: The compute node is to be powered on.Steady green: The compute node is powered on. <p>Note: You can hold down the power button for 6 seconds to power off the compute node.</p>
UID	UID button/indicator	Blue	<p>The unit identification (UID) indicator is used to locate a compute node in a rack. You can press the UID button manually or by remotely running a command on the MM910 CLI.</p> <ul style="list-style-type: none">Off: The compute node is not located.On: The compute node is located. <p>Note: You can hold down the UID button on a compute node panel for 6 seconds to reset iMana.</p>
HLY	Health indicator	Red and green	<ul style="list-style-type: none">Off: The compute node is not powered on.Steady green: The compute node is operating properly.Blinking red at 1 Hz: A major alarm is generated for the compute node.Blinking red at 4 Hz: A critical alarm is generated for the compute node.Blinking red at 5 Hz: The compute node is not properly installed. <p>Tip: It is difficult to distinguish the blinking frequencies of 4 Hz and 5 Hz. When the indicator is quickly blinking red, you are advised to check whether a compute node is properly installed and then whether an alarm is generated.</p>
	Hard disk active indicator	Green	<ul style="list-style-type: none">Off: The hard disk is not detected or is faulty.Blinking green: Data is being read from or written to the hard disk, or synchronized between hard disks.Steady green: The hard disk is inactive.
	Hard disk fault indicator	Yellow	<ul style="list-style-type: none">Off: The hard disk is operating properly or hard disks cannot be detected in the RAID group.Blinking yellow: The hard disk is located, or the RAID group is being rebuilt.Steady yellow: The hard disk is not detected or is faulty.

Indicators on a Switch Module



- | | |
|---|---|
| 1 Stacking status indicator | 2 Health indicator |
| 3 OFL button/indicator | 4 BMC serial port |
| 5 GE electrical port | 6 10GE optical port |
| 7 Data transmission status indicator for the 10GE optical port | 8 Connectivity status indicator for the 10GE optical port |
| 9 Data transmission status indicator for the GE electrical port | 10 SYS serial port |

Note: This course uses the CX110 switch module as an example.

Status Description for Indicators on a Switch Module

Identifier	Description	Color	Status Description
STAT	Stacking status indicator	Green	<ul style="list-style-type: none">Off: The switch module is not powered on.Blinking green (the first 10 times): The switch module is being powered on.Blinking green: The switch module is standby in stacking mode and is operating properly.Steady green: The switch module is active in stacking mode, or is not stacked and is operating properly.
HLY	Health indicator	Red and green	<ul style="list-style-type: none">Off: The switch module is not powered on.Steady green: The switch module is operating properly.Blinking red at 1 Hz: A major alarm is generated.Blinking red at 4 Hz: A critical alarm is generated.Blinking red at 5 Hz: The switch module is not installed properly. <p>Note: It is difficult to distinguish the blinking frequencies of 4 Hz and 5 Hz. When the indicator is quickly blinking red, you are advised to check whether a compute node is properly installed and then whether an alarm is generated.</p>
OFL	OFL button/indicator (reserved)	N/A	N/A
	Data transmission status indicator for the GE electrical port	Amber	<ul style="list-style-type: none">Off: The port is not connected or not properly connected.Blinking amber: Data is being transmitted or received over the port.Steady amber: The port is connected properly.
A	Data transmission status indicator for the 10GE optical port	Amber	<ul style="list-style-type: none">Off: No data is being transmitted.Blinking amber: Data is being transmitted or received over the port.
L	Connectivity status indicator for the 10GE optical port	Green	<ul style="list-style-type: none">Off: The port is not connected or not properly connected.Steady green: The port is connected properly.

Indicator on a PSU



Status
indicator

Color/Status	Description
Steady yellow	The PSU is operating properly.
Blinking green at 0.5 Hz	The PSU is in the hibernation state
Steady red	The PSU is faulty.
Off	No power is supplied.

Indicator for a Fan Module



Status indicator

Color/Status	Description
Steady green	The fan module is operating properly.
Blinking green	The fan module requests activation.
Steady/Blinking red	The fan module is not operating properly.
Off	The fan module is not powered on.



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- 2.5 Typical Cases
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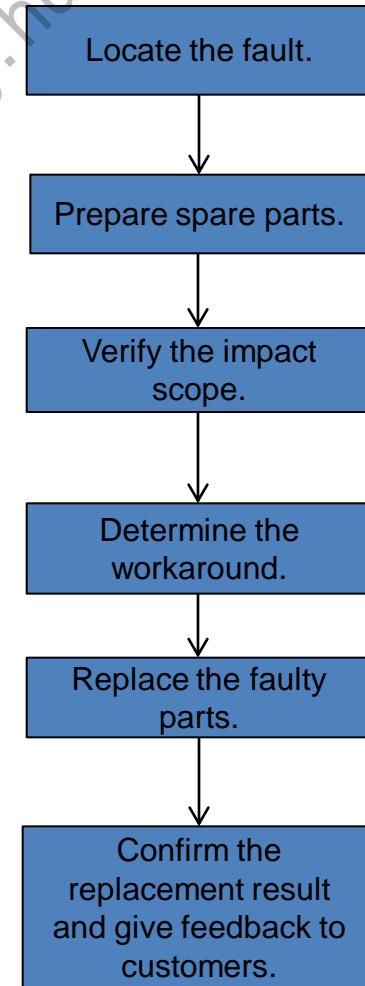
Process and Precautions for Server Parts Replacement

The server parts to be replaced in route maintenance are as follows:

- CPU/DIMM/hard disk
- Mainboard
- PSU backplane/PSU
- RAID controller card (storage controller)
- RAID controller card battery (capacitor)
- Fan module
- Riser card
- PCIe expansion card
- Hard disk backplane
- SAS cable
- I/O module
- Switch module

Process and Precautions for Server Parts Replacement

- Precautions:
 - Take proper electrostatic discharge (ESD) measures.
 - Ensure that the cabinet is properly grounded.
 - Follow exactly the procedures to replace server parts.
 - Handle server parts gently.
 - Notify the customer to stop services and power off the server if needed, and obtain customer's official authorization before performing the replacement.



Process and Precautions for Server Parts Replacement

- When replacing server parts onsite, observe the following:
 - The service will be interrupted during the replacement of non-hot-swappable components. Obtain customer's official authorization before performing the replacement.
 - Wear ESD gloves for the replacement of components with PCBs.
 - Wear an ESD wrist for the replacement of CPUs. Do not wear ESD gloves.
 - Handle the CPU horizontally during replacement to prevent bending CPU socket pins.
 - Before replacing a mainboard, verify related software versions (especially iMana and BIOS versions) if customization information is involved. Ensure that the customization meets customers' requirements.

Process and Precautions for Server Parts Replacement

- Service authentication
 - Device serial number (SN)
- Spare parts application
 - BOM



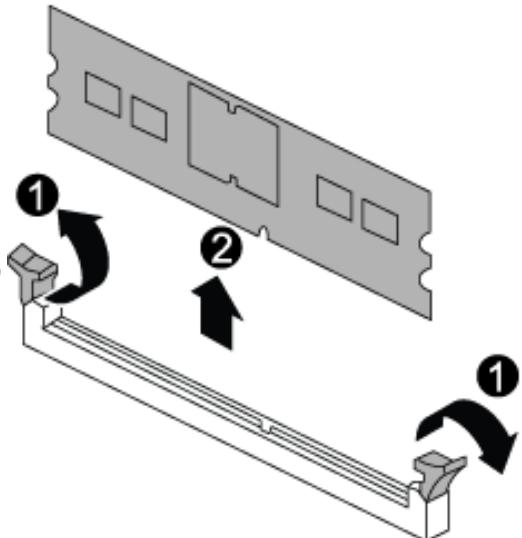
Replacing a DIMM

- Remove the DIMM.

- CAUTION:

- To avoid breaking the fixing clips or damaging the DIMM slots, open or move the clips gently.
 - When you open the two fixing clips of the DIMM at the same time, the DIMM is ejected slightly from the slot. Carefully open the fixing clips to avoid damaging the DIMM.

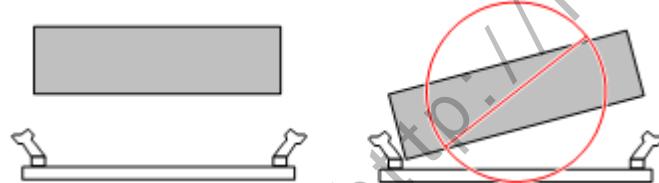
1. Open the two fixing clips gently at the same time to eject the DIMM from the slot.
2. Take the DIMM out of the slot carefully.



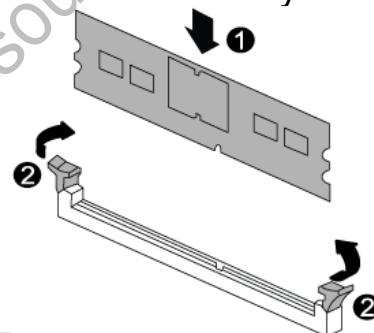
Replacing a DIMM

- Install the spare DIMM

1. Ensure that the two fixing clips of the DIMM connectors are fully open. Adjust the DIMM to align it with the DIMM slot.

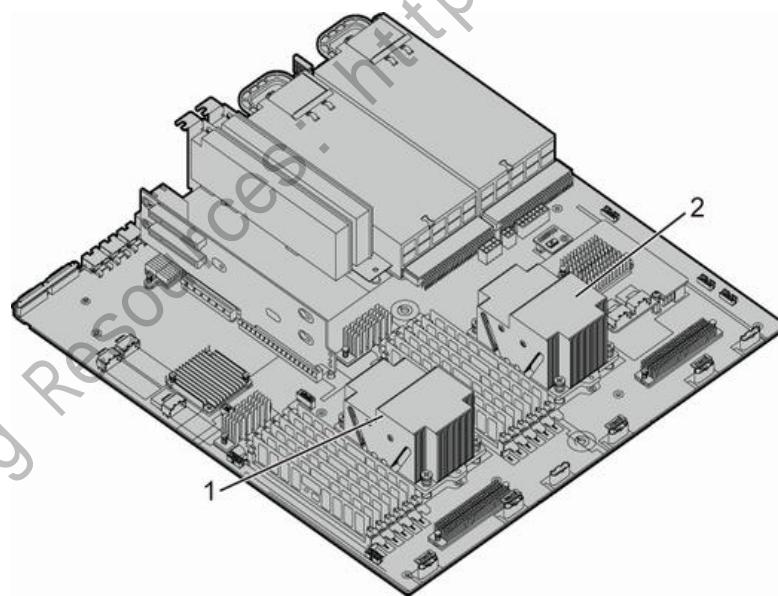


2. Insert the DIMM into the slot along the guide rails.
3. Insert the DIMM into the slot along the guide rails.
4. Ensure that the DIMM is secured by the fixing clips.



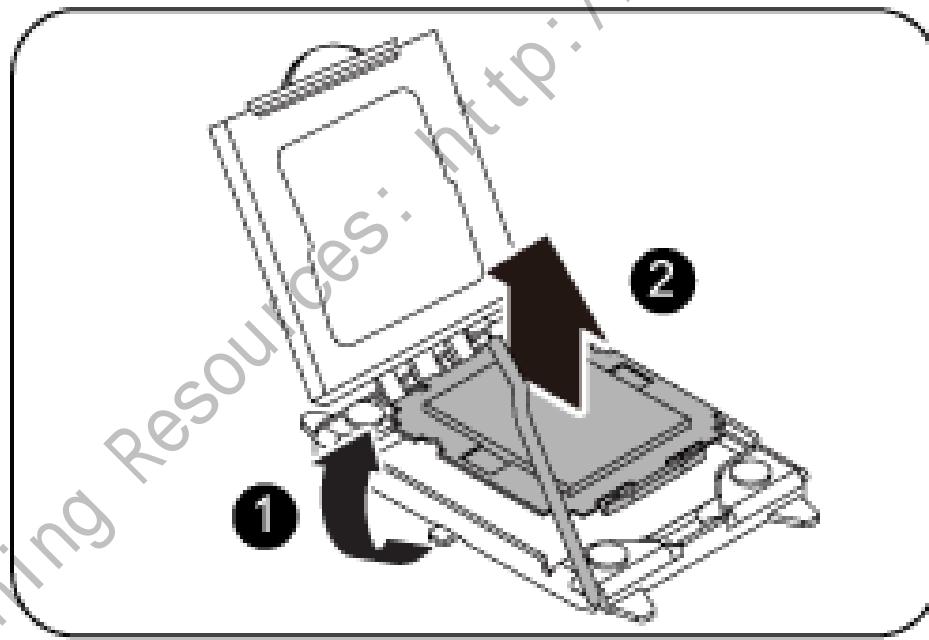
Replacing a CPU

- CAUTION:
 - Only personnel authorized by Huawei and Huawei technical support personnel can replace a CPU.
 - Do not wear gloves when replacing a CPU. The gloves may catch the pins on the bottom of the CPU, which may damage the CPU.



Replacing a CPU

- Remove the CPU
 1. Release the CPU securing rod by moving it in the direction away from the CPU socket until the securing rod is fully open.
 2. Pull the CPU upwards out of the socket.

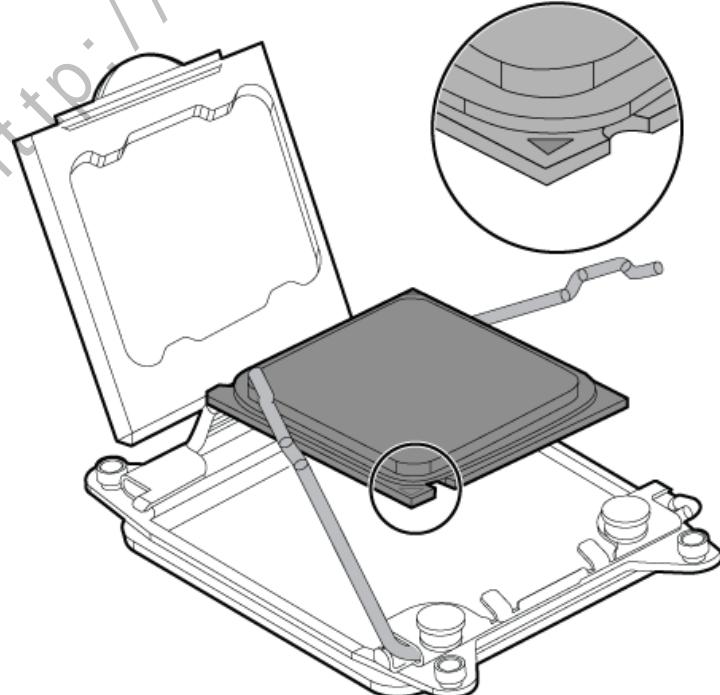


Replacing a CPU

- Install a CPU
 1. Place the CPU downwards in the socket.
 2. Close the securing rod to secure the CPU in the socket.

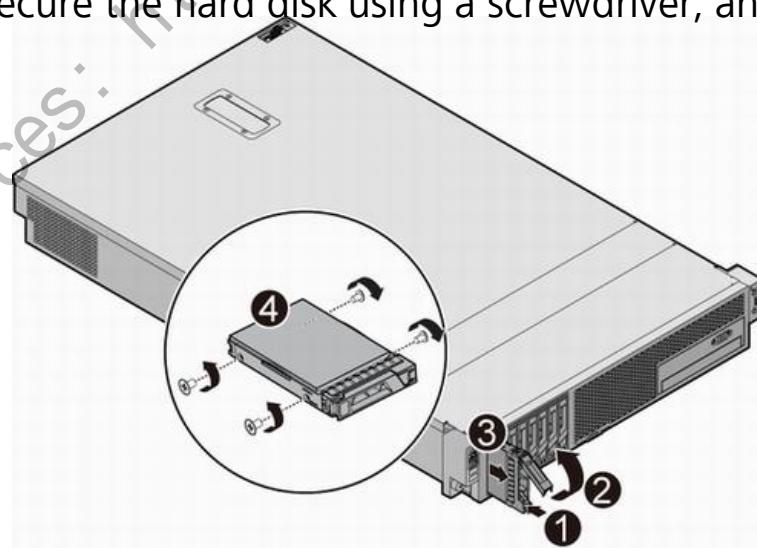
CAUTION:

Ensure that the bottom of the CPU faces the socket and the small hole on the CPU is aligned with the projecting point on the socket.



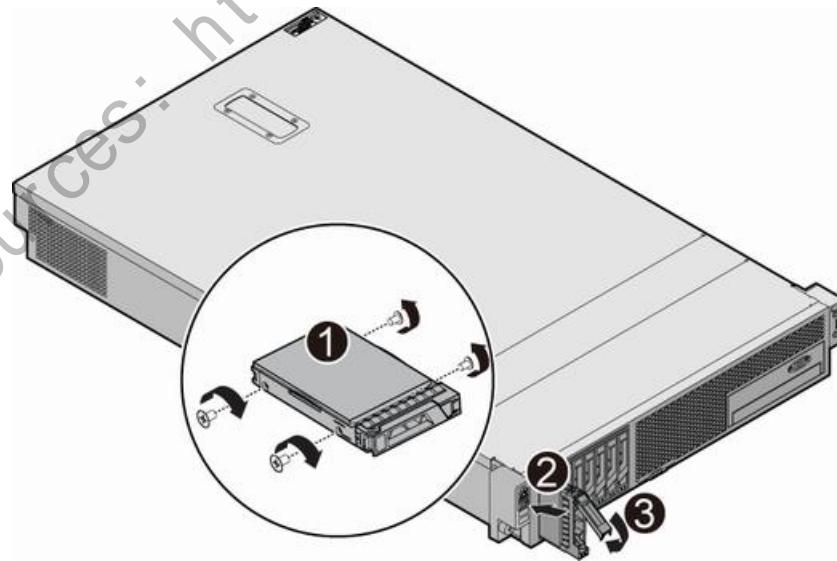
Replacing a Hard Disk

- Remove a hard disk
 1. Press the button on the hard disk panel to open the handle.
 2. Fully open the handle, and pull out the hard disk 3 cm away from the slot to make the hard disk offline. Wait at least 30 seconds till the hard disk stops operating. Then remove the HDD from the slot.
 3. Loosen the screws that secure the hard disk using a screwdriver, and remove the hard disk.



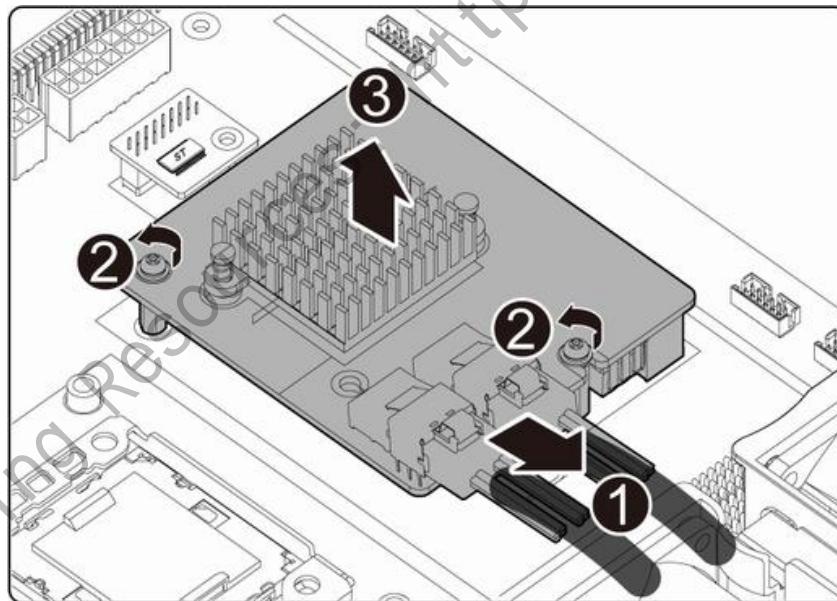
Replacing a Hard Disk

- Install a hard disk
 1. Place the hard disk in the hard disk tray, and tighten the screws to secure the hard disk.
 2. Open the handle and push the HDD in along the guide rails until it does not move.
 3. Ensure that the handle is fastened to the beam, and close the handle to completely insert the HDD into the slot.
 4. After verifying hard disk status, enable RAID or configure RAID properties based on actual service requirements.



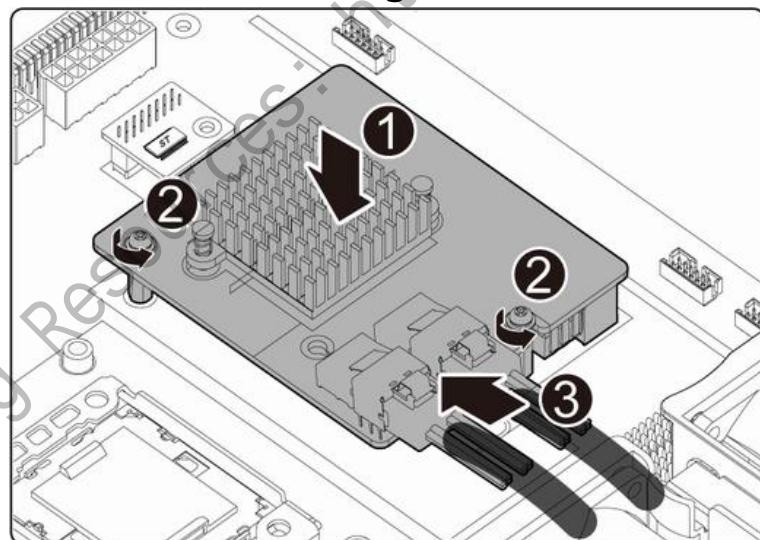
Replacing a Storage Controller Card

- Remove the storage controller card
 1. Remove the cable from the storage controller card.
 2. Loosen the screws that secure the storage controller card.
 3. Lift the storage controller card gently out of the slot.



Replacing a Storage Controller Card

- Install a storage controller card
 1. Align the ports on the storage controller card with the port on the mainboard, and insert the storage controller card gently into the port.
 2. Tighten the screws to secure the storage controller card.
 3. Connect the cable to the storage controller card.





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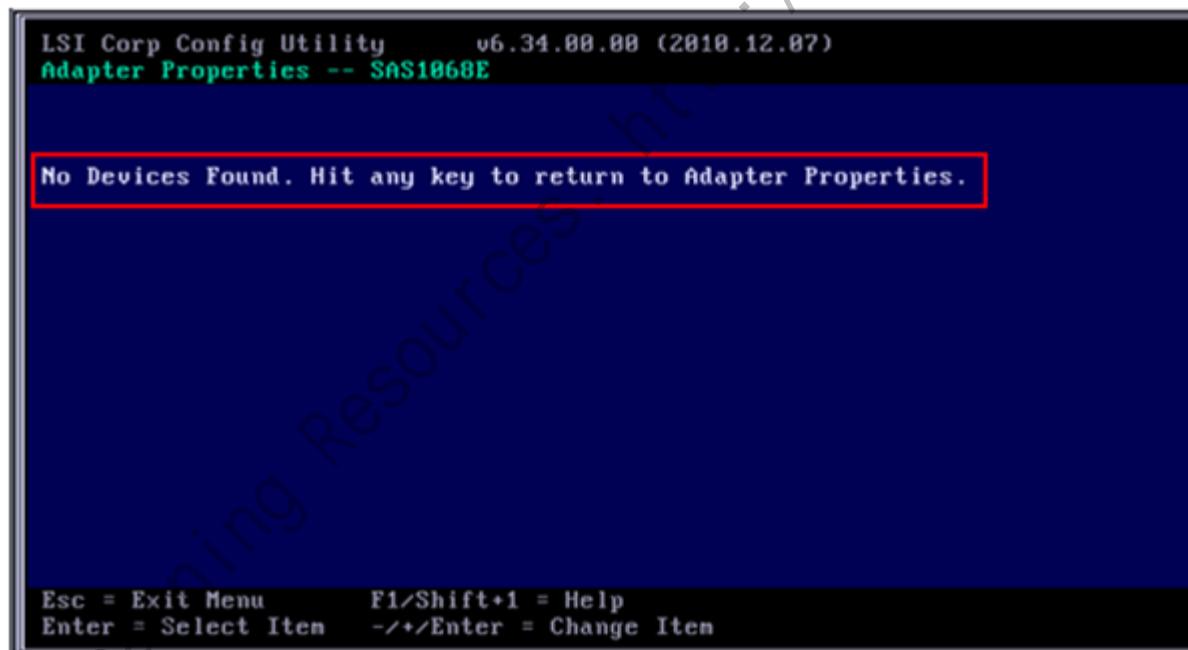
- 2.2 Fault Diagnosis Procedures
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Case 1: An RH2285 Server Cannot Detect Hard Disks

- Fault Symptom
 - Hardware configuration: an RH2285 server configured with 12 hard disks and a 1068E controller card
 - Fault symptom: After a user presses **Ctrl+C** during server startup to open the configuration screen of the 1068E controller card and attempts to view the SAS topology, the system displays the message "No Devices Found", as shown in the figure.



Case 1: An RH2285 Server Cannot Detect Hard Disks

- Alarm Information
None
- Troubleshooting Process
 1. Check that 12 hard disks are all properly installed and active indicators are green.
 2. Press the power button to power off the server, open the chassis cover, and check SAS cable connections to the RAID controller card.
 3. Remove and reconnect the SAS cables, power on the server, and open the RAID configuration screen. Information about the 12 hard disks is displayed in the SAS topology view.

Case 1: An RH2285 Server Cannot Detect Hard Disks

- Troubleshooting Process

LSI Corp Config Utility v6.24.00.00 (2008.07.01)		
SAS Topology -- SAS1068E		
Device Identifier		Device Info
C1068E(04:00)	PMC 8399	1 Enclosure
- Enclosure		
- Bay 0	RAID Physical Disk	SAS
- Bay 1	RAID Physical Disk	SAS
- Bay 2	SEAGATE ST3300657SS 0006	SAS
- Bay 4	RAID Physical Disk	SAS
- Bay 5	SEAGATE ST3300657SS 0006	SAS
- Bay 6	SEAGATE ST3300657SS 0006	SAS
- Bay 7	SEAGATE ST3300657SS 0006	SAS
- Bay 8	SEAGATE ST3300657SS 0006	SAS
- Bay 9	SEAGATE ST3300657SS 0006	SAS
- Bay 10	SEAGATE ST3300656SS 0006	SAS
- Bay 11	SEAGATE ST3300657SS 0006	SAS
- Bay 3	RAID Physical Disk	SAS
L IM VOL	LSTILOGICLogical Volume 3000	
L IM VOL	INACTIVE RAID VOLUME	RAID

Esc = Exit F1/Shift+1 = Help
Alt+D = Device Properties Alt+M = More Keys

- Root Cause

The SAS cables are in poor contact or incorrectly connected.

Case 2: An RH2285 Server Cannot Power On

- An RH2285 Is Powered On by Pressing the Power Button After Connected to AC Power Supplies

Symptom

After an RH2285 is connected to the AC power supplies, you must press the power button on the front panel to start the RH2285 if the RH2285 fails to start within a minute.

Cause Analysis

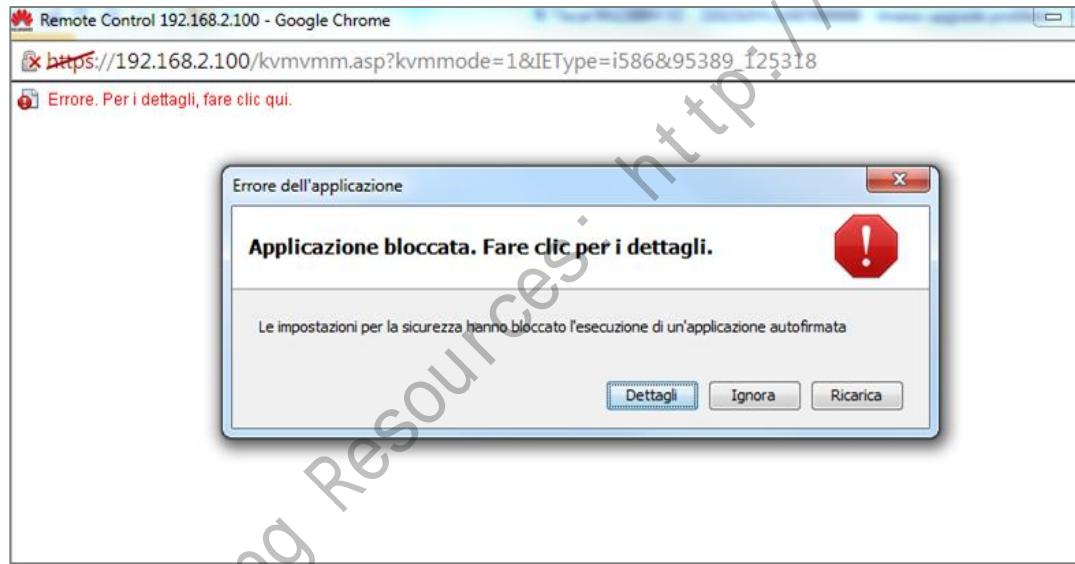
Restore on AC Power Loss in the basic input/output system (BIOS) is set to Power Off.

Solution

- After startup, hold down Delete to access the BIOS. Then move the cursor to Advanced, and press Enter.
- Move the cursor to IPMI 2.Configuration, and press Enter.
- Move the cursor to Restore on AC Power Loss and press Enter. Then move the cursor to Power On.
- Press F10 to save the settings and exit.

Case 3: The Remote Control Function Is Unavailable for an RH2288 Server

- Fault Symptom
 - The remote control screen cannot be opened on iMana of an RH2288 server. The error message shown in the following figure is displayed.



Case 4: An Error Occurs During Windows Installation on an RH2288H V2 Server

- Troubleshooting Process
 1. Check the Java version of the PC, and check whether the version is in the compatibility list.
 2. Change the Java security level to medium.
 3. Add the iMana address to the Java trusted zone. The fault is rectified.
- Root Cause
 - iMana (U1029) 6.00 or later has high security requirements. Before using the remote control function, add the iMana address to the Java trusted zone.

Case 4: An Error Occurs During Windows Installation on an RH2288H V2 Server

- Symptom
 - Windows Server 2008 32-bit Enterprise Edition needs to be installed on an RH2288H V2 server at a site.
 - Create two RAID arrays by using four hard disks on the server. The two 300 GB disks are used to create an RAID 1 array, and the two 600 GB disks are used to create a RAID 0 array.
 - After the RAID arrays are created, restart the server and insert the boot DVD into the DVD drive. Assign 100 GB to the primary partition of drive C, set a password, and insert the OS installation DVD. On the screen for selecting the partition where the OS is to be installed, the following error message is displayed:

The computer hardware may be unable to boot from the disk. Ensure that the disk controller is enabled in the computer BIOS.

Case 4: An Error Occurs During Windows Installation on an RH2288H V2 Server

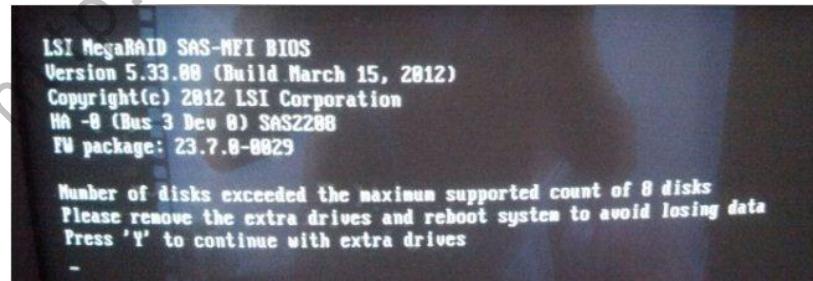
- Troubleshooting Process
 1. Press **Delete** upon server startup to access the BIOS setup menu. Choose **Advanced > IDE Configuration**, and change the value of **HDC Configure As** from **AHCI** to **RAID**.
 2. Press **Ctrl+C** upon server startup to access the configuration screen of the LSISAS2308 controller card on the server. Find the RAID array to be used as the first boot option in the SAS configuration and press **Alt+B**. When "BOOT" is displayed, save the setting and restart the server.
 3. Run the boot DVD, specify a RAID array as the first boot option, and install the OS by following the general process. The fault is rectified.
- Root Cause
 - Two RAID arrays are created on the server, but the RAID array to be used as the first boot option is not specified. As a result, the system cannot identify the RAID array where the OS is to be installed. The installation fails.

Case 5: A Self-Check Exception Occurs

A Self-Check Exception Occurs Due to Incorrectly Configured License Key for the LSI SAS2208 Card

Symptom

The RH2285 V2 Server is configured with 12 hard drives, and the LSI2208 card is configured with a license key for 8 hard drives. During the self-check at the startup of the operating system, a prompt that reads "Number of exceeded the maximum supported count of 8 disks" is displayed.



Cause Analysis

The server has been configured with 12 hard drives. However, the license key for the LSI2208 card supports only 8 hard drives. The LSI2208 card and the RH2285 V2 server do not match.

Solution

Use a RAID card that support 12 hard drives.

RAID Card	SR220	SR320	SR420	SR520	SR620
Hard drive backplane	8 hard drives	8 or 12 hard drives	24 hard drives	8 hard drives	

Case 6: Windows Server 2008 R2 Turns Off automatically

Windows Server 2008 R2 Turns Off One Hour Later After It is Turned On
Symptom

Windows Server 2008 R2 has been installed on the server. However, the operating system automatically turns off one hour after it is turned on.

Cause analysis

The Windows license monitoring service (WLMS) automatically starts upon system startup and monitors the license status. This service cannot be disabled. If the license expires, the system automatically turns off one hour later after it is turned on.

Solution

Use a valid license for
Windows Server 2008 R2.

Event ID	Date	Source	Category	Level
100	12/20/2011 2:54:13 PM	WLMS	None	Information
902	12/20/2011 2:54:13 PM	Security-SPP	None	Information
1003	12/20/2011 2:54:13 PM	Security-SPP	None	Information
1066	12/20/2011 2:54:13 PM	Security-SPP	None	Information
17136	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
17126	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
26037	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
8202	12/20/2011 2:54:12 PM	SRMSVC	None	Information
17201	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
26022	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
26022	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
26048	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information
26022	12/20/2011 2:54:12 PM	MSSQLSERVER	Server	Information

Event 100, WLMS

General | Details

The license period for this installation of Windows has expired. The operating system will shutdown every hour.

Case 7:System of SUSE Linux Enterprise 11 SP1 Crashes After Running for 208 Days

System of SUSE Linux Enterprise 11 SP1 Crashes After Running for 208 Days

Symptom

If the server has an Intel CPU and runs the operating system of SUSE Linux Enterprise 11 SP1 for about 208 days, the operating system randomly crashes.

Cause analysis

After the server runs SUSE Linux Enterprise 11 SP1 for about 208 days, the divide-by-zero error may be triggered, causing system crashes.

```
-----[ cut here ]-----  
WARNING: at /usr/src/packages/BUILD/kernel-default-2.6.32.29/linux-2.6.32/kernel/sched.c:3847 update_cpu_power+0x151/0x160()  
[...]  
Call Trace:  
[fffff810061dc] dump_trace+0x6c/0x2d0  
[fffff813974e8] dump_stack+0x69/0x71  
[fffff8104d754] warn_slowpath_common+0x74/0xd0  
[fffff8103d6e] update_cpu_power+0x151/0x160  
[fffff8103e323] find_busiest_group+0xa83/0xce0  
[fffff8104604d] load_balance_newidle+0xcd/0x380  
[fffff813982db] thread_return+0x2a7/0x34c  
[fffff813992fd] do_nanosleep+0xd/0xc0  
[fffff81068628] hrtimer_nanosleep+0xa/0x140  
[fffff81068730] sys_nanosleep+0x70/0x80  
[fffff81002f7b] system_call_fastpath+0x16/0x1b  
[00007f77d8469da0] 0x7f77d8469da0  
---[ end trace 63f382152a7c7034 ]---
```

PID: 24290 TASK: ffff880064340140 CPU: 0 COMMAND: "blkback.5.hda"
#0 [ffff880064b19910] crash_kexec at ffffff80071e20
#1 [ffff880064b199e0] oops_end at ffffff80353958
#2 [ffff880064b19a00] do_divide_error at ffffff8000886e
#3 [ffff880064b19aa0] divide_error at ffffff80007c05
#4 [ffff880064b19b28] find_busiest_group at ffffff800300f4
#5 [ffff880064b19cb8] load_balance_newidle at ffffff80036cda
#6 [ffff880064b19d38] thread_return at ffffff803500c1
#7 [ffff880064b19dc8] dm_table_unplug_all at ffffffa0424fec
#8 [ffff880064b19e48] blkif_schedule at ffffffa0537734
#9 [ffff880064b19ee8] kthread at ffffff80056816
#10 [ffff880064b19f48] kernel_thread at ffffff80007f0a

Solution

1. Workaround: Run the uptime command to view how long the operating system has been running. If the running time is longer than 208 days, manually restart the operating system.
2. Upgrade the kernel to 2.6.32.59 -0.7.1. (For servers included in various solutions, apply the workaround provided by the solution maintenance teams.)

Case 8: NIC Identified as Unknown Device

NIC Identified as Unknown Device

Symptom

In the Tecal RH2285 that runs SUSE Linux Enterprise 10 SP2, the NIC Intel 82580 is identified as an unknown device.

```
linux120:~# lspci |grep Ether
01:00.0 Ethernet controller: Broadcom Corporation NetXtreme II BCM5709 Gigabit Ethernet (rev 20)
01:00.1 Ethernet controller: Broadcom Corporation NetXtreme II BCM5709 Gigabit Ethernet (rev 20)
02:00.0 Ethernet controller: Intel Corporation Unknown device 150e (rev 01)
02:00.1 Ethernet controller: Intel Corporation Unknown device 150e (rev 01)
02:00.2 Ethernet controller: Intel Corporation Unknown device 150e (rev 01)
02:00.3 Ethernet controller: Intel Corporation Unknown device 150e (rev 01)
```

Cause analysis

1. The driver for Intel 82580 is not installed.
2. The pci.ids file of the Linux system is outdated.

Solution

1. For the first cause, run `lspci -n` to view the vendor ID and device ID of the unknown device, based on which you can determine the device model on <http://pci-ids.ucw.cz>. Then you can download the driver for the device model.
2. For the second cause, download the latest pci.ids file from <http://pci-ids.ucw.cz> and overwrite the original pci.ids file in the system.



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Support Channels

- You can contact us in any of the following ways:

No.	Document	Link
1	Huawei technical support	Enterprise BG (China): 4008229999 Enterprise BG (Global) TAC: http://e.huawei.com/en/service-hotline
2	Enterprise BG website	Product documentation http://support.huawei.com/enterprise Support > Product Support > IT > FusionServer
3	Self-service Platform	http://enterprise.huawei.com/topic/Self_service_server_en/knowledge.html
4	Forum	http://support.huawei.com/ecommunity/?l=en



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 - Partner E-Learning Courses: Any Huawei Partner Engineer have the learning privilege
- 2、Training Materials:
Logon <http://learning.huawei.com/en> and enter [Huawei Training/Classroom Training](#), then you can download training material in the specific training introduction page.
 - Huawei product training material and Huawei career certification training material are accessible without logon.
- 3、Huawei Online Open Class(LVC): <http://support.huawei.com/ecommerce/bbs/10154479.html>
 - The Huawei career certification training and product training covering all ICT technical domains like R&S, UGEC, Security, Storage and so on, which are conducted by Huawei professional instructors
- 4、Product Materials Download: <http://support.huawei.com/enterprise/#tabname=productsupport>
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