

# **Purley Platform 4U L-shaped Server**

# **User's Manual**

# V1.2





# Foreword

This manual is writing for the Purley dual-socket rack server. It mainly introduces the technical characteristics, system architecture, installation method and basic operation of this product. The Purley dual-socket server is divided into 1U4 bay, 1U10 bay, 2U8 bay, 2U12 bay, 2U25 bay, 4U24 bay, 4U36 bay various models, the product has the features of low energy consumption, flexible expansion, high reliability, easy management, easy deployment and so on.

This manual is intended for reference and research by professional system integrators and personal computer technicians, and this product should only be installed and maintained by experienced technicians.

#### Manual structure

#### **Chapter 1 Safety statement**

This chapter describes some environmental conditions that need to be paid attention to when using this product, precautions and a description of the laws and regulations related to this product.

#### **Chapter 2 Product introduction**

This chapter provides the specifications of the main components of the system and describes the main features of each model in the Purley L-shaped dual-socket rack server family.

#### **Chapter 3 Installing system components**

This chapter describes the usage of Purley, the installation method and main precautions of various main system components of the L-shaped dual-socket rack server.

#### **Chapter 4 System rack installation**

This chapter describes the use of Purley, the steps and precautions for installing the L-shaped two-socket rack server with the guide rails that come with it.

#### **Chapter 5 BIOS parameter setting instructions**

This chapter mainly introduces the parameter settings and main functions of the system BIOS.

#### **Chapter 6 RAID setup Instructions**

This chapter mainly introduces how to configure RAID.

#### **Chapter 7 IPMI deployment**

This chapter mainly describes how to quickly deploy IPMI.

# Statement

#### **Copyright statement**

©Shenzhen Gooxi Information Security Co., Ltd. All rights reserved.

This user manual, including but not limited to all the information contained in it, is protected by copyright law. Without the permission of Shenzhen Gooxi Information Security Co., Ltd. (hereinafter referred to as "Gooxi"), no imitation, copying or excerpting, redistribution, etc., or for other uses are allowed.

#### Disclaimer

Gooxi provides this user's manual in "status quo", and within the scope permitted by law, does not provide any express or implied warranties and guarantees, including but not limited to commercial marketability, suitability for specific purposes, non-infringement of any other person's rights and any usage of this manual or the inability to use this manual guarantees, and Gooxi does not guarantee the accuracy or reliability of the results obtained from the use of this manual or any information obtained through this user's manual.

Due to product version upgrades or other reasons, the contents of this user manual will be updated from time to time. Unless otherwise agreed, this user manual is only used as a guide, and the user should bear all the risks of using this user manual.

#### **Trademark statement**

Gooxi is a trademark of Shenzhen Gooxi Information Security Co., Ltd.

Intel and Xeon are trademarks of Intel Corporation in the United States and other countries.

Microsoft and Windows are trademarks of companies within the Microsoft group of companies.

Linux is a registered trademark of Linus Torvalds.

Aspeed is a trademark of ASPEED Technology Inc.

Other trademarks are the property of their respective owners.

#### Product name: Purley Platform L-shaped Dual-socket Server Barebones

Manual version: V1.0

Date of publication: June 2020

#### **Glossary:**

Noun	Meaning
Intel <sup>®</sup> Xeon <sup>®</sup>	
Scalable Processors	
Platinum Efficiency	Platinum Certified power supply is "80 PLUS Platinum" standard, that is, the
Power Supply	conversion rate of 20% load is above 90%, that of 50% load is more than 94%,
11 5	and that of 100% load is more than 91%
M.2	M. 2 interface is a new generation interface standard tailored for Ultrabook,
	which is Intel® pushed a new interface specification to replace mSATA
C621/C622	Intel <sup>®</sup> Chipset
RJ45	Standard 8-bay modular interface
AST2500	Aspeed <sup>®</sup> BMC Chip
Socket P	One of the Intel <sup>®</sup> processor interface types
-F CPU	Means support for Intel® Omni-Path Host Fabric CPU, Omni-Path high-speed optical cable interconnection technology,up to 100Gbps end-to-end interconnection
8038 Fan	Fan size: 80x 80x 38 mm
LGA3647	Land Grid Array, LGA3647 represents 3647 contactors
CR2032	3V CR2032 lithium manganese battery in the form of button
RS-232	One of the communication interfaces on computer. Asynchronous transmission standard interface, called COM interface
Jtag	Joint Test Action Group
NC Pin	No internal connection
XDP	Extend Debug Port

Abbreviation: The full English name and Chinese explanation of each abbreviation are provided as follows:

Abb.	English Name	Chinese Name
РСН	Platform Controller Hub	即之前统称的"南桥"
GbE	Gigabit Ethernet	千兆以太网
BMC	Baseboard Management Controller	基板管理控制器
IPMI	Intelligent Platform Management Interface	智能平台管理接口
CPU	Central Processing Unit	中央处理器
SATA	Serial Advanced Technology Attachment	串行 ATA 接口规范
SAS	Serial Attached SCSI	串行 SCSI
sSATA	secondary SATA	扩展 SATA 接口
LAN	Local Area Network	局域网
VGA	Video Graphics Array	视频传输标准
MB	Mother Board	主板
MIB	Motherboard Interface Board	主板转接板/侧板
BP	Backplane	背板
PCIE	Peripheral Component Interconnect Express	高速串行计算机扩展总线标准
USB	Universal Serial Bus	通用串行总线
FW	Firmware	固件
TPM	Trusted Platform Module	可信赖平台模块
ΙΟ	Input/Output	输入输出
BIOS	Basic Input-Output System	基本输入输出系统
CMOS	Complementary Metal Oxide Semiconductor	互补金属氧化物半导体

ME	Management Engine	管理引擎
DDR4	Double Data Rate 4 SDRAM	第四代双倍数据速率同步动态随机 存储器
DIMM	Dual-Inline-Memory-Modules	双列直插式存储模块
RDIMM	Registered DIMM	带寄存器的双线内存模块
LRDIMM	Load-Reduced DIMM	低负载 DIMM
AEP	Apache Pass	Intel <sup>®</sup> 傲腾 DDR4 内存代号
MEZZ CONN	Mezzanine Connector	夹层/扣卡
KVM	Keyboard Video Mouse	通过直接连接键盘、视频、鼠标端 口,能够访问和控制计算机
CPLD	Complex Programmable Logic Device	复杂可编程逻辑器件
ECC	Error Correcting Code	错误检查和纠正
CFM	Cubic Feet Per Minute	立方英尺每分钟
RPM	Revolution Per Minute	转每分

### **Conventions:**

Caution: It is used to deliver equipment or environmental safety warning messages. If it is not avoided, it may lead to equipment replacement, data loss, equipment performance degradation or other unpredictable results.

**Danger**: It is used to warn potential dangerous situations, which may lead to death or serious personal injury if unavoidable

**Red arrow:** point to a position

Blue arrow: action of pulling out or inserting downward or tilting in.

White arrow: represents the next action or result.

Dark blue rotation arrow 1: represents the action of turning the screw clockwise or pulling outward.

C Dark blue rotation arrow 2: represents the action of turning the screw counterclockwise or turning it inward

Manual	Release date	Modification
version		
V1.0	2020-June-10	Initial Release
V1.1	2021-June-1	Manual optimization
V1.2	2022-April-20	Manual optimization

# CONTENTS

CHAPTER 1 SAFETY STATEMENT	9
1.1 General safety matters	9
1.2 TOXIC AND HAZARDOUS SUBSTANCES OR ELEMENTS IN PRODUCTS	
1.3 WARNING	
1.4 CLIMATE AND ENVIRONMENTAL REQUIREMENTS	
1.5 OTHER IMPORTANT DESCRIPTIONS	12
CHAPTER 2 PRODUCT INTRODUCTION	
2.1 System introduction	
2.2 System configuration	
2.2.1 System parameters	
2.2.2 System architecture	
2.3 INTRODUCTION OF SYSTEM MODEL SPECIFICATIONS	
2.4.1 Front panel components	17
2.4.2 Rear panel components	20
2.4.3 Motherboard components	
2.4.4 HDD backplane components	
2.4.5 DIMM slot locations	29
2.4.6 Hard disk label	
2.4.7 Hard disk indicator	
2.4.8 System fan	
CHAPTER 3 INSTALLING SYSTEM COMPONENTS	
2.1 INSTALLATION OF COLL	22
2.2 INSTALLATION OF CPU	
2.2 MEMORY DISTALLATION	
2.2.1 Mamony masifications symparted	
3.3.2 How to install memory	
2.4 HARD DISK DISTALLATION	
2.5 EDON'T HADD DIGK DACKED AND DISTALLATION	
2.6 M 2 SSD INSTALLATION	
2.7 INSTALLATION OF DOLE EXPLANSION CADD	
2.8 DCIE MODULE DISTALLATION	
2.0 PEAD HADD DICK MODULE DACKDI AND DICTALLATION	
2.10 REAR HARD DISK MODULE BACKPLANE INSTALLATION.	
2 11 INSTALLATION OF DOWED MODULE	
2 12 INSTALLATION OF THE FAN MODULE	
2 12 INSTALLATION OF THE FAN MODULE	
2.14 INSTALLATION OF THE UDDED COVED OF THE CHASSIS	
5.14 INSTALLATION OF THE UPPER COVER OF THE CHASSIS	
CHAPTER 4 SYSTEM RACK INSTALLATION	51
4.1 INSTALLING THE INNER RAIL OF THE GUIDE RAIL	
4.2 INSTALLING THE OUTER RAILS TO THE RACK	
4.3 INSTALL THE SERVER TO THE RACK	53
CHAPTER 5 BIOS PARAMETER SETTING INSTRUCTIONS	
5.1 ENTER THE BIOS SETUP INTERFACE	

5.2 SETUP MENU PARAMETER DESCRIPTION	54
5.2.1 Navigation Key Description	54
5.2.2 Main menu description	
5.2.3 Advanced menu description	56
5.2.4 Trusted Computing	
5.2.5 Serial Port Console Redirection	59
5.2.6 Console Redirection Settings	60
5.2.7 SIO Configuration	
5.2.8 [*Active*] Serial Port	
5.2.9 Option ROM Dispatch Policy	63
5.2.10 PCI Subsystem Settings	65
5.2.11 CSM Configuration	66
5.2.12 NVMe Configuration	67
5.2.13 Network Stack Configuration	68
5.2.14 iSCSI Configuration	70
5.2.15 Platform Configuration menu	70
5.2.16 PCH SATA Configuration	71
5.2.17 PCH sSATA Configuration	72
5.2.18 USB Configuration	74
5.2.19 Miscellaneous Configuration	75
5.2.20 Server ME Configuration	76
5.2.21 Runtime Error Logging	76
5.2.22 Socket Configuration menu	77
5.2.23 Processor Configuration	78
5.2.24 Common RefCode Configuration	81
5.2.25 UPI Configuration	
5.2.26 Memory Configuration	
5.2.27 Memory Topology	
5.2.28 Memory Map	
5.2.29 Memory RAS Configuration	
5.2.30 Socket Configuration	90
5.2.31 Advanced Power Management Configuration	
5.2.32 CPU P State Control	94
5.2.33 Hardware PM State Control	
5.2.34 CPU C State Control	
5.2.35 Package C State Control	97
5.2.36 CPU-Advanced PM Tuning	
5.2.37 Energy Perf BIAS	
5.2.38 Server Mgmt Menu	
5.2.39 System Event Log menu	
5.2.40 BMC network configuration menu	
5.2.41 View System Event Log menu	
5.2.42 BMC User Setting	
5.2.43 Add User	
5.2.44 Delete User	
5.2.45 Change User Setting	
5.2.46 Security menu	
5.2.47 Boot menu	
5.2.48 Save & Exit menu	

5.3 USER OPERATION REMINDER	
CHAPTER 6 RAID SETUP INSTRUCTIONS	115
6.1 PCH CONFIGURING RAID	
6.1.1 Configuring RAID in UEFI Boot Mode	
6.1.3 Configuring RAID in Legacy Boot Mode	
6.2 RAID CARD CONFIGURING RAID	
6.2.1 Configuring RAID in UEFI Boot Mode	
6.2.2 Configuring RAID in Legacy Boot Mode	
CHAPTER 7 IPMI DEPLOYMENT	
7.1 Deployment of IPMI Process	
7.1.1 Make sure the motherboard supports the IPMI function	
7.1.2 Enter BIOS to set IPMI function	
7.1.3 IPMI interface configuration Static mode	
7.1.4 IPMI configuration Java SOL	
7.2 QUICK START INSTRUCTIONS FOR IPMI FUNCTIONS	
7.2.1 Enter the operation interface	197
7.2.2 Default Username and Password	
7.2.3 Contents of IPMI Management System	
7.2.4 Introduction to KVM Remote Management	
7.2.5 KVM page introduction	
7.2.6 Remote control shortcut operation	201
7.2.7 Introduction to SOL	
7.3 Other ways to connect to IPMI	203
7.3.1 IPMI driver	
7.3.2 IPMI tools and other open source software	

# **Chapter 1 Safety Statement**

### 1.1 General safety matters

#### In order to prevent the risks of personal and property losses, please follow the following suggestions.

Please do not open the cover plate of the system by yourself. It should be operated by professional trained maintenance technicians. The triangle mark with lightning symbol may have high voltage or electric shock. Please do not touch it.

Remember: disconnect all cables before carrying out maintenance (There may be more than one cable)

It is strictly forbidden to switch on the machine and other live operation before the cover plate is closed.

When it is necessary to open the cover, please wait for the internal equipment to cool down, otherwise you may be scalded.

Do not use this device in humid environment.

If the extension cable needs to be used, use a three wire cable and make sure it is properly grounded.

Make sure the computer is well grounded. It can be grounded in different ways, but it is required to be actually connected to the ground. If you are not sure whether the safe grounding protection has been provided, please contact the corresponding organization or electrician for confirmation. If you need cable routing, please contact Shenzhen Gooxi Information Security Co.,Ltd.

Please use three-core power cord and socket with grounding protection. Incorrect grounding may lead to electric leakage, burning, explosion and even personal injury.

Please make sure that the power socket and power interface in close contact. Loose contact may cause fire hazard.

Please use your computer under the AC voltage of 220V. if you work under the improper voltage, it will lead to electric shock, fire and damage to the computer.

The computer should be well ventilated and far away from heat source and fire source, and should not block the cooling fan, otherwise the computer may cause smoke, fire or other damage due to overheating.

If you smell or see the computer smoking, please turn off the computer immediately and unplug the power cord.

It is required that the power cord can be easily plugged in and out from the power supply and power socket. Please keep the power cord and plug clean and intact, otherwise there may be a risk of electric shock or fire.

Note: if the battery is not replaced properly, there will be explosion danger. Only the same or equivalent type of replacement recommended by the manufacturer is allowed. The waste battery will pollute the environment. Please deal with the replaced old battery according to the relevant instructions.

Keep the computer away from electromagnetic fields.

Keep away from the electronic noise caused by high-frequency equipment such as air conditioner, fan, motor, radio and TV transmitting tower.

Please do not plug the backplane or move the computer while the computer is running, otherwise the computer may crash or the components may be damaged.

Please avoid frequent restart or switch, in order to prolong the service life of the computer.

Please keep the environment clean and avoid dust. The working temperature of the equipment is 10 °C ~ 40 °C and

the humidity is  $35\% \sim 80\%$ .

Users are requested to back up important data in time. Shenzhen Gooxi Information Security Co., Ltd. is not responsible for data loss caused by any circumstances.

This product uses optical drive as class 1 laser equipment.



Figure 1-1 Class 1 Laser Equipment.

### **1.2 Toxic and hazardous substances or elements in products**

Within the 10-year environmental protection service life, the toxic and hazardous substances or elements contained in the product will not leak or mutate under normal use conditions, and the users will not cause severe pollution to the environment or serious damage to their personal and property.

Component	Hazardous Substances						
component	Pb	Hg	Cd	Cr VI	PBB	PBDE	
Chassis / Baffle	Х	0	Ο	0	0	О	
Mechanical components (fan, heat sink, motor, etc.)	Х	О	0	О	О	Ο	
Printed circuit components - PCA*	Х	О	0	О	Ο	0	
Cable / Wire / Connector	Х	0	0	0	0	0	
HDD	Х	0	0	0	0	0	

Table	1-	1
-------	----	---

	Harmful Substances					
Component	Pb	Hg	Cd	Cr VI	PBB	PBDE
Media read / Store device (CD, etc.)	Х	0	0	О	О	Ο
Power supply / adapter	Х	0	0	0	0	О
Power cord	Х	0	0	0	0	О
Pointing device (mouse, etc.)	Х	Ο	О	О	О	О
Keyboard	Х	0	0	0	0	О
UPS	Х	0	0	0	0	О
Complete rack / Rail	Х	Х	0	0	0	О

products			

Table 1-2

• means that the content of the toxic and harmful substance in all homogeneous materials of the component is below the limit specified in GB/T26572-2011 *Limit Requirements for Restricted Substances in Electronic and Electrical Products*.

× indicates that the content of the toxic and harmful substance in at least one homogeneous material of the component exceeds the limit requirements specified in GB/T26572-2011 *Limit Requirements for Restricted Substances in Electronic and Electrical Products*. However, it complies with the EU RoHS Directive (including its exemption provisions).

Note: the table shows the information of toxic and hazardous substances in all possible components of Gooxi server, storage and workstation products. Customers can refer to the status of toxic and hazardous substances in all components of the purchased products according to this table.

# 1.3 Warning

The product meets the EMC Class A standard.

### 1.4 Climate and environmental requirements

• The optimum working temperature of the equipment is 10°C - 40°C. The maximum indoor ambient temperature

of the equipment is 40°C.

• System battery 3V CR2032 lithium battery

Note: some configurations have been tested at 45°C and 90% (29°C max.dew point) humidity.

Temperature	
Working temperature	$10^{\circ}C{\sim}40^{\circ}C~(50^{\circ}F{\sim}104^{\circ}F)$ , the maximum temperature gradient is $10^{\circ}C$ per hour
Continuous operating temperature range (below 950m or 3117ft above sea level)	In the situation of no direct illumination, 10°C to 40°C (50°F to 104°F)
Storage temperature range	-40°C~65°C (-40°F~149°F)
Humidity	
Storage	The max. dew point is 33°C (91°F). The relative humidity is 5% to 95%. The air must not condense at all times.
Continuous operating humidity	The max. dew point is 26°C (78.8°F) The relative humidity is
percentage range	10% to 80%

Table 1-3

If the lightning protection facilities of the computer are poor or not available, please shut down the computer in thunderstorm weather and unplug the power line, network cable, telephone line, etc. connected with the computer.

- Please use the authorized operating system and software and configure them correctly. Shenzhen Gooxi
   Information Security Co., Ltd. is not responsible for server failure caused by operating system and software.
- Please do not disassemble the chassis, increase or decrease the hardware configuration of the server. Shenzhen
   Gooxi Information Security Co., Ltd. is not responsible for the hardware and data damage caused by this.
- When the server fails, please first check the "troubleshooting" section of this manual to determine and remove common faults. If you are not sure the cause of the failure, please contact the technical support department of Shenzhen Gooxi Information Security Co., Ltd. for help.
- Choosing a suitable environment for the computer is helpful for the stable operation and can prolong the life of the computer.
- Shenzhen Gooxi Information Security Co., Ltd. reserves the right of final interpretation of the above terms

### 1.5 Other important descriptions

( If the equipment is marked with a label, it means that the equipment with the label is only designed and evaluated as the altitude of 2000m. Therefore, it is only suitable for safe use below 2000m, and there may be potential safety hazards when it is used above 2000m.

If the equipment is marked with this mark, it means that the equipment with this mark is only designed and evaluated based on non tropical climate conditions. Therefore, it is only suitable for safe use in non tropical climate conditions, and there may be potential safety hazards when it is used in tropical climate conditions.



# **Chapter 2 Product Introduction**

### 2.1 System introduction

Purley 4U dual-socket L-shaped server is a new generation of 4U dual-socket rack-mounted server with a wide range of uses launched by Gooxi for the needs of the Internet, IDC (Internet Data Center), cloud computing, enterprise market and telecom business applications. It is suitable for IT core business, cloud computing virtualization, high performance computing, distributed storage, big data processing, enterprise or telecom business applications and other complex workloads. The server has the advantages of low energy consumption, strong scalability, high reliability, easy management, and easy deployment. This manual takes 2U as an example.

### 2.2 System configuration

Purley 4U dual-socket L-shaped server products including 4U 24 bay and 4U36 bay models, except for the hard disk connection method and the maximum number of compatible hard disks, other specifications are the same.

### 2.2.1 System parameters

	System			
Model	SL401-D24RE SL401-D36RE			
Chassis	Gooxi 4U Rack Chassis			
Motherboard	G3DCL-B			
CPU	1st and 2nd Gen. Intel® Xeon® Scalable Proce	essors, up to 205W		
	Support 24* DDR4 LRDIMM/RDIMM mem	nory, memory frequency supports		
Memory	2133/2400/2666/2933MHz, supports a single	e maximum capacity of 256G, and the whole		
	server system supports a maximum memory	capacity of 9TB		
	4 U 24 front supports 24* 3.5/2.5-inch hot-sw	vap hard drive bays		
Hard dials	4 U 36 front supports 24* 3.5/2.5-inch hot-sv	vap hard drive bays, rear supports 12*		
drive	3.5/2.5-inch hot-swap hard drive bays			
	Rear supports a maximum of 4* 3.5-inch hot-swap hard drives or 4* 2.5-inch hot-swap			
	hard drives or 8* 2.5-inch hot-swap hard drives			
PCIE				
expansion	Rear supports 6 single-width full-height + 4 single-width half-height			
specification				
Expansion slot	Supports up to 10 PCIE 3.0 expansion slots + 1 OCP 3.0			
LAN features	Support 2 RJ45 1Gigabit			
Management interface	1 RJ45 management LAN port			
Display	Aspeed <sup>®</sup> AST2500 64MB, 1 standard VGA p	ort extended by custom high-density		
function	connector			
M.2	Supports 2 M.2 ports (only NVME disks are	supported )		
USB	4 standard USB3.0 ports are extended by custom high-density connectors, and 1 built-in USB3.0			
Power	System supports 550W, 800W, 1200W, 1	1300W, 1600W, 2000W, 2200W hot-swap		
supply	redundant platinum efficiency power supplies (based on actual power)			

Fan	N+1 hot-swap redundant fans			
System size	799.2* 444* 176.5mm (L*W*H)			
	System board			
Motherboard	G3DCL-B			
model				
Processor	1st and 2nd Gen. Intel <sup>®</sup> Xeon <sup>®</sup> Scalable Processors			
Number of	Supports 24 DDR4 memory slots			
memory				
slots				
Type of	Supports DDR4 LRDIMM/RDIMM memory			
support	Memory frequency supports 2133/2400/2666/2933MHz			
Memory	Support single capacity of 8GB, 16GB, 32GB, 64GB, 128G, 256G			
size				
Hard disk	2 sSATA3.0 DOM, 3 MiniSAS 8643 ports			
interface				
	Supports IPMI 2.0 over network mapped virtual storage devices and KVM			
IPMI	Supports Aspeed <sup>®</sup> AST2500 BMC			
Network	Two Intel <sup>®</sup> I350-AM2 1GbE network interface			
card				
PCIE	2 PCIe 3.0 x 24; 1 PCIe 3.0 x 16; 2 Slimline x 8			
extension				
VGA	Extend a standard VGA port with custom high-density connectors			
USB	1 built-in USB3.0 interface, 4 USB3.0 extended by custom high-density connectors			
Number of	Support 2			
power				
supplies				
Power	System supports 550W, 800W, 1200W, 1300W, 1600W hot-swap redundant platinum			
features	efficiency power supplies (based on actual power)			
Input	100-127Vac/200-240Vac 47Hz~63Hz / 240Vdc (China only)			
voltage				
Output	+12Vdc			
voltage				
Number of	4* 8038 temperature-controlled fans			
fans				
Fan voltage	12(10.8-12.6) Vdc			
Fan current	4A(4.4A Max) Maximum 14000 $\pm$ / 10% PDM			
fan	Maximum 14000 +/- 1070 Kr M			
Fan airflow	3.2m <sup>3</sup> /min (141.9 CFM), minimum 2.63m <sup>3</sup> /min (125.8 CFM)			
Fan air	Minimum 657.5 Pa. maximum 800Pa			
pressure				
OS				
	Cart 057 5/7 6			
OS	RHEL 7.4/7.6			
	SLES12 SP3			
	Ubuntu 16.04 LTS			
	Fedora28			
	Windows 10			
	windows 10			
	Win server 2012 R2/2016/2019			
	Xenserver 7.1			
	ESXi6.7			
	Win server 2012/2016 Hyper-y			
	vin server 2012/2010 hyper-v			

System ambient temperature			
Operating	Operating temperature: 10°C~40°C; Non-operating temperature: -40°C~70°C		
temperature			
Storage	Operating humidity: 35% ~ 80%; Non-operating humidity: 20% ~ 90%		
temperature			
& humidity			
Safety certification			
Certification	UL, CE, CCC, RoHS		
	T11.1.4		

Table 1-4

### 2.2.2 System architecture

Gooxi SL series server is a server barebones system based on Intel Purley platform. The system supports 4U height, supports up to 205W CPU, and supports up to 24 pieces of memory; the name of the motherboard is G3DCL-B.

The motherboard features are as follows:

- The CPU adopts 1st and 2nd generation Intel<sup>®</sup> Xeon<sup>®</sup> Scalable processors, LGA3647 socket, TDP power consumption is 205W;
- Each CPU supports 6-channel DDR4, each channel supports 2 memories, RDIMM/LRDIMM. And each CPU supports a maximum capacity of 4.5 TB;
- ◆ DDR4 Type: DDR4 2133/2400/2666/2933;
- 3 PCIE RISER slots on the board, among which: RISER1 24 PCIE LANEs are all from CPU0, RISER2 24
   PCIE LANEs, of which 8 PCIE LANs come from CPU0, 16 PCIE LANs come from CPU1, RISER3 16
   PCIE LANEs from CPU1;
- G3DCL-B motherboard provides 2 M.2 Key M SSD slots, supports 2280 size, only supports PCIe X2 signal;
- 2 Gigabit Ethernet ports are integrated on the motherboard, using 88E1512 chip from PCH;
- South bridge PCH adopts INTEL LEWISBURG C621/C622 series chipset;
- PCH leads out 14 SATA Ports, maximum speed: 6Gb/s, compatible with SATA 1.5Gb/s, 3.0Gb/s; SATA Controller leads out 8 SATA PORTs, while SSATA leads out 6 SATA PORTs, of which SATA PORT has 8 PORTs, according to sequentially introduced into 2\* SFF8643 connectors, while the first 4 PORTs of SSATA are introduced into 1\* SFF8643 connector, and the latter 2 PORTs are introduced into the 7PIN SATA connector for connecting SATA DOM and DVD;
- BMC chip in this board adopts the AST2500 control chip of ASPEED Company, which is used for IPMI remote management. VGA output port, dedicated 1Gigabit RJ45 management LAN port, and connected to PCH via RMII/NCSI.

The system architecture motherboard block diagram is as follows:



G3DCL-B (Nebula2) Block Diagram

Figure 2-1

# 2.3 Introduction of system model specifications

4U24 bay model







Figure 2 - 2.4 Introduction of system components

### 2.4.1 Front panel components

4U machine 3.5 inch bay model



Figure 2-4

Serial	Name	Serial	Name
number		number	
1	3.5 inch hard drive	2	USB3.0 interface

• 4U24 model



Figure 2-7

Serial	Name	Serial	Name
number		number	
1	Rise module	6	RJ45 Gigabit LAN port
2	Hard disk module	7	COM port
3	Power module	8	USB 3.0 interface
4	Management LAN port	9	OCP3.0 interface
5	VGA interface	10	Front bezel

Table 1- 12

### • 4U36 model



Figure 2-8

Serial	Name	Serial	Name
number		number	
1	Riser module	6	RJ45 Gigabit LAN port
2	Hard disk module	7	COM port
3	Power module	8	USB 3.0 interface
4	Management LAN port	9	OCP3.0 interface
5	VGA interface	10	Hard disk module

Front panel indicators and button descriptions



Serial number	Indicator/Button	Serial number	Indicator/Button
1	Power switch button/indicator	5	System alarm indicator
2	UID button/indicator	6	Network port1 connection status indicator
3	Reset restart server button	7	Network port2 connection status indicator
4	Hard disk indicator		

Table 1- 12

LED status description				
Logo	Indicator/Button	Status description		
Groossi		GOOXI logo		
	Power indicator	Power indicator description: Green (on): Indicates that the device is powered on normally. Green (flashing): Indicates that the device is in standby. Green off: The device is not powered on. Power button description: Short press this button in the power-on state, and the OS shuts down normally. Press and hold the button for 6 seconds in the power-on state to forcibly power off the server. Short press this button in the power-on state to start the machine.		
	UID button/indicator	UID button/indicator is used to conveniently locate the server to be operated. The UID button can be manually pressed or the BMC command can be remotely controlled to turn the indicator off or on. Description of UID indicator: Blue (on/flashing): Indicates that the server is located. Off: Indicates that the server is not located. UID button description: Short press this button to turn on/off the positioning light.		
R	Reset restart server button	Press to restart the server		
	Hard disk indicator	Blinking green light: The hard drive is operating normally		
	System alarm indicator	System alarm indicator. Including system alarms, fan alarms, power supply alarms, etc., which can be viewed via the IPMI management software		
	Network port connection status indicator	Corresponds to the LNA port indicator of the NIC card. Green (on): Indicates that the network port is connected normally. Off: Indicates that the network port is not in use or is faulty. Note: Corresponding to the two 1GbE network ports on the motherboard.		
	Network port	Corresponds to the LAN port indicator of the NIC.		

(	connection status indicator	Green (on): Indicates that the network port is connected normally. Off: Indicates that the network port is not in use or is faulty.	
		Note: Corresponding to the two 1GbE network ports on the motherboard.	

Table 1-13

# 2.4.2 Rear panel components



Figure 2- 9				
Serial	Name	Serial	Name	
number		number		
1	Rise module	7	USB 3.0 interface	
2	Hard disk module	8	OCP3.0 interface	
3	Management network port	9	Power Module 1	
4	VGA interface	10	Power Module 1 AC interface	
5	RJ45 Gigabit LAN port	11	Power Module 2	
6	COM port	12	Power Module 2 AC interface	

Table 1- 14

#### $\diamond$ Note:

Both 1 and 2 can be equipped with rear hard disk modules or Riser modules. This picture is for reference only, and the actual configuration shall prevail.

Name	Туре	No.	Description
VGA interface	DB15	1	For connecting to a display terminal such as a monitor or KVM.
Management network port	GE BASE-T	1	Provide outgoing 1000Mbit/s LAN port. The server can be managed via this interface.
USB interface	USB 3.0	2	Provides an outgoing USB interface via which USB devices can be connected. Notice: When using an external USB device, please make sure that the USB device is in good condition, otherwise the server may work abnormally.
RJ45 Gigabit LAN port	GE BASE-T	2	Server network port.

Power module AC / interface /	1 or 2	according to your actual needs, but make sure that the rated power of the power supply is greater than the rated power of the server system.
COM port	1	Serial communication port
OCP3.0 interface	1	Install the network card of OCP3.0

Table 1- 15

# Rear panel indicators and button descriptions



Figure 2-10

Serial	Name	Serial	Name
number		number	
1	Connection status indicator	4	Data transfer status indicator
2	Data transfer status indicator	5	Power Module Indicators
3	Connection status indicator	6	Power Module Indicators

#### Table 1- 16

Indicator/Button	Status Description		
	Green (on): Indicates that the input and output are normal.		
	Red (on): Indicates that the input is normal, and there is no output due to power		
	supply over-temperature protection, power output over-current/short-circuit,		
D 11	output over-voltage, short-circuit protection, device failure (excluding all device		
Power module	failures) and other reasons.		
indicators	Green (1Hz/flashing): Indicates that the input is normal, the power supply is turned		
	off due to power-on or in-position; the input is over- or under-voltage.		
	Green (4Hz/flashing): indicates that the firmware is being upgraded online.		
	Off: Indicates that there is no AC power input.		
	Steady green: Indicates 1Gigabit Link.		
Connection status	Steady orange: Indicates a 100M link.		
indicator	Off: 10M Links.		
Data transfer status	Yellow (flashing): Indicates that data is being transmitted.		
indicator	Off: Indicates no data transmission.		

Table 1- 17

### 2.4.3 Motherboard components

All models share motherboard components, the interface description is as follows



Figure 2-11

### 2.4.4 HDD backplane components

24-bay expansion backplane as shown TOP side



Figure 2-11

Serial number	Description	Features
1	SAS/SATA hard drive connector	<ol> <li>Maximum support 12G/b SAS hard disk;</li> <li>Maximum support 6G/b SATA hard disk;</li> </ol>

	3. Support SAS/SATA hot-swap hard disk.
--	---



### Bottom side



Serial	Description	Features
1	BP power interface	Backplane power transfer connector for 12V and 5V power transfer
2	Fan interface	For 4pin fan interface
3	SFF-8643 12Gb SAS interface	For 12G/b SAS or 6G/b SATA signal transmission
4	Expander Chip Controller	PM8043 SXP 24Sx12G 24-port 12G SAS Expander
5	CPLD	For data logic processing

Table 1- 19

# 12 bay expansion backplane as shown

# TOP side





Serial	Description	Features
number		
1 SAS/SATA hard drive connector	$S\Delta S/S\Delta T\Delta$ hard drive	1. Maximum support 12G/b SAS hard disk;
		2. Maximum support 6G/b SATA hard disk;
	connector	3. Supports SAS/SATA hot-swap hard disk.

Table 1- 20

Bottom side





	L L	
Serial number	Description	Features
1, 2, 3, 4	Temperature Controlled Fan Socket	For 12G/b SAS or 6G/b SATA signal transmission.
5, 6, 7	Power connector	Backplane power transmission connector for 12V power transmission.
8	Expander chip	PM8043 SXP 24Sx12G 24-port 12G SAS Expander
9	MINI SAS HD High Speed Connector	For 12G/b SAS or 6G/b SATA signal transmission.

Table 1-21

# SAS/SATA backplane as shown TOP side



Figure 2-15

Serial number	Description	Features
		1. Maximum support 12G/b SAS hard disk;
1	SAS/SATA connector	2. Maximum support 6G/b SATA hard disk;
		3. Supports SAS/SATA hot-swap hard disk.
Table 1- 22		

### Bottom side



#### Figure 2-16

Serial number	Description	Features
1	Temperature sensor IC	Temperature sensor chip
2,5	7PIN SATA interface	SATA disk signal line interface
3	I2C interface	For I2C signal interface
4	SGPIO signal for LED	Used for hard disk LED positioning lighting and fault
4	control	LED indication functions.
6	Power interface	Backplane power transfer connector for 12V power
		transfer

Table 1- 23

# U.2 backplane as shown TOP side



Figure 2-17

Serial number	Description	Features
	SEE 9620 Connector	U.2 interface supporting PCIe×4 for connecting to NVME
I SFF-8639 Connector		SSD
		T 11 1 04

### Bottom side



Figure 2-18

Serial number	Description	Features
1,4	Slimline 4i Connector	Provides PCIe×4 interface to connect to CPU and NVME SSD1 (including CPU PEHP I2C and BMC I2C signals)
2	CPLD chip	For data logic processing
3	JATG debugging interface	JTAG debug interface for programming and version upgrade of CPLD
5	Power outlet	4 Pin power socket for docking with PSU or docking with MB 4 Pin plug to power the board

Table 1- 25

### OCP3.0 network card as shown in the figure





Serial	Description	Features
number		
1	Intel 82599ES chip	It is mainly connected to the network interface controller of the motherboard CPU through PCIe Gen.2 X8, which is converted into a 2-port SFP+ at the network card end, and the 82599ES chip also provides an interface for communication with the motherboard BMC NCSI for information transfer between the BMC and the network card.

2	SFP+ LAN1	Provide SFP+ 10G optical port signal			
3	LED1	LED status indicator			
4	LED2	LED status indicator			
5	SFP+ LAN2	Provide SFP+ 10G optical port signal			
6	Network card buckle	It is used to lock the network card. When removing the network card, you need to press down to pull out the network card.			
7	OCP3.0 interface	Used to connect to the motherboard OCP3.0 PCIe X8 signal/12V power supply/Sideband signal			

Table 1- 26

### LED Indicator Description

Serial	Description	Features			
number					
		Green/ yellow indicator for indicating LAN1 speed			
	SED   LANII L'al-LED	Green: 10 Gigabit LAN speed; Yellow: Gigabit LAN			
LED1	SFP+ LANT LINK LED	speed			
LEDI		No light: no optical port LAN cable			
		Green light for LAN1 data activity			
	SFP+ LANI ACT LED	Flashing: data activity ; off: no data activity			
		Green/ yellow indicator for LAN2 speed			
	SFP+ LAN2 Link LED	Green: 10 Gigabit LAN speed; Yellow: Gigabit LAN			
LED2		speed			
LED2		No light: no optical port ALN cable			
		Green light for LAN2 data activity			
	SFP+ LAN2 ACT LED	Flashing: data activity; off: no data activity			
Table 1-27					

# RISER 1 backplane as shown



Serial	Description	Features
number		
1	PCIE 3.0 X8 Slot	For PCIe 3.0 X8 devices.
2	PCIE 3.0 X16 Slot	For PCIe 3.0 X16 devices.
3	RISER POWER	Riser card power transmission connector for 12V power transmission
4	PCIE X16 Specification	For motherboard PCIe X16 X8 interface

	Goldfinger	
5	PCIE X8 specification gold finger	For motherboard PCIe X16 X8 interface



# RISER 2 backplane as shown



Figure 2-21

Serial number	Description	Features	
1	PCIE 3.0 X8 Slot For PCIe 3.0 X8 devices.		
2	PCIE X16 Goldfinger	For motherboard PCIe X16 X8 interface	
3	PCIE X8 Gold Finger	For motherboard PCIe X16 X8 interface	

Table 1- 29



Figure 2- 22

Serial number	Description	Features	
1	PCIE X16 Slot	For PCIe 3.0 X16 devices.	
2	PCIE X8 Slot	For PCIe 3.0 X8 devices.	
3	PCIE X16 Specification	For motherboard PCIe X16 interface	
5	Goldfinger		

Table 1- 30



#### Figure 2-23

Serial number Description		Features	
1	PCIE X16 slot	For PCIe 3.0 X16 devices.	
2	PCIE X8 slot	For PCIe 3.0 X8 devices.	
3	Power interface	Riser card power transmission connector for 12V pow transmission	
4.5	Slimline interface	For connecting Slimline cables	

Table 1- 31

### 2.4.5 DIMM slot locations

The motherboard adopts Intel Purley platform, with Intel Xeon SkyLake CPU, supports 12 DDR4 channels, 24 DDR4 slots (when only one memory is inserted, it is preferred to insert the slot in the red frame in the figure below, the plastic color of the slot on the board is blue), supports DDR4 ECC RDIMMs/LRDIMMs server memory, and the memory frequency supports 2133/2400/2666/2933MHz; the location is shown in the following figure:



Figure 2-24

### 2.4.6 Hard disk label

• 24 bay

	5 BRIN		11 20				
Ľ						10 00	*
	3 838		9	0.00			
	2 888		8 214		80	0000	
Ц				20 00	8	20 00	
	O Balk	8	6	20 00	80	60 00	

Figure 2-25

#### • 12 bay

۲				
۲				•
	C			
۲	۲			
•	•			• •

Figure 2-26

### 2.4.7 Hard disk indicator

2U8/2U12 hard disk indicator



Figure 2-27

Features	Activity indicator (green)	Location indicator (blue)	Error indicator (yellow)			
Hard drive in place	On	OFF	OFF			
Hard drive activity	Flashing 4Hz/sec	OFF	OFF			
Hard disk positioning	On	Flashing 4Hz/sec	OFF			
Hard disk error	On	OFF	On			
RAID rebuild	On	OFF	Flashing 1Hz/sec			

Table 1- 32

### 2U 25-bay hard disk indicator



	Figure 2- 28	
Hard disk status	Activity indicator (green)	Error indicator (yellow)
Hard drive is not in place	OFF	OFF
Hard drive is in place, but no	ON	OFF
data activity		
The hard drive is in place and	Flashing frequency of the hard	OFF
active	disk itself	
Hard drive failure	N/A	ON
Hard drive is located	N/A	4Hz flashing
Hard disk is in Rebuild state	N/A	1Hz flashing

Table 1- 33

# 2.4.8 System fan

The server supports variable fan speeds. Normally the fan runs at the lowest speed, if the server temperature rises, the fan will increase the speed to cool down.



Figure 2-29



# **Chapter 3 Installing System Components**

## **3.1 Installation of CPU**

Install the processor:

Step 1: CPU Installation

1. Tilt the CPU angle as shown in the figure, align the A1 corner (triangle mark), and clamp it on one end of the clamping piece.

2. In accordance with the direction, press the other end of the clamping piece to fix the CPU to the clamping piece.



Figure 3-1

Step 2: Install the CPU on the heat sink, and ensure that the surface of the CPU and heat sink is clean and free of oil and other materials. (As shown below)

- 1. Smear about 0.4ml of thermal grease on the CPU and smooth it evenly.
- 2. Align the A1 corner (triangle mark), and buckle the CPU on the heat sink.





# 3.2 Installation of heat sink

Installation steps:

1. Remove the processor blank (as shown in the figure below)



Figure 3-1

2. Align the heat sink with the heat sink fixing studs on the CPU base, and tighten the heat sink fixing screws in sequence according to the instructions. (As shown below)

NOTE: The pins on the motherboard are extremely fragile and easily damaged. To avoid damaging the motherboard, do not touch the processor or processor socket contacts.



Figure 3-2

### 3.3 Memory installation

#### 3.3.1 Memory specifications supported

The motherboard supports DDR4 memory of 64GB R-DIMM, 128GB LR-DIMM, 256GB 3DS LRDIMM, up to 2933MHz (2933MT/s is only achieved with odd-number memory per channel, depending on the CPU SKU).

**Note:** Please use memory modules with the same CAS delay value on this motherboard. It is recommended that you use the same capacity and same frequency memory produced by the same manufacturer. Recommended settings are as follows in Tables 3.1 and 3.2:

Memory access	Memory access principle: (one CPU)																
			Amount of memory (recommended: √ not recommended: O)														
Processor	Channel	Memory location	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	0	$\checkmark$	0	$\checkmark$	0	0	0	$\checkmark$			
			1	2	3	4	5	6	7	8	9	10	11	12			
		Al	•	•	•	•	•	•	•	•	•	•	•	•			
	A	A2							•	•	•	•	•	•			
CDUM	P	B1		•	•	•	•	•	•	•	•	•	•	•			
CPU0	В	B2								•	•	•	•	•			
	G	C1			•		•	•	•		•	•	•	•			
	С	C2									•		•	•			

P	D1			•	•	•	•	•	•	•	•	•
D	D2							•		•	•	•
Б	E1			•	•	•	•	•	•	•	•	•
E	E2							•		•	•	•
F	F1					•	•		•	•	•	•
r	F2											•
		T-1-1	1- 2 1									

Table 3.1

When installing 1 CPU, there are many rules for memory installation. In order to achieve optimal performance, it is recommended to follow the following specifications:

1 Memory, CPU0 A1

2 Memories: CPU0 A1 / CPU0 B1

3 Memories: CPU0 A1 / CPU0 B1 / CPU0 C1

4 Memories: CPU0 A1 / CPU0 B1 / CPU0 D1 / CPU0 E1

5 Memories: this configuration is not recommended

6 Memories: CPU0 A1 / CPU0 B1 / CPU0 C1 / CPU0 D1 / CPU0 E1 / CPU0 F1

7 Memories: this configuration is not recommended

8 Memories: CPU0 A1/A2, CPU0 B1/B2, CPU0 D1/D2 / CPU0 E1/E2

9 Memories/10 Memories/11 Memories: this configuration is not recommended

12 Memories: insert all

Note: If the above is in the case of the 5th, 7th, 9th, 10th, and 11th memory, the following rules must be followed: Odd-number memory is inserted into the blue above the motherboard;

For even-number memories, you can refer to the configuration of the most recent memory quantity above, and then increase the memory;

In addition, it should be noted that:

In the same Channel, the memory with large capacity must be inserted into the first one (such as A1 /B1 /C1 /D1 /E1 /F1): blue;

Mixed use of RDIMM and LRDIMM is not allowed;

Memory	access prin	ciple: (2 CF	Us)																							
											An	nount	of me	mory	(recor	nmen	ded: \	not r	ecom	mende	ed: O)					
		Memory	0		0		0	$\checkmark$	0	$\checkmark$	0	0	0	$\checkmark$	0	0	0	$\checkmark$	0	0	0	0	0	0	0	
Processor	Channel	location																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
		A1	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A	A2													•	•	•	•	•	•	•	•	•	•	•	•
		Bl			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	В	B1 B2			-					-		-	-	-	-	-							•	•	•	•
		C1																<b>–</b>								
	C											-	-												•	
CPU0		C2										-													•	•
	D	DI							•	-		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		D2															•	•			•	•	•	•	•	•
	Е	E1							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		E2															•	•			•	•	•	•	•	•
	E	F1											•	•	•	•			•	•	•	•	•	•	•	•
	Г	F2																							•	•
		A1		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A	A2														•	•	•	•	•	•	•	•	•	•	•
	_	B1				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	В	B2																•	•	•	•	•	•	•	•	•
		C1						•	•			•	•	•	•	•	•			•	•	•	•	•	•	•
CPU1	C	C2																		•	•		•	•	•	•
		D1								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	D	D2																•	•			•	•	•	•	•
		El								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	E	E2								-	-	-		-	-	-	-	•	•	-	-	•	•	•	•	•

	F	F1							•	•	•	•		•	•	•	•	•	•	•
		F2																		•
							Ta	ble 3	.2											

When installing 2 CPUs, in order to achieve optimal performance, it is recommended to install even-number memories, and the number of memory for each CPU remains the same;

2 memories: CPU0\_A1 / CPU1\_A1

4 memories: CPU0\_A1 / CPU0\_B1 / CPU1\_A1 / CPU1\_B1

6 memories: CPU0/CPU2\_A1, CPU0/CPU1\_B1, CPU0/CPU1\_C1

8 memories: CPU0/CPU2\_A1, CPU0/CPU1\_B1, CPU0/CPU1\_D1, CPU0/CPU1\_E1

10 memories: Asymmetric, this configuration is not recommended

12 memories: CPU0/CPU1\_A1, CPU0/CPU1\_B1, CPU0/CPU1\_C1, CPU0/CPU1\_D1, CPU0/CPU1\_E1,

CPU0/CPU1\_F1

14 Roots RAM: Asymmetric: This configuration is not recommended

```
16 memories: CPU0 A1/A2, CPU0 B1/B2, CPU0 D1/D2, CPU0 E1/E2, CPU1 A1/A2, CPU1 B1/B2,
```

CPU1\_D1/D2, CPU1\_E1/E2

18 memories/20 memories/22 memories: asymmetric, this configuration is not recommended 24 memories: all inserted

Note: In the same Channel, the memory with large capacity must be inserted into the first one (such as A1 /B1 /C1

#### /D1 /E1 /F1): blue

Mixed use of RDIMM and LRDIMM is not allowed; if there is only one memory, install it in CPU0\_A1.

### 3.3.2 How to install memory

The 8 memory slots controlled by CPU 1 on the motherboard are: DIMMA1, A2, DIMMB1, B2, DIMM C1, C2 and DIMM D1, D2; the 8 memory slots controlled by CPU 2 are: DIMME1, E2, DIMMF1, F2, DIMMG1, G2 and DIMMH1, H2, pay attention to the notch of the memory and the notch of the DIMM slot, and snap each DIMM module into place vertically to prevent incorrect installation.



Figure 3-4



Figure 3-5

# 3.4 Hard disk installation

To install a 3.5" hard drive:

1. Put the hard disk in the tray

2. There are 4 countersunk head screws on the left and right sides to lock the hard disk (the screw heads must not protrude from the surface of the slideway on both sides of the tray)



Figure 3-6


Figure 3-7

Install a 2.5" hard drive

1. Put the hard disk in the tray

2. Four countersunk head screws at the bottom lock the hard disk (the screw heads protrude from the bottom of the tray)



Figure 3-8



Figure 3-9

Hard disk tray components installed into chassis

1. With the hard drive wrench open, push it into the chassis

2. When the hard disk gold finger touches the backplane device, turn the wrench in the direction of the arrow

3. Schematic diagram of hard disk installation in place





## 3.5 Front hard disk backplane installation

#### • Front hard disk backplane installation:

1. Align the gourd holes and hanging holes on the left and right sides of the hard disk backplane with the pegs of the hard disk frame, and push in the direction of the arrow

2. After the hard disk backplane is pushed into place, press the backplane down until all the hoist nails and hanging holes on both sides are in place

3. Tighten the screws on the hard disk backplane.



Figure 3-14



Figure 3-15

4. Place the installed hard disk backplane in the chassis, align the screw holes, and tighten the left screw and base screw.



Figure 3-16



Figure 3-17

## 3.6 M.2 SSD Installation

Step 1: Install the positioning studs according to the length of the M.2 card to be installed.



Step 2: Install the M.2 Card

- 1. Insert the M.2 card connector end into the motherboard connector as shown in the illustration.
- 2. Press the other end of the M.2 card to the plane of the positioning stud in step 1.



Figure 3-19

Step 3: Install the fixing screws of the M.2 card.



Figure 3-20

## **3.7 Installation of PCIE expansion card**

Step: Install the PCIE Card

- 1. Insert the PCIE card according to the direction shown in the figure
- 2. Rotate PCIE card lock
- 3. According to the arrow plan, lock the PCIE card lock





Figure 3-23

## 3.8 PCIE module installation

Riser1-3 module installation steps: PCIE components on the rear window, place them vertically downward - align with the PCIE slot, align with the positioning holes, and place them flush with the rear window.



Figure 3-24

Riser4 module installation steps: rear window PCIE components, place vertically downwards - align the PCIE slot, align the positioning holes, place it flush with the rear window, and then tighten the side screws



Figure 3-25

### 3.9 Rear hard disk module backplane installation

Step 1: Rear hard disk module backplane installation

1. Move the backplane limit plunger outwards with your hands, and hold the plunger with your hands - keep the plunger open

2. Align the peg holes on the backplane of the hard disk with the pegs of the hard disk module bracket, push it in, and place it down in place, release the hard disk limit plunger, and the plunger will automatically bounce back to the original position;

3. Turn over the fixing parts on the backplane of the hard disk, as shown in the figure - the fixing parts can be placed flat.



Figure 3-26



Figure 3-27

### 3.10 Rear hard disk module installation

- Rear 3.5-inch hard disk enclosure installation
- Step 1. The hard disk box is placed vertically down and flush with the rear window
- Step 2. Rear hard disk enclosure components fixed
- Step 3. Lock a captive screw



Figure 3-28



Figure 3- 29

Rear 2.5-inch hard disk enclosure installation

- 1. Place vertically downward and align with the guide pin at the lower end
- 2. After placing it flat, push it in the direction of the arrow to the end.
- 3. Lock the captive screw



Figure 3-31

## 3.11 Installation of Power Module

Steps: Push the power supply to the end in the direction of the arrow, and after the plunger wrench on the right makes a clicking sound, it means the installation is in place;



Figure 3-33

## **3.12 Installation of the fan module**

Steps: Place the fan module vertically downward in the direction of the arrow (pay attention to the direction of the fan module)



Figure 3-34



Figure 3-35

## 3.13 Installation of the wind shield

Steps: Align the wind shield module with the hanging points on the left and right sides, and place it vertically downward - the height is lower than the height of the cabinet



Figure 3-36

## **3.14 Installation of the upper cover of the chassis**

Steps: Install the back upper cover of chassis

- 1. Align the upper cover peg with the opening of the chassis and place it downwards
- 2. Rotate the upper cover lock in the direction of the arrow to lock it in place



Figure 3- 37



Figure 3-38

# **Chapter 4 System Rack Installation**

### 4.1 Installing the inner rail of the guide rail

Step 1. Prepare two slide rails and pull out the inner rail.



Figure 4-1

Step 2. Fasten the inner rails on both sides of the chassis.





### 4.2 Installing the outer rails to the rack

Step 3. Install the outer rail on the cabinet racket and tighten the screws.

Note: When installing the rail, you need to align the U mark, and install it in place when you hear a snap, and use M5



Figure 4-3

### 4.3 Install the server to the rack

Step 4. Align the chassis with the inner rails installed on the outer rails for installation.

Note: When you can push the chassis forward, you will hear a sound. If you can't push it, you need to pull the inner rail buckle down to continue to push the chassis gently.





Step 5. When the chassis is pushed forward and cannot slide, the screw installation is completed.

Note: During equipment maintenance, you need to loosen the panel screws, pull the chassis lightly, and do not push or pull the chassis at random to avoid damage to the equipment.



Figure 4-5



# **Chapter 5 BIOS Parameter Setting Instructions**

### 5.1 Enter the BIOS Setup interface

Steps:

1. Power on the server motherboard and connect the keyboard;

2. During the POST process, pay attention to the prompt to enter the BIOS Setup interface at the bottom left of the Logo screen, "Press <DEL> or <ESC> to enter setup, <F7> to enter Boot Menu.";

3. Press the <DEL> or <ESC> key on the keyboard to prepare to enter the BIOS Setup interface;

### 5.2 Setup menu parameter description

### 5.2.1 Navigation Key Description

→←:	Menu switch (Select Screen)
$\uparrow \! \! \downarrow :$	Item switch (Select Item)
Enter:	OK (Select)
+/-:	Change Opt.
F1:	General Help
F2:	Previous Values
F3:	Optimized Defaults
F4:	Save changes and restart the system (Save & Reset)
ESC:	Exit (Exit)

### 5.2.2 Main menu description

The Main interface contains the basic information of the BIOS system, such as BIOS version number, CPU model, memory capacity, and system time can be set.

Aptio Setup Utility Main Advanced Platform Configur	– Copyright (C) 2020 Americar ation Socket Configuration	Megatrends, Inc. Serven Mgmt Security Boot
BIOS Information Project Version Build Date and Time BMC Firmware Revision ME Firmware Version CPLD name CPLD version Build Date and Time Access Level	G3DCL 0.05 x64 06/19/2020 11:28:13 1.00.0 0A:4.1.4.256 01 06/11/2020 Administrator	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 1998–9999 Months: 1–12 Days: Dependent on month Range of Years may vary.
Platform Information Processor Processor Type PCH RC Revision Memory Information Total Memory Usable Memory System Date System Time	50654 - SKX UO Intel(R) Xeon(R) Bro LBG QS/PRQ - 1G - S0 0580.D04 8192 MB 8192 MB [Fri 06/19/2020] [16:50:43]	<pre> ++: Select Screen  14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275.	Copyright (C) 2020American ⊬	legatrends, Inc.

Figure 5-1

#### **BIOS Information**

Project Version:

Displays the version information of the single board BIOS.

Build Date and Time:

Displays the compilation date and time of the single board BIOS.

BMC Firmware Revision:

Displays the version information of the single board BMC.

ME Firmware Version:

Displays the version information of the single board ME.

CPLD Name:

Displays the name information of the single board CPLD.

CPLD Version:

Displays the version information of the single board CPLD.

Build Date and Time:

Displays the compilation date and time of the single board CPLD.

Access Level:

Displays the access rights of the current user of the single board.

Platform Information

#### Processor:

CPUID and stepping information.

Processor Type:

CPU model information.

```
PCH:
```

PCH SKU and stepping information.

RC Revision:

Displays the version information of the single board of RC.

Memory information

Total Memory:

Displays the total system memory capacity.

Usable Memory:

Displays the amount of available memory in the system.

System Language:

Select the current system language.

System Date:

Displays and sets the current system date. The format of the system date is "week month/day/year". Press "Enter" to switch between month, day, and year. You can change the value in the following ways:

Press "+": the value increases by 1.

Press "-": the value decreases by 1.

Press the number key: directly change the value.

System Time:

Display and set the current system time. The system time is in 24-hour format, and the format is "hour:minute:second". Press "Enter" to switch between hours, minutes, and seconds. You can change the value in the following ways:

Press "+": the value increases by 1.

Press "-": the value decreases by 1.

Press the number key: directly change the value.

### 5.2.3 Advanced menu description

The Advanced interface contains advanced configuration items of the BIOS system.



Figure 5-2

**Trusted Computing** 

Trusted Execution Module configuration.

Serial Port Console Redirection

SIO Configuration

**Option ROM Dispatch Policy** 

PCI Subsystem Settings

CSM Configuration

NVMe Configuration

Network Stack Configuration

iSCSI Configuration

Intel Ethernet Connection X722 for xGbE - XX:XX:XX:XX:XX:XX

### 5.2.4 Trusted Computing

TPM20 Device Found Firmware Version: 7.62	Enables on Disables BIOS
Vendor:IFXSecurity Device Support[Enable]Active PCR banksSHA-1,SHA256Available PCR banksSHA-1,SHA256SHA-1 PCR Bank[Enabled]SHA256 PCR Bank[Enabled]	support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Pending operation[None]Platform Hierarchy[Enabled]Storage Hierarchy[Enabled]Endorsement Hierarchy[Enabled]TPM2.0 UEFI Spec Version[TCG_2]Physical Presence Spec Version[1.3]TPM 20 InterfaceType[TIS]Device Select[Auto]	<pre></pre>

#### Figure 5-3

Display and set TCM/TPM module information. Different module options have different settings. Users can set according to the Setup help instructions.

### 5.2.5 Serial Port Console Redirection

Aptio Advanced	Setup Utility -	Copyright	(C) 2020	) American	Megatrends, Inc.
Advanced COMO Console Redirection Console Redirection	Settings	[Disabled	1]		Console Redirection Enable or Disable. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
Vers	ion 2.20.1275. Co	pyright (C	c) 2020 f	American Me	F4: Save & Exit ESC: Exit egatrends, Inc.

Figure 5-4

**Console Redirection** 

The console redirection function switch redirects the information output from the console (such as a graphics card) to the display to the serial port.

Disabled: Disable the redirection function.

Enabled: Enable redirection.

Default: Disabled

### 5.2.6 Console Redirection Settings

Aptio Setup Utility - Advanced	- Copyright (	(C) 2020 American	Megatrends, Inc.
COMO Console Redirection Settings Terminal Type Bits per second Data Bits Parity Stop Bits Flow Control VT-UTF8 Combo Key Support Recorder Mode Resolution 100x31 Putty KeyPad	[VT100+] [115200] [8] [None] [1] [None] [Enabled] [Disabled] [Disabled] [VT100]		Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Version 2.20.1275. (	Copyright (C)	2020 American M	egatrends, Inc.

#### Figure 5-5

Terminal Type

This option selects the emulation type, the BIOS emulation type must match the mode selected in the terminal program. The menu options are:

VT100 VT100+ VT-UTF8 ANSI Default: VT100+

Bits per second

Serial port redirection rate, the value range is  $9600 \sim 115200$ Default: 115200

#### Data Bits

Serial port redirection data bit length, menu options are: 8, 7 Default: 8

#### Parity

Serial port redirection verification switch, the menu options are: None: no verification Even: Even parity Odd: odd parity

Mark: The check digit is always 1 Space: The check digit is always 0 Default: None Mark and Space checks are not allowed to detect errors.

#### Stop Bits

Serial port data packet end flag, the menu options are:

1

2

Default: 1

#### Flow Control

Serial port redirection control flow selection switch, the menu options are: None: close the serial port redirection control flow Hardware RTS/CTS: Request to Send/Clear to Send Default: None

VT-UTF8 Combo key support

ANSI/VT100 terminal VT-UTF8 key combination support switch, the menu options are: Disabled: Disable ANSI/VT100 terminal VT-UTF8 key combination support Enabled: Enable ANSI/VT100 terminal VT-UTF8 key combination support Default: Enabled

#### Recorder Mode

Record mode switch, enable this function, only text information will be sent, the menu options are: Enabled Disabled Default: Disabled

### **5.2.7 SIO Configuration**



Figure 5-6







Use This Device

With this device, the menu options are: Enabled Disabled Default: Enabled

Possible

Select the optimal setting for the serial port according to your needs. The menu options are:

Use Automatic Settings IO=3F8h; IRQ=4; DMA; IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA; IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA; IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA; IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA; Default: Use Automatic Settings

### 5.2.9 Option ROM Dispatch Policy

AMI ROM Dispatch Policy : A5.01.18         Restore if Failure       [         Primary Video Ignore       [         Device Group Default ROM Policy       [         (Selected at CSM Setup Page) :       [         Network Class       : UEFI         Mass Storage Class       : UEFI         Display Class       : UEFI         Other Devices       : UEFI	▲ [Disabled] [Enabled]	If system fails to boot and this option is set to 'Enabled', software will reset settings of this page as well as CSM page to its default values automatically.
Device Class Option ROM Dispatch Polic On Board Mass Storage Controller [ On Board Mass Storage Controller [ On Board Display Controller [ Slot # 1 Empty [ Slot # 2 Empty [ Slot # 3 Empty [ Slot # 3 Empty [ Slot # 4 Empty [ Slot # 5 Empty [ Slot # 6 Empty [ Slot # 7 Empty [ Slot # 8 Mass Storage Controller [ WARNING: Changing Device(s) Option ROM	cy: [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>



Manage Option ROM Dispatch policy

Restore if Failure

To recover from a failure, the menu options are:

Enabled

Disabled

Default: Disabled

#### Primary Video Ignore

Ignoring the base graphics card, the menu options are: Enabled Disabled Default: Enabled

On Board Mass Storage Controller

Onboard or external device controller, the menu options are: Enabled Disabled Default: Enabled

#### On Board Mass Storage Controller

Onboard or external device controller, the menu options are:

Enabled

Disabled

Default: Enabled

#### On Board Display Controller

Onboard or external device controller, the menu options are: Enabled Disabled Default: Enabled

#### Slot # 1 Empty

Onboard or external device controller, the menu options are: Enabled Disabled Default: Enabled

#### Slot # 8 Empty

Onboard or external device controller, the menu options are: Enabled Disabled Default: Enabled

### 5.2.10 PCI Subsystem Settings

Aptio Setup Utility Advanced	– Copyright	(C) 2020 American	Megatrends, Inc.
PCI Bus Driver Version PCI Devices Common Settings: Above 46 Decoding SR-IOV Support	A5.01.18 [Enabled] [Enabled]		Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).
Version 2.20.1275.	Copyright (C	) 2020 American Mu	egatrends, Inc. B4

Figure 5-9

Above 4G Decoding

The decoding control switch of memory space resources above 4G, the menu options are:

Enabled

Disabled

Default value: Enabled

#### SR-IOV Support

SR-IOV supports switch settings, the menu options are:

Enabled

Disabled

Default: Enabled

### 5.2.11 CSM Configuration

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Advanced					
Compatibility Support Module Configu	Enable/Disable CSM Support.				
CSM Support	[Enabled]				
CSM16 Module Version	07.83				
GateA20 Active INT19 Trap Response	[Upon Request] [Immediate]				
Boot option filter	[UEFI and Legacy]				
Option ROM execution					
Option ROM Policy Network Storage Video Other PCI devices	[UEFI] [UEFI] [UEFI] [UEFI] [UEFI]	<pre> ++: Select Screen  ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>			
Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc. B4					



#### CSM Support

To enable or disable compatible support modules, the menu options are:

Disabled

Enabled

Default: Enabled

#### GateA20 Active

The control mode setting of the A20 address line, the menu options are:

Upon Request

Always

Default: Upon Request

#### INT19 Trap Response

Interrupt, capture signal response settings, the menu options are:

Immediate: respond immediately

Postponed

Default: Immediate

#### Boot option filter

Startup option class control switch, the menu options are:

UEFI and Legacy: UEFI and Legacy Boot Items

UEFI only: UEFI boot items

Legacy only: Legacy startup items

Default: UEFI and Legacy

Option ROM Policy Select the Option ROM execution method, the menu options are: UEFI: UEFI mode Legacy: Legacy Mode Default: UEFI

### 5.2.12 NVMe Configuration

Aptio Setup Utility – Copyright (C) 2020 American Advanced	Megatrends, Inc.
NVMe Configuration	
► TOSHIBA-RC100	<pre>**: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. Copyright (C) 2020 American Me	egatrends, Inc.

Figure 5-11



Figure 5-12

Displays detailed information about NVMe hard drives.

### 5.2.13 Network Stack Configuration



#### Network Stack

Network stack control switch, the menu options are: Enabled Disabled Default: Disabled

#### IPv4 PXE Support

Ipv4 UEFI PXE function control switch, the menu options are: Enabled Disabled Default: Disabled

#### Ipv4 HTTP Support

Ipv4 HTTP function control switch, the menu options are: Enabled Disabled Default: Disabled

#### IPv6 PXE Support

Ipv6 UEFI PXE function control switch, the menu options are: Enabled Disabled Default: Disabled

#### Ipv6 HTTP Support

Ipv6 HTTP function control switch, the menu options are: Enabled Disabled Default: Disabled

#### PXE boot wait time

PXE startup waiting time, the user can input the PXE startup waiting time, and can press "ESC" to give up PXE startup during the waiting process, the default is 0.

#### Media detect count

The number of device presence detections, the user can input the number of device network card device detections, the default is 1.

### 5.2.14 iSCSI Configuration



Figure 5-14

iSCSI configuration

### 5.2.15 Platform Configuration menu

Main Advanced Platform Configuration Socket Configuration	Server Mgmt Security Boot I
<ul> <li>PCH SATA Configuration</li> <li>PCH SSATA Configuration</li> <li>USB Configuration</li> <li>Miscellaneous Configuration</li> <li>Server ME Configuration</li> <li>Runtime Error Logging</li> </ul>	SATA devices and settings
Setup Warning: Setting items on this Screen to incorrect values may cause system to malfunction!	
	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>
	F4: Save & Exit ESC: Exit

PCH SATA Configuration

PCH sSATA Configuration

**USB** Configuration

Miscellaneous Configuration

Server ME Configuration

Runtime Error Logging

### 5.2.16 PCH SATA Configuration

Aptio Setup Utility – Platform Configura	Copyright (C) 2020 American tion	Megatrends, Inc.
PCH SATA Configuration		Enable or Disable SATA Controller
SATA Controller Configure SATA as SATA test mode SATA Port 0 Port 0 SATA Port 1 Port 1 SATA Port 2 Port 2 SATA Port 2 SATA Port 3 SATA Port 3 SATA Port 4 Port 4 SATA Port 5 Port 5 SATA Port 6 Port 6 SATA Port 7 Port 7	[Enable] [AHCI] [Disable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. C	opyright (C) 2020 American M	legatrends, Inc. B4

Figure 5-16

SATA Controller

SATA controller switch, control to turn on and off the SATA controller, the menu options are:

Disabled: Disable the SATA controller.

Enabled: Enable the SATA controller.

Default: Enabled

Configure SATA as

SATA mode selection, the menu options are: AHCI: Select SATA mode as AHCI mode.

RAID: Select SATA mode as RAID mode. Default: AHCI

#### SATA test mode

SATA test mode switch, the menu options are: Disable Enable Default: Disable

#### SATA Port X

Displays device information on SATA Port 0~7, and displays Not Installed when no device is connected.

#### Port X

To control the opening and closing of SATA Port X, the menu options are: Disabled: Disable SATA Port X. Enabled: Enable SATA Port X. Default: Enabled

#### Hot Plug

Control the hot plug function of SATA Port X device on and off, the menu options are: Disabled: Disable the SATA Port X hot-plug function.

Enabled: Enable SATA Port X hot plug function.

Default: Enabled

### 5.2.17 PCH sSATA Configuration

Aptio Setup Utility – Platform Configura	Copyright (C) 2020 Americar tion	) Megatrends, Inc.
PCH sSATA Configuration 	(Enable) [AHCI] [Disable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable] [Not Installed] [Enable]	Enable or Disable SATA Controller ++: Select Screen 14: Select Item
Port 4 SSATA Port 5	[Not Installed] [Enable] [Not Installed]	Frier: Select +/−: Change Opt. F1: General Help
Port 5	[Enable]	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. C	opyright (C) 2020American ⊬	egatrends, Inc. B4

Figure 5-17
#### sSATA Controller

sSATA controller switch, control to turn on and off the sSATA controller, the menu options are: Disabled: Disable the sSATA controller. Enabled: Enable the sSATA controller. Default: Enabled

#### Configure sSATA as

sSATA mode selection, the menu options are: AHCI: Select sSATA mode as AHCI mode. RAID: Select sSATA mode as RAID mode. Default: AHCI

#### SATA test mode

SATA test mode switch, the menu options are: Disable Enable Default: Disable

#### sSATA Port X

Displays device information on sSATA Port 0~7, and displays Not Installed when no device is connected.

#### Port X

To control the opening and closing of sSATA Port X, the menu options are: Disabled: Disable sSATA Port X. Enabled: Enable sSATA Port X. Default: Enabled

### 5.2.18 USB Configuration

Aptio Setup Platform	Utility – Copyright Configuration	(C) 2020 American	Megatrends, Inc.
USB Per-Connector Disable XHCI Over Current Pins	[Disable] [Enable]		Selectively Enable/Disable each of the USB Physical Connector (physical port). Once a connector is disabled, any USB devices plug into the connector will not be detected by BIOS or OS. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.2	0.1275. Copyright (C	) 2020 American Me	egatrends, Inc. B4

Figure 5-18

USB Per-Connector Disable

For each USB connector switch, the menu options are:

Enable

Disable

Default: Disable

XHCI Over Current Pins

XHCI overcurrent pin switch, the menu options are:

Enable

Disable

Default: Enable

### 5.2.19 Miscellaneous Configuration

Aptio Setup Utility – Platform Configurat	Copyright (C) 2020 American <mark>ion</mark>	Megatrends, Inc.
Miscellaneous Configuration		Select SO/S5 for ACPI state after a G3
PCH state after G3 Max Page Table Size Select Active Video	[S0] [16] [Auto]	<pre>**: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. Co	pyright (C) 2020 American M	egatrends, Inc. B4

Figure 5-19

#### PCH state after G3

PCH state setting after G3, the menu options are:

S0: Power on directly

S5: You need to press the Power button to turn on the power

Leave power state unchanged

Default: S0

Max Page Table Size Select

To select the maximum page table size setting, the menu options are:

2M

1G

Default: 1G

#### Active Video

Select the active display device type, the menu options are: Auto Onboard Device PCIE Device Default: Auto

### 5.2.20 Server ME Configuration



Figure 5-20

Display Server ME version, features, status and other information;

### 5.2.21 Runtime Error Logging

	Aptio Setup Utility – Co Platform Configuratio	pyright (C) 2020 American n	Megatrends, Inc.
Runtime Error	Logging		System Error Enable/Disable
System Errors		Enable]	
			<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
	Version 2.20.1275. Copy	right (C) 2020 American Me	egatrends, Inc. 84

System Errors

Turn on or off the system error function, the menu options are: Disabled Enabled Default: Enabled

### 5.2.22 Socket Configuration menu

Aptio Setup Utility – Copyright (C) 2020 American Main Advanced Platform Configuration Socket Configuration :	Megatrends, Inc. Server Mgmt Security Boot 🔹 🕨
<ul> <li>Processor Configuration</li> <li>Common RefCode Configuration</li> <li>UPI Configuration</li> <li>Memory Configuration</li> <li>IIO Configuration</li> <li>Advanced Power Management Configuration</li> </ul>	Displays and provides option to change the Processor Settings
	<pre>→+: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. Copyright (C) 2020 American Mo	egatrends, Inc.

Figure 5-22

Processor Configuration

Common RefCode Configuration

**UPI** Configuration

Memory Configuration

IIO Configuration

Advanced Power Management Configuration

## 5.2.23 Processor Configuration

Aptio Setup Utility	– Copyright (C) Socket (	) 2020 America Configuration	n Megatrends, Inc.
Processor Configuration			Change Per-Socket Settings
<ul> <li>Per-Socket Configuration         Processor BSP Revision         Processor Socket         Processor ID         Processor Frequency         Processor Max Ratio         Processor Min Ratio         Microcode Revision         L1 Cache RAM         L2 Cache RAM         L3 Cache RAM         Processor 0 Version         Intel(R) Xeon(R) Bronze 3104 CPU @         Processor 1 Version         Intel(R) Xeon(R) Bronze 3104 CPU @         Hyper-Threading [ALL]         Max CPUID Value Limit         Enable SMX         Hardware Prefetcher         Adjacent Cache Prefetch         State Content Cache Prefetch         Content Cache Prefetch</li></ul>	50654 - SKX Socket 0 00050654*   1.700GHz   11H   08H   0200005A   64KB   1024KB   8448KB   1.70GHz 1.70GHz [Enable] [Disable] [Disable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable]	U0 Socket 1 00050654 1.700GHz 11H 08H 0200005A 64KB 1024KB 8448KB	<pre>**: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275.	Copyright (C) 2	2020 American	Megatrends, Inc. 84

0.1275.Conuright

Figure 5-23

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Socket Configuration				
Processor Frequency Processor Max Ratio Processor Min Ratio Microcode Revision L1 Cache RAM L2 Cache RAM L3 Cache RAM Processor 0 Version Intel(R) Xeon(R) Bronze 3104 CF Processor 1 Version Intel(R) Xeon(R) Bronze 3104 CF	1.700GHz   1.700GHz 11H   11H 08H   08H 0200005A   02000054 64KB   64KE 1024KB   1024KE 8448KB   8448KE <sup>P</sup> U @ 1.70GHz	Enable/disable AES-NI support		
Hyper-Threading [ALL] Max CPUID Value Limit Enable Intel(R) TXT VMX Enable SMX Hardware Prefetcher Adjacent Cache Prefetch DCU Streamer Prefetcher DCU IP Prefetcher LLC Prefetch DCU Mode Extended APIC AES-NI	[Enable] [Disable] [Disable] [Enable] [Enable] [Enable] [Enable] [Enable] [Disable] [32KB 8Way Without E0 [Disable] [Enable]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>		
Vana i an - 9 - 90 - 40	75 . Copupiati (C) . 2020			

Figure 5-24

Display CPU Type \ID \Speed \Cache and other information, configure CPU-related functions;

Pre-Socket Configuration: each slot configuration;

#### Hyper-Threading

Hyper-Threading Control Switch, this option enables or disables the Hyper-Threading feature of Intel processors. When this feature is enabled, each physical processor core is equivalent to two logical processor cores; when this feature is disabled, each physical processor core is equivalent to only one logical processor core. Enabling this feature results in a higher processor core count, improving the overall performance of the application. The menu options are:

Enable Disable Default: Enable

Max CPUID Value Limit

Enabled when booting a legacy operating system that cannot support extended CPUIDs, the menu options are: Enable

Disable

Default: Disable

Enable Intel(R) TXT

Intel TXT function switch, the menu options are: Enable Disable Default: Disable

#### VMX

CPU Virtualization Technology switch, if this option is enabled, the virtualization layer or operating system that supports this option can use the hardware capabilities of Intel Virtualization Technology. Some virtualization layers require Intel Virtualization Technology to be enabled. This option can also be left enabled without using a hypervisor or operating system that supports this option. The menu options are:

Enable Disable Default: Enable

#### Enable SMX

Extended safe mode function switch, the menu options are: Enable Disable Default: Disable

#### Hardware Prefetcher

Hardware prefetching means that before the CPU processes instructions or data, it prefetches these instructions or data from memory to the L2 cache, thereby reducing memory read time, helping to eliminate potential bottlenecks, and improving system performance. The menu options are:

Enable Disable Default: Enable

Adjacent Cache Prefetch

After the adjacent cache prefetch function is enabled, when the computer reads data, it will intelligently think that the data next to or adjacent to the data to be read is also needed, so these adjacent data will be pre-read during processing. , which can speed up reading. When the application scenario is to access memory sequentially, enabling this function will improve performance. When the application scenario is random access to memory, it is recommended to disable this option. The menu options are:

Enable Disable

Default: Enable

#### DCU Streamer Prefetcher

DCU stream prefetch switch, the menu options are: Enable Disable Default: Enable

#### DCU IP Prefetcher

DCU IP prefetch switch, the menu options are: Enable Disable Default: Enable

#### LLC Prefetcher

LLC prefetch switch, the menu options are: Enable Disable Default: Disable

#### DCU Mode

DCU mode setting, the menu options are: 32KB 8Way Without ECC: 32KB 8Way Without ECC 16KB 4Way With ECC: 16KB 4Way With ECC Default: 32KB 8Way Without ECC

#### Extended APIC

To enable/disable extended APIC support, the menu options are: Enable Disable Default: Disable

#### AES-NI

To enable and disable AES (Advanced Encryption Standard), the menu options are: Enable Disable Default: Enable

### 5.2.24 Common RefCode Configuration



Figure 5-25

#### MMIO High Base

Select the MMIO high base address, the menu options are:

56T 40T 24T 16T 4T 1T

Default: 56T

#### MMIO High Granularity Size

To select the MMIO high interval size, the menu options are: 1G 4G 16G 64G 256G 1024G

Default: 256G

#### Numa

To turn non-uniform memory access on or off, the menu options are: Enable Disable Default: Enable

### 5.2.25 UPI Configuration

Aptio Setup Utility –	Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
Aptio Setup Utility - UPI Configuration UPI Status Degrade Precedence Link Speed Mode Link Frequency Select Link LOp Enable Link L1 Enable UPI Failover Support SNC XPT Prefetch KTI Prefetch Legacy VGA Socket Legacy VGA Stack	Copyright (C) 2020 American Socket Configuration [Topology Precedence] [Fast] [Auto] [Auto] [Auto] [Auto] [Disable] [Auto] [Enable] 0 0	Megatrends, Inc. UPI Status Help ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
		F3: Uptimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. Co	pyright (C) 2020 American M	egatrends, Inc. B4

Figure 5-26

UPI Status: UPI link status submenu, showing the current UPI link status

#### Degrade Precedence

When the system settings conflict, set the Topology Precedence to lower the feature, or lower the Topology by setting the Feature Precedence. The menu options are:

Topology Precedence Feature Precedence Default: Topology Precedence

Link Speed Mode

Link speed mode setting, the menu options are:

Slow

Fast

Default: Fast

Link L0p Enable

Link L0p switch, the menu options are: Disable Enable Auto Default: Auto

Link L1 Enable

Link L1 switch, menu options are: Disable Enable Auto

Default: Auto

#### UPI Failover Support

UPI failover supports switch settings, the menu options are: Disable Enable Auto Default: Auto

#### SNC

Sub NUMA cluster settings, the menu options are: Disable Enable Auto Default: Disable

#### **XPT** Prefectch

XPT prefetch settings, the menu options are: Disable Enable Auto Default: Auto

#### **KTI** Prefectch

KTI prefetch settings, the menu options are: Disable Enable Auto Default: Enable

Legacy VGA Socket: Set the number of traditional VGAs, the valid value range is 0~1.

Legacy VGA Stack : Set the number of traditional VGA stacks, the valid value range is 0~6.

### 5.2.26 Memory Configuration

Aptio Setup Utility –	Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
Integrated Memory Controller (iMC) Enforce POR Memory Frequency Data Scrambling for NVMDIMM Data Scrambling for DDR4 Enable ADR Legacy ADR Mode ADR Data Save Mode Erase-Arm NVDIMMS Restore NVDIMMS Interleave NVDIMMS 2x Refresh Enable Memory Topology Memory Map Memory RAS Configuration	Socket Configuration [Auto] [Auto] [Auto] [Auto] [Auto] [Enable] [Disable] [InvDIMMs] [Enable] [Enable] [Disable] [Auto]	Enable - Enforces Plan Of Record restrictions for DDR4 frequency and voltage programming. Disable - Disables this feature. Auto - Sets it to the MRC default setting; current default is Enable. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. C	opyright (C) 2020 American M	legatrends, İnc.

Figure 5-27

Enforce POR

To enforce POR settings, the menu options are:

Auto

POR

Disable

Default: Auto

#### Memory Frequency

Memory frequency setting, the menu options are:

Auto

800

1000

1066

1200

1333 1400

1600

1000

...

Default: Auto

#### Data Scrambling for NVDIMMs

NVDIMM data scramble switch settings, the menu options are:

Auto

Disable Enable Default: Auto

#### Data Scrambling for DDR4

DDR4 data scramble switch settings, the menu options are:

Auto

Disable

Enable

Default: Auto

#### Enable ADR

ADR enable switch setting, the menu options are: Disable Enable Default: Enable

#### Legacy ADR Mode

Traditional ADR mode switch settings, the menu options are: Disable Enable Default: Enable

#### ADR Data Save Mode

ADR data saving mode setting, the menu options are: Disable Batterybacked DIMMs NVDIMMs Default: NVDIMMs

#### Erase-ARM NVDIMMs

Erase-ARM NVDIMMs switch settings, menu options are: Disable Enable Default: Enable

#### Restore NVDIMMs

Fix NVDIMMs switch settings, menu options are: Disable Enable

Auto

Default: Auto

#### Interleave NVDIMMs

To interleave the NVDIMMs switch settings, the menu options are: Disable Enable Default: Disable

2x Refresh Enable

2x refresh switch settings, the menu options are:

Disable

Enable

Default: Disable

Memory Topology

Memory topology submenu, showing in-place memory details;

Memory Map

Memory Map submenu;

Memory RAS Configuration

Memory RAS configuration submenu;

### 5.2.27 Memory Topology

Aptio Setup Utility –	Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
CPU0 A0: Enabled 2133MT/s UNKNOWN CPU0 A1:Not Installed CPU0 B0:Not Installed CPU0 B1:Not Installed CPU0 C0:Not Installed CPU0 C0:Not Installed CPU0 C1:Not Installed CPU0 D1:Not Installed CPU0 E0:Not Installed CPU0 E1:Not Installed CPU0 F0:Not Installed CPU0 F1:Not Installed CPU0 F1:Not Installed CPU1 G0:Not Installed CPU1 G1:Not Installed CPU1 H1:Not Installed CPU1 H1:Not Installed CPU1 J1:Not Installed CPU1 X0:Not Installed CPU1 K0:Not Installed CPU1 K1:Not Installed CPU1 L1:Not Installed CPU1 L1:Not Installed CPU1 L1:Not Installed CPU1 M0:Not Installed CPU1 M1:Not Installed CPU1 M1:Not Installed	SR×4 8GB RDIMM	★: Select Screen ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. Co	ppyright (C) 2020 American Mu	egatrends, Inc. 84

Figure 5-28

Display current in-place memory details

### 5.2.28 Memory Map

Aptio Setup Utility -	- Copyright (C) 2020 Americ Socket Configuration	an Megatrends, Inc.
Volatile Memory Mode AppDirect cache eADR Support 1LM Memory Interleave Granularity IMC Interleaving Channel Interleaving Rank Interleaving Socket Interleave Below 4GB	[Auto] [Disable] [Disable] [Auto] [Auto] [Auto] [Auto] [Disable]	Selects whether 1LM or 2LM memory mode should be enabled ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. (	Copyright (C) 2020 American	Megatrends, Inc.

Figure 5-29

Volatile Memory Mode

Volatile memory mode setting, the menu options are:

1LM

2LM

Auto

Default: Auto

#### 1LM Memory Interleave Granularity

1LM memory interleaving interval setting, the menu options are:

Auto

256B Target, 256B Channel

64B Target, 64B Channel

Default: Auto

#### IMC Interleaving

IMC cross setting, the menu options are: Auto 1-way Interleavel 2-way Interleavel Default: Auto

#### Channel Interleaving

Channel cross setting, the menu options are:

Auto

1-way Interleavel
 2-way Interleavel
 3-way Interleavel
 Default: Auto

Rank Interleaving

Rank cross setting, the menu options are: Auto 1-way Interleavel 2-way Interleavel 4-way Interleavel 8-way Interleavel Default: Auto

Socket Interleave Below 4GB

4GB address space processor interleave switch settings, the menu options are: Enable Disable Default: Disable

### 5.2.29 Memory RAS Configuration

Soci	(C) 2020 American Megatrends, Inc. t Configuration
emory RAS Configuration Setup atic Virtual Lockstep Mode [Disable irror mode [Disable EFI ARM Mirror [Disable emory Rank Sparing [Disable orrectable Error Threshold 7fff DC [Disable DOC Sparing [Disable atrol Scrub [Enable] atrol Scrub Interval 24 atrol Scrub Address Mode [System]	t Configuration Enable Static Virtual Lockstep mode + hysical Ad] ++: Select Screen tl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Figure 5-30

#### Static Virtual Lockstep Mode

Static virtual Lockstep mode switch settings, the menu options are:

Enable Disable Default: Disable

#### Mirror Mode

Mirror mode settings, the menu options are: Disable Enable Mirror Mode (1LM) Default: Disable

#### **UEFI ARM Mirror**

UEFI ARM mirror mode switch settings, the menu options are: Enable Disable Default: Disable

#### Memory Rank Sparing

Memory Rank hot spare switch settings, the menu options are: Enable Disable Default: Disable

Correctable Error Threshold : Correctable error threshold, the valid value is 0x01-0x7fff, the default value is 0x7fff. SDDC

SDDC switch setting, note: not supported when AEP DIMM exists, the menu options are:

Enable

Disable

Default: Disable

#### ADDDC Sparing

ADDDC hot standby switch settings, the menu options are:

Enable

Disable

Default: Disable

#### Set NGN Die Sparing

Set NGN Die hot standby switch settings, the menu options are: Enable Disable Default: Enable

#### Patrol Scrub

Patrol Scrub switch settings, menu options are: Enable Disable Default: Enable



Patrol Scrub Interval : Patrol Scrub interval time setting, the unit is hour, the range is 1-24, the default value is 24.

Patrol Scrub Address Mode

Patrol Scrub address mode setting, the menu options are:

Reverse address

System Physical Address

Default: System Physical Address

### 5.2.30 Socket Configuration



Figure 5-31

SocketN Configuration

The SocketN configuration submenu is used to set the Link speed, Max Payload Size, ASPM and other settings of the device on the PCIE of CPU0, and display the link status of the current PCIE port, the maximum link, the current link rate, etc.;

Intel(R) VT for Directed I/O (VT-d)

Intel VT-d technology related settings submenu, Intel VT-d technology switch settings;

Intel(R) VMD Technology

Intel VMD technology related settings submenu, switch settings of VMD on each PStack of each CPU;

Intel(R) AIC Retimer/AIC SSD Technology(non-VMD)

Intel AIC Retimer/AIC SSD technology related settings submenu, switch settings of AIC Retimer/AIC SSD technology on each PStack of each CPU.

#### PCIe Hot Plug

PCIe hot-plug switch settings, the menu options are:

Enable Disable Default: Disable

PCI-E ASPM Support(Global)

PCIE ASPM master switch settings, the menu options are:

Disable

Per-Port

L1 Only

Default: Per-Port

PCI-E Max Read Request Size

PCIE maximum read request size setting, the menu options are:

Auto 128B 256B 512B 1024B

1024D

2048B 4096B

Default: Auto

IOU0 (II0 PCIe Br1)[Auto]IOU1 (II0 PCIe Br2)[Auto]IOU2 (II0 PCIe Br3)[Auto]MCP0 / IOU3 (II0 PCIe Br4)[Auto]MCP1 (II0 PCIe Br5)[Auto]PCI-E Completion Timeout Disable[Enable]PCI-E Completion Timeout Value[260ms to 900ms]Sck1 RP Correctable Err[Disable]Sck1 RP Fatal Uncorrectable Err[Disable]Sckt1 P Feider1000F0 - Port 1ASocket 1 PcieBr2000F0 - Port 2ASocket 1 PcieBr3002F0 - Port 3ASocket 1 PcieBr3002F0 - Port 3CSocket 1 PcieBr3002F0 - Port 3CSocket 1 PcieBr5000F0 - MCP 1Socket 1 PcieBr5000F0 - MCP 1**: Select ItemEnter: Select*-: Change Opt.F1: General HelpF2: Previous ValuesF3: Optimized DefaultsF4: Save & ExitESC: Exit	Aptio Setup Utility — (	Copyright (C) 2021 American Socket Configuration	Megatrends, Inc.
	<pre>IOU0 (II0 PCIE Br1) IOU1 (II0 PCIE Br2) IOU2 (II0 PCIE Br3) MCP0 / IOU3 (II0 PCIE Br4) MCP1 (II0 PCIE Br5) PCI-E Completion Timeout Disable PCI-E Completion Timeout Value Sck1 RP Correctable Err Sck1 RP Fatal Uncorrectable Err Sck1 RP Fatal Uncorrectable Err Sck1 RP Fatal Uncorrectable Err Sckt1 PcieBr0D00F0 - Port 0 Socket 1 PcieBr1D00F0 - Port 1A Socket 1 PcieBr3D00F0 - Port 3A Socket 1 PcieBr3D00F0 - Port 3C Socket 1 PcieBr3D02F0 - Port 3C Socket 1 PcieBr5D00F0 - MCP 0 / Port</pre>	[Auto] [Auto] [Auto] [Auto] [Auto] [Enable] [260ms to 900ms] [Disable] [Disable] [Disable] [Disable]	Selects PCIe port Bifurcation for selected slot(s)

#### Socket0 Configuration

IOU0 (IIO PCIe Br1)

Control CPU 0 riser 1 x16 PCIE branch option; IOU1 (IIO PCIe Br2)

Control CPU 0 riser 1 x8 and riser 2 x8 PCIE branch options; IOU2 (IIO PCIe Br3) Controls OCP NIC slots and PCIE breakout options linked to PCH upstream channels; Socket 0 PcieBr0D00F0 – Port 0/DMI CPU 0 is linked to the PCH's DMI channel configuration menu; Socket 0 PcieBr1D00F0 – Port 1A CPU 0 riser 1 x16 slot configuration menu; Socket 0 PcieBr2D00F0 – Port 2A CPU 0 riser 2 x8 slot configuration menu; Socket 0 PcieBr2D02F0 – Port 2C CPU 0 riser 1 x8 slot configuration menu; Socket 0 PcieBr3D00F0 – Port 3A CPU 0 OCP card slot configuration menu; Socket 0 PcieBr3D02F0 – Port 3C CPU 0 is linked to the configuration menu of the PCH upstream channel;

#### **Socket1 Configuration**

IOU0 (IIO PCIe Br1) Control CPU 1 riser 3 x16 PCIE branch options; IOU1 (IIO PCIe Br2) Control CPU 1 riser 2 x16 PCIE branch options; IOU2 (IIO PCIe Br3) Control the PCIE branch options of CPU1 Slimline 1 and Slimline 2; Socket 1 PcieBr0D00F0 - Port 0 Unused: Socket 1 PcieBr1D00F0 - Port 1A CPU 1 riser 3 x16 slot configuration menu; Socket 1 PcieBr2D00F0 - Port 2A CPU 1 riser 2 x16 slot configuration menu; Socket 1 PcieBr3D00F0 - Port 3A CPU1 Slimline 1 slot configuration menu; Socket 1 PcieBr3D02F0 - Port 3C CPU1 Slimline 2 slot configuration menu;

### 5.2.31 Advanced Power Management Configuration

Aptio Setup	Utility – Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
Advanced Power Management CPU P State Control Hardware PM State Control CPU C State Control Package C State Control CPU - Advanced PM Tuning SOCKET RAPL Config	Configuration	P State Control Configuration Sub Menu, include Turbo, XE and etc.
		<pre>→+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.2	20.1275. Copyright (C) 2020 American M	egatrends, Inc.

Figure 5-32

CPU P State Control

Hardware PM State Control

Hardware power management state control submenu; CPU C State Control

Package C State Control

CPU-Advanced PM Tuning

CPU performance and power saving tuning submenu;

Socket RAPL Configuration

### 5.2.32 CPU P State Control

Aptio Setup Utility –	Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
CPU P State Control Uncore Freq Scaling (UFS) Config TDP Turbo Mode CPU Flex Ratio Override CPU Core Flex Ratio	[Enable] [Normal] [Enable] [Disable] 23	Enable∕Disable autonomous uncore frequency scaling
		<pre></pre>
Version 2.20.1275. Co	opyright (C) 2020 American M	egatrends, Inc.

Figure 5-33

Uncore Freq Scaling (UFS)

Uncore frequency extension settings, the menu options are:

Enable

Disable

Default: Enable

#### Config TDP

TDP level settings, the menu options are:

Normal

Level 1

Level 2

Default: Normal

#### Turbo Mode

Dynamic acceleration switch settings, the menu options are: Enable Disable Default: Enable

### 5.2.33 Hardware PM State Control

Aptio Setup Utility	– Copyright (C) 2020 America Socket Configuration	n Megatrends, Inc.
Hardware PM State Control Hardware P-States EPP Enable	[Native Mode] [Enable]	Disable: Hardware chooses a P-state based on OS Request (Legacy P-States) Native Mode:Hardware chooses a P-state based on OS guidance Out of Band Mode:Hardware autonomously chooses a P-state (no OS guidance) **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275.	Copyright (C) 2020 American (	Megatrends, Inc.



#### Hardware P-State

The hardware selects whether the P-State state is actively set by the OS. The default value is determined according to the actual test. The menu options are:

Disable : Hardware selects P-States based on legacy OS requests

Native Mode: Hardware selection P-State based on legacy OS boot

Out of Band Mode: Hardware is automatically selected, no OS boot required

Native Mode with No Legacy Support

Default: Native Mode

EPP Enable

EPP enable setting, the menu options are: Enable Disable Default: Enable

### 5.2.34 CPU C State Control

Aptio Setup Utility –	Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
CPU C State Control		Autonomous Core C-State Control
Autonomous Core C-State CPU C6 report Enhanced Halt State (C1E)	[Disable] [Auto] [Enable]	★+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. Co	pyright (C) 2020 American M	egatrends. Inc.

Figure 5-35

#### Autonomous Core C-State

Autonomous core C state switch settings, the menu options are:

Enable

Disable

Default: Disable

#### CPU C6 report

Reports the C6 status switch settings to the OS, the menu options are:

Disable

Enable

Auto

Default: Auto

#### Enhanced Halt State (C1E)

C1E switch settings, the menu options are: Disable

Enable

Default: Enable

## 5.2.35 Package C State Control

Aptio Setup Utility -	- Copyright (C) 2020 Americar Socket Configuration	Megatrends, Inc.
Package C State Control		Package C State limit
Package C State	[Auto]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. (	Copyright (C) 2020 American ⊧	legatrends, Inc.

Figure 5-36

Package C State

Package C status settings, the menu options are:

C0/C1 state

C2 state

C6(non Retention) state

C6(Retention) state

No Limit

Default: Auto

# 5.2.36 CPU-Advanced PM Tuning

Aptio Setup Utility -	Copyright (C) 2020 American Socket Configuration	Megatrends, Inc.
CPU – Advanced PM Tuning		Energy Perf BIAS Sub Menu
▶ Energy Perf BIAS SAPM Control	[Enable]	
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. C	opyright (C) 2020 American M	egatrends, Inc.

Figure 5-37

Energy Perf BIAS

CPU energy saving performance related options settings

### 5.2.37 Energy Perf BIAS

Aptio Setup Utility	– Copyright (C) 2020 America Socket Configuration	n Megatrends, Inc.
Energy Perf BIAS Power Performance Tuning ENERGY_PERF_BIAS_CFG mode Workload Configuration	[OS Controls EPB] [Balanced Performance] [Balanced]	MSR 1FCh Bit[25] = PWR_PERF_TUNING_CFG_MODE. Enable - Use IA32_ENERGY_PERF_BIAS input from the core; Disable - Use alternate perf BIAS input from ENERGY_PERF_BIAS_CONFIG
		<pre> ++: Select Screen  14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275.	Copyright (C) 2020 American	Megatrends, Inc.

Figure 5-38

#### Power Performance Tuning

Energy saving performance adjustment settings, the menu options are: OS Controls EPB: OS Controls Power Saving Performance Tuning BIOS Controls EPB: BIOS Controls Power Saving Performance Tuning Default: OS Controls EPB

#### ENERGY\_PERF\_BIAS\_CFG Mode

Energy-saving performance management settings, this can be set when Power Performance Tuning is set to BIOS Control EPB, the menu options are:

Performance

**Balanced** Performance

Balanced Power: Balanced Energy Savings

Power: Energy saving

Default: Balanced Performance

#### Workload Configuration

To optimize settings for workload characteristics, the menu options are: Balanced I/O Sensitive Default: Balanced

### 5.2.38 Server Mgmt Menu

BMC Self Test StatusFAILEDBMC Device ID32BMC Device Revision1BMC Firmware Revision1.00.0IFMI Version2.0BMC Interface(s)KCSFRB-2 Timer[Enabled]FRB-2 Timer fimeout[6 minutes]FRB-2 Timer Policy[Do Nothing]OS Wtd Timer Dolicy[Reset]++: Select ScreenView System Event Log[Reset]BMC User Settings	Aptio Setup Utility – C Main Advanced Platform Configurat:	Copyright (C) 2020 American ion Socket Configuration	Megatrends, Inc. Server Mgmt Security Boot
<ul> <li>BMC network configuration</li> <li>View System Event Log</li> <li>BMC User Settings</li> <li>T1: Select Item</li> <li>Enter: Select</li> <li>+/-: Change Opt.</li> <li>F1: General Help</li> <li>F2: Previous Values</li> <li>F3: Optimized Defaults</li> <li>F4: Save &amp; Exit</li> <li>ESC: Exit</li> </ul>	BMC Self Test Status BMC Device ID BMC Device Revision BMC Firmware Revision IPMI Version BMC Interface(s) FRB-2 Timer FRB-2 Timer timeout FRB-2 Timer Policy OS Watchdog Timer OS Wtd Timer Timeout OS Wtd Timer Policy Suctem Event Log	FAILED 32 1 1.00.0 2.0 KCS [Enabled] [6 minutes] [Do Nothing] [Disabled] [10 minutes] [Reset]	Enable or Disable FRB-2 timer(POST timer)
	BMC network configuration View System Event Log BMC User Settings		<pre>fl: Select is clean fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

Figure 5-39

Displays BMC self-check status, device ID, device version, BMC software version, and version that supports IPMI specification.

FRB-2 Timer FRB-2 clock switch settings, the menu options are: Enabled Disabled Default: Enabled

#### FRB-2 Timer timeout

FRB-2 clock timeout setting, the menu options are:

- 3 minutes
- 4 minutes
- 5 minutes
- 6 minutes

Default: 6 minutes

#### **FRB-2** Timer Policy

Policy settings after FRB-2 clock timeout, the menu options are: Do Nothing Reset Power Down Power Cycle Default: Do Nothing

#### OS Watchdog Timer

OS watchdog clock switch settings, the menu options are: Enabled Disabled Default: Disabled

OS Wtd Timer timeout

OS watchdog clock timeout setting, the menu options are:

5 minutes

10 minutes

15 minutes

20 minutes

Default: 10 minutes

#### OS Wtd Timer Policy

The policy setting after the OS watchdog clock times out, the menu options are: Do Nothing Reset Power Down Power Cycle Default: Reset

#### System Event Log menu

System Event Log Control Menu BMC network configuration menu

View System Event Log menu View the System Event Log Control Menu

BMC User Settings menu

### 5.2.39 System Event Log menu

Aptio Setup Utility –	Copyright (C) 2020 American	Megatrends, Inc. Server Mgmt
Enabling/Disabling Options SEL Components	[Enabled]	Change this to enable or disable event logging for
Erasing Settings Erase SEL When SEL is Full	[No]	boot.
Custom EFI Logging Options		
NOTE: All values changed here do not effect until computer is resta	take rted.	
		↔: Select Screen f↓: Select Item
		Enter: Select +/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESU: EXIT
Version 2.20.1275. Do	nuright (C) 2020 American M	evatrends. Inc.

Figure 5-40

#### SEL Components

Start-up process system event recording function control switch, menu options:

Enabled

Disabled

Default: Enabled

#### Erase SEL

Clear system event log control switch, menu options:

No: Do not clear

Yes, On next reset

Yes, On every reset

Default: No

#### When SEL is Full

When the system event record storage space is full, operate the control switch, menu options:

Do Nothing

Erase Immediately

Default: Do Nothing

Log EFI Status Codes

Configuration records EFI Status Codes, menu options: Disabled Both: Record Error code & Progress code

102

Error code: Only record Error code Progress code: Only record Progress code Default value: Error code

### 5.2.40 BMC network configuration menu

Aptio Setup Utility –	Copyright (C) 2020 Americar	n Megatrends, Inc. Server Mgmt
BMC network configuration ***********************************		Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network
BMC Sharelink Management channel Configuration Address source Current Configuration Address sour Station IP address Subnet mask Station MAC address Router IP address Bouter DOC address	[Unspecified] DynamicAddressBmcDhcp 0.0.0.0 0.0.0.0 00-24-EC-F2-7D-DD 0.0.0.0	parameters during BIOS phase
BMC Dedicated Management channel Configuration Address source Current Configuration Address sour Station IP address Subnet mask Station MAC address Router IP address Router MAC address	[Unspecified] DynamicAddressBmcDhcp 192.168.1.210 255.255.255.0 00-24-EC-F2-7D-DE 192.168.1.1 9C-A6-15-57-5B-D9	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
жжжжжжжжжжжж Configure IPV6 support Version 2.20.1275. Co	nuright (C) 2020 American B	fegatrends, Inc.

Figure 5-41

Aptio Setup Utility –	Copyright (C) 2020 American	Megatrends, Inc. Server Mgmt
BMC Dedicated Management channel Configuration Address source Current Configuration Address sour Station IP address Subnet mask Station MAC address Router IP address Router MAC address	Unspecified] DynamicAddressBmcDhcp 192.168.1.210 255.255.255.0 00-24-EC-F2-7D-DE 192.168.1.1 9C-A6-15-57-5B-D9	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase
**************************************		
****		
BMC Sharelink Management channel		<pre>++: Select Screen ↑↓: Select Item</pre>
IPV6 Support	[Enabled]	Enter: Select +/-: Change Ont.
Configuration Address source Current Configuration Address sour Station IPV6 address	[Unspecified] DynamicAddressBmcDhcp	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
FE80::224:ECFF:FEF2:7DDD		ESC: Exit
Prefix Length 64		

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

Figure 5-42

Aptio Setup Utility –	Copyright (C) 2020 American	Megatrends, Inc. Server Mgmt
IPV6 Router1 IP Address ::	Î	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will
IPV6 address status IPV6 DHCP Algorithm	Active SLAAC	not modify any BMC network parameters during BIOS phase
BMC Dedicated Management channel		
IPV6 Support	[Enabled]	
Configuration Address source Current Configuration Address sour	[Unspecified] DynamicAddressBmcDhcp	tt: Select Screen
Station IPV6 address FE80::224:ECFF:FEF2:7DDE		↑↓: Select Item Enter: Select
Prefix Length 64		F1: General Help F2: Previous Values
IPV6 Router1 IP Address ::		F3: Optimized befaults F4: Save & Exit ESC: Exit
IPV6 address status IPV6 DHCP Algorithm	Active SLAAC	
Version 2.20.1275. Co	opyright (C) 2020 American M	legatrends, Inc.

Figure 5-43

Configure IPV4 support

BMC sharelink Management Channel

Configuration Address source

To configure the BMC IP address allocation mode, the menu options are:

Unspecified: Do not change BMC parameters Static: BIOS static IP settings DynamicBmcDhcp: BMC runs DHCP to dynamically assign IP DynamicBmcNonDhcp: BMC runs Non-DHCP protocol to dynamically assign IP Default: Unspecified

Modify the parameters from Unspecified to other parameters. After saving and restarting, the options will be restored to the Unspecified value, and there is no need to configure the BMC IP each time the startup process is performed.

When the Configuration Address source option is Unspecified, it will display the network parameter information (IPV4) of the system shared network port, the current IP configuration method, BMC IP, subnet mask, MAC address, routing IP, routing MAC;

BMC Dedicated Management Channel
Configuration Address source
To configure the BMC IP address allocation mode, the menu options are:
Unspecified: Do not change BMC parameters
Static: BIOS static IP settings
DynamicBmcDhcp: BMC runs DHCP to dynamically assign IP
DynamicBmcNonDhcp: BMC runs Non-DHCP protocol to dynamically assign IP
Default: Unspecified

Modify from Unspecified to other parameters, save and restart the execution, the option will restore the Unspecified value, without the need to configure the BMC IP every time the startup process.

When the Configuration Address source option is Unspecified, it will display the network parameter information (IPV4) of the dedicated network port of the system, the current IP configuration method, BMC IP, subnet mask, MAC address, routing IP, routing MAC;

#### Configure IPV6 support

BMC Sharelink Management Channel IPV6 Support Choose whether to support IPV6, the menu options are: Enabled: Supports IPV6 Disabled: Does not support IPV6 Default: Enabled

Modify the parameters from Unspecified to other parameters. After saving and restarting, the options will be restored to the Unspecified value, and there is no need to configure the BMC IP each time the startup process is performed.

When the Configuration Address source option is Unspecified, the network parameter information (IPV6) of the system shared network port will be displayed;

BMC Dedicated Management Channel

IPV6 Support Choose whether to support IPV6, the menu options are: Enabled: Supports IPV6 Disabled: Does not support IPV6 Default: Enabled

Modify the parameters from Unspecified to other parameters. After saving and restarting, the options will be restored to the Unspecified value, and there is no need to configure the BMC IP each time the startup process is performed.

When the Configuration Address source option is Unspecified, the network parameter information (IPV6) of the dedicated network port of the system will be displayed;

### 5.2.41 View System Event Log menu

	Aptio	Setup Utility – Copyright (C)	2020 American S	Megatrends, Inc. Berver Mgmt
No. of lo	g entries .	HEX:		
DATE	TIME	SENSOR TYPE		46 00 02 35 40 H6 5E 20 00 04 14 32 0A 02 FF FF
04/28/20	15:35:17	Button/Switch		Generator ID: BMC – LUN #0
04/28/20	15:35:22	Button/Switch		(Channel #0)
04/28/20	15:35:32	System Event		Sensor Number: 0x32 SCSI
04/28/20	15:35:32	System Event		Bus(Parallel)
01/11/18	05:27:46	System Event		Event Description: Record
01/11/18	05:27:46	System Event		Type-0x02. Assertion Event.
01/11/18	05:28:31	OS Boot		
01/11/18	05:28:31	OEM Record DC		
01/11/18	05:41:12	OS Stop/Shutdown		
01/11/18	05:41:12	OEM Record DD		↔: Select Screen
01/11/18	05:41:14	Voltage		↑↓: Select Item
01/11/18	05:41:14	Voltage		Enter: Select
01/11/18	05:41:14	Voltage		+/-: Change Opt.
01/11/18	05:41:14	Voltage		F1: General Help
04/15/75	16:12:16	Processor		F2: Previous Values
04/15/75	16:12:16	Button/Switch		F3: Optimized Defaults
04/15/75	16:12:39	System Event		F4: Save & Exit
04/15/75	16:12:39	System Event		ESC: Exit
01/11/18	05:46:17	System Event		
01/11/18	05:46:17	System Event		
01/11/18	05:47:00	Button/Switch		
	Uara	ies 0 00 1075 . Convelate (0) 6	1000 Amonicon Ma	Jotsende Tee
	vens.	ion 2.20.1275. Copyright (C) 2	uzu American Me	gatrends, inc.

Figure 5-44

View system event log information.

Note that entering this menu, the BIOS needs to read the SEL data, and it needs to wait for a while.

# 5.2.42 BMC User Setting

Aptio Setup Utility – Copyright (C) 2020American	Megatrends, Inc. Server Mgmt			
BMC User Settings	Press <enter> to Add a User.</enter>			
▶ Add User				
▶ Delete User				
Change User Settings	<pre>++: Select Screen f4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>			
Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.				

Figure 5-45

Add User

Add user submenu Delete User Delete User Submenu Change User Setting Modify User Settings Submenu

### 5.2.43 Add User

Aptio Setup Utility	) – Copyright (C) 2020 Am	merican Megatrends, Inc. Server Mgmt		
BMC Add User Details User Name User Password User Access Channel No User Privilege Limit	[Disable] O [Reserved]	Enter BMC User Name **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.				

Figure 5-46

User Name : User name setting, up to 16 characters are supported.

User Password : User password settings, password characters must contain uppercase and lowercase letters, special characters and numbers, with a minimum of 8 characters and a maximum of 20 characters.

Channel No : BMC channel setting, input 1 or 8

User Privilege Limit

User permission settings, menu options are:

Reserved

Callback

User

Operator

Administrator

After the setting is successful, "Set User Access Command Passed" will be prompted, and the BMC User will take effect immediately.
### 5.2.44 Delete User

Aptio Setup Utility – Copyright (C) 2020American	Megatrends, Inc. Server Mgmt
BMC Delete User Details User Name User Password	Enter BMC User Name
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. Copyright (C) 2020 American Ma	egatrends, Inc.



User Name : Enter the user name to delete.

User Password : Enter the password of the user to be deleted. After the correct password is entered, a prompt "User Delete!!!" will show up. The successfully deleted user will take effect in the BMC immediately, and the user will not be able to log in to the BMC web interface.

### 5.2.45 Change User Setting

Aptio Setup Utility – C	Copyright (C) 2020 American	Megatrends, Inc. Server Mgmt
BMC Change User Settings User Name User Password Change User Password User Access Channel No User Privilege Limit	[Disable] O [Reserved]	Enter BMC User Name ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. Cop	oyright (C) 2020 American M	egatrends, Inc.



User Name: Enter the user name to be modified.

User Password: Enter to modify the user password, the following options can be modified only if the name and password are entered correctly.

User

User permission switch settings, menu options are: Enabled Disabled

Default: Disabled

Change User Password: Change the user password. The input password must contain uppercase and lowercase letters, special characters and numbers, with a minimum of 8 characters and a maximum of 20 characters.

Channel NO: BMC channel setting, input 1 or 8.

User Privilege Limit

To modify user permission settings, the menu options are: Reserved Callback User Operator Administrator

### 5.2.46 Security menu

Aptio Setup Utility — Main Advanced Platform Configurat	Copyright (C) 2020 American ion Socket Configuration	Megatrends, Inc. Serven Mgmt Security Boot I
Password Description		Set Administrator Password
If ONLY the Administrator's password then this only limits access to Setu only asked for when entering Setup. If ONLY the User's password is set, is a power on password and must be e boot or enter Setup. In Setup the Us have Administrator rights. The password length must be in the following range: Minimum length	is set, p and is then this ntered to er will 3	
Maximum length	20	++: Select Screen
Administrator Password User Password		†↓: Select Item Enter: Select
Administrator Password User Password	Not Installed Not Installed	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
TCG Storage Security Configuration: ▶ TOSHIBA-RC100		ESC: Exit
- Version 2.20.1275. Co	pyright (C) 2020 American M	legatrends, Inc.

Figure 5-49

#### Administrator Password

Select this option to set an administrator password;

#### User Password

Select this option to set user password;

#### Administrator Password

Displays the administrator password status, if the system has an administrator password, it displays Installed; if there is no administrator password, it displays Not Installed;

#### User Password

Display the user password status, if the system has a user password, it displays Installed, if there is no user password, it displays Not Installed;

#### Hard Disk Security Configuration

The hard disk list is displayed dynamically. The hard disks connected to the SATA and sSATA controllers will be displayed here. Enter the hard disk interface to set the hard disk password. If there is no hard disk connection, it will not be displayed.

### 5.2.47 Boot menu





Setup Prompt Timeout: Setup prompt timeout setting, set the time to wait for the Setup activation key, the maximum value is 65535 seconds, and the default value is 1.

Bootup Numlock State

During the boot process, the keyboard Numlock indicator light state switch setting, the menu options are:

On

OFF

Default: On

#### Quiet Boot

To turn Quiet Boot on and off, the menu options are: Disabled: Close Quiet Boot, and POST information will be displayed at this time Enabled: Turn on Quiet Boot, and the OEM Logo will be displayed at this time Default: Enabled

#### Optimized Boot

Turn on and off the Optimized Boot function, the menu options are:

Disabled: Close Quiet Boot

Enabled: Turn on Quiet Boot, which will disable Csm support and connect network devices to reduce startup time

Default: Disabled

#### **Boot Option Priorities**

The list of startup options, this list is displayed dynamically and is determined by the number of startup options

### 5.2.48 Save & Exit menu

Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes Discard Changes Default Options Restore Defaults Save as User Defaults Restore User Defaults	
Restore User Defaults ++	Exit system setup after saving the changes.
Boot Override TOSHIBA-RC100 UEFI: Built-in EFI Shell F2 F3 F4 ES	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Figure 5- 51

Save Changes and Exit

Save the settings and exit the BIOS setup menu;

Discard Changes and Exit

Abandon saving settings and exit BIOS setup menu;

Save Changes and Reset

Save the settings and restart the system;

Discard Changes and Reset

Give up saving the settings and restart the system;

Save Changes

Discard Changes

Restore Defaults

Load BIOS factory settings;

Save as user Defaults

Restore user Defaults

Boot Override

A list of startup options, where a startup option can be selected.

### 5.3 User Operation Reminder

1. When the user operates, please understand the operating specifications in detail.

2. When operating options, please understand the meaning of the options in combination with the operation manual and the BIOS Setup interface option descriptions.

# **Chapter 6 RAID Setup Instructions**

# 6.1 PCH configuring RAID

# 6.1.1 Configuring RAID in UEFI Boot Mode

### 6.1.2 Configure RAID operation

During the server startup process, press Delete/Esc as prompted to enter the BIOS Setup interface. Move to the PlatForm page-->PCH Configuration-->PCH Sata Configuration-->Configure SATA as. Configure SATA to RAID mode, as shown in Figure 6-1.

Figure 6-1 Configure SATA to RAID mode:



Figure 6-1

Make sure that Storage and Video in CSM Configuration are in UEFI mode, as shown in Figure 6-2, set Storage and Video to UEFI mode

Aptio Setup Utility – Advanced	Copyright (C) 2020 American	Megatrends, Inc.
Compatibility Support Module Config	uration	Legacy/UEFI ROMs priority
CSM Support	[Enabled]	
CSM16 Module Version	07.83	
GateA20 Active INT19 Trap Response HDD Connection Order	[Upon Request] [Immediate] [Adjust]	
Boot option filter	[UEFI and Legacy]	
Option ROM execution		
Option ROM Policy Network Storage Video Other PCI devices	[UEF1] [UEF1] [UEF1] [UEF1] [UEF1]	<pre>f4: Select Screen f4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>



Restart the server to enter the BIOS Setup interface, move to the Advanced page, you will see the intel(R) RSTe SATA Controller, press enter to enter the RAID configuration, as shown in Figure 6-3 Figure 6-3 Intel RSTe SATA Controller

Aptio Setup Utility – Copyright (C) 2020 American Main Advanced Platform Configuration Socket Configuration	Megatrends, Inc. Server Mgmt Security Boot →
<ul> <li>Trusted Computing</li> <li>Serial Port Console Redirection</li> <li>SIO Configuration</li> <li>Option ROM Dispatch Policy</li> <li>PCI Subsystem Settings</li> <li>USB Configuration</li> <li>CSM Configuration</li> <li>NVMe Configuration</li> <li>T1s Auth Configuration</li> <li>Network Stack Configuration</li> <li>RAM Disk Configuration</li> </ul>	This formset allows the user to manage RAID volumes on the Intel(R) RAID Controller
<ul> <li>All Cpu Information</li> <li>All Cpu Information</li> <li>Intel(R) VROC SATA Controller</li> <li>Intel(R) Ethernet Connection X722 for 1GbE - 00:24:EC:F2</li> <li>Intel(R) Ethernet Connection X722 for 1GbE - 00:24:EC:F2</li> </ul>	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
▶ Driver Health	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

### Figure 6-4 Create RAID

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Advanced		
Intel(R) VROC 6.0.0.1024 SATA Driver ▶ Create RAID Volume	This page allows you to create a RAID volume	
Non-RAID Physical Disks: ▶ Port 4, ST1000DM003-1SB102 SN:29A7JLNM, 931.51GB ▶ Port 5, WDC WD1003FBY2-010FB0 SN:WD-WCAW35PL7F95, 931.51GB		
	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>	



Change the name of the created RAID, being careful not to contain special characters. Figure 6-5 Figure 6-5 Create RAID name

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Advanced		
Create RAID Volume		Enter a unique volume name
Name: RAID Level:	Volume0 [RAIDO(Stripe)]	the beginning or backslash and is 16 characters or less.
Select Disks: Port 4, ST1000DM003–1SB102 SN:Z9A7 Port 5, WDC WD1003FBYZ–010FB0 SN:W	[] []	
Strip Size: Capacity (GB):	[128KB] 0.00	
▶ Create Volume		++: Select Screen
Select at least two disks		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit



RAID Level: Select the RAID level of the configuration, as shown in Figure 6-6, select the RAID level of the configuration





Select Disks: Press the space bar to select the disks that need to participate in the configuring RAID. Figure 6-7

Figure 6-7 Selecting disks for configuring RAID

Aptio Setup Utility – Advanced	Copyright (C) 2020 American	Megatrends, Inc.
Create RAID Volume		X – to Select Disk
Name: RAID Level:	Volume0 [RAIDO(Stripe)]	
Select Disks: Port 4, ST1000DM003–1SB102 SN:Z9A7 Port 5, WDC WD1003FBYZ–010FB0 SN:W	[X] [X]	
Strip Size: Capacity (GB):	[128KB] 1769.86	
▶ Create Volume		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

#### Figure 6-7

Select Create Volume and press Enter to configure the RAID.

The relevant parameters are described in Table 1-36:

1	
Parameter	Remarks
Name	The name of the RAID.
RAID	RAID levels, which determine logical disk performance, fault tolerance,
Level	and capacity.
Select Disks	Select the member disks that make up the RAID. The available disks are displayed below the Select Disks column. Press Enter to select the disk. [X] indicates that the disk has been selected.
Strip Size	Stripe size, the size of the stripe data blocks written on each disk.
Capacity	The capacity of the logical disk.
	T 11 1 26

Table 1- 36

After the RAID is created, it will be displayed under the RAID Volumes directory. Select a RAID and press Enter to view the detailed information of the RAID (including RAID name, level, and disk information, etc.).

### **Configure Hot Spare Disk**

As shown in Figure 6-8, select the disk to be configured as a hot spare, and press Enter. Figure 6-8 Selecting a disk to configure as a hot spare

Aptio Setup Utility – Copyright (C) 2020 American Advanced	Megatrends, Inc.
Intel(R) VROC 6.0.0.1024 SATA Driver	Select to see more information
▶ Create RAID Volume	about the disk
RAID Volumes: ▶ Volume0, RAIDO(Stripe), 1769.86GB, Normal	
Non-RAID Physical Disks: ▶ Port 6, ST1000DM003-1SB10C SN:S9A07WV0, 931.51GB ▶ Port 7, ST1000DM003-1SB10C SN:S9A07PJ6, 931.51GB	
	++: Select Screen
	Enter: Select
	+/−: Change Opt. F1: General Help
	F2: Previous Values
	F4: Save & Exit
	ESC: Exit



Enter the interface shown in Figure 6-9, select "Mark as Spare", and press Enter. Figure 6-9 Hot spare disk configuration interface

Aptio Setup Utility Advanced	– Copyright (C) 2020 Ameri	can Megatrends, Inc.
PHYSICAL DISK INFO		Mark disk as Spare
Disk Actions:		
▶ Mark as Spare		
Mark as Journaling Drive		
▶ Turn Locate LED On		
Dont.	<i>c</i>	
Controllon:	D COTO	
Model Number:	ST1000DW002-199100	
Sonial Number:	S11000DH003-13B100	
Size.	931 51CB	
Status:	Non-RAID	
Block size:	512	++: Select Screen
		11: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit



The interface shown in Figure 6-10 is displayed, select Yes, and press Enter to complete the configuration of the hot spare disk.

Figure 6-10 Confirming the configuration of the hot spare disk



### Delete RAID

Enter the RSTe configuration interface.

Figure 6-10

As shown in Figure 6-11, select the RAID to be deleted in the RAID Volumes directory, and press Enter.

Figure 6-11 Selecting the RAID to be deleted

Aptio Setup Utility – Copyright (C) 2020 American Advanced	Megatrends, Inc.
Intel(R) VROC 6.0.0.1024 SATA Driver	Select to see more information
▶ Create RAID Volume	about the KHID VOIUME
RAID Volumes: ▶ Volume0, RAIDO(Stripe), 1769.86GB, Normal	
Non-RAID Physical Disks: ▶ Port 6, ST1000DM003-1SB10C SN:S9A07WV0, 931.51GB ▶ Port 7, ST1000DM003-1SB10C SN:S9A07PJ6, 931.51GB	
	<pre>++: Select Screen t↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

Figure 6-11

Enter the RAID information interface shown in Figure 6-12, select Delete, and press Enter to delete the RAID. Figure 6-12 RAID information interface

Aptio Setup Utili Advanced	ty – Copyright (C) 2020 Americ	an Megatrends, Inc.
RAID VOLUME INFO		
Volume Actions ▶ Delete		
Name: RAID Level: Strip Size: Size: Status: Bootable: Block size:	VolumeO RAIDO(Stripe) 128KB 1769.86GB Normal Yes 512	
RAID Member Disks: ▶ Port 4, ST1000DM003-1SB102 SN:Z ▶ Port 5, WDC WD1003FBYZ-010FB0 S	9A7JLNM, 931.51GB N:WD-WCAW35PL7F95, 931.51GB	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

# 6.1.3 Configuring RAID in Legacy Boot Mode

### Set RSTe working mode

Enter the BIOS Setup interface.

Move to the PlatForm page-->PCH Configuration-->PCH SATA Configuration



#### Figure 6-13

The onboard soft RAID of RSTe has two controllers, SATA and sSATA, which manage the disks connected to the two interfaces of the RAID card respectively. The SATA controller supports up to 8 disks, and the sSATA controller supports up to 6 disks.

Enter the interface shown in Figure 6-14, select the Configure SATA As item, press Enter, and select the working mode of the RSTe onboard soft RAID.

Figure 6-14 Modifying the working mode of the RAID card

Aptio Setup Utility – Platform Configurat	Copyright (C) 2020 America <mark>tion</mark>	n Megatrends, Inc.
PCH SATA Configuration		▲ Identify the SATA port is connected to Solid State Drive
<ul> <li>SATA Controller</li> <li>Configure SATA as</li> <li>SATA test mode</li> <li>SATA RSTE Boot Info</li> <li>► SATA Mode options</li> <li>Support Aggressive Link Power Mana Alternate Device ID on RAID</li> <li>Load EFI Driver for RAID</li> <li>NVRAM CYCLE ROUTER O ENABLE</li> </ul>	[Enable] [RAID] [Disable] [Enable] [Enable] [Disable] [Disable] [Disable]	UF HALU DISK DEIVE
NVRAM CKO FCIE ROUTER 1 ENABLE NVRAM CR1 PCIE Root Port Number NVRAM CR1 PCIE ROUTER 2 ENABLE NVRAM CR2 PCIE Root Port Number	[PCI Express Root P] [PCI Express Root P] [Disable] [PCI Express Root P]	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. E1: General Help</pre>
SATA Port 0 Software Preserve Port 0 Hot Plug Configure as eSATA Mechanical Presence Switch	[Not Installed] Unknown [Enable] [Enable] [Disable] [Enable]	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Figure 6-14

#### Enter the RSTe configuration interface

Power on or restart the server, and press Ctrl+I when the interface shown in Figure 6-15 is displayed during the BIOS startup process.

Figure 6-15 BIOS startup interface





If the working modes of both the sSATA and SATA controllers are set to RAID, the prompt "Press <CTRL-I> to enter Configuration Utility" will appear twice during the BIOS startup process,

corresponding to the sSATA and SATA controllers in turn. Please configure RAID according to the The desired disk selection controller.

Enter the RSTe configuration interface shown in Figure 6-16 (see Table 1-29 for interface descriptions). Please refer to the key operation tips on the lower border of the interface to navigate and modify settings in the interface. Figure 6-16 RSTe configuration interface

Create BAID Volume     3. Reset Disks to Non-BAID     2. Delete BAID Volume     4. Mark Disks as Spare     5. Exit     [ DISK/VOLUME INFORMATION ]					
RAIL	Volumes:				
Phue	ical Devices				
ID	Device Model	Serial #	Size	Tune/Status(Vol ID)	
8	MB0500GCEHE	WHAYP8272466	465.7GB	Non-RAID Disk	
1	MB0500GCEHE	WMAYP7344426	465.7GB	Non-RAID Disk	
3	MM1000GBKAL	9XG5E7PM	931.5GB	Non-RAID Disk	
	[[]]	Select [ESC]-Exit	(ENTER)-Select	t Menu	

#### Figure 6-16

### Table 1-37 Description of the RSTe configuration interface

Options	Remarks		
	On the upper side of the interface, you can perform the		
	following tasks:		
	1.Create RAID Volume		
MAIN MENU	2.Delete RAID Volume		
(main menu)	3.Reset Disks to Non-RAID: Clear the RAID configuration		
	information of the disk.		
	4.Mark Disks as Spare: Configure a hot spare disk.		
	5.Exit: Exit.		
DISK/VOLUME			
INFORMATION	On the lower side of the configuration interface, you can view		
(disk and volume	the overview information of the created RAID and physical		
information)	disks.		

Table 1- 37

### Common tasks Configure RAID:

Enter the RSTe configuration interface.

As shown in Figure 6-17, select Create RAID Volume on the RSTe configuration interface, and press Enter.

Figure 6-17 RSTe configuration interface

1. Create 2. Delete	RAID Volume RAID Volume	3. Reset Disks to Non-RAID 4. Mark Disks as Spare 5. Exit
RAID Volumes: None defined.	DISK/OULUNE	INFORMATION
Physical Devices: ID Device Model 0 MB2000GCWDA 1 MM1000GBKAL	Serial # Z1Y1LPGY 9XG5DMCZ	Size Type/Status(Vol ID) 1.8TB Non-RAID Disk 931.5GB Non-RAID Disk
(+1)	0-14 [P001 P	

Figure 6-17

Enter the interface shown in Figure 6-18, and set the Name, RAID Level, Disks, Strip Size, and Capacity columns accordingly (see Table 1-30 for parameter descriptions), select Create Volume, and press Enter.

Figure 6-18 Create RAID Volume interface

C C	REATE VOLUME MENU 1		
Name: RAID Level: Disks: Strip Size: Capacity:	LD_RAID1 RAID1(Mirror) Select Disks N/A 10 GB Create Volume		
	L HELP 1		
Press ENTER to create the specified volume.			
[14]Change [TAB]-Nex	t [ESC]-Previous Menu [ENTER]-Select		

Table 1-38 Parameter description

Parameter	Remarks
Name	The name of the RAID.
RAID	RAID level. RAID levels determine logical disk performance, fault tolerance,
Level	and capacity.
Dialta	Select the member disks that make up the RAID. After selecting the Disks
DISKS	column, press Enter, and press SPACE to select the disk.
Strip Size	Stripe size, the size of the stripe data blocks written on each disk.
Capacity	The capacity of the logical disk.

Table 1-38

Entering the interface shown in Figure 6-19, you can view the detailed information of the RAID (including the RAID name, level, and included disk information, etc.).

Figure 6-19 RAID information interface

	[ MAIN MENU ] A. Reset Disks to Non-RAID 2. Delete RAID Volume 5. Exit				
RAID ID Ø	Volumes: Name LD_RAID1	Level RAID1(Mirror)	Strip Size Status Bootabl N/A 884.96B Normal Yes		
Phys ID 0 1	ical Devices: Device Model MB2000GCWDA MM1000GBKAL	Serial # 21X1RRN4 9XG6RFQ7	Size Type/Status(Vol ID) 1.8TB Member Disk(8) 931.5GB Member Disk(8)		
	Et4	I-Select [ESC]-Exit	t [ENTER]-Select Menu		

Figure 6-19

To configure a hot spare disk:

Enter the RSTe configuration interface.

As shown in Figure 6-20, select Mark Disks as Spare on the RSTe configuration interface, and press Enter.

Figure 6-20 RSTe configuration interface

	E NAIN	MENU ]
1. Create 2. Delete	RAID Volume RAID Volume	<ol> <li>Reset Disks to Non-RAID</li> <li>Hark Disks as Spare</li> <li>Exit</li> </ol>
RAID Volumes: None defined.	DISK-VOLUME	INFORMATION 1
Physical Devices: ID Device Model Ø MB2000GCWDA 1 MM1000GBKAL	Scrial # 21Y1LPGY 9XG5DMC2	Size Type/Status(Vol ID) 1.8TB Non-RAID Disk 931.5GB Non-RAID Disk

Figure 6-20

On the interface shown in Figure 6-21, select the disk to be configured as a hot spare disk and press SPACE to select it, then press Enter, enter y in the displayed prompt box, and press Enter to complete the hot spare disk configuration.

Figure 6-21 Select disk



Figure 6-21

On the RSTe configuration interface, you can view the hot spare disk information, as shown in Figure 6-22.

Figure 6-22 Viewing hot spare disk information on the RSTe configuration interface

1. Create 2. Delete	RAID Volume RAID Volume RAID Volume	AENU J 3. Reset Disks to Non-RAID 4. Mark Disks as Spare 5. Exit
RAID Volumes: None defined.	E DISK/VOLUME	INFORMATION ]-
Physical Devices: ID Device Model 0 MB2000GCWDA 1 MM1000GBKAL	Serial # Z1Y1LPGY 9XG5DMCZ	Size Type/Status(Vol ID) 1.8TB <u>Non-RAID Disk</u> 931.5GB <u>Spare Disk</u>
[t]	ll-Select [ESC]-Exi	t [ENTER]-Select Menu

Figure 6-22

### **Delete RAID:**

Enter the RSTe configuration interface.

As shown in Figure 6-23, select Delete RAID Volume on the RSTe configuration interface, and press Enter.

Figure 6-23 RSTe configuration interface

1. Create RAID Volume     3. Reset Disks to     2. Delete RAID Volume     4. Mark Disks as     5. Exit				Reset Disks to Non- Mark Disks as Spare Exit	co Non-RAID : Spare	
RAID	Volumes:					
ID	Nane	Level	Strip	Size Status	Bootable	
8	LD_RAID1	RAID1(Mirror)	N/A	10.0GB Normal	Yes	
Phys	ical Devices:					
ID	Device Model	Serial #		Size Type/Statu	s(Vol ID)	
8	MB2000GCWDA	Z1X1RRN4		1.8TB Member Dis	k(0)	
1	MM1000GBKAL	9XG6RFQ7		931.568 Member Dis	k(0)	
	141	-Select [FSC]_Fuid	(FNT	PD1_Calact Manu		



Enter the interface shown in Figure 6-24, select the RAID to be deleted, and press Delete to complete the deletion.

Figure 6-24 Selecting the RAID to be deleted

Nane LD_RAID1	Level RAID1(Mirror)	Drives	Capacity 10.868	Status Mornal	Bootable Yes
		HELP 1			
	Deleting a volume	will reset	the disks	to non-RAID.	
	WABNING: AI	L DISK DATA.	WILL BE DE	LETED.	
	[14]Select [ESC]	-Previous Me	nu (DEL)-	Delete Volum	e

Figure 6-24

# 6.2 RAID card configuring RAID

# 6.2.1 Configuring RAID in UEFI Boot Mode

### Enter the RAID card configuration interface

During the server startup process, press Delete/Esc as prompted to enter the BIOS Setup interface. Select Advanced>AVAGO MegaRAID<AVAGO MegaRAID SAS 91311-8i>Configuration Utility, and press Enter.

Enter the interface shown in Figure 6-25. Five types of configuration tasks are displayed on the interface (see Table 1-39 for related instructions).

Figure 6-25 RAID card configuration interface, as shown in Figure 6-25



Figure 6-25

Table 1-39 Parameter description

Options	Overview
Configuration Management	Select Configuration Management to perform tasks such as creating logical disks, viewing disk group properties, viewing hot spare information, and clearing configurations.
Controller Management	Select Controller Management to view and manage controller properties and perform tasks such as clearing controller events, scheduling and running controller events, and running patrol reads.
Virtual Drive Management	Select Logical Disk Management to perform tasks such as viewing logical disk properties, locating logical disks, and running consistency checks.
Drive Management	Select Disk Management to view physical disk properties and perform tasks such as locating disks, initializing disks, and rebuilding after disk failures.
Hardware	Select Hardware Components to view supercapacitor properties,

Options	Overview	
Components	manage supercapacitors, and manage peripheral components.	

Table 1-39

### **Common tasks**

### Switch disk mode:

The RAID card supports switching between the following three disk modes.

Unconfigured Good: Indicates that the physical disk is normal and can be used to configure RAID or hot spare disks.

Unconfigured Bad: Indicates that there is residual RAID information on the physical disk and needs to be cleared manually.

JBOD: Just a Bunch Of Disks, it only concatenates the disks together for capacity expansion, but does not have the RAID function.

Here is an example of switching from Unconfigured Good mode to Unconfigured Bad mode.

As shown in Figure 6-26, select Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-26 RAID card configuration interface



Figure 6-26

The interface shown in Figure 6-27 is displayed, select the disk to be configured, and press Enter. Figure 6-27 Drive Management management interface





Enter the interface shown in Figure 6-28, select Operation, and press Enter. In the displayed dialog box, select Make Unconfigured Bad, and press Enter.

Figure 6-28 Operation interface

Operation[Select operation]Lists the operations that you can perform on a drive.BASIC PROPERTIES:Port 4 - 7:01:04can perform on a drive.Drive IDPort 4 - 7:01:04[Unconfigured Good]Status[Unconfigured Good]SizeSizeS58 GB[Disk]ModelHUC101860CSS200Hardware VendorHGST	Aptio Advanced	Setup Utility – Copyright (C) 2017 American	Megatrends, Inc.
Advanced          Operation         Select operation         Start Locate         Stop Locate         Initialize Drive         Drive Erase         Make Unconfigured Bad         ++: Select Screen         +1: Select Item         Enter: Select         +/-: Change Opt.         F1: General Help         F2: Previous Values         F3: Optimized Defaults         F4: Save & Reset         ESC: Exit	Operation BASIC PROPERTIES: Drive ID Status Size Type Model Hardware Vendor Advanced	[Select operation] Port 4 - 7:01:04 [Unconfigured Good] S58 GB [Disk] HUC101860CSS200 HGST Operation Start Locate Stop Locate Initialize Drive Drive Erase Make Unconfigured Bad	Lists the operations that you can perform on a drive. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit

Figure 6-28

Enter the interface shown in Figure 6-29, select Go, and press Enter. Figure 6-29 Select Go

Aptio Setup Utility Advanced	– Copyright (C) 2017 America	n Megatrends, Inc.
Operation Go BASIC PROPERTIES: Drive ID Status	[Make Unconfigured Bad] Port 4 – 7:01:04 [Unconfigured Good]	Starts the selected operation or opens another form.
Size Type Model Hardware Vendor	558 GB [Disk] HUC101860CSS200 HGST	
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268.	Copyright (C) 2017 American	Megatrends. Inc. B4

Figure 6-29

Enter the interface shown in Figure 6-30 and complete the operation of switching the disk mode. Figure 6-30 Complete switching disk mode



Figure 6-30

### **Create RAID:**

As shown in Figure 6-31, select Configuration Management on the RAID card configuration interface, and press Enter.

Figure 6-31 RAID card configuration interface





Enter the interface shown in Figure 6-32, select Create Virtual Drive, and press Enter. Figure 6-32 Select Create Virtual Drive



Figure 6-32

On the interface shown in Figure 6-33, select Select RAID Level, set the RAID level, and press Enter.

### Figure 6-33 Setting the RAID level



Figure 6-33

Enter the interface shown in Figure 6-34, select Select Drives From, set the RAID disk capacity source, and press Enter.

[Unconfigured Capacity] indicates that the capacity comes from the remaining capacity of the RAID-configured disk.

[Free Capacity] indicates that the capacity comes from an empty disk.

Figure 6-34 Setting the disk capacity source of RAID



Figure 6-34

Enter the interface shown in Figure 6-35, select Select Drives, and press Enter. Figure 6-35 Select Select Drives

Aptio Setup Utility - Advanced	Copyright (C) 2017 American	Megatrends, Inc.
<ul> <li>Save Configuration</li> <li>Select RAID Level</li> <li>Protect Virtual Drive</li> <li>Select Drives From</li> <li>Select Drives</li> </ul>	[RAIDO] [Disabled] [Unconfigured Capacity]	Dynamically updates to display as Select Drives or Select Drive Group based on the selection made in Select Drives From.
CONFIGURE VIRTUAL DRIVE PARAMETERS: Virtual Drive Name Virtual Drive Size Virtual Drive Size Unit Strip Size Read Policy Write Policy I/O Policy Access Policy Drive Cache Disable Background Initialization Default Initialization > Save Configuration	0 [GB] [256 KB] [Read Ahead] [Write Back] [Direct] [Read/Write] [Unchanged] [No] [No]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.1268. Co	pyright (C) 2017 American M	legatrends, Inc.

#### Figure 6-35

Enter the interface shown in Figure 6-36, select the disk to be used to configure RAID, [Enabled] means selected, then select Apply Changes, and press Enter. If the status of the disk is JBOD or Unconfigured Bad, it cannot be selected.

Aptio Setup Utility – Advanced	Copyright (C) 2017 American	Megatrends, Inc.
<ul> <li>Apply Changes Select Media Type Select Interface Type Logical Sector Size</li> </ul>	[HDD] [Both] [Both]	
CHOOSE UNCONFIGURED DRIVES: Drive Port 0 - 3:01:00: SAS, 558GB Drive Port 0 - 3:01:01: SAS, 558GB Drive Port 0 - 3:01:02: SAS, 558GB Check All Uncheck All Apply Changes	[Enabled] [Disabled] [Disabled] [Disabled]	<pre>**: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Co	ouright (C) 2017 American Mu	egatrends. Inc.

Figure 6-36

Enter the interface shown in Figure 6-37, make corresponding settings (see Table 1-32 for parameter descriptions), select Save Configuration, and press Enter.

Figure 6-37 Setting RAID parameters

Aptio Setup Utility - Advanced	Copyright (C) 2017 American	Megatrends, Inc.
<ul> <li>Save Configuration Select RAID Level Protect Virtual Drive Select Drives From</li> <li>Select Drives</li> </ul>	[RAIDO] [Disabled] [Unconfigured Capacity]	Assigns a name to identify the virtual drive.
CONFIGURE VIRTUAL DRIVE PARAMETERS: Virtual Drive Name Virtual Drive Size Virtual Drive Size Unit Strip Size Read Policy Write Policy I/O Policy Access Policy Drive Cache Disable Background Initialization Default Initialization Save Configuration	1116 [GB] [256 KB] [Read Ahead] [Write Back] [Direct] [Read/Write] [Unchanged] [No] [No]	<pre> ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Co	pyright (C) 2017 American M	egatrends, Inc.

Figure 6- 37

Parameter Description

Virtual Drive Name The name of the RAID, only supports letters, numbers and

	underscores, case-insensitive	
Virtual Drive Size	RAID capacity	
Virtual Drive Size Unit	RAID capacity unit	
Stripe Size	Stripe size, the size of the stripe data blocks written on each disk	
Pand Policy	Read cache strategy, divided into Read Ahead (open read cache)	
	and No Read Ahead (close read cache)	
	Write caching strategy, divided into Write Through (write-through	
Write Policy	mode), Always Write Back (write-back mode 1) and Write Back	
	(write-back mode 2)	
I/O Doliov	I/O strategy, divided into Cached (cache mode) and Direct (direct	
	read and write mode)	
A append Dolioy	Read and write strategy, divided into Read/Write (read/write), Read	
Access Folicy	Only (read-only) and Blocked (forbidden operation)	
Drive Ceehe	Disk cache strategy, divided into Enable (open), Disable (close)	
Drive Cache	and Unchanged (automatic)	
Default Initialization	Default initialization method	
Save Configuration	Save the configuration created by the wizard	

Table 1- 40

Do not use special characters as RAID names.

Compared with No Read Ahead, Write Through, and Direct, Read Ahead, Write Back, and Cached have improved performance, but data consistency cannot be guaranteed.

If the supercapacitor is abnormal, when the write cache policy is set to "Write Back", the firmware will implement "Write Through" for writing data; if the write cache policy is set to "Always Write Back", the firmware write data will implement "Write Back".

Enter the interface shown in Figure 6-38, select Confirm to enable it, select Yes, and press Enter. Figure 6-38 Confirm the configuration



Figure 6-38



Enter the interface shown in Figure 6-39, complete the RAID configuration operation, and select OK to return to the RAID card configuration interface.

Figure 6-39 Complete the RAID configuration

Advance	Aptio Setup Utility – Copyright (C) 2017 American ed	Megatrends, Inc.
The operation ► OK	has been performed s	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
	Version 2.19.1268. Copyright (C) 2017 American M	egatrends, Inc.

Figure 6-39

As shown in Figure 6-40, select Virtual Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-40 RAID card configuration interface

Aptio Setup Utility – Copyright (C) 2017 American Advanced	Megatrends, Inc.
<ul> <li>Configuration Management</li> <li>Controller Management</li> <li>Virtual Drive Management</li> <li>Drive Management</li> <li>Hardware Components</li> </ul>	Manages the virtual drive properties and enables you to view the basic virtual drive properties and perform operations such as background initialization, consistency check. You can also view additional properties using the Advanced link.
	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 American M	egatrends, Inc.

Figure 6-40

On the interface shown in Figure 6-41, you can see the created RAID, select the RAID to be viewed, and press Enter.

Figure 6-41 Virtual Drive Management interface

Aptio Setup Utility – Copyright (C) 2017 American Advanced	Megatrends, Inc.
▶ Virtual Drive O: RAIDO, 1116GB, Optimal	Displays the properties of a specific virtual drive. You can perform operations (such as Start Locate, Stop Locate, Consistency Check), view basic properties and click Advanced for viewing additional properties.
	++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Me	egatrends, Inc.

Figure 6-41

Enter the interface shown in Figure 6-42, select View Associated Drives, and press Enter to view the detailed information of the RAID (including RAID name, level, and disk information, etc.). Figure 6-42 Select View Associated Drives

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced		
Operation BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Select operation] [RAIDO] [Optimal] 1116 GB	Lists the operations that you can perform on a virtual drive.
		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		

Figure 6-42

### To configure a hot spare disk:

After configuring RAID, a hot spare disk is generally configured to improve data security. A global hot spare disk or a dedicated hot spare disk can be configured as required .

Hot spares are only used for RAID levels where redundancy exists.

The capacity of the hot spare disk is larger than the capacity of a single RAID member disk to contribute to the RAID.

Only disks whose configuration mode is Unconfigured Good are supported as hot spare disks. Configuring a global hot spare

As shown in Figure 6-43, select Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-43 RAID card configuration interface



Figure 6-43

On the interface shown in Figure 6-44, select the disk to be configured as a global hot spare, and press Enter.

Figure 6-44 Drive Management management interface



#### Figure 6-44

On the interface shown in Figure 6-45, select Operation, press Enter, then select Assign Dedicated Hot Spare Drive, and press Enter.

#### Figure 6-45 Operation interface





Enter the interface shown in Figure 6-46, select Go, and press Enter. Figure 6-46 Select Go

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced		
Operation Go BASIC PROPERTIES: Drive ID Status Size Type Model Hardware Vendor Advanced	[Assign Global Hot S] Port 0 – 3:01:02 [Unconfigured Good] 558 GB [Disk] HUC101860CSS200 HGST	Starts the selected operation or opens another form. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit

#### Figure 6-46

Enter the interface shown in Figure 6-47, select Confirm to enable it, select Yes, and press Enter. Figure 6-47 Confirm the configuration



Figure 6-47

Enter the interface shown in Figure 6-48 and complete the operation of configuring the global hot spare disk.

Figure 6-48 Complete the configuration of the global hot spare disk



Figure 6-48
### **Delete RAID:**

As shown in Figure 6-49, select Virtual Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-49 RAID card configuration interface



Figure 6-44

The interface shown in Figure 6-50 is displayed, select the logical disk to be deleted, and press Enter.

Figure 6-50 Logical disk management interface



Figure 6-50

On the interface shown in Figure 6-51, select Operation and press Enter. In the displayed dialog box, select Delete Virtual Drive and press Enter.

Figure 6-51 Operation interface

Aptio Setup Ut Advanced	ility – Copyright (C) 2017 Americ	can Megatrends, Inc.
Operation BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives	[Select operation] [RAIDO] [Optimal] 1116 GB	Lists the operations that you can perform on a virtual drive.
Advanced	Operation Select operation Start Locate Stop Locate Delete Virtual Drive Reconfigure Virtual Drives	
	Fast Initialization Slow Initialization Virtual Drive Erase	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2 19	1268 Copuright (C) 2017 American	n Megatrends Inc

Figure 6-51

Enter the interface shown in Figure 6-52, select Go, and press Enter. Figure 6-52 Select Go



Figure 6-5 2

Enter the interface shown in Figure 6-53, select Confirm to enable it, select Yes, and press Enter. Figure 6-53 Confirm deletion



Figure 6-5 3

The interface shown in Figure 6-54 is displayed, and the RAID deletion operation is completed. Figure 6-54 Complete the deletion of RAID



Figure 6-5 4

### Locate disk location:

Locate physical disks

As shown in Figure 6-55, select Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-55 Select Drive Management

Aptio Setup Utility – Copyright (C) 2017 Advanced	7 American Megatrends, Inc.
<ul> <li>Configuration Management</li> <li>Controller Management</li> <li>Virtual Drive Management</li> <li>Drive Management</li> <li>Hardware Components</li> </ul>	Displays the basic drive properties and performs operations such as assign/unassign a hot spare drive, locate drives, Place Drive offline/online, and rebuild drive. You can also view additional properties using the Advanced link.
	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 A	American Megatrends, Inc.



On the interface shown in Figure 6-56, select the disk to be located, and press Enter. Figure 6-56 Select the disk to be located

Aptio Setup Utility – Copyright (C) 2017 American H Advanced	Megatrends, Inc.
<ul> <li>Drive Port 0 - 3:01:00: SAS, 5586B, Unconfigured Good, (</li> <li>Drive Port 0 - 3:01:01: SAS, 5586B, Unconfigured Good, (</li> <li>Drive Port 0 - 3:01:02: SAS, 5586B, Unconfigured Good, (</li> </ul>	Displays the properties of a specific drive. You can perform several operations (such as Rebuild, Initialize drive), view basic properties of the drive and also click Advanced to view additional properties. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Me	gatrends, Inc.

Figure 6-5 6

On the interface shown in Figure 6-57, select Operation, and press Enter. In the displayed dialog box, select Start Locate and press Enter.

Figure 6-57 Operation interface



Enter the interface shown in Figure 6-58, select Go, and press Enter. Figure 6-58 Select Go

Aptio Setup Utility - Advanced	Copyright (C) 2017 American	n Megatrends, Inc.
Operation ▶ Go BASIC PROPERTIES:	[Start Locate]	Starts the selected operation or opens another form.
Drive ID Status Size Tupe	Port 0 – 3:01:00 [Unconfigured Good] 558 GB [Disk]	
Model Hardware Vendor ► Advanced	HUC101860CSS200 HGST	
		<pre>++: Select Screen 1↓: Select Item Enter: Select</pre>
		+/-: Change Upt. F1: General Help F2: Previous Values F3: Optimized Defaults
		ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		



Enter the interface shown in Figure 6-59 and complete the operation of locating the physical disk. Figure 6-59 Complete physical disk location positioning



Figure 6-5 9

Locate all disks in a logical disk



As shown in Figure 6-60, select Virtual Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-60 RAID card configuration interface

Aptio Setup Utility – Copyright (C) 2017 American Advanced	Megatrends, Inc.
<ul> <li>Configuration Management</li> <li>Controller Management</li> <li>Virtual Drive Management</li> <li>Drive Management</li> <li>Hardware Components</li> </ul>	Manages the virtual drive properties and enables you to view the basic virtual drive properties and perform operations such as background initialization, consistency check. You can also view additional properties using the Advanced link.
	<pre>→+: Select Screen  †↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 American Mo	egatrends, Inc.

### Figure 6-60

On the interface shown in Figure 6-61, select the logical disk to be located, and press Enter. Figure 6-61 Selecting the logical disk to be located





On the interface shown in Figure 6-62, select Operation and press Enter. In the displayed dialog box, select Start Locate and press Enter.

Figure 6-62 Operation interface

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced		
Operation GO BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Start Locate] 111 [RAIDO] [Optimal] 1116 GB Operation Start Locate Stop Locate Delete Virtual Drive Reconfigure Virtual Drives Fast Initialization Slow Initialization Virtual Drive Erase	Lists the operations that you can perform on a virtual drive. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		

Figure 6-62

Enter the interface shown in Figure 6-63, select Go, and press Enter. Figure 6-63 Select Go

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced		
Operation Go BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Start Locate] 111 [RAIDO] [Optimal] 1116 GB	Starts the selected operation or opens another form.
		<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.	1268. Copyright (C) 2017 Amer	ican Megatrends, Inc.



Enter the interface shown in Figure 6-64, and complete the operation of locating all disk locations in the logical disk.

Figure 6-64 Complete the positioning of all disks in the logical disk



Figure 6- 64

### Initialize the logical disk:

This function is used to initialize the internal data space of the logical disk so that it can be recognized and used by the operating system.

As shown in Figure 6-65, select Virtual Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-65 RAID card configuration interface



#### Figure 6-65

On the interface shown in Figure 6-66, select the logical disk to be initialized, and press Enter. Figure 6-66 Logical disk management interface



### Figure 6-66

Enter the interface shown in Figure 6-67, select Operation, and press Enter. In the dialog box that pops up, select Fast/Slow Initialization and press Enter.

Figure 6-67 Operation interface



Figure 6-67

The difference between Fast Initialization and Slow Initialization is that the former can write data immediately, while the latter needs to wait for all the disk space to be initialized before writing data.

Enter the interface shown in Figure 6-68, select Go, and press Enter.

Figure 6-68 Select Go

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced		
Operation Go BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Fast Initialization] 111 [RAIDO] [Optimal] 1116 GB	Starts the selected operation or opens another form.
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.		

Enter the interface shown in Figure 6-69, select Confirm to enable it, select Yes, and press Enter. Figure 6-69 Confirm initialization

Aptio Setup Utility – Copyright Advanced	(C) 2017 American Megatrends, Inc.
Advanced Initializing a Virtual Drive will Confirm [Enabled] Yes ► No	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
	F4: Save & Reset ESC: Exit
Version 2.19.1268. Copyright (C	) 2017 American Megatrends, Inc.

Figure 6-69

Enter the interface shown in Figure 6-70 to complete the initialization of the logical disk. Figure 6-70 Complete the initialization of the logical disk



Figure 6-70

### Initialize the physical disk:

As shown in Figure 6-71, select Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-71 RAID card configuration interface



Figure 6-71

Enter the interface shown in Figure 6-72, select the disk to be initialized, and press Enter. Figure 6-72 Disk management interface



Figure 6-72

On the interface shown in Figure 6-73, select Operation, and press Enter. In the displayed dialog box, select Initialize Drive and press Enter.

Figure 6-73 Operation management interface



Figure 6-73

Enter the interface shown in Figure 6-74, select Go, and press Enter. Figure 6-74 Select Go

Aptio Setup Utility Advanced	– Copyright (C) 2017 Americ	can Megatrends, Inc.
Operation ▶ Go BASIC PROPERTIES:	[Initialize Drive]	Starts the selected operation or opens another form.
Drive ID Status Size Tune	Port 0 – 3:01:02 [Unconfigured Good] 558 GB [Disk]	
Model Hardware Vendor	HUC101860CSS200 HGST	
▶ Advanced		
		++: Select Screen ↑↓: Select Item
		Enter: Select +/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Reset
		ESC. EAT
version 2.19.1268. copyright (C) 2017 American Megatrends, inc.		

Enter the interface shown in Figure 6-75, select Confirm to enable it, select Yes, and press Enter. Figure 6-75 Confirm initialization

Aptio Setup Utility – Copyright (C) 2017 Americ Advanced	an Megatrends, Inc.
Initializing a Drive may result in Confirm [Enabled] Yes No	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.1268. Copyright (C) 2017 American	Megatrends, Inc.

Figure 6-75

Enter the interface shown in Figure 6-76 to complete the initialization of the physical disk. Figure 6-76 Complete the initialization of the physical disk



### Erase disk data:

This function is used to delete data inside the disk, including erasing physical disk data and logical disk data.

Erase physical disk data

As shown in Figure 6-77, select Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-77 RAID card configuration interface



Figure 6-77

The interface shown in Figure 6-78 is displayed, select the disk whose data is to be erased, and press Enter.

Figure 6-78 Disk management interface



Figure 6-78

Enter the interface shown in Figure 6-79, select Operation, press Enter, then select Drive Erase in the displayed dialog box, and press Enter.

Figure 6-79 Operation interface

Aptio Setup Utilit Advanced	ty – Copyright (C) 2017 American	h Megatrends, Inc.
Advanced Operation Progress Stop BASIC PROPERTIES: Drive ID Status Size Type Model Hardware Vendor Advanced	[Select operation] Initialize Drive 2% Port 0 - 3:01:02 [Unconfigured Good] 558 GB [Disk] HUC101860CSS200 Operation Select operation Start Locate Stop Locate Drive Erase Make Unconfigured Bad	Lists the operations that you can perform on a drive.

### Figure 6-79

Enter the interface shown in Figure 6-80, press Enter, and then select the erase mode in the pop-up dialog box (the default mode is recommended: Simple).

### Figure 6-80 Erase Mode interface





Enter the interface shown in Figure 6-81, select Go, and press Enter. Figure 6-81 Select Go

Aptio Setup Utility – ( Advanced	Copyright (C) 2017 American	Megatrends, Inc.
Operation Erase Mode ► Go	[Drive Erase] [Simple]	Starts the selected operation or opens another form.
BASIC PROPERTIES: Drive ID Status Size	Port 0 – 3:01:02 [Unconfigured Good] 558 GB	
Type Model Hardware Vendor ▶ Advanced	LUISKJ HUC101860CSS200 HGST	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F3: Optimized Defaults
		ESC: Exit

### Figure 6-81

Enter the interface shown in Figure 6-82, select Confirm to enable it, select Yes, and press Enter. Figure 6-82 Confirm Erase





Enter the interface shown in Figure 6-83 and complete the operation of erasing the physical disk data.

Figure 6-83 Complete erasing physical disk data



Figure 6-83

To avoid disk failure, do not perform other operations while erasing physical disk data.



Erase Logical Disk Data As shown in Figure 6-84, select Virtual Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-84 RAID card configuration interface



Figure 6-46

On the interface shown in Figure 6-85, select the logical disk whose data is to be erased, and press Enter.

Figure 6-85 Logical disk management interface





Enter the interface shown in Figure 6-86, select Operation, and press Enter. In the displayed dialog box, select Virtual Drive Erase and press Enter.

Figure 6-86 Operation interface

Aptio Setup L	Htility – Copyright (C) 2017 Americ	can Megatrends, Inc.
Operation BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Select operation] 111 [RAIDO] [Optimal] 1116 GB Operation Select operation Start Locate Stop Locate Delete Virtual Drive	Lists the operations that you can perform on a virtual drive.
	Reconfigure virtual brives Fast Initialization Slow Initialization Virtual Drive Erase	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>

#### Figure 6-86

Enter the interface shown in Figure 6-87, press Enter, and then select the erase mode in the pop-up dialog box (the default mode is recommended: Simple).

Figure 6-87 Erase Mode interface





Enter the interface shown in Figure 6-88, select Go, and press Enter. Figure 6-88 Select Go

Aptio Setup Utility - Advanced	Copyright (C) 2017 Americar	Megatrends, Inc.
Advanced Operation Erase Mode Delete After Erase Go BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Virtual Drive Erase] [Simple] [Disabled] 111 [RAIDO] [Optimal] 1116 GB	<pre>&gt;</pre>
Version 2, 19, 1268 - 6	onuright (C) 2017 American M	legatrends. Inc

### Figure 6-88

Enter the interface shown in Figure 6-89, select Confirm to enable it, select Yes, and press Enter. Figure 6-89 Confirm Erase



Figure 6-89

Enter the interface shown in Figure 6-90 and complete the operation of erasing the logical disk data.

Figure 6-90 Completion of erasing logical disk data



Figure 6-90

### Migrating RAID levels:

This function is used to modify the RAID level to meet the configuration requirements without



affecting the current data integrity.

As shown in Figure 6-91, select Virtual Drive Management on the RAID card configuration interface, and press Enter.

Figure 6-91 RAID card configuration interface



Figure 6-91

The interface shown in Figure 6-92 is displayed, select the logical disk to be rebuilt, and press Enter.

Figure 6-92 Virtual Drive Management management interface

Aptio Setup Utility – Copyright (C) 2017 American Advanced	Megatrends, Inc.
▶ Virtual Drive O: 111, RAIDO, 1116GB, Optimal	Displays the properties of a specific virtual drive. You can perform operations (such as Start Locate, Stop Locate, Consistency Check), view basic properties and click Advanced for viewing additional properties.
	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 American Me	egatrends, Inc.

### Figure 6-92

Enter the interface shown in Figure 6-93, select Operation, and press Enter. In the displayed dialog box, select Reconfigure Virtual Drive, and press Enter.

Figure 6-93 Operation interface

Aptio Setup Util Advanced	ity – Copyright (C) 2017 Americ	an Megatrends, Inc.
Operation BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Select operation] 111 [RAIDO] [Optimal] 1116 GB Operation	Lists the operations that you can perform on a virtual drive.
	Select operation Start Locate Stop Locate Delete Virtual Drive Reconfigure Virtual Drives Fast Initialization Slow Initialization Virtual Drive Erase	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt.</pre>
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.12	58. Copyright (C) 2017 Americar	Megatrends, Inc.

Figure 6-93

Enter the interface shown in Figure 6-94, select Go, and press Enter. Figure 6-94 Select Go

Aptio Setup Util. Advanced	ity – Copyright (C) 2017 America	n Megatrends, Inc.
Operation Go BASIC PROPERTIES: Name Raid Level Status Size View Associated Drives Advanced	[Reconfigure Virtual] 111 [RAIDO] [Optimal] 1116 GB	Starts the selected operation or opens another form.
		<pre> ++: Select Screen  f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.126	58. Copyright (C) 2017 American	Megatrends, Inc.



Figure 6-94

On the interface shown in Figure 6-95, set the RAID level, select Add Drives, and press Enter. Figure 6-95 Advanced interface

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced		
RAID LEVEL MIGRATION/CAPACITY EXPANSION PROPERTIES: New RAID Level [RAIDO] ▶ Add Drives ▶ Start Operation	Selects a new RAID level for the selected virtual drive. The default value is the current RAID level.	
	<pre> ++: Select Screen  1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>	
Version 2.19.1268. Copyright (C) 2017 American Me	egatrends, Inc.	

Figure 6-95

On the interface shown in Figure 6-96, select the disk to be added, make it Enabled, select Apply Changes, and press Enter.

Figure 6-96 Add Drives interface

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced			
<ul> <li>Apply Changes</li> <li>Select Media Type</li> <li>Select Interface Type</li> <li>Logical Sector Size</li> </ul>	[HDD] [Both] [Both]	Submits the changes made to the entire form.	
CHOOSE UNCONFIGURED DRIVES: Drive Port 0 - 3:01:03: SAS, 558GB Check All Uncheck All ► Apply Changes	[Enabled]		
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>	
Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.			

Enter the interface shown in Figure 6-97, select Confirm to enable it, select Yes, and press Enter. Figure 6-97 Confirm migration

Aptio Advanced	) Setup Utility – (	Copyright (C) 20	)17 American	Megatrends,	Inc.
Selecting these Dri Confirm Yes No	ves will cause	[Enabled]		<pre>++: Select S 14: Select I Enter: Select +/-: Change F1: General F2: Previous F3: Optimize F4: Save &amp; F ESC: Exit</pre>	Screen Stem St Opt. Help S Values St Defaults Seset
Vers	ion 2.19.1268. Co	oyright (C) 2017	American Me	gatrends, Ir	10.

Figure 6-97

On the interface shown in Figure 6-98, select Start Operation, and press Enter. Figure 6-98 Start Operation interface

Aptio Setup Utility – Copyright (C) 2017 Ame Advanced	rican Megatrends, Inc.
RAID LEVEL MIGRATION/CAPACITY EXPANSION PROPERTIES: New RAID Level [RAIDO] Add Drives Start Operation	Starts reconstruction of the selected virtual drive. Once this operation is in progress, it cannot be cancelled.
	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 Ameria	can Megatrends, Inc.

Enter the interface shown in Figure 6-99, select OK, and press Enter. Figure 6-99 Select OK

Aptio Setup Utility — Copyright (C) 2017 American Advanced	Megatrends, Inc.
The operation has been started suc ► OK	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.19.1268. Copyright (C) 2017 American Me	egatrends, Inc.



On the interface shown in Figure 6-100, you can view the current migration progress. Figure 6-100 RAID information interface

Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc. Advanced			
Operation Progress BASIC PROPERTIES: Name Raid Level Status Size > View Associated Drives > Advanced	[Select operation] Reconstruction 0% 111 [RAIDO] [Optimal] 1116 GB	Lists the operations that you can perform on a virtual drive.	
Version 2.19.1268	. Copyright (C) 2017 Americ	an Megatrends, Inc.	

Figure 6- 100

### **Clear disk RAID information:**

This function is used to clear the residual RAID information in the disk, so that the disk can be reused for RAID configuration. This function is often used for disks whose mode is Unconfigured Bad.

Switch the disk mode Unconfigured Bad to Unconfigured Good.

As shown in Figure 6-101, select Configuration Management on the RAID card configuration interface, and press Enter.



Figure 6- 101

On the interface shown in Figure 6-102, select Manage Foreign Configuration, and press Enter. Figure 6-102 Select Manage Foreign Configuration



Figure 6- 102

Enter the interface shown in Figure 6-103, select Clear Foreign Configuration, and press Enter. Figure 6-103 Select Clear Foreign Configuration



Figure 6- 103

Enter the interface shown in Figure 6-104, select Confirm to enable it, select Yes, and press Enter.



Figure 6-49

Enter the interface shown in Figure 6-105 and complete the operation of clearing disk RAID information.



Figure 6- 105

# 6.2.2 Configuring RAID in Legacy Boot Mode

Enter the RAID card configuration interface

During the BIOS startup, when the interface shown in Figure 6-105 is displayed, press Ctrl+R. Figure 6-106 Press Ctrl+R according to the prompt during BIOS startup

IA -8 lattery CI SI	(Bus 2 De y Status: ot Number	v 0) AVAGO MegaRAID SAS 9361- Missing : 4	81	
D LUN	VENDOR	PRODUCT	REVISION	CAPACITY
	Allaco	Alloco HegaBoth SoS 9361_81	4 659 99-6121	1024HR
18 8	ATA	MM1999GBKAL	HP6C	95386988
838	ATA	MM1888GBKAL	HPGC	95386988
848	ATA	MM1000GBKAL	HPGC	953869HB
288	HP	EG8388FBUFL	HPDC	286102MB
298	HP	EG0300FCVBF	HPDS	286102MB
388	HP	EG8388FBVFL	HPDC	286102MB
8	AVAGO	Virtual Drive	RAIDO	5120MB



Enter the interface shown in Figure 6-107. Please refer to the key operation tips at the lower border of the interface to navigate the interface and modify settings. Figure 6-107 LSI RAID management interface



### Common tasks Configure RAID:

As shown in Figure 6-108, press F2 on the VD Mgmt interface and select Create Virtual Drive. Figure 6-108 Select Create Virtual Drive



Figure 6- 108

Enter the interface shown in Figure 6-109, set the RAID level, and press Enter. Figure 6-109 Setting the RAID level

HID LEVEL:	RAID-1	- Drives	NZH)	
	RAID-5	ID Ty	pe Size	
ta rrotection:	RolD-18	L J	278 87 68	
	ReiD-58	[ 1::84	278.87 GB	
	BAID-68	[ ]:-:85	278.87 GB	
		L 1::86	278.87 68	222
		[ ]::87 51	2c 931.88 GB	
- Basic Settings Size: Mane:		Advanced	01	CANCEL

### Figure 6- 109

The interface shown in Figure 6-110 is displayed, select the disk for configuring RAID, and press Enter.

Figure 6-110 Select disk

RAID Level: RAID-1	PD per Span : NZA	
Data Protection: Disable	ID         Type         Size           IX1::88         278.87         68           IX1::84         278.87         68           I         1::84         278.87         68           I         1::85         278.87         68           I         1::85         278.87         68           I         1::85         278.87         68           I         1::86         278.87         68           I         1::86         278.87         68           I         1:-:86         278.87         68           I         1:-:86         278.87         68           I         1:-:86         278.87         68	
Basic Settings Size: 278.875 68 Mane:	Advanced OK	CANCEL

Figure 6- 110

Enter the interface shown in Figure 6-111, set the Size and Name accordingly, select Advanced, and press Enter.

Figure 6-111 Setting the RAID name and capacity

Virt RAID Level: RAID-1	PD per Span : NZA	
Data Protection: Disable	ID         Type         Size           IX1::98          278.87         68           IX1::81          278.87         68           I<1::84          278.87         68           I<1::84          278.87         68           I<1:-:85          278.87         68           I<1:-:85          278.87         68           I<1:-:85          278.87         68           I<1:-:86          278.87         68           I<1:-:86          278.87         68           I<1:-:87         512e         931.88         68	80 81   
Basic Settings Size: 20.000 GB Mane: Usl	Advanced OK	CANCEL



Enter the interface shown in Figure 6-112, set relevant parameters, select OK, and press Enter. Figure 6-112 Setting advanced parameters

VD Mgnt PD	Mgnt Ctrl Mgnt Properties Virtual Drive Management
P.	Create New VD
BOID Leve	Greate Ofetual Drive-Sdvanced
	Strip Size: 256KB [] Initialize
Data Prot	Read Policy: Ahead E 3 Configure HotSpare
	Write Policy: Write Back with
	I/O Policy: Direct (IK
Basic Size: Name:	Disk cache Unchanged CANCEL
El-Help Fi2-	C+1e



Enter the interface shown in Figure 6-113, select OK, and press Enter to complete the RAID configuration operation.

Figure 6-113 Confirm creation

AID Level: RAID-1	PD per Span : MZA	
Data Protection: Disable	ID         Type         Size           IX1:-:88          278.87         68           IX1:-:81          278.87         68           I         1:-:84          278.87         68           I         1:-:84          278.87         68           I         1:-:84          278.87         68           I         1::-:85          278.87         68           I         1::-:85          278.87         68           I         1::-:86          278.87         68           I         1::-:86          278.87         68           I         1::-:87         512e         931.88         68	80 81  
Basic Settings Size: 20.000 GB Mane: ys1	Advanced OK	CANCEL

### Figure 6- 113

Select the RAID to be viewed and press Enter to view the detailed information of the RAID (including the RAID name, level, and disk information), as shown in Figure 6-114. Figure 6-114 Viewing RAID information



Figure 6- 114

### To configure a hot spare disk:

After configuring RAID, a hot spare disk is generally configured to improve data security. Global
hot spare disks and dedicated hot spare disks can be configured as required.

Hot spares are only used for RAID levels where redundancy exists.

The capacity of the hot spare disk is larger than the capacity of a single RAID member disk to contribute to the RAID.

Only disks whose configuration mode is Unconfigured Good are supported as hot spare disks.

Configuring a global hot spare

As shown in Figure 6-115, select the disk to be configured as a global hot spare on the PD Mgmt interface, and press F2.

Figure 6-115 Selecting the disk to be configured as a global hot spare

VD Mgnt	PD Mgmt	Ctrl Mgnt	Propertie	58		
UD Hgmt 9 13 14 15 16 17	PD fight Backi ID Type SAS SAS SAS SATA SAS SAS	Ctri Mgmt Capacity 278.87 GB 278.87 GB 278.87 GB 931.80 GB 278.87 GB 278.87 GB 278.87 GB	Propertia Drive M State UG UG UG Online Online	DG - - - 00 00	vent Vendor HP HP ATA HP HP	PAGE-1 Secured: No Encryption Capable: No EKM Support: Disabled Connector: Enclosure Model: SGP10 Slot Mumber: 6 Logical Sector Size: 512 B Physical Sector Size: 512 B Physical Sector Size:
						EG0300FCV8F (GoToPage:2)

Figure 6- 115

Enter the interface shown in Figure 6-116, select Make Global HS, and press Enter to complete the configuration of the global hot spare disk.

Figure 6-116 Select Make Global HS

VD Mgnt	PD Mgat	Ctrl Mgnt	Properties	
-			- prive nanagement	PAGE-1
Device	Back! D Type	lanc Capacity	Rebuild	red:
9 13	SAS	278.87 GB 278.87 GB	Copyback	Tion Capable:
19 15 16	SATA	931.00 GB	Locate	bied
17	SAS	278.87 GB	Place drive Online Place drive Offline	mare Model:
			Make Global HS Remove Hot Spare drive Drive Erase	unber:
			Make JBOD Make unconfigured good	B B B
			Prepare for Removal	BBFCVBF
	<b>no. o</b>			(GoToPage:2)

Figure 6- 116

Return to the interface shown in Figure 6-117 and select a hot spare to view information about the global hot spare.

Figure 6-117 Viewing global hot spare disk information

VD Mgmt	PD Mgnt	Ctrl Ngnt	Propertie	:S	aent	
Device I 9 13 14 15 16 17	BackP D Type SAS SAS SAS SATA SAS SAS	lanc Capacity 278.87 GB 278.87 GB 278.87 GB 278.87 GB 278.87 GB 278.87 GB	- Drive Ma State Hotspare UG UG Online Online	06 - - - 80 80	Vendor HP HP ATA HP HP	PAGE-1 Secured: No Encryption Capable: No EKM Support: Disabled Connector: Enclosure Model: SGPIO Slot Number: 6 Logical Sector Size: 512 B Physical Sector Size: 512 B Product ID: EG83000FCV0F
F1-He In	F2-Operat	ions F5-Refr	esh Ctrl-h	I-Nex	t Page Ctr	GoToPage:2> 1-P-Prev Page:F12-Ctir

#### Delete RAID:

This function is used to delete RAID that is damaged or difficult to meet your needs.

Figure 6- 117

As shown in Figure 6-118, select the logical disk to be deleted on the VD Mgmt interface, and press F2.

Figure 6-118 Select the logical disk to be deleted



Figure 6- 118

Enter the interface shown in Figure 6-119, select Delete VD, and press Enter. Figure 6-119 Select Delete VD



The interface shown in Figure 6-120 is displayed, select YES, and press Enter to complete the RAID deletion operation.

Figure 6-120 Confirm deletion



Figure 6- 120

#### Locate the disk location:

This function makes it easy for you to quickly find the disk by lighting the blue indicator of the corresponding slot of the disk. A single physical disk or all member disks included in a logical disk can be located.

As shown in Figure 6-121, select the disk to be located on the PD Mgmt interface and press F2. Figure 6-121 Select the disk to be located

D Mgmt PD M	gnt Ctrl Mgnt	Propertie - Drive N	es anager	nent —	
B Device ID Typ 9 SAS 13 SAS 14 SAS 15 SAT 16 SAS 17 SAS	ackPlanc E Capacity 278.87 GB 278.87 GB 278.87 GB 0 931.00 GB 278.87 GB 278.87 GB 278.87 GB	State UG UG UG Online Online	DG - - - - - - - - - - - - - - - - - - -	Vendor HP HP ATA HP HP	PAGE-1 Secured: No Encryption Capable: No EKM Support: Disabled Connector: Enclosure Model: SGPIO Slot Mumber: 6 Logical Sector Size: 512 B Physical Sector Size: 512 B Physical Sector Size:

Figure 6- 121

Enter the interface shown in Figure 6-122 and select Locate->Start to complete the disk location operation.

Figure 6-122 Select Locate->Start

VD Mgmt	PD Mgmt	Ctrl Mgmt	Properties - Drive Management	PAGE-1
Beuice	Backi	flanc Capacitu	Rebuild	red:
9	SAS	278.87 GB	Comuback	mtion Capable:
14	SAS	278.87 GB	Jacata	Start
16 17	SAS	278.87 GB	Place drive Boline	Stop
			Place drive Offline	
			Make Global HS Remove Hot Spare drive	dinber:
			Drive Erase	B
			Make JBOD Make unconfigured good	t ID:
			Prepare for Renoval	(GoToPage:2)

#### Figure 6- 122

Locate->Start: Start the disk location operation.

Locate->Stop: Stop the locating disk operation.

#### Initialize the logical disk:

This function is used to initialize the internal data space of the disk so that it can be recognized and used by the operating system.

As shown in Figure 6-123, select the disk to be initialized on the VD Mgmt interface, and press F2.

Figure 6-123 Selecting the disk to be initialized



Figure 6- 123

Enter the interface shown in Figure 6-124 and select Initialization->Start FGI. Figure 6-124 Select Initialization->Start FGI



Figure 6- 124

BGI: Background Initialization, background initialization, first initialize part of the RAID space for writing data, and the rest of the space is initialized in the background.

FGI: Full Ground Initialization, the whole disk is initialized, all the space of the RAID is initialized, and the data can be written after the initialization is completed.

Enter the interface shown in Figure 6-125, select YES, and press Enter to complete the disk initialization operation.

Figure 6-125 Confirm initialization



#### Erase disk data:

This function is used to delete data inside the disk, including erasing physical disk data and logical disk data.

Erase physical disk data

As shown in Figure 6-126, select the physical disk to be erased on the PD Mgmt interface, and press F2.

Figure 6-126 Select the physical disk to be erased

VD Mgnt	PD Mgat	Ctrl Mgmt	Propertie	es	10.1410 - C	
in the second	111 C. C. A. D. R. C. C. C.	A notes sold with the second	- Drive M	anaget	aent —	
1						PAGE-1
a management	Back	Plane		14.425	The second second	Secured:
Device	ID Type	Capacity	State	DG	Vendor	No
9	SAS	278.87 GB	UG	1.	HP	Encryption Capable:
13	SAS	278.87 68	UG UG		HP	No
14	SAS	278.87 GB	UG		HP	EKM Support:
15	SATA	931.88 68	UG		ATA	Disabled
16	SAS	278.87 GB	Online	88	HP	Connector:
17	SAS	278.87 GB	Online	88	HP	CONTRACTOR CONTRACTOR
						Enclosure Model:
						3GP10
						Slot Mumber:
						6
						Logical Sector Size:
						512 B
						Physical Sector Size:
						512 B
						Product ID:
						EG8398FCUBF
						<gotopage:2></gotopage:2>
F1-Help	F2-Operat	tions PS-Refr	esh Ctrl-	N-Next	t Page Ctr	1-P-Prev Page F12-Ctlr

Figure 6-126

Enter the interface shown in Figure 6-127, select the erase mode (the default mode is recommended: Simple), and press Enter.

Figure 6-127 Select Erase Mode

VD Hgnt	PD Mynt	Ctrl Mgnt	Properties	
				PAGE-1
Device	ID Type	Capacity	Rebuild	red:
13	SAS	278.87 GB 278.87 GB	Copyback	Cion Capable:
19	SATA	270.87 GB 931.80 GB	Locate	bled
17	SAS	278.87 GB	Place drive Online Place drive Offline	ure Model:
			Nake Global HS Remove Hot Spare drive Drive Erase	)
			Make JBOD Make unconfigured good	Nornal Thorough
			Prepare for Removal	stop LPase
				<gotopage:2></gotopage:2>
F1-Help	F2-Opera	tions F5-Refr	esh Ctrl-N-Next Page Ctrl-	P-Prev Page F12-Ctlr

Figure 6- 127

Enter the interface shown in Figure 6-128, select Yes, and press Enter to complete the operation of erasing the physical disk data.

Figure 6-128 Confirm Erase

	1.000					1	PAGE-1
eviceID	BackP Type	lane Capacity	State	DG	Vendor	Secure No	d:
9	SAS						tion Capable:
14	SAS	This oper	ation tak	es se	eral ninu	tes	ort:
15	SATA	to comple	te and wi	pes of	it all dat	4	ed
16	SAS	present o	m the art	vc.			
		Are you	sure you	want	to contin	ue?	e Model:
							ber:
			res		100		Sector Size:
							Sector Size:
							ID:
		5				EG8388	FCVBF
							CoToBage 22

Figure 6- 128

To avoid disk failure, do not perform other operations while erasing physical disk data. Erase Logical Disk Data

As shown in Figure 6-129, select the logical disk to be erased on the VD Mgmt interface, and press F2.

Figure 6-129 Select the logical disk to be erased .



Figure 6- 129

Enter the interface shown in Figure 6-130, select the erase mode (the default mode is recommended: Simple), and press Enter.

Figure 6-130 Select Erase Mode



Figure 6- 130

Enter the interface shown in Figure 6-131, select Yes, and press Enter to complete the operation of

erasing the logical disk data. Figure 6-131 Confirm Erase



Figure 6- 131

#### **Clear disk RAID information:**

This function is used to clear the residual RAID information in the disk, so that the disk can be reused for RAID configuration. This function is often used for disks whose mode is Unconfigured Bad.

Switch the disk mode Unconfigured Bad to Unconfigured Good.

As shown in Figure 6-132, on the Foreign View interface, select the RAID controller card, press F2, select Foreign Config->Clear, and press Enter.

Figure 6-132 Select Foreign Config->Clear



Figure 6- 132

In the displayed dialog box shown in Figure 6-133, select OK and press Enter to complete the operation of clearing disk RAID information.

Figure 6-133 Confirm Clear



Figure 6- 133



# **Chapter 7 IPMI Deployment**

# 7.1 Deployment of IPMI Process

Figure 7-1 shows the general process of how to quickly deployment the IPMI function of the server.



Figure 7-1 IPMI deployment process

# 7.1.1 Make sure the motherboard supports the IPMI function

Check your motherboard manual and confirm that your motherboard supports IPMI, and then find the dedicated IPMI network port for the motherboard, or you can choose a shared network port, as shown in Figure 7-2.



Figure 7-2 Motherboard dedicated network port

# 7.1.2 Enter BIOS to set IPMI function

Reboot your system and press ESC or DEL key while the device is booting to enter the motherboard BIOS system. The BIOS setting interface is shown in Figure 7-3 below.

Aptio Setup Utility Main Advanced Platform Configur	– Copyright (C) 2020 America ration Socket Configuration	n Megatrends, Inc. Server Mgmtl Security Boot
BIOS Information Project Version Build Date and Time BMC Firmware Revision ME Firmware Version CPLD name CPLD version	G3DCL 0.05 x64 06/19/2020 11:28:13 1.00.0 0A:4.1.4.256 01	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 1998–9999 Months: 1–12 Days: Dependent on month Range of Years may vary.
Build Date and Time Access Level	06/11/2020 Administrator	
Platform Information Processor Processor Type PCH RC Revision	50654 – SKX U0 Intel(R) Xeon(R) Bro LBG QS/PRQ – 1G – S0 0580.D04	++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. E1: General Help
Memory Information Total Memory Usable Memory System Date System Time	8192 MB 8192 MB [Fri 06/19/2020] [16:50:43]	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275.	Copyright (C) 2020 Am <u>erican</u>	Megatrends, Inc.

Figure 7-3 Motherboard BIOS setting interface

After entering this interface, use the left and right keys on the keyboard to switch the menu item to the Server Mgmt option, and you will see the page shown in Figure 7-4.

Aptio Setup Main Advanced Platform	Utility – Copyright (C) 2017 Americar Socket Server Mgmt Security Boot	Megatrends, Inc. Save & Exit
<ul> <li>BMC Self Test Status</li> <li>BMC Device ID</li> <li>BMC Device Revision</li> <li>BMC Firmware Revision</li> <li>IPMI Version</li> <li>System Event Log</li> <li>BMC network configuration</li> <li>View System Event Log</li> <li>BMC Warm Reset</li> </ul>	PASSED 32 1 1.4.2 2.0	Press <enter> to change the SEL event log configuration.</enter>
		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Reset ESC: Exit</pre>
Version 2.1	9.1268. Copyright (C) 2017 American M	legatrends, Inc.

#### Figure 7-4 Server Mgmt interface

After entering this interface, enter the BMC network configuration option through the keyboard, and you will enter the following interface, as shown in Figure 7-5.



Figure 7-5 BMC network configuration option interface

On this page, you can see two configurable network ports, one is the dedicated network port for Dedicated, and the other is the shared network port for Sharelink. Take the shared network port as an example here. If you connect a dedicated network port, the setting method is the same as the shared network port. Switch to the Configuration Address Source option and press Enter to set the network mode of the network port, as shown in Figure 7-6.

Aptio Setup Ut	ility – Copyright (C) 2017 America Server Mgmt	an Megatrends, Inc.
BMC network configuration- BMC Dedicated Management Cha Configuration Address source Current Configuration Address Station IP address Subnet mask Station MAC address Router IP address	 Innel (Unspecified) s sour DynamicAddressBmcDhcp 0.0.0.0 0.0.0.0 11-22-33-aa-bb-cc 0.0.0.0	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase
Router MAC address BMC Sharelink Management Ch Configuration Address sourc Current Configuration Addre Station IP address Subnet mask Station MAC address Router IP address Router MAC address	Configuration Address source Unspecified Static DynamicBmcDhcp DynamicBmcNonDhcp aa-bb-cc-00-00-01 192.168.1.1 00-00-00-00-00-00	Select Screen Select Item r: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.19.	1268. Copyright (C) 2017 American	Megatrends, Inc.

Figure 7-6 Configuring the network port network mode

There are four network modes that can be configured on this interface, namely Unspecified, Static, DynamicBMCDHCP, and DynamicBMCNonDHCP. Static is the static mode, you can manually set the IP address, and DHCP is the dynamic mode. Setting this item allows the BMC to automatically obtain the IP address from the DHCP server.

## 7.1.3 IPMI interface configuration Static mode

If you choose to configure Static mode for an IPMI interface, pay attention to the following issues:

(1) If there are multiple IPMI devices in your local area network, it should be noted that the IP addresses between the devices cannot be repeated, otherwise communication cannot be established.

(2) If the IP of your IPMI device is an intranet address, the terminal device that communicates with it must be in the same network segment as the address of the IPMI device.

(3) The IP address of the IPMI device can be mapped to the WAN through the routing device to achieve long-distance management.

(4) The IPMI port has the function of obtaining an IP address through DHCP.

(5) IPMI supports both TCP/IP v4 and TCP/IP v6 protocols.

Configure the IP address and subnet mask according to your actual situation. For example, here we set the IP address to 192.168.0.236 and the subnet mask to 255.255.252.0, as shown in Figure 7-7 below. After setting, press F4 to save and exit the BIOS interface.

Aptio Setup Utility -	Copyright (C) 2017 Americ Server Mgmt	an Megatrends, Inc.
Aptio Setup Utility - BMC network configuration BMC Dedicated Management Channel Configuration Address source Current Configuration Address sour Station IP address Subnet mask Station MAC address Router IP address Router IP address BMC Sharelink Management Channel Configuration Address source Station IP address Subnet mask Station MAC address Router IP address	Copyright (C) 2017 Americ Server Mgmt [Unspecified] DynamicAddressBmcDhcp 0.0.0.0 0.0.0.0 11-22-33-aa-bb-cc 0.0.0.0 00-00-00-00-00-00 [Static] 192.168.0.236 255.255.252.0 aa-bb-cc-00-00-01 192.168.1.1 00-00-00-00-00-00	an Megatrends, Inc. Enter router IP address ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Ontimized Defaults
Vencion 2, 19, 1268 - Pr	prunight (C) 2017 American	F3: Optimized Defaults F4: Save & Reset ESC: Exit

Figure 7-7 Satic Mode Settings

We have completed the operation of configuring the IPMI function.

## 7.1.4 IPMI configuration Java SOL

- 1. Press the <Del> key when the system starts to enter the BIOS setup interface.
- 2. Switch to the Advanced menu, select Serial Port Console Redirection, and press < Enter>.
- 3. Make sure that the Console Redirection of COM0 is in the [Enabled] state, if not, select Console Redirection, and then press the <Enter> key to set the state to [Enabled]. To ensure the normal

operation of iBMC, this option is set to [Enabled] by default.

## 7.2 Quick Start Instructions for IPMI Functions

After completing the previous configuration steps, we can start to log in to the management interface of IPMI. The management interface of IPMI can be accessed using standard web browsers. Here we recommend using Google Chrome browser, Firfox Firefox browser and IE browser. browser (IE 11 and above) for the best browsing experience. Since the new version of the operation interface is based on HTML5, the overhead of computer resources is relatively large. We recommend that users configure more than 8G memory on the client side when using KVM.

#### 7.2.1 Enter the operation interface

Taking the Google Chrome browser as an example, enter the access address of IPMI in the address bar of the browser and press Enter to access the management interface of IPMI. Since all HTTP links have been converted to HTTPS encrypted links, you will enter Figure 7-8. Privacy settings error page shown, other browsers may vary.

Your connection isn't private
Attackers might be trying to steal your information from <b>192.168.0.120</b> (for example, passwords, messages, or credit cards).
NET:ERR_CERT_AUTHORITY_INVALID
Hide advanced Go back
This server couldn't prove that it's <b>192.168.0.120</b> ; its security certificate is not trusted by your computer's operating system. This may be caused by a misconfiguration or an attacker intercepting your connection.
Continue to 192.168.0.120 (unsafe)



On this page, click "Advanced" >> "Continue" in turn, you can access the IPMI management page normally, and enter the login page, as shown in Figure 7-9.

Login	
Username	
Password	
Sign me in I forgot my password	

Figure 7-9 IPMI management login interface

## 7.2.2 Default Username and Password

Factory default username: admin

Factory default password: admin

When you log in with this username, you will have full administrator rights. It is recommended that you change the password after logging in.

#### 7.2.3 Contents of IPMI Management System

After you log in to the IPMI management system correctly, you can see the page shown in Figure



IPMI management interface menu description

#### (1) Dashboard

On this page, users can view the basic information of the IPMI management system. Includes firmware information, network information, and sensor monitoring information.

The firmware information includes BMC firmware version information, BIOS version information, Motherboard CPLD version information, backplane CPLD version information, and BMC firmware compilation time information.

The network information includes the MAC address of the system network and BMC network information. You can choose to view the shared network port or dedicated network port of the BMC. The BMC network information includes BMC network MAC address information, IPV4 network mode information, IPV4 address information, IPV6 network mode information, and IPV6 address information.

The sensor monitoring information will display the current alarm sensor information in real time, including sensor name, sensor reading value, real-time curve change of sensor reading value and alarm status.

(2) Sensor

This page displays the status of all sensors. When there is a sensor alarm, the sensor will be displayed in the key sensor column, and when the alarm is removed, the sensor will be automatically removed from the key sensor column.

(3) System list

This page can view server CPU and memory information. In the block diagram, click on the CPU block to view the CPU information. The memory block is displayed in green to indicate that the memory exists. Click the memory block with the mouse to view the memory information.

(4) Hard disk information

For the backplane with Expander, a green square indicates that the hard disk is in place, otherwise it indicates that it is not in place. The status of the hard disk can be viewed on the right or below the hard disk block. Left-click the green square to view the detailed information

of the hard disk, and right-click to locate the hard disk.

(5) Power consumption

In this menu, the power consumption can be capped, and the recent power consumption can also be viewed.

(6) FRU information

Select this menu to view basic FRU information.

(7) Logs & Reports

In this menu, you can view the IPMI time log, audit log and video log.

(8) Settings

BMC can be configured in this menu. Including BSOD, date & time, network, etc...

(9) Remote control

On this page, KVM, SOL can be started, and power control and UID (server logo light) control can also be performed.

(10) Mirror redirection

On this page, you can get the latest image file on the remote storage device.

(11) Maintenance

You can perform basic maintenance operations on the server, such as BMC firmware update, BIOS firmware update.

(12) Cancellation

Click to log out the current user's login.

#### 7.2.4 Introduction to KVM Remote Management

#### Launch KVM remote management

As shown in Figure 7-11, in Remote Control > KVM & Java SOL Remote Control menu, KVM can be started.

line	×	KVM & SOL KVM & SOL
vard		KVM
Inventory		Launch KVM
ormation		
Reports s	>	Serial Over LAN
e Control		📥 Activate
Redirection		
nance		

Figure 7-11 Launch KVM

**7.2.5 KVM page introduction** As shown in Figure 7-12, it is the KVM interface after KVM is started.

Ste	op KVM								CD Image: Browse File (0 KB) Start Media
Video 🕶	Mouse 🗸	Options -	Send Keys 🕶	Hot Keys 🕶	Video Record 🗸	Power -	Active Users -	Help 🕶	A Zoom 100 % 🖵 🙂
		BLK7:	Alias(s):		or more substance				
		DI WO	PC1Root(0)	<1)/Pc1(0)	<8,0x1)/Pc1(	0x0,0x3	)/USB(0x1,0	x0)/USB(0>	<1,0x0)/Unit(0x3)
		BLK8:	Allas(s):	1) /Poi/(0)	0.001220017	000 000		uó) zijen (ó.	1. 000) (16 († (004)
		DI VO.	Aliac(c)	(1)/FCI(0)	(0,UXI)/FCI(	0x0,0x3	)/USB(UXI,U	XU)/USB(U)	x1,0x0)/UHIL((0x4)
		ULK J -	PriPoot(A)	/2)/Pci(0)	28.0v2)/Pci(	0.00 0.00	)/Sata(UA2		2)
		BLK13	Alias(s):		0,002//1010	0.0,0.0	// Julu(0/2,	0.000	*
		DERIO.	PriRnot(0)	(2)/Pci(0)	(8.0x2)/Pci(	0x0.0x0	)/Sata(0x3.	0xEEEE.0x0	1)
		BLK10:	Alias(s):	,		0110 9 0110	, outation ,		
			PciRoot(0>	<2)/Pci(0)	<8,0x2)/Pci(	0x0,0x0	)/Sata(0x2,	0xFFFF,0x0	0)/HD(1,GPT,3595CFB5-3383-4F74-AD
	41	D-CB1DA22	C53C0,0x80	00,0x8000)					
		BLK11:	Alias(s):						
			PciRoot(0>	<pre>(2)/Pci(0)</pre>	<8,0x2)/Pci(	0x0,0x0	)/Sata(0x2,	0xFFFF,0x0	))/HD(2,GPT,01094C58-80F9-4433-AB
	7	E-B56EBDE	DC679,0x88	300,0xC7F8	3000)				
		BLK12:	Alias(s):						and a second distance will be second the
			PciRoot(0>	<2)/Pci(0)	<8,0x2)/Pci(	0x0,0x0	)/Sata(0x2,	0xFFFF,0x0	0)/HD(3,GPT,5CB2F4A7-8281-405C-82
	0	3-ED02EDC	08D653,0xC8	300800,0x:	186A0000)				
		BLK15:	Alias(s):		0.0.010-77				
		000000	PC1ROOT(U)	(2)/PC1(U)	(8,0X2)/PC1(	0x0,0x0	)/Sata(UX3,	UXFFFF,UXU	J)/HD(2,GP1,06FA830F-B8EB-4386-B7
	3		Aliac(c)	1000,0X200	)000)				
		DEKIU.	PriRoot(A)	/2)/Pci(0)	28 0v2)/Pci(	0.00 0.00	)/Sata(Uv3		1)/HD(3_CPT_C9310859_5265_4850_82
	A	-6883251	27875_0x26	4800_0x74	44A2000)	010,010	// outu(0//0,	v//////,v//	37710(0,011,0301101371203 1020 02
	P	ress ESC	in 2 secor	nds to sk:	io startup.n	sh or a	ny other ke	u to conti	inue.
	S	nell>							
	S	nell>							
	si	nell>							
	SI	nell>							
	SI	nell>							
	SI	nell>							
	SI	nell> _							



Figure 7-12 KVM interface

As shown in Figure 7-13, the KVM interface consists of two parts: one part is the menu and shortcut buttons, and the other part is the remote desktop window, that is, the server desktop information returned remotely.



Figure 7-13 Composition of KVM interface

#### 7.2.6 Remote control shortcut operation

Stop KVM	Stop KVM
OCD Image: Browse File (0 KB) Start Media	Hanging on the CD image, generally used
	to remotely install the operating system
🛕 Zoom 100 % 🖵 🙂	The host display is unlocked, the server is
	turned on and off
T 11 1	41



#### 7.2.7 Introduction to SOL

Click Activate Java SOL on the page shown in Figure 7-14 to open the interface shown in Figure 3-7 below.

Gooxi 国鑫	≡
Host Online	KVM & SOL KVM & SOL
Quick Link 🔻	
Dashboard	KVM
System Inventory	Launch KVM
» FRU Information	
Lull Logs & Reports >	Serial Over LAN
Settings	
🖵 Remote Control	🛃 Activate
🖨 Image Redirection	
🗲 Maintenance	
🕒 Sign out	



- 1. After clicking to activate, the SOL interface shown in Figure 7-15 will appear.
- 2. Press Enter to activate the screen.

Aptio Setup Utili Main Advanced Platform Confi	ty – Copyright (C) 2020 Americ. guration Socket Configuration	an Megatrends, Inc. ∩ Server Mgmt Security Boot →
BIOS Information		Set the Date. Use Tab to
Project Version	G3DCL 0.05 ×64	switch between Date elements.
Build Date and Time	06/19/2020 11:28:13	Default Ranges:
BMC Firmware Revision	1.00.0	Year: 1998-9999
ME Firmware Version	0A:4.1.4.256	Months: 1-12
OPL D. Hanna		Days: Dependent on month
CPLD name	0.1	Range of Years may vary.
CFLD VERSION	01	
Buitu Date and Time	06/11/2020	
Access Level	Administrator	
Platform Information		
Processor	50654 - SKX UO	↔+: Select Screen
Processor Type	Intel(R) Xeon(R) Bro	↑↓: Select Item
PCH	LBG QS/PRQ - 1G - SO	Enter: Select
RC Revision	0580.D04	+/-: Change Opt.
		F1: General Help
Memory Information		F2: Previous Values
Total Memory	8192 MB	F3: Optimized Defaults
Usable Memory	8192 MB	F4: Save & Exit
		ESC: Exit
System Date	[Fri 06/19/2020]	
System Time	[16:50:43]	
Version 2.20.127	5. Copyright (C) 2020 American	Megatrends. Inc.

Figure 7-15 SOL operation interface

Note: The SOL interface operation function has only been tested for BIOS screen synchronization,

and other interfaces have not been tested. This time is an operation demonstration and will not be described in detail.

# 7.3 Other ways to connect to IPMI

The AST2500 firmware complies with the IPMI 2.0 specification, so users can use the standard IPMI driver assigned by the operating system.

#### 7.3.1 IPMI driver

The AST2500 supports Intel referenced drivers, available from:

https://www.intel.com/content/www/us/en/servers/ipmi/ipmi-technical-resources.html via Windows Server 2003 R2, and also from Microsoft An IPMI driver package is provided, you can also use the Open IPMI driver in the system.

AST2500 supports Open IPMI driver for Linux kernel. Use the following command to load the IPMI driver: "modprobe ipmi\_devintf" "modprobe ipmi\_si" If you are using an older version of the Linux kernel, you need to replace the "ipmi\_si" component with "ipmi\_kcs".

#### 7.3.2 IPMI tools and other open source software

AST2500 supports open source IPMI tools, you can also use other software, such as: Open IPMI, IPMI Utility, etc.

The above files are designed to help you quickly understand and deploy the IPMI function of the system. We will provide other help files for the detailed IPMI function operation manual.