

# Lanner

## Telecom Datacenter Appliances

Innovative Platforms for Next Generation Network Infrastructure

# HTCA-6310S User Manual

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## About this Document

This manual describes the overview of the various functionalities of this product and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or information technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the [Lanner Download Center](#) page with a login account and password.



## Conventions & Icons

This document utilizes different font types and icons in order to make selected text more transparent and explicable to users. This document contains the following conventions:

### Font Conventions

Example	Convention	Usage
<code>iptables -F</code>	Monospace, shaded	A command to be entered at a shell command-line
<b>Setup</b> page	Bold	A title of a dialog box or a page
<Enter>	Between a pair of inequality signs	A physical keyboard button
"Menu"	Between a pair of quotation marks	A menu option or a software button to be clicked
<i>Readme.txt</i>	In Italic	A filename or a file path
<u>IPMI User Guide</u>	Underlined	The name of another document or a chapter in this document

### Icon Descriptions

Icon	Usage
 Note or Information	This mark indicates that there is something you should pay special attention to while using the product.
 Warning or Important	This mark indicates that there is a caution or warning and it is something that could damage your property or product.

## Online Resources

To obtain additional documentation resources and software updates for your system, please visit the [Lanner Download Center](#). As certain categories of documents are only available to users who are logged in, please be registered for a Lanner Account at <http://www.lannerinc.com/> to access published documents and downloadable resources.

For troubleshooting the issues with your system, please visit the [Lanner Q&A](#) page for diagnostic procedures and troubleshooting steps.

## Technical Support

In addition to contacting your distributor or sales representative, you could submit a request to our **Lanner Technical Support** at <http://www.lannerinc.com/technical-support> where you can fill in a support ticket to our technical support department.

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## Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email to [contact@lannerinc.com](mailto:contact@lannerinc.com). Thank you for your time.

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## Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution

- ▶ Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- ▶ This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



#### Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



#### Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

## Safety Guidelines

Follow these guidelines to ensure general safety:

- ▶ Keep the chassis area clear and dust-free during and after installation.
- ▶ Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- ▶ Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- ▶ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- ▶ Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- ▶ Do not work alone if potentially hazardous conditions exist.
- ▶ Never assume that power is disconnected from a circuit; always check the circuit.

## Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- ▶ Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- ▶ Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- ▶ Portez des lunettes de sécurité pour protéger vos yeux.
- ▶ N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- ▶ Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- ▶ Ne travaillez pas seul si des conditions dangereuses sont présentes.
- ▶ Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

## Lithium Battery Caution

- ▶ There is risk of explosion if the battery is replaced by an incorrect type.
- ▶ Dispose of used batteries according to the instructions.
- ▶ Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all installation procedures and device specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ Please conform to your local laws and regulations regarding safe disposal of lithium battery.
- ▶ Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.

- ▶ Leaving a battery in an extremely high temperature environment can result in an explosion or the leakage of flammable liquid or gas.
- ▶ A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

## **Avertissement concernant la pile au lithium**

- ▶ Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- ▶ Jetez les piles usagées conformément aux instructions.
- ▶ L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- ▶ Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

## **Operating Safety**

- ▶ Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- ▶ Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- ▶ Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- ▶ Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- ▶ Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

## **Sécurité de fonctionnement**

- ▶ L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- ▶ Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- ▶ Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du

retrait et du remplacement de composants.

- ▶ Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- ▶ Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

### **Mounting Installation Precautions**

The following should be put into consideration for rack-mount or similar mounting installations:

- ▶ Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- ▶ The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- ▶ Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- ▶ Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.
- ▶ Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- ▶ Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- ▶ Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- ▶ Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).



## Electrical Safety Instructions

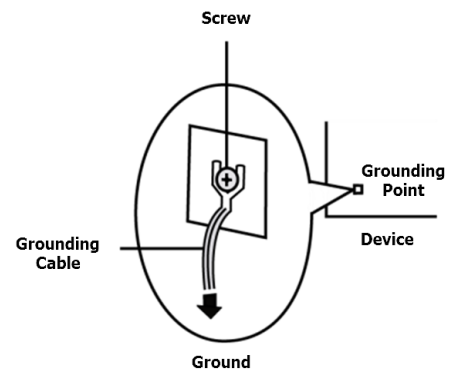
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm<sup>2</sup> or 12 AWG.

## Consignes de sécurité électrique

- ▶ Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- ▶ Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- ▶ Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- ▶ Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm<sup>2</sup> ou 12 AWG.

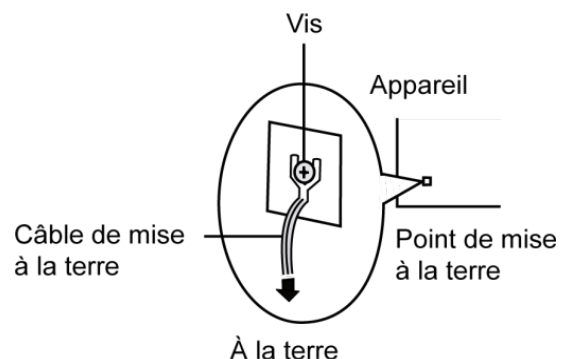
## Grounding Procedure for DC Power Source

- ▶ Loosen the screw of the earthing point.
- ▶ Connect the grounding cable to the ground.
- ▶ The protection device for the DC power source must provide 30 A current.
- ▶ This protection device must be connected to the power source before DC power.



## Procédure de mise à la terre pour source d'alimentation CC

- ▶ Desserrez la vis du terminal de mise à la terre.
- ▶ Branchez le câble de mise à la terre à la terre.
- ▶ L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.
- ▶ Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.





**CAUTION:** TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.

注意：要断开电源，请将所有电源线从本机上拔下。

**WARNUNG:** Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.

**ATTENTION:** DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

- ▶ This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.

Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée

- ▶ Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

- ▶ The machine can only be used in a restricted access location and has installation instructions by a skilled person.

Les matériels sont destinés à être installés dans des EMBLEMES À ACCÈS RESTREINT.

Instruction for the installation of the conductor to building earth by a skilled person.

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# CHAPTER 1: PRODUCT OVERVIEW

HTCA-6310S can support up to 256GB of DDR4 2,400 MHz REG DIMM memory modules and comes with sixteen SATA 3.5" hot-swappable disk drive bays. In addition, HTCA-6310S provides other I/O functionality including one onboard CF slot, one NIC module slot compliant with 1/10/40/Fiber/Copper LAN connectivity, one RJ-45 console, one IPMI port for remote management, and one double-width PCIe\*16 socket for graphic acceleration card and a PCIe \*8 socket for RAID Card support of 16xBays SATA HDD. HTCA-6310S is built with redundant design supporting 1 + 1 redundant power supply and removable fan module. HTCA-6310S is optimal for telecommunication and data center applications such as IP surveillance, ISP & cloud hosting, and TV/Media industry where performance and storage are critical.

## Main Features

- ▶ 3U High Performance Storage Server Appliance
- ▶ Support Intel® Xeon® E5-2600 v3/v4 Series CPUs and max. up to 8 x DDR4 R-DIMM
- ▶ 16 x hot swappable 3.5" storage bays by Avago MegaRAID SAS 9361-16i RAID Card.
- ▶ Support Lanner NIC module on the rear
- ▶ One Console RJ45, LOM port, MGT port, 2x USB, VGA port
- ▶ Internal 1x PCIe by 16 slot for graphic acceleration card
- ▶ 1+1 redundant power and removable fan module

## Ordering Information

SKU No.	Main Features
HTCA-6310SA	HybridTCA™ high-performance chassis 3U storage server appliance with Intel® Xeon® E5-2600 series v3/v4 processors + 16 bays 3.5" HDDs (by Avago MegaRAID SAS 9361-16i RAID Card) with 1x NIC module slot
HTCA-6310SB	HybridTCA™ high-performance chassis 3U storage server appliance with Intel® Xeon® E5-2600 series v3/v4 processors + 16 bays 3.5" HDDs (by Avago MegaRAID SAS 9361-16i RAID Card) + Riser for 1x PCIe by 16 with 1x NIC module slot

## Package Content

Your package contains the following items:

- ▶ 1x HTCA-6310S System
- ▶ 2x Power Cable (Based on region and power type)
- ▶ 1x Ear Rack mount kit with screws
- ▶ 1x Console cable (RJ45 to D-SUB9)
- ▶ 2x LAN Cable



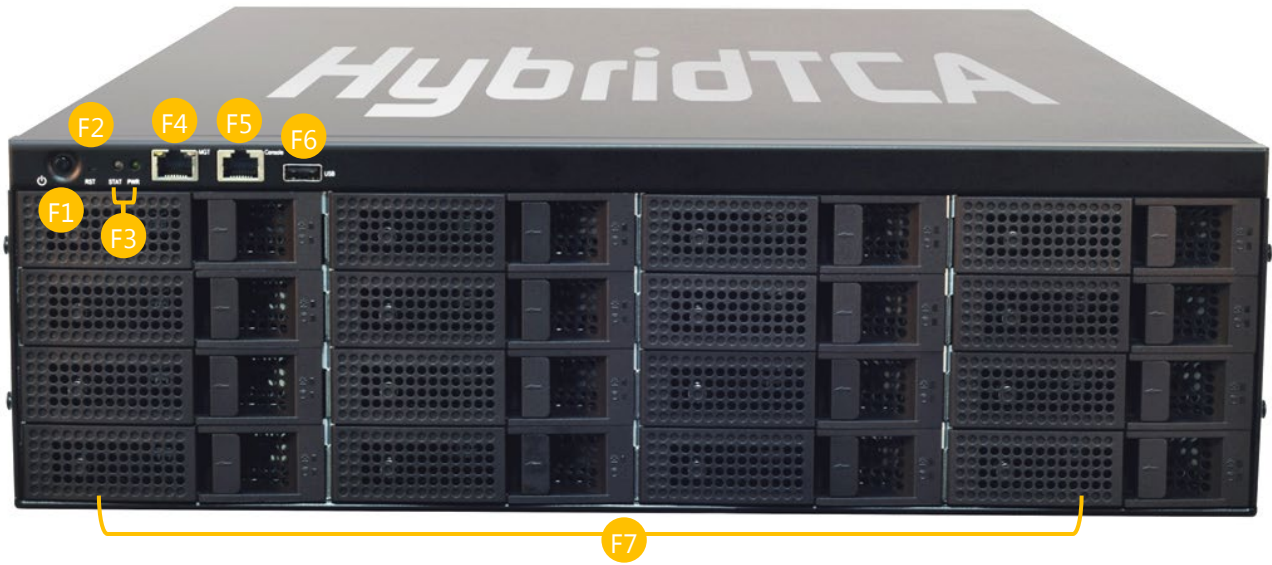
### Note


If you should find any components missing or damaged, please contact your dealer immediately for assistance.

## System Specifications

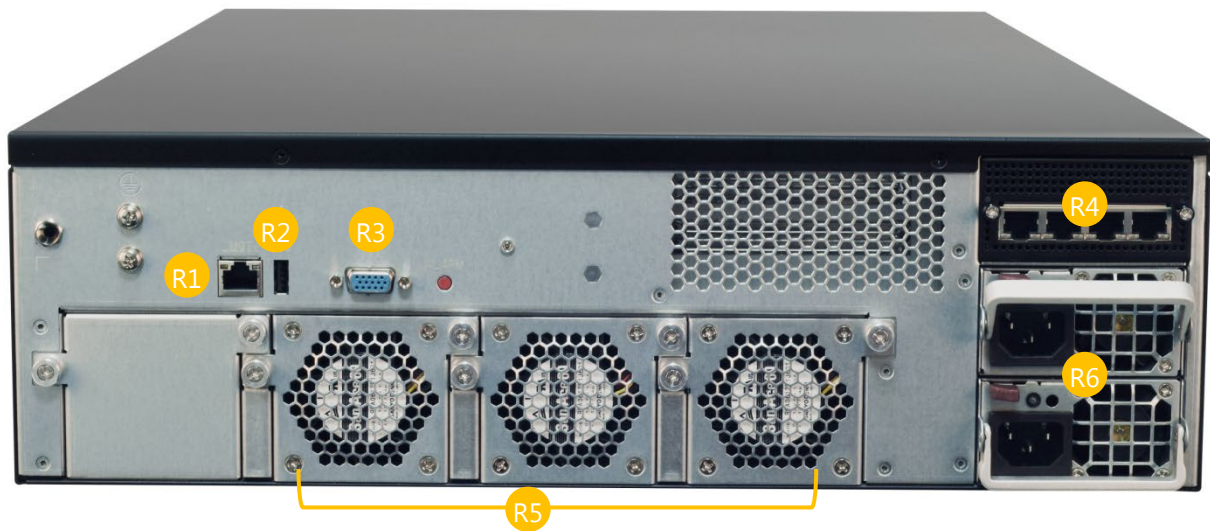
<b>Compute Node</b>	CPU Options	Intel® Xeon® processor E5-2600 v3/v4 Series
	BIOS	AMI SPI Flash BIOS
	Chipset	Intel C612 Chipset
<b>Memory</b>	Technology	DDR4 2400MHz (Registered)
	Max. Capacity	256GB (Registered)
	Socket	Up to 8 x 288-pin DIMM
<b>Ethernet Port</b>	Controller	2 x i210
	Interface	1 x MGMT port, 1 x LAN port
<b>Storage</b>	Type	SATA III, 6Gb/s per port
	Installation	1 X PCIe X8 Slot reserved for RAID Card to support 16x 3.5” Swappable Drive Bays
	Type	CF
	Installation	1 x CF socket
<b>Rear IO</b>	Reset Button	Yes
	Console	1 x RJ45 (without LED)
	Display	VGA
	USB	2x type A
	IPMI	OPMA socket to support IPMI (IAC-AST2300)
<b>Expansion</b>	PCIe	2x by 8 (1 for RAID card, others for Lanner NIC module)
<b>Cooling</b>	Processor	CPU heatsinks with fan duct
	System	3 x hot-swappable cooling fan sets with smart fan control
<b>Environment</b>	Operating/Storage Temperature	0 ~ 40°C / -20 ~ 70°C
	Relative Humidity	5%~90%, non-condensing
<b>System Dimensions</b>	LCD Module	N/A
	Watchdog	Yes
	Internal RTC with Li Battery	Yes
<b>Mechanical</b>	Dimension (W x H x D)	442 x 132 x 736.6 mm
	Weight	30 kg
	Mounting	Rack mount
<b>Power</b>	Type / Watts	AC 1200 watt 1+1 Redundant /each DC 1010 watt 1+1 Redundant /each PM bus support, up to 2 PSU slots
	Input	AC 100~240V DC -36~-72V
<b>OS Support</b>	Linux	Linux Kernel 2.6 or above
<b>Certification</b>	EMC	CE Class A, FCC Class A

## Front Panel



No.	Description	
F1	Power Button	Push to power on/off the system
F2	Reset Button	Software reset
F3	LED Indicators	System Status  System Power
F4	MGMT Port	RJ-45 Management Port
F5	Console Port	RJ45 Console Port
F6	USB Port	1x USB 2.0 Port
F7	HDD Tray	16x 3.5" Swappable HDD Tray

## Rear Panel



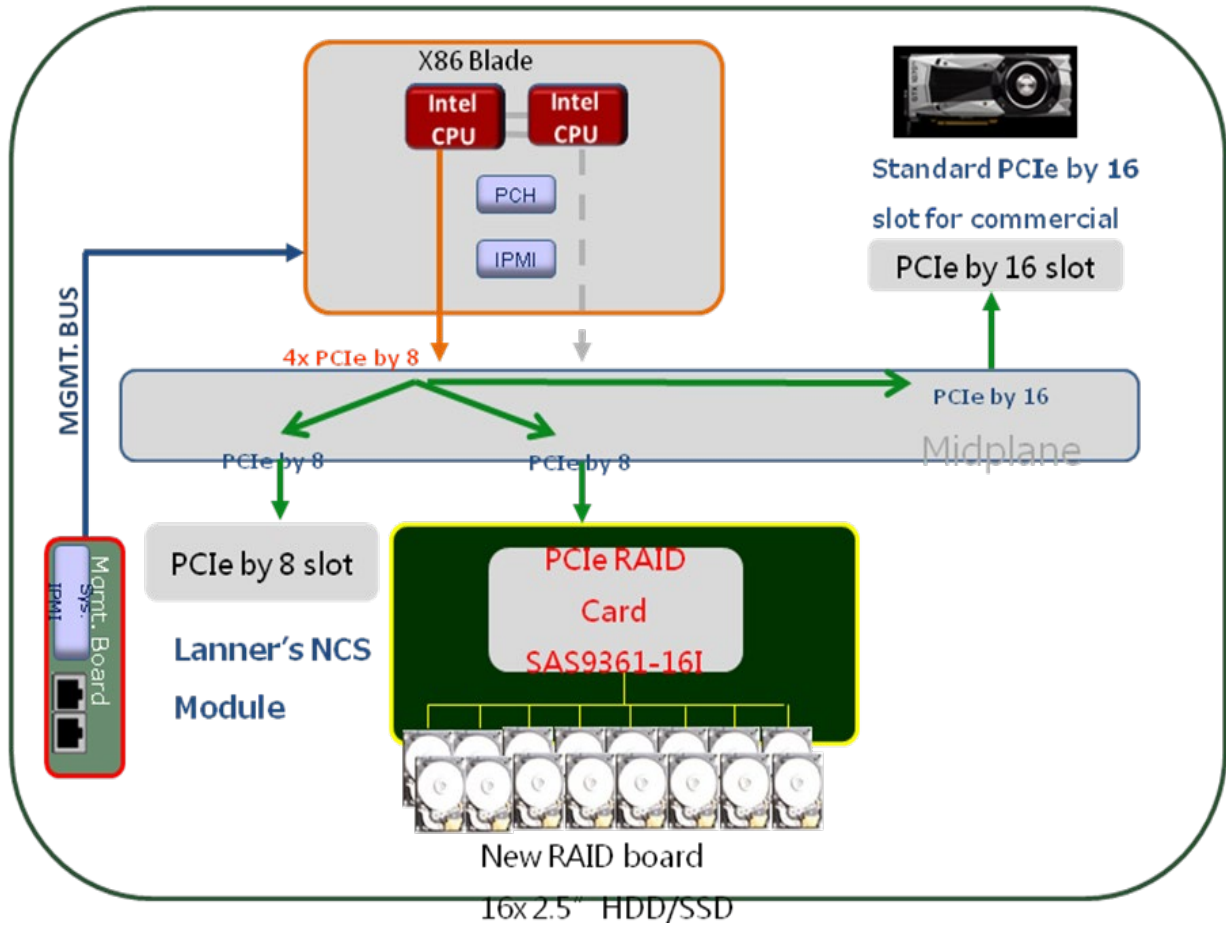
No.	Description	
R1	LAN Port	1x RJ45 LAN Port
R2	USB Port	1x USB 2.0 Port
R3	VGA Port	1x DB15 VGA Port
R4	NIC Module Slot	For 1x PCIe by 8 Lanner NIC module
R5	Cooling Fan	3x cooling fans per CPU blade
R6	Redundant Power Supply	AC:1200 Watt N+1 Redundant /each, 85~264 V DC:1010 Watt N+1 Redundant /each, -36 ~ -72 V



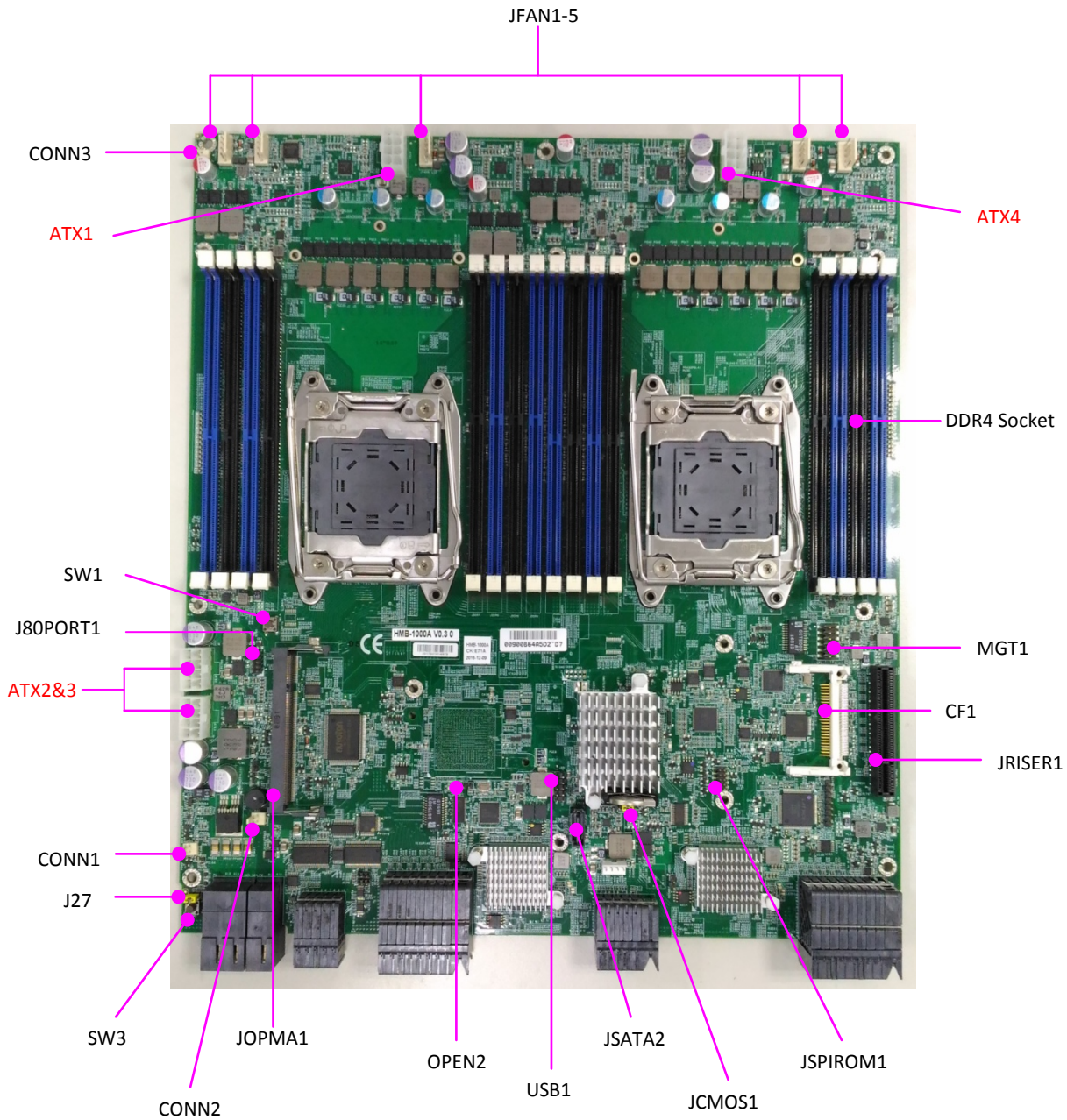
## Motherboard Information

### Block Diagram

The block diagram indicates how data flows among components on the motherboard. Please refer to the following figure for your motherboard's layout design.



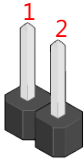

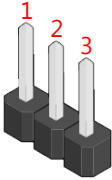

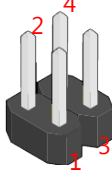
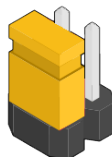
The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



## Internal Jumpers

The pin headers on the motherboard are often associated with important functions. With the shunt (Jumper) pushed down on the designated pins (the pin numbers are printed on the circuit board, surrounding the pin header), certain feature can be enabled or disabled. While changing the jumpers, make sure your system is turned off.

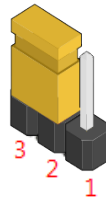
To short the designated pins, push the jumper down on them so that they become **SHORT**. To make the pins setting **OPEN**, simply remove the jumper cap.

2-pin Header		3-pin Header		4-pin Header	
					
Open	Short	Open	(1-2) Jumped	Open	(1-2) Jumped

### ■ J27: Software reset

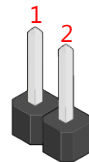
Select **SW3** reset option

Pin	Description
1-2	Hardware Reset
2-3	Software Reset



### ■ OPEN2: Management Port select Pin header

Pin	Description
Close	IPMI card
Open	On board I210



### ■ JCMOS1: Clear CMOS Jumper

You may set jumper pins to clear CMOS

Pin	Description
1-2	Normal (Default)
2-3	Clear CMOS



## Internal Connectors

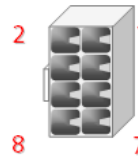
- **MGT1:** 2x6 pin header for RJ-45 LAN management port (rear side).

Pin	Description	Pin	Description
1	MGT2_MDIP_0	2	MGT2_MDIN_0
3	MGT2_MDIP_1	4	MGT2_MDIN_1
5	MGT2_MDIP_2	6	MGT2_MDIN_2
7	MGT2_MDIP_3	8	MGT2_MDIN_3
9	MGT_LAN2_100#	10	MGT_LAN2_ACT#
11	MGT_LAN2_1G#	12	P3V3_AUX



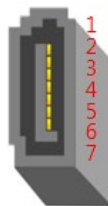
- **ATX1~ATX4:** 8-pin ATX power connectors.

Pin	Description
1	GND
2	+12V
3	GND
4	+12V
5	GND
6	+12V
7	GND
8	+12V



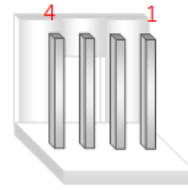
- **JSATA2:** 7-pin SATA signal connector for SATA storage device.

Pin	Description
1	GND
2	TX_P
3	TX_N
4	GND
5	RX_N
6	RX_P
7	GND



■ **CON3:** SATA Power connector

Pin	Description
1	+12V
2	GND
3	GND
4	+5V



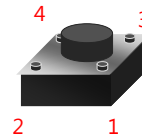
■ **JFAN1~5:** 5-pin FAN connectors.

Pin	Description
1	Ground
2	+12V
3	RPM Sense2
4	RPM Sense1
5	PWM Output



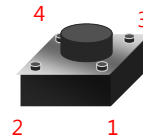
■ **SW1:** PS\_ON Power Switch (for debug).

Pin	Description
1-2	GND
3-4	Power On



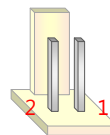
■ **SW3:** Reset Switch (for debug).

Pin	Description
1-2	GND
3-4	Reset signal



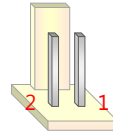
■ **CONN1:** Hot swap Power control header

Pin	Description
1	Power Enable
2	GND



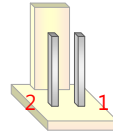
■ **CONN2:** PS\_ON Power switch header

Pin	Description
1	GND
2	Power On signal



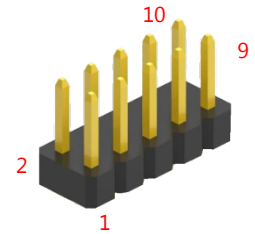
■ **CONN3:** Compute Blade status LED header

Pin	Description
1	+5V_SB
2	Status Output signal



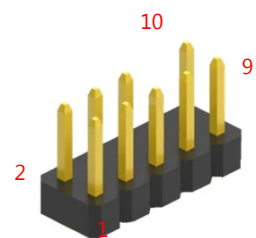
■ **USB1:** 2x5-pin internal USB V2 pin header

Pin	Description	Pin	Description
1	USB_VCC	2	USB_VCC
3	USBD0-	4	USBD1-
5	USBD0+	6	USBD1+
7	Ground	8	Ground
9	Ground	10	Ground



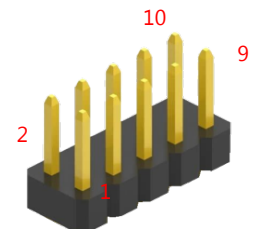
■ **J80PORT1:** 2x5-pin internal pin header(for debug)

Pin	Description	Pin	Description
1	PCI_33M_Clock	2	LPC_LAD1
3	Reset#	4	LPC_LAD0
5	LPC_FRAME#	6	3.3V
7	LPC_LAD3	8	NC
9	LPC_LAD2	10	GND



■ **JSPIROM1:** 2x5-pin internal pin header for SPI ROM update(for debug)

Pin	Description	Pin	Description
1	USB_VCC	2	USB_VCC
3	USBD0-	4	USBD1-
5	USBD0+	6	USBD1+
7	Ground	8	Ground
9	Ground	10	Ground



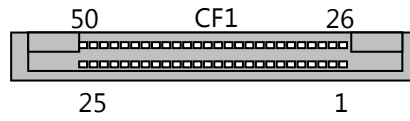
■ **JRISER1:** PCIeX8 slot(option)

Pin	Description	Pin	Description
B1	+12V	A1	NC
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMBus clock	A5	NC
B6	SMBus Data	A6	NC
B7	GND	A7	NC
B8	+3.3V	A8	GPIO pin
B9	JTAG1	A9	+3.3V
B10	+3.3V_AUX	A10	+3.3V
B11	Wake#	A11	PCIe Reset#
B12	NC	A12	GND
B13	GND	A13	PCIe_Clock_P
B14	PCIE_TX_P7	A14	PCIe_Clock_N
B15	PCIE_TX_N7	A15	GND
B16	GND	A16	PCIE_RX_P7
B17	NC	A17	PCIE_RX_N7
B18	GND	A18	GND
B19	PCIE_TX_P6	A19	NC
B20	PCIE_TX_N6	A20	GND
B21	GND	A21	PCIE_RX_P6
B22	GND	A22	PCIE_RX_N6
B23	PCIE_TX_P5	A23	GND
B24	PCIE_TX_N5	A24	GND
B25	GND	A25	PCIE_RX_P5
B26	GND	A26	PCIE_RX_N5
B27	PCIE_TX_P4	A27	GND
B28	PCIE_TX_N4	A28	GND
B29	GND	A29	PCIE_RX_P4
B30	PCIe_Clock_P	A30	PCIE_RX_N4
B31	PCIe_Clock_N	A31	GND
B32	GND	A32	NC
B33	PCIE_TX_P3	A33	NC
B34	PCIE_TX_N3	A34	GND
B35	GND	A35	PCIE_RX_P3

B36	GND	A36	PCIE_RX_N3
B37	PCIE_TX_P2	A37	GND
B38	PCIE_TX_N2	A38	GND
B39	GND	A39	PCIE_RX_P2
B40	GND	A40	PCIE_RX_N2
B41	PCIE_TX_P1	A41	GND
B42	PCIE_TX_N1	A42	GND
B43	GND	A43	PCIE_RX_P1
B44	GND	A44	PCIE_RX_N1
B45	PCIE_TX_P0	A45	GND
B46	PCIE_TX_N0	A46	GND
B47	GND	A47	PCIE_RX_P0
B48	NC	A48	PCIE_RX_N1
B49	GND	A49	GND



■ **CF1:** Compact Flash card slot



Pin	Description	Pin	Description
1	GND	26	CD1-
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	CE1#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	READY#
13	CFVCC3	38	CFVCC3
14	A6	39	CSEL
15	A5	40	VS2#
16	A4	41	RESET
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	DASP#
21	DATA0	46	DIAG#
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	WP	49	DATA10
25	CD2-	50	GND

## CHAPTER 2: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely. Also, please wear ESD protection gloves when conducting the steps in this chapter.

Based on your application and modules used, install modules in the corresponding slots.



### Installing the CPU

Please note that the system delivered to you comes with rather sophisticated design; therefore, the assembly of which must be handled with exclusive tools and extreme care by professionals. It is strongly recommended that you not make any adjustments to, remove or even re-install the processor on your own. If handling the processor on your own is inevitable, please read through the instructions in this section to make sure you have acquired the necessary knowledge and comply with the requirements.

Installing the processor onto motherboard involves two stages:

1. Remove the protective plastic cap.
2. Install the processor.
3. Install the Heatsink onto the motherboard.

### Tools Required

Tool	Description
Torque screwdriver (Star T20)	For opening/closing the CPU sockets. 
ESD Protection (ESD gloves, ESD-safe work surface, etc.)	During the entire assembly process, at least wear a pair of ESD gloves to avoid damaging or contaminating the electronic parts while enhancing your own safety. 



#### Note

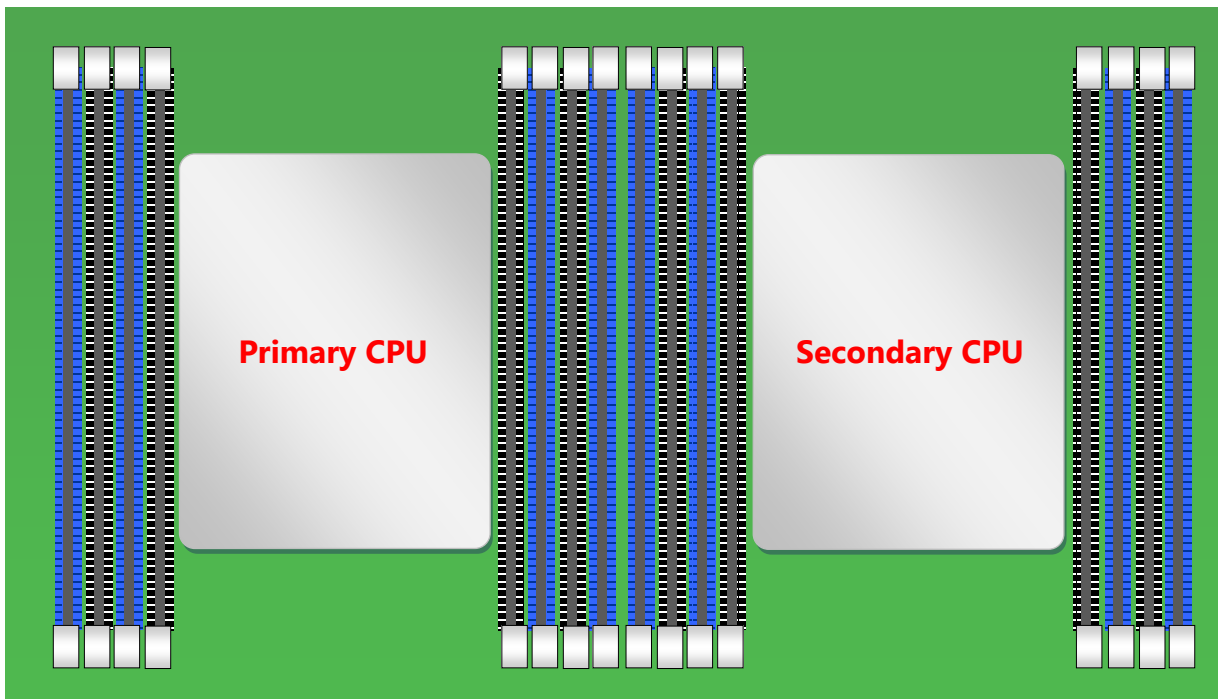
The images of tools shown in this document are merely for reference; the actual tools you use might differ.

## Installing the System Memory

The motherboard supports 16 memory slots for DDR4 registered DIMM.

### Supported System Memory Summary

Total Slots	16 (8 slots per processor)
Number of Channels	8 (1 DIMM per channel) per processor
Supported DIMM Capacity	4GB, 8GB, 16GB, 32GB
Memory Size	Maximum 512 GB RDIMM (32GB*16)
Memory Type	DDR4 RDIMM up to 2400MT/s
Minimum DIMM Installed	Each processor requires at least 1 memory modules to boot and run from.



## DIMM Population Guidelines

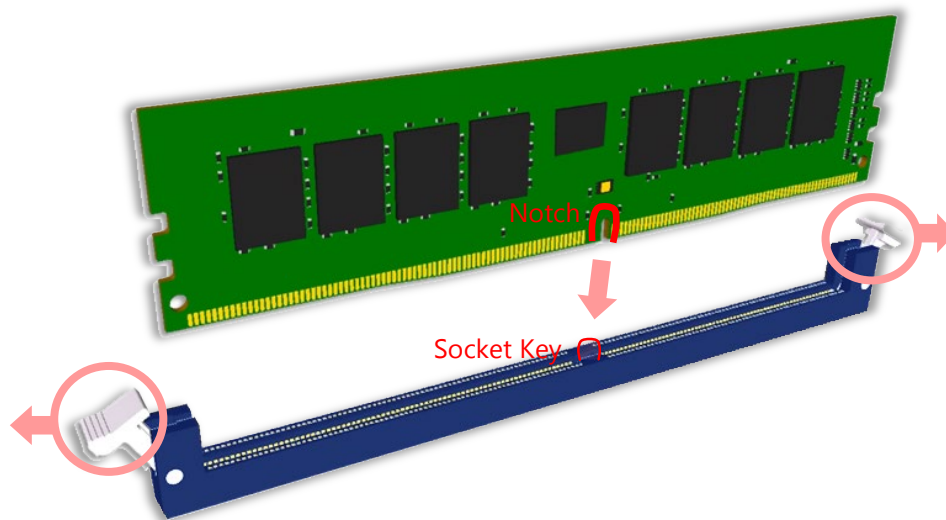
Please do follow the memory module installation instructions to install the DIMMs, and make sure

- Each CPU requires **at least 1** memory module to boot and run from.
- If you do not plan to fill up all the sockets with 16 memory modules, always start with the **blue** ones for optimal performance.
- Try to split the DIMMs evenly across the CPUs.
- Using memory modules of the same capacity, speed and from the same manufacturer are highly recommended. However, with mixed module speeds, the overall speed will be that of the slowest installed memory module.

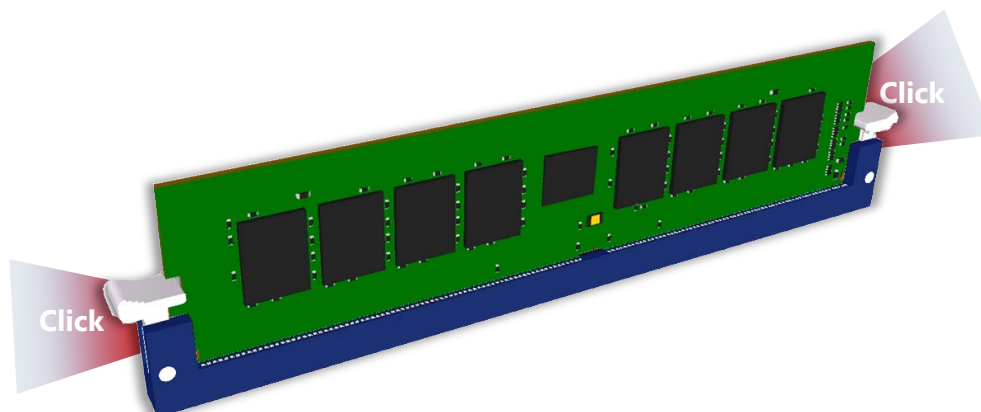
## Memory Module Installation Instructions

Please follow the steps below to install the DIMM memory modules.

1. Power off the system.
2. Pull open the DIMM slot latches.
3. Align the notch of the module with the socket key in the slot and carefully insert the card into the slot.



4. Push the module down into the slot until it is firmly seated. Press vertically on both corners of the card until it clicks into place.



# CHAPTER 3: SOFTWARE SETUP

## Remote Server Management

### Overview

This document specifies the BMC firmware features of Lanner. The BMC firmware implements IPMI 2.0 based on ASPEED service processor. It performs all the BMC management tasks defined by IPMI 2.0.

In addition, Lanner's BMC firmware runs an embedded web-server for full configuration using Web UI, which has a low learning curve.

### BMC Main Features

Feature		Description
<b>IPMI 2.0 Standard Features</b>	System Interface support	<ul style="list-style-type: none"> <li>• KCS (System Interface Support)</li> <li>• LAN (RMCP+)</li> <li>• BMC stack with an IPMI 2.0 implementation</li> <li>• Sensor monitoring</li> <li>• System power management</li> <li>• Watchdog timer</li> <li>• Fan speed monitor and control</li> <li>• FRU information</li> <li>• System Event Log (SEL)</li> <li>• Support in IPMI stack for SOL to remotely access BIOS and text console before OS booting</li> <li>• IPMI based user management</li> <li>• Multiple user permission level</li> </ul>
	IPMI 2.0 based Management	
	System Management	
	Event Log	
	Text Console Redirection: SOL	
	User Management	
<b>Non-IPMI functions</b>	Web User Interfaces	<ul style="list-style-type: none"> <li>• BMC management via web user interface</li> <li>• Integrated KVM and Virtual Media</li> <li>• RADIUS support</li> <li>• LDAP support</li> </ul>
	User authorization	
	Security	<ul style="list-style-type: none"> <li>• SSL and HTTPS support</li> <li>• Auto-sync time with NTP server</li> <li>• Remote firmware update by Web UI or Linux tool</li> </ul>
	Maintenance	

## BMC Firmware Functional Description

### System health monitoring

The BMC implements system sensor monitoring feature. It could monitor voltage, temperature, and current of critical components.

### System Power Management

The BMC implements chassis power and resets functions for system administrators to control and manage the system power behavior. These functions can be activated by sending the IPMI 2.0 compatible chassis commands to the BMC over messaging interfaces. The following list summarizes the supported functions.

- Chassis power on
- Chassis power off
- Chassis power cycle
- Chassis power reset
- Chassis power soft
- Server's power status report

### Watchdog Timer

The BMC provides an IPMI 2.0 compatible watchdog timer which can prevent the system from system hanging.

### Fan Speed Control

BMC is in charge of fan speed control. The fan speed can be modified by varying the duty cycle of PWM signal. The fan speed control algorithm mainly refers to the readings of on-board temperature sensors.

### Field Replaceable Unit (FRU)

The BMC implements an interface for logical FRU inventory devices as specified in IPMI 2.0 specification. This functionality provides commands for system administrators to access and management the FRU inventory information.

### System Event Log (SEL)

A non-volatile storage space is allocated to store system events for system status tracking.

## Serial over LAN (SOL)

IPMI 2.0 SOL is implemented to redirect the system serial controller traffic over an IPMI session. System administrators are able to establish a SOL connection with a standard IPMI client, like IPMITOOL, to remotely interact with serial text-based interfaces such as OS command-line and serial redirected BIOS interfaces.

## User Management

The BMC supports 9 IDs for IPMI user accounts. The maximum length of the username and password are 16 and 20 respectively, and the possible privilege levels are Callback, User, Operator, and Administrator. Moreover, the account creator is allowed to enable/disable the user account at any time. If not specified, the default user accounts are listed follows:

User Name	Password	User Access	Characteristics
admin	admin	Enabled	Password can be changed

## Keyboard, Video, Mouse (KVM) Redirection

- The BMC provides keyboard, video, and mouse (KVM) redirection over LAN. This application is available remotely from the embedded web server.
- Support video recording, recorded videos to be downloaded & playable.

## Virtual Media Redirection

- The BMC provides remote virtual CD, HD and FD redirection. CD image could be mounted directly in KVM window. HD, FD could be mounted by NFS and SAMBA.
- Efficient USB 2.0 based CD/DVD redirection with a typical speed of 20XCD.
- Completely secured transmission.

## IPMI Commands Support List

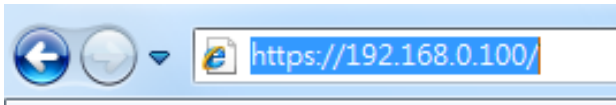
COMMANDS	NETFN	CMD
<b>IPM Device “Global” Commands</b>		
Get Device ID	APP (06h)	00h
Cold Reset	APP (06h)	02h
Warm Reset	APP (06h)	03h
Get Device GUID	APP (06h)	08h
<b>BMC Watchdog Timer Commands</b>		
Reset Watchdog Timer	APP (06h)	22h
Set Watchdog Timer	APP (06h)	24h
Get Watchdog Timer	APP (06h)	25h
<b>BMC Device and Messaging Commands</b>		
Get System GUID	APP (06h)	37h
Get Channel Info	APP (06h)	42h
Set User Access	APP (06h)	43h
Get User Access	APP (06h)	44h
Set User Name	APP (06h)	45h
Get User Name	APP (06h)	46h
Set User Password	APP (06h)	47h
<b>Chassis Device Commands</b>		
Get Chassis Capabilities	Chassis (00h)	00h
Get Chassis Status	Chassis (00h)	01h
Chassis Control	Chassis (00h)	02h
Chassis Reset	Chassis (00h)	03h
<b>Sensor Device Commands</b>		
Get Sensor Reading Factors	S/E (04h)	23h
Get Sensor Hysteresis	S/E (04h)	25h
Get Sensor Threshold	S/E (04h)	27h
Get Sensor Event Enable	S/E (04h)	29h
Get Sensor Event Status	S/E (04h)	2Bh
Get Sensor Reading	S/E (04h)	2Dh
Get Sensor Type	S/E (04h)	2Fh
<b>FRU Device Commands</b>		
Get FRU Inventory Area Info	Storage (0Ah)	10h
Read FRU Data	Storage (0Ah)	11h
Write FRU Data	Storage (0Ah)	12h
<b>SDR Device Commands</b>		
Get SDR Repository Info	Storage (0Ah)	20h
Get SDR Repository Allocation Info	Storage (0Ah)	21h
Get SDR	Storage (0Ah)	23h
Get SDR Repository Time	Storage (0Ah)	28h
<b>SEL Device Commands</b>		
Get SEL Info	Storage (0Ah)	40h
Get SEL Allocation Info	Storage (0Ah)	41h
Get SEL Entry	Storage (0Ah)	43h
Delete SEL Entry	Storage (0Ah)	46h



Clear SEL	Storage (0Ah)	47h
Get SEL Time	Storage (0Ah)	48h
Set SEL Time	Storage (0Ah)	49h
Get SEL Time UTC Offset	Storage (0Ah)	5Ch
Set SEL Time UTC Offset	Storage (0Ah)	5Dh
<b>LAN Device Commands</b>		
Set LAN Configuration Parameters	Transport (0Ch)	01h
Get LAN Configuration Parameters	Transport (0Ch)	02h
<b>Serial/Modem Device Commands</b>		
Set User Callback Options	Transport (0Ch)	1Ah
Get User Callback Options	Transport (0Ch)	1Bh
SOL Activating	Transport (0Ch)	20h
Set SOL Configuration Parameters	Transport (0Ch)	21h
Get SOL Configuration Parameters	Transport (0Ch)	22h

## Using BMC Web UI

In the address bar of your Internet browser, input the IP address of the remote server to access the BMC interface of that server.



Initial access of BMC prompts you to enter username and password. A screenshot of the login screen is given below:

A screenshot of a login page. At the top, there is a green header with the text "Engineering Sample" in white. Below the header, there are two input fields: "Username" and "Password". Below these fields is a green button with the text "Sign in" in white.

### *Login Page*

- ▶ **Username:** Enter your username in this field.
- ▶ **Password:** Enter your password in this field.
- ▶ **Sign me in:** After entering the required credentials, click the **Sign me in** to log in to Web UI.



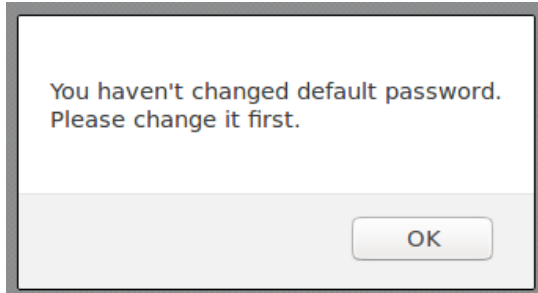
### Note

- (1) If not specified, the default IP to access BMC is <https://192.168.0.100>.
- (2) Please use **https** to access Web UI.

## Default User Name and Password

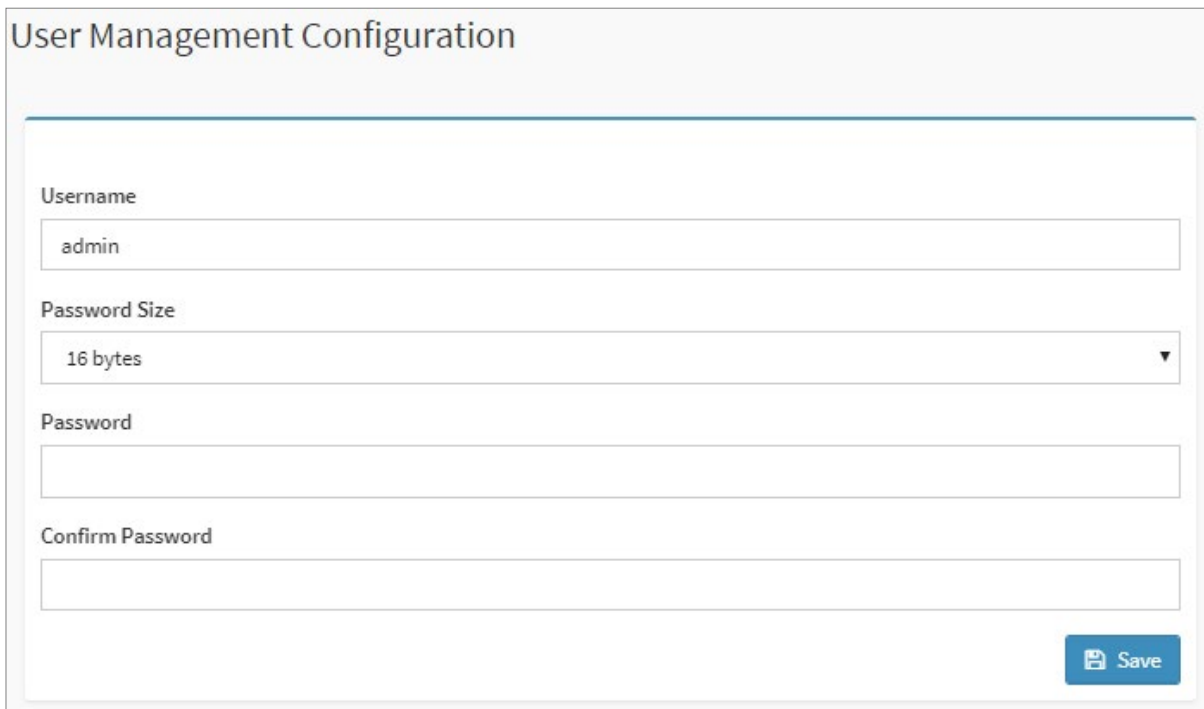
- ▶ **Username:** admin
- ▶ **Password:** admin

The default username and password are in lower-case characters. When you log in using the default username and password, you will get full administrative rights, and it will ask you to change the default password once you log in. The dialog is shown below:



*Change the default password - Dialog*

Clicking **OK** will take you to the User Management Configuration page to set a password.



*Change the default password – Set password*



### Note

Duplicate usernames shouldn't exist across various authentication methods like LDAP, RADIUS or IPMI since the privilege of one Authentication method is overwritten by another authentication method during logging in, and hence the correct privilege cannot be returned properly.

## Web UI Layout

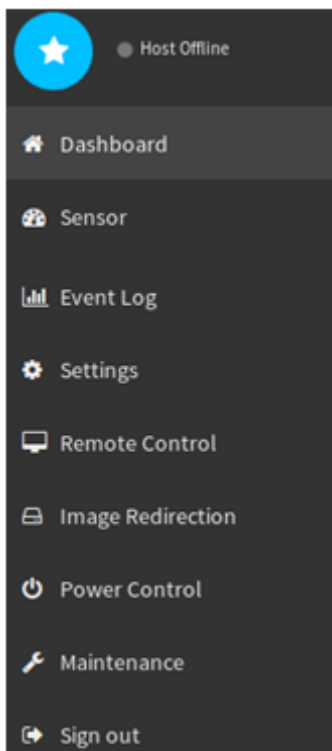
The BMC Web UI consists of various menu items:

### Menu Bar

The menu bar displays the following:

- ▶ Dashboard
- ▶ Sensor
- ▶ Event Log
- ▶ Settings
- ▶ Remote Control
- ▶ Image Redirection
- ▶ Power Control
- ▶ Maintenance
- ▶ Sign out

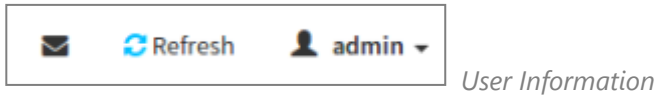
A screenshot of the menu bar is shown below:



*Menu Bar*

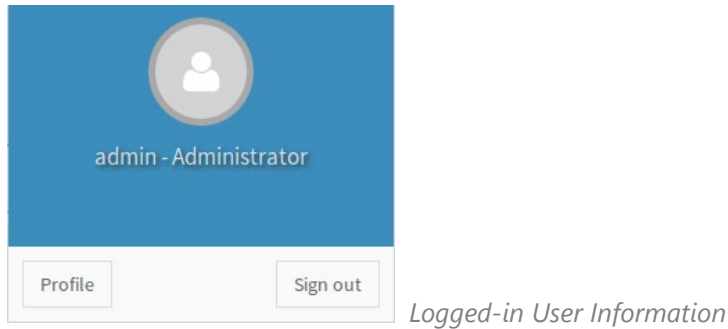
## Quick Button and Logged-in User

The user information and quick buttons are located at the top right of the Web UI.



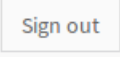


**Logged-in user information:** Click the icon  **admin** ▾ to view the logged-in user information.

A screenshot of the logged-in user information is shown below:



The logged-in user information shows the logged-in user's username, privilege, with the quick buttons allowing you to perform the following functions:


- ▶ **Notification:** Click the icon  to view the notification messages.
- ▶ **Refresh:** Click the icon  **Refresh** to reload the current page.
- ▶ **Sign out:** Click the icon  to log out of the Web UI.

## Logged-in user and its privilege level

This option shows the logged-in username and privilege. There are four kinds of privileges:

- ▶ **User:** Only valid commands are allowed.
- ▶ **Operator:** All BMC commands are allowed except for the configuration commands that can change the behavior of the out-of-hand interfaces.
- ▶ **Administrator:** All BMC commands are allowed.
- ▶ **No Access:** Login access denied.

## Help

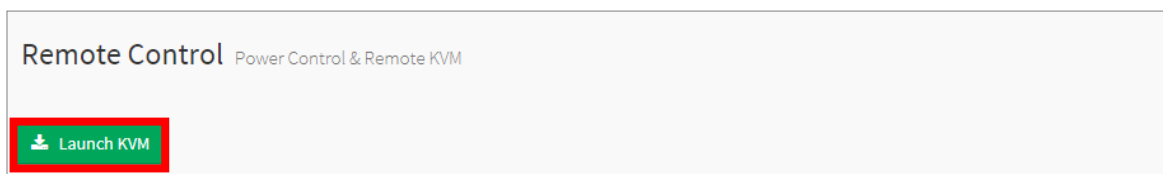
**Help:** The **Help** icon  is located at the top right of each page in Web UI. Click this help icon to view more detailed field descriptions.

## Installing Operating System

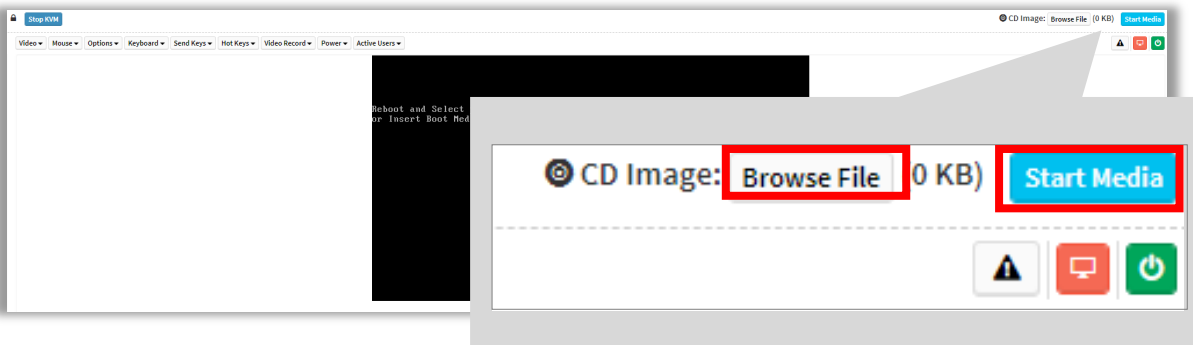
If your system is shipped without an operating system, install the supported operating system using the following resources.

### Via IPMI Interface

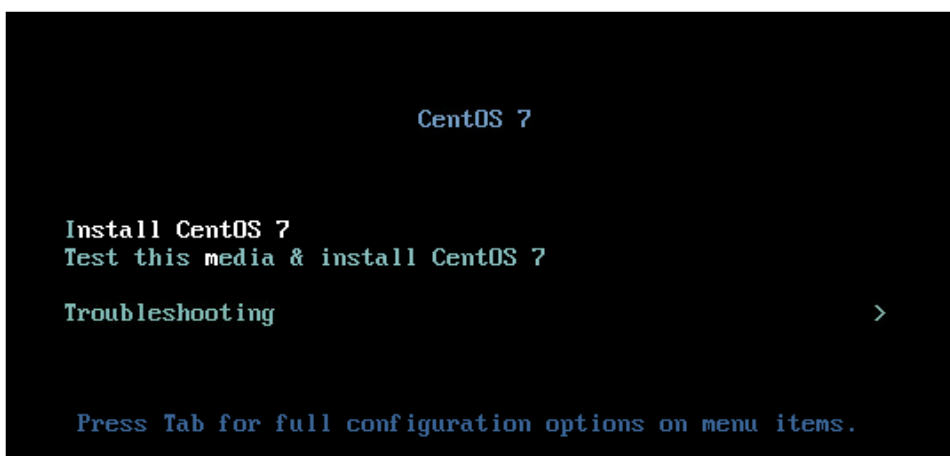
1. Download the ISO image and make a bootable DVD from it.
2. Connect a DVD player or other type of readers (floppy disk, or a drive) to a computer.
3. Connect to your target system from this computer. (Refer to Remote Server Management for instructions on how to access the target system through Web UI).
4. After entering the main screen, click **"Launch KVM"** to open the Remote Control KVM page:



5. Click **"Browse File"** to select **CD Image**.



6. Click **"Start Media"** to redirect the selected CD image file to the Host.
7. The installation process will automatically start. Please follow the onscreen instruction to complete the rest of the steps and restart the target system manually.



# APPENDIX: TERMS AND CONDITIONS

## Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for the repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
  - ▶ Improper or inadequate maintenance by the customer
  - ▶ Unauthorized modification, misuse, or reversed engineering of the product
  - ▶ Operation outside of the environmental specifications for the product.

## RMA Service

### Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.



#### Note

Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected. Your computer will reboot during restart in order to change State of the Device.

## RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

<b>RMA No:</b>	Reasons to Return: <input type="checkbox"/> Repair(Please include failure details) <input type="checkbox"/> Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____	
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____	
<input type="checkbox"/> Others: _____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

**\*Problem Code:**

- |                        |                              |                    |                          |
|------------------------|------------------------------|--------------------|--------------------------|
| 01: D.O.A.             | 07: BIOS Problem             | 13: SCSI           | 19: DIO                  |
| 02: Second Time R.M.A. | 08: Keyboard Controller Fail | 14: LPT Port       | 20: Buzzer               |
| 03: CMOS Data Lost     | 09: Cache RMA Problem        | 15: PS2            | 21: Shut Down            |
| 04: FDC Fail           | 10: Memory Socket Bad        | 16: LAN            | 22: Panel Fail           |
| 05: HDC Fail           | 11: Hang Up Software         | 17: COM Port       | 23: CRT Fail             |
| 06: Bad Slot           | 12: Out Look Damage          | 18: Watchdog Timer | 24: Others (Pls specify) |

**Request Party**

**Confirmed By Supplier**

\_\_\_\_\_  
Authorized Signature / Date

\_\_\_\_\_  
Authorized Signature / Date