

## R282-N80-VN Server

Technical Guide

Rev. 100



## R282-N80-VN

### 3rd Gen. Intel® Xeon® Scalable DP Server System - 2U 24-Bay Gen4 NVMe

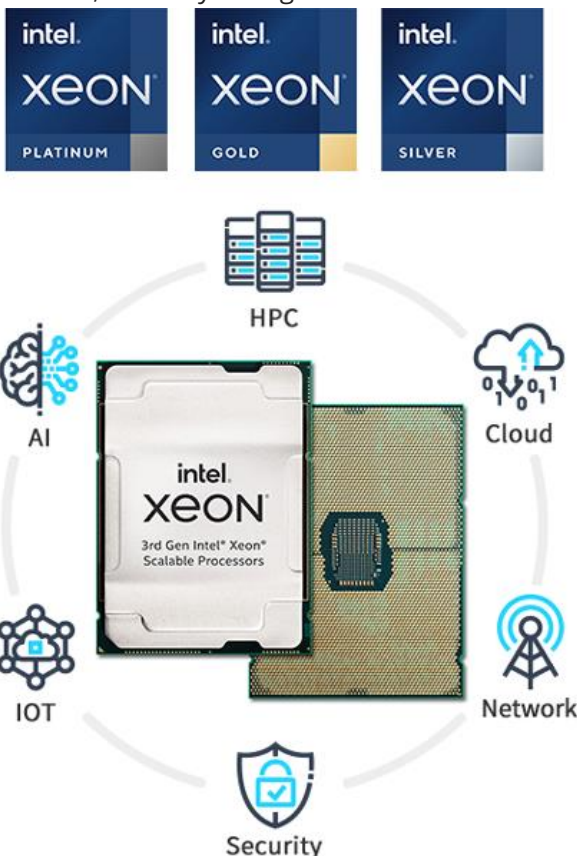
- 3rd Gen. Intel® Xeon® Scalable Processors
- 8-Channel RDIMM/LRDIMM DDR4 per processor, 32 x DIMMs
- Intel® C621A Express Chipset
- Dual ROM Architecture supported
- 2 x 1Gb/s LAN ports (Intel® I350-AM2)
- 1 x Dedicated management port
- 16 x 2.5" SATA/SAS hot-swappable HDD/SSD bays
- 8 x 2.5" SATA/SAS/Gen4 NVMe hot-swappable HDD/SSD bays
- 2 x 2.5" SATA/SAS hot-swappable HDD/SSD bays in rear side
- Onboard 12Gb/s SAS expander
- 8 x PCIe Gen4 x16 expansion slots
- 1 x OCP 3.0 Gen4 x16 mezzanine slot
- 1 x OCP 2.0 Gen3 x8 mezzanine slot
- 1200W (240V) 80 PLUS Platinum redundant power supply



## Where Compute Reigns

3rd Gen Intel® Xeon® Scalable Processors – “Ice Lake”

GIGABYTE servers and Intel Xeon Scalable Processors deliver incredible 1P/2P performance from edge to data center with incredible gains in I/O throughput and workload demands that need high performing CPUs with large, yet optimized, memory configurations.



- **Enhanced I/O:** Support for PCIe 4.0 allows for double the throughput of PCIe 3.0 for fast and large data transfers. Also, 64 lanes per socket with up to 128 lanes in a 2P configuration for fast data transmission from CPU to GPU, accelerator or storage.
- **CPU Performance Boost:** Now up to 40 cores per socket with greatly improved IPC on Intel’s 10nm architecture while operating CPUs at 105-270W. Also, an additional UPI lane is added for up to 11.2GT/s for a low latency interconnect between CPUs.
- **Next Gen Memory:** Support for DDR4-3200MHz (1DPC or 2DPC) DIMM. 8 channel memory has been added with up to 16 DIMMs per socket delivering up to 4TB of system memory via usage of 256GB DDR4 DIMM. Additionally, 2/4/6/8-way interleaves for optimal configuration.
- **Arrival of Intel Optane PMem 200 Series:** Optimized for improvements in latency while increasing system memory up to 6TB per socket as a mix of PMem and DDR. The 200 Series also has support for memory mode to expand capacity and app direct mode to act as fast flash storage.



## R282-N80-VN Product Overview

3rd Gen Intel Xeon Scalable processors  
2 x LGA 4189 sockets (Socket P+)

8-Channel DDR4 memory, 32 x DIMMs

16 x 2.5" SATA/SAS hot-swap HDD/SSD bays  
8 x 2.5" SATA/U.2 hybrid hot-swap SSD/HDD bays

2 x 2.5" SATA hot-swap HDD/SSD bays



Dual 1200W redundant  
power supply

2 x USB 3.0  
1 x VGA

2 x 1GbE LAN  
1 x MLAN

6 x FHHL PCIe Gen4 x8 expansion slots  
2 x LPHL PCIe Gen4 x16 expansion slots  
1 x OCP 3.0 Gen4 x16 mezzanine slot  
1 x OCP 2.0 Gen3 x8 mezzanine slot



## High Performance

### OCP 3.0 Ready

GIGABYTE offers servers that feature an onboard OCP 3.0 slot for the next generation of add on cards.

Advantages of this new type include:

- **Easy Serviceability:** simply slot in or pull out the card, without opening the server or using tools
- **Improved thermal design:** horizontal position and optimal heat sink design allow for air cooling to eliminate the heat efficiently



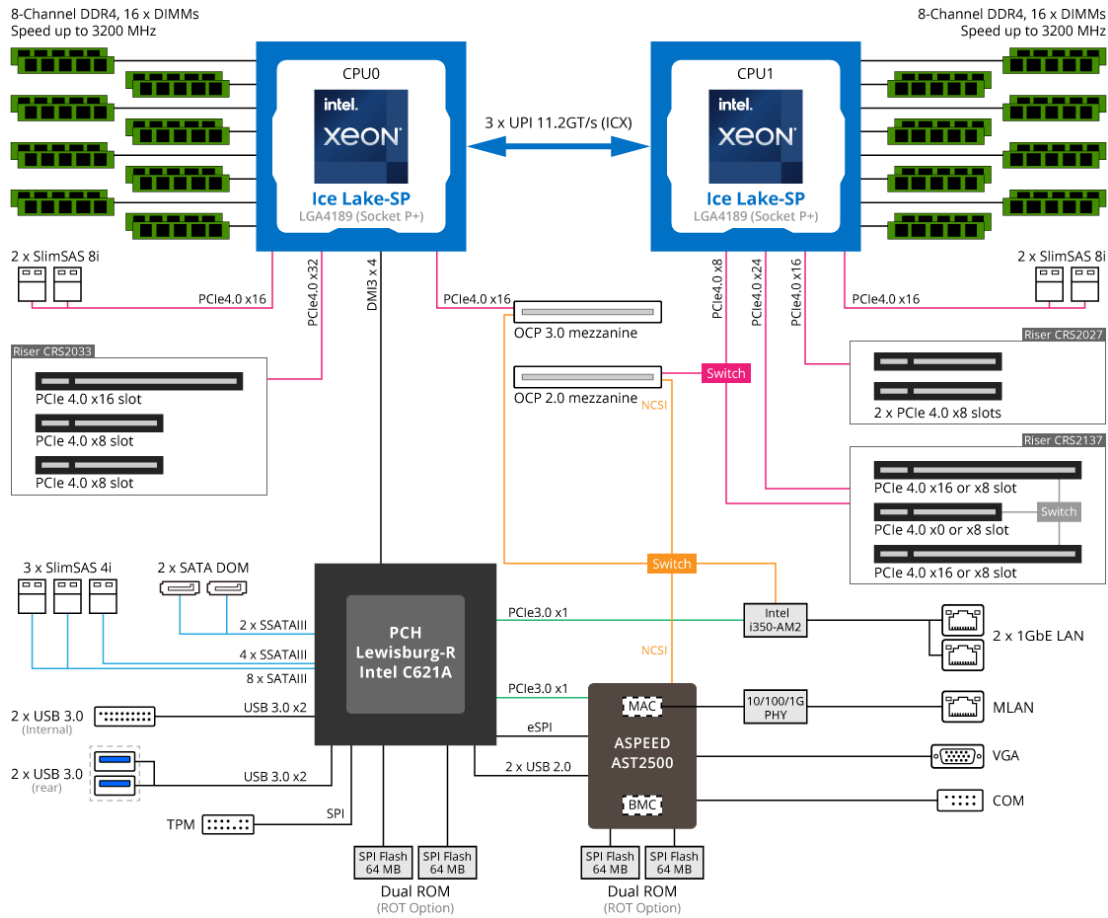
## Power Efficiency

### Automatic Fan Speed Control

GIGABYTE servers are enabled with Automatic Fan Speed Control to achieve the best cooling and power efficiency. Individual fan speeds will be automatically adjusted according to temperature sensors strategically placed in the servers.

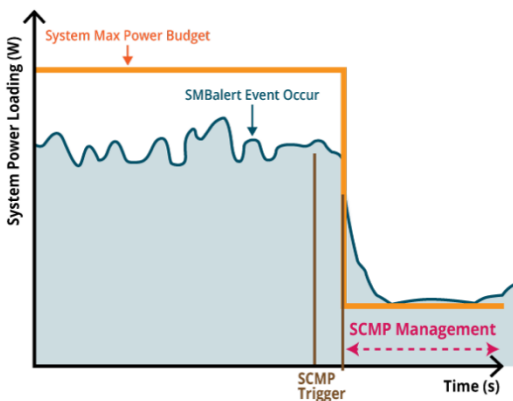
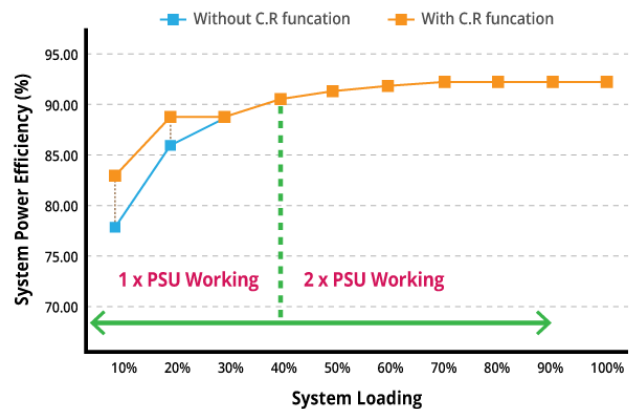


## R282-N80-VN System Block Diagram



## Cold Redundancy

To take advantage of the fact that a PSU will run at greater power efficiency with a higher load, GIGABYTE has introduced a power management feature called Cold Redundancy for servers with N+1 power supplies. When the total system load falls lower than 40%, the system will automatically place one PSU into standby mode, and results of 10% improvement in efficiency.



## High Availability

**Smart Crises Management and Protection (SCMP)**  
 SCMP is a GIGABYTE patented feature which is deployed in servers with non-fully redundant PSU design. With SCMP, in the event of faulty PSU or overheated system, the system will force the CPU into an ultra-low power mode that reduces the power load, which prevents the system from unexpected shutdown and avoids component damage or data loss



## Dual ROM Architecture

If the ROM that stores the BMC and BIOS fails to boot, the system will reboot with the backup BMC and/or BIOS replacing the primary. Once the primary BMC is updated, the ROM of the backup BMC will automatically update the backup through synchronization. For the BIOS, it can be updated based on user's choice of firmware version.



## Dual ROM



## Hardware Security

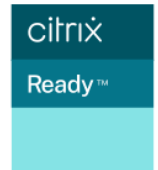
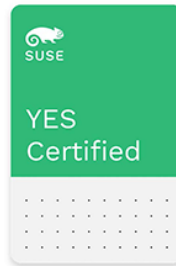
Optional TPM 2.0 Module

For hardware-based authentication, the passwords, encryption keys, and digital certificates are stored in a TPM module to prevent unwanted users from gaining access to your data. GIGABYTE TPM modules come in either a Serial Peripheral Interface or Low Pin Count bus.

## User Friendly

Certified Ready with Software Partners

Being a member of key software alliance partner programs enables GIGABYTE to together rapidly develop and validate joint solutions, enabling our customers to modernize their data centers and implement IT infrastructure and application services with speed, agility, and cost optimization. GIGABYTE servers have a compatibility across various ecosystems.



## Value-added Management

GIGABYTE offers free-of-charge management applications via a specialized small processor built on the server.

### GIGABYTE Management Console

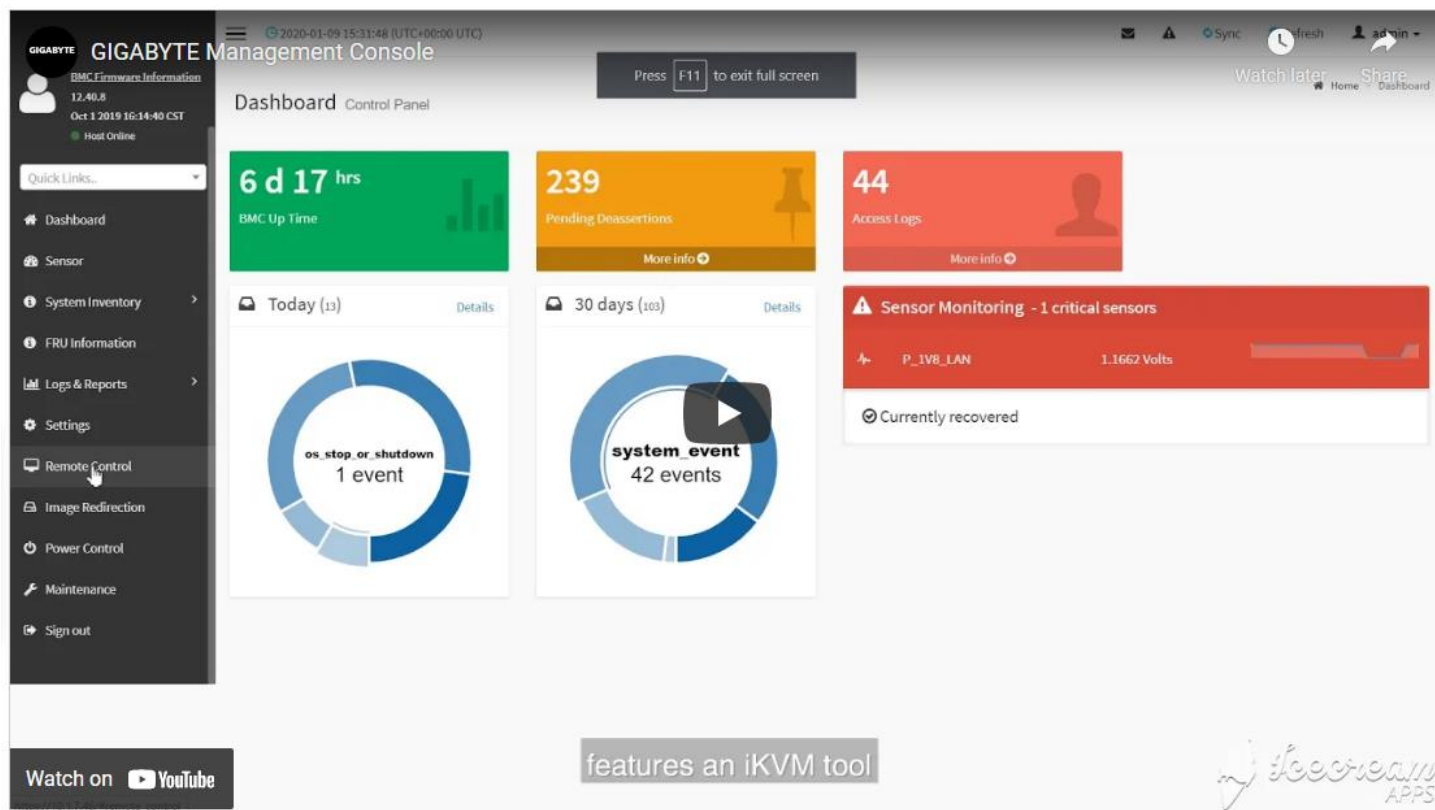
For management and maintenance of a server or a small cluster, users can use the GIGABYTE Management Console, which is pre-installed on each server. Once the servers are running, IT staff can perform real-time health monitoring and management on each server through the browser-based graphical user interface. In addition, the GIGABYTE Management Console also provides:

Support for standard IPMI specifications that allows users to integrate services into a single platform through an open interface

Automatic event recording, which can record system behavior 30 seconds before an event occurs, making it easier to determine subsequent actions



Integrate SAS/SATA/NVMe devices and RAID controller firmware into GIGABYTE Management Console to monitor and control Broadcom® MegaRAID adapters.



## GIGABYTE Server Management (GSM)

GSM is a software suite that can manage clusters of servers simultaneously over the internet. GSM can be run on all GIGABYTE servers and has support for Windows and Linux. GSM can be downloaded from GIGABYTE website and complies with IPMI and Redfish standards. GSM includes a complete range of system management functions like update OS, firmware; alarm system.... that includes the following utilities:

**GSM Server:** A software program that provides real-time, remote control using a graphical user interface through an administrator's computer or through a server in the cluster. The software allows ease of maintenance for large clusters of servers and support REST/RESTfull API for 3<sup>rd</sup> party software.

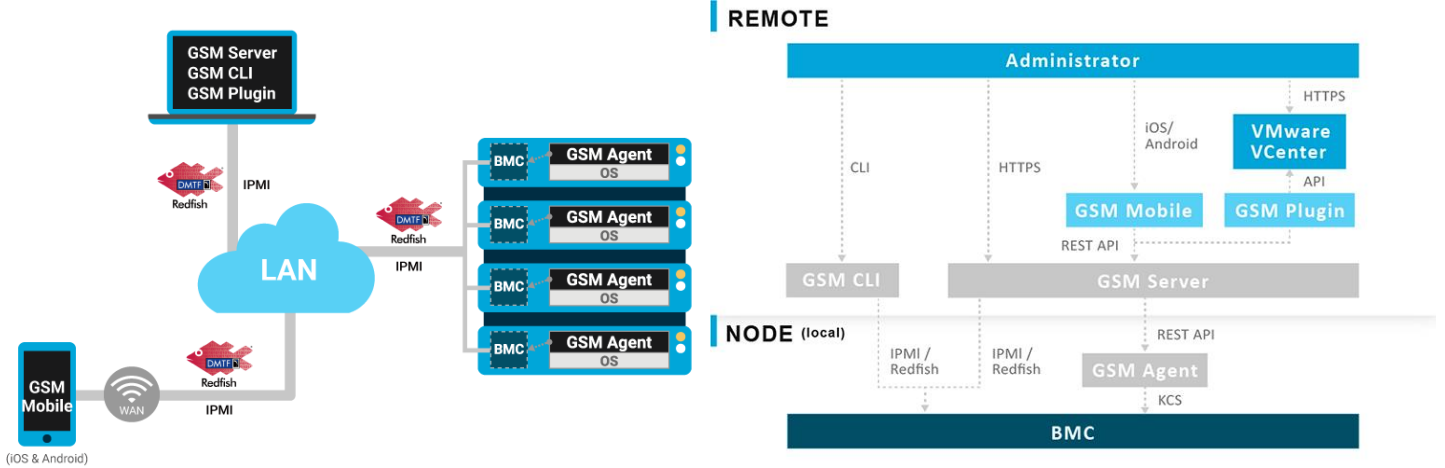
**GSM CLI:** A command-line interface for monitoring and managing remotely.

**GSM Agent:** A software program installed on each GIGABYTE server node that retrieves all information of event, error... from each system and devices through the OS, and this software integrates with GSM Server or GSM CLI.

**GSM Mobile:** A mobile app for both Android and iOS that provides admins with real-time system information.

**GSM Plugin:** An application program interface that allows users to use VMware vCenter for real-time monitoring and management of server clusters.





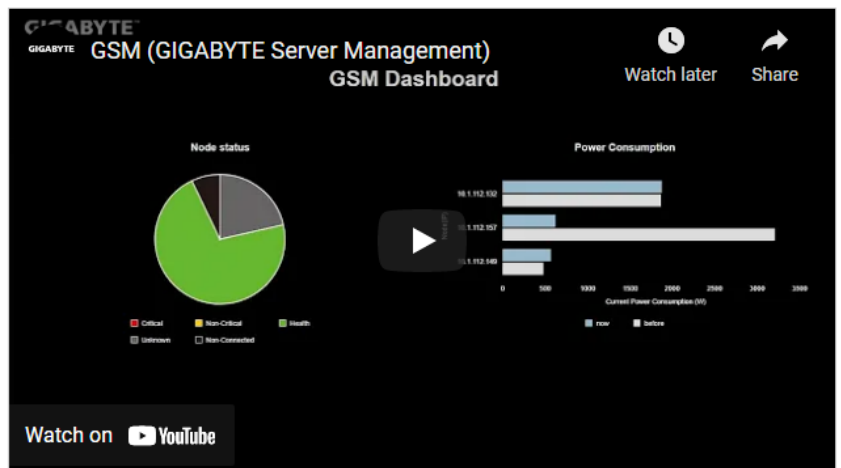
## Intuitive & Informative User Interface

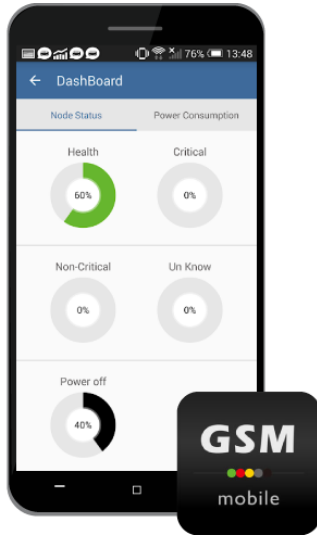
Starting from the GSM Server dashboard, the user can clearly understand the status of each node in the IT environment, including:

- Node connection status (system is online/offline)
- Node hardware sensor status (to detect hardware anomalies). Sensors measure voltage, fan speed and temperature
- Node usage rate status (allowing you to timely allocate more resources when they are needed), including:
  - Power consumption
  - Disk/RAID usage information
  - Memory usage rate
  - CPU usage rate
  - Network card / PCI information

The user can also perform various management functions, including:

- Node remote access
  - Power on / off / reset
  - Launch iKVM
  - Reboot BMC / BMC Account Configuration
- Network Configuration
  - IPv4/IPv6 setting
- Alert Management
  - SNMP trap setting
  - Platform events filters
  - Forwarding alerts by email
- BMC / BIOS / CPLD Update
- Power Consumption Limit Setting
- Group Management
  - Create groups of nodes for BMC / BIOS update or manage power consumption settings





## **GSM Mobile for iOS and Android**

A GSM Mobile app is available for download for both iOS and Android mobile phones for remote server management on the go.

## **Management through VMware vCenter**

A GSM Plugin is available for VMware's vCenter, allowing the user to perform remote monitoring and management of GIGABYTE server nodes without having to switch to a separate software platform.





## Specification

### Dimensions (WxHxD, mm)

2U  
438 x 87.5 x 730

### Motherboard

MR92-FS0  
Support Dual BIOS and Secure Boot Hardware for Silicon Root of Trust  
Support BIOS Live Scan, Crypto-verified Trusted Boot, System Erase (Based on RAID)

### CPU

3rd Generation Intel® Xeon® Scalable Processors  
Intel® Xeon® Platinum Processor, Intel® Xeon® Gold Processor, Intel® Xeon® Silver Processor  
10nm technology, CPU TDP up to 270W

**NOTE: If only 1 CPU is installed, some PCIe or memory functions might be unavailable**

### Socket

2 x LGA 4189

Socket P+

### Chipset

Intel® C621A Express Chipset

### Memory

32 x DIMM slots  
**DDR4 memory supported only**  
8-channel memory architecture per processor  
RDIMM modules up to 128GB supported, max memory up to 4TB  
LRDIMM modules up to 128GB supported, max memory up to 4TB  
3DS RDIMM/LRDIMM modules up to 256GB supported, max memory up to 6TB  
1.2V modules: 3200/2933/2666 MHz

### LAN

2 x 1Gb/s LAN ports (Intel® I350-AM2) support PXE  
1 x 10/100/1000 management LAN  
Support Gigabyte and 3rd party NIC: Intel, LR-Link

### Video

Integrated in Aspeed® AST2500  
2D Video Graphic Adapter with PCIe bus interface  
1920x1200@60Hz 32bpp, DDR4 SDRAM

### Audio

N/A

### Storage

Front side: 16 x 2.5" SATA/SAS ports, 8 x 2.5" SATA/SAS/Gen4 NVMe hybrid

### Expansion Slots

#### Riser Card CRS2033:

- 1 x PCIe x16 slot (Gen4 x16), Full height half-length  
- 2 x PCIe x8 slots (Gen4 x8), Full height half-length

#### Riser Card CRS2137:

- 1 x PCIe x16 slot (Gen4 x16 or x8), Full height half-length  
- 1 x PCIe x8 slots (Gen4 x0 or x8), Full height half-length  
- 1 x PCIe x16 slot (Gen4 x16 or x8), shared with OCP 2.0, Full height half-length

#### Riser Card CRS2027:

- 2 x PCIe x8 slots (Gen4 x8), Low profile half-length

1 x OCP 3.0 mezzanine slot with PCIe Gen4 x16 bandwidth from CPU\_0  
Supported NCSI function

1 x OCP 2.0 mezzanine slot with PCIe Gen3 x8 bandwidth from CPU\_1  
Supported NCSI function

### Internal I/O

2 x CPU fan headers  
1 x USB 3.0 header  
1 x TPM header  
1 x VROC connector  
1 x Front panel header  
1 x HDD back plane board header  
1 x IPMB connector  
1 x Clear CMOS jumper  
1 x BIOS recovery switch

### Front I/O

2 x USB 3.0  
1 x Power button with LED  
1 x ID button with LED  
1 x Reset button  
1 x NMI button  
1 x System status LED  
1 x HDD activity LED  
2 x LAN activity LEDs

### Rear I/O

2 x USB 3.0  
1 x VGA  
2 x RJ45  
1 x MLAN  
1 x ID button with LED

### Backplane I/O

Front side\_CBP2007NR: 16 x SATA/SAS and 8 x SATA/SAS/NVMe ports  
Rear side\_CBP2022: 2 x SATA/SAS

### System Management

Aspeed® AST2500 management controller support protocol  
SNMP(v2c,v3), IPMI 2.0, DCMI

GIGABYTE Management Console (AMI MegaRAC SP-X) web interface

- Dashboard
- JAVA Based Serial Over LAN
- HTML5 KVM
- Sensor Monitor (Voltage, RPM, Temperature, CPU Status ...etc.)
- Sensor Reading History Data
- FRU Information
- SEL Log in Linear Storage / Circular Storage Policy
- Hardware Inventory
- Fan Profile
- System Firewall
- Power Consumption
- Power Control
- LDAP / AD / RADIUS Support
- Backup & Restore Configuration
- Remote BIOS/BMC/CPLD Update
- Event Log Filter
- User Management
- Media Redirection Settings
- PAM Order Settings
- SSL Settings
- SMTP Settings

### OS Compatibility

Windows Server 2016

Windows Server 2019

[Red Hat Enterprise Linux 7.9 \(x64\) or later](#)

Red Hat Enterprise Linux 8.3 (x64) or later

SUSE Linux Enterprise Server 12 SP5 (x64) or later

SUSE Linux Enterprise Server 15 SP2 (x64) or later

Ubuntu 20.04 LTS (x64) or later

Ubuntu 20.04.1 LTS (x64) or later

VMware ESXi 6.7 Update3 P03

VMware ESXi 7.0 Update2

VMware vSphere: 6.0 U3, 6.5 U2 & 6.7 U1

Citrix Hypervisor 8.2.0

### System Fans

4 x 80x80x38mm (16,300rpm) support hot-plug



## ports

Rear side: 2 x 2.5" SATA/SAS hot-swappable HDD/SSD bays (Connected via SAS Expander)

SAS card is required for SAS devices support

Broadcom SAS35x36R expander

Bandwidth: SATA 6Gb/s or SAS 12Gb/s per port

Default configuration supports:

8 x 2.5" NVMe drives, non-supported SATA/SAS drives without SAS card

## SAS

Supported via add-on SAS Card

## RAID

RAID Level depends on SAS Card

Support Gigabyte and 3<sup>rd</sup> party RAID:

Broadcom, Microsemi

## Peripheral Drives

Support Gigabyte and 3<sup>rd</sup> party devices

## ports

Bandwidth: PCIe Gen4 x4 or SATA 6Gb/s or SAS 12Gb/s per port

## TPM

1 x TPM header with SPI interface

Optional TPM2.0 kit: [CTM010](#)

## Power Supply

2 x 1200W redundant PSUs

80 PLUS Platinum

2 x Standard PS cable CAB-C13/14-PS

AC Input:

- 100-120V~/ 12A, 50-60Hz

- 200-240V~/ 10.0A, 50-60Hz

DC Input:

240Vdc, 10A

DC Output:

- Max 1000W/ 100-120V~

+12V/ 81.5A

+12Vsb/ 2.5A

- Max 1200W at 200-240V or 240Vdc

Input

+12V/ 133A

+12Vsb/ 2.5A

## Operating Properties

Operating temperature: 10°C to 35°C

Operating humidity: 8-80% (non-condensing)

Non-operating temperature: -40°C to 60°C

Non-operating humidity: 20%-95% (non-condensing)

## Packaging Dimensions

982 x 588 x 268 mm

## Packaging Content

1 x R282-N80-VN

2 x CPU heatsinks

1 x Rail kit

## Part Numbers

Barebone package: 6NR2823C0MR-00

### Part Numbers:

- Motherboard: 9MR92FS0NR-00

- VROC module: 25FD0-R181N0-10R

(Supported for Intel SSD only, in option)

- Rail kit: 25HB2-3A0202-K0R

- CPU heatsink: 25ST1-343102-M1R

- Back plane board\_12-port:

9CBP20C5NR-00

- Back plane board\_2-port:

9CBP2022NR-00

- Front panel board: 9CFP2001NR-00

- Power supply: 25EP0-212002-F3S

- Power cord: CAB-C13/14-PS

- Riser card - CRS2033: 9CRS2033NR-00

- Riser card - CRS2137: 9CRS2137NR-00

- Riser card - CRS2027: 9CRS2027NR-00



## Component and Add-on

### INTEL CPU

Product Name	Code Name	Q-Spec	Stepping	Cache	System Bus	# of Cores/Threads	Processor Base Frequency	Max Turbo Frequency	TDP	Memory Types
Intel® Xeon® Processor Platinum 8380	IceLake	QXC0	D1	60MB	11.2GT/s	40/80	2.3 GHz	3.4 GHz	270W	DDR4-3200
Intel® Xeon® Processor Platinum 8368	IceLake	QWLL	D1	57MB	11.2GT/s	38/76	2.4 GHz	3.4 GHz	270W	DDR4-3200
Intel® Xeon® Processor Platinum 8368Q	IceLake	QXC1	D1	57MB	11.2GT/s	38/76	2.6 GHz	3.7 GHz	270W	DDR4-3200
Intel® Xeon® Processor Platinum 8360Y	IceLake	QXBZ	D1	54MB	11.2GT/s	36/72	2.4 GHz	3.5 GHz	250W	DDR4-3200
Intel® Xeon® Processor Platinum 8362	IceLake			48MB	11.2GT/s	32/64	2.80 GHz	3.60 GHz	265 W	DDR4-3200
Intel® Xeon® Processor Platinum 8358	IceLake	QWMU		48MB	11.2GT/s	32/64	2.6 GHz	3.4 GHz	250W	DDR4-3200
Intel® Xeon® Processor Platinum 8358P	IceLake	QXCM	D1	48MB	11.2GT/s	32/64	2.6 GHz	3.4 GHz	240W	DDR4-3200
Intel® Xeon® Processor Platinum 8352Y	IceLake	QWM3	D1	48MB	11.2GT/s	32/64	2.2 GHz	3.4 GHz	205W	DDR4-3200
Intel® Xeon® Processor Platinum 8352V	IceLake	SRK32	D2	54MB	11.2GT/s	36/78	2.1 GHz	3.5 GHz	195W	DDR4-2933
Intel® Xeon® Processor Platinum 8352M	IceLake	QXZ0	D2	48MB	11.2GT/s	32/64	2.30 GHz	3.50 GHz	185W	DDR4-3200
Intel® Xeon® Processor Gold 6346	IceLake	QWMD	D1	36MB	11.2GT/s	16/32	3.1 GHz	3.6 GHz	205W	DDR4-3200
Intel® Xeon® Processor Gold 6342	IceLake	QXRU	M1	36MB	11.2GT/s	24/48	2.80 GHz	3.50 GHz	230 W	DDR4-3200
Intel® Xeon® Processor Gold 6338	IceLake	QWN3	D1	48MB	11.2GT/s	32/64	2.0 GHz	3.2 GHz	205W	DDR4-3200
Intel® Xeon® Processor Gold 6338N	IceLake	QWM6	D1	48MB	11.2GT/s	32/64	2.2 GHz	3.5 GHz	185W	DDR4-2667
Intel® Xeon® Processor Gold 6338T	IceLake	QXS3	M1	36MB	11.2GT/s	24/48	2.10 GHz	3.40 GHz	165 W	DDR4-3200
Intel® Xeon® Processor Gold 6348	IceLake	SRKHP	D2	42MB	11.2GT/s	28/56	2.60 GHz	3.50 GHz	235 W	DDR4-3200
Intel® Xeon® Processor Gold 6336Y	IceLake	QXRV	M1	36MB	11.2GT/s	24/48	2.40 GHz	3.60 GHz	185 W	DDR4-3200
Intel® Xeon® Processor Gold 6334	IceLake	QXRQ	M1	18MB	11.2GT/s	8/16	3.60 GHz	3.70 GHz	165 W	DDR4-3200
Intel® Xeon® Processor Gold 6330	IceLake	QWMC	D1	42MB	11.2GT/s	28/56	2.0 GHz	3.1 GHz	205W	DDR4-2933
Intel® Xeon® Processor Gold 6330N	IceLake	QWLP	D1	42MB	11.2GT/s	28/56	2.2 GHz	3.4 GHz	165W	DDR4-2667
Intel® Xeon® Processor Gold 6326	IceLake	QXS7	M1	24MB	11.2GT/s	16/32	2.90 GHz	3.50 GHz	185 W	DDR4-3200
Intel® Xeon® Processor Gold 5320T	IceLake	QXS6	M1	30MB	11.2GT/s	20/40	2.30 GHz	3.50 GHz	150 W	DDR4-2993
Intel® Xeon® Processor Gold 5320	IceLake	QXRT	M1	39MB	11.2GT/s	26/52	2.20 GHz	3.40 GHz	185 W	DDR4-2933



Product Name	Code Name	Q-Spec	Stepping	Cache	System Bus	# of Cores/Threads	Processor Base Frequency	Max Turbo Frequency	TDP	Memory Types
Intel® Xeon® Processor Gold 5318Y	IceLake	QXS2	M1	36MB	11.2GT/s	24/48	2.10 GHz	3.40 GHz	165 W	DDR4-2933
Intel® Xeon® Processor Gold 5318S	IceLake	QXRX	M1	36MB	11.2GT/s	24/48	2.10 GHz	3.40 GHz	165 W	DDR4-2933
Intel® Xeon® Processor Gold 5318N	IceLake	QXS4	M1	36MB	11.2GT/s	24/48	2.10 GHz	3.40 GHz	150 W	DDR4-2667
Intel® Xeon® Processor Gold 5317	IceLake	QXRM	M1	18MB	11.2GT/s	12/24	3.00 GHz	3.60 GHz	150 W	DDR4-2933
Intel® Xeon® Processor Gold 5315Y	IceLake	QXRR	M1	12MB	11.2GT/s	8/16	3.20 GHz	3.60 GHz	140 W	DDR4-2933
Intel® Xeon® Processor Silver 4316	IceLake	QXS5	M1	30MB	10.4GT/s	20/40	2.30 GHz	3.40 GHz	150 W	DDR4-2667
Intel® Xeon® Processor Silver 4314	IceLake	QXS8	M1	24MB	11.2GT/s	16/32	2.40 GHz	3.40 GHz	135 W	DDR4-2667
Intel® Xeon® Processor Silver 4310T	IceLake	QXRP	M1	15MB	11.2GT/s	10/20	2.30 GHz	3.40 GHz	105 W	DDR4-2667
Intel® Xeon® Processor Silver 4310	IceLake	QXRN	M1	18MB	10.4GT/s	12/24	2.10 GHz	3.30 GHz	120 W	DDR4-2667
Intel® Xeon® Processor Silver 4309Y	IceLake	QXRS	M1	12MB	11.2GT/s	8/16	2.80 GHz	3.60 GHz	105 W	DDR4-2667

## RAM

Product Name	Memory Type	OEM Supplier	Size	Chip Brand	Rank	Voltage	Data Transfer Rate	Error Correction	CAS Latency	Pins
<b>RDIMM</b>										
M393A2K43DB2-CVFBQ	DDR4	Samsung	16GB	Samsung-IDT	2Rx8	1.2v	2933MHz	ECC Registered	21	288-pin
M393A8G40AB2-CVFBY	DDR4	Samsung	64GB	Samsung-IDT	2Rx4	1.2v	2933MHz	ECC Registered	21	288-pin
MTA9ASF2G72PZ-2G9E1UI	DDR4	Micron	16GB	Micron-Rambus	1Rx8	1.2v	2933MHz	ECC Registered	21	288-pin
CT32G4RFD4293-2G9E2.001	DDR4	CRUCIAL	32GB	Micron	2Rx4	1.2v	2933MHz	ECC Registered	21	288-pin
CT32G4RFD4293.36FE2	DDR4	CRUCIAL	32GB	Micron	2Rx4	1.2v	2933MHz	ECC Registered	21	288-pin
MTA36ASF4G72PZ.2G9E2TG	DDR4	Micron	32GB	Micron-Montage	2Rx4	1.2v	2933MHz	ECC Registered	21	288-pin
MTA36ASF4G72PZ.2G9E2VG	DDR4	Micron	32GB	Micron-IDT	2Rx4	1.2v	2933MHz	ECC Registered	21	288-pin
MTA36ASF4G72PZ.2G9E2UG	DDR4	Micron	32GB	Micron-Rambus	2Rx4	1.2v	2933MHz	ECC Registered	21	288-pin
HMAA8GR7CJR4N-XN T4	DDR4	SKhynix	64GB	SKhynix-Montage	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
HMAA8GR7CJR4N-XN TG	DDR4	SKhynix	64GB	SKhynix-IDT	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
HMAA8GR7CJR4N-XN T8	DDR4	SKhynix	64GB	SKhynix-Rambus	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin



Product Name	Memory Type	OEM Supplier	Size	Chip Brand	Rank	Voltage	Data Transfer Rate	Error Correction	CAS Latency	Pins
HMA82GR7DJR8N-XN T8	DDR4	SKhynix	16GB	SKhynix-Rambus	2Rx8	1.2v	3200MHz	ECC Registered	22	288-pin
HMA82GR7DJR8N-XN TG	DDR4	SKhynix	16GB	SKhynix - IDT	2Rx8	1.2v	3200MHz	ECC Registered	22	288-pin
HMAA8GR7CJR4N-XN T4	DDR4	SKhynix	64GB	SKhynix-Montage	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
HMAA8GR7CJR4N-XN TG	DDR4	SKhynix	64GB	SKhynix-IDT	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
HMAA8GR7CJR4N-XN T8	DDR4	SKhynix	64GB	SKhynix-Rambus	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
MTA9ASF2G72PZ-3G2E1TI	DDR4	Micron	16GB	Micron-Montage	1Rx8	1.2v	3200MHz	ECC Registered	22	288-pin
MTA18ASF2G72PDZ-3G2J3UI	DDR4	Micron	16GB	Micron-Rambus	2Rx8	1.2v	3200MHz	ECC Registered	22	288-pin
M393A4K40DB3-CWEGQ	DDR4	Samsung	32GB	Samsung-Rambus	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
M393A4K40EB3-CWECQ	DDR4	Samsung	32GB	Samsung-Montage	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
M393A4K40EB3-CWEBY	DDR4	Samsung	32GB	Samsung-IDT	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
M393A8G40AB2-CWEBQ	DDR4	Samsung	64GB	Samsung-IDT	2Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
KSM32RS8/16MER	DDR4	Kingston	16GB	Micron-Rambus	1Rx8	1.2v	3200MHz	ECC Registered	22	288-pin
KSM32RS4/32MER	DDR4	Kingston	32GB	Micron-Rambus	1Rx4	1.2v	3200MHz	ECC Registered	22	288-pin
AD4R3200716G22-BHYA	DDR4	ADATA	16GB	SKhynix-Montage	1Rx8	1.2v	3200MHz	ECC Registered	22	288-pin
<b>LRDIMM</b>										
M386A8K40CM2-CVFBY	DDR4	Samsung	64GB	Samsung-IDT	4DR x4	1.2v	2933MHz	ECC Registered	21	288-pin
M386A8K40DM2-CWELQ	DDR4	Samsung	64GB	Samsung-IDT	4DR x4	1.2v	3200MHz	ECC Registered	22	288-pin
<b>Intel® Optane™ DC Persistent Memory</b>										
NMA1XXD128GPSU4	DDR4	Intel	128GB	Intel	4DR x4	1.2v	2933MHz	ECC Registered	21	288-pin
NMA1XXD256GPSU4	DDR4	Intel	256GB	Intel	4DR x4	1.2v	2933MHz	ECC Registered	21	288-pin
NMA1XXD512GPSU4	DDR4	Intel	512GB	Intel	4DR x4	1.2v	2933MHz	ECC Registered	21	288-pin

## HDD

<b>HDD</b>										
Product Name	Type	OEM Supplier	Form Factor	Format	Capacity	Interface Speed	Series	Cache	RPM	Encryption
<b>Seagate Enterprise 3.5 inch HDD</b>										
ST1000NM000A	SATA	Seagate	3.5"	512n	1TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST2000NM000A	SATA	Seagate	3.5"	512n	2TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST3000NM000A	SATA	Seagate	3.5"	512n	3TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST4000NM000A	SATA	Seagate	3.5"	512n	4TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A



HDD										
ST6000NM002A	SATA	Seagate	3.5"	512n	6TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST1000NM001A	SATA	Seagate	3.5"	512n	1TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST2000NM003A	SATA	Seagate	3.5"	512n	2TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST3000NM001A	SATA	Seagate	3.5"	512n	3TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST4000NM003A	SATA	Seagate	3.5"	512n	4TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST6000NM003A	SATA	Seagate	3.5"	512n	6TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST2000NM001A	SATA	Seagate	3.5"	512e	2TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST4000NM002A	SATA	Seagate	3.5"	512e	4TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST6000NM021A	SATA	Seagate	3.5"	512e	6TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST8000NM000A	SATA	Seagate	3.5"	512e	8TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST2000NM004A	SATA	Seagate	3.5"	512e	2TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST4000NM005A	SATA	Seagate	3.5"	512e	4TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST6000NM029A	SATA	Seagate	3.5"	512e	6TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST8000NM001A	SATA	Seagate	3.5"	512e	8TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST2000NM002A	SATA	Seagate	3.5"	4Kn	2TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST4000NM001A	SATA	Seagate	3.5"	4Kn	4TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST6000NM022A	SATA	Seagate	3.5"	4Kn	6TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST8000NM002A	SATA	Seagate	3.5"	4Kn	8TB	SATA 6Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST2000NM005A	SATA	Seagate	3.5"	4Kn	2TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST4000NM004A	SATA	Seagate	3.5"	4Kn	4TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST6000NM030A	SATA	Seagate	3.5"	4Kn	6TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST8000NM003A	SATA	Seagate	3.5"	4Kn	8TB	SAS 12Gb/s	Exos 7E8 Enterprise	256MB	7200	N/A
ST300MP0006	SATA	Seagate	2.5"	512 Native	300GB	SAS 12Gb/s	Enterprise Performance	256MB	15K	N/A
ST600MP0006	SATA	Seagate	2.5"	512 Native	600GB	SAS 12Gb/s	Enterprise Performance	256MB	15K	N/A
ST900MP0006	SATA	Seagate	2.5"	512 Native	900GB	SAS 12Gb/s	Enterprise Performance	256MB	15K	N/A
ST300MP0106	SATA	Seagate	2.5"	4K Native / 512 Emulation	300GB	SAS 12Gb/s	Enterprise Performance	256MB	15K	N/A
ST600MP0136	SATA	Seagate	2.5"	4K Native / 512	600GB	SAS 12Gb/s	Enterprise Performance	256MB	15K	N/A



## HDD

Product Name	Type	OEM Supplier	Form Factor	Capacity	Interface	Performance	Cache	Spindle Speed	Other
ST900MP0146	SATA	Seagate	2.5"	900GB	SAS 12Gb/s	Enterprise Performance	256MB	15K	N/A

## SSD

### SSD

Product Name	Type	OEM Supplier	Form Factor	Interface	Capacity	Interface Speed	Note
<b>SATA SSD</b>							
MTFDDAK3T8TDS-1AW1ZABYY (5300 PRO)	SSD	Micron	2.5"	SATA	3.84TB	6Gb/s	
MTFDDAK1T9TDS-1AW1ZABYY (5300 PRO)	SSD	Micron	2.5"	SATA	1.92TB	6Gb/s	
MTFDDAK3T8TDS-1AW1ZABYY (5300 PRO)	SSD	Micron	2.5"	SATA	3.84TB	6Gb/s	
MTFDDAK1T9TDS-1AW1ZABYY (5300 PRO)	SSD	Micron	2.5"	SATA	1.92TB	6Gb/s	
MZ-7LH1T9NE 883 DCT Series	SSD	Samsung	2.5"	SATA	1.92TB	6Gb/s	
SSDSC2KG019T8 D3-S4610 Series	SSD	Intel	2.5"	SATA	1.92TB	6Gb/s	
SSDSC2KB019T8 D3-S4510 Series	SSD	Intel	2.5"	SATA	1.92TB	6Gb/s	
XA960LE10063	SSD	Seagate	2.5"	SATA	960GB	6Gb/s	
SSB1K9GTLCG-D2-SME520GBT ESM1220 Series	SSD	Phison	2.5"	SATA	1.92TB	6Gb/s	
KHK61RSE960G	SSD	Toshiba	2.5"	SATA	960GB	6Gb/s	
SEDC500M/480G	SSD	Kingston	2.5"	SATA	480GB	6Gb/s	
SEDC500M/960G	SSD	Kingston	2.5"	SATA	960GB	6Gb/s	
SEDC500M/1920G	SSD	Kingston	2.5"	SATA	1920GB	6Gb/s	
SEDC500M/3840G	SSD	Kingston	2.5"	SATA	3840GB	6Gb/s	

### PCIe SSD

Product Name	Type	OEM Supplier	Form Factor	Interface	Capacity	Interface Speed	Note
Samsung PM1725b MZPLL3T2HAJQ PCIe Gen3 x8 3.2TB	PCIe	Samsung	PCI-E 3.0	PCIe(NVMe)	3.2TB	PCIe Gen3 x8	
SSDPEDKX040T701 P4500 Series PCIe Gen3 x4 4TB	PCIe	Intel	PCI-E 3.0	PCIe(NVMe)	4TB	PCIe Gen3 x4	

### U.2 NVme

Product Name	Type	OEM Supplier	Form Factor	Interface	Capacity	Interface Speed	Note
<b>U.2 (VROC support)</b>							
SSDPE2KE032T801 P4610 Series	U.2	Intel	2.5"	SFF8639(NVMe)	3.2TB	PCIe Gen3 x4	
SSDPE2KX020T801 P4510 Series	U.2	Intel	2.5"	SFF8639(NVMe)	2TB	PCIe Gen3 x4	
<b>U.2</b>							
SSDPE2KE032T801 P4610 Series	U.2	Intel	2.5"	SFF8639(NVMe)	3.2TB	PCIe Gen3 x4	
SSDPE2KX020T801 P4510 Series	U.2	Intel	2.5"	SFF8639(NVMe)	2TB	PCIe Gen3 x4	



SSD							
MZWLL3T2HAJQ PM1725b Series	U.2	Samsung	2.5"	SFF8639(NVMe)	3.2TB	PCIe Gen3 x4	
MZWLJ3T8HBLS PM1733 Series	U.2	Samsung	2.5"	SFF8639(NVMe)	3.84TB	PCIe Gen4 x4	
MTFDHAL3T2TCU 9200 Series	U.2	Micron	2.5"	SFF8639(NVMe)	3.2TB	Gen3 x4	
MTFDHBE960TDF 7300 Pro Series	U.2	Micron	2.5"	SFF8639(NVMe)	960GB	PCIe Gen3 x4	MTFDHBE960TDF-1AW4ZABY Y
KCD51LUG960G CD5 Series	U.2	KIOXIA	2.5"	SFF8639(NVMe)	960GB	PCIe Gen3 x4	
PWFX100 3.2TB	U.2	PHISON	2.5"	SFF8639(NVMe)	3.2TB	PCIe Gen3 x4	

## RAID

RAID Cards								
Product Name	RAID-on-Chip Controller	Host Bus Type	Internal Ports	Internal Connectors	External Ports	External Connectors	Data Transfer Rates	Note
<b>GIGABYTE Storage Cards</b>								
CRA3338	LSI SAS 3008	PCIe Gen3 x8	8	2 x Mini-SAS HD SFF-8643	-	-	Up to 12Gb/s per port	
CSA3548	LSI SAS 3008	PCIe Gen3 x8	-	-	8	2 x Mini-SAS HD SFF-8644	Up to 12Gb/s per port	
CRAO438	LSI SAS 3108	<b>OCP</b> PCIe Gen3 x8	8	2 x8 SlimSAS SFF-8654	-	-	Up to 12Gb/s per port	
CRA4448	LSI SAS 3108	PCIe Gen3 x8	8	2 x Mini-SAS HD SFF-8643	-	-	Up to 12Gb/s per port	
CRAO438	LSI SAS 3108	<b>OCP</b> PCIe Gen3 x8	8	2 x8 SlimSAS SFF-8654	-	-	Up to 12Gb/s per port	
CRAO338	LSI SAS 3008	<b>OCP</b> PCIe Gen3 x8	8	2 x8 SlimSAS SFF-8654	-	-	Up to 12Gb/s per port	
CRAO558	LSI SAS 3108	<b>OCP</b> PCIe Gen3 x8	4	1 x4 SlimSAS SFF-8654	1	1 x OCuLink port	Up to 12Gb/s per port	
<b>LSI RAID Controller Cards</b>								
MegaRAID SAS 9460-16i without Tri-mode	SAS3516 dual-core RAID-on-Chip (ROC)	PCIe Gen3 x8	8	4 x Mini-SAS HD SFF-8643	-	-	Up to 12Gb/s per port	
MegaRAID SAS 9560-16i Tri-Mode	SAS3916 dual-core RAID-on-Chip (ROC)	PCIe Gen4 x8	16	2 x8 SFF-8654 (SlimSAS)	-	-	Up to 12Gb/s per port	
<b>LSI Host Bus Adapters (HBAs)</b>								





## RAID Cards

<b>LSI SAS 9400-16i without Tri-mode</b>	SAS3416	PCIe Gen3 x8	16	4 x Mini-SAS HD SFF-8643	-	-	Up to 12Gb/s per port
Microsemi RAID Cards							
<b>SmartRAID 3154-16i</b>	PM8236	PCIe Gen3 x8	16	4 x Mini-SAS HD SFF-8643	-	-	Up to 12Gb/s per port
Microsemi Host Bus Adapters							
<b>SmartHBA 2100-8i</b>	PM8222	PCIe Gen3 x8	8	2 x Mini-SAS HD SFF-8643	-	-	Up to 12Gb/s per port

## LAN

### LAN Cards

Product Name	Connector	System Interface Type	# of Ports	Data Rate	Note
GIGABYTE LAN Cards					
<b>CLNO832</b>	SFP+	<b>OC</b> P PCIe Gen2 x8	Dual	10Gb/s per port	INTEL 82599ES Support OCP 2.0 type1
<b>CLNOQ42</b>	SFP28	<b>OC</b> P PCIe Gen3 x8	Dual	25Gb/s per port	Qlogic (Cavium) QL41401-A2G Support OCP 2.0
<b>CLNO222</b>	RJ-45	<b>OC</b> P PCIe Gen3 x4	Dual	10Gb/s per port	INTEL X550-AT2 Support OCP 2.0 type1
<b>CLN4312</b>	RJ-45	PCIe Gen2 x4	Dual	1Gb/s per port	INTEL i350-AM2
<b>CLN4752</b>	QSFP+	PCIe Gen3 x8	Dual	40Gb/s per port	INTEL XL710
<b>CLN4224</b>	RJ-45	PCIe Gen3 x4	Quad	10Gb/s per port	INTEL X550-AT2
<b>CLN4M34</b>	SFP28	PCIe Gen3 x16	Quad	10Gb/s per port	Mellanox ConnectX-4
Intel_10GbE					
<b>Intel® Ethernet Network Adapter X722-DA4</b>	SFP+	PCIe Gen3 x8	Quad	10Gb/s per port	
Intel_25GbE					
<b>Intel® Ethernet Network Adapter E810-XXVDA4</b>	SFP28	PCIe Gen4 x16	Quad	25Gb/s per port	
<b>Intel® Ethernet Network Adapter E810-XXVDA2</b>	SFP28	PCIe Gen4 x16	Dual	25Gb/s per port	
<b>Intel® Ethernet Network Adapter XXV710-DA2 for OCP</b>	SFP28	<b>OC</b> P PCIe Gen3 x8	Dual	25Gb/s per port	Support OCP 2.0 type1
<b>Intel® Ethernet Network Adapter XXV710-DA2</b>	SFP28	PCIe Gen3 x8	Dual	25Gb/s per port	
Intel_40GbE					
<b>Intel® Ethernet Converged Network Adapter XL710-QDA2</b>	QSFP+	PCIe Gen3 x8	Dual	40Gb/s per port	
Intel_100GbE					
<b>Intel® Ethernet Network Adapter E810-CQDA2</b>	QSFP28	PCIe Gen4 x16	Dual	100Gb/s per port	
LR Link_10GbE					
<b>LREC9804BF-4SFP+</b>	SFP+	PCIe Gen3 x8	Quad	10Gb/s per port	Intel@ XXV710 Based
<b>LREC9812BF-2SFP+</b>	SFP+	PCIe Gen3 x8	Dual	10Gb/s per port	Intel@ XXV710 Based
<b>LREM7100PF-2SFP+</b>	SFP+	<b>OC</b> P PCIe Gen3 x8	Dual	10Gb/s per port	Intel@ XXV710 Based



## LAN Cards

### LR Link\_25GbE

<b><u>LRES1001PF-2SFP28</u></b>	SFP28	PCIe Gen3 x8	Dual	1/10/25Gb/s per port	Intel® XXV710 Based
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### LR Link\_100GbE

<b><u>LRES1019PF-QSFP28</u></b>	SFP28	PCIe Gen4 x16	Single	100Gb/s per port	Intel® Ethernet Adaptive Virtual Function
<b><u>LRES1014PF-2QSFP28</u></b>	SFP28	PCIe Gen4 x16	Dual	100Gb/s per port	Intel® Ethernet Adaptive Virtual Function

### Mellanox ConnectX

<b><u>MCX566A-CDAI</u></b>	QSFP28	<b>OC</b> P PCIe Gen4 x16	Dual	100Gb/s per port	Mellanox ConnectX-5 Ex EN / Support OCP 3.0
<b><u>MCX516A-CDAT</u></b>	QSFP28	PCIe Gen4 x16	Dual	100Gb/s per port	Mellanox ConnectX-5 Ex EN
<b><u>MCX516A-CCAT</u></b>	QSFP28	PCIe Gen3 x16	Dual	100Gb/s per port	Mellanox ConnectX-5 EN
<b><u>MCX515A-CCAT</u></b>	QSFP28	PCIe Gen3 x16	Single	100Gb/s per port	Mellanox ConnectX-5 EN
<b><u>MCX623105AN-CDAT</u></b>	QSFP56	PCIe Gen4 x16	Single	100Gb/s per port	NVIDIA CONNECTX-6 DX
<b><u>MCX623106AN-CDAT</u></b>	QSFP56	PCIe Gen4 x16	Dual	100Gb/s per port	NVIDIA CONNECTX-6 DX
<b><u>MCX4121A-ACAT</u></b>	SFP28	PCIe Gen3 x8	Dual	25Gb/s per port	Mellanox ConnectX-4 Lx EN
<b><u>MCX4121A-XCAT</u></b>	SFP28	PCIe Gen3 x8	Dual	10Gb/s per port	Mellanox ConnectX-4 Lx EN

### Mellanox VPI Adapter Cards

<b><u>MCX654106A-HCAT</u></b>	QSFP56	PCIe Gen3 x16	Dual	200Gb/s per port	Mellanox ConnectX-6 Ex VPI (InfiniBand) PCIe3.0 x16 + PCIe3.0x16 aux. card Socket Direct
<b><u>MCX653106A-HDAT</u></b>	QSFP56	PCIe Gen4 x16	Dual	200Gb/s per port	Mellanox ConnectX-6 Ex VPI (InfiniBand)
<b><u>MCX653105A-ECAT</u></b>	QSFP56	PCIe Gen4 x16	Single	100Gb/s per port	Mellanox ConnectX-6 Ex VPI (InfiniBand)
<b><u>MCX653106A-ECAT</u></b>	QSFP56	PCIe Gen4 x16	Dual	100Gb/s per port	Mellanox ConnectX-6 Ex VPI (InfiniBand)
<b><u>MCX556A-EDAT</u></b>	QSFP28	PCIe Gen4 x16	Dual	100Gb/s per port	Mellanox ConnectX-5 Ex VPI (InfiniBand)
<b><u>MCX555A-ECAT</u></b>	QSFP28	PCIe Gen3 x16	Single	100Gb/s per port	Mellanox ConnectX-5 VPI (InfiniBand)
<b><u>QL45611HLCU</u></b>	QSFP28	PCIe Gen3 x16	Single	100Gb/s per port	
<b><u>QLE3442-RJ-CK</u></b>	RJ-45	PCIe Gen3 x8	Dual	10Gb/s per port	

### Broadcom (Emulex) Ethernet Networking Adapters

<b><u>BCM957508-P2100G</u></b>	QSFP56	PCIe Gen4 x16	Dual	100Gb/s per port	BCM57508
<b><u>BCM957414A4142CC</u></b>	SFP28	PCIe Gen3 x8	Dual	25Gb/s per port	BCM57414
<b><u>BCM957508-N2100G</u></b>	QSFP56	<b>OC</b> P PCIe 4.0	Dual	100Gb/s per port	BCM57508 / Support <b>OC</b> P 3.0
<b><u>BCM957504-N425G</u></b>	SFP28	<b>OC</b> P PCIe 4.0	Quad	25Gb/s per port	BCM57504 / Support <b>OC</b> P 3.0
<b><u>BCM957414M4142C</u></b>	SFP28	<b>OC</b> P PCIe Gen3 x8	Dual	25Gb/s per port	BCM57414 / Support OCP 2.0 type1
<b><u>BCM957416A4160C</u></b>	RJ-45	PCIe Gen3 x8	Dual	10Gb/s per port	BCM5741 (P210TP)

### Broadcom FC Host Bus Adapter

<b><u>LPe32002-M2</u></b>	SFP+	PCIe Gen3 x8	Dual	32Gb/s per port	XE501 controller
<b><u>LPe31002-M6</u></b>	SFP+	PCIe Gen3 x8	Dual	16Gb/s per port	XE501 controller

## PERIPHERAL DEVICES

### USB Device

Product Name	Type	OEM Supplier	Capacity	Note
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## USB 3.0

<b>PURE CLASSIC X176B1FWBO75</b>	HDD	Gigabyte	500G			
<b>GoFlex STAA500305</b>	HDD	Seagate	500G			
<b>TOSHIBA CANVIO BASIC</b>	HDD	Toshiba	500G			
<b>NA317U+</b>	Device	ineo				
<b>SST-TS13</b>	Device	Silver Stone				
<b>S1-DS3-Plus</b>	Device	CyberSLIM				
<b>MB981U3-1S</b>	Device	ICYDOCK				
<b>i310-SB3(6G)</b>	Device	STARDOM				
<b>12.7mm slim Internal DVD writer</b>						
<b>DS-8ACSH</b>	ODD	LITEON	SATA	8X	24X	

\* The entire materials provided herein are for reference only. GIGABYTE reserves the right to modify or revise the content at anytime without prior notice.

\* Advertised performance is based on maximum theoretical interface values from respective Chipset vendors or organization who defined the interface specification. Actual performance may vary by system configuration.



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\* Due to standard PC architecture, a certain amount of memory is reserved for system usage and therefore the actual memory size is less than the stated amount.



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