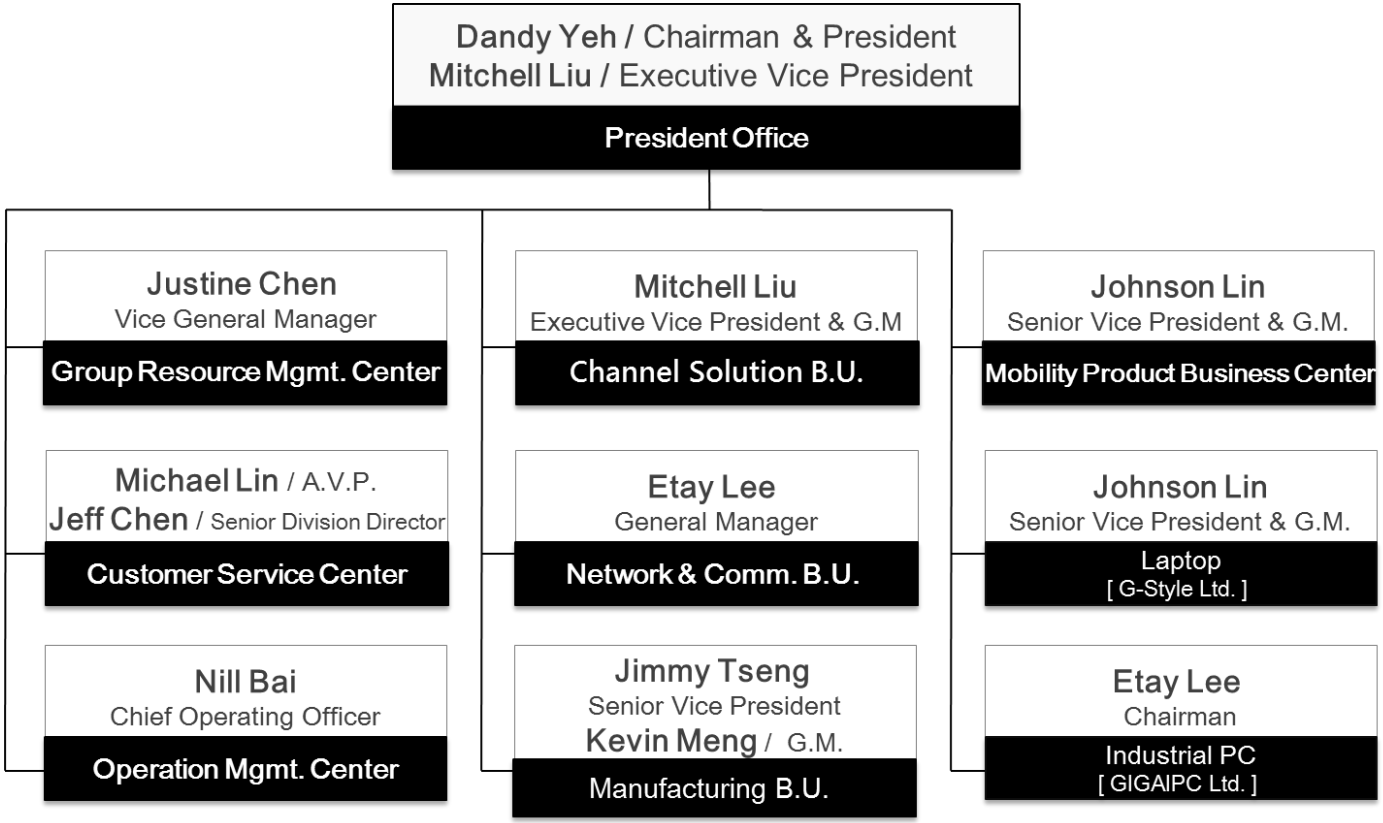
GIGABYTE Position in ARM Server Market - Leading Pioneer

Akira Hoshino
Head of Product Strategy and Planning at GIGABYTE
2018/10/17

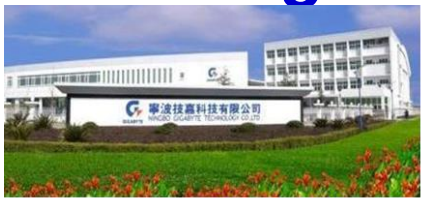
Executive Summary

Founded	April 1986
IPO	Listed on TSE since Sept. 24,1998 (Taiwan)
Capital	US$ 197.61 million (NT$ 6.29 billion)
Gross Revenue	US$ 1,624.54 million (NT$ 52.3 billion @ 32.22)
Certifications	ISO 14064-1:2006, PAS 2050:2008, ISO/TS 16949:2002, IECQ QC 080000 RoHS, ISO9001:2015,OHSAS 18001:2007, ISO 14001:2015
Mfg. Capacity	Motherboard 1,730 K/M, Graphics Card 520 K/M, System Products 200 K/M, Laptop 55 K/M, Server Solution 100 K/M, Embedded and IoT 40 K/M
Purchasing	Direct account of Intel、AMD、Nvidia & major ASIC
Technology	Key vendor's alpha & beta site: Intel、AMD、Microsoft….
RD Expenditure	3% of revenue per year (= 25% of net profit)
Patents	Filed：3,529；Approved：2,178

Executive Team

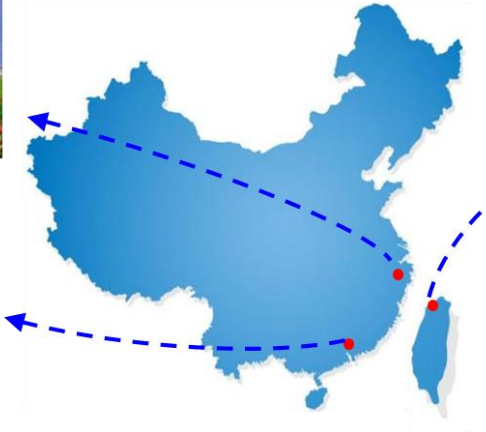


Manufacturing Capacity



Ning-Bo, China

Dong-Guan, China

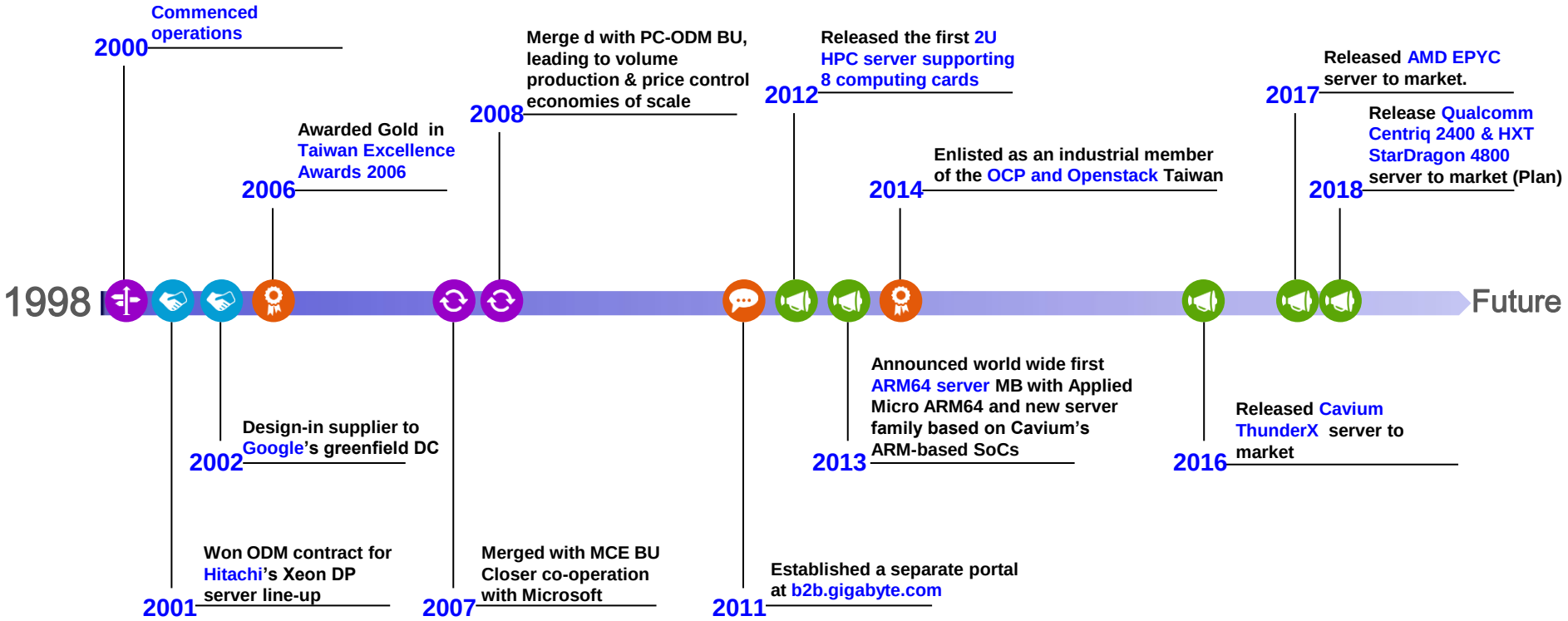


Nan-Ping, Taiwan

Product Type	Ning-Bo	Dong-Guan	Nan-Ping	Total / Monthly
Motherboards	650 K	680 K	400 K	1,730 K
Graphics Cards	100 K	320 K	100 K	520 K
Desktops PC & Peripherals	100 K	95 K	5K	200 K
Laptops	45 K	-	10 K	55 K
Server	30 K	20 K	50 K	100 K
Embedded and IoT	-	-	40 K	40 K
Floor Space	60,000 M²	38,000 M²	45,000 M²	

Global Operation & Support Centers

NCBU Milestone



Milestone of GIGABYTE ARM64 Server

GIGABYTE Product Portfolio

R-Series

Affordable and expandable server rackmounts, offering ease-of-use, low power consumption and quiet operation

H-Series

Compact and scalable systems providing higher density computing power in a smaller footprint for cloud, and large scale-out computing applications

G-Series

Versatile and scalable high performance computing with leading efficiency and performance. Ideal for datacenters

S-Series

Design-optimized storage server providing higher data density for cold storage

W-Series

Tower server providing wide range of Entry , High end computing and HPC

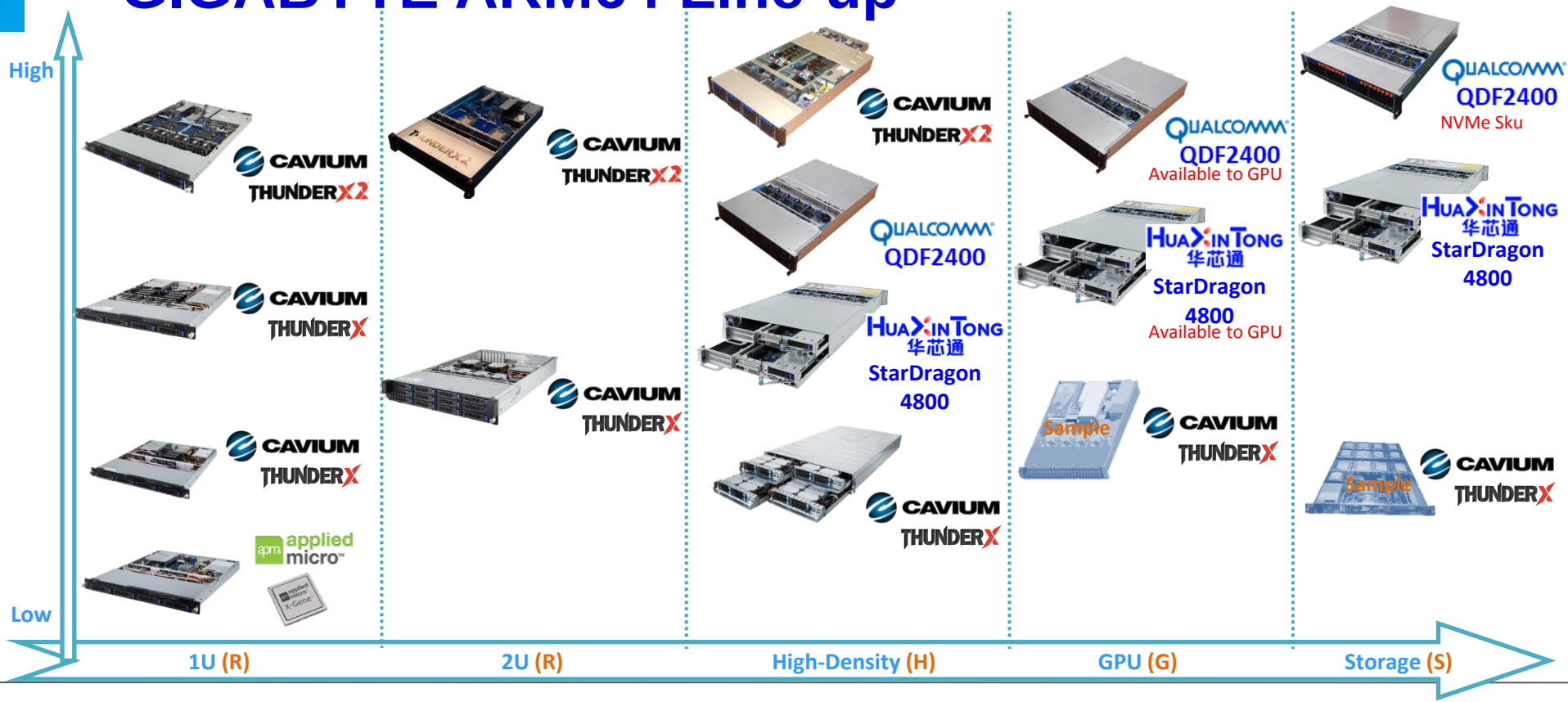
N-Series

New application of networking server, gateway device and edge computing

RACKLUTION

A datacenter solution simple in design, but also highly efficient in power consumption, computing power and configuration

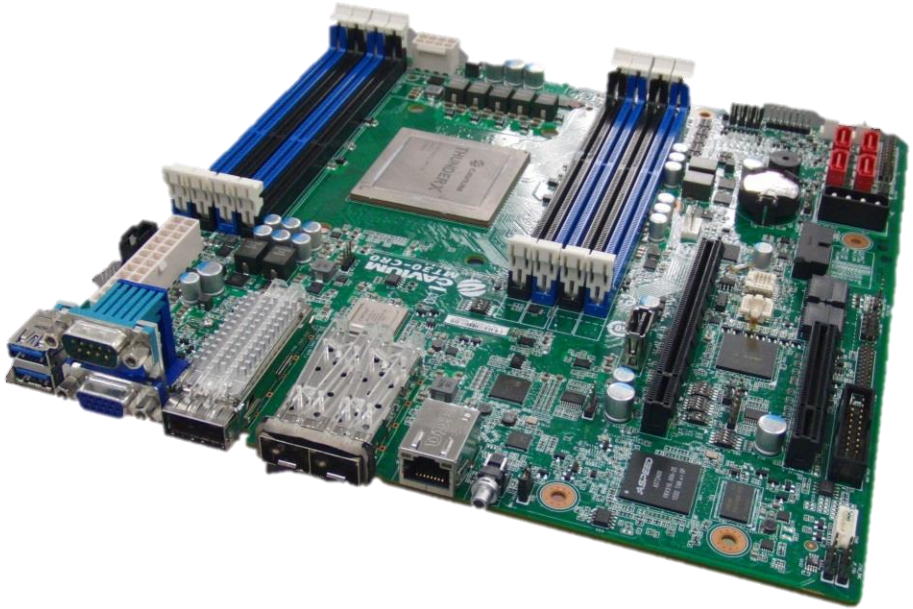
GIGABYTE ARM64 Line-up



APM X-Gene Worldwide First ARM64 Server

X-Gene WW First Real Server
2013-2014

Cavium ThunderX & ThunderX2 CRB



Cavium ThunderX CRB (Reference Board)
2014-2015

Cavium ThunderX 2 CRB (Reference Board)
2016-2017

19th July 2016 ThunderX World Premiere in Shanghai

19th July 2016 ThunderX World Premiere in Shanghai

網易数码 网易首页 应用 网易考拉 LOFTER

先人一步！技嘉ThunderX服务器解决方案

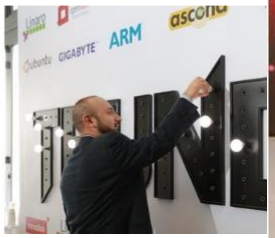
2016-07-22 05:48:00 来源: 中关村在线(北京)

易信 微信 QQ空间 微博 更多

（原标题：先人一步！技嘉ThunderX服务器解

第1页：ThunderX™服务器解决方案震撼发布

北京时间2016年7月19日，知名主板和服务
2376）今日与凯为半导体（NASDAQ：CAVM）
式推出市场上第一个ARM双芯片的服务器产品——



Linaro Partnership and 96 Board

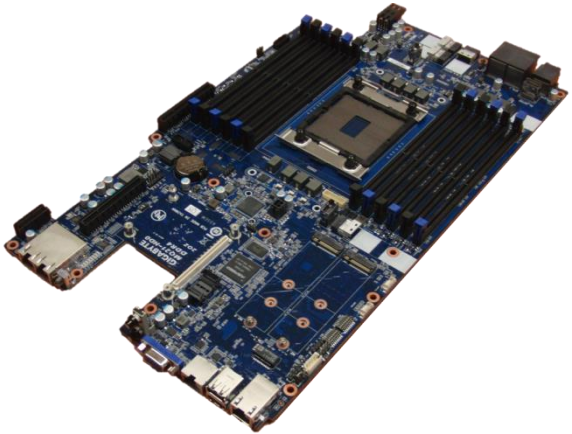
96Boards Developerbox (SynQuacer)

- Latest Tianocore EFI
- RPK Linux Kernel (4.14 / 4.16)
- SynQuacer SC2A11, 24x A53
- Up to 64GB DDR4
- GT-710 GFX

Linaro provided architecture guidance and review to the SoC vendor Socionext, and to the board ODM Gigabyte. This architecture guidance and review included board specifications, board layout, schematics review, in addition to identification of silicon errata fixes. An example of the breadth and depth provided in the following slide.

Linaro & Socionext 96 Board 2016

「悟空 Wukong」Project with Qualcomm



Qualcomm Worldwide First Mainstream
19 Inch Traditional Server (2017-2018)

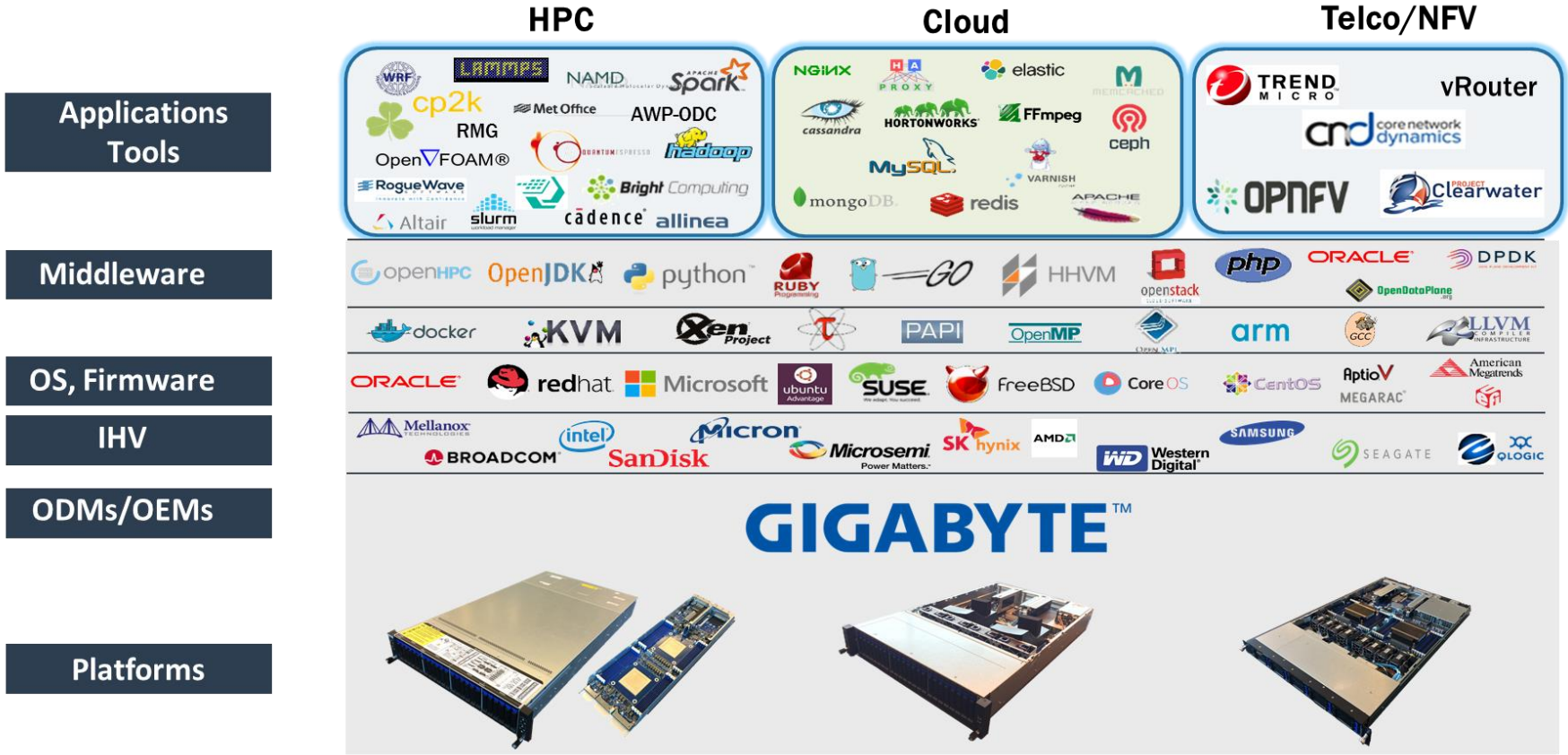
QUALCOMM
HUAXINTONG 华芯通

Key Product of ThunderX2

THUNDERX2® SKU Stack

Ordering code	Cores	Frequency (GHz)	PCIe lanes	Memory controllers	GIGABYTE Product Status
CN9980-2200BG4077-Y21-G	32	2.2	56	8	Waiting for Order to Kick off
CN9975-2200BG4077-Y21-G	28	2.2	56	8	Waiting for Order to Kick off
CN9975-2000BG4077-Y21-G	28	2	56	8	Leading Project & Launch
CN9965-2100BG4077-Y21-G	20	2.1	56	6	Under Planning
CN9960-2200BG4077-Y21-G	16	2.2	48	4	Under Planning

THUNDERX2® Eco-system



MT91-FS1 Mother Board

ARM AARCH 64

THUNDERX2

DDR4 2667

10 Gigabit LAN

12G SAS3

ThunderX2 Dual Processor
(CN9975-2000BG4077-Y21-G)

24 x DDR4 Conn.

2 x SATA Ⅲ 6Gb/s

PCI-e x16
(@Gen3 x16 Signals) slot4

2 Slimline Conn. Speed: 12Gb/s
For 8 SAS Ⅲ 12Gb/s w/ LSI 3008

Proprietary PCI-e
(@Gen3 x24 Signals) slot3

OCP1

Qlogic QL41102

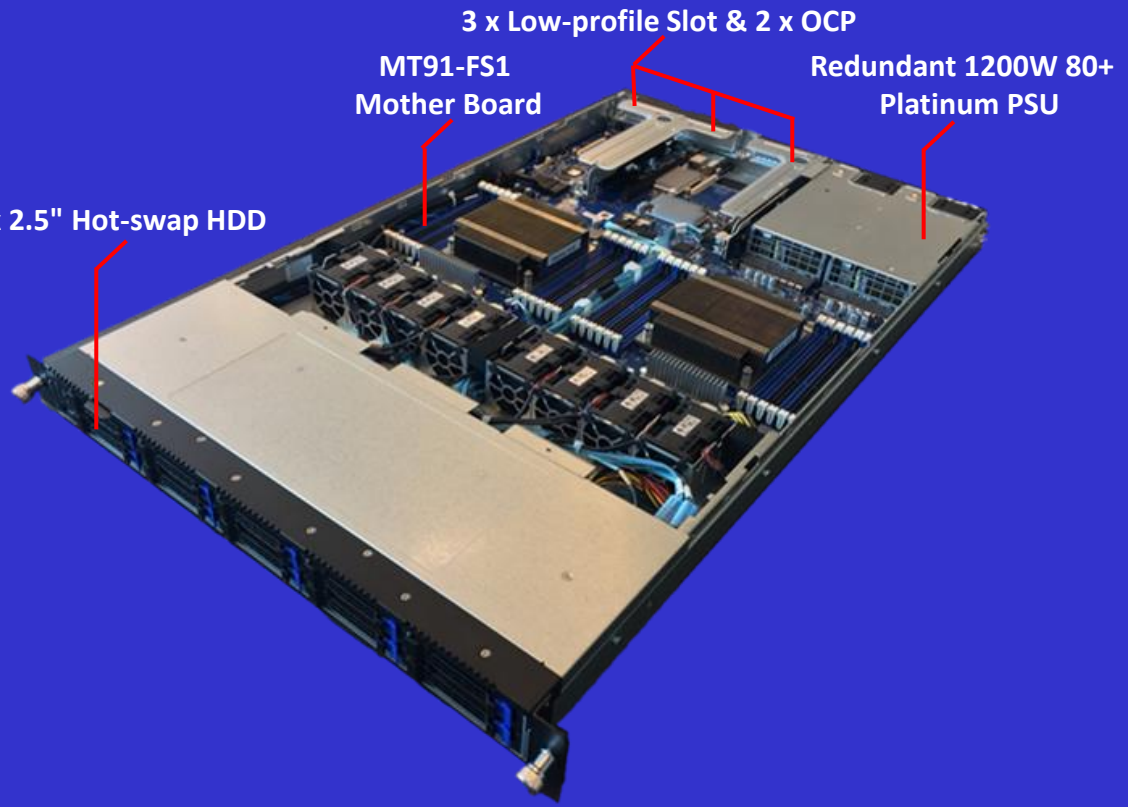
Proprietary PCI-e
(@Gen3 x24 Signals) slot2
(x16 S/W)

AST2500 BMC

OCP2

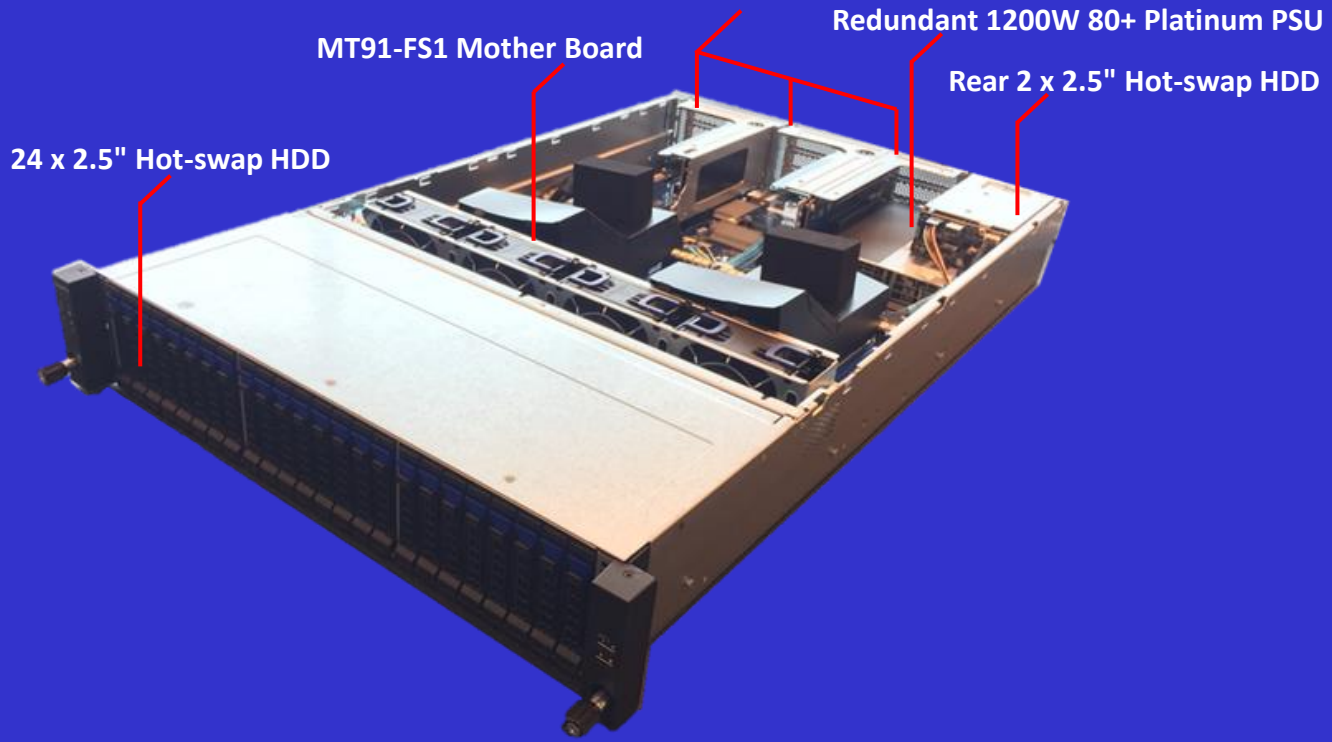
Proprietary PCI-e
(@Gen3 x16 Signals) slot1
Share with slot2

Mainstream 1U Dual Socket server R181-T90

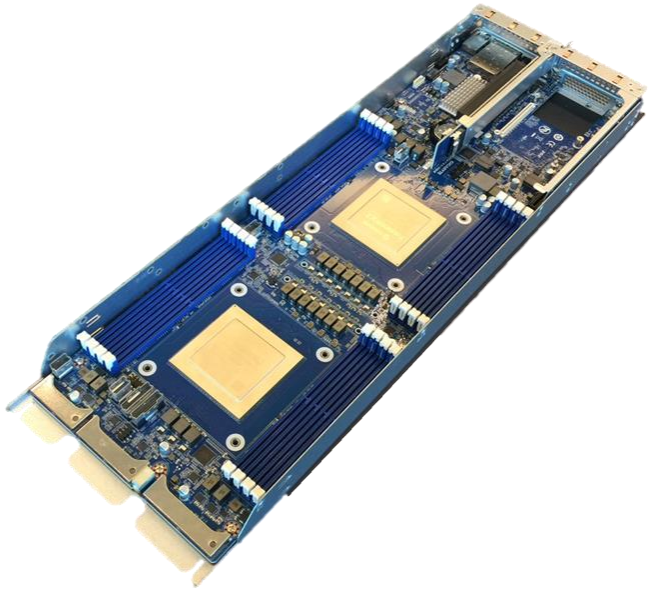


Mainstream 2U Dual Socket server R281-T91

6 x Full Height Half Length & 2 x Low-profile & 2 x OCP



H261 Series Specification - MB (MT61-HD0)



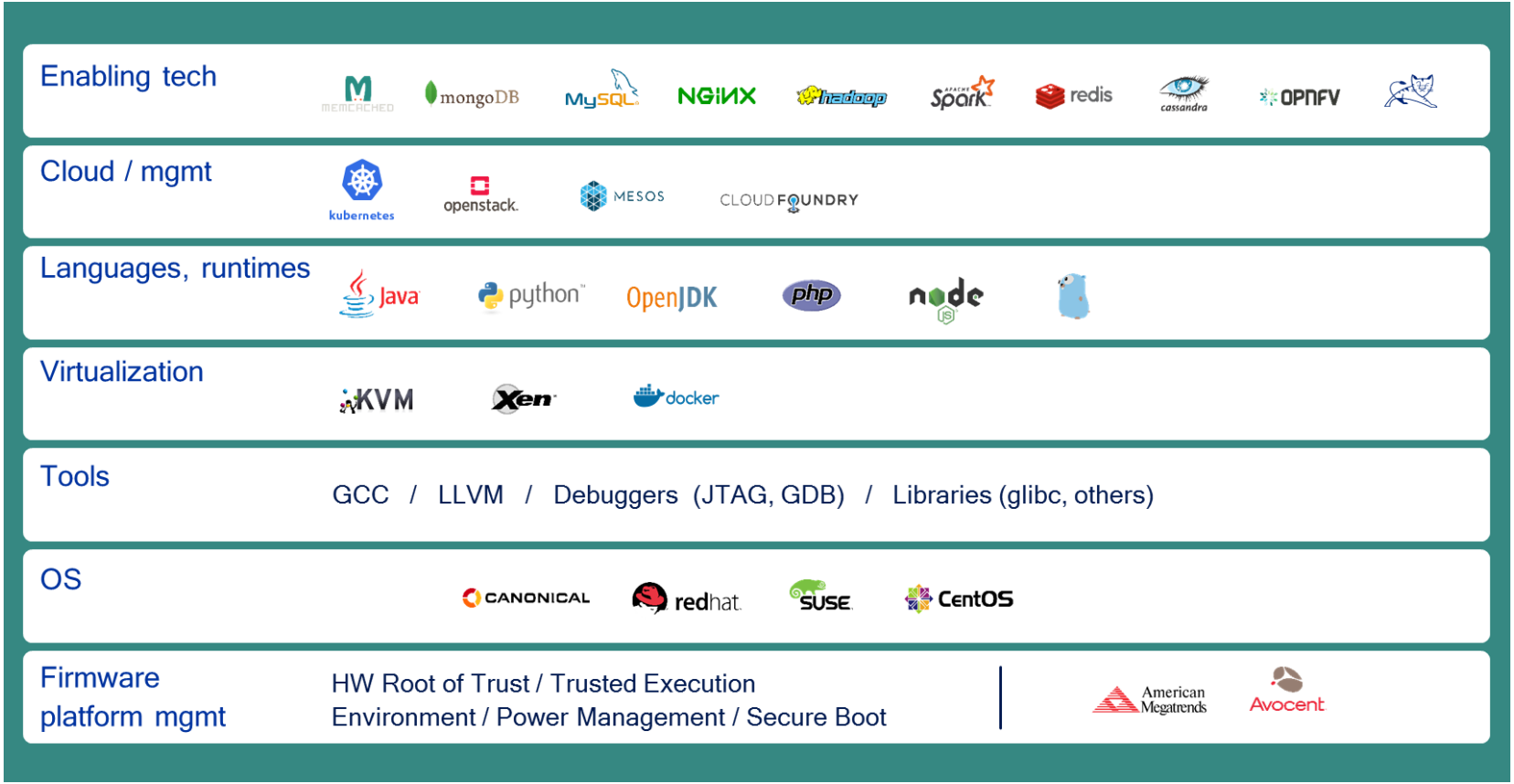
Feature	Specification
Form factor	Proprietary (169 x 525 mm; 6.6’’x 20.67”)
Processor Support	Cavium ThunderX II CN9975-2000BG4077-Y21-G Dual Processor (BGA)
Memory	16 x DIMM slots, support 8 channel per CPU DDR4 RDIMM 2666/2400/2133 MHz
LAN	2 x SFP+ 10G (Option: QL41202 2 x 25G) 1 x Management LAN 10/100/1G
VGA / VRAM	Integrated in BMC
BMC	ASPEED AST2500
Expansion Slot	1 x PCIe x16 (@Gen 3 x16) from CPU0 1 x PCIe x16 (@Gen 3 x16) from CPU1 1x OCP mezzanine PCIe (@Gen 3 x16) from CPU0 (TYPE 1 P1,P2,P3,P4)
Storage	1 x Slimline for 4 x SATAIII; OS SW RAID 0/1/10/5 support
Rear IO Connector	1 xCOM, 2xSFP+, 1 x MLAN (RJ45), 2 x USB3.0, 1x UID LED
Internal Connector	1x TPM, 1xVGA

H261 Series Specification - System

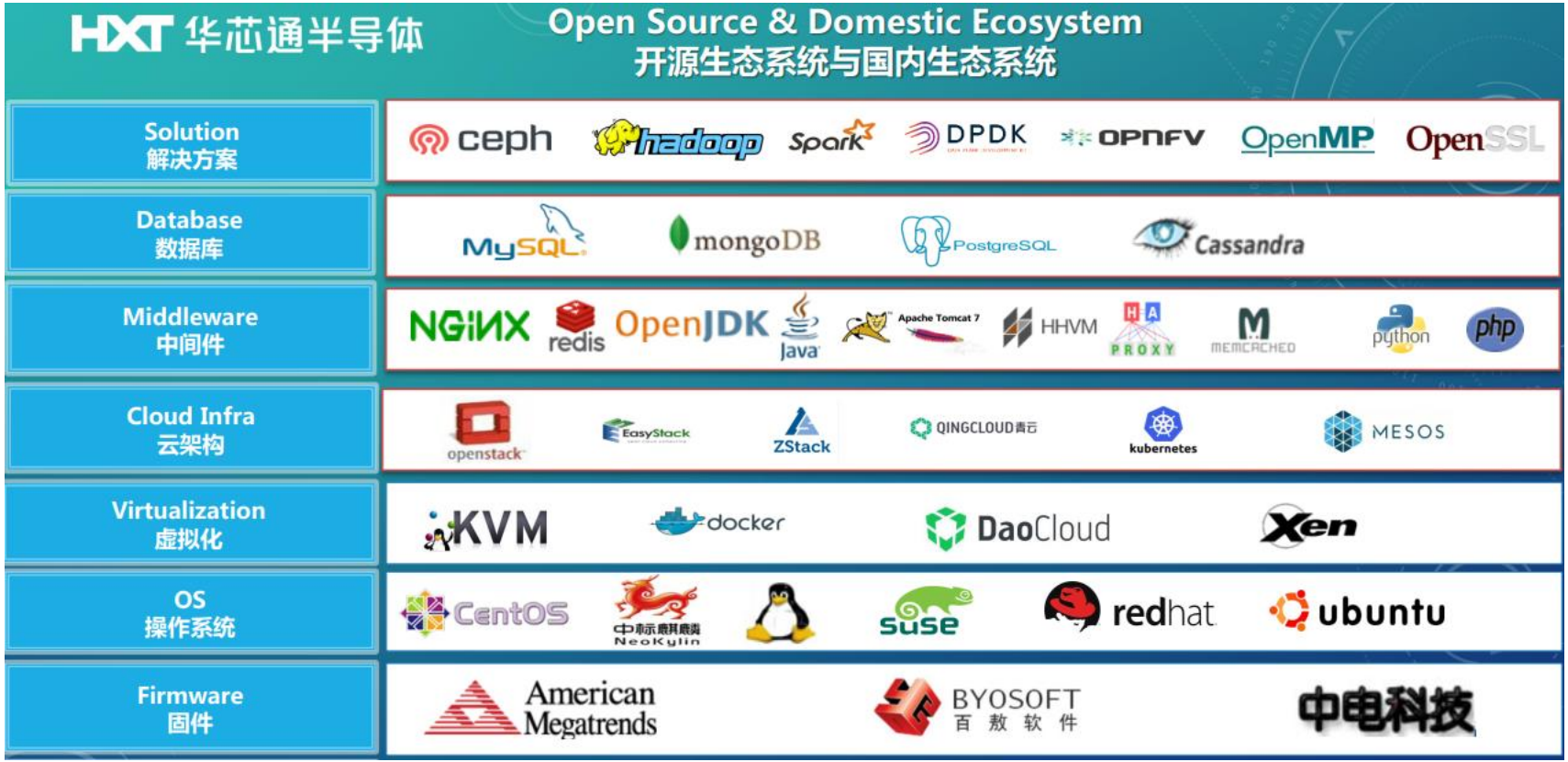
Feature	Specification
Dimension	2U 4 node Rack (87.5 x 440 x 820 mm; 3.44" x 17.32" x 32.28")
Mother Board Spec	Half width MB = MT61-HD0
Drive Bay	(T60)12 x 3.5" Hot-swap HDD (3 x HDD per Node) (T61)16 x 2.5" Hot-swap HDD & 8 x Dummy cover (4 x HDD & 2 x Dummy cover; Default 4 x SATA3 per Node); No ODD
Expansion Slot	2 x Low Profile Slot (Per node) 1 x OCP Mezzanine Card (TYPE 1 P1,P2,P3,P4) (Per node)
Power Supply	Redundant 2200W 80+ Platinum
System Cooling	8 x 8038 Redundant Fan Wall
Front Panel	Power On/Off Button (Including LED); ID Button (Including LED)
Backplane	SAS(12Gb/s) / SATA(6Gb/s) HDD Backplane

Key Product of Centriq 2400 & StarDragon 4800

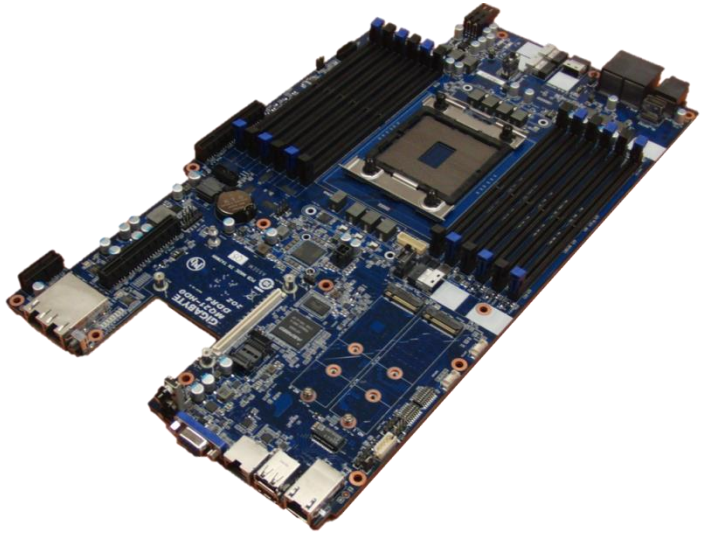
Qualcomm Centriq 2400 Eco-system



HXT StarDragon 4800 Eco-system



Wukong Project MB (MQ21-HD0) Spec



Feature	Specification
Form factor	Proprietary (383 x 220 mm)
Processor Support	Qualcomm QDF2400 SoC HXT StarDragon 4800
Chipset	SoC
Memory	12 x DIMM slots support/6 channel DDR4 2400 to 2667 MT/s @ R-DIMM / LR-DIMM
LAN	2 x 1G Base-T (1 x 1G Base-T for Debug only) 1 x Management LAN 10/100/1G
VGA / VRAM	Integrated in BMC
BMC	ASPEED AST2500
Expansion Slot	1 x PCIe x16 (@Gen 3 x16) or 2 x8 1x OCP mezzanine PCIe (@Gen 3 x8)(TYPE 1 P1,P2,P3,P4 with NCSI support)
Storage	6 x SATA(6Gb/s) 2 x M.2 (@SATA , 2280 size)
Rear IO Connector	1 x VGA, 2 x RJ45, 1 x MLAN, 2 x USB2.0, 1 x ID Button, 1x COM (RJ45), System RST BTN; PWR BTN,
Internal Connector	1x TPM
TPM	I/F w/ Add-on kit (Optional)

Wukong Project Sku1 (H221-Q20) Spec

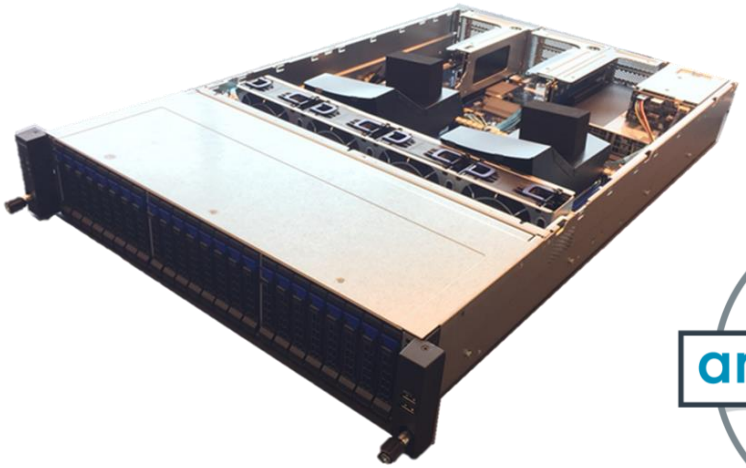
Feature	Specification
Dimension	2U Rack (87 x 440 x 750 mm ; 3.43” x 17.32” x 29.52”)
Mother Board Spec	Half width MB = MQ21-HD0
Drive Bay	2U-2Node:12 x 3.5” Hot-swap Drive Bays Per node 6 x Front LFF SAS or SATA, Hot swap Onboard 2 x M.2 SATA
Expansion Slot	Per node: 1 x Low Profile Slot,1 x FHFL Slot , 1 x OCP Mezzanine Card
Power Supply	Redundant 1200W 80+ Platinum (Default for 2U-2Node 3.5” SKU)
System Cooling	5 x 6038 N+1 Redundant Fan Wall (Option: 10 x 6038 Redundant Fan Wall)
Front Panel	Power On/Off Button (Including LED); ID Button (Including LED)
Backplane	SAS(12Gb/s) / SATA(6Gb/s)

Wukong Project Sku2 (H221-Q21) Spec

Feature	Specification
Dimension	2U Rack (87 x 440 x 720 mm ; 3.43” x 17.32” x 28.34”)
Mother Board Spec	Half width MB = MQ21-HD0
Drive Bay	2U-2Node: 24 x 2.5” Hot-swap Drive Bays Per node Front 8 x U.2 SFF hot swap & 4 x LFF SAS or SATA hot swap Onboard 2 x M.2 SATA
Expansion Slot	Per node: 1 x Low Profile Slot (N/A) 1 x FHFL Slot (for PCIe Expander card) 1 x OCP Mezzanine Card (PCIe Gen3 x8)
Power Supply	Redundant 1600W 80+ Platinum
System Cooling	5 x 6038 N+1 Redundant Fan Wall (Option: 10 x 6038 Redundant Fan Wall)
Front Panel	Power On/Off Button (Including LED); ID Button (Including LED)
Backplane	SAS(12Gb/s) / SATA(6Gb/s) /NVMe HDD Backplane

Exciting News

ARM Server Ready & Certification



Certified arm ServerReady Version 1.0

THUNDERX2™

QUALCOMM

HUAXINTONG 华芯通 (Plan)

GIGABYTE™

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Upgrade Your Life