GIGABYTE Position in ARM Server Market
- Leading Pioneer

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

<table>
<thead>
<tr>
<th>Founded</th>
<th>April 1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPO</td>
<td>Listed on TSE since Sept. 24,1998 (Taiwan)</td>
</tr>
<tr>
<td>Capital</td>
<td>US$ 197.61 million (NT$ 6.29 billion)</td>
</tr>
<tr>
<td>Gross Revenue</td>
<td>US$ 1,624.54 million (NT$ 52.3 billion @ 32.22)</td>
</tr>
<tr>
<td>Mfg. Capacity</td>
<td>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</td>
</tr>
<tr>
<td>Purchasing</td>
<td>Direct account of Intel, AMD, Nvidia &amp; major ASIC</td>
</tr>
<tr>
<td>Technology</td>
<td>Key vendor’s alpha &amp; beta site: Intel, AMD, Microsoft,..</td>
</tr>
<tr>
<td>RD Expenditure</td>
<td>3% of revenue per year (= 25% of net profit)</td>
</tr>
<tr>
<td>Patents</td>
<td>Filed: 3,529; Approved: 2,178</td>
</tr>
</tbody>
</table>
Executive Team

- **Dandy Yeh** / Chairman & President
- **Mitchell Liu** / Executive Vice President

**President Office**

**Group Resource Mgmt. Center**
- **Justine Chen** / Vice General Manager
- **Michael Lin** / A.V.P.
  **Jeff Chen** / Senior Division Director

**Customer Service Center**
- **Nill Bai** / Chief Operating Officer

**Operation Mgmt. Center**

**Channel Solution B.U.**
- **Mitchell Liu** / Executive Vice President & G.M.

**Network & Comm. B.U.**
- **Etay Lee** / General Manager
  **Jimmy Tseng** / Senior Vice President
  **Kevin Meng** / G.M.

**Manufacturing B.U.**

**Mobility Product Business Center**
- **Johnson Lin** / Senior Vice President & G.M.

**Laptop [G-Style Ltd.]**
- **Etay Lee** / Chairman

**Industrial PC [GIGAIPC Ltd.]**
- **Johnson Lin** / Senior Vice President & G.M.
Manufacturing Capacity

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Ning-Bo</th>
<th>Dong-Guan</th>
<th>Nan-Ping</th>
<th>Total / Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motherboards</td>
<td>650 K</td>
<td>680 K</td>
<td>400 K</td>
<td>1,730 K</td>
</tr>
<tr>
<td>Graphics Cards</td>
<td>100 K</td>
<td>320 K</td>
<td>100 K</td>
<td>520 K</td>
</tr>
<tr>
<td>Desktops PC &amp; Peripherals</td>
<td>100 K</td>
<td>95 K</td>
<td>5K</td>
<td>200 K</td>
</tr>
<tr>
<td>Laptops</td>
<td>45 K</td>
<td>-</td>
<td>10 K</td>
<td>55 K</td>
</tr>
<tr>
<td>Server</td>
<td>30 K</td>
<td>20 K</td>
<td>50 K</td>
<td>100 K</td>
</tr>
<tr>
<td>Embedded and IoT</td>
<td>-</td>
<td>-</td>
<td>40 K</td>
<td>40 K</td>
</tr>
<tr>
<td>Floor Space</td>
<td>60,000 M²</td>
<td>38,000 M²</td>
<td>45,000 M²</td>
<td></td>
</tr>
</tbody>
</table>
Global Operation & Support Centers

Europe
- Germany
- UK
- Holland
- Spain
- Turkey
- Russia
- Ukraine
- Poland
- Saudi Arabia
- South Africa

Middle East & Africa
- Algeria
- Bangladesh
- Hong Kong
- India
- Indonesia
- Japan

Asia & Oceania
- Korea
- Malaysia
- Philippines
- Singapore
- Sri Lanka
- Thailand
- Vietnam

Taiwan
- Taipei
- Hsinchu
- Taoyuan
- Taichung
- Tainan
- Kaohsiung

North America
- USA
- Mexico

South America
- Brazil
- Peru
- Argentina

China
- Baotou
- Beijing
- Canton
- Changchun
- Changzhou
- Chengdu
- Chongqing
- Dalian
- Dongguan
- Fuzhou
- Guilin
- Hangzhou
- Harbin
- Hefei
- Jinan
- Jingzhou
- Kunming
- Lanzhou
- Lhasa
- Longyan
- Nanchang
- Nanjing

- Nanning
- Ningbo
- Oce
- Qingdao
- Quanzhou
- Seaport
- Shanghai
- Shantou
- Shenyang
- Shenzhen
- Shijiazhuang
- Suzhou
- Taiyuan
- Urumqi
- Wenzhou
- Wuhan
- Wuxi
- Xiamen
- Xi'an
- Xuzhou
- Zhengzhou
- Zhongshan
- Zhuhai
NCBU Milestone

1998 - 2018

Commenced operations: 2000

- Awarded Gold in Taiwan Excellence Awards 2006: 2006
- Design-in supplier to Google’s greenfield DC: 2002
- Won ODM contract for Hitachi’s Xeon DP server line-up: 2001

2000 - 2008

- Merged with PC-ODM BU, leading to volume production & price control economies of scale: 2001
- Released the first 2U HPC server supporting 8 computing cards: 2012
- Released AMD EPYC server to market: 2017

2008 - 2018

- Merged with MCE BU: 2007
- Closer co-operation with Microsoft: 2007
- Merged with MCE BU, leading to volume production & price control economies of scale: 2008
- Established a separate portal at b2b.gigabyte.com: 2011
- Announced world wide first ARM64 server MB with Applied Micro ARM64 and new server family based on Cavium’s ARM-based SoCs: 2013
- Released Cavium ThunderX server to market: 2016
- Released Qualcomm Centriq 2400 & HXT StarDragon 4800 server to market (Plan): 2018

Future
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.
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
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.
「悟空 Wukong」Project with Qualcomm

Qualcomm Worldwide First Mainstream 19 Inch Traditional Server (2017-2018)
Key Product of ThunderX2
## SKU Stack

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Cores</th>
<th>Frequency (GHz)</th>
<th>PCIe lanes</th>
<th>Memory controllers</th>
<th>GIGABYTE Product Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN9980-2200BG4077-Y21-G</td>
<td>32</td>
<td>2.2</td>
<td>56</td>
<td>8</td>
<td>Waiting for Order to Kick off</td>
</tr>
<tr>
<td>CN9975-2200BG4077-Y21-G</td>
<td>28</td>
<td>2.2</td>
<td>56</td>
<td>8</td>
<td>Waiting for Order to Kick off</td>
</tr>
<tr>
<td>CN9975-2000BG4077-Y21-G</td>
<td>28</td>
<td>2</td>
<td>56</td>
<td>8</td>
<td>Leading Project &amp; Launch</td>
</tr>
<tr>
<td>CN9965-2100BG4077-Y21-G</td>
<td>20</td>
<td>2.1</td>
<td>56</td>
<td>6</td>
<td>Under Planning</td>
</tr>
<tr>
<td>CN9960-2200BG4077-Y21-G</td>
<td>16</td>
<td>2.2</td>
<td>48</td>
<td>4</td>
<td>Under Planning</td>
</tr>
</tbody>
</table>
## Eco-system

### HPC
- cp2k
- RMG
- AWP-ODC
- OpenFOAM
- pmdem
- Bright Computing
- slurm
- Cadence
- allinea

### Cloud
- nginx
- OpenStack
- Cassandra
- MySQL
- mongoDB
- redis
- Apache
- FFmpeg
- ceph

### Telco/NFV
- TREND
- Micro vRouter
- OpenStack
- OPNFV
- Clearwater

### Applications Tools
- openHPC
- OpenJDK
- python
- Ruby
- GO
- HHVM
- PHP
- Oracle
- DPDK

### Middleware
- docker
- KVM
- Xen
- PAPI
- OpenMPI

### OS, Firmware
- Oracle
- redhat
- Microsoft
- SUSE
- FreeBSD
- CoreOS
- CentOS

### IHV
- Mellanox
- Intel
- Micron
- Microsemi

### ODMs/OEMs
- BROADCOM
- SanDisk
- PowerMatters

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**GIGABYTE**

Hoshino  NCBU 2018 Product
MT91-FS1 Mother Board

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

24 x DDR4 Conn.

PCI-e x16 (@Gen3 x16 Signals) slot4

PCI-e x16 (@Gen3 x24 Signals) slot3 OCP1

Proprietary PCI-e ( @Gen3 x24 Signals) slot2

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

OCP2

Qlogic QL41102

AST2500 BMC

VGA

Dual 10G USB (RJ45) SFP+ 3.0 COM MLAN ID Button/ LED

2 x SATA III 6Gb/s

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

PCI-e x16 (@Gen3 x16 Signals) slot4

Qlogic 2 x SATA III 6Gb/s

Gigabit LAN

12G SAS

12G

DDR4 2667

ARM 64

Hoshino NCBU 2018 Product
Mainstream 1U Dual Socket server R181-T90

- 10 x 2.5" Hot-swap HDD
- MT91-FS1 Mother Board
- 3 x Low-profile Slot & 2 x OCP
- Redundant 1200W 80+ Platinum PSU
- ARM
- THUNDERX2
- DDR4 2667
- 10 Gigabit LAN
- 12G SASS
Mainstream 2U Dual Socket server R281-T91

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

MT91-FS1 Mother Board

Redundant 1200W 80+ Platinum PSU

Rear 2 x 2.5" Hot-swap HDD

24 x 2.5" Hot-swap HDD
## H261 Series Specification - MB (MT61-HD0)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form factor</strong></td>
<td>Proprietary (169 x 525 mm; 6.6” x 20.67”)</td>
</tr>
<tr>
<td><strong>Processor Support</strong></td>
<td>Cavium ThunderX II CN9975-2000BG4077-Y21-G Dual Processor (BGA)</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>16 x DIMM slots, support 8 channel per CPU&lt;br&gt;DDR4 RDIMM 2666/2400/2133 MHz</td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>2 x SFP+ 10G &lt;br&gt; (Option: QL41202 2 x 25G) &lt;br&gt; 1 x Management LAN 10/100/1G</td>
</tr>
<tr>
<td><strong>VGA / VRAM</strong></td>
<td>Integrated in BMC</td>
</tr>
<tr>
<td><strong>BMC</strong></td>
<td>ASPEED AST2500</td>
</tr>
<tr>
<td><strong>Expansion Slot</strong></td>
<td>1 x PCIe x16 (@Gen 3 x16) from CPU0 &lt;br&gt; 1 x PCIe x16 (@Gen 3 x16) from CPU1 &lt;br&gt; 1x OCP mezzanine PCIe (@Gen 3 x16) from CPU0 (TYPE 1 P1,P2,P3,P4)</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>1 x Slimline for 4 x SATAIII; OS SW RAID 0/1/10/5 support</td>
</tr>
<tr>
<td><strong>Rear IO Connector</strong></td>
<td>1 xCOM, 2xSFP+, 1 x MLAN (RJ45), 2 x USB3.0, 1x UID LED</td>
</tr>
<tr>
<td><strong>Internal Connector</strong></td>
<td>1x TPM, 1xVGA</td>
</tr>
</tbody>
</table>
### H261 Series Specification - System

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimension</strong></td>
<td>2U 4 node Rack (87.5 x 440 x 820 mm; 3.44&quot; x 17.32&quot; x 32.28&quot;)</td>
</tr>
<tr>
<td><strong>Mother Board Spec</strong></td>
<td>Half width&lt;br&gt;MB = MT61-HD0</td>
</tr>
<tr>
<td><strong>Drive Bay</strong></td>
<td>(T60)12 x 3.5&quot; Hot-swap HDD (3 x HDD per Node)</td>
</tr>
<tr>
<td></td>
<td>(T61)16 x 2.5&quot; Hot-swap HDD &amp; 8 x Dummy cover (4 x HDD &amp; 2 x Dummy cover; Default 4 x SATA3 per Node); No ODD</td>
</tr>
<tr>
<td><strong>Expansion Slot</strong></td>
<td>2 x Low Profile Slot (Per node)&lt;br&gt;1 x OCP Mezzanine Card (TYPE 1 P1,P2,P3,P4) (Per node)</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>Redundant 2200W 80+ Platinum</td>
</tr>
<tr>
<td><strong>System Cooling</strong></td>
<td>8 x 8038 Redundant Fan Wall</td>
</tr>
<tr>
<td><strong>Front Panel</strong></td>
<td>Power On/Off Button (Including LED); ID Button (Including LED)</td>
</tr>
<tr>
<td><strong>Backplane</strong></td>
<td>SAS(12Gb/s) / SATA(6Gb/s) HDD Backplane</td>
</tr>
</tbody>
</table>
Key Product of Centriq 2400 & StarDragon 4800
# Qualcomm Centriq 2400 Eco-system

<table>
<thead>
<tr>
<th>Enabling tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>MongoDB, MySQL, NGINX, Terraform, Spark, redis, cassandra, OPNFV, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cloud / mgmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kubernetes, OpenStack, Mesos, CloudFoundry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Languages, runtimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java, Python, OpenJDK, PHP, Node</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Virtualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVM, Xen, Docker</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCC, LLVM, Debuggers (JTAG, GDB), Libraries (glibc, others)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canonical, Red Hat, SUSE, CentOS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Firmware platform mgmt</th>
</tr>
</thead>
<tbody>
<tr>
<td>HW Root of Trust / Trusted Execution Environment / Power Management / Secure Boot</td>
</tr>
</tbody>
</table>
# HXT StarDragon 4800 Eco-system

<table>
<thead>
<tr>
<th>Solution</th>
<th>Database</th>
<th>Middleware</th>
<th>Cloud Infra</th>
<th>Virtualization</th>
<th>OS</th>
<th>Firmware</th>
</tr>
</thead>
<tbody>
<tr>
<td>华芯通半导体</td>
<td>解决方案</td>
<td>数据库</td>
<td>中间件</td>
<td>云架构</td>
<td>虚拟化</td>
<td>操作系统</td>
</tr>
<tr>
<td>Open Source &amp; Domestic Ecosystem 开源生态系统与国内生态系统</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Solution**
  - ceph
  - hadoop
  - Spark
  - DPDK
  - OPNFV
  - OpenMP
  - OpenSSL

- **Database**
  - MySQL
  - mongoDB
  - PostgresQL
  - Cassandra

- **Middleware**
  - NGINX
  - redis
  - OpenJDK
  - Java
  - Apache Tomcat
  - HHVM
  - HA PROXY
  - Memcached
  - Python
  - PHP

- **Cloud Infra**
  - openstack
  - EasyStack
  - ZStack
  - QINGCLOUD
  - Kubernetes
  - Mesos

- **Virtualization**
  - KVM
  - Docker
  - DaoCloud
  - Xen

- **OS**
  - CentOS
  - Suse
  - Suse
  - Redhat
  - Ubuntu

- **Firmware**
  - American Megatrends
  - BYOSOFT
  - 中电科技
## Wukong Project MB (MQ21-HD0) Spec

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form factor</strong></td>
<td>Proprietary (383 x 220 mm)</td>
</tr>
<tr>
<td><strong>Processor Support</strong></td>
<td>Qualcomm QDF2400 SoC</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>SoC</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>12 x DIMM slots support/6 channel DDR4 2400 to 2667 MT/s @ R-DIMM / LR-DIMM</td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>2 x 1G Base-T (1 x 1G Base-T for Debug only) 1 x Management LAN 10/100/1G</td>
</tr>
<tr>
<td><strong>VGA / VRAM</strong></td>
<td>Integrated in BMC</td>
</tr>
<tr>
<td><strong>BMC</strong></td>
<td>ASPEED AST2500</td>
</tr>
<tr>
<td><strong>Expansion Slot</strong></td>
<td>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)</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>6 x SATA(6Gb/s) 2 x M.2 (@SATA, 2280 size)</td>
</tr>
<tr>
<td><strong>Rear IO Connector</strong></td>
<td>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,</td>
</tr>
<tr>
<td><strong>Internal Connector</strong></td>
<td>1x TPM</td>
</tr>
<tr>
<td><strong>TPM</strong></td>
<td>I/F w/ Add-on kit (Optional)</td>
</tr>
</tbody>
</table>
# Wukong Project Sku1 (H221-Q20) Spec

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>2U Rack (87 x 440 x 750 mm ; 3.43” x 17.32” x 29.52”)</td>
</tr>
<tr>
<td>Mother Board Spec</td>
<td>Half width</td>
</tr>
<tr>
<td>Spec</td>
<td>MB = MQ21-HD0</td>
</tr>
<tr>
<td>Drive Bay</td>
<td>2U-2Node:12 x 3.5” Hot-swap Drive Bays</td>
</tr>
<tr>
<td></td>
<td>Per node 6 x Front LFF SAS or SATA, Hot swap</td>
</tr>
<tr>
<td></td>
<td>Onboard 2 x M.2 SATA</td>
</tr>
<tr>
<td>Expansion Slot</td>
<td>Per node: 1 x Low Profile Slot, 1 x FHFL Slot, 1 x OCP Mezzanine Card</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Redundant 1200W 80+ Platinum (Default for 2U-2Node 3.5” SKU)</td>
</tr>
<tr>
<td>System Cooling</td>
<td>5 x 6038 N+1 Redundant Fan Wall</td>
</tr>
<tr>
<td></td>
<td>(Option: 10 x 6038 Redundant Fan Wall)</td>
</tr>
<tr>
<td>Front Panel</td>
<td>Power On/Off Button (Including LED); ID Button (Including LED)</td>
</tr>
<tr>
<td>Backplane</td>
<td>SAS(12Gb/s) / SATA(6Gb/s)</td>
</tr>
</tbody>
</table>
# Wukong Project Sku2 (H221-Q21) Spec

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