Radio Cloud OpenEdge Server design
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Tomi Männikkö, HW Architect, Nokia
Raymond Huang, AVP/GM, Enterprise Solutions Business, ASUS
Craig White, Product Architect, Nokia
Abstract

Nokia and ASUS have jointly developed a new 2nd generation Open Edge server sled featuring support for 3rd Generation Intel® Xeon® Scalable Processors. This presentation highlights the main technical specifications of this server. The 2nd generation Open Edge server is a major advancement over the initial Open Edge server release of 2018.

The main enhancement is the introduction of support for 3rd Generation Intel® Xeon® Scalable Processor family CPUs and EDSFF E1.S with forward-looking SSD technology. The new CPU generation and several other improvements bring significant benefits in running various real-time applications at the edge. Improved system cooling will enable simultaneous use of higher TDP CPUs and various accelerator cards.
Workloads are moving closer to the edge of the network

<table>
<thead>
<tr>
<th>Far Edge data centers</th>
<th>Edge / Central data centers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sites/Cells/Site</strong></td>
<td>10000's / 3 - cells</td>
</tr>
<tr>
<td><strong>Footprint</strong></td>
<td>Smallest</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>Very Low</td>
</tr>
<tr>
<td><strong>Distance</strong></td>
<td>0 km (&lt;50µs RTT)</td>
</tr>
<tr>
<td><strong>Far edge D-RAN</strong></td>
<td></td>
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<tr>
<td><strong>Far Edge C-RAN</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Aggregated Edge</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Regional / Central</strong></td>
<td></td>
</tr>
</tbody>
</table>

- **Lowest latency / high throughput**
  - Open edge, 2RU, 1-2 servers
  - Open edge, 3RU, 1-5 racks
  - Compact Open Rack or 19" Rackmount or Open edge
  - Full size/compact Open Rack or 19"rackmount

- **Signaling driven**
  - Open edge, 2RU, 1-2 servers
  - Open edge, 3RU, 1-5 racks
  - Compact Open Rack or 19" Rackmount or Open edge
  - Full size/compact Open Rack or 19"rackmount

- **Fronthaul**
  - NRT F1

- **Power**
  - Very Low
  - Low
  - Medium
  - Medium - High

- **Distance**
  - 0 km (<50µs RTT)
  - 20-40 km (240µs RTT)
  - 200-350 km (4-10 ms RTT)
  - >10ms

- **Footprint**
  - Smallest
  - Smaller
  - Small
  - Large

- **Sites/Cells/Site**
  - 10000's / 3 - cells
  - 100-1000's / 100-1000's cells
  - 10-100's / 1000-10000's cells
  - <10

- **Distance**
  - 0 km (<50µs RTT)
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**Open Possibilities.**
Edge cloud use cases & motivation for design update

• Cloudification of telco applications
  - VRAN (Virtualized Radio Access Network) workloads, e.g. processing of data to/from 5G mMIMO antenna arrays, are compute intensive
  - higher core-count enables more dense, lower cost solutions
  - Increasing user data rates call for high-performance networking and HW acceleration

• Other applications: MEC, RIC, vCU, retail, IoT, enterprise, etc.
  - such as video transcoding, AI, ML, etc.
Technology enhancements

Latest Intel XEON scalable gen3 support
• Significant increase in core count
• Platform improvements in supporting real-time applications
• Increased number of memory buses: 6 -> 8
• Increased memory bus speed: DDR4 2993 MT/s -> 3200 MT/s
• Support for new PCIe generation: Gen3 -> Gen4
• Increased number of PCIe lanes: 48 -> 64

Support for OCP 3.0 SFF
• Hot-swappable
• Higher TDP and performance
• Support for dual-QSFPxx in front panel for increased throughput

Enhanced thermal performance
• Increased sled TDP: 400 W -> 500 W
• Support for 230 W CPU TDP in 1U sled

Enhanced storage solution
• Support for dense EDSFF E1.S
• Enhanced cooling using heat sink solution
• Modern SSD technology

Environmental and regulatory compliance
• Compliant with Open edge specifications, including full NEBS level 3 (EMC, safety, Zone-4, acoustics, etc.), extended operating temperature range
Open Edge Server Sled, 1U

Key Specifications

- Power feed capacity up to 500W, for high performance applications
- Single 3rd Gen Intel® Xeon® Scalable Processor (Up to 230W)
- PCH : Intel® C621A
- Memory : 8 x DDR4 3200 (1 DPC), support Intel® Optane™ Persistent Memory 200 series technology
- Extension slots
  - PCIe Gen4 x16, FHHL, 75 W
  - OCP v3.0, PCIe Gen4 x16, 80 W
- Storage
  - 2 x EDSFF E1.S new NVMe for high performance, density and cooling, supports VROC
  - 2 x M.2 SSD, SATA/NVMe, 22110/2280
Mechanical design for useability

• Full Front Access: cabling, tool-less serviceability
• Modular Design Concept: fan module, SSD assembly, riser assembly, EDSFFs, M2s
• Flexible Fan Module Design: options for front-to-rear/ rear-to-front airflow direction
• Hot Swap Storage for High Availability
1U Sled Interfaces - Front and Rear

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power button (with identifier LED)</td>
</tr>
<tr>
<td>2</td>
<td>2 x USB3.2 Gen 1 connector</td>
</tr>
<tr>
<td>3</td>
<td>Mini-USB Type UART debug</td>
</tr>
<tr>
<td>4</td>
<td>Reset button</td>
</tr>
<tr>
<td>5</td>
<td>Display port connector</td>
</tr>
<tr>
<td>6</td>
<td>OCP 3.0 (Gen4 x16 link) slot (small form-factor)</td>
</tr>
<tr>
<td>7</td>
<td>FHHL PCI-E x16 (Gen4 x16 link) expansion slot</td>
</tr>
<tr>
<td>8</td>
<td>2 x EDSFF E1.S, NVMe, hot swap</td>
</tr>
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<tr>
<td>1</td>
<td>Fan module, front to rear &amp; rear to front options</td>
</tr>
<tr>
<td>2</td>
<td>Backplane power connector</td>
</tr>
<tr>
<td>3</td>
<td>Backplane signal connector</td>
</tr>
</tbody>
</table>
Product Info


ASUS: [https://servers.asus.com](https://servers.asus.com)


OCP Marketplace: [https://www.opencompute.org/products](https://www.opencompute.org/products)
Call to Action

• Join regular Edge sub-project calls (under Telco project)
• Edge sub-project Wiki page containing latest specifications: https://www.opencompute.org/wiki/Telcos/Edge
• Edge sub-project mailing list: https://ocp-all.groups.io/g/OCP-Edge
Thank you!