OCP openEDGE Enclosure

Mike Moore, Nokia Regional Product Manager
Managing the lowest latency/cost trade off with a layered architecture Datacenter portfolio for all deployments from Far Edge to HyperScale

<table>
<thead>
<tr>
<th>Open Edge</th>
<th>Compact OpenRack or 19” Rack-mount or Open Edge</th>
<th>Full size/compact OpenRack or 19” Rack-mount</th>
<th>Full size OpenRack or 19” Rack-mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sites</td>
<td>100-1000’s</td>
<td>&lt;10</td>
<td>2-3</td>
</tr>
<tr>
<td>Footprint</td>
<td>Smallest</td>
<td>Large</td>
<td>Large</td>
</tr>
<tr>
<td>Power budget</td>
<td>Low</td>
<td>Medium - High</td>
<td>High</td>
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<tr>
<td>Distance</td>
<td>20-40 km (&lt;1ms RTT)</td>
<td>200-350 km (4-10 ms RTT)</td>
<td>&gt;10 ms RTT</td>
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<tr>
<td></td>
<td>Aggregated edge</td>
<td>Regional</td>
<td>Central</td>
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Network enhancement use cases at the edge
Starting points to incrementally realize the target over time

RAN Cloudification & Evolution to 5G

Latency, bandwidth, and security critical use cases (IoT, MEC)

Fixed Access Network Transformation

Public/Private Cloud and open ecosystem for innovation moving to Edge

Virtualized & distributed IP Edge

openEDGE
Open edge chassis overview

Key specifications

- 3U, 19” mountable (EIA-310 compatible)
- 130.6 x 440 x 430 mm (H x W x D)
- 12 kg / 26 lbs (Chassis with two PSUs and RMC)
- 1U and 2U, half width sleds are supported
  - Support for high end accelerators
- Redundant, centralized power supply
  - 2000 W max power feed capacity, 80+ Platinum
  - AC (100..127/ 200..240 VAC) and DC (-48 VDC) options
- Sled power feed capacity
  - 400 W (1U sled)
  - 700 W (2U sled)
- Environmental
  - Full NEBS compliancy, seismic zone 4
    - [GR-63-Core, GR-1089-Core]
  - Extended operating temperature range
    - -5C..+45C [ETSI EN300 019-1-3 Class 3.2]
    - short term : -5C to +55C [GR-63-CORE]
Open edge chassis overview

Key specifications

- **Cooling**: Fan units are part of sled solution
  - Air flow direction configurable: front-to-rear/rear-to-front
- **Chassis management controller (RMC)**
  - PSU management (control, sensors, ..)
  - Management Ethernet interface to sleds
    - 1 GE to all sleds via backplane
    - 1x 1 GE (RJ45) + 2x 10 GE (SFP+) front panel interface for external connectivity and chaining of multiple chassis
- **All sleds managed through single interface in RMC unit**
  - On board BMC (in server sleds)
- **Power distribution board and chassis backplane provide connectivity between RMC, sleds and PDUs**
Key Specifications

- **1U/2U, half width**
- **Power consumption**
  - 400W (1U)
  - 700W (2U)
- **PCH options:** Intel C621, C627 (with QAT)
- **Memory:** 6 x DDR4-2933 + 2 x Intel Optane
- **Single riser for disks and add-in cards**
- **Extension slots**
  - PCIe x16, FHHL, 75 W (1U)
  - 1 x PCIe x16, FHFL, dual-wide, 300 W max (2U)
  - OCP Mezzanine 2.0, PCIe x16
- **Storage**
  - 2 x hot-plug SSD, SATA/NVMe, 2.5”, 7/9.5 mm
  - 2 x hot-plug SSD, SATA/NVMe, 2.5”, 7/9.5/15 mm (2U)
  - 2 x M.2 SSD, SATA/NVMe, 2280/22110
OpenEdge builds compute at the network edge to meet real-time requirements

**Compute & Power efficiency:**
High performance cloud computing platform supporting Telco VNFs
Intel Xeon SP Platinum CPU up to 28 cores, 400W per 1U sled and 700W per 2U sled.

**Deployment Flexibility:**
Deployable at radio site (D-RAN) and at Far Edge (C-RAN)
Cooling optimization, Re-use of AirScale indoor/outdoor cabinets

**Compute / Switching / Storage / Optical / etc**
Opportunity to build the ecosystem with sled contributions to meet a variety of Far Edge Use Cases

**Virtualized real-time with targeted Acceleration:**
PCIe add-on cards with FPGA / DSP / GPU / etc based accelerators
Accelerators for AI/ML, video, security, IoT, etc

OpenEdge Platform is purpose built for Far Edge, differentiating with performance and innovation
## openEDGE Ecosystem Status

### openEDGE product evolution

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Events</th>
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<tbody>
<tr>
<td>2Q18</td>
<td>- April openEDGE was announced at NFV World Congress</td>
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<tr>
<td>3Q18</td>
<td>- Planning began for openEDGE contribution to OCP and sub-committee formation</td>
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<td>4Q18</td>
<td>- Working Demo shown at Amsterdam Summit</td>
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<td></td>
<td>- Draft Specifications Released</td>
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<td></td>
<td>- Commercial Availability Achieved</td>
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<tr>
<td>1Q19</td>
<td>- First Commercial Contract</td>
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<td>- F2F Design Workshop held in Mountain View</td>
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<td>2Q19</td>
<td>- V1.2 of the Chassis Specification granted as “OCP Accepted”</td>
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<td>- Continue to promote community involvement and adoption</td>
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**General Trends:**
- Continue to promote community involvement and adoption.
openEDGE Sub-committee Status

The project will gather requirements and specifications for the Open Edge computing platforms from the adopters.

- This will include (but not exclusively)
  - dimensions
  - power budgets
  - cooling requirements
  - networking requirements

- Nokia has contributed openEDGE server chassis specification and design files
  - Draft of openEDGE Server Chassis Specification – OCP Accepted
  - Draft of openEDGE Server Specification – applying for OCP Inspired
  - [https://www.opencompute.org/wiki/Telcos/openEDGE](https://www.opencompute.org/wiki/Telcos/openEDGE)
openEDGE ecosystem needs

- Functionality required for the Far Edge as new Applications drive processing requirements
- Further compression of devices to provide a compact solution
- Additional Sled Designs
  - Switch
  - Router
  - Optical
  - Storage
  - Accelerators
  - Battery Backup
Thank You!