OCP openEdge Workshop @ Flex

Mike Moore, openEDGE Sub-project Lead, Nokia
February 12, 2020

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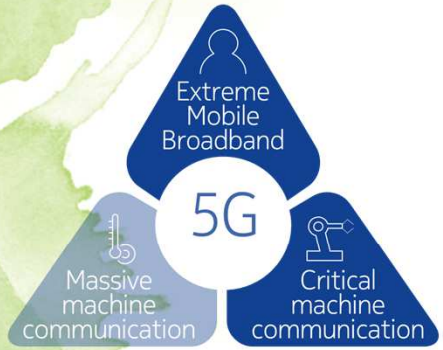
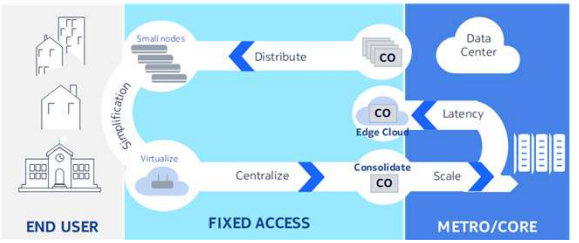
Network enhancements use cases at the edge
Starting points to incrementally realize the target over time

RAN Cloudification & Evolution to 5G



Fixed Access Network Transformation



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

Virtualized & distributed IP Edge

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

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openEDGE Ecosystem Status

openEDGE product evolution

2-3Q18
- April openEDGE was announced at NFV World Congress
- Planning began for openEDGE contribution to OCP and sub-committee formation

4Q18
- Working Demo shown at Amsterdam Summit
- Draft Specifications Released
- Commercial Availability Achieved

1Q19
- First Commercial Contract
- F2F Design Workshop held in Mountain View
- V1.2 of the Chassis Specification granted as "OCP Accepted"

2Q19
- Wiwynn announces intent to product openEDGE Chassis and Server Blades

3-4Q19
- ARM-based sled under development
- Battery Backup Unit under development
- ASUS announces plans to adopt openEDGE Chassis/Sleds

1Q20
- MiTAC plans to adopt openEDGE
- F2F Design Workshop Milpitas @ Flex

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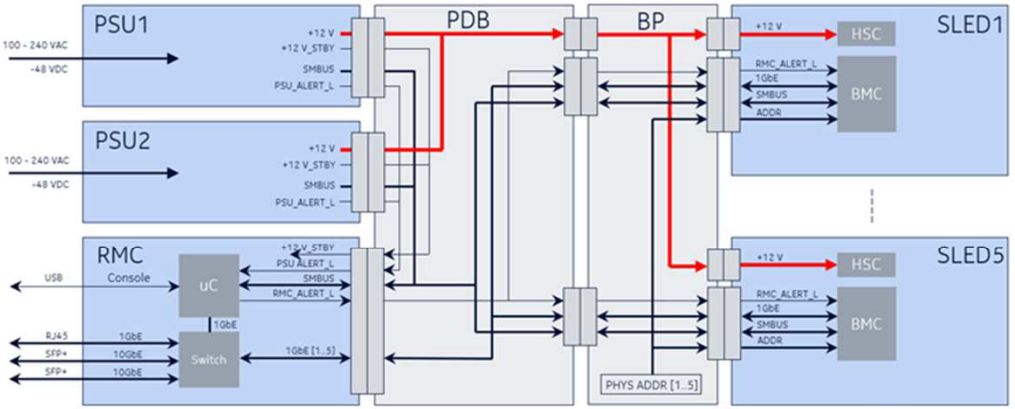
Open edge chassis overview

Key specifications

- 3U, 19” mountable (EIA-310 compatible)
- 130.6 x 440 x 430 mm (H x W x D)
- 1U and 2U, half width sleds are supported
- 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), 12 VDC



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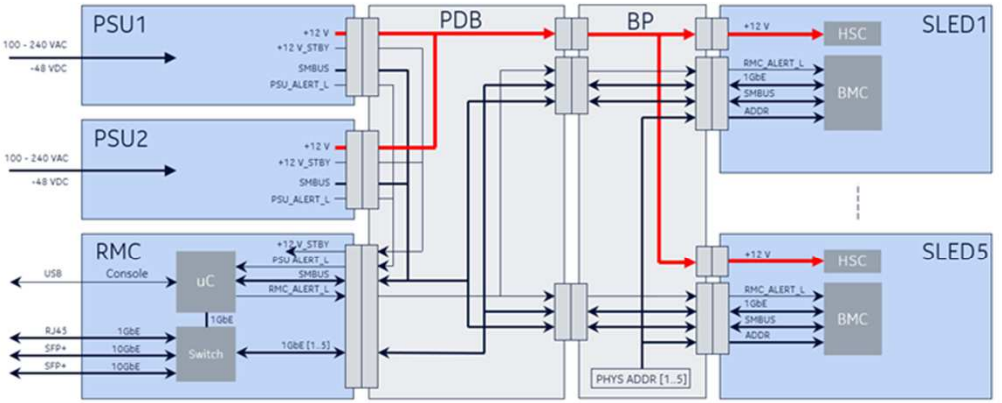
Open edge chassis overview

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
- Power distribution board and chassis backplane provide connectivity between RMC, sleds and PDUs



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Key environmental and regulatory compliancy

Operating conditions

- Operating temperature range: -5 C ...+45 C [ETSI EN300 019-1-3 Class 3.2]
- Short term operating temperature: -5 C to +55 C [GR-63-CORE]
- Operating humidity: 5 % to 95 %

EMC

- EN300386 (v1.6.1)
- FCC CFR47 15 (class A), CISPR 22/32 (class A) CISPR 24
- TEC/EMI/TEL-001/01/FEB-09 and TEC/IR/SWN-2MB/07/MAR-10
- GR-1089-CORE, and more

Safety

- IEC 62368-1:2014
- GR-1089-CORE (electrical safety, grounding and bonding)

Seismic tolerance

- GR-63-CORE (Zone 4)

Acoustic noise

- GR-63-CORE (equipment room criteria)

Fire resistance

- GR-63-CORE (shelf level criteria)

NOKIA

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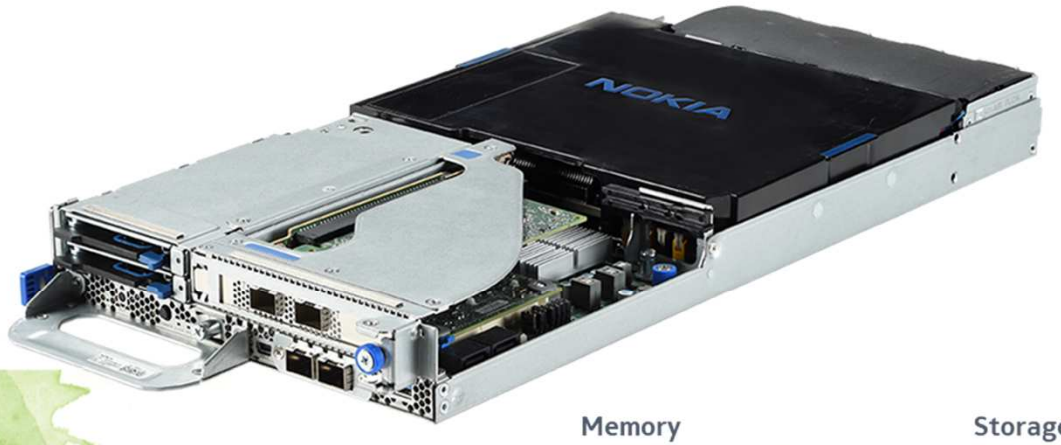
AirFrame open edge server – 1U sled
Intel Xeon® SP next gen



Processor (single socket)
- Intel® Xeon® SP, up to 24cores, 2,4GHz

Chipset
- Intel® C621/C627

Thermal
- Max. CPU TDP support: 205W
- Four redundant dual rotor fans per node; air flow front to rear/rear to front

Dimensions, weight
- 41 x 215x 427mm (H x W x D)
- 3.4 kg / 7.5 lbs.**

Memory
- DIMM slots: 6 typical (8 max)
- DIMM type: 16GB / 32GB / 64GB - DDR4 RDIMM 2933 MHz

Management
- Redfish, IPMI v2.0 Compliant, on board BMC
- Access through RMC unit

Storage
- 2x 2,5" Hot-plug bays for NVMe and SATA devices 9,5/7mm
- 2x internal M.2 2280 or 22110 devices

Security
- TPM 1.2/ 2.0

Expansion Slots
- 1x PCIe Gen3 x16 OCP mezzanine card
- 1x PCIe Gen3 x16 FHHL PCIe card

**) Server node with typical commodity

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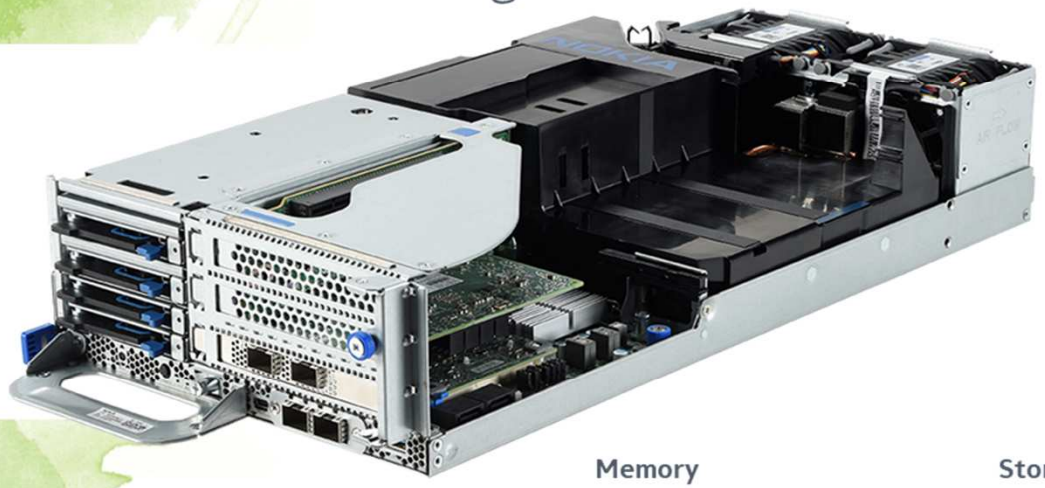
AirFrame open edge server – 2U sled
Intel Xeon® SP next gen



Processor (single socket)
- Intel® Xeon® SP, up to 24cores, 2,4GHz

Chipset
- Intel® C621/C627

Thermal
- Max. CPU TDP support: 250W
- Two redundant dual rotor fans per node; air flow front to rear/rear to front

Dimensions, weight
- 83 x 215x 427mm (H x W x D)
- 4.7 kg / 10.4 lbs.**

**) Server node with typical commodity

Memory
- DIMM slots: 6 typical (8 max)
- DIMM type: 16GB / 32GB / 64GB - DDR4 RDIMM 2933 MHz

Management
- Redfish, IPMI v2.0 Compliant, on board BMC
- Access through RMC unit

Storage
- 2x 2,5" Hot-plug bays for 15 mm SATA / NVMe drives
- 2x 2,5" Hot-plug bays for 7 / 9,5 mm SATA / NVMe drives
- 2x internal M.2 2280 or 22110 devices

Security
- TPM 1.2/ 2.0

Expansion Slots
- 1x PCIe Gen3 x16 OCP mezzanine slot
- 1-2x PCIe Gen3 x8/x16 FHHL slot
- 1x PCIe Gen3 x16 FHFL double wide slot

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Possible Far Edge Use Cases

Reuse existing BBU/Cellsite Cabinet Options

Intersection Case Configuration

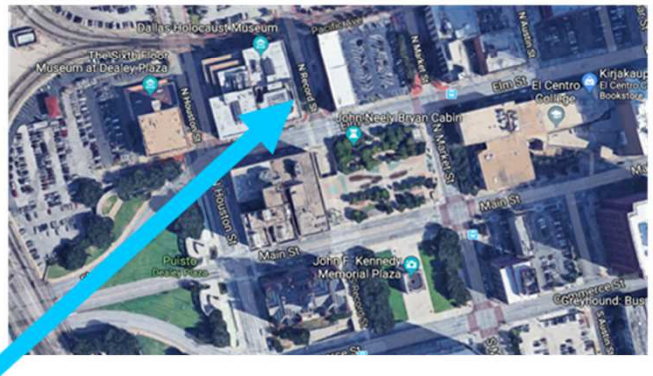
AirFrame openEDGE server

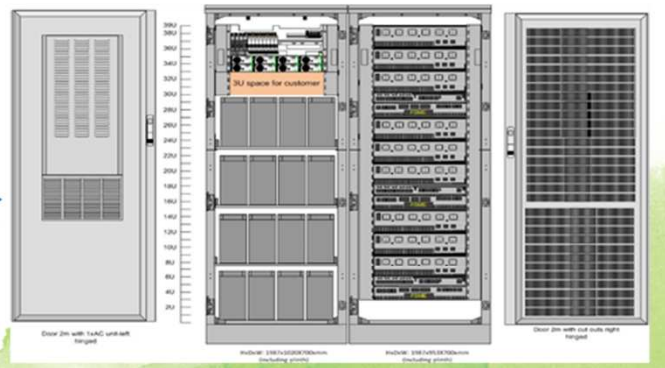
Adding compute capabilities to a base station site

Reuse existing site solutions

AirScale base station

Block Case Configuration





FCOB Flexi Outdoor cabinet

Dual/Street Cabinet Solution

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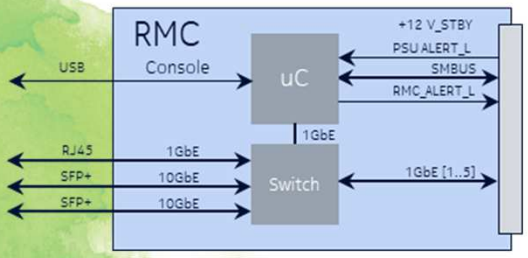
Nokia AirFrame New Contributions (applying for Accepted)

Chassis management controller (RMC)



2U Chassis

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Call to Action

Looking for equipment manufactures to adopt the openEDGE formfactor and involvement of consumers to continue to enhance and evolve this formfactor

Where to buy:

- https://www.opencompute.org/products

Project Wiki with latest specification:

- https://www.opencompute.org/wiki/Telcos/openEDGE

Mailing list: OCP-Open-Edge@OCP-All.groups.io

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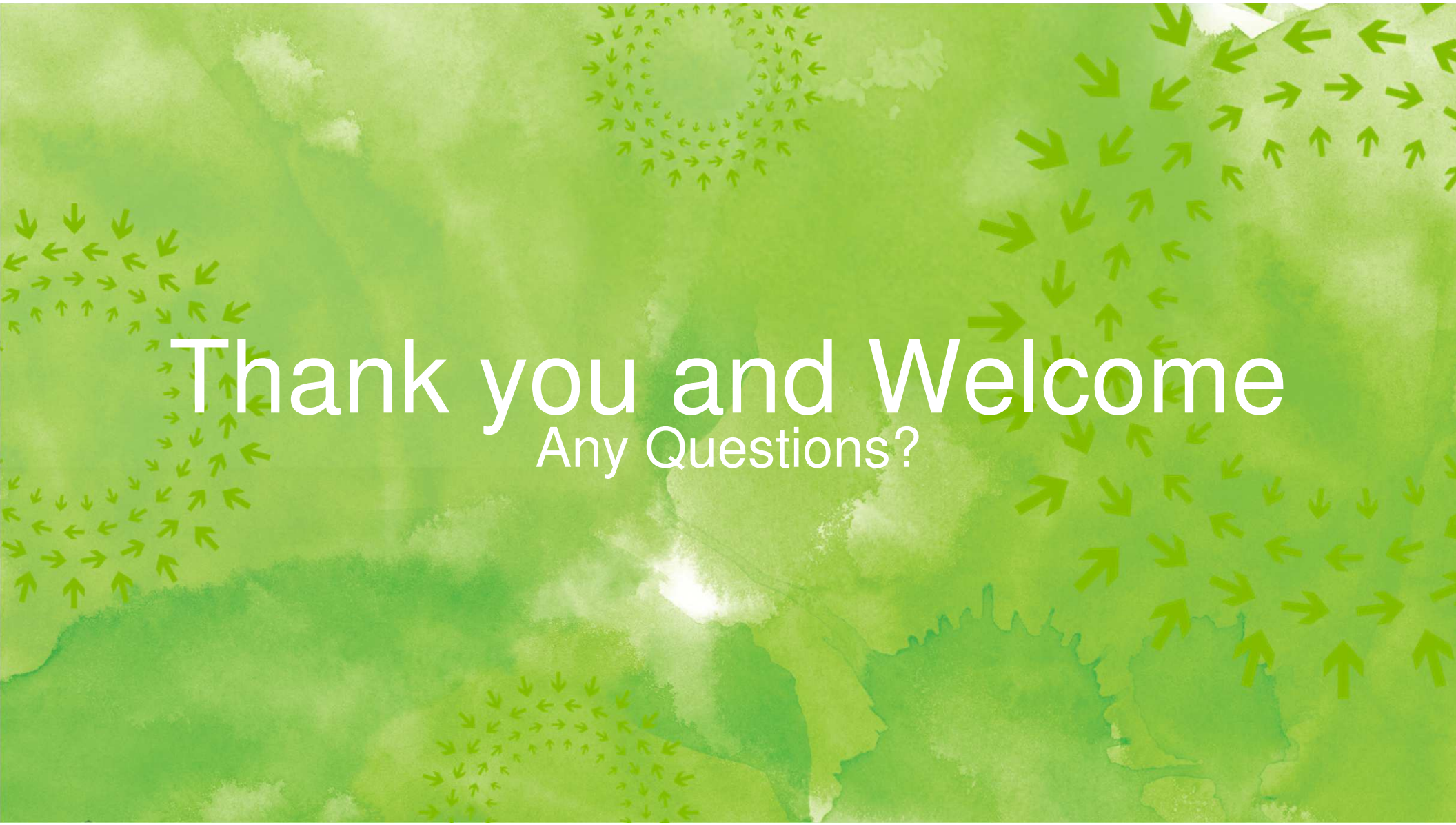
Thank you and Welcome
Any Questions?