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EDGE SERVER AND CHASSIS

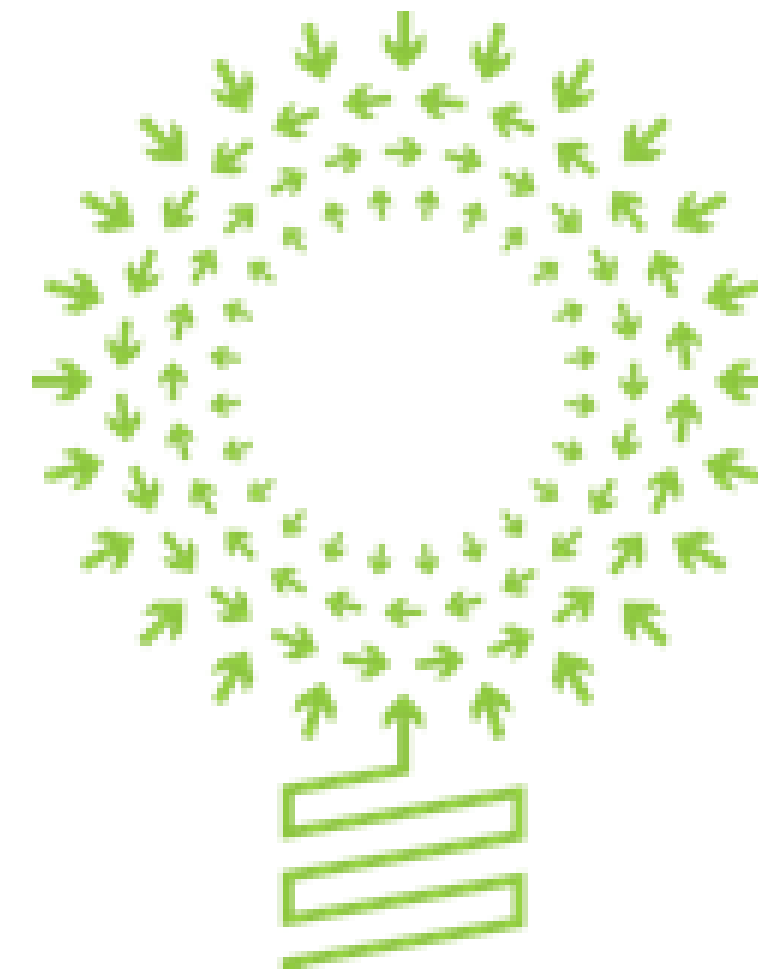
Tomi Männikkö/HW Architect, Datacenter R&D/
Nokia

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Nokia in Open Compute Project

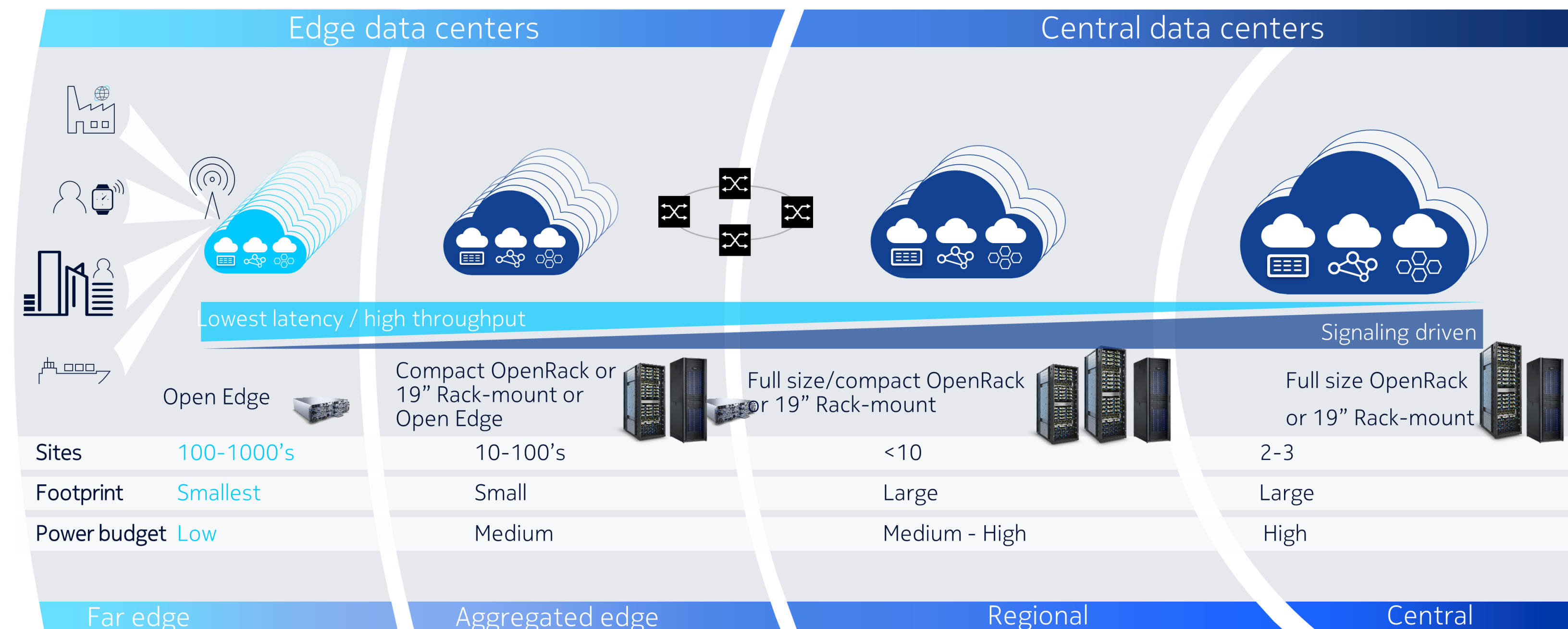
Nokia is a Platinum Member of the Open Compute Project and an OCP Solution Provider



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Open edge server key objectives

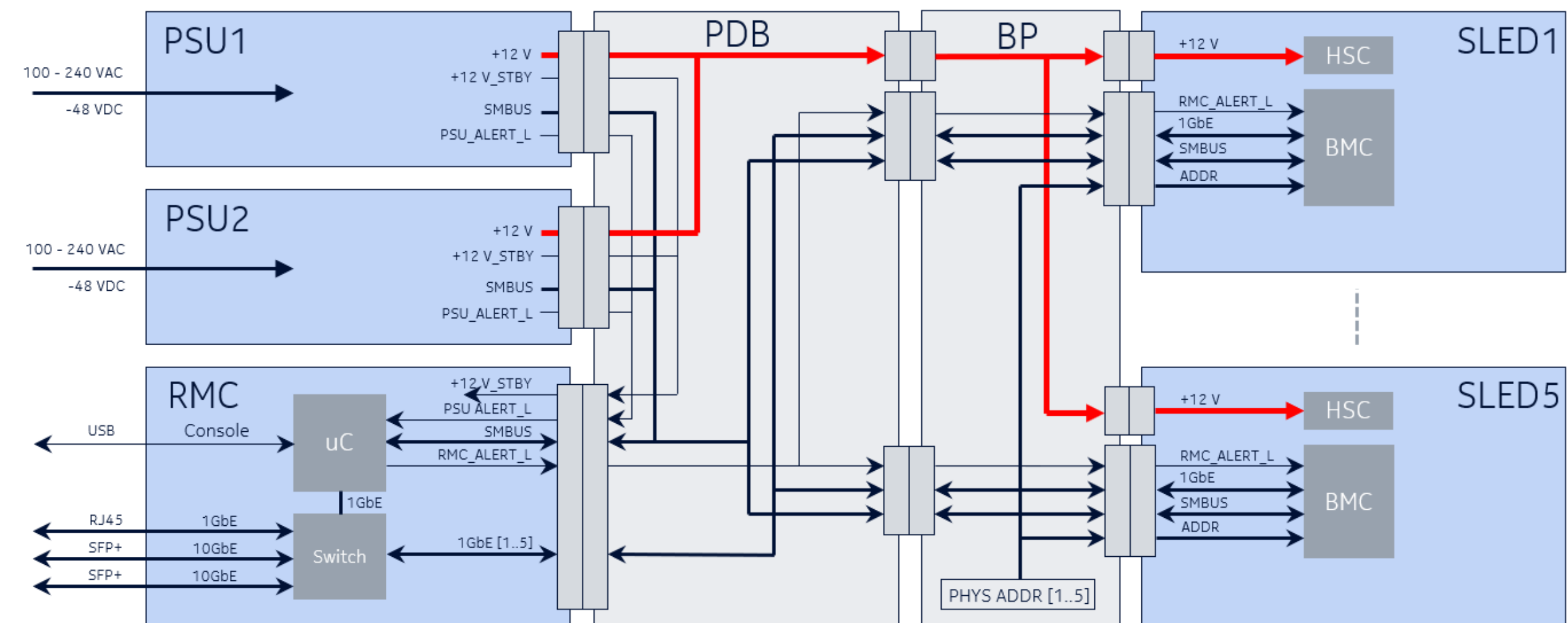
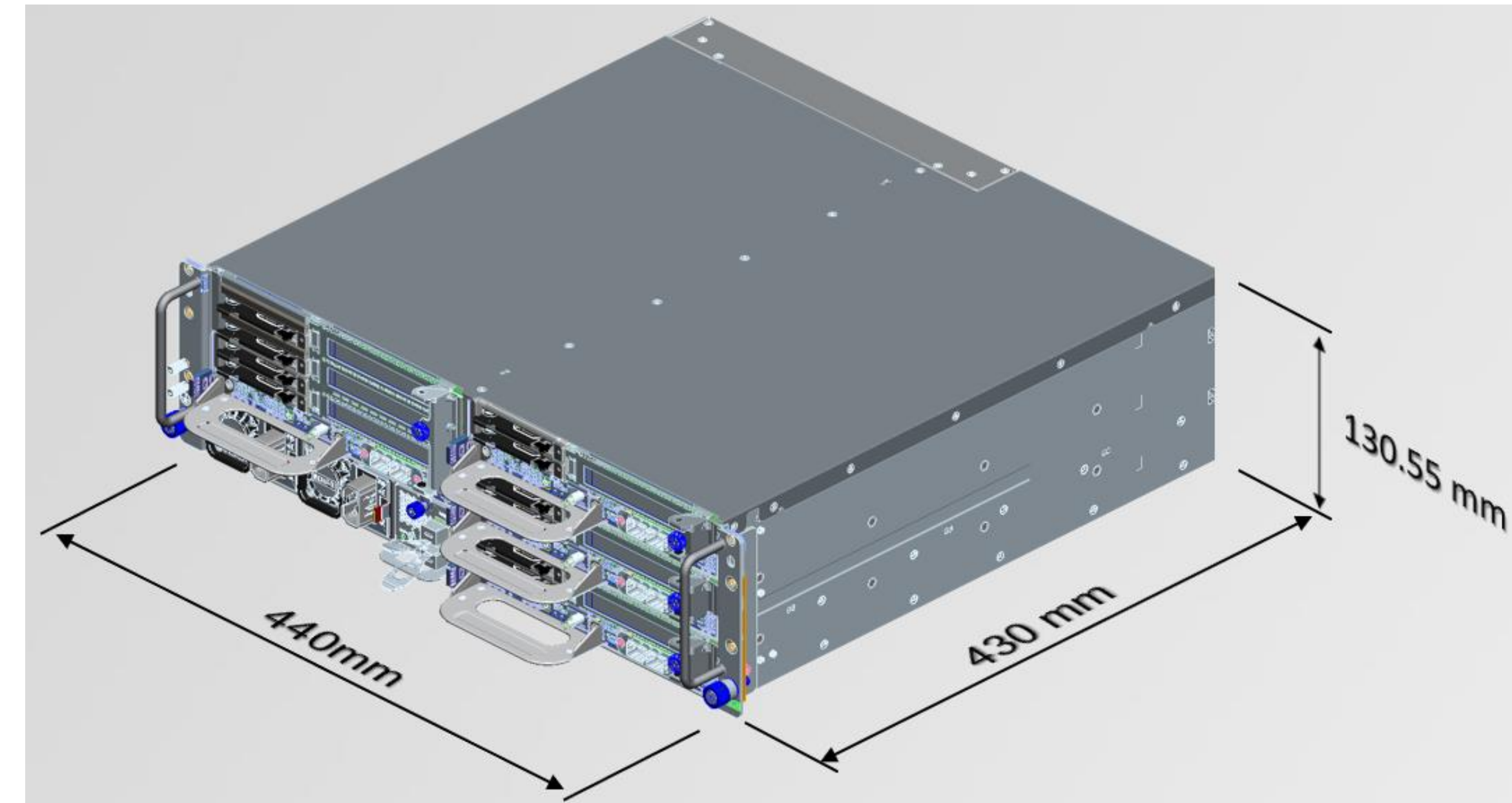
- Edge site requirements
 - Limited floor space -> small form factor
 - Varying thermal conditions -> extended temperature range
 - Varying types of power feed -> DC, AC, 3-phase, 1-phase with PDUs
 - Limited power feed capacity -> system scalability from one chassis to multiple racks
- Accelerator support (e.g. cRAN/ MEC)
- OCP design principles
 - Centralized power feed
 - Front access
 - Tool-less maintenance
 - Vanity free desing



Open edge chassis overview

Key specifications

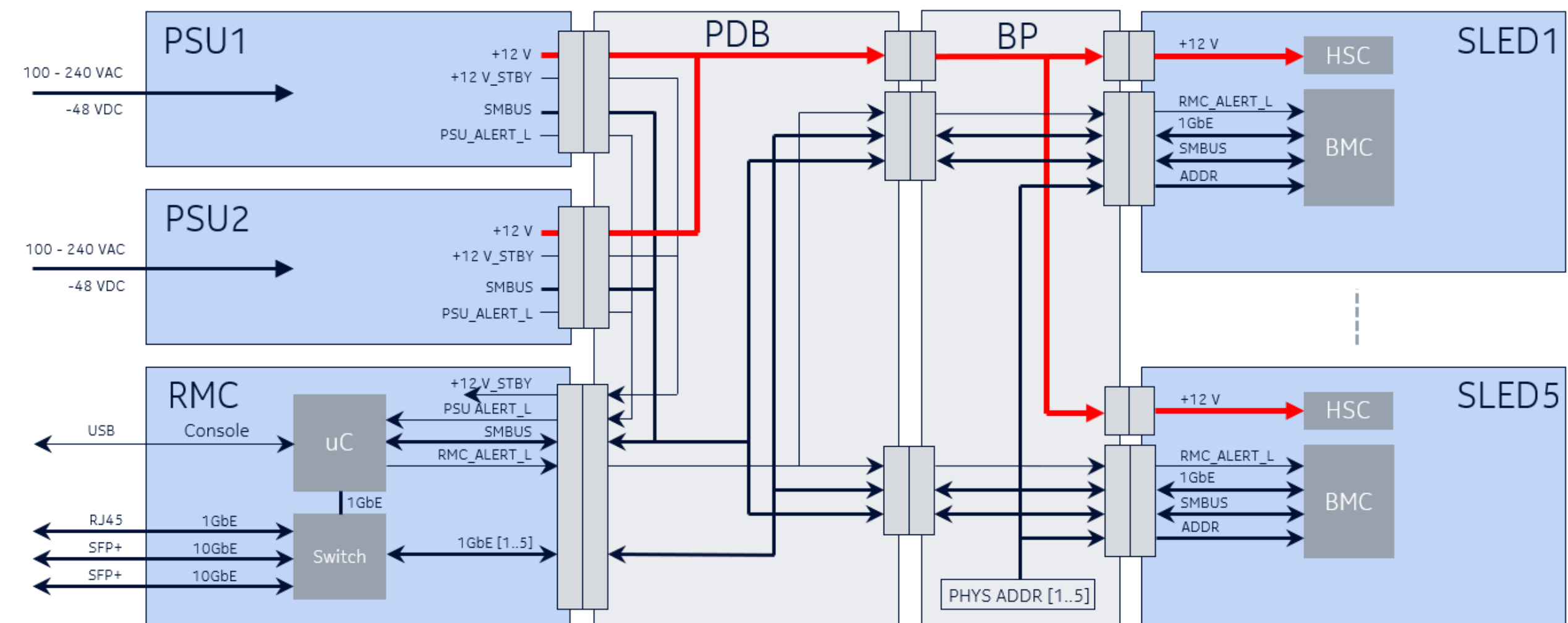
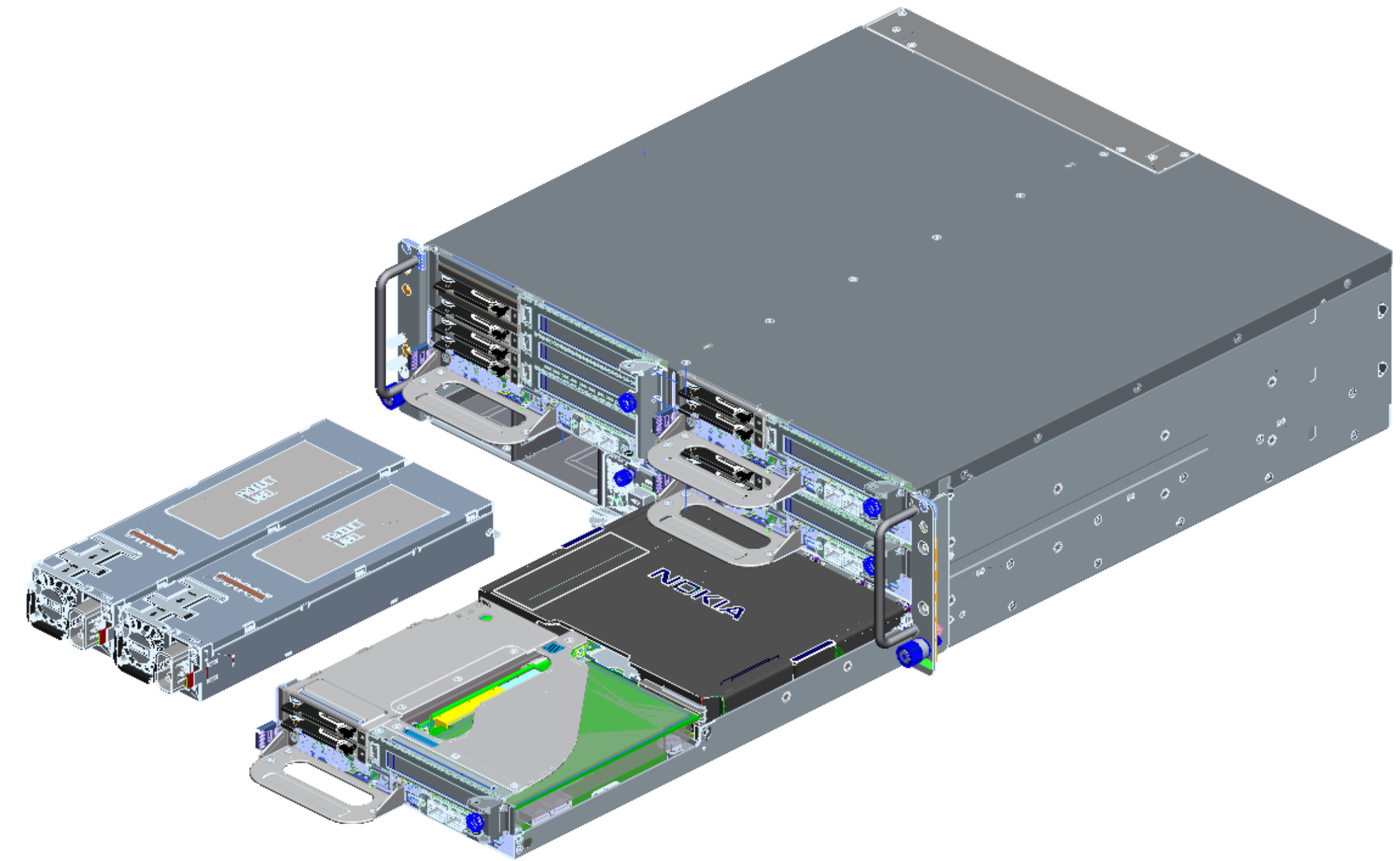
- 3U, 19" mountable (EIA-310 compatible)
- 130.6 x 440 x 430 mm (H x W x D)
- 1U and 2U, half width sleds are supported
- Redundant, centralized power supply
 - 2000 W max power feed capacity, 80+ Platinum
 - AC (100..127/ 200..240 VAC) and DC (-48 VDC) options
- Sled power feed capacity 400 W (1U sled), 700 W (2U sled), 12 VDC



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



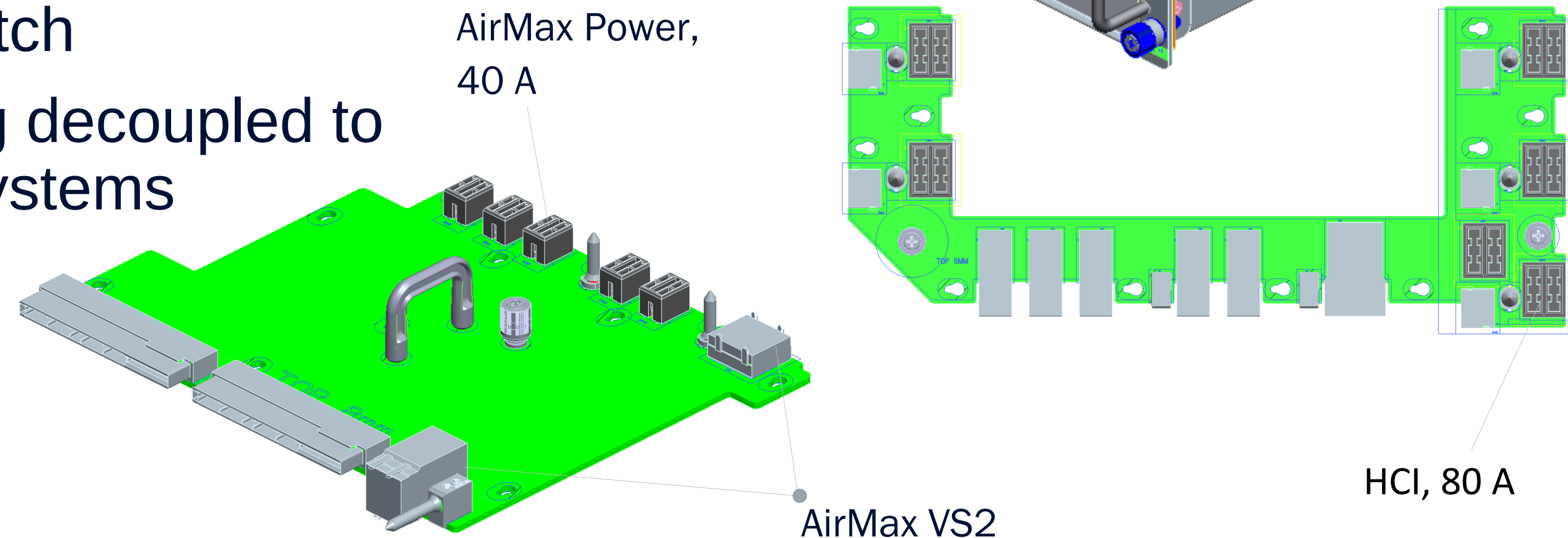
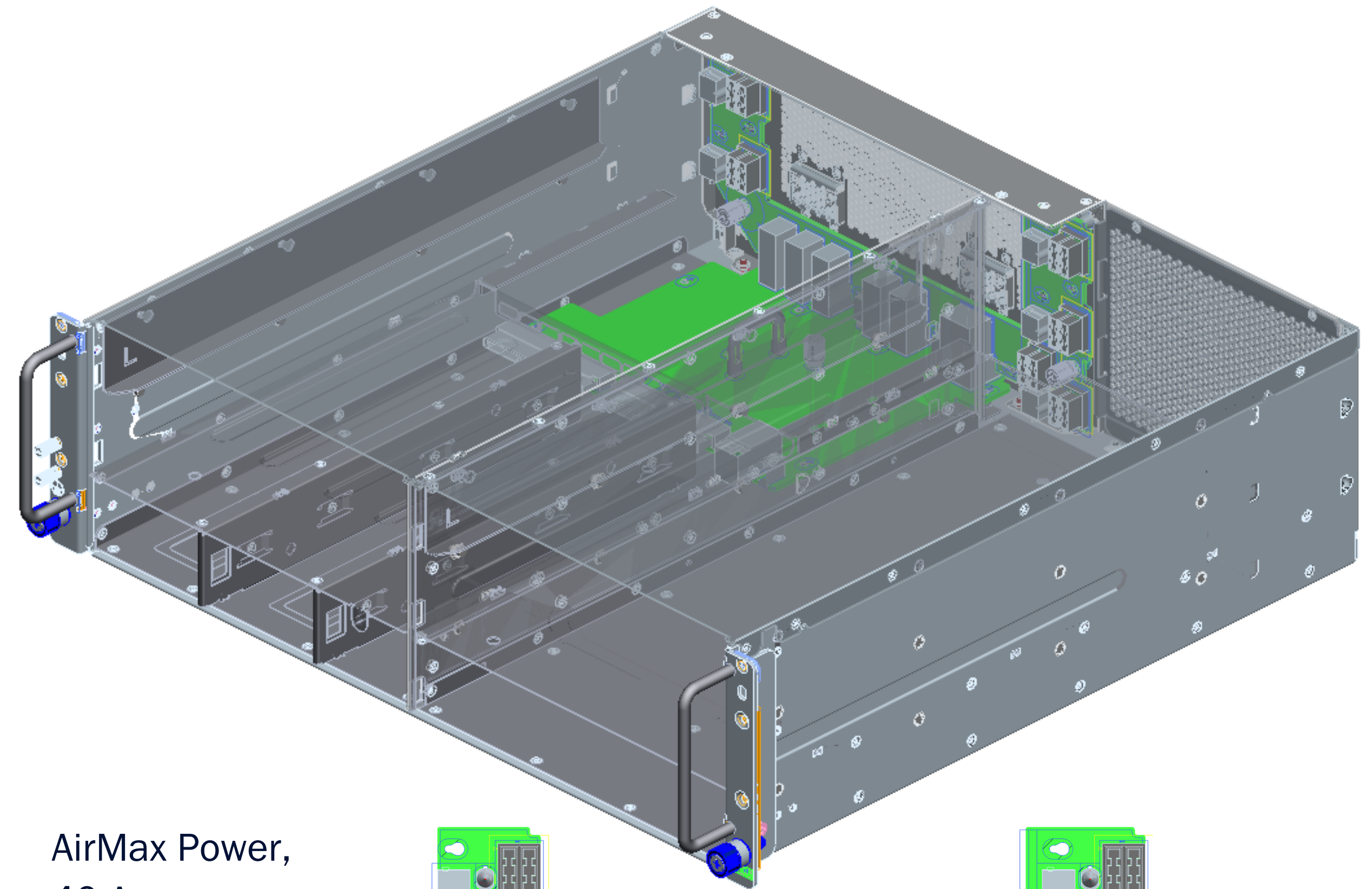
Open edge chassis construction

Simple construction, few parts

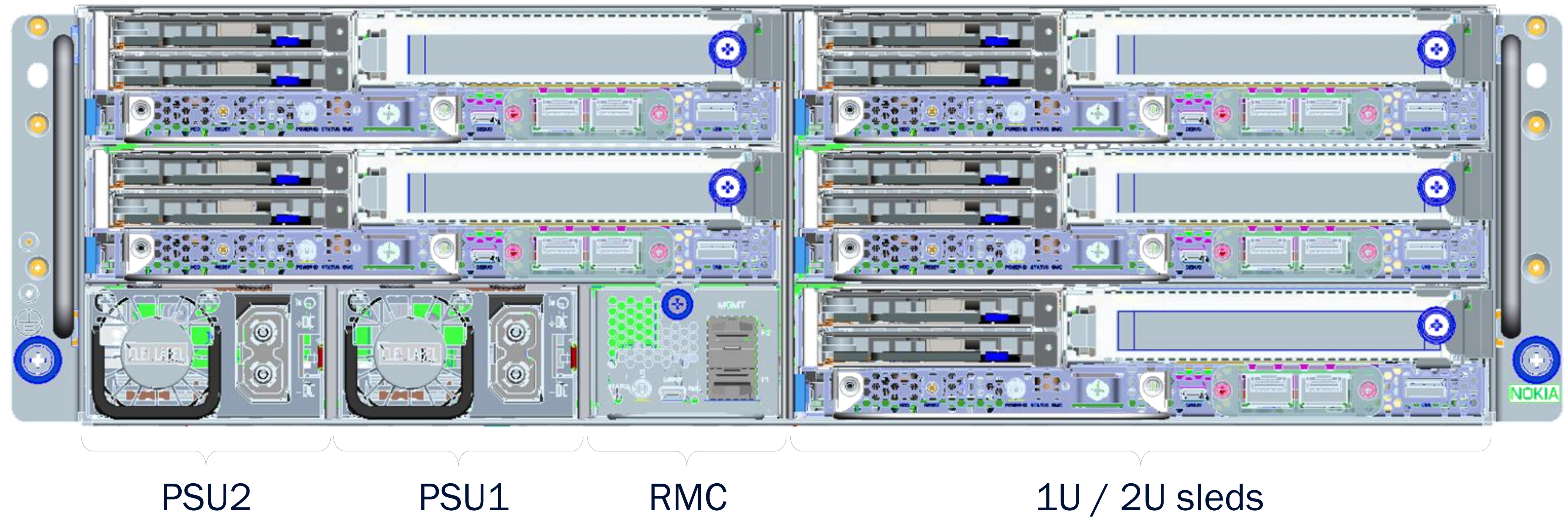
- Steel enclosure
- Mounting brackets
- Backplane assembly
- Power distribution board
- Support brackets for 1U sleds, tool-less

No integrated user plane switch

- Computing and networking decoupled to allow optimization of subsystems



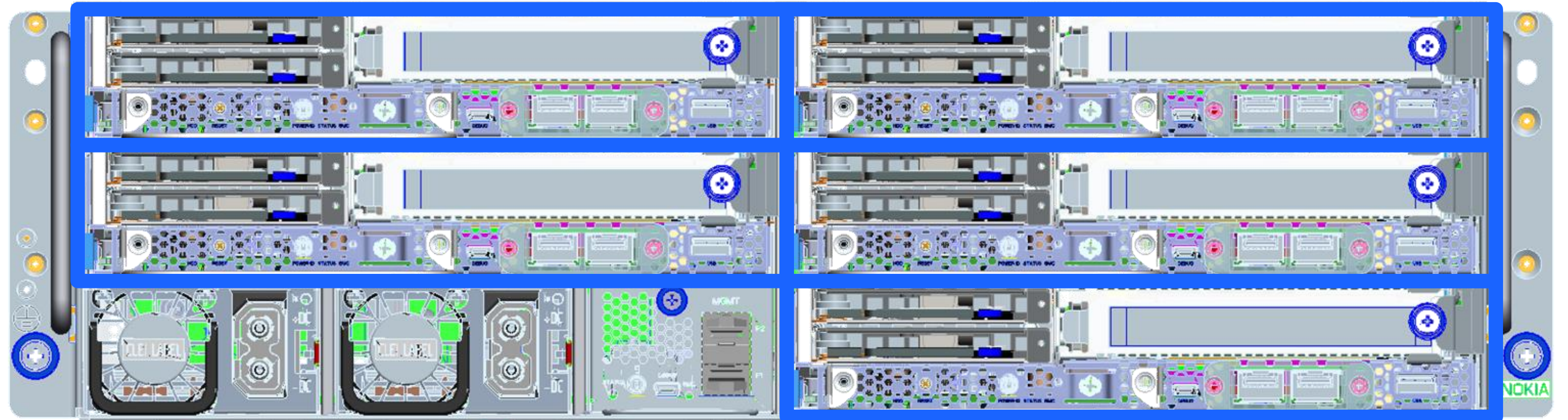
Open edge chassis front view



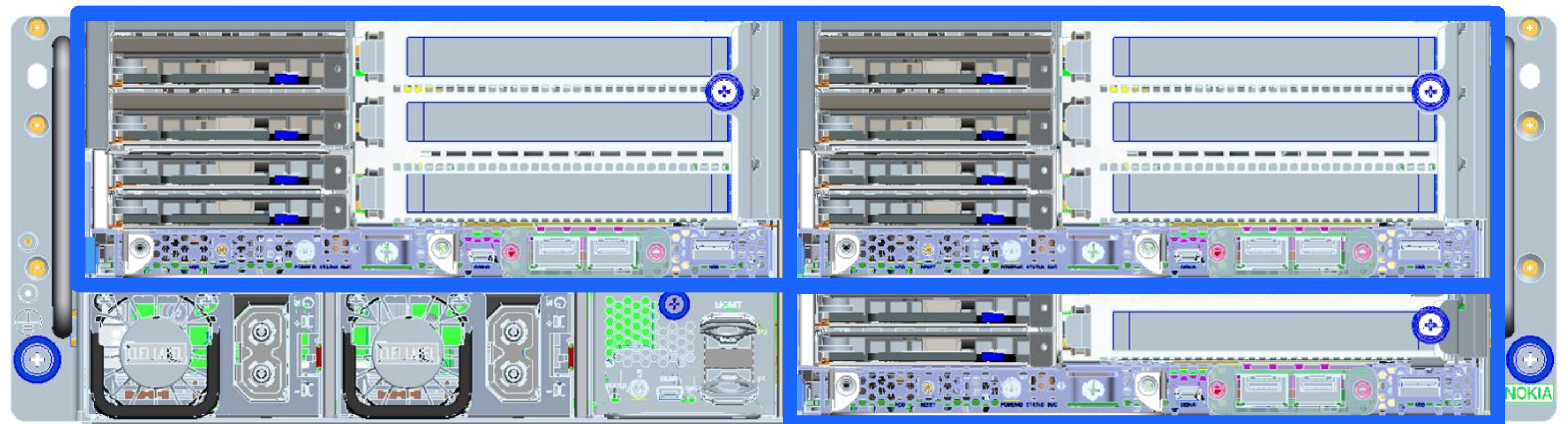
1U and 2U sleds are supported

- Open edge chassis allows flexible installation of both 1U and 2U sleds
- Supported configurations are
 - 5x 1U
 - 3x 1U + 1x 2U
 - 1x 1U + 2x 2U
- A support bracket for 1U sled is removed when installing a 2U sled (tool-less)

5x 1U



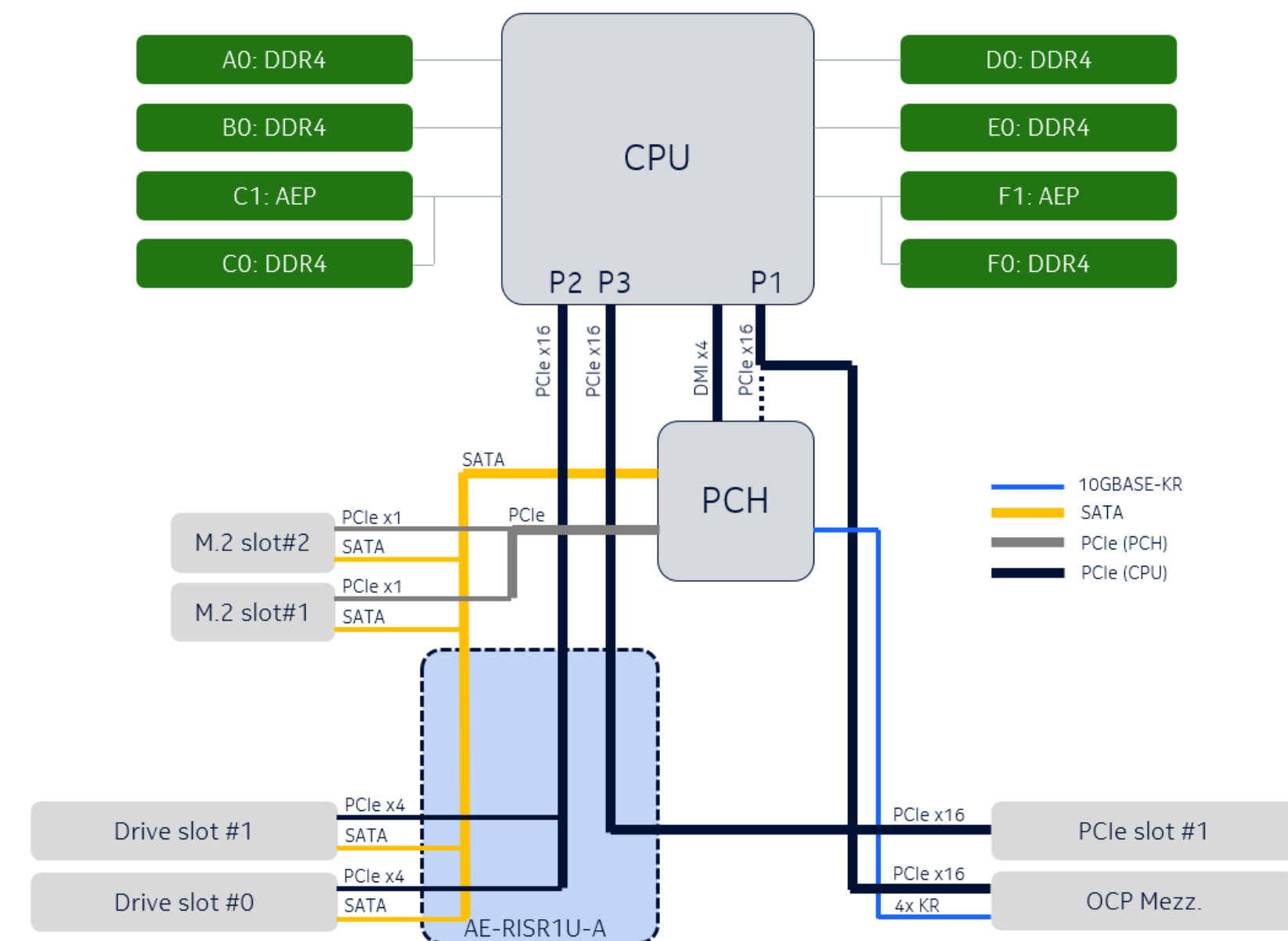
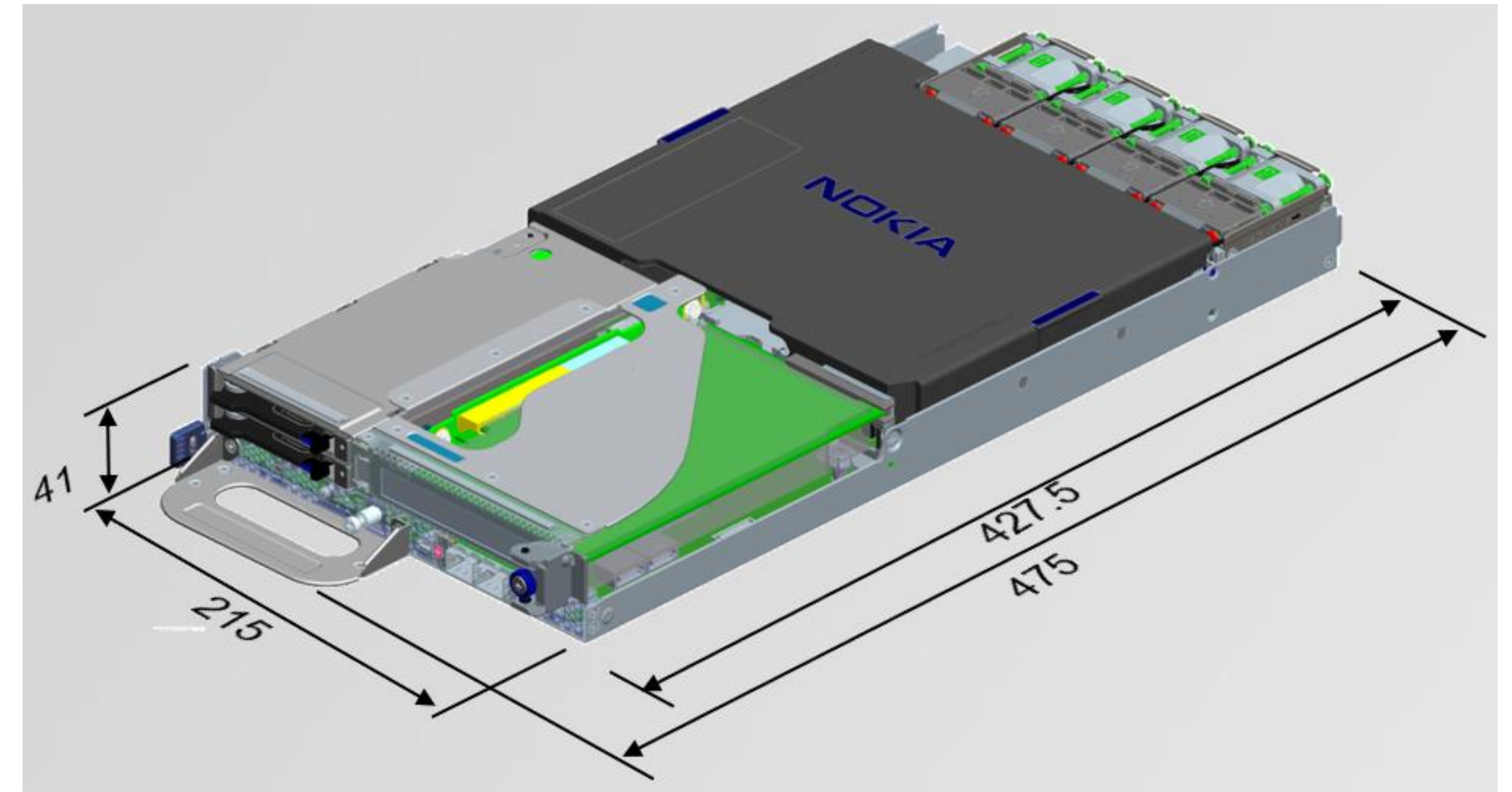
1x 1U + 2x 2U



Server sled, 1U

Key specifications

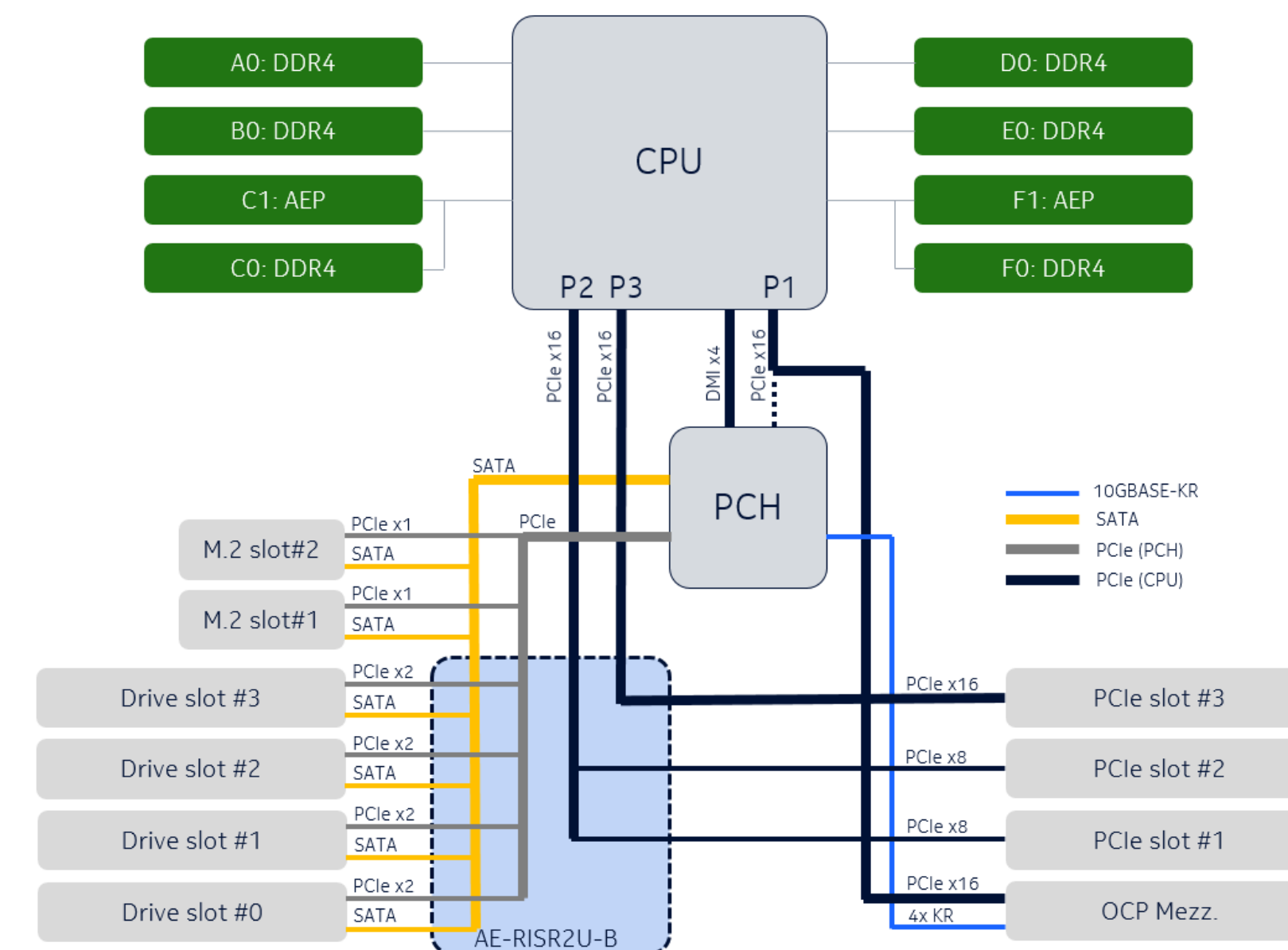
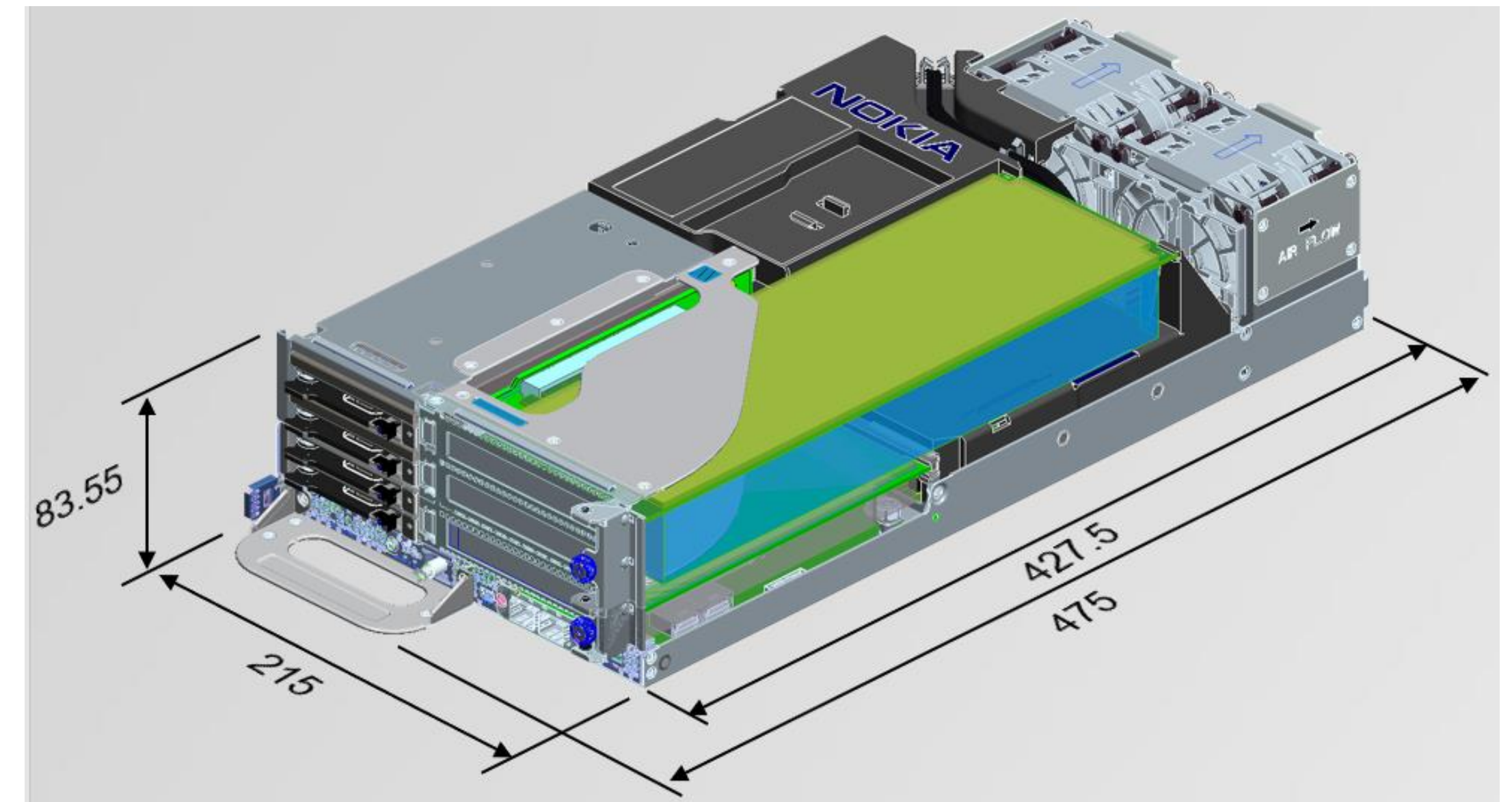
- 1U, half width
- 215 mm x 41 mm x 423 mm (W x H x D)
- Power consumption 400 W, max
- Single-socket CPU, Intel® Xeon® Scalable Family, Thermal Design Power (TDP): max. 205 W
- PCH options: Intel C621, C627 (with QAT)
- Memory: 6 x DDR4-2933 + 2 x Intel Optane
- Single riser for disks and add-in cards
- Extension slots
 - PCIe x16, FHHL, 75 W
 - OCP Mezzanine 2.0, PCIe x16
- Storage
 - 2 x hot-plug SSD, SATA/NVMe, 2.5 ", 7/9.5 mm
 - 2 x M.2 SSD, SATA/NVMe, 2280/22110



Server sled, 2U

Key specifications

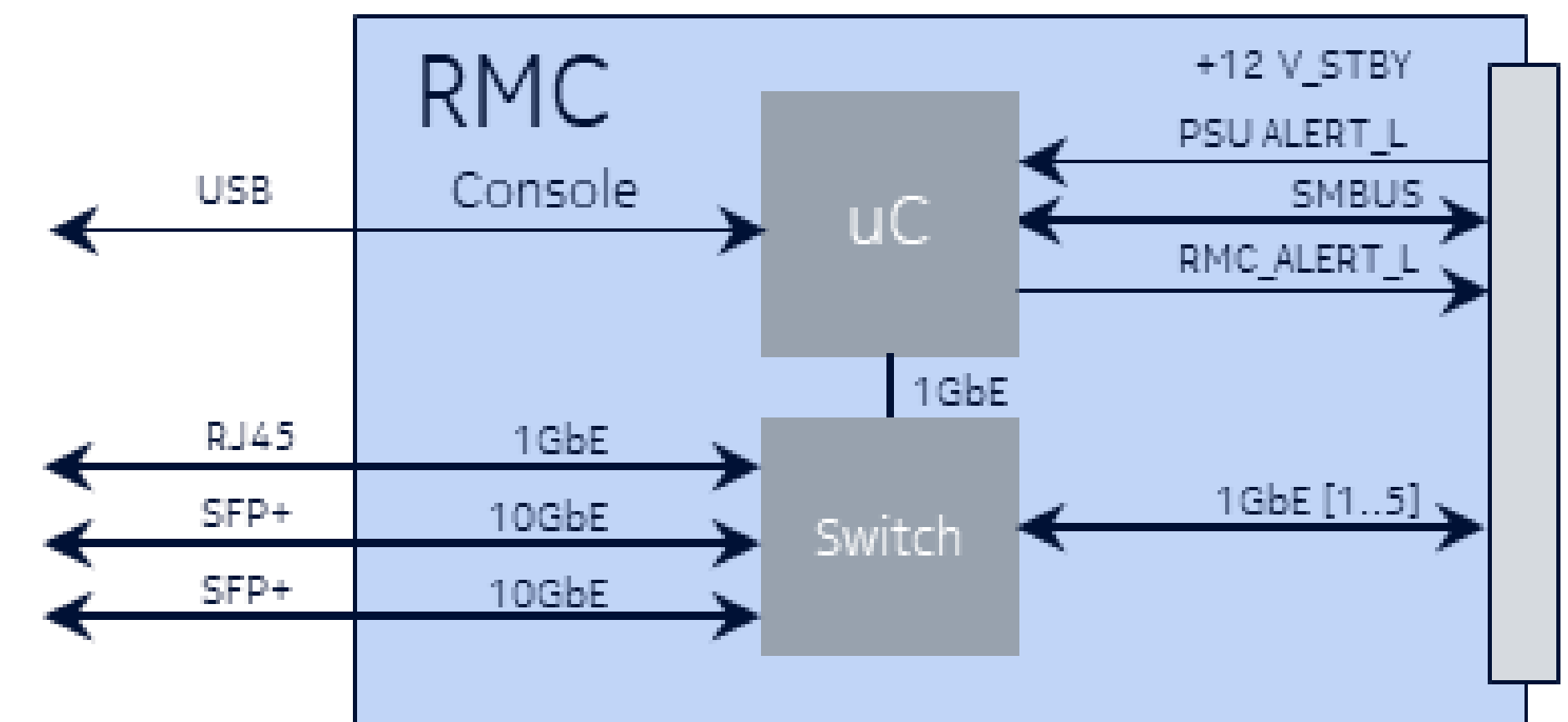
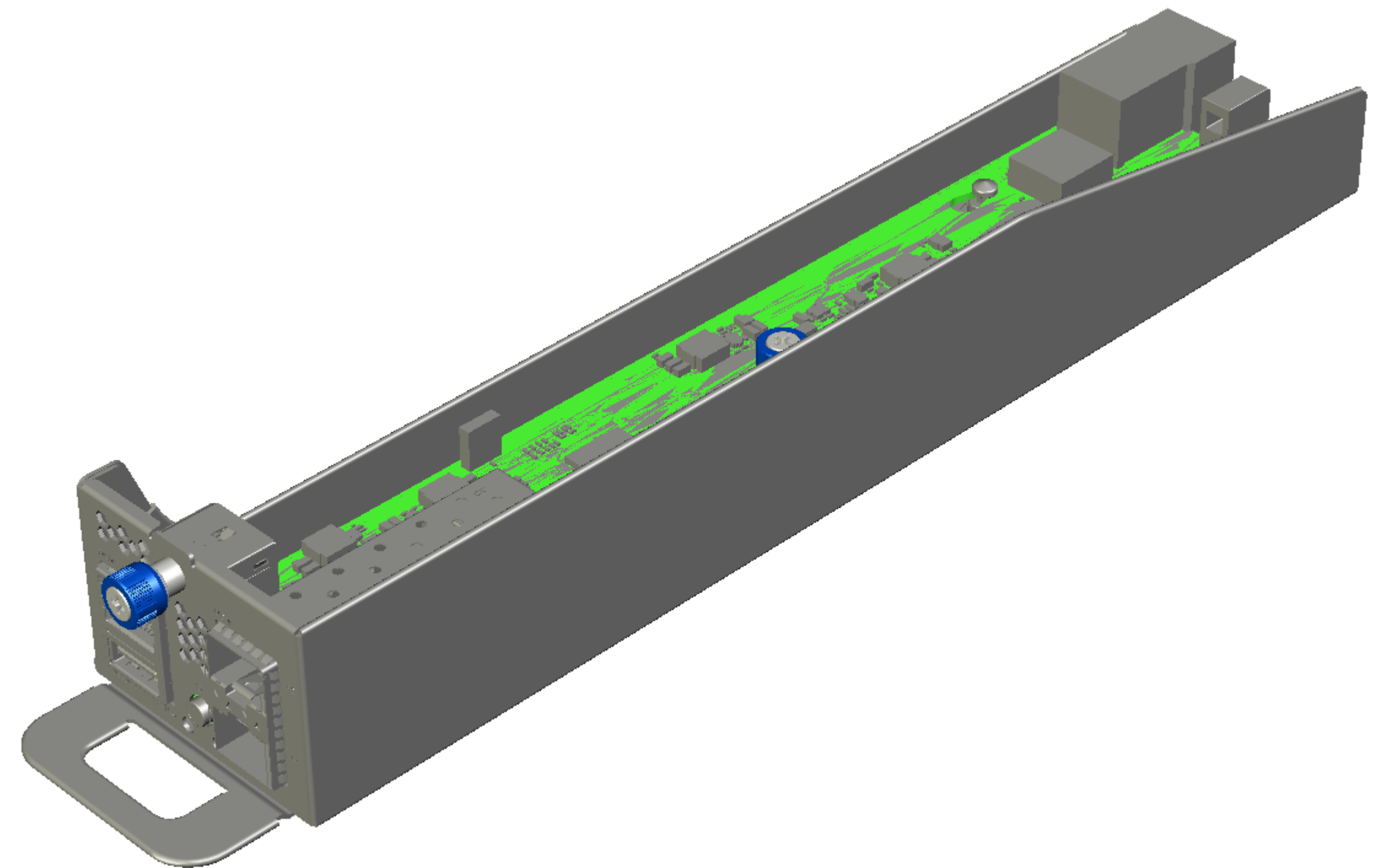
- 2U, half width
- 215 mm x 83.6 mm x 423 mm (W x H x D)
- Power consumption 700 W, max
- Single-socket CPU, Intel® Xeon® Scalable Family, Thermal Design Power (TDP): max. 250 W
- PCH options: Intel C621, C627 (with QAT)
- Memory: 6 x DDR4-2933 + 2 x Intel Optane
- Single riser for disks and add-in cards
- Extension slots
 - 1 x PCIe x16, FHFL, dual-wide, 300 W max
 - 1-2 x PCIe x8, FHHL, 75 W max
 - 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
 - 2 x M.2 SSD, SATA/NVMe, 2280/22110



RMC

Chassis management controller (RMC)

- PSU management (control, sensors, ..)
 - Control and supervision of PSUs
 - Access to sensor data (voltages, currents, power consumption)
- RMC controller from AST2500 family
 - USB debug port in front panel
- On-board unmanaged Ethernet switch simplifies HW management connectivity
 - Single management interface for entire chassis
 - 1 GE management Ethernet interface to all sleds via backplane (1000BASE-T)
 - 1x 1 GE (RJ45, 1000BASE-T)
 - 2x 10 GE (SFP+) front panel interface for external connectivity and chaining of multiple chassis



Rack installation solution

Compact rack solution for edge sites

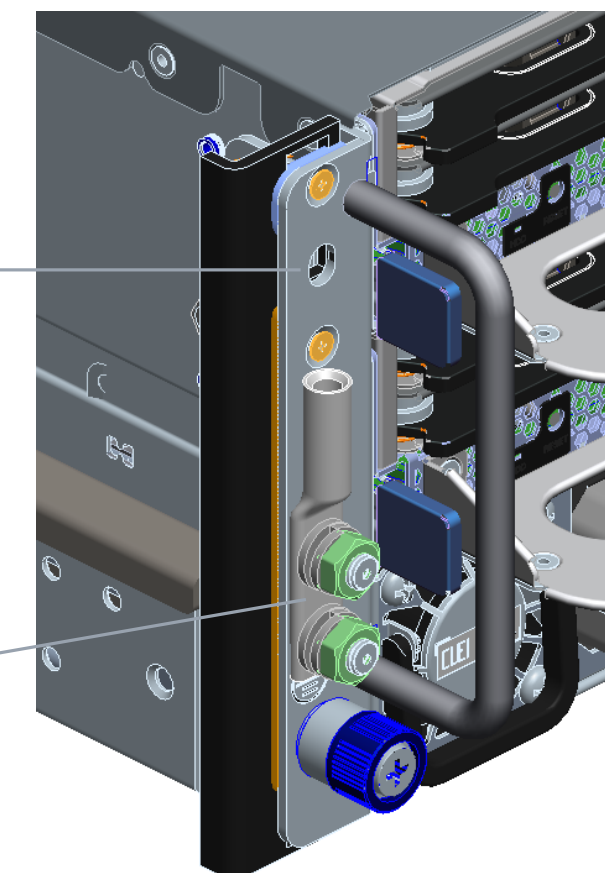
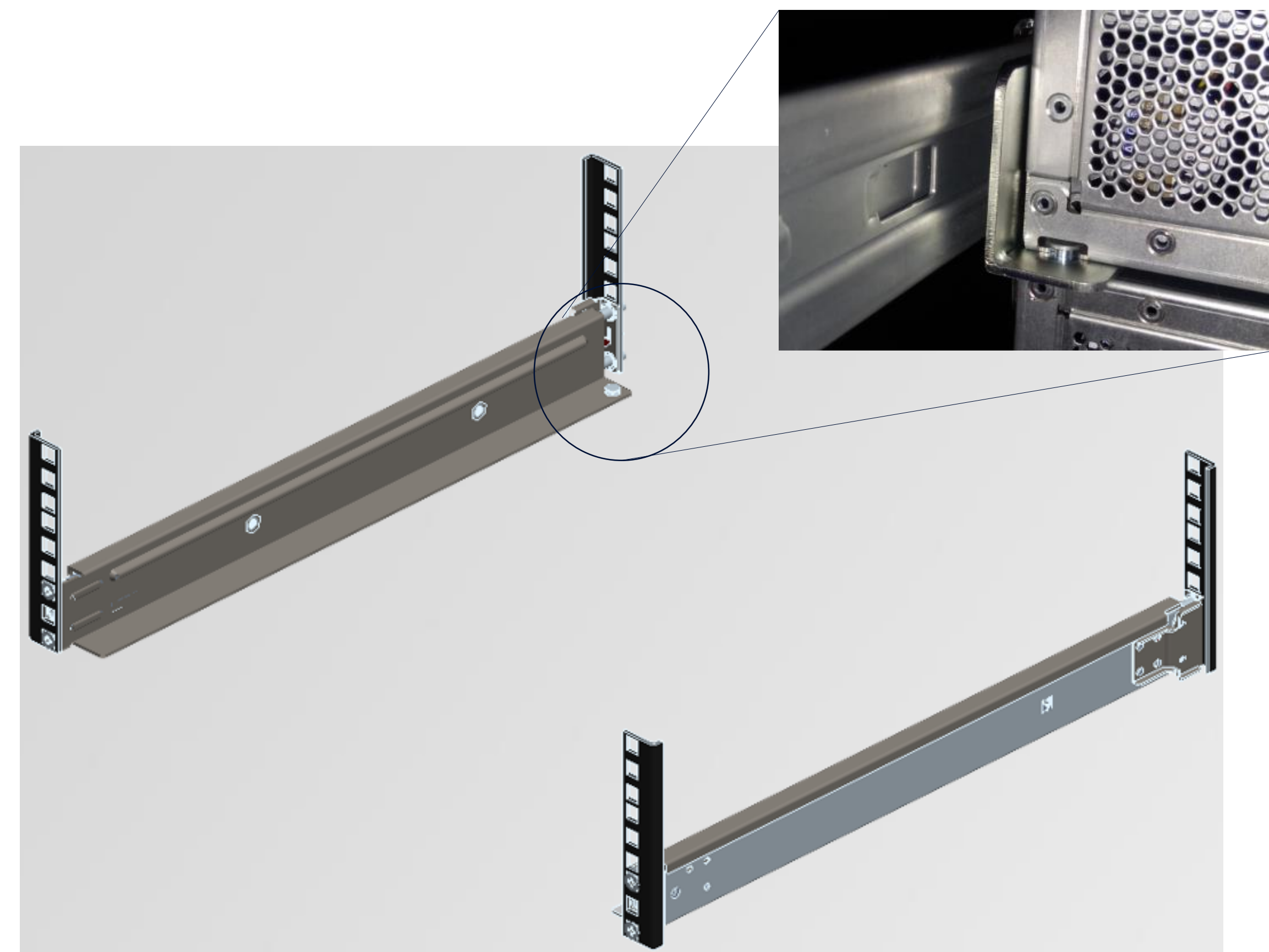
- small form factor of chassis (depth 430 mm) enables installation to racks with small footprint (600 x 600 mm)
- Front maintenance

Rail kit

- Compatible with 19" rack mechanics (EIA-310)
- Adjustable rail adapts to front-rear post distances of 450 – 750 mm.
- Chassis mounting
 - Front: thumb screws to front post + optional screw fixing for additional robustness
 - Rear: T-standoffs on rail for vertical retention

Grounding

- Grounding point in mounting bracket (2-hole lug)



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 plan for contribution to OCPf

- Nokia plan is to contribute Open edge server chassis specification and design files and apply for OCP accepted™ product recognition.
- Target timeline for spec contribution is 4th quarter 2018 and target to have product available on OCP marketplace in early 2019
- Draft of Open edge server chassis specification:
<http://files.opencompute.org/oc/public.php?service=files&t=e4bf4116a070a7d7d418d0f2c284cd4b&download>
- Draft of Open edge server specification:
<http://files.opencompute.org/oc/public.php?service=files&t=ada3b7aabae6f81ae73c00a30ea6fa5a&download>

Thank You!

Come and visit us at Nokia booth A26

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