HIGH TEMPERATURE DATACENTER

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• Use cases – now and future
• Extended datacenter in an unified system
• Network and site types
• Environment and characteristics
• High temperature site – building blocks
• Planned OCP design contributions
Use cases now and future

- Edge computing
- Vertical applications
- Internet of Things
- Mobile Virtual Network Operator (MVNO)
- Public safety communications
- Customer centric networks

(open source software. open hardware. open future.)
Extended datacenter in a unified system

- Remote site
- Central Datacenter
- Remote site
- Remote site

- Remote Small Site
- Remote Datacenter
- Central Office
- Regional PoP Datacenter
- Central Datacenter

- Increased QoS
- Reduced latency
- Real-time analytics
Network and site types

Small Antenna sites
- Roof-top with hub
- In-building systems
- Tower sites

Central Office

Distributed Antenna Locations

Aggregation

Indoor systems (Enterprise, Stadium etc)

NoC = Network operation Center
DC = IT Data Center

[Cb=Curb site, BB=Backbone site]
Environment and Characteristics

Central Office/Switch site

- Smaller sites, outdoor sites – compact deployments
- Shallow and low cabinets
- Hot air blowing upwards into an exhaust or mixed with cold air
- 50 °C (122 °F) max room temperature
- DC power feed
- Telecom grade compliant (NEBS3 or ETSI)

Datacenter

- Large sites – IT cloud deployments
- Handles heat by separating hot and cold air
- Requires front to back airflow and same cabinet size: 2.2 m (7.2 ft) tall and ~1m (3.3 ft) deep
- 30 °C (86 °F) max room temperature
- AC power feed
Site Environmental Characteristics

- Flexible Placement
- Front Cabling
- DC Power
- Low Noise
- Redundant Power
- Redundant Cooling
- Power Spike Protection
- Humidity Control
- EMC Protection
- Spike Protection
- Humidity Control
High Temperature Site

Building blocks

Subrack
- Allows flexible placement, back-to-back, against a wall
- Front cabling only for easy access
- Inbuilt EMC protection (ETSI and NEBS)

Switches & Processor boards
- Embedded long life components
- Heat sink
- Designed for 0-50 °C (32-122 °F) operating temperature

Power & Fan Module
- Air intake from front to enable chimney
- Low noise - SW controlled fans
- -48 V DC - energy efficient (few conversions) and could be fed from batteries
- Sustain > 10 ms power feed outages
- Power spike protection on subrack level
Planned Ericsson OCP design contributions

Subrack

- Redundant backplane including power distribution, positioning, 40GbE, management and maintenance buses
- 28 vertical 15mm (0.59”) slots
- Redundant switch structures
- Dual sync support
- High density
- Subrack power supply and cooling through a Power and Fan Module (PFM)
- Complete redundant configuration
- Built-in power spike protection
- -48VDC, Low Ohmic Distribution
- 3 fans per PFM
Planned Ericsson OCP design contributions

Board Design

- 225 mm x 265 mm (8.9” x 10.4”) boards
- Embedded long life components
- Connector specification
- EMC shield mechanics
- Heat sink
- Designed for 0-50 °C (32-122 °F) operating temperature
Attributes for managing demanding environments/sites

- Form factors that allows flexible placement, back-to-back or against a wall, due to space limitations in many cases.
- Easy access and flexible placement of cabinets requires front cabling only.
- Attended areas requires low noise - need SW controlled fans.
- Energy efficiency (with few conversions steps) and battery back-up requires 48 V DC voltage.
- Power outages requires power modules (PFM) to sustain at least 10 ms power feed.
- Power spike protection on subrack level.
- Site power & cooling redundancy built according to customer specifications, normally 2n for power, n+1 for cooling.
- Inbuilt EMC protection according to ETSI and NEBS.
- Humidity levels controlled by cooling equipment or separate equipment.