
OPEN
Compute Project
OCP U.S. SUMMIT 2017
Santa Clara, CA

HIGH TEMPERATURE DATACENTER

Tomas Fredberg, Senior Expert IT & Telco DC Infrastructure, Ericsson.

OPEN HARDWARE. OPEN SOFTWARE. OPEN FUTURE.

OPEN Compute Project

Content

- 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

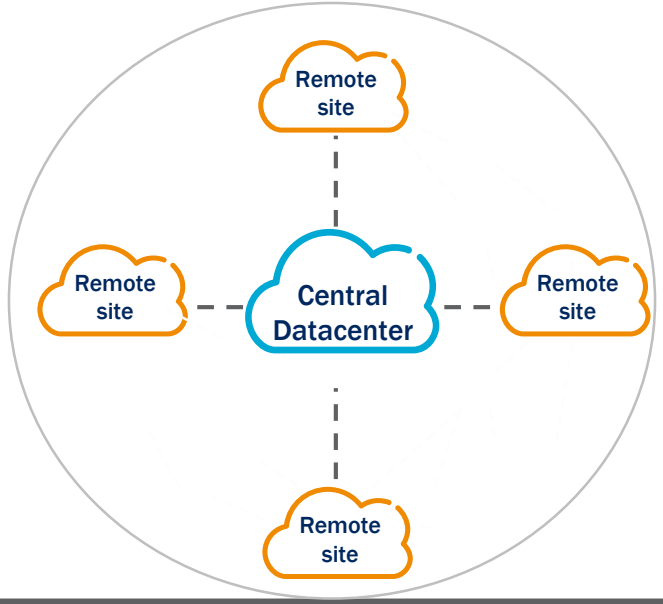
Internet of Things

Mobile Virtual Network Operator

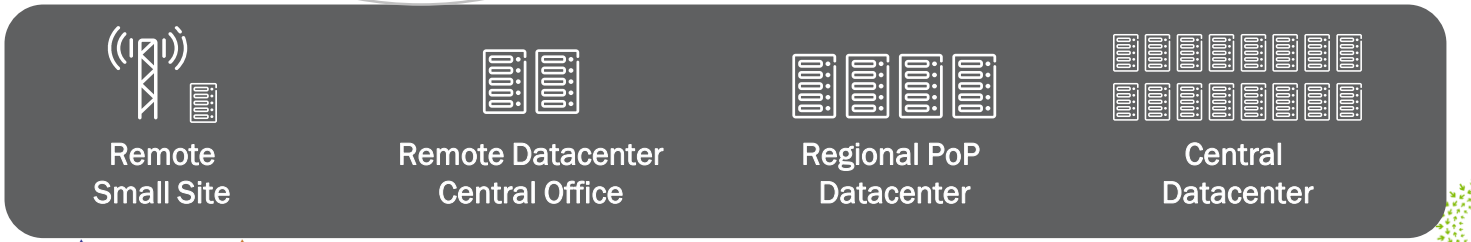
Public safety communications

Customer centric networks

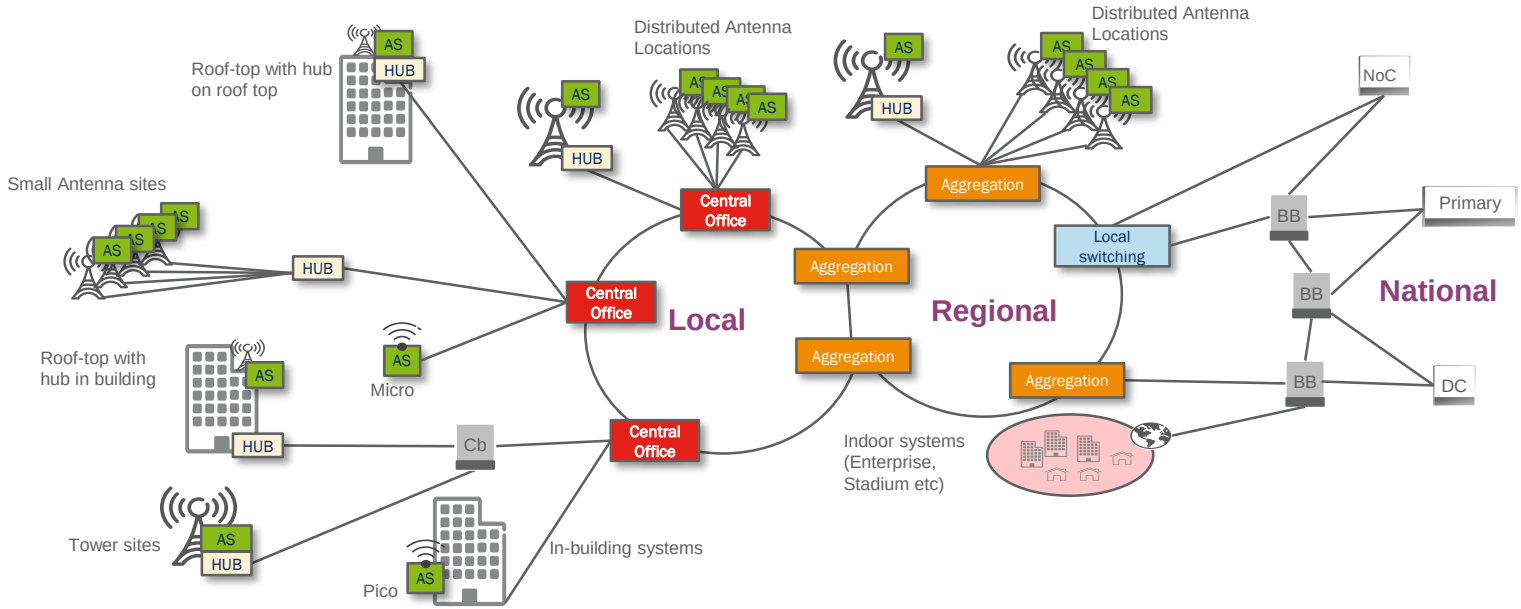
Extended datacenter in a unified system



- Reduced latency
- Increased QoS
- Real-time analytics



Network and site types



NoC = Network operation Center
DC = IT Data Center

Transport site
[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)

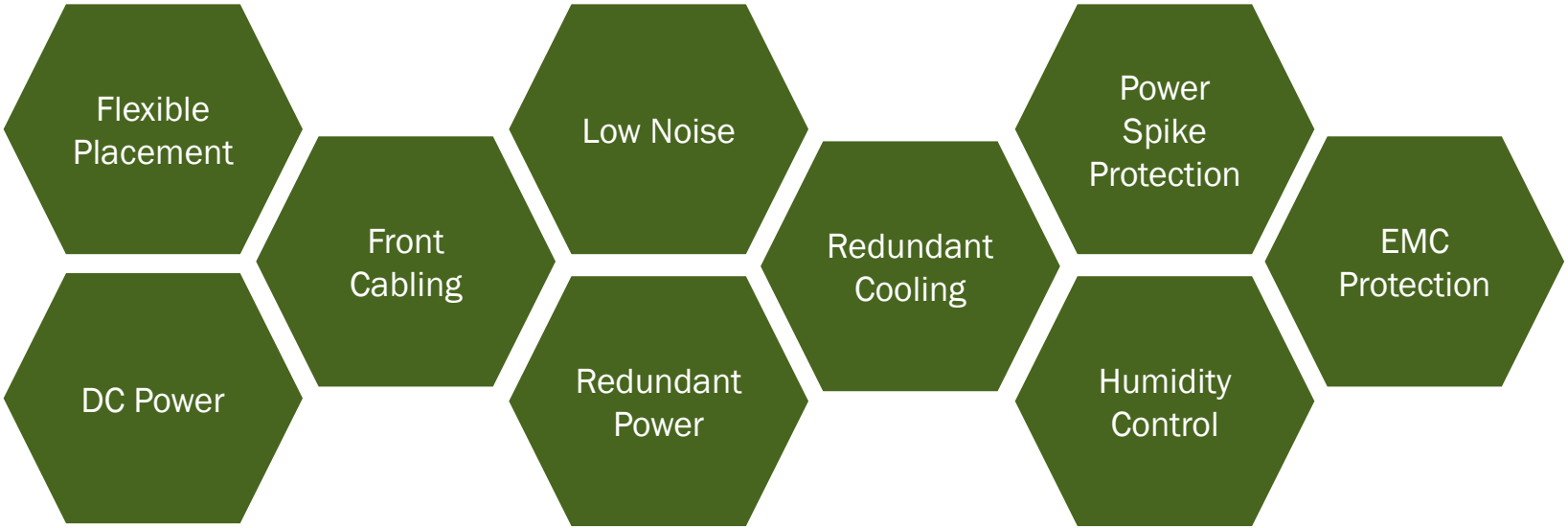
Datacenter

- 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

OPEN HARDWARE. OPEN SOFTWARE. OPEN FUTURE.

OPEN Compute Project

Site Environmental Characteristics



High Temperature Site

Building blocks

Subrack

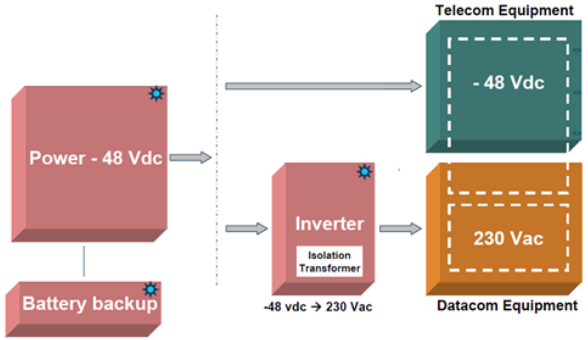
- Allows flexible placement, back-to-back, against a wall
- Front cabling only for easy access
- Inbuilt EMC protection (ETSI and NEBS)

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



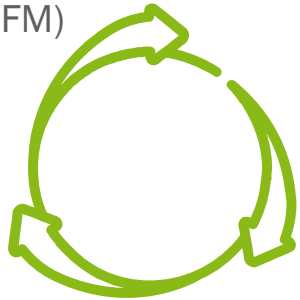
OPEN HARDWARE. OPEN SOFTWARE. OPEN FUTURE.

OPEN Compute Project

Planned Ericsson OCP design contributions

Subrack

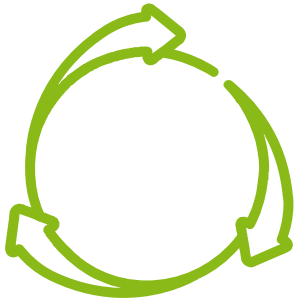
- Redundant backplane including power distribution, positioning, 40GbE, management and maintenance buses
- 28 vertical 15mm (0.59”) slots
- Redundant switch structures
- Dual sync support
- High density
- Subrack power supply and cooling through a Power and Fan Module (PFM)
- Complete redundant configuration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



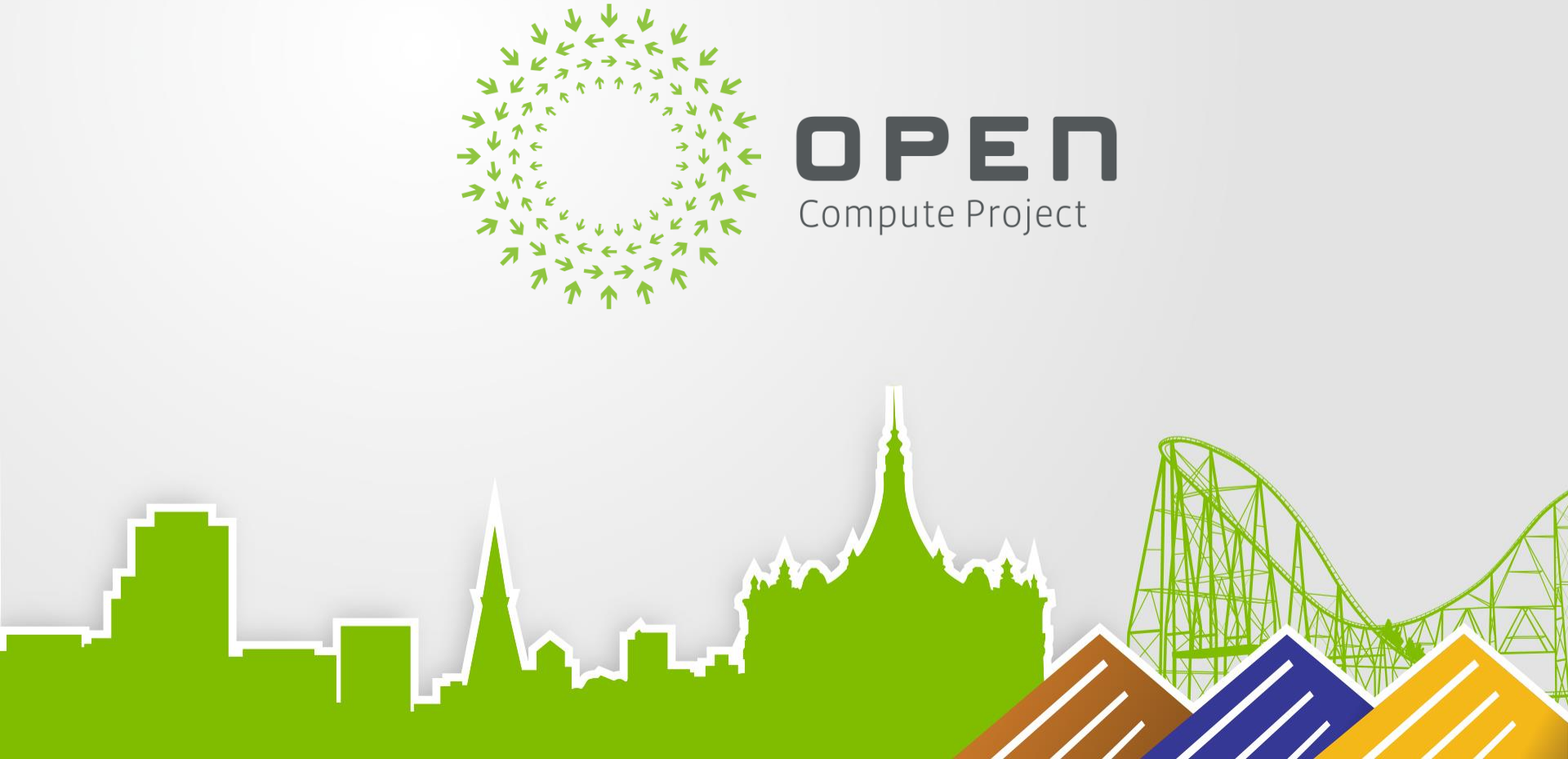
Planned Ericsson OCP design contributions

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



ERICSSON


OPEN
Compute Project

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