Concept & Philosophy

- Leverage current good ideas from Open Compute Project as a base model
- Update and optimize for telecom-oriented central offices, data centers & equipment practices
- Do not constrain with rigid backwards compatibility, but allow easy adaptation of existing COTS elements (OCP-contributed and others)
- Use agile-style approach to create deployable system instantiations and iterate quickly
- Collaborate tightly with customers all along the way
- Work closely with interested partners
- Create something useful, share, evolve, and expand
Broad Requirements

- **Physical**
  - Suitable for CO retrofit and new telco data center environments with standard and readily available dimensions
  - 19" rack width with 450mm equipment aperture
  - Standard "RU" spacing
  - 1000 to 1200mm cabinet depth, supporting GR-3160 floor spacing dimensions

- **Content/workload**
  - Heterogeneous compute and storage servers
  - Range of brawny and wimpy processing elements and storage technologies
  - Half and full rack width sleds, xRU high (2U typical)

- **Management**
  - Ethernet based OOB management network connecting all nodes via a TOR management switch
  - Optional rack level platform manager

- **Networking/Interconnect**
  - One or more Ethernet TOR networking switches for I/O aggregation to nodes
  - Fiber cables, cabled from the rear, blind-mate with flexible interconnect mapping. Front cabled solutions also acceptable.
  - Environment & Power Seismic & acoustic CO environmental requirements applicable
  - Safety and other certification standards also applicable
  - NEBS optional (L1/L3)
  - AC (200-250V) or DC (-48V) power to the rack.
  - Wide range of power consumption per rack – scalability required (from 5 to 35kW); typical deployments at 7-15kW.
  - Dual 12V (nominal) DC power bus bar for nodes; other options possible in future
Telecom Open Rack Block Diagram

Switching

Usable Compute / Storage Capacity

Power

Vertical 12VDC bus bar in frame mates with power connector located on sled

4 x optical fiber ports via blind mate rear connector to sled

Note: Note not drawn to scale
Example Optical Connections to Sleds
## Example System Configuration

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack Standard</td>
<td>19”, 42U Telco Rack with vertical DC power bus-bars</td>
</tr>
<tr>
<td>Data-plane Switch</td>
<td>1U switch, 32x 40Gb or 96x 10Gb + 8x 40Gb</td>
</tr>
<tr>
<td>Management-plane Switch</td>
<td>1U switch, 48x 1Gb + 2x 10g</td>
</tr>
<tr>
<td>Compute or Storage</td>
<td></td>
</tr>
<tr>
<td>Server PBA</td>
<td>Dual socket Xeon server</td>
</tr>
<tr>
<td>Server</td>
<td>10GbE NIC Dual port, 10Gb, 10GBASE-SR</td>
</tr>
<tr>
<td>Server</td>
<td>Server 1Gb NIC Dual port, 1Gb, 1000BASE-SR, 1 or both connected to server BMC</td>
</tr>
<tr>
<td>CPU</td>
<td>2 or more Xeon processors</td>
</tr>
<tr>
<td>RAM</td>
<td>256GB (16 x 16GB)</td>
</tr>
<tr>
<td>Storage</td>
<td>boot &amp; app Boot SSD, 1 or more application SSDs</td>
</tr>
<tr>
<td>Storage Bulk</td>
<td>2 or more HDD with high-capacity controller</td>
</tr>
</tbody>
</table>
Designed and Integrated Solution

- Optimized Rack
- Industry Leading Density
- Integrated and Supported Open Source Software
- DCEngine

Modular Sled Architecture
Up to 152 Xeon Processor

Up to 3 PB Storage

DCEngine

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Current Collaboration & Ecosystem

- **Verizon**
  - Provided guidance with early engagement and overall feature/functional requirement

- **Intel**
  - IA compute technology & servers
  - Intel ® Rack Scale Architecture (management SW)

- **ON.Lab**
  - Integration of open and collaborative CORD (Central Office Re-architected as a Datacenter) projects

- **Pentair**
  - Cabinet, rack, mechanicals, and adaptations

- **Cavium**
  - ARM-based compute server technology
Example Future Integration in Half-Width Geometry

- **ADLink: MICA Platform**
  - Optimized for smaller nodes for Mobile Edge Computing applications
  - 2-4U enclosure, 19" wide, 600-900mm deep, AC or DC power → easily accommodated in full rack position
  - Cabled Front I/O → remain as-is (independent), or re-oriented for rear connection to TOR aggregation switches
  - Management stand alone or subtended to rack manager

As a complete 2U 19” Sub-System

Or as server PCBAs within a Sled
Next Steps

- Specification complete, contribution in progress

- Contribute concept basically “as is”, with appropriate modularity for future derivations and some genericizing to broaden appeal and usability

- Collaborate with Telco-WG members and others to define architectural evolution and inclusion of alternate/compatible designs

- Continue to evolve Radisys products and contribute key innovations back to the OCP community