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How to Design an ORv2 OCP Based Rack-scale Solution

Menno Kortekaas/CTO/Circle B
Circle B provides solutions based on:

- Rack & Power
- Server
- Storage
- Network
- Services
For Who?

Size Matters, at least 10-20 racks goal to get the benefits of:

• Efficiency
• Tool-less design
• Openness
• Impact
Change of mindset

- Rack scale (rack = chassis)
- Modular
- Fewer components
- Commodity computing
- Operational efficiency
- Minimize human interaction
Why partner with a Solution Provider?

• Single point of contact
• Local support
• Validated designs (R&D, OCP = spec.)
• Conversion services
• Time and resource saver
Which workload?

• Linux
  • RHEL / CentOS
  • Ubuntu
• Windows Server
• VMware ESXi
Example Workload
OpenStack

Example workload CEPH & Kubernetes

Source: https://cdn.circleb.eu/pdf-ceph-and-kubernetes-on-st7200/
Thinking Rack Scale

Type IV

- Data warehouse storage and analytics (for ex. Hadoop)
- Powerful Compute + Mass Storage
Thinking Rack Scale

Type III

- High performance database applications
- Compute nodes w/ PCI-E Flash Cards
Rack & Power

- Open Rack v2
- 220h x 600w x 106,6d mm
- 2 zones with single 12V DC bus bar
Colo configuration
- Dual AC input
- 3-phase, 32A
- 2 zones of 6.6kW
- 2 C13 on each shelf
- Management card

Telco configuration
- Dual -48VDC input
- 2 zones of 6.6kW
- Management card

With Battery Backup System
- Dual AC input
- 3-phase, 32A
- 2 zones of 6.6kW
- 2 C13 on each shelf
- 7kW backup power (up to 21 w 3)
- Management card
Server

- Tioga Pass design
- Intel Scalable Family
- 20U 3-Node
- M.2 on-board
- single 3.5” or up to 4x 2.5”
- 12V DC input
Server (example)

Low
- Single Silver 4116
- 12 cores, 85 W
- 4x 32G = 128G RAM
- 256G M.2
- Single 10G LAN

High
- Dual Gold 6130
- 16 cores, 125 W
- 12x 32G = 384G RAM
- 256G M.2
- Dual 25G LAN
Storage

- **2U OCP SAS12G Storage**
  - 12G SAS Expander
  - 15 drives per tray
  - 3.5” to 2.5” carrier

- **4U OCP 72Bay SAS12G Storage**
  - 12G SAS Expander
  - 36 drives per side
  - Xeon-D microserver option

- **2U OCP All-Flash NVMe Storage**
  - 15 U.2 / 30 M.2 per tray
  - PCIe Switch, 2x 16 lanes
Network

There is a lot of choice! But what do you need?
- Choose Silicon / Manufacturer
- Choose OS
- Single ToR / Dual ToR
- Edgecore Wedge can connect to the 12V DC bus bar!
CLOS Architecture for the Data Center

Source: Cumulus Networks
## Rack Calculation

<table>
<thead>
<tr>
<th>Amount</th>
<th>Part Description</th>
<th>Weight (min)</th>
<th>Weight (max)</th>
<th>Power (idle W)</th>
<th>Power (Max W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rack and Power</td>
<td>272</td>
<td>272</td>
<td>303 kW</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Switch tray for 2 switches</td>
<td>5</td>
<td>5</td>
<td>342 kW</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Blank plate</td>
<td>288</td>
<td>342</td>
<td>4068 kW</td>
<td>11700 kW</td>
</tr>
<tr>
<td>1</td>
<td>Blank plate</td>
<td>294</td>
<td>348</td>
<td>4068 kW</td>
<td>11700 kW</td>
</tr>
<tr>
<td>1</td>
<td>18100G-QSFP28 to 4x 25G UTP28 cable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Limitations in:**
- Space
- Power
- Cooling
Ready to accept OCP ORv2

- Facility Guidelines at:
  https://www.opencompute.org/wiki/Data_Center_Facility
Delivered anywhere in the world

Circle B Partner assembling locations:
- ZhongShan, China
- Juarez, Mexico
- Brno, Czech Republic

Non-U.S. supply chain
Marketplace

• See what is available at:
https://www.opencompute.org/products/
Turn key solution
21”Open Rack v2
Turn key solution
19” MiTAC ESA
Here to help!

- https://circleb.eu
- Twitter @CircleB_eu
- Youtube https://www.youtube.com/c/CircleB
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