OCP & 2CRSi talk

A strong and valuable partnership

The OPEN PLUS portfolio at a glance.

May 6th, 10am CEST.
Today’s speakers

Steve HELVIE
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Adrien BADINA
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Tolga DOGAN
Senior Product Manager, 2CRSi.
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One thing about open source is that even the failures contribute to the next thing that comes up.

Unlike a company that could spend a million dollars in two years and fail and there's nothing really to show for it,

If you spend a million dollars on open source, you probably have something amazing that other people can build on.
240+ companies
8K engineers
190+ contributions.
Some of our Projects

Networking  Server  Storage  Rack & Power  Advanced Cooling

Data Center  Telco  HW Mgmt  Open System Firmware  HPC  Security

Modular DC  openEDGE
OCP Tenets

- Efficiency
- Growth
- Scale
- Openness
Discussing the value of an Open Community and the story of how a customer's requirements changed 2CRSi Group's perspective on “Open”.

OCP & 2CRSi partnership.

Adrien BADINA, Director of Innovation.
in a nutshell...
A global Tech Group

164 M€
2020/2021
global revenue (group)

350+
Team members
Worldline

11
Countries

7
Plants

21
Offices
Our core business

Since 2005, we design, manufacture and sell customised, environment-friendly high-performance IT servers.

...for a wide range of sectors & industries.

...and we address ‘critical’ needs.
Our vision

We want to reconcile IT with the planet.

Today we provide high performance servers able to reduce energy consumption.

Tomorrow, we will reuse waste heat and develop a cradle-to-cradle approach.

#powerReductioNeed’19
Reducing the power consumption of high-performance servers

#reusEnergies’23
Reuse of fatal heat from servers for other purposes

#producElectricity’25
Creation of alternative sources of electricity.
Our customers throughout the globe

<table>
<thead>
<tr>
<th>INTERNET / TELCOS / ASP</th>
<th>SOFTWARE EDITORS</th>
<th>SCIENCE &amp; EDUCATION</th>
<th>INDUSTRY</th>
<th>DEFENSE GOVERNMENT</th>
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<tbody>
<tr>
<td>BLADE</td>
<td>CALDERA</td>
<td>Institut de Cerveau</td>
<td>20020</td>
<td>Groupe Dassault</td>
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<td>OVHcloud</td>
<td>ubuntu</td>
<td>BIOMÉRIEX</td>
<td>20020</td>
<td>AIRBUS Defence &amp; Space</td>
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<td>free</td>
<td>Gamestream</td>
<td>Ircadre</td>
<td>la prairie</td>
<td>NAVAL GROUP</td>
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<td>Caltech</td>
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<td>CLOUD4C</td>
<td>systems</td>
<td>CERN</td>
<td>PRIME COMPUTER</td>
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<td>OUTSCALE</td>
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<td>DONTNOD</td>
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</table>
The story behind our partnership with the Open Compute Project.
From 19” to OPEN

2017: The tender

It started with a Tender of 500 standard Server: 2CRSi was selected but couldn't apply due to a mandatory shipping date that couldn't be met and also due to a component shortage at the time.

3 months later, the Customer touched base with a new request of 1000 servers this time!

We decided to build new servers based on the OCP form factor which brought a much better OPEX score card to our customer.

The OCtoPus servers were born! (1.OU Dual socket Intel with 4 GPU – No fan). We sold more than 8000 to this customer! What a success story!

We are now proud OCP members since 2018 and we were able to contribute many times (PDU, PDB,...)

The 2CRSi R&D Team is engaged in various projects such as Rack designs & Power or Advanced Cooling solutions.
Revealing the OPEN PLUS portfolio

Inspired by the

Tolga DOGAN, Senior Product Manager.
Market Analysis

- Data center energy efficiency PUE.

- Average density per rack is increasing.

- Rack densities (below 10kW/Rack remain most common).

Source: Uptime Institute 2020
IT Environment with OCP technology and the 2CRSI solutions

Innovative data center
- IEC60364-8-1 + IEC30134-1 rules on Energy Efficiency
- Optimization of CAPEX and OPEX
- PUE Power Usage Effectiveness

Open Compute Project (OCP)
- Scalability. More efficient, flexible hardware
- Performance of Data Centers
- Share design with the community.

OPEN Plus & OCtoPus ranges by 2CRSi
- Best advantages of OCP architectures
- R&D innovation for customized design
- New technologies from strategic partners.

In comply with OCP specs.
Inspired from OCP spec
The Benefits of Open Hardware

**HIGH DENSITY COMPUTING & FLEXIBILITY**

- 21” form factor allows more flexibility compared to 19”.
- More server, storage and network capacity in less space save costs.
- Modular solutions.

**OPTIMIZED POWER**

- Centralized powershelf instead of individual PSU in 19” permits higher power capacity per rack.
- More efficient on power consumption.

**OPTIMIZED COOLING**

- 21” size permits greater thermal dissipation.
- Better temperature flow allows efficient cooling.
- Optimization of cold/hot aisle.

**STREAMLINED MAINTENANCE**

- Hot-pluggable power supply unit and servers.
- Tool-less.
- Easy access design with serviceability from the front.
- Power modules are redundant and hot-swappable.
- Improved MTBF thanks to less PSU and robust fans.
OCP products
The OPEN PLUS family by 2CRSi

Multi-node Server
Flexible combination of multiple servers in 2U space for compute application with enhanced IO performance.

JBOD – HDD Storage
Cost-effective micro server in 4U for large capacity storage applications. High-density storage system designed with redundant controllers to each HDD.

JBOF - All-flash NVMe
Leading industrial storage system in 2U provides the best IOPS and IO performance

Compliant with
- Open
- Redfish
- OpenBMC
- vSAN
- SUSE
- Kubernetes
- Rancher
- OpenStack
- Red Hat OpenShift
- CentOS
Servers

Dimensions comparison

Key features:

- Increases airflow and thermal dissipation
- Optimize the component management
- Serviceability from the front
- Modular design of the chassis
- Cable-less power distribution system by 12VDC busbars.

<table>
<thead>
<tr>
<th>dimensions</th>
<th>19” Standard</th>
<th>mm</th>
<th>21” OCtoPus</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of U / OU</td>
<td>Inch</td>
<td>mm</td>
<td>Inch</td>
<td>mm</td>
</tr>
<tr>
<td>Width (total)</td>
<td>19”</td>
<td>482</td>
<td>21”</td>
<td>537</td>
</tr>
<tr>
<td>Width for components</td>
<td>17,5”</td>
<td>444,5</td>
<td>21”</td>
<td>537</td>
</tr>
<tr>
<td>Height (1U or OU)</td>
<td>1,75”</td>
<td>44,45</td>
<td>1,89”</td>
<td>45,5 (48 pitch)</td>
</tr>
<tr>
<td>Depth - nominal</td>
<td>30”</td>
<td>760</td>
<td>31,5”</td>
<td>800</td>
</tr>
<tr>
<td>Ground surface (m²)</td>
<td>-</td>
<td>0,34</td>
<td>-</td>
<td>0,43</td>
</tr>
<tr>
<td>Volume (dm³)</td>
<td>-</td>
<td>15</td>
<td>-</td>
<td>20</td>
</tr>
</tbody>
</table>
**Racks**

**Dimensions comparison**

**Key features:**

Efficient use of space for 24” column width (standard floor tile pitch is 600mm for 19" & 21" servers)

19" = 73% space efficiency
21" = 88% space efficiency
Serviceability from the front

Cable-less power distribution system by bus bars.

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<table>
<thead>
<tr>
<th>dimensions</th>
<th>19” ETA traditional Rack</th>
<th>21” Open Rack</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of U / OU</td>
<td>42U</td>
<td>41OU</td>
</tr>
<tr>
<td>Width</td>
<td>24” 600</td>
<td>24” 600</td>
</tr>
<tr>
<td>Height</td>
<td>78” 1990</td>
<td>87” 2210</td>
</tr>
<tr>
<td>Depth - nominal</td>
<td>40” 1000</td>
<td>42” 1067</td>
</tr>
<tr>
<td>Depth - with Fans</td>
<td>- 1000</td>
<td>- 1125</td>
</tr>
<tr>
<td>Ground surface (m²)</td>
<td>- 0,6</td>
<td>- 0,6402</td>
</tr>
<tr>
<td>Volume (dm³)</td>
<td>- 1194</td>
<td>- 1415</td>
</tr>
</tbody>
</table>
**Racks**

**Focus on Open Rack**

Key features:

- **Power Zone**
  - 1 to 3 busbars is defined according to Power zone needs (kW)

- **Open Rack IT Zone**
  - Greater IT volume per floor tile vs EIA, NEC
  - Two data cables zones accessible from cold aisle, segregated from AC power

Source: uptime Institute 2020
Data Center designs

Focus on Power

**Power Shelves:**

- Up to 6 hot swappable PSU
- 5+1 redundant operation
- Dual input PSU with ATS
- Network Access Controller
- PMBus protocol support
- C13 outlets at the rear

**Battery Backup System:**

- 7kW system backup power
- PMBus protocol support
- Powers you Edgecore network switch with ORSA-1RU and 12V passthrough card
Data Center designs

Power management

Traditional or OCP architecture:
Features and advantages

Density and Efficiency
- **Reduction up to 30%** of cooling costs (Optimization of cold/hot aisle)
- 30% **less space** compared to regular air-cooled racks
- Lower complexity.

200 regular air-cooled racks
Space > 1,000m²

150 OCP air-cooled racks
Space < 700m²
Q&A session with our speakers

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Power consumption & PSU Product cost

Key features:

Reduce Fans power consumption
➔ saving 3641€/year

Reduce product Power Supply Unit (PSU)
➔ costs saving 12000€

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<table>
<thead>
<tr>
<th>PSU Product cost - Power</th>
<th>19'' 1U Server</th>
<th>21'' OCP Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>19U</td>
<td>21OU - OCP</td>
</tr>
<tr>
<td>Server</td>
<td>10U</td>
<td>20U</td>
</tr>
<tr>
<td>Nodes</td>
<td>40</td>
<td>48</td>
</tr>
<tr>
<td>IT Power</td>
<td>8 kW</td>
<td>14.4 kW</td>
</tr>
<tr>
<td>Number of Fan for 1 U or OU</td>
<td>9 units</td>
<td>3 units</td>
</tr>
<tr>
<td>Number of Fan for 2 U or OU</td>
<td>18 units</td>
<td>6 units</td>
</tr>
<tr>
<td>Number of Fan for 4 U or OU</td>
<td>36 units</td>
<td>12 units</td>
</tr>
<tr>
<td>Number of Fan per Rack (40 U/OU)</td>
<td>360 units</td>
<td>96 units</td>
</tr>
<tr>
<td>Fan (Individual Power Consumption)</td>
<td>15 watt</td>
<td>10 watt</td>
</tr>
</tbody>
</table>

Fans power consumption per Rack

- Electricity cost (€/kWh)
  - 0.094 €/kWh
- Cost per rack for 1 hour
  - 0.505 €
- Cost per rack for 1 year
  - 4428 €
- Cost per node
  - 110,69 €
- Saving per Node
  - -
- Saving per Rack
  - -

Saving 3641€ per year

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<td>IT Power</td>
<td>8 kW</td>
<td>14.4 kW</td>
</tr>
<tr>
<td>Number of PSU for 1 server</td>
<td>2 modules</td>
<td>-</td>
</tr>
<tr>
<td>Number of PSU for 2 servers</td>
<td>4 modules</td>
<td>0.02</td>
</tr>
<tr>
<td>Number of PSU for 4 servers</td>
<td>16 modules</td>
<td>12</td>
</tr>
<tr>
<td>Number of PSU for 8 servers</td>
<td>40 modules</td>
<td>54</td>
</tr>
<tr>
<td>Number of PSU per Rack (40 U/OU)</td>
<td>400 €</td>
<td>4000 €</td>
</tr>
<tr>
<td>PSU (price) or Powershelf per Rack</td>
<td>16000 €</td>
<td>4000 €</td>
</tr>
<tr>
<td>Cost per server</td>
<td>400,000 €</td>
<td>74,074 €</td>
</tr>
<tr>
<td>Saving per Rack</td>
<td>-</td>
<td>12000 €</td>
</tr>
</tbody>
</table>

* Power shelves can be reuse in server are renewed.
Thank you!

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