Open Source Hardware to drive the Reinvention of an efficient Data Center
## Today’s Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>11.00am</td>
<td>Welcome Address</td>
</tr>
<tr>
<td>11.05am</td>
<td>Introduction of the open source hardware model and discussion with chair of OCP Incubation Committee</td>
</tr>
<tr>
<td>11.15am</td>
<td>Quick Peeks of OCP Projects &amp; OCP Market:</td>
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<tr>
<td></td>
<td>• Open source servers, storage &amp; networking</td>
</tr>
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<td></td>
<td>• Drivers of OCP adoption</td>
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<tr>
<td>11.30am</td>
<td>Energy and cost efficiencies through open source hardware in Telco’s and CSPs</td>
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<td></td>
<td>Q&amp;A with an OCP Solution Provider – CTC Japan</td>
</tr>
<tr>
<td>11.45am</td>
<td>Closing address and key interests in Session 2 and 3</td>
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</table>
Thank You!
Creative Destruction - the process of breaking older conventions to accelerate movement to the future, without cutting off from the past.

Joseph Shumpeter (Economist)
<table>
<thead>
<tr>
<th>OEM (Original Equipment Manufacturer)</th>
<th>ODM/White Box (Original Design Manufacturer or White Box)</th>
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<tbody>
<tr>
<td>Buys platform components from the manufacturer</td>
<td>Manufactures platform components</td>
</tr>
<tr>
<td>Resells those components under their own brand name</td>
<td>Provide full product development services</td>
</tr>
<tr>
<td>Create products that can serve the broadest possible market</td>
<td>Can manufacture specialised solutions</td>
</tr>
<tr>
<td>Support and managed services</td>
<td>Support centred on product</td>
</tr>
</tbody>
</table>
ODM/White Box + Open Source
The old innovation pipeline

TECHNOLOGY

OEMs

USERS
Reinvention...or “Creative Destruction”
Facebook to Build Its Own Data Centers

Facebook has decided to begin building its own data centers, and may announce its first facility as soon as tomorrow. The fast-growing social network has previously leased server space from wholesale data center providers.

Rich Miller | Jan 20, 2010
What can we remove from the system?

Can we raise operating temperatures and have the servers survive?

Can we increase relative humidity operational ranges to make the system much more efficient?

Do we need a centralized power supplies?

Open Compute Project
A collaborative community focused on redesigning hardware technology to efficiently support the growing demands on compute infrastructure.
200+ companies
189 contributions
6K engineers
Our Projects

Networking
Server
Storage
Rack & Power
Advanced Cooling

Data Center
Telco
HW Mgmt
Open System Firmware
HPC
Security

Modular DC
openEDGE

https://www.opencompute.org/projects
Thoughts on the direction and momentum of OCP

Dharmesh Jani
Facebook
Chairman OCP
Incubation Committee

Efficiency

Scale

Impact

Openness
Server bezels... gratuitous differentiation
Tool less OCP vanity free open source cubby servers
Open Rack Unit Innovations - Server Fans “Cube Law”

40 mm Fans

EIA “U”

80 mm Fans

OCP “OU”

openEdge

Ultra small footprint

Fully front-operated (cabling, tool less serviceability)

High availability: redundant fans, hot swap storage

Full NEBS compliancy, seismic zone 4

https://www.opencompute.org/projects/openedge-sub-project
Walmart takes on Amazon with edge computing and 5G

https://techwireasia.com/2020/01/walmart-takes-on-amazon-with-edge-computing-and-5g/
## Server Shipments and Market Share Q4 2019

<table>
<thead>
<tr>
<th>Company</th>
<th>4Q19 Unit Shipments</th>
<th>4Q19 Market Share</th>
<th>4Q18 Unit Shipments</th>
<th>4Q18 Market Share</th>
<th>4Q19/4Q18 Unit Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dell Technologies</td>
<td>549,488</td>
<td>16.1%</td>
<td>580,579</td>
<td>19.4%</td>
<td>-5.4%</td>
</tr>
<tr>
<td>2. HPE/New H3C Group</td>
<td>507,228</td>
<td>14.9%</td>
<td>484,668</td>
<td>16.2%</td>
<td>4.7%</td>
</tr>
<tr>
<td>3. Inspur/Inspur Power</td>
<td>270,567</td>
<td>8.0%</td>
<td>247,600</td>
<td>8.3%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Systems b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T4. Lenovo*</td>
<td>233,896</td>
<td>6.9%</td>
<td>190,721</td>
<td>6.4%</td>
<td>22.6%</td>
</tr>
<tr>
<td>T4. Huawei*</td>
<td>216,734</td>
<td>6.4%</td>
<td>211,618</td>
<td>7.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td>ODM Direct</td>
<td>1,054,743</td>
<td>31.0%</td>
<td>689,394</td>
<td>23.1%</td>
<td>53.0%</td>
</tr>
<tr>
<td>Rest of Market</td>
<td>570,667</td>
<td>16.8%</td>
<td>582,070</td>
<td>19.5%</td>
<td>-2.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,403,323</strong></td>
<td><strong>100%</strong></td>
<td><strong>2,986,651</strong></td>
<td><strong>100%</strong></td>
<td><strong>14.0%</strong></td>
</tr>
</tbody>
</table>

Source: IDC Worldwide Quarterly Server Tracker, March 12, 2020
Growth of the OCP Market

Double Digit Growth through 2021

America’s CAGR = 42%

APAC CAGR = 108%

EMEA CAGR = 59%

Source: IHS Markit
Not including Facebook or Microsoft deployments

https://www.youtube.com/watch?v=e9111zvJ-c
OCP by Industry Forecast

Market just forming for disaggregated cell tower equipment

Automotive and Manufacturing have highest 5YR GAGR

Healthcare in very early stages of adoption

https://www.youtube.com/watch?v=pdpPKAo-HUY
Drivers of OCP Adoption

- Cost Reduction
- Standardisation
- Energy Efficiency
- Reliability

Source: IHS Markit
“Creative Destruction” of Server Efficiency

https://www.opencompute.org/events/past-summits

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OCP Adoption around the World

New hardware layer 35% Reduction in TCO
30% Reduction in OPEX
Link to presentation

London Internet Exchange - First IXP in the world to adopt an open networking model
Link to presentation

Open Networking – Cumulus on OCP switches
Link to presentation

Marketing media company w/ 70+ locations worldwide implementing OCP for compute
Link to article
Traditional Delivery Model

ODM → Brand Named Vendor (OEM) → Specialised customers such as Cloud Service Providers (CSP’s) → Traditional customers such as banks, telco’s, public sector
OCP Delivery Model

ODM

Rack integration
QA
Delivery
Installation
Operation
Support
Mgd. Services

Those who can
procure, design,
configure and
maintain/support
OCP hardware by
themselves

Those who need
help to procure,
design,
configure or
maintain/support
OCP hardware

CSP’s
Telco’s
Public Sector
E-Commerce
Manufacturing
Fintech
SaaS
Open. For Business.

The Open Compute Project (OCP) is reimagining hardware, making it more efficient, flexible, and scalable. Join our global community of technology leaders working together to break open the black box of proprietary IT infrastructure to achieve greater choice, customization, and cost savings.

https://www.opencompute.org/solutions

https://www.opencompute.org/solutions
Fast Start

Designed to slip under your desk and plug into standard 110v/220v power so you can quickly test your software on production nodes

https://www.opencompute.org/circular-economy/1/sesame-fast-start
OCP Virtual Global Summit
May 12th – 15th
https://www.opencompute.org/summit/global-summit
OCP Marketplace
https://www.opencompute.org/products

Past Events (recordings and slides)
https://www.opencompute.org/events/past-summits
https://www.opencompute.org/events/past-events

Social
https://www.youtube.com/user/OpenComputeProject
https://www.linkedin.com/groups/4152886/
@OpenComputePrj
https://www.facebook.com/groups/opencompute/
Final thought...whatever market open source enters it eventually dominates.

7 open hardware projects working to solve COVID-19

Open hardware solutions can prevent the spread and suffering of the novel coronavirus.

19 Mar 2020 | Harris Kenny | 38 | 4 comments

https://opensource.com/article/20/3/open-hardware-covid19
Webinar - #2 in the OCP series

What is Open Networking?

May 21st, 2020
Thank You