A Look Inside An OCP Optimised Data Center In Southeast Asia
Get involved in the Q+A

Select “?” on the right side of your GoToWebinar window and type in your question(s).
Speakers

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Darren Hawkins
CEO and Founder
darren.hawkins@spacedc.com
Today’s Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.00am</td>
<td>Welcome Address</td>
</tr>
<tr>
<td>11.05am</td>
<td>Introduction to OCP</td>
</tr>
<tr>
<td>11.10am</td>
<td>Open Rack – An Overview Of The OCP Rack Efficient Design</td>
</tr>
<tr>
<td>11.20am</td>
<td>OCP Ready™ facility – An Introduction To An OCP Optimised DC</td>
</tr>
<tr>
<td>11.40am</td>
<td>Q&amp;A and Closing Address</td>
</tr>
</tbody>
</table>
Open Compute Project
A collaborative community focused on redesigning hardware technology to efficiently support the growing demands on compute infrastructure.
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
150+ companies
190+ contributions
6K engineers

150+ OCP Accepted™ & OCP Inspired™ Products

OCP Ready™ Facilities
The Impact of AI on the average Density per Rack

- Less than 3kW per Rack: 1%
- 3kW – 5kW per Rack: 7%
- 6kW – 10kW per Rack: 32%
- 11kW – 15kW per Rack: 33%
- 16kW – 20kW per Rack: 11%
- More than 20kW per Rack: 5%
- Don’t Know: 12%

Source: 451 Research 2019
Gartner, Inc., predicts that more than 30% of data centers that fail to sufficiently prepare for AI will no longer be operationally or economically viable.

- Weight of a fully loaded rack
- Raised floor may not allow a rolling load
- Available power to the rack
What's inside a Facebook Datacenter Open Compute Rack?

181,903 views • 15 Mar 2019

https://www.youtube.com/watch?v=2l6gI-ksdKs&t=6s

Converged rack frame
Flexible power shelf
Universal AC power interconnect
Pluggable DC power shelf output interconnect
Battery backup systems

Facebook and Microsoft announce Open Rack V3 to address the power demands from artificial intelligence and networking.
Resul Altinkilic
Project Manager Global
Key Accounts IT
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Rittal Open Hardware. Open Solution. Open Future

Resul Altinkilic, Project Management Global IT Key Accounts
Rittal Global Footprint
Worldwide product availability

10,000 employees worldwide

11 production sites

58 subsidiaries all over the world

1961 est.
Headquarter Herborn / Germany
100% family-owned business
Global Footprint

Company profile: Close to our customers / Production at 11 sites on three continents

- 250,000 m² production space worldwide
- 200,000 cooling units per annum
- 15,000 enclosures each day
## Why Open Hardware

### Open Hardware Development

#### Trend

- Data volumes are increasing exponentially
- Efficient and fast data processing will in future more and more decisive for business success

#### OCP Platform

- Reduce investment and operating costs
- Reduce energy consumption
- Environmental impact of data centers by way of innovative, full standardised IT architectures
- Sharing ideas and know-how
Why Open Hardware
Open Hardware Development

- Cost reduction and power efficiency biggest drivers for OCP servers
- Standardization is a big influence of OCP adoption for switches
- Survey from OCP users “Why OCP?”

Why OCP

58
21
12
7
2
Rittal – OCP Engagement
Platinum Member

OCP Platinum Member since 2018

- Enables actively to participate on events and develop products and influence future OCP Roadmaps in Rack, Cooling and Power
- Contributed specification in the rack & power working group
- Participating actively at OCP Summits in US and Europe, including workshops, presentations and panel discussion at the shows
Open Rack Infrastructure
Open Compute Project – Rittal’s experience

- Rittal gets involved
- Rittal start v.1.0 production
- Rittal start v.1.2 production
- Shipped 3,000+ v1.0/1.1 racks
- V1.2 Open Rack Spec completed
- Lead developer of Version 1.2 Open Rack
- V1.0 Open Rack Spec completed
- Shipped 15,000+ v1.2 racks
- V1.v2.0 spec started
- Lead developer of Version 2.0
- First 8 Proof of Concept v.2.0 racks shipped
- Lead developer of Version 3.0
- Rittal showed v.3.0 prototype
Open Rack Infrastructure
Rittal OCP V3

- 48vDC Busbar
- Power shelves in any rack position
- Tool-less rack rails
- RU gear support
- Modular rack cabling option
- Moveable horizontal frame support
- Max. IT gear weight 1.600kg
Open Rack Infrastructure
12vDC & 48vDC Busbar

- 48 V DC
- 1 Power zones
- 1 bus bars/zone
- 15 kW/Zone
- 15 kW/Rack
- 1450 kg Payload
- 600 x 2210 x 1068

- 12 V DC
- 2 Power zones
- 1 bus bars/zone
- 6.6 kW/Zone
- 13.2 kW/Rack
- 1450 kg Payload
- 600 x 2210 x 1068
Open Rack Infrastructure
Rittal and Partners Solutions for OCP

**OCP Cooling**
- Two-Phase, direct contact cooling, non-conductive liquid
- Closed single loop, Low Pressure, on demand

**OCP Power**
- Join collaboration with Bel Power Solution, Rittal provides power supplies for OCP racks.
- Innovative and efficient power distributors are a key element of any OCP architecture
- PDU, Power supply unit, Power shelves
Introduction to Space DC

Data Center Provider

Darren Hawkins I Chief Executive Officer
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Who is Space\textsuperscript{DC}?
“Help customers unlock opportunities in fast moving digital markets by providing an efficient, reliable and network rich data center space to grow their business on”.

Mission
At Space DC we deliver

- **Flexibility**: Modular and scalable space
- **Connectivity**: Network rich ecosystem
- **Reliability**: Uninterrupted power
- **Security**: 8 layers of physical access controls
- **Cooling**: Continuous cooling with chilled water
- **Sustainability**: Reduced carbon footprint 30%
ID01 Campus
25.45MW IT Load
ID01 Campus – JAK1
ID01 Campus Facilities

<table>
<thead>
<tr>
<th></th>
<th>JAK1</th>
<th>JAK2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Wholesale</td>
<td>Hyperscale</td>
</tr>
<tr>
<td>MW</td>
<td>24</td>
<td>1.45</td>
</tr>
<tr>
<td>PUE</td>
<td>1.2</td>
<td>1.3</td>
</tr>
</tbody>
</table>
# OCP Ready COLO Facility Assessment

## Self Assessment Status:
- Data Center Location Name: [Image]
- Data Center Location Address: [Image]
- Site Description: White Space Area: [Image]
- Site Description: Critical IT Power: [Image]
- Site Description: Network Provider Availability: [Image]
- Site Description: Facility Features: [Image]
- Site Description: Other Services: [Image]
- Date Original Assessment is Completed: [Image]

## REQUIREMENTS - Attribute
(Required an Optimum or Acceptable result)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCESS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Access</td>
<td>2. Road level with step and threshold free access</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Delivery pathway, loading dock to Goods in</td>
<td>1. ≥2.7m (10ft) H x ≥2.4m (8ft) W x ≥2.4m (8ft)</td>
<td>Optimum</td>
</tr>
<tr>
<td>Delivery pathway, Goods in to White space</td>
<td>1. ≥2.4m (8ft) H x ≥1.8m (6ft) W x ≥2.4m (8ft)</td>
<td>Optimum</td>
</tr>
<tr>
<td>Corridor floor rolling load</td>
<td>1. 2608kg (5500lb) (6.67kPa)</td>
<td>Optimum</td>
</tr>
<tr>
<td>Unboxing/pre-staging/storage area floor uniform load</td>
<td>2. 2732kg/m² (1500lb/ft²) (67.4kPa/m²)</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Unboxing/pre-staging/storage area floor concentrated load</td>
<td>2. 2567kg (1250lb) (5.56kPa)</td>
<td>Acceptable</td>
</tr>
<tr>
<td><strong>RAMPS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradient</td>
<td>1:12 or less</td>
<td>Optimum</td>
</tr>
<tr>
<td>Width</td>
<td>5. 1.5m (60in)</td>
<td>Optimum</td>
</tr>
<tr>
<td>Landing area</td>
<td>1. ≥1.5m x 1.5m (60in x 60in)</td>
<td>Optimum</td>
</tr>
<tr>
<td>Railings</td>
<td>1. ≥900mm (36in) and &lt;1000mm (40in)</td>
<td>Optimum</td>
</tr>
</tbody>
</table>

## JAK2
**COMPLETE-MEETS REQUIREMENTS**
- SpaceDC JAK2
- Jl. Daan Mogot KM. 18 No.18, RT.11/RW.6, Kalideres, Jakarta Barat 11840, Indonesia
- 1 x data hall, 700m² data hall.
- 1,400kW per data hall
- Carrier neutral site, with more than 7 network providers.
- Site includes 2 story admin building, technical support spaces including UPS, generator and cooling plant, loading docks, MMRs and security. 2 x single story data halls.
- We provide business continuity seating, customer seating, offices, lockers and meeting spaces upon request.
- 6-12-2020
JAK2
1.45MW – Tier III Facility
<table>
<thead>
<tr>
<th>JAK 2 Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facility</strong></td>
</tr>
<tr>
<td>• 1 X 1,450kW data halls</td>
</tr>
<tr>
<td>• Tier III - 99.982% availability</td>
</tr>
<tr>
<td>• Two story administration building</td>
</tr>
<tr>
<td><strong>Data Hall</strong></td>
</tr>
<tr>
<td>• 380 racks per data hall</td>
</tr>
<tr>
<td>• Average rack density: 3.8kW</td>
</tr>
<tr>
<td>• Maximum rack density: 15kW</td>
</tr>
<tr>
<td>• Rack dimension</td>
</tr>
<tr>
<td>- 600 (W) x 1050mm (D) x 2300 (H) 48U</td>
</tr>
<tr>
<td>- 800 (W) x 1200mm (D) x 2300 (H) 48U</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
</tr>
<tr>
<td>• Carrier neutral</td>
</tr>
<tr>
<td>• Multiple ISPs</td>
</tr>
<tr>
<td>• 4 X Meet Me Rooms</td>
</tr>
<tr>
<td>• Multiple entry points and diverse underground cable pathways</td>
</tr>
</tbody>
</table>
Access Control
Data hall
### Overview – Security and Protection

<table>
<thead>
<tr>
<th>Monitoring and Security</th>
<th>Fire Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 24/7 onsite security personnel</td>
<td>• Double interlock, dry pipe, per action sprinkler system to data halls</td>
</tr>
<tr>
<td>• Cardkey access control and biometric authentication procedures</td>
<td>• VESDA overhead and concealed space smoke detection to data halls</td>
</tr>
<tr>
<td>• Sitewide CCTV surveillance</td>
<td>• Emergency warning and indication systems through facility</td>
</tr>
<tr>
<td>• 24/7 onsite NOC monitoring power, HVAC and critical operations</td>
<td>• Water mist suppression to generator enclosures</td>
</tr>
<tr>
<td>• 24/7 Singapore office security monitoring and NOC</td>
<td></td>
</tr>
<tr>
<td>• CSMS monitors all building functions including BMS, SCADA, fire, security and access</td>
<td></td>
</tr>
</tbody>
</table>
## Overview - Power

### Power Supply
- 20kV mains supply and dedicated transformers.
- N+N on site diesel generators provide backup power.
- 36 hours fuel storage at full load.
- Isolated fuel storage tanks for each generator.

### UPS
- N+N distributed redundant uninterruptable power supply to each data hall.
- UPS battery backup time of 5 minutes at full load.
- N+N mechanical UPS to power to pumps and fans for uninterrupted cooling

### Power Distribution
- Dual overhead busbar above each suite with dual supplies to each rack.
- Takeoff box with metering and power monitoring.
- Integrated site power quality monitoring and energy management system.
Overview - Cooling

Cooling Plant

Full backup cooling provided by N+N high efficiency electric chillers.

Chilled water cooling with absorption chillers utilizing waste heat from gas generators.

Tier III concurrently maintainable chilled water ring main

N+N Mechanical UPS power to pumps and fans for uninterrupted cooling

Air Handling

Data halls served by N+2 Fanwalls.

Fanwall separated from data hall in services corridor with maintenance from corridor.

Hot aisle containment and return air ceiling plenum.

Data hall internal conditions in accordance with ASHRAE TC9.9 A1 recommended range
Fanwall – Operating Principle

- Data halls served by N+2 Fanwalls.
- Fanwall separated from data hall in services corridor with maintenance from corridor.
- Data hall “flooded” with low velocity cool air from fanwall unit.
- Hot aisle containment and return air ceiling plenum returns hot air to fanwall.
- Raised floor not required
- Greater flexibility in rack density and location.
OCP and Space DC - space to grow
Space to grow

www.spacedc.com
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https://www.opencompute.org/products

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https://w.media
Data Center Selection & Migration in Asia Pacific

Thursday 23rd July

https://w.media/webinar/
Questions?
Thank You!