Powering The Open Data Center Revolution
Intelligent World Requires Enormous Computing Power

- 95% workload (container/vm) runs on cloud
- High demand on the scale of data processing and efficiency
- Development of AI drives computing capability significantly

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Data source: Cisco

2015: 75%
2018: 25%
2025: 5%

- 20 million images/day
- Complete processing ≈ 2.3 million
- 1000 images/s

Digitalization
Amount of data
Computing Power
Open Platform, Making Ecosystem More Open

Open Hardware

- Member: Facebook, Inspur, Google, Microsoft
- Over billion deployment
- Member: Baidu, Tencent, Alibaba, Intel, Inspur
- Millions of nodes deployed
- OpenPower

Open Software

- Rack Level Management
- OCP China Technology Day
Open Platform, Making Ecosystem More Open

Beneficial

Open Design Platform

Accelerate Innovation
Decrease TCO
Lower Failure Rate
Easy to Join

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Goal for Open Platform

- No.1 Server supplier for Alibaba
- Alibaba e-Commerce Platform is Running on Inspur ODCC Rack
  Peak of system transaction reached 175,000 orders per second
- Over 80% of Baidu's hyperscale rack-level servers
  Deploying 10,000 nodes per day

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Momentum of OCP & Inspur

2016 MAY
Emerged as an active participant within the OCP community

2017 MAR
Inspur released the Open Rack series including rack servers which are compliant with the OCP standard

2017 JUN
The OCP committee declared Inspur as the newest Diamond member

2017 OCT
Inspur ON5263M5 (San Jose Compute Solution) received OCP-Accepted certification from the OCP committee

2017 NOV
Inspur and OCP held a joint Session during SC17

TODAY
Inspur is introducing more OCP-based compute nodes, storage nodes, AI hardware remote management software and a series of other products

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**Open Rack Architecture Comparison**

Share the same inner dimension: 21-inch wide
Front maintenance: computing nodes, PSU, Switch, Cables can be maintained from cold aisle

<table>
<thead>
<tr>
<th>Item</th>
<th>OCP</th>
<th>Inspur SR Rack</th>
</tr>
</thead>
<tbody>
<tr>
<td>1U Height (mm)</td>
<td>46.5 (Scorpio Unit)</td>
<td>48</td>
</tr>
<tr>
<td>Rack Height</td>
<td>42/46 SU</td>
<td>41 OU</td>
</tr>
<tr>
<td>Server Node Width</td>
<td>21&quot;</td>
<td>21&quot;</td>
</tr>
<tr>
<td>Device Space</td>
<td>36/40 SU</td>
<td>32 OU</td>
</tr>
<tr>
<td>Switch</td>
<td>3 SU</td>
<td>3 OU</td>
</tr>
<tr>
<td>Power</td>
<td>3 SU</td>
<td>6 OU</td>
</tr>
<tr>
<td>Bus bar</td>
<td>1 pair(left)</td>
<td>3 pair</td>
</tr>
<tr>
<td>Unified Cooling</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Unified Mgmt</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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![Open Rack V2 Diagram](image_url)
Converge ODCC Rack and OCP Rack

ODCC Form Factor → OCP Form Factor

<table>
<thead>
<tr>
<th>Component</th>
<th>SR Storage Node</th>
<th>OCP Storage Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>HDD Tray</td>
<td>Share</td>
<td>Share</td>
</tr>
<tr>
<td>Controller Board</td>
<td>Share</td>
<td>Share</td>
</tr>
<tr>
<td>HDD Backplane</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Power Distribution Board</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>SR GPU Node</th>
<th>OCP GPU Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>GPU Switch Board</td>
<td>Share</td>
<td>Share</td>
</tr>
<tr>
<td>Expansion Board</td>
<td>Share</td>
<td>Share</td>
</tr>
<tr>
<td>Power Distribution Board</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

Convert ODCC storage and GPU nodes to OCP, with key components shared. Design cycle shortened 60%, high reliability and cost efficiency.
Inspur OCP Rack Level Product Overview

Compute
- I/O Balance
  - 2x 3.5" HDD or NVMe
  - 2x M.2
  - 1x FHFL (3.5""): CPU0
  - 1x FHFL (2.5""): CPU1

- High Expansion
  - 4x 3.5" HDD or NVMe
  - 1x M.2
  - 3x FHFL (1""): CPU0

Density Computing
- 2x M.2
- Expansion Slot
- 1x FHFL (4"") CPU0

Energy Efficiency
- 1x 3.5" HDD
- 1x M.2
- 1x FHFL (2""): CPU0
- 1x FHFL (3""): CPU1

Storage
- New

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AI
- New

Solution

GPU Box
- 40U Form Factor
- 56 PCIe GPU Cards

Each drive support Hot-plug

Node Design
- 3.5" HDFS or SSD
- Two drive tray design
- Each drive support Hot-plug

Modular
- 20U Form Factor
Inspur OCP Compute Family

Converged Computing Architecture

Conververage Architecture
- Unified MB Design to cover 4 Types Application
- Cover High Expansion, Resource Balance, Energy Efficiency and Density Computing

High Density & High Performance
- High density architecture to support 20U three Node and 10U three Node
- High performance computing capability
Inspur OCP JBOD Storage

Storage Density and Cost Efficiency

High Storage Density
- 2U 34*HDDs, improve 13% storage capacity

Flexible Architecture
- Dual Separate Storage tray, 17 drives per tray
- Each tray support SATA and SSD, maintain individually

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Inspur OCP AI Product

Scalable and Leading Compute Architecture

Leading Compute Capability
40U 16*GPU for training
or 16*FPGA for Inference
Optimization Architecture for AI

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Hardware Management For OCP Rack

OpenBMC

WebUI to monitor system status

Component Firmware Life cycle Management
1. Version auto discovery
2. Intelligent update for BMC, BIOS, CPLD, FPGA etc.
3. Firmware rollback when error occurs.

Redfish/Restful Function, Support Redfish OCP Baseline Profile

Fault Diagnosis
1. System Fault rapid diagnosis.
2. Output the detailed fault records and recommendations.
3. BMC Subsystem fault diagnosis

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Inspur’s OpenBMC Roadmap

2017 Aug: Building OpenBMC for Inspur 2 sockets Server
2018 Jul: Inspur becomes the first manufacture to pass the DMTF redfish plugfest for OCP Baseline Profile
2018 May: Porting Latest OpenBMC Version to OCP Node
2018 Aug: Inspur released OpenBMC Version 1.0 for OCP Compute Node
2019 Mar: Inspur Will Release OpenBMC Version 2.0 and start to contribute some features to the community

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OCP Global Summit
San Jose, CA
March 14–15, 2019

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