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Leverage OCP Design Advantages on EIA 19” Accelerator Server

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Agenda

• Brief System Overview
• High CFM/watt Thermal Efficiency
• Flexible & Easy Design for Different Applications
• Design for Serviceability
• Design Extension to ORv2
• Power Distribution Design for ORv2
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Brief System Overview – I

• System Design Advantages
  • High CFM/watt thermal design for large-scale simulation models and DL training at all workloads
  • By selecting different PCIe Topologies and PCIe cards, various different applications can be addressed

• OCP Related Design Highlights
  • Front IO Access
  • Tool-less ME design for labor-saving
  • Integrated field proven Mt. Olympus M/B for high quality assurance
Brief System Overview – II

• EIA 19” Design Highlights
  • Standard 4RU High-Power Server design
  • Designed for 8 double-width PCIe G3 x16 slots → adopt to various accelerators for different workloads
• Dual-Zone thermal/cooling design → Cold air run through PCIe card directly
• CRPS PSU → 2+2 Power redundancy
• Scalable design → easily migrated to ORv2

So, how do we achieve them?
Accelerator Server Basics

PCIe card x1

2+2 Redundant PSU

3+1 Redundant Fan

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High CFM/watt Thermal Efficiency – I

Two isolated cooling zones enable cold air run through PCIe cards directly

- Thermal efficiency
  0.135 CFM/watt, at 30°C
  0.117 CFM/watt, at 25°C
  → Exceed DC requirement
High CFM/watt Thermal Efficiency – II

3+1 System Fan Redundant design for up to 2.8KW workload @ 35°C

- CPU 82°C, 134.7W
- CPU 84°C, 134.7W
- SSD 40.1°C
- DIMM 56°C
- GPU inlet 35.3°C
- GPU outlet 52.5°C
- PSU inlet 41.8°C

35°C Inlet

48°C Outlet

Location of failed fan
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Flexible & Easy Design for Different Applications

CPU-PCle Cards

Topology 1 – Balance Mode

CPU:GPU = 1:4

Higher bandwidth between CPU and GPU.
Flexible & Easy Design for Different Applications – II

CPU-PCle Cards
Topology 2 – Cascade Mode
CPU:GPU = 1:8

Peer to Peer performance can be extended to 8 PCle cards
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Tool-less Design for PCIe Cards Maintenance – I

Module and tool-less design for DW PCIe maintenance

- Modular SW tray for easy DW PCIe cards swap
- Using quarter-turn fastener for PCIe cards replacement
Tool-less Design for PCIe Cards Maintenance – II

Rotatable SSD bracket for PCIe card maintenance

- Tool-less design
- Prevents interference on serviceability on M/B
Serviceability Design for Fan and SSD Replacement

Modularized and labor-saving design

- Hot plug fan module with labor-saving handle for fast replacement
- Hot plug, front access SSDs are tool-less design
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Design Extension to ORv2

- Retrofit to 4OU chassis to fit for ORv2 supporting 12V DC busbar
- Redesign PTB for power transition to server board and PCIe switch board
- Support up to 8x SATA SSDs

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Processor</td>
<td>2S Intel® Xeon® Processor Scalable Family</td>
</tr>
<tr>
<td>DIMM</td>
<td>1.5TB DDR4; up to 2666 MT/s; 24 DIMM slots</td>
</tr>
<tr>
<td>Storage</td>
<td>Drive support: 8 x 2.5&quot; hot plug SATA HDDs/SSDs</td>
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<tr>
<td></td>
<td>M.2 SSD Module: 4 onboard M.2 modules</td>
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<tr>
<td>Accelerator</td>
<td>PCIe 3.0 slot: 8, GPU/FPGA/Flash add-in cards</td>
</tr>
<tr>
<td>Expansion Slot</td>
<td>PCIe Gen3 (x16): 3, (1 or 2 reserved for GPU connection)</td>
</tr>
<tr>
<td>System Dimensions (mm)</td>
<td>4OU; 188 (H) x 537 (W) x 879 (D)</td>
</tr>
</tbody>
</table>
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Power Distribution Design for ORv2

- Dual Busbar Clips to support up to 2.8KW
- Power transition board (PTB) for MB, Switch board, Fan board
Welcome

The Open IT Gears By Choice


Booth A12