ZT Systems Open Accelerator Infrastructure (OAI) Server Solution

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Agenda

- Business case for Open Accelerator Infrastructure (OAI)

- ZT OAI System Details

ZT Systems Overview

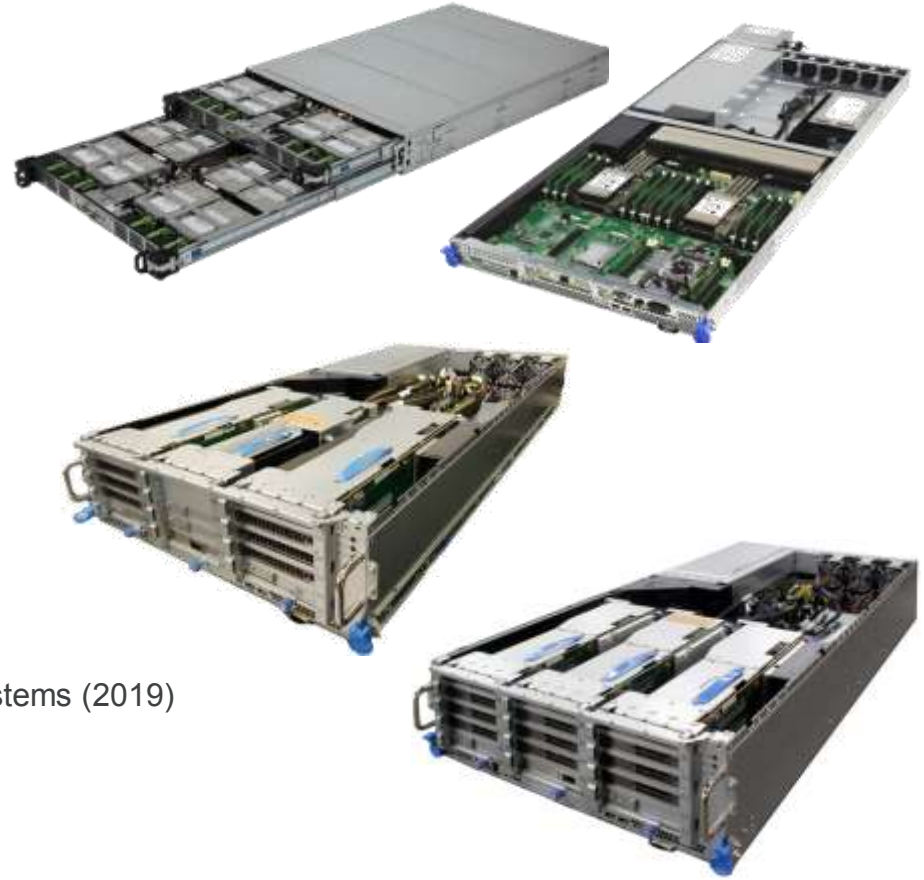
- Leading provider of optimized servers and storage servers for hyperscale data centers
  - Founded in 1994, celebrating 25 years in business
  - HQ in Secaucus, NJ; global sites & capabilities
  - Private company
- Built for Hyperscale
  - Maximum design flexibility
  - Continuity of Supply
  - Industry leading achievement to aggressive delivery SLAs
  - Full range of flexible service and support options
  - Broad range of component options

OPEN Compute Project SOLUTION PROVIDER®

A solution design and manufacturing partner with a record of success serving the world's largest data center customers

ZT OCP Engagement

- History
  - Engaged since 2012
  - Gold Member
  - Engineering projects
  - Solution Provider
  - Sponsored 8 Summits
- Products
  - 2U Open Storage (2014)
  - 1U XPO200 (2017)
  - XPO200-3UN & XPO200-3UA PCIe Expansion Systems (2019)
  - OAI based system to launch in 2H 2020

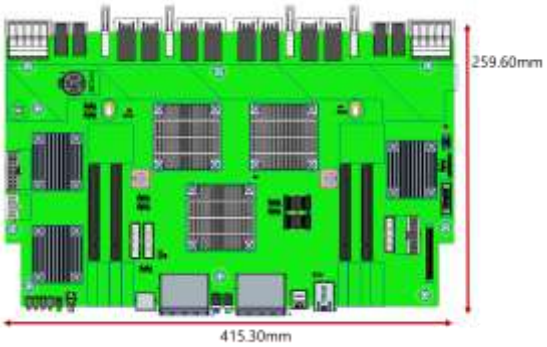


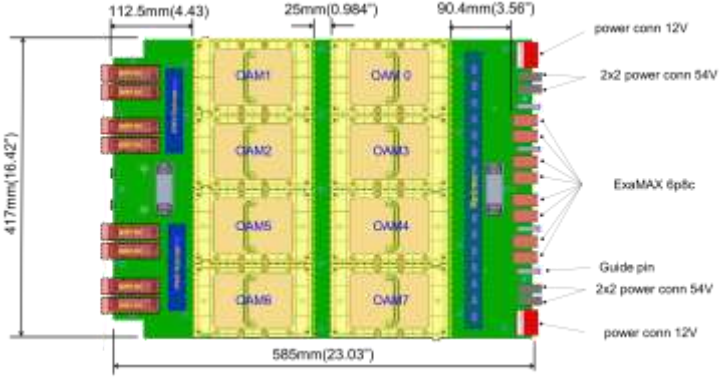
OCP standards benefit: OCP Mezz Card Example

- Prior to 2012 OCP mezzanine specification → NIC mezzanine solutions were all proprietary with the OEMs
- Without standards, impossible to deliver common solutions (from vendors) for large customers
  - No customer value for different solutions
- Following the release of the OCP mezzanine specification, ZT Systems
  - Delivered 10s of thousands of servers with OCP mezz NICs
  - Expedited time to market (TTM)
  - Lowered development costs

Open Accelerator Infrastructure (OAI) Primer

- OCP Accelerator Module (OAM)
- Universal Baseboard (OAI-UBB)
  - 8xOAMs, 8xQSFP-DD
- Host Interface Board (OAI-HIB)
  - 3xPCIe Gen4 switches, 4xPCIe slots, 4xNVMe SSDs





Business case for Open Accelerator Infrastructure (OAI)

- Harnessing the performance benefit of new innovations *through standards*
  - Faster, more efficient product development
  - Improved manufacturability, serviceability, reliability, and cost
- With the rapid evolution of AI → explosion of hardware accelerations for:
  - Machine Learning (ML)
  - Deep Learning (DL)
  - High-Performance computing (HPC)
  - GPUs, FPGAs, ASICs, NPUs, etc.

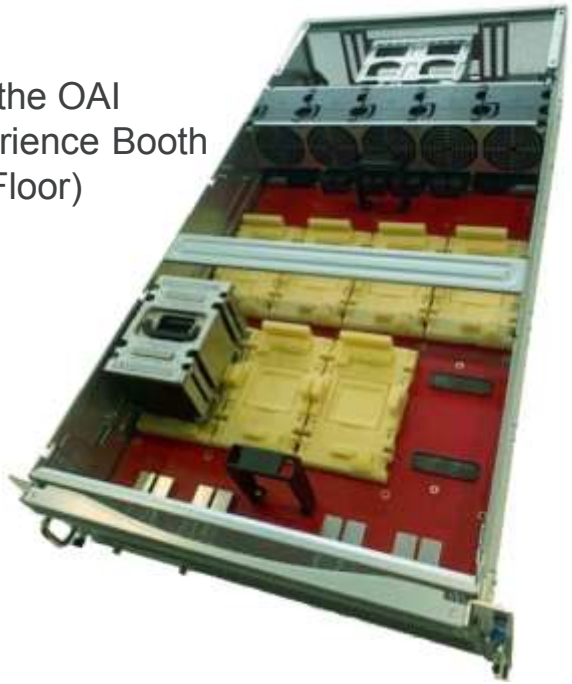
Business case for Open Accelerator Infrastructure (OAI) (cont.)

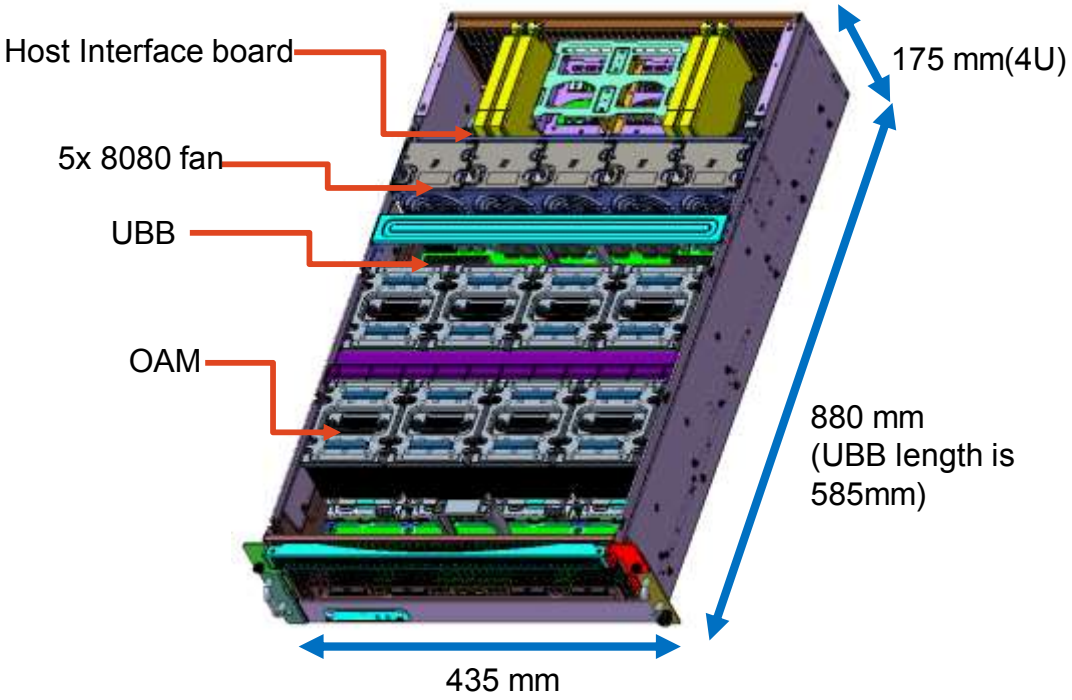
- Building server solutions for each hardware accelerator is not feasible due to
  - Development costs
  - Time-to-market considerations
- Open Accelerator Infrastructure (OAI) is an open standards approach to:
  - Realize the performance benefits of the various hardware accelerators
  - Utilizing common building blocks to simplify system development

ZT OAI System

ZT OAI System

Visit the OAI Experience Booth (2nd Floor)

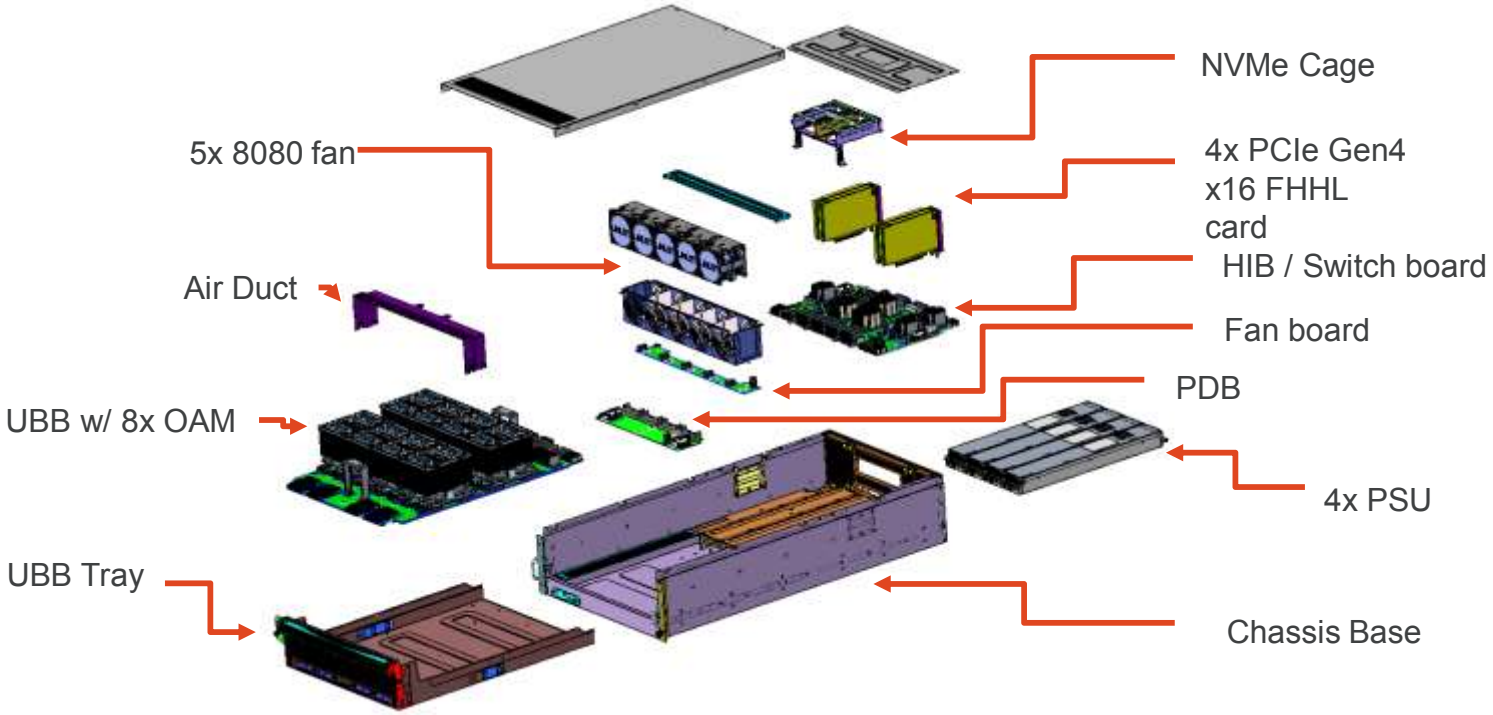




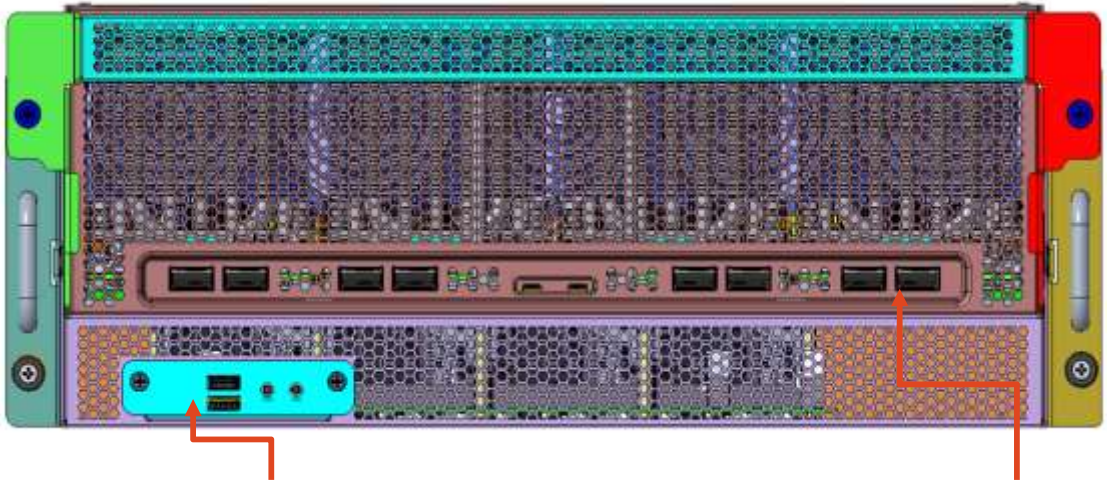
System Features

Feature	Description
Chassis Dimensions	435mm width x 880mm length x 175mm height (4U)
Rack Infrastructure	19” Rack
Host Node Connectivity	Non-Integrated External Host
Universal Baseboard	Supports 8x OAM modules in a 8-port Hybrid Cube Mesh (HCM) topology
Host Interface Board	Co-planar connectivity to UBB, BMC, 3 Broadcom Gen4 Switches, and PCIe expansion slots
Expansion Slots	Support 4* PCIe Gen4 x16 Single width including 2 * PCIe Gen4 x16 Uplinks for multi-host
Storage	Front: 4* 2.5” NVME hot plug drive (Option)
Power	3000W Platinum PSU 54V for 2+2
System Management	Aspeed 2520, IPMI v2.0 Compliant
System Fans	5x 8080(80mmx80mmx80mm) dual rotor fans
IO Rear	PWR button, RST button, UID button, System Health LED, 8x OAM Health LED MGMT (RJ45), Com port, USB 3.0 (USB 2.0/UART/I2C)
IO Front (Optional)	PWR button, RST button, USB 3.0 (USB/UART/I2C)

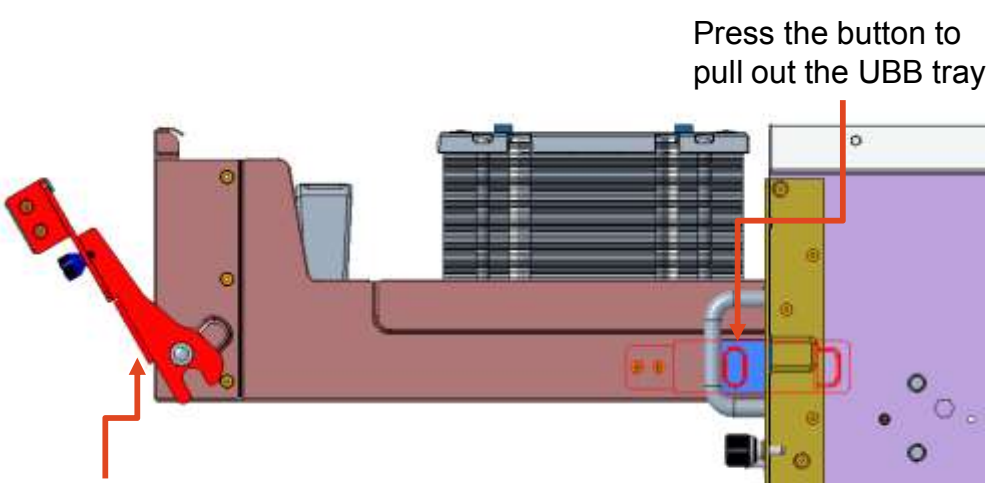
ZT OAI System: Exploded View



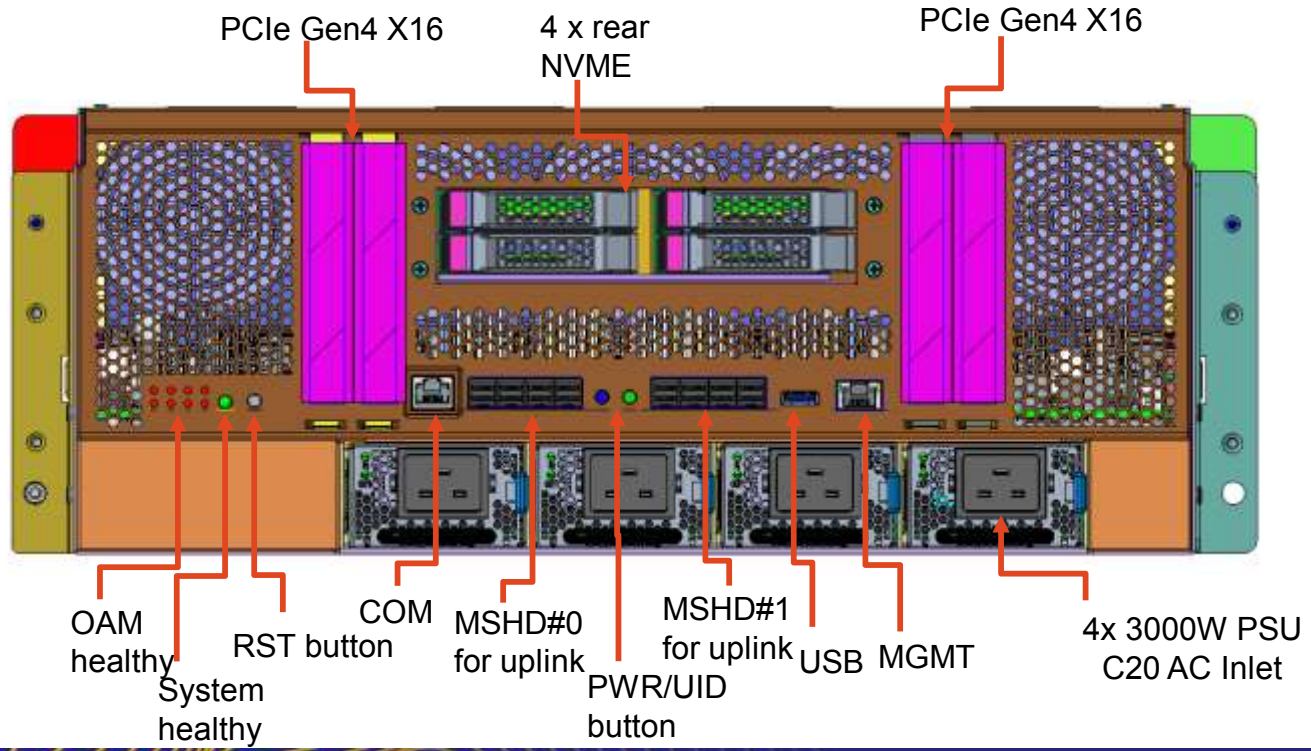
ZT OAI System: Front View



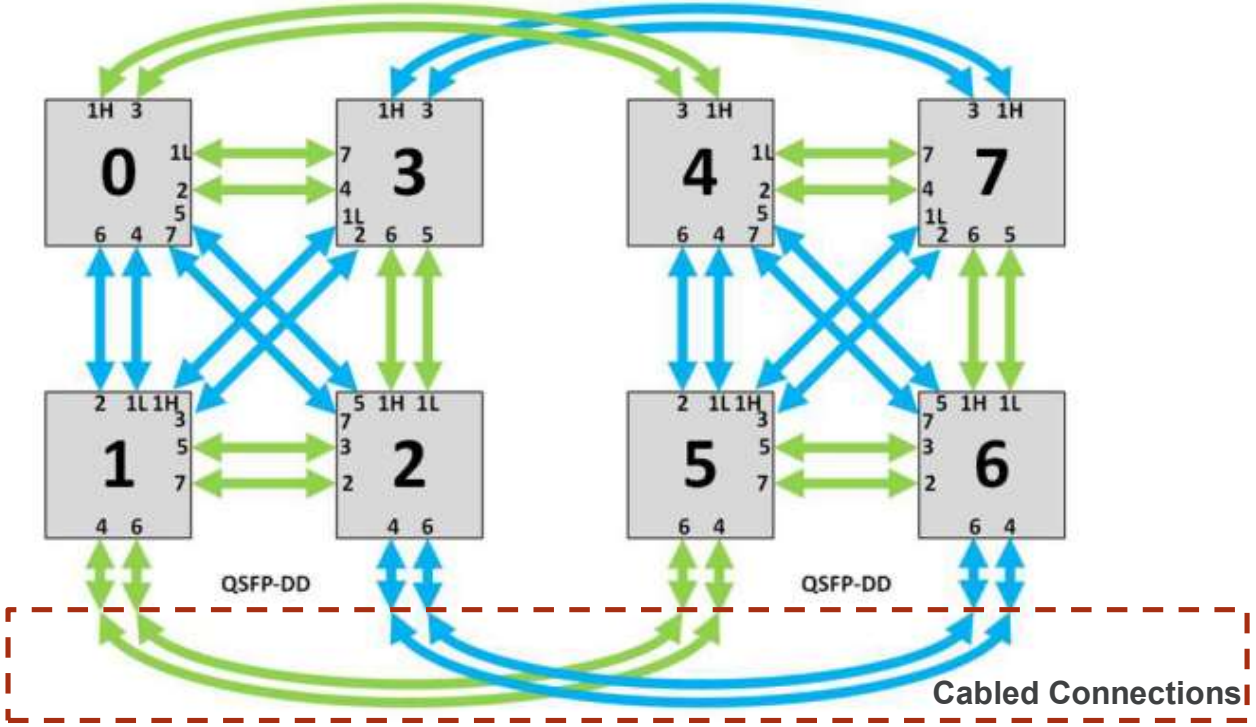
ZT OAI System: UBB Serviceability



ZT OAI System: Rear View

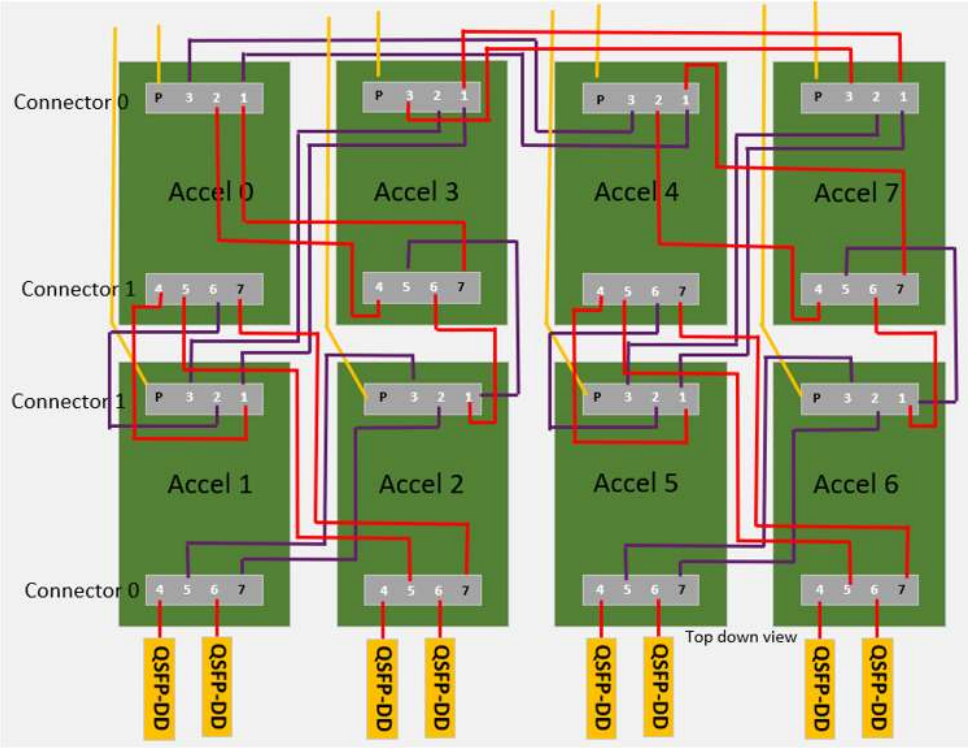


UBB 8-port HCM topology



UBB 8 Port HCM topology

- HCM using 8 ports: 1L, 1H, 2, 3, 4, 5, 6, 7
- SerDes Port 2, 3, 4, 5, 6, 7 are x8 lanes
- SerDes Port 1 is x16 (2 x8) lanes
  - 1L – SerDes 1 Lower 8-lanes
  - 1H – SerDes 2 Upper 8-lanes
- Ports 4 and 6 (OAM #1, #2, #5 and #6)
  - Ports 4 & 6 on the bottom row are cabled connections to support full 8 port HCM.
  - Alternatively, Ports 4 and 6 can be used for OAI expansion (scale out) via QSFP-DD cables to another UBB board.



Summary

- Server industry has flourished through benefit of open standards
- OAI provides a standards based approach to harness new accelerator technologies within common developed building blocks
  - Reducing development costs
  - Improved time-to-market
  - More robust/proven building blocks
- ZT OAI System targeted launch 2H 2020

More sessions/demos on OAI:

- *Open Accelerator Infrastructure Overview*: **Friday, 9/27 at 13.00 in room G103**
- *OAI Reference Systems Joint Review:* **Friday, 9/27 at 13.45 in room G103**
- *OAI Experience Booth: 2nd Floor, both days*