

OCP HPC Sub Project

Minutes - 02/18/2025

OCP Local Recording :

https://drive.google.com/file/d/12UJKvJ705zilGE2_71MjCskqQCHQO0h5/view?usp=drive_link

Meeting Transcript :

https://drive.google.com/file/d/18isA5o2cJKIQ7RrcTD881HhibZBQu26d/view?usp=drive_link

Attendees

Attendee	Affiliation	02/18/2025
Howard Andrews	Lotes	x
Munir Ahmed	Lattice	x
Christian Boreli	Analogue Insight	x
Kevin Cameron	Individual	x
Allan Cante	Nallasway	x
Ben Cante	Nallasway	x
Michael Choi	Samsung	x
Robert Ciotti	CTG Federal	x
Olivier Franza	Intel Foundry	x
Nhat Nguyen	Ayar Labs	x
Ariel Delos Reyes	LOTES	x
Mitch Wright	Liquid	x
Totals		12

Meeting Objectives

Proposed Agenda for this meeting :

- 1) Introductions to New Attendees.
- 2) Bring-Up Concept MCIO Connector discussion
- 3) OCP Regional Summit Submission
- 4) AOB

Meeting Discussion Notes

- 1) Introductions to New Attendees.
- 2) Bring-Up Concept MCIO Connector discussion
- 3) OCP Regional Summit Submission

Pioneering the Next Era: Rack-Scale Heterogeneous HPC & AI in the OCP Ecosystem

With the pace of innovation continuing to accelerate, we need to think beyond just the next generation or 2 of computing architectures. We must reimagine every facet of computing infrastructure for the coming decade. Heterogeneous modularity is currently emerging as a key enabler, empowering system architects to easily construct domain-specific computers.

In this presentation, the OCP HPC SubProject introduces a novel “fast path” process designed to rapidly transition new processor and accelerator chips from fabrication to deployment within an OCP modular, rack-scale architecture. This streamlined development-to-deployment cycle not only accelerates innovation in high-performance computing but also lays the foundation for enhanced artificial intelligence processing capabilities. We will detail how these new processors and accelerators can then be efficiently integrated into a high-density, 500KW+ RackScale OCP infrastructure, setting the stage for a new era of HPC and AI performance.

- 4) AOB

AI Generated Meeting Summary - NOTE this is an OK summary but is confused in several areas.

**Meeting summary for OCP Server - High Performance
Computing (02/18/2025)**

Quick recap

The team discussed their experiences working remotely, with Howard sharing his recent visit to Design Con and Allan expressing his own feelings of isolation. They also presented an updated model of a deployable bring-up board for silicon startups and discussed the dimensions and specifications of cables for their project. Furthermore, they discussed the feasibility of using high volume manufacturing for prototype volumes, the potential implementation of a new system, and the integration of the HPCM into a 19-inch rack.

Next steps

- Ben to narrow the cable width in the model to 20mm and keep it central on the connector.
 - Allan to have offline discussions with Howard about costing options for near stack vs. modified MCIO connectors.
 - Ben to update the HPCM model to fit into a 21-inch chassis with 12 modules.
 - Allan to present the "Pioneering the Next Era Rack Scale Heterogeneous HPC and AI in the OCP Ecosystem" at the regional summit.
 - Ariel to check and provide information on the outer diameter of twin-ax cables with insulation for MCIO connectors.
 - Allan and Ben to further optimize the HPCM design to fit within the 2U height constraint.
 - Allan to follow up with Bob (rciotti) later in the day.
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Summary

Remote Work and Future Travel Plans

Howard and Allan discussed their experiences working remotely and the challenges it presents. Howard shared his recent visit to Design Con and his growing understanding of the company's diverse product offerings. Allan expressed his own feelings of isolation working from home. They also discussed their plans for future travel, with Allan planning to attend the OCP Regional Summit in Dublin and Howard considering a trip to Dublin to visit his daughter. They reminisced about their past experiences, with Allan recalling his time in Glasgow and Howard mentioning his potential meeting with Mitch Wright.

Deployable Bring-Up Board for Startups

Allan and Ben present an updated model of a deployable bring-up board for silicon startups, designed to fit in an OCP 21-inch DCMHS chassis. The model includes four modules with power fingers connecting to bus bars for 48V power distribution. A frame serves as an exoskeleton, incorporating water cooling manifolds and power bus bars. The design aims to provide a fast path from chip fabrication to deployment in an OCP chassis. The team is working on integrating water cooling systems and power distribution, using Molex 75 amp connectors. They are seeking input from thermal management companies to refine the cooling system design.

Cable Specifications and Universal Topology Discussion

Allan, Ben, and Ariel discussed the dimensions and specifications of cables for their project. They agreed to use a 4mm diameter cable, as received from Z, and to maintain a minimum internal diameter of 3mm for higher speed applications. They also discussed the possibility of bundling cables into round tubes and the use of twin-ax cables. The team considered the challenges of fitting the cables into the available space and the potential for using fewer cables in their new universal topology variant. Howard expressed concerns about the tight bend radius and its

potential impact on signal integrity. The team agreed to double-check the thicknesses and dimensions with all stakeholders.

Modifying the Mclo Connector Design

Allan proposes modifying the MCIO connector for a universal topology interconnect idea. The modifications include removing through-hole features, adding surface mount legs, and reducing the cable count. Howard and Ariel explain that making sample cables is not a big undertaking, but changing the connector housing and tooling will require some modifications. They discuss the implications of removing power connections from the cable and keeping the power contacts only for potential active cable use in the HPCM model.

Prototype Manufacturing and Connector Options

Allan, Ariel, and Howard discussed the feasibility of using high volume manufacturing for prototype volumes. Ariel clarified that prototypes could be in hundreds or thousands, but the exact quantity for production was uncertain. Allan raised concerns about the cost difference between prototype and high volume manufacturing, which Ariel agreed needed further investigation. Allan also proposed an alternative implementation using Molex's near stack connector system, which could potentially reduce tooling costs. However, he acknowledged potential mechanical challenges in holding down the connector. The team agreed to further explore these options.

Narrowing Cables for Near Stack

Allan discussed the potential implementation of a new system, which could involve tooling changes and cost considerations. He suggested that if they went with the near stack, they could potentially narrow the cables to 20mm width. Allan also mentioned that they had stopped Ben from doing more wiring, but they could potentially bring the power pins together. The team agreed to narrow the cables to 20mm width for modeling purposes. Allan also mentioned the possibility of changing connectors to near stacks if they went with the near stack due to cost reasons. The conversation ended without any other questions or topics to discuss.

Regional Summit Submission and HPCM Platform

Allan discussed the submission for the regional summit, focusing on the development of a deployable bring-up platform and a high-density HPCM platform. He emphasized the strategic initiative of open systems for AI, which involves combining DCMHS and OAI into one umbrella under DCMHS. Allan also mentioned the interest of the CTO in advancing HPCM ideas within the chassis. He outlined the presentation's abstract, which highlights the need for reimagining computing infrastructure and the role of heterogeneous modularity in accelerating innovation in high-performance computing and AI processing capabilities.

HPCM Integration and Chassis Setup Plans

Allan and Ben discussed the integration of the HPCM into a 19-inch rack, with the aim of fitting 12 HPCMs into a 21-inch chassis. They also discussed the need for a manifold at the front of the chassis to bring in water and the potential for a bus bar mechanism to split the bus bars into four separate columns. The total height of the setup was estimated to be 82mm, with a total of 48 plus 48, totaling 94mm. Allan suggested that they might need to add some height to accommodate cables.

The discussion ended with Allan needing to run to another call, and RCIOTTI requested a later discussion with Allan.

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