

**Hewlett Packard  
Enterprise**

# **An Early Access Program for ARM in HPC**

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# Introduction

- The Data Center Infrastructure Group (DCIG) is the home of HPC within HPE
- Within DCIG, the Advanced Technologies Group (ATG) focusses on disruptive and emerging technologies
- Early access HPC program for ARM is one of the projects ATG is leading
- Presentation will not cover Gen-Z as is suggested by the agenda
  - From [www.genzconsortium.org](http://www.genzconsortium.org): “*Gen-Z: An open systems interconnect designed to provide memory semantic access to data and devices via direct-attached, switched or fabric topologies.*”

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# Program Overview

- Mission:
  - Accelerate ecosystem development for ARM, based on open standards and software
  - Partner with key collaborators
  - Develop a robust HPC SW stack
  - Pave the way for large-scale ARM HPC deployments
  - Earliest Cavium ThunderX2 access from a Tier 1 vendor
- Started in February 2017
- Ongoing

# Hardware

## HPE Apollo r2200 Enclosure



## Node Options / Trays:



### 1U Node

2 TX2

Half-width

4 per enclosure



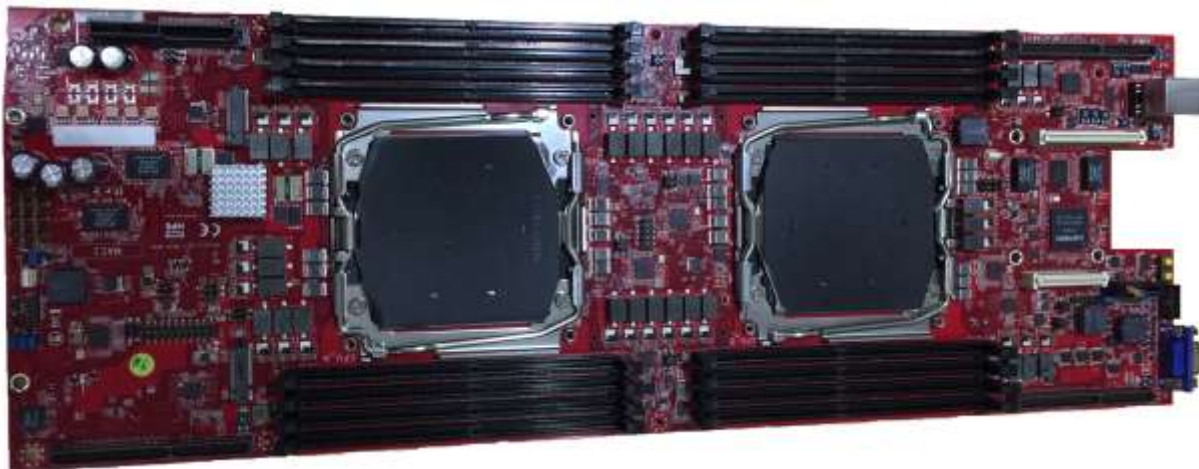
### 2U Node

2 TX2 + 2 GPU

Half-width

2 per enclosure

## System Board



## Node Features

### Compute

- Dual ThunderX2 Series processors
- ICI coherent connection

### Memory / Storage

- 16x DDR4 DIMM Support
- 2x m.2 SATA SSD
- 2x LFF SATA HDD

### I/O

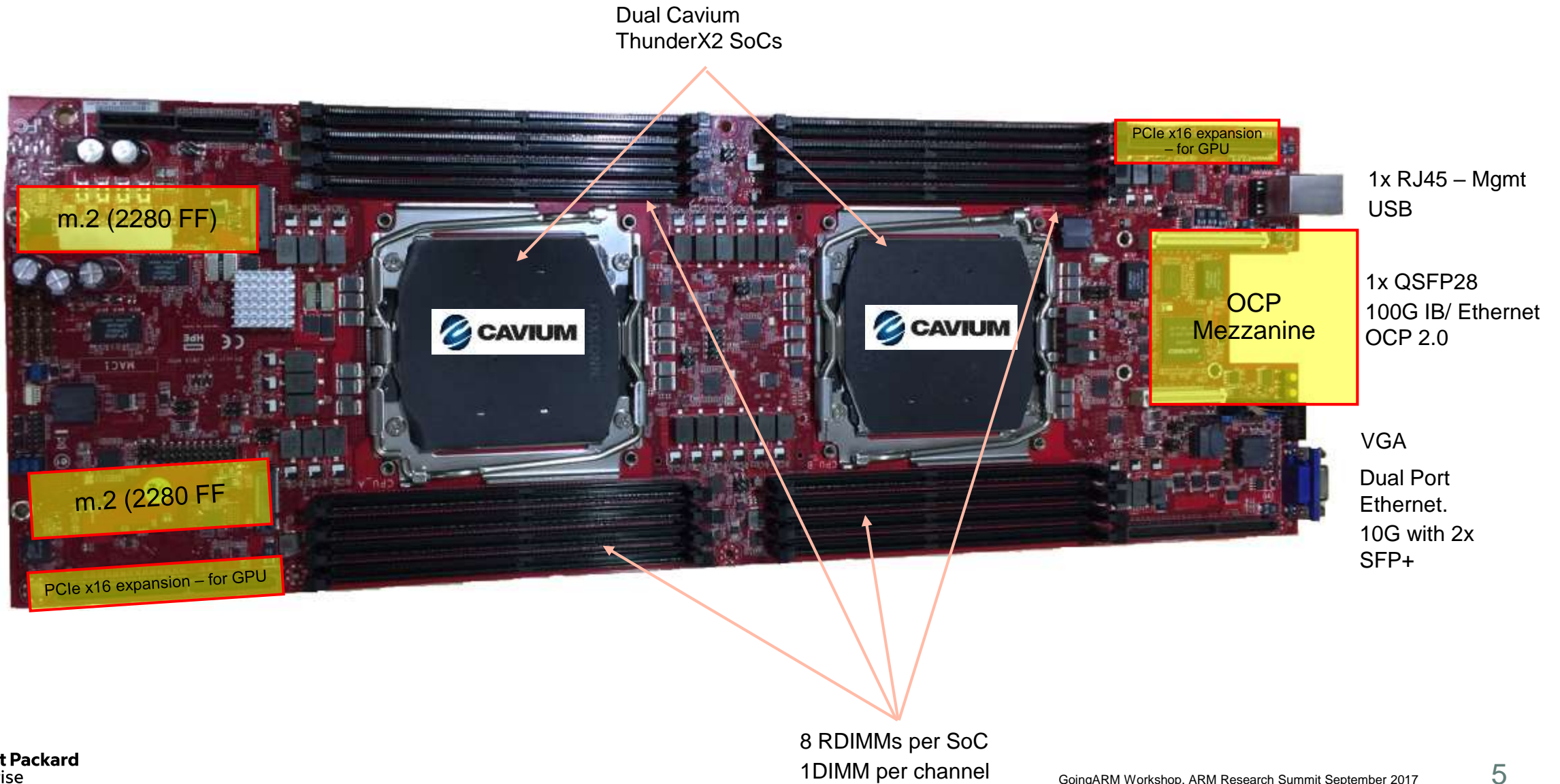
- Single Port QSFP28: 25/50/100Gb/s NIC (IB or Ethernet) – Mellanox VPI Adaptor, OCP 2.0)
- Dual Port SFP+: 1/10GbE
- Single Port RJ-45: 1GbE
- 1x USB, 1x VGA, 1x UART

### Acceleration

- Up to 2x AMD s9170 FirePro GPU via PCIe riser cards (requires 2U tray)



# System Board



# Program Collaborators

Drive open HPC ARM SW stack to be as robust as x86.

## Platform (HPE)



- Develop & Deploy a stable ARM64 Platform
- Coordinate & Facilitate The Collaboration
- Sponsor Forums for Discussion / Communication
- Honest Broker

## Partners



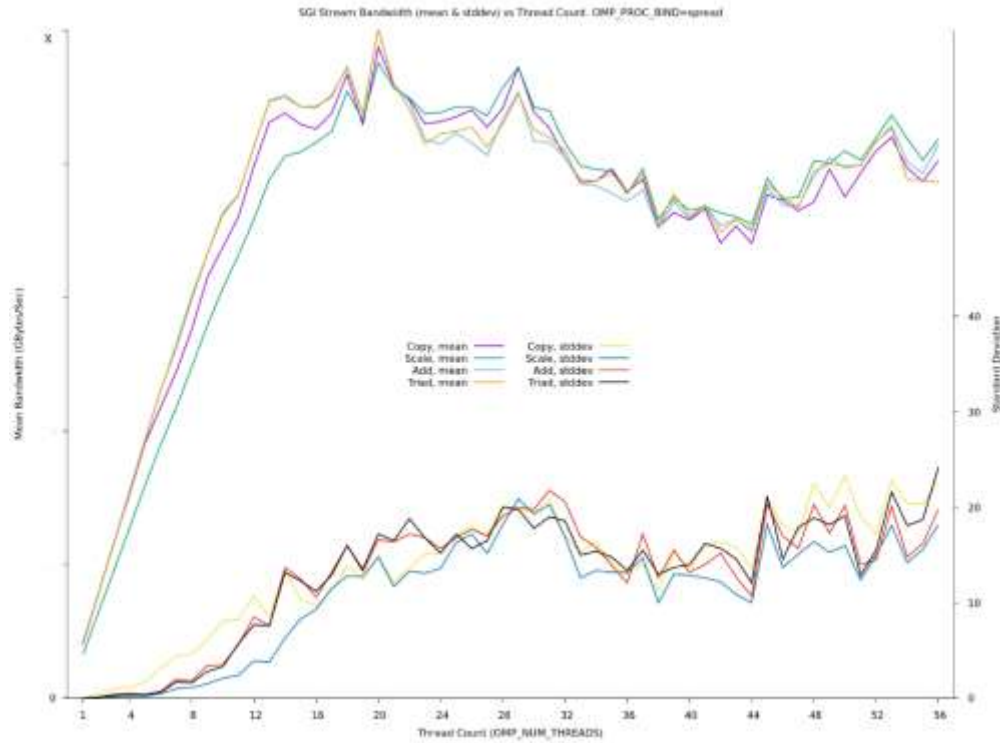
- Port/create, develop, optimize, validate & support key software components
- Collaborate with HPE and customers.
- Participate in Forums and discussion

## Customers

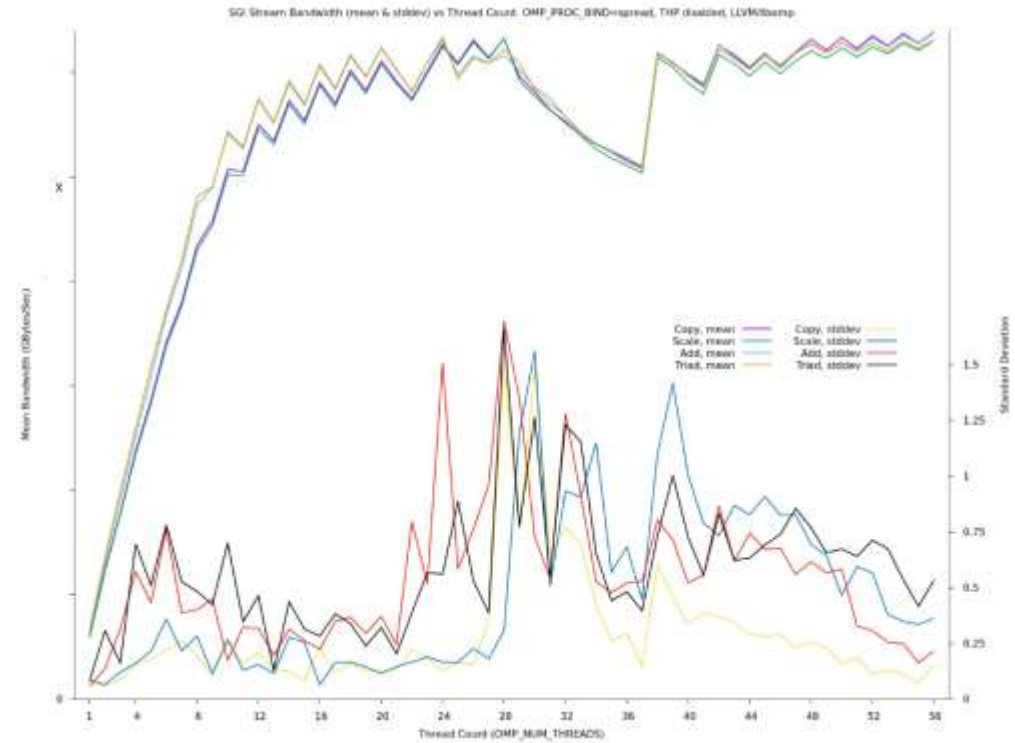


- Provide real-world exposure to ARM platform.
  - Select and port/develop workloads/projects
  - Provide feedback and insight into results
  - Identify, implement & distribute improvements
  - Cooperate with partners to resolve problems.
- Collaborate
  - Port/develop as required.
  - Measure performance & optimize.
  - Communicate inside and outside the program

# Example – Transparent Huge Pages



THP: On



THP: Off

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# Customers





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# Questions ?

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# Thank You

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