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## Zion Modular System Architecture Overview



**OCP**  
GLOBAL  
SUMMIT

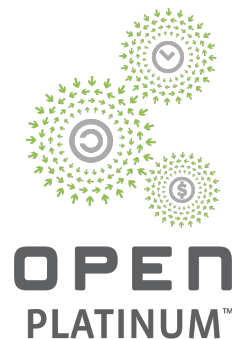
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# Zion Modular System Architecture Overview

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Tyler Hart, RTP Engineer, Facebook



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# Facebook Open Fleet

2011	2012	2013	2014	2015	2016	2017	2018	2019	2021			
 Data Center	 Triplet Rack	 Windmill (Intel)	 Knox	 Open Rack V2	 BluRay	 Wedge 100	 Backpack	 Wedge 100S	 Big Basin	 Big Basin V2	 Open Accelerator Module	 Delta Lake
 Battery Cabinet	 Freedom Servers	 Watermark (AMD)	 Winterfell	 Mezzanine Card V2	 Leopard	 Big Sur	 Lightning	 Bryce Canyon	 100G CWD4-OC	 Twin Lake	 Minipack	 Yosemite V3
 Spitfire Server (AMD)	 Mezzanine Card V1	 Open Rack V1	 Cold Storage	 Wedge	 Yosemite	 Yosemite V2	 Yosemite V2	 OCP NIC3.0	 Minilake	 Wedge400	 Minipack2	
 Power Supply		 Group Hug	 Micro Server (Panther)	 Honey Badger	 Six Pack	 Tioga Pass	 FAV3					

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# AI in FB

AI is used extensively in FB

**Ranking**

**Content Understanding**

**Pattern Detection**

**Speech Recognition**

**Translation**

**Powerful AI Models need Powerful Hardware!**

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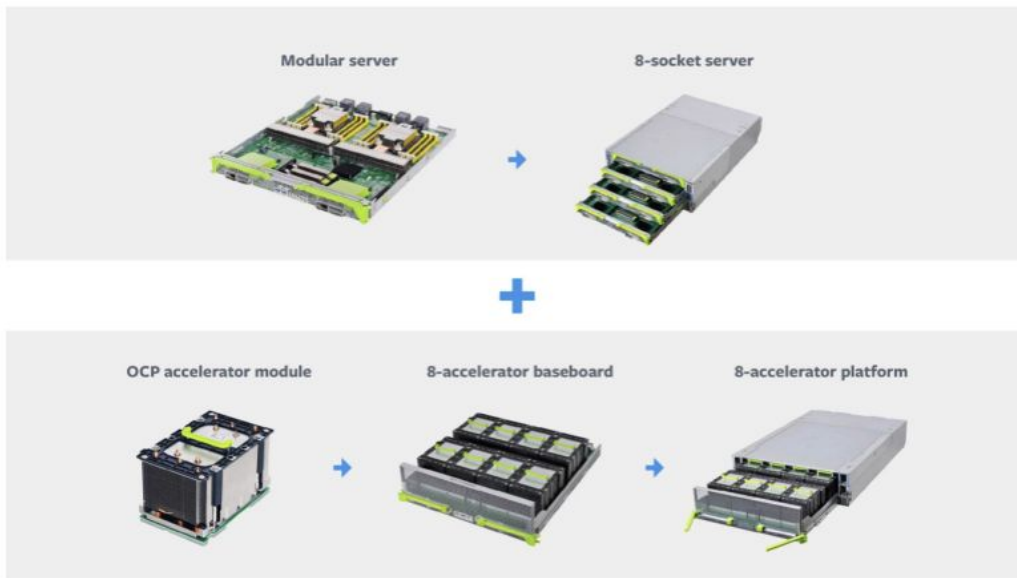


# Zion System Overview

Zion is designed to support AI workload.



SERVER



Presented in 2019 OCP Summit

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# Zion System Overview

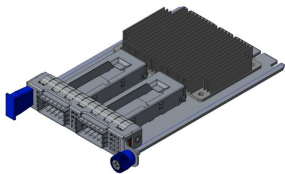
2-socket modular server



2 or 4 socket platform



OCP NIC + Storage Modules



Expander Box



Open Accelerator Module

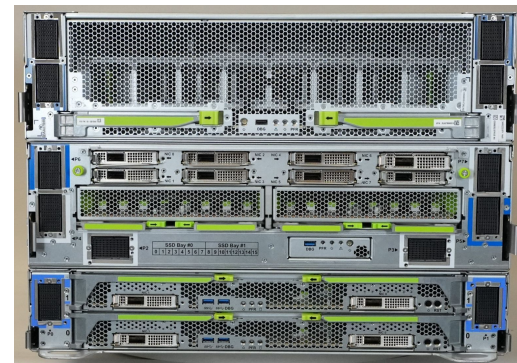


8 Accelerator Platform



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ZionEX system



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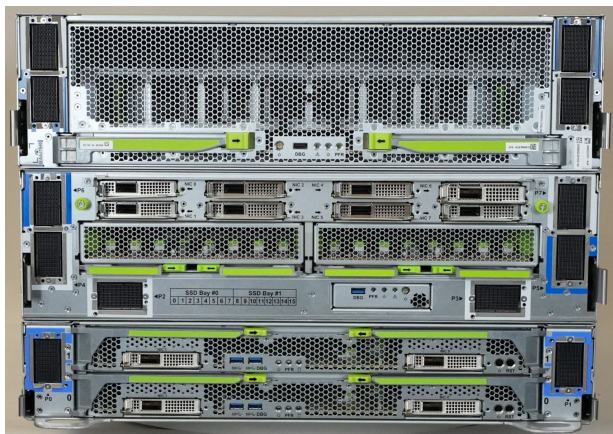


# Zion System Overview

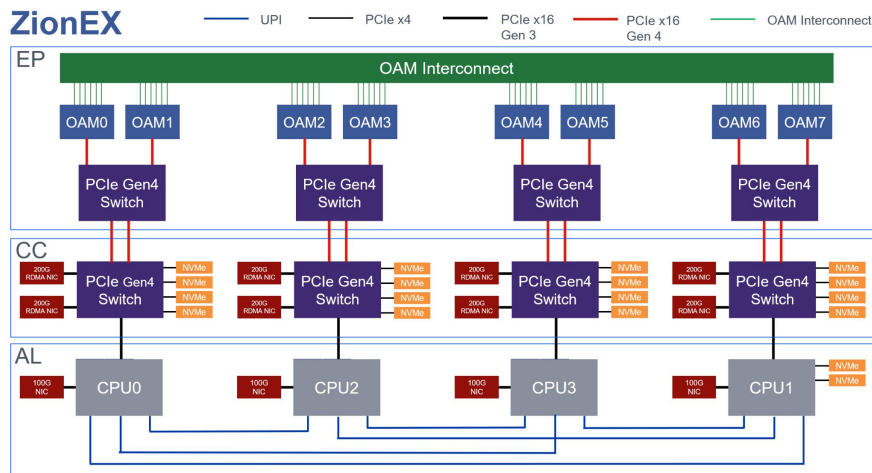
Zion is designed to support AI workload.



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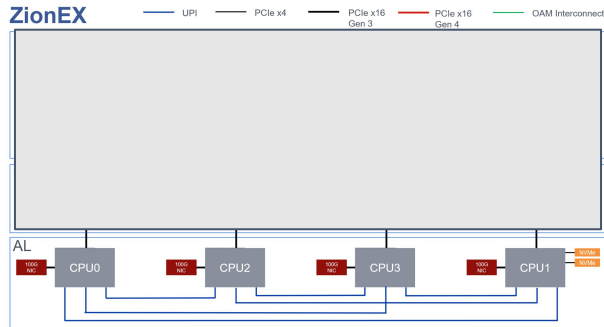
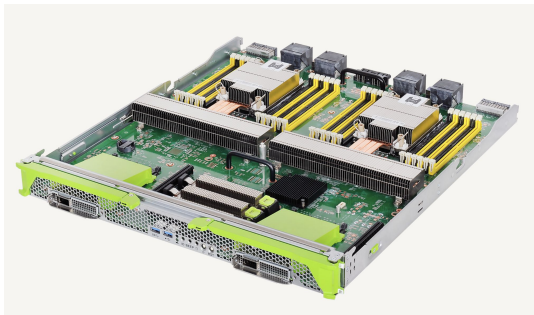
## ZionEX



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# Angels Landing



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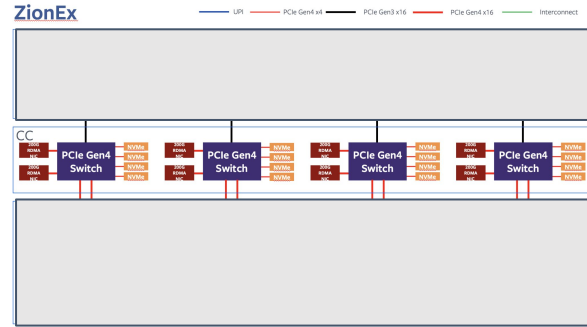
- Up to 4 socket Intel Cooperlake CPUs
- 4x 100G OCP3.0 NICs
- 1.5TB DDR4 RAMs
- Fully connected UPI through backplane

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# Clear Creek

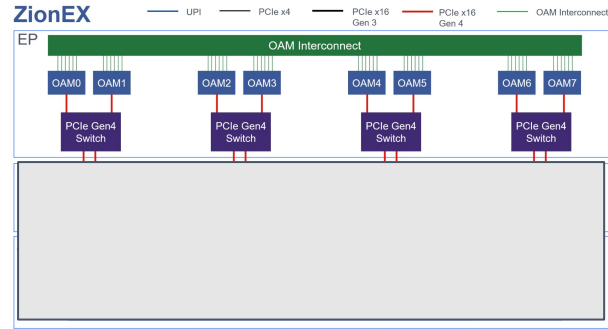


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- 4x PCIe Gen4 Switch
- 8x 200G NICs for scale out
- 16x E1.S/M.2 SSDs

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# Emerald Pools



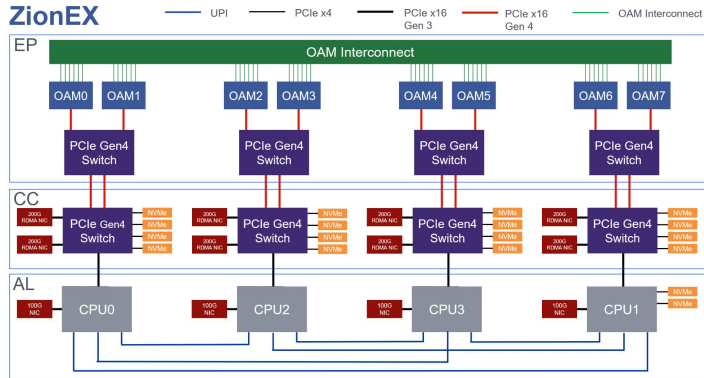
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- 8x Open Accelerator Modules
- OAM interconnections support high speed communications between accelerators

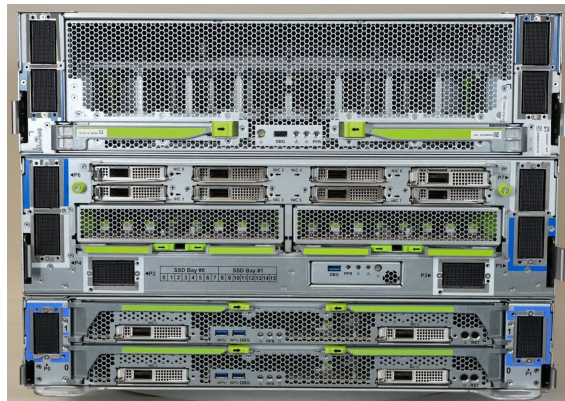
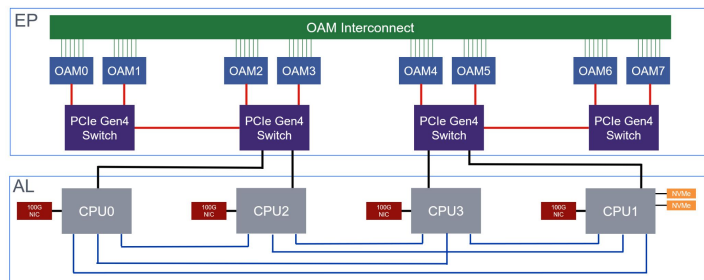
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# Flexible Configurations

## ZionEX



## Zion2S/4S



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Modular system designs enable hardware to be tailored for each AI use case

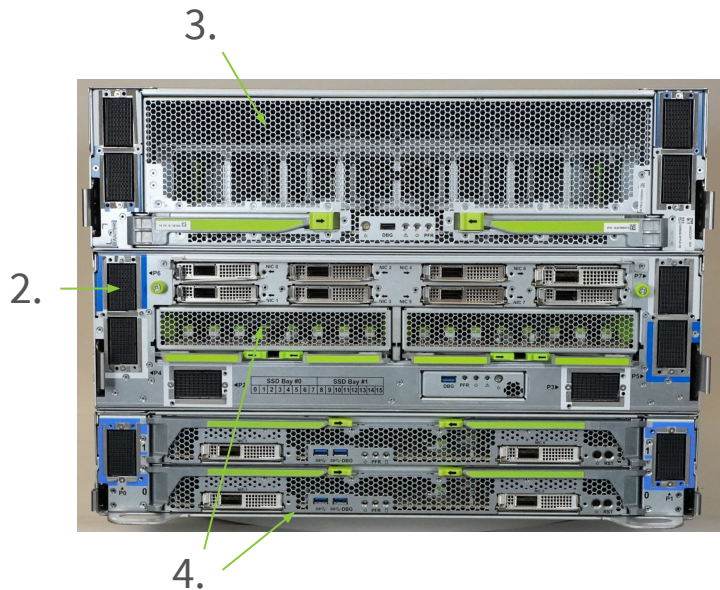
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# Designed for Field Service



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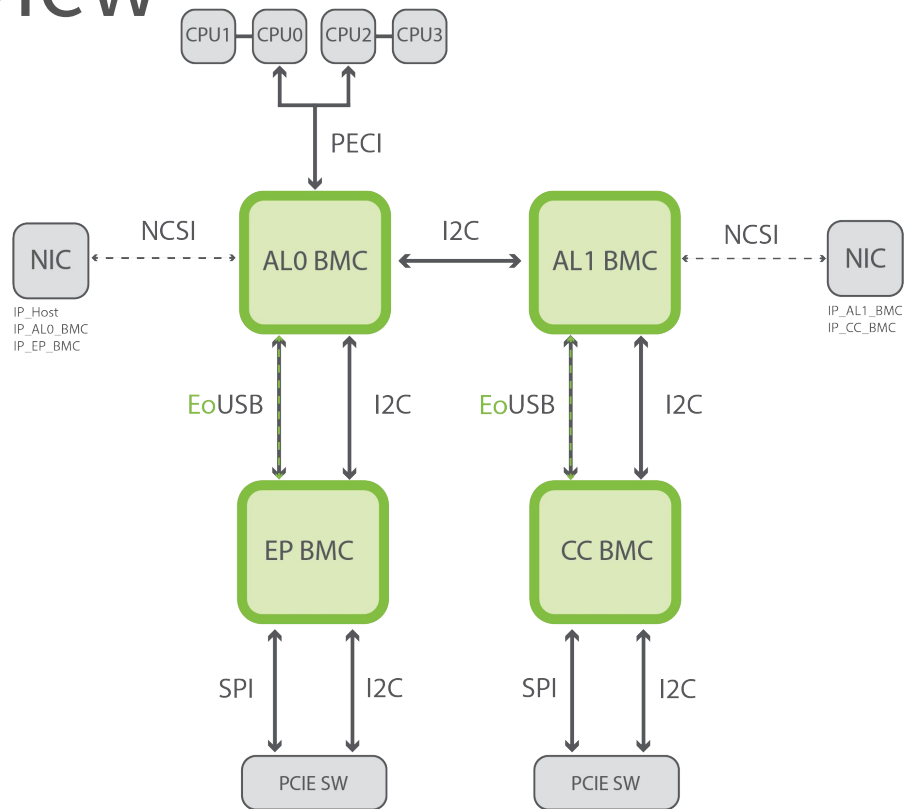


1. All field replaceable units (FRUs) with significant failure rates are accessible without removing cabling
2. PCIe cabling is routed from the back of each board, around the sides and to the front of each system
3. The OAMs are accessible from a sliding rail kit
4. CPUs, DIMMs, and storage modules are accessible on front accessible trays

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# BMC Overview

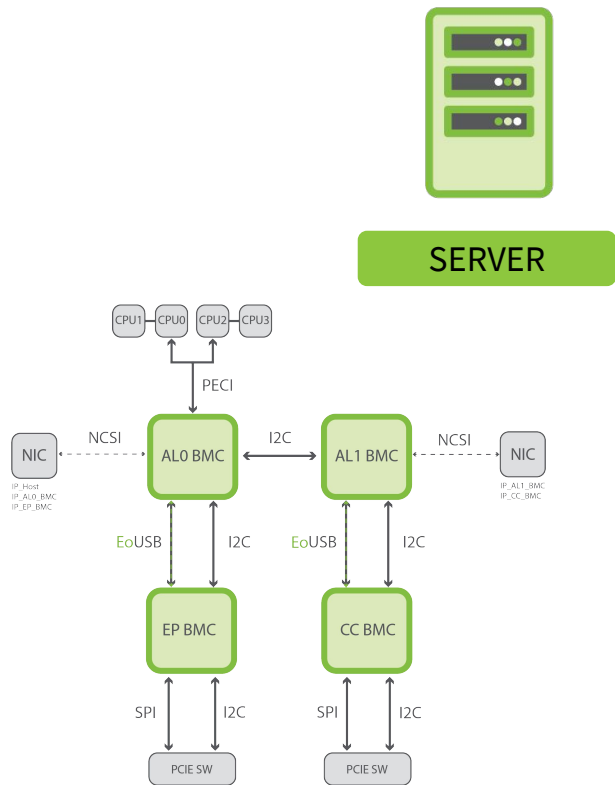


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# Autonomous Crash Dump

1. CATERR pin triggered, SEL created in AL0 BMC
2. AL0 BMC starts crash dump collection
3. MC Banks collected, sensors recorded
4. Crash dump log saved into BMC flash
5. Logging service extracts crash dump to database



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# Call to Action

- FB are contributing Zion system, Angels Landing, Clear Creek and Emerald Pools Specification to OCP Server/OAI group
- QCI will contribute the design collaterals soon.
- Zion System is already in MP stage.

Where to buy: <https://www.opencompute.org/products>

Project Wiki with latest specification : <http://www.opencompute.org/wiki/Server/OAI>

Mailing list: <http://lists.opencompute.org/mailman/listinfo/opencompute-server>

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Thank you!



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