



**OCP**  
SUMMIT

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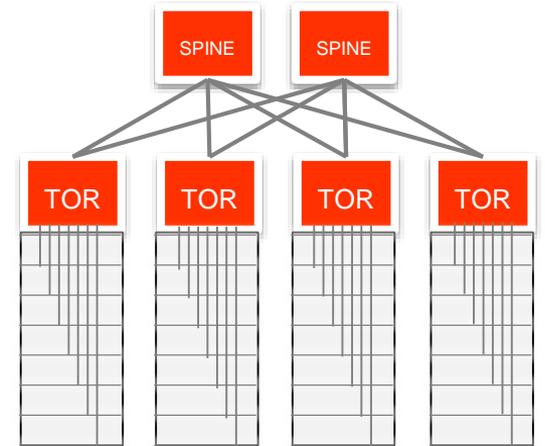
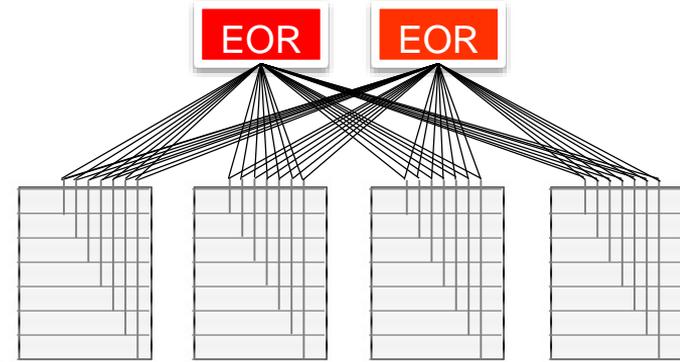
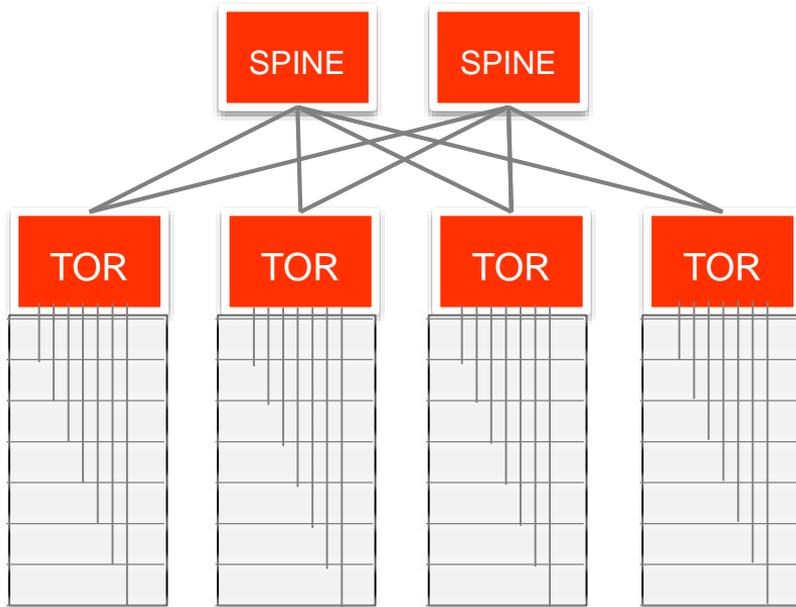
# Addressing Diversity in Data Center Networks.

Yaniv Kopelman, Networking CTO,  
Marvell Semiconductor

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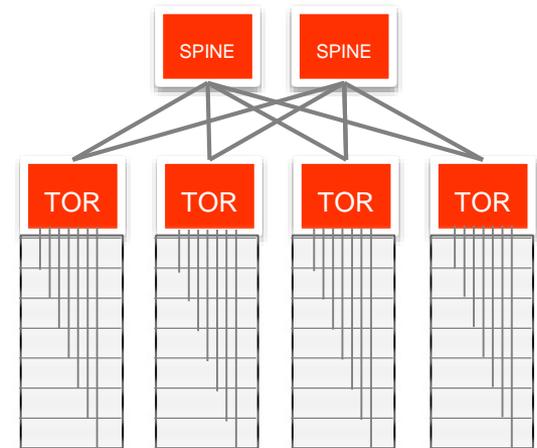
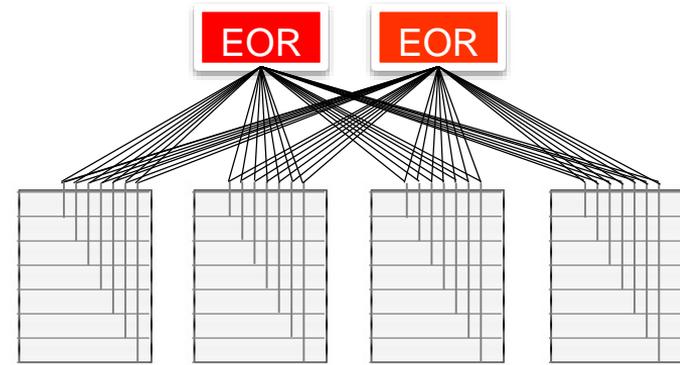


# Mega Scale Data Center



# Mega Scale Data Center

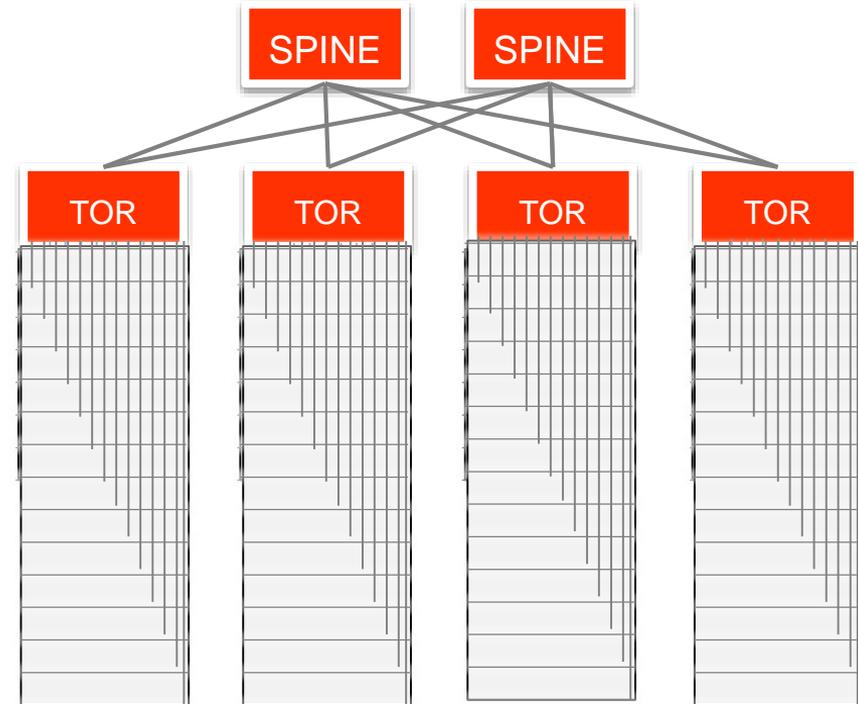
- Mega Scale DC Requirements:
  - Very high throughput
    - Compute: 50G -> 100G -> 200G
    - Network: 100G -> 400G -> 800G
  - Storage and Compute Convergence
  - Analytics
  - High radix
  - Large forwarding tables
  - One-Size-Fits-All



# Enterprise and Private Cloud



- Enterprise DC and Private DC, typically try to duplicate MSDC architecture
- Enterprise and Private DC Requirements:
  - Lower throughput:
    - Compute: 1G -> 10G -> 25G
    - Network: 10G -> 40G -> 100G
  - Higher density racks
  - Feature rich



# Edge and uEdge Cloud

- Edge DC – DC closer to the premises
- uEdge DC – DC in a Rack or DC in a Box
- Edge DC Requirement
  - Real Time response for mission critical tasks
  - Security
  - Roaming
  - Low Power
  - Smaller form factor



# DC Hubs - Colocation

- Exchange hubs for Cloud Service Providers
- Colocation DC Requirements:
  - Security
  - Diverse I/O configuration
  - Automatic Reconfiguration
  - Seamless migration from one CSP to another
  - Resiliency for disaster recovery
  - SLA's different QoS and service levels

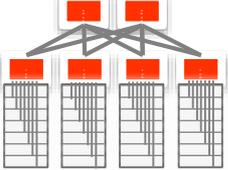


## Mega Scale DC

## Private Cloud

## Edge Cloud

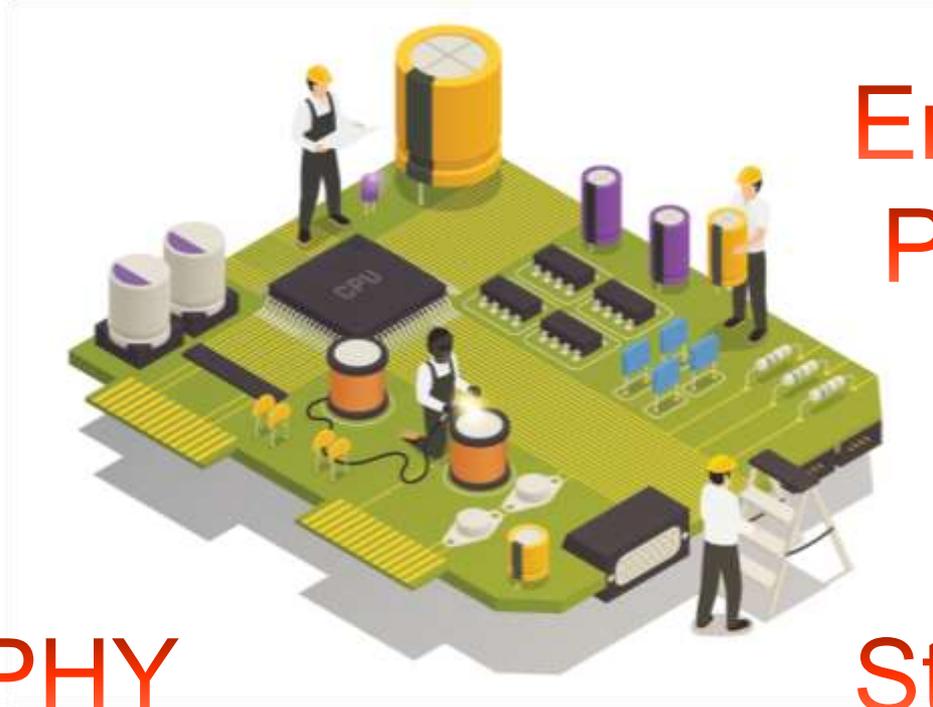
## Colocation

			
Higher throughput	Lower throughput	Low Power	Diverse I/O Configuration
Storage and Compute Convergence	Higher density racks	Real Time response for mission critical tasks	Seamless migration from One CSP to another
Analytics	Feature rich	Security	Resiliency for disaster recovery
High Radix		Roaming	Automatic reconfiguration
Large forwarding tables		Smaller form Factor	
One Size First All			



# Chips for Networking and Storage Infrastructure

Switch



Embedded  
Processor

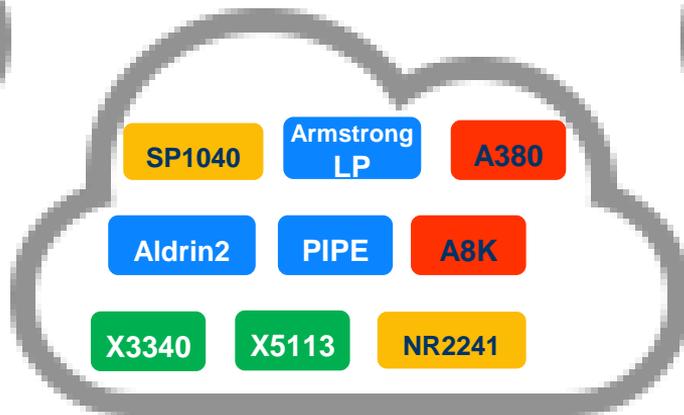
PHY

Storage

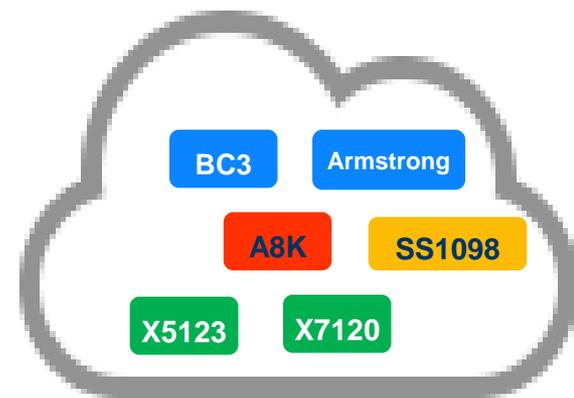
# Full Portfolio of Products



## Private Cloud



## Edge



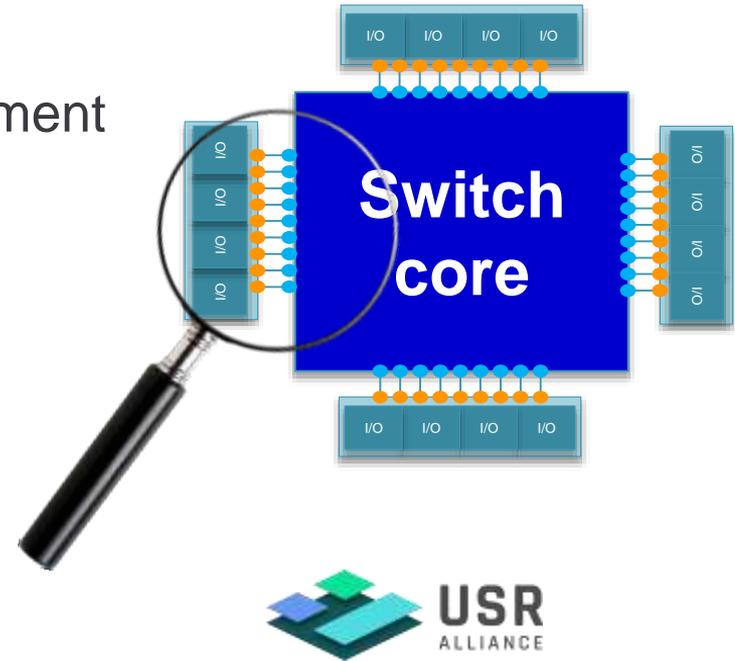
## Public Cloud (MSDC)

# Introducing Modularity



# Marvell Prestera Switch – Modular Architecture

- Enables different I/O configuration
- Different I/O speeds
- Optimized configuration per market segment
- Fully featured packet processor
  
- Addressing Diversity
  - Diverse Bandwidth solutions
  - Diverse I/O portfolio
  - Rich Features set: e.g. Roaming, Security
  - Enhanced Analytics
  - Low Latency
  - Advanced QoS



# Opening the Door for Chip Interconnect

Open Hardware

Open Software

Open System Firmware

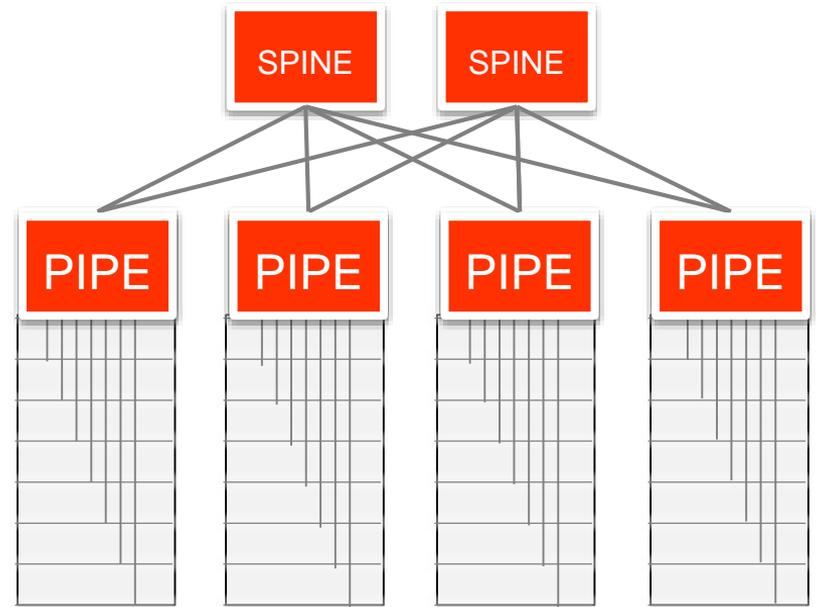
Open Chip Interconnect



**USR**  
ALLIANCE

# System Modularity – Prestera Port Extenders

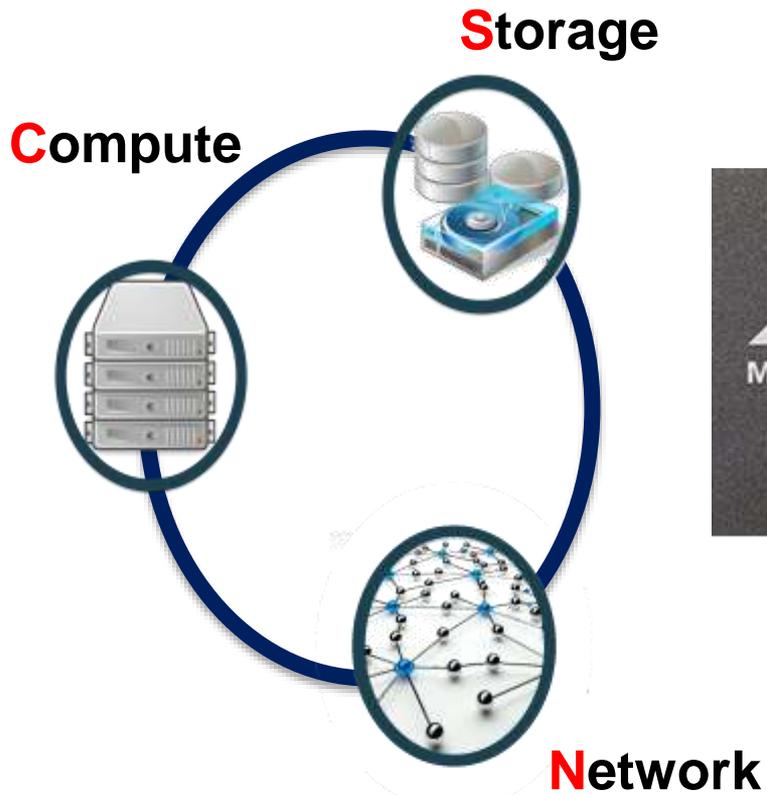
- PIPE – **P**assive **I**ntelligent **P**ort **E**xtender
- Replacing TOR switches with Passive Port Extenders
- Simpler management
- Plug and Play between vendors using standard 802.1BR protocol
- Addressing Diversity
  - Smaller network scale
  - Lower Power
  - Lower TCO



**30% of the RBOM**

**40% of the Power – Fan less design**

# PHY Solutions

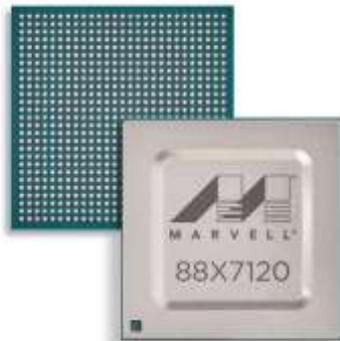
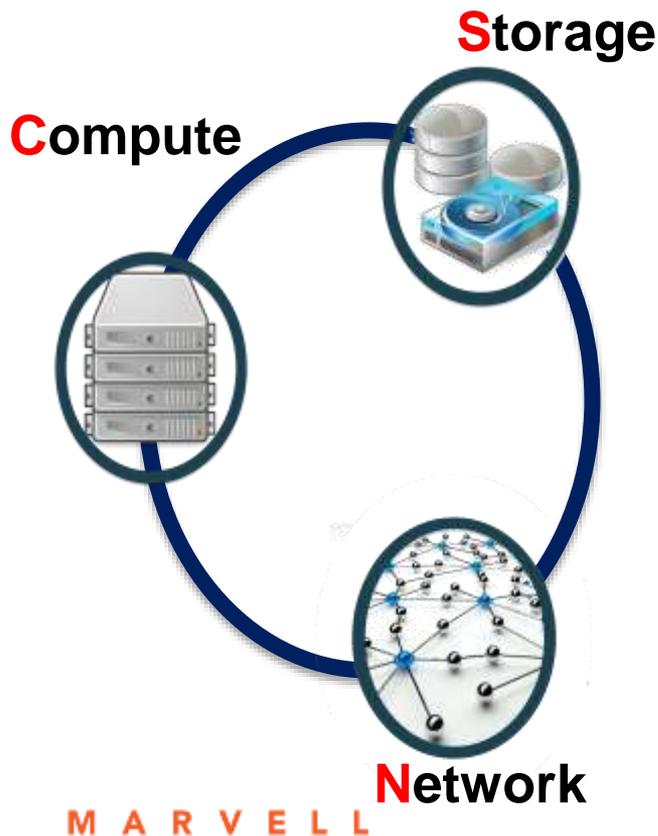


**Cable Plant:**  
Data Center, Carrier, Enterprise



**1GbE, 2.5/5GbE, 10GbE, 25GbE,  
50GbE, 100GbE, 200GbE, 400GbE**

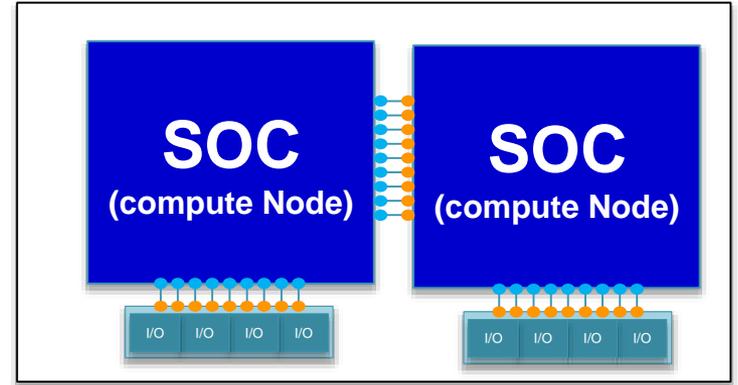
# PHY Solutions



- 16 Port 50GbE PHY
- Dual 400GbE Retimer
- Quad 100GbE Reverse Gearbox
- Fully compliant to IEEE 802.3cd and 802.3bs standards
- Optimized for QSFP-DD and OSFP applications

# ARM Based Modular Compute Nodes

- QUAD CORE ARM A72
  - 2 Clusters of 2xCA72
  - High performance Coherent interconnect
  - Virtualization support (Core and IO)
  - Secured boot support
- ARM Based Embedded processor for TOR and SPINE
  - SONIC and ONIE ported to ARM



# Address Future Trends

- Artificial Intelligence driving even higher Bandwidth
- Convergence of Storage Compute and Networking
- Larger Networks -> drive larger scales of switches
- Optical Interfaces directly from the Server



## THE REASON TO **WORK** WITH **MARVELL**

Marvell is the ONE company that can deliver a complete portfolio of Networking and Storage Infrastructure for all Data Centers



### **Experience**

Experienced veteran networking team  
Execution track record



### **End to End Product Portfolio**

Multiple generations of Eth Switch, embedded processors and Phy products  
Complementary products (e.g. Storage) from Marvell rich portfolio



### **Innovation**

Differentiating, feature rich, highest capacity DC switch  
Modular architecture and scalable design

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