



OPEN
Compute Project



OCP U.S. SUMMIT 2017

Santa Clara, CA



OCP Networking Done Right

Kevin Deierling

VP, Marketing

Mellanox Technologies

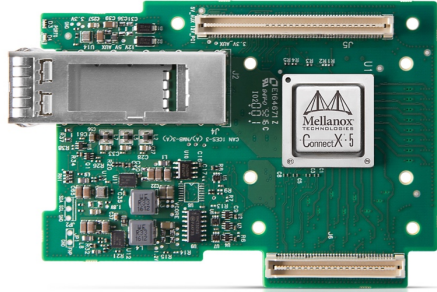
OPEN HARDWARE. OPEN SOFTWARE. OPEN FUTURE.



Mellanox Connects OCP!



ConnectX[®] 5

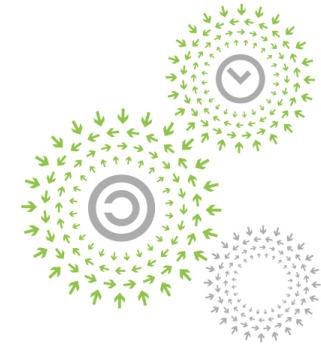


Dual-Port 100GbE MultiHost NIC

Spectrum[™]



25/50/100Gb/s Ethernet Switch



OPEN[™]
GOLD

- Supporting OCP partners since the beginning
 - Over 10 contributions for adapters, switches, Open Optics, & software
- Connecting the Clouds!
- Connecting WebScale Data Centers!
- Connecting All Major Next-Gen Server Architectures!
- Connecting Open Networking Platforms!
- Connecting World's First 25G, 50G, 100G, and now PCIe Gen-4 Server Platform!

Rackspace: World's First PCIe Gen-4 Server Platform



Rackspace Barreleye G2:

World's First PCIe Gen-4 Server (Zaius)

World's First OpenPOWER Power9 Processor

Mellanox ConnectX-5 OCP 100GbE NIC

World's First PCIe Gen-4 OCP Adapter

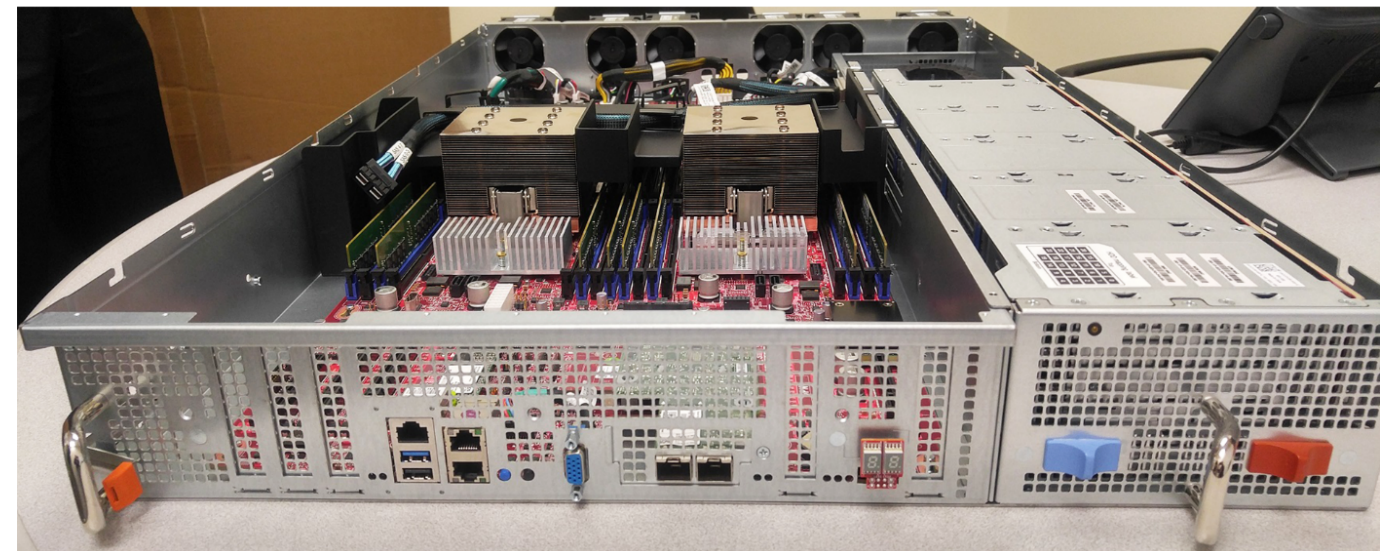
State-of-the-art application acceleration

OpenPOWER-based Platform Designed for Cloud, Cognitive Computing, Web 2.0 Applications



■ Barreleye G2 OCP Platform

- Based on Google/Rackspace Zaius Motherboard
- OpenCAPI OCP Server with ConnectX-5 OCP NIC
- High Density SAS/SATA/NVMe SSD
- 48V Open Rack V2
- High Capacity Chassis Option (20U)



Breakthrough OCP-Based Qualcomm ARM Server Platform



Qualcomm Centriq™ 2400:
World's First 10nm Server Processor

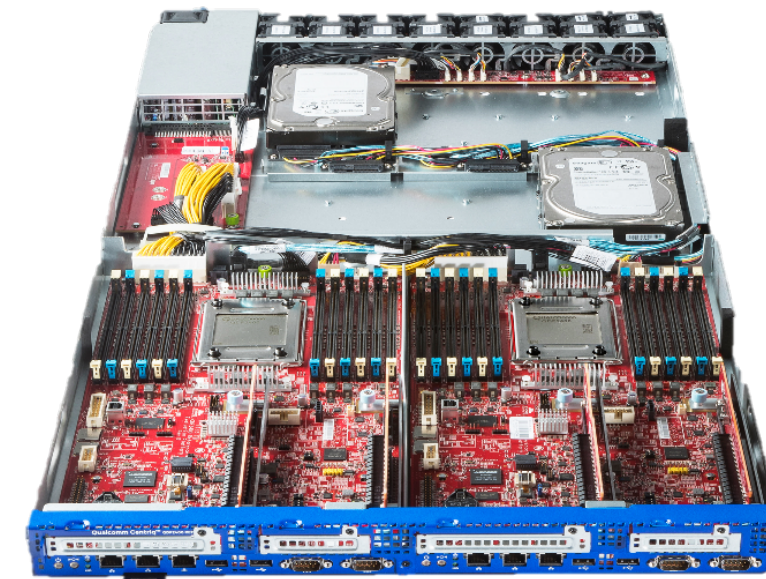
Mellanox ConnectX-5 100GbE NIC
State-of-the-art application acceleration

**ARM-based OCP Platform Designed for
Cloud, HPC, AI & Web2.0 Applications**

■ Qualcomm Reference Evaluation Platform

- Dual Node 1U OCP Design
- 12x 2DIMMs per Channel Memory
- 4x PCIe Gen3
- 6x SATA/SAS HDD/SSDs

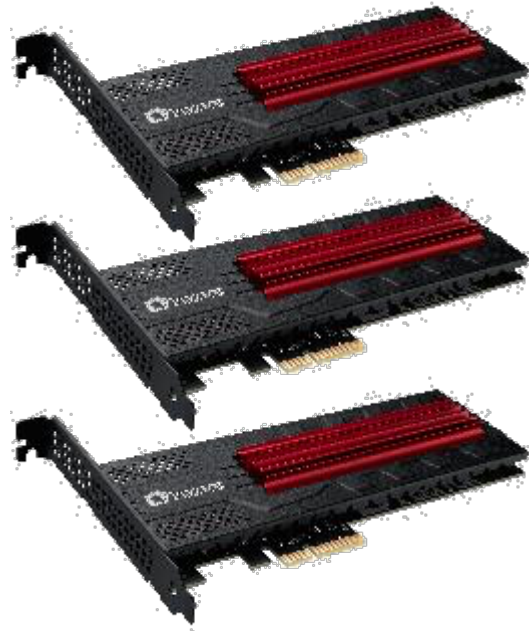
**Qualcomm Centriq™ 2400
Open Compute Motherboard**



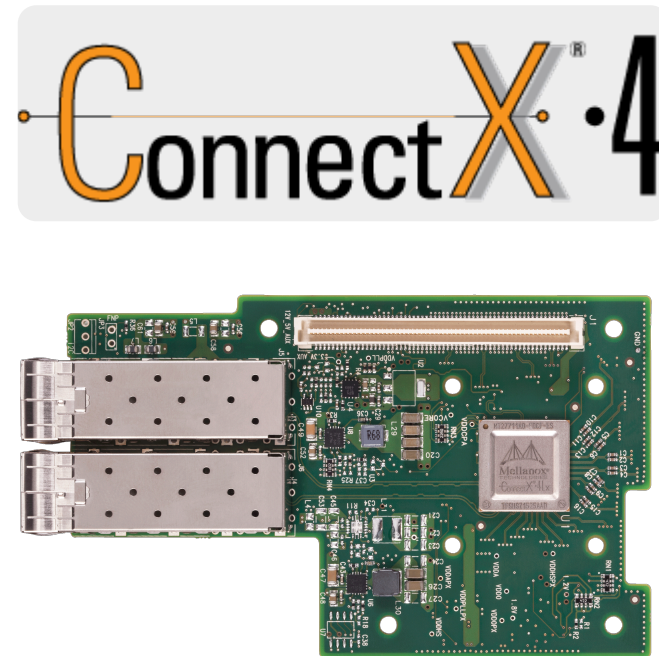
Qualcomm Centriq is a product of Qualcomm Datacenter Technologies, Inc.

Delivering Tomorrow's Open Server Platform Today!

Faster Storage Needs Faster Networks!

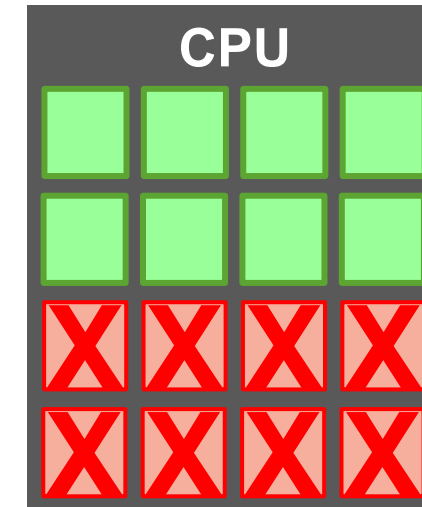


=



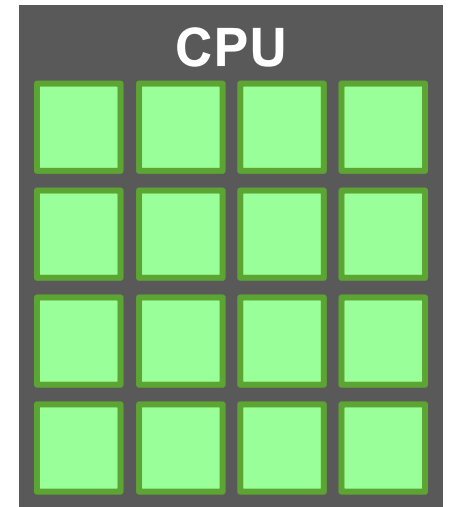
&

½ Bandwidth
10X CPU load



Without RoCE

Full Bandwidth
1/10 CPU load



With RoCE

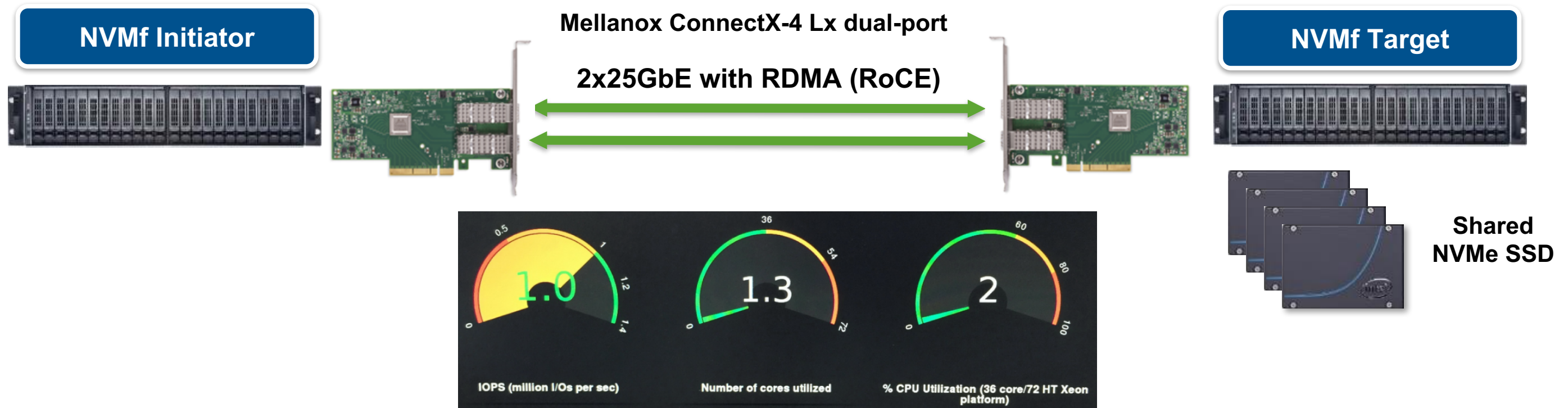
Three NVMe Flash Drives

One 100GbE Links

Fast Storage Needs RDMA

- Just three NVMe Flash can saturate 100 Gb/s Link
 - Needs 100GbE ConnectX-4 & RoCE
- RoCE
 - Burn Rubber! Not CPU Cycles.

NVMe Over Fabrics – The Future of Storage Networking



- NVMe fastest growing storage media - Expected to double over next 2 years
- NVMe over Fabrics (NVMe-OF) delivers penalty free sharing of Flash
 - Single NVMe Flash devices can saturate 25G/s Link
 - 1.3M+ IOPs Random Read Performance, sub 10us added latency
- Mellanox is enabling converged NVMe-OF at 25, 50, & 100 Gb/s speeds
 - Significant price performance advantage over Fibre Channel and reduced OPEX

Open Networking is Now a Reality

■ Open Composable Networks

1. Open Ethernet Platforms

- Your choice of NOS, switch & applications

2. Standard, Open APIs

- OCP: ONIE, SAI
- Linux: Switchdev

3. Network Automation

- Mellanox NEO™ Network Orchestration
- Automation & Software Defined

Network Disaggregation

- Separates hardware & software
- Multiple NOS for Spectrum
- Leverage best-of-breed building blocks



Innovation Re-Defined, At Your Speed!

See Mellanox 100GbE in Action in Microsoft Booth #A4

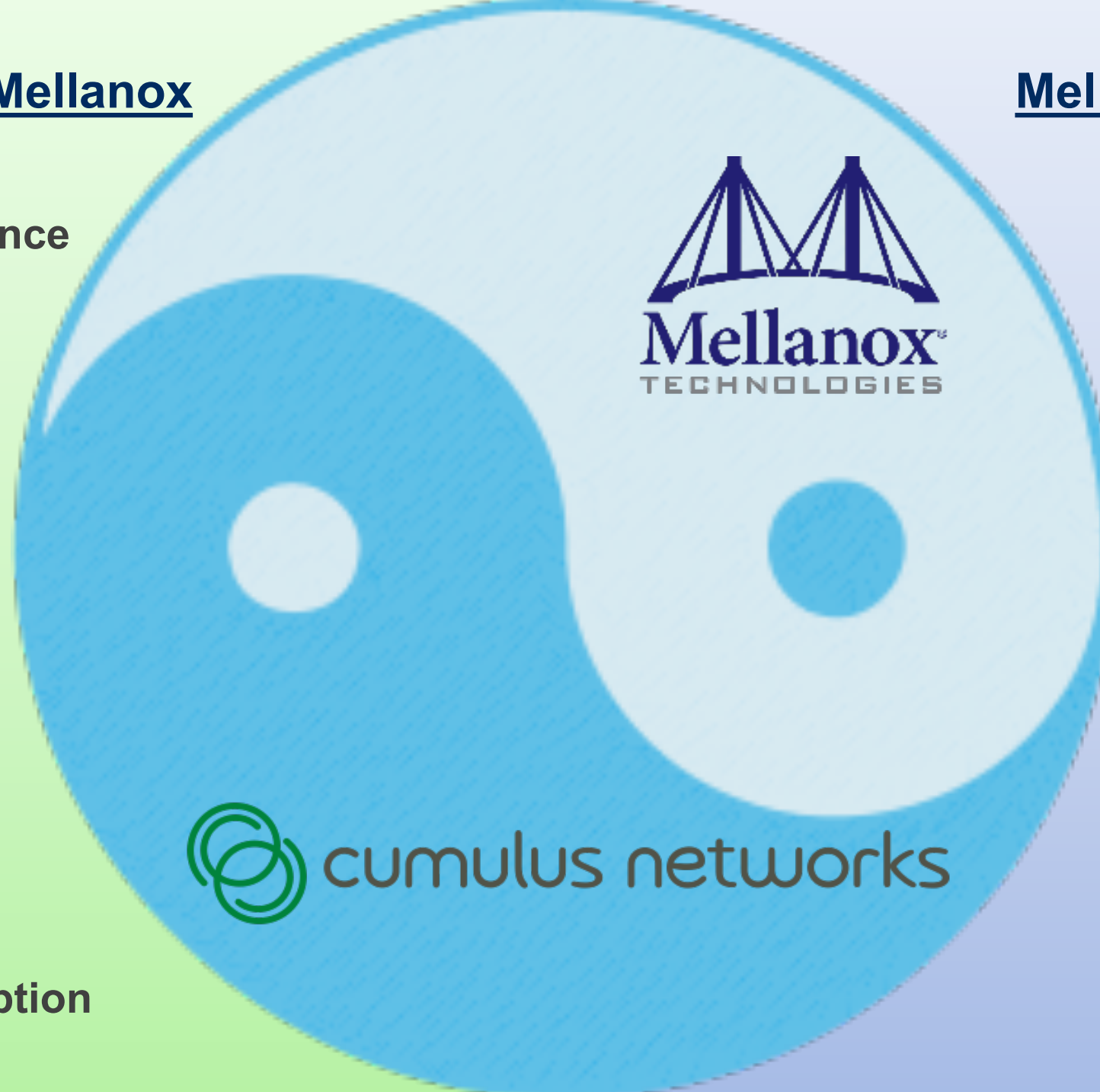


Mellanox + Cumulus = Better Together



Cumulus is better with Mellanox

- Best in class performance
- Superior Buffering
- Higher Scale
- Lower Power Consumption



Mellanox is better with Cumulus

- Best in Class Automation
- Controller-free Overlays
- Cloud Orchestration
- Server Provisioning tools

Spectrum: The Ultimate 25/100GbE Switch



Spectrum™



PACKET FORWARDING

- Zero Packet Loss
- Line Rate all Packets
- 4.76 BPPS

UBURST RESILIENCE

- Fully Shared Buffer
- Efficient Allocation
- 9X - 15X More Resilient

FAIRNESS

- Fair BW allocation
- Port independent
- SLA Guarantees

Predictable Performance

- Highest Packet Forwarding Rate
- 10-15X better microburst performance
- Fairness in bandwidth allocation
- Predictable behavior
- Better latency: 50% lower
- Lower power consumption


Spectrum: The Ultimate 25/100GbE Switch



**DON'T BE
SUBJECT
TO
PACKET
LOSS**

**KEEP
ALL
YOUR
DATA
INTACT**

zeropacketloss.com


Spectrum™

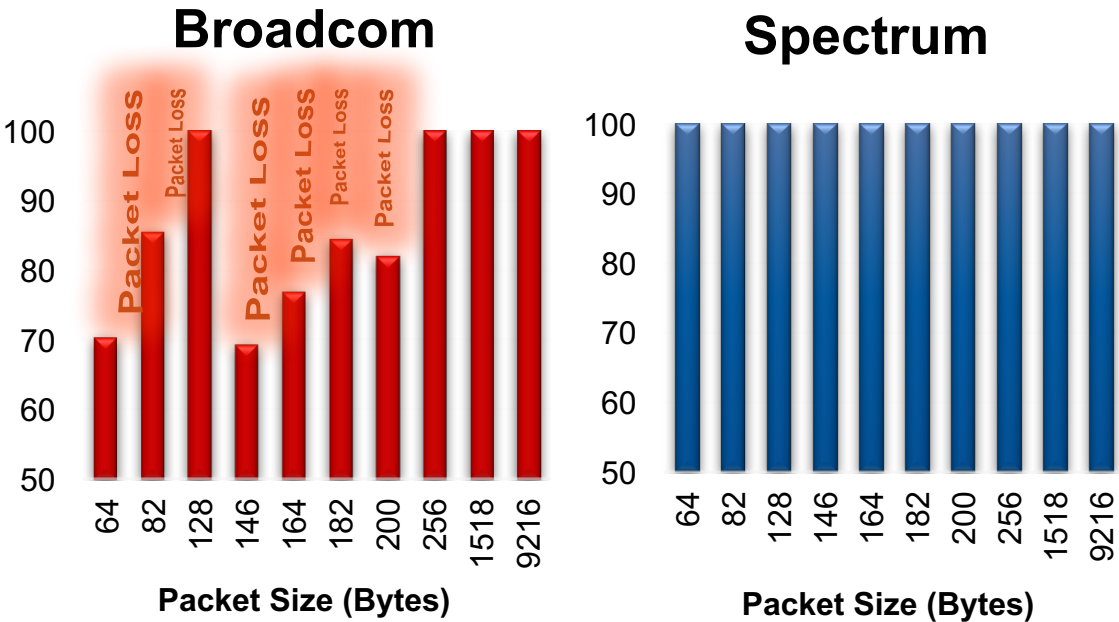
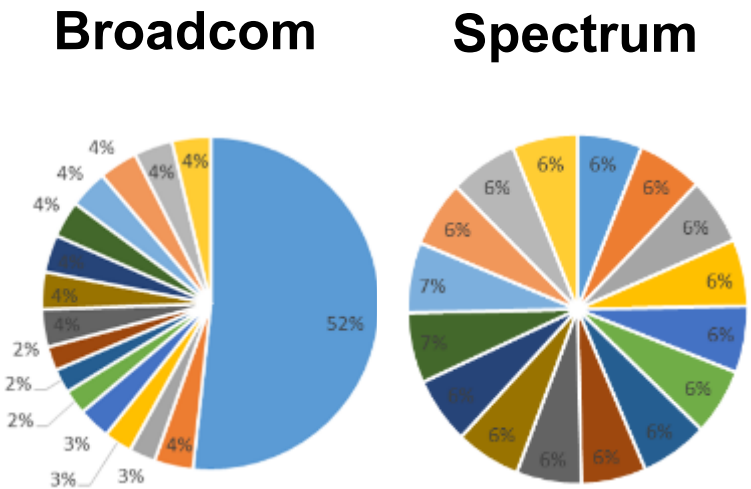
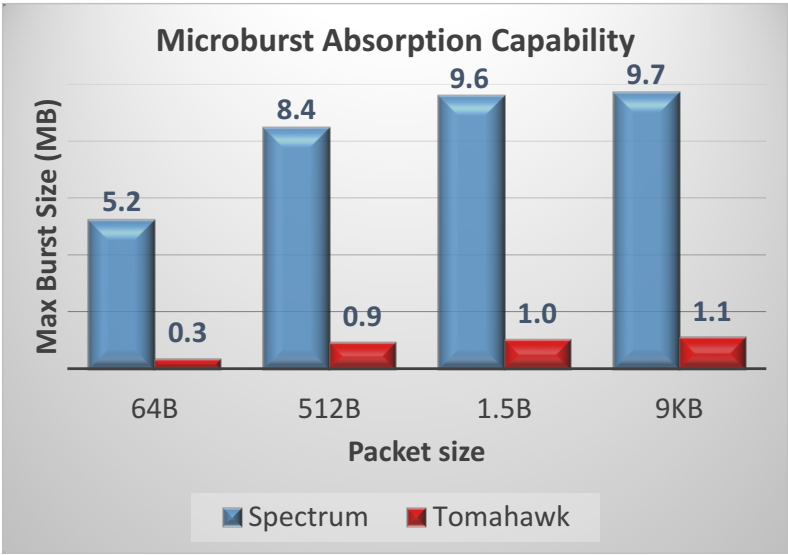


Predictability
The key to application
performance at
25 & 50 & 100 GbE

- The only predictable 25/50/100Gb/s TOR Ethernet switch
- Full wire speed, non-blocking switch
 - Doesn't drop packets per RFC2544
- ZPL: ZeroPacketLoss for all packets sizes



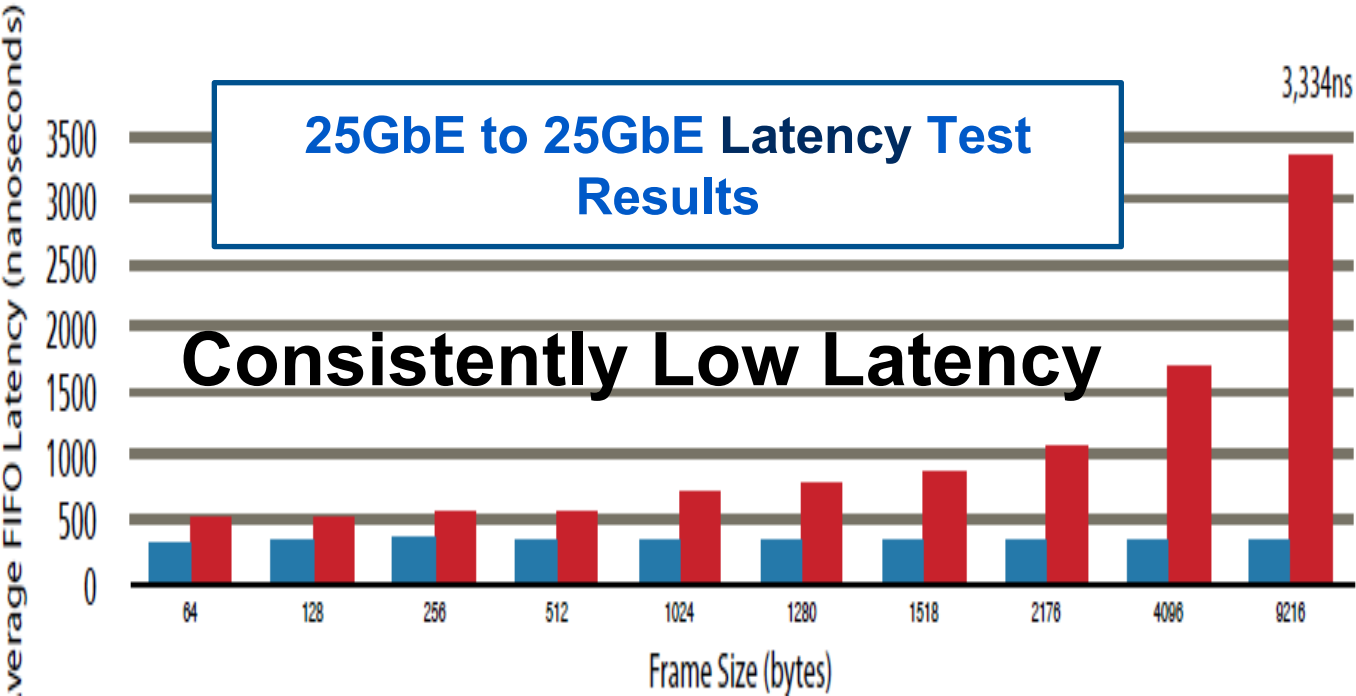
Critical Elements to Look for in a Data Center Switch



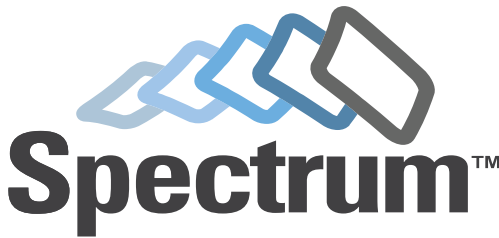
Congestion Management

Fairness

Avoidable Packet Loss



www.Mellanox.com/tolly
www.zeropacketloss.com



Lowest Latency OCP Network for Financial Applications



**World's Fastest
25/50/100G
switch**



**Predictable
Latency with
Highest Fairness**



**Enhanced
Proactive
Monitoring**



**Industry's
Lowest Error
Rate (10^{-15})**



**Eliminates
Forward Error
Correction Need**



**Ultra Low
Latency NIC with
Kernel Bypass**



**Fastest Storage
and Database
Access**



IEEE 1588 PTP



ConnectX[®] 4

LinkX[™]
CABLES
TRANSCEIVERS
COMPONENTS

When Every Nanosecond Counts...

Come Visit us!

Booth C#23



**Network
OS Choice**



Open APIs



Automation



OPEN

Compute Project

