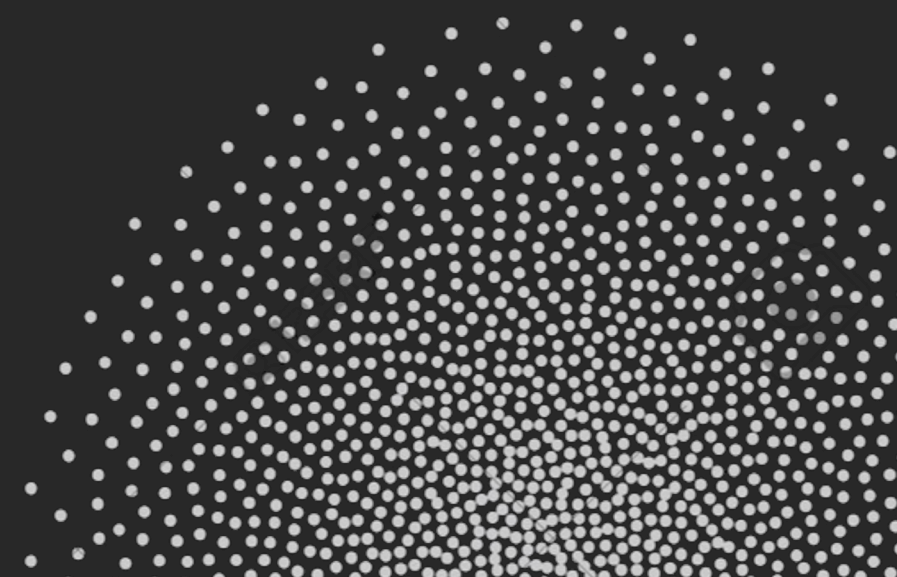




Rockport Networks

Hyperion HPC User Forum

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ABOUT ROCKPORT NETWORKS

Simplify the Network

Rockport has re-imagined the network with an embeddable switchless architecture that delivers the performance at scale needed for emerging data centers, ending decades of unnecessary complexity

HPC

Working with 7 leading
high-performance compute leaders

STORAGE OEMS

Active engagement with 5
of the top 7 OEMs

COMPUTE OEMS

Well entrenched with 2 of
the top 5 compute OEMs



rockport.

An aerial photograph of a complex multi-level highway interchange. The image shows several overpasses and ramps curving and crossing each other. There are many cars visible on the roads, indicating heavy traffic. The surrounding area includes some trees and buildings. The overall tone of the image is somewhat muted, with a focus on the geometric patterns of the infrastructure.

The Impact of Network Congestion

The Broad Impact of Network Congestion

Workload Performance

- High tail latency
- Extended and unpredictable workload completion times
- Limited workload scale
- Research scientists must wait longer for results

Workload Capacity

- Fewer workloads can be run
- Extended job queues
- Research scientists must wait longer for jobs to start

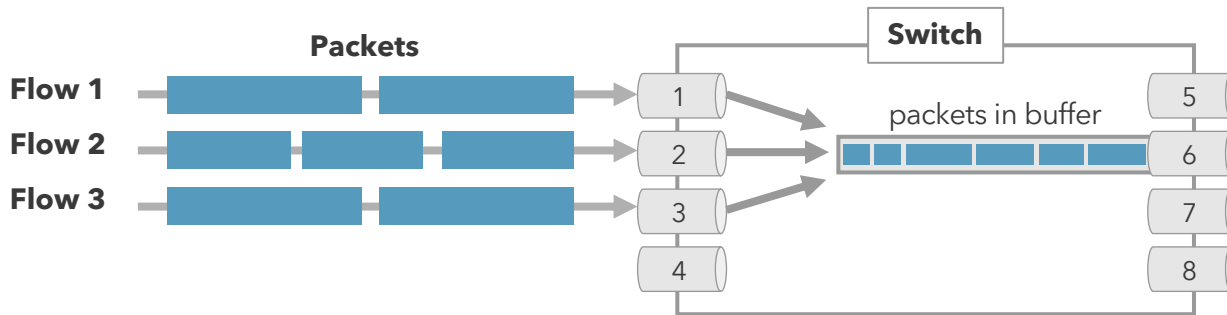
Cluster Efficiency

- Idle cluster resources
- Increased workload costs
- Fewer workloads can be run each year, reducing the value of the cluster

You're Only As Good as Your Short Timeframe Response

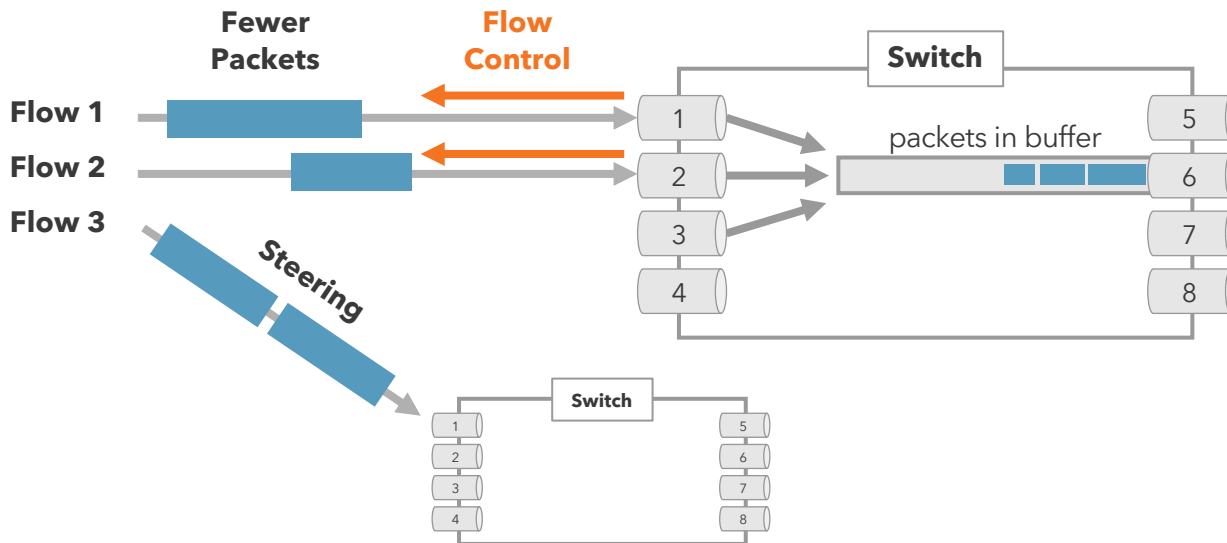
All Congestion Starts Out as Short Timeframe Congestion

Short Timeframe



- It is common for multiple flows to converge on the same switch output port
- At small timescales, the switch's only option is to buffer the excess traffic
- This leads to spikes in latency, driving **high tail latency** and **extended workload completion times**

Long Timeframe



- If the contention for the switch port lasts long enough, the network can react by:
 - Using flow control to slow flows
 - Steering flows away from the congestion (adaptive routing)

Simplify the Network

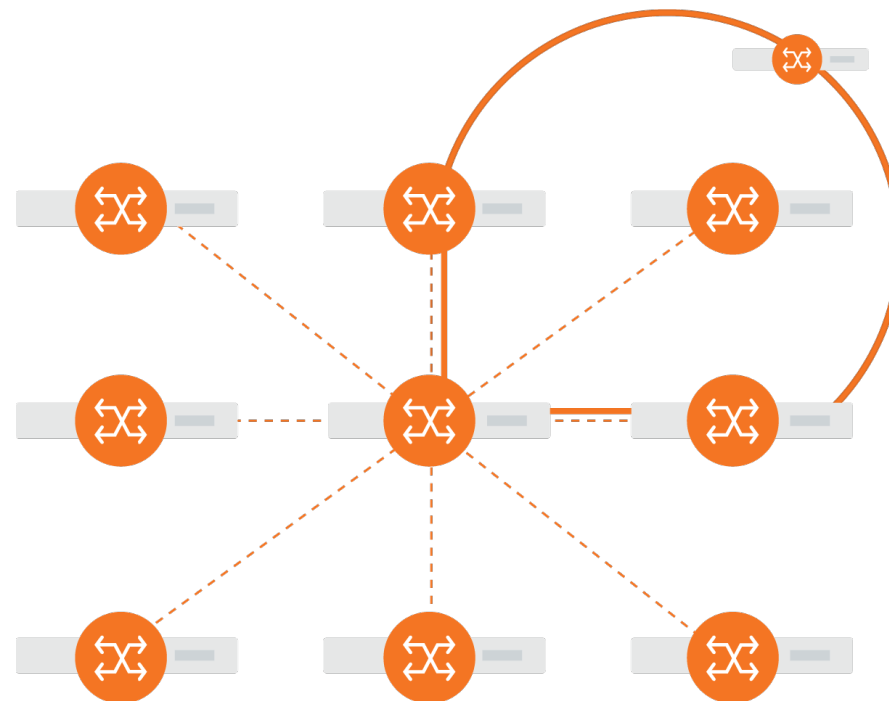
Rethinking Network Performance at Scale for HPC Environments

Rockport has reimagined performance networks with an embeddable switchless architecture that delivers the performance at scale needed for HPC, AI, and HPDA.

By distributing the network switching function into each device endpoint,

the nodes create the network:

- Direct interconnect with 12 neighbors
- Distributed routing and control planes
- Linear scaling
- No external, centralized switches



Rockport Architecture

Self-discovering, self-configuring, self-healing

Distributed source routing

Distributed, embedded FLIT switching

Scalable Supercomputer Networking, Simplified

Rockport Switchless Network Solution

Rockport RO6100 Network Card

World's first Network Card

Standard Ethernet interface (verbs and sockets)

Patented FLIT Switching in a field-upgradable FPGA

12x 25 Gbps

passive cable

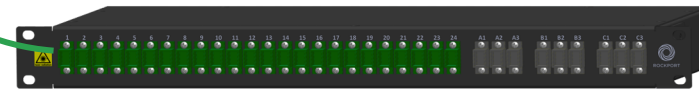


Rockport SHFL

Supercomputer networking topologies prewired in box

Stunningly simple cabling solution

Completely passive



Rockport Autonomous Network Manager

Bird's eye view into active network

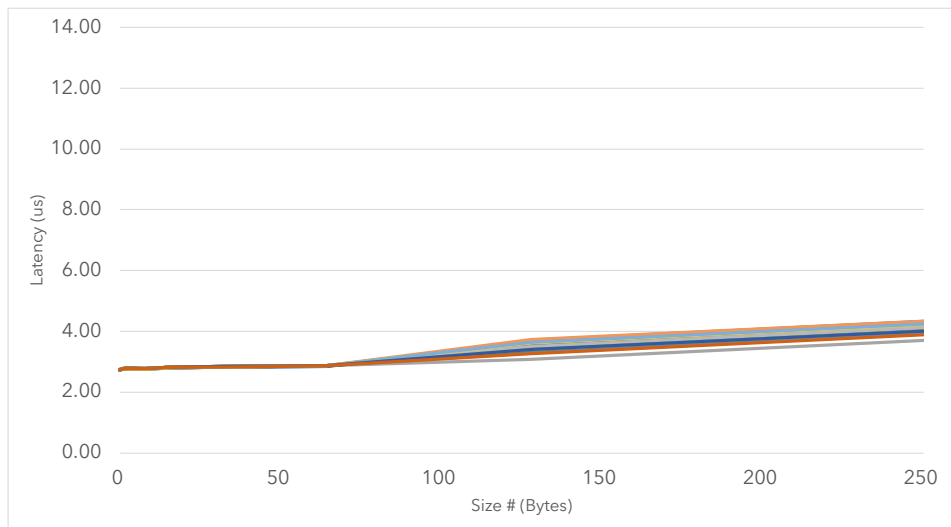
Deep insight into network performance on a per-job basis

Never seen before time travel



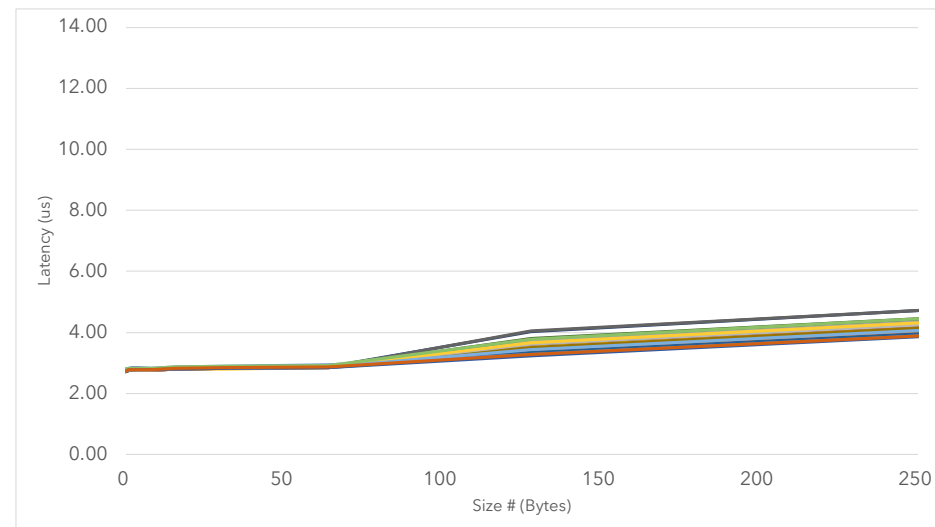
Critical Messages Immune to Heavy Network Congestion

OSU Unloaded Latency



Message Size	Average Latency Impact Under Heavy Load
0	< 0.1%
1	< 0.1%
2	< 0.1%
4	< 0.1%
8	< 0.1%
16	< 0.1%
32	< 0.1%
64	< 0.1%
128	2.9%
256	2.9%

OSU Loaded Latency



Rockport delivers consistent, excellent latency performance for critical messages, even under heavy load

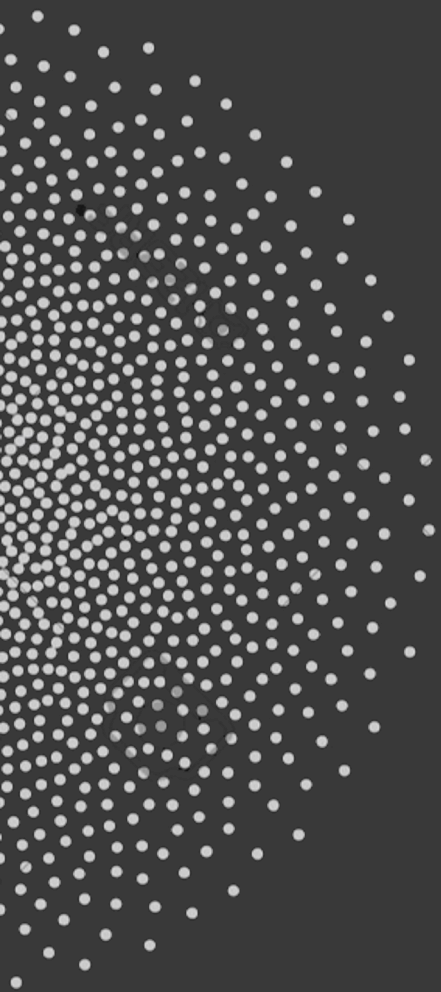
Graphs show the results of 20 runs of the OSU latency benchmark in unloaded and loaded conditions

Network load generated by 5 pairs of adversarial ib_send_bw traffic generators

Summary

The real costs of congestion
Key performance drivers
New switchless direct interconnect
Performance at scale, simplified





— **rockport.**