RIPE

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Evolving Peering with a New Router Architecture

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RIPE

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Peering Requirements / Challenges

- Availability
  - Critical service on limited number of nodes
  - HA hardware features
- Scalability
  - Bandwidth (100G interconnects)
  - Port density (Nx10G, 100G)
  - BGP scaling
  - FIB convergence
- Dual stack IPv4/IPv6
  - MP-BGP to support both AFs
  - RIB/FIB scaling

Peering Requirements / Challenges

- Stable/evolved BGP implementation
  - Flexible routing policy framework
  - 4-byte ASN support, capability negotiation route reflectors, confederations
- Security
  - Infrastructure filtering
  - Accounting (Netflow v9, IPFIX)
  - Control plane protection
- Colocation Cost control
  - Space
  - Power Consumption

Lessons from the Data Center Market

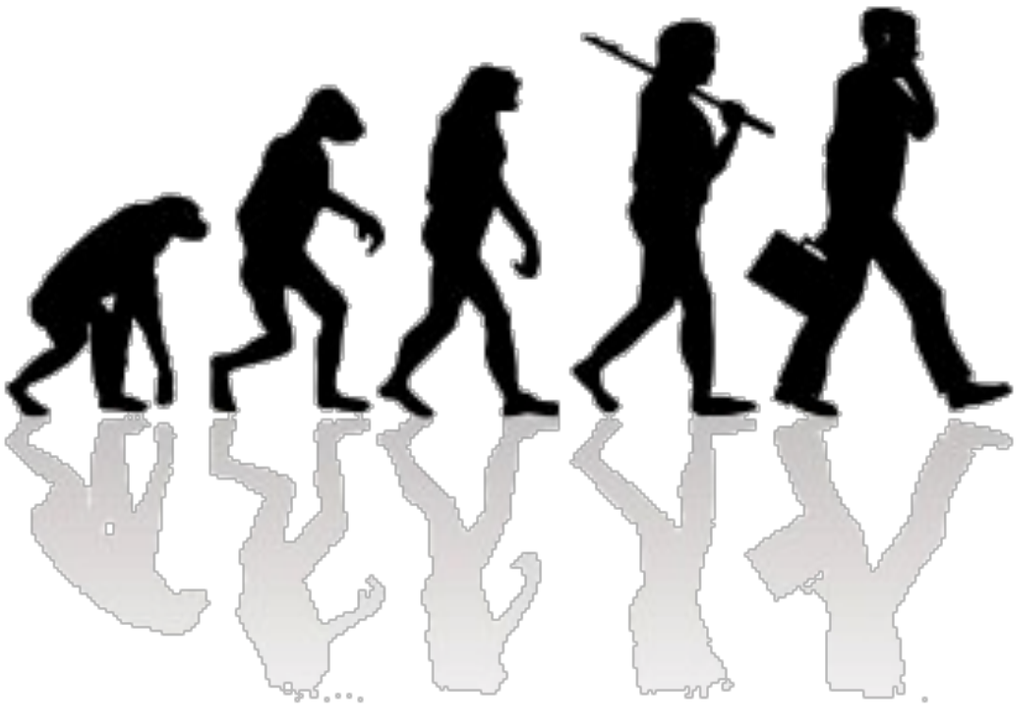
Monolithic Mainframes

Virtualized Data Center

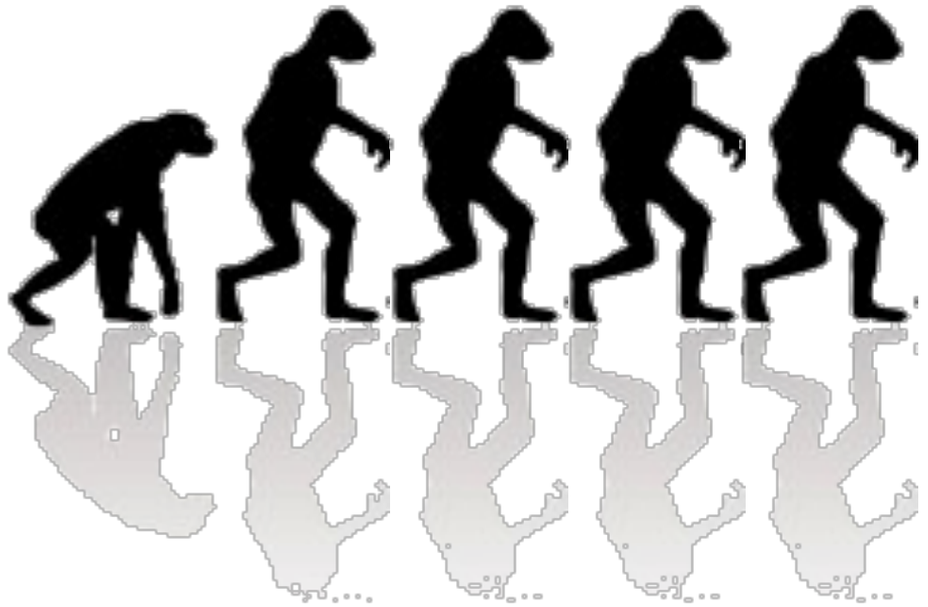
Clustering & Virtualization Brought Efficiency to the Data Center

Evolution of Industries

Data Centers



Networks

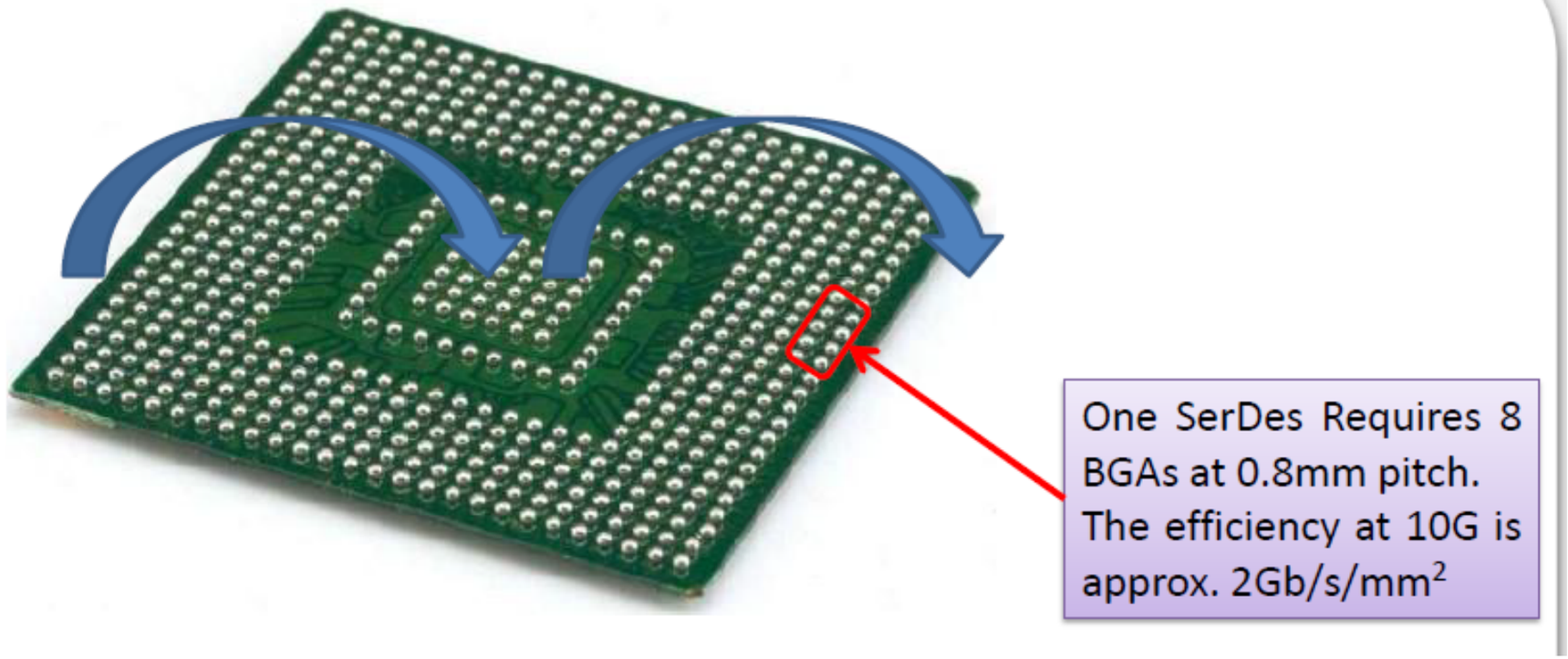


Can Networks Follow The Data Center Evolution?

So why do we have “Mainframe-like” routers?

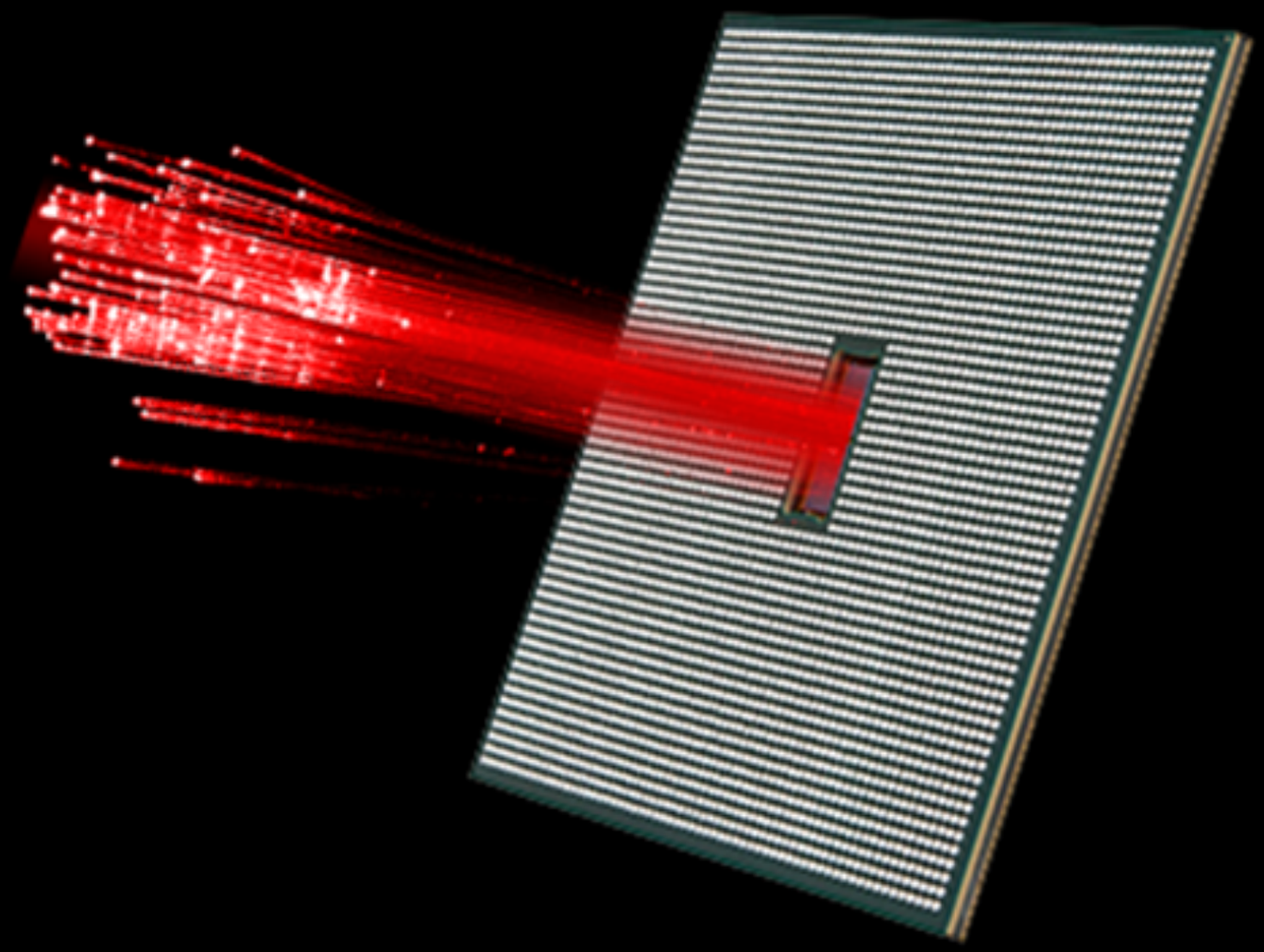
It’s Electronics and Copper Limitations

Zooming in on the challenge



- Chip I/O at speeds of 100G is limited to a few centimeters
  - Requiring Amplification every 2/3 cm
  - Requiring MORE electronics
  - Requiring MORE cooling
  - Requiring MORE space

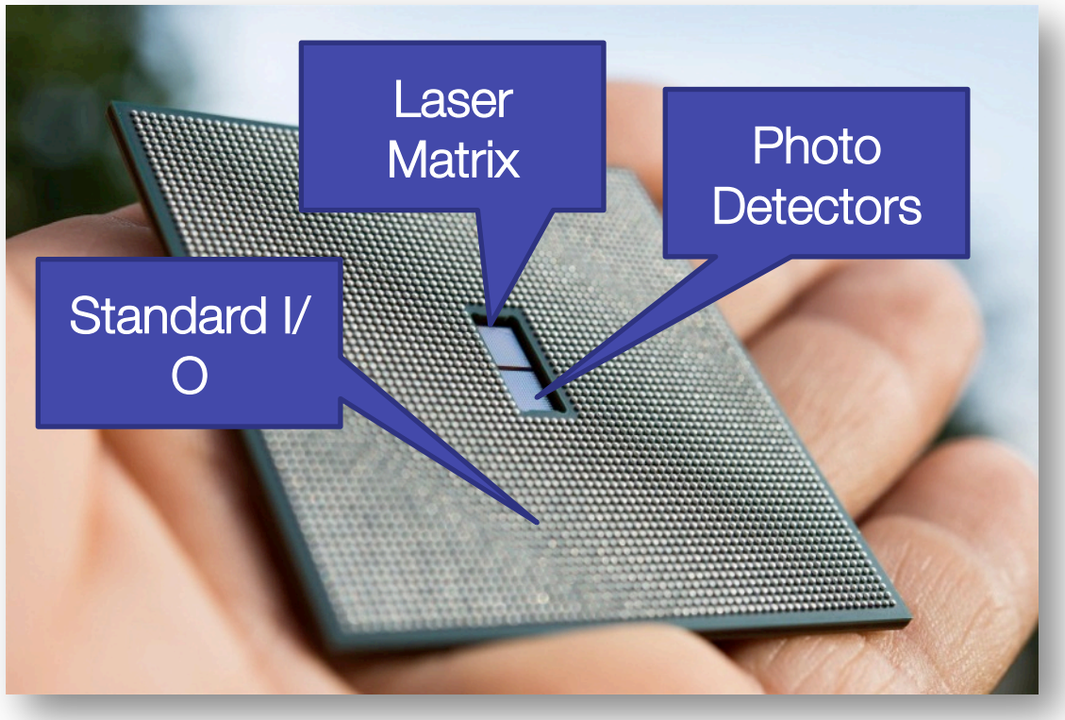
Compass-EOS icPhotonics™

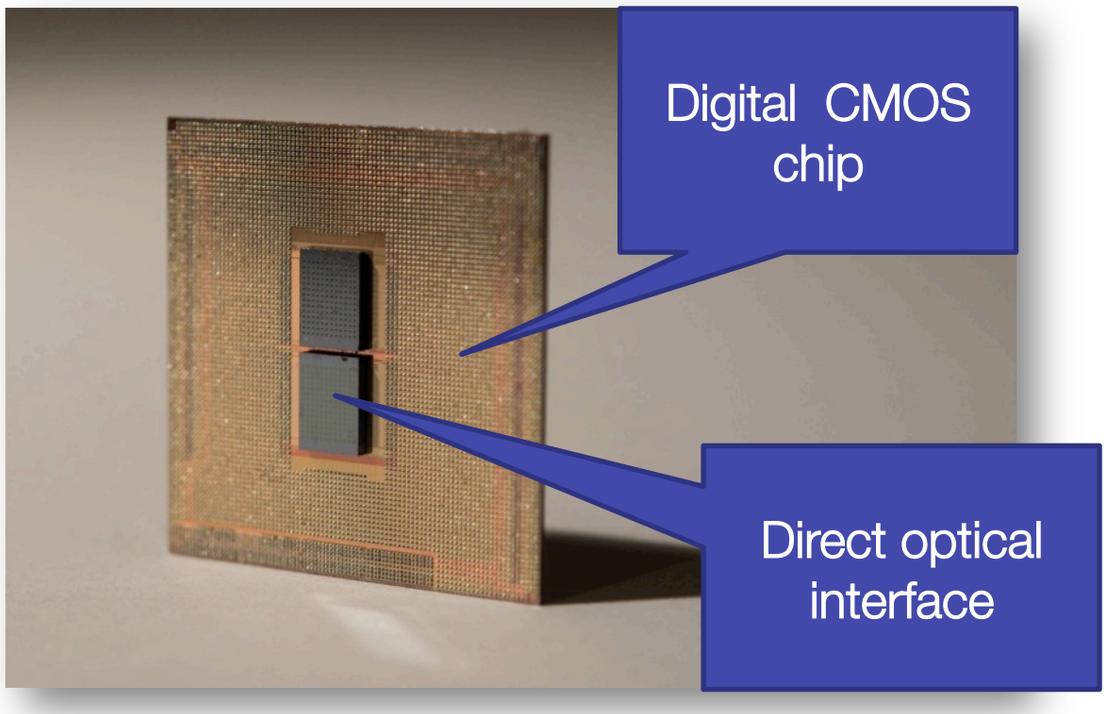


World First Chip-to-Chip Optical Interconnect

icPhotonics™

World's First Chip-to-Chip Optical Interconnect

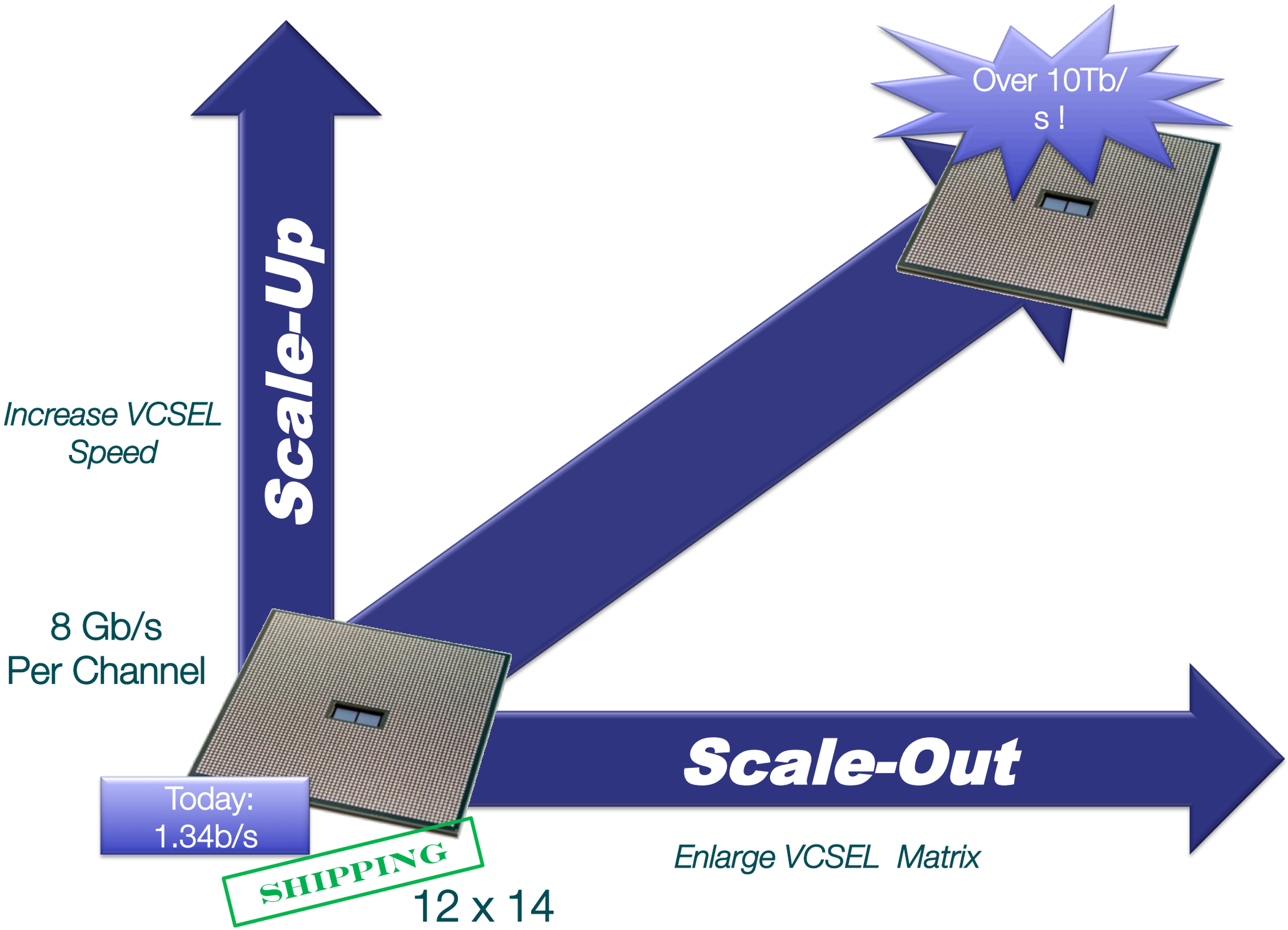




- 1.34Tb/s Full Duplex Bandwidth
- Order of magnitude higher Chip I/O Density. 64Gb/a per mm2
- Passive optical links that stretch to Hundreds of Meters vs. Centimeters with Electronics

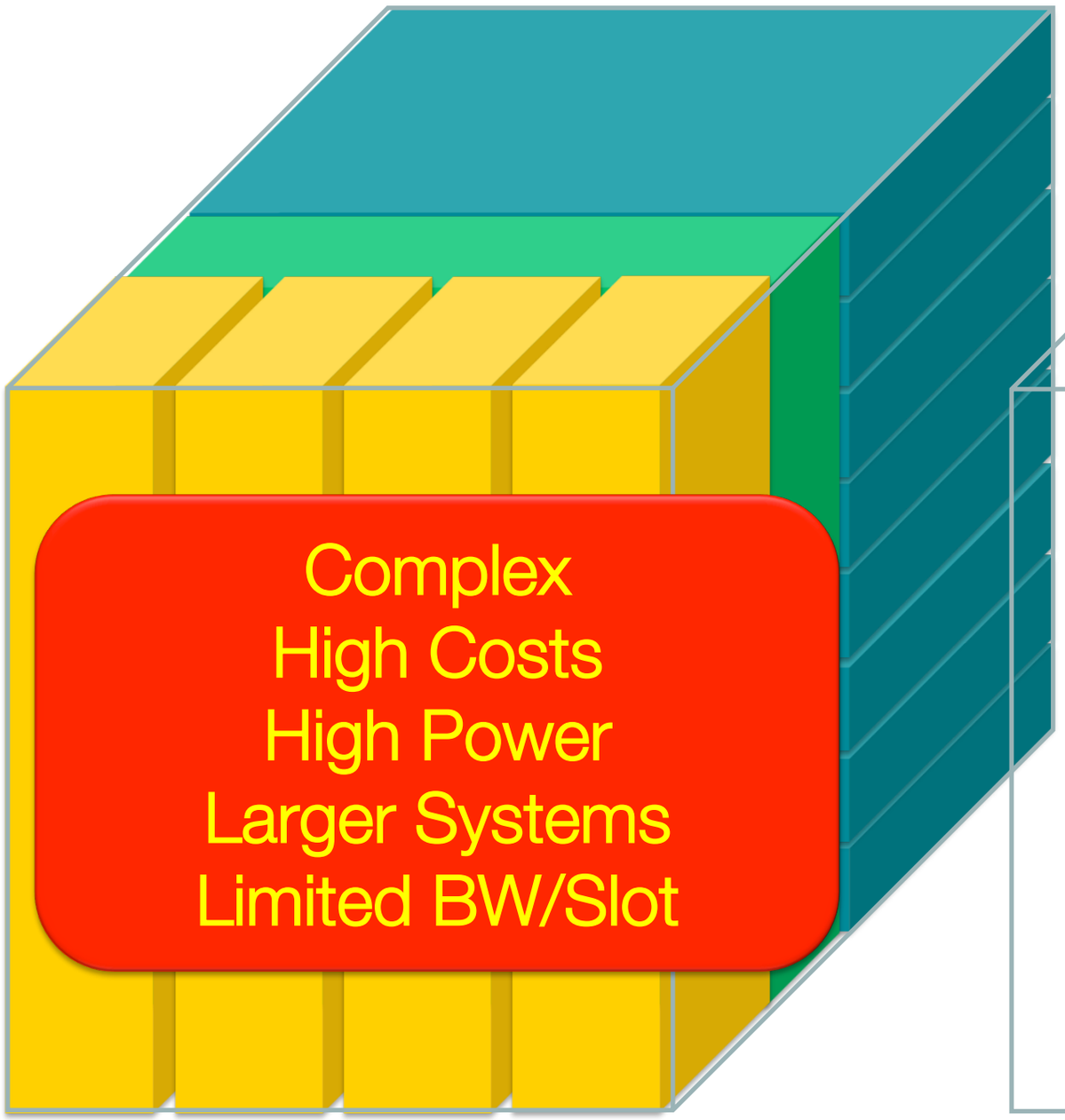
- Direct Coupling to CMOS Chip
- Low energy consumption: 10pJ/bit
- Dozens of Patents Covering Technology & Processes
- Flexible form factor
- Deployed in Production

Scaling icPhotonics™ to Even Higher Capacities



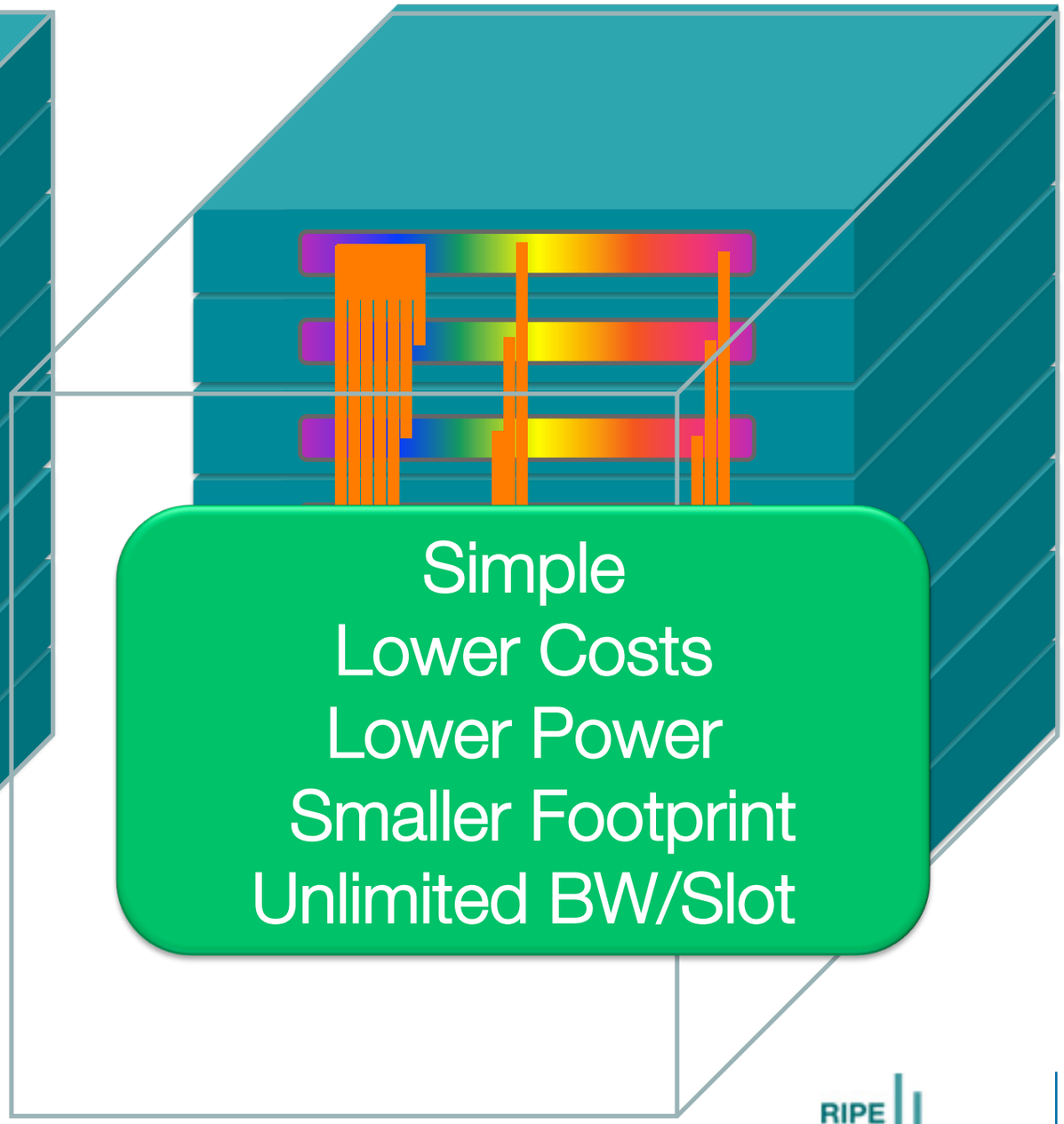
Revolutionizing Backplane Connectivity

The Traditional Way: Multi-Layer Midplane and Switching Fabric



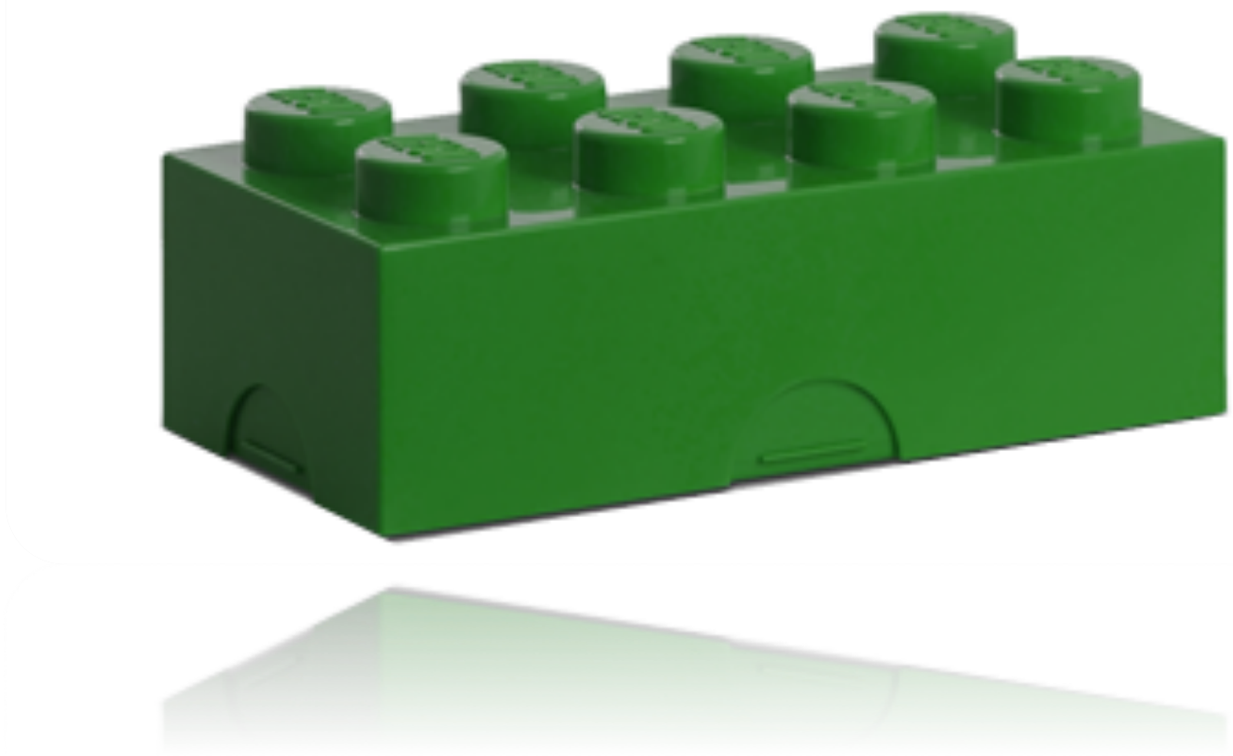
Complex
High Costs
High Power
Larger Systems
Limited BW/Slot

The Compass-EOS Way: icPhotonics™ Passive Optical Mesh

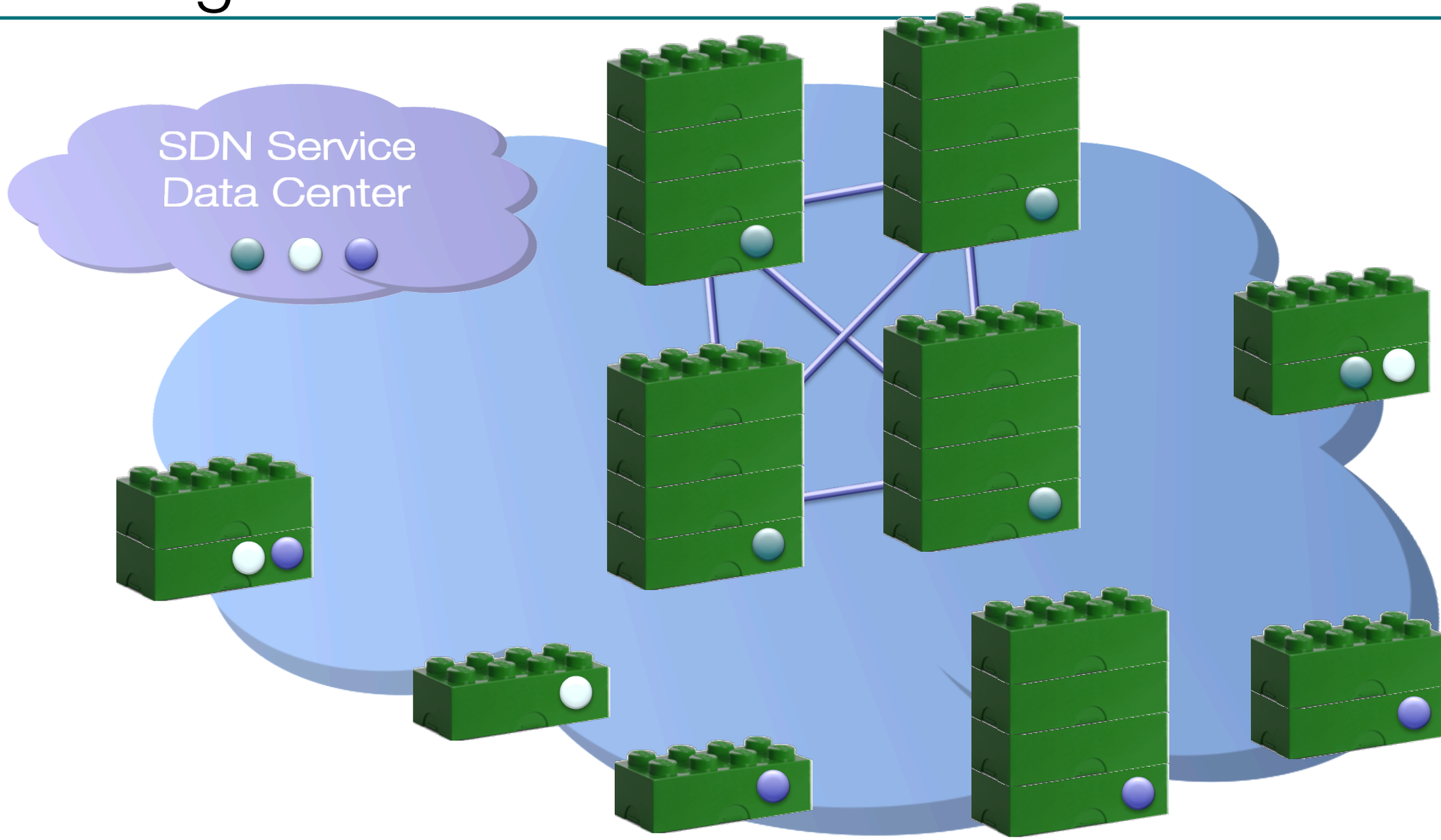


Simple
Lower Costs
Lower Power
Smaller Footprint
Unlimited BW/Slot

Enabling a simplified routing building-block



Enabling the Vision of Network Virtualization



Simplifying the Network with Routing Building Blocks & SDN

How icPhotonics plays

Requirement	Solution
Colocation Cost Efficiency	Optical backplane reduces the routers physical foot print and power consuptions
Efficient port density and scale	Congestion free optical mesh enables dense 100G solutions
Availability	Higher MTBF with passive optical backplane replaces active electronics based fabric boards
Security	No “Security Vs. Capacity” Compromises – Full mesh based centralized policing

Enabled by Compass-EOS icPhotonics™

Questions?

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