3rd MTCA Workshop

128 Gb/s
PCIexpress-Uplink
Optical & Copper

Vollrath Dirksen
vollrath@nateurope.com

Let Your **Application** benefit

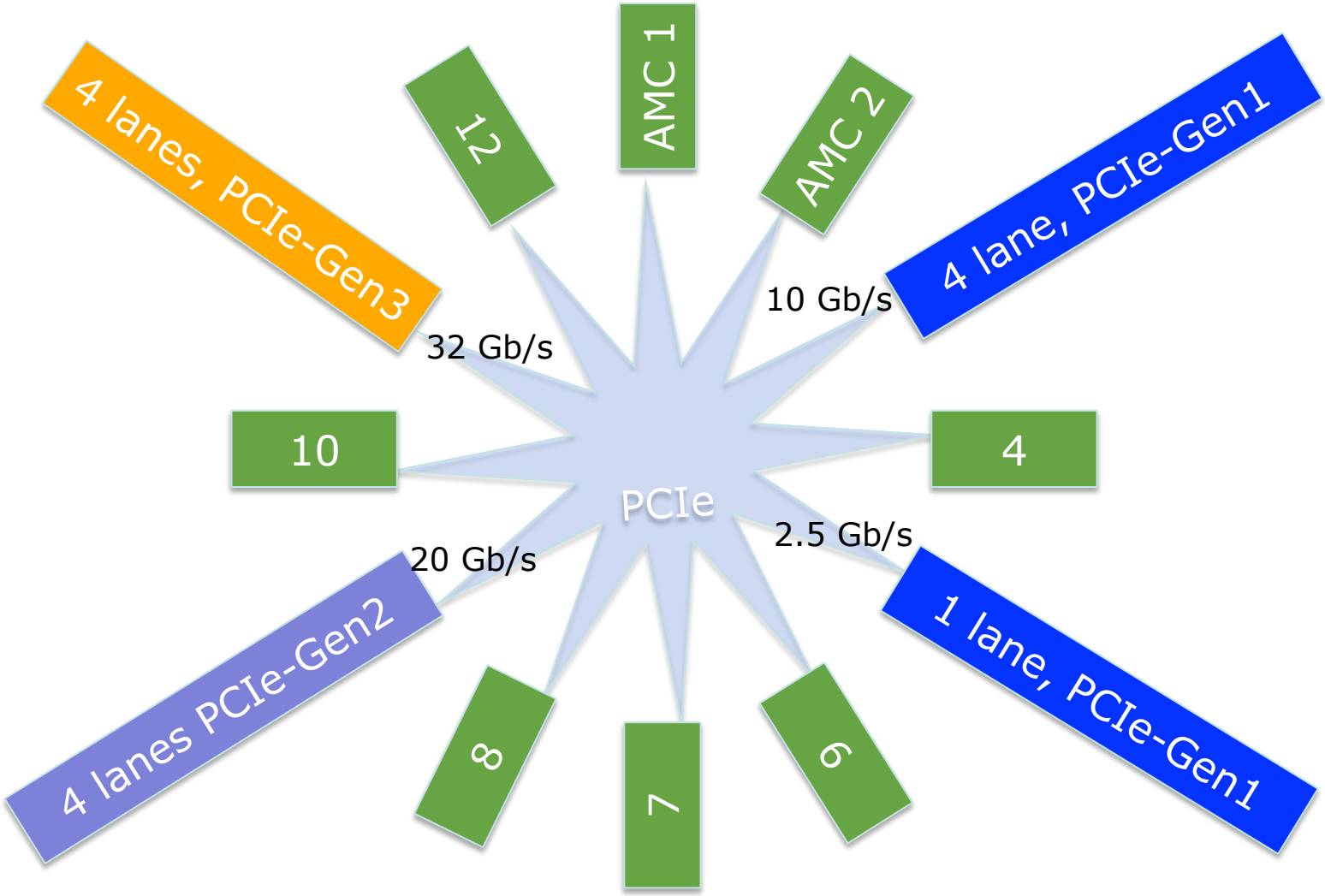
www.nateurope.com

MTCA.4 Workshop

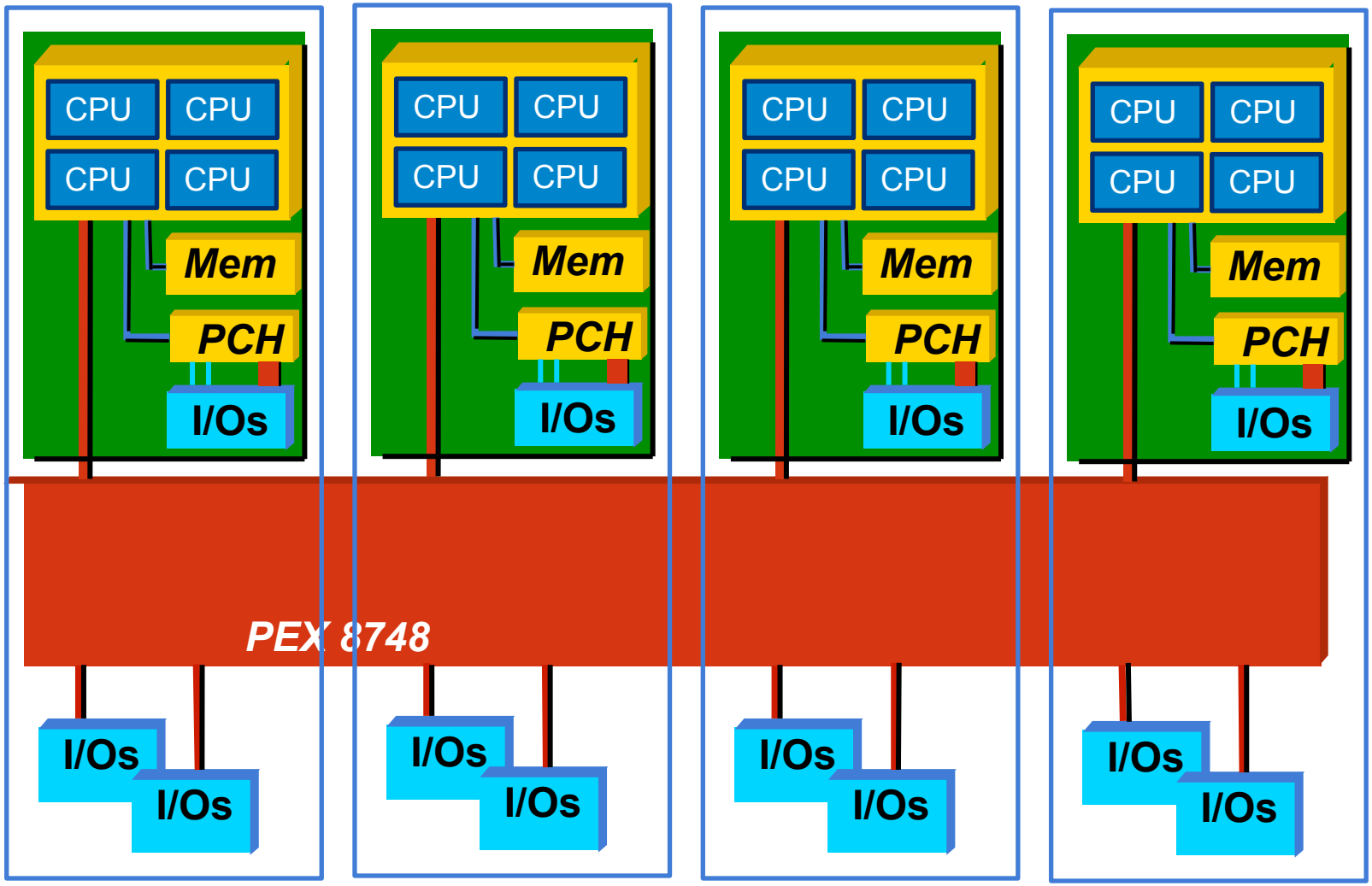
MTCA.4 PCIexpress Uplinks – optical & copper

- Motivation
- More Proceesing Power by Clustering
- > 4 PCIexpress to internal CPU
- Maximum PCIexpress performance to external CPU
- Combination of RTM backplane and 16 PCIexpress lanes

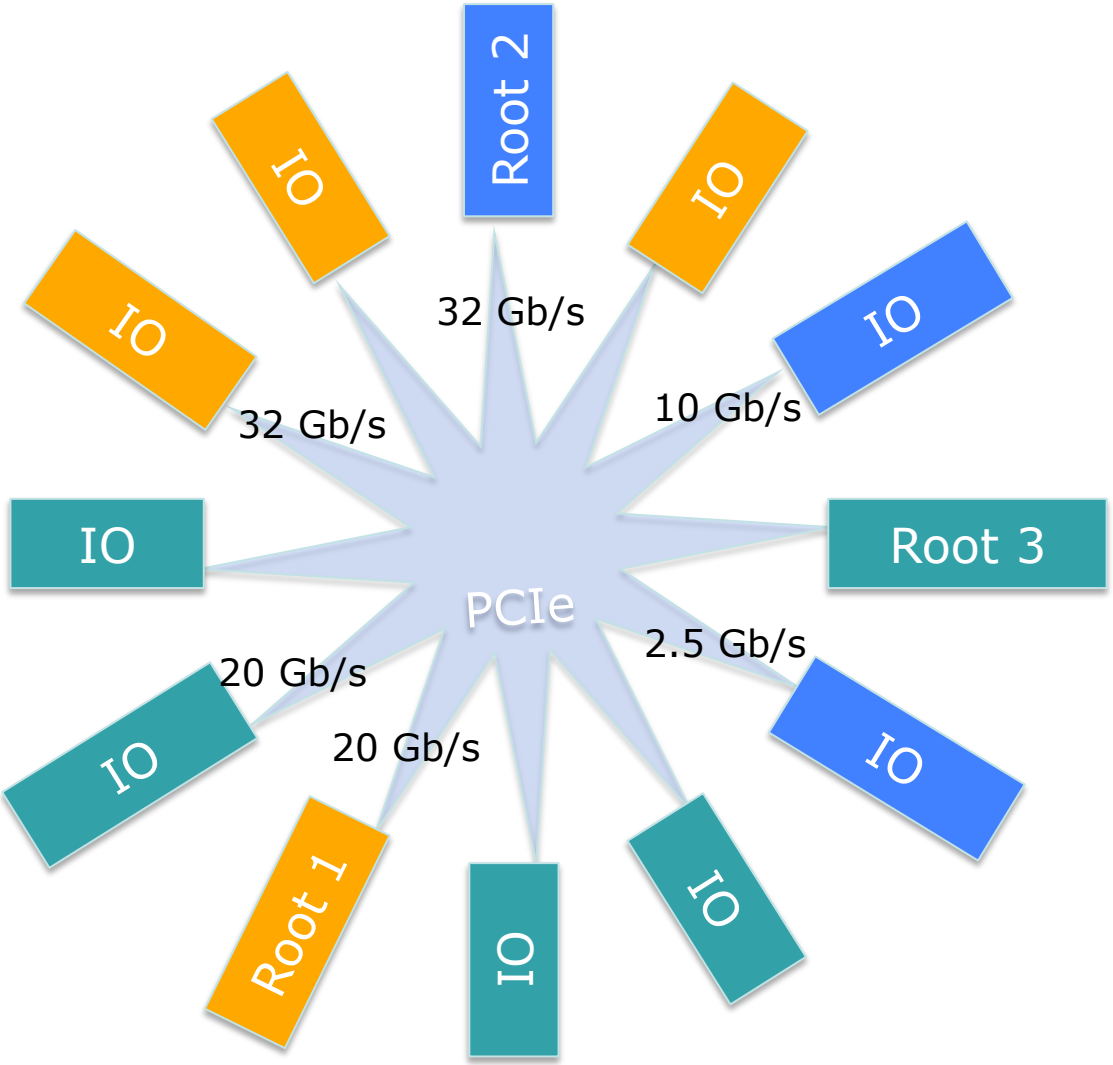
PCIexpress Topology
different speed, different # of lanes



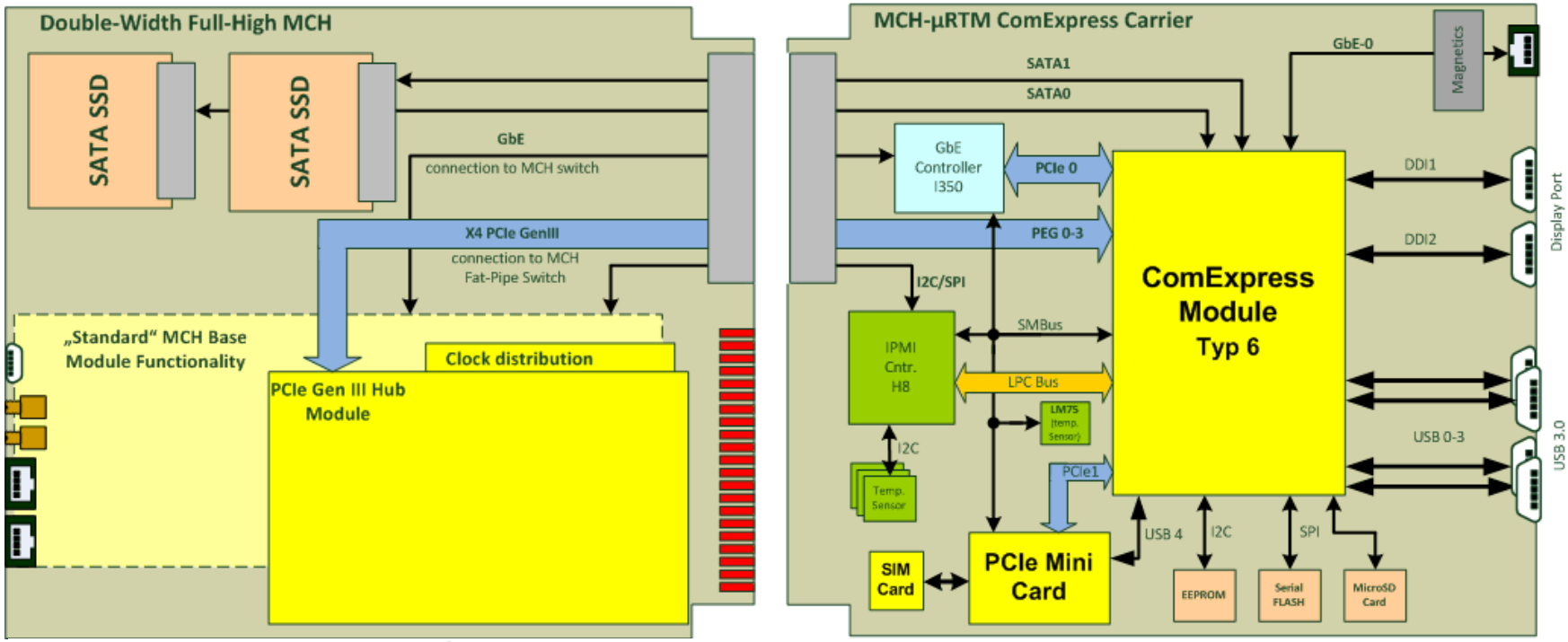
PEX8748
Multi-Host Configuration



PCIexpress Topology
different speed, different # of lanes



NAT-MCH-PHYS, double-width with µRTM ComExpress Carrier Core-i7

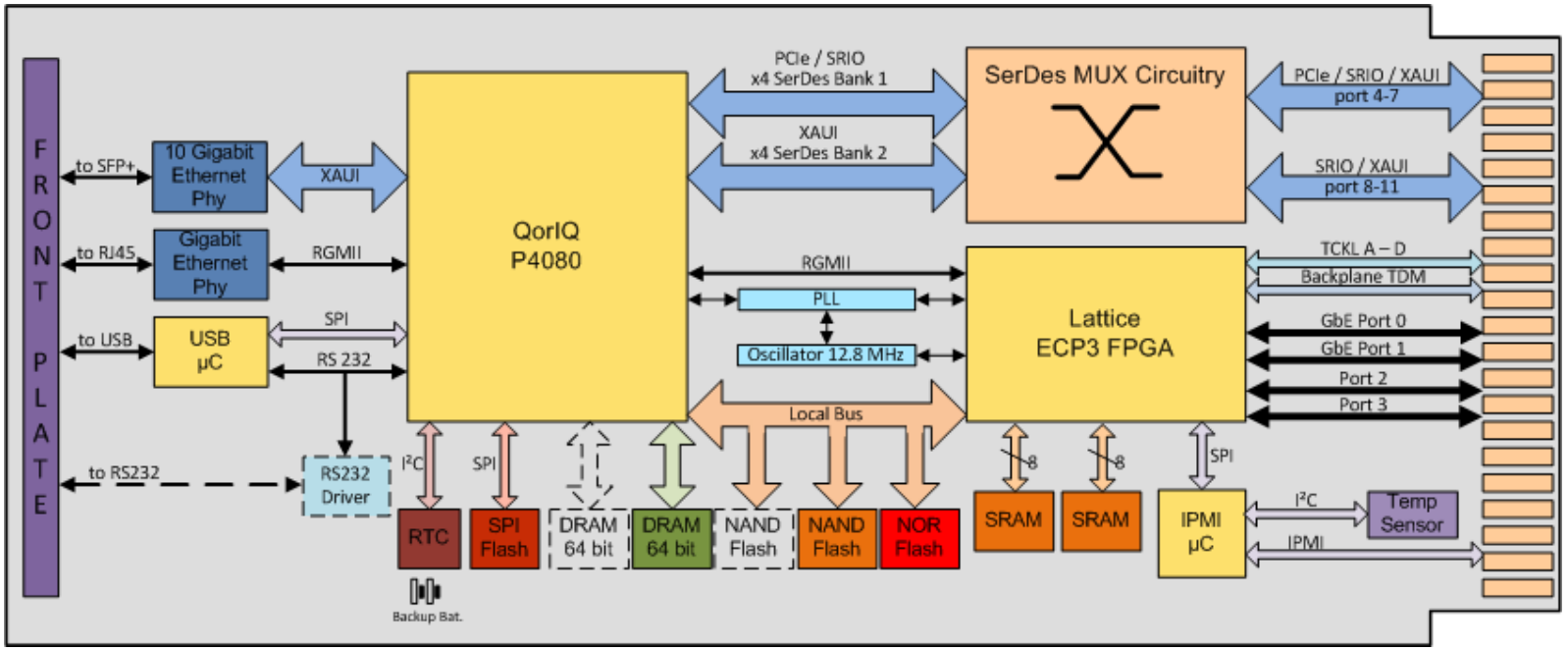


POWER-UP AND START

- Quick Start
- NAT documentation
- Webinterface NAT-MCH
- Command Line Interface
- NAT-FTP-Server
- Auxiliary files to build own desktop
- NAT Remote Support

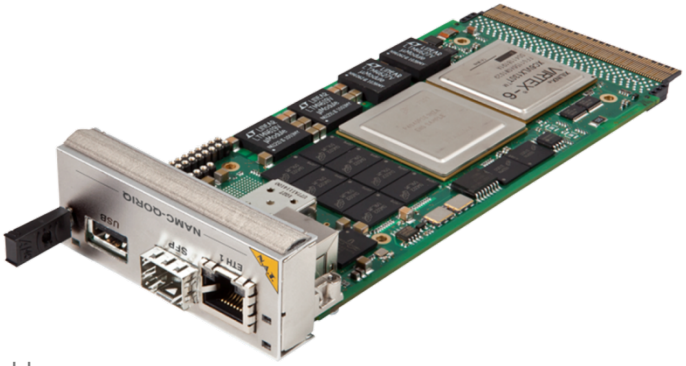
Multiple Fat-Pipes

Example: NAMC-QorIQ-P4080



NAMC-QorIQ-P40 – QorIQ + FPGA:

- FPGA is located between processor and base fabric
  - for manipulating bit streams
  - protocols for example ITDM
  - as pre-processing or co-processing device
- 10GbE at the front panel

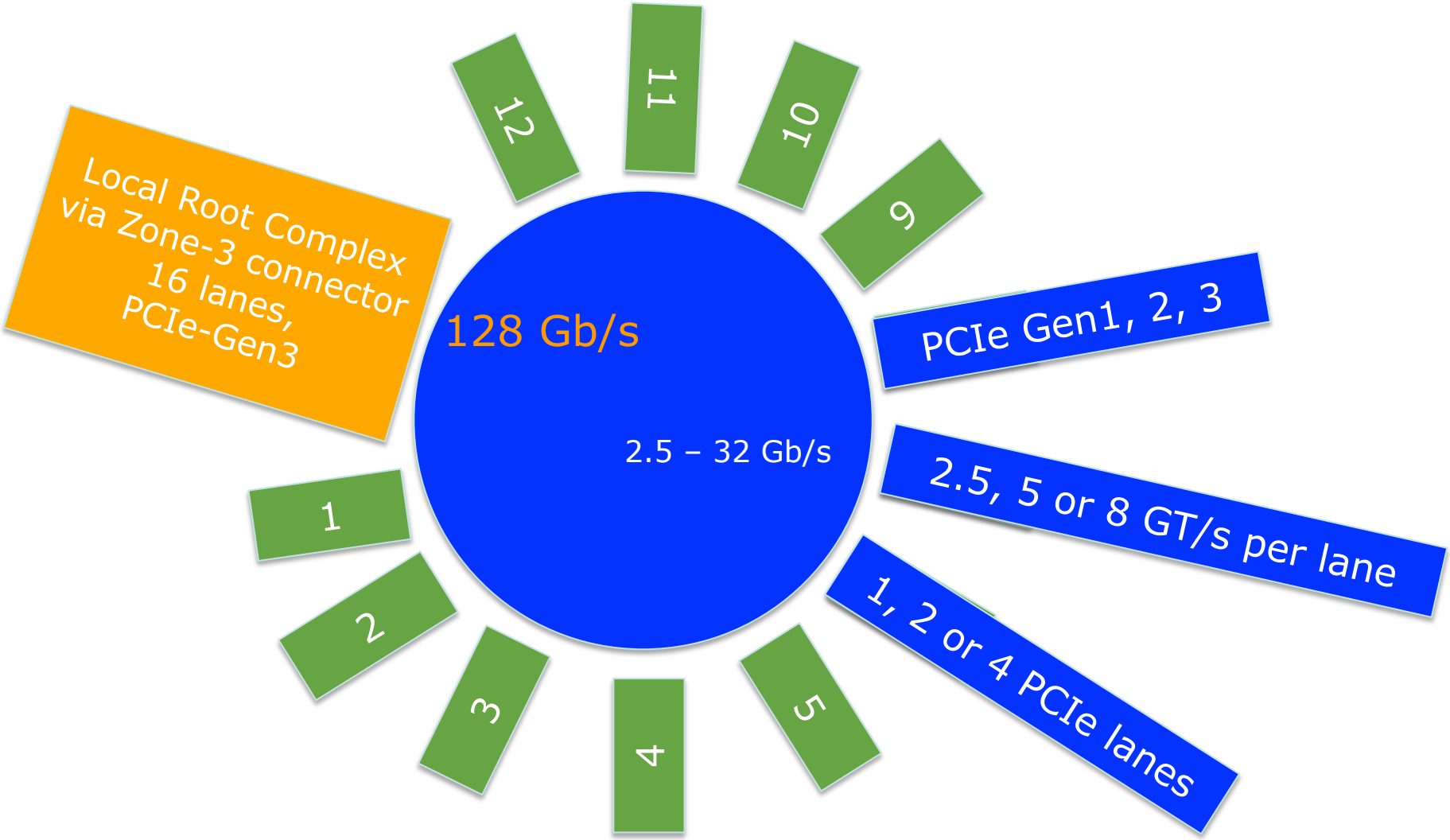


PLX8748 –> PLX8780
Port Configurations

Option	Station 0	Station 1	Station 2
1	x16	x16	x16
2	x8 x8	x8 x8	x8 x8
3	x8 x4 x4	x8 x4 x4	x8 x4 x4
4	x4 x4 x4 x4	x4 x4 x4 x4	x4 x4 x4 x4

Option	Station 0	Station 1	Station 2	Station 3	Station 4
NEW	x4 x4 x4 x4	x4 x4 x4 x4	x4 x4 x4 x4	X16	x16

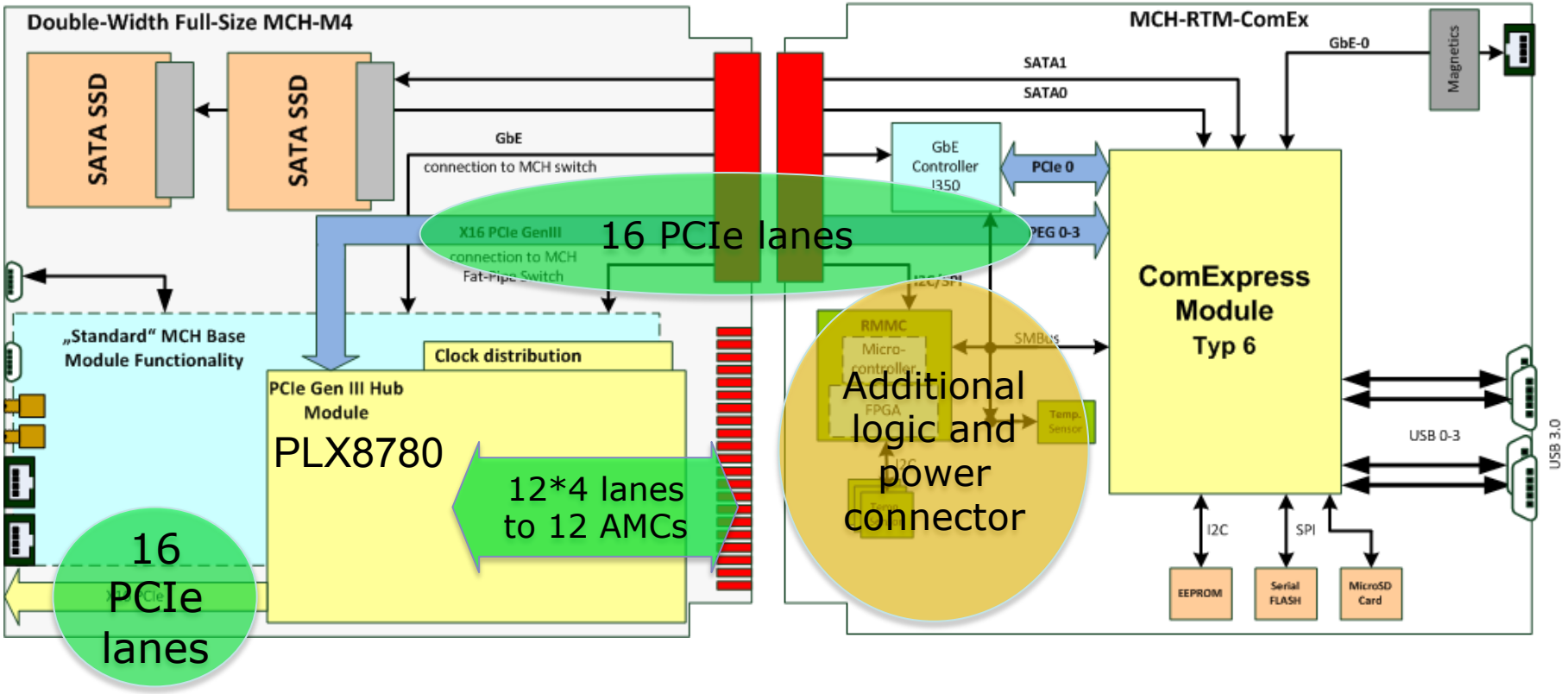
Boost in existing MTCA.4 Systems
12 * 4 PCIe lanes, 1 * 16/32 PCIe lanes



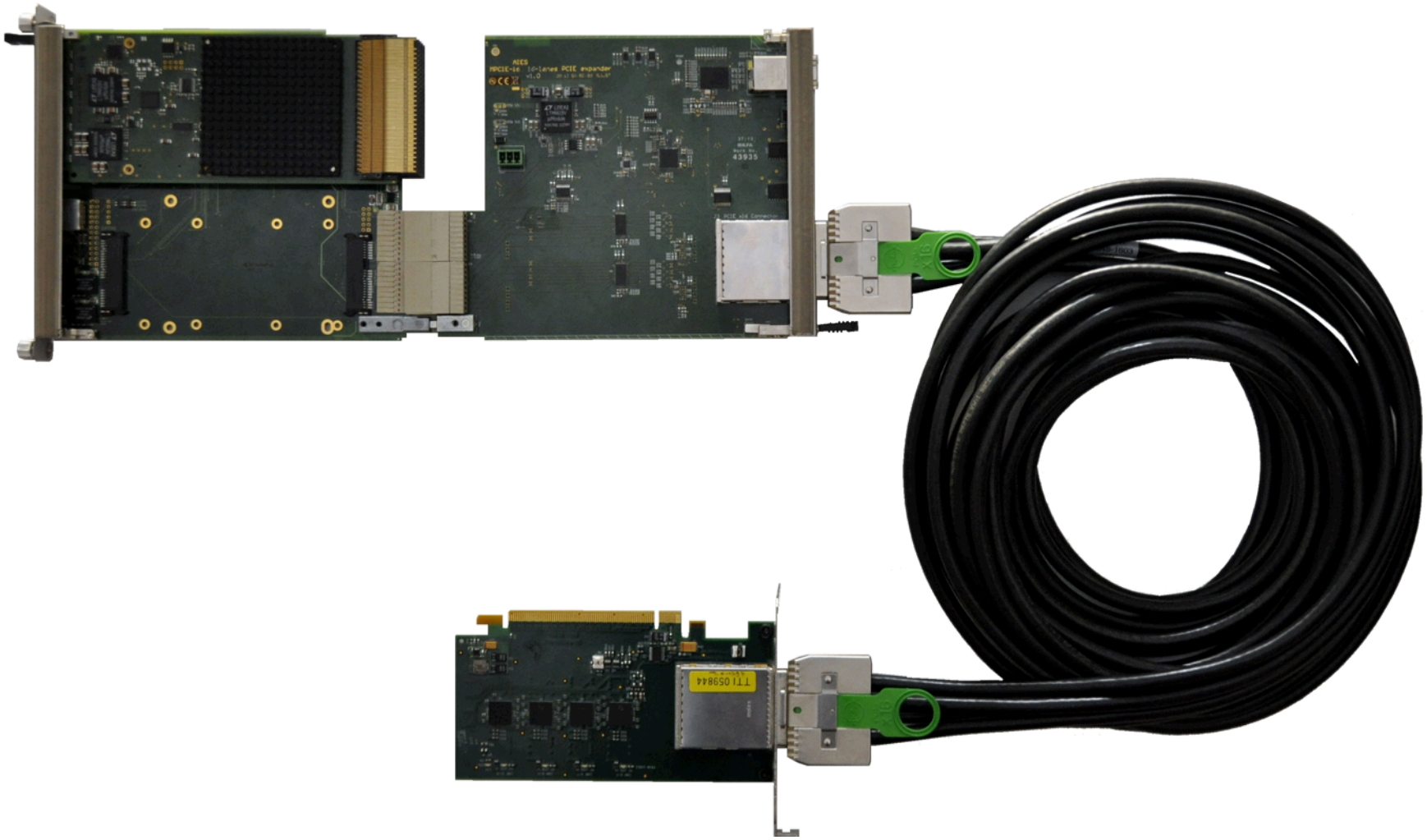
NAT-MCH-PHYS80

12 * 4 PCIe lanes

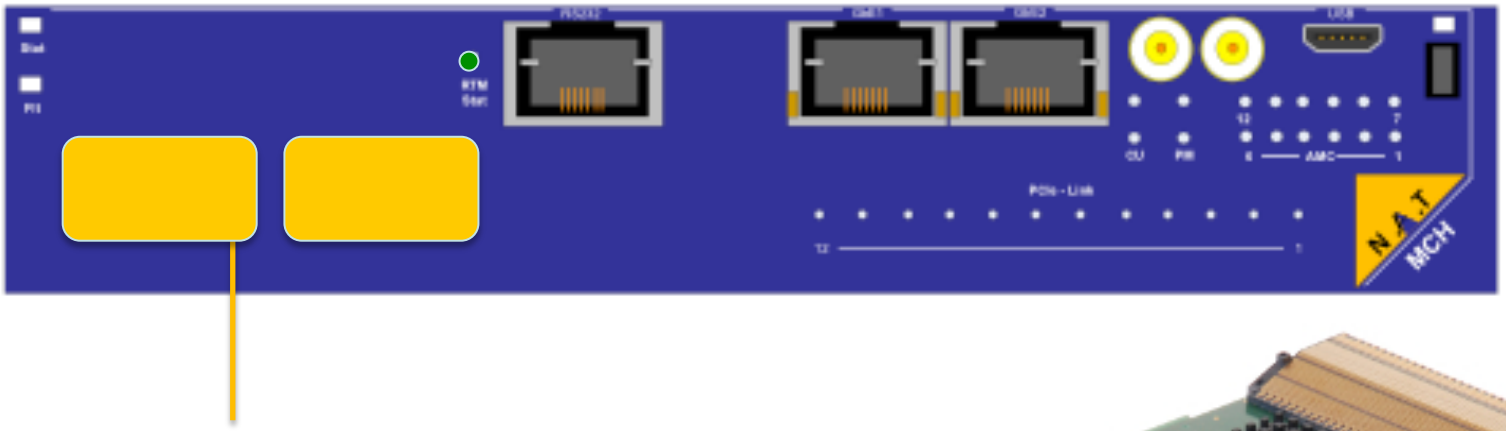
2 * 16 PCIe lanes



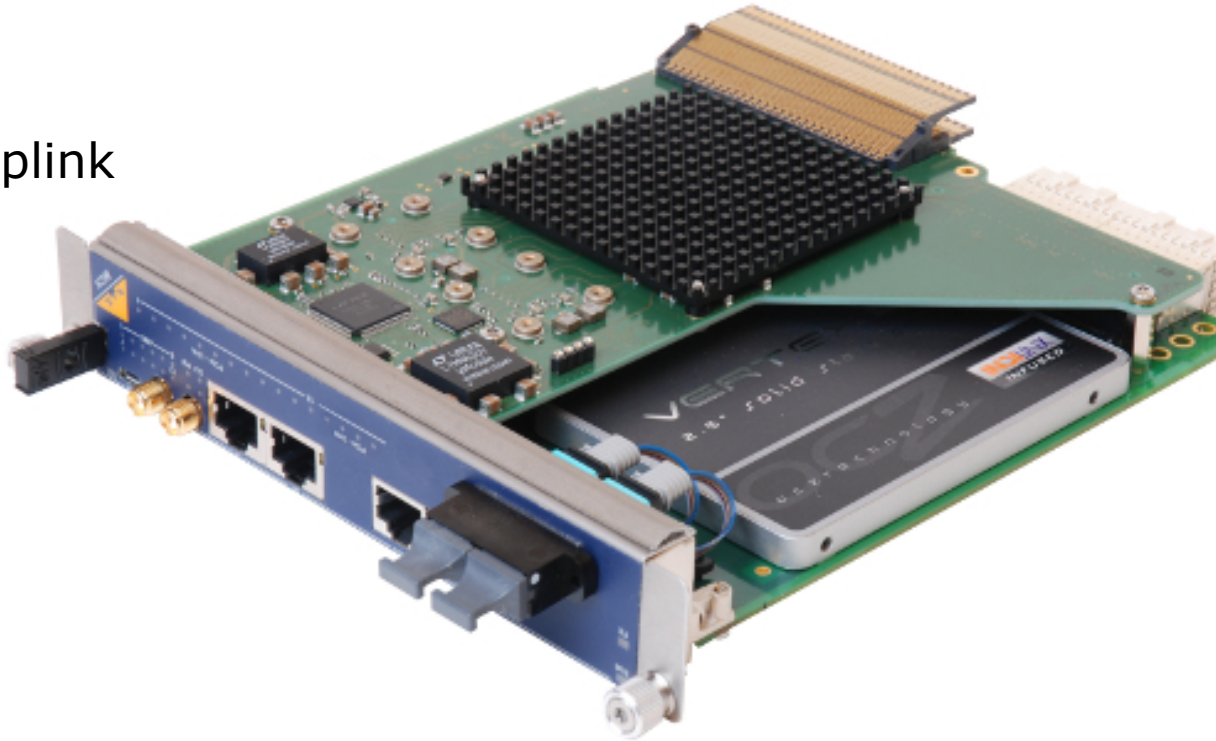
Existing Solution:
NAT-MCH-PHYS or NAT-MCH-PHYS80 & RTM-PCIEx16-UPLNK



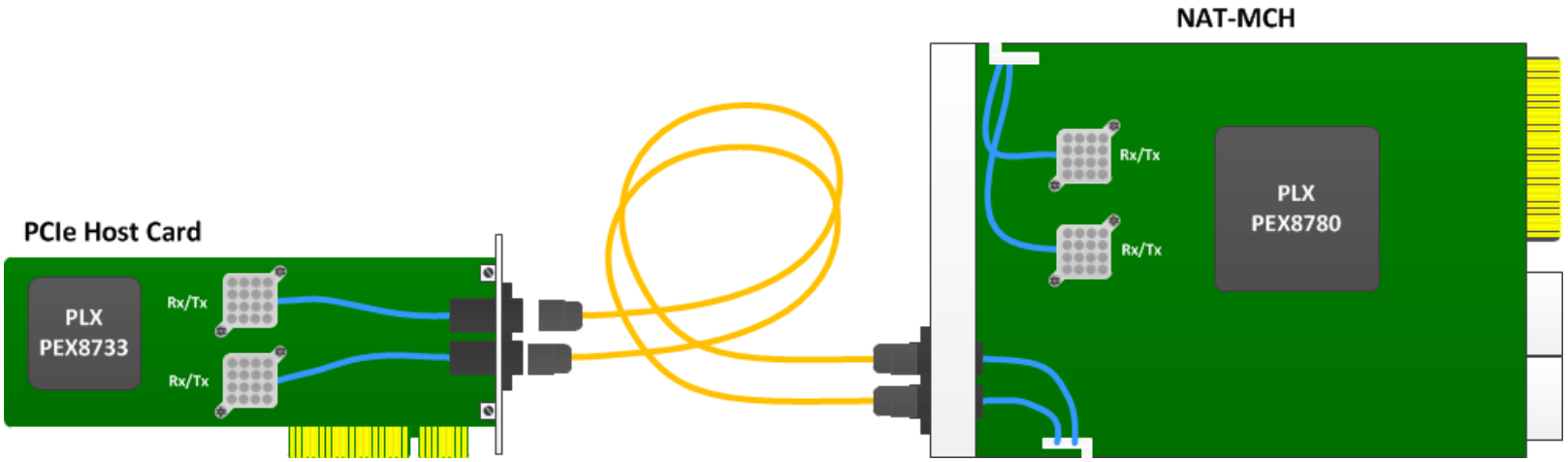
NAT-MCH-PHYS80-
PCIEx16-UPLNK



Optical PCIexpress-Uplink



NAT-MCH-
PCIEx16-UPLNK



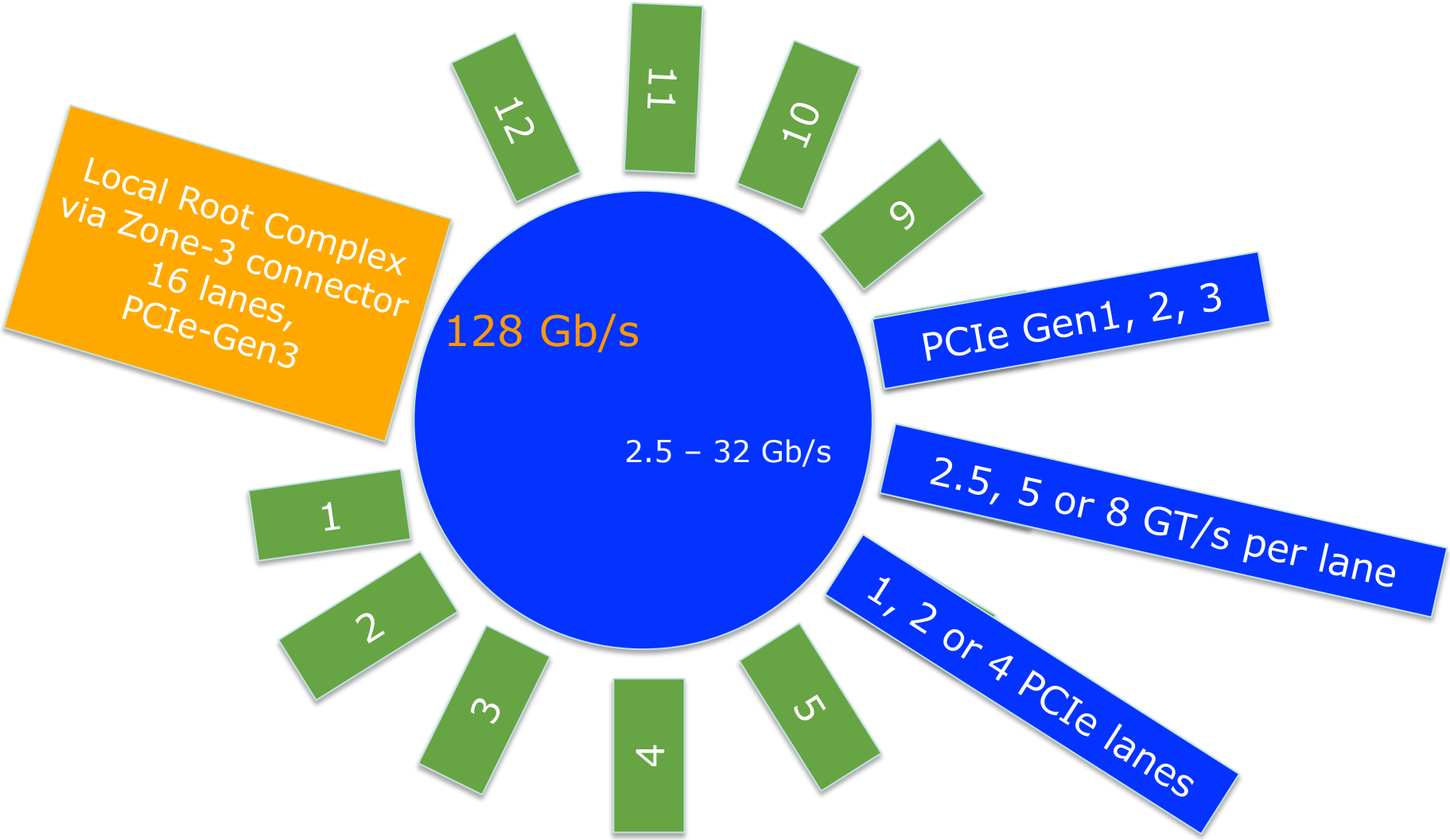
Needed Parts:

- 4 x Finisar BOA
- 4 x Pig Tail
- 4 x Face Plate Adapter
- 2 x Patch Cord 5m
- Resulting Costs for a PCIe

GenIII x16 Uplink Connection:

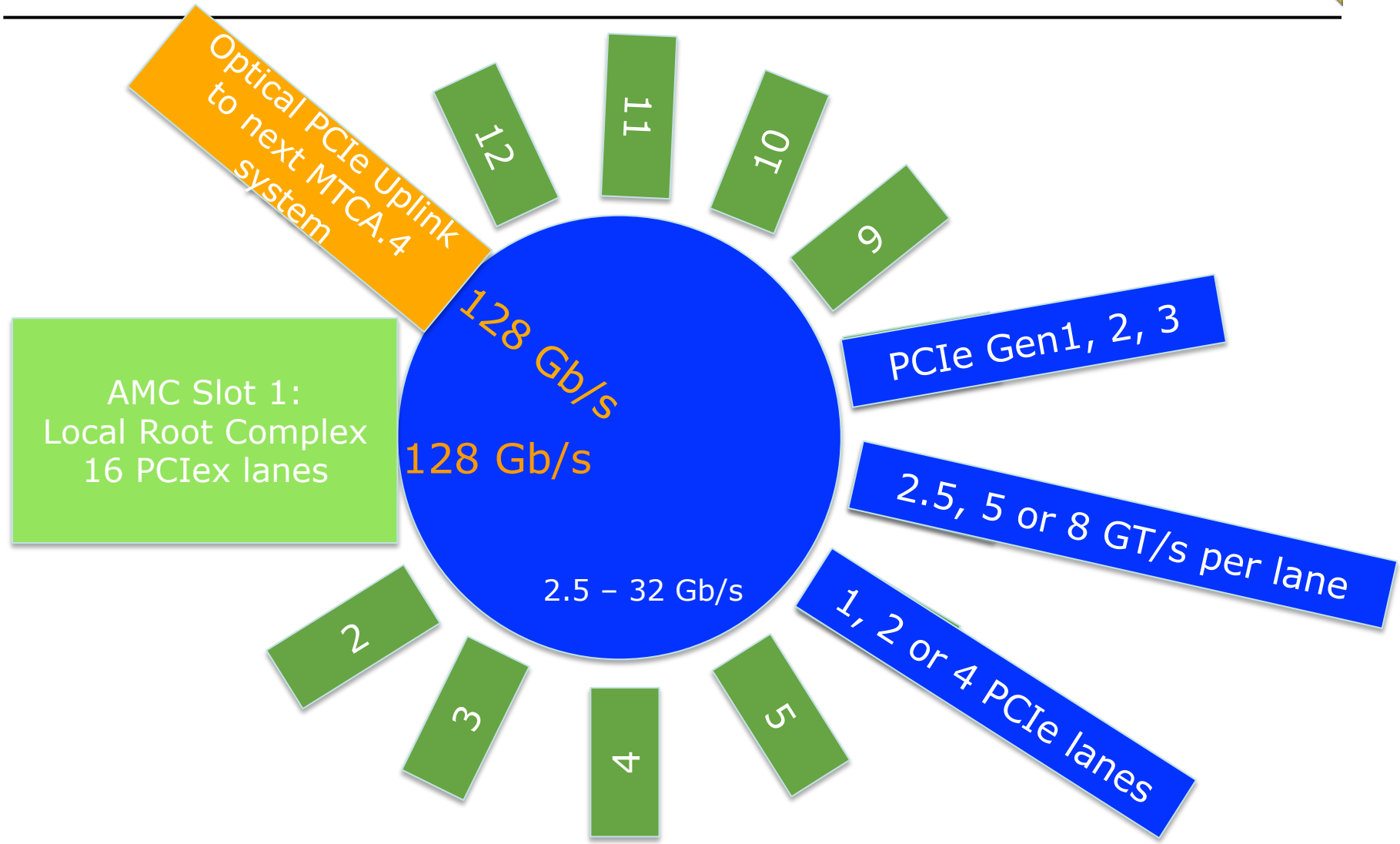
Boost in existing MTCA.4 Systems

12 * 4 PCIe lanes, 1 * 16/32 PCIe lanes



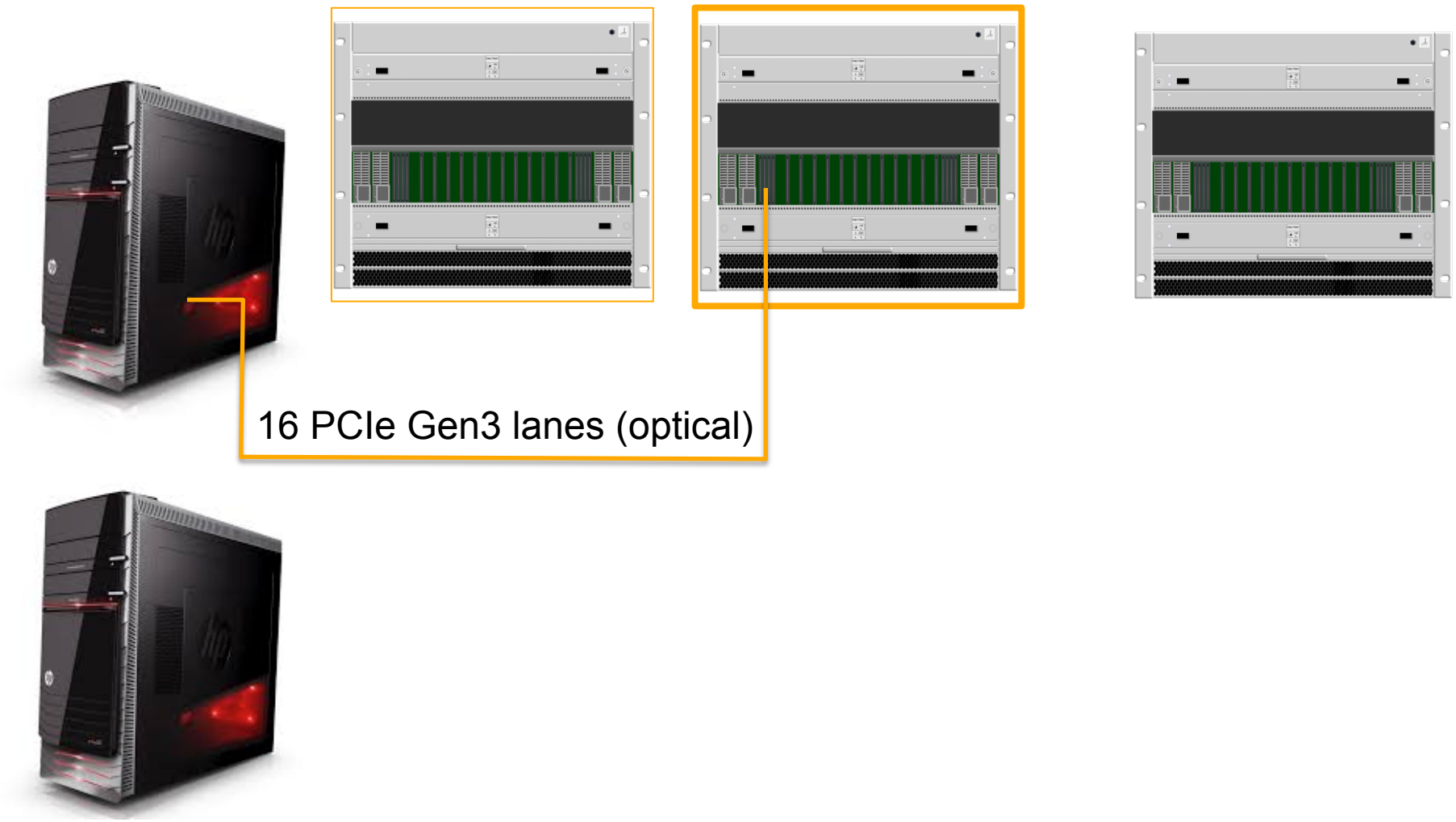
Boost new MTCA.4 Systems

12 * 4 PCIe lanes, 2 * 16 PCIe lanes



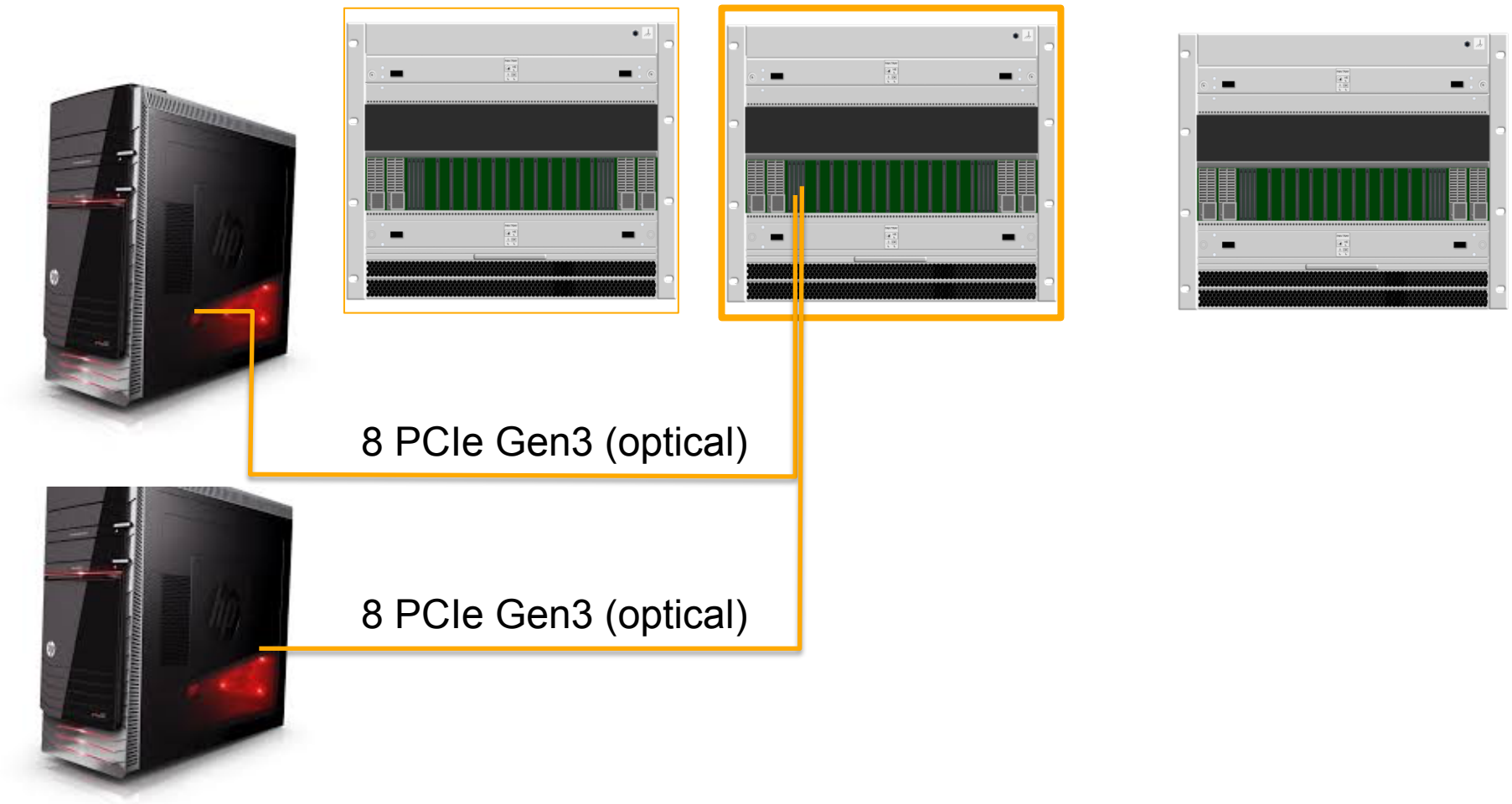
System Uplink Configurations

Local 16 PCIe Gen3 lanes to CPU rear MCH slot



System Uplink Configurations

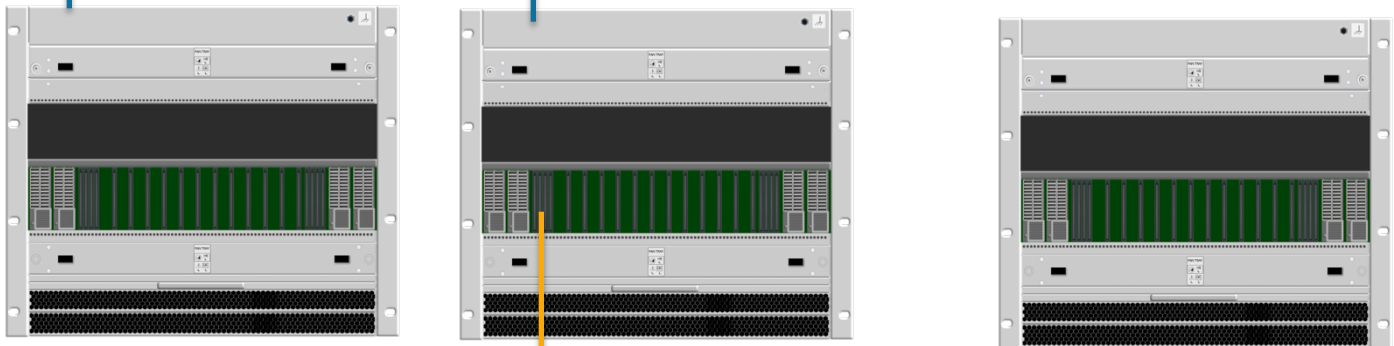
Local 16 PCIe Gen3 lanes to CPU rear MCH slot



System Uplink Configurations

Local 16 PCIe Gen3 lanes to CPU rear MCH slot

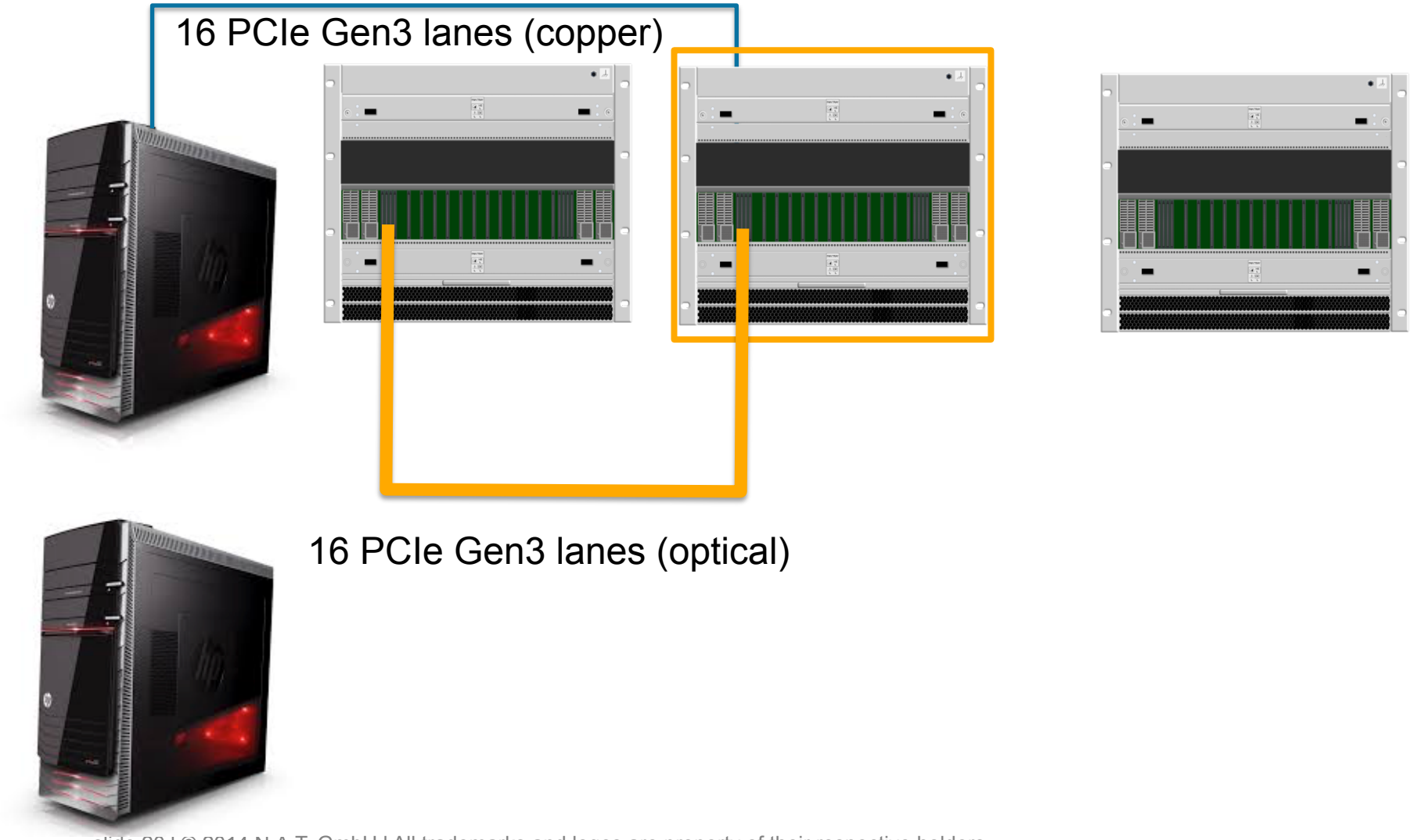
16 PCIe Gen3 lanes (copper) on the rear side



16 PCIe Gen3 lanes (optical)

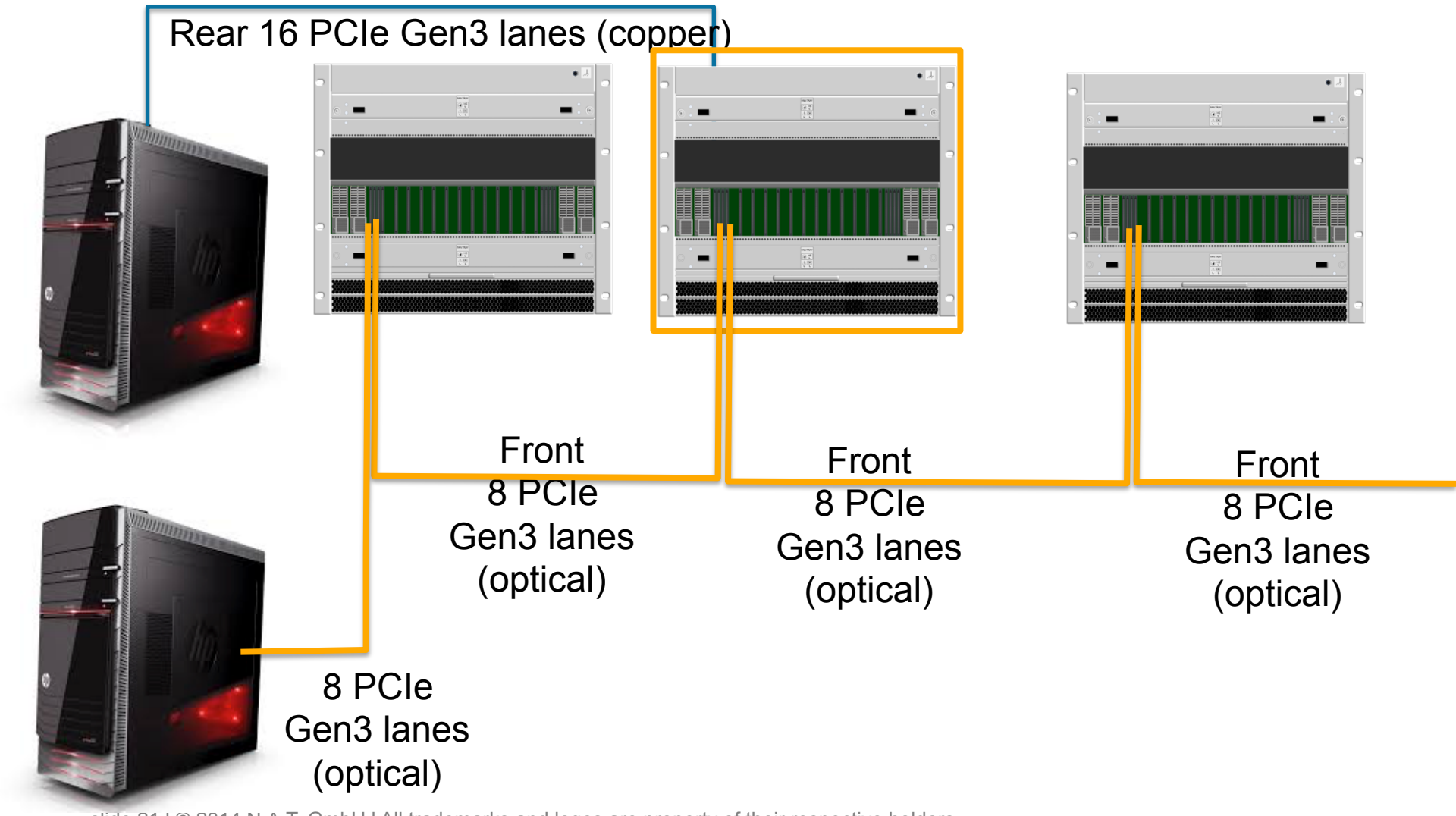
System Uplink Configurations

Local 16 PCIe Gen3 lanes to CPU rear MCH slot



System Uplink Configurations

Local 16 PCIe Gen3 lanes to CPU rear MCH slot



Summary

External PC 1	External PC 2	2nd chassis	3rd chassis	Local MCH-CPU	Cluster CPUs
128 Gb/s optical		128 Gb/s copper			Up to 6 * 32 Gb/s
128 Gb/s optical				128 Gb/s	Up to 6 * 32 Gb/s
128 Gb/s copper				128 Gb/s	
128 Gb/s copper		64 Gb/s optical	64 Gb/s optical		
64 Gb/s optical	64 Gb/s optical	128 Gb/s copper			

Thank you very much!
Questions?

Vollrath Dirksen
Strategic Business Development

vollrath@nateurope.com

N.A.T. GmbH
Konrad-Zuse-Platz 9
53227 Bonn, Germany

www.nateurope.com

MTCA.4 Training:

mtca.desy.de/support/training

2015: PowerBridge N.A.T.

