

# Ethernet Alliance:

**Higher Speeds  
More Pervasive Usage  
New Use Cases**

2023 SmartNICs Summit - Peter Jones, June 14 , 2023



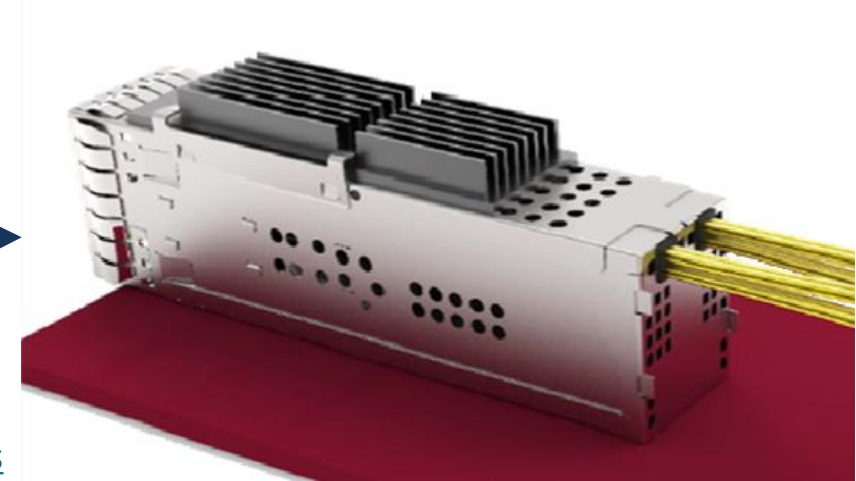
ethernet alliance

[www.ethernetalliance.org](http://www.ethernetalliance.org)

# Presentation Disclaimer

The views expressed in this presentation are those of the presenters and not of the Ethernet Alliance.

# Ethernet @ 50, Turing Award for Bob Metcalfe



Watch:  
[ACM video, career and accomplishments](#)  
[Voices Of Ethernet: Bob Metcalfe](#)



# The Ethernet Alliance

Global Community of End Users, System Vendors & Component Suppliers

## Our Mission

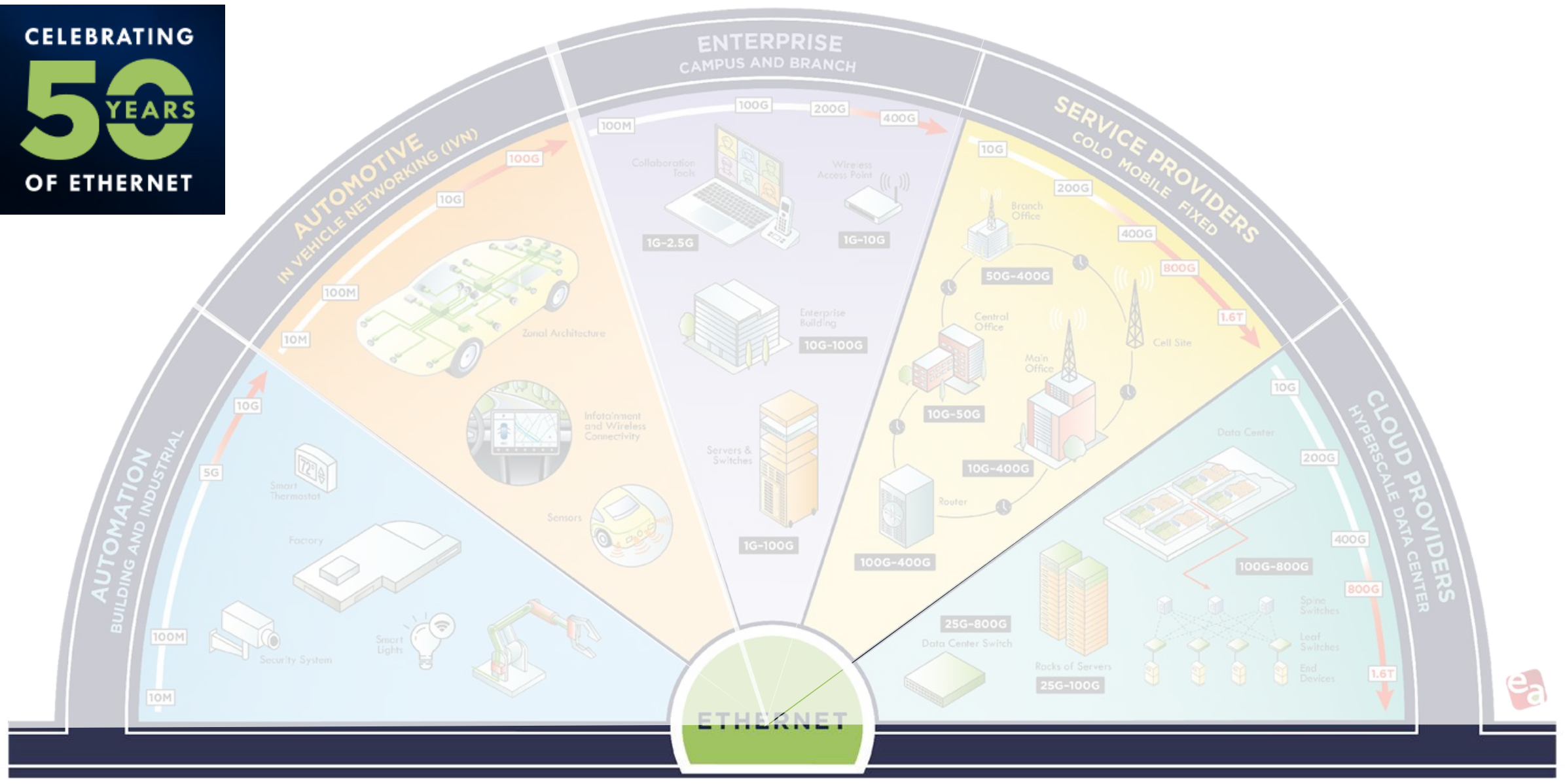
- **To promote** industry awareness, acceptance and advancement of technology and products based on, or dependent upon, both **existing and emerging IEEE 802 Ethernet standards** and their management.
- **To accelerate industry adoption** and remove barriers to market entry by providing a cohesive, market-responsive, industry voice.
- Provide resources to establish and **demonstrate multi-vendor interoperability**.



# Ethernet Alliance Strategy

Expanding the Ethernet Ecosystem, Supporting Ethernet Development

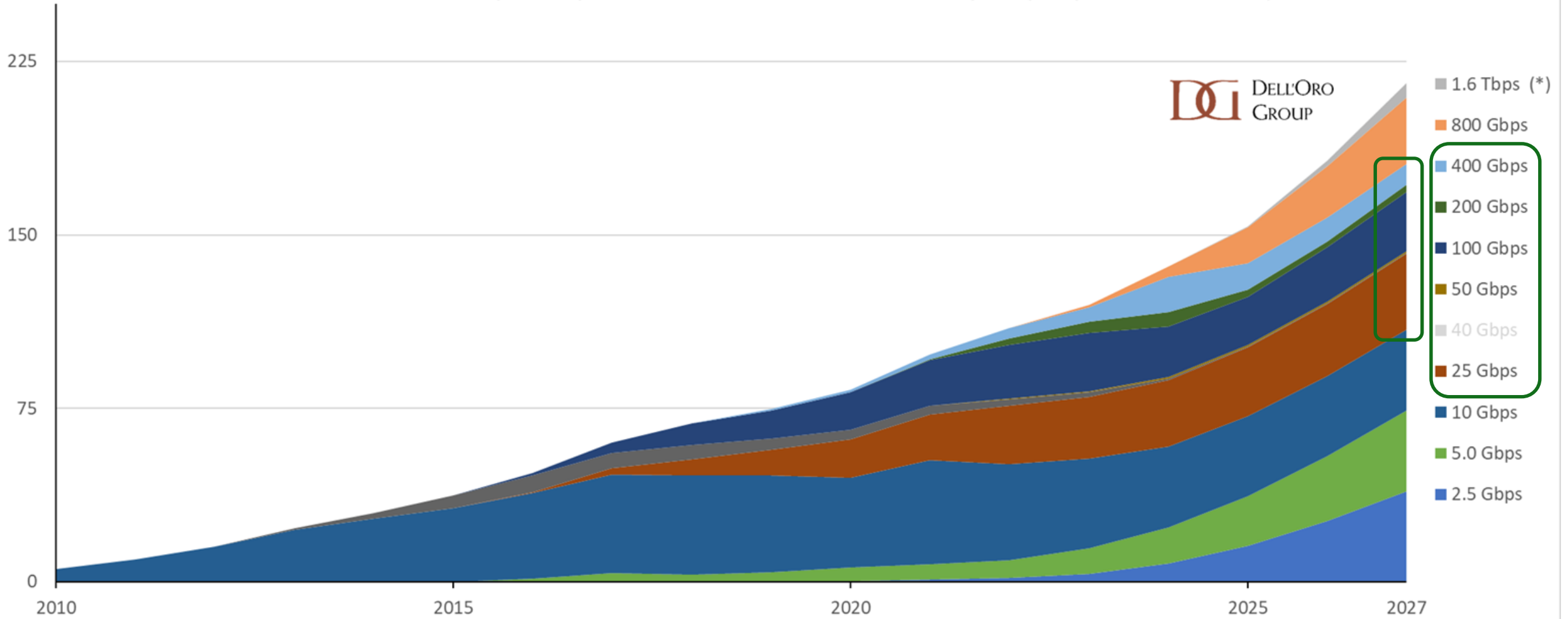
- **Facilitate interoperability testing & assurance**
  - Industry Plug fests supporting member and technology initiatives
  - PoE Certification Program
- **Global outreach and collaborative interaction with other industry organizations**
  - Worldwide Membership
  - Multiple SIGs, applications and MSAs
  - Industry consensus building
- **Thought Leadership**
  - EA-hosted Technology Exploration Forums (TEFs)
  - Technology and standards incubation
- **Promotion of Ethernet**
  - Media and industry analyst outreach
  - Education
  - Marketing (trade shows & panel presentations, white papers, blogs & social media)



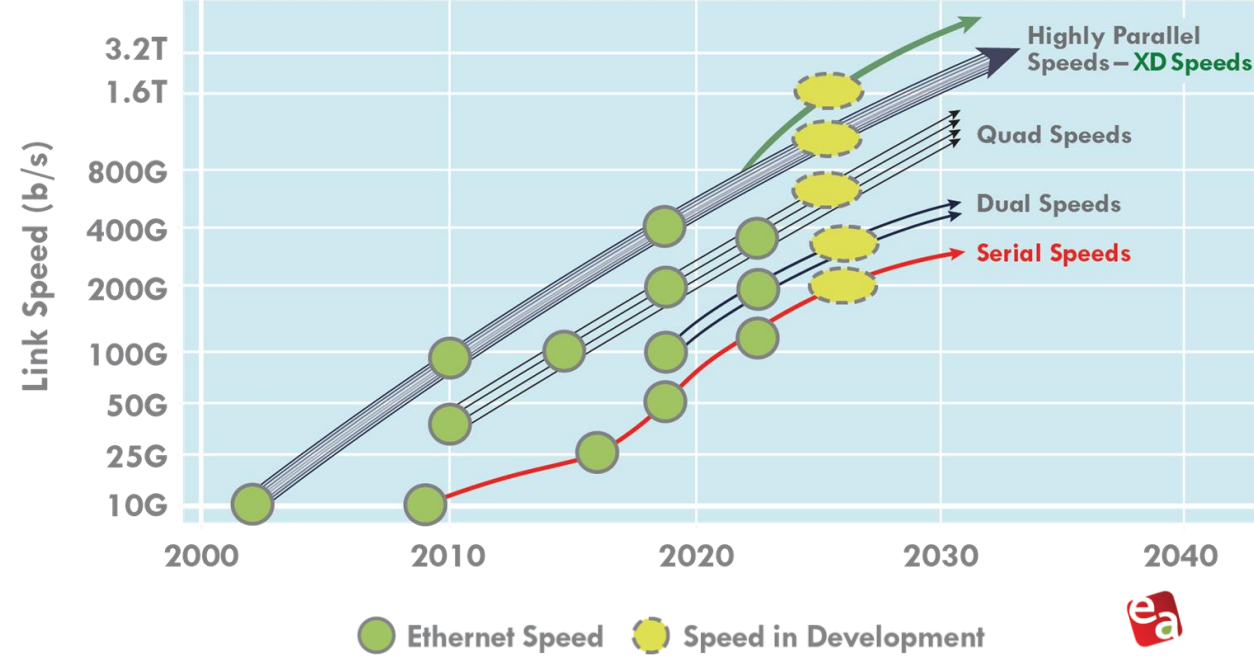
Ethernet Alliance 2023 roadmap available [here](#)

# Ethernet Port Speed Trends (> 1 Gbps)

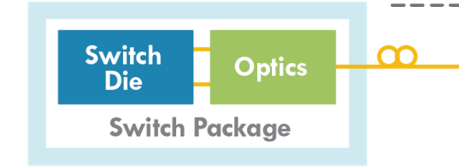
Switch Ports per year, Speeds > 1 Gbps (Millions)  
Source: Dell'Oro Group January 2023 Ethernet Switch 5-Year Forecast reports (Campus and Data Center)



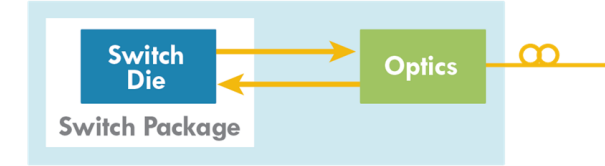
# Technologies



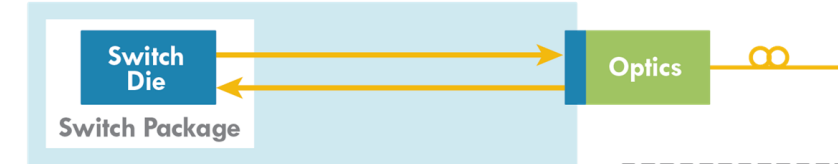
## Co-Packaged Optics



## On-Board Optics

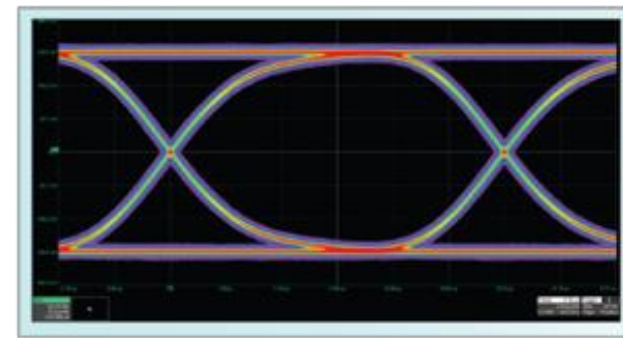


## Pluggable Optics

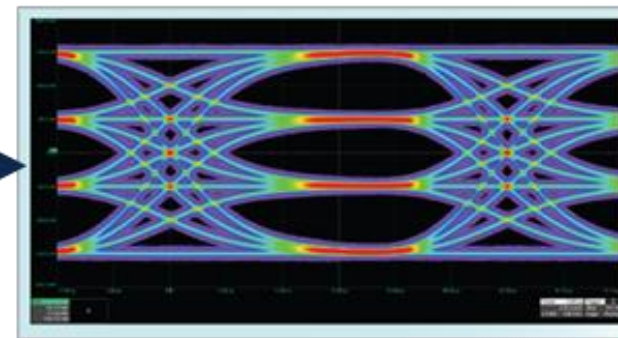


Optimal Power Efficiency

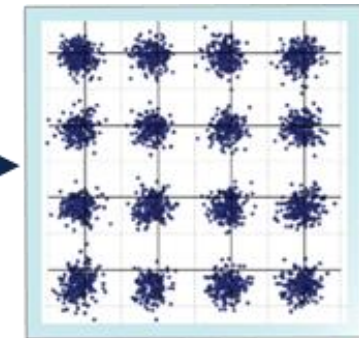
The ever-increasing demand for power efficiency in the data center is driving the transition to co-packaged optics.



NRZ



PAM4



Coherent

Ethernet Alliance 2023 roadmap available [here](#)

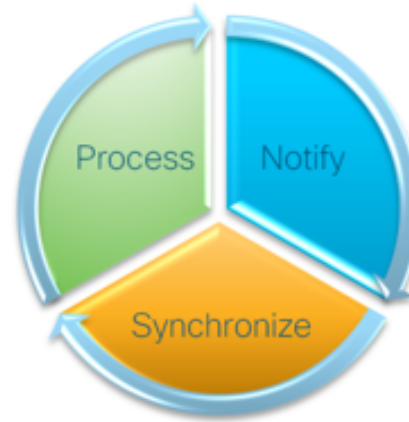


# Building Networks for ML/AI Workloads

## Requirements

### Execute Instructions on GPU

High bandwidth compute can saturate network links



### Send results of computation

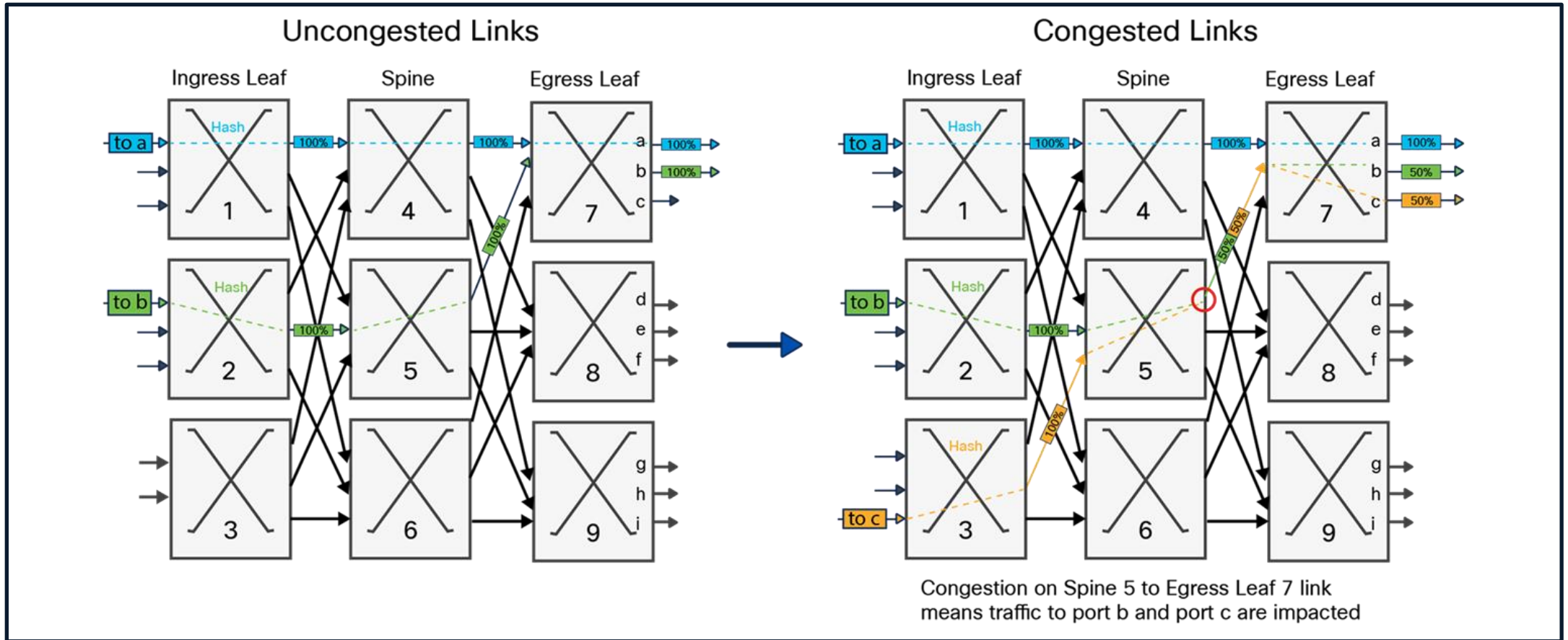
Several methods, we'll focus on just one  
All-to-All Collective (Everyone sends to everyone)

### Wait for everyone to complete

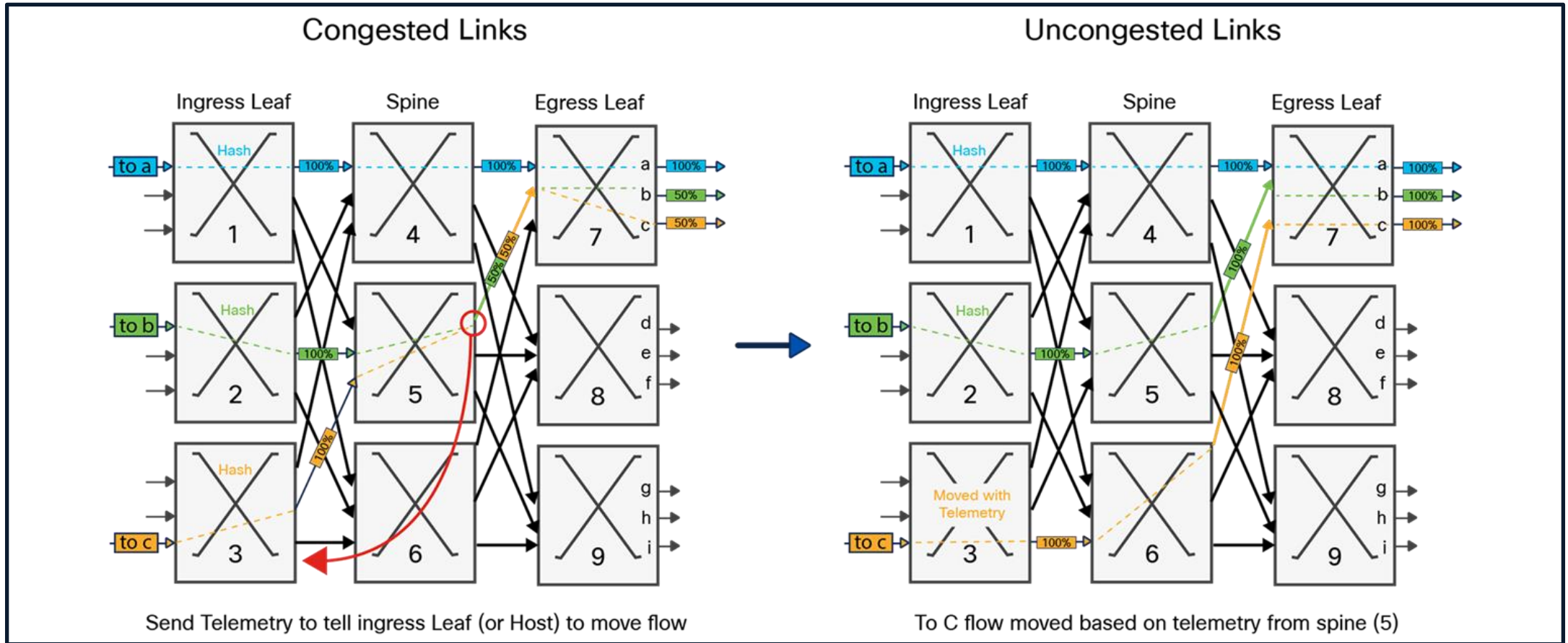
Creates synchronization between GPUs  
**Computation stalls waiting for the slowest path**  
Job Completion Time (JCT) is based on the *worst-case* tail latency

# Building Networks for ML/AI Workloads

## Operation with ECMP

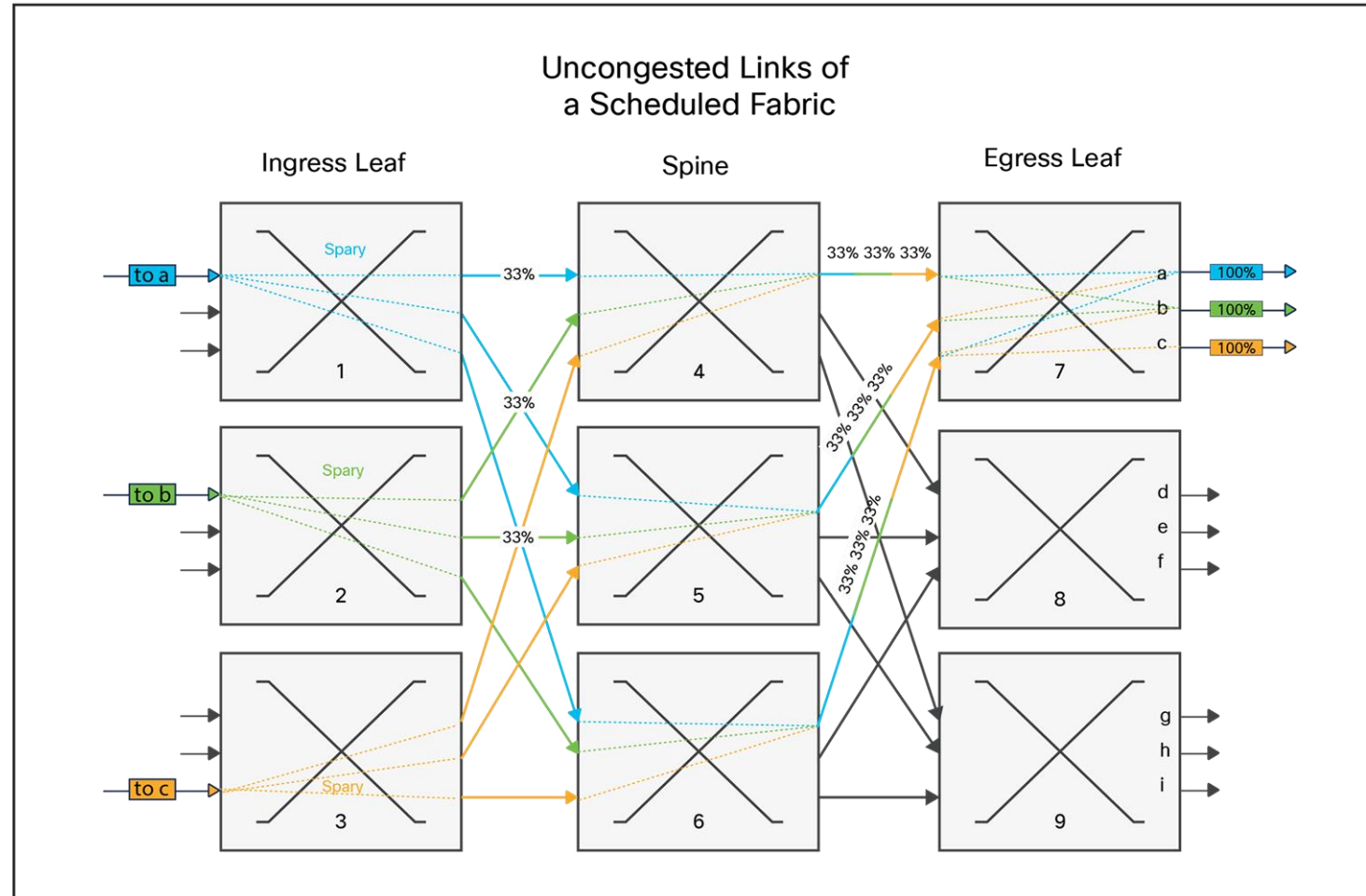


## Operation with Telemetry assisted Ethernet



# Building Networks for ML/AI Workloads

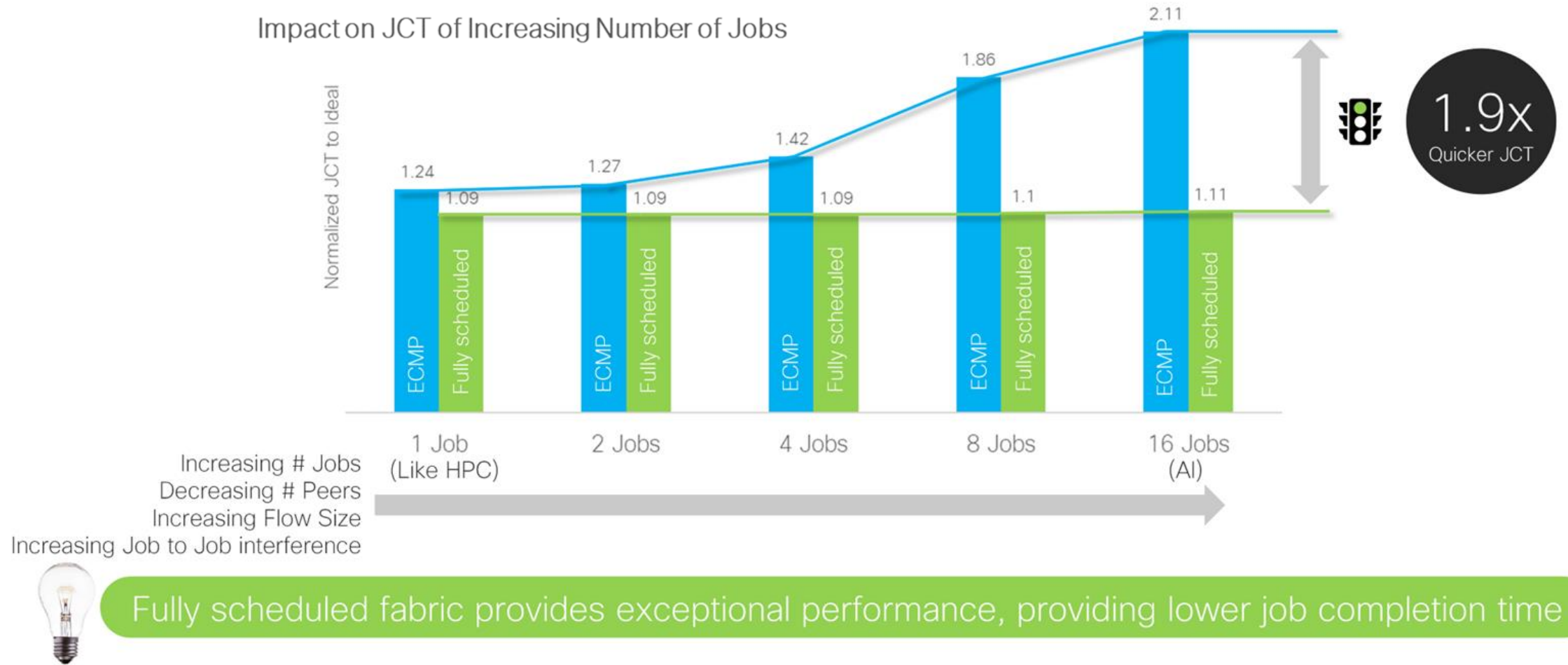
## Operation with Fully Scheduled Fabric





# ML/AI Workloads - Outcomes with Fully Scheduled Fabric

MORE INFO AT ...  
Evolved Networking: The AI/ML Challenge  
Rakesh Chopra, OCP Global Summit October 2022  
[Slides](#), [Video](#)



# Thank you!

If you have any questions or comments, please email [admin@ethernetalliance.org](mailto:admin@ethernetalliance.org)

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