CISCO *Live!*

Let's go

# Cisco Webex App

## Questions?
Use Cisco Webex App to chat
with the speaker after the session

## How

1. Find this session in the Cisco Live Mobile App

2. Click "Join the Discussion"

3. Install the Webex App or go directly to the Webex space

4. Enter messages/questions in the Webex space

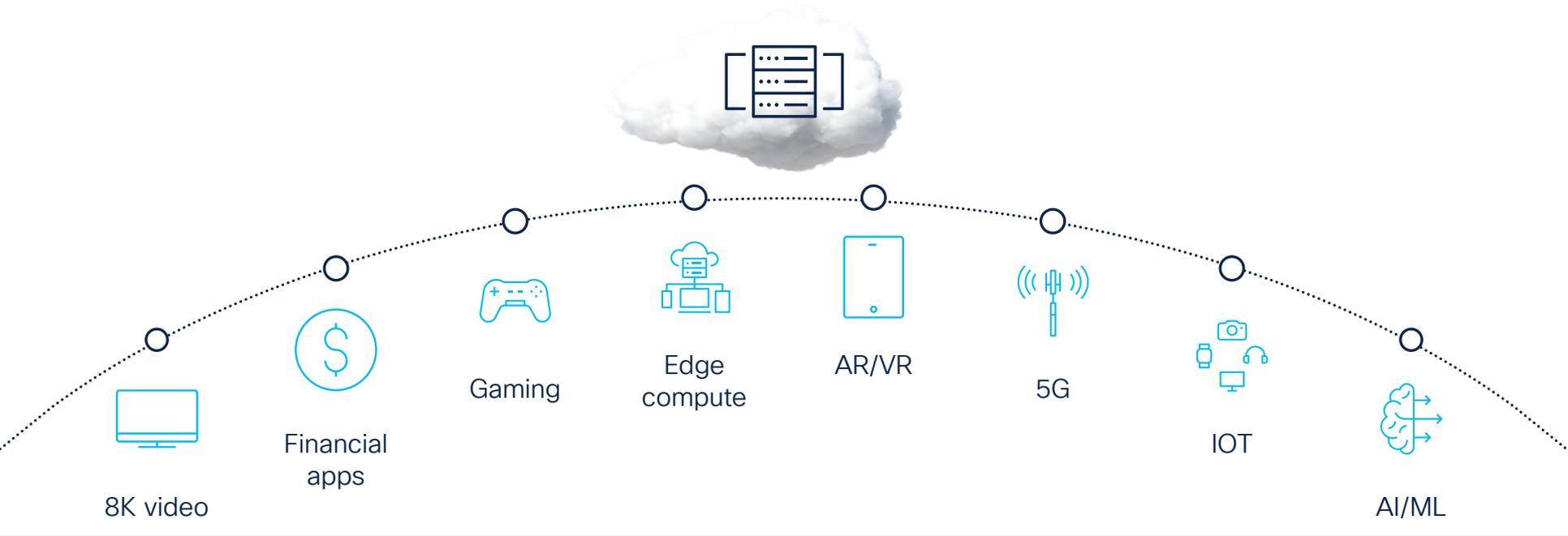Webex spaces will be moderated
by the speaker until June 9, 2023.

https://ciscolive.ciscoevents.com/ciscolivebot/#PSODCN-1708
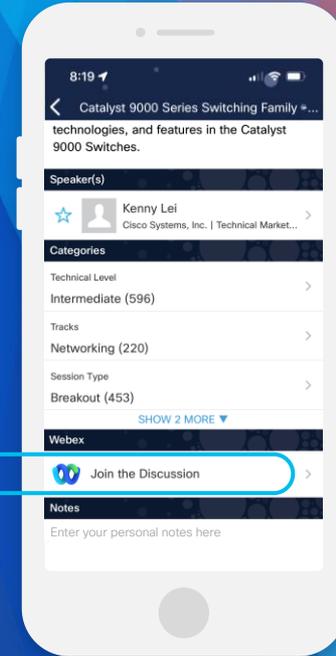
# Agenda

- Introduction

- New Cisco Nexus Switches

- Special Guest

- Cisco ASICs

- Architectures

- Conclusion

# Data center traffic drivers



8K video

Financial apps

Gaming

Edge compute

AR/VR

5G

IOT

AI/ML

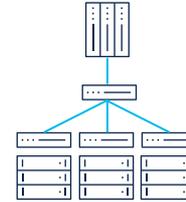Hyperscalers | Webscalers | Enterprise | Telcos | Media providers

# Cloud-scale infrastructure use cases

400G/800G

## Large scale AI/ML clusters
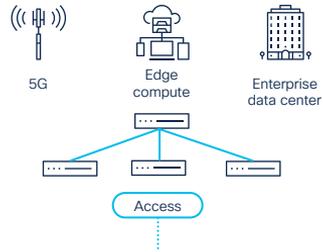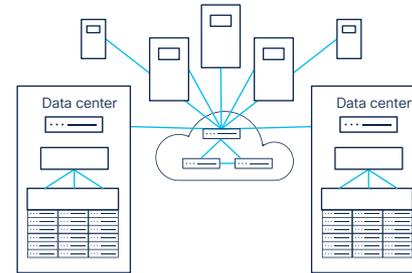


## Multi-tier fabrics: leaf, spine, super-spine



## Edge compute



5G

Edge compute

Enterprise data center

Access

## Data Center Interconnect (DCI)



Data center

Data center

# Nexus 9000 portfolio evolution



Nexus 9232
32p 800G

Nexus 9400
64p 400G
128p 200G

Nexus 9300
48p 400G
64p 400G

800G

Nexus 9300
16p 400G
28p 100G + 8p 400G

Nexus 9500
16 port 400G line card

Nexus 9300
32p 400G

Nexus 9808
Up to 288 400G ports
800G ready

Nexus 9804
Up to 144 400G ports
800G ready

100G

400G

| CY19 | CY21 | CY22 Q2 | CY22 Q4 | CY23 |
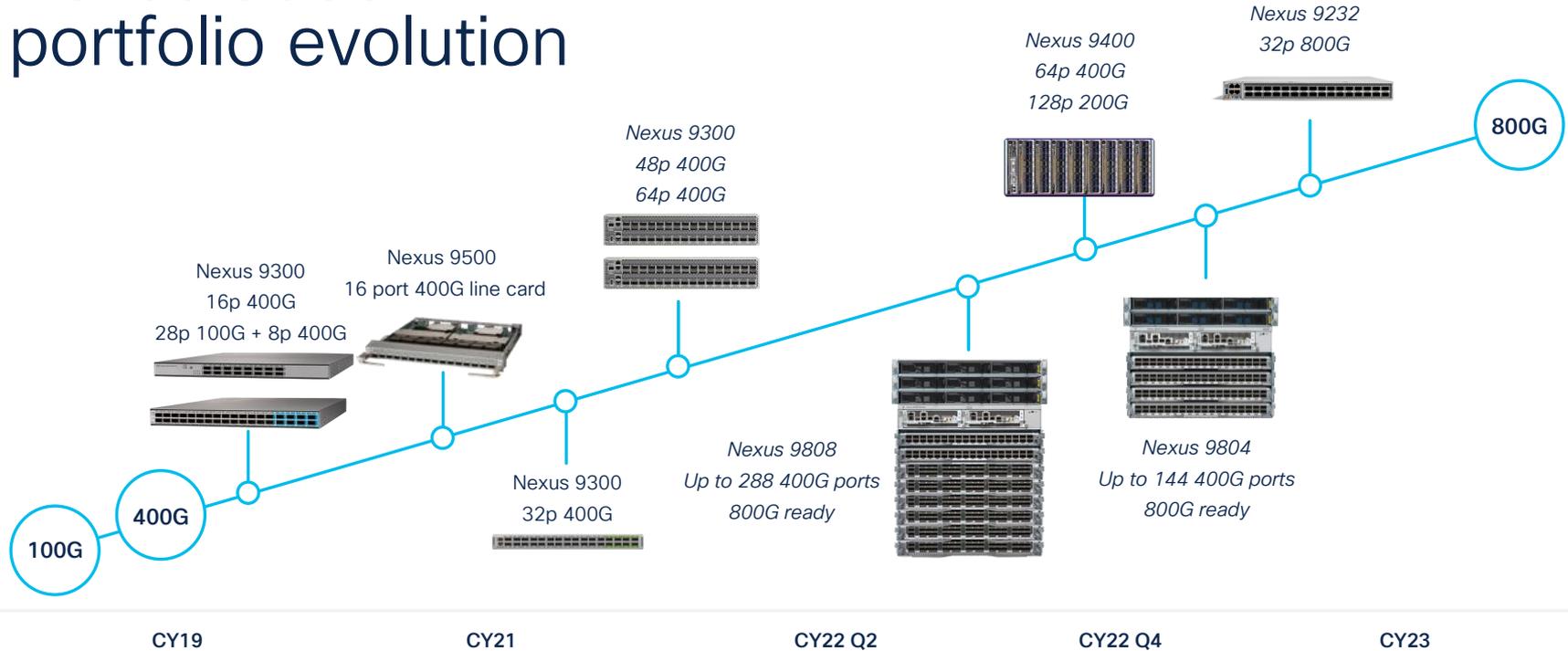
Cloud service providers

Telco service providers

Enterprise

Media networks

# Cisco Nexus 9232E switch

Compact 1RU 25.6T Switch | 32 800G capable ports

Up to 64 line rate 400G ports (2x400G breakout)

25.6T G100 ASIC (7nm) | 112G SERDES

108MB packet buffer

QSFP-DD800 ports:
Backward compatible with QSFP-DD, QSFP28, QSFP+

Quad Core x86 CPU | 32GB RAM | 128GB SSD

Cisco NXOS spine capable

N9K-C9232E-B1

# Introducing high density 400G with QSFP-DD800 modules

QSFP-DD
8x100G FR

QSFP-DD
2x400G FR4

| | |
|---|---|
| Increased density | Double port bandwidth for Single Mode Fiber links up to 2km |
| Investment protection | Reuse existing cabling infrastructure: Dual Duplex LC and Dual MPO-12 SMF connectors |
| Backwards compatibility | Connect existing pluggable transceivers: QSFP+, QSFP28, QSFP56, QSFP112, QSFP-DD |
| Flexible design support | 800G port to port | Breakout to 400G or 100G ports |
| Improved sustainability | Supports over 30W of power dissipation and riding heatsink in host platform |
| Standards compliant | QSFP-DD 800 MSA, IEEE 400GBASE-FR4, 100GBASE-FR1 |

High density | Investment protection | Power efficient

# Introducing Cisco Nexus 9800 series
## Performance, flexibility, and efficiency



- High Performance | High Port Density | Scalable | Low Power
- 8-slot and 4-slot Modular Switches
- Highly Redundant (N+1 fabric, 1+1 Sup, n+n PS)
- 36 400G ports per slot
  - Line rate MACsec on all 400G ports
- 48 100G ports per slot
  - Line rate MACsec on 16 100G ports

# Cisco Nexus 9800 series
## 36-port 400G MACsec line card

- 36 400G QSFP56-DD Ports | 14.4Tbps
- Line-rate MACsec on all ports
- ZR and ZR+ support
- 3x 108MB on-die packet buffer + 3x 8GB HBM packet buffer
- 4x 100G, 4x 25G, and 4x 10G breakout
- 7+1 fabric module redundancy

N9K-X9836DM-A

# Cisco Nexus 9800 series
## 34-port 100G + 14-port 400G line card

- 14 400G QSFP56-DD + 34 100G QSFP28 ports | 9Tbps
- Line-rate MACsec on 16 100G Ports (top-row)
- 2x 108MB on-die packet buffer + 2x 8GB HBM packet buffer
- 4x 100G, 4x 25G, and 4x 10G breakout
- 4+1 fabric module redundancy (48p 100G mode)
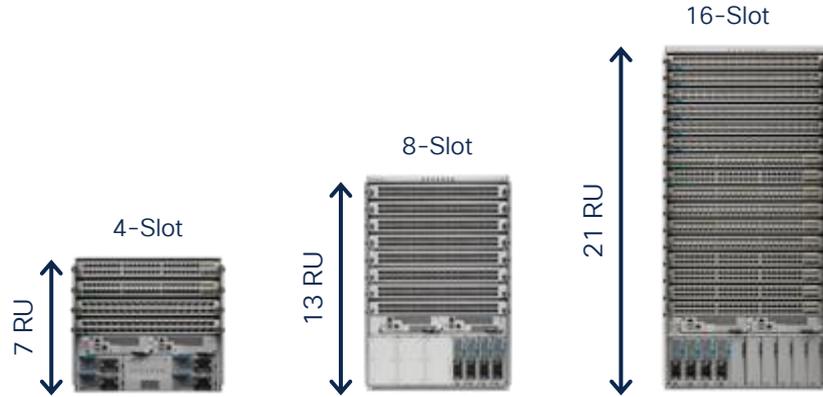- 7+1 fabric module redundancy (100G + 400G mode)

N9K-X98900CD-A

# Cisco Nexus 9500 cloud scale modular portfolio

## Cisco Nexus® 9500 Chassis



| | NX-OS | ACI | MACsec |
|---|---|---|---|

**16-Slot** — 21 RU

**8-Slot** — 13 RU

**4-Slot** — 7 RU

| | Nexus 9504 | Nexus 9508 | Nexus 9516 |
|---|---|---|---|
| | FM-E (100G flows) | FM-E2 (100G flows) | FM-E2 (100G flows) |
| | FM-G (400G flows) | FM-G (400G flows) | N/A |

**X9716D-GX 16p 400G** — NX-OS ✓, ACI ✓, MACsec ✓

**X9736C-FX 36p 100G** — NX-OS ✓, ACI ✓, MACsec ✓

**X9788TC-FX 48p 1/10G + 4p 100G** — NX-OS ✓

**X97160YC-EX 48p 25G + 4p 100G** — NX-OS ✓

13

# Nexus modular platform evolution

**Nexus 9800 Series**
**100G/400G/800G**

**Nexus 9500 Series**
**40G/100G/400G**

Port speed      40G or lower      100G      400G      800G or higher

# Introducing Cisco Nexus 9400 series
## Compact, flexibility, and efficiency



N9K-C9408

- High Performance | High Port Density | Scalable | Low Power

- 8 Modules – max 64 400G ports or 128 100/200G ports

- Compact 4 RU design, 24in depth

- Line rate MACsec for 400G & 200G ports

- Single 25.6T Cisco ASIC

- All cards are field replaceable
  - Supervisor
  - Switch Card
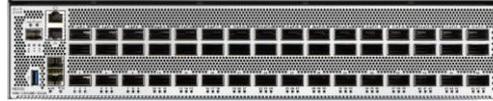  - Port Card
  - Power Supplies & Fans

# Cisco Nexus high density 400G fixed switches

| N9K-C9364D-GX2A | N9K-C9348D-GX2A | N9K-C9332D-GX2B |
|---|---|---|

Single 25.6T ASIC

2 RU 64 400G ports

MACsec on 16 ports

Single 25.6T ASIC

2 RU 48 400G ports

MACsec on all 48 ports

Single 12.8T ASIC

1 RU 32 400G ports

MACsec on 8 ports

# Special Guest

workday®

## Ahsan Ghayas

**Sr. Principal Engineer | CCIE# 19745**
**Workday**

# Cisco Nexus 9300 100/400G switches

**ACI leaf**

Nexus 9336C-FX2
36p 100G

**ACI spine**

Nexus 9364C
64p 100G

Nexus 9332C
32p 100G

**ACI spine or leaf**

Nexus 9364D-GX2A
64p 400G

Nexus 9364C-GX
64p 40/100G

Nexus 9332D-GX2B
32p 400G

Nexus 9316D-GX
16p 400G

Nexus 93600CD-GX
28p 40/100G & 8p 400G

**NX-OS**

# Cisco Nexus 9000 cloud scale 1/10/25G switches

**1/10/25G Switches**

96p 1/10/25G SFP + 12p 40/100G

Nexus 93360YC-FX2

48p 1/10/25G SFP + 6p 40/100G

Nexus 93180YC-FX3

**1G/10G BaseT Switches**

96p 100M/1/10GT + 12p 40/100G

Nexus 93216TC-FX2

48p 100M/1/10GT + 6p 40/100G

Nexus 93108TC-FX3P

**100M/1G BaseT Switches**

48p 100M/1GT + 4p 1/10/25G + 2p 40/100G
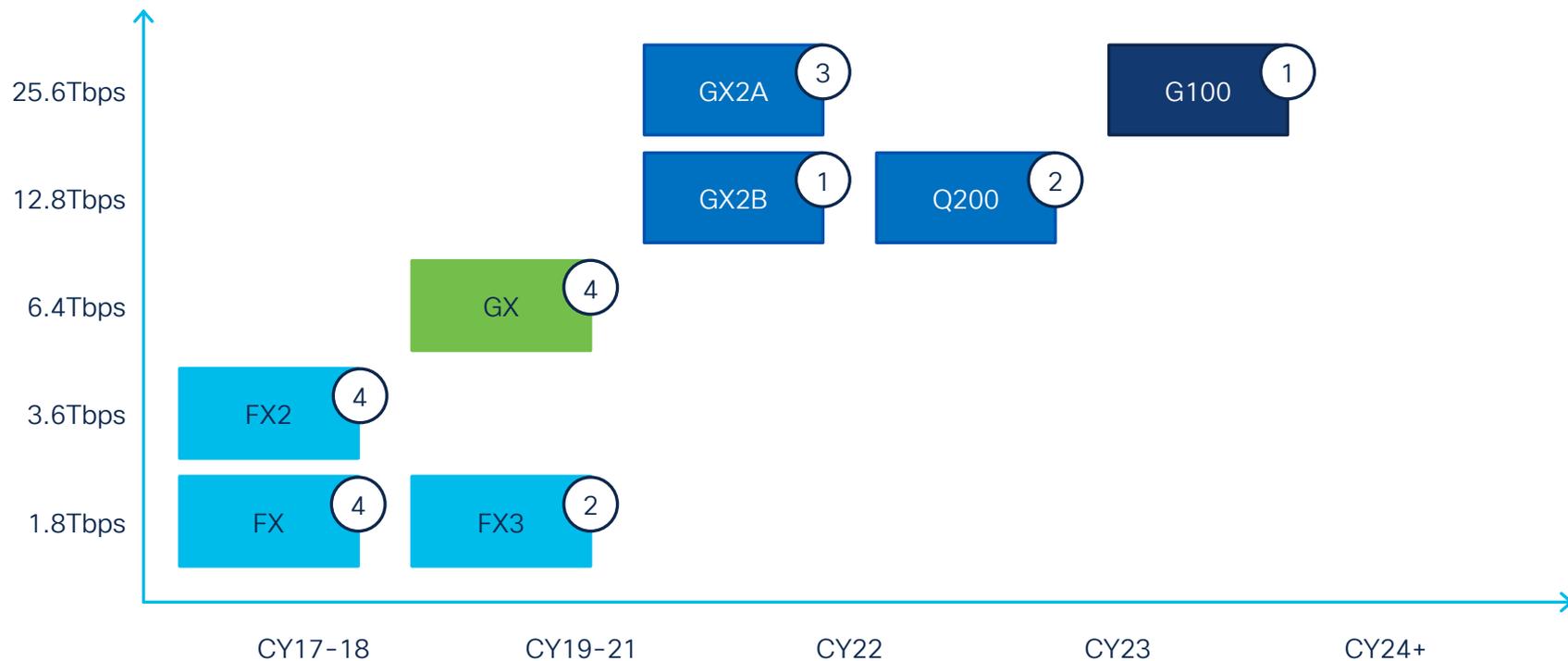
Nexus 9348GC-FXP

48p 100M/1GT + 4p 1/10/25G + 2p 40/100G

Nexus 92348GC-X (no VXLAN & no ACI)

# 400G connectivity and migration with single mode fiber

Nexus 9800 36p 400G line card

N9K-X9836DM-A

| DR4 | 500m |
|-----|------|
| FR  | 2km  |
| LR  | 10km |

QDD-4X100G-FR-S

MPO-12 SMF w 4 Lanes

1λ 100G PAM4

4x QSFP-100G-FR

Duplex LC SMF

1λ 100G PAM4

Nexus 9336C-FX2 36p 100G switch

N9K-C9336C-FX2

**Standardize on parallel SMF for 400G and 100G deployments**

# 400G connectivity and migration with single mode fiber

Nexus 9800 36p 400G line card
N9K-X9836DM-A

| DR4 | 500m |
|-----|------|
| FR | 2km |
| LR | 10km |

QDD-4X100G-FR-S
MPO-12 SMF w 4 Lanes
1λ 100G PAM4

QDD-4X100G-FR-S
MPO-12 SMF w 4 Lanes
1λ 100G PAM4

4x QSFP-100G-FR
Duplex LC SMF
1λ 100G PAM4

Nexus 9332D-GX2B 32p 400G switch
N9K-C9332D-GX2B

Nexus 9336C-FX2 36p 100G switch
N9K-C9336C-FX2
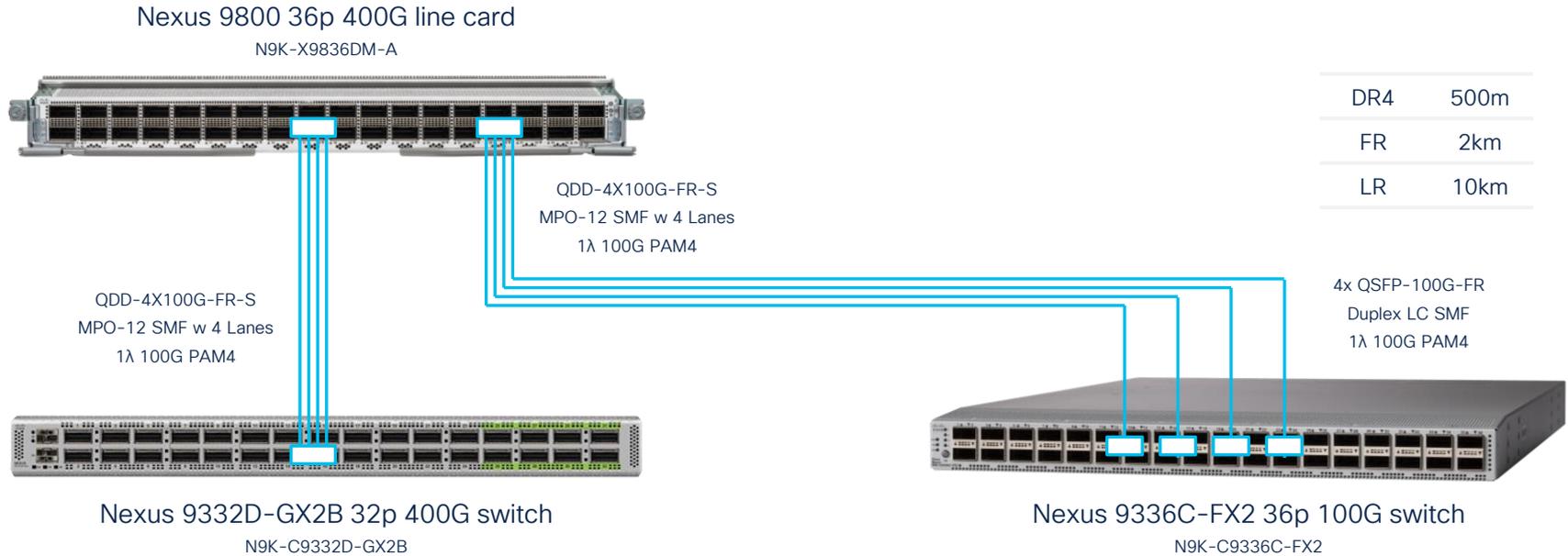
**Standardize on parallel SMF for 400G and 100G deployments**

# AI/ML blueprint for data center networking

Addressing needs of the most demanding datacenter production networks

Best performing AI/ML networks

Intelligent buffering, low latency, telemetry/visibility, RoCEv2
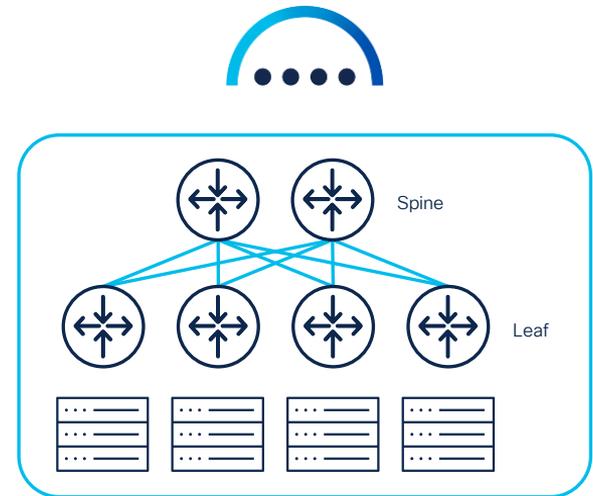
Easily build lossless fabrics
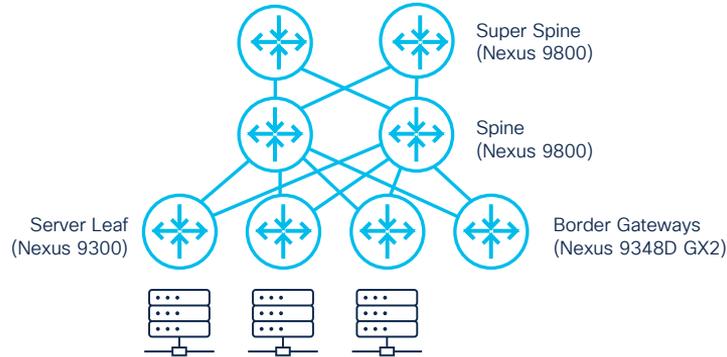
Efficient application performance

Lower TCO

Validated designs for network and ecosystem partners

Spine

Leaf

# Architecture: Financial services

## Topology



Super Spine
(Nexus 9800)

Spine
(Nexus 9800)

Server Leaf
(Nexus 9300)

Border Gateways
(Nexus 9348D GX2)

## Benefits

- Scale out: Super Spine connecting multiple data halls

- Reliability: N+1 Redundancy across all spines

- Future proof: Build core with modular 400G for the next decade of growth

- Security: Encryption between data halls and sites

# Architecture: Telco or enterprise data center

## Topology



Spine
(Nexus 9000 Modular)

Leaf
(Nexus 9300)
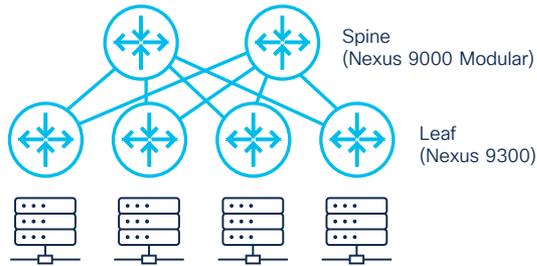
## Benefits

- Size: Compact for space constrained regional DC and edge locations

- Speed: 100G/400G fabrics

- Port density: Ready for NFV/5G adoption cycle

# Fill out your session surveys!

Attendees who fill out a minimum of four session surveys and the overall event survey will get **Cisco Live-branded socks** (while supplies last)!

Attendees will also earn 100 points in the **Cisco Live Challenge** for every survey completed.

**These points** help you get on the leaderboard and increase your chances of winning daily and grand prizes

# Continue your education

- Visit the Cisco Showcase for related demos

- Book your one-on-one Meet the Engineer meeting

- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs

- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand
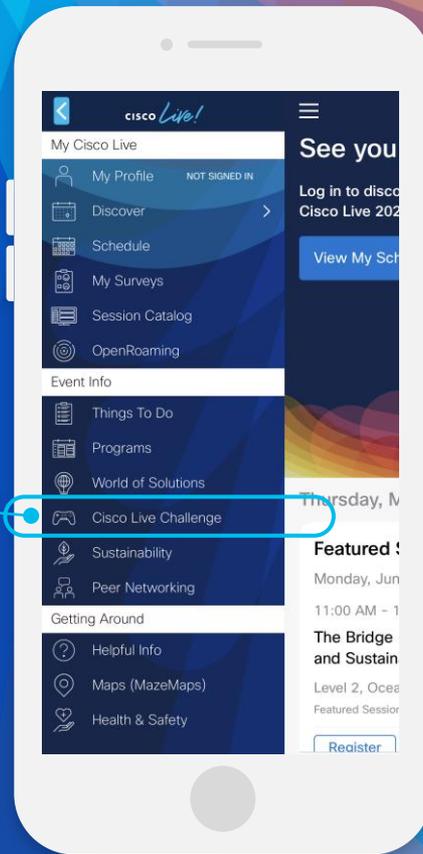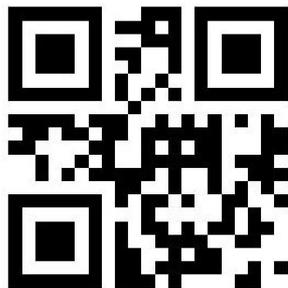
# Thank you

# Cisco Live
# **Challenge**

## Gamify your Cisco Live experience!
Get points for attending this session!

## How:

1. Open the Cisco Events App.

2. Click on 'Cisco Live Challenge' in the side menu.

3. Click on View Your Badges at the top.

4. Click the + at the bottom of the screen and scan the QR code:

CISCO *Live!*

Let's go