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#CiscoLive



The bridge to possible

Secure Access Networks in a Hybrid World

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Leader, Technical Marketing Engineering
BRKENS-2093



#CiscoLive

Session Abstract

This session will talk about the Access Networks in a Hybrid World. One of the things the pandemic has taught us is how to deal with uncertainties. As we come back to offices and start living and working in a new normal, what is important for the access network is top of mind for a lot of Networking professionals. In this session we will [see how the new trends are driving new requirements](#). We will then look at how our [latest product introductions in the Catalyst Switching 9000 family](#) are helping our customers address the challenges. We will discuss the new requirements and their solutions. This session will touch on [Smart Buildings, ThousandEyes](#), the new platforms being introduced as well as [cloud based security solutions](#) in campus networks.

Cisco Webex App

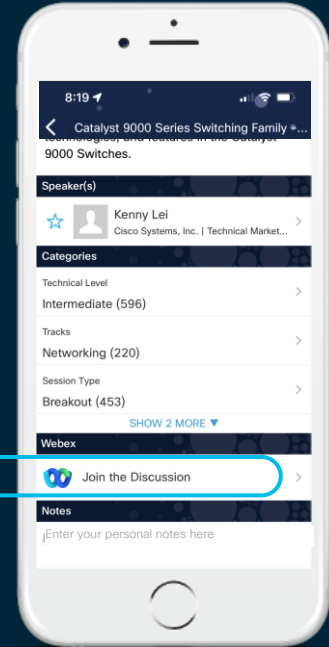
Questions?

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”
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- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until June 17, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKENS-2093>



Agenda

- Hybrid Work Network Requirements
- Catalyst 9000X Access
- Catalyst Powered Smart Buildings
- Catalyst 9000X Core
- C9K-X Secure Connectivity Use Cases
- Edge Intelligence with C9K hosted Apps

Digital Trends Shaping the Future of Business



Hybrid work

Work from home | Work from anywhere | Work from office



Industry 4.0

Wireless | Automation | Internet of Things | AI/ML



Hybrid cloud

Private cloud | Hybrid cloud | Public cloud



and the **network** is the core engine of hybrid work

New Access Requirements for Hybrid Work

Distribution/Core/Edge

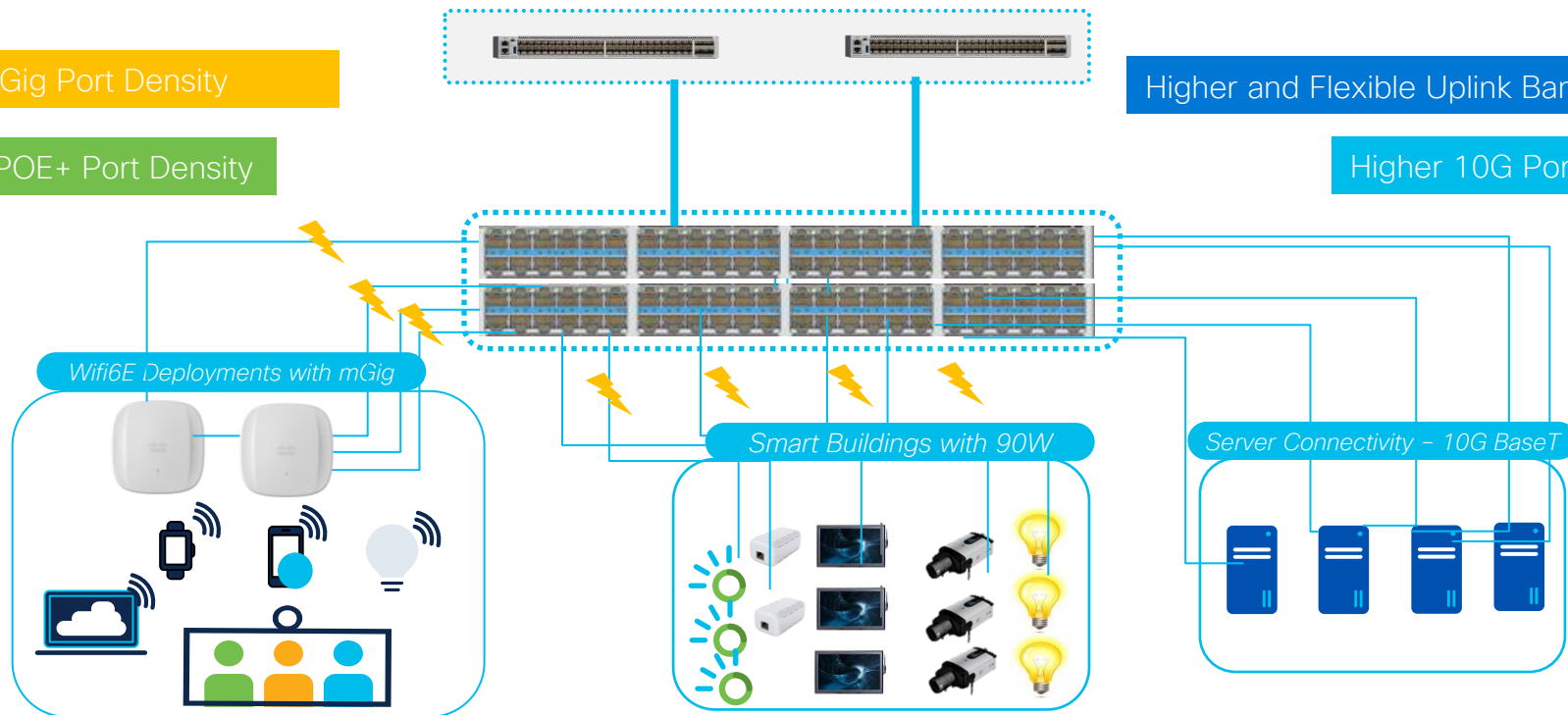
Higher Speeds, Scale, Buffer, etc.

Higher mGig Port Density

Higher UPOE+ Port Density

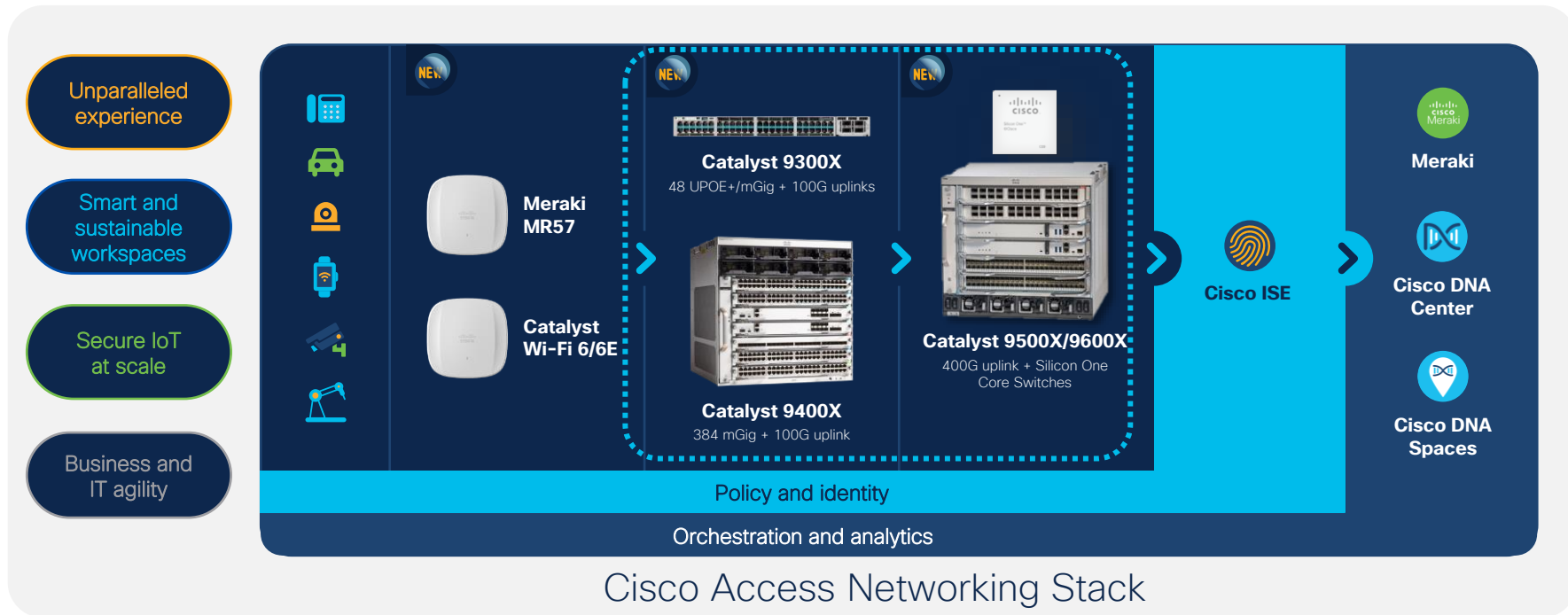
Higher and Flexible Uplink Bandwidth

Higher 10G Port Density

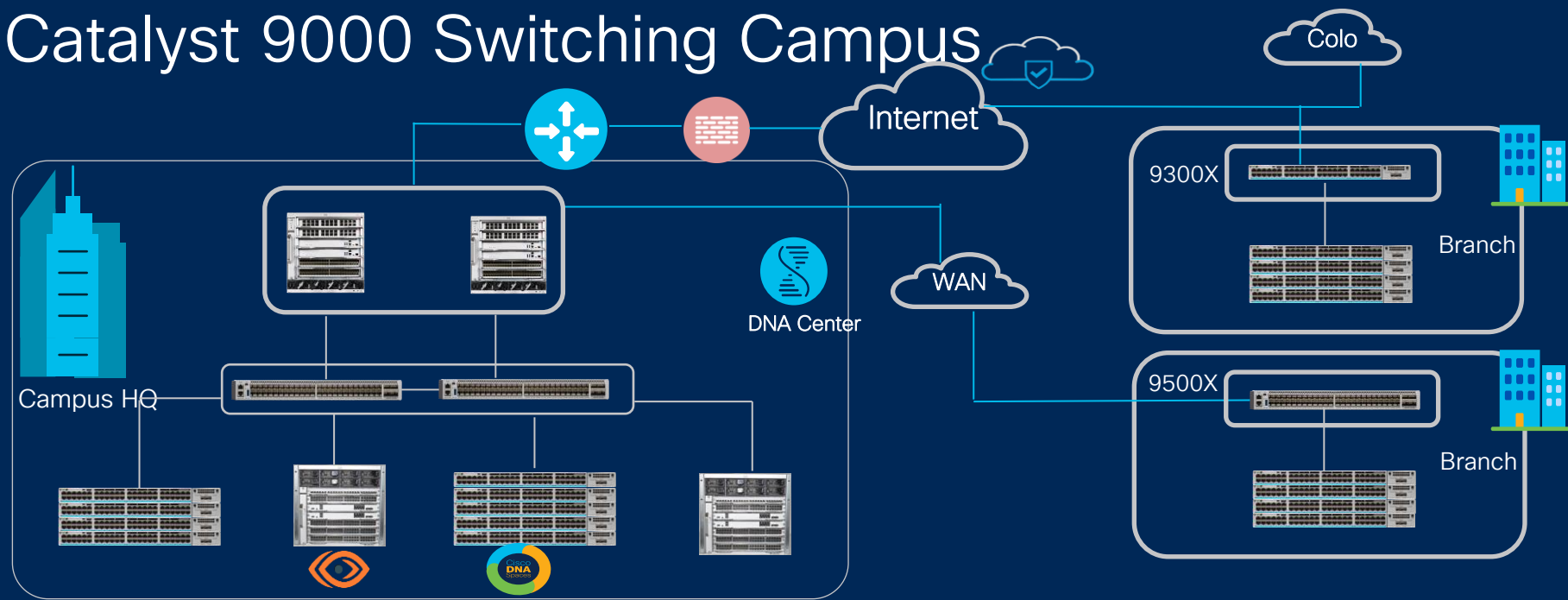


Cisco Wi-Fi 6E and Catalyst 9000X

Enabling better business outcomes end-to-end with simplicity and choice



Catalyst 9000 Switching Campus



IT/OT End Points

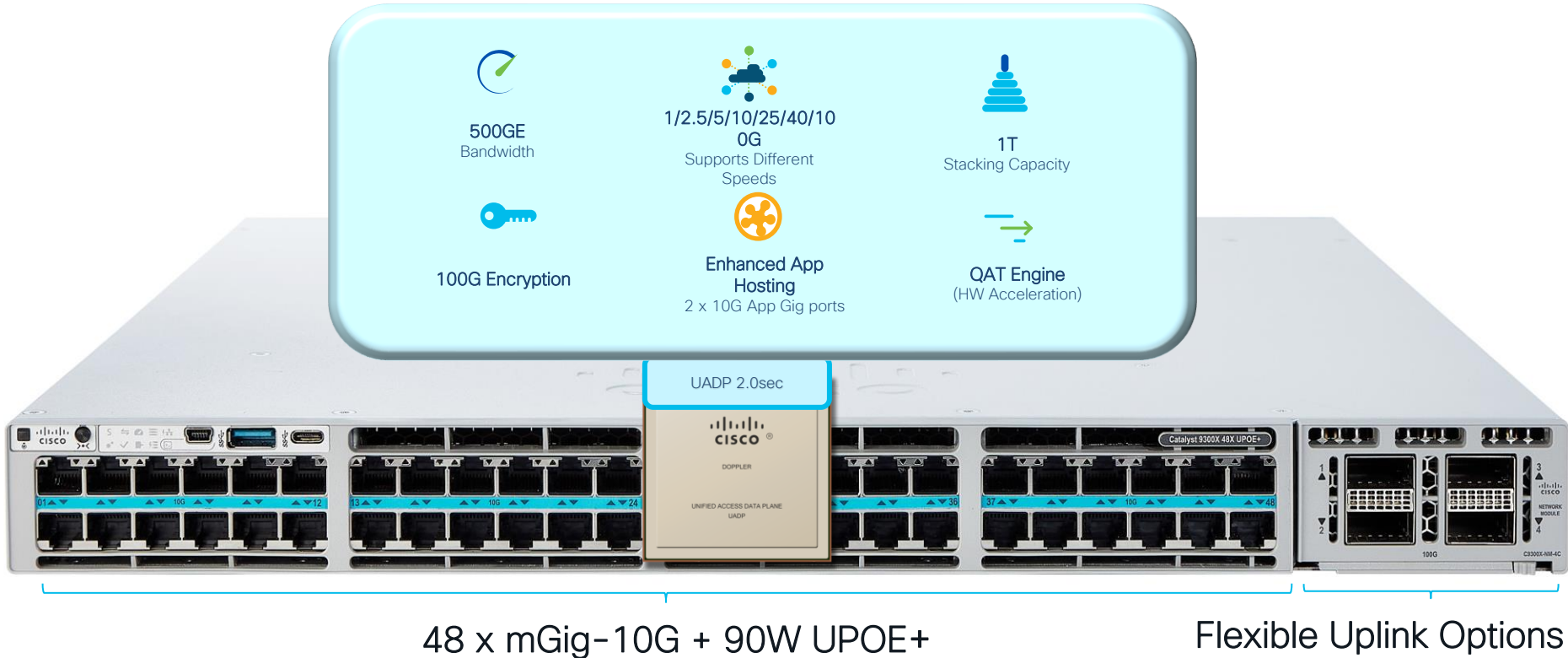


Time Sensitive Applications



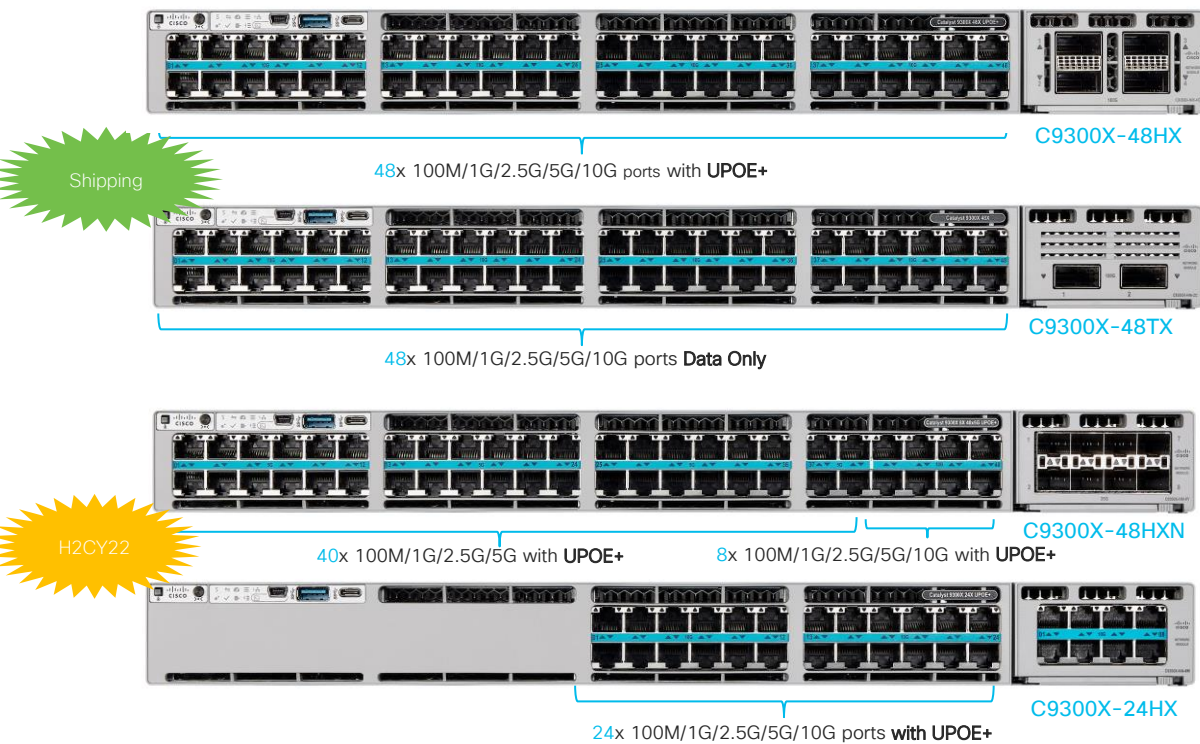
Bonjour End Points

Catalyst 9300X – New High Performance Access Switch



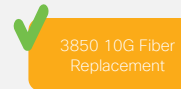
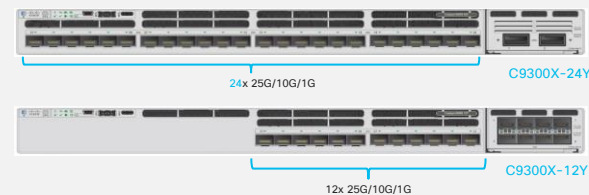
Catalyst 9300X Multigigabit Models

StackWise-1 Terabit



448 mGig Ports with
8-Member Stack

Catalyst 9300X High Speed Fiber



Common Components and Stacking Backward Compatible with Catalyst 9300

Highest and Flexible Speed Uplink Options in the Industry

100/40G Modular Uplinks



C9300X-NM-4C*

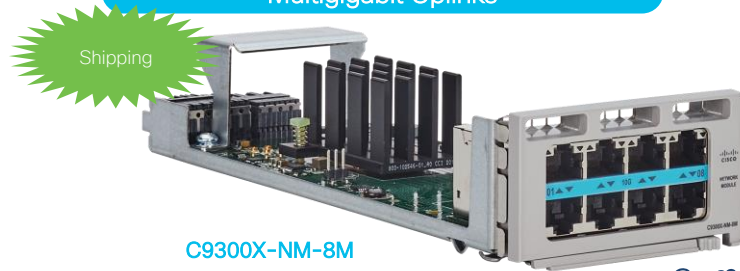
4 x 100/40G* QSFP



C9300X-NM-2C

2 x 100/40G QSFP

Multigigabit Uplinks



C9300X-NM-8M

8 x 10G-mGig

10/25 G Modular Uplinks



C9300X-NM-8Y

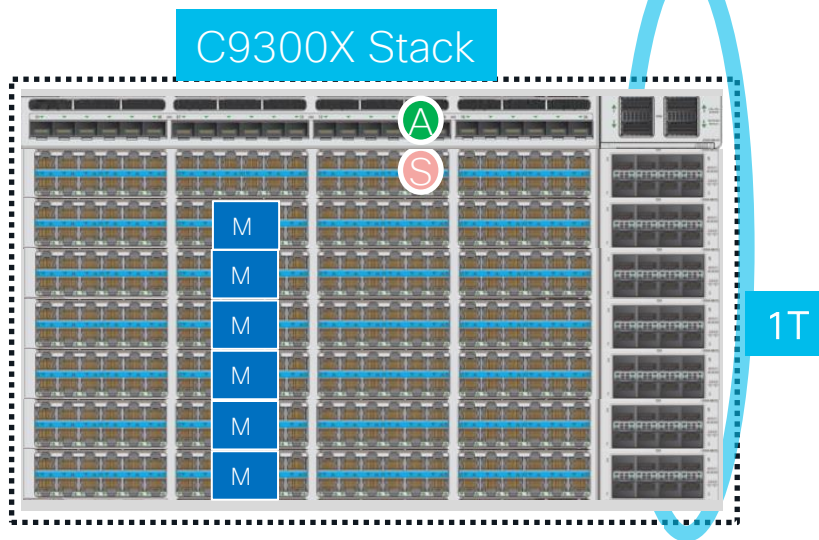
8 x 25/10/1G**

** Last 4 ports disabled on C9300X-48HXN

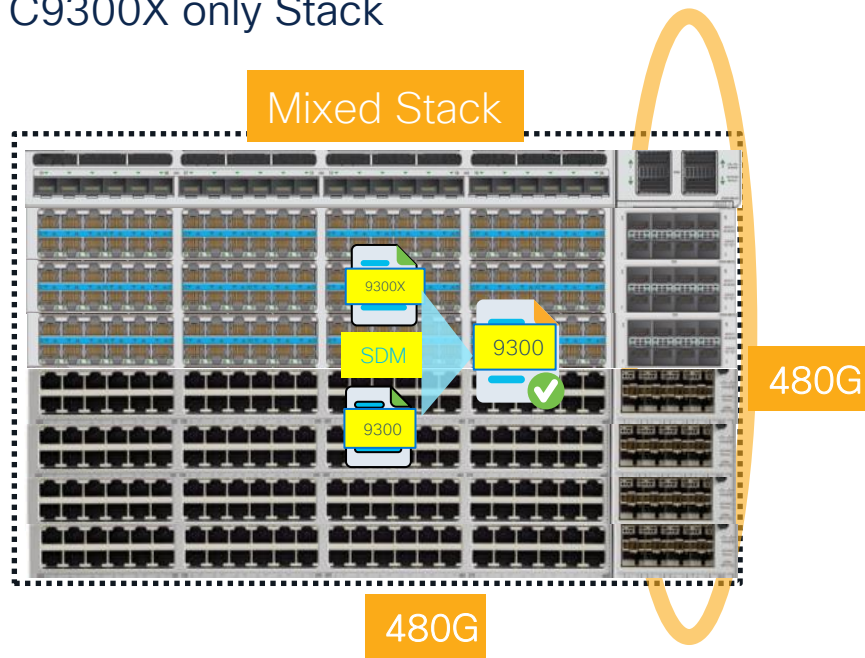
C9300X-Only Uplink modules Enabling High Speed and Port Density

StackWise-1 Terabit

Highest Stacking Bandwidth in the Industry for C9300X only Stack



```
Switch#sh switch stack-bandwidth
Switch#  Role  Stack  Current
         Bandwidth  State
-----
*1       Active  1000G  Ready
2        Standby 1000G  Ready
3        Member  1000G  Ready
```



C9300X and C9300* Mixed Stack (Copper and Fiber)

* C9300 B/L Models is not supported in mixed stack

Cisco Catalyst 9400X

New Supervisor 2/2XL powered by Cisco UADP 3.0sec ASIC



UADP 3.0sec

UADP 2.0XL



Sup-1/1XL



Sup-2/2XL

4.8 Tbps

Up to 240G
bandwidth

1/2.5/5/10/25/40G
Supports Different
Speeds

Up to 1.6T
Bandwidth

1/2.5/5/10/25/40/100G
Supports Different Speeds

Forwarding + ACL Scale
Up to 96K MACs
Up to 64K Routes

Up to 32 MB
(2 x 16MB)
packet buffer

Increased
Forwarding + ACL Scale
Up to 128K MACs*
Up to 256K Routes*

Up to 36 MB
Unified packet
buffer

240/120/80Gbps/Slot with Sup-1XL (4/7/10 Slot Chassis)
80Gbps/Slot with Sup-1 (All Chassis)

480Gbps/Slot with Sup-2XL
240Gbps/Slot with Sup-2

Up to 100G
Encryption
IPSec*, WAN-MACsec*

Customizable
Templates for
higher Scale*

* Hardware Capable, Software Support not committed

Unmatched Flexibility

Maximum Investment Protection

100G Leadership in Access

Same Series, Chassis options – New SUPs and Line cards

Introducing Catalyst 9400 Gen 2 Line Cards

Higher Bandwidth & Higher Density Line Cards



C9400-LC-48HX
(48 x 10G mGig UPOE+)



C9400-LC-48HN
(48 x 5G mGig UPOE+)

Up to 384 mGig Ports at Line rate w/ Sup2XL
All ports support 90W UPOE+/802.3BT



C9400-LC-48XS
(48 x 10G SFP+)

Up to 384 10G Fiber Ports at Line rate w/ Sup2XL



C9400-LC-48UX
(24 x mGig UPOE+24 x UPOE)

Up to 192 mGig Ports with Oversubscription w/ Sup1

Access



C9400-LC-24XS
(24 x 10G SFP+)

Up to 192 10G Ports with Oversubscription w/ Sup1

Aggregation

New Line Cards are supported only on Supervisor-2/2XL

Bandwidth Boost with Gen2 Supervisors



Cisco C9400 SUP 1/1XL

Cisco C9400X SUP2

Cisco C9400X SUP2XL



	Type	C9404R	C9407R	C9410R	C9404R/C9407R/C9410R	C9404R/C9407R/C9410R
C9400-LC-48HX	UPOE+	-	-	-	240	480
C9400-LC-48XS	Fiber	-	-	-	240	480
C9400-LC-48UX	UPOE	80 / 240	80 / 120	80	240	240
C9400-LC-24XS	Fiber	80 / 240	80 / 120	80	240	240
C9400-LC-48HN	UPOE+	80 / 120	80 / 120	80	240	240

Not Supported

Bandwidth in Gbps

Bold indicates Line Rate

3x Bandwidth Uplift for Gen1 LCs (80G -> 240G) on 10 Slot Chassis w/ SUP2XL
2x Bandwidth Uplift for Gen1 LCs (120G -> 240G) on 7 Slot Chassis w/ SUP2XL

Cisco Catalyst 9200CX compact switches

Cisco DNA for distributed architectures

Orderable
Aug CY22



C9200CX 12 Port Data

- 12 x 1G data
- 2x 1G CU and 2x SFP+ uplinks
- External power adapter (80W)
- UPOE+ powered (70W)



C9200CX 12 Port PoE+

- 12 x 1G PoE+
- 2x 1G CU and 2x SFP+ uplinks
- Internal AC power supply
- 240W PoE power budget

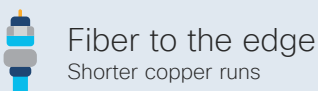


C9200CX 8 Port PoE+

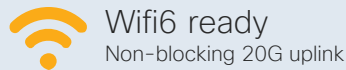
- 8 x 1G PoE+
- 2x 1G CU and 2x SFP+ uplinks
- Internal AC power supply
- 240W PoE power budget



Deployment flexibility
Any space, mount or enclosure



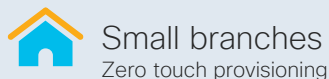
Fiber to the edge
Shorter copper runs



Wifi6 ready
Non-blocking 20G uplink



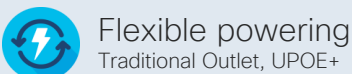
Architecture options
Fabric or Traditional 2-Tier



Small branches
Zero touch provisioning



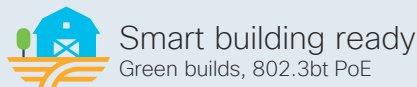
Enhanced Security
MACSEC 256



Flexible powering
Traditional Outlet, UPOE+



Lean IT
Cisco DNA automation, Assurance



Smart building ready
Green builds, 802.3bt PoE

Powered by:



UADP 2.0 mini

&



Cisco IOS-XE Lite

Catalyst 9K features

SDA Edge Node (16 VN's)

AES 256-Bit MACSEC

SD-AVC w/ NBAR2

PNP/ZTP

Full Flexible NetFlow

Bonjour Service Peering

YANG Models

Streaming Telemetry

Flexlink+

In Compact Form Factor

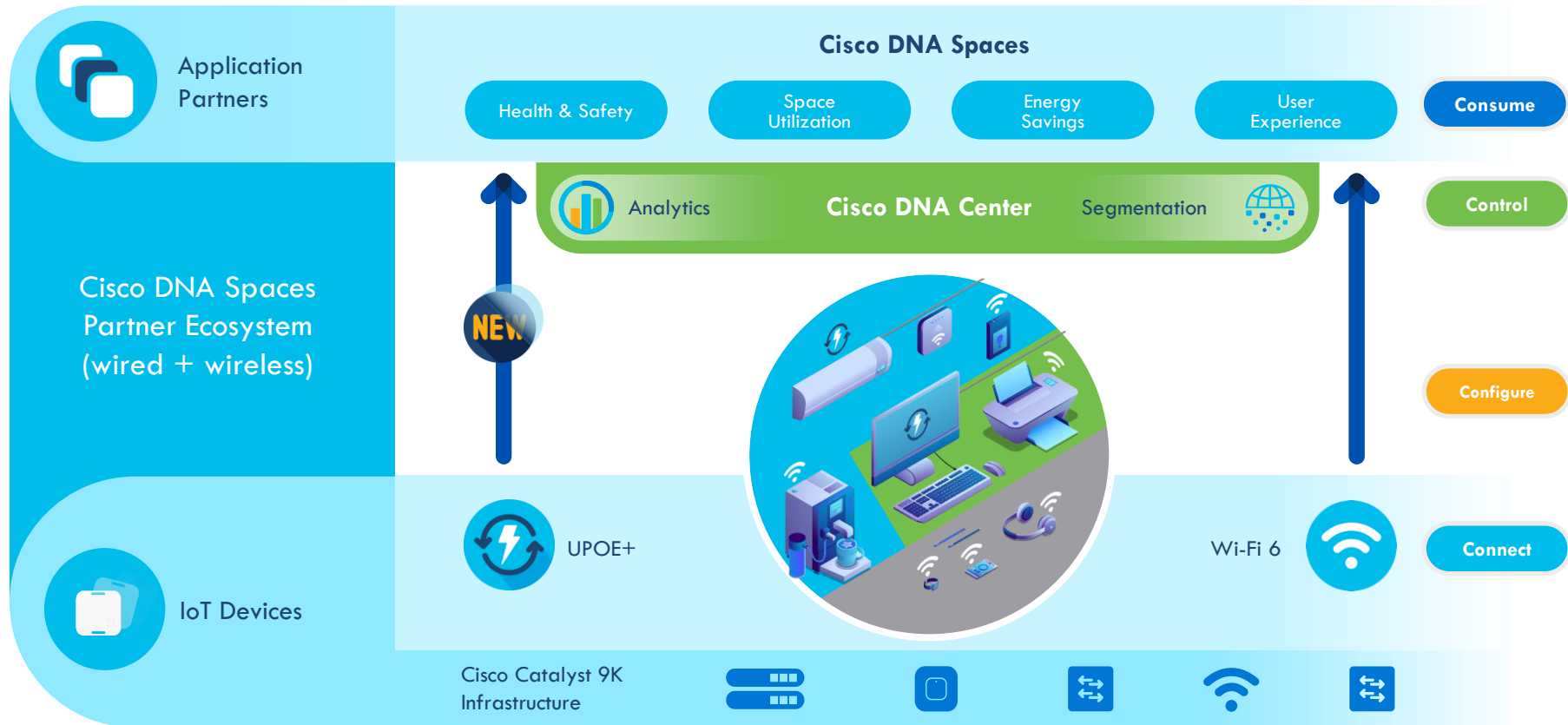
Small FF, Low thermal, Fan less design

Seamlessly fits in all brownfield installs

Wall, Rack, Din Rail, Table/Shelf Mount

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Cisco Smart Buildings Architecture



Catalyst 9000X Powered Smart Buildings

90W
UPOE+

IEEE 802.3bt
Type 1-4

P/FOE with
Stack power

288
concurrent
90W ports
in a stack



C9300-24/48H, 24/48HX



1900W AC PSU

NEW

36 90W
ports per
switch



C9300X-48HX

48x mGig / 48 UPOE+ ports



C9300X-48HXN

40x upto 5G + 8x mGig / 48 UPOE+ ports



C9300X-24HX

24x mGig / 24 UPOE+ ports

260
concurrent
90W ports



4-Slot



7-Slot



10-Slot



C9400-LC-48H



C9400-LC-48HN

NEW



SUP2/XL Perpetual POE Capable



C9400-LC-48HX

✓ Cisco StackPower

✓ DNA Spaces IoT Gateway

✓ Power Analytics

✓ AI End Point & Trust Analytics

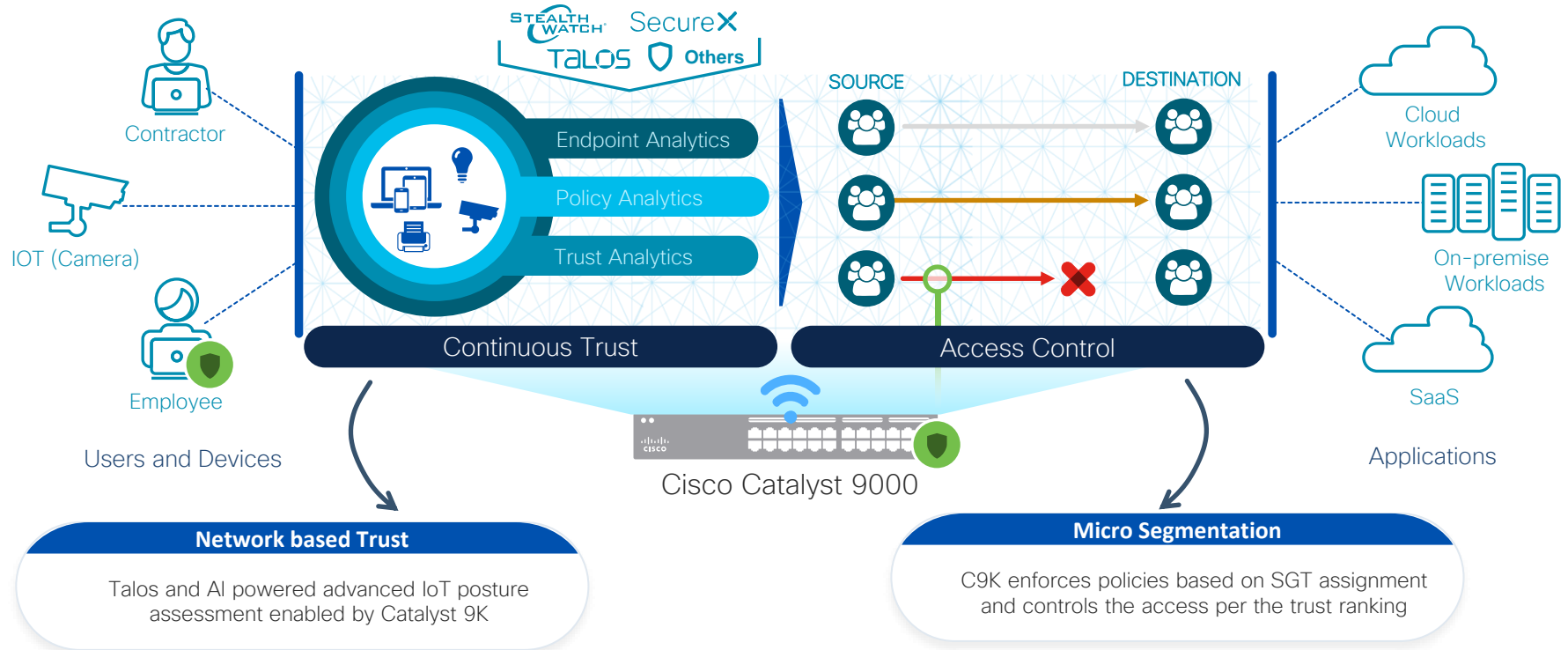
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Catalyst 9000/X Enabling Continuous Trusted Access



Cisco Silicon One™ Q200

Industry leading Switching and Routing Silicon



12.8T BW



8.1 Bpps



8G HBM for
deep buffers



10M IPv4
or 5M IPv6
route scale



Fully P4
Programmable
Pipeline



50G PAM4
Serdes

Cisco Silicon ONE Q200
Industry Leading
12.8T System on Chip



First 7nm ASIC providing
lowest watts/GE power
consumption



Fully P4 programmable enabling
feature velocity



Multi slice architecture for
flexibility and scale

Routing Capabilities with Switching Power and Performance

Extending Cisco Catalyst 9500 & 9600 Series

Powered by Cisco Silicon One™ Q200 ASIC



C9500 & C9600-SUP1 (w/ UADP 3.0)

Optimized for Features

- ✓ **Speed**
 - 1/10 & 25G SFP
 - 40 & 100G QSFP
- ✓ **Scale**
 - Upto 128K MACs
 - Upto 256K Routes
 - 108MB Buffers (3x 36MB)
- ✓ **Services**
 - L2/L3 Routing, MPLS
 - LAN MACsec, Netflow, NAT
 - Custom ASIC Templates
 - Campus Fabric (SDA & EVPN)

Double Existing
Throughput



WAN MACsec*,
1588v2 PTP**



C9600X-SUP-2
C9600-LC-40YL4CD



C9500X-28C8D



80MB Low-Latency +
8GB High-BW Buffers

50GE, 400GE,
Coherent DWDM



10^x

Routing &
MPLS Scale



C9500X & C9600X-SUP2 (w/ S1 Q200)

Optimized for Scale

- ✓ **Speed**
 - 10/25G & 50G** SFP
 - 40/100G & 200**/400G QSFP
- ✓ **Scale**
 - Upto 256K MACs
 - Upto 2M Routes
 - 80MB + 8GB Buffers
- ✓ **Services**
 - L2/L3 Routing, MPLS/TE
 - LAN & WAN-MACSec, Netflow*, NAT*
 - Custom ASIC Templates
 - Campus Fabric (SDA & EVPN*)

NEW

Maximum Investment Protection

400G Leadership in Campus

Unmatched Flexibility

*Hardware capable. Roadmap (not committed)

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Catalyst 9500X-28C8D

Extending the Catalyst 9500 high-performance fixed core



Silicon One™ Q200

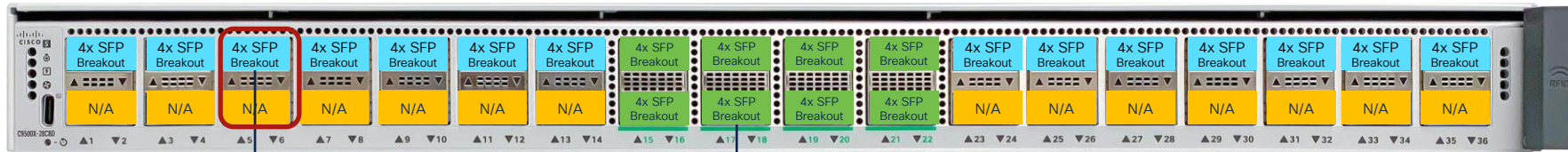
1x Cisco Silicon One™ Q200 ASIC

- 6.0 Tbps system throughput
- 28x QSFP28 ports - 40/100G
- 8x QSFP-DD ports - 100/200*/400G

- 1x 8C 2.4-GHz x86 CPU
- 2x 16-GB (32GB) DDR4 DRAM
- 16-GB flash; optional SSD (480 GB, 960 GB)

12x CDR5M PHYs

- MACsec, WAN MACsec, ClearTag v3.4
- IEEE 1588 and PTPv2*



100G ports

400G ports

100G ports

- Breakout is supported on top row (odd-numbered) 100G (QSFP28) ports
- Breakout mode: 4x 10/25G
- **Maximum ports: 14 x 4 = 56**

- Breakout supported on **all 400G (QSFP-DD) ports**
- Breakout mode: 4x 10/25G, 8x 10/25G,* 4x 100G*
- **Maximum ports: 8 x 4 = 32**

2x

Total capacity
6.0 Tbps
36x 100G or
28x 100G + 8x 400G
Core + Edge

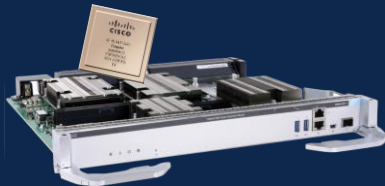
Maximum ports with breakout at FCS: 88 (56 + 32)

*Hardware capable. Roadmap (not committed)

Catalyst 9600X

Extending modular core with a performance-optimized Supervisor 2

UADP 3.0



Supervisor 1

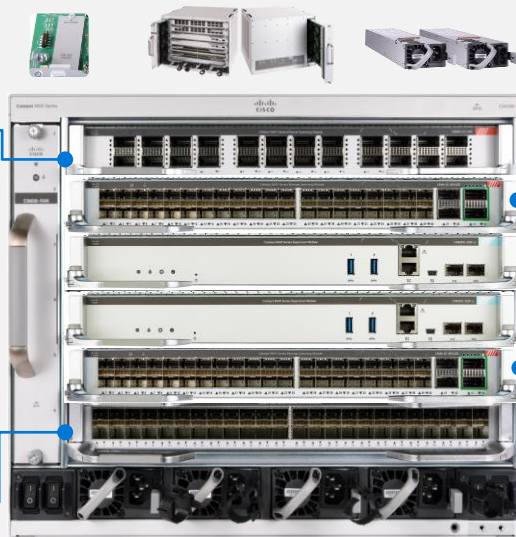
Total capacity

4.8 Tbps

Slot bandwidth

1.2 Tbps

Gen 1
1.2T per slot



Gen 2
3.2T per slot

Gen 1
1.2T per slot

Gen 2
3.2T per slot

NEW

Silicon
One™
Q200



Supervisor 2

Optimized for 10G to 400G

Total capacity

12.8 Tbps

Slot bandwidth

3.2 Tbps

>2.5X

8C x86 2.4GHz CPU
32 GB DDR4 DRAM

Introducing the first 400G line cards in campus

Shipping

Catalyst® 9606R



C9600-LC-24C



C9600-LC-48YL



C9600-LC-48S



C9600-LC-48TX
(Multigigabit)



Combo line cards

C9600-LC-40YL4CD



NEW

3.2 Tbps with SUP-2
1.2 Tbps with SUP-1

C9600X-LC-32CD



Q3CY22

With SUP-2 only (3.2Tbps)

Provide for uplink
requirement without using
additional slot



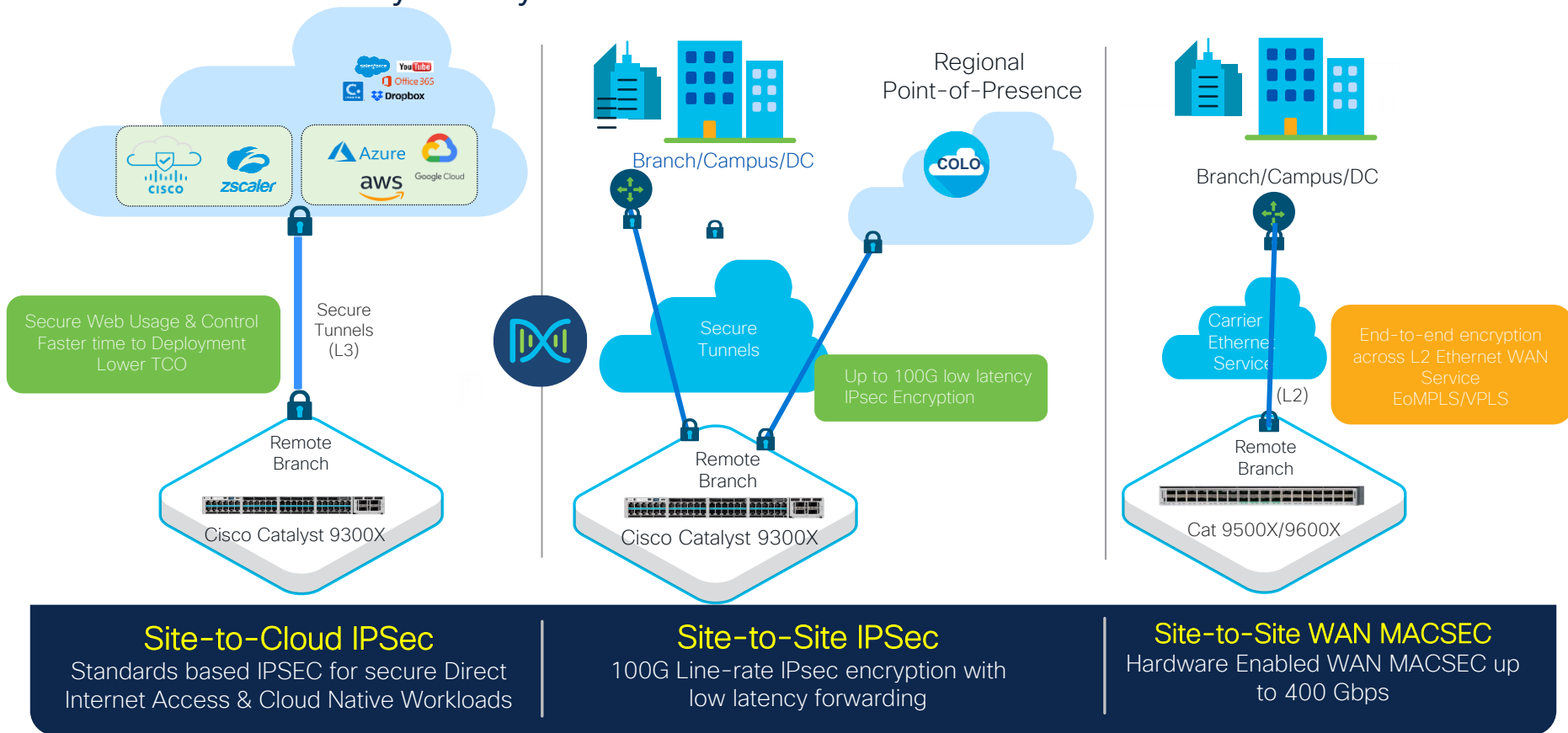
Dual-personality
line cards

Flexible speed
support

Lower total BoM
cost, save on
additional line
cards

C9K platforms for the New Edge

Secure connectivity to anywhere



Enhanced App Hosting with C9000/X Series

Consolidate Physical Infrastructure



Enhance Visibility & Security Enforcement



Reduce App Latency & Optimize App Traffic



3rd Party App Hosting

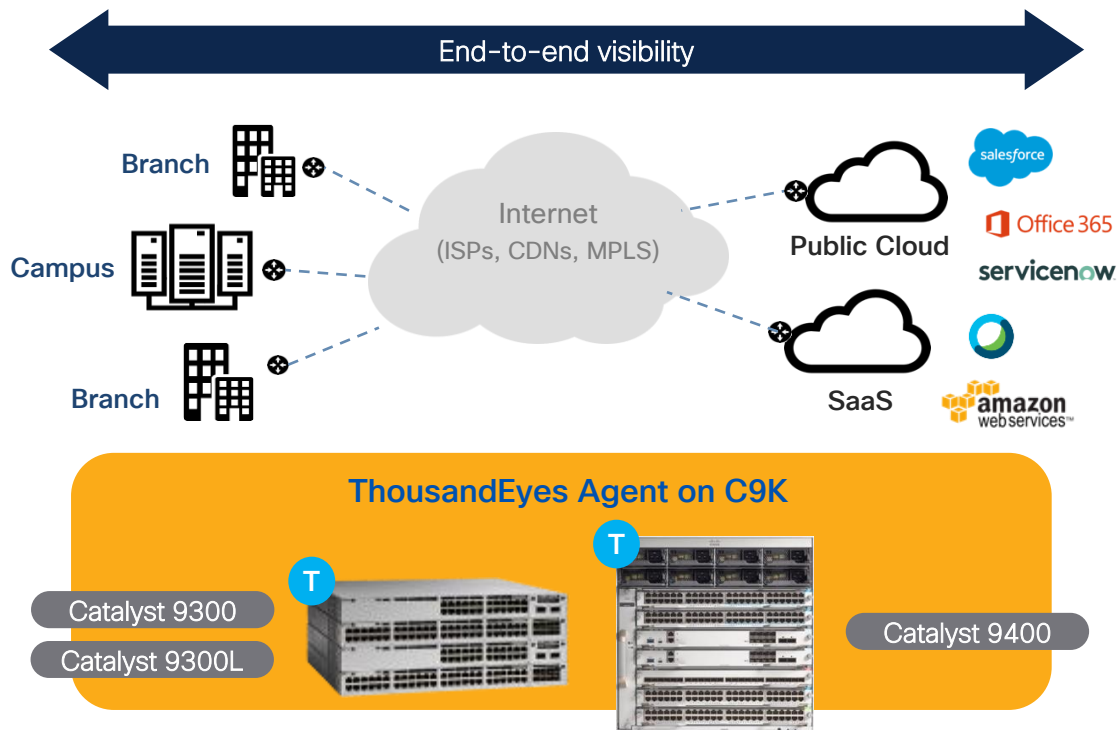
Rich ecosystem partnership with 25+ certified apps and 200+ active customer

	Resource type	Catalyst 9300	Catalyst 9300-X	Catalyst 9400	Catalyst 9400-X	Catalyst 9500	Catalyst 9500-X	Catalyst 9600	Catalyst 9600-X
Networking	AppGig Port	1x1G	2x10G	1x1G	2x10G	Mgmt Port*	2x10G	Mgmt Port*	Mgmt Port* (2x10G CPU ports)
Resources	Memory	2GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB
	CPU	1 core	2 core	1 core	1 core	1 core	1 core	1 core	1 core
	Storage	240GB (USB3.0/SSD)	240GB (USB3.0/SSD)	480-960GB (SATA)	480-960GB (SATA)	480-960GB (SATA)	480-960GB (SATA)	480-960GB (SATA)	480-960GB (SATA)

* Using loopback with any external ports

Service Assurance Delivered with ThousandEyes

C9K switches lets IT customers regain control and visibility over their network



DNA Subscription

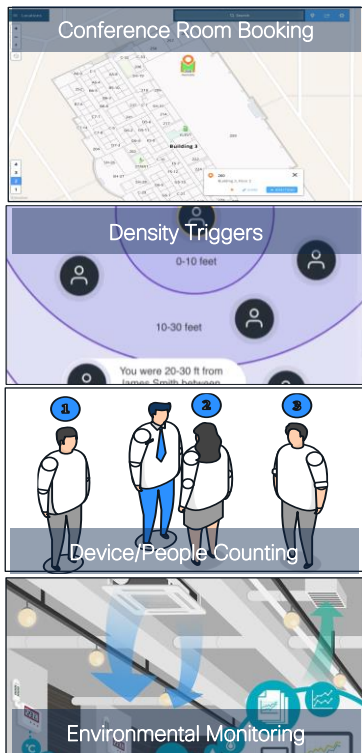
DNA Advantage

- Each DNA-A License includes 22 TE Units
- Pool entitled test capacity to deploy anywhere within your network

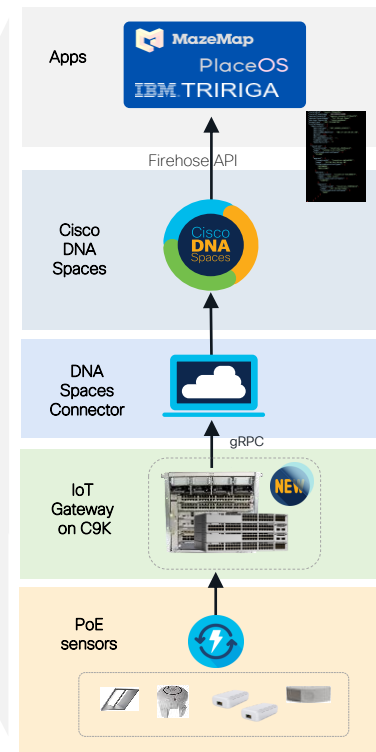
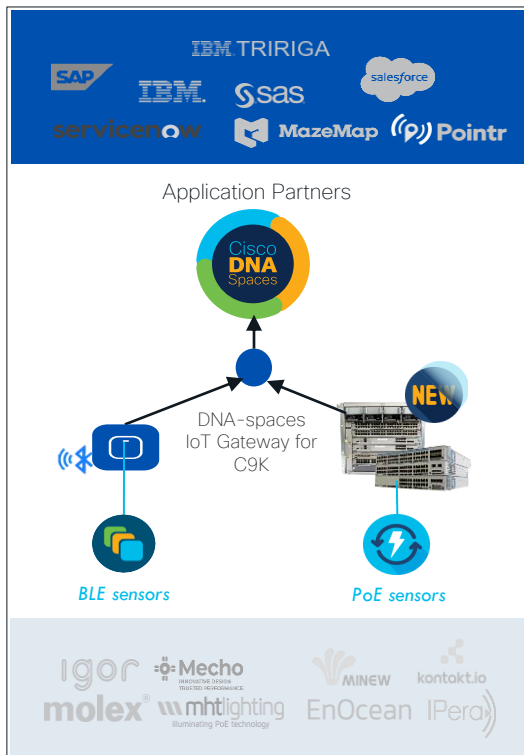
Cisco DNA Spaces IoT Gateway for C9K Switches

Democratizing Enterprise IoT

OUTCOMES



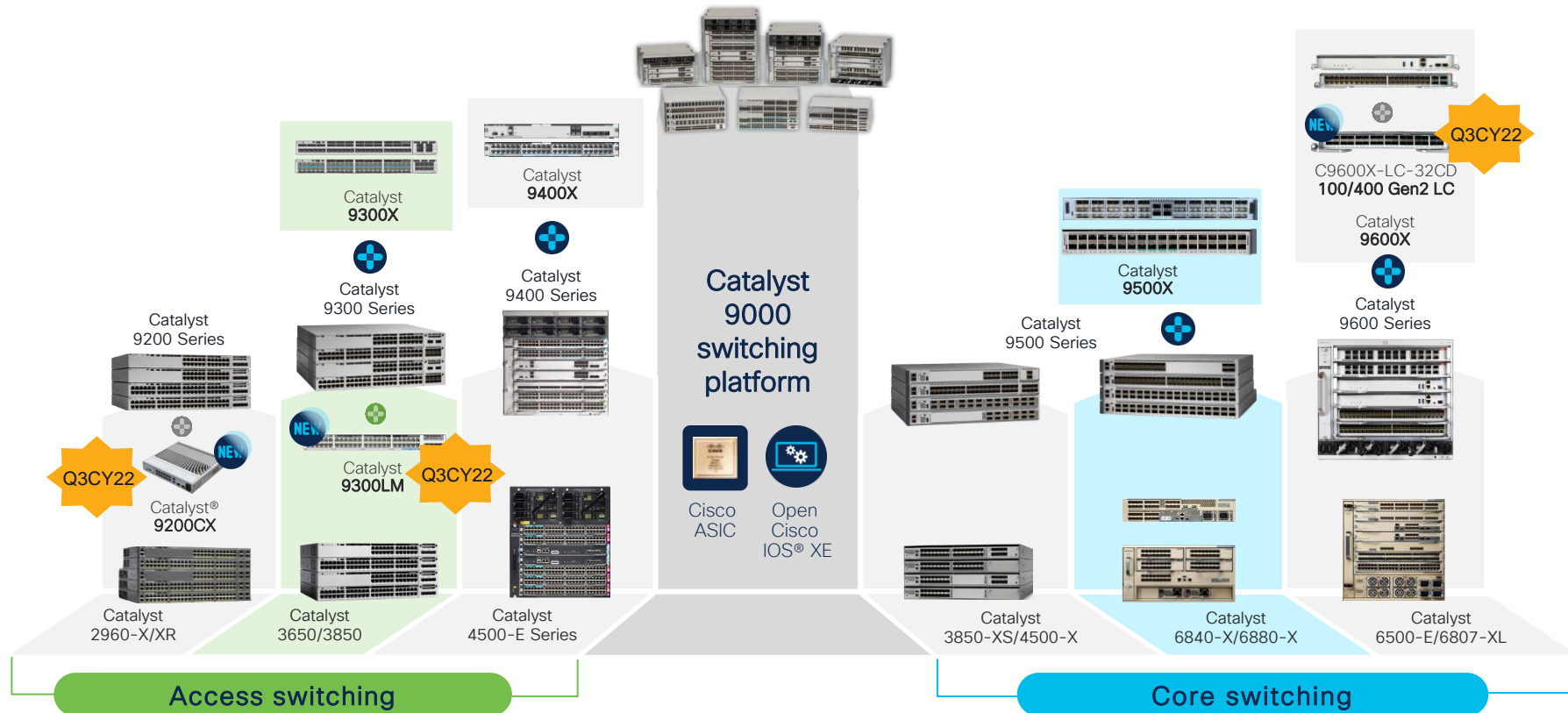
ARCHITECTURE



Summary

The Expanded Catalyst 9000 Switching Family

Enabling Secure Access networks for the Hybrid World



Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
- Attendees will also earn 100 points in the Cisco Live Game for every survey completed.
- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.



Cisco Learning and Certifications

From technology training and team development to Cisco certifications and learning plans, let us help you empower your business and career. www.cisco.com/go/certs

Pay for Learning with Cisco Learning Credits

(CLCs) are prepaid training vouchers redeemed directly with Cisco.



Learn

Cisco U.

IT learning hub that guides teams and learners toward their goals

Cisco Digital Learning

Subscription-based product, technology, and certification training

Cisco Modeling Labs

Network simulation platform for design, testing, and troubleshooting

Cisco Learning Network

Resource community portal for certifications and learning



Train

Cisco Training Bootcamps

Intensive team & individual automation and technology training programs

Cisco Learning Partner Program

Authorized training partners supporting Cisco technology and career certifications

Cisco Instructor-led and Virtual Instructor-led training

Accelerated curriculum of product, technology, and certification courses



Certify

Cisco Certifications and Specialist Certifications

Award-winning certification program empowers students and IT Professionals to advance their technical careers

Cisco Guided Study Groups

180-day certification prep program with learning and support

Cisco Continuing Education Program

Recertification training options for Cisco certified individuals

Here at the event? Visit us at **The Learning and Certifications lounge at the World of Solutions**



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



The bridge to possible

Thank you

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