

Catalyst 9000 Series Switching Family - Access

cisco Live !

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Cisco Webex App

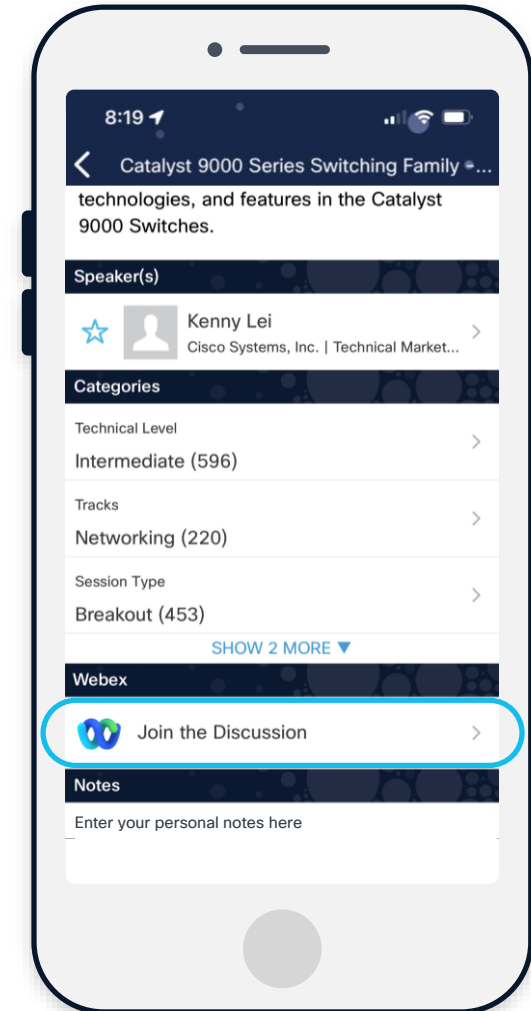
Questions?

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

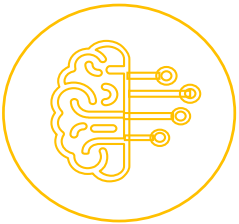
Webex spaces will be moderated by the speaker until June 13, 2025.



Cloud, Mobility, & AI/ML are changing everything

Industry Trends

Artificial intelligence



Enable Advanced analytics, predictive maintenance and intelligent automation to proactively detect and resolve issues

Cloud acceleration



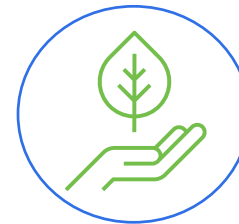
Increasing demand for Cloud management, cloud security, & XaaS due to flexibility, scalability and simplified operations

Mobility first



WiFi 6/6E/7, private 5G, high performance networks

Sustainable, Smart buildings



Convergence of IT and OT systems, reduce carbon footprint

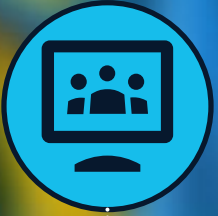
Secure infrastructure



Digital transformation driving need for secure infrastructure with Zero trust architecture

Is Your Network Ready for the New Era?

IP Display/DMS



Printer



IP Camera



LED Lights



AP



PC/Laptop



IP Phone



Does the platform support new PoE devices efficiently?

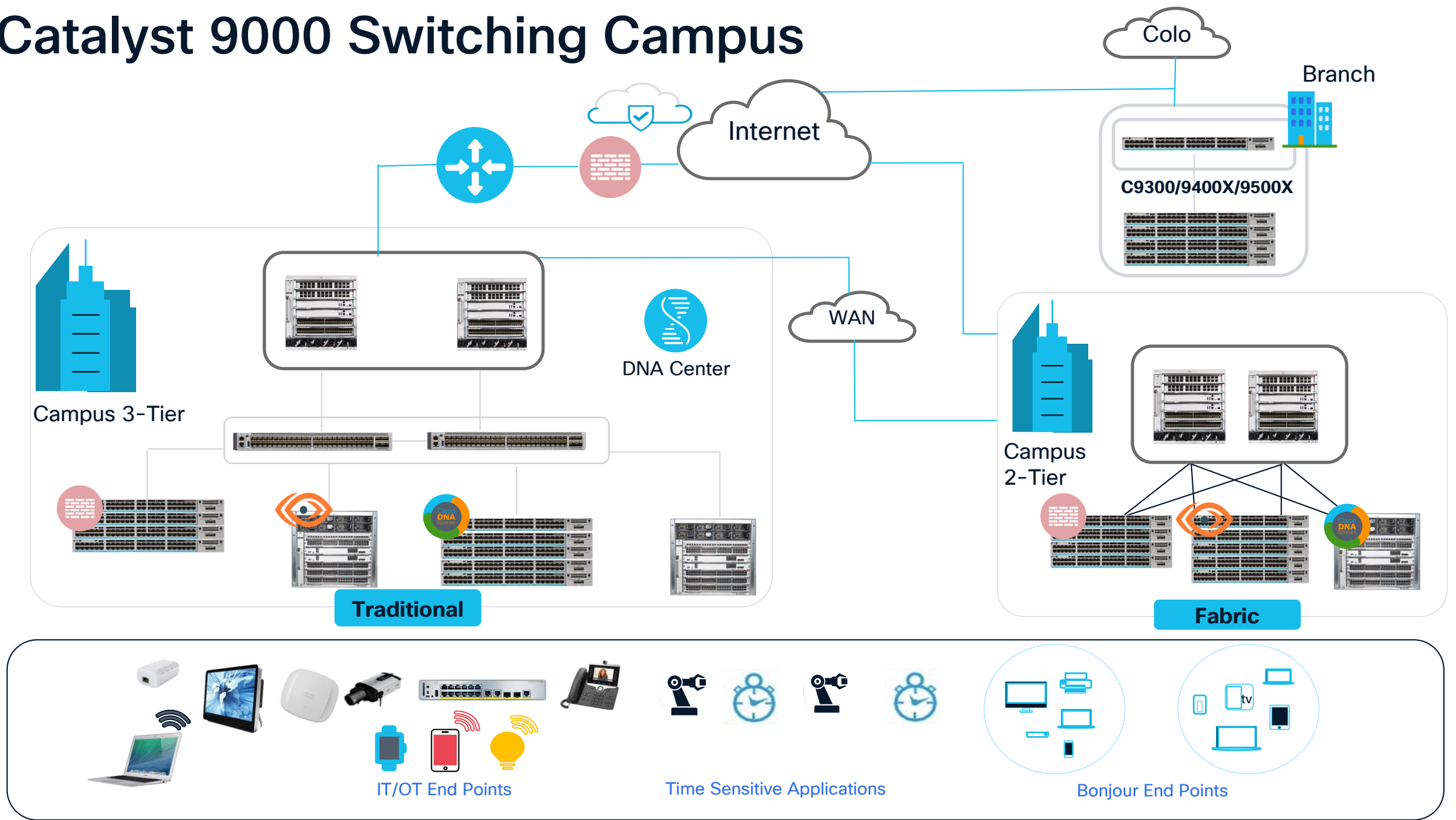
Does the platform make it easy to provision and scale?

Does the platform support enough Programmability?

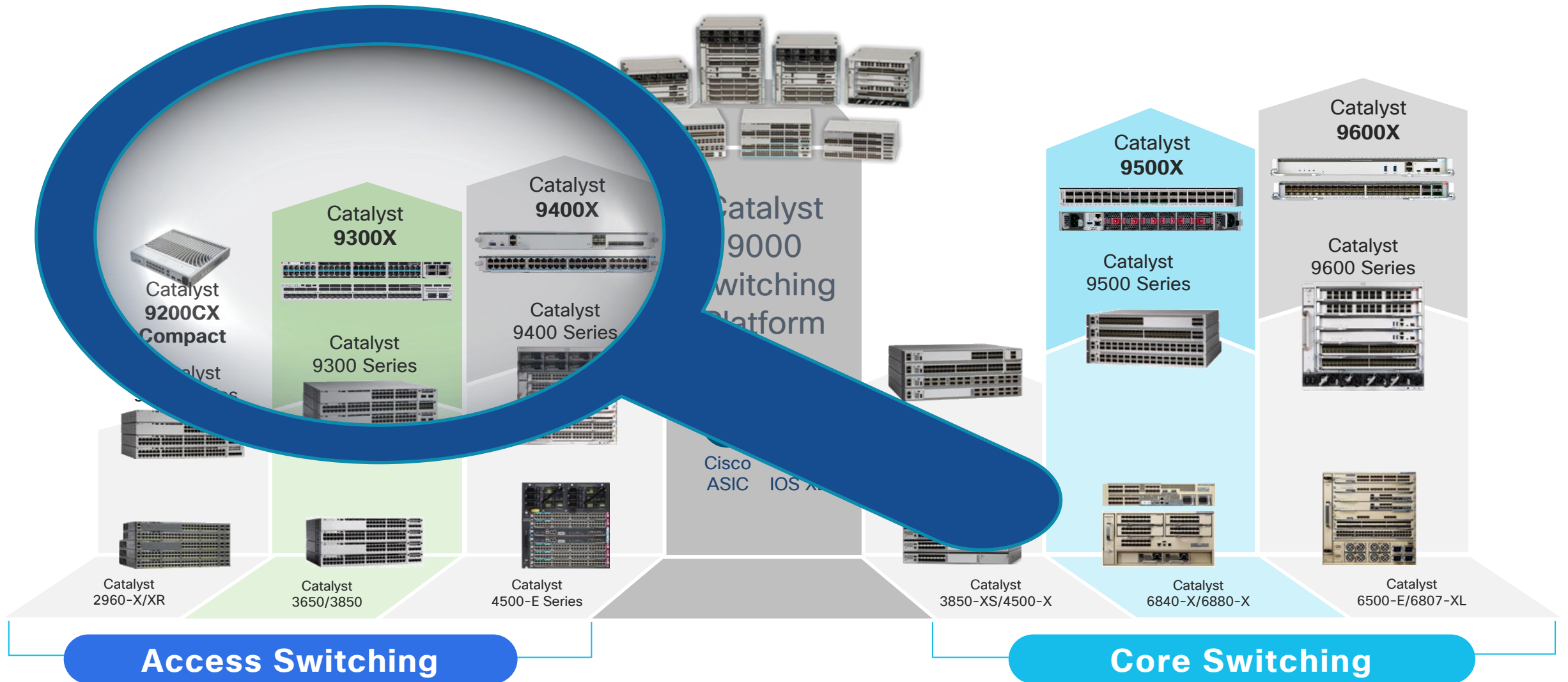
Does the platform ensure secure network access?

Does the platform let you adapt to new connectivity requirements?

Catalyst 9000 Switching Campus



Cisco Catalyst 9000 Switching Portfolio



Agenda

- 01 Introduction**
- 02 Catalyst 9200CX / 9200**
- 03 Catalyst 9300X / 9300**
- 04 Catalyst 9400X / 9400**
- 05 IOS XE Software & Innovations**
- 06 Summary**

Catalyst 9200

Catalyst 9200 Series



UADP 2.0 Mini



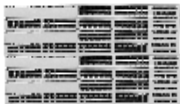
Cisco IOS-XE Lite



6MB
Packet Buffer



Up to 100GE
Bandwidth



Cisco StackWise
160/80



Enhanced Security
MACsec 128



Smart building ready
Green builds, 802.3bt PoE

Cisco Catalyst 9200 Series highlights

UADP 2.0 mini

Cisco IOS XE Software

Limited-scale SD-Access

MACsec-128 link encryption

Trustworthy solutions

Perpetual/Fast PoE

Programmability

Cold patching

Full Flexible NetFlow
streaming telemetry

Right Sized Switching for simple Branch Deployments

Cisco Catalyst 9200 Series

Lead with Catalyst 9200/L for simple branch deployments

Cisco IOS®
XE Lite



Multicore
X86 CPU



UADP 2.0
Mini



Fixed Uplinks


C9200L-48T/ C9200L-48P/ C9200L-48PL


C9200L-24P/ C9200L-24T

POE+ & mGig models


C9200L-48PXG-4X/2Y


C9200L-24PXG-4X/2Y

Modular Uplinks

Recommended for small scale SDA deployments


C9200-48T/ C9200-48P/ C9200-48PL
C9200-48PB ²

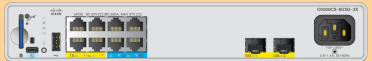

C9200-24T/ C9200-24P
C9200-24PB ²

POE+ & mGig models


C9200-48PXG


C9200-24PXG

Compact Switches


C9200CX-8UXG-2X


C9200CX-12P-2X2G


C9200CX-8P-2X2G


C9200CX-12T-2X2G

Modular fans

FRU Fan



Higher Efficiency AC FRU Power Supplies

FRU PSU

 Silver Rated
125WAC

 Platinum Rated
600WAC

 Platinum Rated
1000WAC

 Platinum Rated
715WDC ⁴

Modular Uplinks

FRU Uplinks ¹

 4x 1G

 4x 10G

 2x 25G

 2x 40G

Catalyst 9200 Family Highlights

SD-Access

Programmability

MACsec-128 ³

Cold Patching

Trustworthy
Solutions

Full Flexible NetFlow

Perpetual/Fast PoE

Cloud Monitoring **NEW**

¹ C9200 1G SKUs support 1/10G uplinks while C9200 mGig will support 10/25/40G uplinks

³ 9200CX Supports MACsec-256

² C9200 32 VN SKUs only support 1/10G uplinks and these SKUs cannot be stacked with other C9200 SKUs

Lookup tables

Forwarding Resources		
	9200	9200L
MAC	32k	16k
Host Route	10k	8k
IGMP Groups	1k	1k
Indirect Route	4k	3k
Multicast Route	1k	1k
SGT	2k	2k

Feature Resources		
	9200	9200L
Security ACL • PACL • VACL • RACL	1k	1k
QoS ACL	1k	1k
Netflow ACEs	128	128

Netflow

Netflow Entries: 16k per ASIC

Catalyst 9200CX Series Switches

Next Generation of Compact Catalyst Switches

- Powered by Cisco IOS-XE Lite
- SD-Access
- MACsec-256
- Programmability
- Full Flexible NetFlow
- Trustworthy solutions
- Cold patching
- Perpetual/Fast PoE
- Bonjour Service Peering



UADP 2.0 Mini



Cisco IOS-XE Lite



6MB
Packet Buffer



Up to 60GE
Bandwidth



Enhanced Security
MACsec 256



Smart building ready
Green builds, 802.3bt PoE

- Flexible Deployment Option
 - Architecture options
Fabric or Traditional 2-Tier
 - Flexible powering
Traditional Outlet, UPOE+
 - Deployment flexibility
Any space, mount or enclosure
 - Fiber to the edge
Shorter copper runs
 - Small branches
Zero touch provisioning

Catalyst 9000 Feature Richness Packed in a Compact Form Factor

Catalyst 9200CX Compact Family

AC Power Supply Units



12 and 8 Port PoE+ Models



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



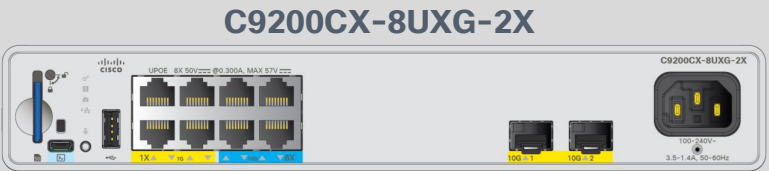
- 8 x 1G PoE+
- 2 x 1G copper and 2 x SFP+ uplinks
- Internal AC power supply
- 240W PoE power budget

12 Port Data-Only Model



- 12 x 1G data
- 3 x 1G copper and 2 x SFP+ uplinks
- Fully Powered by 802.3bt Class 6 60W Uplink
- OR External 80W Power Supply

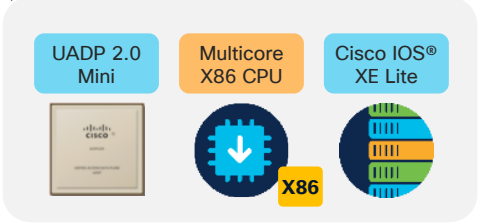
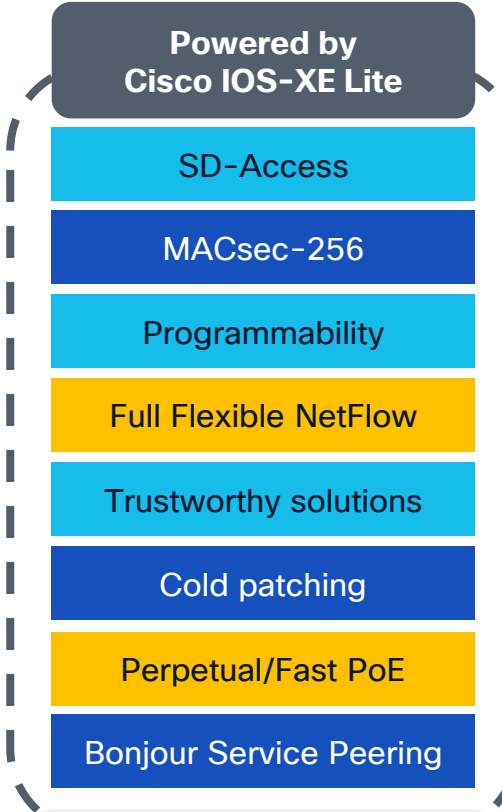
mGig/UPOE Model



- 4x mGig/10G + 4x 1G
- 8x 802.3bt Type 3 Class 6 60W (all ports)
- 2x 1/10G SFP+
- Internal AC power supply
- 240W PoE power budget

Wi-Fi 6/6E with Catalyst 9100 Series APs

AP	PoE power consumption	Link speed	Link Layer Discovery Protocol (LLDP)
C9136I	802.3bt (UPOE)	5G	47.3W
C9162I	802.3bt (UPOE)	2.5G	25.5W
C9164I	802.3bt (UPOE)	2.5G	30W
C9166	802.3bt (UPOE)	5G	30.5W



Catalyst 9200CX Compact Family

HVDC Power Supply Units

HVDC 1G/PoE+

C9200CX-8P-2X2GH



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

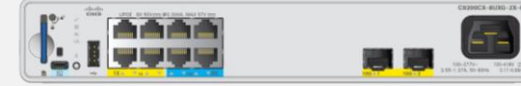
C9200CX-12P-2X2GH



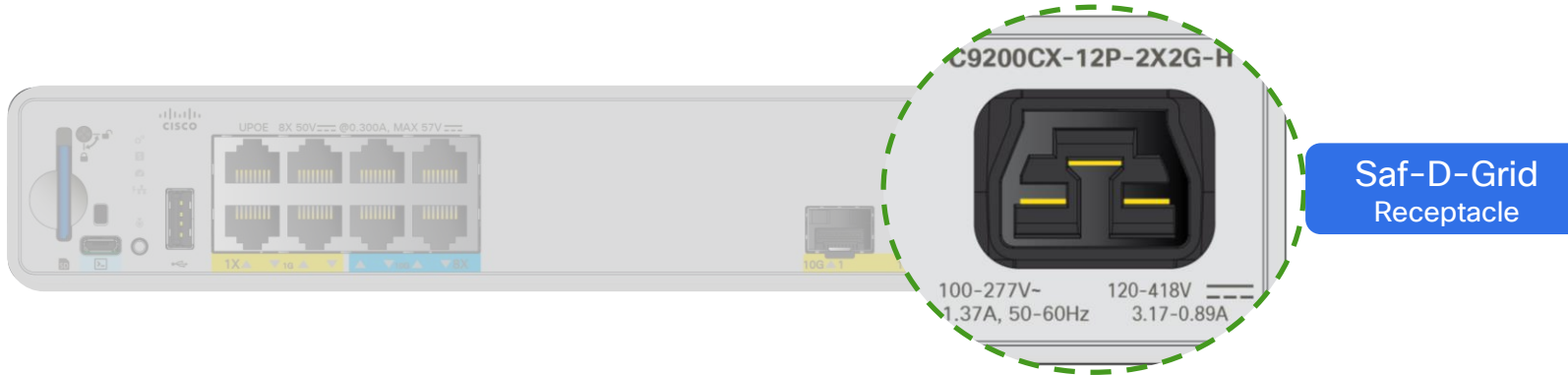
- 12 x 1G PoE+
- 2 x 1G copper and 2 x SFP+ uplinks
- Internal HVDC power supply
- 240W PoE power budget

HVDC mGig/UPOE

C9200CX-8UXG-2XH



- 4x mGig/10G + 4 x 1G (802.3bt Type 3 Class 6 60W all ports)
- 2x 1/10G SFP+
- Internal HVDC power supply
- 240W PoE power budget



Saf-D-Grid
Receptacle

Powered
by **AC** or
hVDC

Powering Options

AC (110-240VAC)

Plenum Voltage (277VAC)¹

HVDC (120V-418VDC), 380VDC²

Cabling Options³

Ring terminal to SAF-D-GRID



C14 to SAF-D-GRID



C20 to SAF-D-GRID



Investment protection
with **MAX** flexibility!

¹ Need a plenum rated enclosure

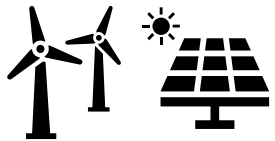
² 380VDC, commonly used in DC micro grids and Class 4 deployments

³ Cables not provided with switch

Why High Voltage DC?



Benefits



Avoids double conversion. From DC → AC, then AC → DC:

- Production of Wind/Solar power is in DC
- Electrical devices with transistors use DC power



Higher voltage helps reduce conductor material (less copper) or improve transition efficiency:

- Controllability
- Better voltage regulation

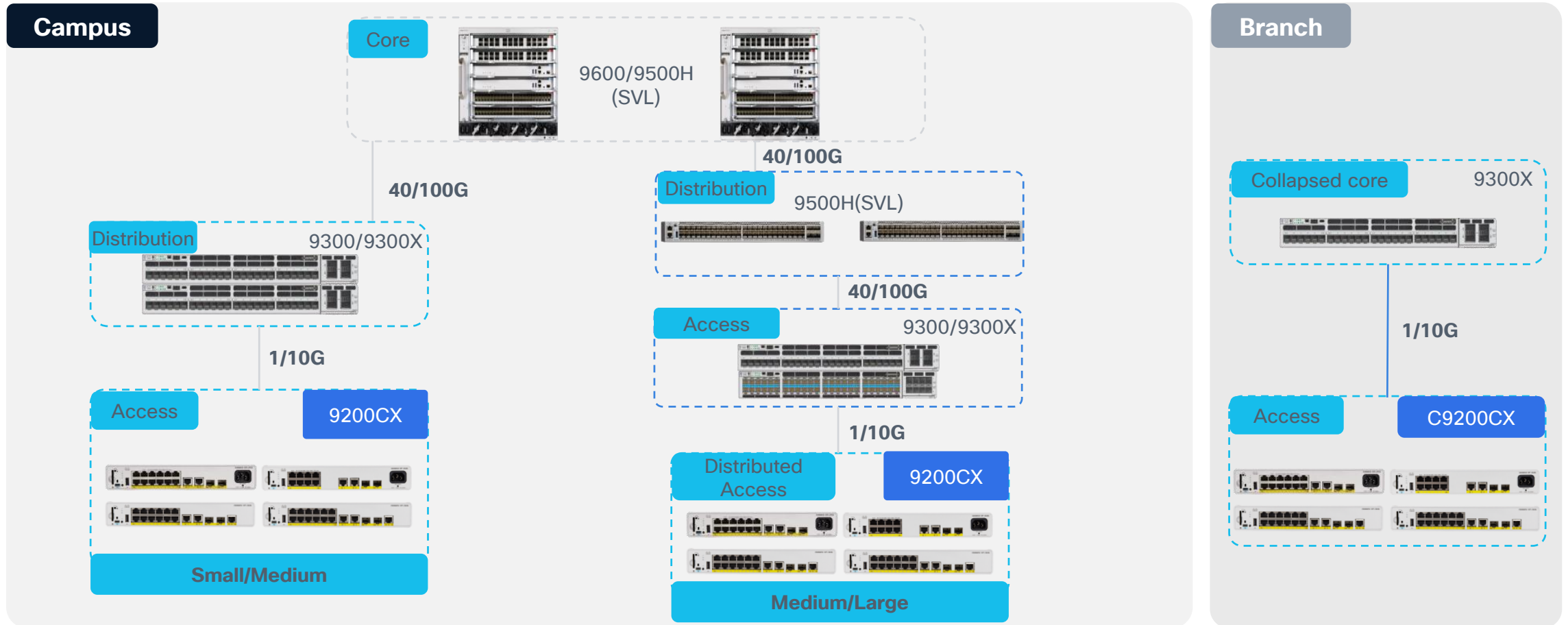


Considerably lower power losses compared to 120VAC when transporting over long distances:

- Offshore power needs/Undersea power lines
- Power transmission for longer distances

Flexible Design Options with the Catalyst 9200CX

3 or 4-tier Architecture



Bringing Flexible and Compact Access Switching to the Enterprise Campus

Catalyst 9200CX – Next Generation Compact Switches



	Catalyst® 3560CX models		Catalyst® 9200CX models
Market-Leading Encryption	AES 128-Bit MACsec	+	AES 256-Bit MACsec
Network Visibility	Limited Flexible NetFlow	+	Full Flexible NetFlow
SD Bonjour Services	Not Available	+	Bonjour Service Peering
Programmability	Basic Scripting with Python	+	YANG Models (RESTCONF, NETCONF, gNMI), ZTP
Application Visibility	Smart Logging, Limited Flexible Net Flow, and AVC	+	Streaming Telemetry (NETCONF Dial-In and gRPC Dial-Out) SD-AVC w/ NBAR2
SDA Fabric	SDA Extended Node Capability	+	SDA Edge Node Capability (16VNs)



IBN innovations



Assurance w/ Cisco DNAC



Wired assurance,
SD-Access, AVC, FNF



ETA,
MACsec-256



Cisco
TrustSec

Catalyst 9300

Cisco Catalyst 9300 Series

Expanded Catalyst 9300 Series with Catalyst 9300X &

Catalyst 9300L/LM Fixed Uplink Switches

9300LM

Depth <= 13.2 inch

mGig with UPOE

UPOE Models

Copper Data

715W DC 600W AC 1000W AC

New Platinum Rated PS

9300L

UPOE & mGig models

C9300L-48UXG-2Q

1G & PoE+

Common across
Platforms

USB 3.0 - 120/240GB

Storage

Catalyst 9300 Flexible Uplink Switches

mGig models with UPOE

1G copper with PoE/UPOE/UPOE+

Modular Uplinks

Features

Catalyst 9300X Flexible Uplink Switches

Fiber Models

C9300X-24Y

C9300X-12Y

C9300X-24HX

mGig with UPOE+ Models

C9300X-48HX/TX

C9300X-48HXN

Modular Uplinks

Platinum Rated Power Supplies

Modular Fans

UPOE

UADP 2.0

Front Panel SSD*

1x1G App Hosting

StackWise® 320G

Cisco StackPower

StackWise® 480G

Cisco UPOE+

StackWise® 1T

Cisco UPOE+

Highest mGig density

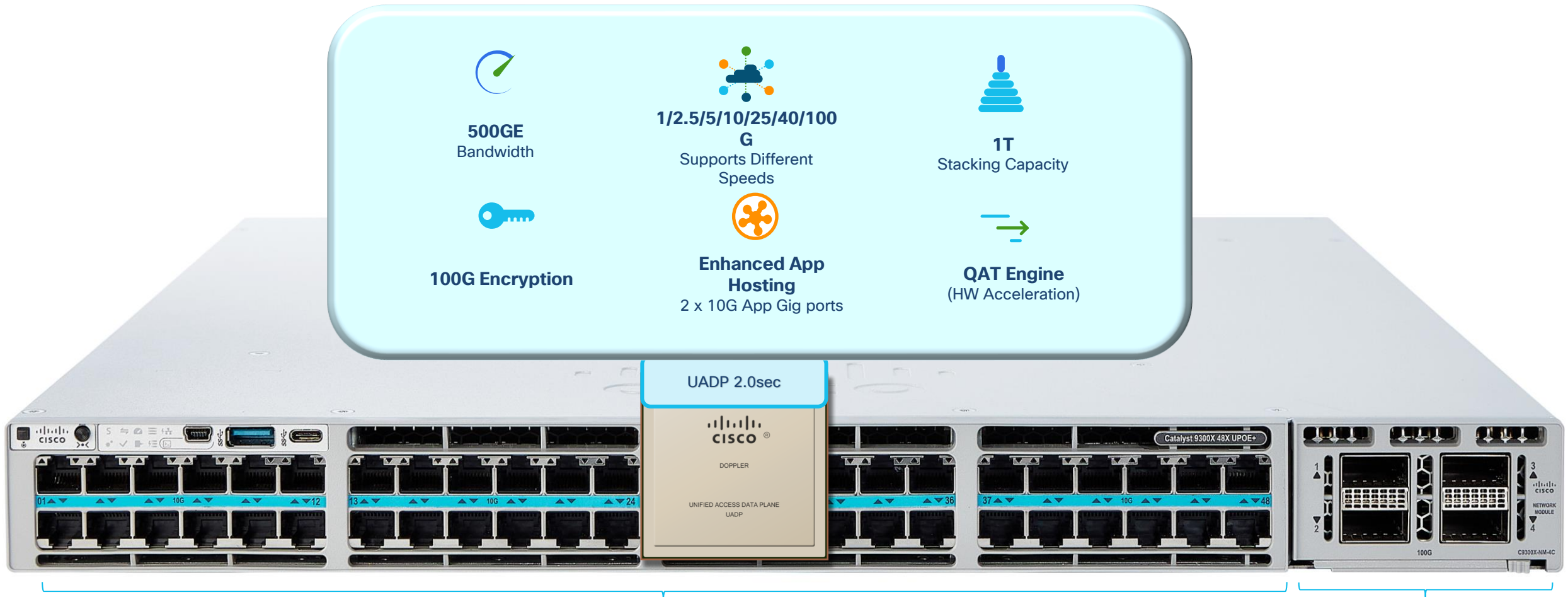
100G Uplinks

100G HW IPsec

2x10G App Hosting

*Available only on C9300LM

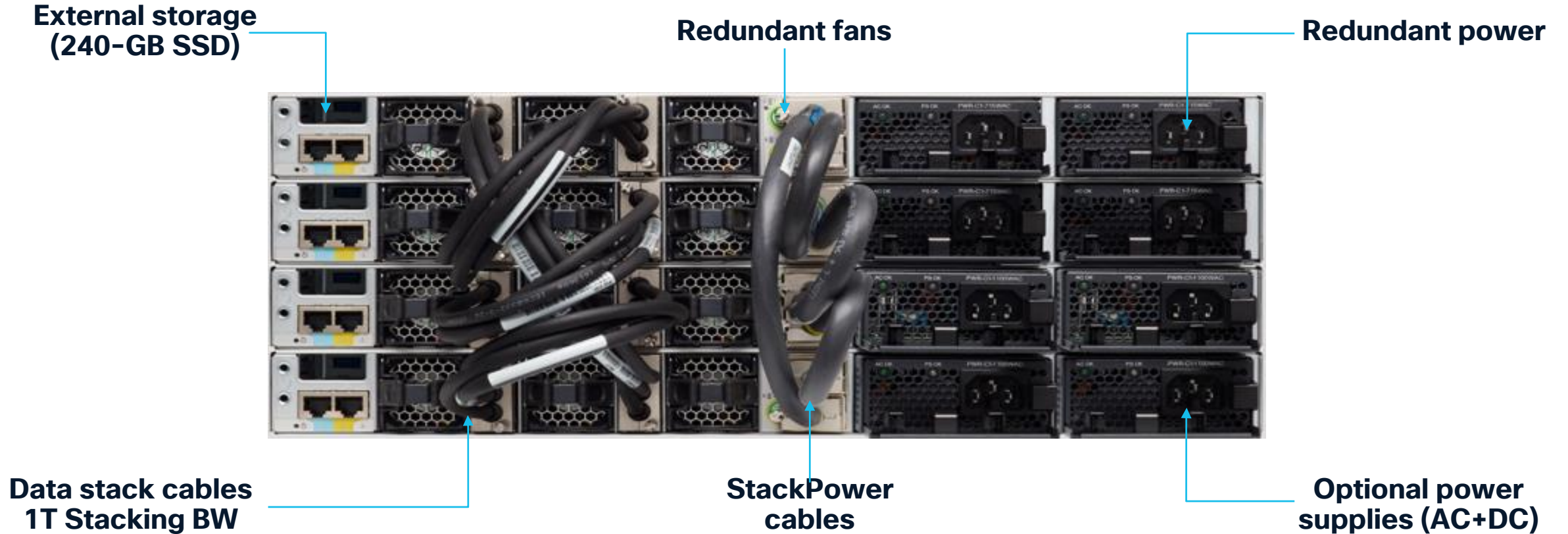
Catalyst 9300X –High Performance Access Switch



48 x mGig-10G + 90W UPOE+

Flexible Uplink Options

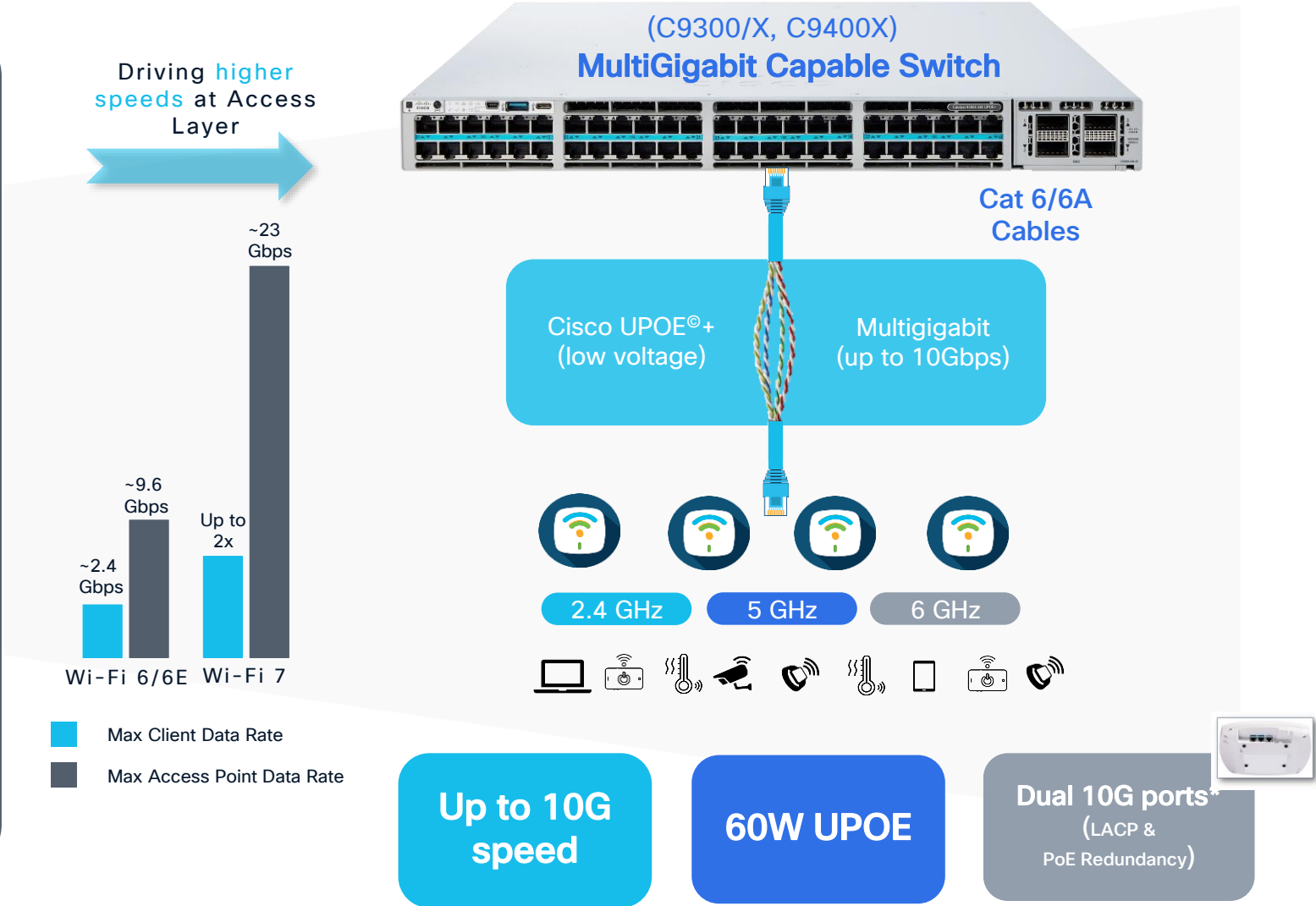
Investment protection with Catalyst 9300X



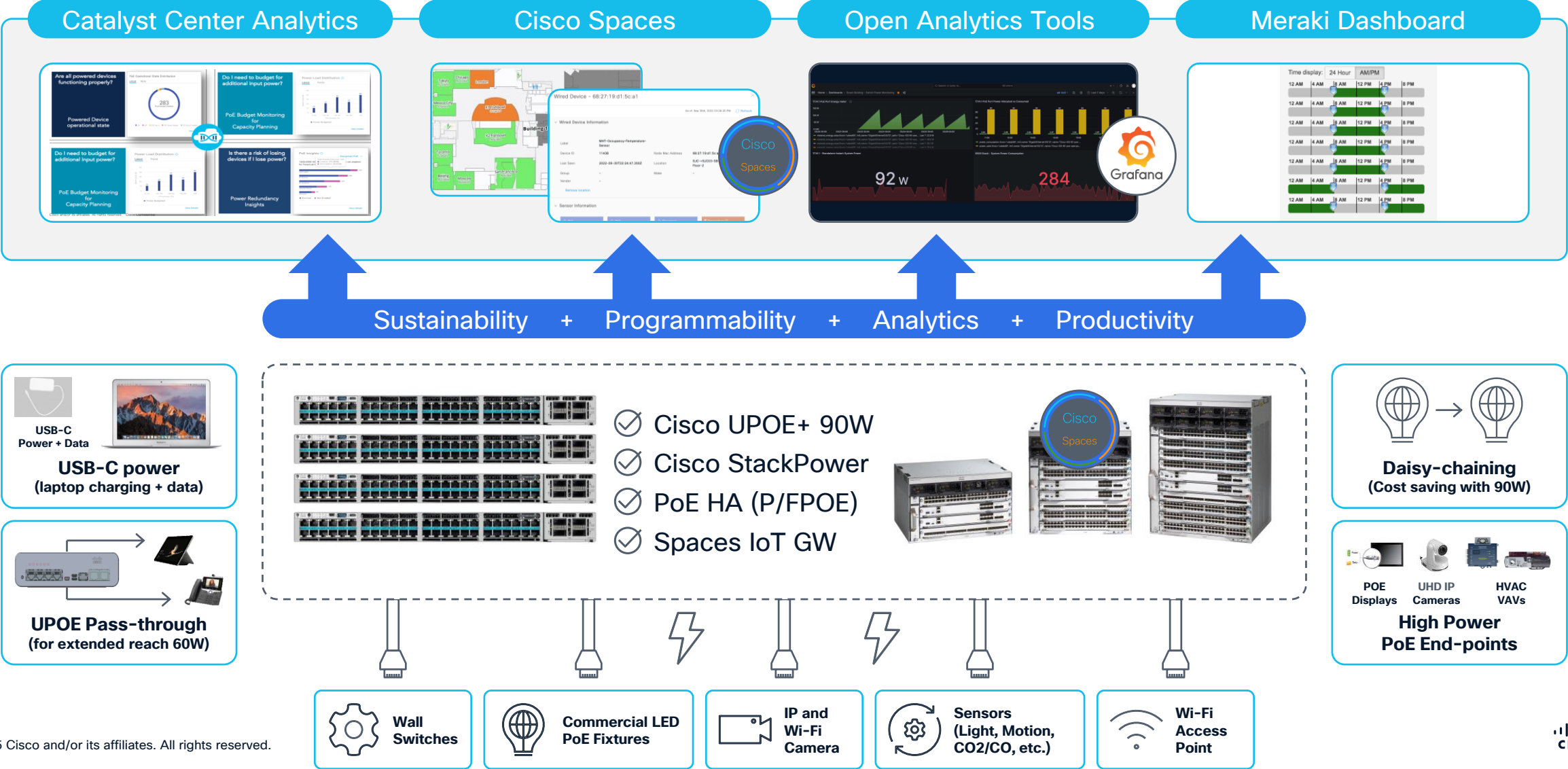
Common components and stacking backward compatible with Catalyst® 9300 Series

Higher Speeds driving Multi-Gigabit Access

Future Proof with Speed and More Power Over Ethernet

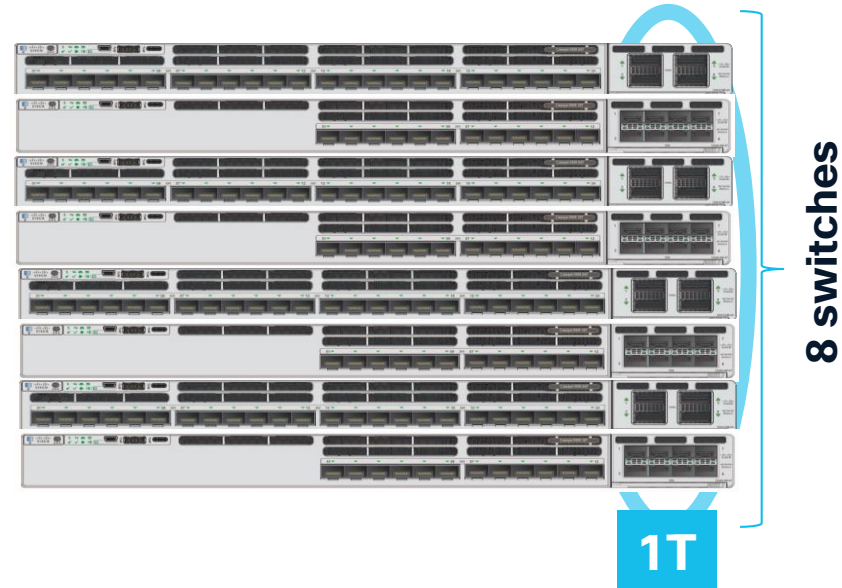


Catalyst powered smart buildings

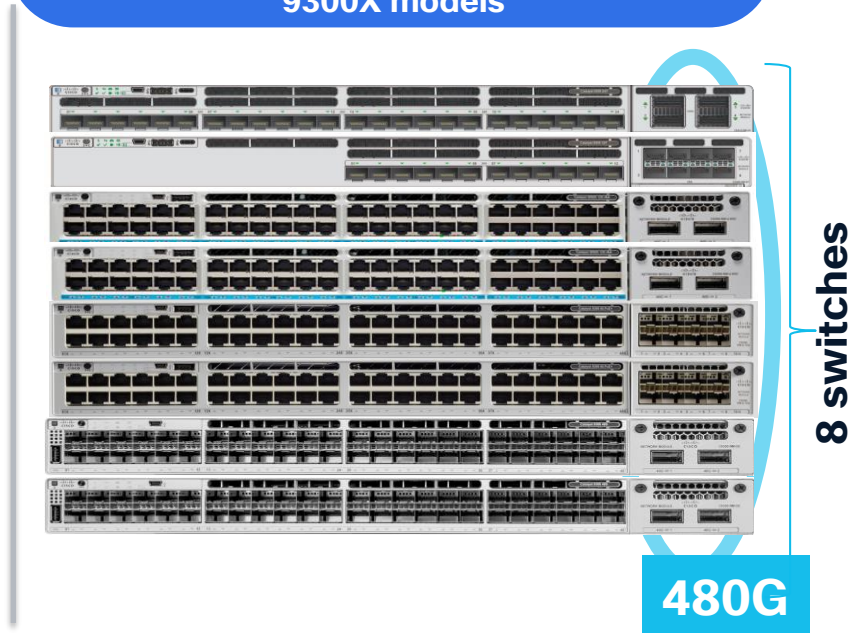


Catalyst 9300 Stacking Support

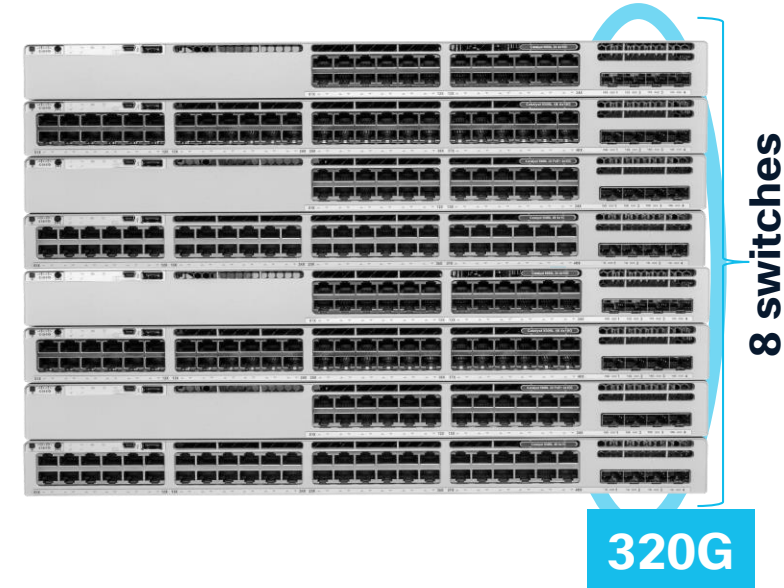
Modular Uplink
Catalyst 9300X models (10/25G Fiber)



Modular Uplink
Catalyst 9300 (non -B) and Catalyst
9300X models



Fixed Uplink
Catalyst 9300L models



Stacking supported among Catalyst 9300X models and mixed stacking between Catalyst 9300 and Catalyst 9300X models

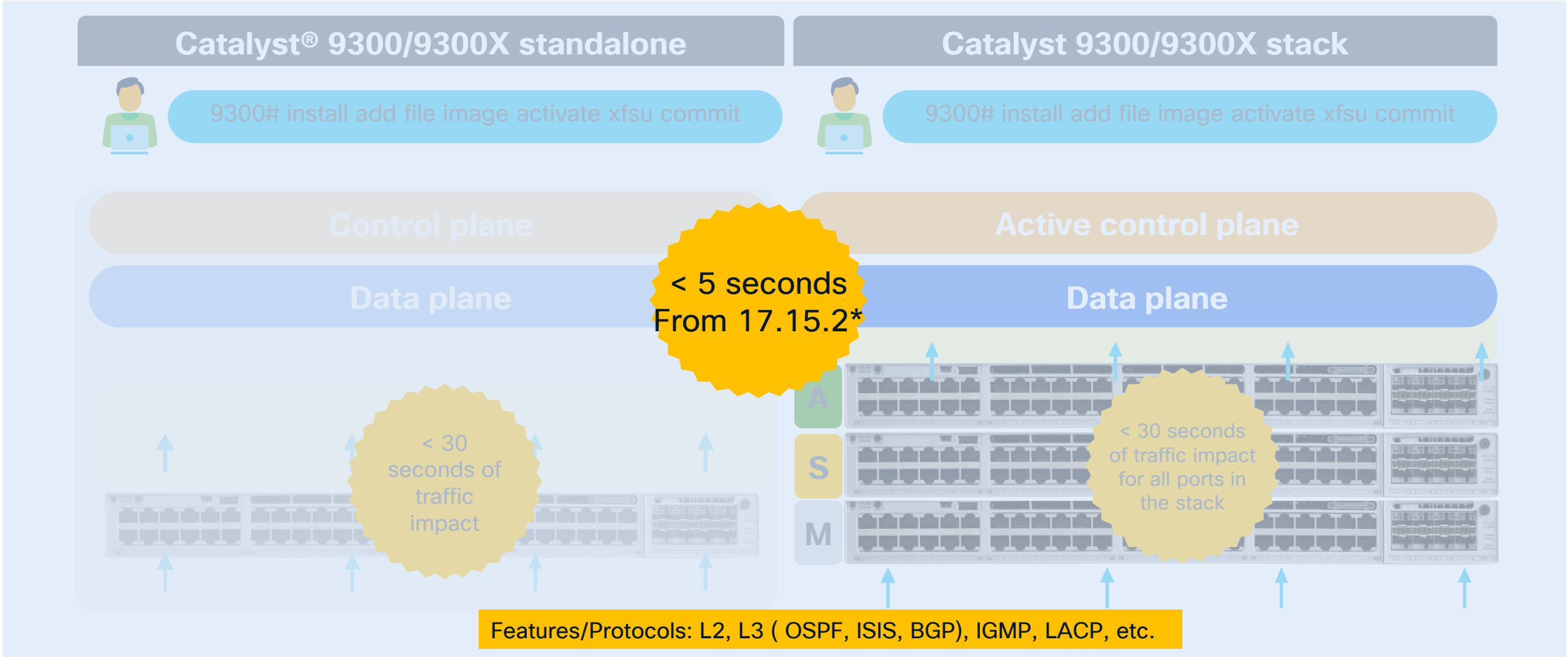
Stacking supported among Catalyst 9300L models only

Mixed stacking is not supported between **Catalyst 9300**, **9300X**, and **9300L** models

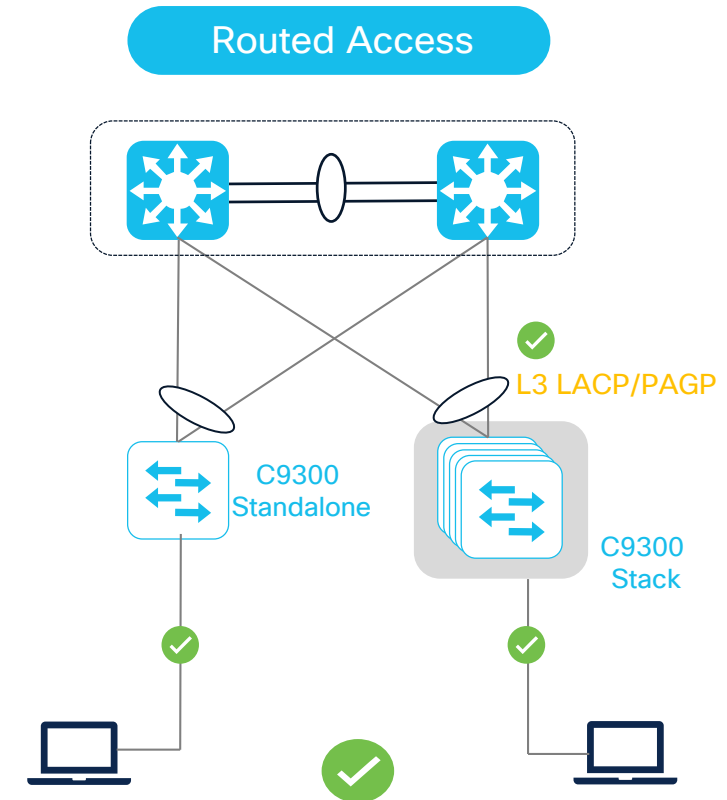
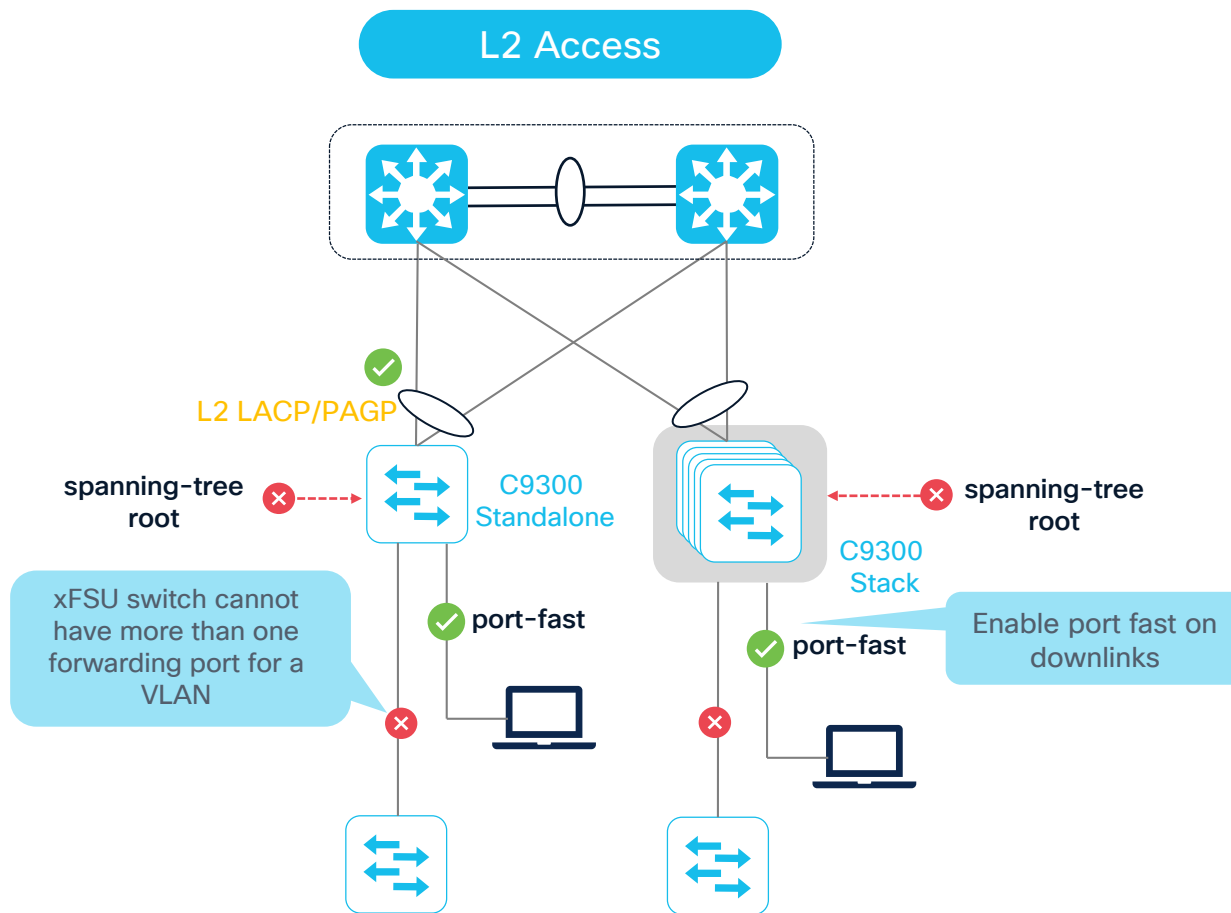
Operational Resiliency with Extended Fast Software Upgrade

C9300- 17.3.2

C9300X- 17.7.1



Flexible Layer 2 and Layer 3 Access Designs



Graceful Restart Routing Protocol:
BGP, IS-IS, OSPF
Additional NSF/Graceful restart
configuration required

Full protocol support: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst_standalones/b-extended-fast-software-upgrade.html

Enhanced xFSU Pre-checks

```
C9300_Switch# show xfsu eligibility
```

```
Reload fast supported: Yes
```

```
The following features are configured which do not support Graceful reload.
This could result in interface flaps or longer traffic loss during XFSU.
```

```
*****
```

1. LISP

```
*****
```

```
The following features are configured without the necessary GR support This may cause
control protocol flaps, leading to longer traffic loss during XFSU.
```

```
*****
```

```
1.OSPF is not configured in GR Mode. Required
Config "ip ospf retransmit-interval "greater than 9 seconds.
```

```
*****
```

Eligibility Check	Status
=====	=====
Autoboot Enabled	Yes
Install Mode	Yes
Spanning Tree	Eligible
MacSec	Eligible

```
FATLED: FPGA on switch 1 does not support XFSU, please upgrade
FPGA via normal install or upgrade hu-programmable fpga
```

```
XFSU Eligibility Summary
```

```
=====
```

```
XFSU Eligibility: NOT ELIGIBLE
```

```
=====
```

Performs pre-check

Configuration Check

User is notified if current configuration does not meet the required GR criteria or any supported protocols, which could result in traffic loss.

FPGA Check

FPGA version is lower than supported. Recommends to do a normal upgrade

xFSU Eligibility

Shows if reload or upgrade can proceed.
If criteria above aren't met, the process is aborted.

Start Pre-check

xFSU Prechecks:
License/Ring
Status/STP/MacSec

NEW

Configuration Check

FPGA Check

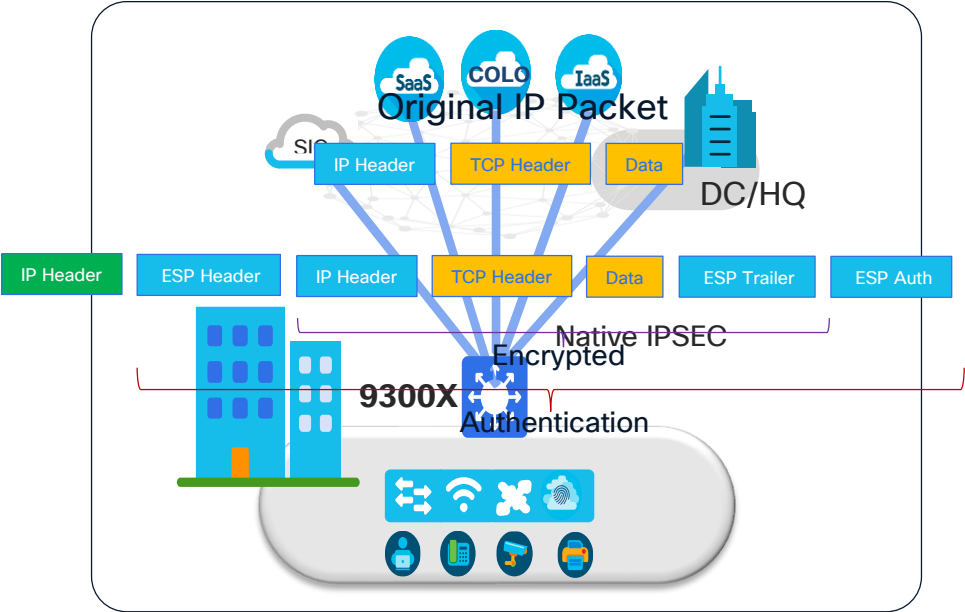
Eligibility Status

Catalyst 9300X – Hardware based IPsec

Software
IOS-XE 17.6.2
With DNA-A license
(HSEC Key for Export Control)



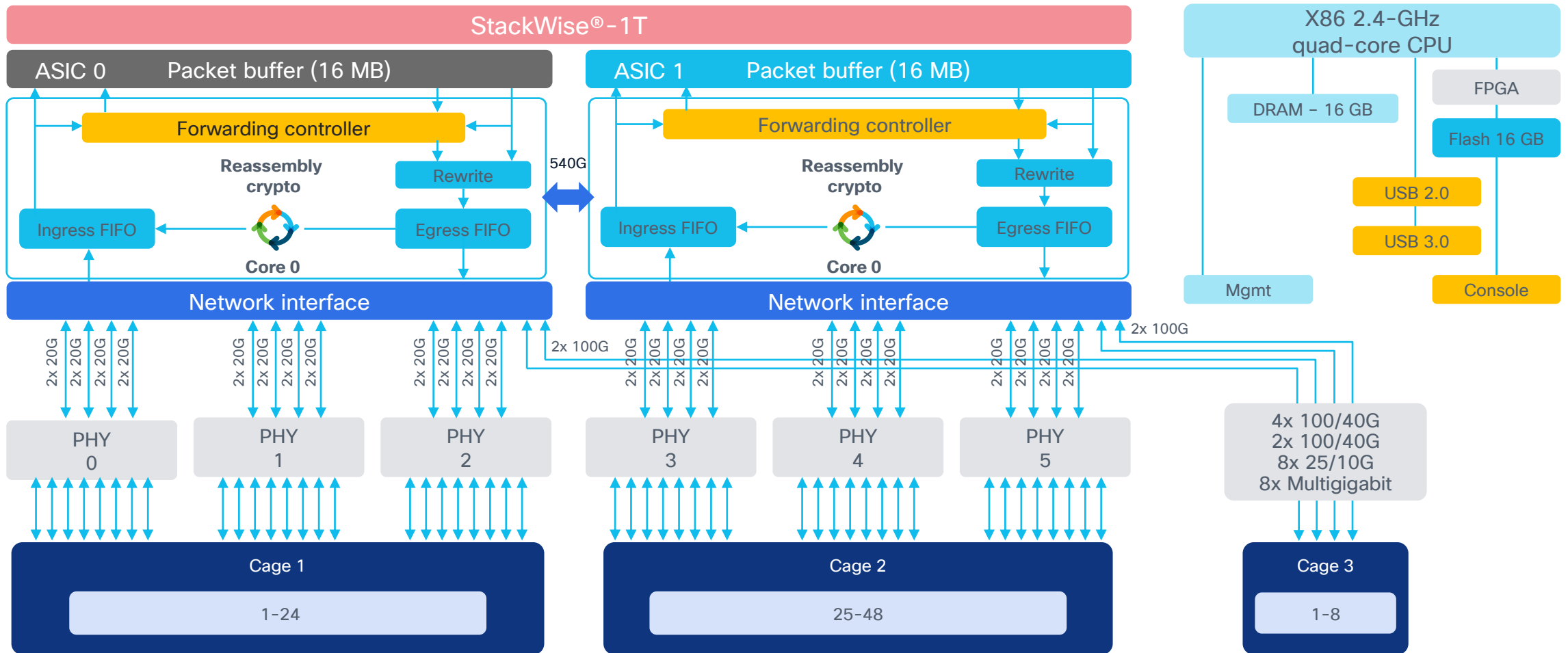
Cisco Catalyst 9300X



Encryption	Authentication
AES-128-CBC	HMAC/SHA1
AES-128/256-GCM	GMAC
Tunnel Mode	
Encapsulation - ESP	
IKEv2	

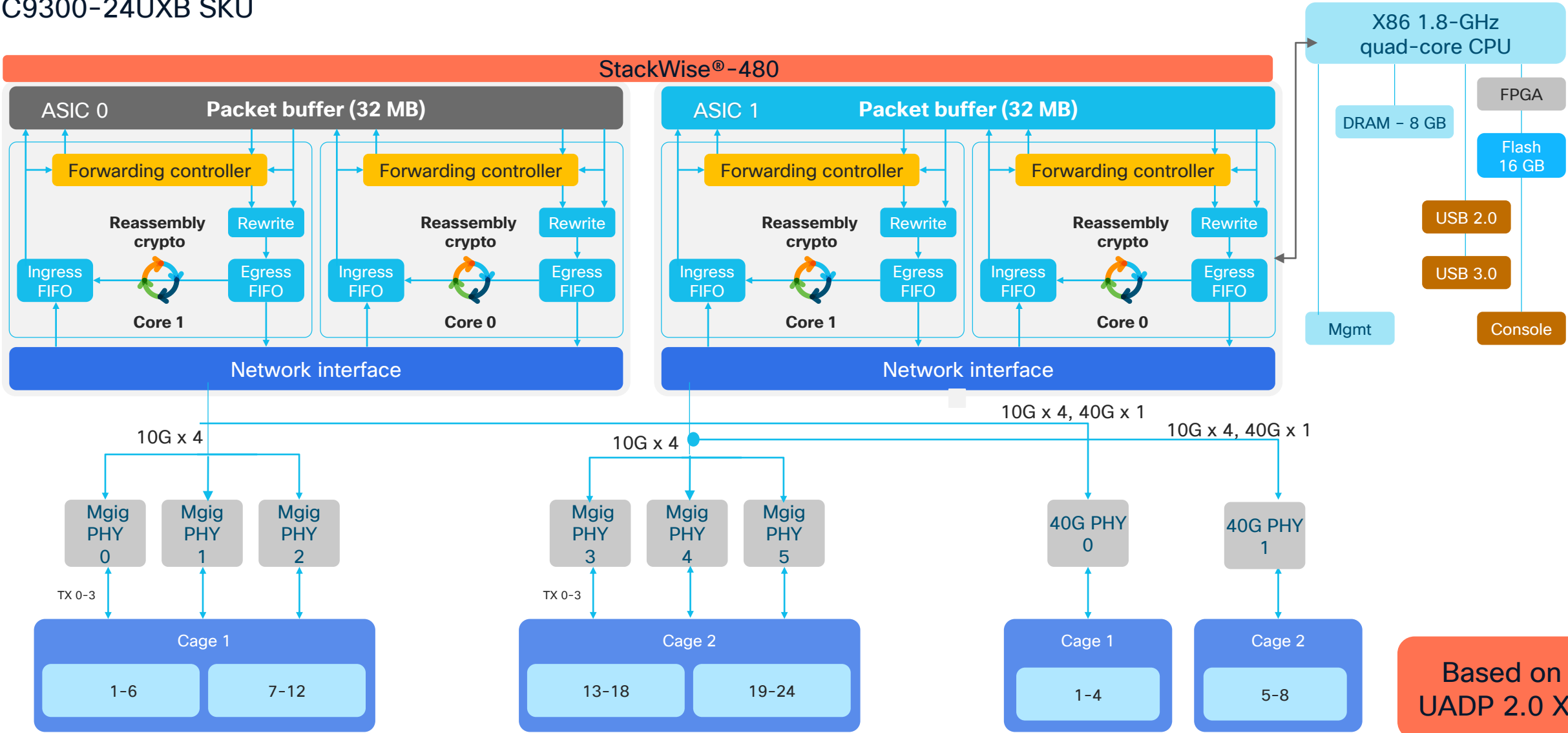
- Static Virtual Tunnel Interface
- NAT Traversal
- IPv4/IPv6
- Multicast Routing
- OSPF/BGP
- L3 segmentation over IPSEC
- PBR + Set Interface
- L2 Extension over IPSEC

Cisco Catalyst 9300X models



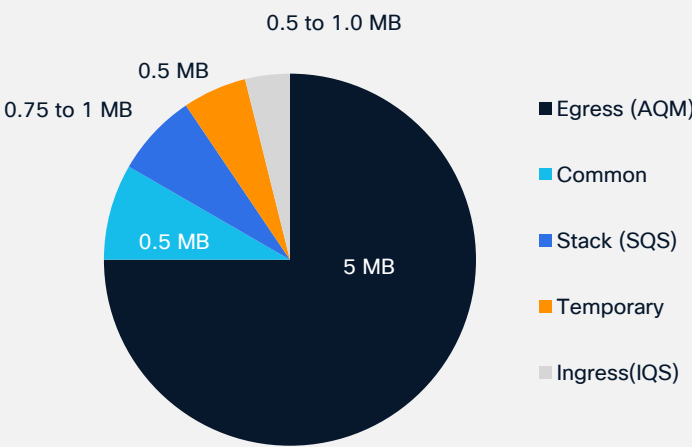
24-port Multigigabit UPOE model block diagram

C9300-24UXB SKU



Cisco Catalyst 9300 – buffer complex composition

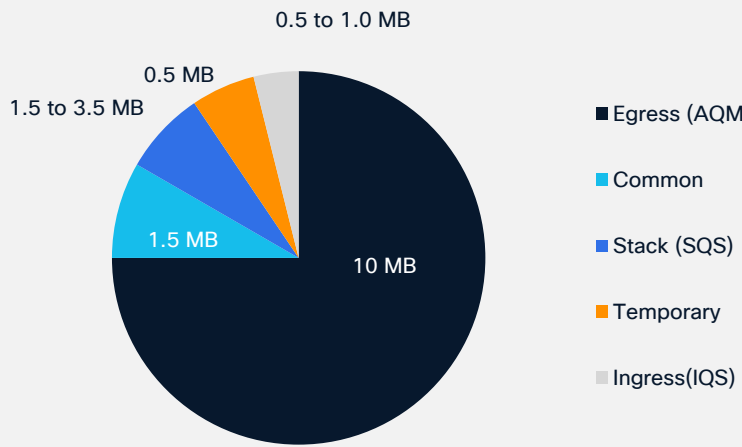
UADP 2.0



Catalyst 9300/L models

- Total of 16 MB buffer on switch
- 8 MB packet buffer per core is shared by ingress and egress data paths

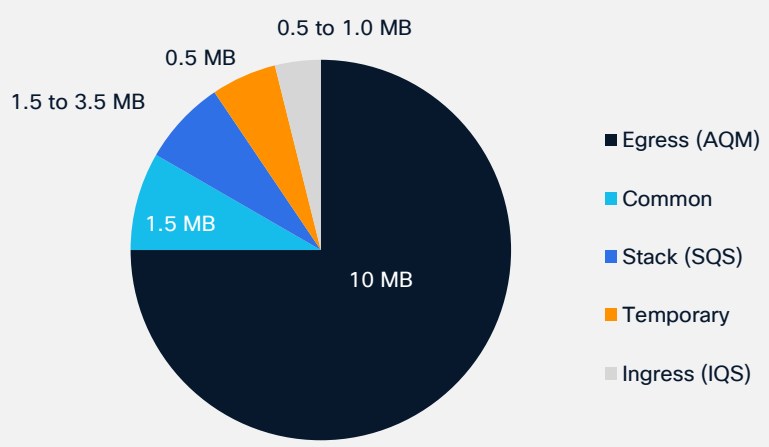
UADP 2.0 XL



Catalyst 9300B models

- Total of 32 MB buffer on switch
- 16 MB packet buffer per core is shared by ingress and egress data paths

UADP 2.0sec



Catalyst 9300X models

- Total of 16 or 32 MB buffer on switch depending on Single or Dual Asic switch
- 16 MB packet buffer is shared by ingress and egress data paths

Lookup tables

Forwarding resources

	Cisco Catalyst™ 9300X Series	Cisco Catalyst 9300 Series	Cisco Catalyst 9300B Series
MAC addresses	32,000	32,000	64,000
Host/direct routes	24,000	24,000	48,000
IGMP groups	8,000	8,000	16,000
LPM/indirect routes	15,000	8,000	64,000
Multicast routes	8,000	8,000	16,000
SGTs	8,000	8,000	8000

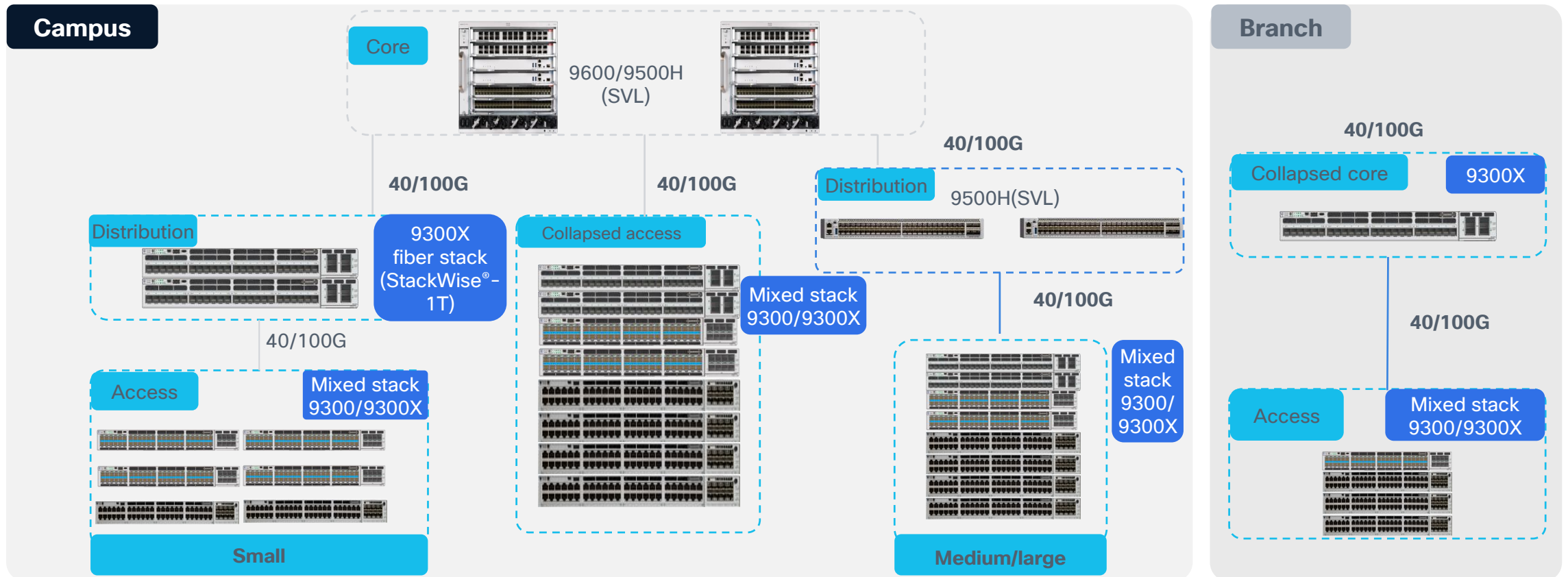
Feature resources

	Cisco Catalyst 9300X Series	Cisco Catalyst 9300 Series	Cisco Catalyst 9300B Series
Security ACL entries • Port ACL (PACL) • VLAN ACL (VACL) • Router ACL (RACL)	8,000	5,000	18000
QoS ACL entries	4,000	5,000	18000

NetFlow

NetFlow entries: 128,000/64,000/64,000 per UADP 2.0 XL/2.0/2.0sec ASIC

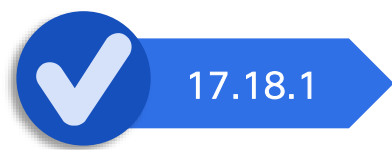
Flexible design options with the Catalyst 9300X in 2- or 3-tier architecture



Bringing 10/25/40/100G with StackWise-1 Terabit to access

Introducing Cisco C9350 Smart Switches

Introducing C9350 Series New Hardware launch



Higher Bandwidth
1.3 TERABYTES

Cisco IOS XE



Silicon One A100

X86 CPU

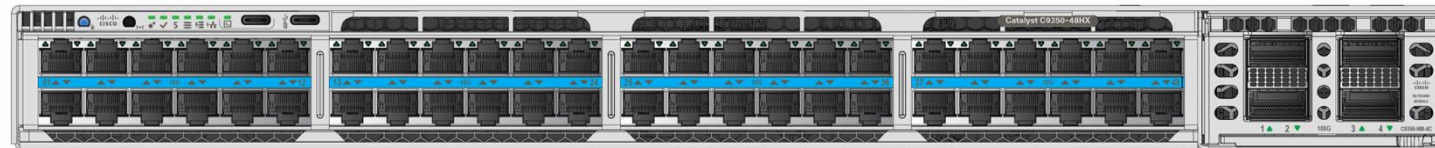


Flexible Speeds
10M/100M/1/2.5/5/10/25/50/100G

Higher Scale
4 X MAC Scale
4 X ACL Scale
6 X Route Scale

Advanced Security
Crypto-Ready*, PQC Resistant

Highly Resilient
NG-StackWise, StackPower,
Redundant PS/Fan's & xFSU*



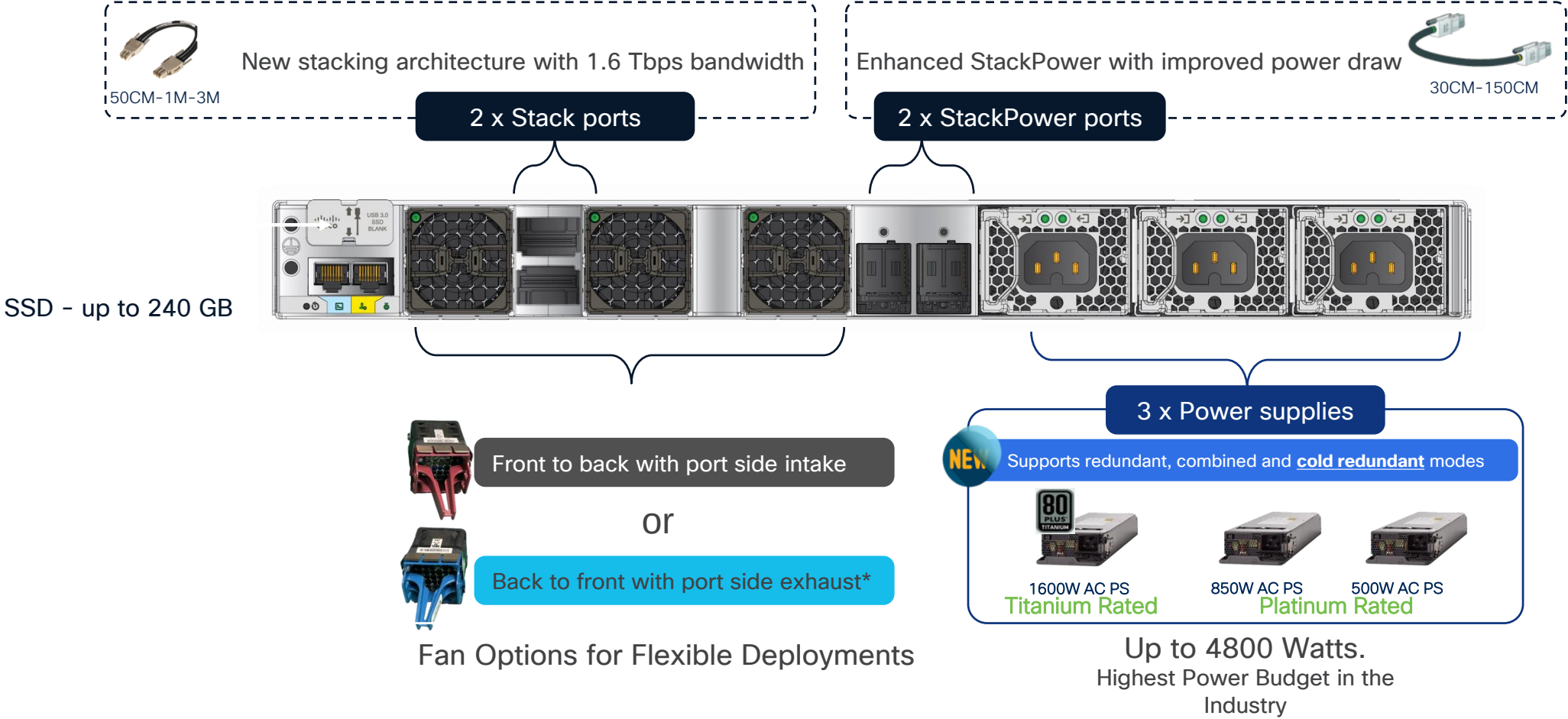
48 x mGig & 10G + 90W PoE

Flexible Uplink Options
1G/10G/25/50/100G

Smarter & Intelligent
Enh. App-Hosting, Unified
Management

Introducing C9350

Re-designed for flexibility

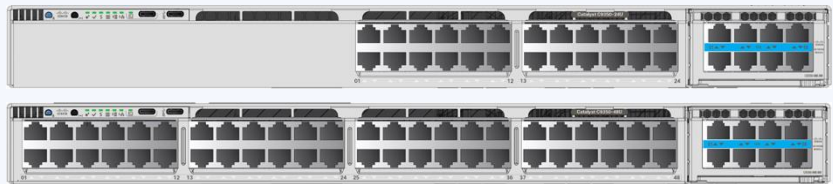


*Applicable for the data only skus

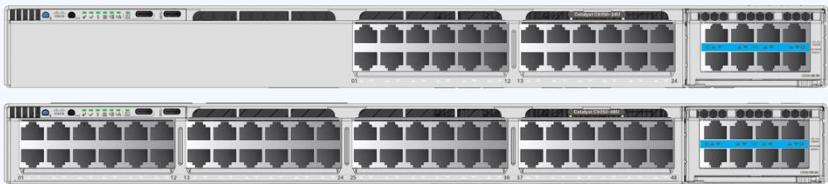
Cold redundant mode 'hibernates' redundant power supply when power requirement is low <5W consumption

Cisco 9350 Series Portfolio

Gigabit SKUs



C9350-24P/48P
24/48x 1G/100M/10M copper
30W PoE+



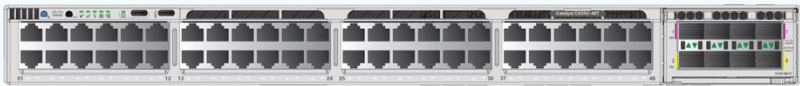
C9350-24U/48U
24/48x 1G/100M/10M copper
60W UPoE



C9350-24T/48T
24/48x 1G/100M/10M copper
Data only



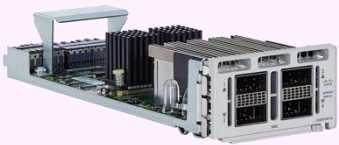
C9350-48HX
48x 10G mGig
90W UPOE+



C9350-48TX
24/48x 10G mGig
Data only

MultiGigabit SKUs

Modular Uplink 50G at access



C9350-NM-4C
4x40/100G



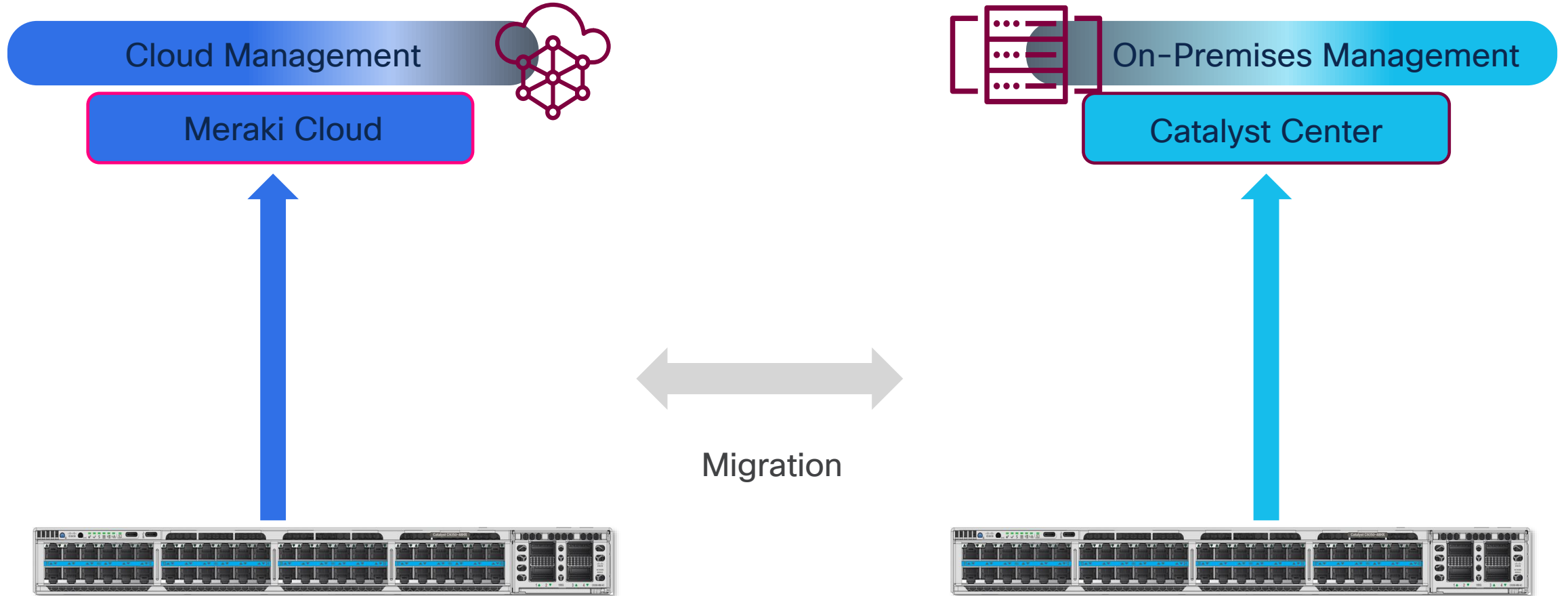
C9350-NM-2C
2x40/100G



C9350-NM-8Y
8x10/25G or 4x50G

Unified Experience: The New out-of-box Experience

Effortless Onboarding: Catalyst or Meraki mode, hands-free!

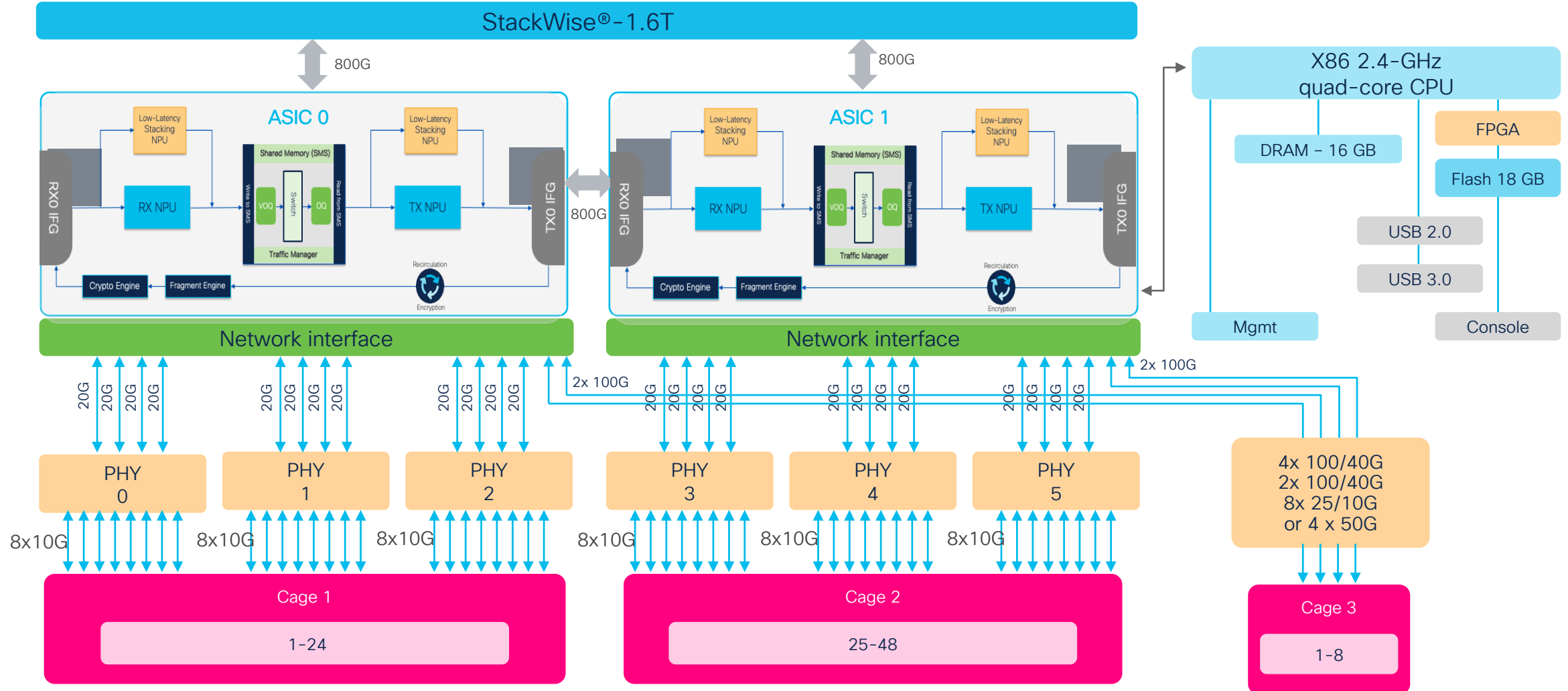


Single Unified Product

One box, your choice, hands free
No CLI conversion or -M SKUs needed!

Cisco C9350-48HX/TX models

48 port 1/2.5/5/10G copper



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ware without a mgmtbr: port 1(oobnd0) entered disabled state
valid license isoobnd0: entered allmulticast mode
not permitted aoobnd0: entered promiscuous mode
nd may result inmgmtbr: port 1(oobnd0) entered blocking state

fees charged tmgmtbr: port 1(oobnd0) entered forwarding state
o your account. Cisco reserves the right to terminate access to,
or restrict the function_

Cisco C9350 Series Switches

New stacking architecture for the new generation of campus switching

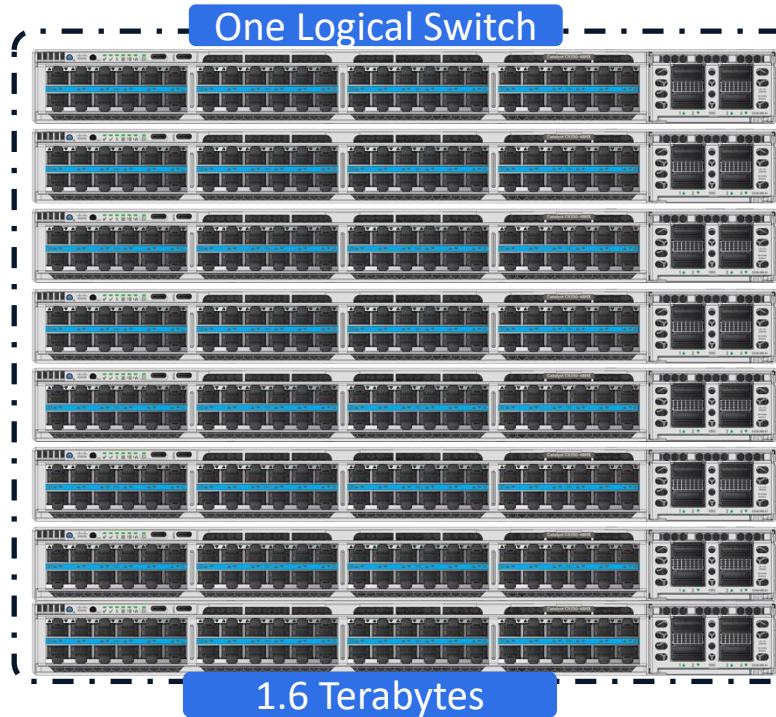
Standard Ethernet Stacking based on SPF(Shortest Path First)/VxLAN



8 Member Stack



Sub-Second Stateful Switchover with SSO & NSF



User friendly stacking design
Eliminate mandatory long stack cable requirement

Point-to-point architecture for low latency and optimized path selection

Isolated bandwidth loss in event of failure

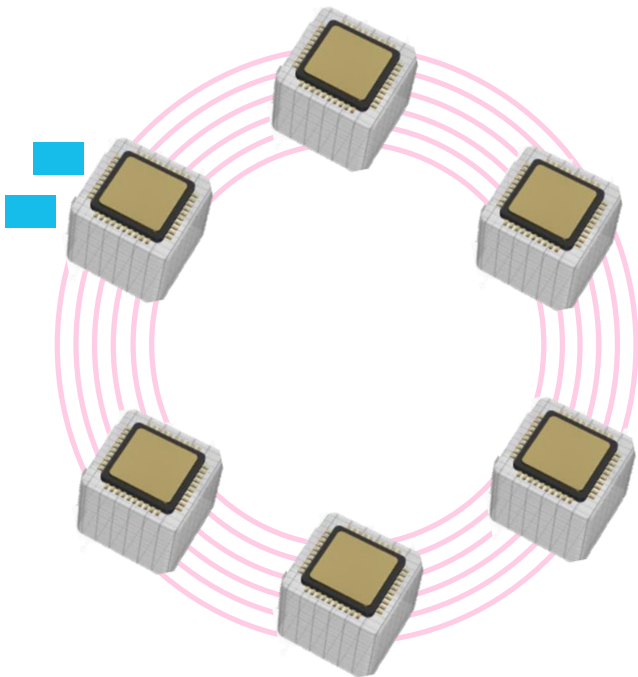
Highest Stacking Density in the Industry

New Architecture for StackWise

Example – 6-member stack

Current StackWise architecture

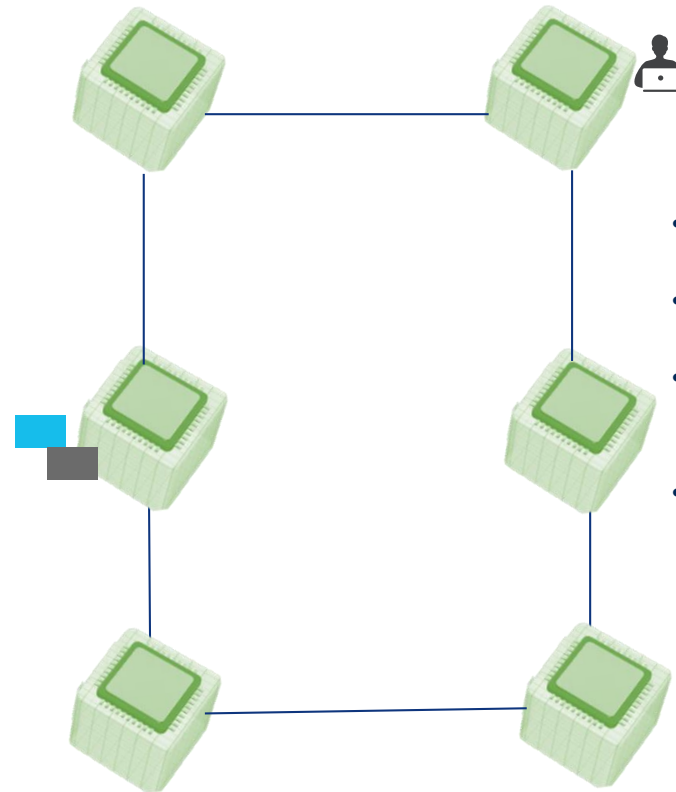
Ring-based stacking



- Spatial Re-Use Algorithm
- Best Effort Bandwidth
- Non-Flexible Cabling Configuration

Next Generation StackWise architecture

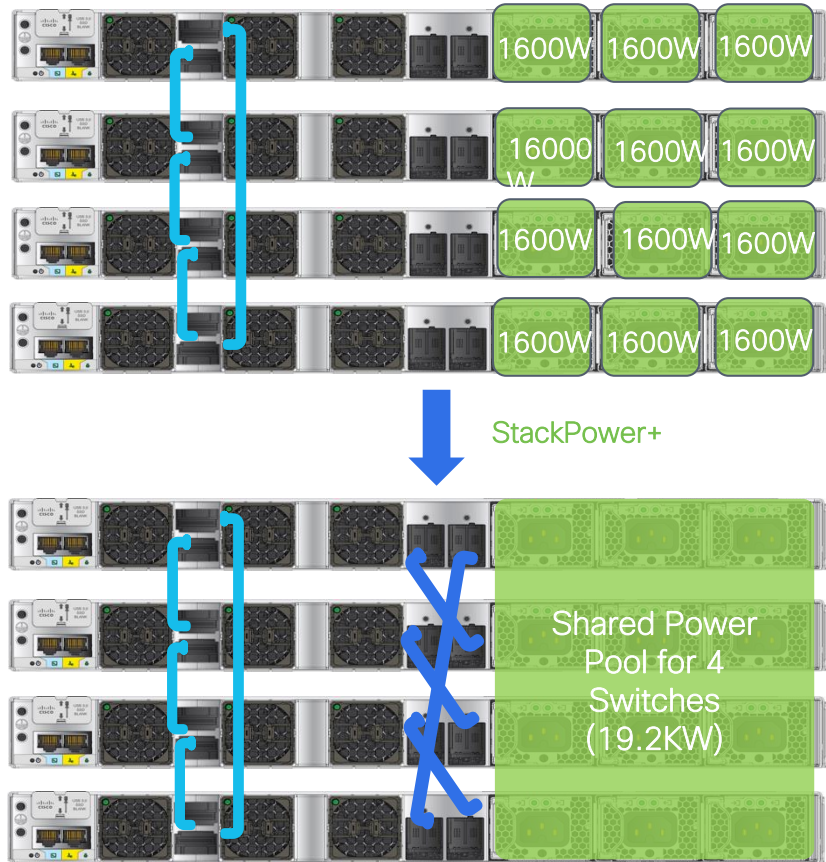
Standard SPF/VXLAN based stacking



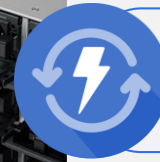
- Flexible Cabling Design
- Guaranteed Bandwidth
- Based on Proven L3 SPF Algorithm & VXLAN
- ECMP & Low Latency

Ensures minimal latency, high throughput, and consistent Packet forwarding

Cisco C9350 Series - Enhanced StackPower+



Enhanced Stackport Circuitry for reliable power distributions



New Stack Cables of Handling Higher Current(55A)



Support for up to **4 Switches** in a single StackPower Group

Zero-Footprint RPS

Built-in power redundancy, without extra hardware

Power Pooling

Shared power across switches for efficient use

1+N Redundancy

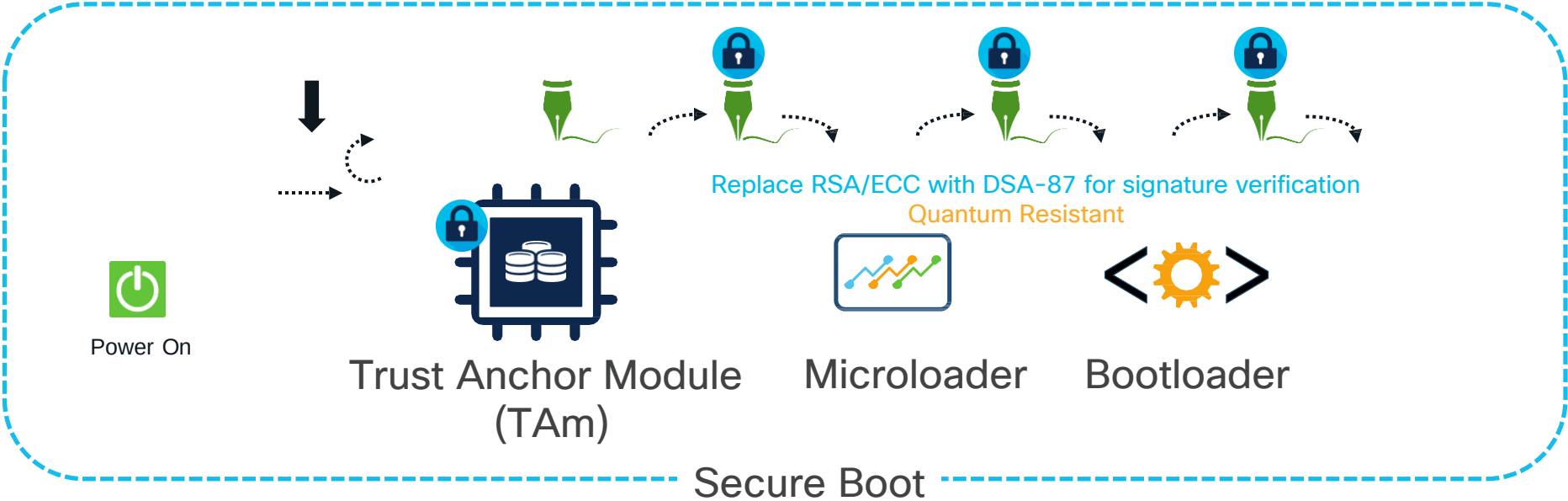
Inline PSU backup for higher reliability and uptime

Priority Power Allocation

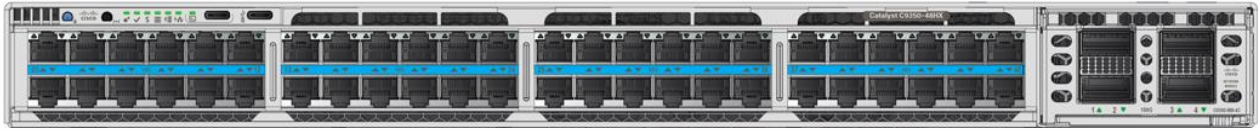
with unused PSUs on standby

StackPower+ delivers over 30% more power via StackPower ports

Securing the Switch – Hardware to Software



Quantum Resistant Hardware & Software



Cisco 9350 – Energy Management

With SmartPower

Monitor

Optimize

Catalyst Center/ Meraki Cloud – Policy Management*

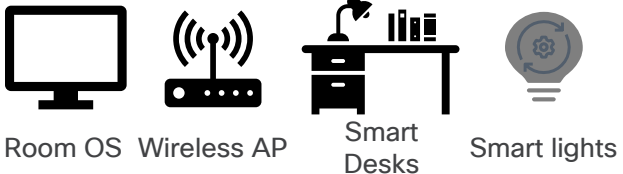
Power Optimization 0 to 100%

Level 1	Shut off
Level 2	Hibernation*
Level 3	Deep sleep*
Level 4	NA
Level 5	NA
Level 6	NA
Level 7	Auto off - LED, PSU and SFP
Level 8	Auto off - LED and SFP
Level 9	Auto off - SFP
Level 10	Full Power

Auto-Off PSU - StackPower



Negotiate over LLDP



2 Endpoint integrations with switch

Example: Set SmartPower level for IP phone to 7
Screen on phone turns off to preserve power

IP Phone integration available today

1 Global control for device optimization

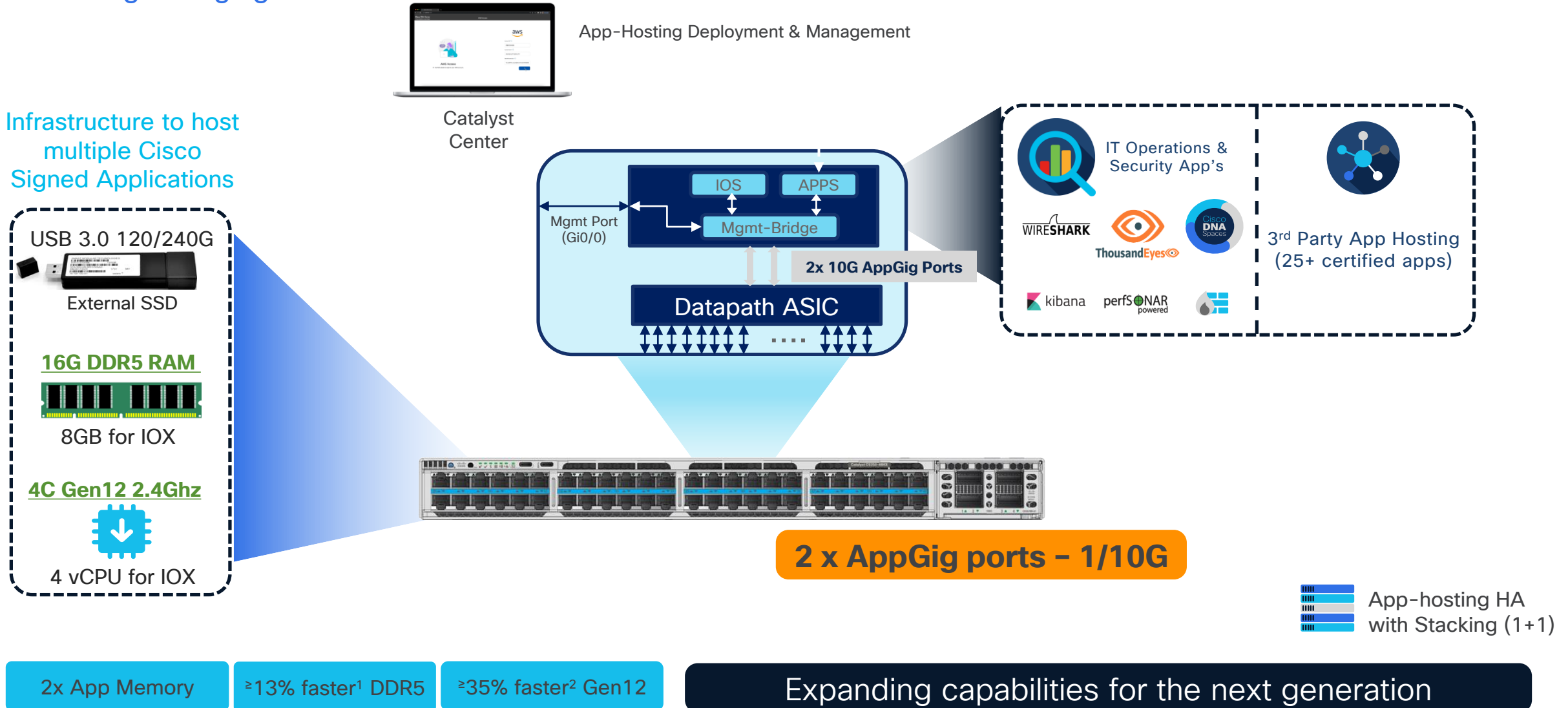
Example: Set SmartPower level to 7
All port LED, SFP and unused PSUs are tuned off

* roadmap

Achieving NetZero Goals with Intelligent SmartPower Framework

C9350 Enhanced Application-Hosting

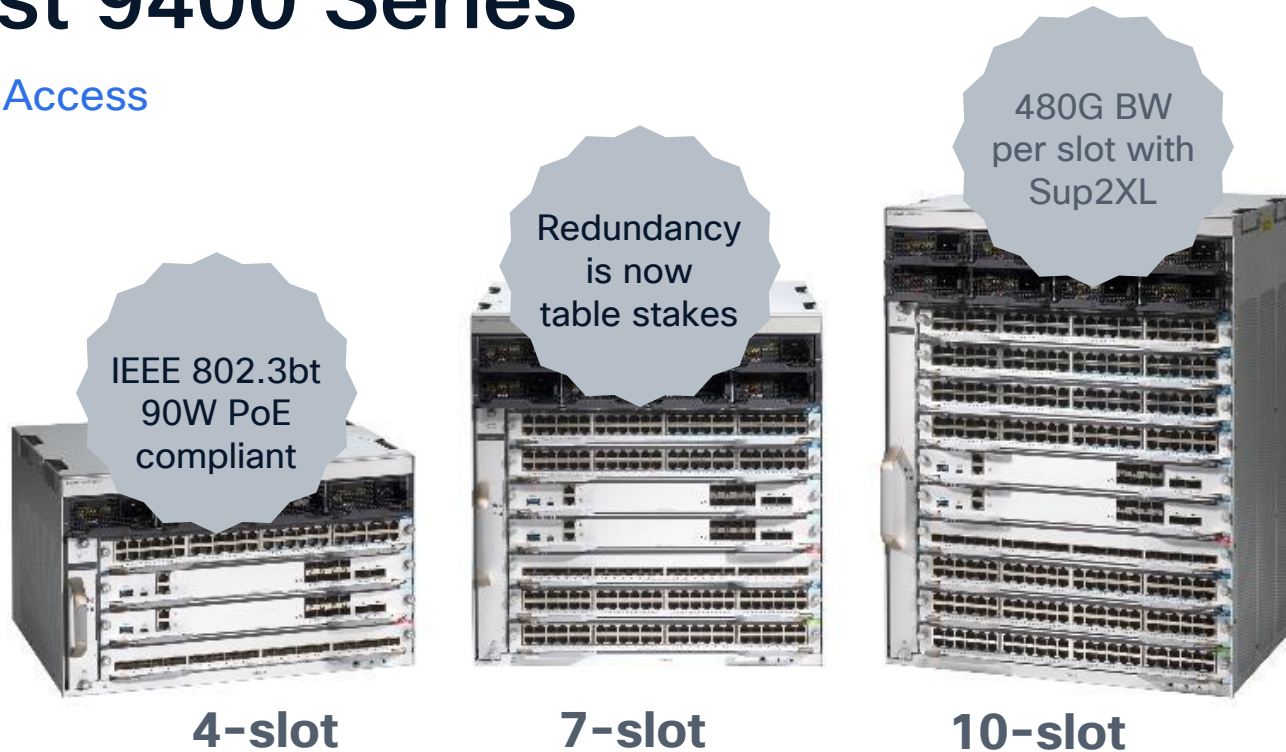
Unlocking emerging use cases



Catalyst 9400X/9400

Cisco Catalyst 9400 Series

Industry Leading Modular Access



Supervisors

- Sup-1: Access
- Sup-1XL: Access
- SUP-1XL-Y: Access
- SUP-2: Access/Distribution
- SUP-2XL: Access/Distribution

Copper Line Cards

- 48x 10G mGig UPOE+
- 48x 5G mGig UPOE+
- 24x mGig + 24x UPOE
- 48x 10/100/1000 UPOE+
- 48x 10/100/1000 UPOE
- 48x 10/100/1000 POE+
- 48x 10/100/1000 Data

Fiber Line Cards

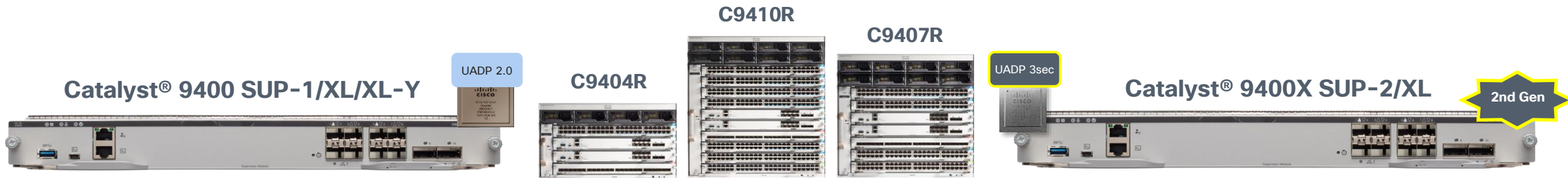
- 48x 10G SFP+
- 24x 10G SFP+
- 48x 1G SFP
- 24x 1G SFP

Power Supplies

- 3200W AC
- 2100W AC
- 3200W DC

Cisco Catalyst 9400 Series

High Performance, Flexibility and Investment protection with C9400X



Up to 240G/slot



1/2.5/5/10/25/40G



Up to **96,000** MACs
Up to **64,000** routes



Up to **32 MB**
packet buffer/ASIC



Up to 480G/slot
No Oversubscription*



Up to **128,000** MACs
Up to **256,000** routes



1/2.5/5/10/25/40G
+ 100G



Up to **36 MB**
packet buffer/ASIC



Flexible ASIC
Templates



100G IPsec
Encryption

DATA



C9400-LC-48T

1G SFP



C9400-LC-24S



C9400-LC-48S

POE+/UPOE



C9400-LC-48P



C9400-LC-48U

UPOE +



C9400-LC-48HX



C9400-LC-48H

MultiGigabit



C9400-LC-48UX



C9400-LC-48HN

10G SFP+



C9400-LC-48XS



C9400-LC-24XS

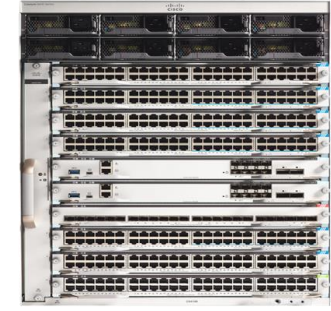
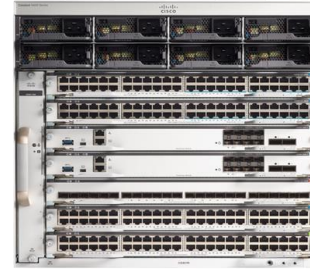
Unmatched flexibility

Maximum investment protection

100G leadership in access

Cisco Catalyst 9400 Series

Chassis Options



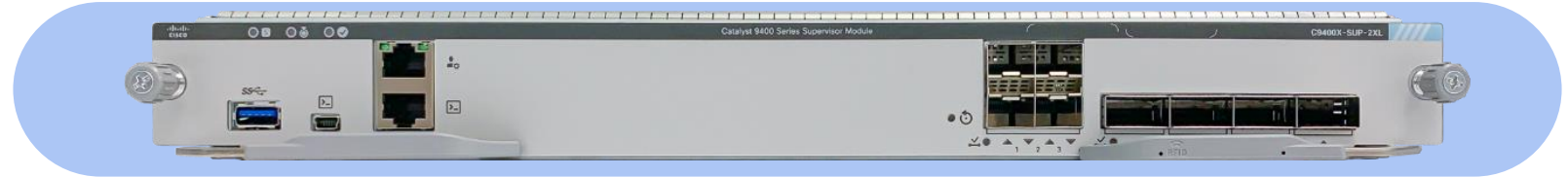
		4-slot	7-slot	10-slot
Supervisor		2 (redundant)		
Line Cards		2	5	8
Max LC ports by speed	10/100/100M	96	240	384
	1/2/5/10G	96	240	384
	1/10G SFP	96	240	384
Max SUP ports by speed	10G SFP	8 (SUP1) – 4 (SUP2)		
	25G SFP	2 (SUP1-XL) – 4 (SUP2)		
	40G QSFP	2 (SUP1-XL) – 4 (SUP2)		
	100G QSFP	4 (SUP2)		
BW per LC slot (SUP1/1XL/2/2XL)		80/240/240/480G	80/120/240/480G	80/80/240/480G
Dimensions (W/D/H)		W:17.5 in. / D:16.25 in. / H: 6RU	W:17.5 in. / D:16.25 in. / H: 10RU	W: 17.5 in. / D:16.25 in. / H: 13RU
Power supply		4 PS (N+1 and N+N)	8 PS (N+1 and N+N)	8 PS (N+1 and N+N)
PoE per slot		4800W		
Cooling		Side to Side (Front to Back for PS)		

Catalyst 9400 Supervisor Modules

Supported on all Chassis Types

C9400X-SUP-2XL

480G/slot High-end Access



C9400X-SUP-2

240G/slot Extended Access



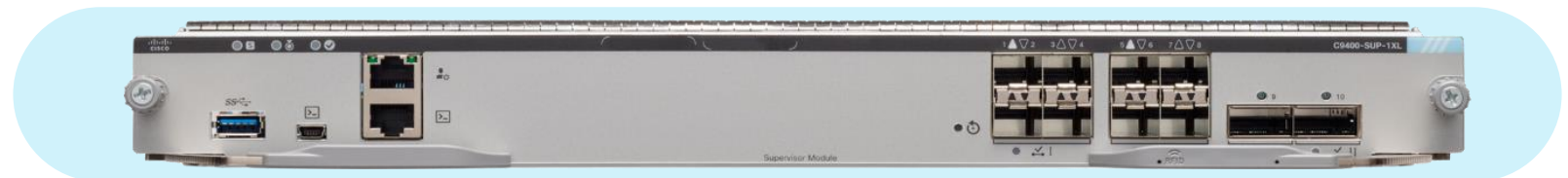
C9400-SUP-1XL-Y

80-240G/slot Access



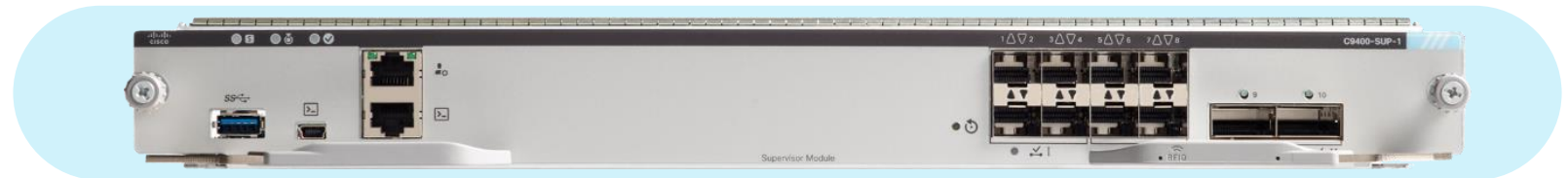
C9400-SUP-1XL

80-240G/slot Access



C9400-SUP-1

80G/slot Access



C9400X-SUP-2/2XL

Gen 2 supervisor modules with UADP 3.0sec

4.8 Tbps Sup2XL/
2.4 Tbps Sup2
(full duplex)

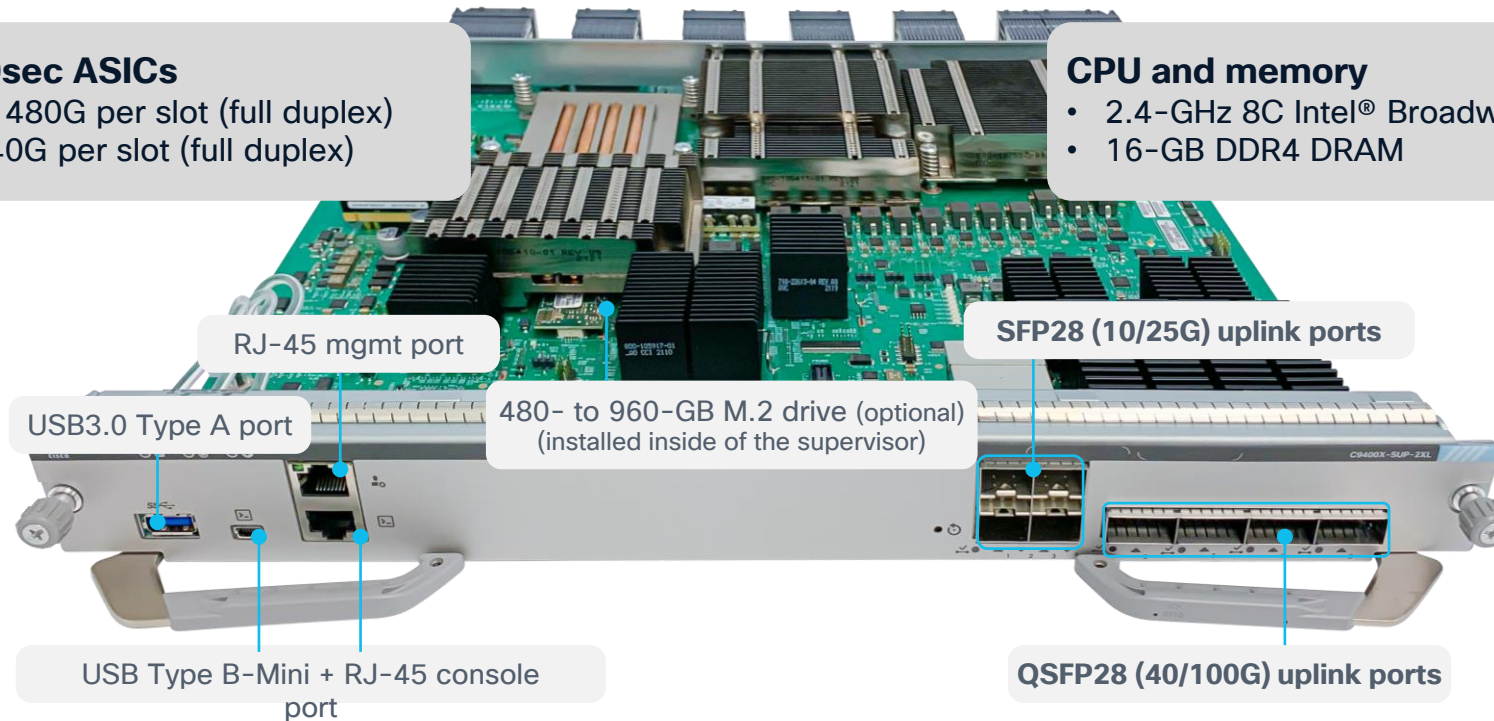
Cisco IOS® XE
17.11.1

3x UADP 3.0sec ASICs

- SUP-2XL – 480G per slot (full duplex)
- SUP-2 – 240G per slot (full duplex)

CPU and memory

- 2.4-GHz 8C Intel® Broadwell DE-NS CPU
- 16-GB DDR4 DRAM

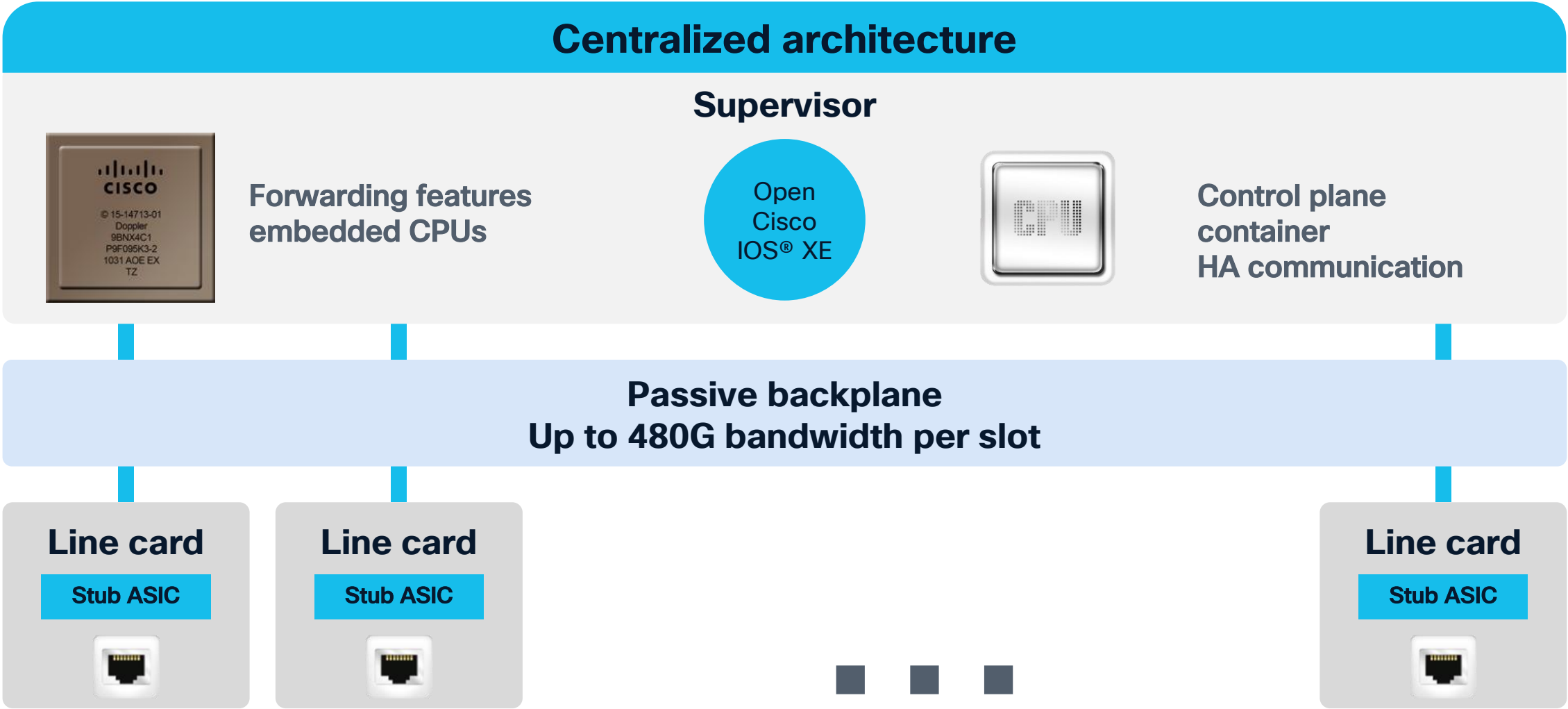


SUP-1XL feature parity

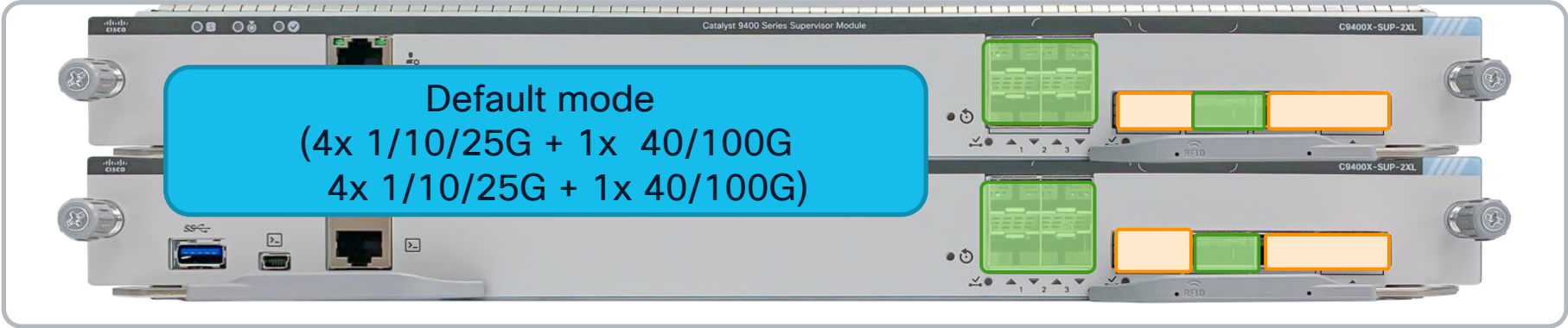
1G support on 10/25G ports
(SFP-1G-LH SFP-1G-SX)



Architecture



Sup 2 / 2XL Uplinks – Dual Supervisors

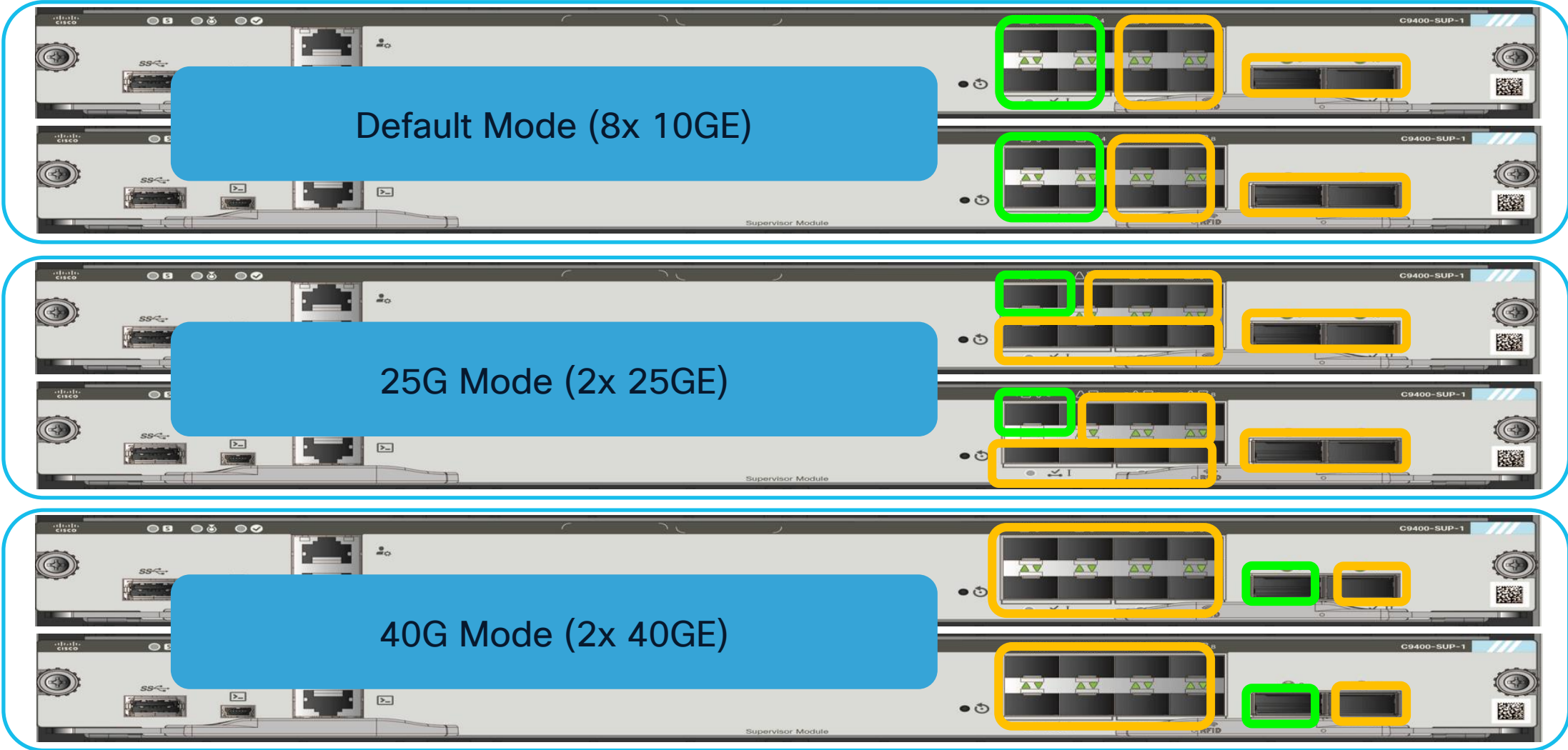


 **Active**  **Disabled**

Sup-1/Sup-1XL/Sup-1XL-Y Uplink - Dual Sup

Active

Disabled



New Line Cards for Sup2/2XL – Gen 2 Line Cards



C9400X-SUP-2XL

IOS XE 17.7.1

C9400X-SUP-2

IOS XE 17.7.1

C9400-LC-48HX

IOS XE 17.8.1

C9400-LC-48XS

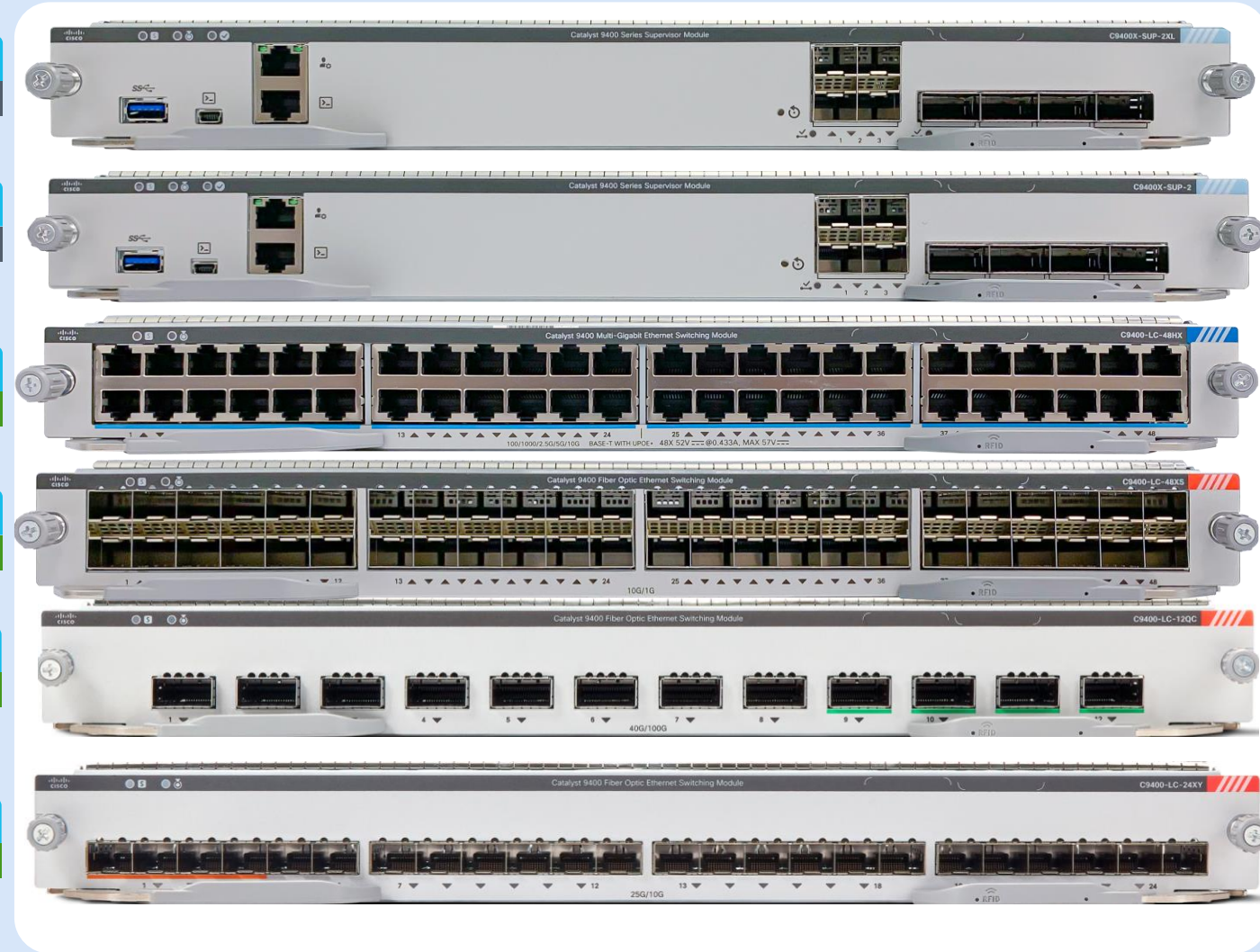
IOS XE 17.8.1

C9400-LC-12QC

IOS XE 17.12.1

C9400-LC-24XY

IOS XE 17.12.1



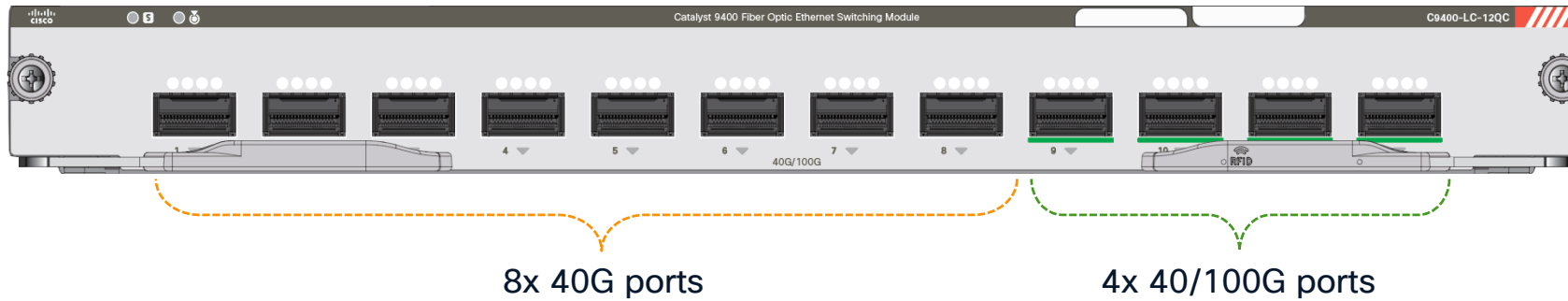
Note: Same Supervisor model required in dual SUP/SSO configuration.

25G & 40G/100G Line Cards on C9400X



IOS XE 17.12.1

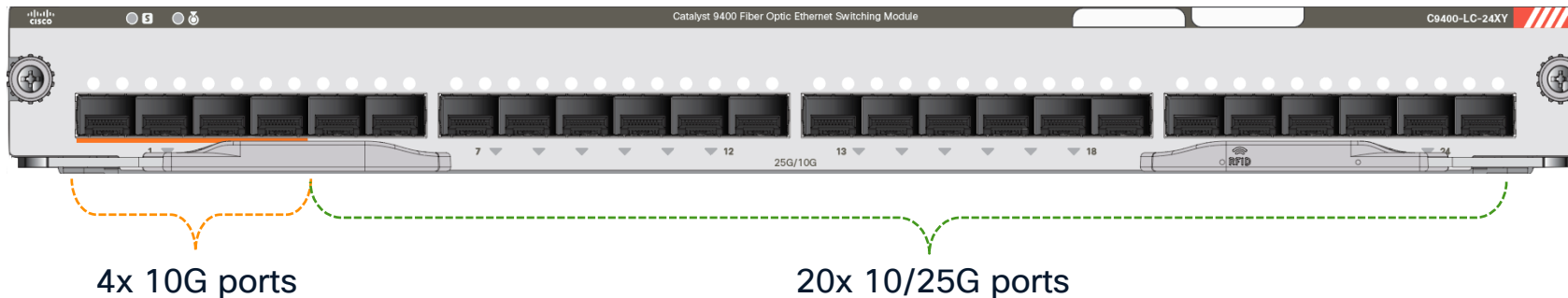
C9400-LC-12QC



Enabling Collapsed Access & Distribution Transition with SUP2

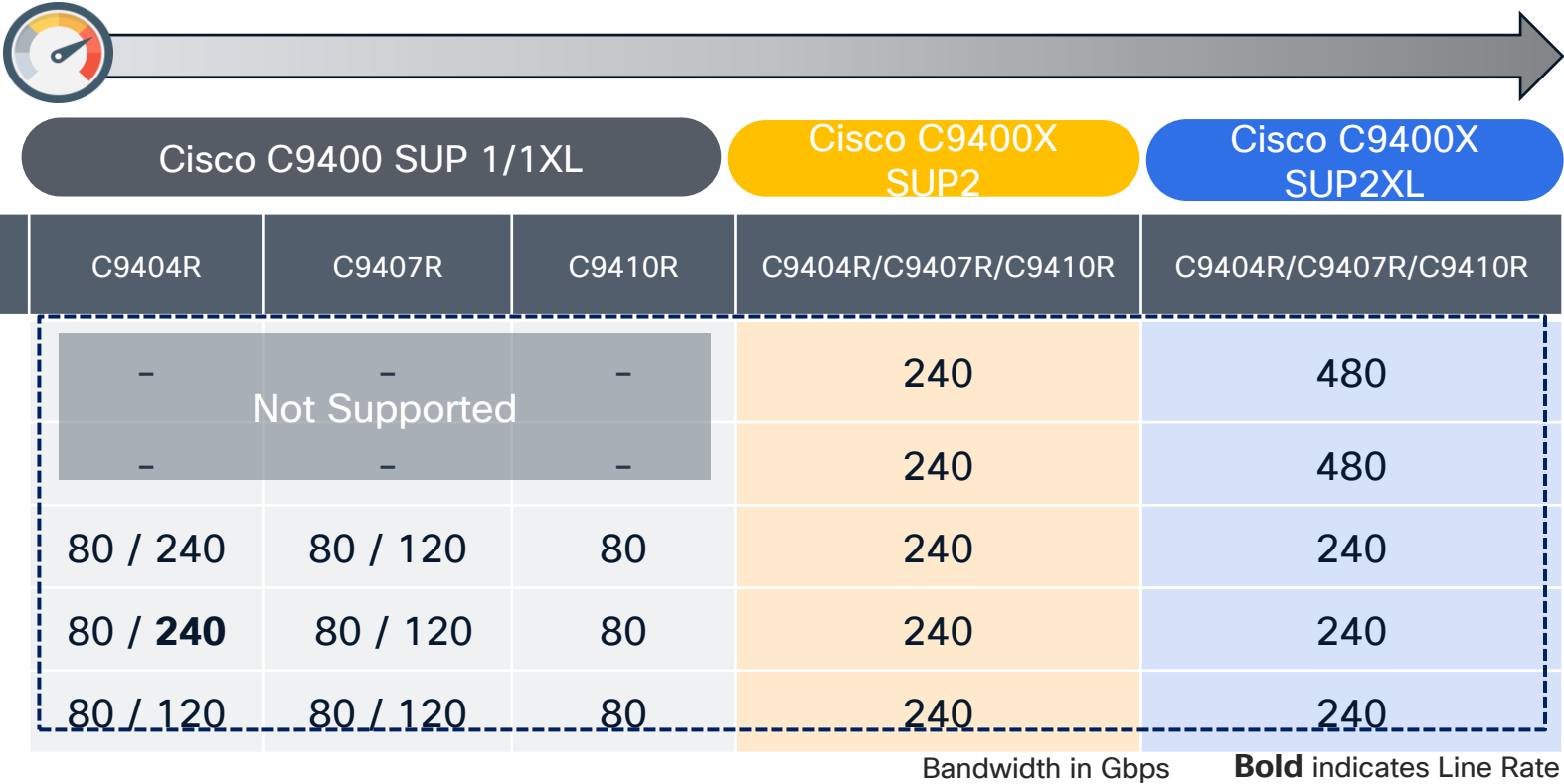
Higher speed downlinks for High-end Access expanded designs

C9400-LC-24XY



Supported with SUP-2 & SUP-2XL Only

Bandwidth Boost with Gen2 Supervisors



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

Concurrent 60W/90W POE Port Density with C9400-LC-48HX

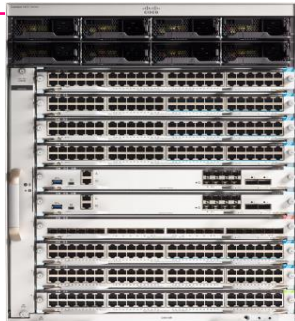
With 3200W Power Supply in Combined Mode(Fully loaded PSUs):



C9404



C9407



C9410

Total Ports	96 ports	240 ports	384 ports
UPOE + 90W	96 ports (Fully loaded chassis)	226 ports (Up to 4 fully loaded LCs + 34 Ports)	224 ports (Up to 4 fully loaded LCs + 32 Ports)
UPOE 60W	96 ports (Fully loaded chassis)	240 ports (Fully loaded chassis)	336 ports (Up to 7 fully loaded LCs)

Catalyst 9400X – Custom SDM Templates

SDM templates and scale numbers

Feature (ACL) TCAM

Forwarding (FIB) Hash

IOS-XE 17.11.1

NEW

FIB

Double width fields ensures IPv4 and IPv6 have the same scale

L2 and L3 Multicast can have a total of 48K FIB Resources

Space for Some features can be disabled completely by setting scale to 0

ACL ingress and egress are split between two cores

Due to space reserved for IPsec SA table, max ACL on core 1 is 25K

Maximum Security ACL size possible is 25 + 27 = 52K

All features need dedicated space. 0 setting is not allowed

ACL TCAM

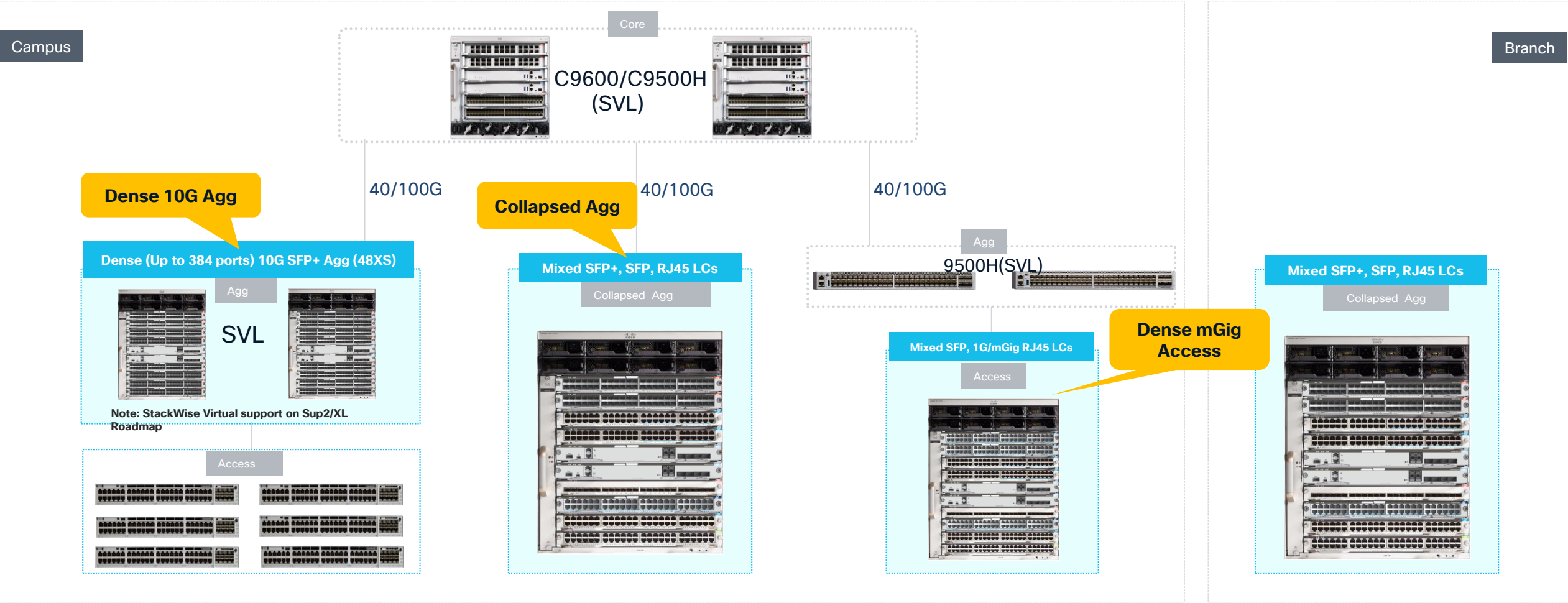
Features			Range	Access (default)	Step-Size	
Unicast routes (LPM & Host, IPv4/IPv6)			✂	64K-256K	112K	16K
MAC address entries			✂	32K-128K	64K	16K
L2 Multicast groups			✂	0-32K	16K	16K
L3 Multicast routes (IPv4/IPv6)			✂	0-32K	16K	16K
Flexible NetFlow	Ingress	✂	0-64K	32K	32K	
	Egress	✂	0-64K	0	32K	
SGT, MPLS			✂	0-64K total	32K SGT, 16K MPLS	32K
Total FIB Resources - 416K						
Security ACL	Ingress	✂	4K-27K	10K	2K	
	Egress	✂	4K-27K	16K	2K	
NetFlow ACL	Ingress	✂	1K-2K	1K	1K	
	Egress	✂	1K-2K	1K	1K	
LISP			✂	1K-2K	2K	1K
PBR/NAT (per direction)			✂	1K, 2K-16K	2K	2K
Tunnels (Termination)			✂	1K-3K	1K	1K
SPAN	Ingress		0.5K		Not Customizable	
	Egress		0.5K		Not Customizable	
CPP			0.5K		Not Customizable	
IPsec			1K		Not Customizable	
MACsec SPD			0.25K		Not Customizable	
Total ACL Resources - 54K						



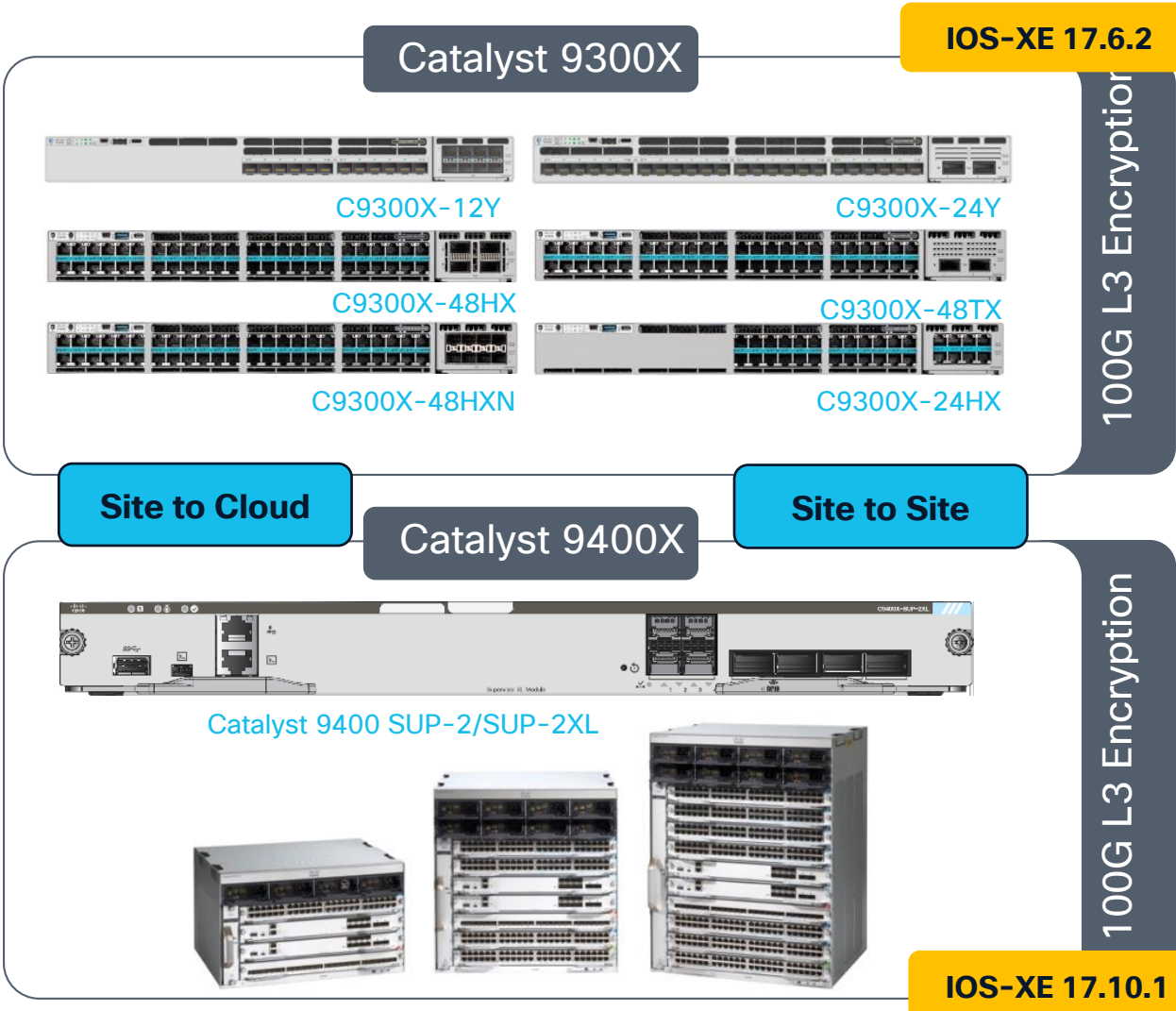
Customizable Resources

Catalyst 9400 Deployment Flexibility

C9400X enables dense 10G SFP+ aggregation and multigigabit access use cases



Expanding IPsec Capabilities to Modular C9400X



Encryption	Authentication
AES-128-CBC	HMAC/SHA1
AES-128/256-GCM	GMAC
Tunnel Mode	
ESP Encapsulation	
Internet Key Exchange Version 2 (IKEv2)	

- Static virtual tunnel interface
- IPv4/IPv6
- OSPF/BGP
- Policy Based Routing
- Multicast Routing
- NAT Traversal**
- L3 segmentation over IPsec
- L2 segmentation over IPsec

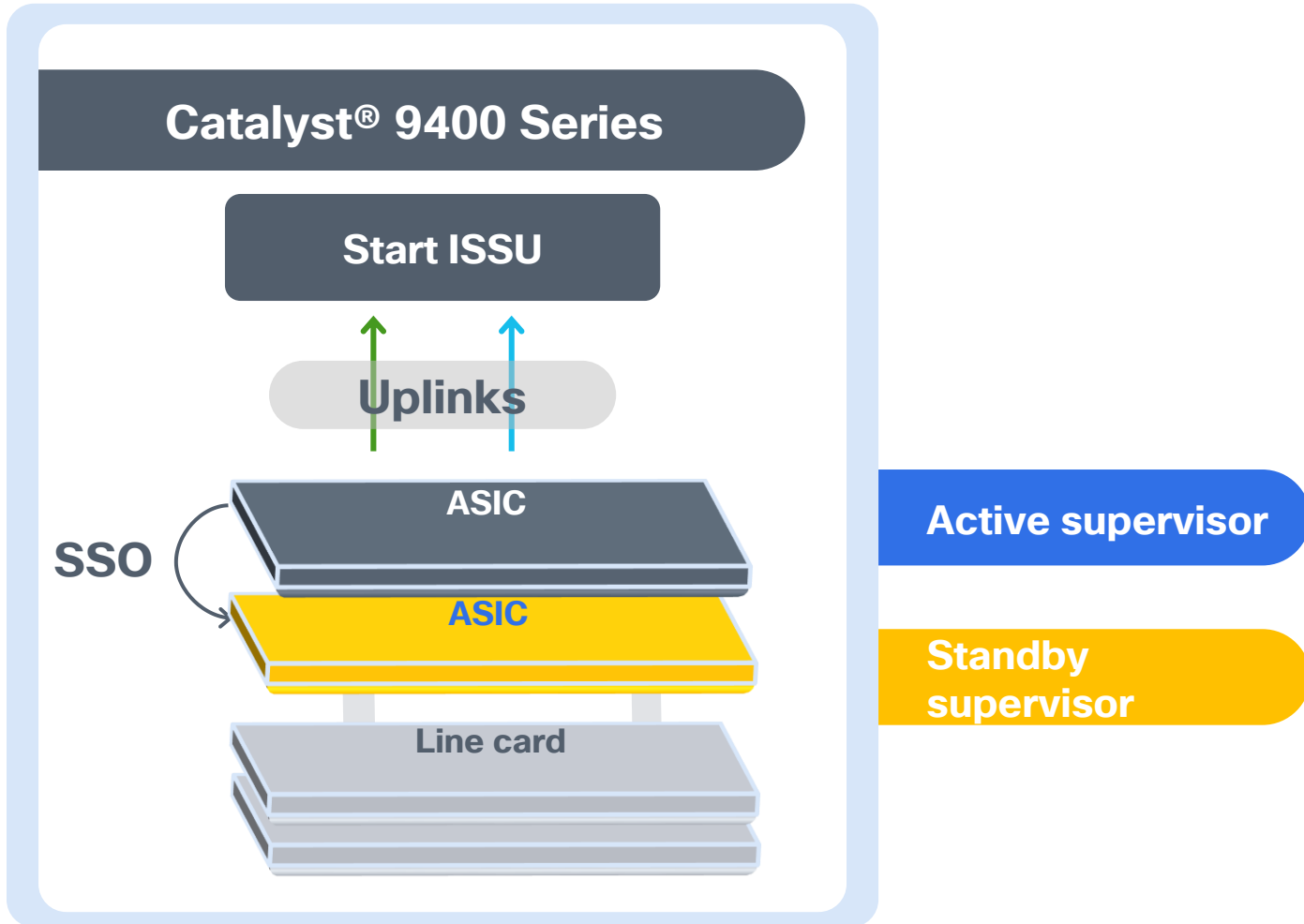
128 Tunnels / 384 SA's

* C9400X support with 17.11

HSEC License required for IPsec

Software Upgrades with ISSU

Dual supervisors (Required)



- Uplinks on both Active and Standby supervisors are forwarding traffic
- Convergence takes less than 200 ms during the switchover

Power Redundancy

Normal

PS failure

Combined
(default)



Load sharing on all PSs



Load sharing on functional PSs

Redundant



Load sharing on active PSs
Standby PS in output disabled



Standby PS becomes active
System enters alarm state

Failed PS

Active

Standby

Power redundancy: N+1 and N+N

- Default active is PS1 through 4, and standby is PS5 through 8
- Standby power slots are configurable



- Default active is PS1 through 7, and standby is PS8
- Standby power slot is configurable



```
SW(config)#power redundancy-mode redundant ?  
  N+N  Redundant N+N (N is active, N is standby)  
  N+1  Redundant N+N (N is active, 1 is standby)  
SW(config)#power redundancy-mode redundant N+1 ?  
  <1-8> standby slot in N+N mode  
SWR(config)#
```

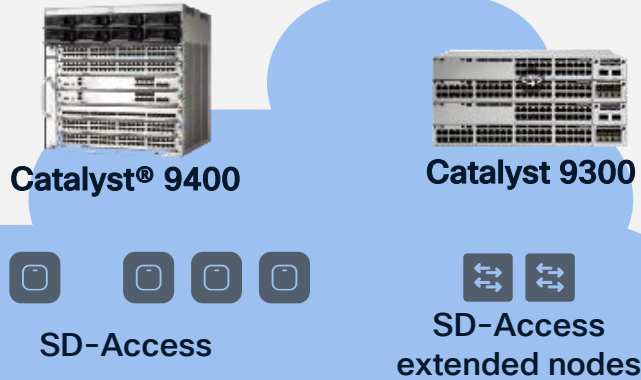
```
SW(config)#power redundancy-mode redundant ?  
  N+N  Redundant N+N (N is active, N is standby)  
  N+1  Redundant N+N (N is active, 1 is standby)  
SW(config)#power redundancy-mode redundant N+1 ?  
  <1-8> standby slot in N+1 mode  
SWR(config)#
```

Active

Standby

Cisco Catalyst Access Switching Positioning

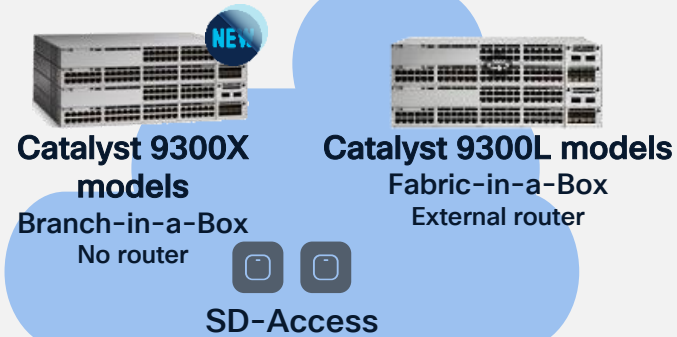
Secure, resilient campus



Choose Catalyst 9400 Series or Catalyst 9300 Series modular uplink models (C9300X and C9300) models

- Designed for security, mobility, IoT, and cloud
- High availability, ETA, application hosting

Business-critical branch



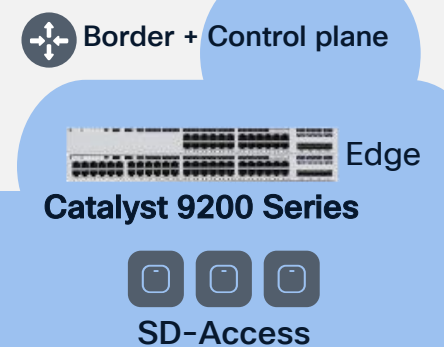
Choose: A) Catalyst 9300 Series fixed uplink models (C9300L models) with external router

- Full security with visibility
- High availability, ETA, application hosting

B) Catalyst 9300X models for complete branch solution

+ IPsec, firewall, additional app hosting

Simple branch



Consider Catalyst 9200 Series (C9200 and C9200L models)

- Extend automation and policy
- Limited VRFs

Choose Catalyst 9400 or 9300/9300L for innovations in Intent-Based Networking (IBN)



Full SD-Access, fabric-in-a-box,
Embedded Wireless Controller



Wired Assurance,
SD-Access, AVC



ETA,
MACsec-256



On-box
app hosting



HA, hot patching,
StackPower, Cisco UPOE+

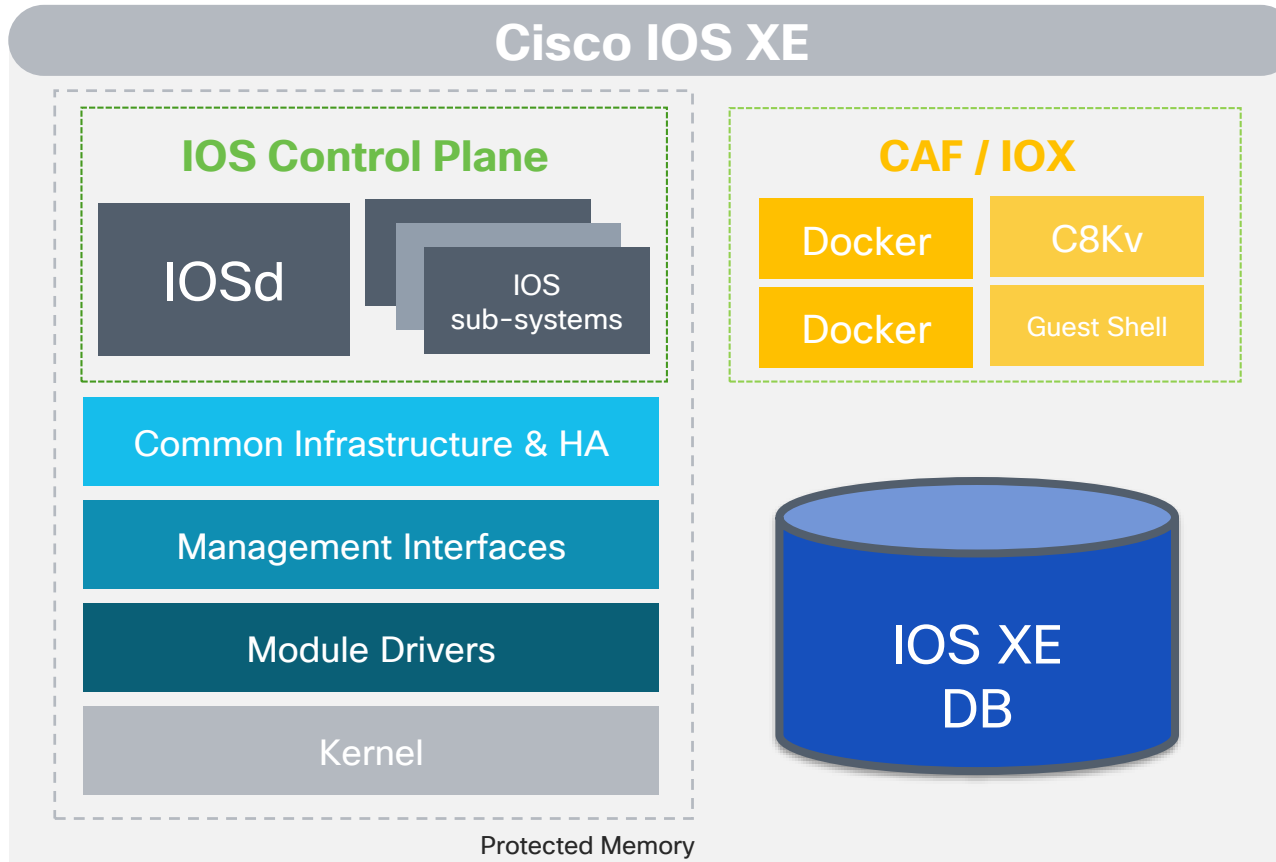
Entry point for IBN



SD-Access, fabric edge, Full
NetFlow

IOS-XE Software & Innovations

Cisco IOS XE – A Modern Operating System



Cisco IOS subsystems

Resiliency and High Availability



Cisco IOS XE database

Programmability and Open models

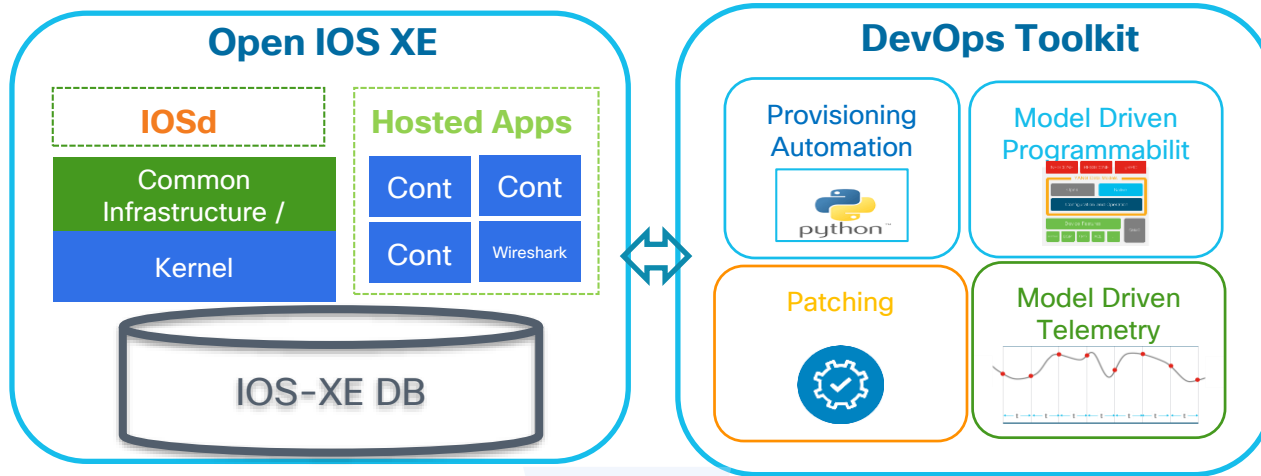


IOX + Docker containers

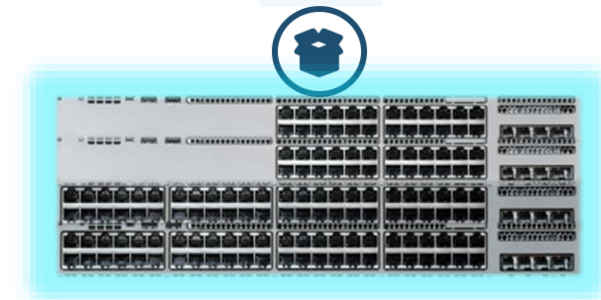
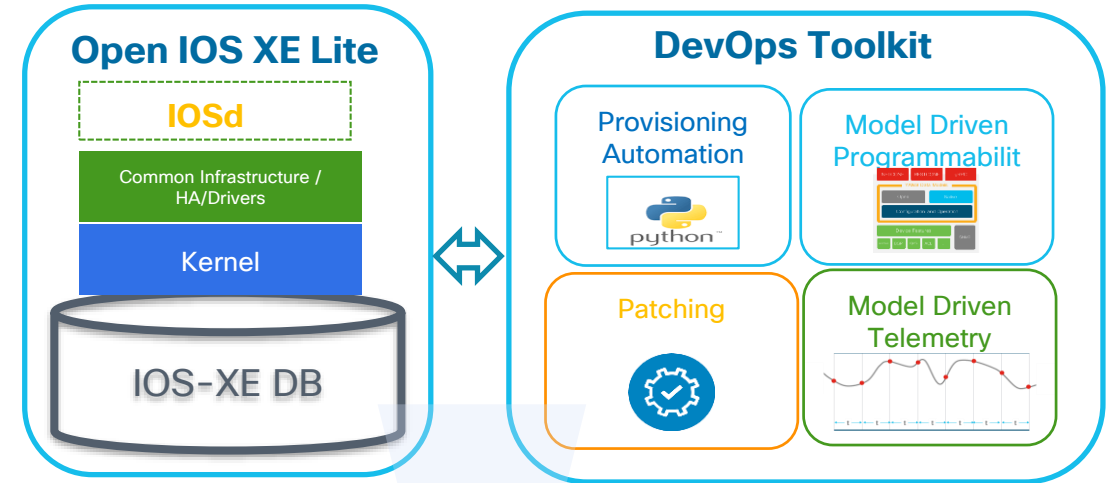
Cisco and 3rd-party App hosting

Open, Model Driven & Secure Operating System

Open IOS-XE



Catalyst 9k Family – 9300/9400/9500/9600



Catalyst 9200/9200CX

Software Maintenance Upgrade



SMU is a package that can be installed on a system to provide a fix or a security resolution to a released image.

- **Hot Patching** - does not require explicit reload after installation to get activated. (*not traffic-affecting*)
- **Cold Patching** - requires a system reload after installation to get activated. (*traffic-affecting*). The 9200 family supports only this.

- **Bundle SMU** - One single SMU file containing and applying multiple SMU fixes on the backend.
- **Independent SMU** - One single SMU file tailored to address a specific bug or vulnerability.

NEW

Patching can also be performed using Cisco DNAC

C9300-Access.cisco.com (172.26.192.131) Image Update

Date: Mar 16, 2023 12:15 PM Duration: 4 minutes 20 seconds Status: ● Successfully Activated cat9k_iosxe.17.03.04.SPA.bin cat9k_iosxe.17.03.04.CSCwa53947.SPA.smu.bin

DNAC Version: Guardian 2.3.3
License Level : DNA Advantage

Operations Checks

> ● SMU Distribution 1 minute 51 seconds

✓ ● SMU Activation 2 minutes 27 seconds

SMU Activation of image: cat9k_iosxe.17.03.04.CSCwa53947.SPA.smu.bin on device: 172.26.192.131 completed successfully

> ● Pre Activation Script Execution 1 second

> ● Activation 2 minutes 26 seconds



Reduces time and scope of testing



Self-sufficient and reliant bug fix solution for **PSIRT, CFD & IFD**



Hot Patching



EMR Releases with **371** SMU files available

Cisco innovations in Power over Ethernet (PoE)

Deliver a robust low-voltage infrastructure

2-event classification

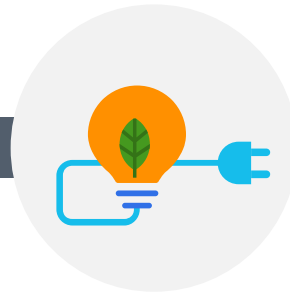
- Fast power negotiation without Link Layer Discovery Protocol (LLDP)
- Physical layer negotiation < 1 second

Perpetual PoE*

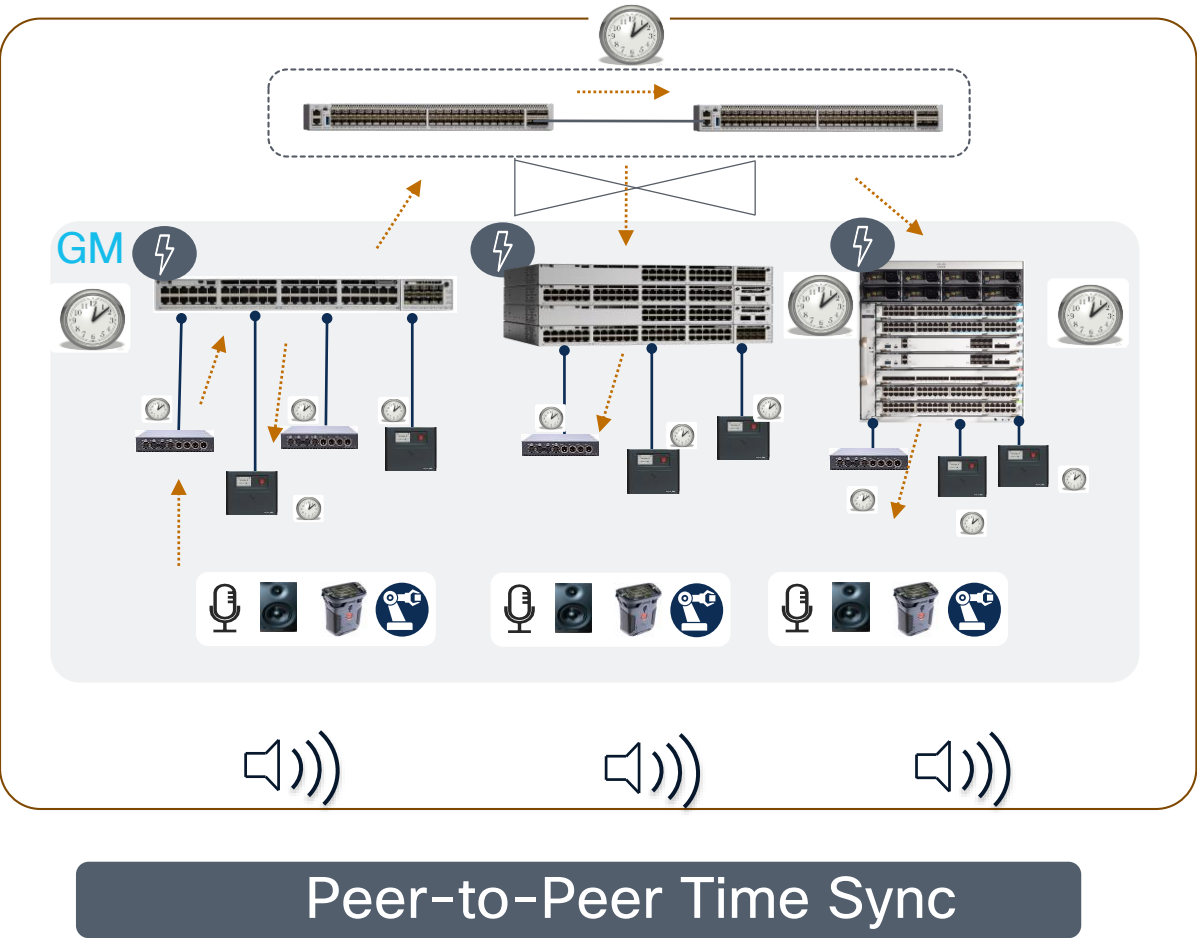
- Uninterrupted PoE power during control plane reboot

Fast PoE*

- Bypasses Cisco IOS® control plane boot
- Restores power to Powered Device (PD) within 30 seconds of power resumption



Time Sensitive Networks with Catalyst 9k



Timing Protocol

Precision Time Protocol

Hardware Timestamping

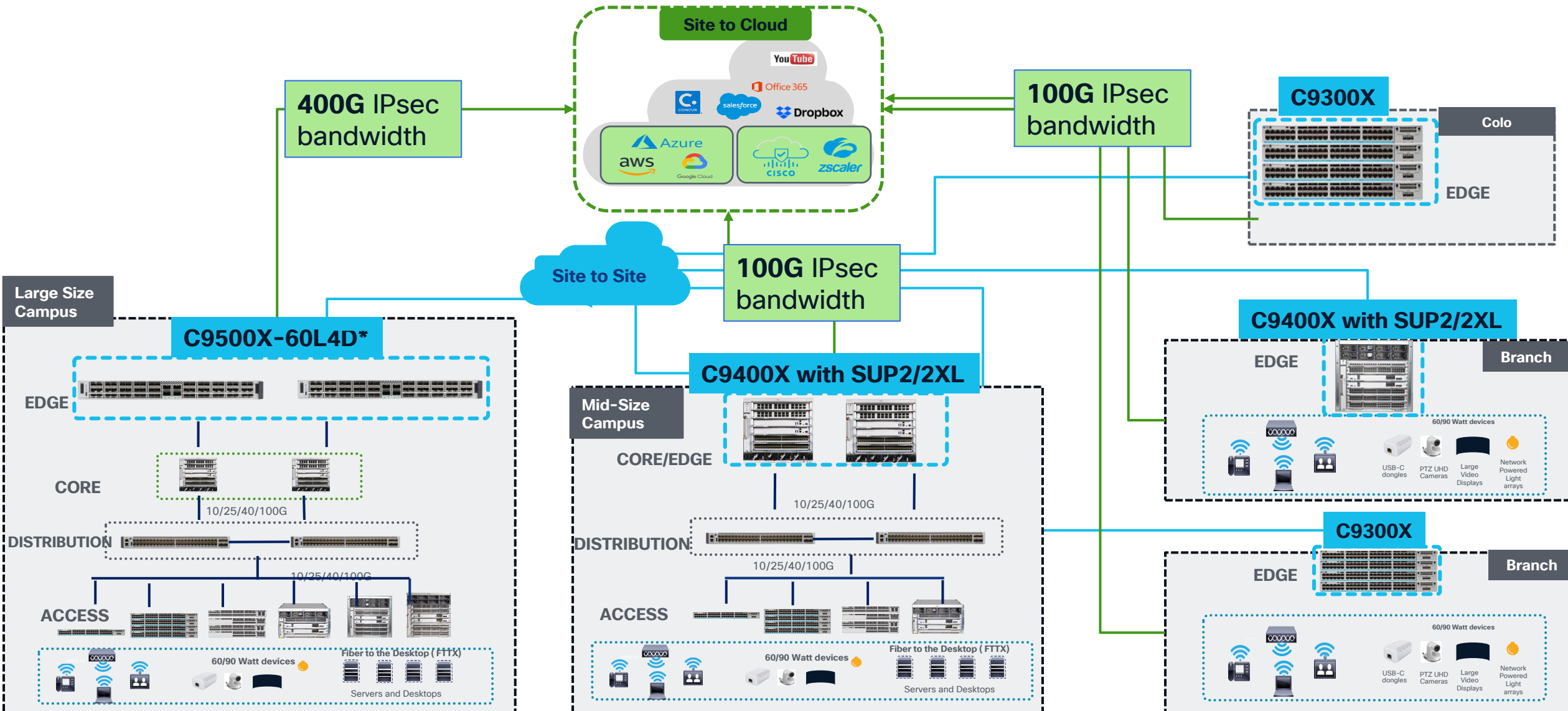
Transparent / Boundary Clock

Industry Standard – IEEE 1588v2

< 100ns Accuracy

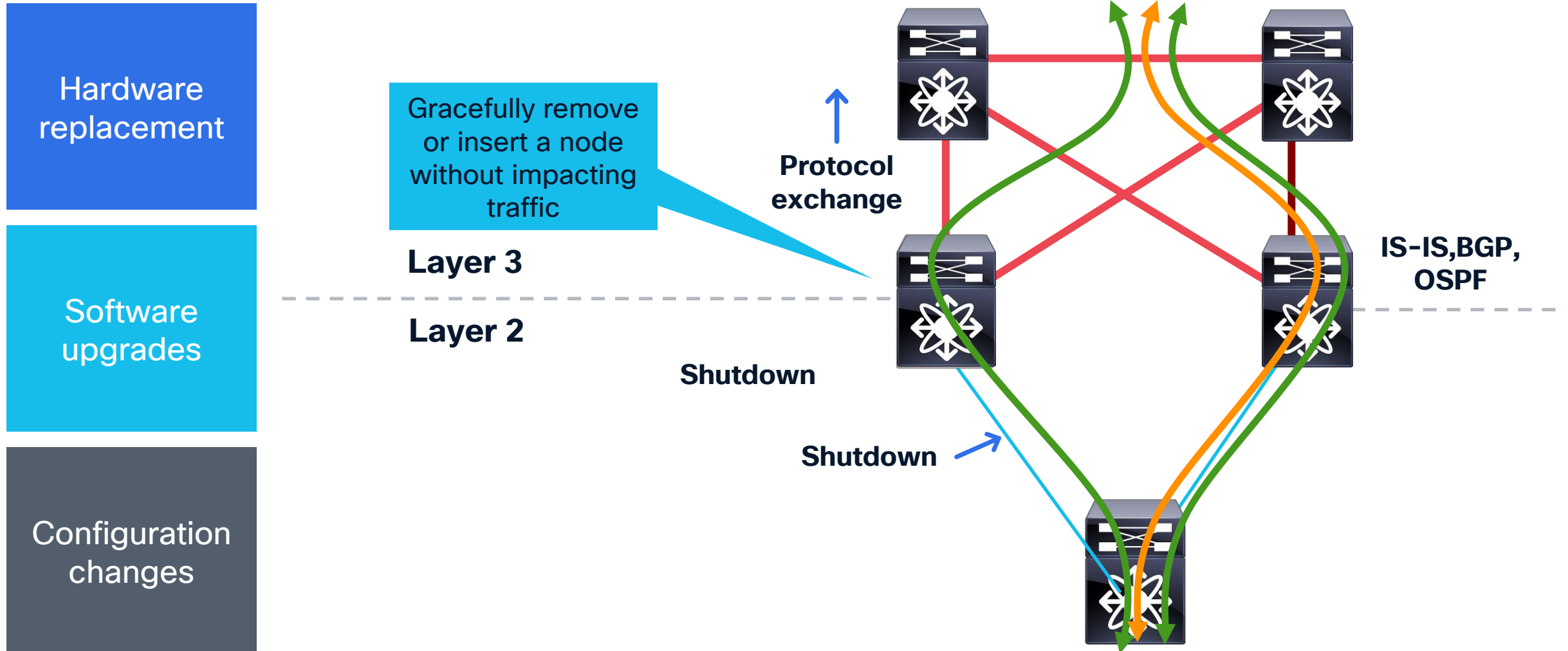
 Telecommunication	 Financial	 Multimedia Broadcast	 Industrial Automation
 Military Systems	 Smart Grid	 Airline Industry	

End-to-End Encryption in Enterprise Campus with IPsec

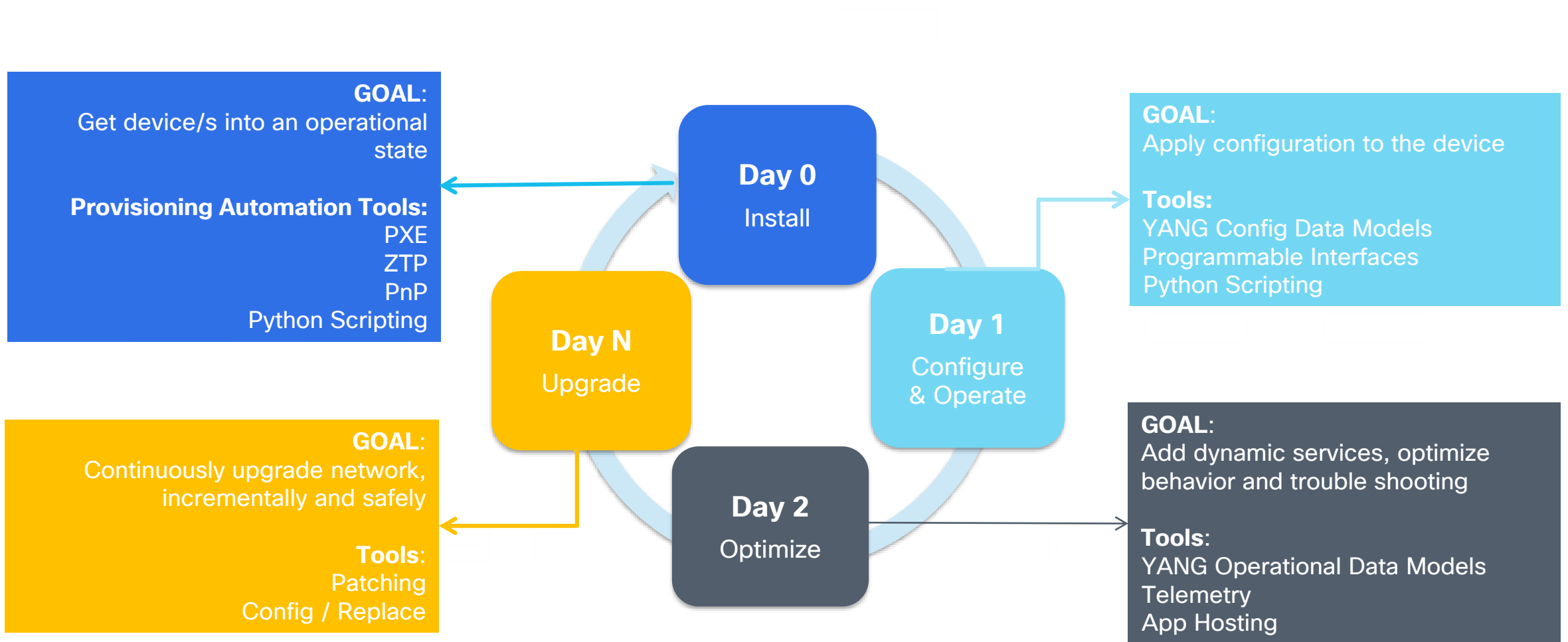


* Limited Availability

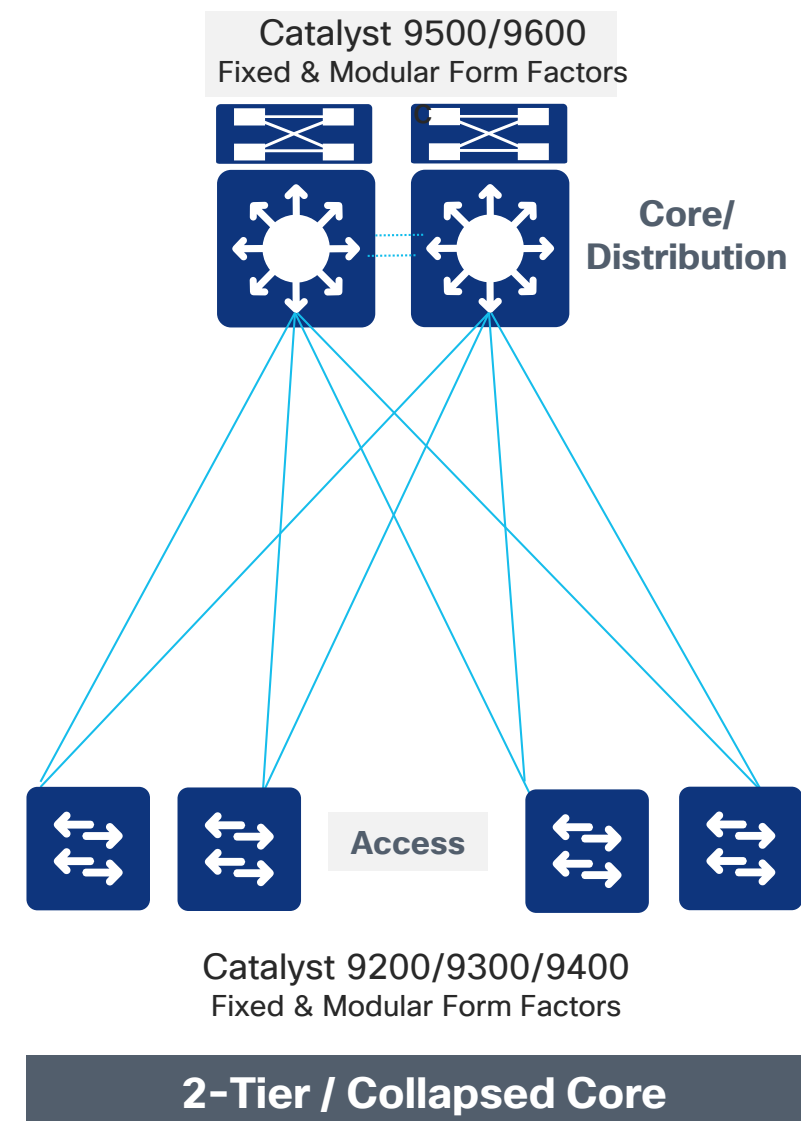
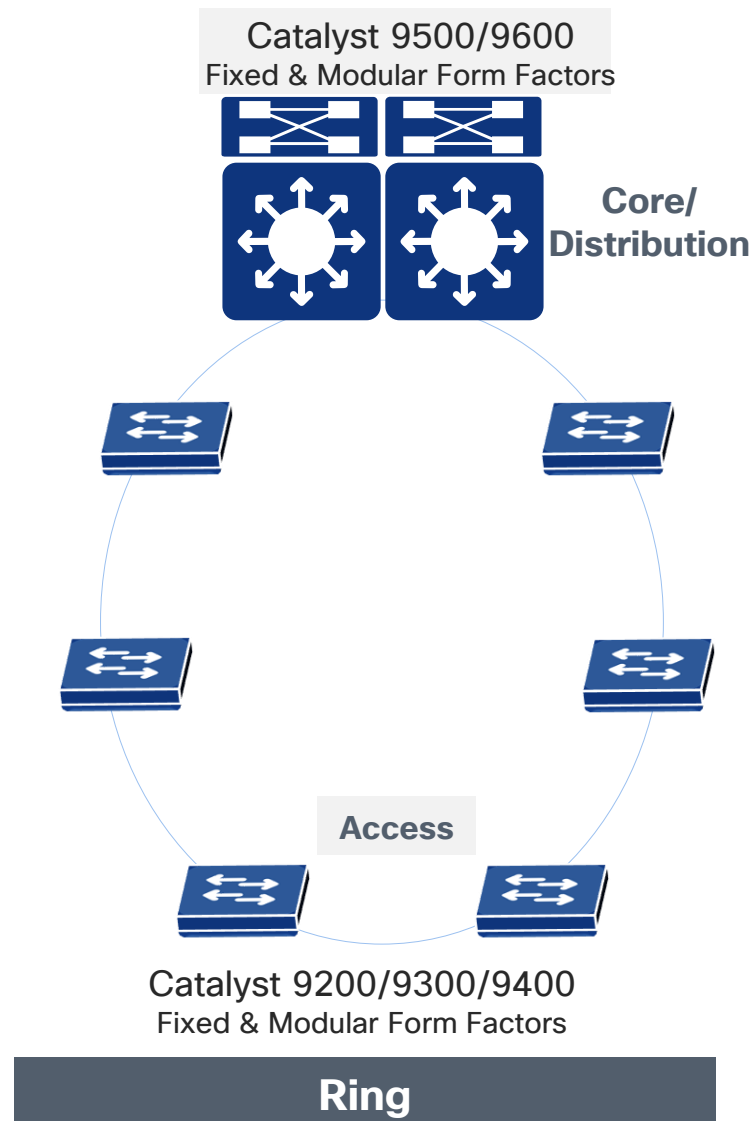
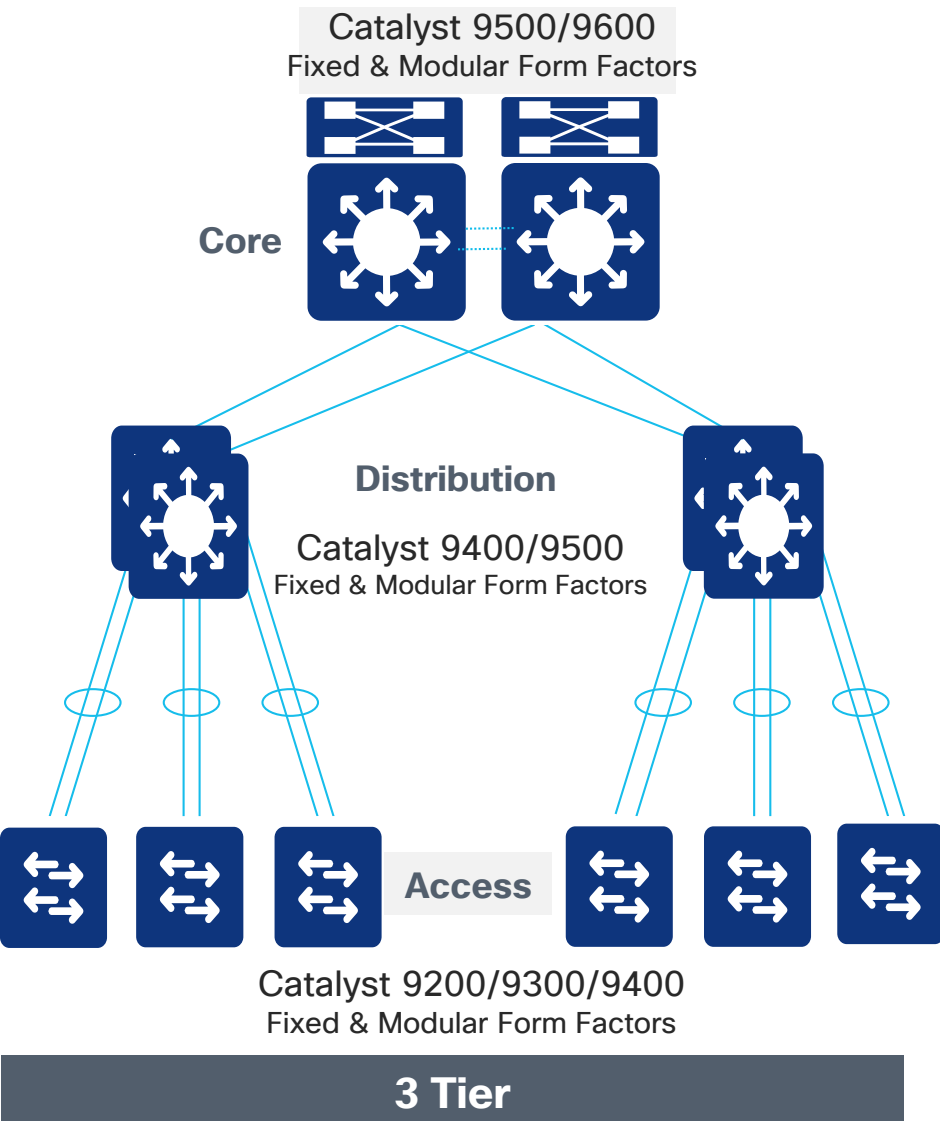
Graceful Insertion and Removal (GIR)



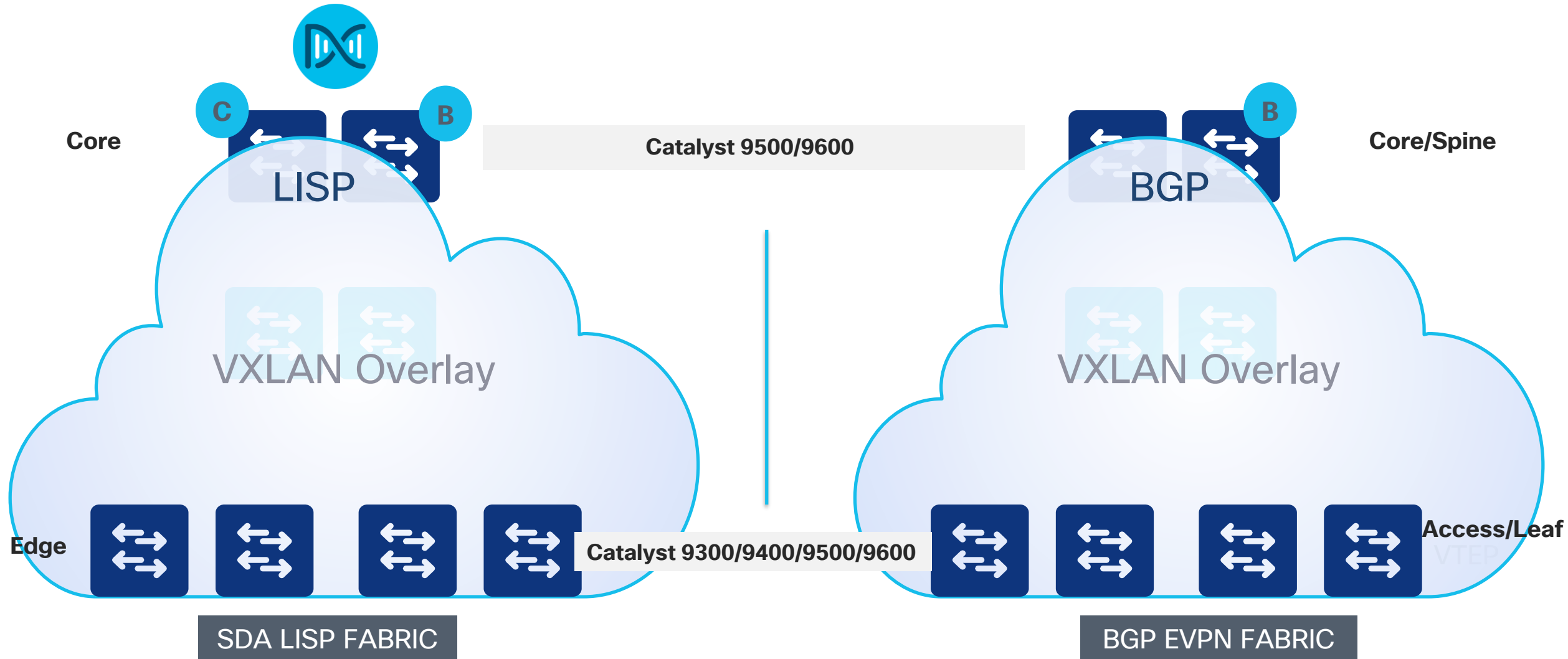
Comprehensive Automation Lifecycle with Catalyst 9000



End to End Catalyst 9000 for Traditional Campus Networks



End to End Catalyst 9000 for Fabric Based Networks



Meeting customers where they are



Cloud management

Prefer cloud-enabled delivery for simplicity



On-prem management

Use cases require on-prem delivery

Intuitive and efficient

Powerful and customizable



Meraki

+



Catalyst



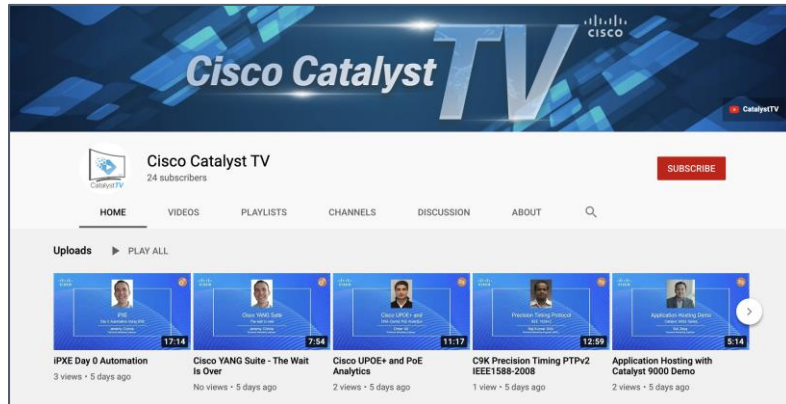
Catalyst 9000 collateral

Guides and learning material

FYI

Catalyst TV YouTube

SUBSCRIBE

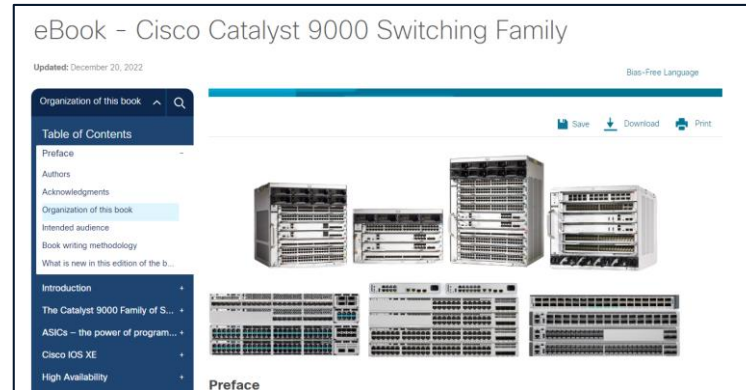


[Cs.co/CatalystTV](https://cs.co/CatalystTV)

Short form videos on variety of topics related to Catalyst products

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Catalyst 9000 eBook

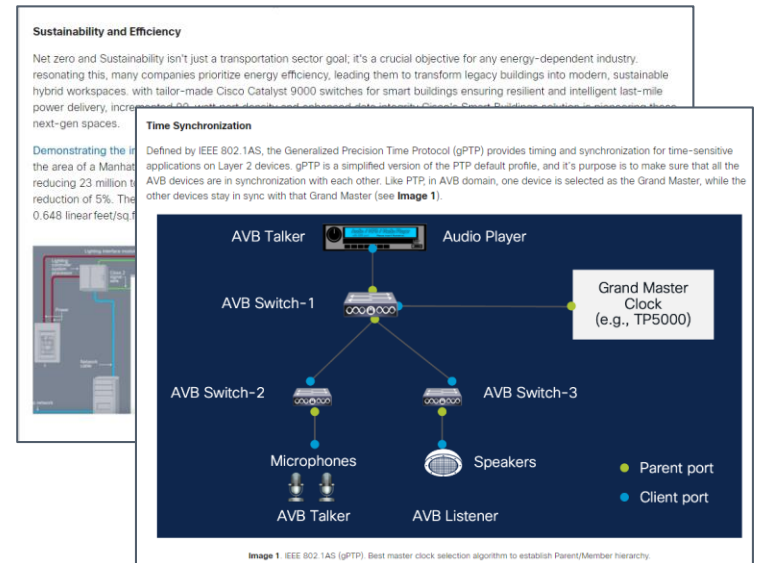


Scan to get your C9K E-Book

Detailed book to get started with Catalyst 9000 switches

BRKARC-2098

Catalyst 9000 communities' blogs



Scan for the link

Dedicated blog posts on various use-cases and topics

79

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