



# Catalyst 9000 Switching Update

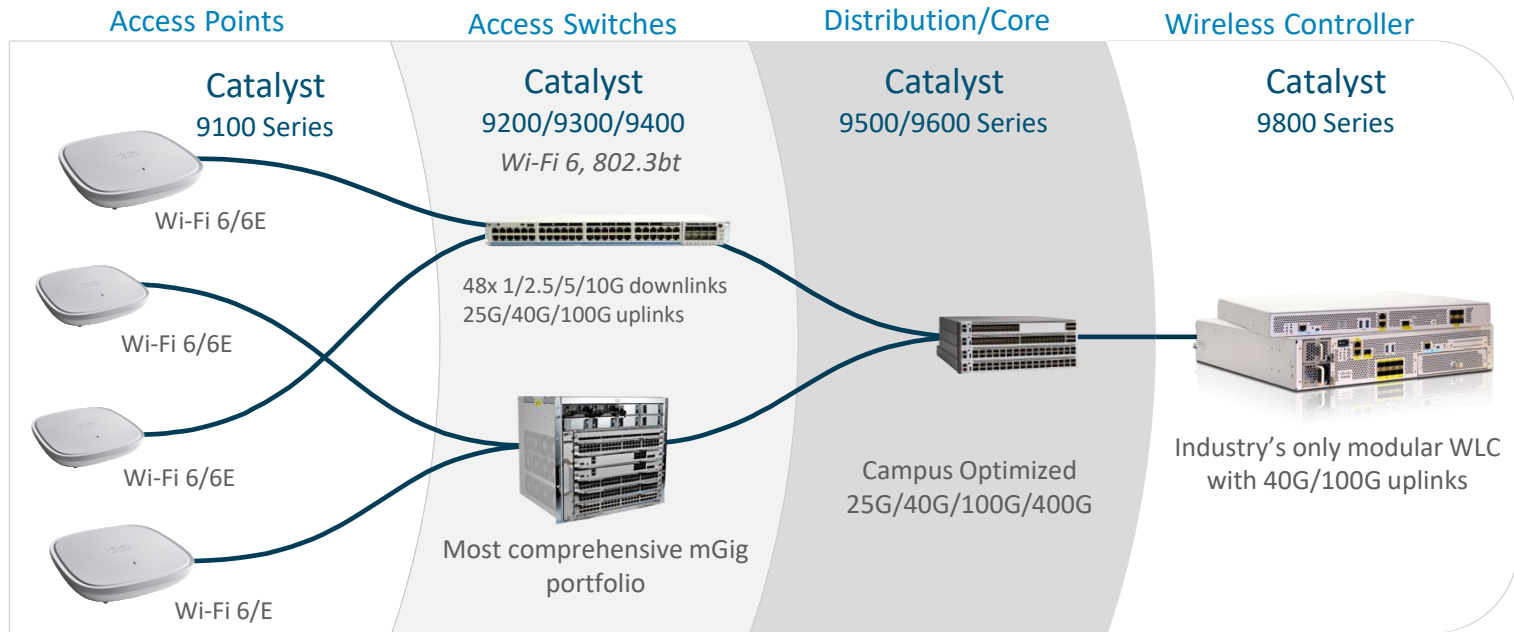
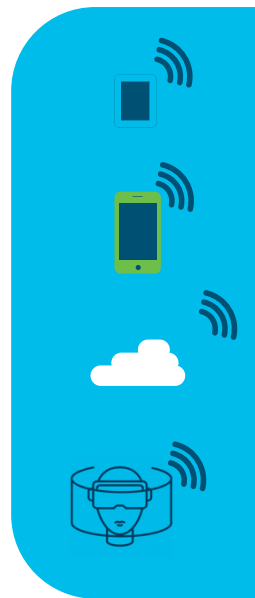
Jaromír Pilař

Technical Solutions Architect, CCIE #2910

9.5.2023

# Cisco Catalyst Access Network

## Best Access Experience for IT and IoT



← Fully Integrated End to End →

Built for intent-based networking



Automation



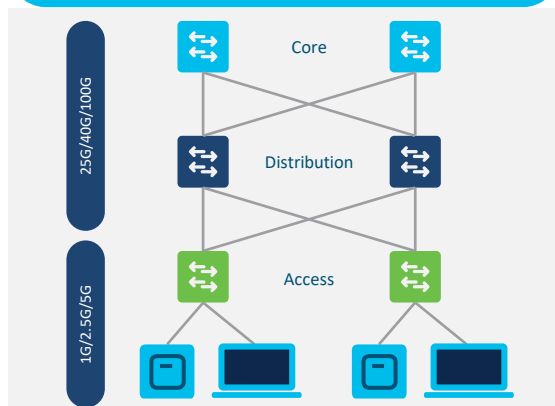
Security



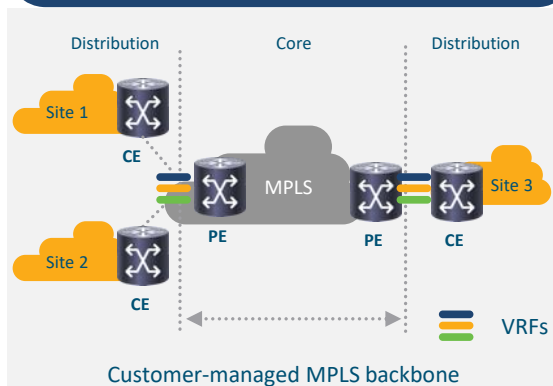
Analytics

# Cisco Catalyst 9000 – flexibilita nasazení

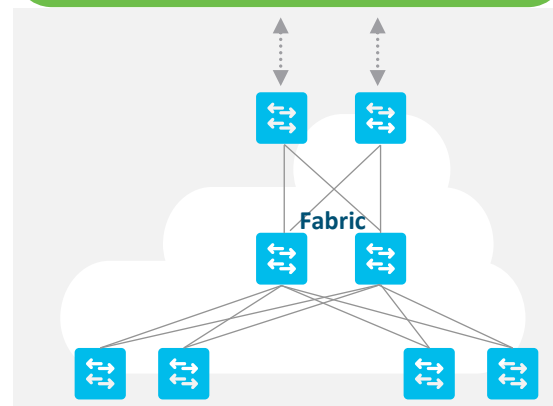
## Klasický vícevrstevný model



## Layer 3 Core, MPLS, VPLS,...



## Fabric: SDA, BGP-EVPN



### Cisco řešení "na klíč"

- SD-Access
- Cisco DNA Assurance
- Cisco DNA Service for Bonjour
- Cisco DNA Application Visibility Service
- Encrypted Traffic Analytics



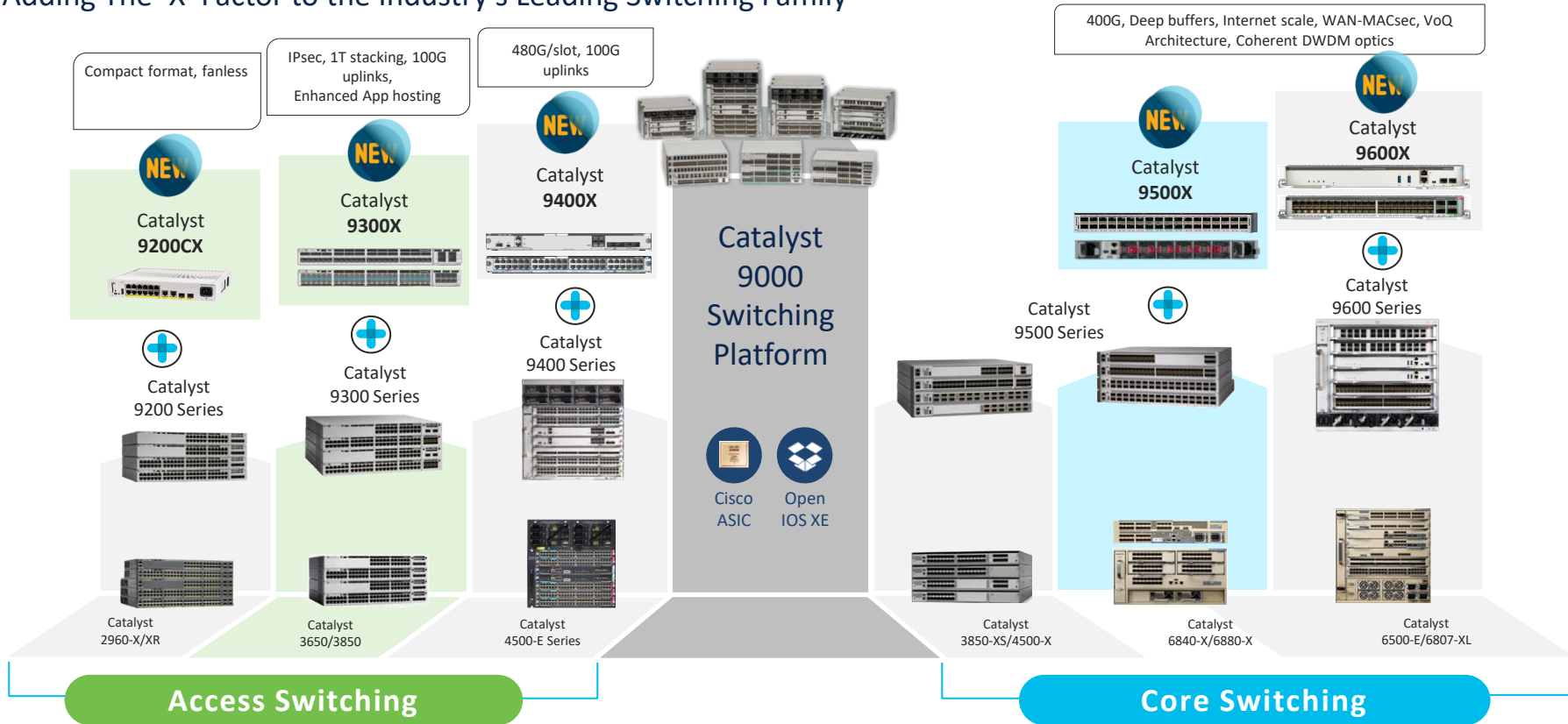
### Do-It-Yourself (DIY) řešení

- BGP-EVPN
- MPLS/VPLS
- Tradiční 2/3-vrstvé topologie
- Programabilita – YANG modely s Netconf, Restconf, gNMI API

One platform. Any place. Any speed (10Mbps to 400Gbps)

# Catalyst 9000 – Expanding Industry Leadership

## Adding The 'X' Factor to the Industry's Leading Switching Family



# Cisco Catalyst 9200CX Series

Next generation of compact access switches for intent-based networking



Security



Resiliency



Application  
experience

## 9200 (Fixed Uplinks and Fanless)

### Data

\* Power via UPOE/UPOE+ Uplink!



**C9200CX-12T-2X2G**

12x 1G Ports

802.3bt PD Port

3 x 1G Copper and 2 x 1/10G SFP Uplinks

### POE+



**C9200CX-12P-2X2G**

12x 1G Ports



**C9200CX-8P-2X2G**

8x 1G Ports

2 x 1G Copper and 2 x 1/10G SFP Uplinks

External PS on Data SKU  
Fixed Internal PS on PoE+ SKUs

\* Class 6 802.3bt (60W) minimum needed to power

## Cisco Catalyst 9200 Series Highlights

UADP 2.0 Mini

Cisco IOS XE Lite Software

SD-Access

MACsec-256 link encryption

Trustworthy solutions

Perpetual/Fast PoE

Programmability

Cold patching

Full Flexible NetFlow  
streaming telemetry

All Uplink Ports can be simultaneously used. Providing maximum bandwidth when needed.

# Catalyst 9200CX Family

Shipping

## PoE+ and Data Models

### C9200CX-12P-2X2G



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

### C9200CX-8P-2X2G



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

### C9200CX-12T-2X2G



- 12 x 1G data
- 3 x 1G copper and 2 x SFP+ uplinks
- External power adapter (80W)
- 802.3bt Class 6 powered (60W)

Q1CY23

## HVDC Models

### C9200CX-12P-2X2GH



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

### C9200CX-8P-2X2GH



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

# Cisco Catalyst 9200 Series



Security



Resiliency



Application experience

## Catalyst 9200L Fixed uplinks, limited scalability



48 ports Full POE+/Data, 1G/10G Uplink



48 ports Full POE+, 12xmGig, 10G Uplink

48 ports Full POE+, 8xmGig, 25G Uplink



24 ports Full POE+/Data, 1G/10G Uplink



24 ports Full POE+, 8xmGig, 10G Uplink

24 ports Full POE+, 8xmGig, 25G Uplink

## Catalyst 9200 Modular uplinks



48 ports Full POE+/Data

48 port Full POE+ with 32 VN\*\*



48 ports Full POE+, 8xmGig



24 ports Full POE+/Data

24 ports Full PoE+ with 32 VN\*\*



24 ports Full POE+, 8xmGig

Modular fans

Higher Efficiency AC FRU Power Supplies

FRU Fan



125W



600W



1000W

Modular uplinks

FRU Uplinks\*



4x 1G



4x 10G



2x 25G



2x 40G

# Cisco Catalyst 9300L Series

Fixed Uplink Models

## Fixed Uplinks ( C9300L Models )

1G & PoE+



48/24 ports Data



Fixed 1G or 10G  
uplinks



48/24 ports PoE+

Fixed 1G or 10G  
uplinks



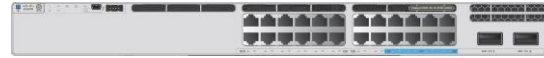
UPOE & mGIG models

C9300L-48UXG-2Q



36 x 10/100/1000 & 12 x 100/1/2.5/5/10G UPOE Ports

C9300L-24UXG-2Q



16 x 10/100/1000 & 8 x 100/1/2.5/5/10G UPOE Ports

C9300L-48UXG-4X



36 x 10/100/1000 & 12 x 100/1/2.5/5/10G UPOE Ports

C9300L-24UXG-4X



16 x 10/100/1000 & 8 x 100/1/2.5/5/10G UPOE Ports

Fixed 40G  
uplinks

Fixed 10G  
uplinks

Optional StackWise-320 Kit

Platinum-rated power supplies

Modular Fans

Common  
components



Stack Adapters



50CM-1M-3M



315W AC



715W AC/DC



1100W AC



1900W AC

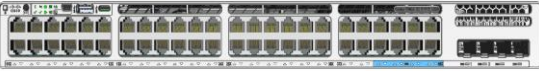

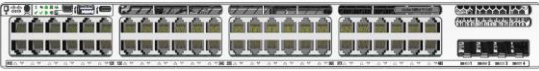











\* DC PS is Gold-Rated



# Cisco Catalyst 9300LM Series

## Fixed uplink replacement for Catalyst 3650-mini

 <p>8 mGig Ports, 4x1/10/25G Uplink</p> <p>48 Port mGig UPOE</p>	 <p>4x1/10/25G Uplink</p> <p>48 Port 1G UPOE</p>
 <p>4x1/10/25G Uplink</p> <p>48 Port 1G Data</p>	 <p>4x1/10/25G Uplink</p> <p>24 Port 1G UPOE</p>

-  UADP 2.0
-  Multicore X86 CPU
-  Open IOS XE
-  USB 3.0 type-A Front Panel SSD
-  Stackable with C9300L
-  mGig
-  802.3bt Type-3
-  25G Ready

Modular fans\* | Modular Stacking | Higher-efficiency AC and DC power supplies



600W AC

715W DC

1000W AC

Cisco Catalyst 9000 leadership	
Same UADP performance as C9300L	
Cisco IOS® XE Software	
SD-Access	
x86 CPU and containers	
Encrypted Traffic Analytics (ETA)	
AES-256/MACsec-256	
Trustworthy systems	
Cisco StackWise-320	
IEEE1588 and AVB	
NBAR2	
Perpetual/Fast PoE	
Model-driven programmability	
Patching/GIR	
Streaming telemetry	
NEBS L3 Certified	



488 mm

Catalyst C9300L



305 -335 mm

Catalyst C9300LM

Platform Depth <350 mm		
	AC PSU	DC PSU
UPOE	335 mm	325 mm
Data	315 mm	305 mm

Note: \* Data SKU utilize fixed fans

# Cisco Catalyst 9300 Series

\* Supported on C9300X-24Y and C9300X-48HX/TX  
 \*\* Last 4 ports disabled on C9300X-48HXN

## C9300 SKUs with Modular Uplinks

1G Copper ports with PoE/UPOE/UPOE+



48/24 ports Data 1G



48/24 ports UPOE 1G



48/24 ports PoE+ 1G



48/24 ports UPOE+ 1G



48/24 ports UPOE 1G – 9300B

2-4x  
Scale/Buffer

## C9300X SKUs with Modular Uplinks

High Density Multigigabit Models with UPOE+

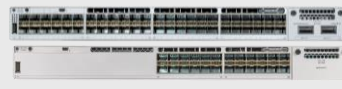


Multigigabit Models with UPOE



48/24 ports mGig

1G Fiber Models



48/24 ports SFP 1G

1/10/25G Fiber Models



C9300 Only Modular Uplinks



4x Multigigabit



4x 1G SFP



8x 1/10G SFP/SFP+



2x 1/10/25 G SFP/SFP+



2x 40G QSFP

StackWise and StackPower Cables



50CM-1M-3M



30CM-150CM

Platinum rated power supplies



315W AC



715W AC/DC



1100W AC



1900WAC

Modular Fans



C9300X Only Modular Uplinks



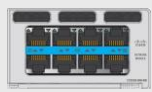
4x 40/100G \*



2x 40/100G



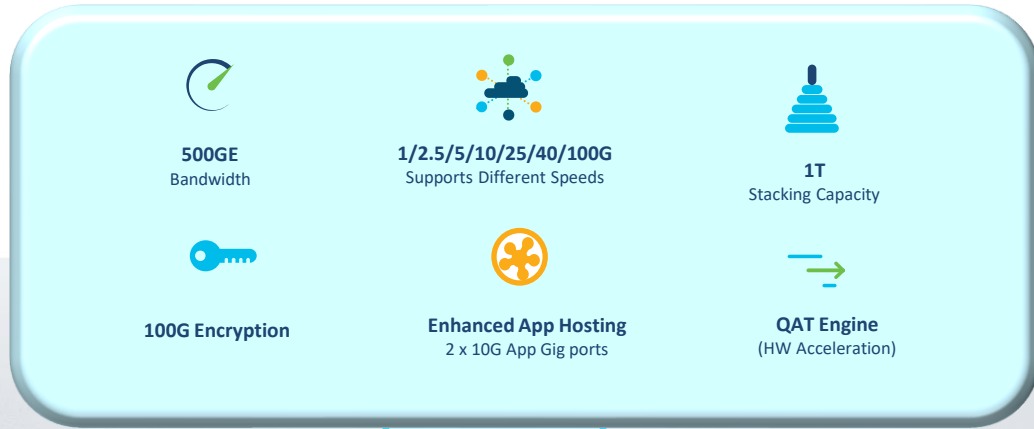
8x 10/25G \*\*



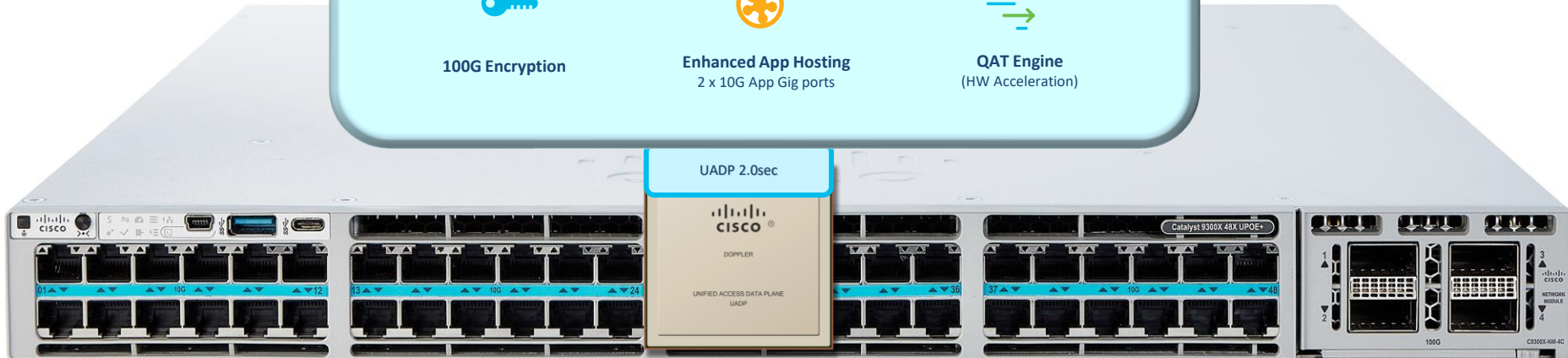
8x mGig

Common Components

# Catalyst 9300X – New High Performance Access Switch



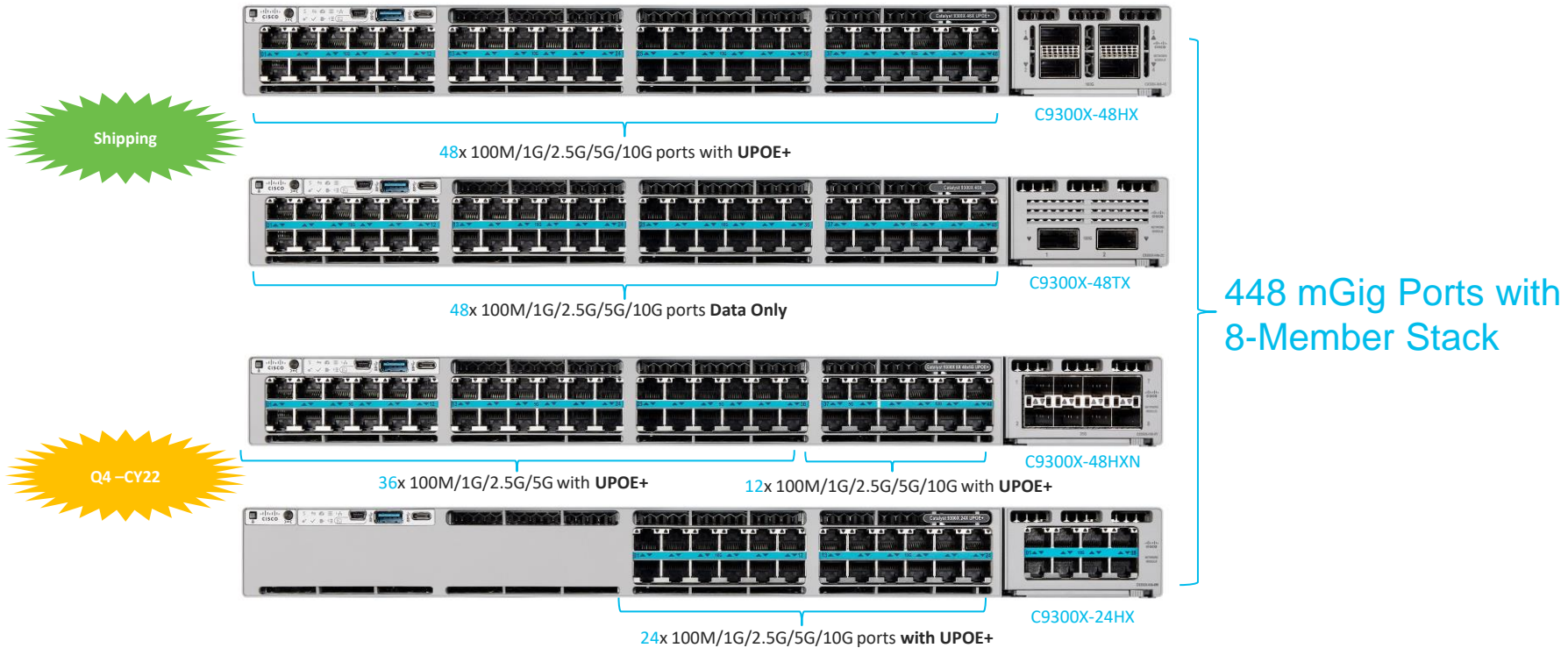
- 500GE Bandwidth
- 1/2.5/5/10/25/40/100G Supports Different Speeds
- 1T Stacking Capacity
- 100G Encryption
- Enhanced App Hosting  
2 x 10G App Gig ports
- QAT Engine  
(HW Acceleration)



48 x mGig-10G + 90W UPOE+

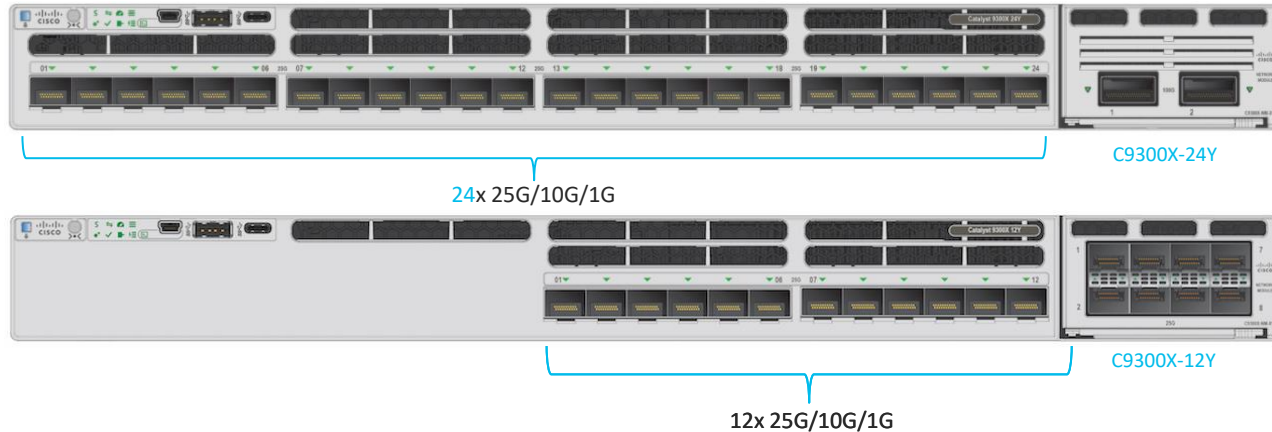
Flexible Uplink Options

# Catalyst 9300X Multigigabit Models

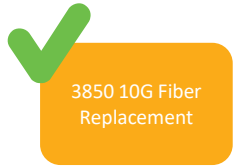


Highest Multigigabit Ports in the Industry with Standalone and StackWise-1T

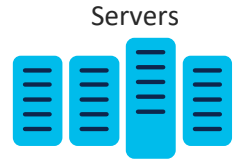
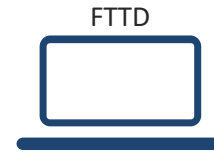
# Catalyst 9300X High Speed Fiber



Stackable with  
C9300/C9300X



Collapsed Access



Bringing Stackable High Speed fiber to the Access

# Cisco Catalyst 9400X



**Up to 240G**  
bandwidth



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



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



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

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

**UADP 2.0XL**



**Sup-1/1XL**

**UADP 3.0sec**



**Sup-2/2XL**

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

**NEW**



**Up to 1.6T**  
Bandwidth



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



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



**Up to 36 MB**  
Unified packet  
buffer



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



**Customizable**  
Templates for  
higher Scale\*

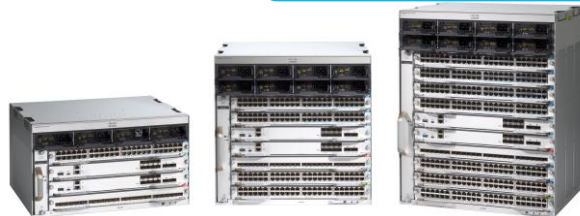
\* Hardware Capable, Software Support not committed

**Unmatched Flexibility**

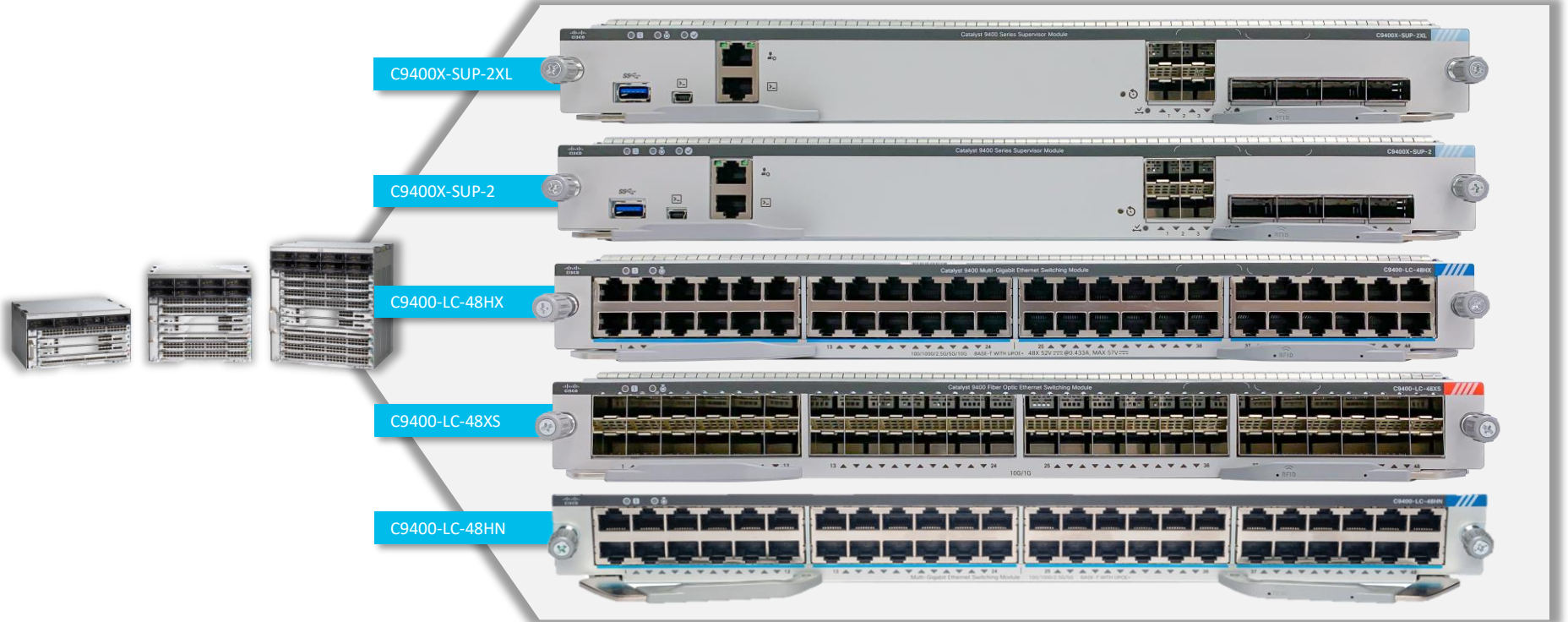
**Maximum Investment Protection**

**100G Leadership in Access**

**Same Series, Chassis options – New SUPs and Line cards**



# Same Chassis with New Supervisors and Line cards



NOTE: Same Supervisor model required in Dual SUP/SSO configuration

# 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
<b>C9400-LC-48HX</b>	UPOE+	-	-	-	240	480
<b>C9400-LC-48XS</b>	Fiber	-	-	-	240	480
<b>C9400-LC-48UX</b>	UPOE	80 / 240	80 / 120	80	240	240
<b>C9400-LC-24XS</b>	Fiber	80 / 240	80 / 120	80	240	240
<b>C9400-LC-48HN</b>	UPOE+	80 / 120	80 / 120	80	240	240

Not Supported

Bandwidth in Gbps

**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



# 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



10<sup>x</sup>

Routing &  
MPLS Scale



C9500X-28C8D



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



50GE, 400GE,  
Coherent DWDM



## 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\*)

Maximum Investment Protection

400G Leadership in Campus

Unmatched Flexibility

# 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



First 7nm ASIC providing lowest watts/GE power consumption



Fully P4 programmable enabling feature velocity

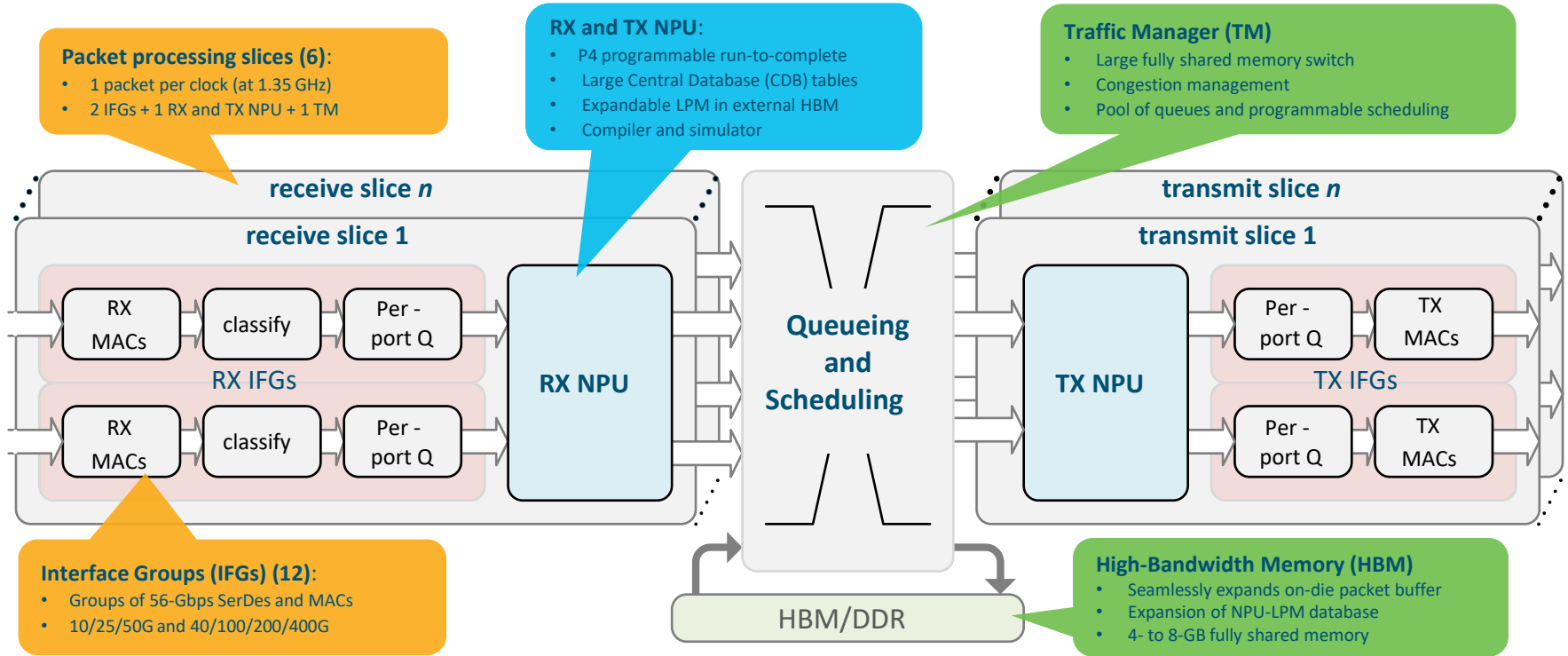


Multi slice architecture for flexibility and scale

Routing Capabilities with Switching Power and Performance



# Silicon One ASIC architecture overview



# Catalyst 9000 Series – Common Building Blocks



Programmable x86  
Multi-Core CPU

Application Hosting  
Secure Containers



Open IOS XE<sup>®</sup>  
Polaris

Model-Driven APIs  
Modular Patching



Cisco Silicon One<sup>™</sup>  
Q200 ASIC

Programmable Pipeline  
Flexible Tables

Same binary image for both UADP and Silicon One C9K platforms\*

# Catalyst 9500 Series

Extending the Catalyst 9500 High-Performance Fixed Core

Non-XL Scale

**Catalyst 9500H**  
(UADP 3.0)



C9500-32C / C9500-32QC



C9500-48Y4C / C9500-24Y4C

Total Capacity

**3.2 Tbps**

32 x 100G or  
48 x 25G + 4 x 100G

XL Scale

**Catalyst 9500X**  
(S1 Q200)



C9500X-28C8D

Total Capacity

**6.0 Tbps**

36 x 100G or  
28 x 100G + 8 x 400G

**2x**

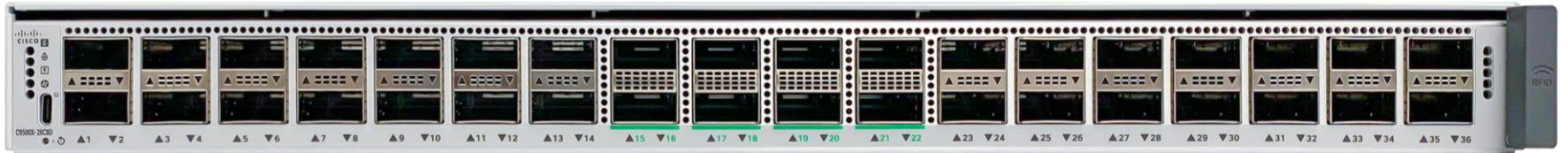
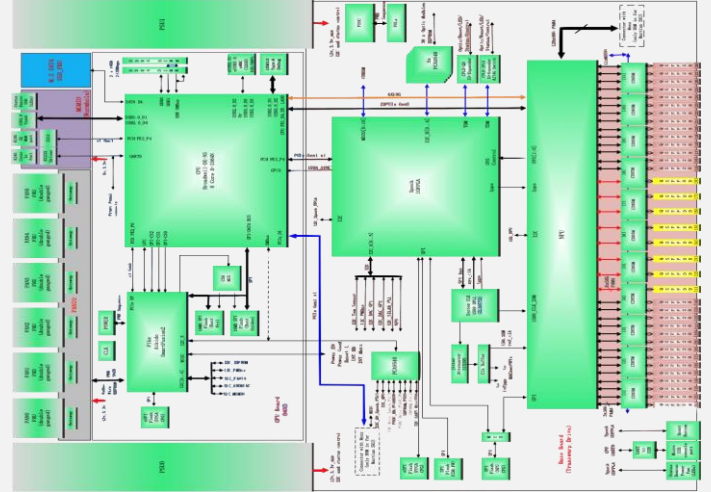
**NEW**

# C9500X-28C8D

Gen2 Fixed 1RU QSFP Switch - 36x 100G / 28x 100G + 8x 400G

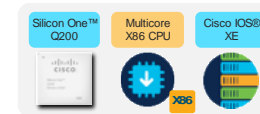
6.0 Tbps

- 1x **Cisco SiliconOne Q200** ASIC
  - **6.0 Tbps** System Throughput
  - **28x QSFP28** ports - 40/100GE
  - **8x QSFPDD** ports - 100/200\*/400GE
- 1x **8C 2.4GHz x86** CPU with 2x **16GB (32GB) DDR4** DRAM
- **16GB Flash**; Optional SSD (480G, 960G)
- 12x **CDR5M** PHYs
  - MACSec, WAN-MACSec, ClearTag v3.4
  - IEEE 1588 & PTPv2\*
- **Various SFP Breakout & QSA support\***



# Introducing Catalyst 9500X-60L4D

Dense 1 RU SFP56 Switch – 60 x 10/25/50G + 4 x 40/100/200\*/400G



## ~3 x Switch Performance

Upto 4.6 Tbps switching capacity  
Upto 8 Bpps forwarding rate

## 10x Route Scale and ultra-deep Buffers

Up to 2 million route scale  
8 GB of ultra-deep buffers

## 50G SFP in Campus

Dual rate optics for future proofing  
High Port Density

IOS-XE 17.10.1

Unmatched Flexibility with Customizable Templates

50G & 400G leadership

Secure with LAN & WAN MACsec or IPsec\*

Application Hosting (2 x 10G AppGig ports)

50G SFP56



400G QSFP-DD



Powered by S1 Q200

## C9500X-60L4D



Q1 CY23

Industry first

## Reversible Airflow

Front to Back  
Back to Front

## Highest Fixed Resiliency

Redundant fans (5+1)  
Redundant power supplies (AC & DC options)  
StackWise® Virtual (17.11.1)

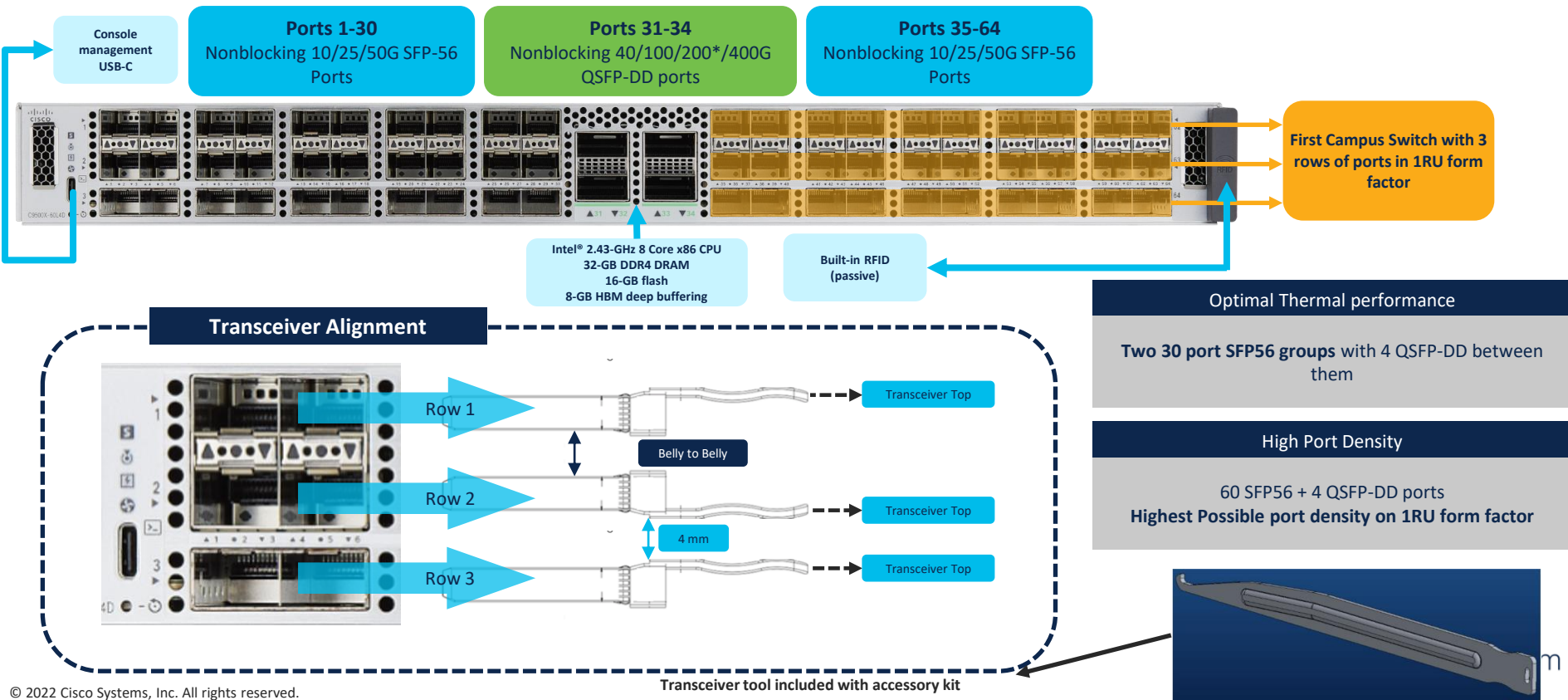
## Hardware Encryption

LAN MACsec  
WAN MACsec  
IPsec\*

Cisco Global Sales Enablement Team  
Virtual Teams

# Catalyst C9500X-60L4D

## Innovative Design





# Catalyst 9600 Series

## Extending Modular Core with a Performance-Optimized Supervisor 2



**Supervisor 1**

Total Capacity  
**4.8 Tbps**  
Slot B/W  
**1.2 Tbps**



**Supervisor 2**

Total Capacity  
**12.8 Tbps**  
Slot B/W  
**3.2 Tbps**

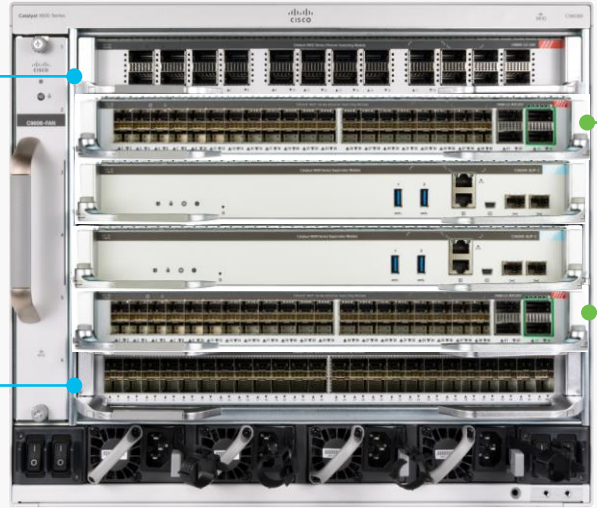
**Gen1**  
1.2T /slot

**Gen2**  
3.2T /slot



**Gen1**  
1.2T /slot

**Gen2**  
3.2T /slot



**400G**

40x 1/10/25/50G + 2x 200G + 2x 400G **NEW**

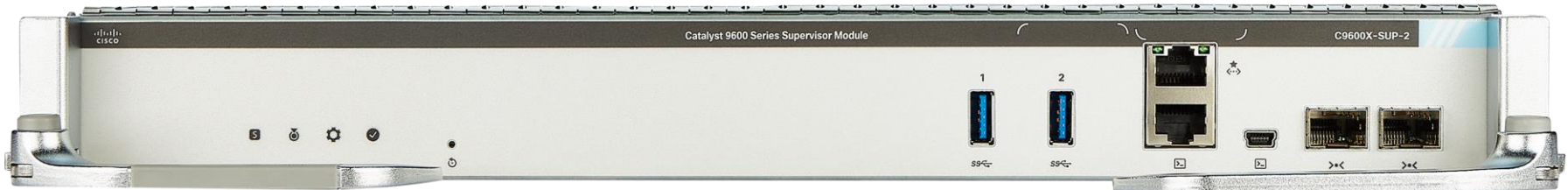
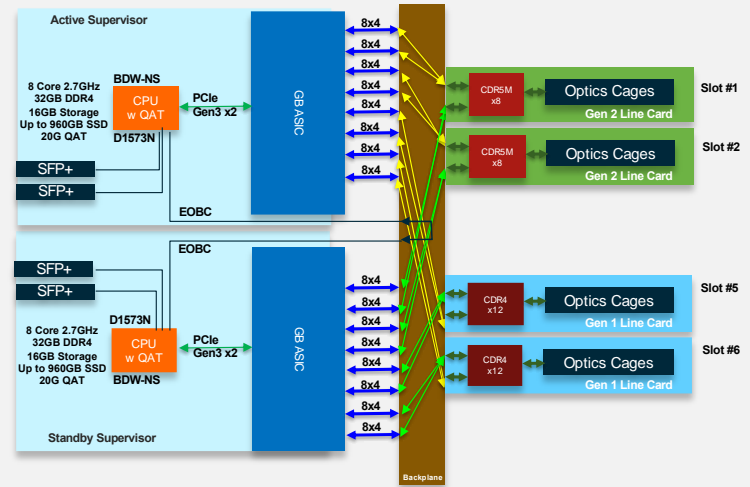
# C9600X-SUP-2

Gen2 Supervisor Module with Silicon One™ Q200

12.8 Tbps

Shipping

- **1x Cisco SiliconOne Q200 ASIC (12.8Tbps)**
  - 3.2Tbps per Slot
  - Optimized for 10G to 400G
- **1x 8C X86 2.4GHZ CPU with 2x 16GB (32GB) DDR4 DRAM**
- **Management**
  - 2x 10G SFP+ Mgmt ports to CPU (App Hosting)
  - 1x 10/100/1000M RJ45 Mgmt0 port
  - 1x RJ45 Console port, USB Type-B-Mini port
- **Storage**
  - 2x USB3.0 Type-A SSD ports
  - 480-960GB M.2 SATA Drive (optional)



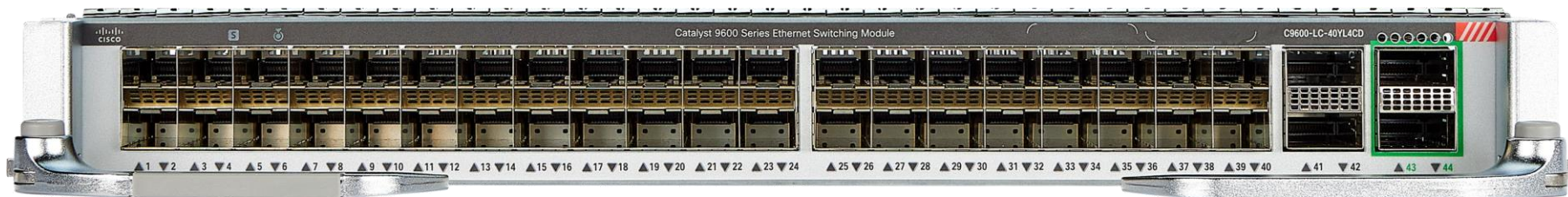
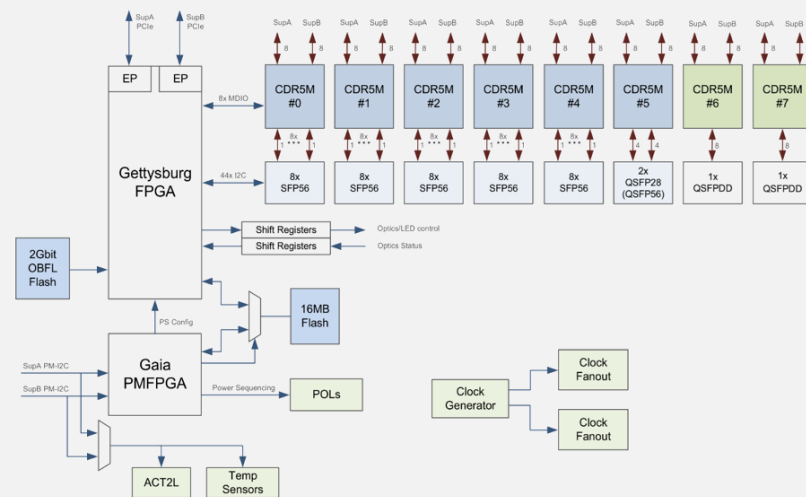
# C9600-LC-40YL4CD

Gen2 Combo Line-Card – 40xSFP56 + 2xQSFP56 + 2xQSFPDD

3.2 Tbps

Shipping

- **3.2 Tbps With Gen2 Sup**
  - 40x SFP56 ports - 10/25/50\*GE
  - 2x QSFP56 ports - 40/100/200\*GE
  - 2x QSFPDD ports - 40/100/200\*/400GE
- **1.2 Tbps With Gen1 Sup**
  - 40x SFP28 ports - 1/10/25GE
  - 2x QSFP28 ports - 40/100GE
- 8x CDR5M PHYs
  - MACSec, WAN-MACSec, ClearTag v3.4
  - IEEE 1588 & PTPv2\*
  - Hitless MUX (HMUX)
- Various Breakout & QSA support (QSFP ports)\*



# C9600 Line Card – Supervisor Support Matrix

	SUP 1	SUP 2
C9600-LC-24C	✓ 24x 40G or 12x 100G	✓ 24x 40G & <b>100G</b> (No MACsec)
C9600-LC-48YL	✓ 48x 1/10 & 25G	✓ 48x 10/25 & <b>50G*</b> (No MACsec, No 1G)
C9600-LC-48TX	✓ 48x 1/2.5/5 & 10G (mGig)	✓ 48x 10G (No MACsec, No 1/2.5/5G)
C9600-LC-48S	✓ 48x 1G SFP	✗
C9600-LC-40YL4CD	✓ 40x 1/10 & 25G + 2x 40 & 100G	✓ 40x 10/25 & <b>50G*</b> + 2x 40/100 & <b>200G*</b> + 2x 40/100/ <b>200*</b> & <b>400G</b> MACsec & WAN-MACsec (No 1G)



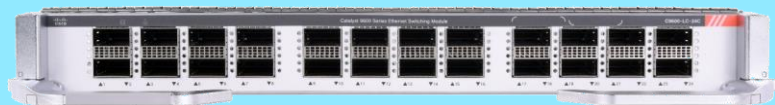
**SUP2 does not support 1GE or below speeds**

If 1GE downlinks are required, position SUP1

# Line cards positioning for Catalyst 9600

QSFP

### C9600-LC-24C



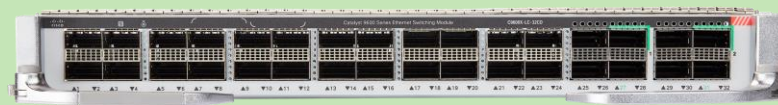
Sup 1

- 24 x 40G or 12 x 100G
- MACsec at line rate across all ports

Sup 2

- 24 x 40/100G
- No MACsec

### C9600X-LC-32CD



Only supported on Sup 2

- 32 ports at 100G (or 24 ports at 100G and 2 ports at 400G or 28 ports at 100G and 1 port at 400G)
- MACsec and WAN-MACsec\* at line rate across all ports

SFP

### C9600-LC-48YL



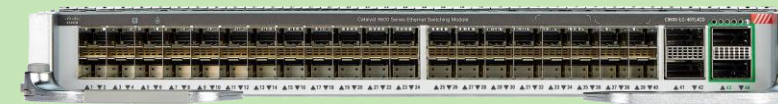
Sup 1

- 48 x 1/10/25G
- MACsec at line rate across all ports

Sup 2

- 48 x 10/25/50G<sup>1</sup>
- No MACsec

### C9600-LC-40YL4CD



Sup 1

- 40 x 1/10/25G and 2 x 100G
- MACsec at line rate across all ports

Sup 2

- 40 x 10/25/50G<sup>1</sup> and 2 x 40/100G and 2 x 100/400G
- MACsec and WAN-MACsec\* at line rate across all ports

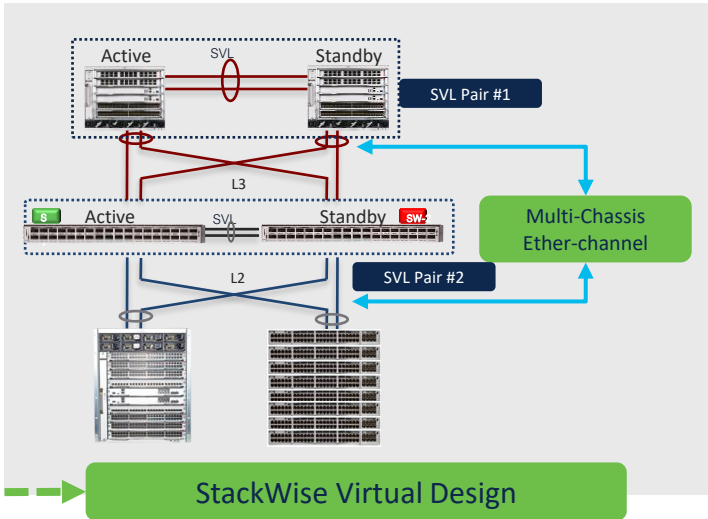
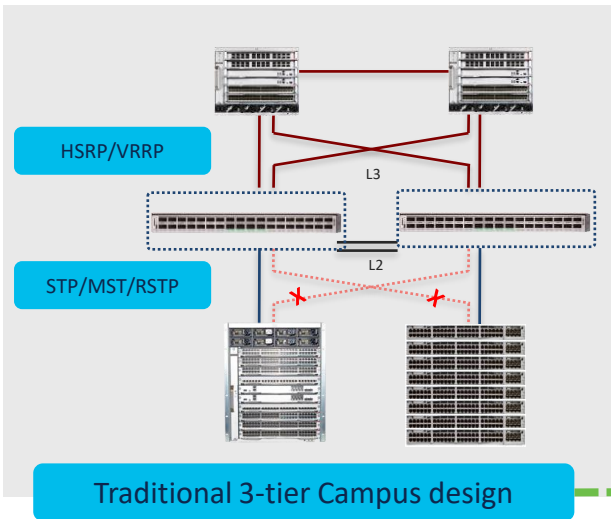
<sup>1</sup>50G support with IOS-XE 17.10 \*Requires a HSEC License for WAN-MACsec functionality

# StackWise Virtual on Catalyst 9400X, 9500X and 9600X

## Campus resiliency across Catalyst 9000 Portfolio\*

### SVL parity between Gen 1 and Gen 2

<b>IOS-XE 17.9.1</b>	Catalyst 9400X-SUP2/XL	<b>NEW</b>
<b>IOS-XE 17.10.1</b>	Catalyst 9500X-28C8D and 9600X-SUP2	<b>NEW</b>
<b>IOS-XE 17.11.1</b>	Catalyst 9500X-60L4D	<b>NEW</b>



**Simplify Operations**

Eliminate loop prevention and redundancy protocol like STP, FHRP (HSRP/VRRP)

**Double Bandwidth and Reduce Latency**

Active-Active Multi-chassis EtherChannel (MEC)

**Enhanced Redundancy - SSO/NSF**

Sub-second failovers and Graceful protocol recovery

**NEW** New Features specific to Q200 Platforms

Dynamically add/remove SVL and DAD links

© Cisco

ISSU for C9500X/C9600X coming in next EMR release - 17.12.1

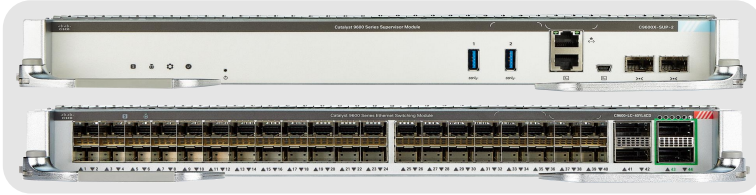
Quad Sup RPR not supported on 9400 Sup1/2 & 9600 Sup 2



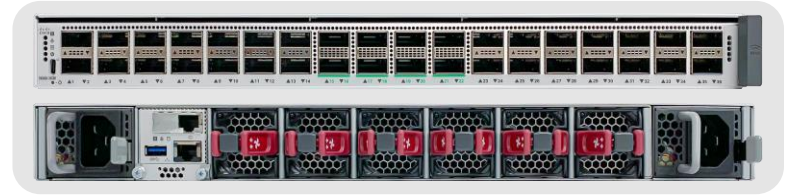
# Catalyst 9500X & 9600X – Things to know

Next Generation Core + Edge Switching with Silicon One™ Q200

### C9600X-SUP-2 + LC-40YL4CD



### C9500X-28C8D



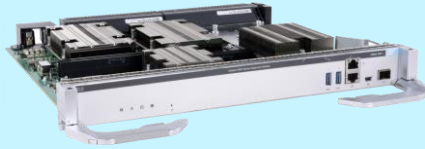
Technology	Brief Description	Diffs from UADP 3.0
✔ Large LPM Table	<ul style="list-style-type: none"> <li>Up to 2M IPv4 or 1M IPv6 (hash efficiency is about 80%)</li> <li>Dedicated Memory for LPM</li> </ul>	<ul style="list-style-type: none"> <li>Up to 256K IPv4/IPv6 with Custom SDM template</li> <li>LPM and other features share 416K ASIC memory</li> </ul>
✔ Large MAC Table	<ul style="list-style-type: none"> <li>Up to 256K MAC entries Custom SDM template.</li> <li>Shared with other features</li> </ul>	<ul style="list-style-type: none"> <li>Up to 128K MAC entries with Custom SDM template</li> <li>MAC shared with LPM, etc. in same 416K ASIC memory</li> </ul>
✔ VoQ QoS + HBM	<ul style="list-style-type: none"> <li>Q200 has 80MB local (low-latency) + 8GB HBM (High Bandwidth Memory) buffer memory.</li> <li>Q200 uses a Virtual Output Queue (VoQ) architecture. All queuing and policing policies applied on Ingress.</li> </ul>	<ul style="list-style-type: none"> <li>Max 36MB unified buffer memory per ASIC</li> <li>Supports both Ingress/Egress queuing &amp; policing</li> </ul>
✔ OGACL & SGACL	<ul style="list-style-type: none"> <li>8K IPv4, 4K IPv6 ACL TCAM entries.</li> <li>Object-Group &amp; Security-Group ACLs use CEM to map IP-to-Group label, TCAM only uses L4 ACEs. (OG/SG ACL design is optimal for layer 3 environment).</li> </ul>	<ul style="list-style-type: none"> <li>64K ACL TCAM entries per ASIC</li> <li>Object-group expand into the TCAM space</li> </ul>
✔ LAN & WAN-MACsec	<ul style="list-style-type: none"> <li>Q200 does not have built-in crypto engine.</li> <li>C9500X &amp; C9600X-LC uses new CDR5M PHY (400Gbps Full-Duplex). CDR5M provides line-rate (8x 400G = 3.2T) 802.1ae (LAN) MACsec and WAN-MACsec.</li> </ul>	<ul style="list-style-type: none"> <li>UADP3 has built-in MACsec crypto (speed of ASIC)</li> <li>UADP3 only supports LAN MACsec (no WAN-MACsec)</li> </ul>
✔ Flexible NetFlow*	<ul style="list-style-type: none"> <li>Q200 does not have built-in Flow Cache memory (no hardware-based Netflow).</li> <li>C9500X &amp; C9600X uses new Software-based FNF (≤ 2M entries), with a dedicated CPU core (~2Mpps). FNF sampler rate 1:1000, ~10Tbps of 512-Byte packets = ~2Mpps.</li> </ul>	<ul style="list-style-type: none"> <li>UADP3 has built-in (HW) FNF, max 64K entries per ASIC</li> <li>FNF shared with LPM, etc. in same 416K ASIC memory</li> </ul>

# Catalyst 9500 & 9600 Series Core Positioning

Next Generation Core + Edge Switching with Silicon One™ Q200



## Feature Optimized C9500 & C9600-SUP-1



**C9600-SUP-1**



**C9500**

- ✓ Best-in-class Enterprise Core feature set
- ✓ Low speeds (1G – 40G) and port density
- ✓ Comprehensive MPLS, EVPN and SDA
- ✓ Ideal for Campus Core, Collapsed Core + Agg



## Performance Optimized C9500X & C9600X-SUP-2



**C9600X-SUP-2**



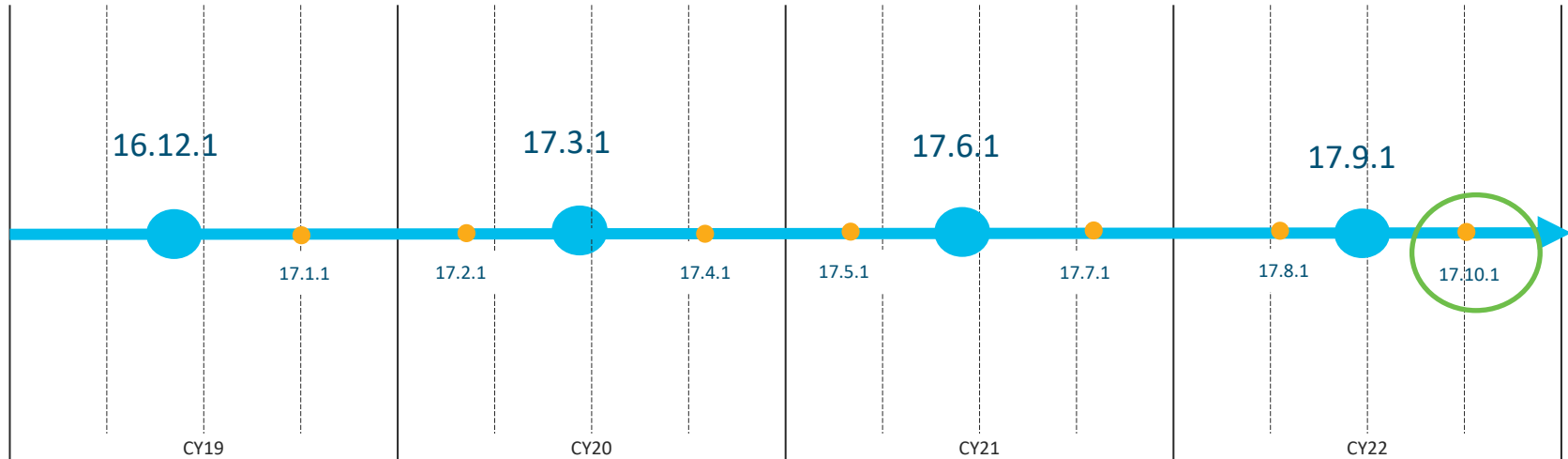
**C9500X**



- ✓ Unmatched forwarding scale and performance
- ✓ High speeds (10G – 400G) and port density
- ✓ Scaled MPLS and SDA, WAN-MACsec
- ✓ Ideal for Campus Core + Edge, or Centralized WLC



# IOS XE Release Schedule

## 3 Releases Annually (every 4 months)



-  Extended Maintenance Release (“EMR”) – **36 months support.**  
Recommended for wide-scale production deployments – Supports patches (SMU) and ISSU\*
-  Standard Maintenance Release (“SMR”) – **12 months support**

# IOS XE 17.9.1 Software Release Summary



C9200CX-12T-2X2G



C9300LM-48UX-4Y



C9600X-LC-32CD

## Platform/Infra

- ✓ 9400X
  - ✓ StackWise Virtual on C9400X-SUP-2/XL
  - ✓ 4K Active VLAN support for C9400X-SUP-2/XL
  - ✓ C9400X-SUP2/SUP2XL - 432 Port Channels
  - ✓ Perpetual PoE support with C9400X-SUP-2/XL
  - ✓ Auto Negotiation on SUP-2/2XL
- ✓ Destination IP based NAT Scale improvement – 9500H/9600
- ✓ Conditional NAT using Route-map
- ✓ Audio Video Bridging on 9500H (AVB)

## Security and Routing

- ✓ NAT-Traversal support for IPSEC
- ✓ VRF Aware IPSEC
- ✓ BGP EVPN over IPsec
- ✓ MACSEC HA on 9400X Linecard Ports
- ✓ MACSEC XPN Support on 9400X SUP ports
- ✓ Phantom RP for PIM-Bidir 9500H and 9600

## Programmability

- ✓ OpenConfig: YANG Model Updates
- ✓ YANG Service Model: EVPN
- ✓ gNMI Infrastructure As Code (IAC)
- ✓ CONFD Upgrade to 7.5
- ✓ AAA Method List
- ✓ Guest Shell High Availability
- ✓ YANG model for CLI execution
- ✓ gRPC Dial-Out with mTLS

# IOS XE 17.10.1 Software Release Summary

## Platform/Infra

- ✓ LACP Standalone Mode on L3 EtherChannels
- ✓ Linecard- 50G and 1G speed support
- ✓ Switch Integrated Security Features
- ✓ StackWise Virtual Support on Silicon 1
- ✓ ERSPAN capabilities for AppGig interface
- ✓ PTP on StackWise Virtual
- ✓ Stateful NAT64
- ✓ NAT on L3 EtherChannel
- ✓ Silicon 1 Bonjour Support

## Security

- ✓ DHCP Snooping Glean
- ✓ Reflexive ACL
- ✓ Silicon 1 IPv4 SGACL support
- ✓ IOS-XE automate-tester enhancement for Radius Server
- ✓ MACsec Transparent Pass Through
- ✓ MACsec Fallback Key with High Availability.
- ✓ Secure Data Wipe

## Fabric Solutions

- ✓ BGP EVPN Control and Data Plane over IPv6 in the Underlay
- ✓ BGP EVPN Dynamic Peering
- ✓ TRM support with BGP EVPN over IPsec

## Programmability

- ✓ YANG 1.1 Support
- ✓ gNMI Native Configuration Yang Model
- ✓ Guest Shell High Availability Guest-Share Folder Sync

