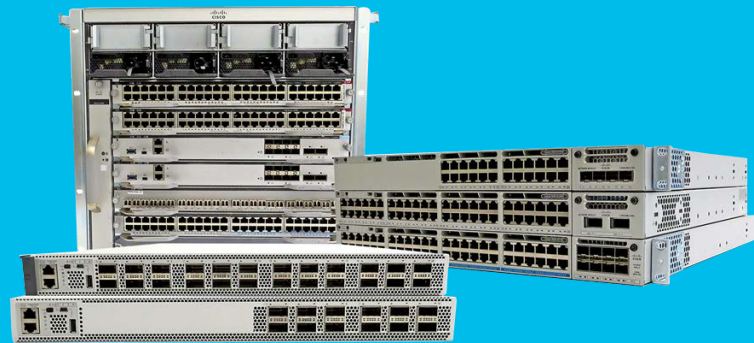




# Cisco Catalyst 9000

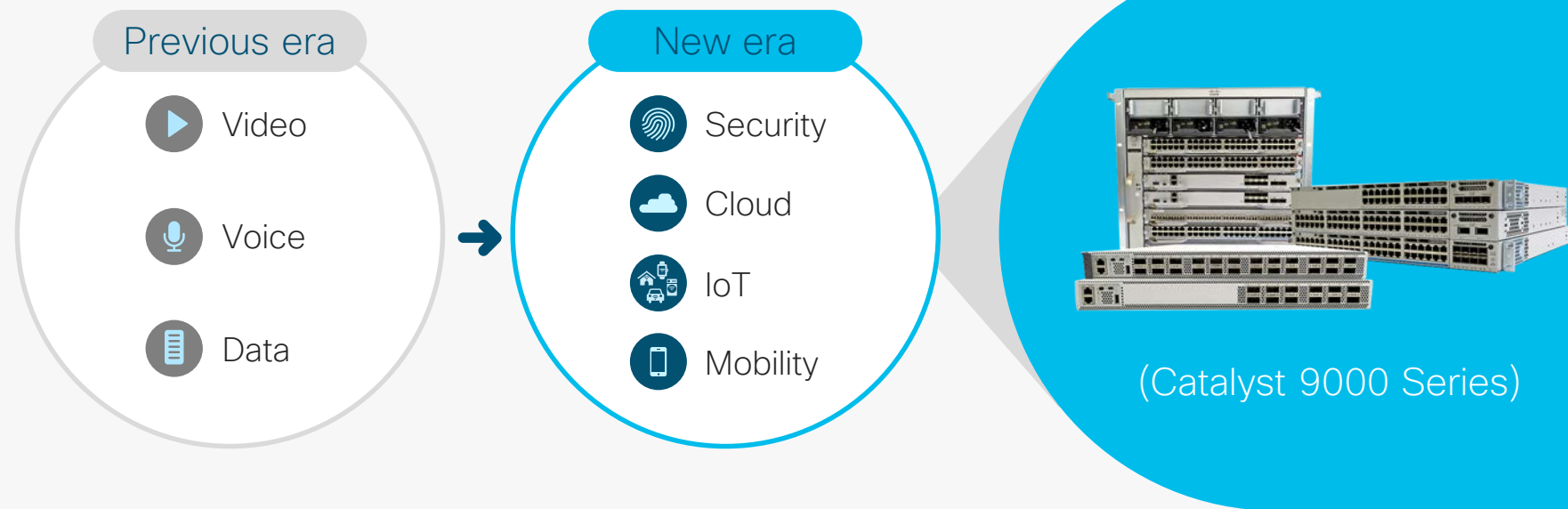
An entirely new era of networking





Software-Defined Access  
(SD-Access)

# An entirely new era in networking



SD-Access: Policy-based automation from edge to cloud

# Cisco Catalyst 9000: The platform for the new era

- SD-Access integrated
- Converged ASIC
- Single image
- Common licensing



First in enterprise

- x86 CPU with application hosting
- Programmable ASIC
- Software patching

Industry's unmatched

- High availability
- Multigigabit density
- UPOE scale

Future-Proofed

- IEEE 802.11ax ready
- 100W PoE (IEEE 802.3bt) ready
- 25G Ethernet ready



Security



IoT convergence



Mobility



Cloud

# Cisco Catalyst 9000 at a glance

## Enabling an entirely new era of networking



Cisco® Catalyst® 9300

Lead fixed access

Cisco Catalyst 9400

Lead modular access

Cisco Catalyst 9500

Lead fixed core

### Platform innovations



#### Secure

- Encrypted threat analytics
- AES256/MACSEC256/IPSec
- Trustworthy systems
- Group-based policy
- Full NetFlow for StealthWatch®



#### IoT convergence

- CoAP/IoT device profiling
- SD Bonjour
- Perpetual PoE
- IEEE 1588/AVB
- Emerging standards: MUD



#### Mobility

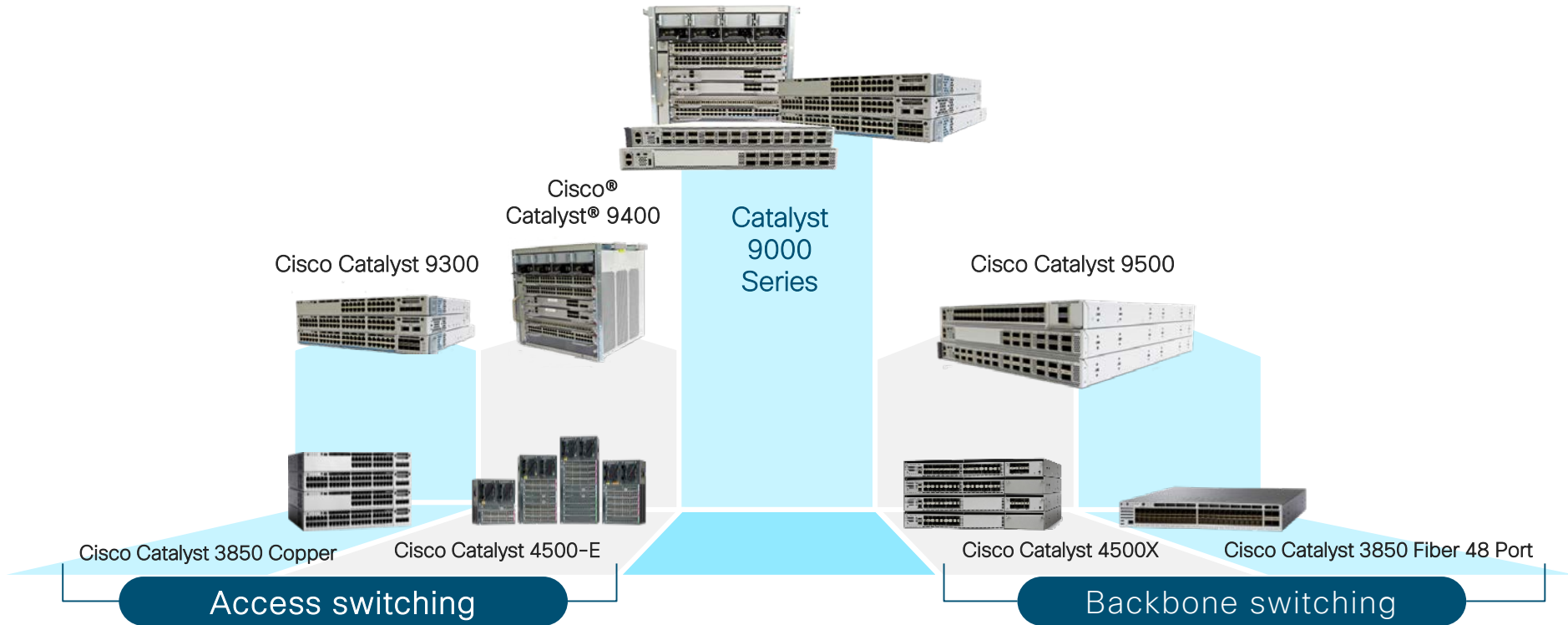
- Fabric-enabled wireless
- Embedded WLC
- Distributed wireless scale
- Unified control and policy
- Wired and wireless guest



#### Cloud

- DevOps toolkit
- Netconf/Yang models
- Streaming telemetry
- Patching/GIR
- Application hosting

# Cisco Catalyst 9000 platform transitions

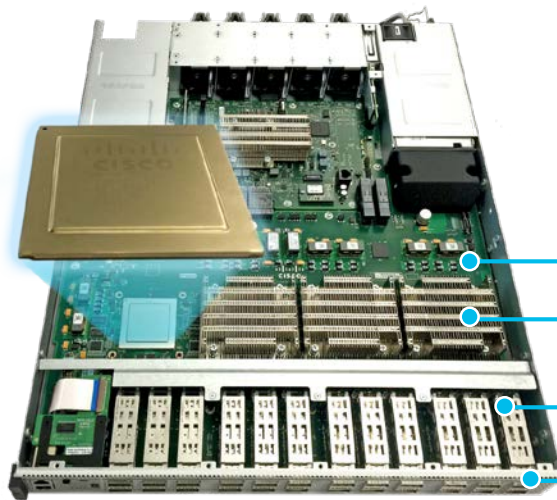


# Primary building blocks

Cisco Catalyst 9000

An entirely new era of networking

# UADP 2.0: Introducing new generation of enterprise ASICs



Programmable pipeline  
Investment protection

Flexible tables  
Universal deployment

SmartFabric\*  
Fabric innovations

StackWise® virtual  
Flexible switch deployments



384K flex  
counters



Shared  
lookup



Embedded  
CPUs



240GE  
bandwidth



Up to 2x to 4x  
forwarding + TCAM

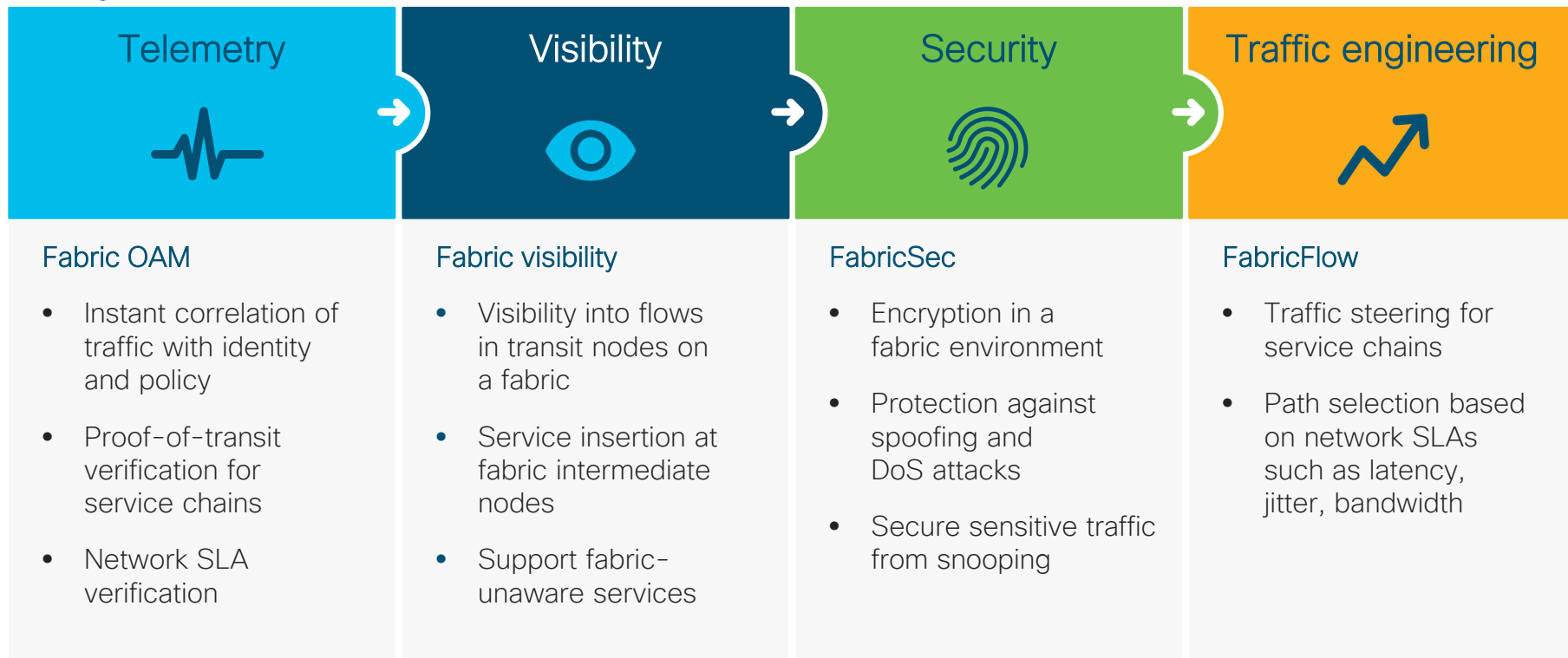


32 MB  
packet buffer



64K x2 NetFlow  
records

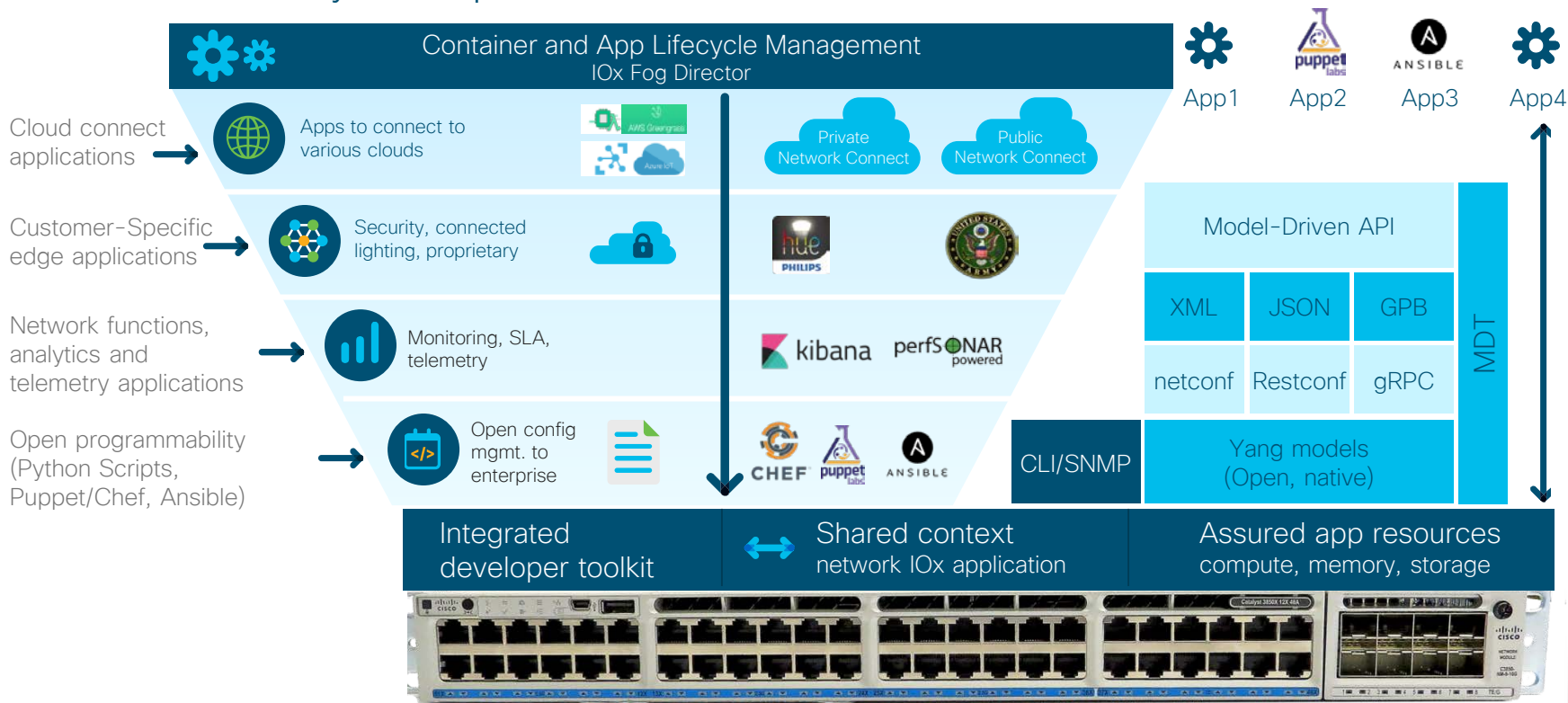
# Fabric innovations on Cisco Catalyst 9000 enabled by UADP 2.0





# Power of Cisco IOS XE software

## Best of turnkey and open solutions



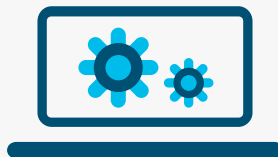
# Cisco Catalyst 9000 offers complete DevOps toolkit

## The power of Cisco IOS XE Software

Device bootstrap  
and onboarding



Configuration automation  
through open interfaces



Server management tools  
on x86 infrastructure



Open

Programmable

Container-based  
app hosting

IOx Fog director\* for centralized container management

# Introducing Software-Defined Access (SD-Access)

Policy-based automation from edge to cloud

Fundamental shift in how we build and manage networks



Secure Fabric

Virtual networks and  
microsegmentation  
made easy

Decouple policy  
from network topology



Automation

Simple policy definition and  
enforcement through  
APIC-EM and ISE

Industry best practices and  
policy compliance



Assurance

Monitoring and  
troubleshooting  
through NDP

Proactive issue identification and  
resolution through analytics

# Solving business challenges

Cisco Catalyst 9000

An entirely new era of networking



# The security challenge



## Motivated and targeted adversaries

- State sponsored
- Financial/espionage motives
- \$1T cybercrime market



## Increased attack surface

- BYOD blurring perimeter
- Public cloud services
- Enterprise IOT



## Increased attack sophistication

- Advanced persistent threats
- Encrypted malware
- Zero-day exploits

Scale too many alerts

Complexity securing everything

Sophistication  
Keeping up against attackers

100%

Customers lack network segmentation at time of breach



200 days

Industry average detection time for a breach



60 days

Industry average time to contain a breach



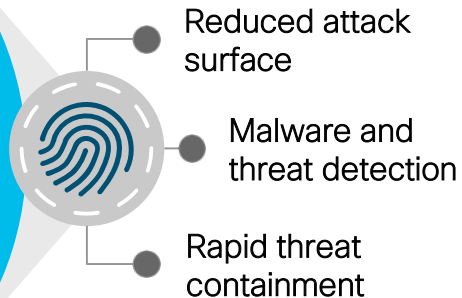
\$3.8M

Average cost of a data breach

# Cisco Catalyst 9000 delivers advanced security capabilities



Network infrastructure-enabled  
advanced threat defense



## Before



- Advanced endpoint profiling
- Authenticated, identity-based access
- Group-based network segmentation

## During



- Full NetFlow-based behavior analytics
- Encrypted threat analytics
- Policy enforcement analytics

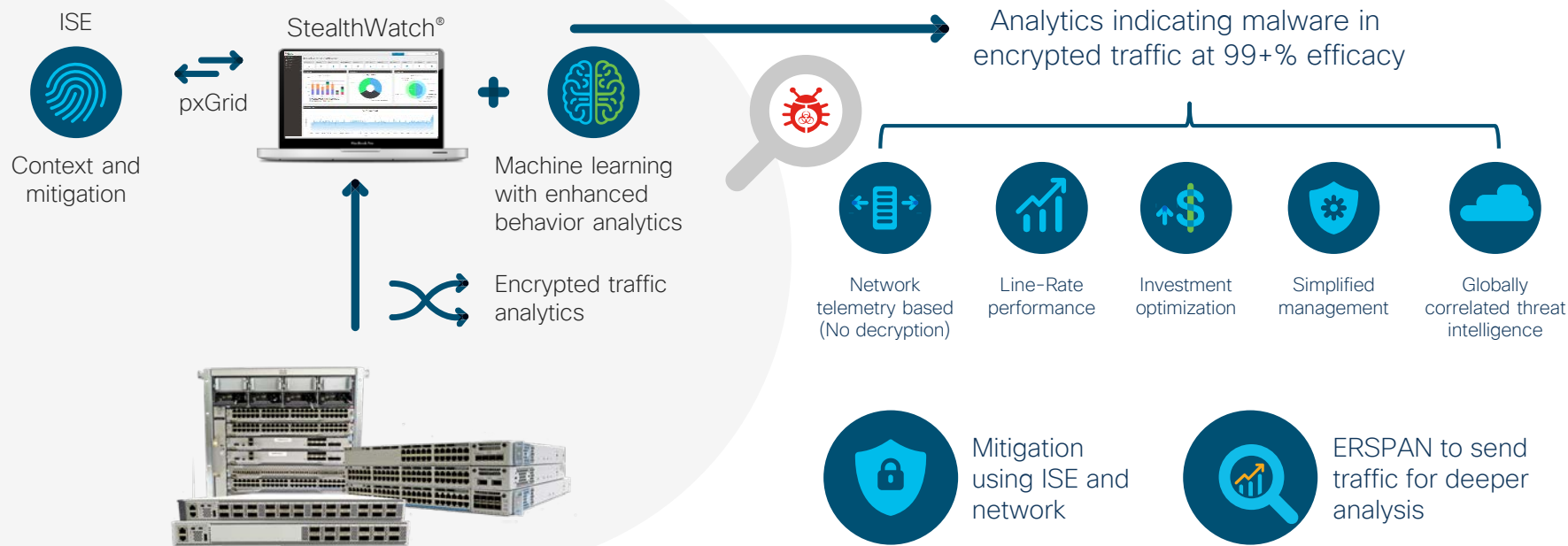
## After



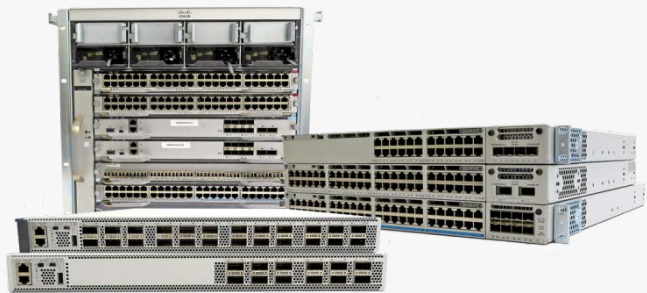
- Endpoint quarantining w/out IP address change
- Flexible packet capture
- Flexible traffic redirection

# Cisco Catalyst 9000 enables enhanced network as a sensor and enforcer

Analytics to identify malware in encrypted traffic without decryption and respond



# Cisco Catalyst 9000 enables encrypted traffic analytics



## Telemetry from switch analytics

- **NetFlow data:** SrcIP, DstIP, SrcPort, DstPort, Proto, #Bytes, #Packets
- **Intraflow data:** Sequence of packet lengths and times (SPLT), byte distribution, and more
- **TLS metadata:** Extensions, ciphersuites, SNI, certificate strings, and more

## Primary use case

Malware in  
encrypted traffic



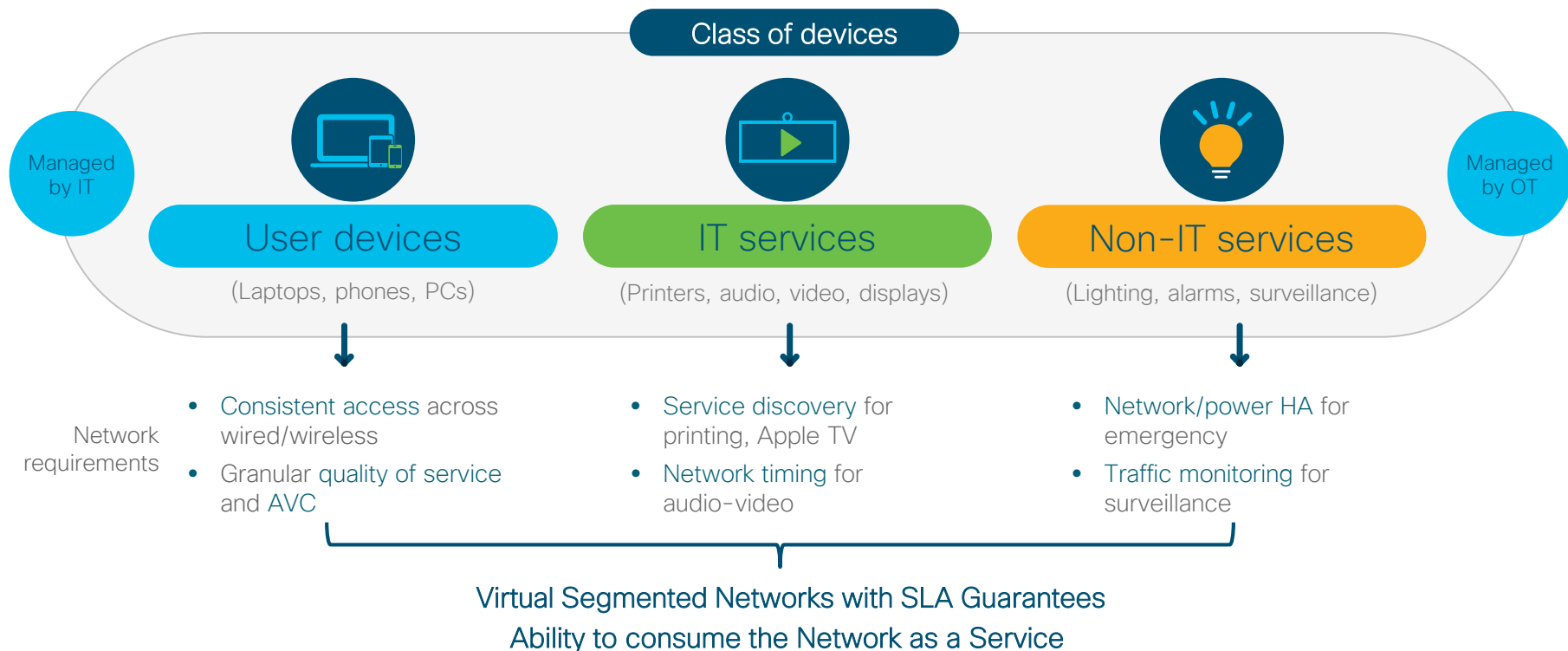
## Secondary use case

Cryptographic audits





# The IoT challenge: Diverse set of requirements in networks



# Cisco Catalyst 9000 innovations enable IoT convergence



IT services (printer, Apple TV, collab.)

- SD Bonjour for discovery/policy across WAN/LAN
- NBAR and NetFlow for full AVC



Connected lighting

- Power HA with perpetual/fast UPOE
- CoAP for IoT convergence



IP surveillance

- ERSPAN for monitoring and forensics
- Superior QoS, multicast, and buffer management



Networked AV and timing

- ERSPAN for monitoring and forensics
- Superior QoS, multicast, and buffer management



## Platform benefits

### Resilient infrastructure

- Optimized for mGig access
- Unmatched UPOE scale

### Scalable operation

- Table sizes, memory, routes
- Faster MAC learning and scale with x86

### Robust security

- Segmentation and policy with SD-Access
- Extend trust to digital building

# Cisco catalyst 9000 innovations: Next-generation mobility



Built for  
mobility



## Benefits

Built for scale and security  
future-proofed lower TCO



Future-proofed for performance and scale

- **802.11ac wave 2 optimized:** Support for industry's highest densities of wave 2 Access Points in 1RU
- **802.11ax ready:** Dense 5G downlinks\* model
- **Consistent architecture** with controller options on appliance, switch, or VM\*
- **Distributed** data plane and optimized for roaming



Policy-based segmentation for IoT, Wired, and wireless

- **NBAR2:** Visibility into wired and wireless
- **Secure fabric:** Virtual networks and microsegmentation



Optimized guest deployment for branches and at lower TCO

- **Simplified** guest and mobility tunneling, no dedicated guest controller

\* Not available at FCS

# Cisco catalyst 9000 enables cloud-ready networks



Built for cloud



## Benefits

Flexibility, operational simplicity,  
and optimizes cost



### Cloud hosting

- Automation assurance policy



### Cloud connectivity

- Private/public cloud SaaS colo



### Analytics

- Streaming telemetry\*
- Network monitoring



### On-Box app hosting

- Monitoring security IoT



### DevOps toolkit

- Zero-touch provisioning
- Model-driven programmability
- Server management tools



### High availability

- Patching, graceful insertion and restart, ISSU

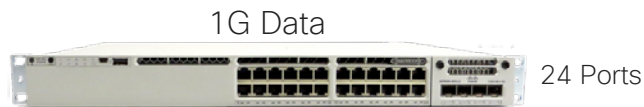
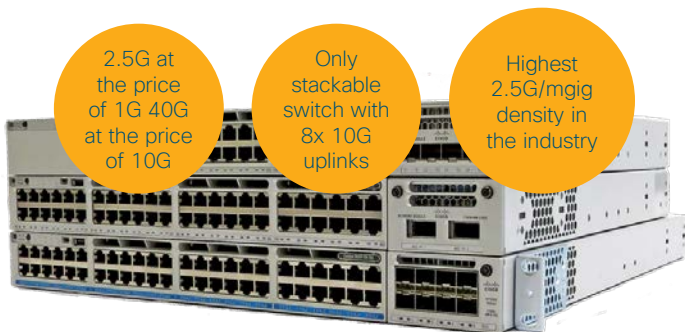
# Introducing three brand-new switches

Cisco Catalyst 9000

An entirely new era of networking

# Introducing Cisco Catalyst 9300

## New generation of fixed access



### Modular Fans



### Modular uplinks



8x10G



2x40G



4x mGig



4x1G

### Modular power supplies



350W



715W



1100W

Cisco Catalyst 9000 leadership

UADP 2.0

Cisco IOS® XE Software

SD-Access

x86 CPU and containers

Encrypted Traffic Analytics (ETA)\*

AES256/MACSEC256\*

Trustworthy systems

StackWise® Virtual\*

IEEE1588 and AVB\*

NBAR2

Perpetual/fast PoE

Model-driven programmability

Patching/GIR

Streaming telemetry\*

# Cisco Catalyst 9300 innovations and benefits

Flexible ASIC  
• UADP 2.0

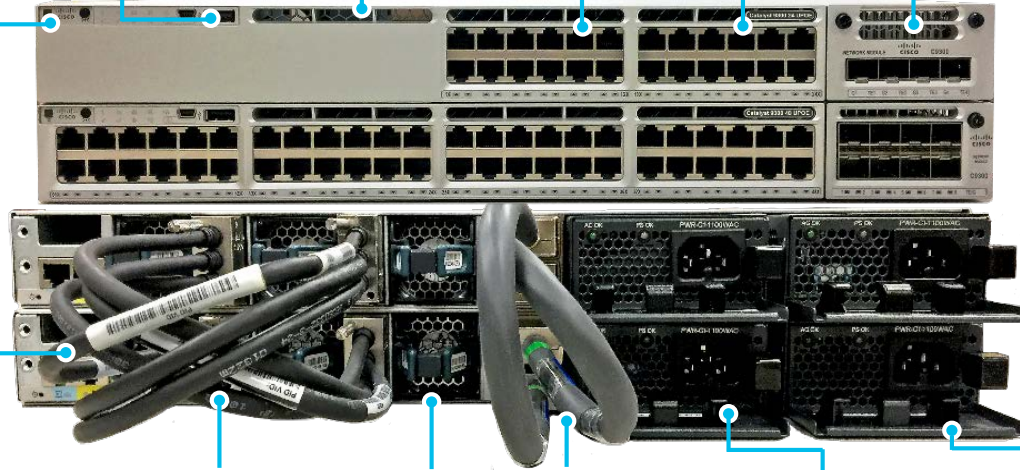
Optional bluetooth management  
• USB 2.0\*

Powerful CPU complex  
• Intel x86 CPU  
• 4-core 1.8GHz  
• 8 GB memory  
• 16 GB flash

Wireless scale  
• 48x Wave 2 APs in 1RU

Most dense and flexible uplink offering  
• 8x10G, mGig, 25G

Unmatched PoE  
• Resiliency: perpetual/fast  
• high power: 60W UPOE



Local storage  
• Removable storage (120GB)

Most flexible stacking  
• Front\*+back stacking  
• Multiple cabling types: copper and fiber  
• Best HA: NSF/SSO

Redundant fans

Intelligent power management  
• Cisco StackPower®

Optional PS  
• Power supplies (AC+DC)

High-efficiency PS  
• Power supplies (AC+DC\*)

Extends 3850 leadership

1.5x throughput

4x VRF scale

2x wireless scale

4x Wave 2 APs supported

2-4x flash/memory

Pluggable storage

2x CPU performance

2x uplink scale

25G uplinks

mGig uplinks

8x10G/2x40G UL at price of 2x10G



# Introducing Cisco Catalyst 9400

## New generation of modular access



### Supervisor

- Sup-1: 80G/slot access optimized
- Sup-1XL\*: 120G/slot core optimized

### Access line cards

- 24xmGig + 24xUPOE\*
- 48xUPOE
- 48xPoE+\*
- 48xData

### Core line cards

- 24x 10G SFP+\*
- 48x1G SFP\*
- 24x1G SFP\*

### Power supply

- 3200W AC
- 3200W DC\*
- 2400W AC\*

Cisco Catalyst 9000 leadership

UADP 2.0

Cisco IOS® XE Software

SD-Access

x86 CPU and containers

Encrypted Traffic Analytics

AES256/MACSEC256\*

Trustworthy systems

StackWise® Virtual\*

IEEE1588 and AVB\*

NBAR2

Perpetual PoE\*

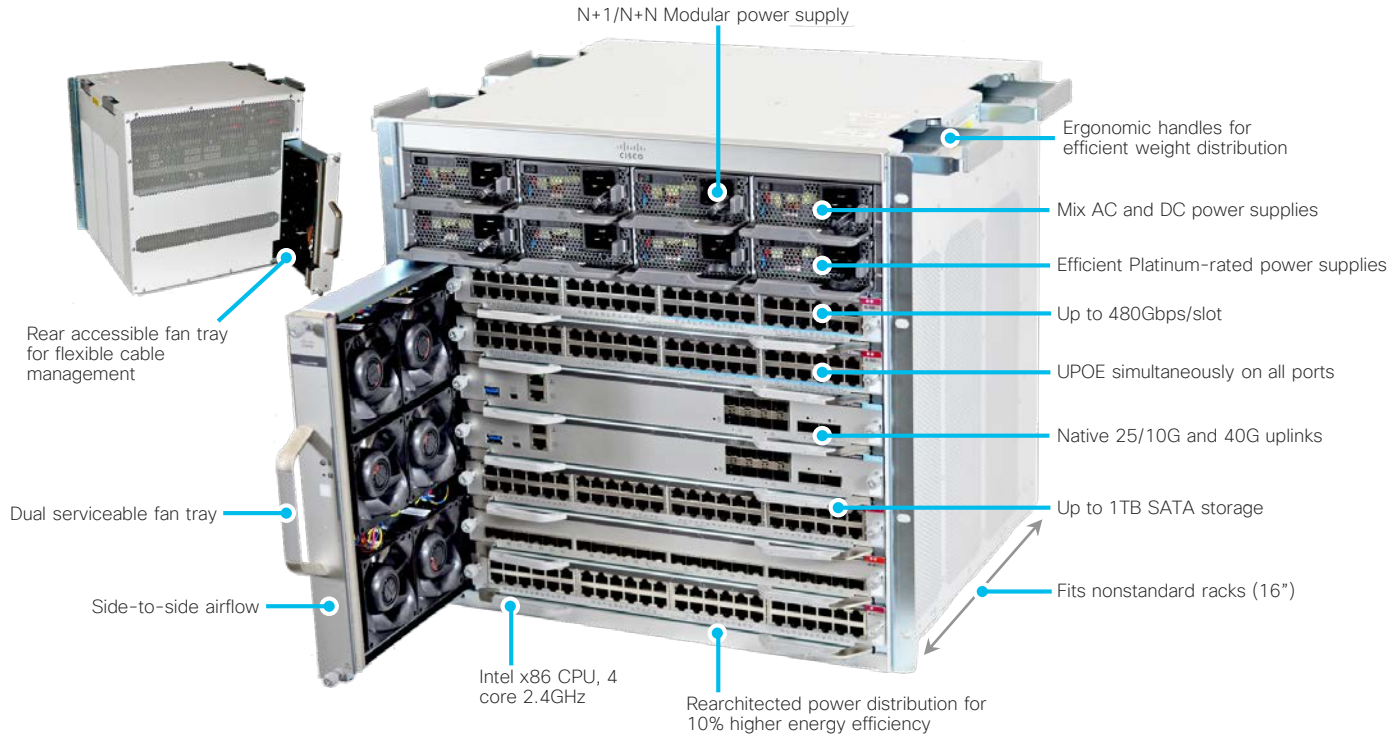
Model-driven programmability

Patching/GIR

Streaming telemetry\*



# Cisco Catalyst 9400 innovations and benefits



Extending Cisco Catalyst 4500E leadership in modular access

4x throughput

3x client scale

2x wireless scale

4x power scale

3x buffering

10x bandwidth

4x memory and flash

Lower power

Better acoustics

Higher MTBF

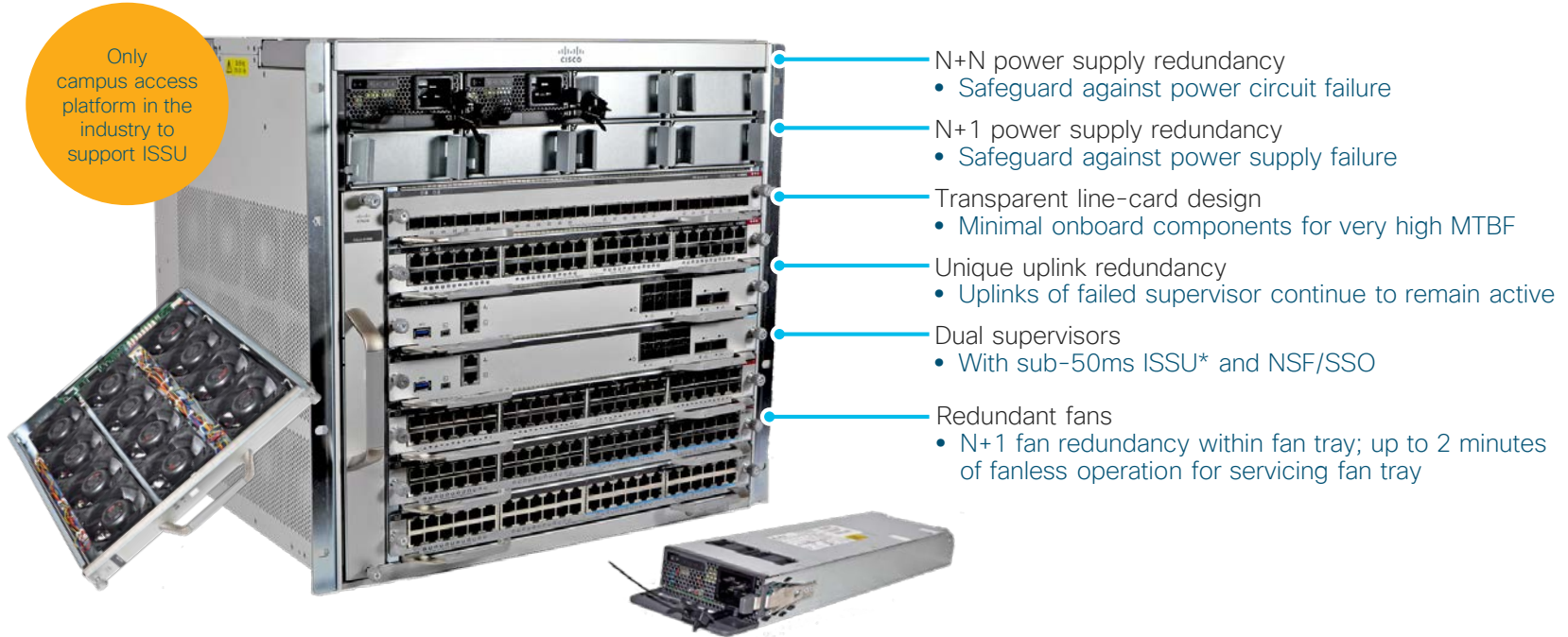
MPLS VPN

While preserving ....

HA architecture

Investment protection story

# Cisco Catalyst 9400: State-of-the-Art high availability



# Introducing Cisco Catalyst 9500

## New generation of purpose-built fixed core/aggregation



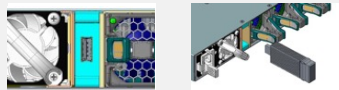
Redundant platinum-rated power supplies



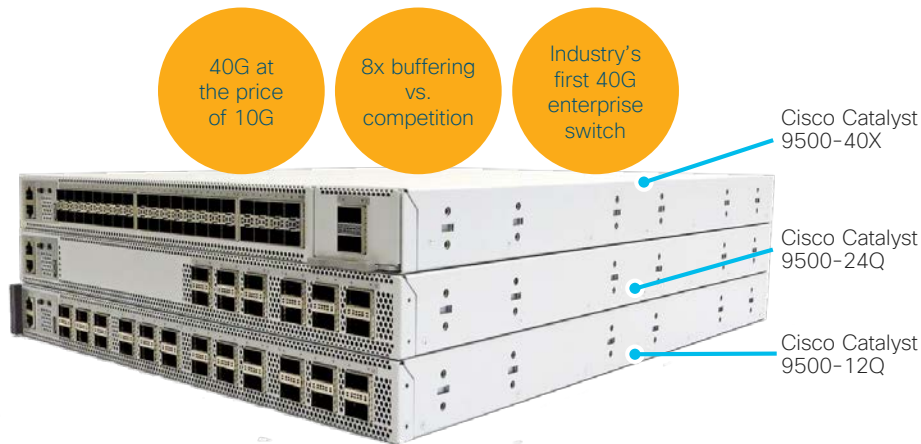
Front-to-back airflow with N+1 modular fans



RFID for efficient inventory management



USB3.0 storage to host high-end applications



Modular fans

Modular uplinks

Modular power supplies



Cisco Catalyst 9000 leadership

UADP 2.0

Cisco IOS® XE Software

SD-Access

x86 CPU and containers

Encrypted Traffic Analytics\*

256 bit MACsec\*

Trustworthy systems

StackWise® Virtual

IEEE1588 and AVB\*

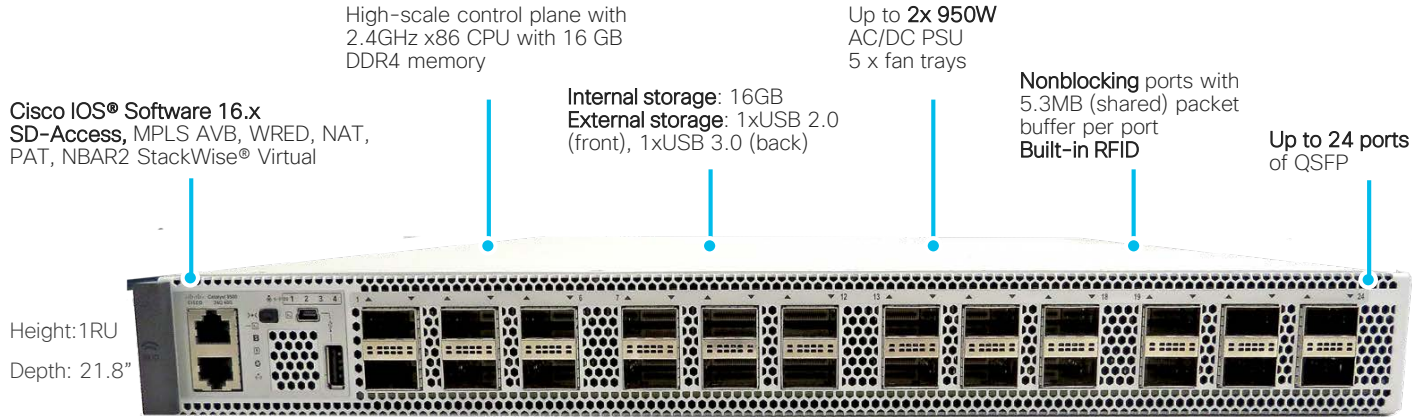
NBAR2

Model-driven programmability

Patching/GIR

Streaming telemetry\*

# Cisco Catalyst 9500 innovations and benefits



Extending Cisco Catalyst 4500X leadership in fixed backbone

3x throughput

3x bandwidth

5x buffering

5x CPU speed

4x memory and flash

4x port speed

2.4x 10G port density

Granular port densities to address all campus sizes



12Px40G



24Px40G



40Px10G + 8Px10G/2Px40G

