

Catalyst
Tuesdays



Catalyst
8000 Phase
2 Launch
Update

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Ramesh Kalimuthu, Prakash Khilolani
EN Routing Product Marketing

Date: February 9, 2021

Introducing

Catalyst 8000

Edge Platforms Family

Agenda

Introduction

Catalyst 8500L

Catalyst 8200

Catalyst 8200 uCPE/8000V

ISR1100X-4G/6G

Catalyst Cellular Gateway

Promotion Offers and Summary

It's a Multicloud World



Technology transformations

Top digital business initiatives in the cloud age



SASE/Multicloud

Cloud migration will continue to accelerate the adoption of SD-WAN

- Markets & Markets Research



Predictable Scale

75%

believe SaaS/Cloud are important to WAN choice

[IDC Report](#)



5G/IOT

By 2022, 5G Infra in Branch expected to grow to \$1.9 billion

- IDC Report



Reducing Risk

43%

of teams identified embedded network security as priority

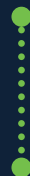
[Cisco Global Networking Report](#)



Edge Computing

37% of enterprise customers plan to implement SD-Branch in some way in next 5 years

- IDC Report



Increasing Agility

50%

of all workloads run outside of enterprise DC by 2021

[Cisco Global Networking Report](#)

Powered by secure cloud scale SD-WAN

Cisco's flexible architecture for Intent-based Networking

Any Deployment



On-premise | Cloud | Multi-tenant
Automation | Network Insights | Machine Learning | AI
Open | Programmable | Scalable

Any Service



Multicloud
Optimization



Multi-Layer
Security



Analytics



Voice



Multi-Domain
IBN Policy

Any Transport



Satellite



Internet



MPLS



5G/LTE

Any Location



Branch



Colocation



Cloud



Remote Work

Introducing Catalyst 8000 Edge Platforms Family

Built for the cloud edge



Catalyst 8000v Edge Software/
Catalyst 8200 Edge uCPE



Catalyst 8300/8200 Series Edge Platforms



Catalyst 8500 Series Edge Platforms



Secure, connected experience

- SD-WAN ready
- Cloud-scale multi-layer security
- 256-bit WAN MACSec



Cloud-native agility

- 2-5x throughput improvement
- 10G in access to 40G/100G in edge
- Integration with leading cloud providers



Business-first resiliency

- Built-in edge compute resources
- End-to-end analytics and assurance

Cisco Catalyst 8000 Edge Platforms Family

Optimized for SASE with Cisco Secure Cloud-scale SD-WAN

Catalyst 8500/8500L
Series Edge Platforms



ASR 1K Fixed

Aggregation

Catalyst 8300/8200
Series Edge Platforms



ISR 4400/4300

Modular Access

Catalyst 8000V Edge Software
Catalyst 8200 Edge uCPE



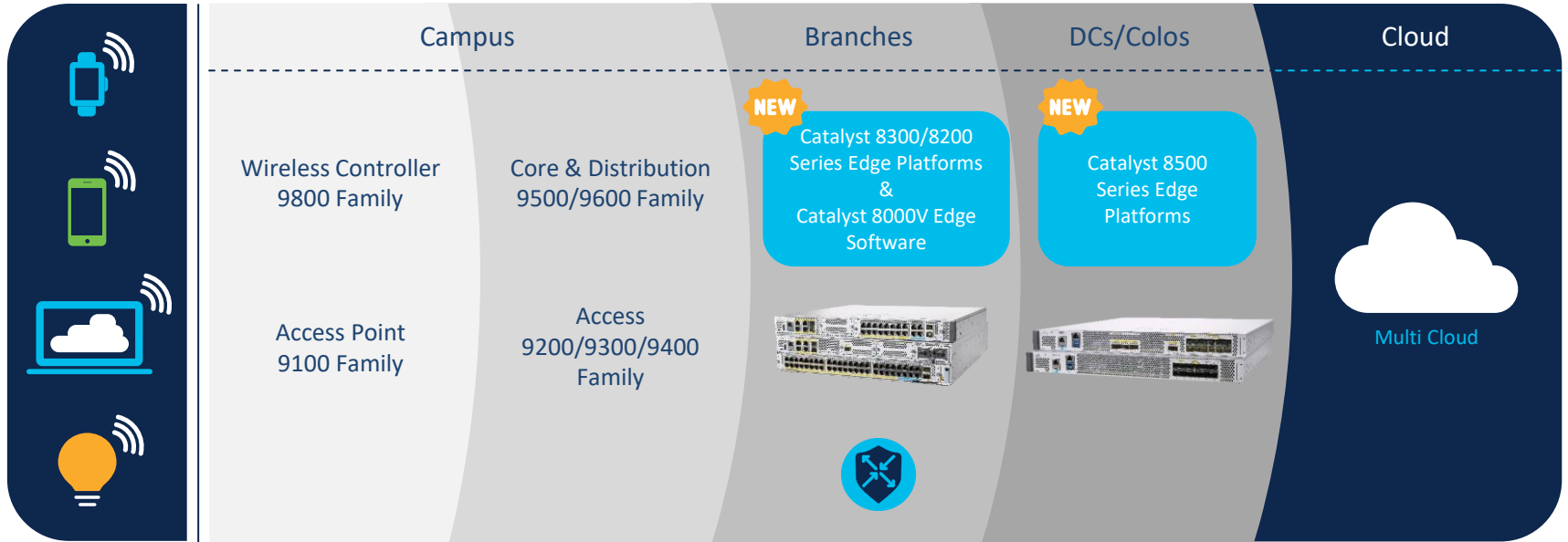
CSR 1000V/ENCS 5100

Cloud/Virtual

Delivering SASE for your Multicloud WAN Edge needs

Cisco Catalyst for Intent-based Networking

Intent-based Networking



Consistent Experience End to End

Intent



Policy



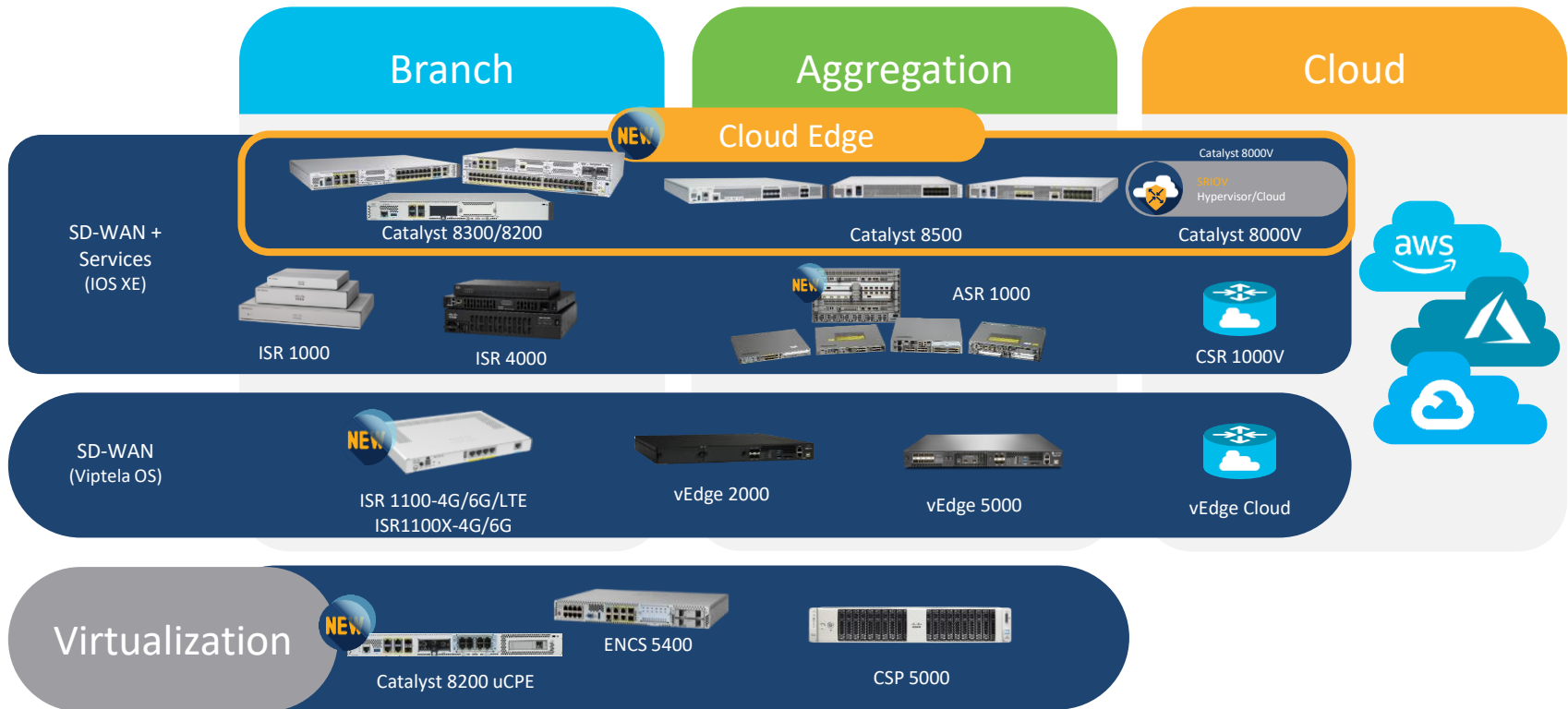
Automation



Analytics

Cisco offers the broadest portfolio for WAN transformation

Resilient Infrastructure to deliver IT agility



Built to enable multitude of use cases at the WAN Edge



Software-Defined WAN
SD-WAN for secure, optimized
multicloud connectivity



Software-Defined Branch
SD-Branch for consolidating branch
services.



5G Ready
Connecting remote sites using 5G



SASE Architecture
Evolving WAN architecture to Secure
Access Service Edge (SASE)



Edge Computing
Edge compute for low latency
applications including IoT



Secure Remote Access
Cloud delivered security for securing
direct internet access

Enhanced flexibility through software subscription

Simple software
subscription tiers

Cisco DNA Premier

Cisco DNA Advantage

Cisco DNA Essentials*

Consistent across the
portfolio



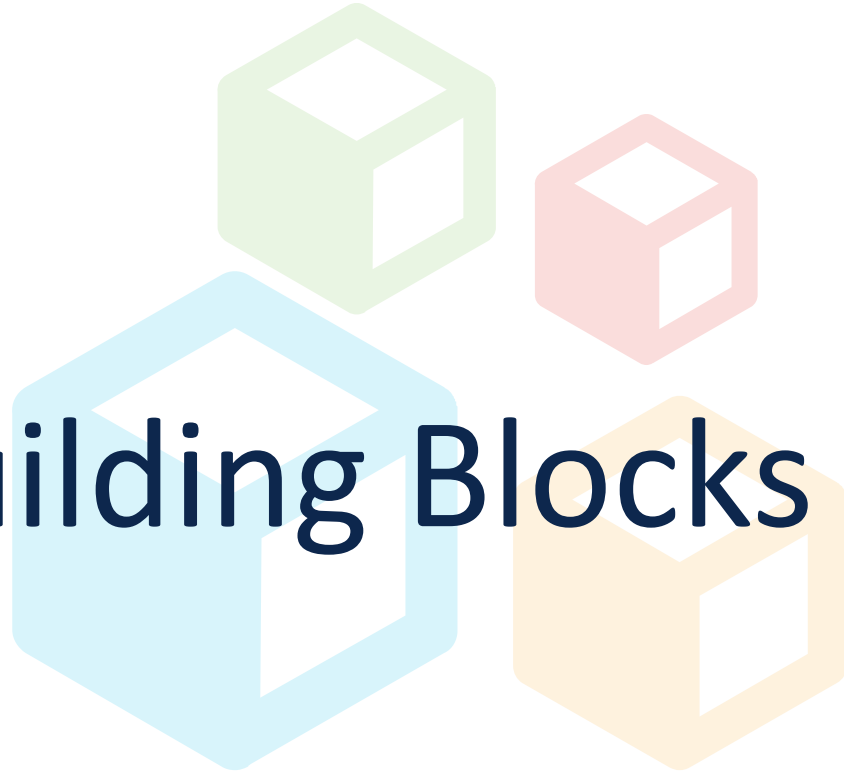
Flexibility and
portability

On-Premises

Cloud Managed

Catalyst 8000 is only available with Cisco DNA software subscription

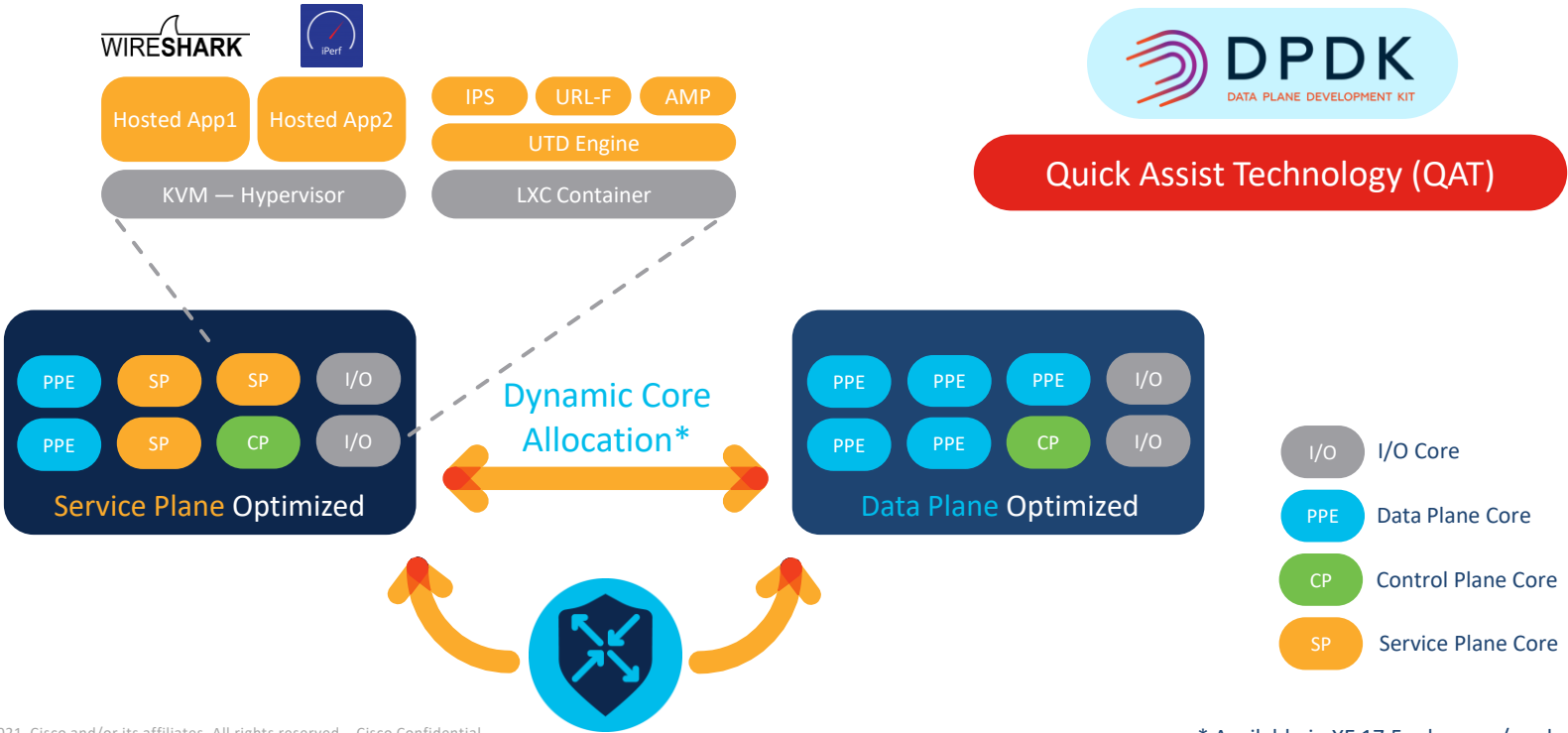
Key Building Blocks





x86 Multi-core SoC Architecture

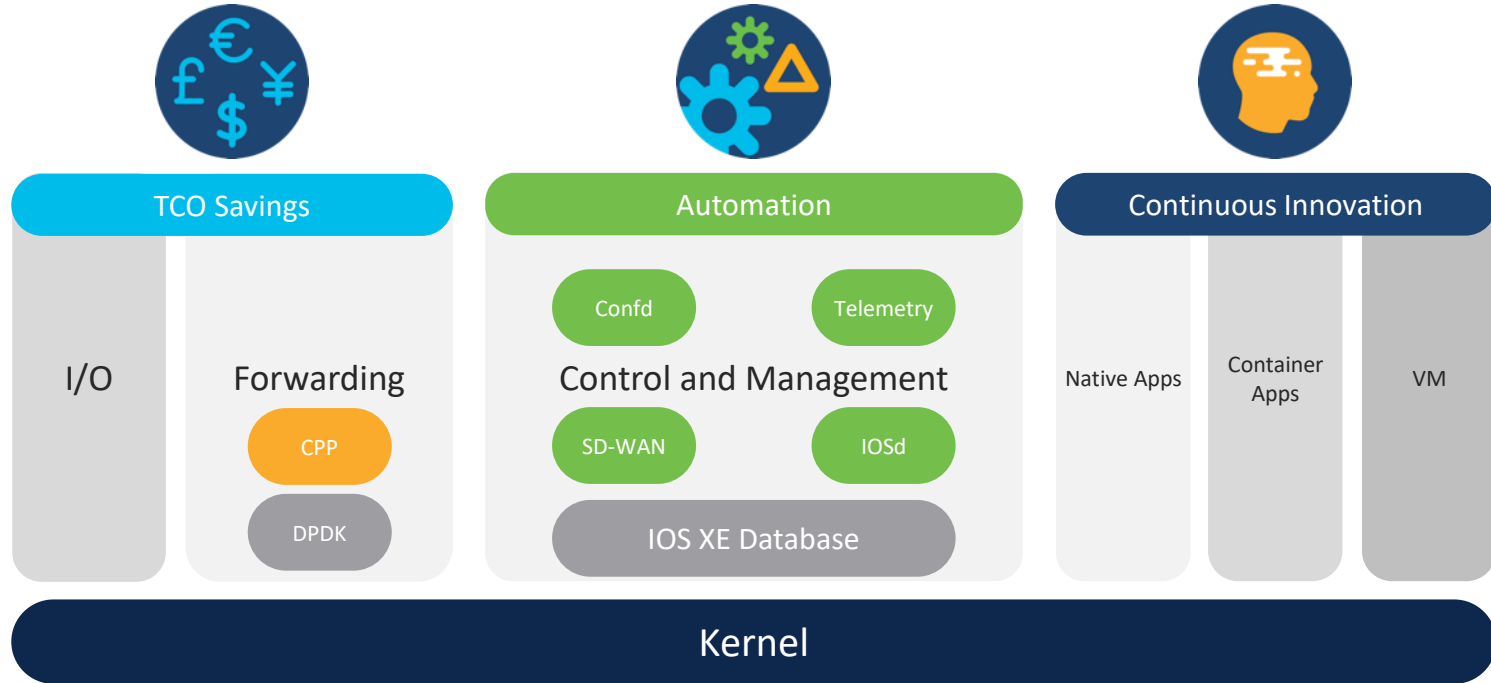
Key Datapath Innovations – Catalyst 8300, 8200, 8500L and 8000V





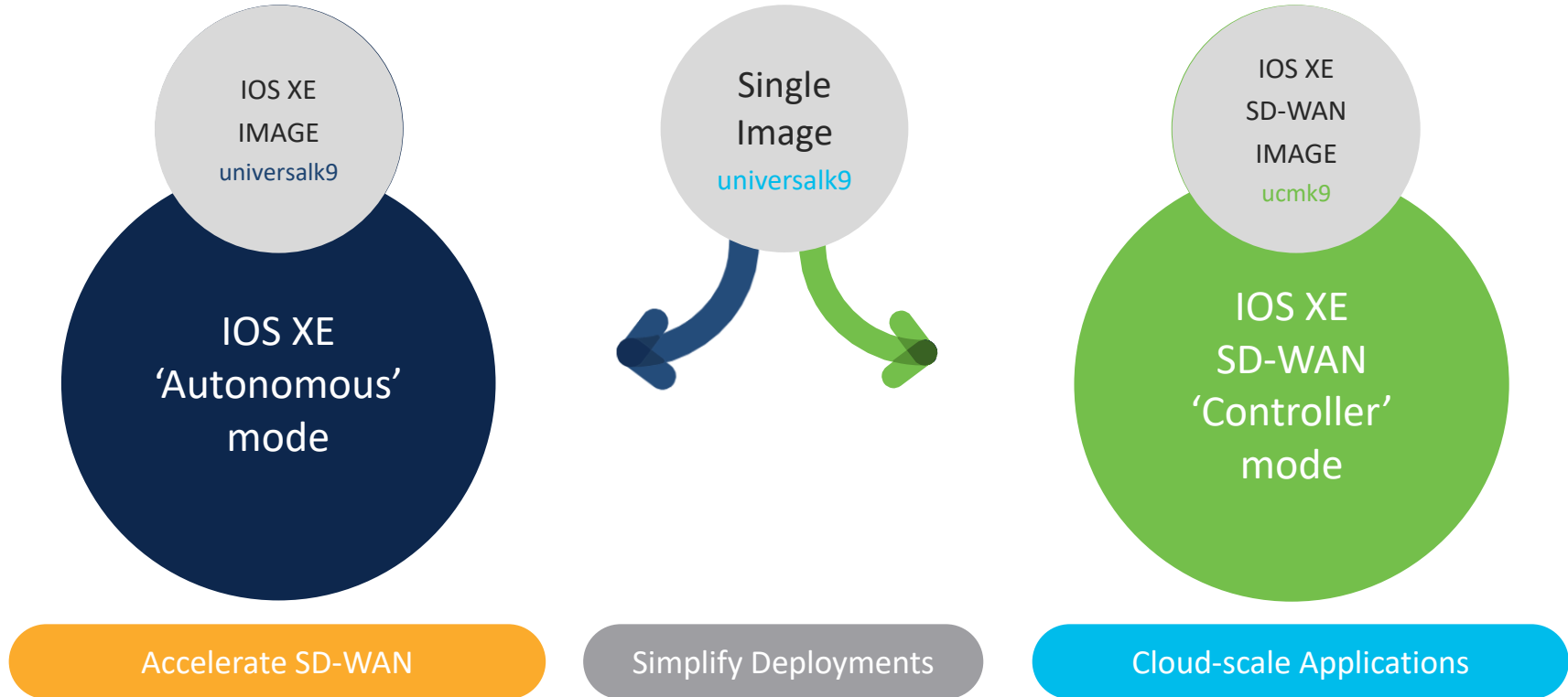
Open and Extensible IOS XE

Open IOS XE — A Modern Operating System



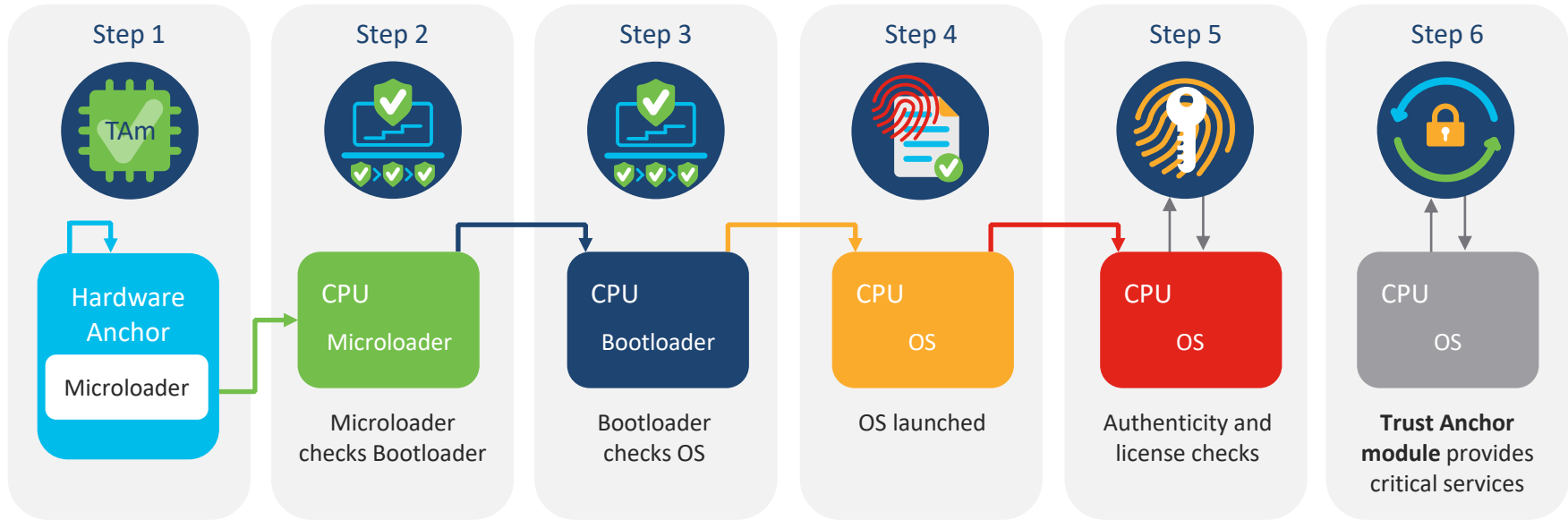
Open, API, Model Driven & Secure Operating Systems

Easy Operations with Single Image





Secure Platform with Trustworthy Solutions



First instructions run on CPU stored in tamper-resistant hardware

Confidentiality

Integrity

Authenticity



Catalyst 8500L

Evolution of ASR1000-X routers

Cisco Catalyst 8500/8500L Series Edge Platforms

Highly Capable 1RU SD-WAN Headend

Integrated Rich Services

NBAR2, NAT, Firewall, QoS, etc.
Industry's Leading Service Edge Platforms

Edge Intelligence

Compute
Container based Apps



Scale

Up to 8000 SD-WAN Tunnel Aggregation
High Density 10/1 Gigabit Ethernet Ports

Multi-layer Security

Trustworthy Solutions
High Throughput IPsec
WAN MACsec on all ports
Umbrella SIG and App Aware Firewall

Manageability

Open APIs

vManage

DNA Center

Analytics

Catalyst 8500L Series Edge Platform

1G, 10G
'S' 'X'



C8500L-8S4X

8 SFP, 4 SFP+

Up to 20 Gbps CEF,
High Performance IPsec



Advanced Flow Based
Forwarding Algorithms



User Centric Design, RFID,
Label Tray, FRUs



C8500L - Performance enhancements using advanced flow-based forwarding



Multi-Core Parallel Processing



High Scale Feature Velocity
Improved Performance, Programmable



High speed IPsec, with QAT
In-Line Encryption, Decryption



Advanced flow-based forwarding
algorithm



Advanced flow based forwarding on C8500L

Multicore Architecture

12 cores

Variable distribution depending on use case and customer selection

Specialized Hardware Assist

Crypto supported by dedicated cores

Stateful flows are locked to cores to optimize forwarding. Intel® Quick Assist Technology (QAT) is used to accelerate cryptography for maximum secure throughput.

Traditional x86 based data planes give any packet to any available core.



Stateful features require additional processing and spend time moving state information.



Advanced flow based forwarding locks a flow to a given core.



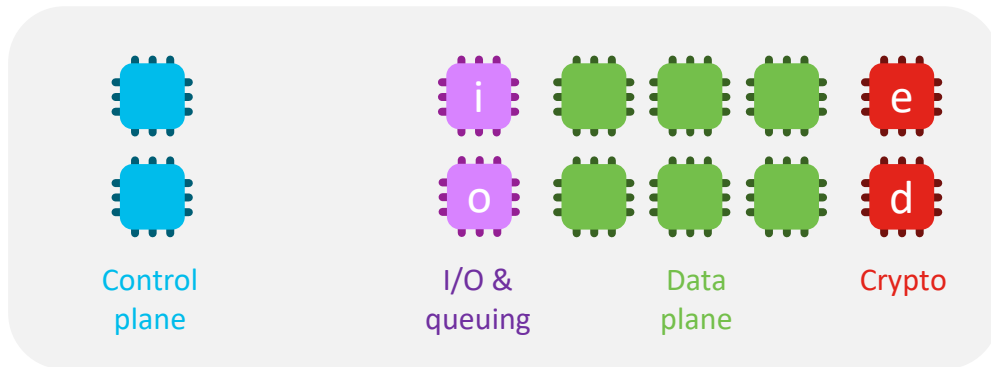
- reduces overhead for stateful features



Two modes – data or service plane focused

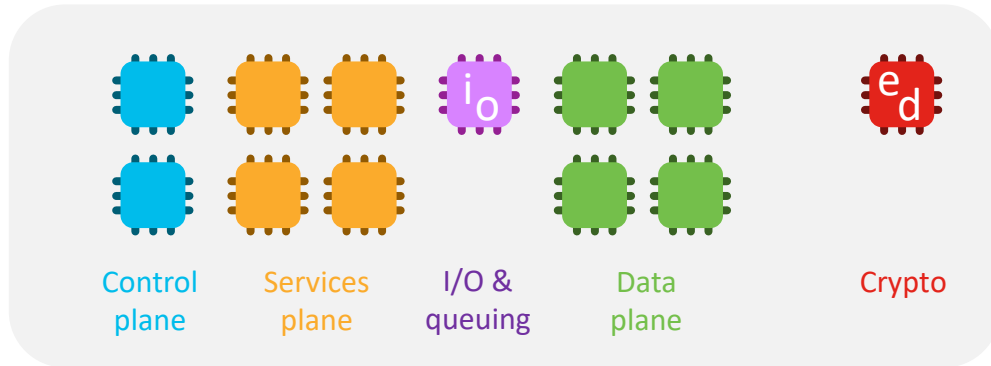
Data plane focus

- 2 cores for control plane
- No cores for services
- 10 cores for data plane
 - 2 cores shared for I/O and queuing
 - 2 crypto cores (1 encrypt, 1 decrypt)
 - 6 cores for feature processing



Services focus

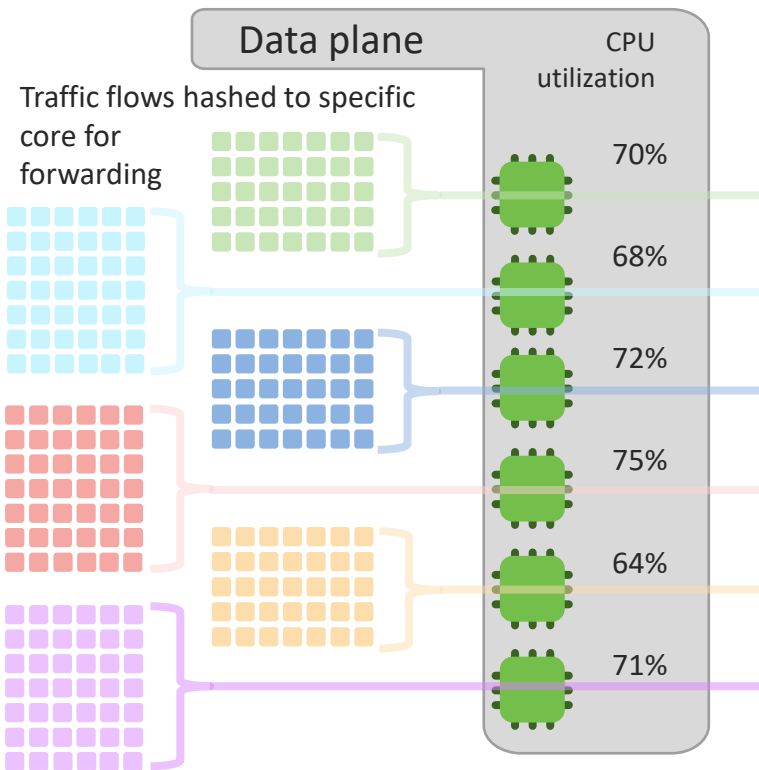
- 2 cores for control plane
- 4 cores for services
- 6 cores for data plane
 - 1 core shared for I/O and queuing
 - 1 crypto core (encrypt and decrypt)
 - 4 cores for feature processing



CLI configuration and reboot required to change modes. Roadmap for future software to not require reboot.



C8500L uses Advanced Flow-based forwarding to optimize x86 architecture forwarding



Flow based forwarding is optimized for forwarding a diversity of flows traffic flows.

A diverse set of flows will ensure a broad distribution across all cores so that they are in use equally to get optimal forwarding rates.

Flows are distributed based on a hash of the L3 and L4 packet headers.

ASR1001-X vs C8500L-8S4X

Product Comparison

Up to 4.5 Gbps SD-WAN, 6000 tunnels

Up to 20Gbps CEF, 5.5Gbps Crypto

2M NAT/PAT, 15 Gbps NAT perf

4GB DP Memory, 16K Queues

Ports: 6x 1G, 2x 10G

8GB to 32GB upgradable DRAM

QFP 2.0, 31 Cores

Up to 8.5Gbps SD-WAN, 8000 tunnels

Up to 20Gbps CEF, 13Gbps Crypto

2M NAT/PAT, 17 Gbps NAT perf

Max 4GB DP Memory, 16K Queues

Ports: 8x 1G, 4x 1/10G

16GB to 64GB upgradable DRAM

x86, 12 Cores, Flow Based Architecture



All perf numbers are aggregate IMIX throughput



Catalyst 8200

Evolution of ISR4300



Cisco Catalyst 8200 Series Edge Platforms

Multi Gig SD-WAN branch with Accelerated Services



2x Data plane Performance



2x Services Performance



Gigabit+ Cellular, 5G Ready



SD-WAN Voice Integration

SoC Architecture for
Dynamic Core allocations



Hardware
Accelerated Services



Up to 2500 SD-WAN
IPsec Tunnels



High Speed Cloud Access



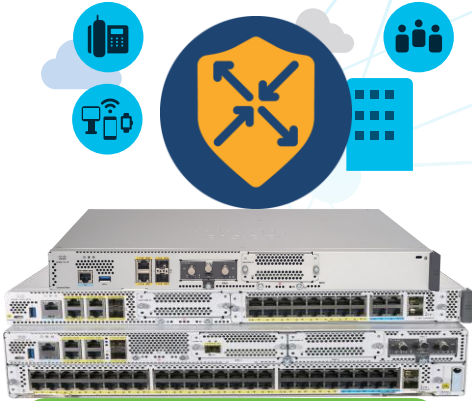
SD-WAN Hub, Branch and Cloud

10G WAN, LTE/5G, DSL, PoE

SASE, Cloud on-ramp

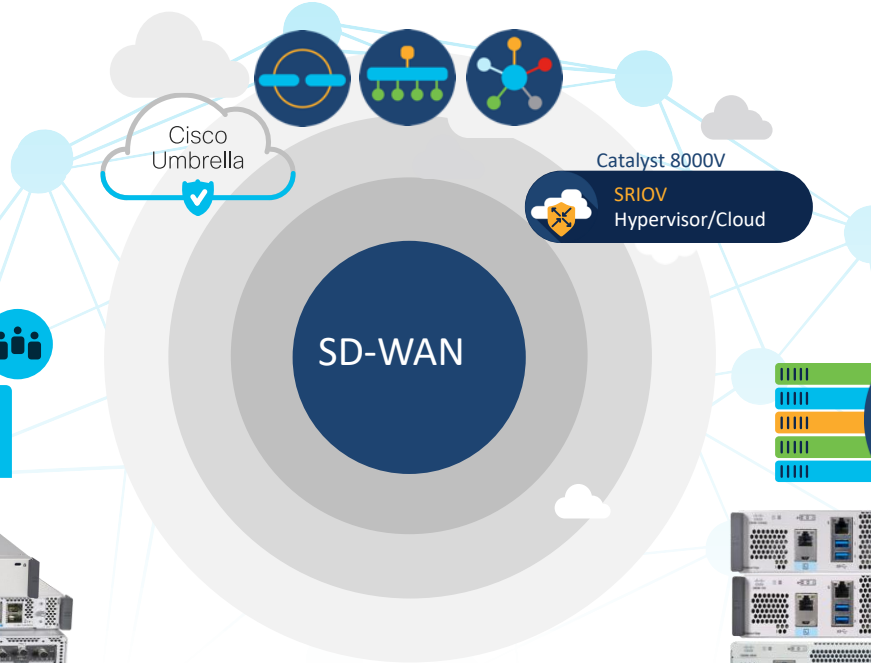
On-prem security stack

UC/Voice Integration



Branch

Catalyst 8300/8200

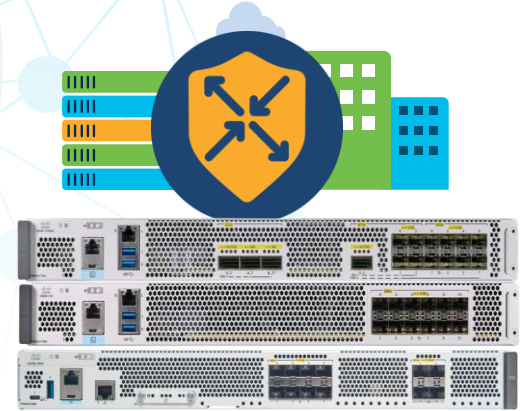


100G, 40G Connectivity

High SD-WAN Performance

High SD-WAN Scale

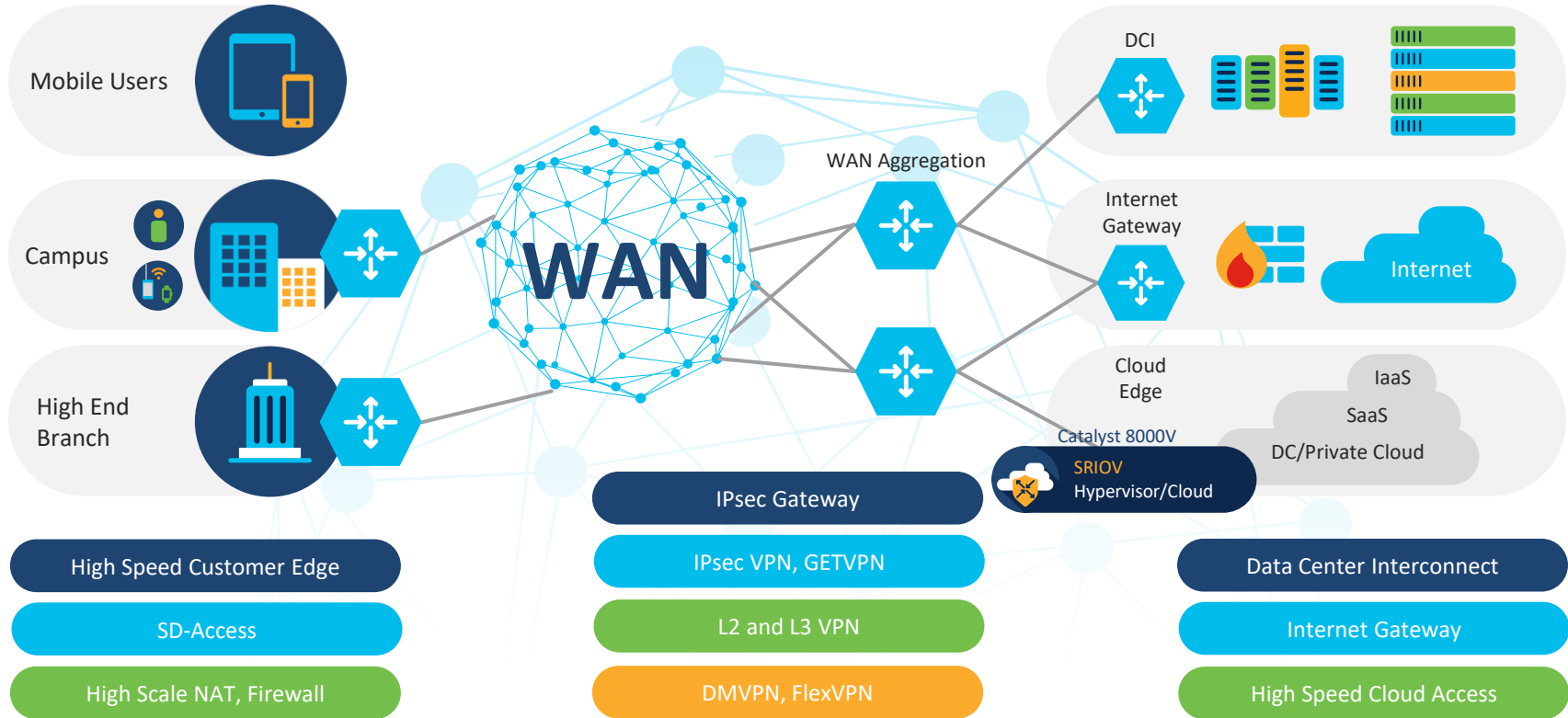
1RU form factor



Aggregation

Catalyst 8500

Enterprise Applications



Cisco Catalyst 8200 Series Edge Platforms

Foundation for the Secure Cloud Scale SD-WAN branch

Integrated Rich Services

Voice Survivability, Forward Error Correction
& Packet Duplication, TCP Optimization

Edge Intelligence

Container based Apps



Performance & Scale

Up to 2x IPsec and CEF Performance
Core Availability for 2x Services Performance
Up to 2x higher IPSEC tunnel Scale

Multi-layer Security

SSL Acceleration
Application Firewall
IPS/IDS, URL Filtering
AMP, Threat Grid
Umbrella SIG

Connectivity

Higher
WAN Port
density

Default 8G
DRAM

PIM
Support

Pluggable
NVMe
Storage

5G Ready

Manageability

vManage

DNA Center

Open APIs

Analytics

YES
Modularity

Cisco Catalyst 8200 Series Edge Platforms

Introducing 1G in Access with higher port density

C8200-1N-4T

1G WAN Ports 'T'
& 1G IPsec



2 RJ45
2 SFP

NVMe
Storage

Voice/
Cellular

User Centric Design
(RFID, QR label)



Catalyst 8200 Supported Modules



LAN

NIM-ES2-4
NIM-ES2-8
NIM-ES2-8-P

Async

NIM-16A*
NIM-24A*

WAN

NIM-1T
NIM-2T*
NIM-4T*
NIM-2BRI-S/T*
NIM-4BRI-S/T*

WAN + Voice:
NIM-1MFT-T1/E1
NIM-2MFT-T1/E1
NIM-4MFT-T1/E1
NIM-8MFT-T1/E1
NIM-1CE1T1-PRI
NIM-2CE1T1-PRI
NIM-8CE1T1-PRI

LTE

NIM-LTEA-EA
NIM-LTEA-LA
P-LTE-VZ
P-LTE-NA
P-LTE-US
P-LTE-JN
P-LTE-GB
P-LTE-IN
P-LTE-AU
P-LTEA-EA
P-LTEA-LA
P-LTEAA-EA
P-LTEAP18-GL
CG418-E*
CG522-EE

5G

(1H, CY21 : Roadmap)

P-5GS6-GL

Voice

NIM-2FXSP
NIM-4FXSP
NIM-2FXS/4FXOP
NIM-2FXO
NIM-4FXO
NIM-4E/M*
NIM-2BRI-NT/TE*
NIM-4BRI-NT/TE*
NIM-PVDM-32
NIM-PVDM-64
NIM-PVDM-128
NIM-PVDM-256

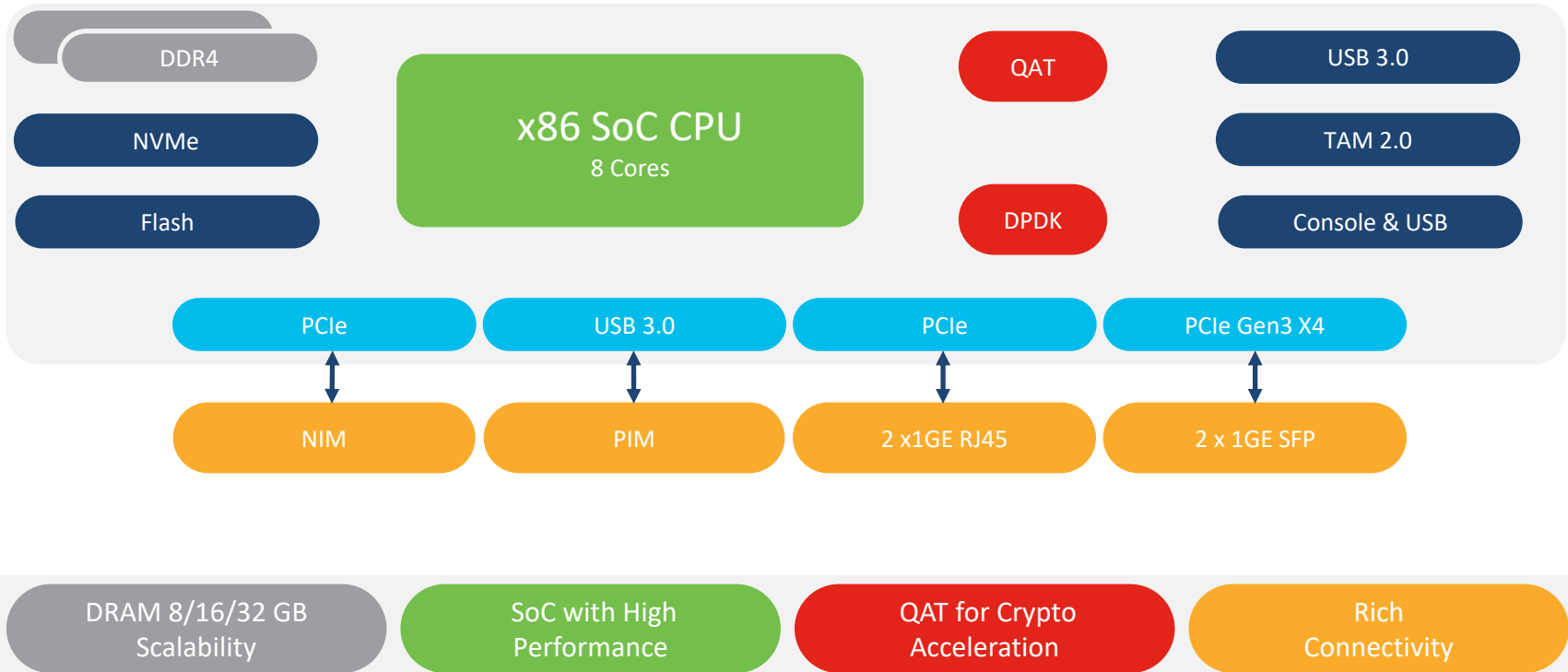
DSL

NIM-VAB-A
NIM-VA-B*
NIM-VAB-M
NIM-4SHDSL-EA*

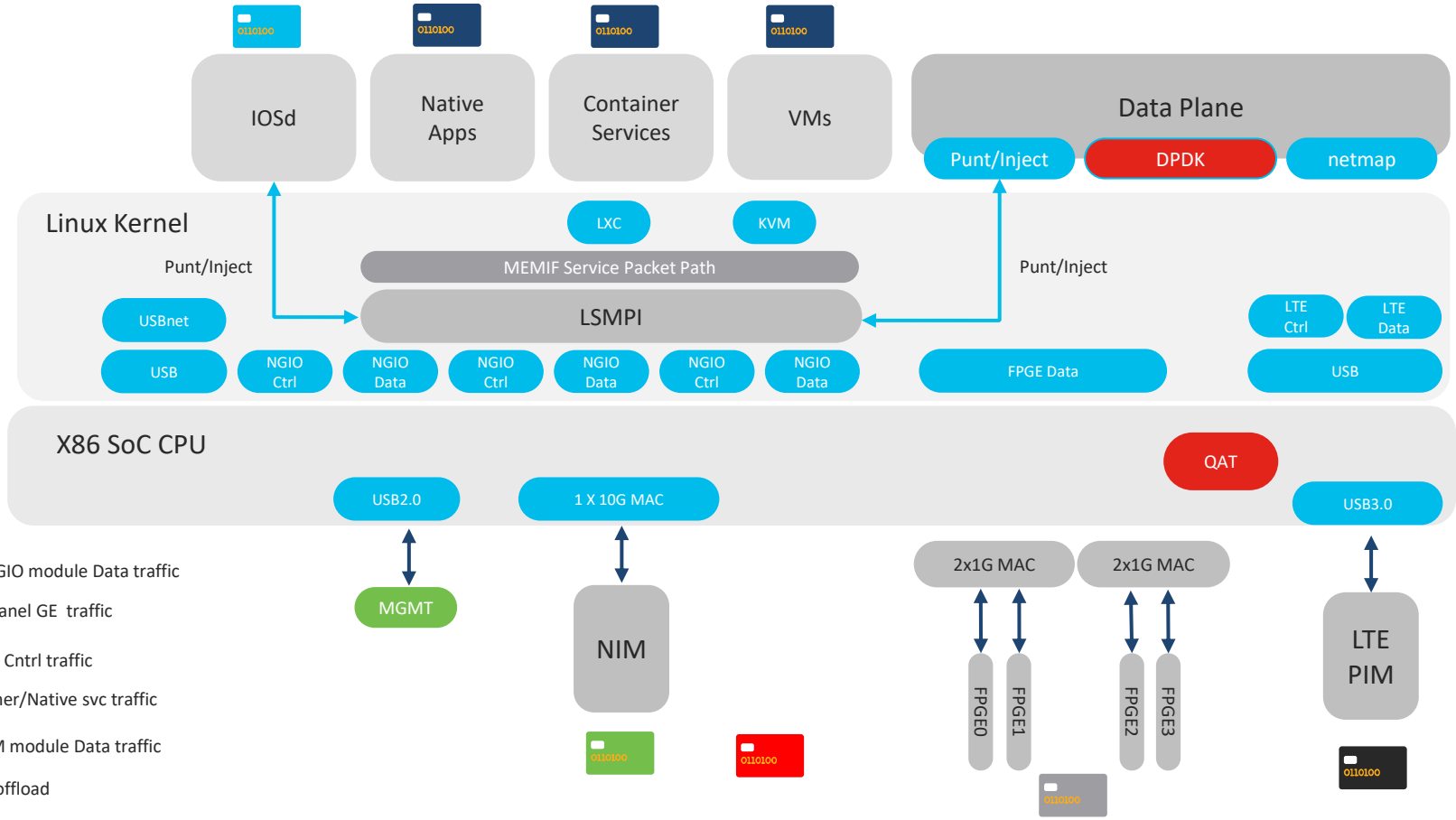
Storage

SSD-M2NVME-600G
M2USB-16G
M2USB-32G

C8200-1N-4T Block Diagram



Catalyst 8200 and Life of a Packet



ISR 4331 vs C8200-1N-4T

At a glance

Up to 1000 SD-WAN & 2000 Traditional IPsec Tunnels

Up to 485Mbps SD-WAN IPsec

Up to 1.8Gbps CEF, 445Mbps Crypto

200Mbps IPS/IDS + URL-Filtering

4GB to 16GB upgradable DRAM

Default WAN Ports: 3 Ports

Split CP/DP, 4C+4C

Up to 2500 SD-WAN & 4000 Traditional IPsec Tunnels

Up to 1Gbps SD-WAN IPsec

Up to 3.8Gbps CEF, 1Gbps Crypto

400Mbps IPS/IDS + URL-Filtering

8GB to 32GB upgradable DRAM

Default WAN Ports: 4 Ports

X86 SoC, 8C Cores, HW Crypto



All perf numbers are aggregate IMIX throughput (352B)



Catalyst 8200 uCPE/8000V

Evolution of ENCS 5100

Virtualization Offers Flexibility, Simplicity, Savings



Router



Firewall



Wan Opt



Load Balancer

Physical Branch



VNFs



Hypervisor

Server

Virtual Branch

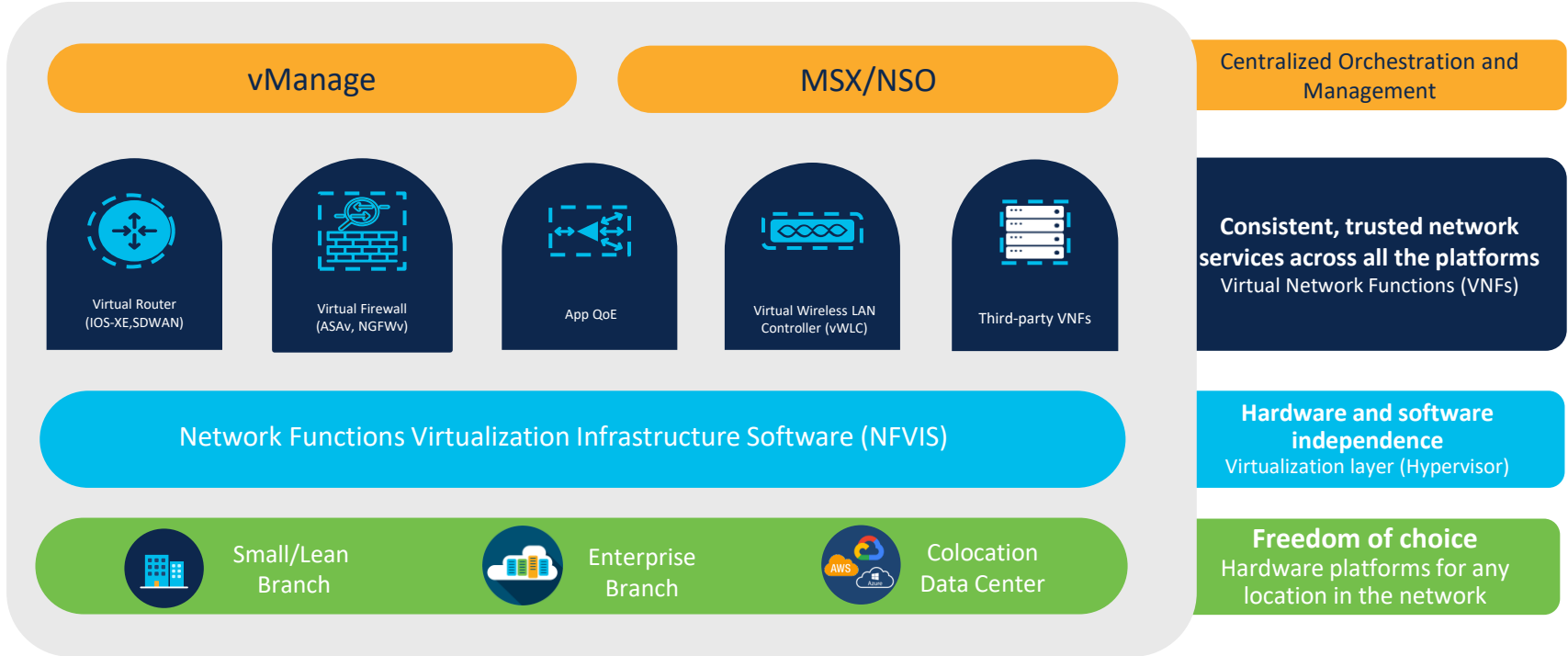
Why Virtualization?

- Flexibility
- Less Devices, More VNFs
- Quick Rollout Time
- Service Agility
- Efficient Resource Utilization
- OpEx Savings

Cisco's Virtualization is available for both Traditional Routing as well as SD-WAN routing

Cisco's virtualization portfolio

Network services on any platform, anywhere - branch or data center



C8200 Edge uCPE Platform Use-Cases

Enterprise WAN Edge

Traditional & SD-WAN
Security Compliance

Deployment Use-Case



Catalyst 8200 Edge
uCPE

Managed Service Providers

Managed CPE
Wireless WAN
SLA Monitoring and Management

DDI Services and Network Analysis

DHCP, DNS, IPAM
Thousandeyes

Secure Access Services Edge (SASE)

Cloud onramp for IaaS & SaaS
Umbrella SIG Integration
Multi-layer security

Purpose built edge platforms centered around cloud, services & SD-WAN

Cisco Catalyst 8200 Series Edge uCPE

Designed for Software-Defined Small and Lean Branches



More Cores for services



5G Ready



Diverse Orchestration Support



Added Storage for applications



01

Multiple VNFs on a single platform

02

Higher WAN port density with 5G readiness

03

Support for business applications

04

Easy, zero-touch provisioning

Cisco Catalyst 8200 Edge uCPE Platform

Platform Evolution for SP NFV Deployment



Rich Service Chain

SDWAN Routing, Security, WLC VNFs



Performance Elasticity

Up to 500Mbps IPSec and 2 Gig CEF Performance with QAT
Optimized datapath with OVS-DPDK and SRIOV

Edge Compute

AI/ML, Monitoring with ThousandEyes
IOT applications

Comprehensive Security

Trustworthy Solution
Secure Overlay for NFVIS Out of Band Management
SASE

System



Connectivity

Higher WAN Port density

8 Cores

Pluggable NVMe storage

Pluggable LTE

5G Ready

Manageability

vManage

MSX

Open APIs

Analytics

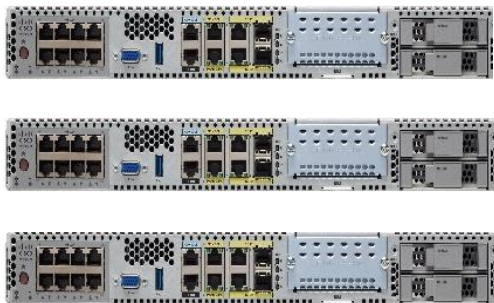
Cisco's Virtualization Portfolio

Small/Lean SD-Branch



Catalyst 8200 Series Edge uCPE
8 cores

Enterprise Virtualization



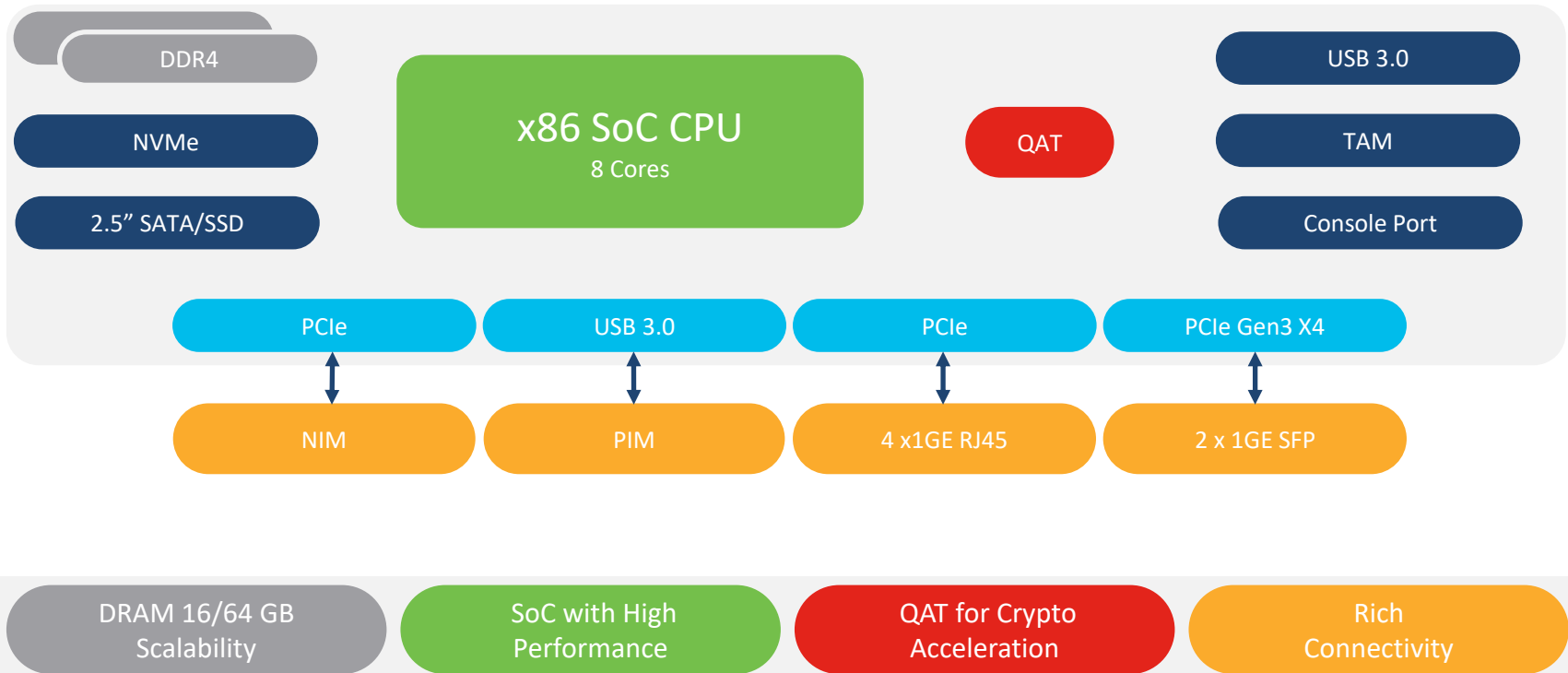
ENCS 5400 Series
6 to 12 cores

DC, Hub and Colocation



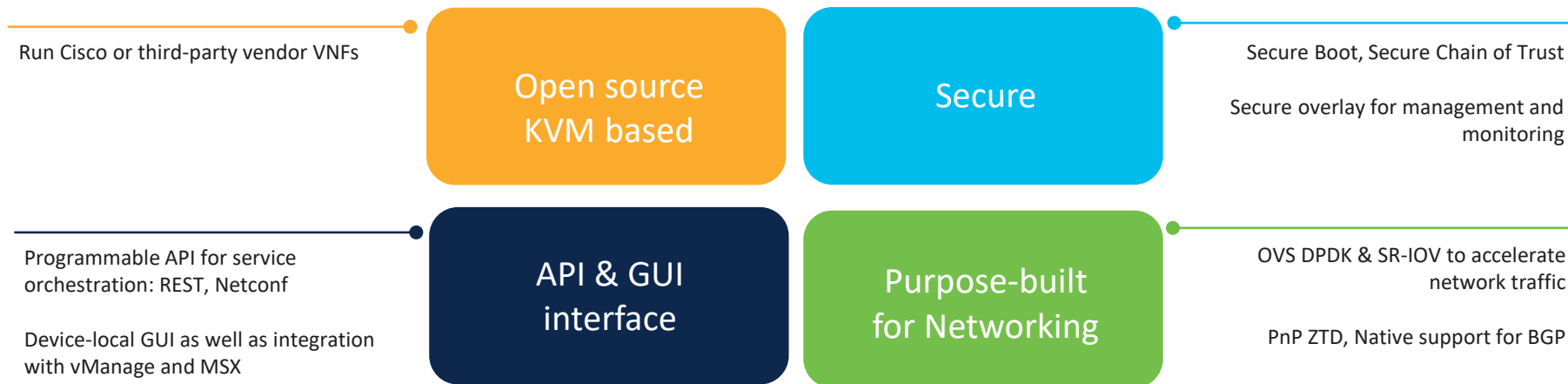
CSP 5200 & 5400 Series
16 to 56 cores

C8200-uCPE-1N8 Block Diagram

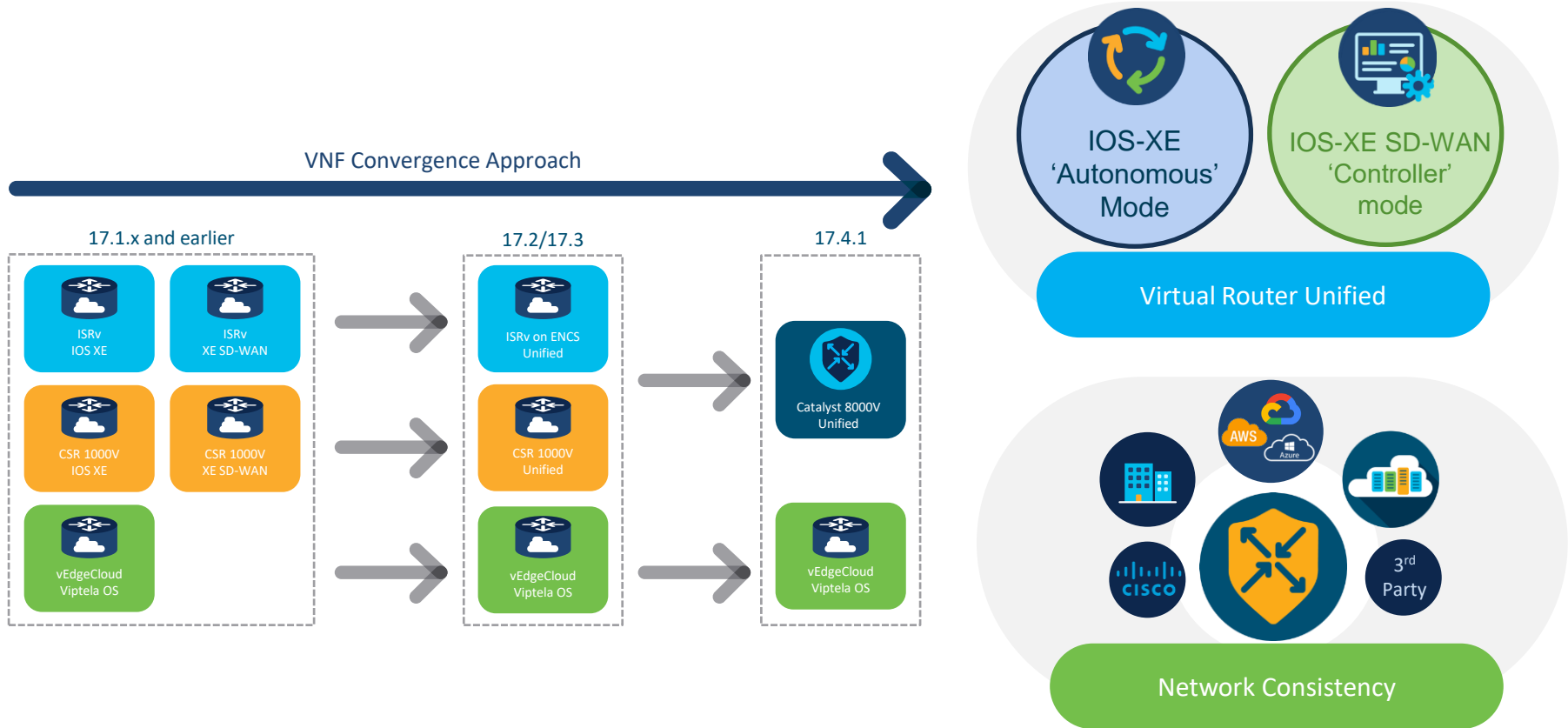


Cisco Network Function Virtualization Infrastructure Software (NFVIS)

Purpose built hypervisor designed specifically for hosting VNFs



Virtual Router Convergence

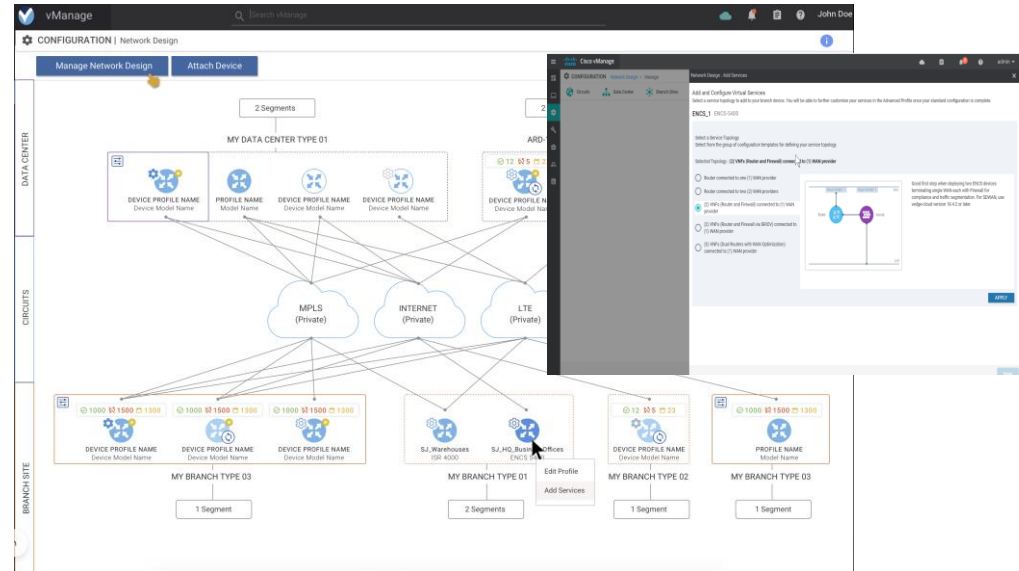


vManage for SD-Branch



Single pane of glass operations

- Unified life-cycle management of device and SD-WAN
- Monitoring, assurance and troubleshooting
- Centralized image repository and VNF packaging tools
 - Cisco and 3rd party VNFs

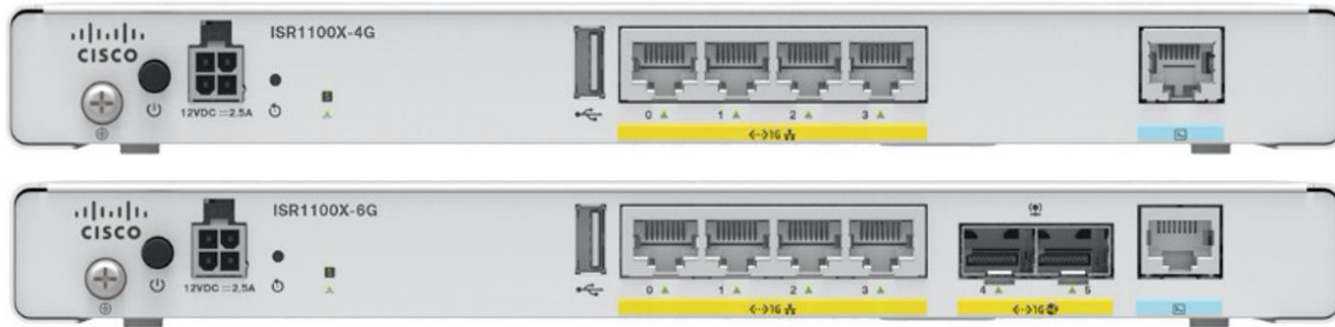


Automated service chaining

Zero-touch provisioning

Cloud delivered orchestrator

Validated network design templates



ISR1100X Platform for SD-WAN Branch

Bridge to Feature Rich SD-WAN from Viptela OS

Cisco ISR1100X Series Routers

Bridge to Feature Rich SD-WAN from Viptela OS

IOS-XE SD-WAN
17.4.1a or Viptela OS
20.4.1 onwards



ISR1100X—4G



8GB DRAM

8GB Flash

4x1GE Ethernet

ISR1100X—6G



8GB DRAM

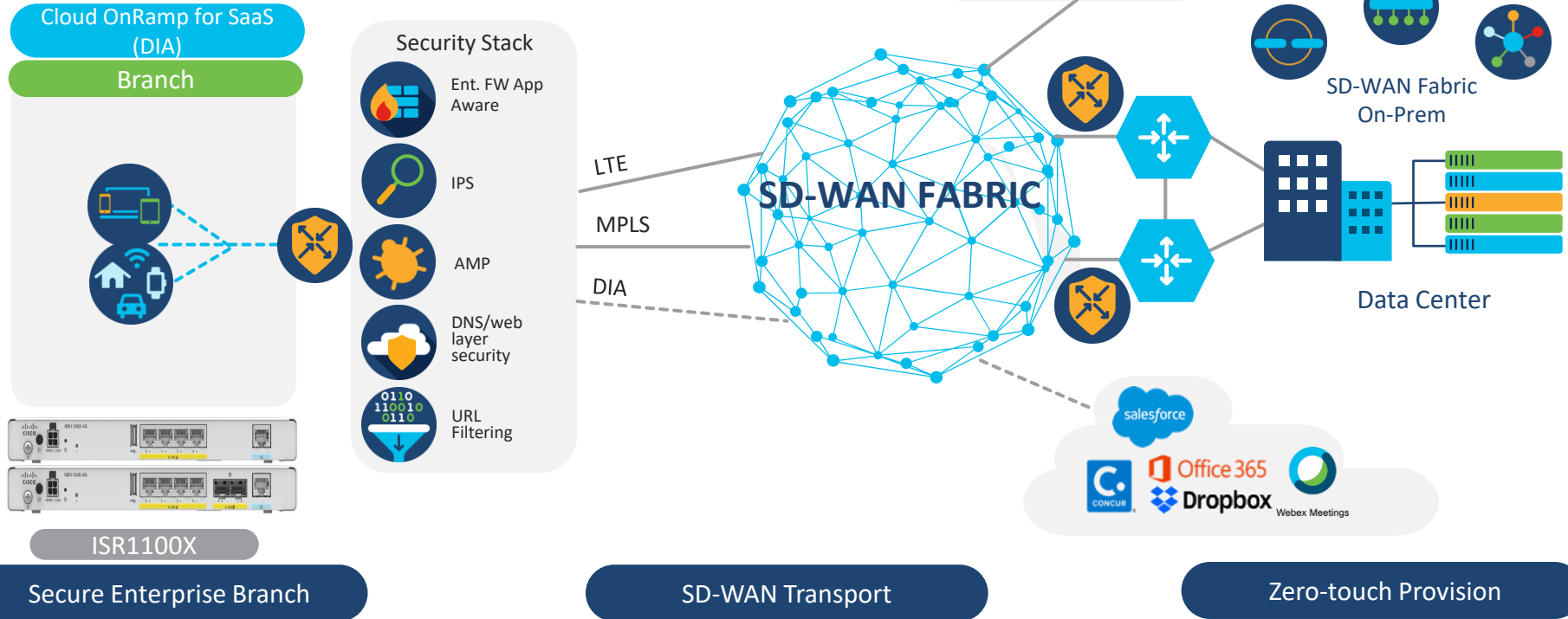
16GB Flash

4x1GE Ethernet
2x1GE SFP

SD-WAN to the Branch

Enterprise Branch Office

SD-WAN Controller Cloud/On-Prem



Cisco ISR1100 Series Routers

Existing 4GB DRAM
Platforms launched in
2019

ISR1100—4G



4 X 10/100/1000Mbps
4GB DRAM

ISR1100—6G



4 X 10/100/1000Mbps
2 X 1G SFP
4GB DRAM

ISR1100—4GLTE



4 X 10/100/1000Mbps
Cat-4 Integrated LTE
4GB DRAM

SD-WAN to the Branch

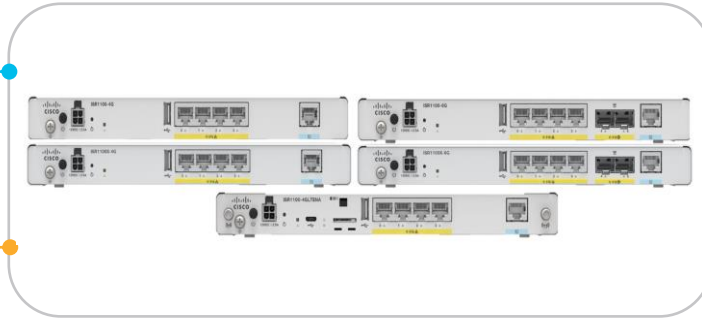
Cisco ISR1100 and ISR1100X Series Routers for SD-WAN Branch

Integrated Rich Services

Forward Error Correction & Packet Duplication, TCP Optimization
SGT Propagation*, SD-AVC*, Custom Applications*

Advanced Mobility

Integrated LTE (Cat 4)



High Performance & Scale

Up to 500Mbps of IPSEC IMIX throughput
Dynamic Core Allocation*
Up to 3000 IPSEC and GRE Overlay Tunnels

Comprehensive Security

IPS*
URL Filtering*
Advanced Malware Protection*
Enterprise FW with Application Awareness*
DNS Web Layer Security (Umbrella)

* IOS-XE SD-WAN

Full Featured SD-WAN



Rich Services with Enhanced Performance

Ethernet/LTE

8GB DDR4
(ISR1100X Series)

IOS-XE SD-WAN/
Viptela OS

Manageability

vManage

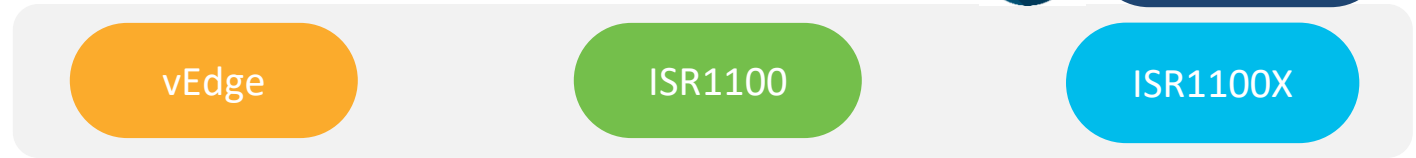
Open APIs

Analytics

ISR1100 and ISR1100X Series Platform Evolution



IOS-XE SD-WAN
17.4.1a or Viptela
OS 20.4.1 onwards



vEdge 100B
vEdge 100M
vEdge 1000

ISR1100-4G
ISR1100-4GLTE
ISR1100-6G

ISR1100X-4G
ISR1100X-6G

	vEdge	ISR1100	ISR1100X
Ports	5 – 8 WAN ports	4 – 6 WAN ports	4 – 6 WAN ports
OS	Viptela OS	Viptela OS, Upgradable to IOS-XE SD-WAN	Viptela OS or IOS-XE SD-WAN
DRAM	2 - 4 GB DRAM	4 GB DRAM	8 GB DRAM
Feature Support	Basic SD-WAN	Basic SD-WAN with Viptela OS, Feature rich SD-WAN with IOS-XE	Basic SD-WAN with Viptela OS, Feature rich with Full Stack SD-WAN Security with IOS-XE
Scale	Up to 1500 IPSEC and GRE Tunnels	Up to 1500 IPSEC and GRE Tunnels	Up to 3000 IPSEC and GRE Tunnels

Superior Hardware

Branch Security

IOS-XE SD-WAN vs Viptela OS Comparison

ISR1100X - Bridge to Feature Rich SD-WAN from Viptela OS

IOS-XE SD-WAN Benefits



Comprehensive Security
now available on ISR1100X
Series Routers with
IOS-XE SD-WAN

Features	Viptela OS				IOS-XE SD-WAN			
	1100-4G	1100X-4G	1100-6G	1100X-6G	1100-4G	1100X-4G	1100-6G	1100X-6G
SD-WAN Security	IPS	●	●	●	●	●	●	●
	URL Filtering	●	●	●	●	●	●	●
	AMP	●	●	●	●	●	●	●
	ENT FW	●	●	●	●	●	●	●
	DNS Web Layer Security (Umbrella)	●	●	●	●	●	●	●
TCP Optimization	●(BBR1)	●(BBR1)	●(BBR1)	●(BBR1)	●	●(BBR2)	●	●(BBR2)
IPv6	●**	●**	●**	●**	●	●	●	●
SGT Propagation	●	●	●	●	●	●	●	●
SD-AVC	●	●	●	●	●	●	●	●
Custom App	●	●	●	●	●	●	●	●
Service side NAT	●	●	●	●	●	●	●	●
Route Leaking	●	●	●	●	●	●	●	●

*Viptela OS supports only Prefix, Protocol, Port based matches conditions, however IOS-XE SD-WAN supports App based match along with 5-tuple match

**Viptela OS supports Static IPv6 addressing on Transport side



Catalyst Cellular Gateway

Cellular Evolution towards 5G

Cellular Gateway platforms

- IP Passthrough device
 - LTE to Ethernet IPv4/IPv6 connectivity
 - No NAT
 - No Firewall
 - No L3 / L4 features
- Extending LTE radio to favorable location
- Use existing facility ethernet infrastructure to connect Cellular Gateway to network stack
- Generic requirement for DHCP server / client operation



Deployment connectivity

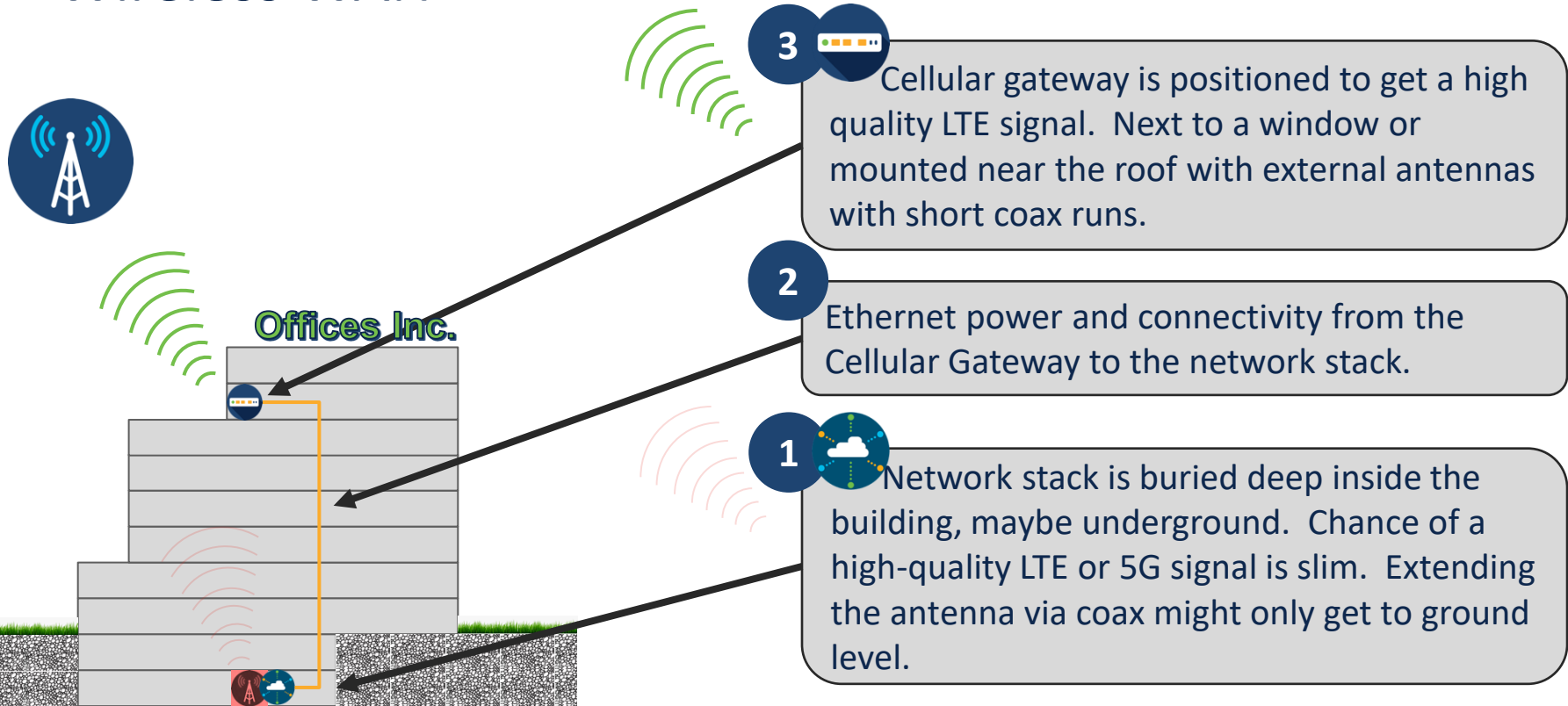
Recommended deployment uses ethernet cable to attach to the 2.5 mGig interface on the Cellular Gateway.

The other end of that cable is attached to one of the WAN interfaces on the client device. GigabitEthernet 0/0/0 – 0/0/3 on C8300 for example.

This cable can also deliver power to the Cellular Gateway if the client device offers PoE. Otherwise, a power brick can be used.



Why Cellular Gateway is needed for high quality Wireless WAN



Cellular Gateways

All gateways

Dual Micro SIM
Single Radio

Supported with 3rd
party devices

Zero touch
deployment

4x4 ↓ MIMO

2x2 ↑ MIMO

Carrier Aggregation

SD-WAN support

Router GUI

vManage support

CG522-E

5G Sub-6 GHz
4G CAT 20

↓ 2.4 Gbps
↑ 300 Mbps

4G & 5G status LEDs

CG418-E

CAT 18 LTE

↓ 1.2 Gbps
↑ 150 Mbps

4G status LED

Same form factor
Same security profile
Same connectivity
options



Cellular Gateway connections

Management

- Serial console
- optional micro-USB for debug
- Reset switch

SIMs

- 2 micro-SIM cards



AUX console

- Roadmap for reverse console support

Ethernet

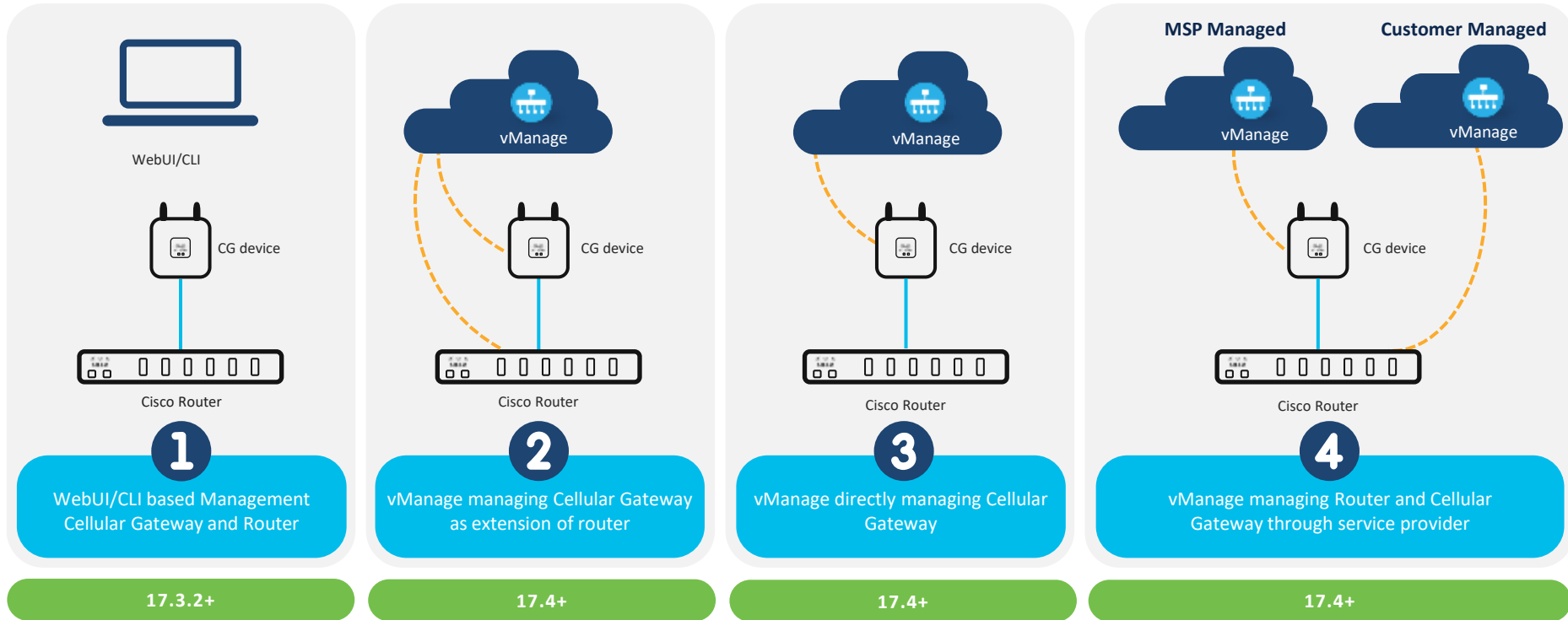
- mGig 2.5G ethernet link to the client device
- optional PoE+ power



Antennas

- 4 SMA connectors
- Supports 4x4 MIMO

Management Use Cases with Flexibility



Simplified management and cellular deployment while offering a bridge into 5G wireless WAN

Promotion Offers and Summary

Q3FY21 Promotion Offers

**LIMITED
TIME OFFER**

ISR G2 (2900/3900)



End of PSIRT Support : Dec '20
LDoS in next 18-24 months



Catalyst 8200/8300



SD-WAN | Voice Survivability | Interface Richness

C8300

Up to 28% on HW models
(Minimum 3Y DNA Tier1 Licenses)



FREE Switch Module



22P Port UADP Based Switch Module

OR

FREE PIM Module



4G/Cat18 Based Gigabit Cellular Module

C8200

Up to 38% on HW models
(Minimum 3Y DNA Tier0 Licenses)



FREE PIM Module



4G/Cat18 Based Gigabit Cellular Module

Offer applicable for Ala-Carte, EA, MSLA across all regions

Cisco Catalyst 8000 Edge Platforms Family

High Performance SD-WAN Headend, Intelligent Branch and Agile Cloud Edge



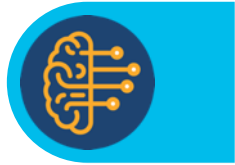
Ready for the Agile Cloud Journey

High Speed Cloud Access
Multi-Cloud Application Optimization
Compact, Powerful 1RU Platforms



Ready for 5G, Edge Compute

3rd Generation QFP In-Line Crypto
SASE driven Feature Innovations
Improved Services Performance



5G Ready Edge Intelligence

High End Aggregation 100/40/10/1GE Port flexibility
Multi-Domain Intent Based Networking



Equipped with User Centric Design

Operational Ease for better Tracing
Radio Frequency ID, Label Tray
Field Replaceable FAN Tray

1st 100/40GE Port
1RU SD-WAN
Platform



3rd Gen QFP, HW
Accelerated Services



High Performance



Catalyst 8000V

SRIOV
Hypervisor/Cloud



10GE WAN, Rich
connectivity



Cloud Security and
on-prem Security



Automation &
Telemetry

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- Weekly webinar series focused on just Catalyst products, features and solutions.
- Topics will rotate between Routing, Switching and Wireless including:
 - Product Deep Dives
 - Feature Deep Dives
 - Solution Deep Dives



- Sessions delivered by Subject Matter Experts with live Q&A.
- Convenient times for all regions.
- Part of the Cisco Customer Connection Program, connecting 30,000 Cisco customers and partners around the world.

- Register at:
<https://community.cisco.com/t5/customer->





The bridge to possible