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ALL IN

#CiscoLive



The bridge to possible

Which one is the perfect ISR1K for me?

Abhishek Keswani, Technical Marketing Engineer
BRKARC-1881

CISCO *Live!*

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Agenda

- ISR 1000 Hardware Overview
- Features, Technologies & Use Cases
- *Live!* Demo
- Performance & Scale
- FAQs
- Resources

Cisco Webex App

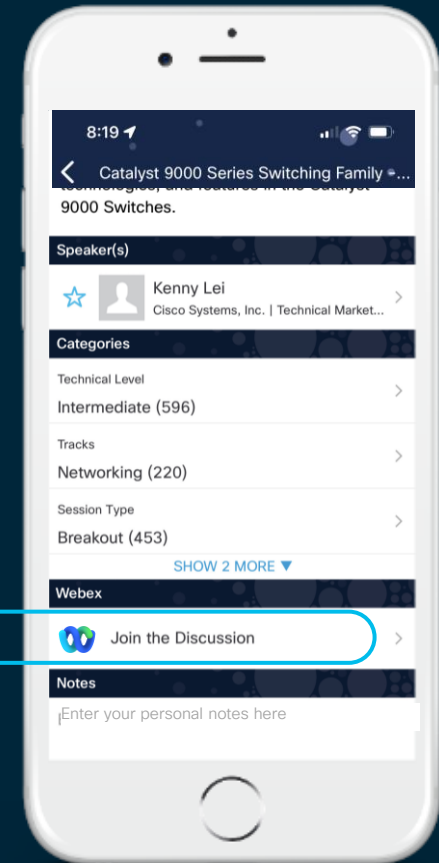
Questions?

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”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

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



<https://cicolive.ciscoevents.com/cicolivebot/#BRKARC-1881>

ISR 1000 Hardware Overview



What makes up a great branch router?



All the ISR 1000s!

DRAM/Flash
Storage

Embedded
Access Points

Cellular
Connectivity

DSL/ADSL/
VDSL/G.SHDSL



All the ISR 1000s!

DRAM/Flash Storage

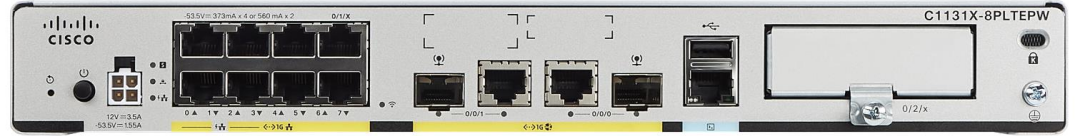
Embedded Access Points

Cellular Connectivity

DSL/ADSL/VDSL/G.SHDSL



C1161X-8PLTEP



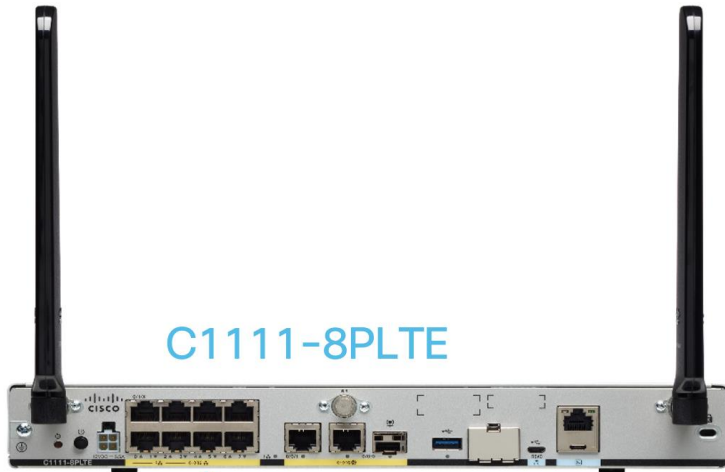
C1131X-8PLTEPW



C1121X-8PLTEPW



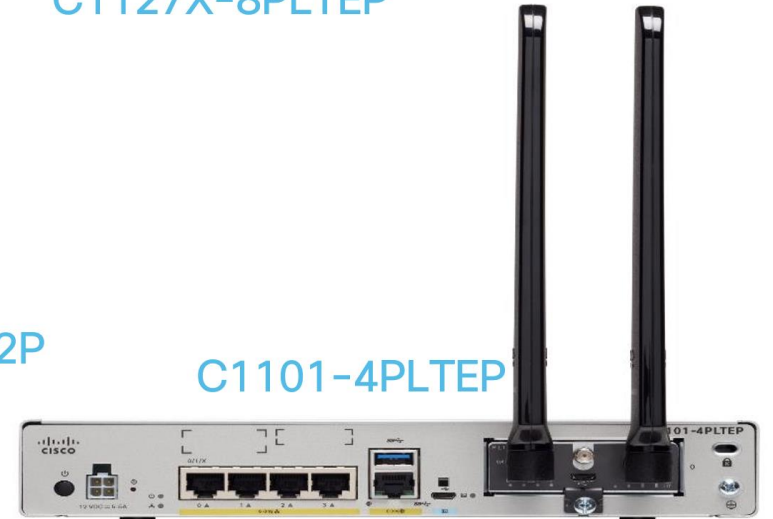
C1127X-8PLTEP



C1111-8PLTE



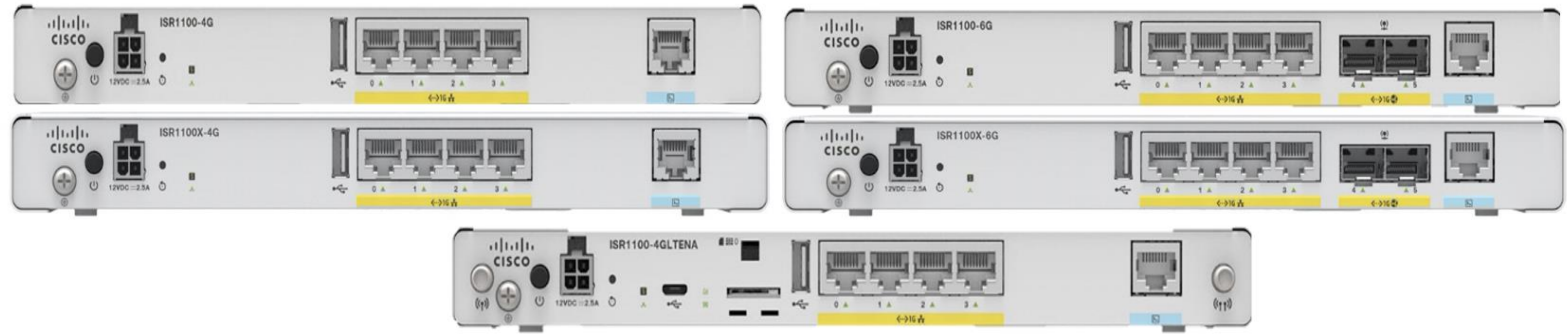
C1109-4PLTE2P



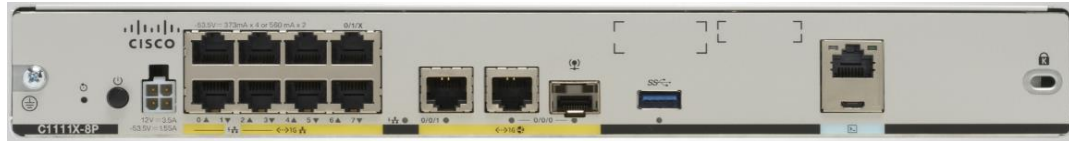
C1101-4PLTEP

CISCO *Live!*

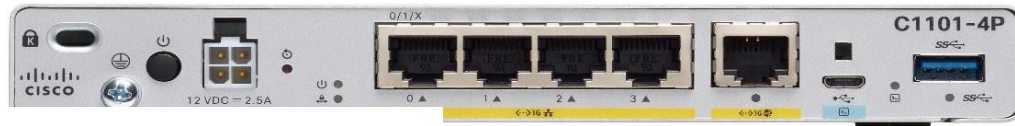
... almost all 😊



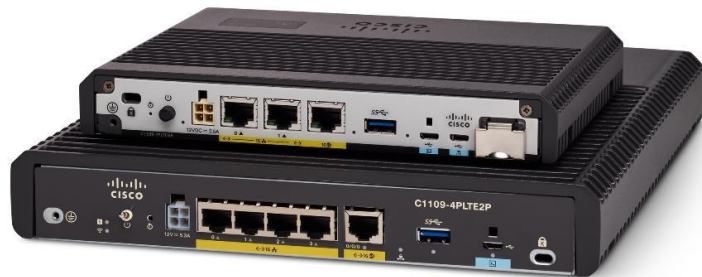
ISR1100(X)-4G/4GLTE/6G



C1111X-8P



C1101-4P



C1109-2PLTE
C1109-4PLTEP2P

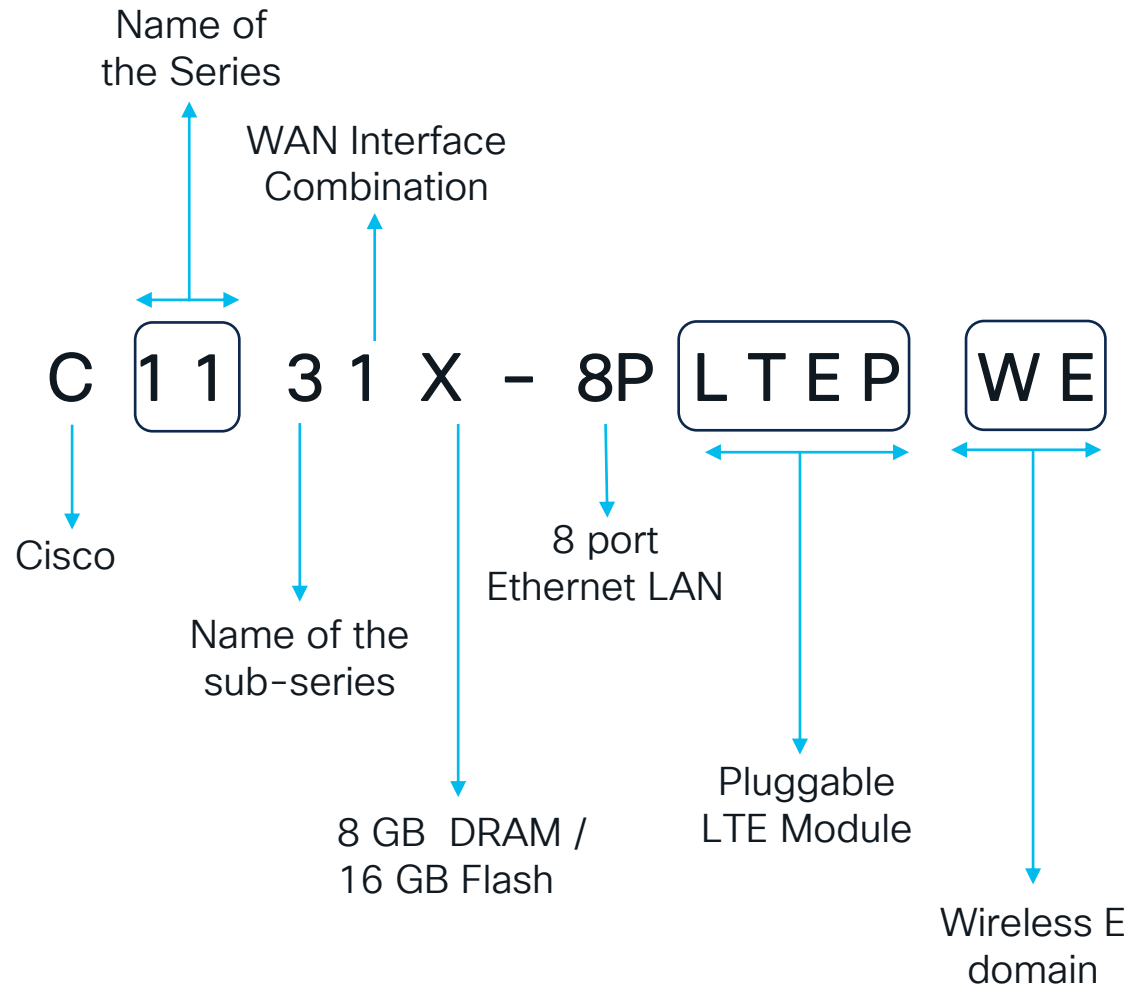


C1117-4PLTE



C1128-8PLTEP

Router PID Breakdown



Feature	Description
Power over Ethernet (PoE/PoE+)	4PoE/2PoE+
WAN Interface Combination	2xRJ45/SFP Combo
LTE Technologies	CAT 4 6 18 PIM Module CAT 4 LTE Dongle CG418, CG522
Wi-Fi Domains	A, B, E, Q, Z

What is your requirement?



Feature	ISR 116x	ISR 113x	ISR 112x	ISR 111x	ISR 110x
IPsec	820 Mbps		650 Mbps		1101 - 470 Mbps 1109 – 350 Mbps
Cisco SD-WAN			Yes		
SD-WAN Security*		Yes			No
LTE		CAT18 / CAT6 / CAT4		Integrated CAT6	CAT6 / CAT4 1109-2P – CAT4
Wi-Fi	No	Yes – Wi-Fi6		Yes	1101-4P – Yes 1109-2P – Yes 1109-4P – No
DSL		No		Yes	No
POE / PoE+		Yes			No

Hardware Features

Feature	ISR 116x	ISR 113x	ISR 112x	ISR 111x	ISR 110x
CPU			4 cores		
DRAM (Fixed)*		4GB / 8GB			4GB
Flash (Fixed)*	4GB / 8GB	8GB / 16GB	4GB / 8GB		4GB
USB Ports (USB 3.0)			Yes		
Console	Micro-USB	RJ45	Micro-USB	RJ45 + Micro-USB	Micro-USB
Operating Temperature		0 to 40°C		0 to 40°C	1101-4P 0 to 45°C 1109-2P 0 to 50°C 1109-4P -20 to 55°C
Rack/Wall Mounting		ACS-1100-RM2-19		ACS-1100-RM-19	NA

Interface Combinations



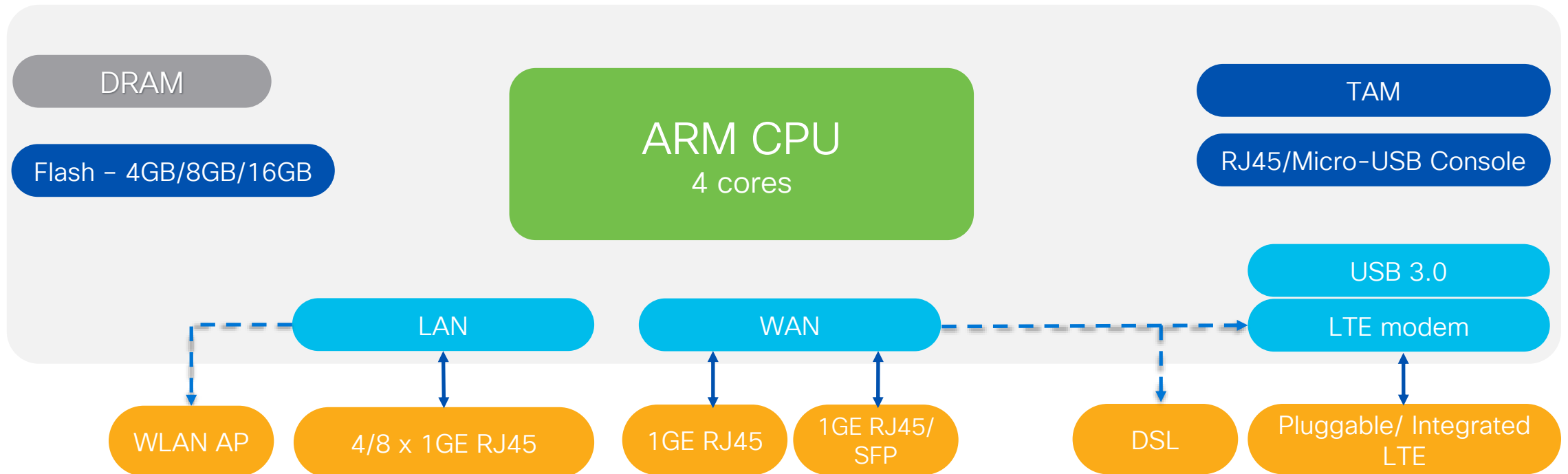
Feature	ISR 116x	ISR 113x	ISR 112x	ISR 111x	ISR 110x
2 LAN Ports	-	-	-	-	✓
4 LAN Ports	-	-	✓	✓	✓
8 LAN Ports	✓	✓	✓	✓	-
Wi-Fi only	-	✓	-	✓	-
DSL only	-	-	✓	✓	✓
LTE only	✓	-	✓	✓	-
Wi-Fi + DSL	-	-	-	✓	✓
Wi-Fi + LTE	-	✓	✓	✓	-
DSL + LTE	-	-	✓	✓	✓
Wi-Fi + DSL + LTE	-	-	-	✓	-

Interface Combinations (contd.)



Feature	ISR 116x	ISR 113x	ISR 112x	ISR 111x	ISR 110x
8GB DRAM ("X" PID) only	✓	-	✓	✓	-
"X" + Wi-Fi	-	✓	-	-	-
"X" + LTE	✓	-	✓	-	-
"X" + DSL	-	-	✓	-	-
"X" + Wi-Fi + LTE	-	✓	✓	-	-
"X" + Wi-Fi + DSL	-	-	-	-	-
"X" + LTE + DSL	-	-	✓	-	-
"X" + Wi-Fi + LTE + DSL	-	-	✓	-	-
Voice	✓	✓	✓	✓	✓
CAT 4 LTE USB Dongle	✓	✓	✓	-	✓
CG418-E / CG 522-E	✓	✓	✓	✓	✓

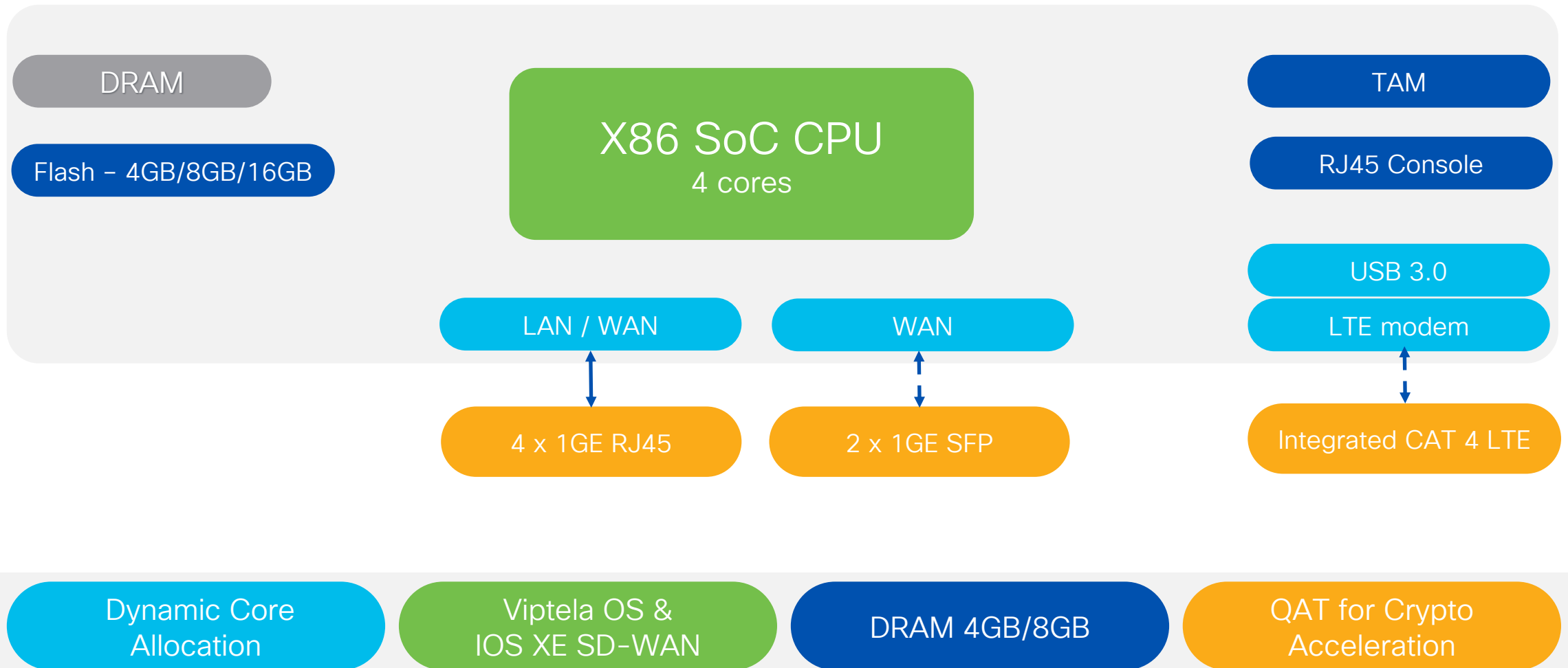
Cisco ISR 1000 Series Routers Block Diagram



Dynamic Core Allocation Flexible WAN Connectivity Options DRAM 4GB/8GB Rich Connectivity

Cisco ISR1100 Series Routers Block Diagram

ISR1100(X)-4G/4GLTE/6G



Cisco ISR1100 Series Routers

Bridge to Feature Rich SD-WAN from Viptela OS

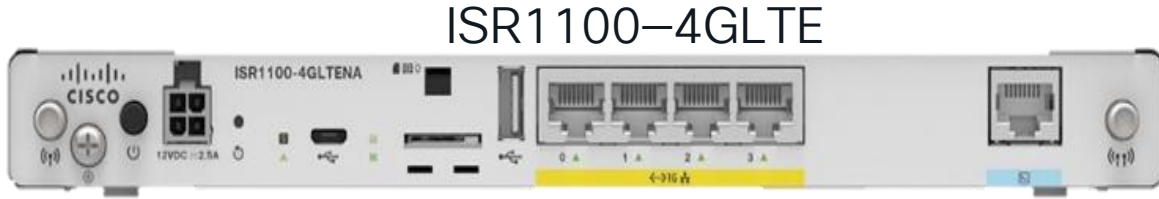
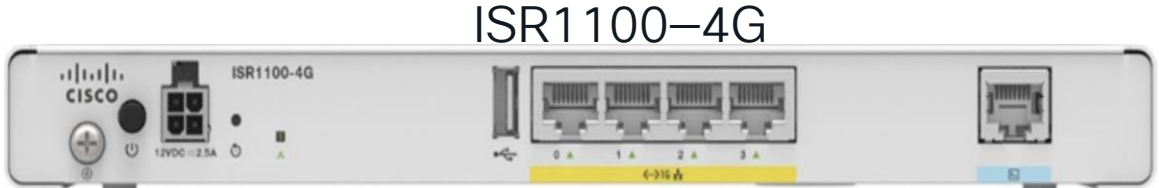
4GB DRAM

8GB Flash

4x1GE Ethernet

2x1GE SFP
(ISR1100-6G)

Integrated LTE
(ISR1100-4GLTE)



SD-WAN to the Branch

Cisco ISR1100X Series Routers

Bridge to Feature Rich SD-WAN from Viptela OS



ISR1100X-4G



8GB DRAM

8GB Flash

4x1GE Ethernet

ISR1100X-6G



8GB DRAM

16GB Flash

4x1GE Ethernet
2x1GE SFP

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

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

		Viptela OS				IOS-XE SD-WAN			
Features		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

Please check Cisco documentation on exact details around feature support

BBR- Bottleneck Bandwidth & Round trip propagation time

Cisco ISR 1000 & ISR 1100 Series Routers

Integrated Rich Services

Application Quality of Experience
TCP Optimization
Packet Duplication
SGT Propagation



Advanced Mobility

Pluggable LTE (Cat 4|6|18)
USB Dongle for non-LTE SKUs
Integrated Wi-Fi capabilities



High Performance & Scale

Up to 350Mbps of IPSEC throughput
Dynamic Core Allocation
Up to 200 IPSEC and GRE Overlay Tunnels



Comprehensive Security

IPS
URL Filtering
Advanced Malware Protection
Enterprise FW with Application Awareness
Umbrella SIG

Full Featured SD-WAN



Rich Services with Enhanced Performance

Secure Access
Service Edge
(SASE)

Unified
Communications

ThousandEyes with
ISR1100X-6G

Manageability

vManage

WebUI

DNAC On Prem

C1161X-8PLTEP

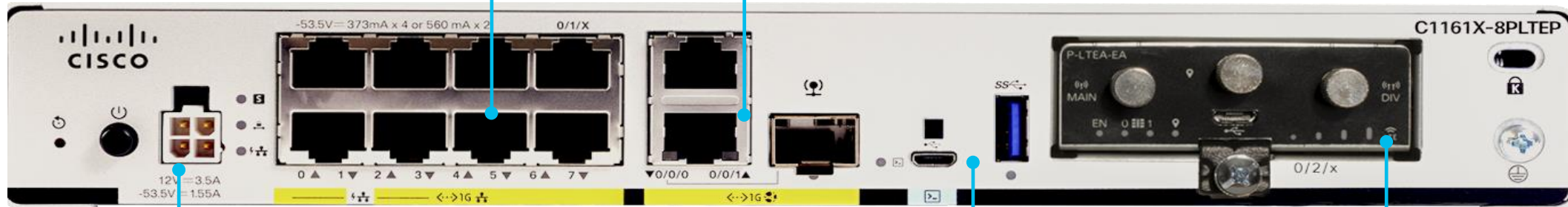
DRAM/FLASH*
8GB/8GB

SD-WAN Ready

External PSU

Data Interfaces

- 8 x GE LAN
- 4 PoE or 2 PoE+ Capable
- 1 x GE WAN + 1 x RJ45/SFP GE WAN Combination



Status and physical security

- Status LED
- Power button
- Reset button
- Power connector

Management/USB Storage

- Micro USB Console
- USB 3.0, Type A

Pluggable LTE Technology

- CAT 4
- CAT 6
- CAT 18

* 4GB versions available in C1161 models

C1121X-8PLTEPWx

DRAM/FLASH*
8GB/8GB

SD-WAN Ready

802.11ac
Wave 2

External PSU

Data Interfaces

- 8 x GE LAN
- 4 PoE or 2 PoE+ Capable
- 1 x GE WAN + 1 x RJ45/SFP GE WAN Combination



Status and physical security

- Status LED
- Power button
- Reset button
- Power connector

Management/USB Storage

- Micro USB Console
- USB 3.0, Type A

Pluggable LTE Technology

- CAT 4
- CAT 6
- CAT 18

* 4 Port (2 PoE or 1 PoE+) variants available

** 4GB versions available in C1121 models

C1127X-8PLTEP

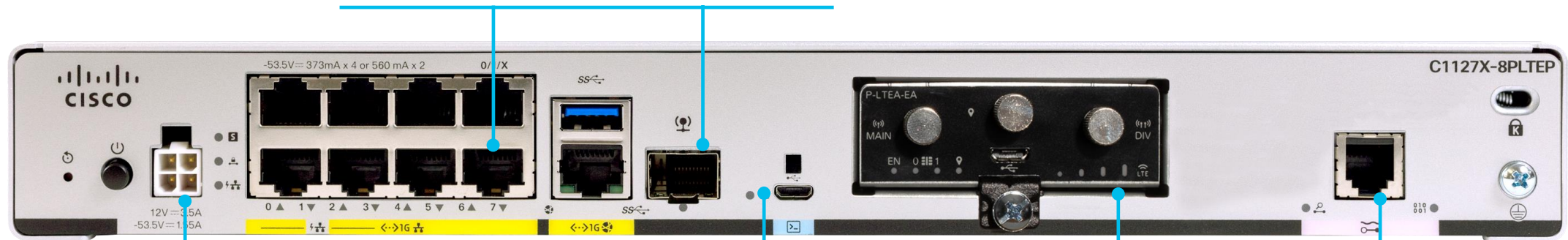
DRAM/FLASH*
8GB/8GB

SD-WAN Ready

External PSU

Data Interfaces

- 8 x GE LAN
- 4 PoE or 2 PoE+ Capable
- 1 x RJ45/SFP GE WAN Combination



Status and physical security

- Status LED
- Power button
- Reset button
- Power connector

Management/USB Storage

- Micro USB Console
- USB 3.0, Type A

Pluggable LTE Technology

- CAT 4
- CAT 6
- CAT 18

DSL Annex A**

* 4GB versions available in C1127 models

** DSL Annex M support available in C1127X-8PMLTEP

** DSL Annex B/J Support available in C1126 model

C1127X-8PLTEP

- VDSL 2 Profiles 8a, 8b, 8c, 8d, 12a, 12b, 17a
- Theoretical speeds: 22Mbps – 150 Mbps*
- Supported Platforms
 - C1126-8PLTEP / C1126X-8PLTEP
 - C1127-8PLTEP / C1127X-8PLTEP
 - C1127-8PMLTEP / C1127X-8PMLTEP
 - C1116-4P / C1117-4P / C1117-4PM



ADSL/VDSL2 Interface

DSL Technology	C1127-8P	C1127-8PM	C1126-8P	C1117-4P	C1117-4PM	C1116-4P
Multi-mode over POTS, Annex A	Yes	-	-	Yes	-	-
Multi-mode over POTS, Annex M	-	Yes	-	-	Yes	-
Multi-mode over ISDN, Annex B/J	-	-	Yes	-	-	Yes

C1111X-8P

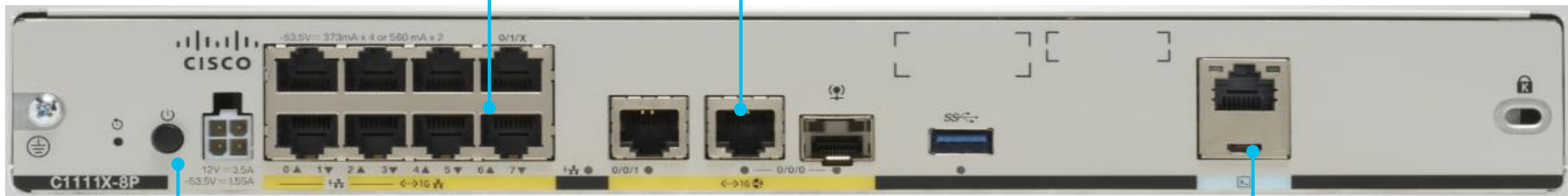
DRAM/FLASH*
8GB/8GB

SD-WAN Ready

External PSU

Data Interfaces

- 8 x GE LAN
- 4 PoE or 2 PoE+ Capable
- 1 x GE WAN + 1 x RJ45/SFP GE WAN Combination



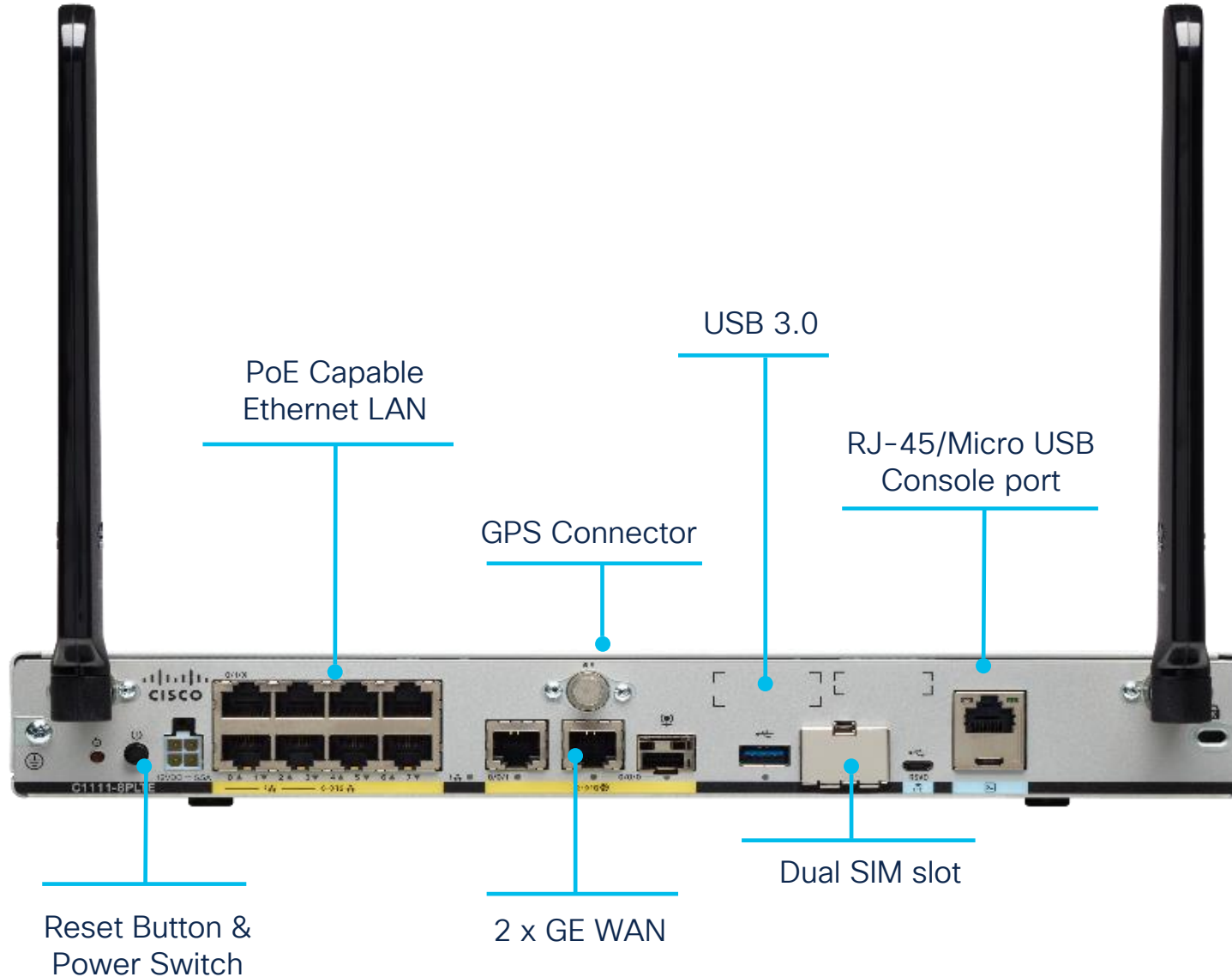
Status and physical security

- Status LED
- Power button
- Reset button
- Power connector

Management/USB Storage

- RJ45 Console
- USB 3.0, Type A

C1111-8PLTEW



SD-WAN Ready

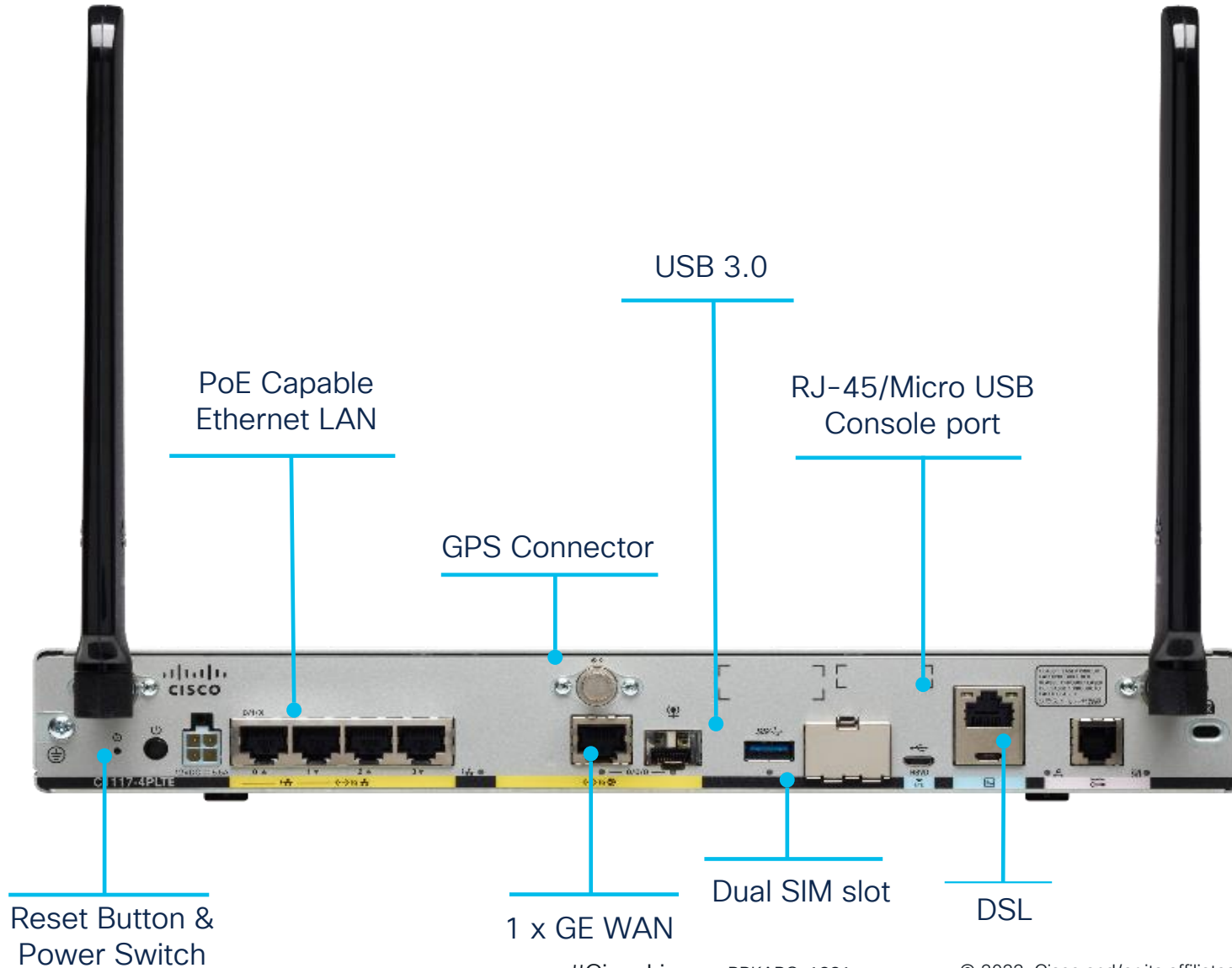
External PSU

DRAM/FLASH*
8GB/8GB

802.11ac
Wave 2

Integrated
CAT6 Modem

C111x-4PLTE



SD-WAN Ready

External PSU

DRAM/FLASH*
8GB/8GB

DSL

Integrated
CAT6 Modem

G.FAST/VDSL2

- Supports G.FAST and VDSL2
- Profile 35b, 106a, 106b
- Theoretical speeds: 150Mbps – 1Gbps*
- Supported Platforms
 - C1113-8P / C1113-8PM
 - C1112-8P



DSL Technology	C1113-8P	C1113-8PM	C1112-8P
Multi-mode over POTS, Annex A	Yes	-	-
Multi-mode over POTS, Annex M	-	Yes	-
Multi-mode over ISDN, Annex B/J	-	-	Yes

C1101-4P

DRAM/FLASH
4GB/4GB

SD-WAN Ready

External PSU

Data Interfaces

- 4 x GE LAN
- 2 PoE or 1 PoE+ Capable
- 1 x GE WAN



Status and physical security

- Status LED
- Power button
- Reset button
- Power connector

Management/USB Storage

- RJ45 Console
- USB 3.0, Type A

C1101-4PLTEP

SD-WAN Ready

External PSU

DRAM/FLASH
4GB/4GB

Status and physical security

- Status LED
- Power button
- Reset button
- Power connector

Data Interfaces

- 4 x GE LAN
- 2 PoE or 1 PoE+ Capable
- 1 x GE WAN



Management/USB Storage

- RJ45 Console
- USB 3.0, Type A

Pluggable LTE Technology

- CAT 4
- CAT 6

C1109-4PLTE2PWx

SD-WAN Ready

External PSU

DRAM/FLASH
4GB/4GB



Dual Pluggable LTE Technology

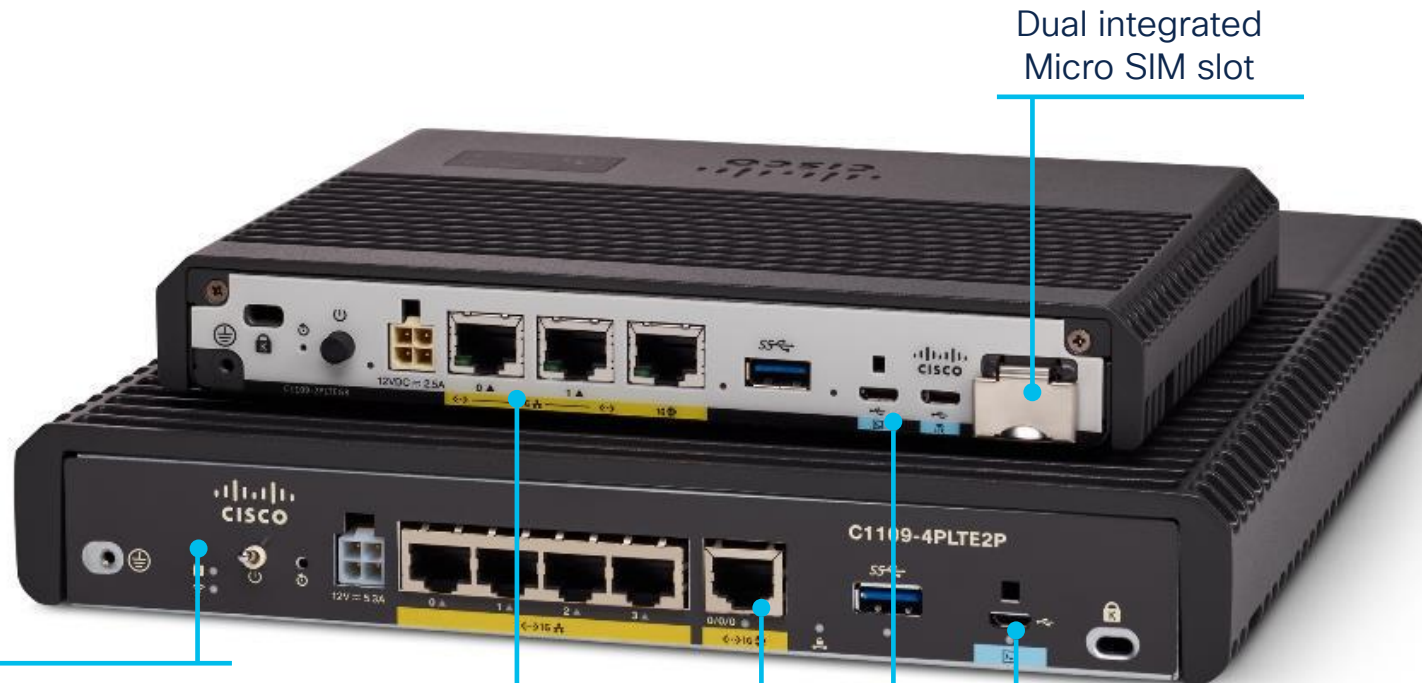
- CAT 4
- CAT 6

C1109-2PLTE / C1109-4PLTE2P

SD-WAN Ready

External PSU

DRAM/FLASH
4GB/4GB



Status and physical security

- Status LED
- Power button/switch
- Reset button
- Power connector

Data Interfaces

- GE LAN (2, 4)
- 1 X GE WAN

Management/USB Storage

- RJ45 Console
- USB 3.0, Type A

ISR1100 and ISR1100X Series Platform Evolution

NEW

vEdge

ISR1100

ISR1100X

vEdge 100B
vEdge 100M
vEdge 1000

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

ISR1100X-4G
ISR1100X-6G

Ports

5 - 8 WAN ports

4 - 6 WAN ports

4 - 6 WAN ports

Operating System

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 Security SD-WAN with IOS-XE

Scale

Upto 1500 IPSEC and GRE Tunnels

Upto 1500 IPSEC and GRE Tunnels

Upto 3000 IPSEC and GRE Tunnels

Superior Hardware

Branch Security

ISR1100-4G vs ISR1100X-4G

Product Comparison

ISR1100-4G
CPU: Intel 2.2GHz 4-core
Memory: 4GB DDR4, ECC
Bulk Flash: 8GB eMMC pSLC
Routed Ports (WAN/LAN): 4x GE
Integrated LTE US and Global): No USB Dongle support (Viptela OS only)
Console: 1x RJ45
USB Type A: USB3.0, 4.5W
Power supply: External Adapter, 30W
Form Factor: 10.2" x 7" x 1.1"

ISR1100X-4G
CPU: Intel 2.2GHz 4-core
Memory: 8GB DDR4, ECC
Bulk Flash: 8GB eMMC pSLC
Routed Ports (WAN/LAN): 4x GE
Integrated LTE (US and Global): No USB Dongle support (Viptela OS only)
Console: 1x RJ45
USB Type A: USB3.0, 4.5W
Power supply: External Adapter, 30W
Form Factor: 10.2" x 7" x 1.1"



ISR1100-6G vs ISR1100X-6G

Product Comparison

ISR1100-6G
4-core x86 CPU
Memory: 4GB DDR4, ECC
Bulk Flash: 8GB eMMC pSLC
Routed Ports (WAN/LAN): 4x GE + 2x SFP (6 individual ports)
Integrated LTE (US and Global): No USB Dongle support (Viptela OS only)
Console: 1x RJ45
USB Type A: USB3.0, 4.5W
Power supply: External Adapter, 30W
Form Factor: 10.2" x 7" x 1.1"

ISR1100X-6G
4-core x86 CPU
Memory: 8GB DDR4, ECC
Bulk Flash: 16GB eMMC pSLC
Routed Ports (WAN/LAN): 4x GE + 2x SFP (6 individual ports)
Integrated LTE (US and Global): No USB Dongle support (Viptela OS only)
Console: 1x RJ45
USB Type A: USB3.0, 4.5W
Power supply: External Adapter, 30W
Form Factor: 10.2" x 7" x 1.1"



Upgrading ISR1100 and ISR1100X Series Routers

Pre 20.4/17.4

Until 20.4/17.4 release:

- ISR1100-4G, ISR1100-4G-LTE, ISR1100-6G can be deployed with Viptela OS for the pure play SD-WAN use cases
- Minimum software release supported on these platforms is Viptela OS 19.2

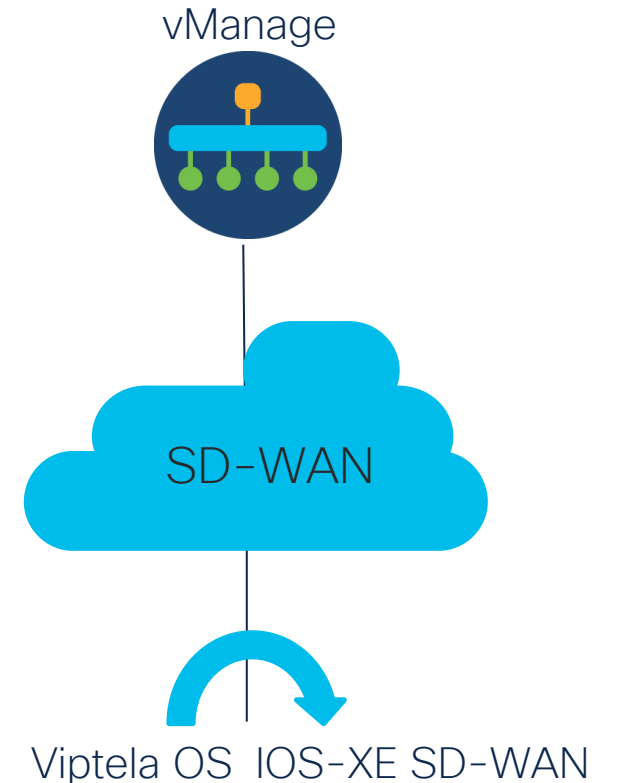
With 20.4/17.4

Starting with 20.4/17.4:

- We have option to run the IOS-XE SD-WAN code on ISR1100 and ISR1100X series routers and leverage all services such as Security, AppQoE, SD-AVC which are supported on IOS-XE SD-WAN software
- Minimum software release supported on ISR1100X series routers is Viptela OS 20.4 or IOS-XE SD-WAN 17.4

Prerequisites

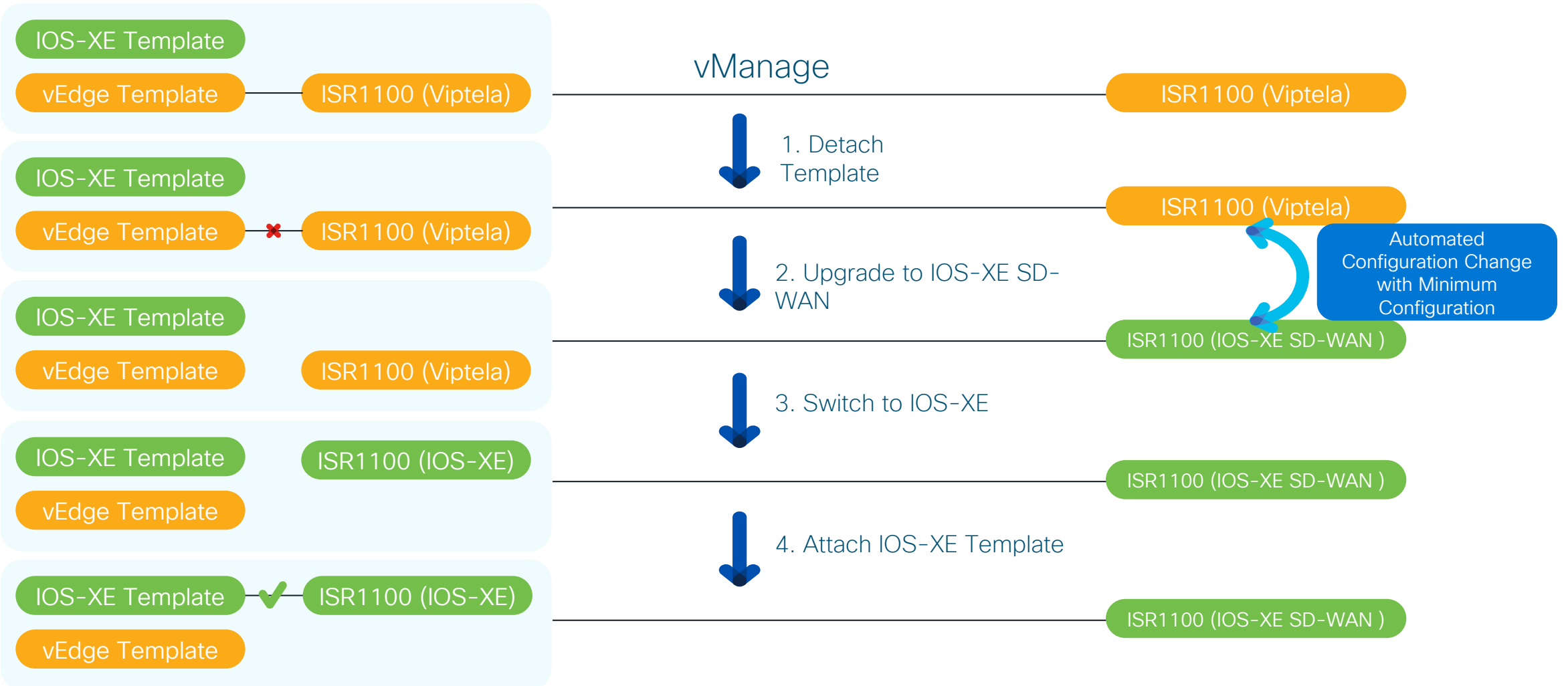
ISR1100 router should be first upgraded to 20.4 Viptela OS code to upgrade the firmware and then we can migrate to IOS-XE SD-WAN 17.4 code



Only Controller Mode is supported with support of IOS-XE SD-WAN. Autonomous Mode is not supported

Cisco ISR1100 and ISR1100X Series Routers

Migration Workflow

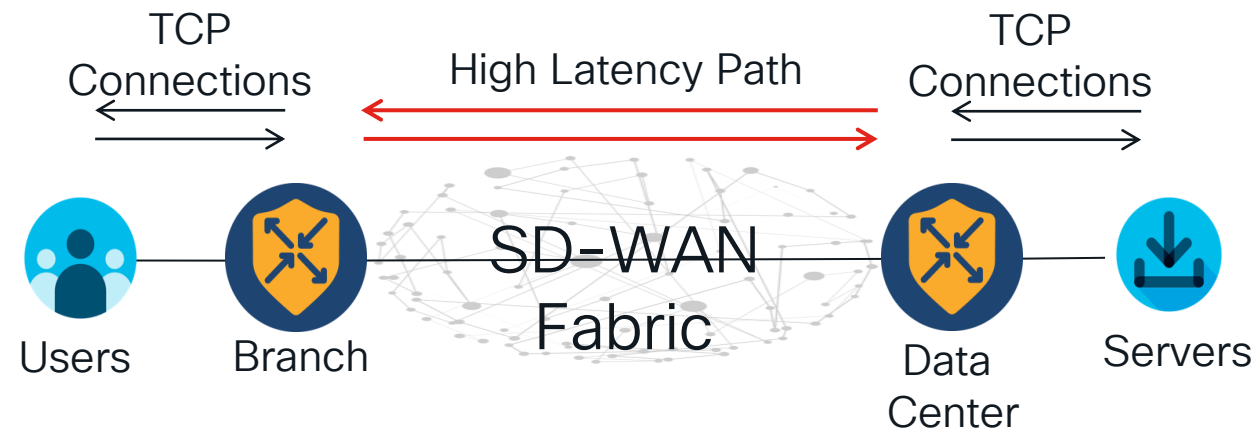
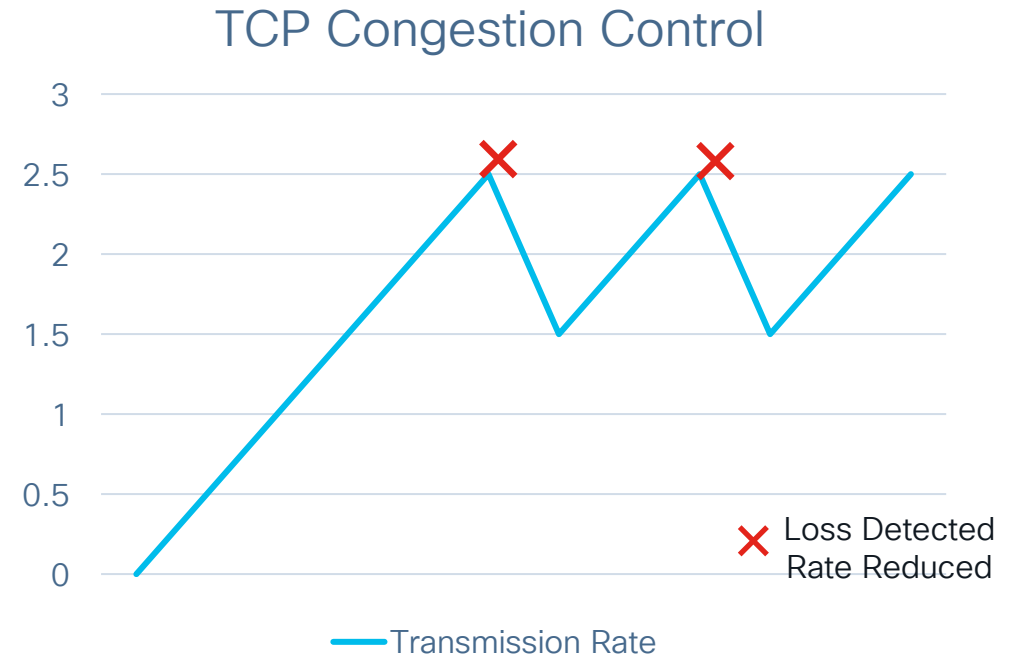


Features, Use Cases

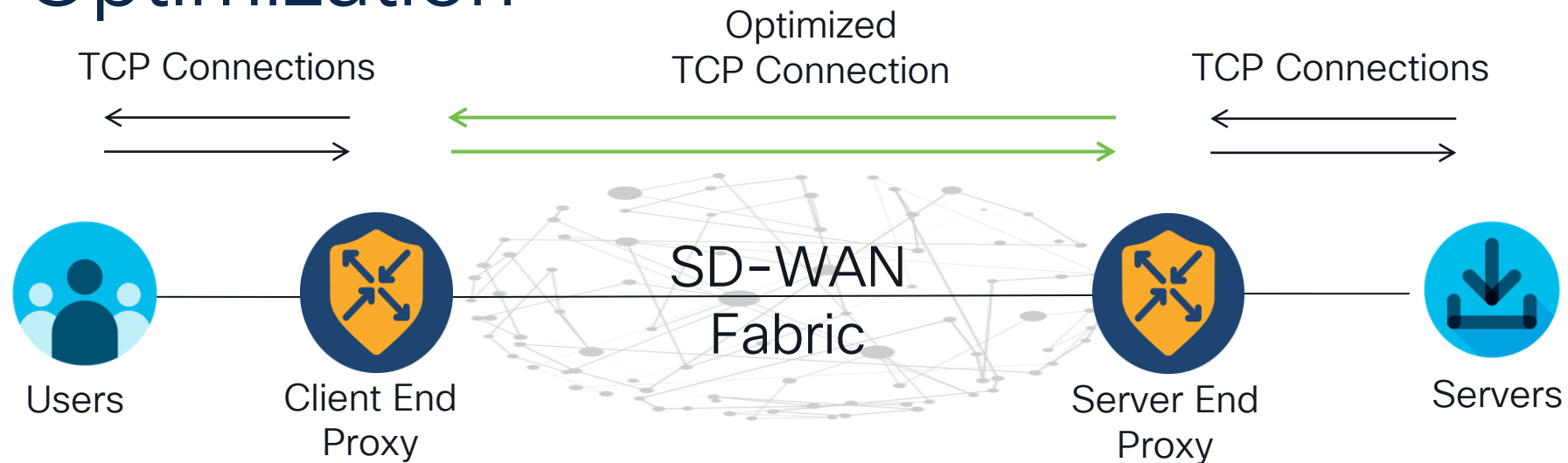


TCP Bandwidth Probing

- TCP session follows peaks and troughs during transmission
- When packet loss is detected, flow rate is reduced and then gradually increases
- Entire bandwidth is not used for end-to-end communication
- High latency path between users and applications, ex. geo-distances
- Need for mechanism to overcome high latency values

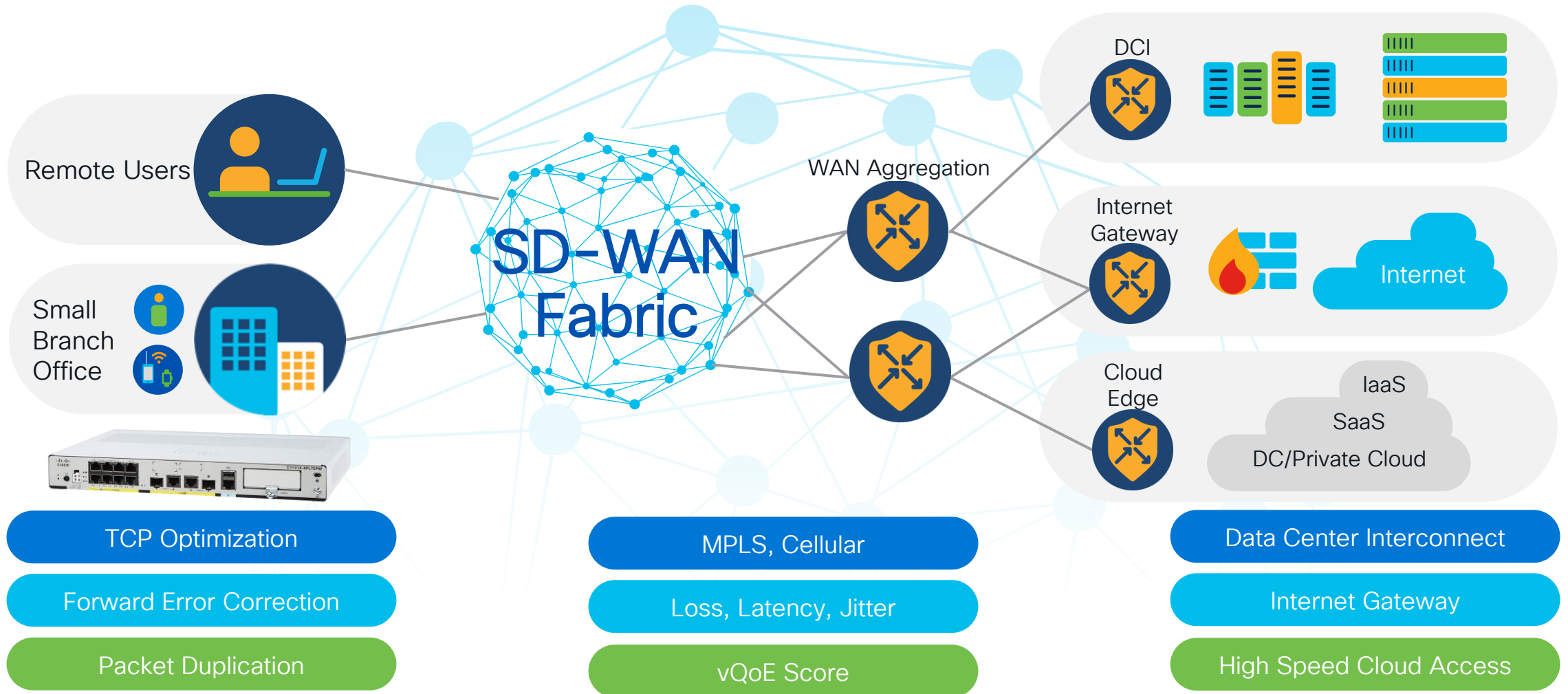


TCP Optimization



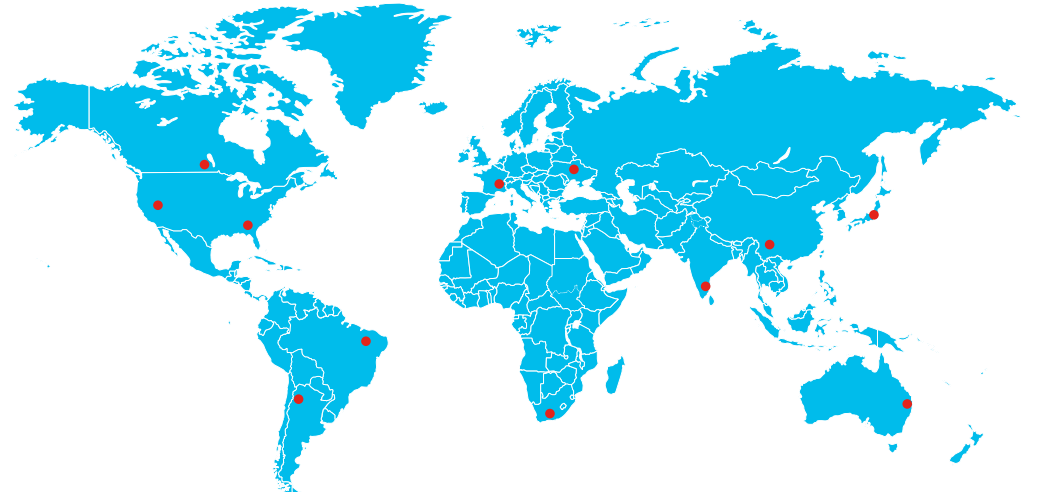
- WAN Edge routers terminate TCP sessions and provide local acknowledgements
- Hosts don't have to wait for end-to-end TCP ACKs and pause TCP transmission
- Optimized TCP connection uses selective acknowledgement to prevent unnecessary retransmissions and large initial TCP window size to maximize throughput
- Hosts using older TCP/IP stacks will see the most benefit

AppQoE with SD-WAN



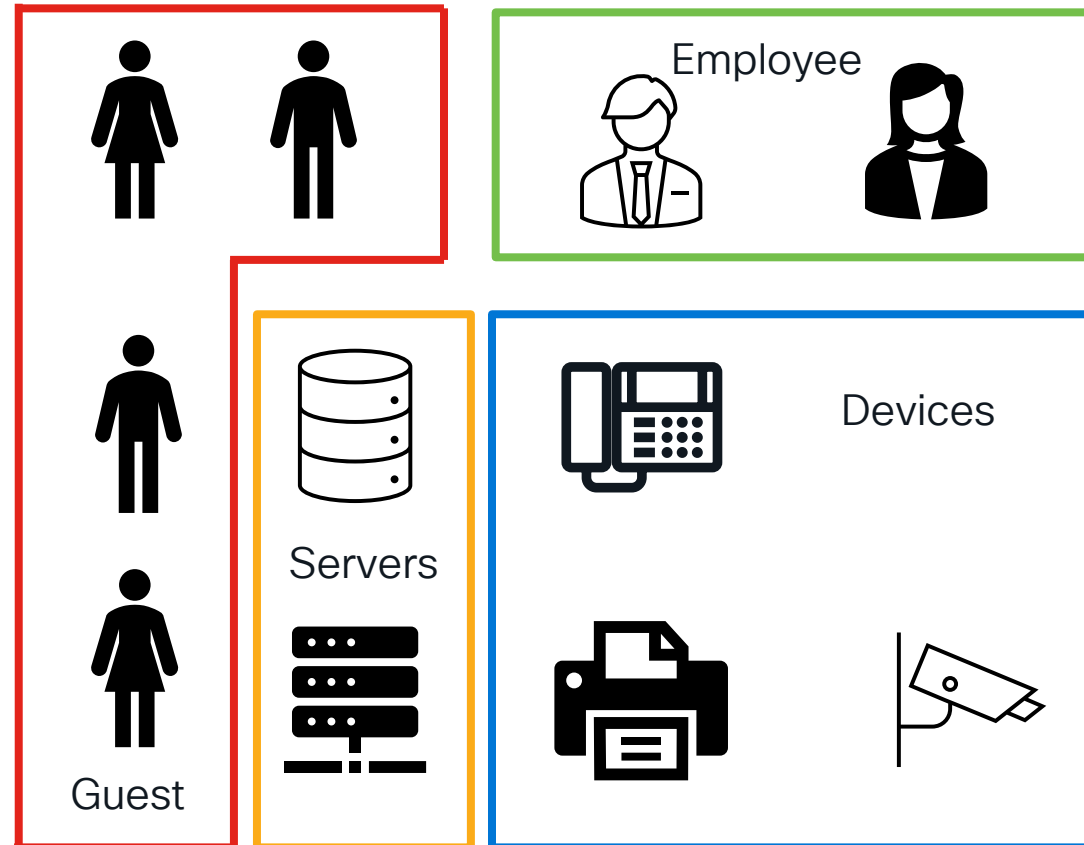
Network Segmentation with TrustSec - SGT Tags

- Traditional networks create separate VLANs for classification
- Benefit: Localize threats, limit impact radius, great for fewer deployments
- Need to manually allocate IP addresses, DHCP, Routing, ACLs
- Design needs to be replicated for floors, buildings, offices, and other facilities globally
- Cost could be extremely high

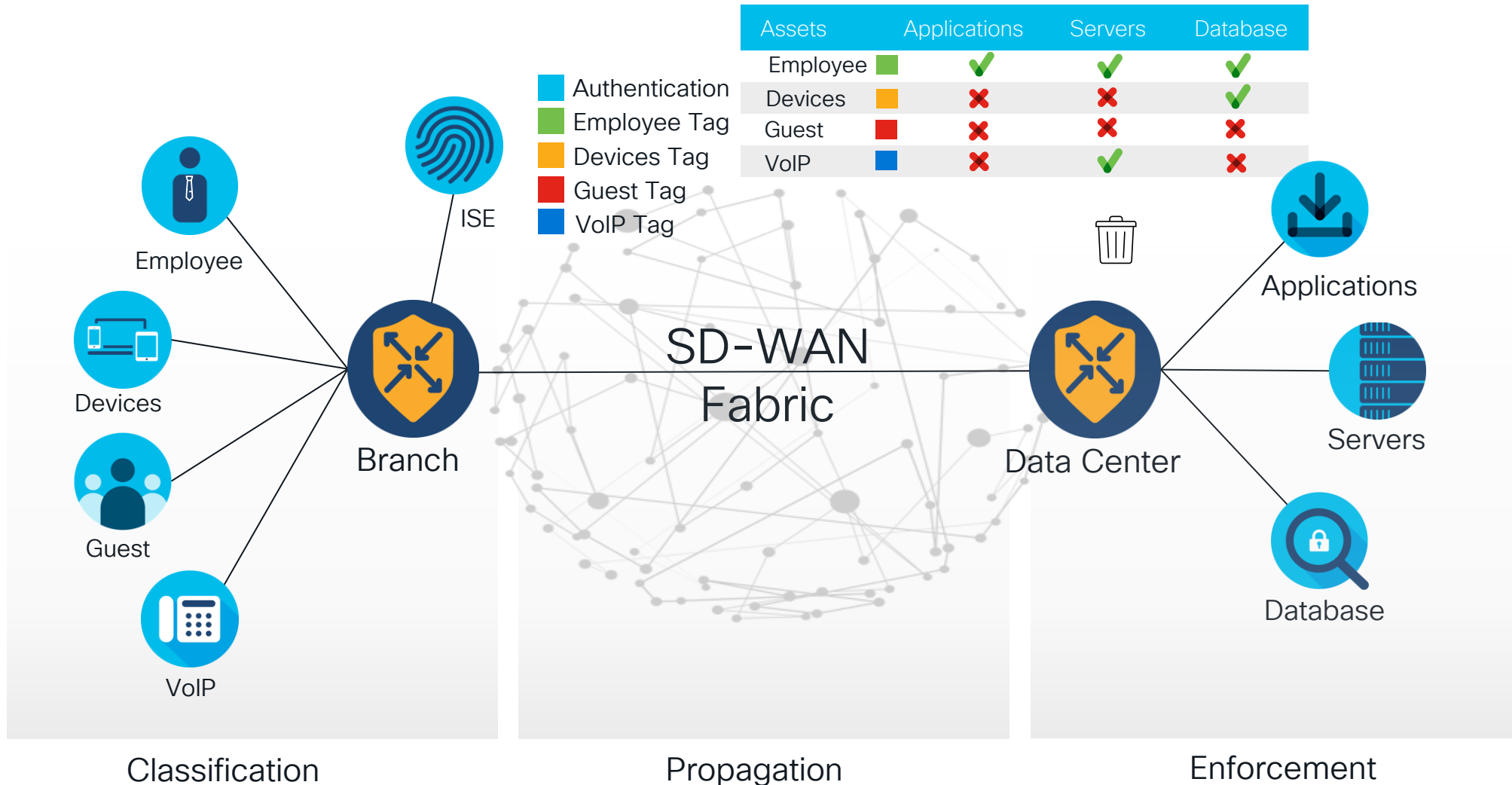


Groups Denote Common Roles and Policy

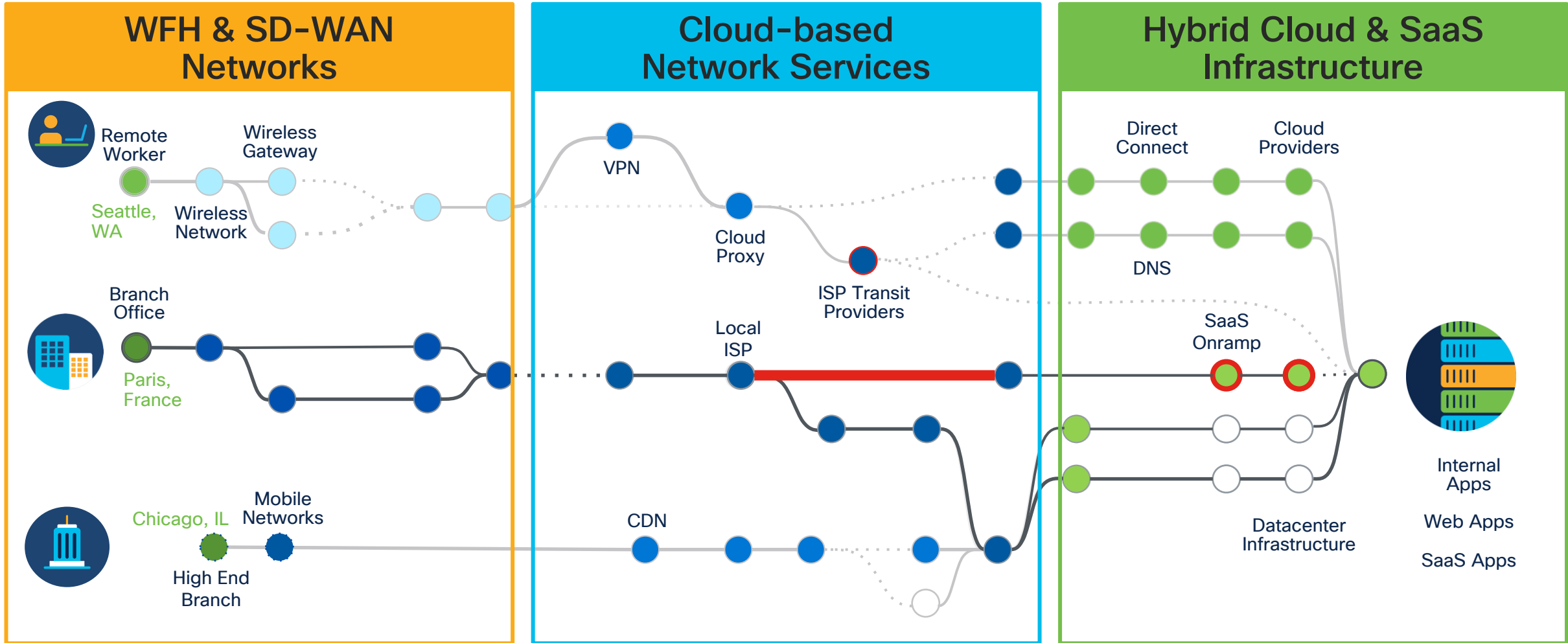
- Business based groupings to provide consistent policy and access independent of network topology
- Leverage attributes such as user role, location, device type to define group assignments



Classification, Propagation and Enforcement



ThousandEyes with ISR1 100X-6G – Observability



How ThousandEyes Collects Data



Enterprise Agent

Lightweight agent deployed to customer sites and data center locations.



Cloud Agent

No installation required. 376 internet connected vantage points.



Endpoint Agent

Pushed to end user laptop or desktop for last mile visibility.



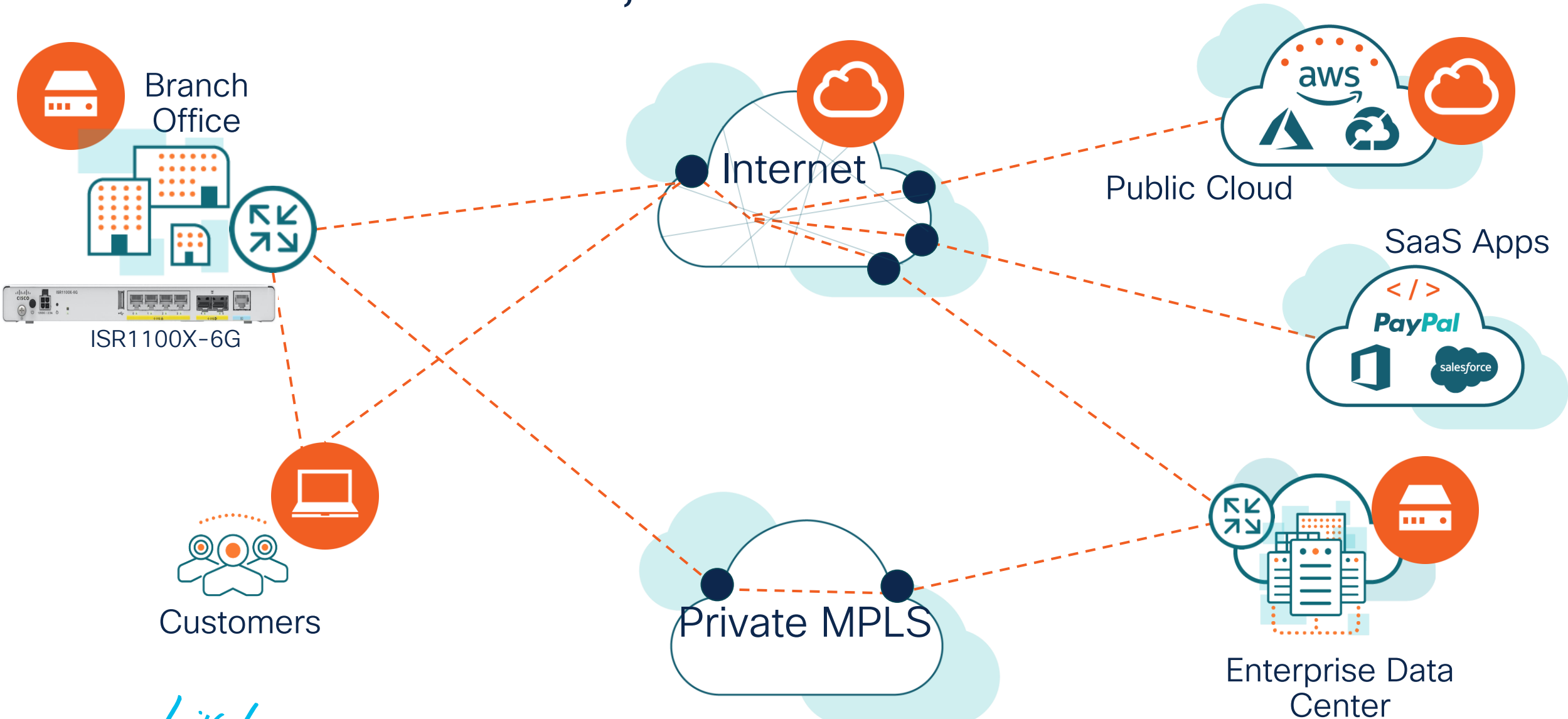
Make the internet look like your own environment



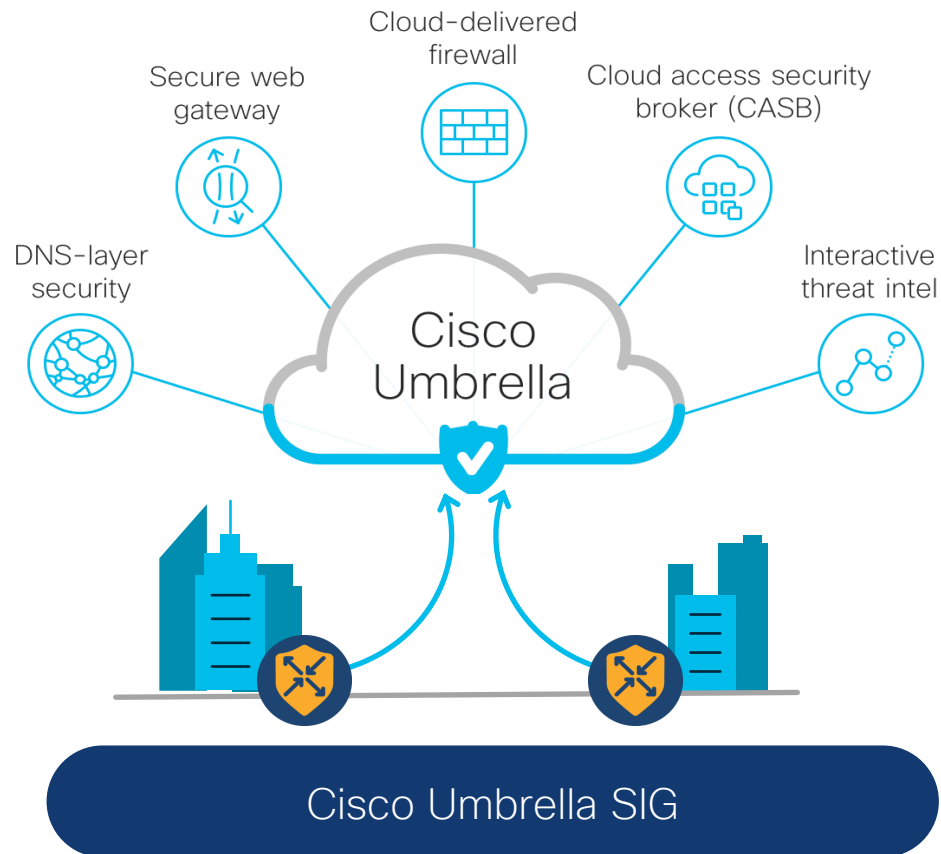
Increase business agility through visibility into connectivity issues



Visualize the Cloud, Internet and SaaS traffic



Umbrella Secure Internet Gateway



Problem

- Lean branch – no on-prem security
- Applications hosted on the internet vulnerable to attacks
- Internet bound traffic must be subjected to policy enforcement
- Enforce secure web usage & control

Solution

- Leverage cloud hosted security with SIG
- User traffic redirected to Umbrella via Transport side IPSec tunnel

Cellular Technologies



Cisco Wireless WAN Current Offerings



CAT 4 LTE
USB Dongle

CAT 18 LTE
PIM Module



CAT 4|6 LTE
PIM Module

CG418-E
CG522-E
Cellular
Gateway



LTE Dongle

USB Based LTE Dongle

SMA Antenna

Length: 2.46 in
Weight: 0.3 oz

Compact Form

Dimensions: 3.69 in x 1.30 in x 0.39 in
Weight: 1.1 oz

Micro-SIM Card Slot



D-LTE-xx

- ✓ Sierra Wireless WP76xx modem
- ✓ Single micro-SIM, single radio
- ✓ 75 Mbps DL / 50 Mbps UL
- ✓ USB Powered
- ✓ Sub-miniature version - A (SMA) Antenna
- ✓ Field Replaceable / Hot-Swappable

Supported Bands :

D-LTE-NA: 2,4,5,12,13,14,17

D-LTE-GB: 1,3,7,8,20,28

D-LTE-AS: 1,3,5,8,40,41

Budget LTE Dongle

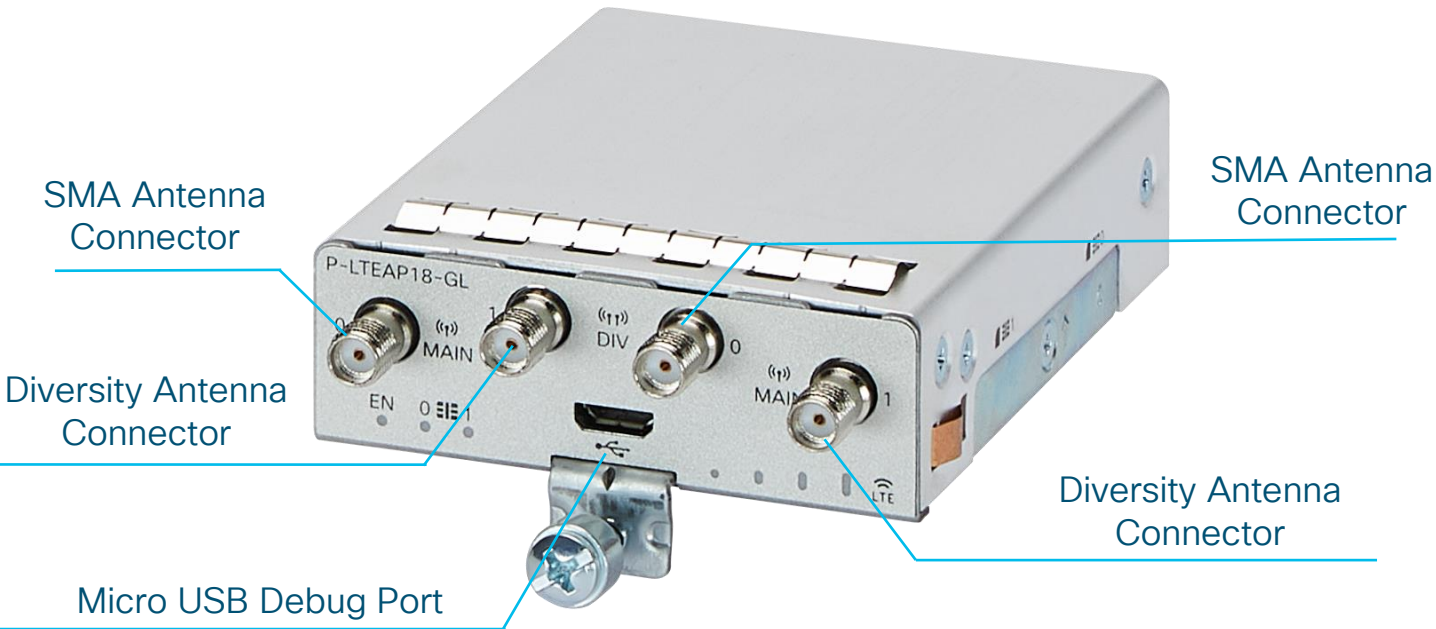
LTE Category 4

Zero-Touch
Provisioning

Autonomous Mode

LTE Advanced Pro

CAT 18 LTE PIM Module



P-LTEAP18-GL

- ✓ Telit LM960A18 modem
- ✓ Dual micro-SIM, single radio
- ✓ 1.2 Gbps DL / 200 Mbps UL
- ✓ FirstNet Certified
- ✓ SMA Antenna support
- ✓ Field Replaceable / Hot-Swappable

Supported Bands:

P-LTEAP18-GL: 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 29, 30, 32, 38, 39, 40, 41, 42, 43, 46, 48, 66, 71

Carrier Aggregation

Dying Gasp

Active / Standby SIMs

SD-WAN

LTE Advanced

CAT 4|6 LTE PIM Module



P-LTE(A)-xx

- ✓ Telit LM960A18 modem
- ✓ Dual micro-SIM, single radio
- ✓ 300 Mbps DL / 50 Mbps UL
- ✓ GPS Enabled
- ✓ SMA Antenna support
- ✓ Field Replaceable / Hot-Swappable

Supported Bands:

CAT4:

P-LTE-US: 2, 4, 5, 12
 P-LTE-GB: 1, 3, 7, 8, 20, 28
 P-LTE-VZ: 4, 13
 P-LTE-MNA: 2, 4, 5, 12, 13, 14, 17, 66

CAT6:

P-LTEA-LA: 1, 3, 5, 7, 8, 18, 19, 21, 28, 38, 39, 40, 41
 P-LTEA-EA: 1-5, 7, 12, 13, 20, 25, 26, 29, 30, 41

Carrier Aggregation

Dying Gasp

Active / Standby SIMs

SD-WAN

Pathway to 5G

Cisco Cellular Gateway



CG418-E / CG522-E

- ✓ Flexible Fail-Over Cellular Gateway
- ✓ 3.3 Gbps DL / 420 Mbps UL
- ✓ PoE Powered (or externally powered)
- ✓ IP Passthrough
- ✓ External Antenna Support
- ✓ Integrated security with ACT2 for SUDI
- ✓ Console Port for Out-of-Band management

Supported Bands :

5G: n1, n2, n3, n5, n28, n41, n66, n71, n77, n78, n79
LTE: 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26,
28, 29, 30, 32, 34, 38, 39, 40, 41, 42, 43, 46, 48,
66, 71
HSPA+: 1, 9, 19

Improved WAN
Connection Speed

Dual SIM Support

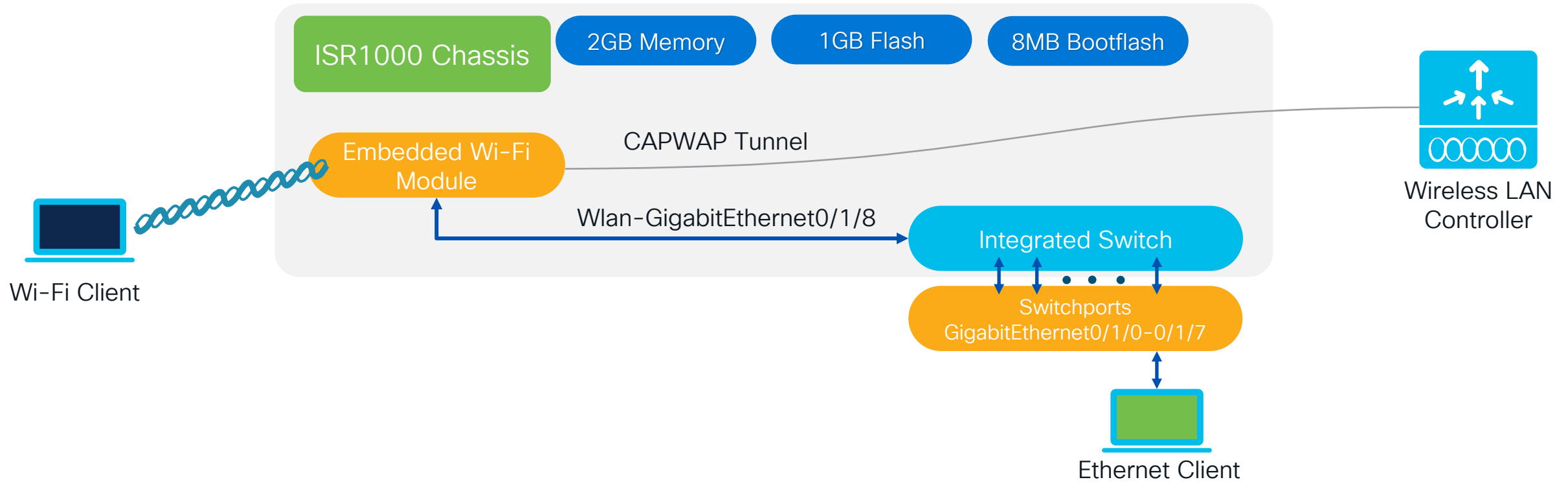
Zero-Touch
Provisioning

SD-WAN

Wi-Fi Technologies



Wireless LAN Hardware Block Diagram



Maximal Ratio Combining

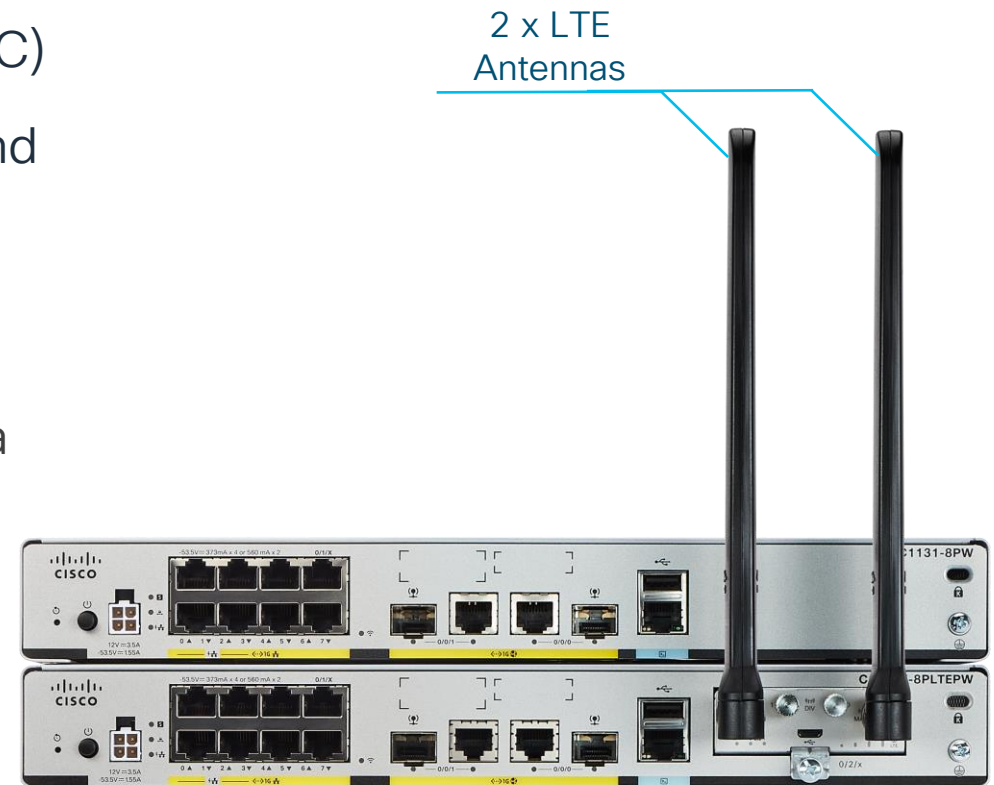
OFDMA

BSS Coloring

Target Wake Time

Wireless LAN Overview – ISR1131

- WLAN Module based on the Cisco Catalyst 9105 AXI
- Default image – Embedded Wireless Controller (EWC)
- For CAPWAP mode – Use DHCP option 43 command
- 802.11ax Dual Radio (2.4 GHz & 5 GHz)
- 2x2 MU-MIMO, with 2 Spatial Streams
- 2 internal Wi-Fi antennas, no external Wi-Fi antenna
- Console access via the router console
 - hw-module session 0/2 → For Non-LTE SKUs
 - hw-module session 0/3 → For LTE SKUs
- 1 Gbps uplink to the host CPU



Embedded Wireless Controller Configuration

1

Baseline Configuration

2

Scan QR Code on Router

Over-the-air provisioning
Mobile app

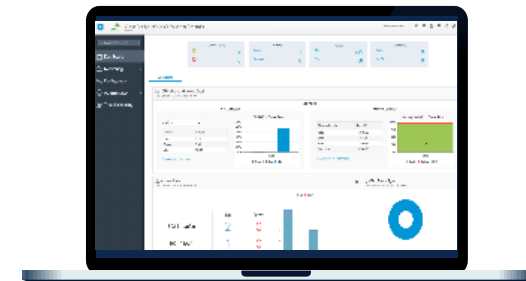


OR

2

Connect to default SSID

Go to mywifi.cisco.com
URL for WebUI



Baseline Configuration

1. Configure DHCP Pool for EWC to receive IP address

```
ip dhcp pool Wireless
network 10.10.10.0 255.255.255.0
default-router 10.10.10.1
dns-server 8.8.8.8
```

2. Configure SVI

```
interface Vlan199
description Wireless
ip address 10.10.10.1 255.255.255.0
ip nat inside
```

3. Configure WAN and LAN interface

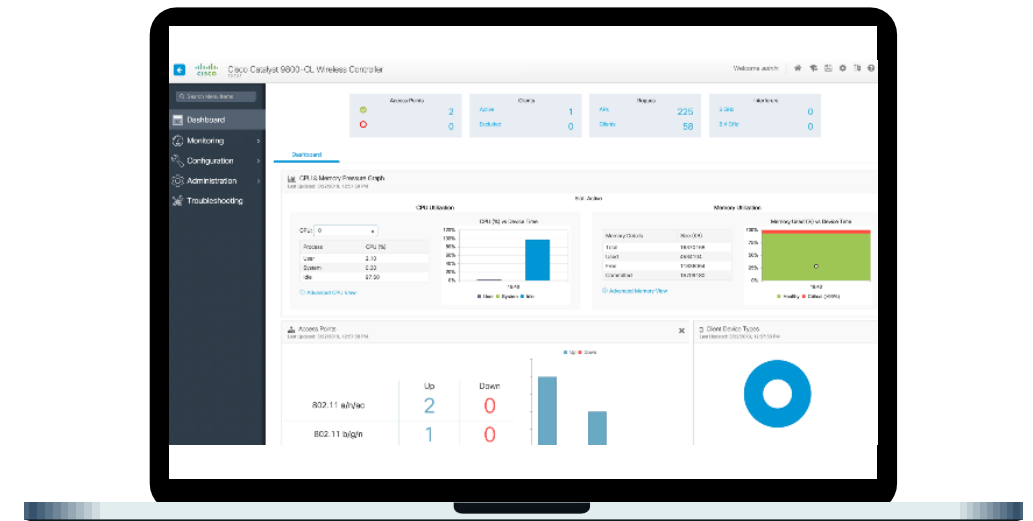
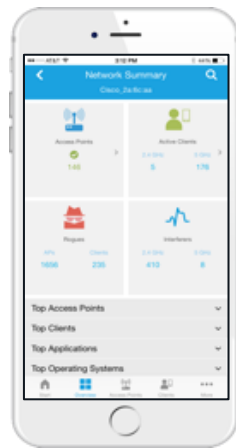
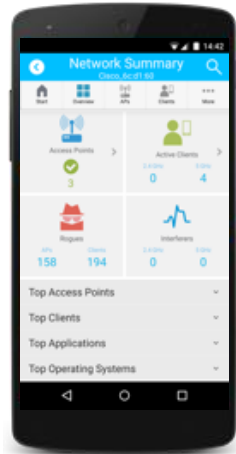
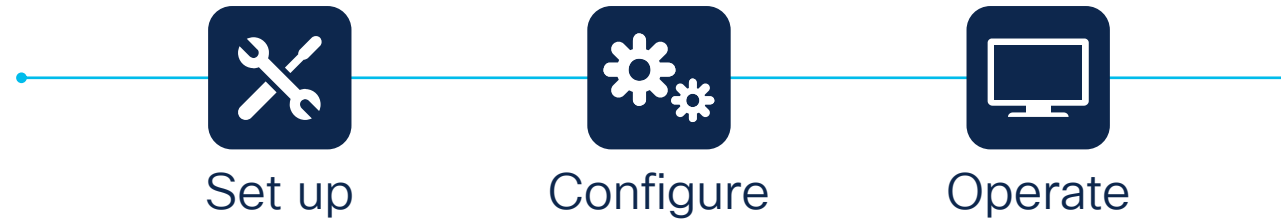
```
interface GigabitEthernet0/0/0
ip address dhcp
ip nat outside
!
interface Wlan-GigabitEthernet0/1/8
switchport mode access
switchport access vlan 199
```

4. Configure NAT and ACL

```
ip nat inside source list 10 interface
GigabitEthernet0/0/0 overload
!
ip route 0.0.0.0 0.0.0.0 192.168.0.1
!
ip access-list standard 10
10 permit 10.10.10.0 0.0.0.255
```

Over-The-Air Provisioning (OTAP)

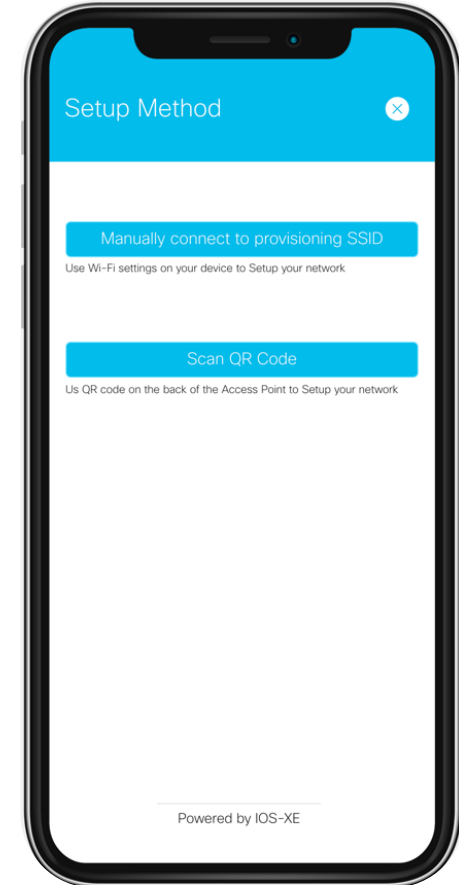
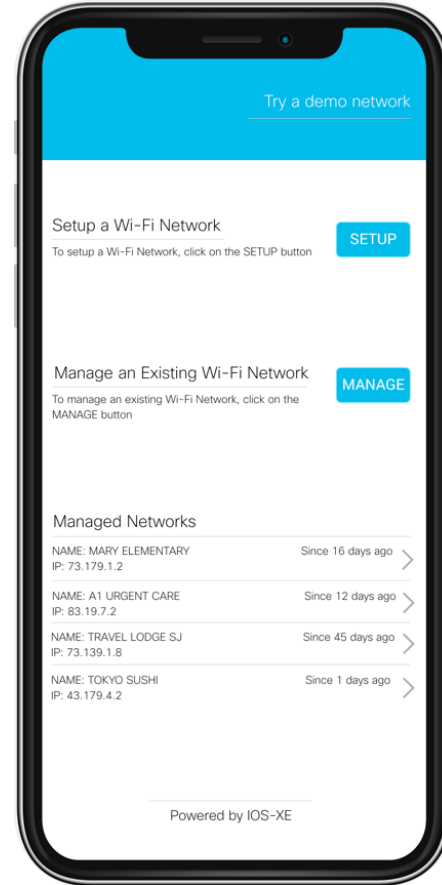
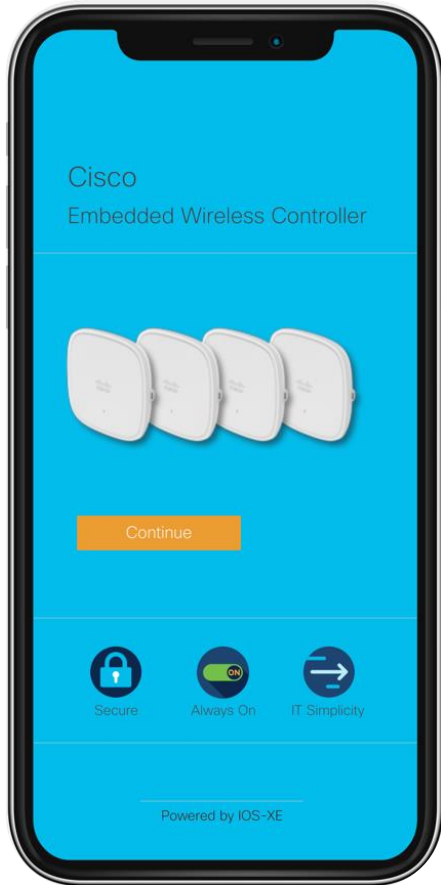
Get your wireless network up and running in less than 10 minutes



“Cisco Wireless” mobile app

WebUI

Cisco Wireless Mobile App



1

Landing Page

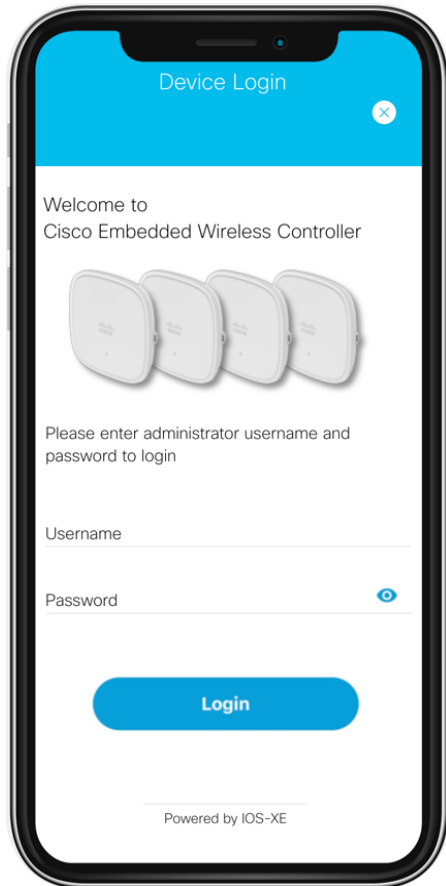
2

Setup Wi-Fi Network

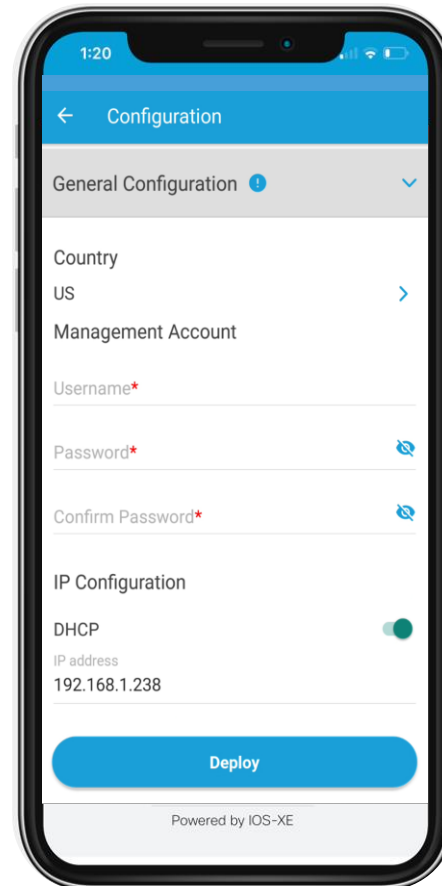
3

Manual or Scan QR Code

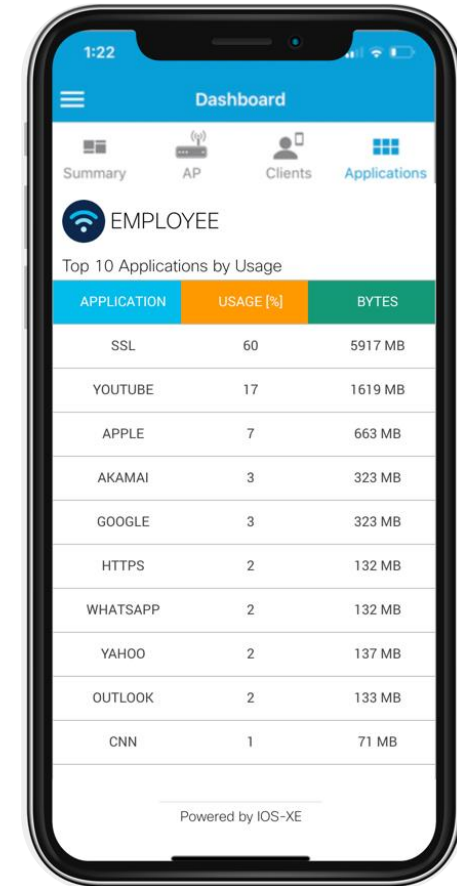
Cisco Wireless Mobile App



4 Login Credentials



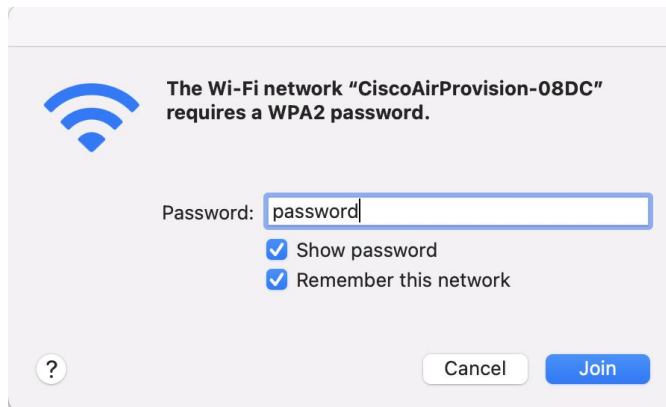
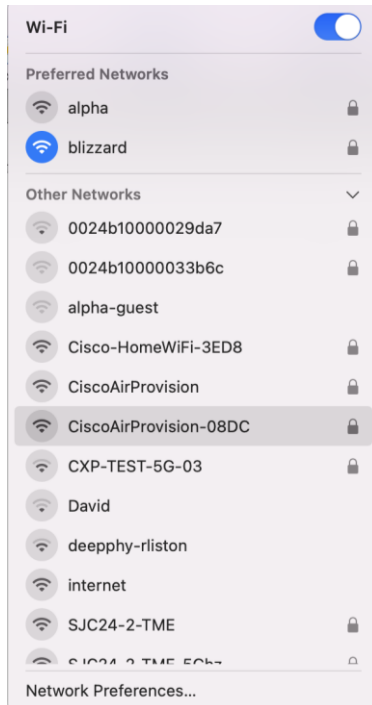
5 Deploy Day-0 Wizard



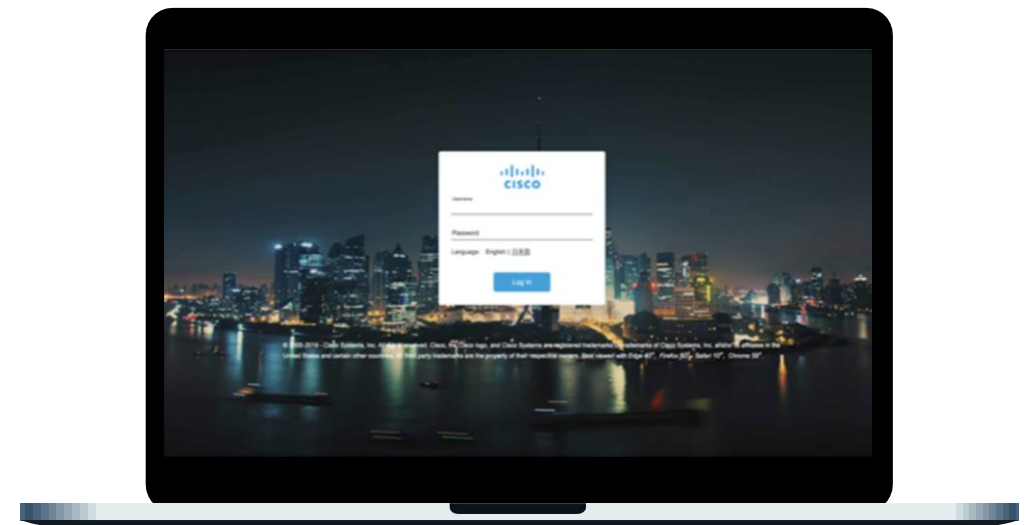
6 Manage your network

Connect to the default SSID

1 CiscoAirProvision-XXXX



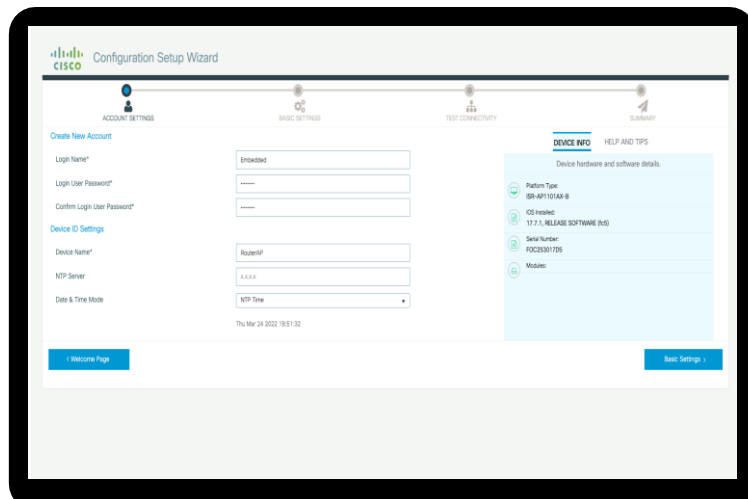
2 Go to mywifi.cisco.com



Connect to the default SSID

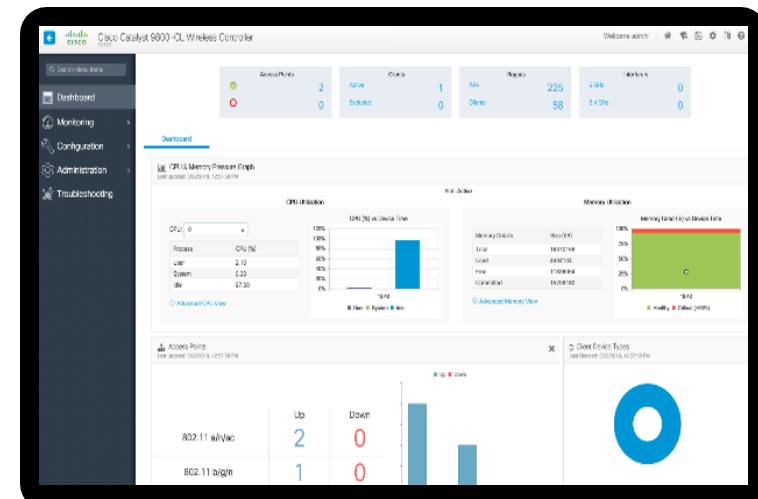
3

Day-0 Config Wizard



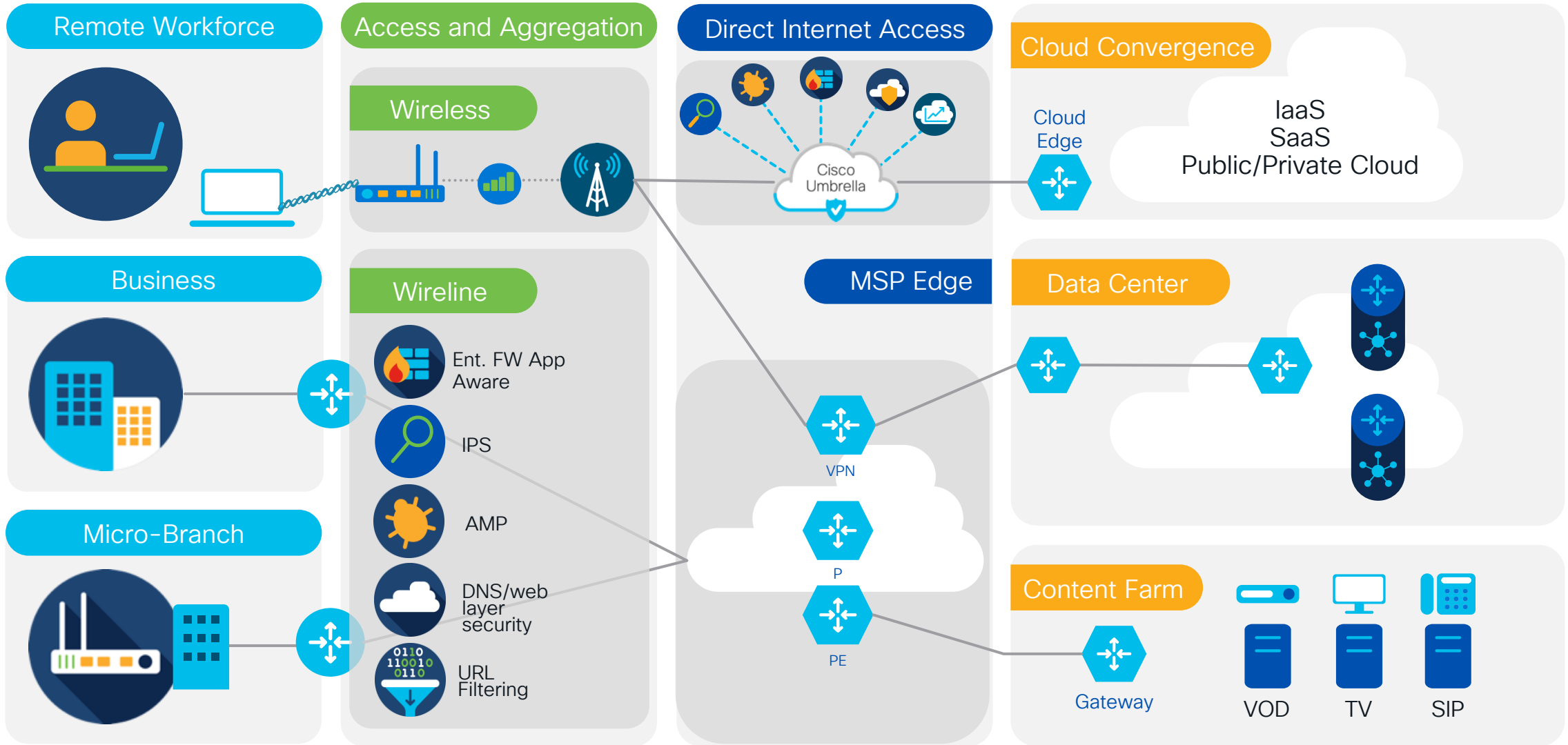
4

Manage Your Network



Securing the Access Layer

Demo SSID: BRKARC-1881
Password: mysmallbranch.



Demo

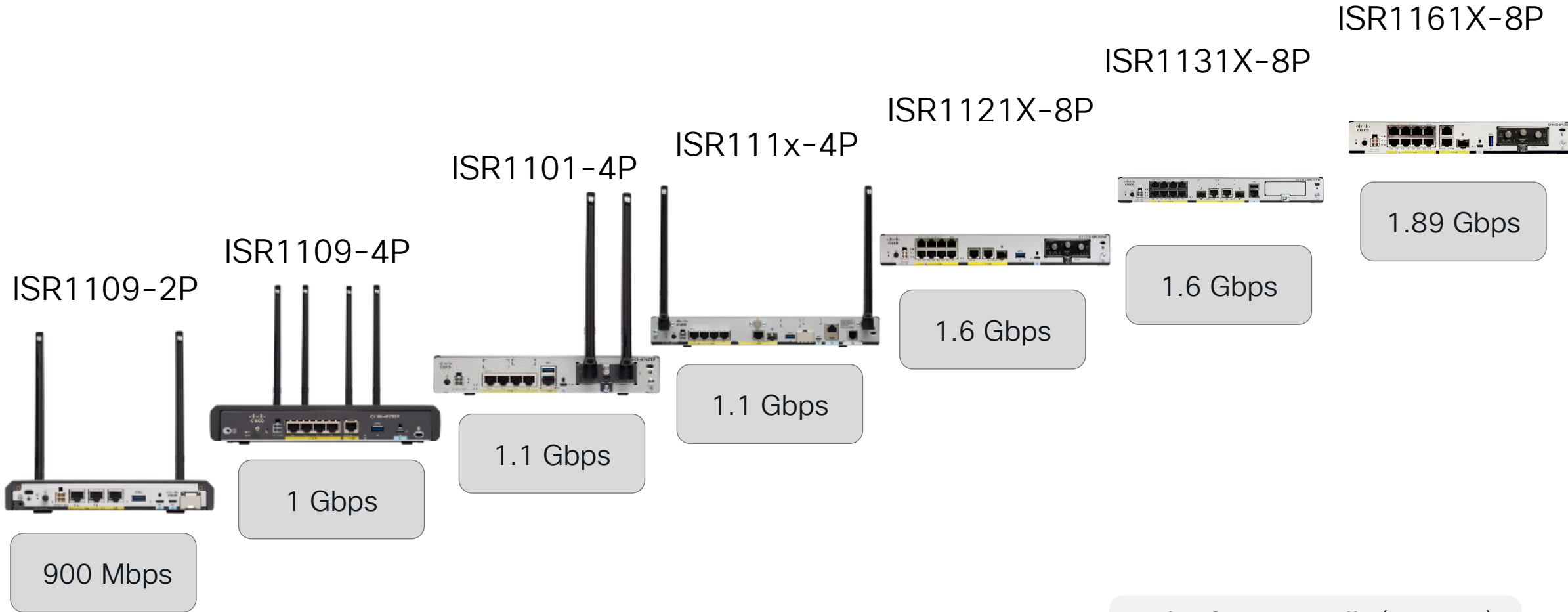


Performance & Scale



Cisco ISR 1000 - CEF Throughput

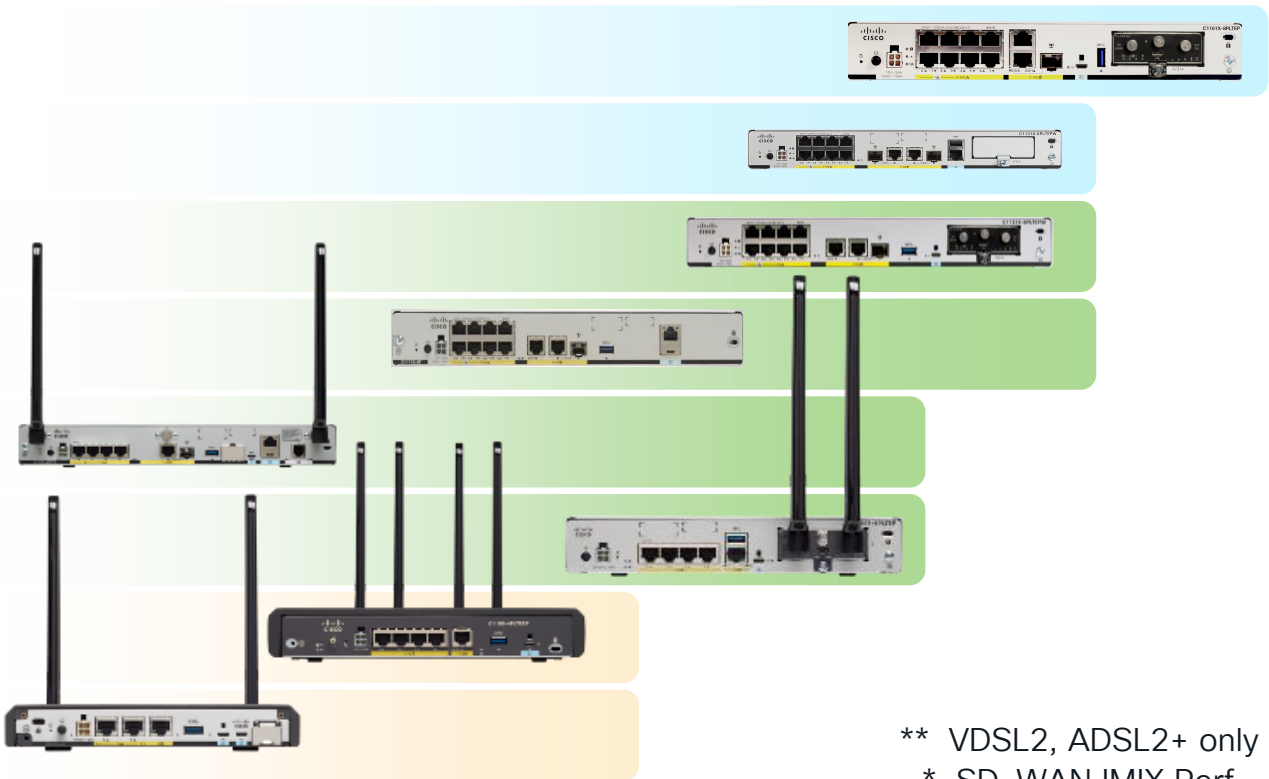
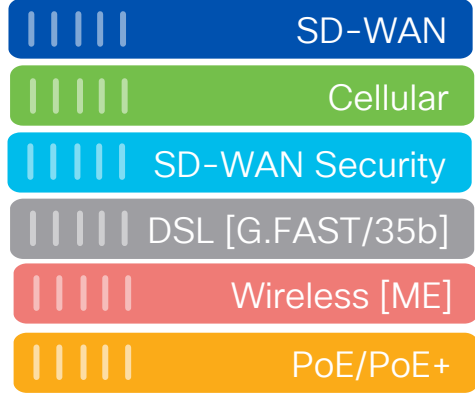
CEF Performance



Profile: Cisco IMIX traffic (352 Bytes)

Cisco ISR1000 Series Routers

IPsec Performance



● ● ● ● ●	ISR 1161X-8P	Up to 600 Mbps*
● ● ● ● ●	ISR 1131X-8P	Up to 470 Mbps*
● ● ● ● ●	ISR 1121X-8P	Up to 470 Mbps*
● ● ● ● ●	ISR 1111X-8P	Up to 470 Mbps*
● ● ● ● ●	ISR 111x-4P	Up to 350 Mbps*
● ● ● ● ●	ISR 1101-4P	Up to 350 Mbps*
● ● ● ● ●	ISR 1109-4P	Up to 260 Mbps*
● ● ● ● ●	ISR 1109-2P	Up to 200 Mbps*

** VDSL2, ADSL2+ only
 * SD-WAN IMIX Perf

- Machine to Machine
Extended temperature & dual LTE
- Remote Workers
- Managed Service Provider CPE
- Branch in a box

Cisco ISR1100 and ISR1100X Routers

IPsec Performance

- |||| SD-WAN
- |||| Integrated LTE
- |||| SD-WAN Security
- ||| CAT4 USB Dongle (Viptela)



- ● ● ISR1100X-6G up to 428 Mbps*
- ● ● ISR1100X-4G up to 399 Mbps*
- ● ● ISR1100-6G up to 428 Mbps*
- ● ● ISR1100-4GLTE up to 399 Mbps*
- ● ● ISR1100-4G up to 399 Mbps*

* SD-WAN IPSEC IMIX Performance (Aggregate)

Better Performance with IOS-XE SD-WAN with SD-WAN Security

Cisco ISR1000 Series Routers

SD-WAN Scale

IOS XE SD-WAN	C1161X-8P	C1121X-8P	C1121-4P	C1111X-8P	C1111-8P	C1111-4P	C1101-4P	C1109-4P	C1109-2P
IPSec Overlay Tunnels	200	200	200	200	200	200	200	200	200
GRE Overlay Tunnels	200	200	200	200	200	200	200	200	200
DPI Flows	32K	32K	32K	32K	32K	32K	32K	32K	32K
cFlows Entries	32K	32K	32K	32K	32K	32K	32K	32K	32K
OMP Routes (overlay)	120K	120K	120K	120K	120K	120K	120K	120K	120K
IPv4 Routes	120K	120K	120K	120K	120K	120K	120K	120K	120K

Higher Scale with IOS-XE SD-WAN

Cisco ISR1100 and ISR1100X Series Routers

SD-WAN Scale

	1100-4G	1100X-4G	1100-6G	1100X-6G	1100-4G	1100X-4G	1100-6G	1100X-6G
Viptela OS					IOS-XE SD-WAN			
IPSec Overlay Tunnels	247	250	1500	1500	250	500	1500	3000
GRE Overlay Tunnels	247	250	1500	1500	250	500	1500	3000
DPI Flows	14K	14K	14K	14K	50K	256K	50K	256K
cFlows Entries	8K	8K	65K	65K	50K	256K	50K	256K
OMP Routes (overlay)	30K	30K	128K	128K	200K	512K	200K	512K
IPv4 Routes	30K	250K	128K	250K	256K	512K	256K	512K

Higher Scale with IOS-XE SD-WAN

Frequently Asked Questions



Does ISR1K support....?

- SGT
 - SGT Inline tagging is supported. Static SGACL is supported. SGACL enforcement is available only on WAN interface
 - From 17.5, static SGACL can be enforced on SVI as well
 - From 17.5, dynamic SGT assignment and SGACL on WAN and SVI from ISE will be supported.
- Voice
 - CUBE is supported, but only on IOS XE
 - From 17.6 SRST support will be added as well (IOS XE)
- VPN
 - EzVPN server only, IPsec VPN, DMVPN, GETVPN & FlexVPN
- VDSL2 35b
 - Only on G.FAST DSL platforms – C1112, C1113 variants
- Embedded Security
 - Supports entire SD-WAN security stack – ZBFW, IPS/IDS, URL-Filtering, AMP/TG, DNS/Web Layer Security
- WiFi in SD-WAN
 - Yes for CAPWAP mode. Starting 17.6, ME can be configured via SD-WAN feature templates
- LTE Dongle in SD-WAN
 - Currently on-track for 17.8 release image
- FirstNet (Band 14) for CAT18 LTE PIMs
 - Currently on-track for end of CY21
- Active-Active LTE
 - C1109 variants support 2 LTE PIMs each operating in active-standby mode, providing 2 active LTE connections simultaneously

Resources



Cisco ISR1000 Series Routers

- Datasheet: <https://www.cisco.com/c/en/us/products/collateral/routers/1000-series-integrated-services-routers-isr/datasheet-c78-739512.html>
- Embedded Wireless AP Configuration Guide: https://www.cisco.com/c/en/us/td/docs/routers/access/isr1100/software/configuration/xe-17/isr1100-sw-config-xe-17/configuring_wifi6.html
- Remote Workforce Routing Solution – Step by step guide- <https://community.cisco.com/t5/networking-documents/remote-workforce-routing-solution-cisco-sd-wan/ta-p/4049385>
- Blogs:
 - Remote Worker : <https://community.cisco.com/t5/networking-blogs/simplify-your-remote-worker-network-with-cisco-sd-wan/ba-p/4308306>
 - Everything ISR1000 : <https://community.cisco.com/t5/networking-blogs/your-one-stop-shop-for-soho-routing/ba-p/4270343>

Cisco ISR1100 and ISR1100X Series Routers for SD-WAN Branch

FYI

- Datasheet: <https://www.cisco.com/c/en/us/products/collateral/routers/1000-series-integrated-services-routers-isr/datasheet-c78-742893.html>
- OS Migration Guide: <https://www.cisco.com/c/en/us/td/docs/routers/sdwan/configuration/isr1100series-migration/sw-install-and-upgrade-guide-isr1100-series.html>
- Hardware Installation Guide: <https://www.cisco.com/c/en/us/td/docs/routers/sdwan/hardware/isr1100-4g-6g/cisco-isr-1100-4g-6g-hig.html>
- Blog: <https://community.cisco.com/t5/networking-blogs/cisco-isr1100-and-isr1100x-series-routers-for-sd-wan-branch/ba-p/4280554>

Technical Session Surveys

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



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Cisco Modeling Labs

Network simulation platform for design, testing, and troubleshooting

Cisco Learning Network

Resource community portal for certifications and learning



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Cisco Training Bootcamps

Intensive team & individual automation and technology training programs

Cisco Learning Partner Program

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Cisco Instructor-led and Virtual Instructor-led training

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Certify



Cisco Certifications and Specialist Certifications

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

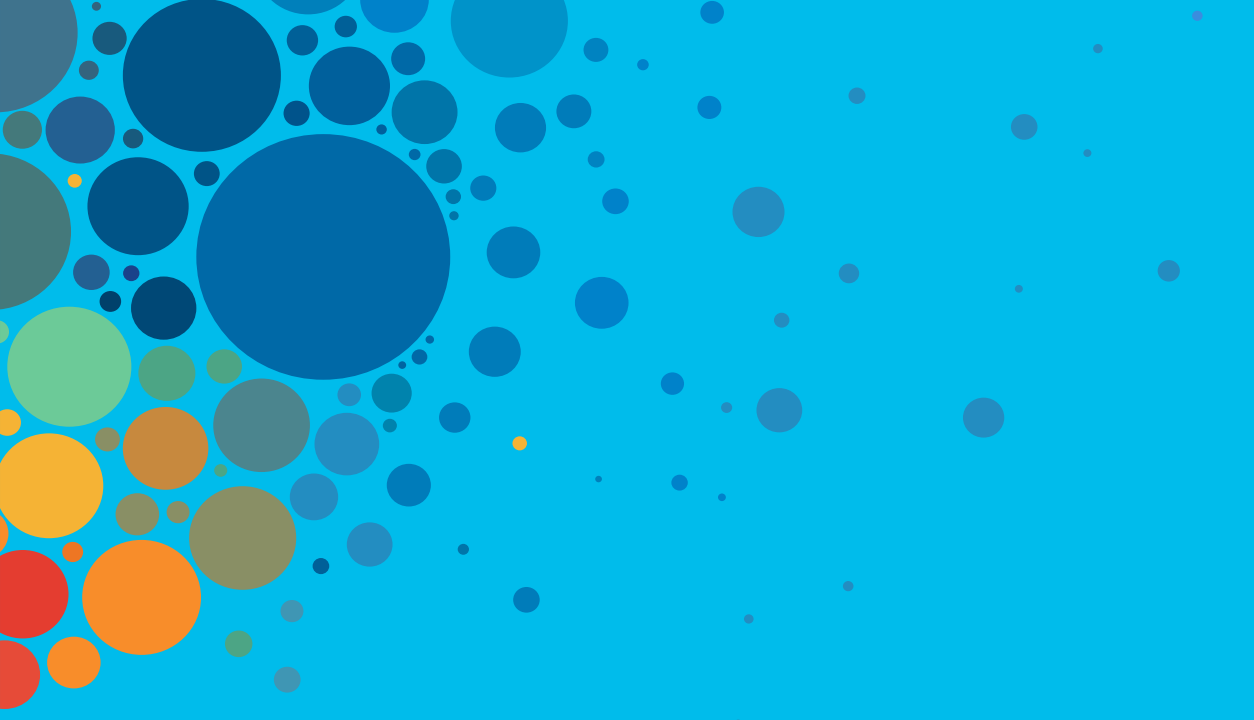
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180-day certification prep program with learning and support

Cisco Continuing Education Program

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Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

Learning Map

Branch and Aggregation Routing Solutions

BRKARC-1881  You are here!
Branch Router Segmentation & Security

- [TECARC-2407](#)
Architecture, Deployments and Troubleshooting deep dive for Catalyst 8000 Series Edge Platforms
- [BRKARC-1881](#)
Which one is the perfect ISR1K for me?
- [BRKXAR-2003](#)
Extending Enterprise Network to the public cloud with Cisco Catalyst 8000V Edge Software
- [BRKARC-2885](#)
Cisco Catalyst 8500 Series Edge Platform Deep Dive
- [BRKENT-2809](#)
Untangle Enterprise Direct Cloud Connectivity with Powerful Catalyst 8500 Series Edge Platforms
- [BRKENT-2312](#)
Cisco SD-WAN Security Evolution to SASE



The bridge to possible

Thank you

CISCO *Live!*

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ALL IN

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