



Unified Communications on Catalyst 8000 Edge Platforms Family

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June 2021

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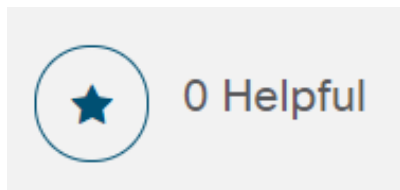


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Unified Communications on Catalyst 8000 Edge Platforms Family

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Agenda

- 1 Catalyst 8000 UC Overview
- 2 NIM-PVDM Voice Module
- 3 Cisco SD-WAN Voice Support
- 4 Catalyst 8000 UC Positioning & Scale
- 5 BYoPSTN for Cloud Calling
- 6 Key Feature Highlights

Catalyst 8000 UC Overview

Cisco Catalyst 8000 UC Overview

Aggregation

**CATALYST 8500
EDGE
PLATFORMS**



Modular Access

**CATALYST
8300/8200
EDGE PLATFORMS**

VOICE ✓



Cloud

**CATALYST
8000V EDGE
SOFTWARE**

VOICE ✓

NEW

Catalyst 8000V



**SRIOV
Hypervisor/Cloud**



ASR 1001/2-HX



ISR 4000



CSR 1000V

Unified Communication on Cisco Catalyst 8300 Edge Platforms

Catalyst 8300 Edge Platforms

1G

C8300-2N2S-6T



4 RJ45 & 2 SFP

C8300-1N1S-6T



4 RJ45 & 2 SFP

10G

C8300-2N2S-4T2X



4 RJ45 (1G) & 2 SFP+

C8300-1N1S-4T2X



4 RJ45 (1G) & 2 SFP+

DSP Modules

T1/E1 Voice Modules

Analog Voice Modules



UC Capabilities

SD-WAN Voice

Analog Voice

Digital Voice

SRST

CUBE SBC

New Modules

NIM-PVDM

C-SM-NIM-ADPT

Call Control

CUCM 12.5.1 SU4
& CUCM 14 SU1

CME (IOS XE 17.6*)

Catalyst 8300 UC Solution coverage

Call Control

- Cisco Unified Border Element (CUBE) SBC for SIP calls
- Survivable Remote Site Telephony (SRST) for backup
- Secure voice Calling (SRTP) Support

DSPFARM Services

- 4th Gen Packet Voice DSP Module (PVDM4) DSP for IP and TDM services
- NIM-PVDM* Modules for IP Services (Transcoding , Conferencing etc.)
- SM modules for high density PVDM based IP Services

Analog Voice**

- Support for **legacy devices** (analog phones , fax machines etc.)
- Network Interface modules for **FXS/FXO , E/M & BRI** based analog connections
- **High density FXS modules** for increased number of FXS ports

Digital Voice**

- Support for **T1/E1 voice** terminations
- Network Interface modules ranging from **(1 to 8) port MFT/CE1T1 Modules**
- NIM adaptors for **SM to NIM conversion** (for Increased T1/E1 ports)



- Starting IOS XE 17.3.2 release
- Autonomous mode



- *No onboard(MB) DSP support on Catalyst 8300



- **CUCM Gateway Support with version 12.5.1 SU4 & CUCM 14 SU1
Protocol support : MGCP, SCCP

Unified Communication on Cisco Catalyst 8200 Edge Platform

Catalyst 8200 Edge Platform

C8200-1N-4T/C8200L-1N-4T



2 RJ45 & 2 SFP

1G

 No SM-X Slot

DSP Modules

T1/E1 Voice Modules

Analog Voice Modules



UC Coverage

SD-WAN Voice

SRST

Analog Voice

Digital Voice

CUBE SBC

New Modules

 NIM-PVDM

CUCM 12.5.1 SU4 & CUCM 14 SU1

CME (IOS XE 17.6*)

Catalyst 8200 UC Solution coverage

Call Control

- Cisco Unified Border Element (CUBE) SBC for SIP calls
- Survivable Remote Site Telephony (SRST) for backup
- Secure voice Calling

DSPFARM Services*

- 4th Gen Packet Voice DSP Module (PVDM4) for IP and TDM services
- NIM-PVDM Modules for IP Services (Transcoding , Conferencing etc.)

Analog Voice**

- Support for **legacy devices** (analog phones , fax machines etc.)
- Network Interface modules for FXS/FXO , E/M & BRI based analog connections

Digital Voice

- Support for **T1/E1 voice** terminations
- Network Interface modules ranging from (1 to 8) port Multiflex trunk voice cards



- Starting IOS XE 17.4.1 release
- Autonomous mode

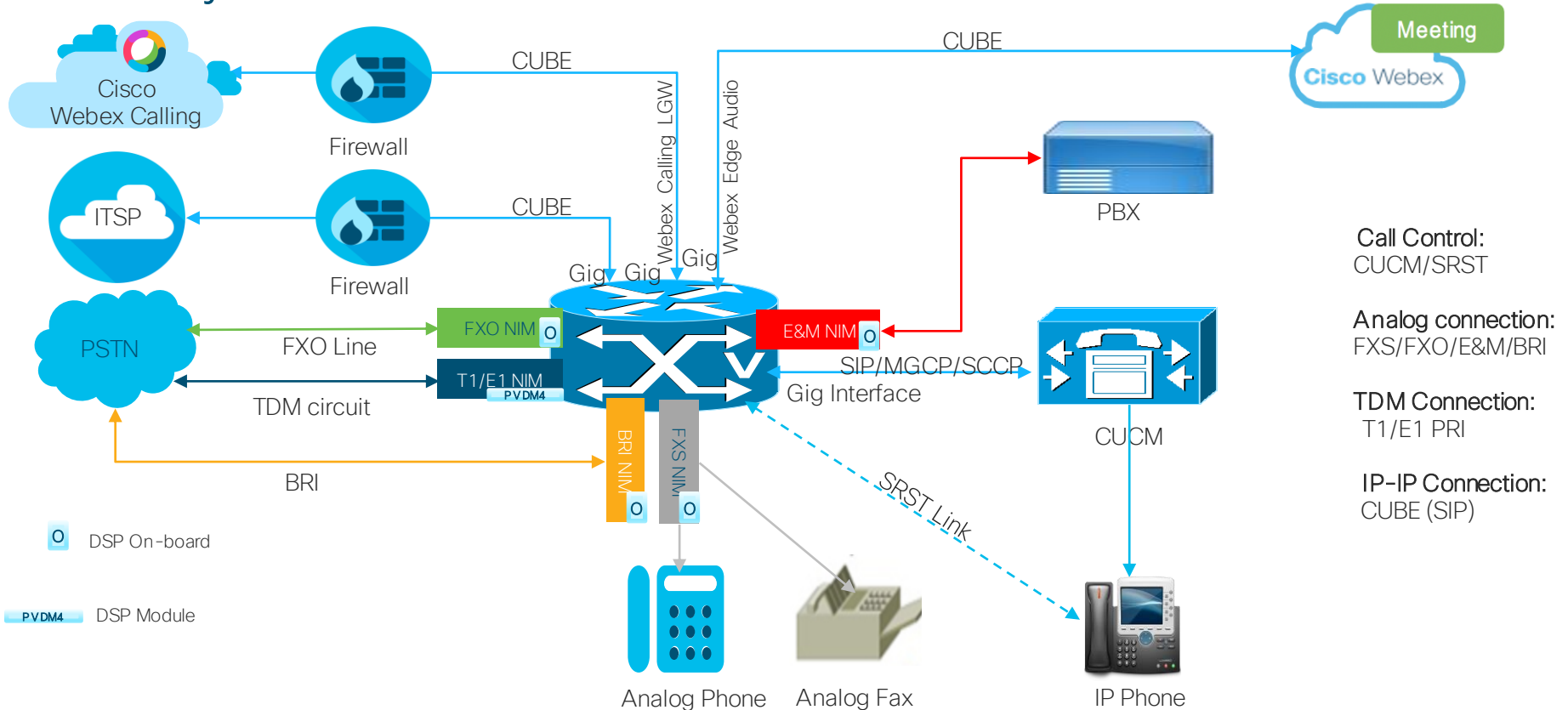


- *No onboard (MB) DSP support on Catalyst 8200
- No **High density** analog / DSP Module support



- **CUCM Gateway Support with version 12.5.1 SU4 & CUCM 14 SU1
Protocol support : MGCP, SCCP

Catalyst 8300/8200 Modular Branch UC Design



Catalyst 8300/8200 Voice Module Coverage

Digital Voice

T1/E1 Voice NIM



Form Factor:

- NIM-1MFT-T1E1
- NIM-2MFT-T1E1
- NIM-4MFT-T1E1
- NIM-8MFT-T1E1
- NIM-1CE1T1-PRI
- NIM-2CE1T1-PRI
- NIM-8CE1T1-PRI

NIM-PVDM



Form Factor:

- NIM-PVDM-32
- NIM-PVDM-64
- NIM-PVDM128
- NIM-PVDM256

PVDM DSP Card



Form Factor:

- PVDM4 - 32
- PVDM4 - 64
- PVDM4 - 128
- PVDM4 - 256

High Density DSP SM*



Form Factor:

- SM-X-PVDM-500
- SM-X-PVDM-1000
- SM-X-PVDM-2000
- SM-X-PVDM-3000

Analog Voice

FXS/FXO NIM



Form Factor:

- NIM-2FXO
- NIM-4FXO
- NIM-2FXS/P*
- NIM-4FXS/P*
- NIM-2FXS/4FXO/P*

BRI NIM



Form Factor:

- NIM-2BRI-NT/TE
- NIM-4BRI-NT/TE

E/M NIM



Form Factor:

- NIM-4E/M

High Density Analog SM*

Form Factor:

- SM-X-8FXS/12FXO
- SM-X-16FXS/2FXO
- SM-X-24FXS/4FXO



Single Wide Module



SM-X-72FXS

Double Wide Module

NIM-PVDM Module

NIM PVDM Introduction ^{NEW}

NIM-PVDM

Next-generation Digital Signal Processor (DSP) modules (NIM-PVDM) with on board DSP daughter card to support low to medium density voice media services:

Transcoding

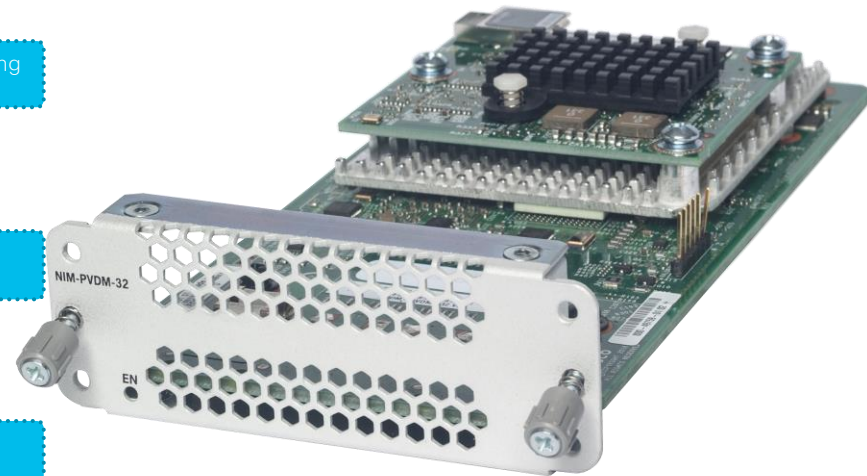
SCCP Transcoding (CUCM), LTI Transcoding (CUBE)

Conferencing

SCCP secure & non-secure conferencing

Media Termination

SCCP hardware media termination & optimization



Why NIM-PVDM?

No motherboard slots in the newer platforms

Eliminates the need to procure additional T1/E1 MFT card for dspfarm services

Low to Medium density DSP Module at optimum cost



NIM-PVDM Part Numbers

SKU	Description
NIM-PVDM-32	32-channel density voice DSP module
NIM-PVDM-64	64-channel density voice DSP module
NIM-PVDM-128	128-channel density voice DSP module
NIM-PVDM-256	256-channel density voice DSP module

NIM-PVDM Platform Support

NIM-PVDM will be supported on the following Cisco Catalyst 8300/8200 Edge Platforms and Cisco ISR4461 Platform.


PID	Min IOS XE	RU
C8200L-1N-4T	17.5.1	1
C8200-1N-4T	17.4.1	1
C8300-1N1S-4T2X	17.3.2	1
C8300-1N1S-6T	17.3.2	1
C8300-2N2S-4T2X	17.3.2	2
C8300-2N2S-6T	17.3.2	2
ISR4461	17.3.2	3

NIM-PVDM Platform Capacity

PID	NM	SM	Max NIM-PVDM
C8200-1N-4T / C8200L-1N-4T	1	0	1
C8300-1N1S-4T2X	1	1	3*
C8300-1N1S-6T	1	1	3*
C8300-2N2S-4T2X	2	2	6*
C8300-2N2S-6T	2	2	6*
ISR4461	3	3	6

* The above counts are with C-SM-NIM-ADPT carrier card

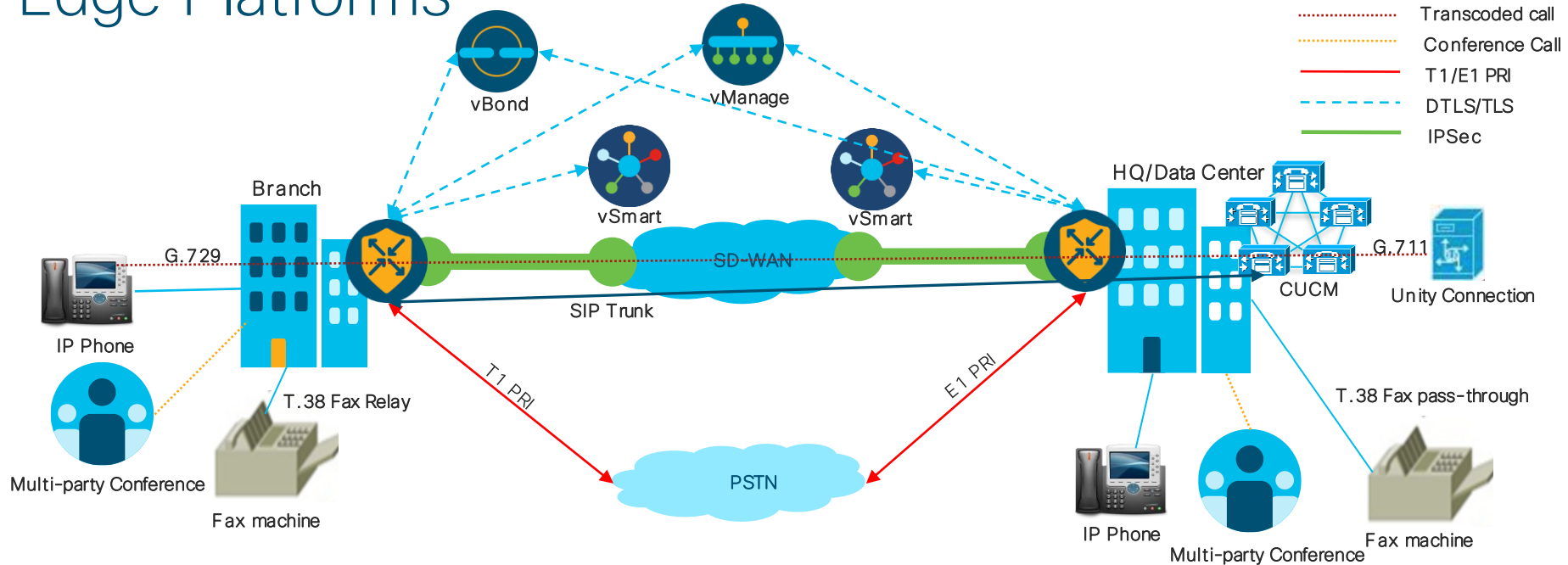
NIM-PVDM DSPFARM Codec Support

Codec	Complexity	Transcoding	Conferencing	HW MTP
G.711alaw	Low	Supported	Supported	Supported
G.711ulaw	Low	Supported	Supported	Supported
Pass-through	Low	Supported	Not Supported	Supported
G.722	Medium	Supported	Supported	N/A
G.729	Medium	Supported	Supported	N/A
G.729a	Medium	Supported	Supported	N/A
G.729b	High	Supported	Supported	N/A
G.729ab	High	Supported	Supported	N/A
iLBC	High	Supported	Supported	N/A
iSAC	High	Supported	Not Supported	N/A
OPUS (IOS XE 17.6. 	High	Supported	N/A	N/A

*July 2021

Cisco SD-WAN Voice Support

SD-WAN Voice Support on Catalyst 8300/8200 Edge Platforms



Unified Communications Features

Call Control

Analog Voice

Digital Voice

DSPFARM

Catalyst 8300/8200 UC SD-WAN coverage

Call Control

- SIP Survivable Remote Site Telephony (SRST) for backup
- CUCM SIP Trunking support (IP – TDM , IP – FXS/FXO)
- Voice Translations for inbound/outbound calls

DSPFARM Services

- 4th Gen Packet Voice DSP Module (PVDM4) for TDM services
- NIM-PVDM* Modules for IP Services (Transcoding , Conferencing etc.)
- **SM modules for high density PVDM based IP Services

Analog Voice

- Network Interface modules for FXS/FXO based legacy devices
- **High density FXS modules for increased number of FXS ports
- SIP based T.38 fax relay, Fax & Modem pass-through

Digital Voice

- Support for T1/E1 voice PRI Circuits
- Network Interface modules ranging from (1 to 8) port MFT/CE1T1 Modules
- **NIM adaptors for SM to NIM conversion (for Increased T1/E1 ports)



- Catalyst 8300 support starting IOS XE 17.3.2 release
- Controller mode



*No onboard(MB) DSP support on Catalyst 8300/8200



- Catalyst 8200 support starting IOS XE 17.4.1 release
- Catalyst 8200L support starting IOS XE 17.5.1 release
- Controller mode



**No SM-X slot on Catalyst 8200

Catalyst 8300/8200 SD-WAN Voice Module Coverage

DSP Modules

- **PVDM DSP Cards*** : PVDM4-32, PVDM4-64, PVDM4-128, PVDM4-256
- **NIM Modules**: NIM-PVDM-32, NIM-PVDM-64, NIM-PVDM128, NIM-PVDM256
- **SM Modules****: SM-X-PVDM-500, SM-X-PVDM-1000 , SM-X-PVDM-2000 , SM-X-PVDM-3000

Analog Voice Modules

- **NIM Modules**: NIM-2FXO, NIM-4FXO, NIM-2FXSP, NIM-4FXSP, NIM-4FXOP, NIM-2FXS/4FXOP
- **SM Modules****: SM-X-8FXS/12FXO, SM-X-16FXS/2FXO, SM-X-24FXS/4FXO, SM-X-72FXS

Digital Voice Modules

- **NIM Modules**: 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

Note: PVDM4 DSP Cards required for T1/E1 packetization

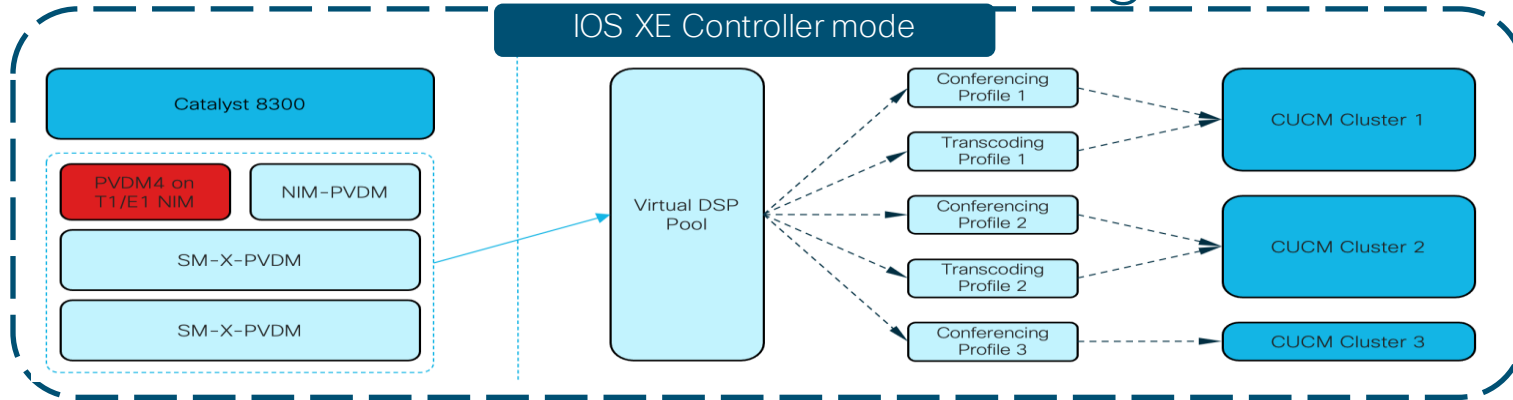
SD-WAN Voice support Limitation

*No DSPFARM support for DSP inserted in NIM T1/E1 module

** No SM Module Support on Catalyst 8200

C-SM-NIM-ADPT : SM to (2) NIM slot Conversion

DSPFARM Resource Pool Sharing



1. DSPFARM Configuration

All the SM-X-PVDM & NIM-PVDM add up in the DSPFARM Resource Pool to provide aggregated DSP Sessions.

DSPFARM Pool = 2 SM-X-PVDM + NIM-PVDM*

Note: PVDM4 DSP on the T1/E1 card cannot be used in DSPFARM Resource pool

2. Audio Conferencing

Maximum conference participants per profile can be 8, 16 or 32

Max Participant Per Conference = [8][16][32]

3. Audio Transcoding

Transcoding session in excess of 4K requires a second DSPFARM profile

Max Transcoding Session(per profile) = 4000

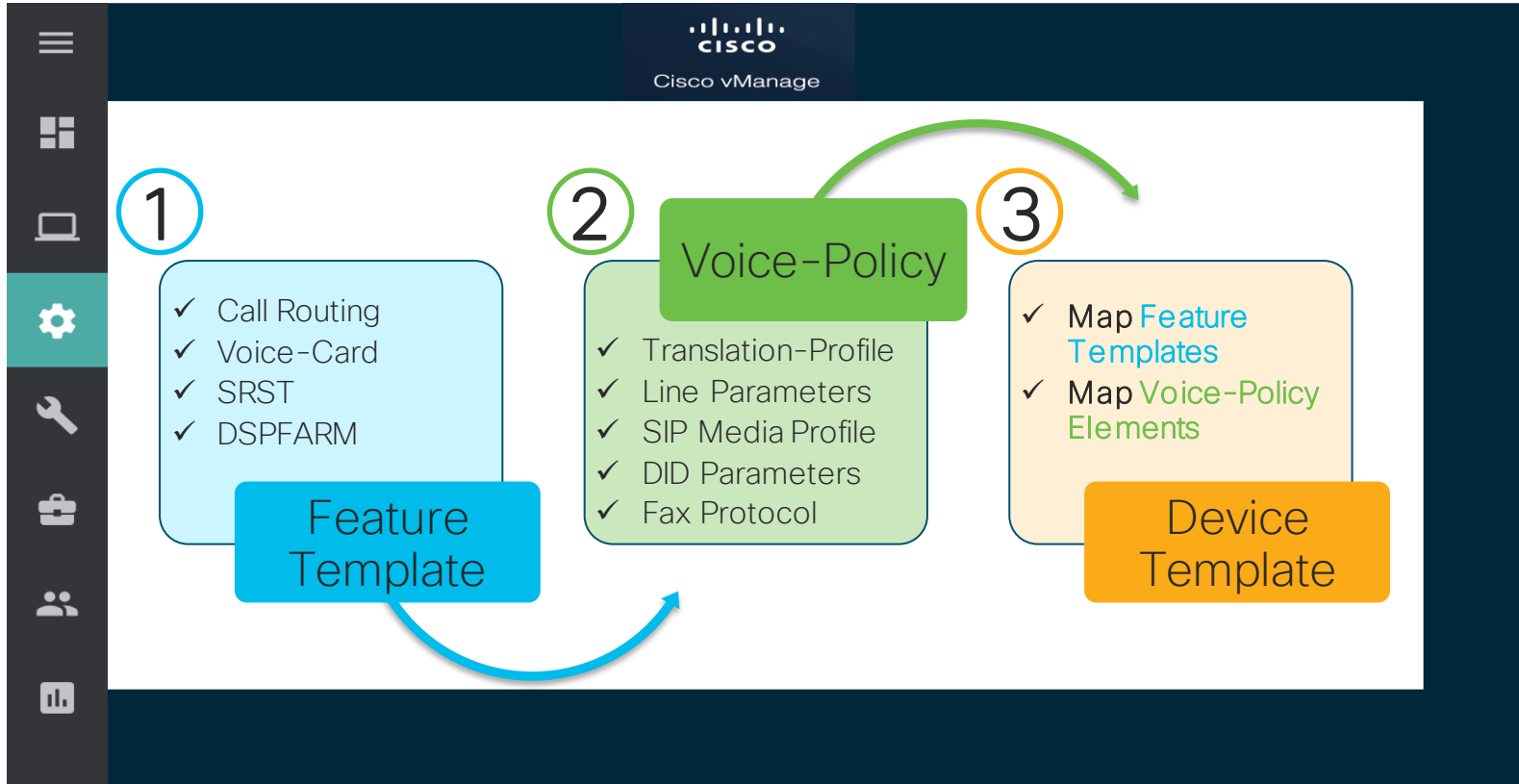
4. Software Media Termination

SW MTP session in excess of 6K requires a second DSPFARM profile

Max Software MTP Session(per profile) = 6000



UC SD-WAN Configuration Flow



vManage View for Unified Communications

The screenshot shows the Cisco vManage interface for configuring Unified Communications templates. The main area displays a 'UNIFIED COMMUNICATION' template with four numbered components:

- 1 Call Routing**: Includes SIP/POTS Dial-peers.
- 2 DSPFarm**: Includes Transcoding/ Conferencing/ MTP.
- 3 SRST**: Includes Max Phone/DN/ SIP Phone Profile.
- 4 Voice Card**: Includes Analog/Digital interface.

A central note states: **UNIFIED COMMUNICATION (SIP and SRST templates need to be provisioned to enable stand-alone SRST feature)**.

On the left, the 'Select Devices' section shows the following devices selected:

- ✓ C8300-1N1S-4T2X
- ✓ C8300-1N1S-6T
- ✓ C8300-2N2S-4T2X
- ✓ C8300-2N2S-6T



Catalyst 8300:

- Starting IOS XE 17.3.2 release
- vManage 20.3.2



Catalyst 8200:

- Starting IOS XE 17.4.1 release
- vManage 20.4.1



Catalyst 8200L:

- Starting IOS XE 17.5.1 release
- vManage 20.5.1

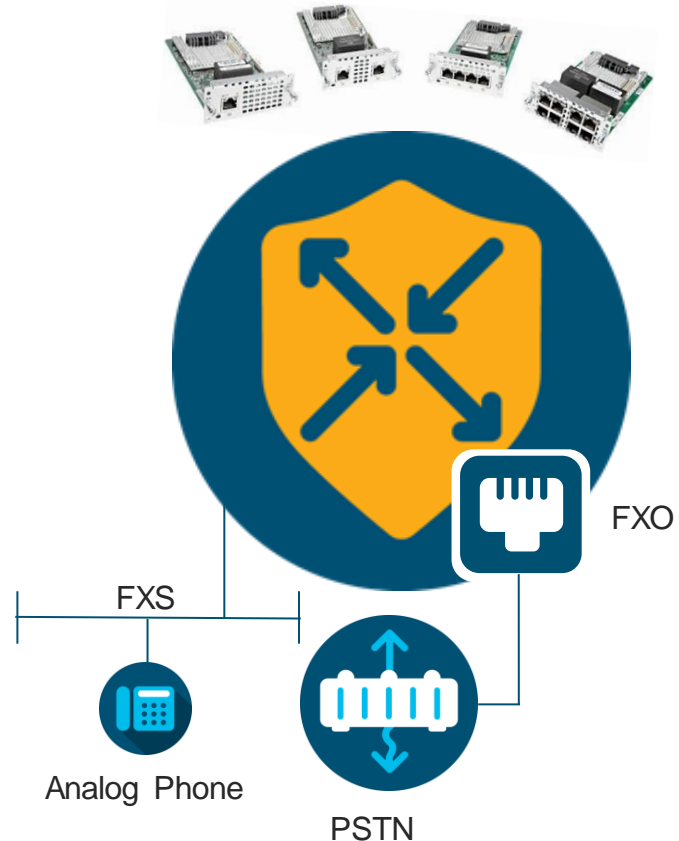
FXS/FXO Based Analog Voice Support

Feature Template Settings:

- Module/Slot configuration
- Local bypass (Hairpinning)
- PLAR
- Caller-ID
- **Signal Type**
 - Loopstart/Groundstart/DID

Unified Communications Policy

- Trunk Group
- Translation Profile
- Line & Parameters
- Station ID Settings
- Supervisory Disconnect settings (FXO)
- DID Timers (FXS DID)



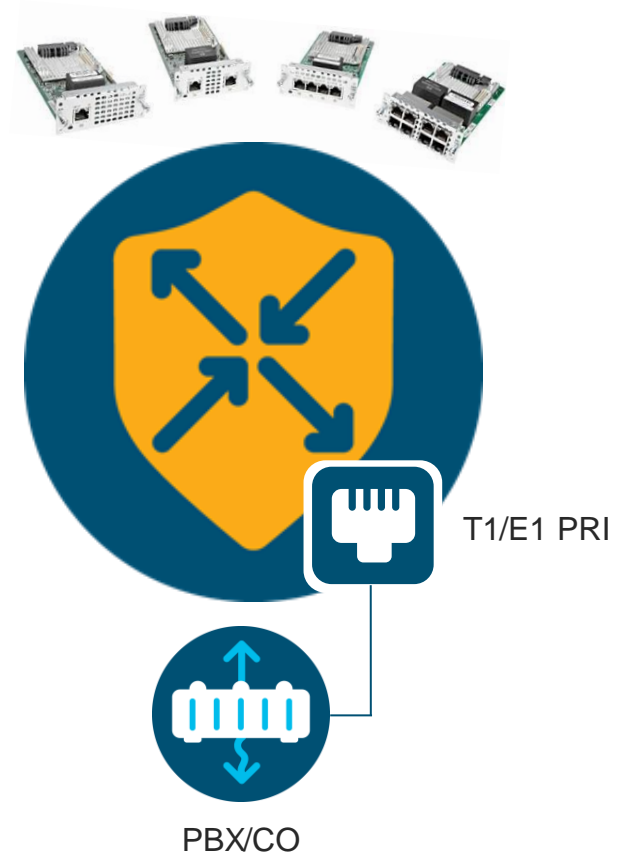
T1/E1 Voice PRI

Feature Template Settings:

- Interface/Slot configuration
- Local bypass (TDM Hairpinning)
- Clock Configuration
- ISDN Timers
- ISDN Switch Type
 - QSIG, NET5, NTT, 4ESS, 5ESS, DMS100, and NI

Unified Communications Policy

- Trunk Group (Hunt Scheme, Max Calls et.,)
- Translation Profile
- Line Parameters
 - Gain/Attenuation/VAD,CP tone etc.



DSPFarm Services

Feature Template Settings:

- Module/ Slot configuration
- Profile Configuration
 - Transcoding/Conferencing/MTP
- SCCP Configuration
 - CUCM Group/SCCP binding/Switchover

Codec Settings

- Transcoding
(g711alaw/ulaw, g729abr8/ar8/br8/r8,g722-64,ilbc,pass-thru)
- Conferencing
(g711alaw/ulaw, g729abr8/ar8/br8/r8,g722-64)
- HW MTP
(g711alaw/ulaw, pass-thru)
- **SW MTP**
(g711alaw/ulaw, g729abr8/ar8/br8/r8,g722-64,ilbc,pass-thru,isac)



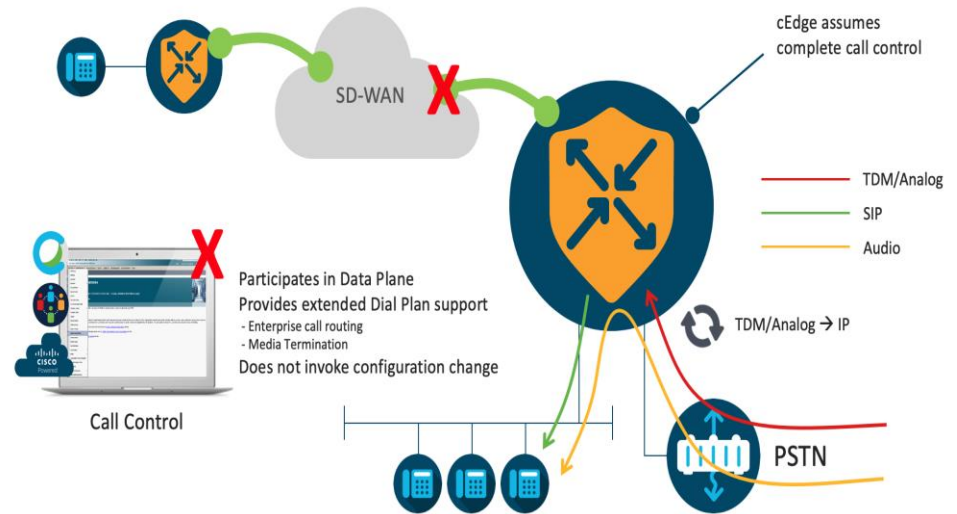
Survivable Remote Site Telephony

Feature Template Settings:

- Max Phone / DN
- Music on Hold
- Phone Profile Configuration
 - Voice Pool
 - Device Network Settings

Unified Communications Policy

- Media Profile
 - DTMF
 - Codec



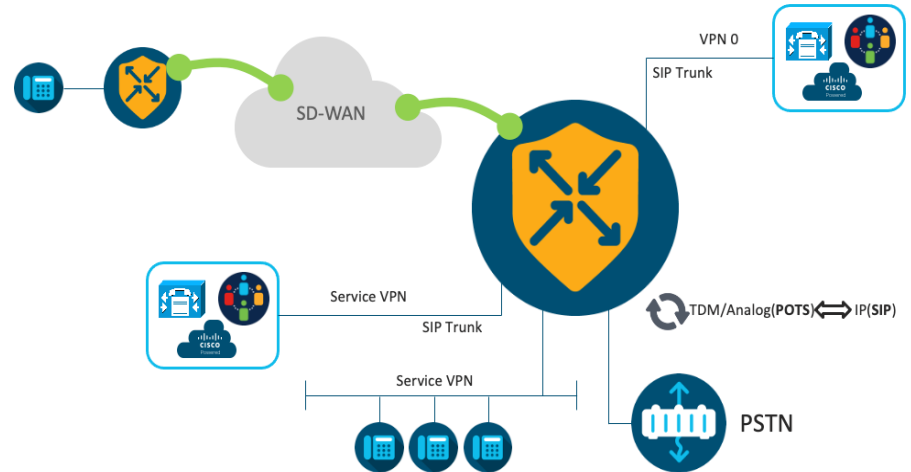
Dial-Peer Based Call Routing

Feature Template Settings:

- Toll Fraud Prevention (Trusted IP List)
- Global Interface binding
- Incoming/Outgoing Dial-peers
 - POTS Dial-peer
 - SIP Dial-peer Settings

Unified Communications Policy

- POTS Dial-peers
 - Trunk Group/ Translation Profile
- SIP Dial-peers
 - Translation Profile/Media Profile/Modem/ Fax Protocol



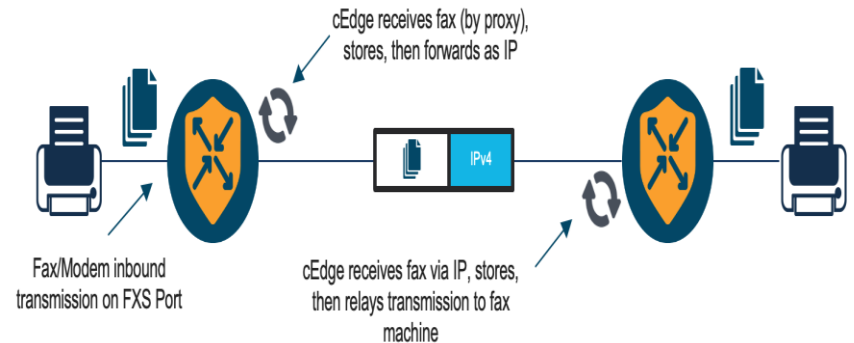
Fax/Modem Support

Fax/Module Policy Settings:

- Fax Protocol settings
 - SIP-based T.38 Fax Relay
 - Fax Pass-Through (G.711)
- Fallback settings
- speed settings
- Modem Pass-Through (NSE)

Note:


Settings applicable to SIP Dial-peers with SIP trunking flows



Catalyst 8300/8200 SD-WAN Voice Feature Specifications

Feature	Specifications
Survivable Remote Site Telephony(SRST)*	SIP SRST Only, COR list*, no voice translations
FAX & Modem	SIP based T.38 Fax Relay, Fax Pass-Through (G.711), Modem Pass-Through(NSE)
Call Routing	SIP -POTS(SIP-FXS, SIP-FXO,SIP-T1/E1)& FXS-FXO supported, IP-IP (CUBE SBC), secure calling not supported
DSPFARM IP Services	NIM & SM-X PVDMS supported, DSP on T1/E1 Modules, LTI Transcoding or secure conferencing not supported, No opus transcoding
T1/E1 Digital Voice Termination	T1/E1 PRI only, CAS ,E1R2 not supported
Analog Voice Modules	NIM & SM FXS/FXO Modules supported, E/M & BRI modules not supported
Voice Translations	Supported only on Dial-peers/Voice-Ports
Protocol	SIP (call control) & SCCP (DSPFARM) supported, MGCP & H.323 not supported

cEdge MGCP to SIP Migration for UC SD-WAN Deployment

Considerations	MGCP	SIP 
Call Control binding	MGCP Gateway	SIP Trunk
Call Routing	CUCM	SIP Dial-peers
Fax	MGCP T.38	SIP T.38
Supplementary services	FXS	Not Supported
PSTN Control (T1/E1 PRI/FXO)	CUCM Controlled	Gateway controlled
PRI Selection	CUCM Route group	Gateway Dial-peers
SRST	MGCP/SCCP	SIP

UC Positioning & Scale

UC Positioning & Scale

UC Licensing

Catalyst 8300/8200 Edge Platforms UC Licensing

Platform	Software Mode	DNA Subscription	Add-on License*
C8300-1N1S-4T2X C8300-1N1S-6T C8300-2N2S-4T2X C8300-2N2S-6T	IOS XE Autonomous mode	DNA Essential (CUBE)	CUBE License (L-CUBE)
C8200-1N-4T C8200L-1N-4T	IOS XE Controller mode	DNA Advantage (UC modules & features, SRST)	SRST License (L-SRST)



*CUBE and SRST require add-on licenses

UC Positioning & Scale

Catalyst 8000 & ISR 4000
comparison

Platform Support Summary


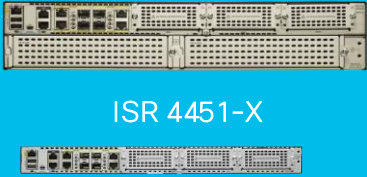
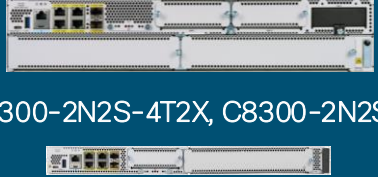
Autonomous Mode:

Platform	CME	SRST	CUBE	TDM	DSP Farm	Analog NIM
Catalyst 8300/8200	IOS XE 17.6.1*	Supported	Supported	Supported	Supported	Supported
ISR 4400/4300	Supported	Supported	Supported	Supported	Supported	Supported
CSR1000v/ CSR8000v	Supported	Not Supported	Supported	Not Supported	Not Supported	Not Supported

Controller Mode:

Platform	CME	SRST	CUBE	TDM	DSP Farm	Analog NIM
Catalyst 8300/8200	Not Supported	Supported (SIP SRST)	Roadmap	Supported (Voice PRI)	Supported	Supported
ISR 4400/4300	Not Supported	Supported (SIP SRST)	Roadmap	Supported (Voice PRI)	Supported	Supported

Catalyst 8300 & ISR 4400 Key Comparison

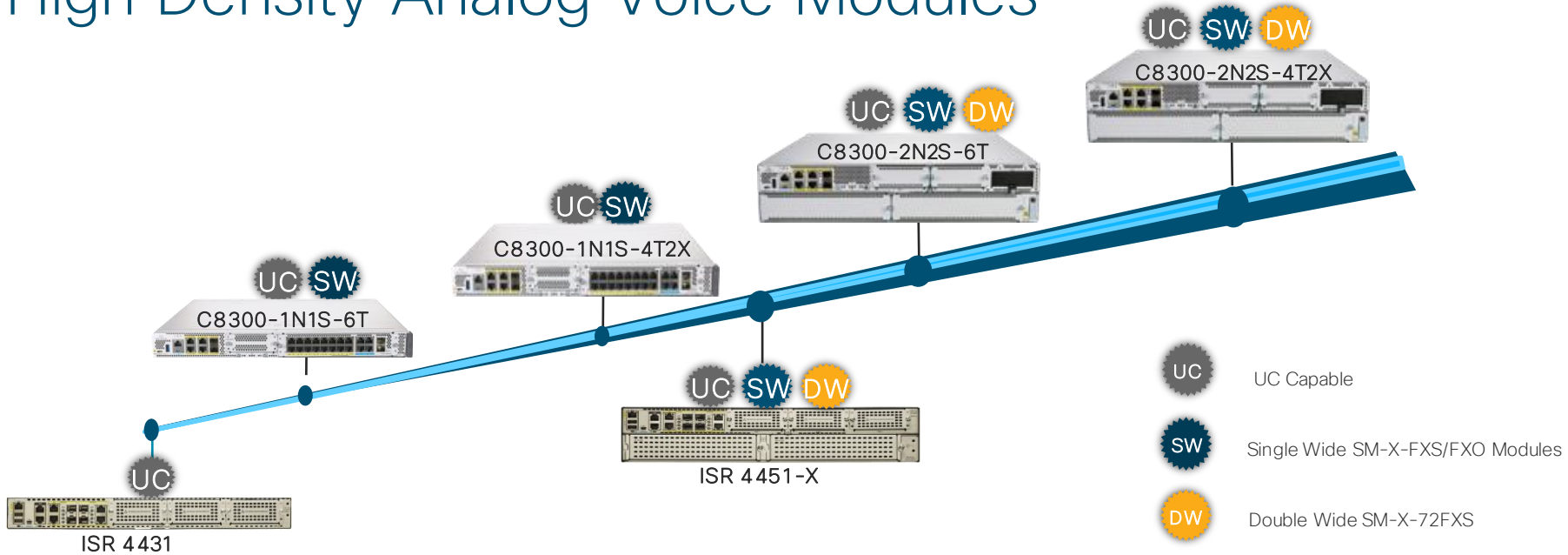
 Factors	 ISR 4451-X ISR 4431	 C8300-2N2S-4T2X, C8300-2N2S-6T C8300-1N1S-4T2X, C8300-1N1S-6T
CME Support	Yes	IOS XE 17.6
SM to NIM Adapter	SM-X-NIM-ADPTR (SM = 1* NIM)	C-SM-NIM-ADPT (SM = 2* NIM)
NIM-PVDM	No	Yes
Motherboard DSP	Yes	No
Power Supply	Dual (AC/DC)	Dual (AC/DC)
DRAM	4GB (default)	8GB(default)
NIM slot	4451-X: Default NIM(3) ,Max NIM(5) 4431: Default NIM(3), Max NIM(3)	2 RU: Default NIM(2) ,Max NIM(6) 1 RU: Default NIM(1), Max NIM(3)
SM Slot	4451-X: SM(2) 4431: SM(0)	2 RU: SM(2) 1 RU: SM(1)

High Density PVDM Modules(SM-X-PVDM)

Platform	SM-X-PVDM-500	SM-X-PVDM-1000	SM-X-PVDM-2000	SM-X-PVDM-3000
C8300-2N2S-4T2X	2	2	2	2
C8300-2N2S-6T	2	2	1	1
4451-X*	2	2	1	1
C8300-1N1S-4T2X	1	1	1	1
C8300-1N1S-6T	1	1	1	1
4431	N/A	N/A	N/A	N/A

*All SM-X-PVDM modules require 8GB DRAM




High Density Analog Voice Modules



Module	Total FXS	Total FXO	FXS-E enabled Ports	FXO Failover
SM-X-8FXS/12FXO	8	12	8	8 ports
SM-X-16FXS/2FXO	16	2	16	2
SM-X-24FXS/4FXO	24	4	16	4
SM-X-72FXS	72	0	Mode - 1: 16(FXS-E) / 56 (FXS) Mode - 2: 56(FXS-E) / 16(Disabled)	N/A

Catalyst 8300 is ideal for large scale analog voice deployments

Catalyst 8200 & ISR 4300 Key Comparison

 Factors	 ISR 4331 ISR 4321	 C8200-1N-4T C8200L-1N-4T
CME Support	Yes	IOS XE 17.6
SM to NIM Adapter	SM-X-NIM-ADPTR (SM = 1*NIM)	No
NIM-PVDM	No	Yes
Motherboard DSP	Yes	No
Power Supply	Single (AC or DC)	AC
DRAM	4331: 4GB (default) 4321: 4GB (default)	C8200-1N-4T: 8GB (default) C8200L-1N-4T: 4GB (default)
NIM slot	4331: Default NIM(2), Max NIM(3) 4321: Default NIM(2), Max NIM(2)	C8200-1N-4T: Default NIM(1), Max NIM(1) C8200L-1N-4T: Default NIM(1), Max NIM(1)
SM Slot	4331: SM(1) 4321: No	C8200-1N-4T: No C8200L-1N-4T: No

UC Positioning & Scale

Catalyst 8000
IP & Modular Voice Scale

High Scale Modular Voice with Catalyst 8000

1. Analog Voice Port Density

On par with ISR 4451 for analog FXS/FXO port density.

Max port : Up to 72 FXS with 8 FXO ports

2. Scalable PSTN Termination

More number of T1/E1 ports leading to high channel density.

Max Channel Density=:Up to 1440 E1 PRI / 1104 T1 PRI Channels

3. Increased Transcoding Sessions

More sessions to handle enterprise deployments with CUBE, Contact Center, etc.

Max Transcoding Session: Up to 6672

4. Large Scale Audio conferencing

Ability to handle 900 plus 8 party audio conferences

Max 8 party Conferences: Up to 937 (non secure) & 525 (secure) 8 Party conferences



High Scale IP Voice with Catalyst 8000

1. More Software MTP sessions

More sessions for transrating ,pass through calls or DTMF internetworking etc..

Max SW MTP Sessions: Up to 7500 @ 15 CPS

2. Better Fallback Coverage

Increased SRST fallback phone coverage at branch site

Max SRST Phones: 2500

3. More IP-IP Voice Session

Increased capacity to handle high SIP call volume for ITSP termination & Enterprise Networks

Max CUBE sessions=:Up to 10000 Sessions @ 55 CPS

Note: Based on unencrypted RTP(G711)-RTP(G711) calls



Cisco Catalyst 8000V Edge Platform



IOS XE 17.4.1a



NEW

vCUBE on Amazon Web
Services (AWS)

- CSR 1Kv AMI with IOS XE 16.12.4a
- Catalyst 8Kv AMI with IOS XE 17.4.1a
- Instance billed only for hosting by AWS (with BYOL)
- Up to 3000 max sessions at 20 CPS (2vCPU)



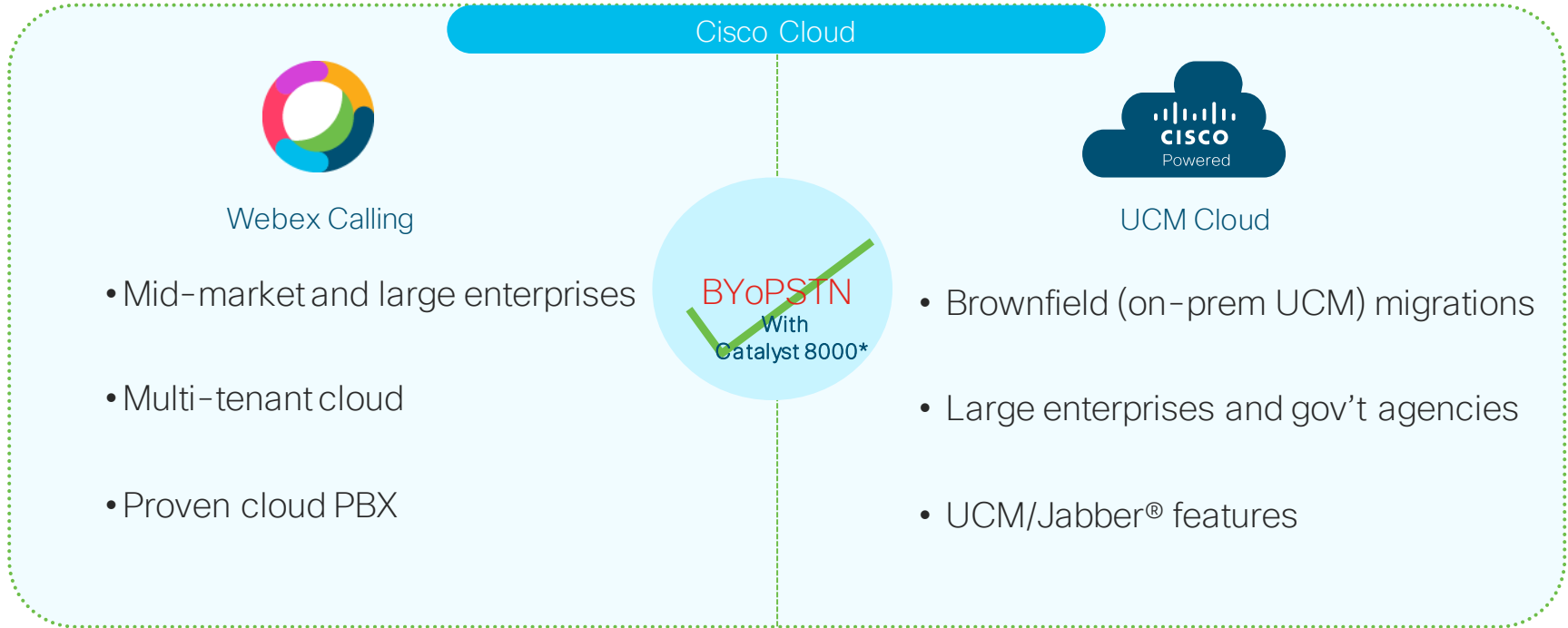
[AWS Marketplace](#)

- No Impact to Voice Performance (CME & CUBE)
- CME Version (14.1) and CUBE Version (14.2)
- 450 is the maximum phone capacity for CME Registrations
- 6000 is the maximum CUBE Session capacity at 30 CPS

Note: Max Capacity with 8 GB DRAM and 4vCPU

BYoPSTN for Cloud Calling

Cisco Cloud Calling Portfolio



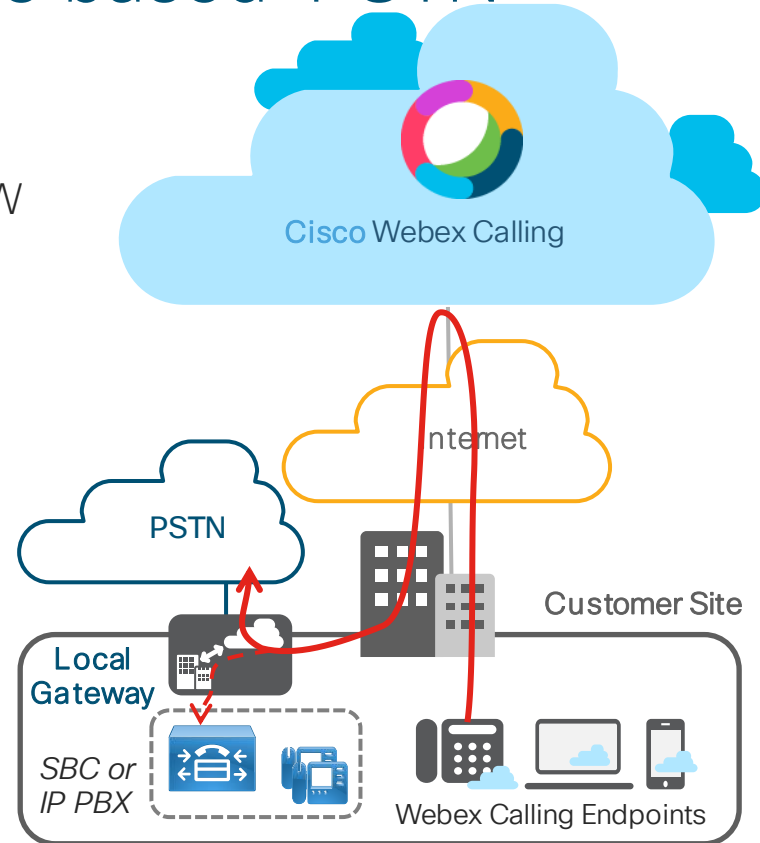
Catalyst 8000 Webex Calling Premises based-PSTN

- Enables BYoPSTN option for Webex Calling
- Provide connectivity to a dedicated SBC/PSTN GW or an on-premises IP PBX
- Supports Cisco CUBE (for IP-based connectivity) or Cisco IOS Gateway (for TDM-based connectivity)
- CUBE calling licenses included in Webex Calling Flex License



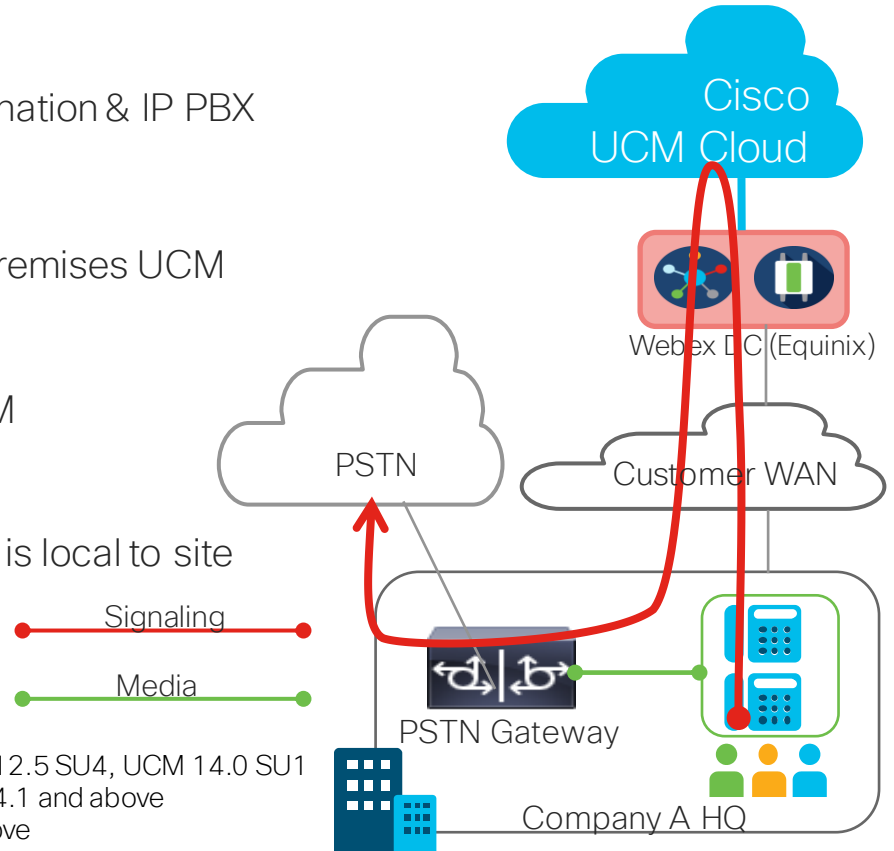
Note:

- Support for **Catalyst 8300** requires IOS-XE 17.3.2 and above
- Support for **Catalyst 8200/Catalyst8kv** requires IOS-XE 17.4.1 and above
- Support for **Catalyst 8200L** requires IOS-XE 17.5.1 and above



Catalyst 8000 UCM Cloud Local Breakout Gateway

- Customer managed edge device for PSTN termination & IP PBX internetworking
- Voice gateway platform support parity with on-premises UCM
- Gateway configuration same as on-premise UCM
- Signaling traverses through UCM Cloud & media is local to site
- SIP Gateway recommended



Note:

- Support for **Catalyst 8300** needs IOS-XE 17.3.2 with UCM 12.5 SU4, UCM 14.0 SU1
- Support for **Catalyst 8200/Catalyst 8kv** requires IOS-XE 17.4.1 and above
- Support for **Catalyst 8200L** requires IOS-XE 17.5.1 and above



Microsoft Phone System Direct Routing with Catalyst 8000

Two options for Public Switched Telephone Network (PSTN) access

Calling Plan

Microsoft is the carrier and bills for connecting PSTN calls to the cloud

Direct Routing

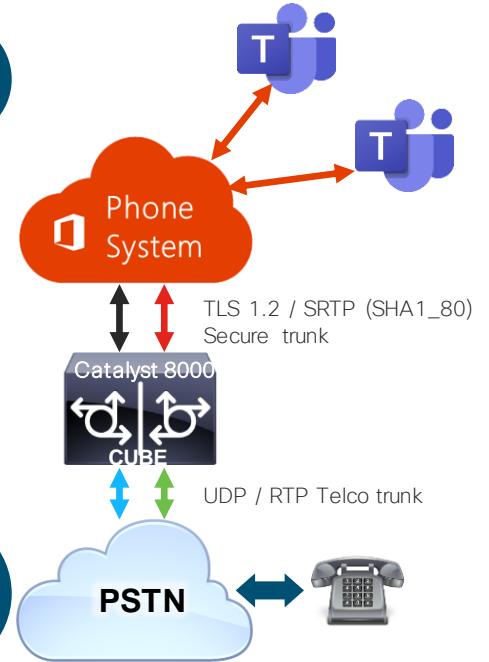
Customers use their own carrier and calling plan, using a certified Session Border Controller (SBC)

PSTN
Microsoft Provided

Microsoft Calling Plan

Direct Routing in Teams

Cisco Catalyst 8300 as CUBE SBC with IOS XE 17.3.2
Cisco Catalyst 8200 Catalyst 8Kv as CUBE SBC with IOS XE 17.4.1
Cisco Catalyst 8300 as CUBE SBC with IOS XE 17.5.1



Requires CUBE Trunk Licenses

Catalyst 8300/8200

Key Feature Highlights

Catalyst 8300/8200 Key Feature Highlights

Feature

Use Case

FXS/FXO Based Native Media Recording

Compliance and Regulatory control with call recording

FXS Auto-registration & CUCM Self-provisioning

Seamless Migration & add/remove changes for supplementary services

Survivable Remote Site Telephony

Prevent internal/external phone outage at the branch site

DSPFARM Services

Audio recording, Bandwidth Saving, Media bridges

Land Mobile Radio

Multicast Audio & Announcement

Catalyst 8300/8200 Key Feature Highlights

Feature

Use Cases

Cloud Calling Local Gateway

Decouple PSTN Connection from Cloud Calling

FXO Failover Bypass

Emergency calling even during power outages

SRTP Support

Secure Voice Calling and Native SRTP – RTP Internetworking

CUBE Media Forking

T1/E1 audio recording with CUBE in media path (SIPREC)

Call Progress Analysis

Detect Live Calls/answering machines in call centers/outbound dialers

Summary

Summary



Broad UC deployment coverage: Analog, Digital & IP Voice

Catalyst 8300/8200 is SD-WAN Voice ready

High performance & scale in contrast to ISR 4000 Series

Proven interoperability with Cisco products, third-party PBXs, and service providers



Backup Slides

ISR 4000 vs Catalyst 8000 UC Scale

Disclaimer:

IP Voice (1D) scale information is only intended as a guideline. Actual session count & performance may vary based on the number of features turned on the ISR 4000/ CSR1Kv/ Catalyst 8000 along with the IOS-XE version being used.

Analog Port density With Max FXS(FXO)

Platform	Max FXS Ports	FXO Ports	Total
ISR4451**	72	12	84
C8300-2N2S-4T2X**	72	8	80
C8300-2N2S-6T**	72	8	80
C8300-1N1S-4T2X**	24	8	32
C8300-1N1S-6T**	24	8	32
ISR4431*	12	12	12
ISR4331**	24	12	36
C8200-1N-4T*/ C8200L-1N-4T*	4	4	4
ISR4321*	8	8	8



- Max port count may vary based on module selection
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



**With SM-X Module for Max FXS Count

* FXS or FXO

Max T1/E1 Port Density

Platform	Max T1/E1 ports	Max E1 PRI channels	Max T1 PRI channels
C8300-2N2S-4T2X	48**	1440	1104
C8300-2N2S-6T	48**	1440	1104
ISR4451	40*	1200	920
C8300-1N1S-4T2X	24**	720	552
C8300-1N1S-6T	24**	720	552
ISR4431	24	720	552
ISR4331	24	720	552
C8200-1N-4T/ C8200L-1N-4T	8	240	184
ISR4321	8	240	184



- Based on number of calls/bearer channels per port
Per port : E1 PRI (30 channels) & T1 PRI (23 channels)
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



** With C-SM-NIM-ADPT carrier card

* With SM-X-NIM-ADPTR card

DSP Session Capacity (G.711 Transcoding)

Platform	Max Sessions (G.711 xcoding)*	Required Throughput (For Max Session)
C8300-2N2S-4T2X	6672	2.5 G
C8300-2N2S-6T	3592	1 G
C8300-1N1S-4T2X	3336	2.5 G
ISR4451	3336	1 G
C8300-1N1S-6T	3336	1 G
ISR4431	1024	500M
ISR4331	1024	300M
C8200-1N-4T/ C8200L-1N-4T	256	250M
ISR4321	768	100M



- Performance based on up to 75 % platform CPU usage
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



With appropriate DSP voice Modules:
SM-X-PVDM / NIM PVDM / PVDM4

Software MTP Capacity (15 CPS)

Platform	Max Sessions	Required Throughput (For Max Session)
C8300-2N2S-4T2X	7500	2.5 G
C8300-1N1S-4T2X	7000	2.5 G
C8300-2N2S-6T	6000	1 G
ISR4451	5000	1 G
C8300-1N1S-6T	4700	1 G
ISR4431	2500	500M
C8200-1N-4T	2000	500M
ISR4331	600	300M
C8200L-1N-4T	1000	250M
ISR4321	320	100M



- Performance based on up to 75 % platform CPU usage
- Tested at 15 *calls per second*(CPS)
- Up to 99% *Call Success Rate*
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L

Non-Secure Conferencing Max Participants

Platform	Max Participants (G.711 conferencing)	Max 8-party sessions (G.711 conferencing)	Required Throughput (For Max Session)
C8300-2N2S-4T2X	7496	937	2.5 G
C8300-2N2S-6T	4728	591	1 G
C8300-1N1S-4T2X	4160	520	2.5 G
ISR4451	4016	502	1 G
C8300-1N1S-6T	3984	498	1 G
ISR4431	1928	241	500M
ISR4331	1760	220	300M
C8200-1N-4T/ C8200L-1N-4T	704	88	250M
ISR4321	1040	130	250M



- Performance based on up to 75 % platform CPU usage
- Up to 99% *Call Success Rate*
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



*With appropriate DSP voice Modules:
SM-X-PVDM / NIM PVDM / PVDM4

Secure Conferencing Max Participants

Platform	Max Participants (G.711 conferencing)	Max 8-party sessions (G.711 conferencing)	Required Throughput (For Max Session)
C8300-2N2S-4T2X	4200	525	2.5 G
C8300-2N2S-6T	2656	332	1 G
C8300-1N1S-4T2X	2520	315	2.5 G
ISR4451	2400	300	1 G
C8300-1N1S-6T	2312	289	1 G
ISR4431	1136	142	500M
ISR4331	1048	131	300M
C8200-1N-4T/ C8200L-1N-4T	704	88	250M
ISR4321	440	55	100M



- Performance based on up to 75 % platform CPU usage
- Up to 99% *Call Success Rate*
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



With appropriate DSP voice Modules:
SM-X-PVDM / NIM PVDM / PVDM4

CUBE Session Capacity By Platform

Platform	Max Sessions	Calls Per Second(CPS)
C8300-2N2S-4T2X*	10000	55
C8300-1N1S-4T2X	8000	45
C8300-2N2S-6T	7500	42
C8300-1N1S-6T	7000	40
ISR4451*	6000	40
ISR4431*	3000	15
C8200-1N-4T	2500	14
ISR4331	1000	10
C8200L-1N-4T	1500	9
ISR4321	500	4



- Based on unencrypted RTP(G711)-RTP(G711) calls
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



*Requires DRAM Upgrade for max sessions

SRST IP Phone Capacity By Platform

Platform	Max Phones
C8300-2N2S-4T2X	2500
C8300-1N1S-4T2X	2500
C8300-2N2S-6T	2500
C8300-1N1S-6T	2500
ISR4451*	2000
ISR4431*	1200
C8200-1N-4T	2500
ISR4331	100
C8200L-1N-4T*	1500
ISR4321	50



- Max number of SCCP or SIP phones is same
- With IOS XE 17.3.2 on Catalyst 8300
- With IOS XE 17.4.1 on Catalyst 8200
- With IOS XE 17.5.1 on Catalyst 8200L



*Requires DRAM Upgrade for max sessions

CME IP Phone Capacity By Platform

Platform	Max Phones
C8300-2N2S-4T2X	750
C8300-1N1S-4T2X	750
C8300-2N2S-6T	500
C8300-1N1S-6T	500
ISR4451*	450
ISR4431*	350
C8200-1N-4T	250
ISR4331	100
C8200L-1N-4T*	100
ISR4321	50

Coming Soon



- Max number of SCCP or SIP phones is same
- With **upcoming** IOS XE release 17.6.1 on:
 - Catalyst 8300
 - Catalyst 8200/Catalyst 8200L



*Requires DRAM Upgrade for max sessions

DSP Calculator Update

DSP Calculator

Select Platform, Mode and Software

Select Platform Family

✓ select one
Catalyst 8300
Catalyst 8200
ISR 4000

Select Platform

Select Mode

Autonomous Controller

Select Release

select one ▼

Coming Soon



- Autonomous & controller Mode
- **NIM-PVDM** DSP Voice Module
- **Opus** Codec
- New Platforms:
 - Catalyst 8300
 - Catalyst 8200/Catalyst 8200L
 - ISR 4461

For voice codec & DSP Module specifications please refer to the [Cisco Packet Voice Digital Signal Processor Modules \(PVDMs\) data sheet](#)

SM Slot to NIM slot conversion requires additional adapter module



Thank you!

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Questions Now!



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questions, our expert will respond

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ASK ME ANYTHING

Till July 2nd, 2021

With Lokesh Kumar Lal

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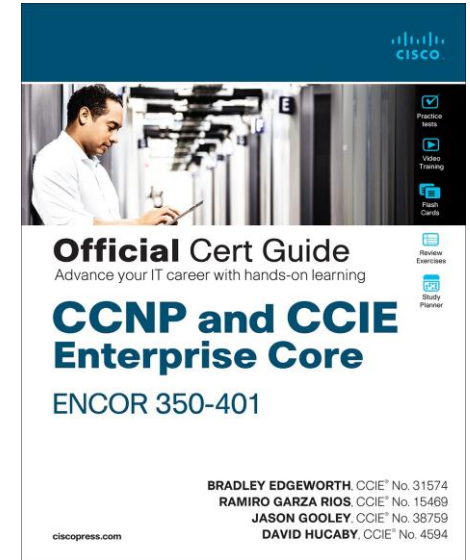
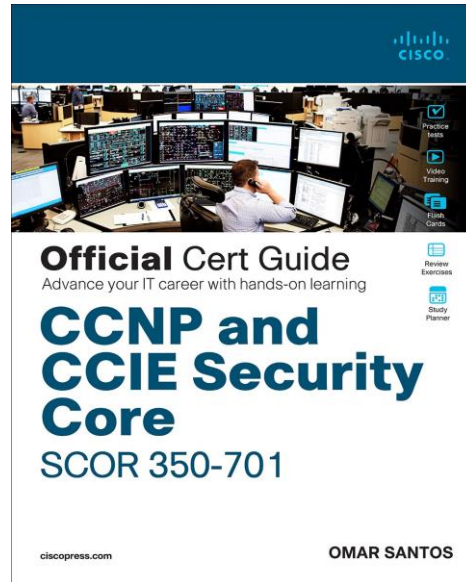
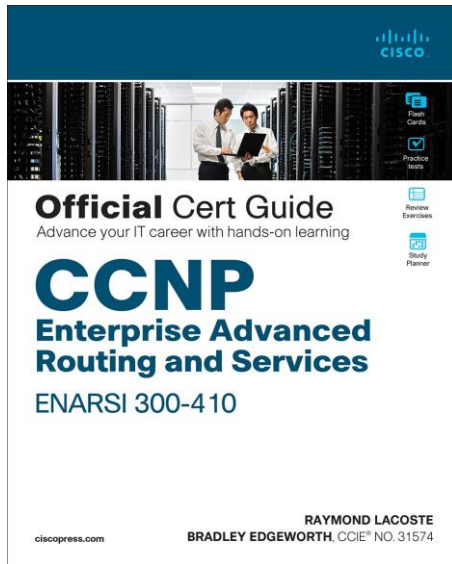
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