Cisco Networkers 2011
May 19, Toronto, Canada

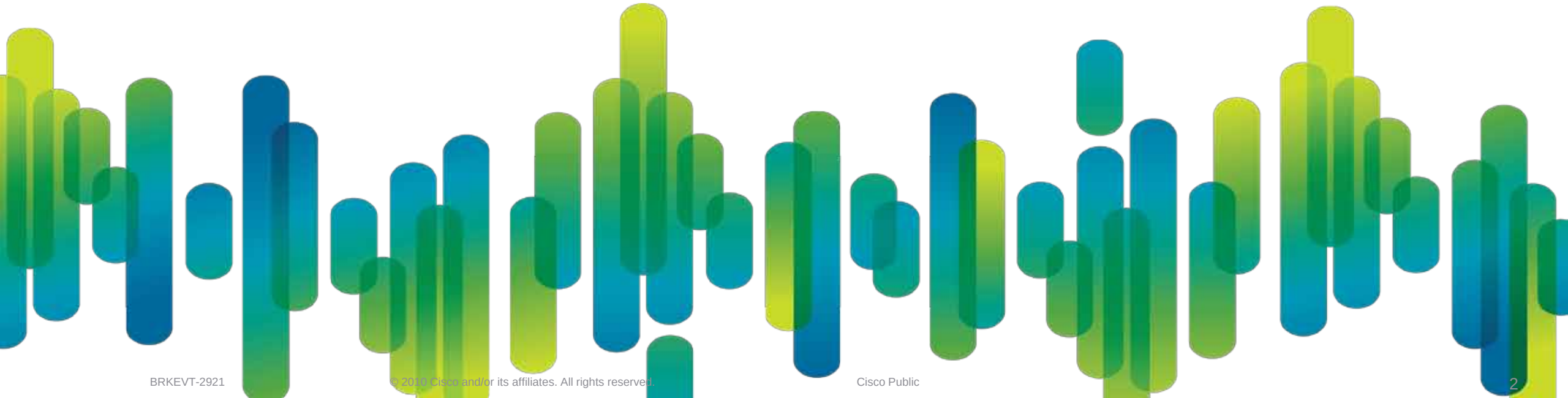
Knowledge Is Power.
Learn. Share. Collaborate.

Video Infrastructure Update

Presented by: Jason Swan
Jason Thorsby

Video Infrastructure Update

A deep technical dive into the various integration scenarios available through our expanded product portfolio on the Infrastructure side. During this session we will bring you up to speed on the TelePresence server the TIP implementation. We will also dive into what a trunk between CUCM and VCS will bring to your video and telephony deployments while showcasing best practices to help you get started. Other topics will cover the strength of combining the Content server with the Show and Share product for a truly strong corporate streaming strategy. Overall a deep technical session that aims to deepen your knowledge of our unique infrastructure proposition.



Video Infrastructure Agenda

- Telepresence Infrastructure Overview
- CUCM Signaling Overview
- Introduction to VCS Control and Expressway
- VCS and CUCM Integration and Architecture
- Impact of Direct Registration to CUCM

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TANDBERG

TANDBERG is now part of Cisco.

for reference

Old Name	New Name
Tandberg E20	Cisco IP Video Phone E20
Tandberg C Series	Cisco Telepresence System Integrator C Series
Tandberg Profile Series	Cisco Telepresence System Profile Series
Tandberg EX Series	Cisco Telepresence System EX Series
Tandberg Movi	Cisco Telepresence Movi
Tandberg T Series	Cisco Telepresence System T Series
Tandberg Codian MCU 4xxx	Cisco Telepresence MCU 4xxx Series
Tandberg Codian MSE 8000	Cisco Telepresence MSE 8000 Series
Tandberg Video Communication Server	Cisco Telepresence Video Communication Server
Tandberg Management System	Cisco Telepresence Management System
Tandberg Content Server	Cisco Telepresence Content Server

Introduction

Cisco Video Solutions Today

Cisco webex

Cloud Services, SP Services, Internet

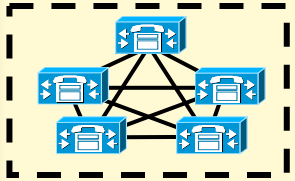
WebEx Node

Show and Share

WebEx

CUBE

Unified CM



GK

Gatekeeper

Gateways

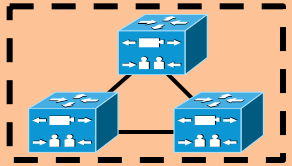
Multipoint Resources (CUVC, CUMP)

MP

CUVA, CUPC, Video IP Phones...

VCS-E

VCS-C



TMS

TCS

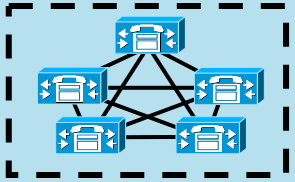
Gateways

Multipoint Resources (MCU's, TS)

Movi, E20, EX series, Profile series, C-series...

CUBE

Unified CM



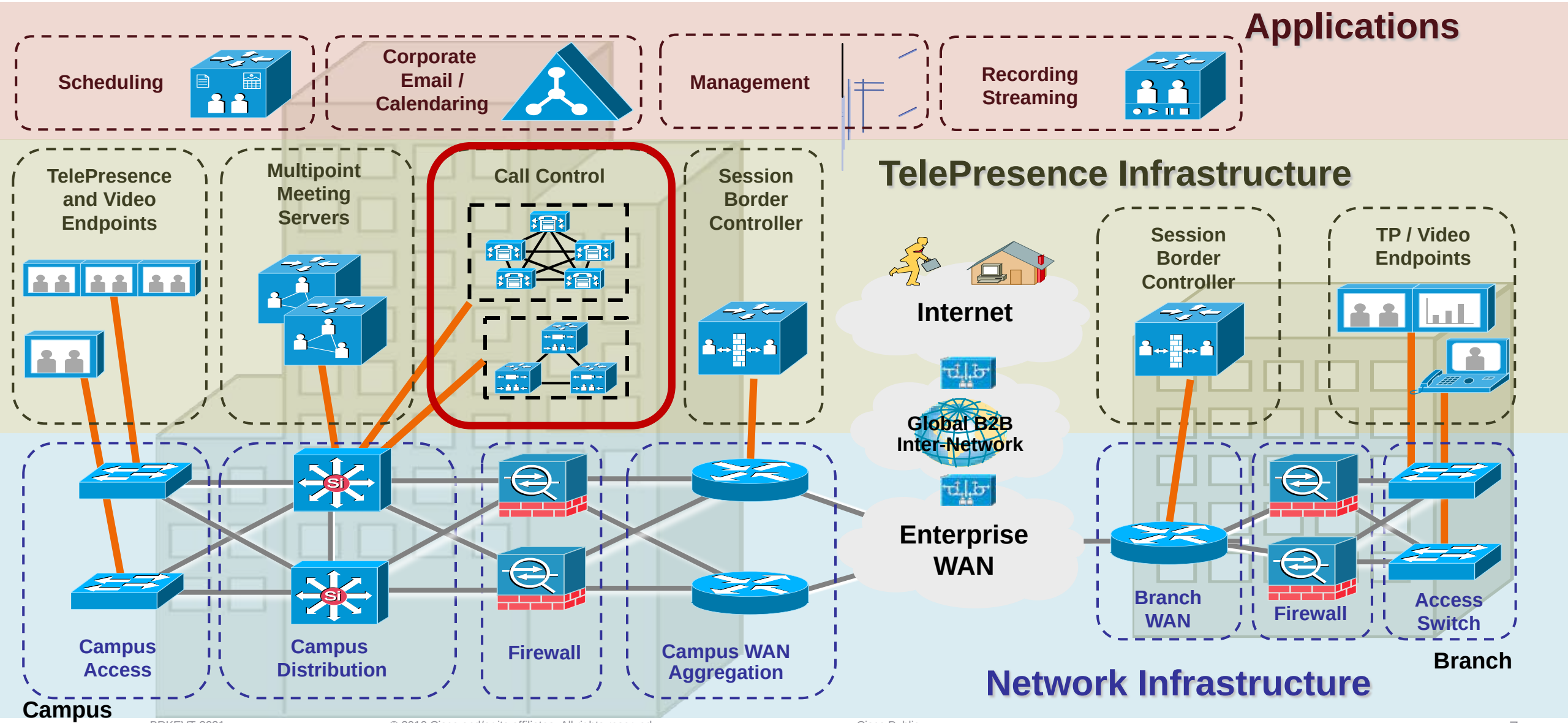
CTS- Man

MXE

Multipoint Resources (CTMS)

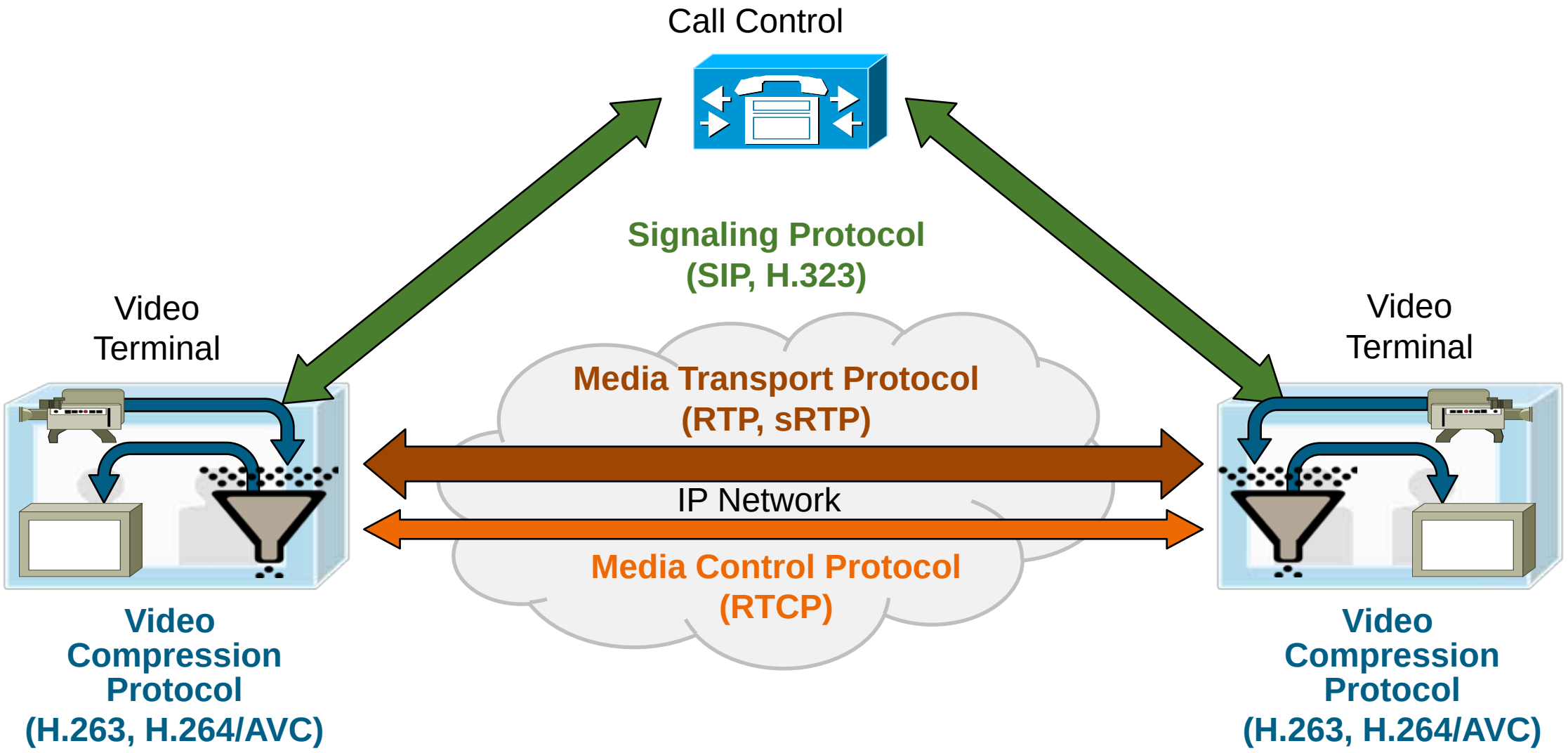
CTS-series

Telepresence Overview



Video Fundamentals

Protocols and Standards



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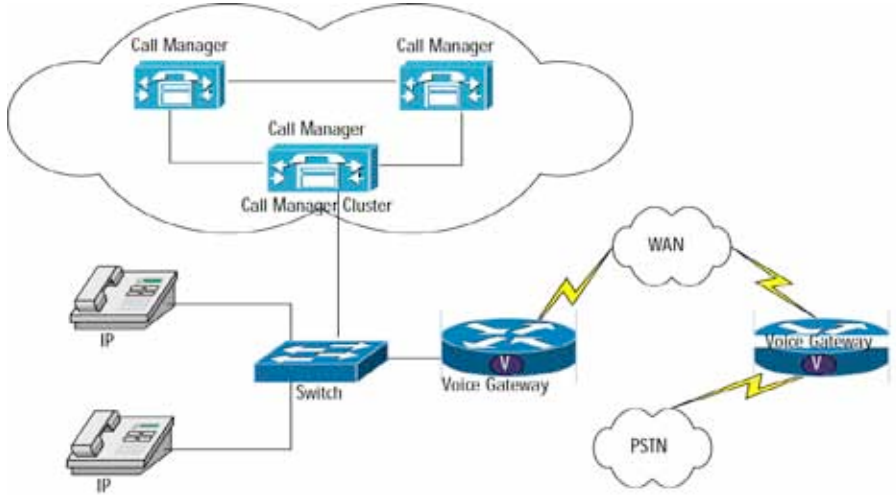
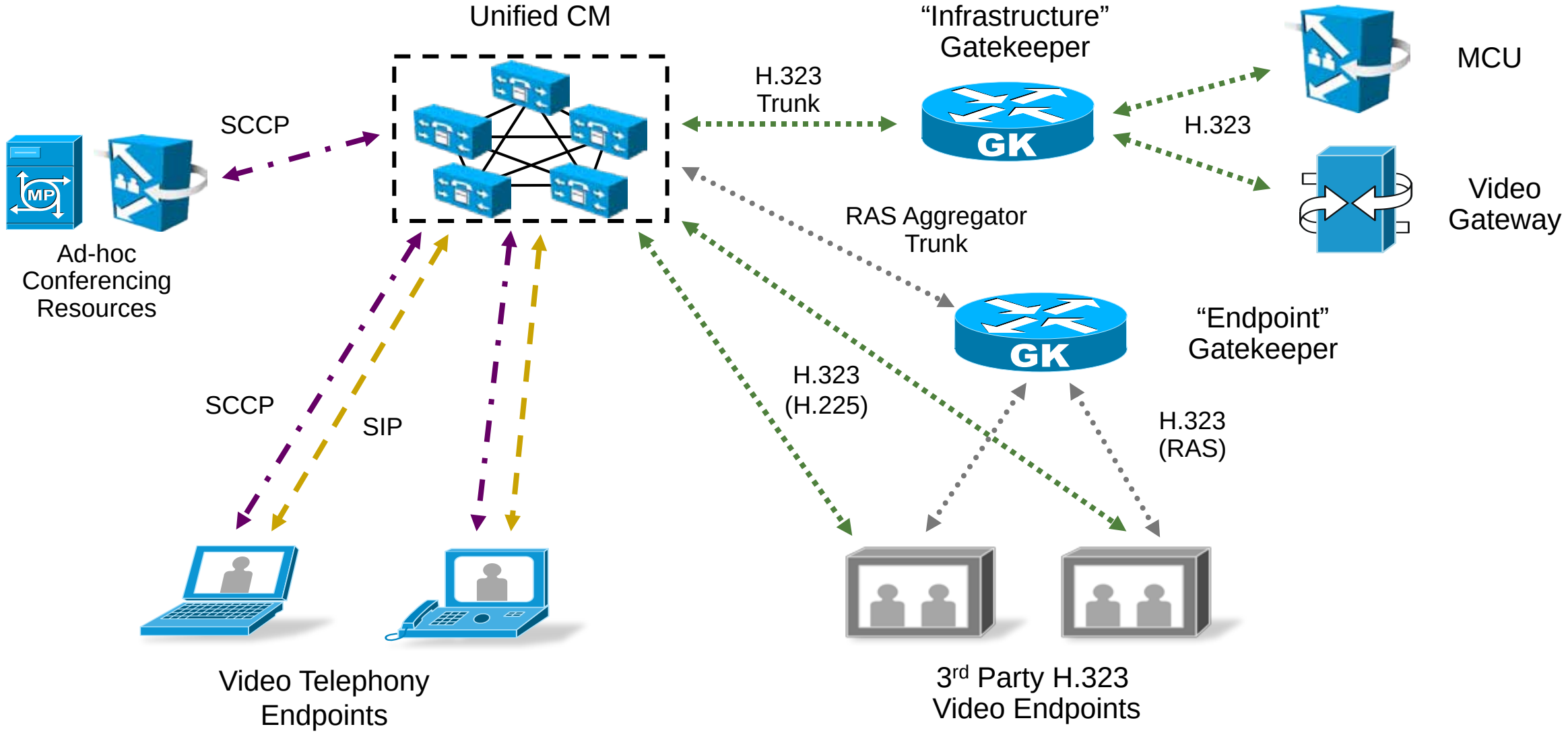
Cisco Unified (CUCM) Communications Manager

- Provisioning
- Registration / Signaling
- Dial-Plan
- Software / Firmware updates



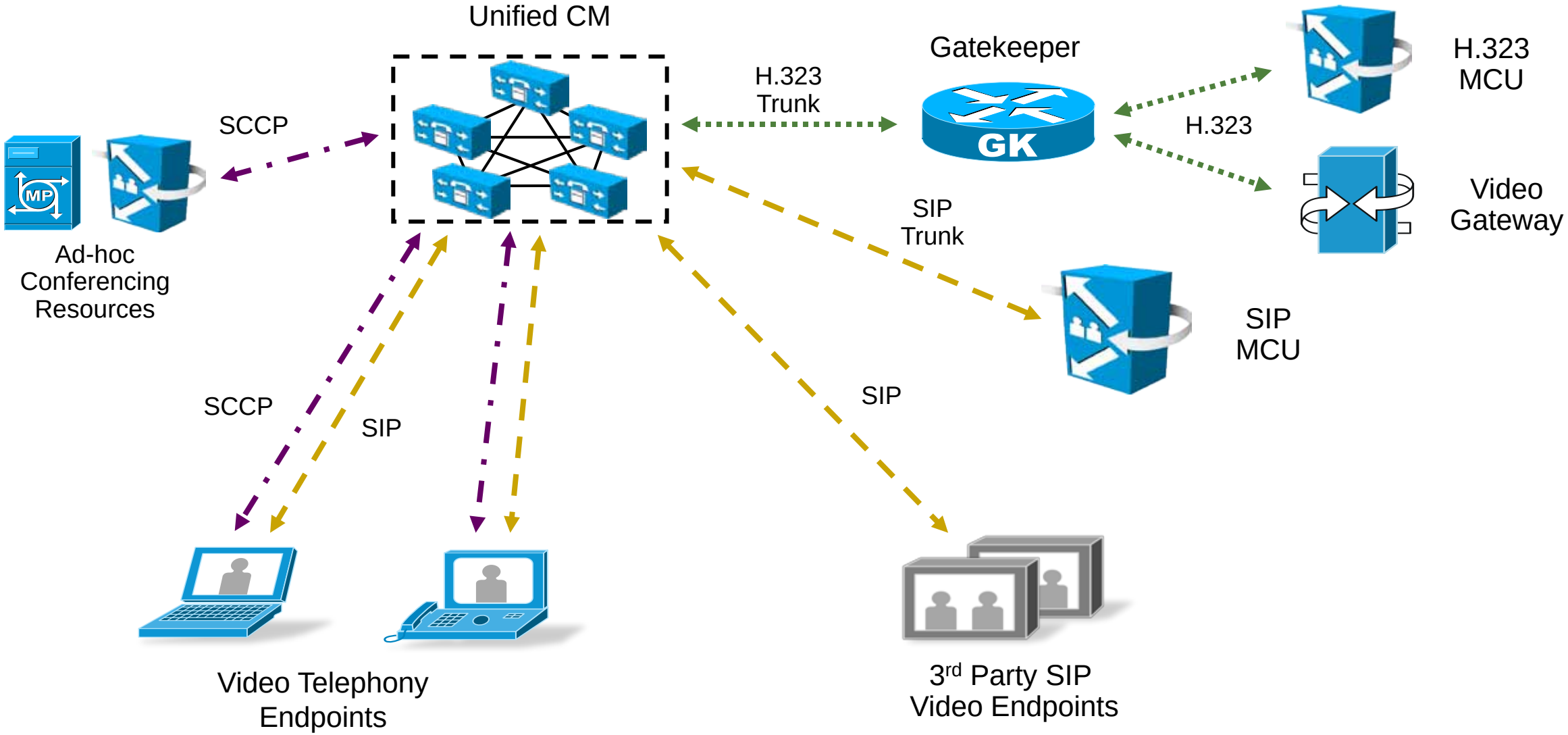
CUCM Signaling Overview

Traditional Architecture: H.323 Endpoint Integration



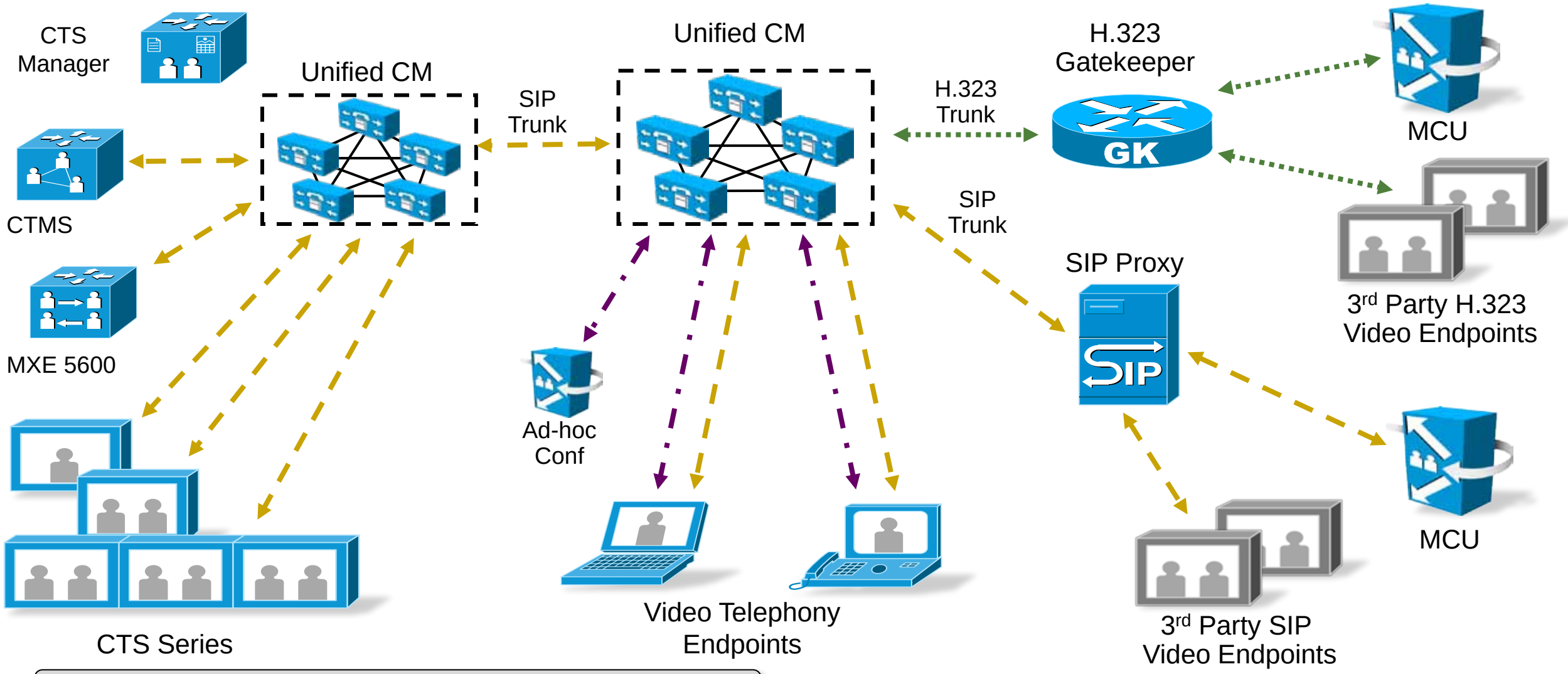
CUCM Signaling Overview

Traditional Architecture: SIP Endpoint Integration



CUCM Signaling Overview

Traditional Architecture: Trunk-side Integration



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VCS Control and Expressway

Registration and Signaling

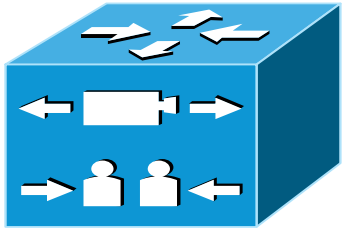
Dial Plan

Firewall traversal for inter- and intra-company calling

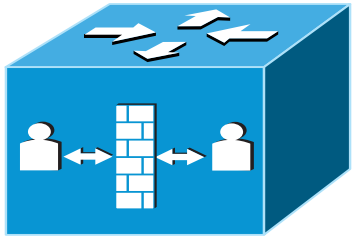
Interworking SIP to H.323 video endpoints

VCS Overview

The Cisco Telepresence VCS Family



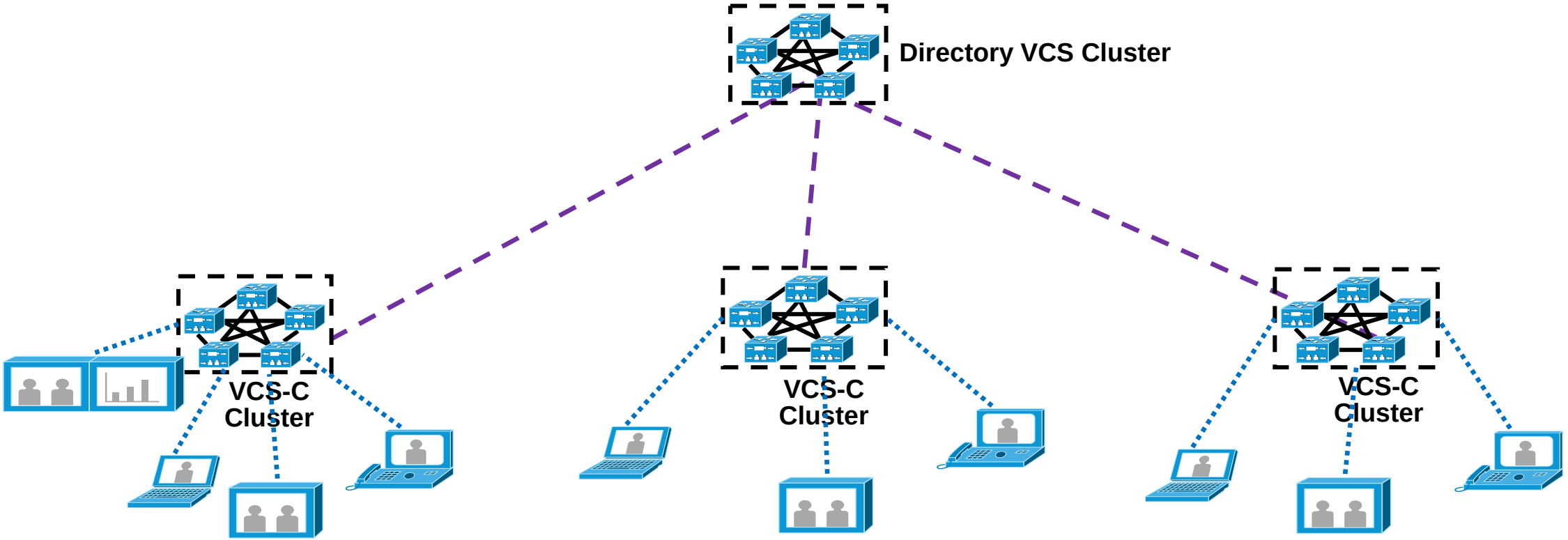
- VCS Control (VCS-C): video call control and endpoint registration
- Includes a H.323 Gatekeeper, a SIP Proxy/ Registrar and a H.323-SIP gateway server
- Normally deployed within the Enterprise network



- VCS Expressway (VCS-E): Session Border Controller for SIP/H.323 firewall traversal
- Registration of traversal-enabled devices
- Normally deployed outside of the Enterprise firewall or in the DMZ

VCS Deployment Model

§ Multi Site VCS



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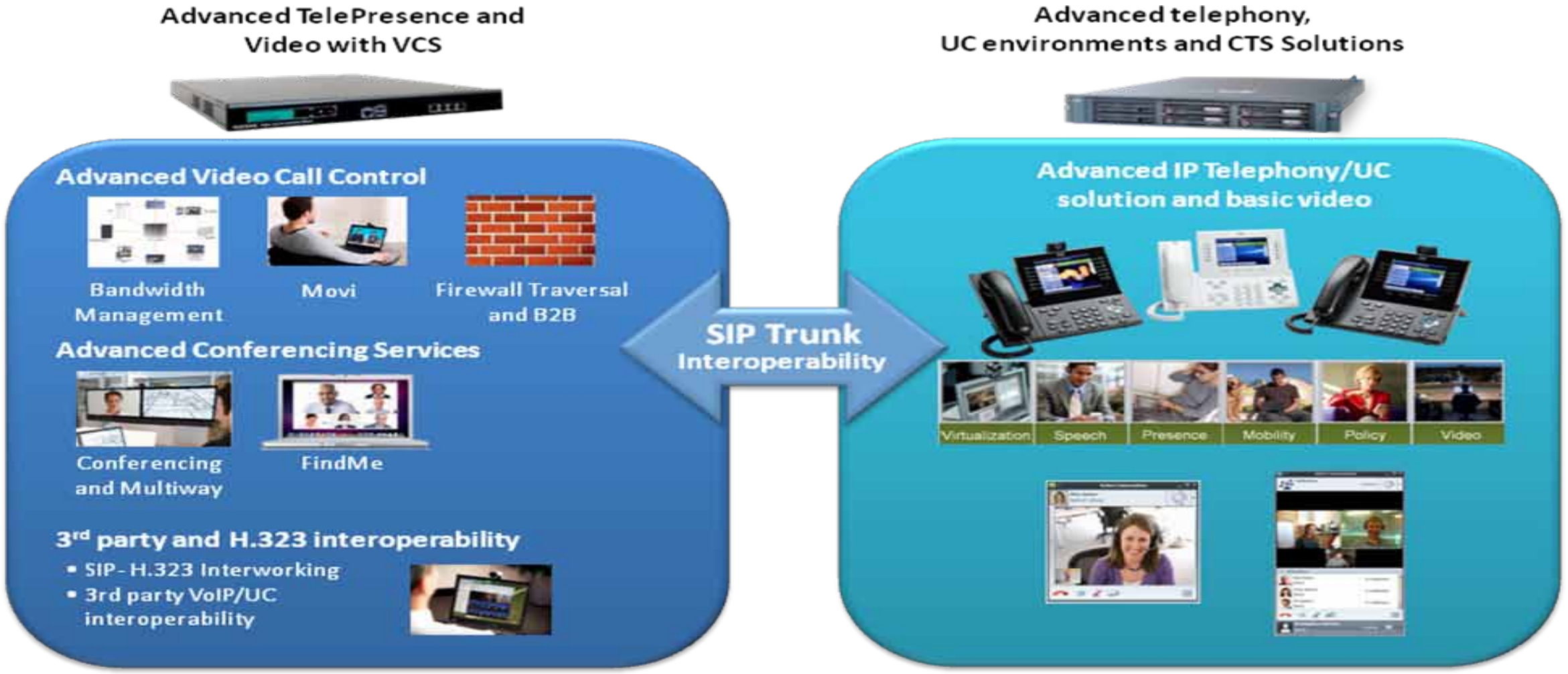
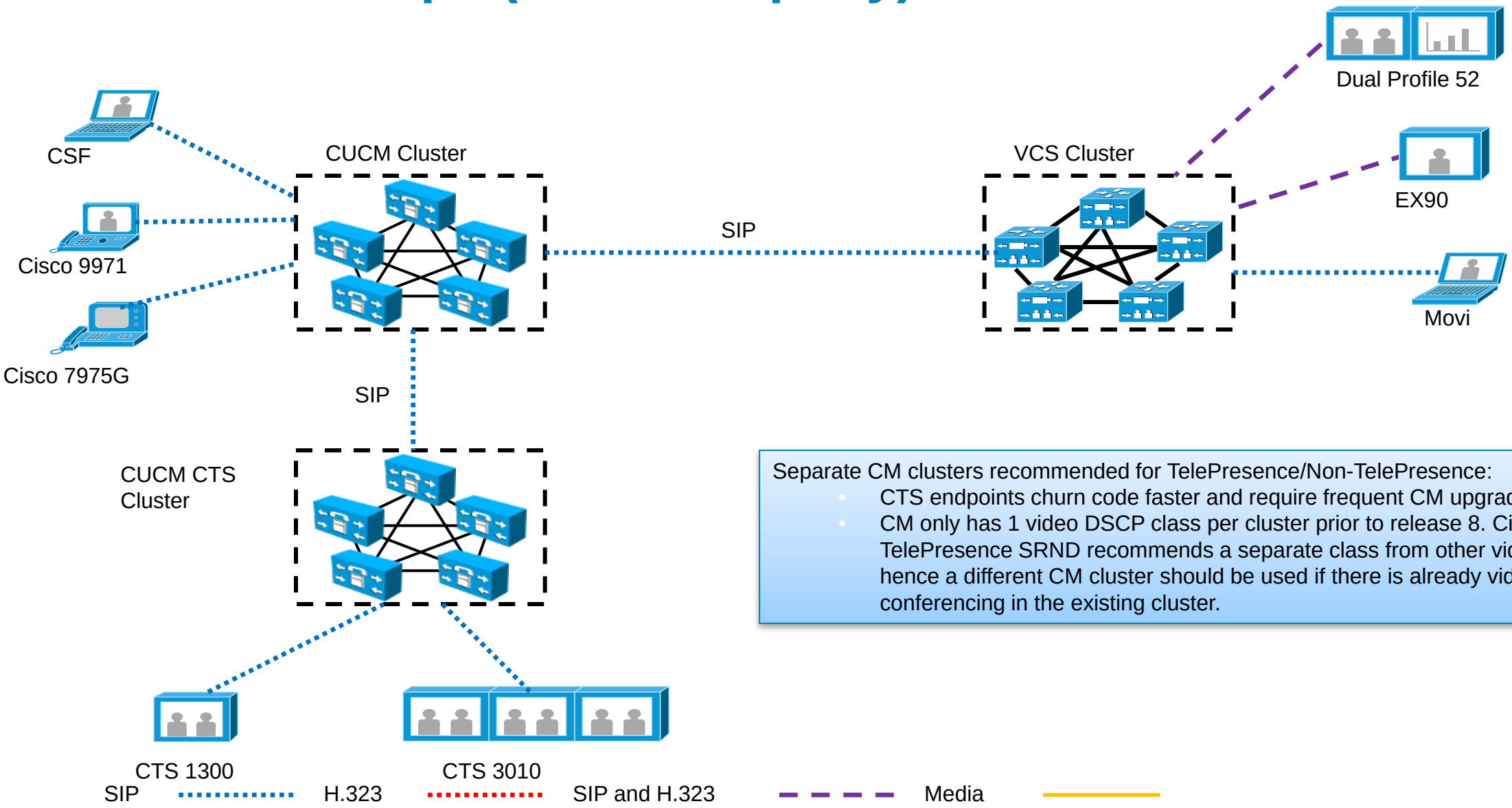
Basic VCS to CUCM integration architecture



Video Conferencing Signaling Relationships (intra-company)



Separate CM clusters recommended for TelePresence/Non-TelePresence:

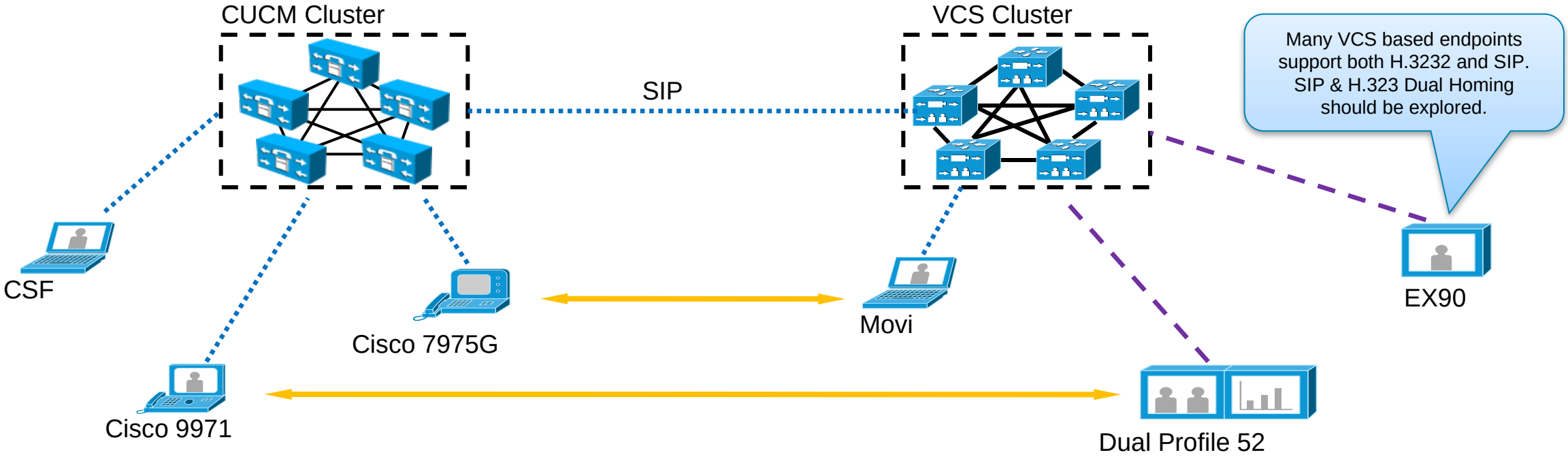
- CTS endpoints churn code faster and require frequent CM upgrade.
- CM only has 1 video DSCP class per cluster prior to release 8. Cisco TelePresence SRND recommends a separate class from other video hence a different CM cluster should be used if there is already video conferencing in the existing cluster.

Intra-company Media Flow

SIP to SIP

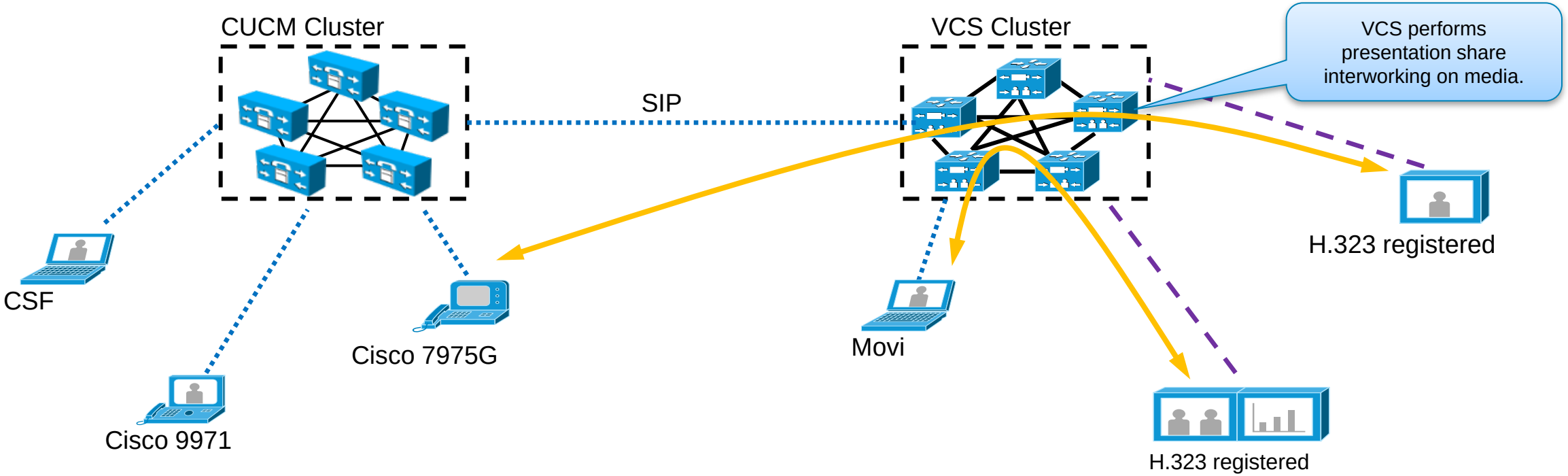
§ No Signaling Protocol Interworking Required

§ Media Flows Directly between Terminating Endpoints



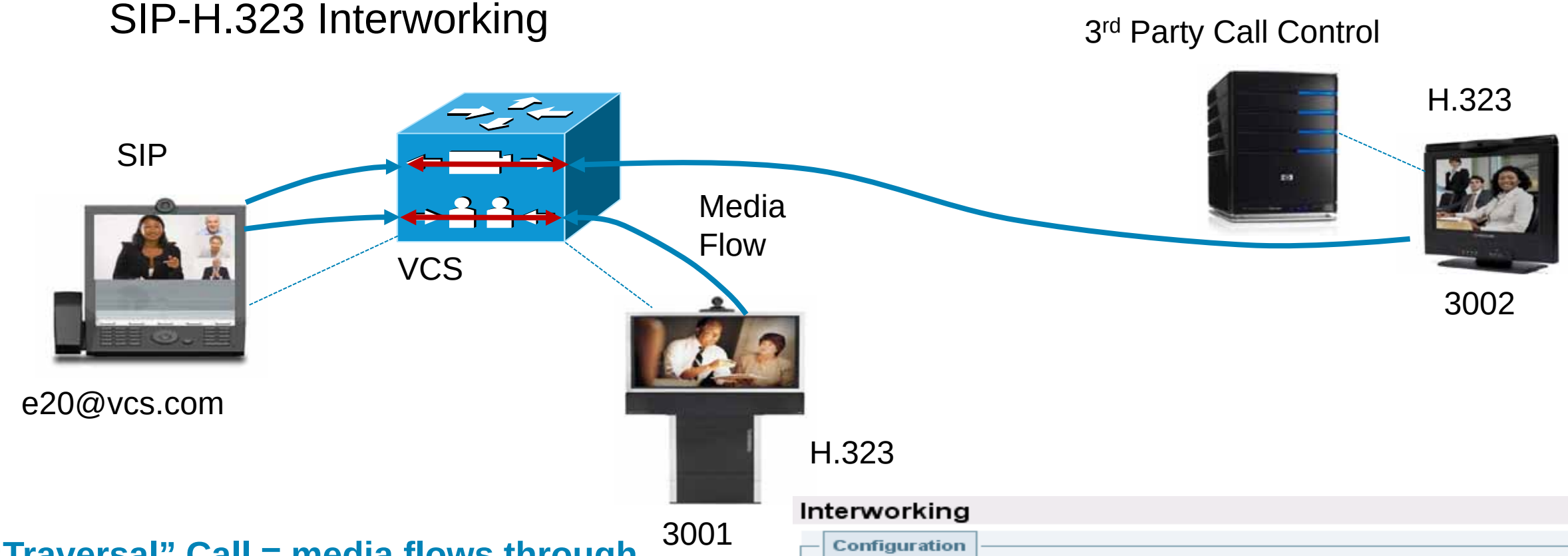
Intra-company Media Flow
SIP/H.323 Interworking

- CUCM supports SIP/H.323 Interworking
  - Presentation Share (BFCP to H.239) translation requires VCS (or SBC)
  - BFCP support in CUCM 8.6
- Media Flows through the device
- Because of media anchoring, geographical location of the VCS is Important

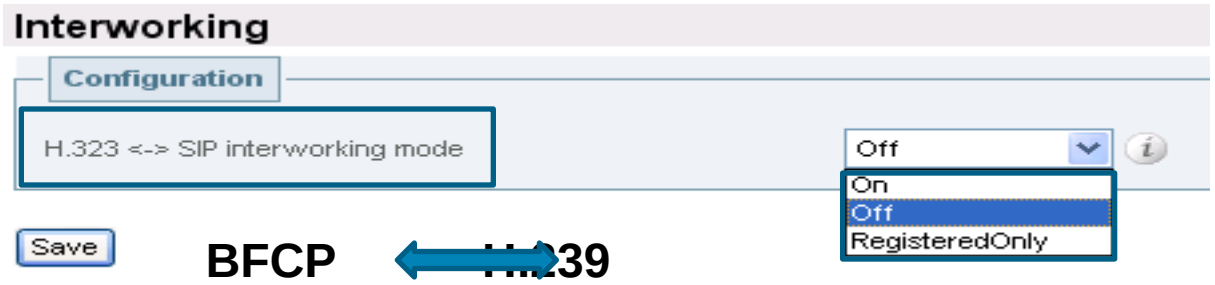


VCS Overview

SIP-H.323 Interworking

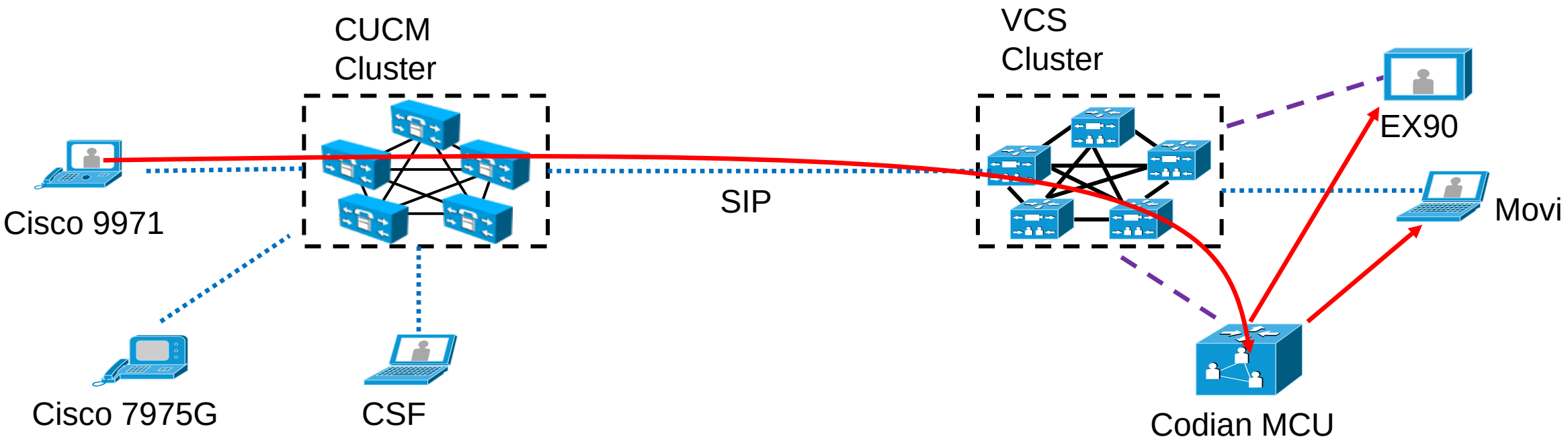


“Traversal” Call = media flows through the VCS



Note: Traversal calls also occur in other situations, i.e. between VCS-Control and VCS-Expressway

Dial out from CUCM endpoint to Conference bridge MCU

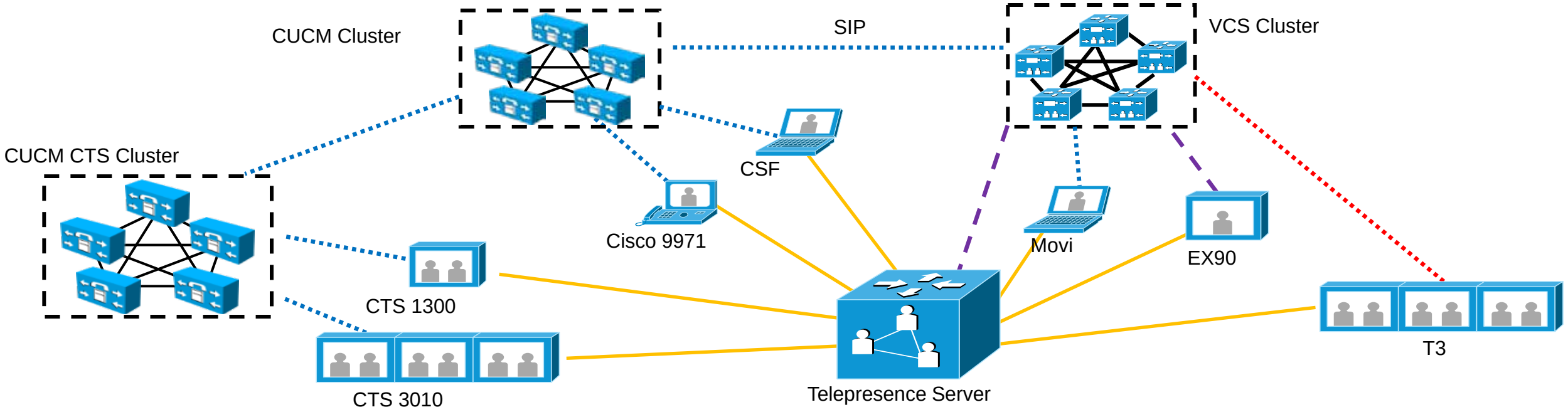


Intra-company Media Flow

Multipoint with TelePresence Server

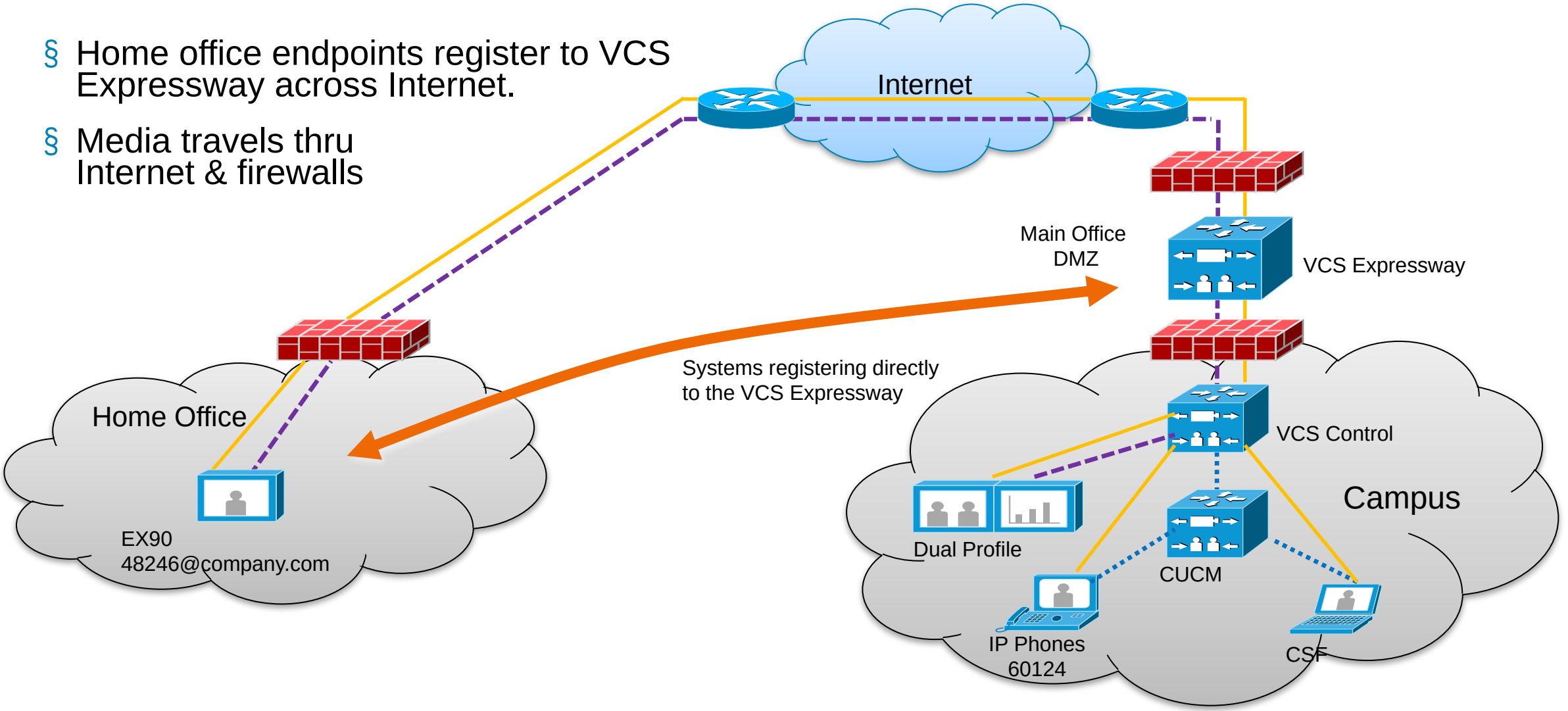
Does-it-All Platform

- Triple Screen to Triple Screen Interop Capability
- Large Footprint of Supported Video Conferencing Systems
- BFCP/H.239 and CTS Auto Collaborate Content Sharing



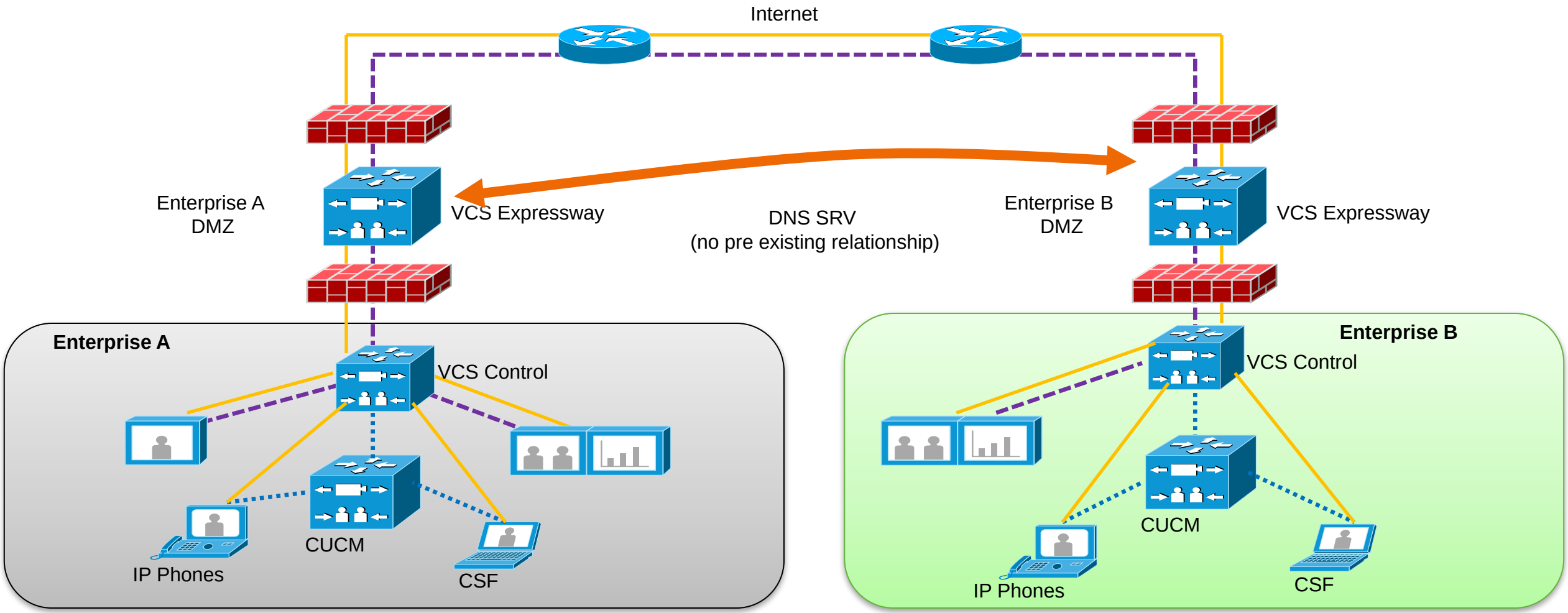
Over the Internet (VCS Expressway)
Main Office to Home Workers

- Home office endpoints register to VCS Expressway across Internet.
- Media travels thru Internet & firewalls



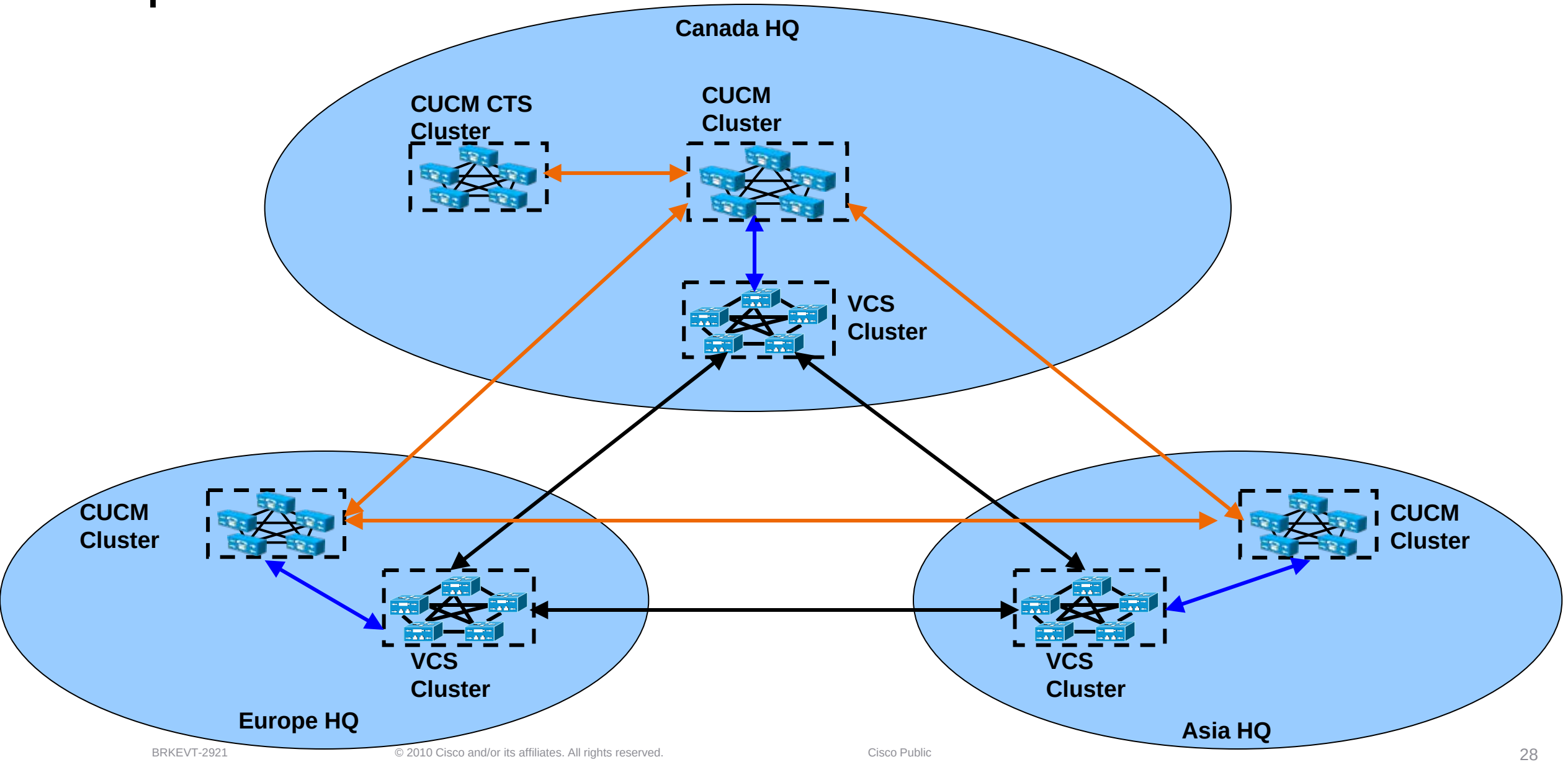
SIP H.323 SIP and H.323 Media

Over the Internet (VCS Expressway)
Direct B2B communication



Multiple Site Deployment

Optional solution



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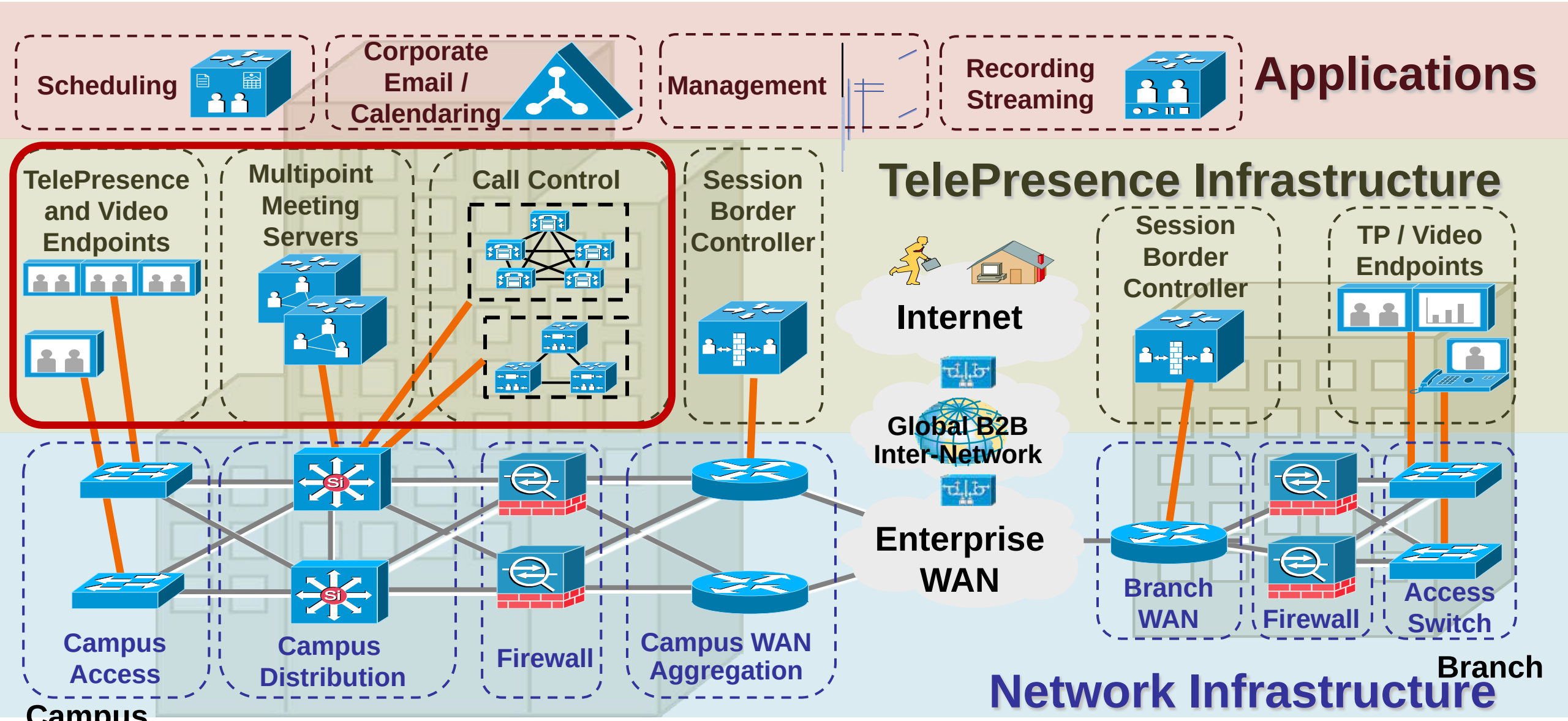
Cisco SIP Video Endpoints

Cisco IP Video Phone E20 – Call Control options

For Your Reference

	E20 on CUCM 8.5	E20 on VCS (trunk to CUCM)
Line ID and Name ID	√	√
Call Hold and Resume	√	√
Transfer Unattended	√	√
Transfer Attended	√	√
Call Forwarding All	√	√
Multiple Calls per Line	√	√
Multiple Lines per Phone	√	√
Message Waiting Indication	√	√
Conferencing	Can participate, cannot initiate	√ (Multiway)
Device management	√ (limited)	√
Directories	On Roadmap	√
View presentation (BFCP)	On Roadmap	√
Encryption	On Roadmap	√

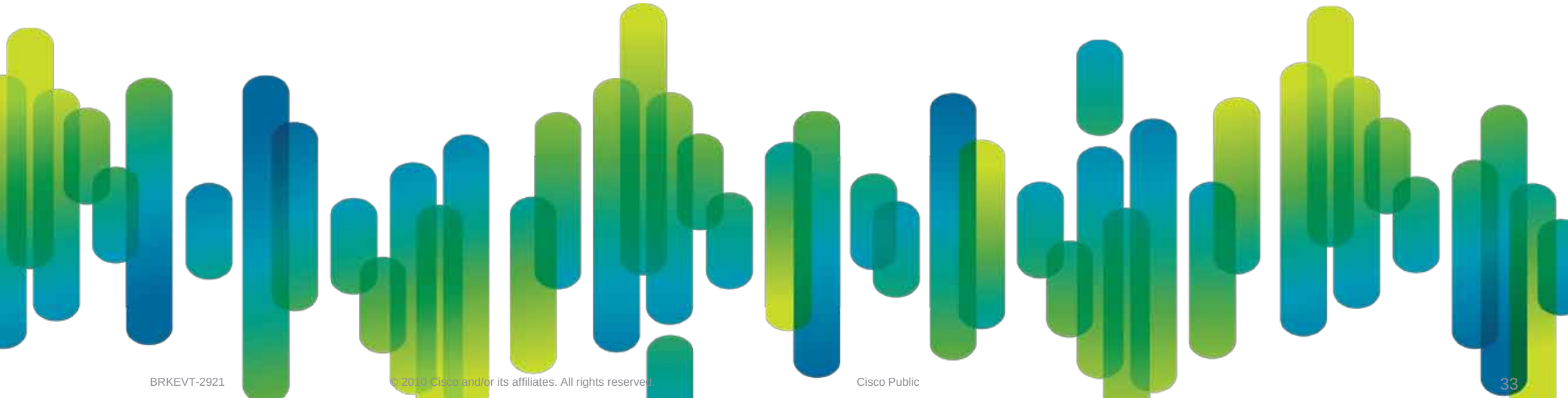
Interoperability and Integration



Agenda

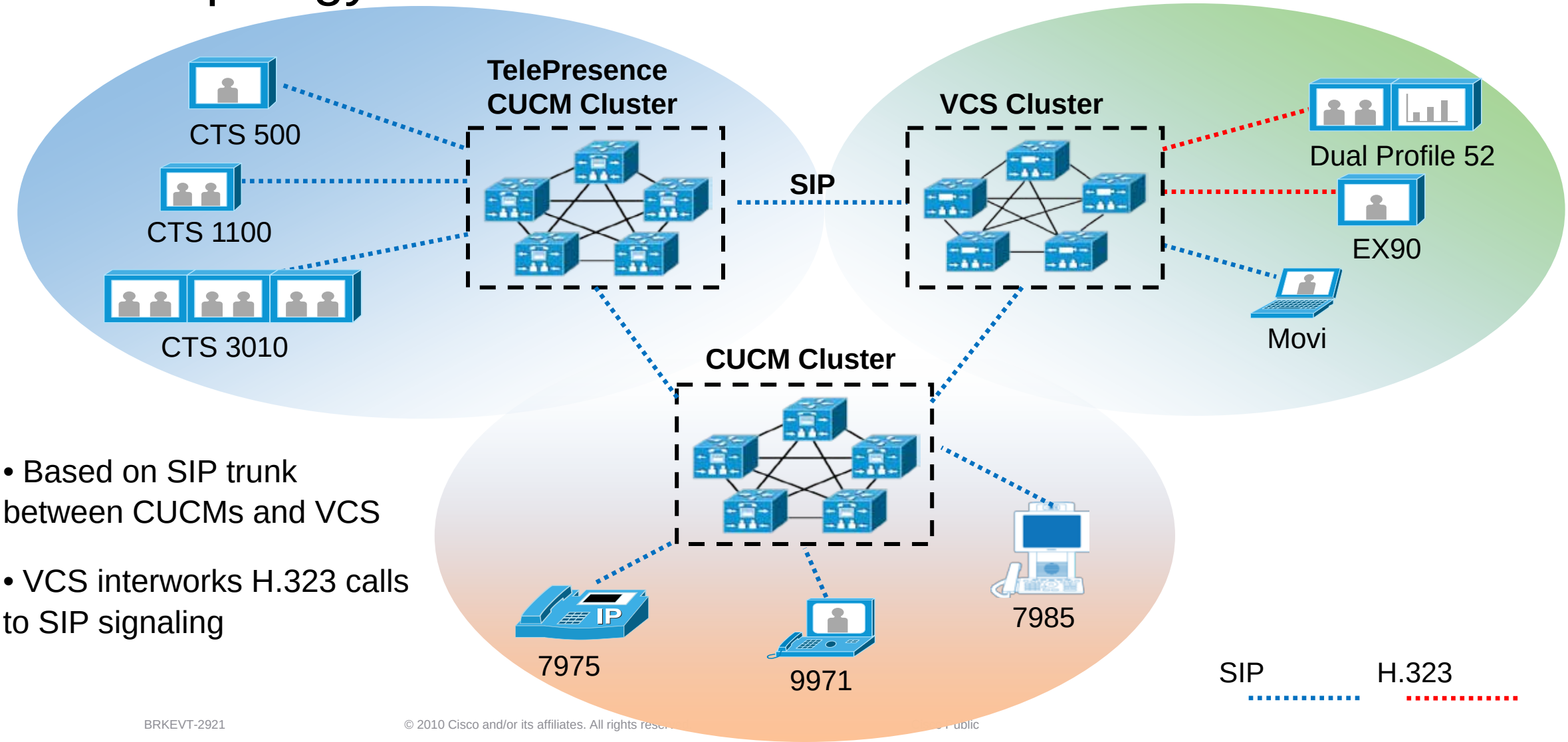
- TIP
- Cisco TelePresence Server
- Recording & Streaming Update
- Q&A

TIP



Integration Review

Topology



- Based on SIP trunk between CUCMs and VCS
- VCS interworks H.323 calls to SIP signaling

Native CTS Mux

Multi-screen Solution for Media

Challenge

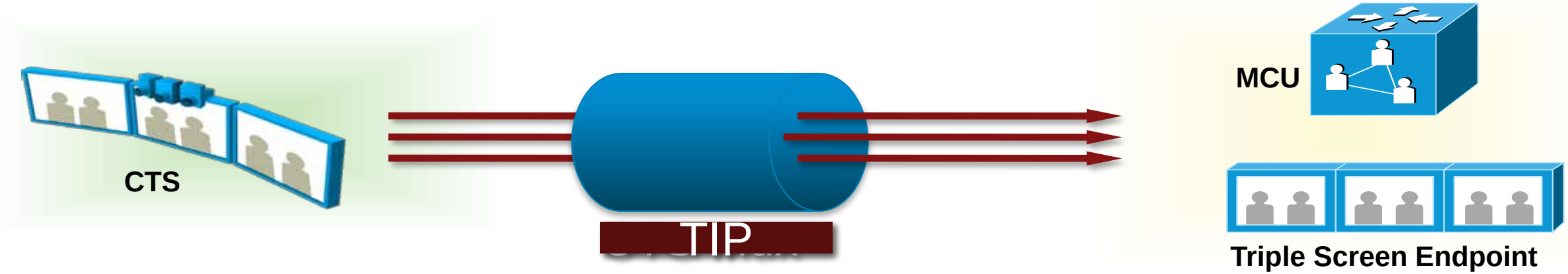
- **Multi-Screen Systems**
  - Multiple Audio/Video Channels per Endpoint
- **Lack of Multi-Channel Signaling Solution Prior to CTS**
  - Each Media Channel Requires Individual Call Setup

Solution

- **CTS Mux Protocol**
  - Bundles Multiple Media Channel into 1 Bearer Path (RTP)
  - Capability Exchange for Multiple Channels in Same SIP Call
  - Identified with RTP CSRC

TIP in Action

TelePresence Interoperability Protocol



Challenge

- Non CTS Endpoints Has no Knowledge of CTS Mux
- CTS Cannot Interoperate with Other Endpoints

Solution

- TelePresence Interoperability Protocol
  - Derivative of CTS Mux to Negotiate
  - Multi-Channel, CABAC, LTRP and GDR Negotiations
- Cisco Licenses CTS Mux Features as TIP

TelePresence Interoperability Protocol (TIP)

TIP is an open protocol for TelePresence interoperability

- Many video companies have signed the royalty-free TIP license
- TIP Open Source project launched in July
- Cisco to transfer TIP ownership to IMTC

Enables multi-screen interoperability

Supports

- HD video and high-quality audio
- Data and presentation sharing
- Point-to-point and multi-point
- Switched architecture

TIP Open Source Launch

A legacy of Tandberg Interop

1st Half 2010

2nd Half 2010

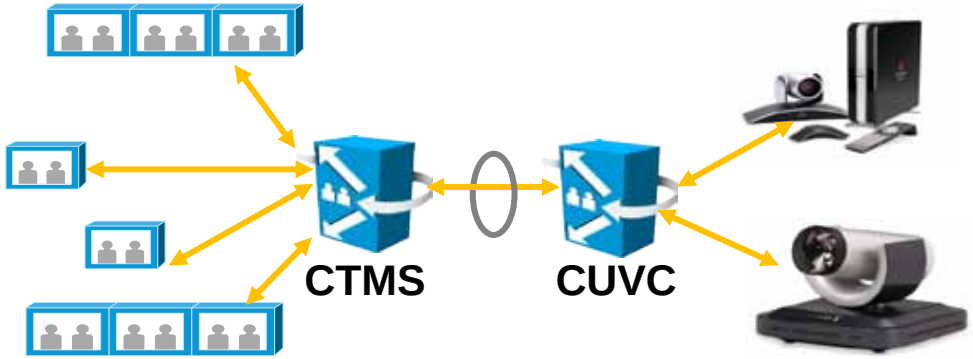
TIP to go to Industry Body

TIP on TelePresence Server

Conferencing and Interoperability

Initial Interop Solution

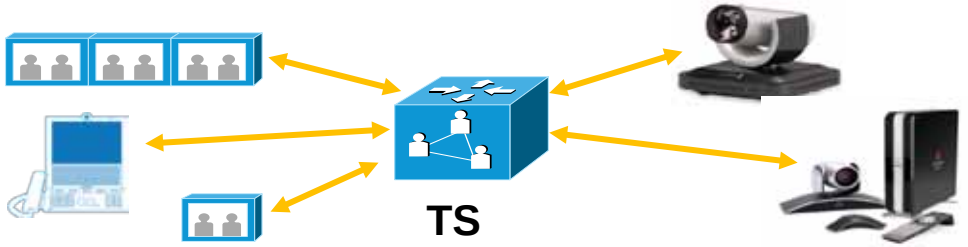
CUVC

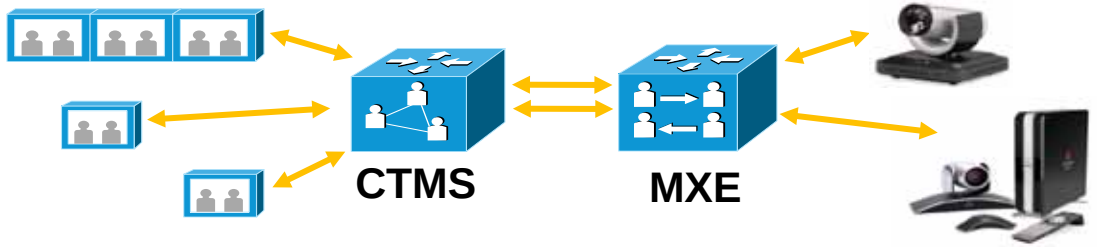


Today (conferencing is interop)

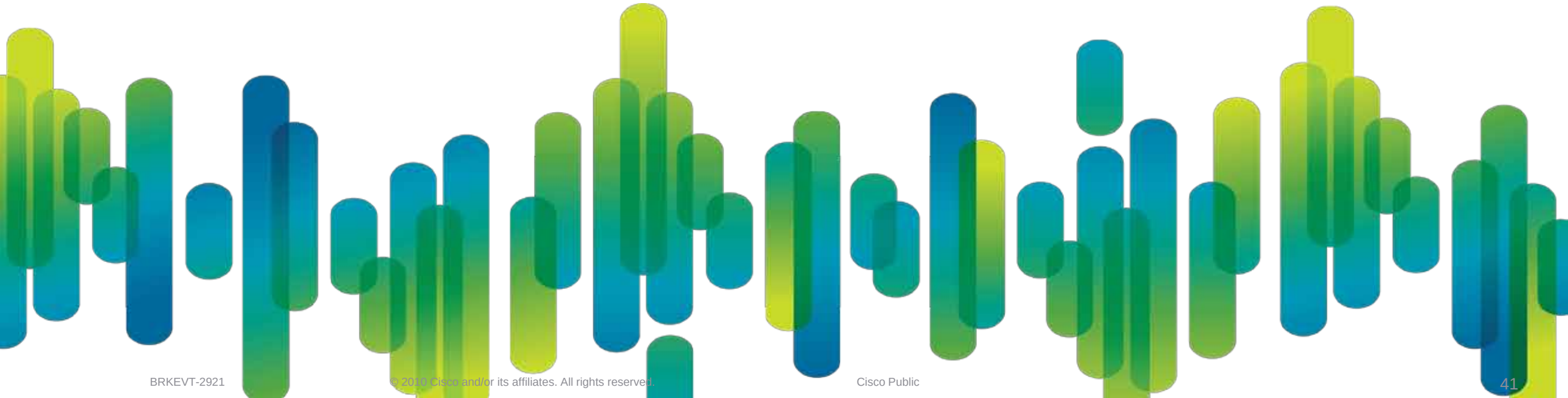
TelePresence Server

MXE





Cisco TelePresence Server



Cisco TelePresence Server

- Comes in two models:
  - 8710 blade
  - Standalone 7010
- Each blade or appliance box supports up to 16 screens
- Up to 3 8710 blades can be clustered
- Dual registers to VCS via SIP and H.323
- Features “Active Presence”
- Supports TIPv6 in release 2.1 and later!

CTS Endpoints

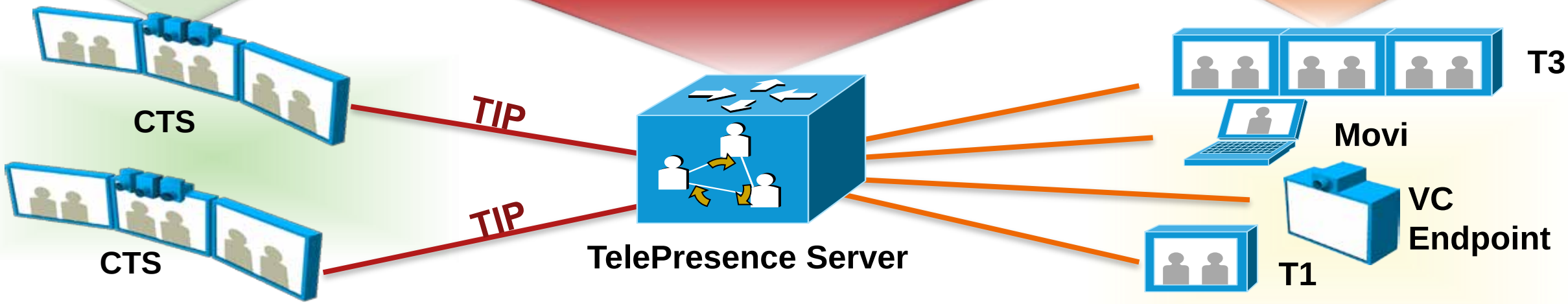
- **Triple or Single Screen**
  - CTS-500/CTS-1X00
  - CTS-30X0/CTS-32X0
- **Media Negotiated to TIP**
  - Channel Multiplexing
  - LTRP
  - Auto Collaborate

TelePresence Server

- **Host TelePresence Meetings**
- **Media Capability**
  - Up to 720p
  - Auto Collaborate, H.239, BFCP
  - TIP with CTS
  - Separate Call per Segment

SIP/H.323 Endpoints

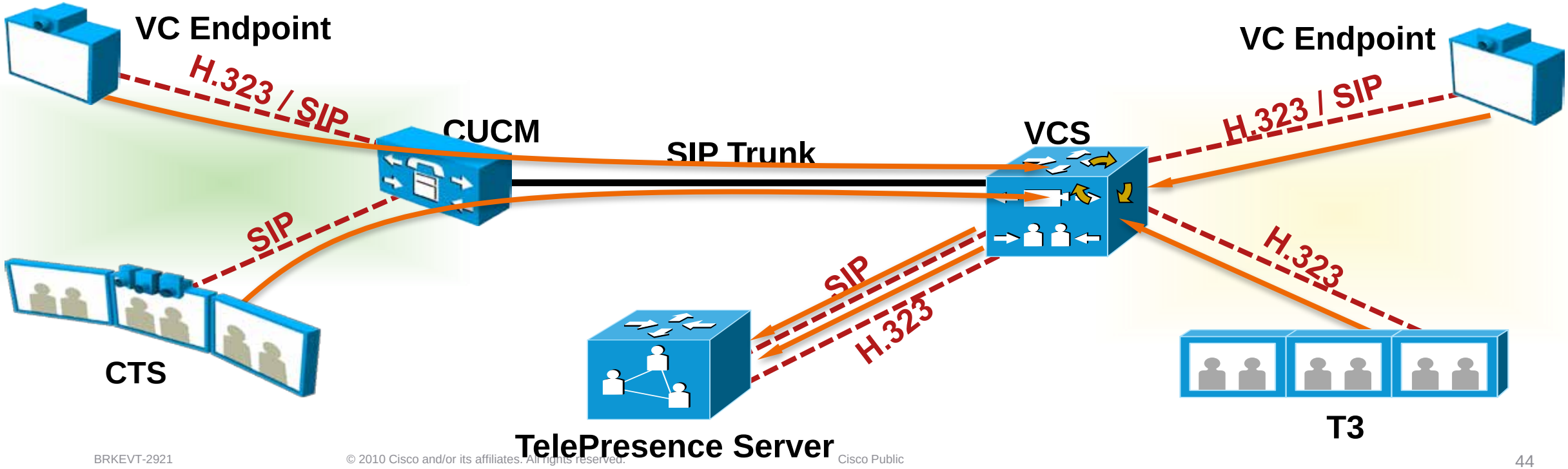
- **Triple or Single Screen**
  - Cisco T1/T3
  - Regular VC Endpoints
- **Media Capability**
  - SDP over SIP
  - H.245
  - Up to 720p + H.239/BFCP



Call Flow

Cisco TelePresence Server

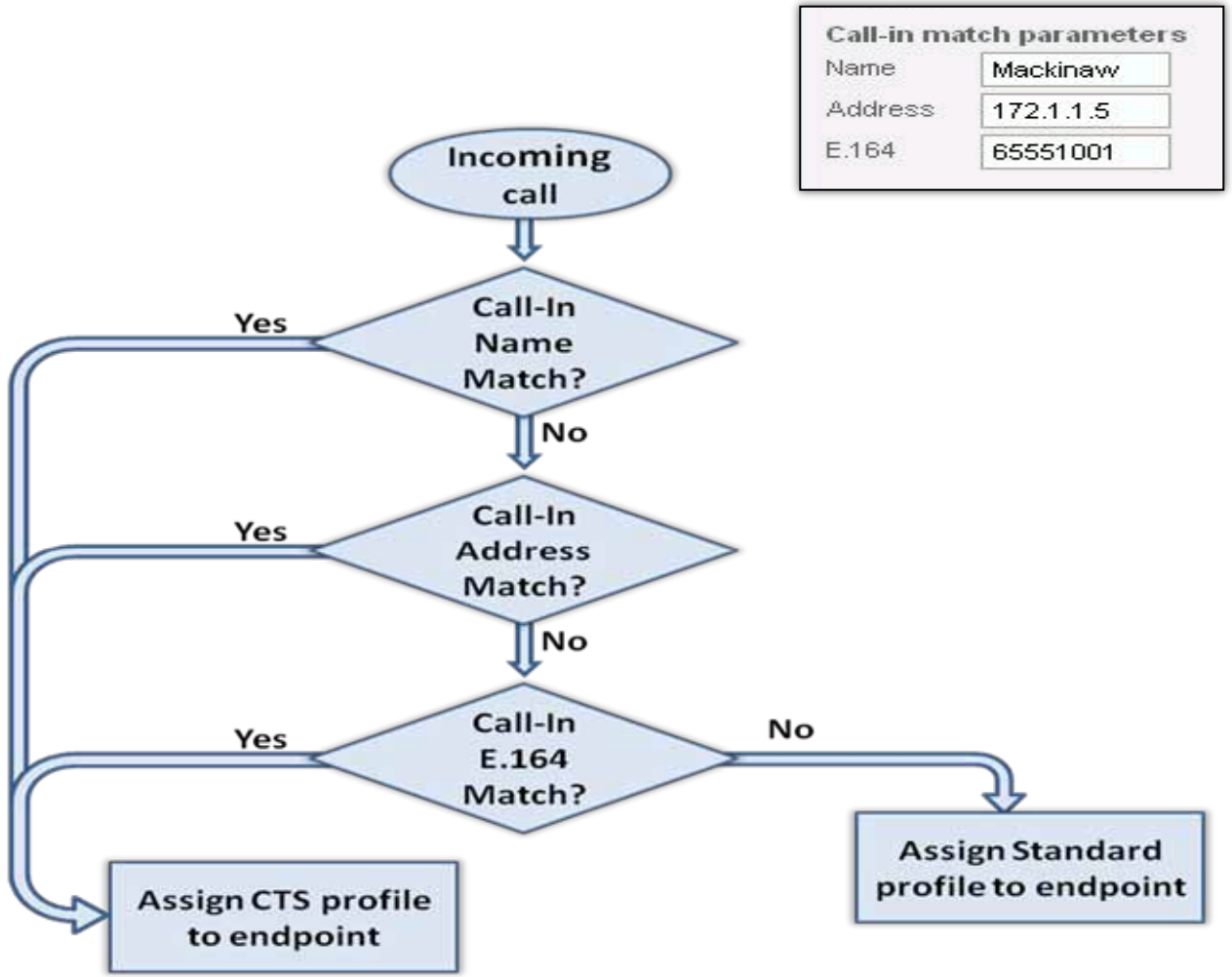
Device Type	Signaling	
CTS 1X00/3XX0/500	SIP	Registered to CUCM, Routed through VCS
CTS T1 or T3	H.323	Registered to VCS, Routed through VCS
Other Endpoints	H.323 / SIP	Routed through VCS



Directional Flow

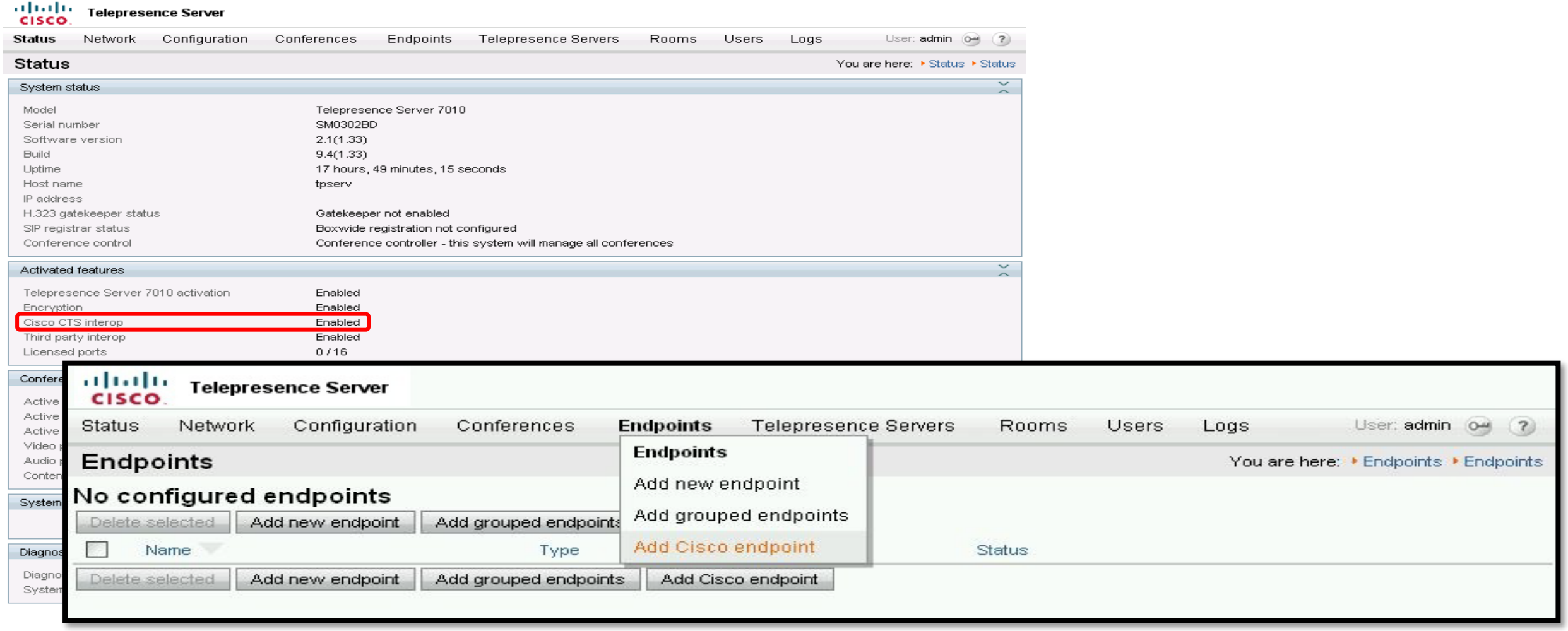
Cisco TelePresence Server

- Release 2.1 introduced support for CTS endpoints
- The TS must recognize the incoming call as a CTS to negotiate TIP successfully
- Currently each CTS must be manually configured on the TS*
- This flow chart describes the TS matching behavior



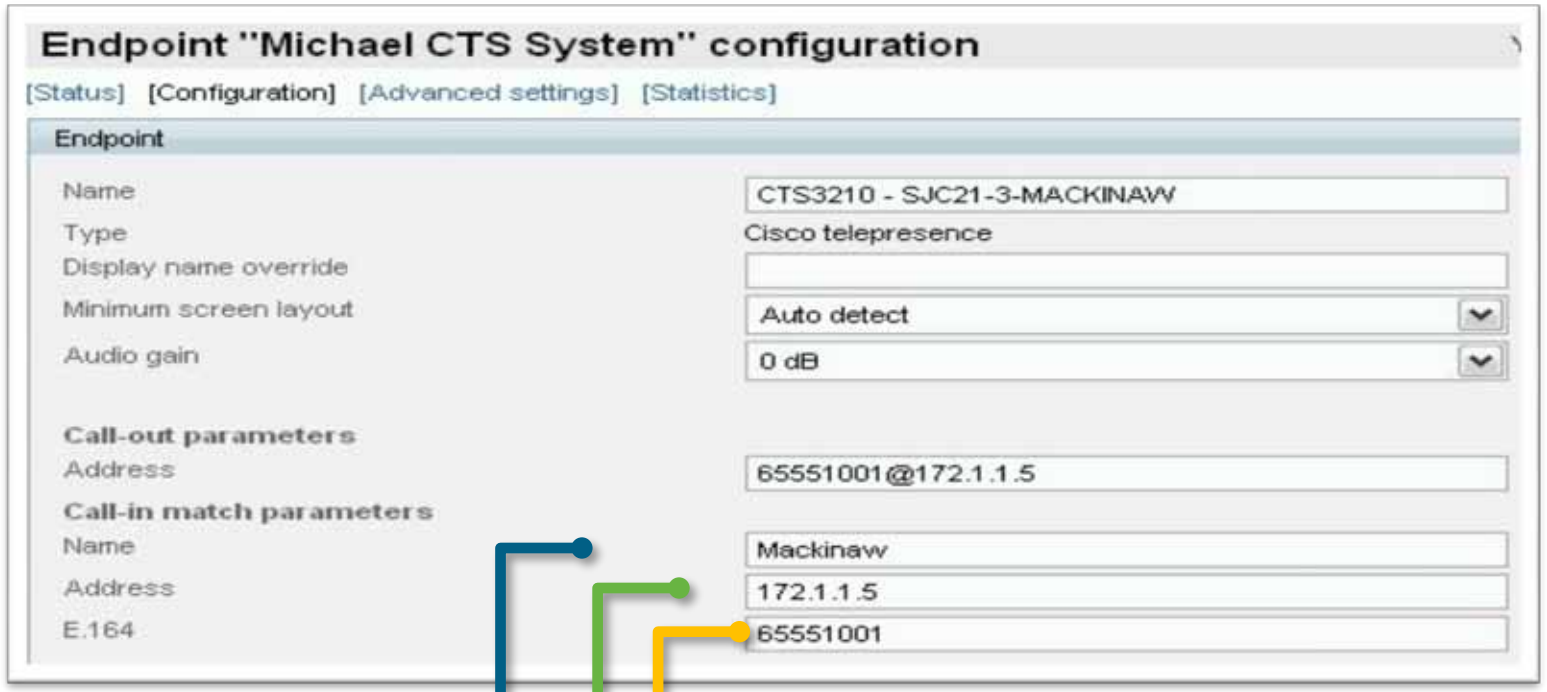
Adding a CTS to a TelePresence Server

- Cisco TelePresence Server



Adding a CTS to a TelePresence Server

- Cisco TelePresence Server



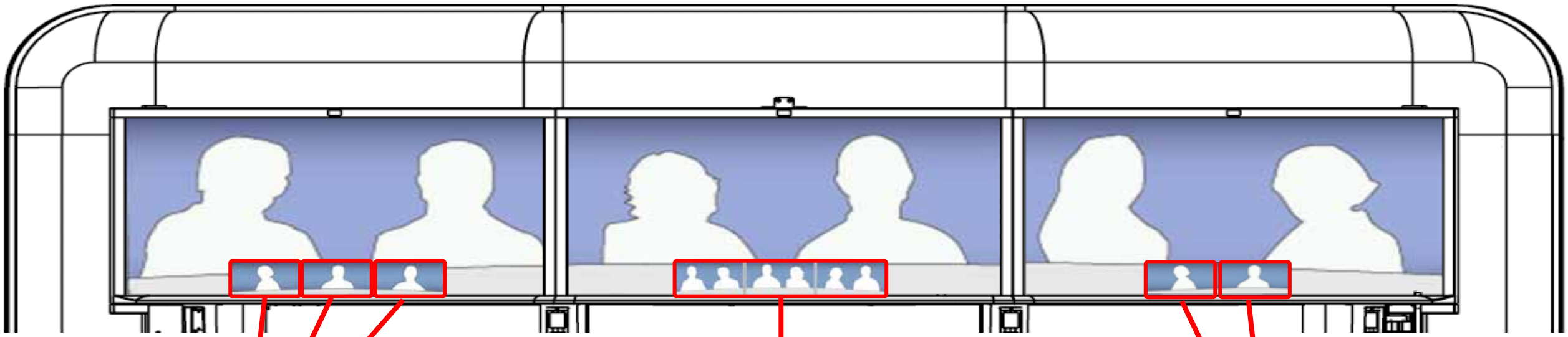
The directory number of the CTS and IP address/hostname of the CUCM

The directory number assigned to CTS in CUCM

The originating IP address or hostname of the SIP INVITE received by VCS. In this case the CUCM IP/hostname that has a SIP trunk to VCS

Remote Party ID in SIP INVITE. When originating from CUCM this is the "ASCII Display (Internal Caller ID)" on the endpoint's Directory Number

Cisco ActivePresence™
User Experience

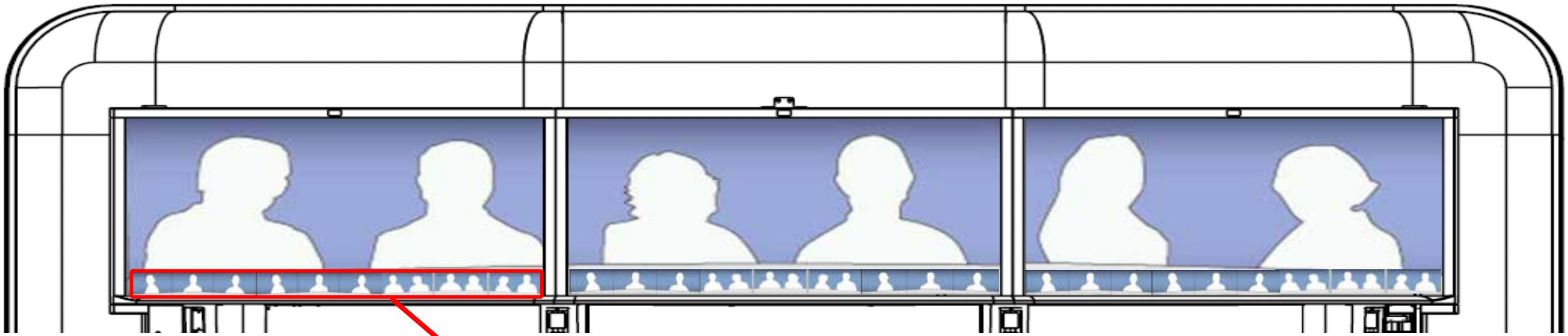


Single Screen Endpoints

Multi-screen Endpoints

Single Screen Endpoints

Cisco ActivePresence™
User Experience

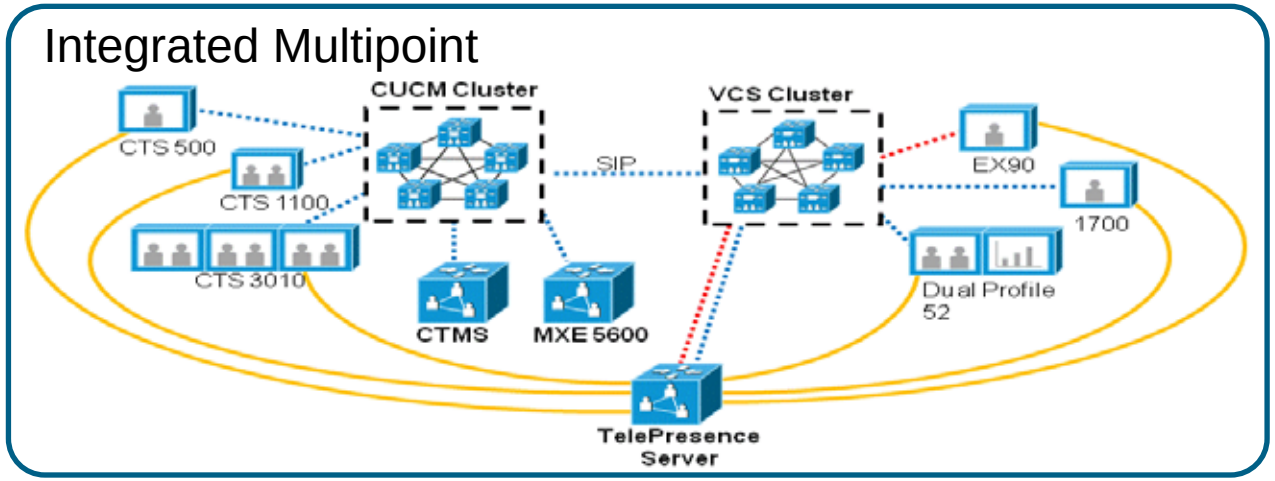


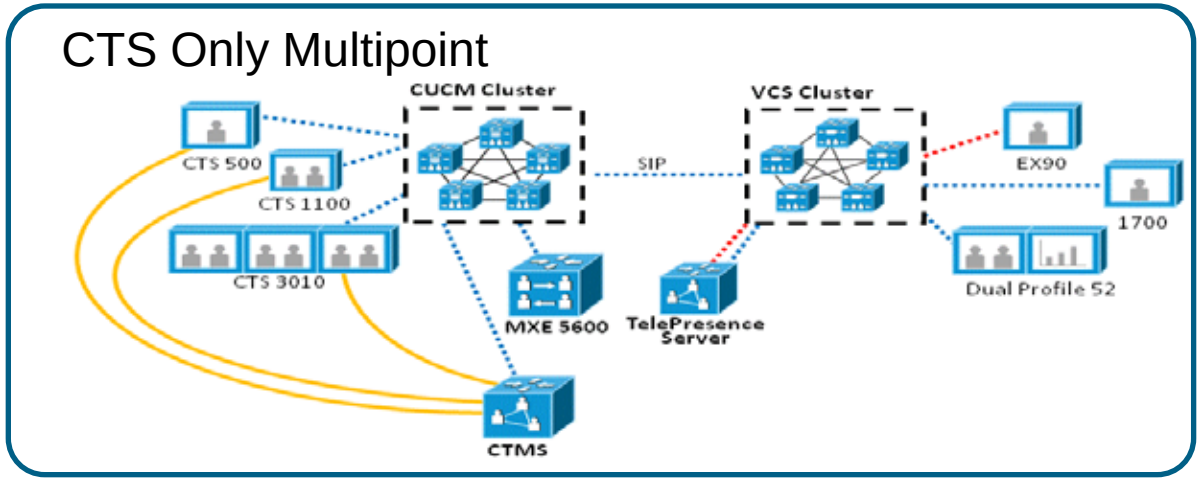
Up to 9 Active Presence windows on a single screen at a time. (27 total on a triple screen)

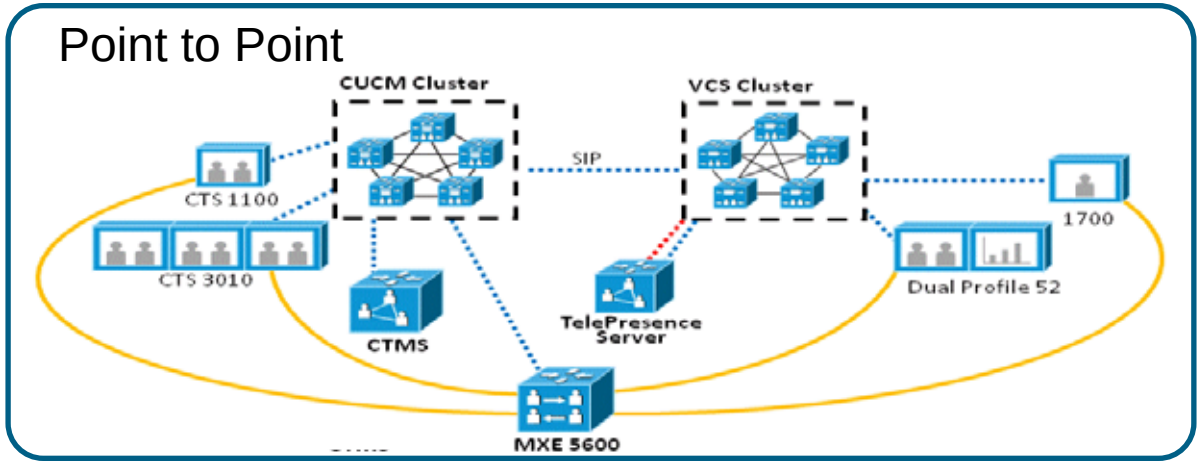
Cisco ActivePresence™
User Experience

Interoperability & Integration Review

§ TelePresence Server and MXE and CTMS







SIP..... H.323..... Media

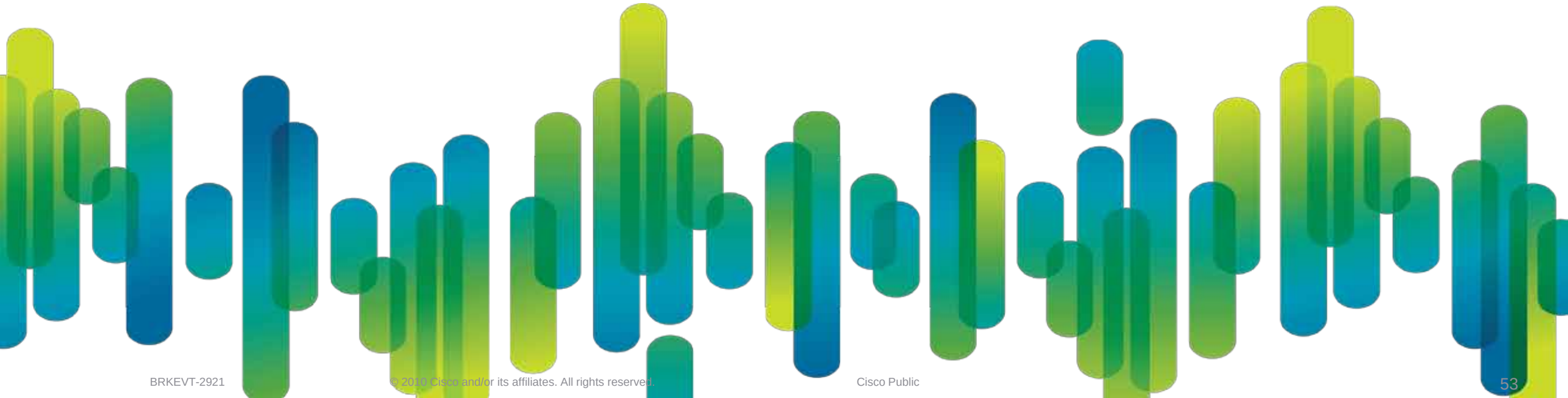
Interoperability and Integration

§ Feature Comparison

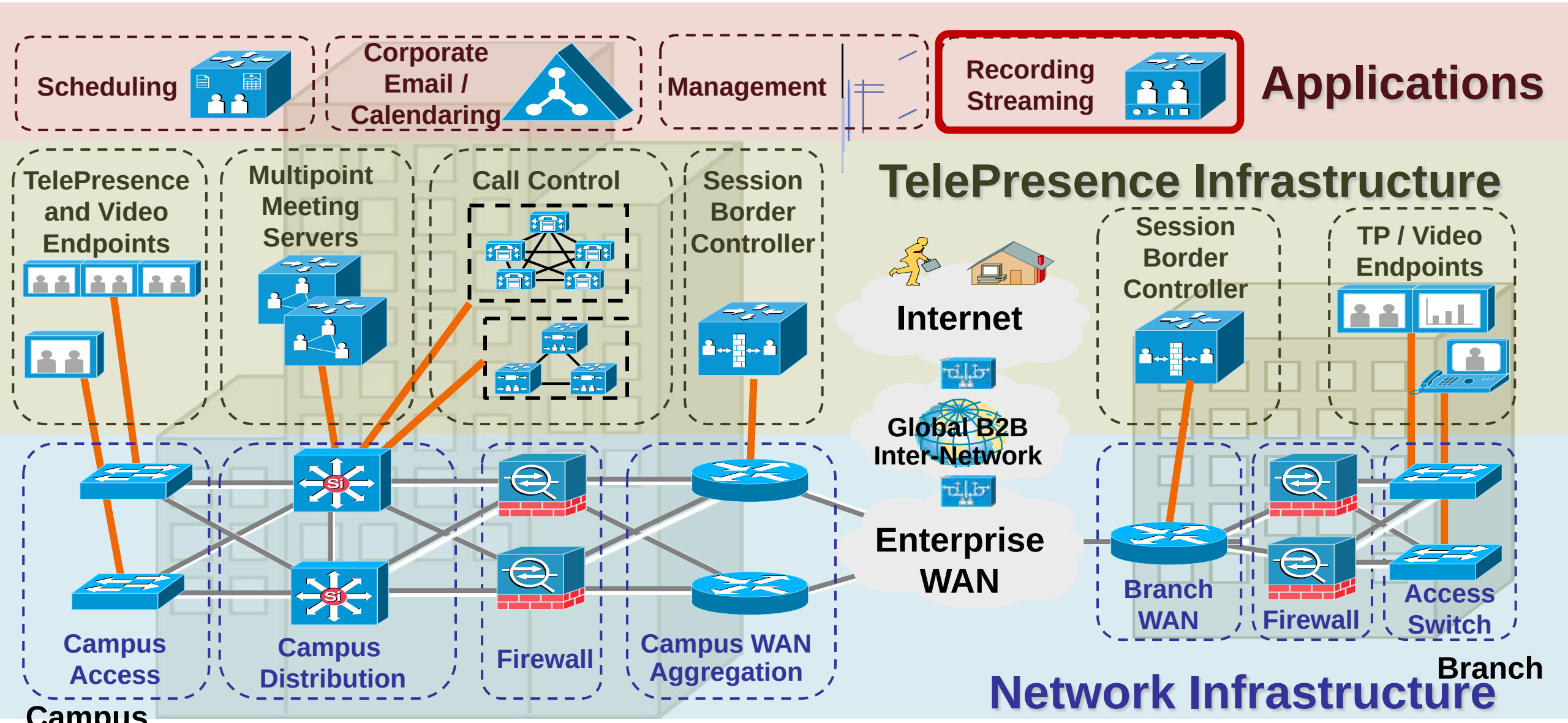
	Multipoint Solution		
	TelePresence Server	CTMS (CTS Only)	CTMS+MXE
3rd Party Interop	✓	✗	✓
Multi-screen 3rd party Support	✓	✗	✗
OBTP	✗[1]	✓	✓[2]
Active Presence	✓	✗	✗
Data sharing	✓	✓[3]	✗
H.239/BFCP/Auto-Collaborate Data Sharing Translation	✓	✗	✗
Layout changes possible from endpoints	✓	✗	✗
Webex OneTouch	✗[1]	✓	✓
Speaker Switching	✗	✓	✓
SIP and H.323 Support	✓	✗	✓✗[4]

[1] Future release will add support
[2] Only CTS endpoints in call get OBTP, interop devices (non-CTS) get manual dial-in number
[3] This is a CTS only call so Auto-Collaborate is supported (TIP's version of BFCP)
[4] MXE-5600 is a SIP only device. H.323 endpoints can utilize MXE by having a CUCM or VCS translate from H.323 to SIP.

Recording & Streaming Update



Recording & Streaming



Share and Distribute Content

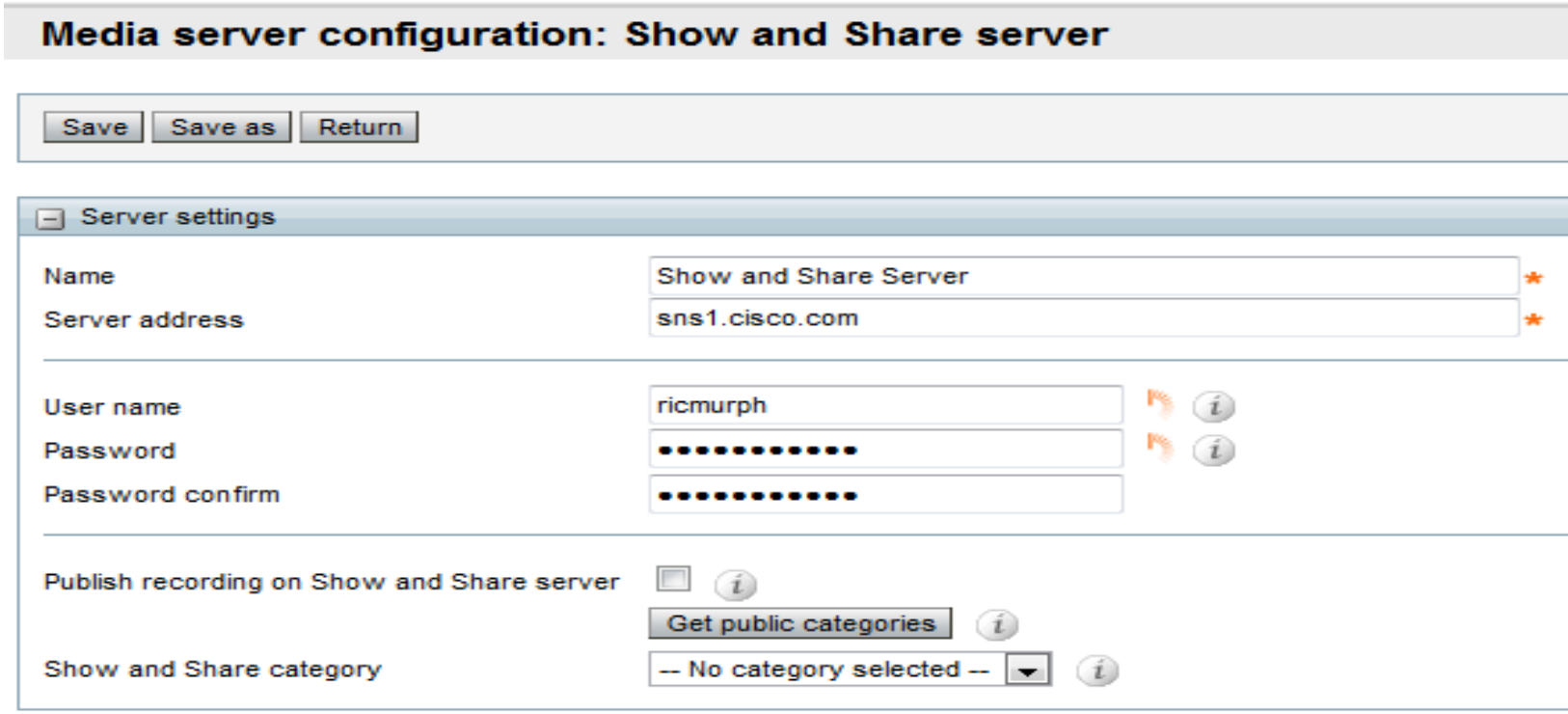
TCS and Cisco Show and Share

① Professor uses Content Server to record lecture

② Content Server sends video recording to Cisco Show and Share

Show and Share Integration

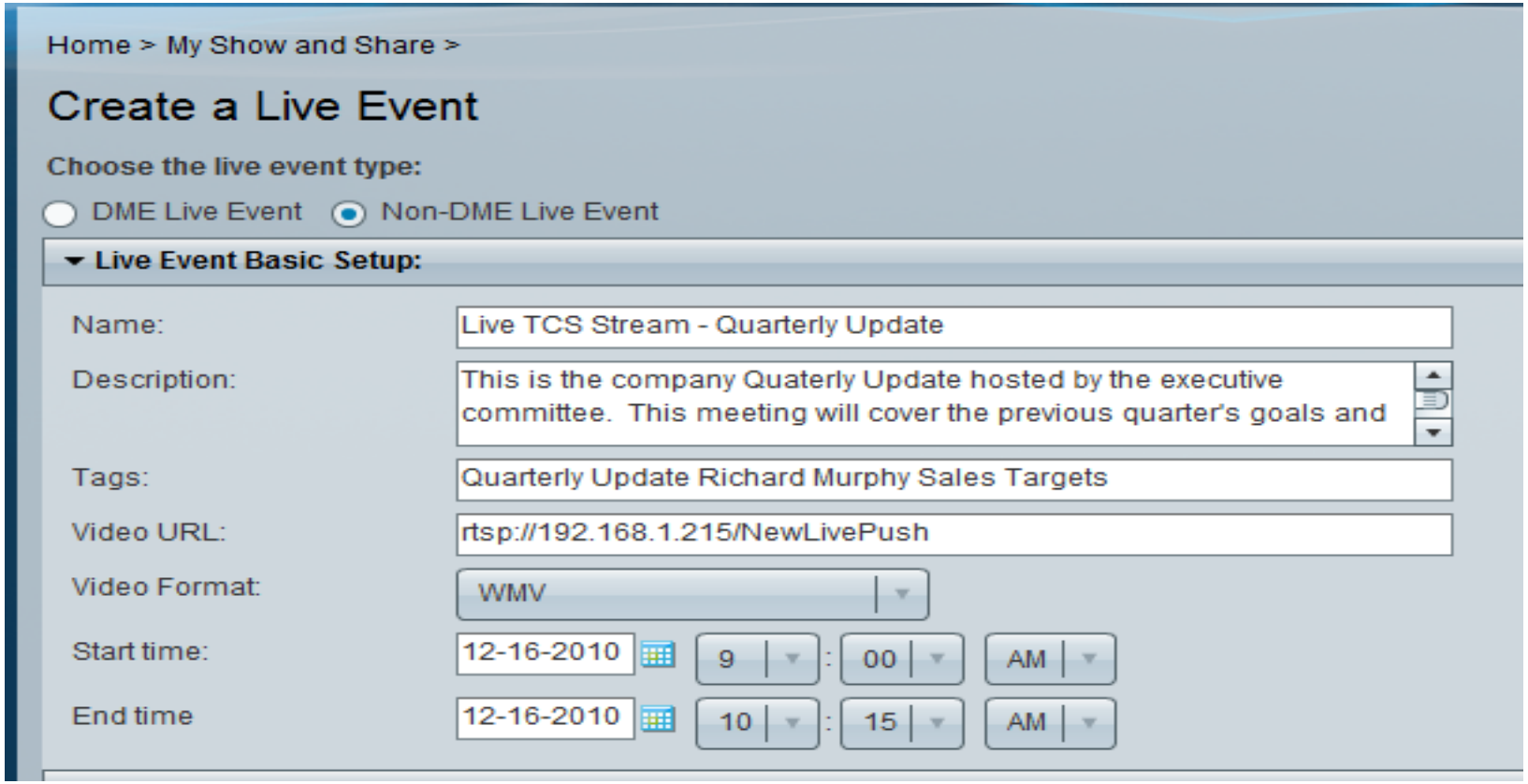
- Video on Demand
  - S5.0 New Media Server for SnS
  - Need Credentials on SnS



Show and Share Integration

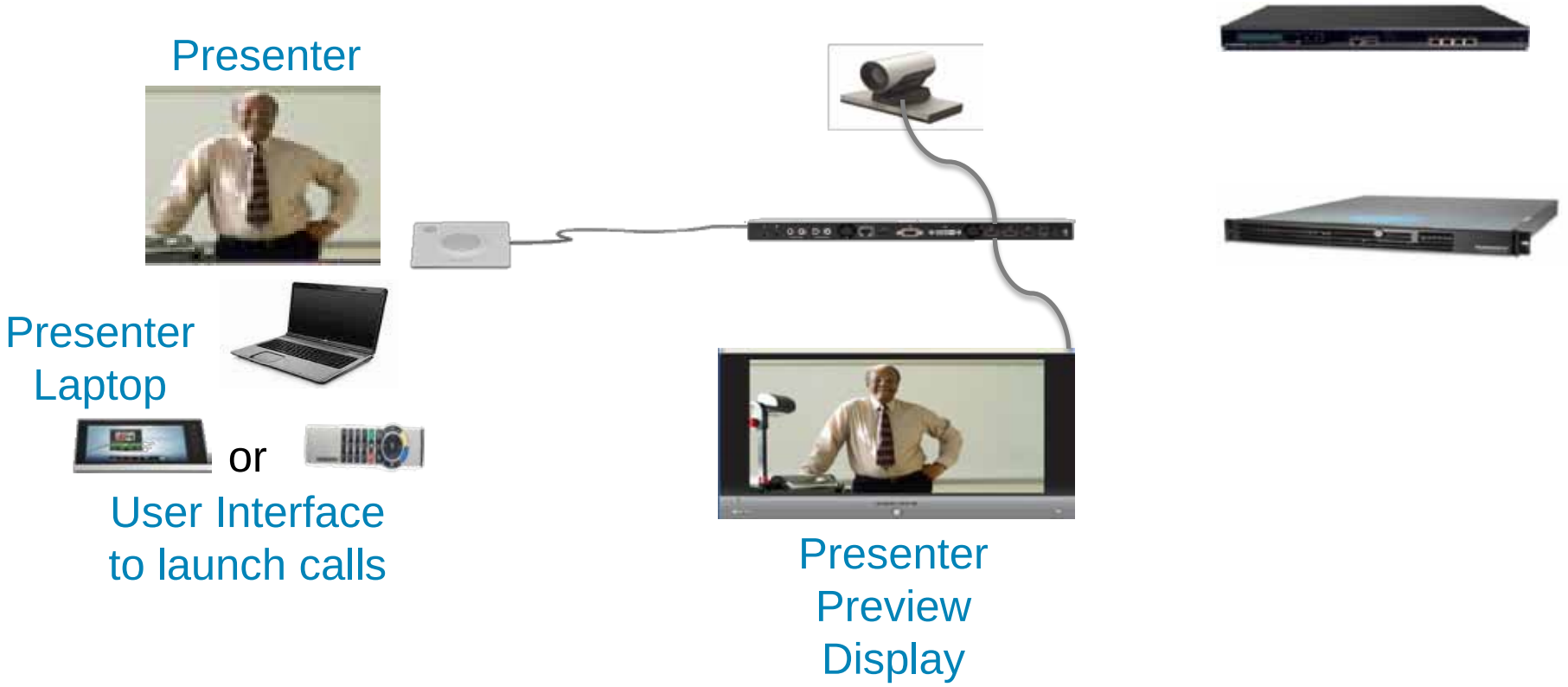
Live Streaming

- TCS S5.0 and Live Event License on SnS
- TCS publishing point referenced as Non DME live event on SnS



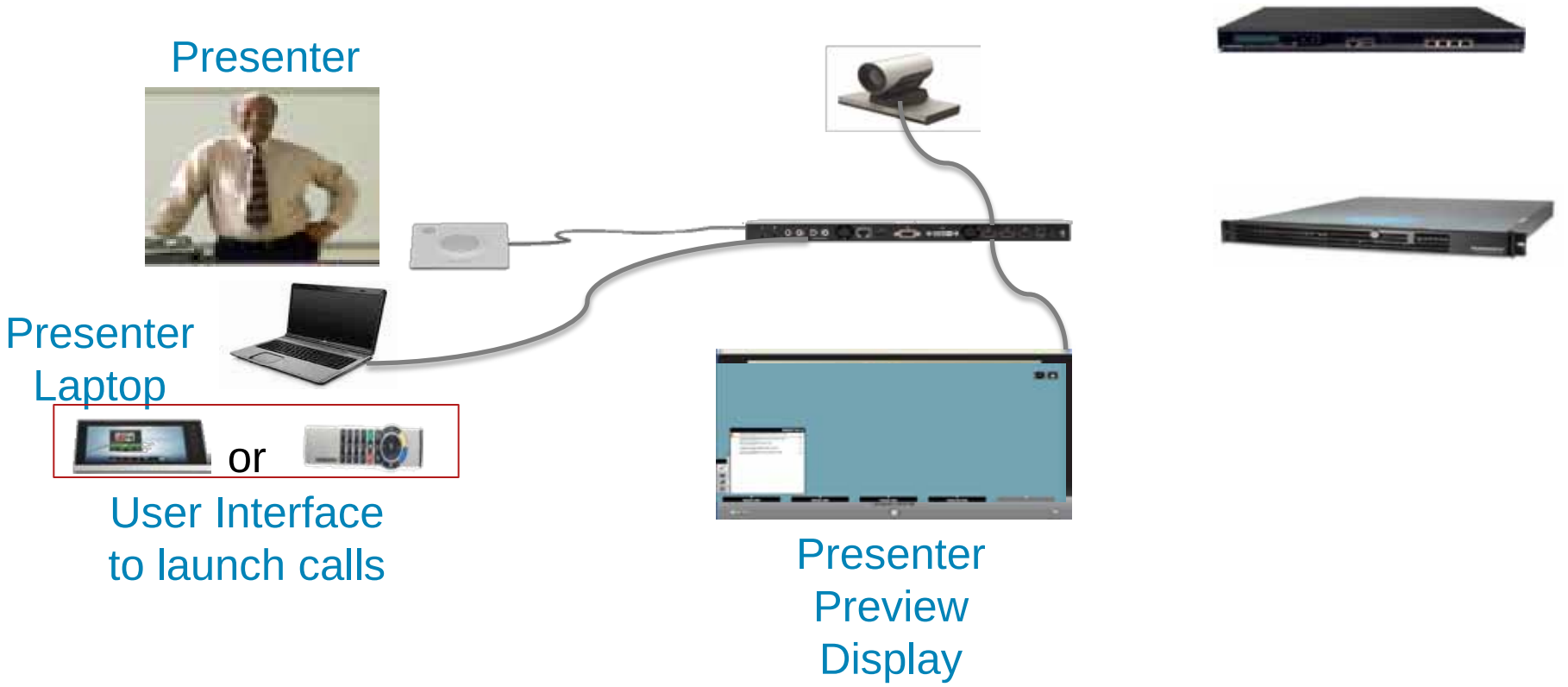
Company Wide Broadcast

1. Presenter positions themselves in front of camera and microphone with PC.



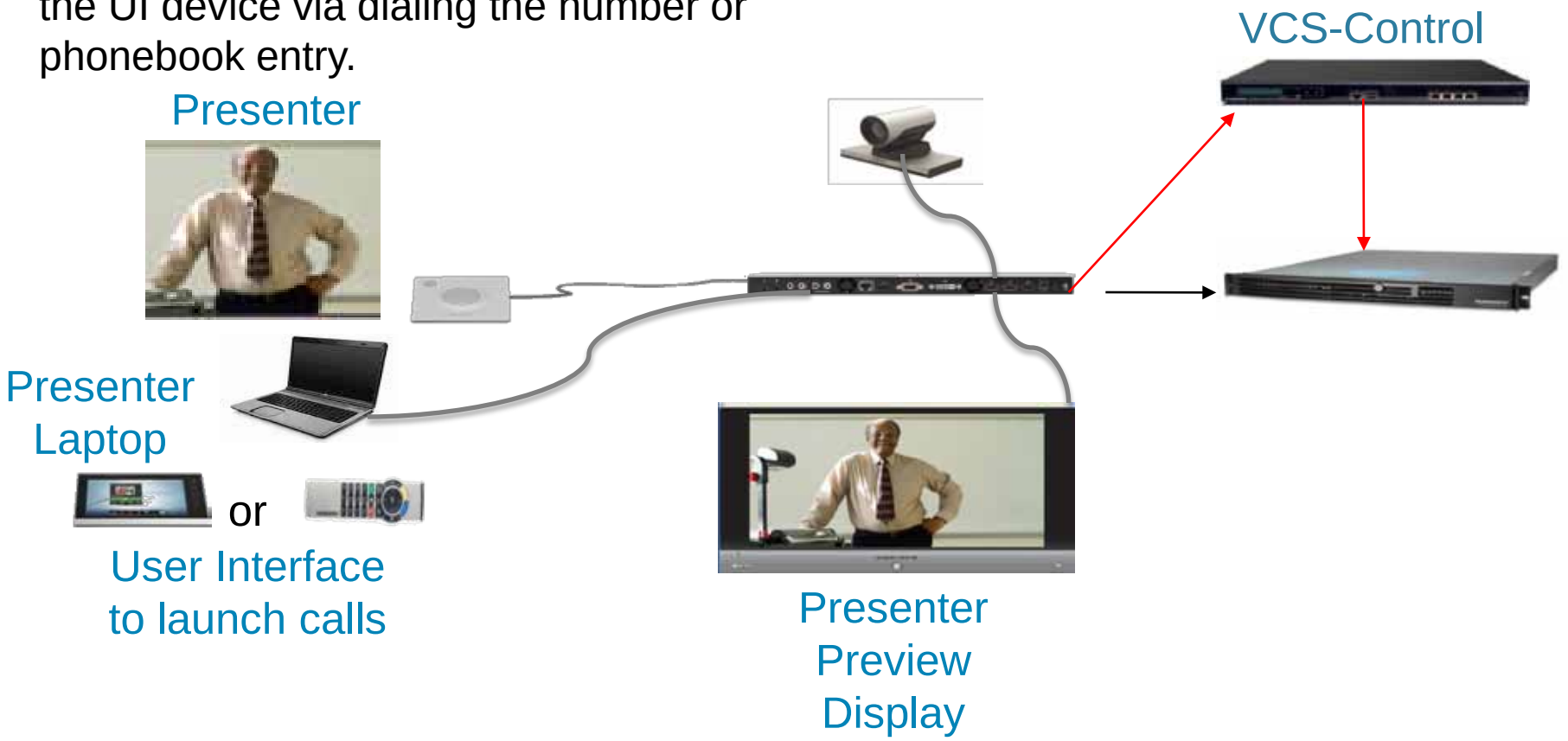
Presenter Workflow

2. Presenter connects PC to VGA cable.



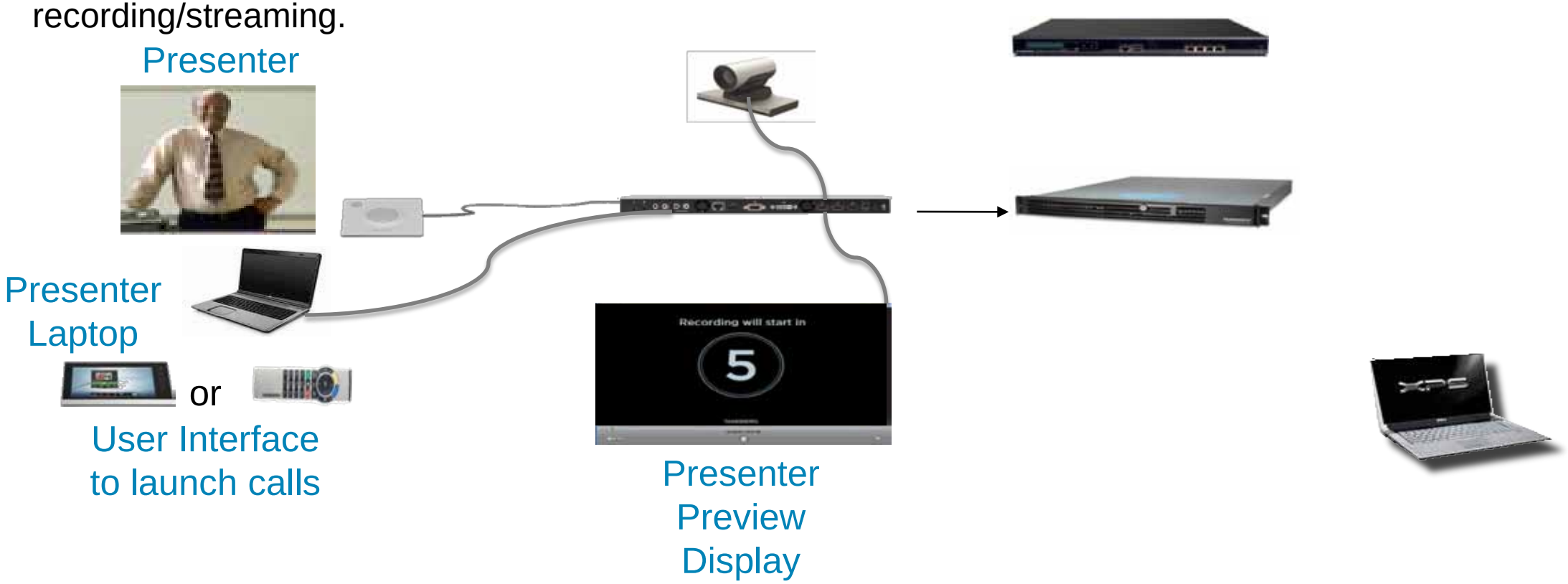
Presenter Workflow

3. The presenter will launch the call from the UI device via dialing the number or phonebook entry.



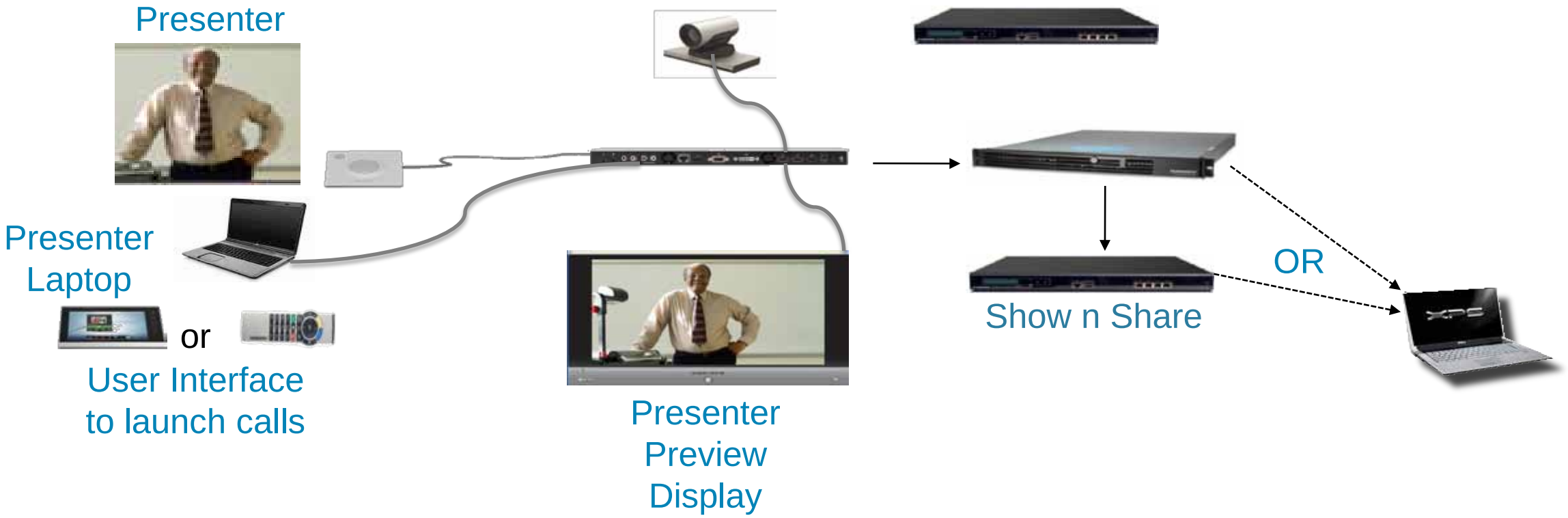
Presenter Workflow

5. Once connected to TCS the presenter will see a countdown prior to recording/streaming.



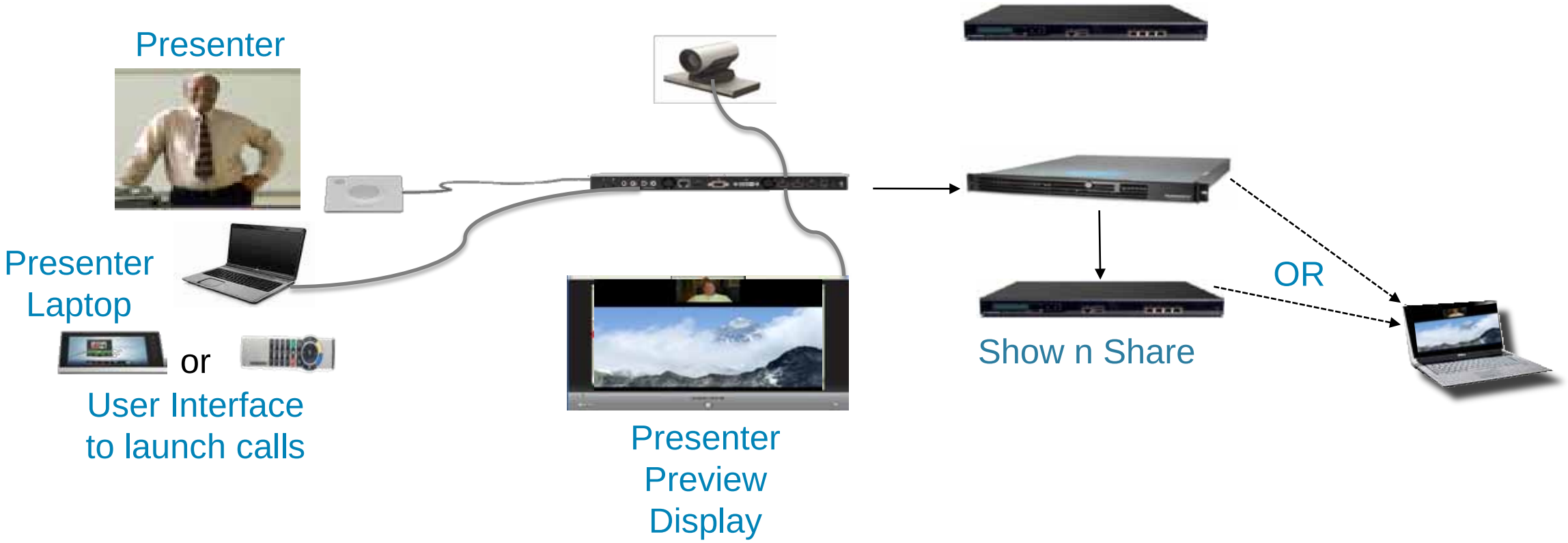
Presenter Workflow

6. Two ways to access the stream; The PC stream can be accessed directly through TCS or as a live WMV stream via Show & Share portal



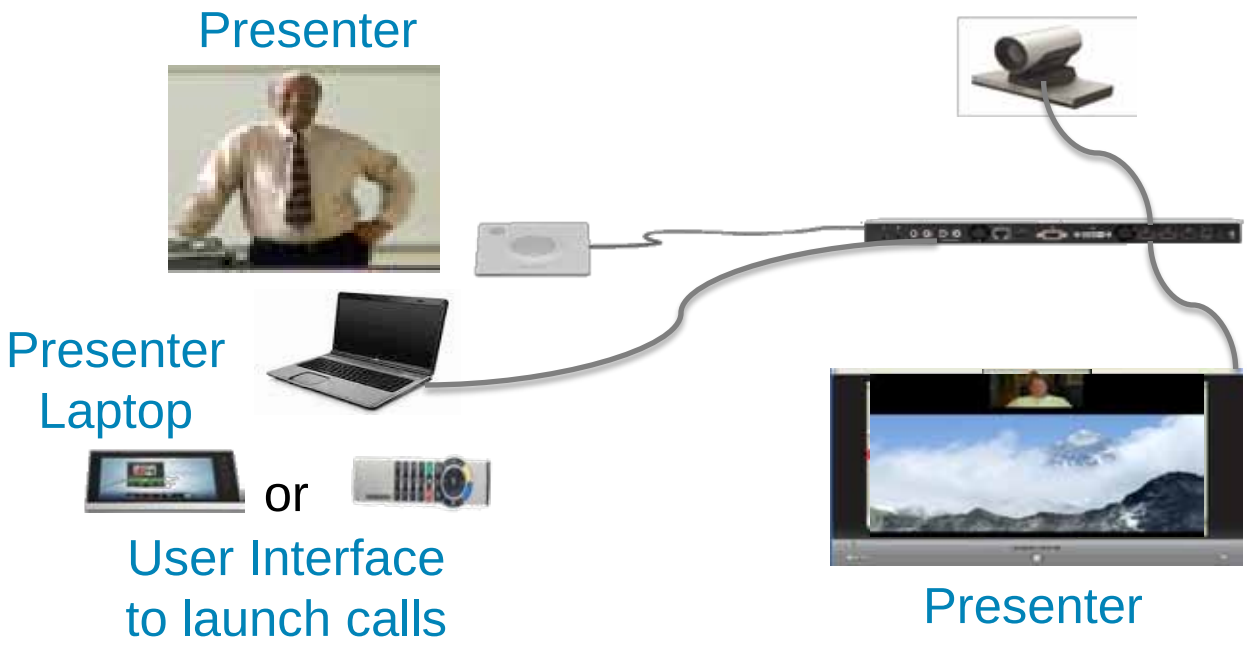
Presenter Workflow

7. At any time the presenter can share content from the PC by pressing the key combination.



Presenter Workflow

8. Press the end call key to terminate the call and stop the recording and automatically initiate the transfer to Show & Share VOD portal



Q & A

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Thank you.