Understanding Cisco TelePresence Conductor and Virtual TP Resources

BRKEVT-2809

Richard Murphy

Technical Marketing Engineer

Cisco *live!*

Abstract for BRKEVT-2809

Cisco has a strategy that enables comprehensive multiparty conferencing to any user on any device with a consistent user experience in a rich collaboration environment.

This session will focus on the Cisco **TelePresence Conductor** and the Cisco **TelePresence Servers** as the core components of this strategy. The purpose of this session is to learn how to build an architecture utilising these key products. We will thus start by introducing the products, and later focus on how to design and implement them into common architectures based on specific scenarios while identifying best practices and design considerations.
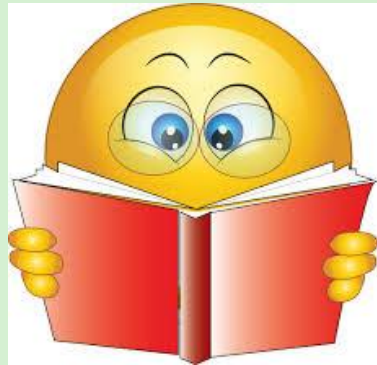
Cisco live!

On-demand Library   Online Events

Session Number	Session Name
BRKCCT-2661	Cisco Multichannel Contact Centre and Remote Expert Solutions
BRKCCT-2662	Design & Deployment of UCCE
BRKCOL-2020	Cisco Unified Communications and Microsoft Integrations
BRKCOL-2025	Deploying Cisco WebEx in Enterprise Networks (On-Premises or Cloud)
BRKCOL-2315	Understanding Cisco Hosted Collaboration Solution
BRKEVT-2615	Implementing Enterprise TelePresence and Video Communication Solutions
BRKEVT-2664	Implementing Video Scheduling and WebEx Enabled TelePresence
BRKEVT-2809	Understanding Cisco TelePresence Conductor and Virtual TP Resources
BRKEVT-3661	Troubleshooting the TelePresence Experience
BRKUCC-2006	SIP Trunk Design and Deployment in Enterprise UC Networks
BRKUCC-2008	Designing Dial Plans for Enterprise Unified Communications
BRKUCC-2057	Deploying Cisco Unified Communications at Branch Offices and Small-Medium Businesses
BRKUCC-2058	Utilising Network Intelligence for Collaboration and Real Time Media
BRKUCC-2059	Designing and Deploying Cisco Contact Centre Express
BRKUCC-2225	Planning and Designing Virtualised Unified Communication Solutions
BRKUCC-2480	Deploying Cisco Jabber Desktop Clients
BRKUCC-2661	Deploying Cisco Jabber Mobility Solutions
BRKUCC-2664	Unified Communications and Directory Integrations (SSO)
BRKUCC-2665	Communications Manager for Video Call Control (Unified Call Control)
BRKUCC-2666	Federation and Remote Access for Unified Communications Leveraging Collaboration Edge
BRKUCC-2667	Call Admission Control and Quality of Service for Collaboration
BRKUCC-2668	Best Practises in Upgrading your Unified Communications Environment to Version 10
BRKUCC-2670	Accelerate and Assure Collaboration Deployments with Cisco Prime Collaboration
BRKUCC-2671	Enabling Workspace Transformation with Cisco Collaboration
BRKUCC-2672	Network Media Recording and Streaming with Cisco MediaSense
BRKUCC-3661	Troubleshooting Jabber Desktop Clients

Agenda

- Conductor
- TelePresence Server
- Architectures
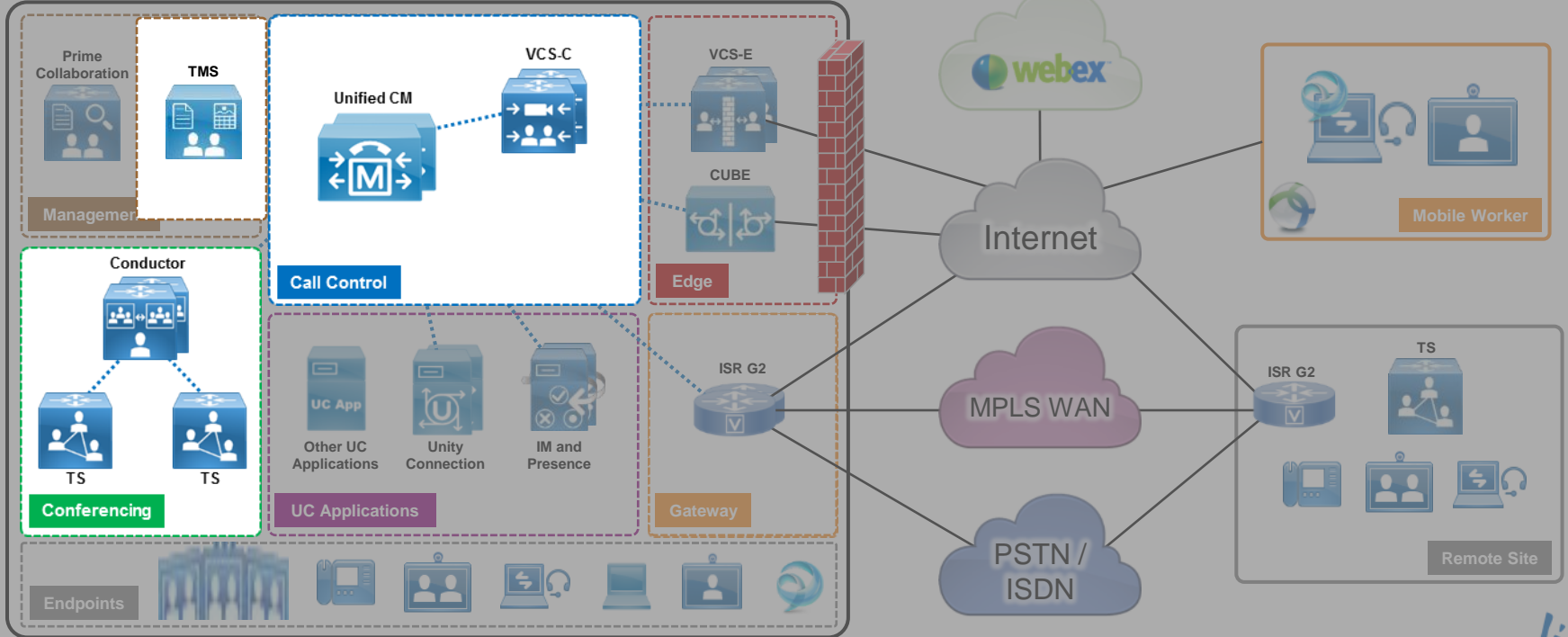
Cisco Public

Cisco live!
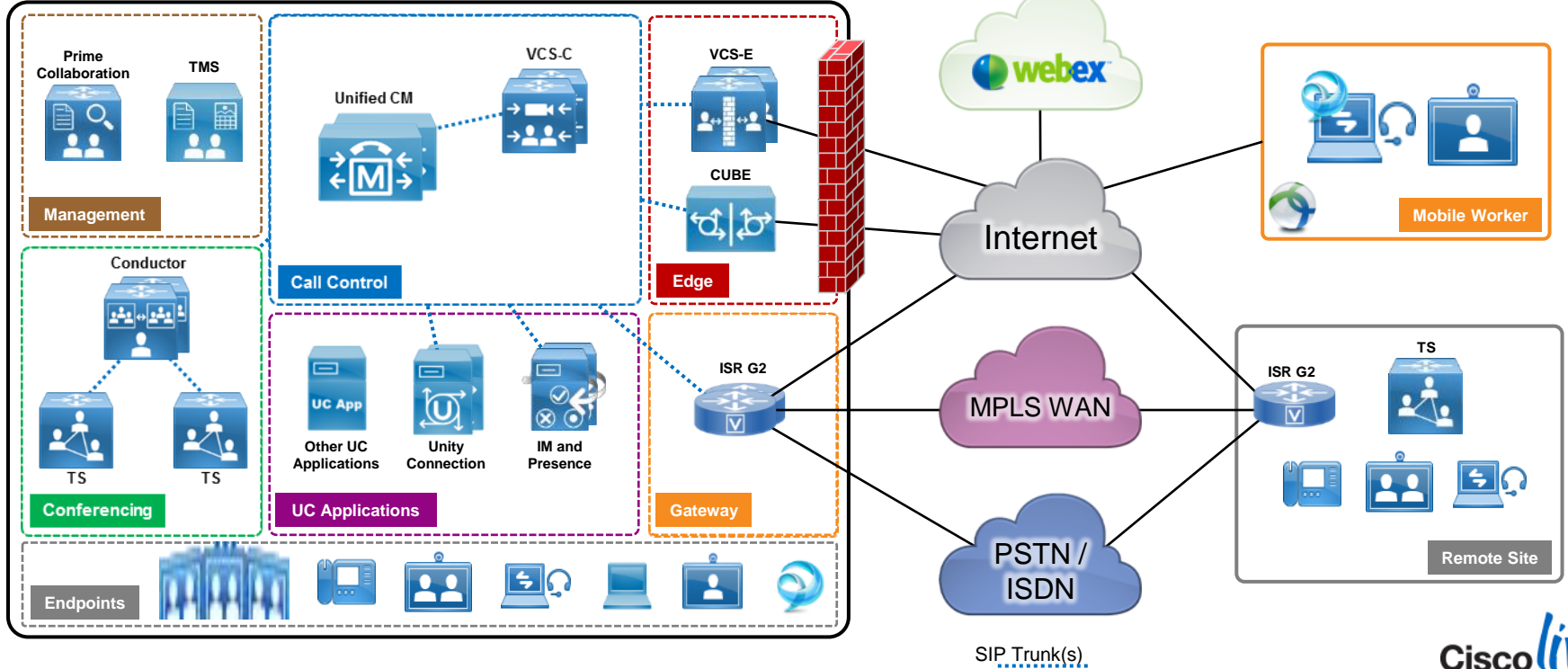
Collaboration Architecture Overview

Collaboration Architecture Overview

Travel Back Through Time

History of Conductor Releases

Conductor

XC1.1

XC1.2

2011	2012	2013
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Conductor Video

http://www.youtube.com/watch?v=4-C7F2fTEYE

Conductor Original Use Cases

- Personal Conference Creation

I need a Video bridge number?

Admin

- Maintain Consistent User Experience across multiple MCUs
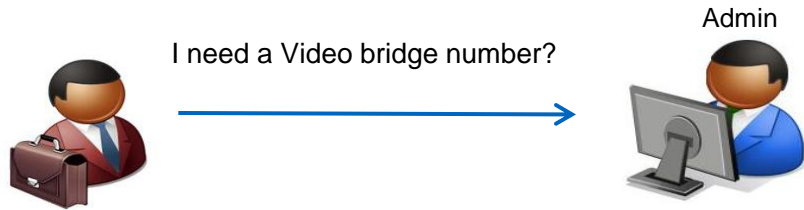
- Redundancy during MCU outage or high utilisation

- Offer different service levels to different users i.e. HD for executives only

What is this?

© 2014 Cisco and/or its affiliates. All rights reserved.   Cisco Public

What is Cisco TelePresence Conductor?

- Hardware:
  - Same Hardware platform as Video Communication Server
  - Serial numbers are different between Conductor and VCS.
  - Note: TelePresence Conductor application will not co-exist with the VCS application
- Software
  - Same base software platform as Video Communication Server but unique application built on the base software.
  - Key point
  - Conductor is not a VCS and a VCS is not a Conductor!

What does TelePresence Conductor do?

What does this mean?	What does this mean?	What does this mean?
Conference Virtualisation	Resource Management/Conference Bridge Selection	Centralised Conference Provisioning and Administration

- Consistent User Experience

- Whether using a Adhoc Conferences or Rendezvous Conferences

- Knows all the available and used ports

- Intelligent Bridge selection

- Automatic cascading of MCUs

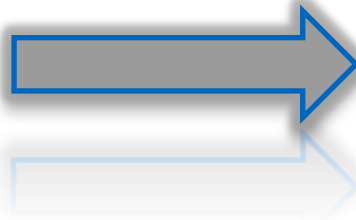- Single configuration applied to any conferencing resource

- Ad Hoc and Rendezvous Conference support

Cisco Public

User Requests a Rendezvous Conference

Bill

Video Admin

Only happens once!

Video Admin
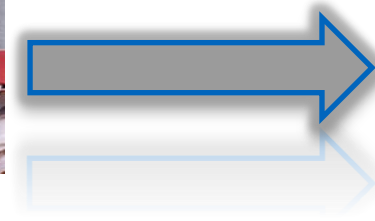
TelePresence Conductor

Only happens once!

Cisco Public

Cisco live!

User Initiates Conference

VCS Cluster

MCU Pool

meetbill@test.com
or
1234

Bill

MCU 1

MCU 2

Conductor Cluster

Cisco live!

TelePresence Conductor Orchestrates the Conference

MCU Pool

VCS Cluster

meetbill@test.com
or
1234

VCS request to TelePresence
Conductor to transform the alias
to the correct URI

MCU 1

Bill

MCU 2

Conductor Cluster

Cisco live!
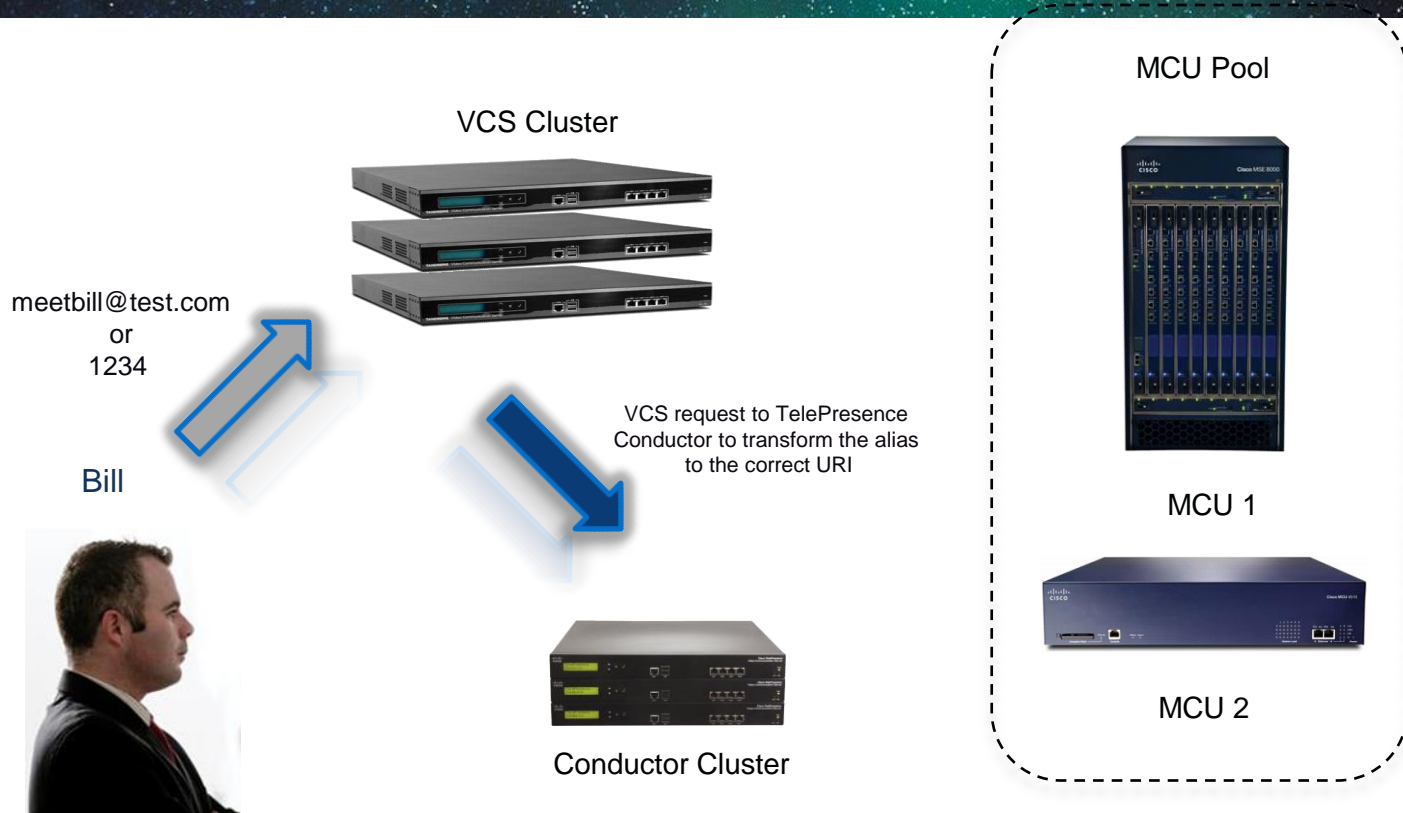
Intelligent Conference Creation

MCU Pool

VCS Cluster

meetbill@test.com
or
1234

Bill

MCU1
New Conference ID

TelePresence Conductor
creates the conference on
the most appropriate MCU
and returns the URI to VCS

MCU 1

MCU 2

Conductor Cluster

Cisco live!
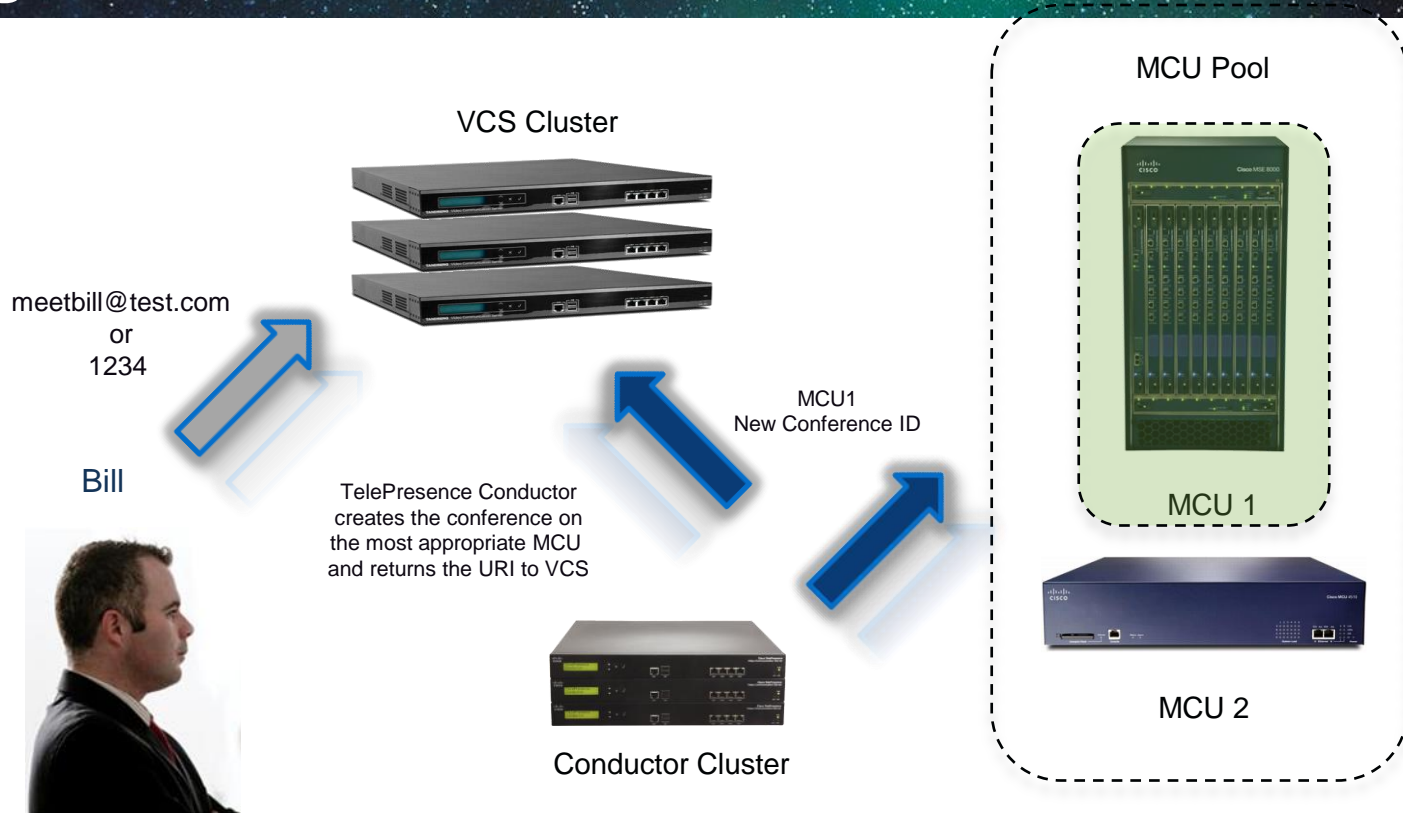
User Connected to Conference

VCS Cluster

Bill's Conference

MCU Pool

MCU 1

MCU 2

meetbill@test.com
or
1234

Bill

Conductor Cluster

Cisco Public
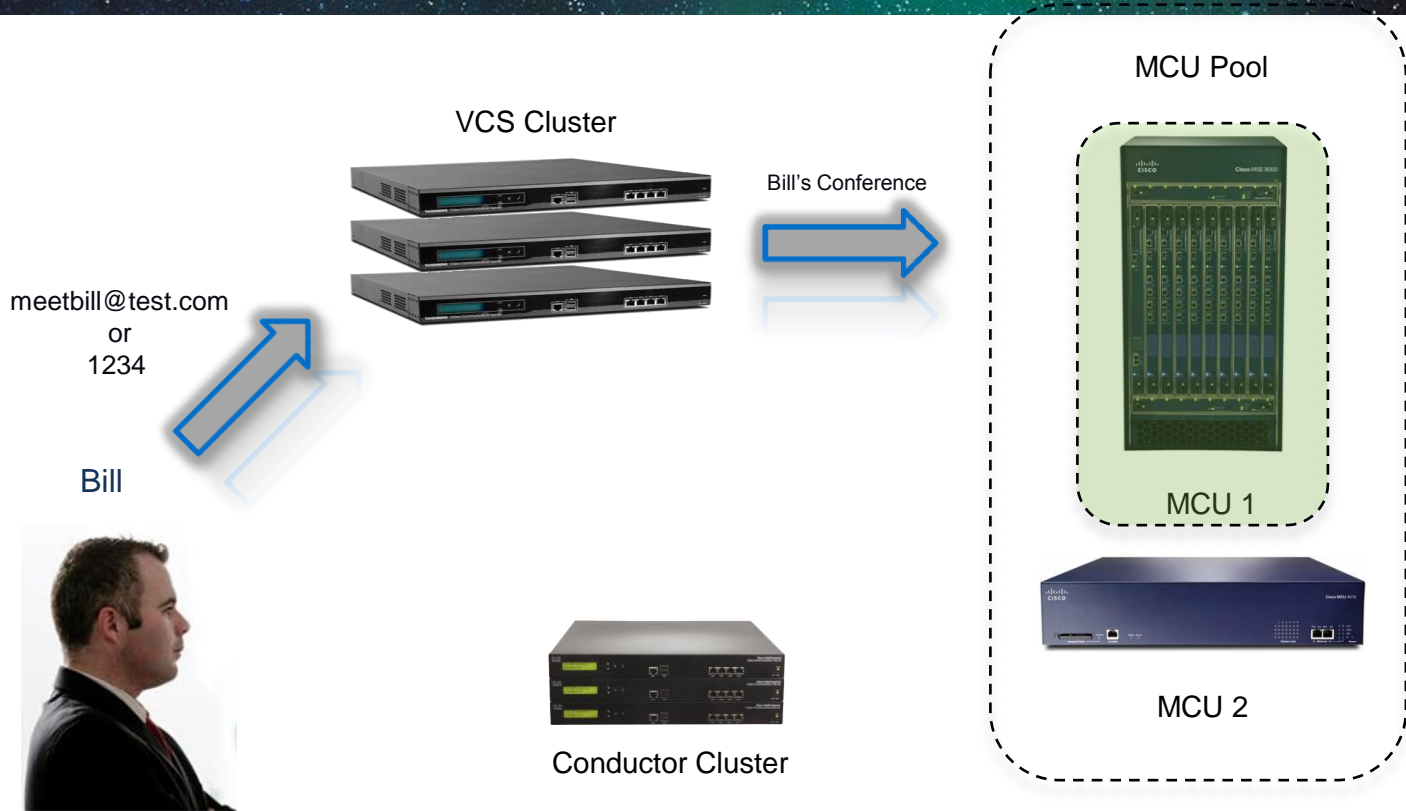
Next User Calls into the Conference

VCS Cluster

MCU Pool

meetbill@test.com
or
1234

Mary

MCU 1

MCU 2

Conductor Cluster

Cisco Public

Cisco live!
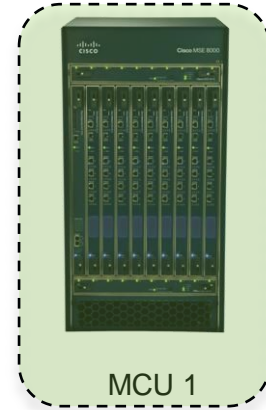
TelePresence Conductor Directs the Call

VCS Cluster

meetbill@test.com
or
1234

Mary

VCS requests URI

MCU1
Bill's Conference ID

Conductor Cluster

MCU Pool

MCU 1

MCU 2

Cisco Public

Cisco *live!*

User Connected to the Conference

VCS Cluster

Bill's Conference

MCU Pool

meetbill@test.com
or
1234

Mary

MCU 1

MCU 2

Conductor Cluster
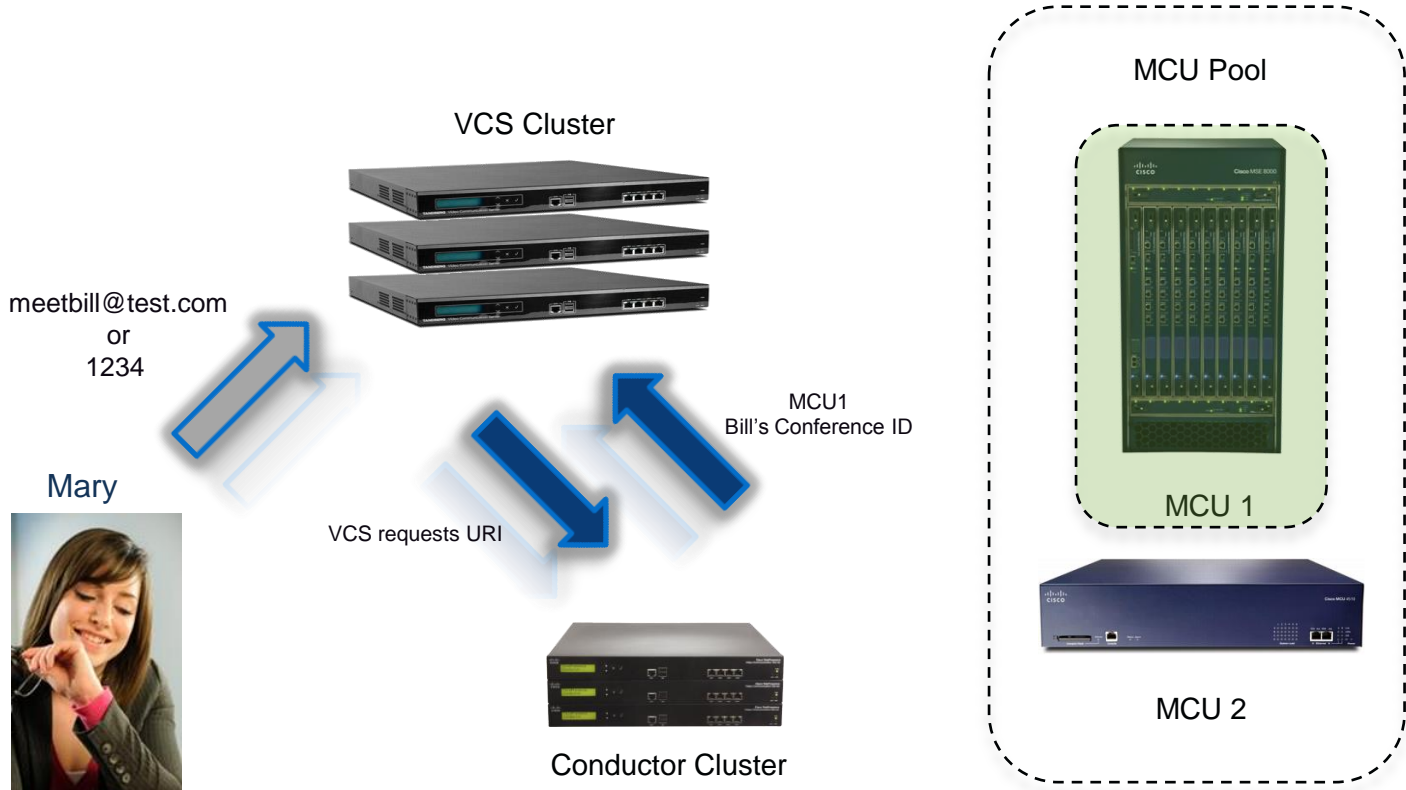
Cisco live!
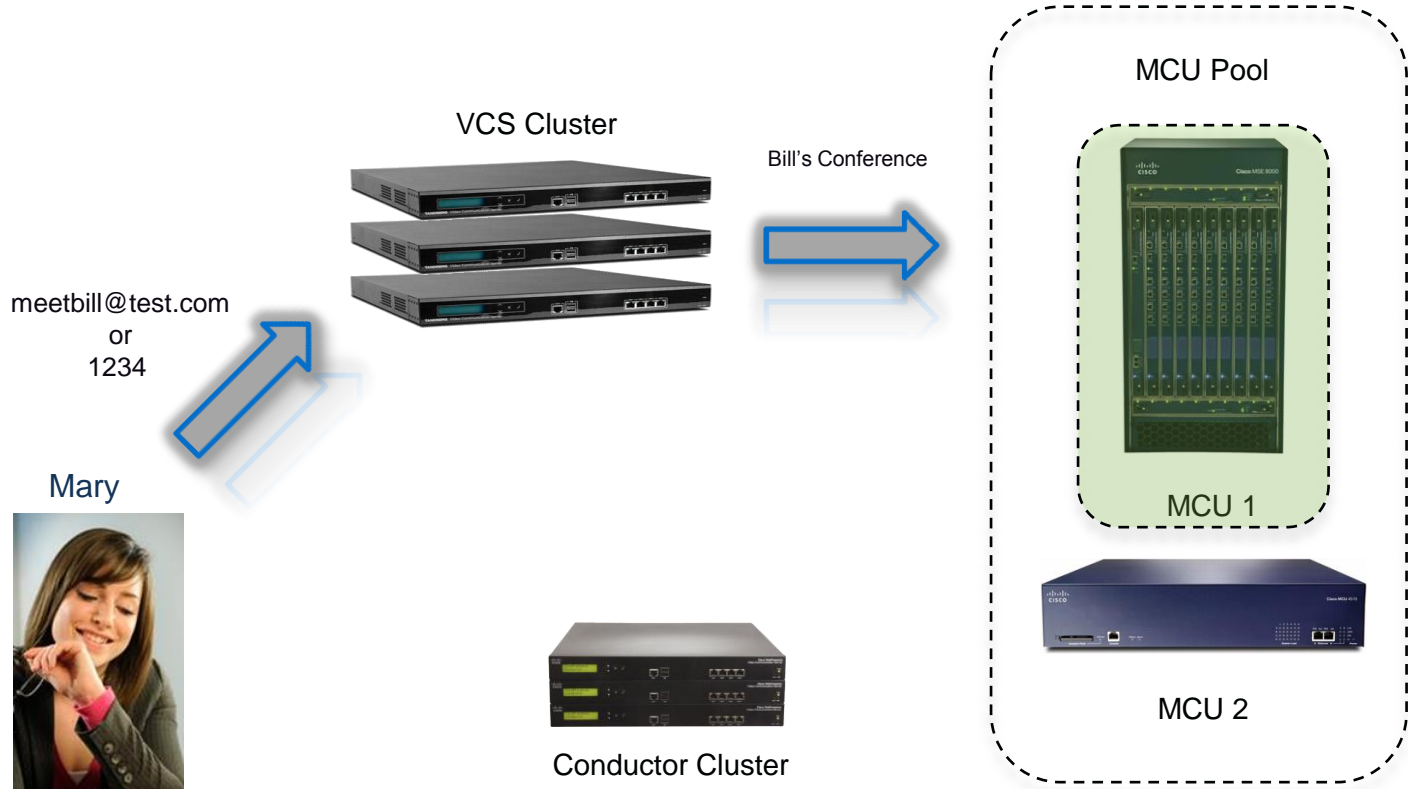
Working Example: Scalability

- Let us consider a conference growing beyond the available ports on a physical MCU
  - Administrator can permit cascading on Primary MCU
  - Once all resources on an MCU are used the Primary MCU cascades the call to the next appropriate MCU in the pool

Cisco Public

Cisco *live!*

User Calls into a Conference – MCU Full

MCU Pool

VCS Cluster

MCU 1

MCU 2

meetbill@test.com
or
1234

Ben

Conductor Cluster

Cisco Public
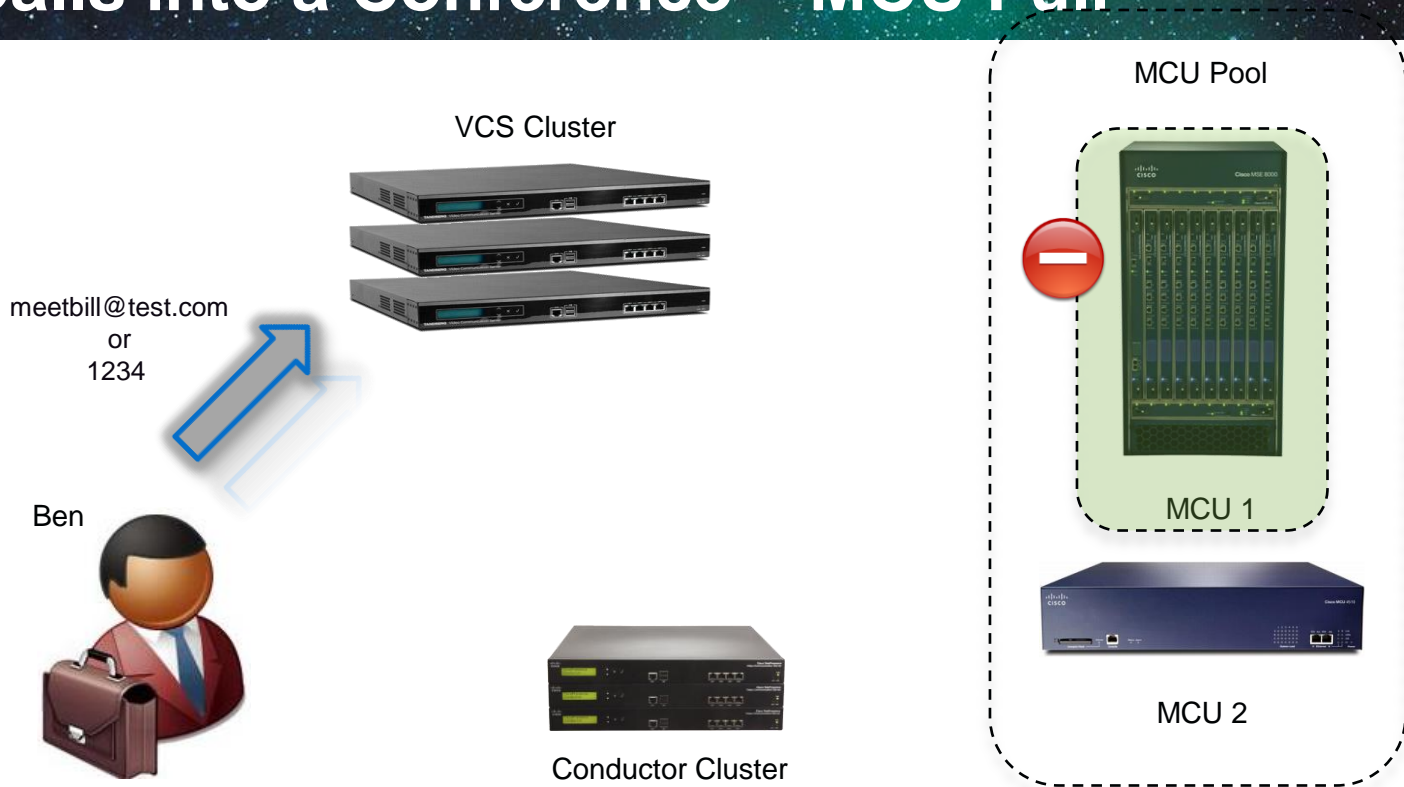
TelePresence Conductor Polls MCU Pool

VCS Cluster

MCU Pool

meetbill@test.com
or
1234

Ben

VCS requests URI

Conductor Cluster

MCU 1

MCU 2

Cisco live!
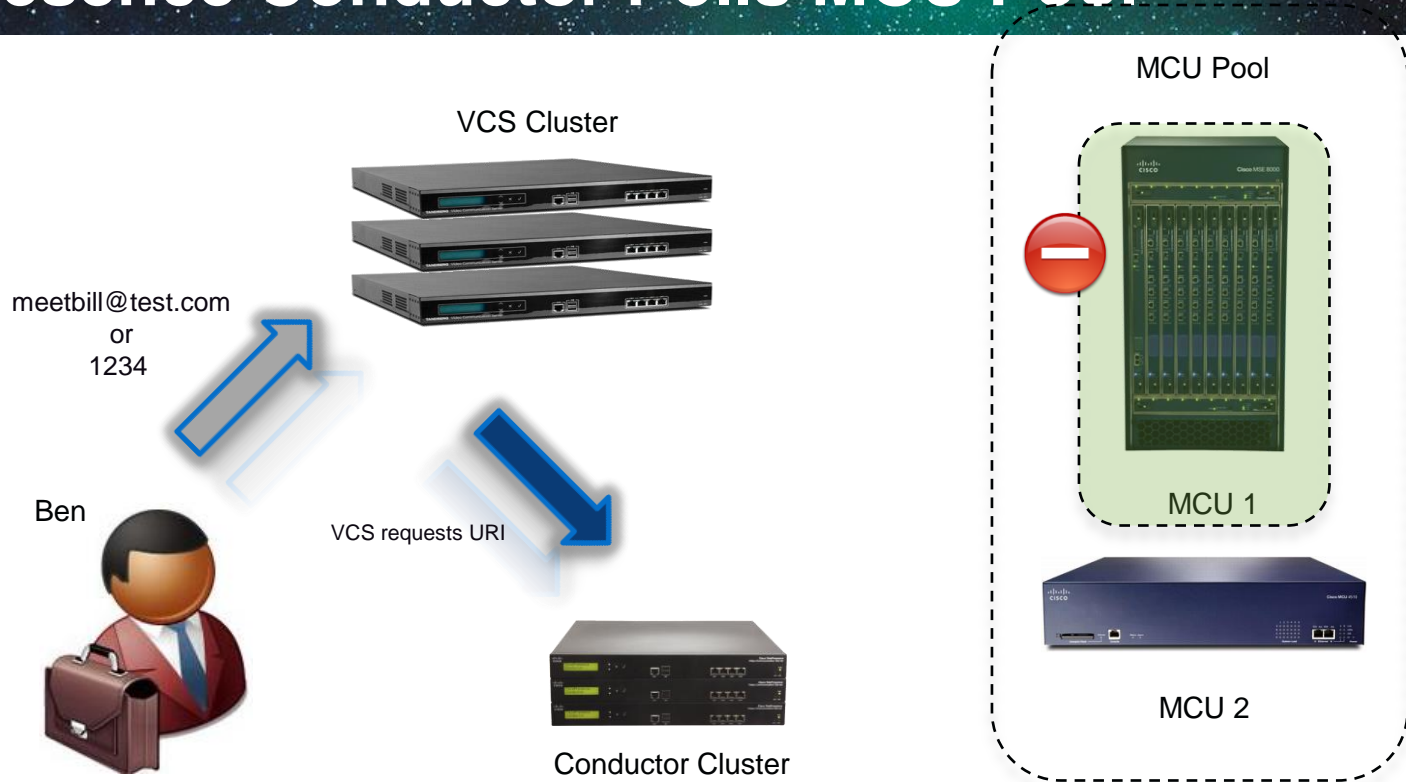
TelePresence Conductor Starts New Conference

VCS Cluster

MCU Pool

meetbill@test.com
or
1234

MCU1
Bill's Conference ID

Ben

TelePresence Conductor
creates a new conference on
the most appropriate MCU
and returns the URI to VCS

MCU 1

MCU 2

Conductor Cluster

Cisco live!

User Connected to the Conference

VCS Cluster

Bill's Conference
On MCU2

meetbill@test.com
or
1234

Ben

Conductor Cluster

MCU Pool

MCU 1

MCU 2
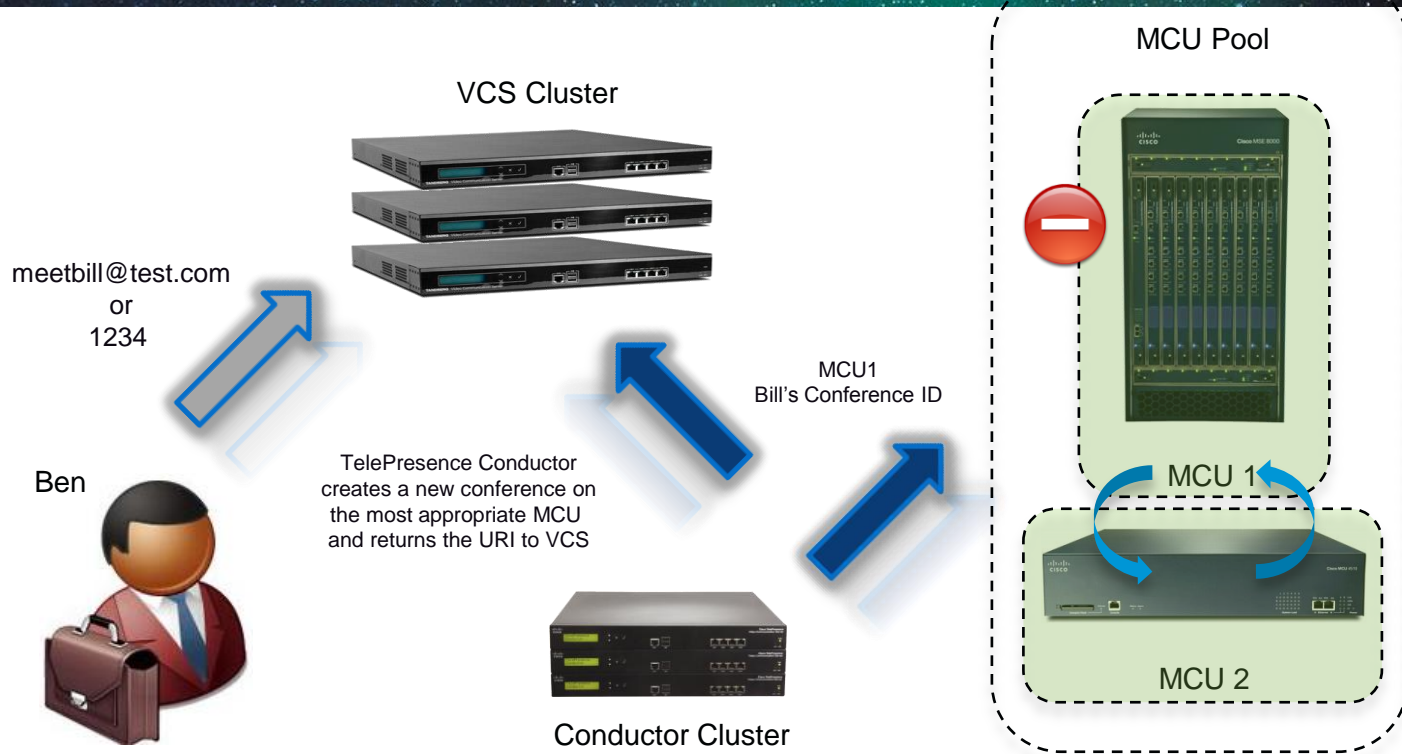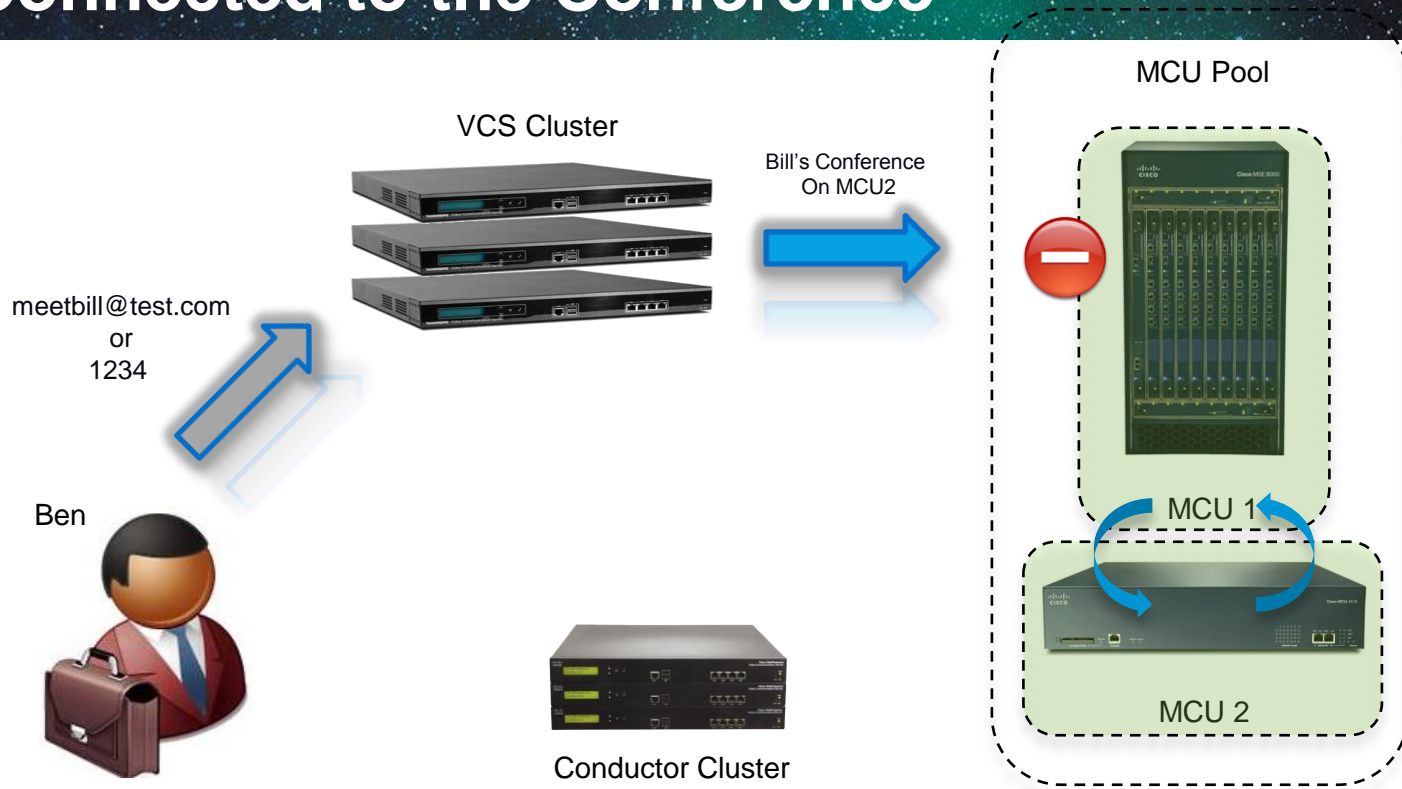
Method of Integration
External Policy Server
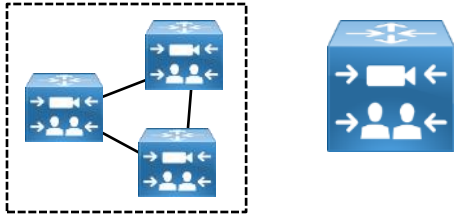
VCS supports 3 types of external policy severs.

1. Registration Policy – to allow or reject registrations

2. Call Policy – to control the allowing, rejecting, or routing of calls

1. User Policy – used for FindMe
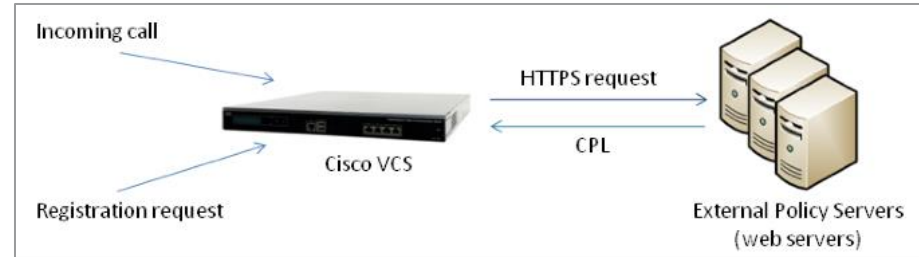
CPL – Call Policy Language

RFC 3380 - http://www.ietf.org/rfc/rfc3880.txt

The Call Processing Language (CPL) is a language that can be used to describe and control Internet telephony services. It is not tied to any particular signalling architecture or protocol; it is anticipated that it will be used with both the Session Initiation Protocol (SIP) and H.323.

CPL is also designed to be easily created and edited by graphical tools. It is based on the Extensible Markup Language (XML)

Supported Integration Designs
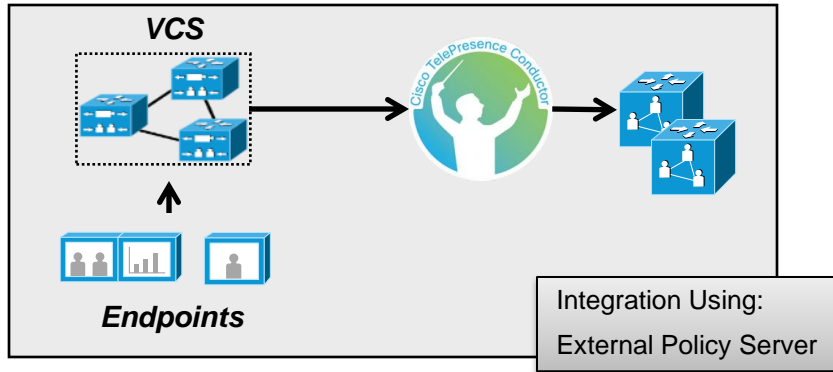
Original integration method

- Conductor is a policy server

- VCS keeps the signalling

- Conductor to Conference Bridge uses XMLRPC over HTTPS

VCS

TelePresence Conductor

Conf. Bridge

Search Rule to Policy service

Bridge conference creation, to bridge from an appropriate pool.

Search Rule (Bridge in Neighbor Zone)
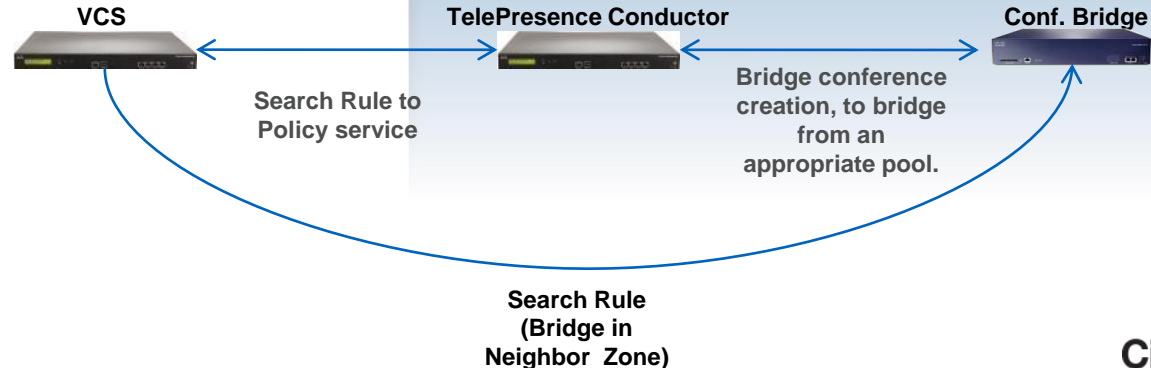
How does Conductor Communicate?

Endpoint

TelePresence Conductor

H.323 traffic

VCS

HTTPS Request
CPL reply

XML RPC over HTTPS

SIP traffic

SIP/H.323 traffic

MCU pool
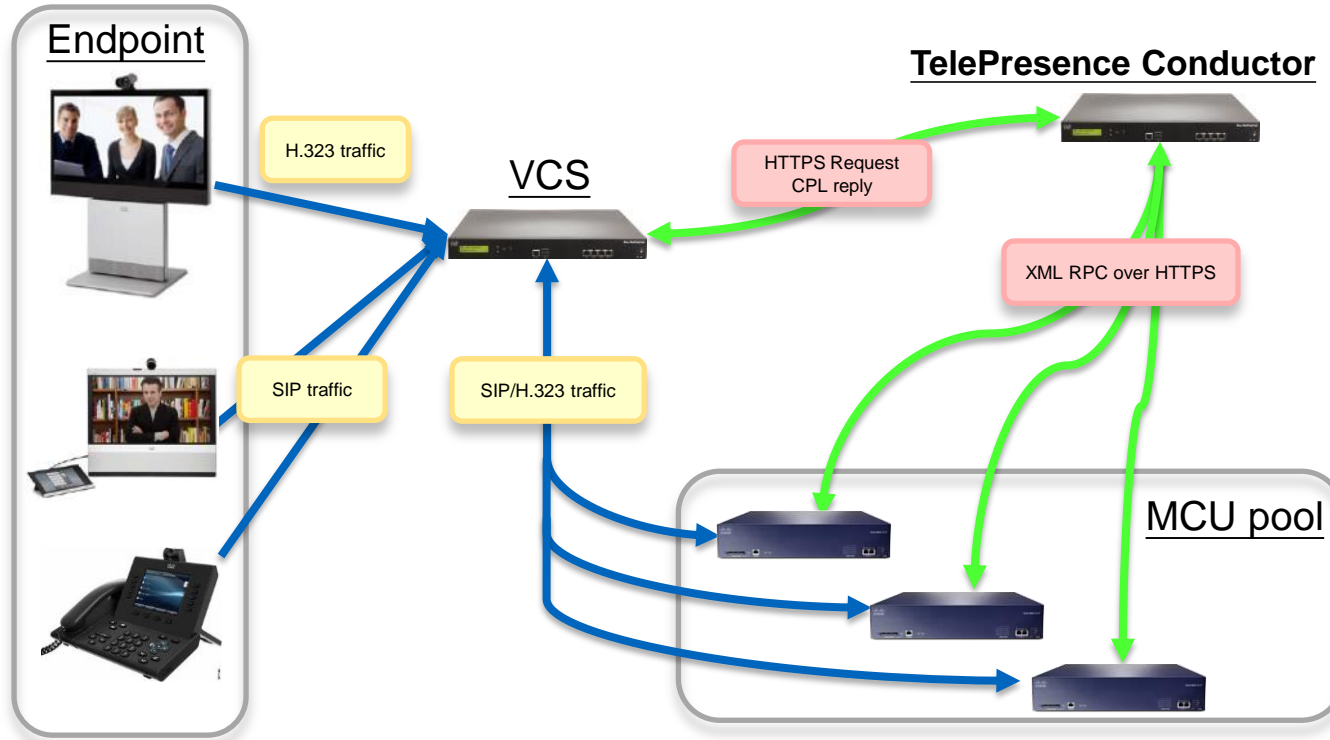
High Level Flow – External Policy Server

VCS

Conductor

Conference Bridge

Incoming call request to 1234

Disconnect

No Match

1. Search Rule match

CPL

2. Alias Match 1234 ?

3. Bridge Ports Available?

HTTPs/XMLRPC

4. Create Conference

5. Conference created with Conductor template parameters

CPL

Prefix and Conf_ID

6. Tell VCS information

7. Second Search rule lookup

Waiting call request to 1234

8. Route call to Conference

9. Add to Conference

Cisco Public

Overall Setup Requirements

Cisco VCS Configuration

① Service Policy - TelePresence Conductor

② Search Rule for Conference Aliases configured on TelePresence Conductor

③ Neighbor zone configuration – MCU

① Search Rule for MCU dial plan prefix

Conductor Configuration

① MCU Pool configuration

② MCU Service Preferences configuration

③ Conference template configuration

④ Conference aliases configuration

⑤ Auto-dialed participants configuration

Cisco MCU Configuration

① H.323 Configuration

② SIP Configuration

③ User account

Note:

http://www.cisco.com/en/US/docs/telepresence/infrastructure/conductor/config_guide/Cisco_TelePresence_Conductor_with_Cisco_VCS_Policy_Service_Deployment_Guide_XC2-2.pdf

VCS Integration Demo Configuration

Clustering

- For resiliency – not redundancy
- Active/Active design
- 3 Conductors in a cluster
- Uses IPSEC communications between peers.
- NTP needs to be configured
- Low latency connections between peers
- Failover does not impact on going calls

Note:

http://www.cisco.com/en/US/docs/telepresence/infrastructure/conductor/config_guide/Cisco_TelePresence_Conductor_Cluster_Creation_and_Maintenance_Deployment_Guide_XC1-2.pdf

 Cisco Public

Geographical Cascade

Tell MCU to Cascade

Dials "allhands.amer"

Dials "allhands.emea"

Automatic cascade
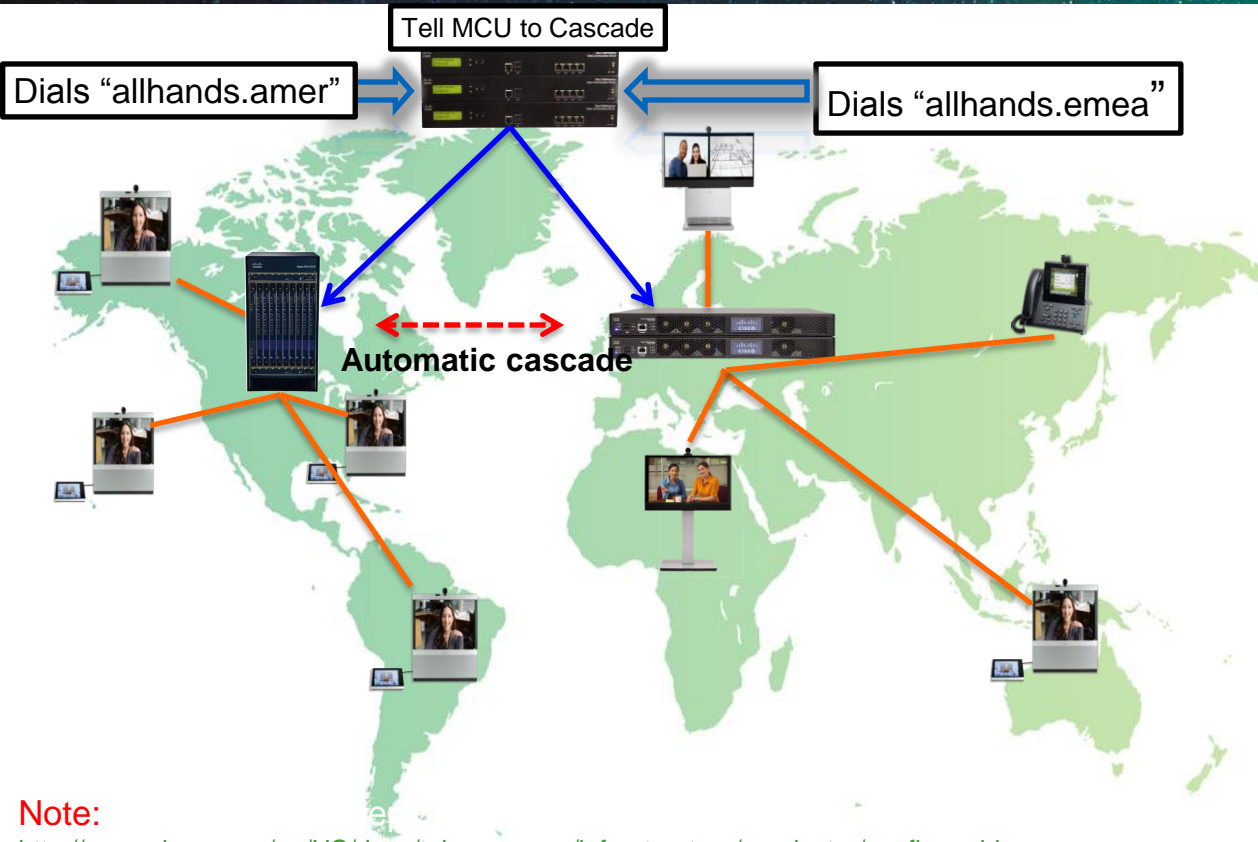
Products:
- Dual VCSs
- Conductor cluster
- Multiple MCUs

Benefit of Conductor:
- XC1.2 release feature
- Keeps traffic local
  - Bandwidth optimisation
- Single cascade link

- Deployment guide available on this design.

Note:
http://www.cisco.com/en/US/docs/telepresence/infrastructure/conductor/config_guide
Cisco_TelePresence_Conductor_Geographic_Cascading_Deployment_Guide_XC1-2.pdf

Multiway Adhoc Conferencing

3-way call established on an MCU intelligently selected by TelePresence Conductor

An incoming call from a third person

Activate MultiWay

Original call on hold
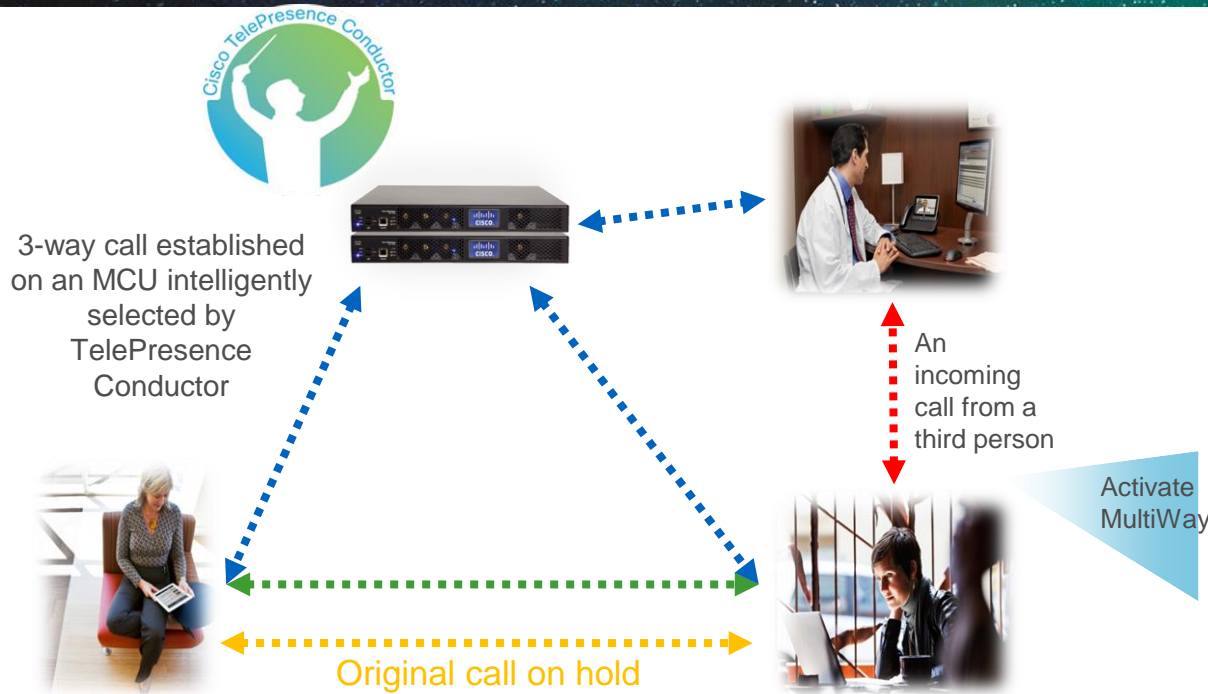
Products:
- VCS
- Conductors
- Cisco MCU

Benefit of Conductor:
- XC1.2 release feature
- Scales Multiway to all adhoc MCUs
- Consistent user experience
- Provides Redundancy

Note:
http://www.cisco.com/en/US/docs/telepresence/infrastructure/vcs/config_guide/Cisco_TelePresence_Multiway_Deployment_Guide_X7_XC1-2.pdf

History of Conductor Releases

Conductor

XC1.1

XC1.2

XC2.0

2011						2012												2013										
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

VCS Integration

MCU supported

Cisco live!
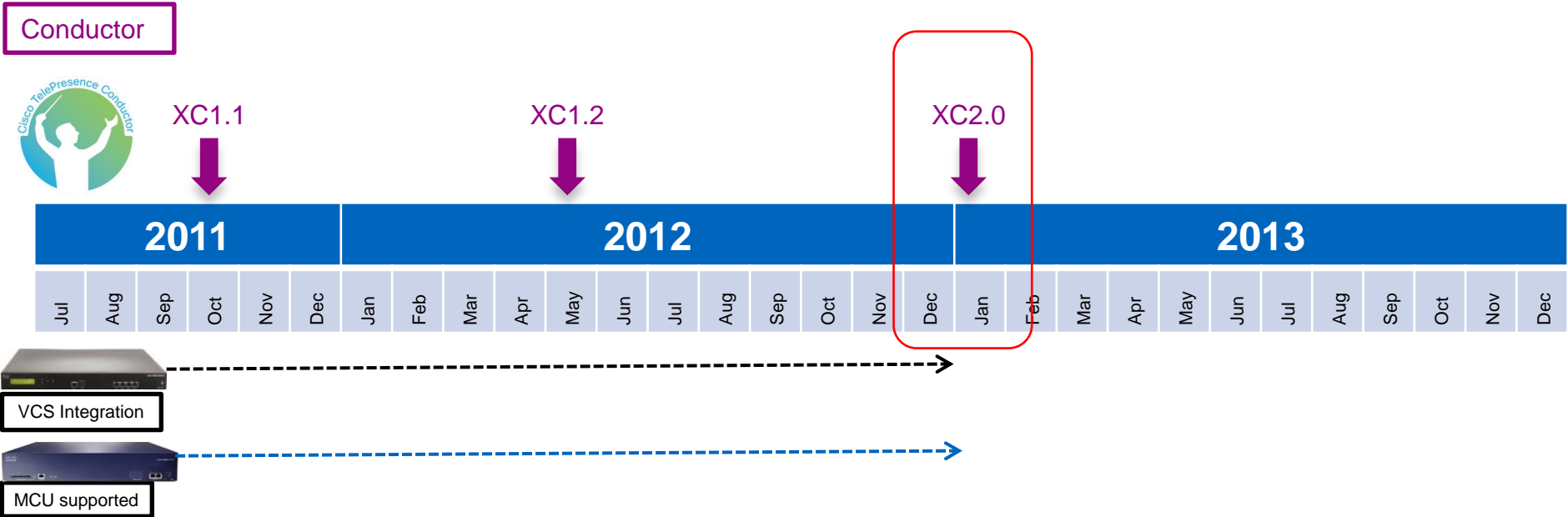
Conferencing
Types of Conferences

- Adhoc Conference
  - Impromptu meetings, they are not scheduled beforehand ,nor require an administrator to initiate them. Suitable for smaller, on-the-fly, meetings. A point-to-point call escalated to a multipoint call is considered adhoc.

- Rendezvous Conference
  - Also called meet-me/permanent/static conferences, requires endpoints to dial in to a pre-determined number. Often used for recurring meetings which involve different endpoints each time.

- Scheduled Conference (discussed later)
  - Provides a guarantee that endpoints and multipoint resources will be available at a certain time. Endpoints join manually or are automatically connected by the multipoint resource.

TelePresence Server (TS)	Cisco Multipoint Control Unit (MCU)
✓ Ad Hoc *	✓ Ad Hoc
✓ Rendezvous	✓ Rendezvous
✓ Scheduled	✓ Scheduled
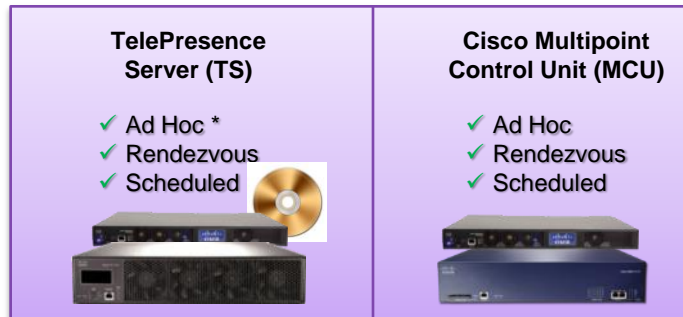
* Requires Conductor

Conductor Connectivity Points

Call Control — NEW

VCS

Conductor with UCM Support in XC2.0

Cisco TelePresence Conductor

Conductor HW or VM

Adhoc Rendezvous

MCU Resource Pool

MCU 4200 Series

MCU 4500 Series

MCU 5300 Series

MSE 8420 SD MCU
MSE 8510 HD MCU

TelePresence Resource Pool — NEW

TelePresence Server (TS 7010 & MSE 8710)
Support in XC2.0 with TS 3.0

Endpoints

Management

Basic Conductor Scheduling Support in TMS14.1.1

Registration
SIP Trunk
XC2.0 or higher

Unified CM

Conference Bridge Connectivity

Requirements

Supports Adhoc and Rendezvous Conferences

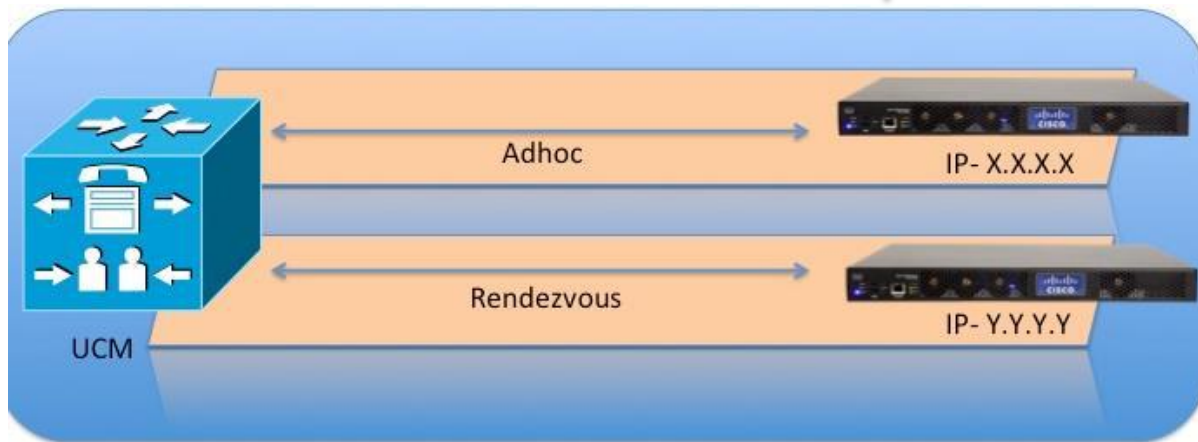Requires UCM 8.6 or higher, UCM 9.0 for encrypted links

MCU version 4.3 or higher

Limitations

Cascading not supported

Cisco Public

Method of Integration
Back to Back User Agent (B2BUA)
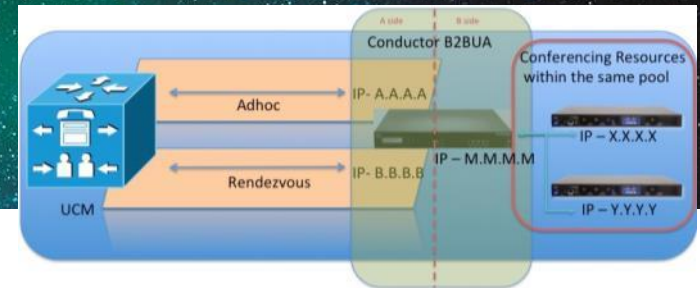
B2BUA – Back to Back User agent

is a logical network element in SIP applications. SIP is a signalling protocol to manage multimedia (VoIP) telephone calls. **A back-to-back user agent operates between both end points of a phone call or communications session and divides the communication channel into two call legs and mediates all SIP signalling between both ends of the call, from call establishment to termination.** As all control messages for each call flow through the B2BUA, a service provider may implement value-added features available during the call.

In the originating call leg the B2BUA acts as a *user agent server* (UAS) and processes the request as a *user agent client* (UAC) to the destination end, handling the signalling between end points back-to-back. A B2BUA maintains complete state for the calls it handles. Each side of a B2BUA operates as a standard SIP network element as specified   RFC 3261
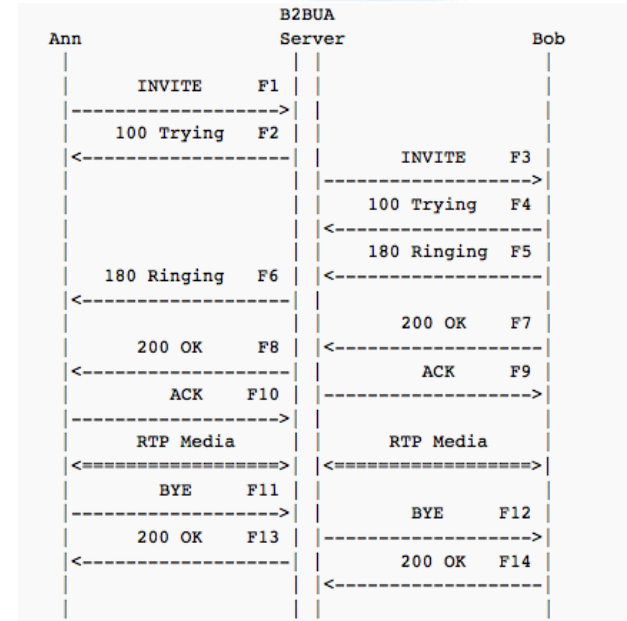
Source: http://en.wikipedia.org/wiki/Back-to-back_user_agent

Conductor and UCM
How does the Model Change?

Added B2BUA in Conductor

Uses Multiple IP addresses

Looks like MCU to UCM
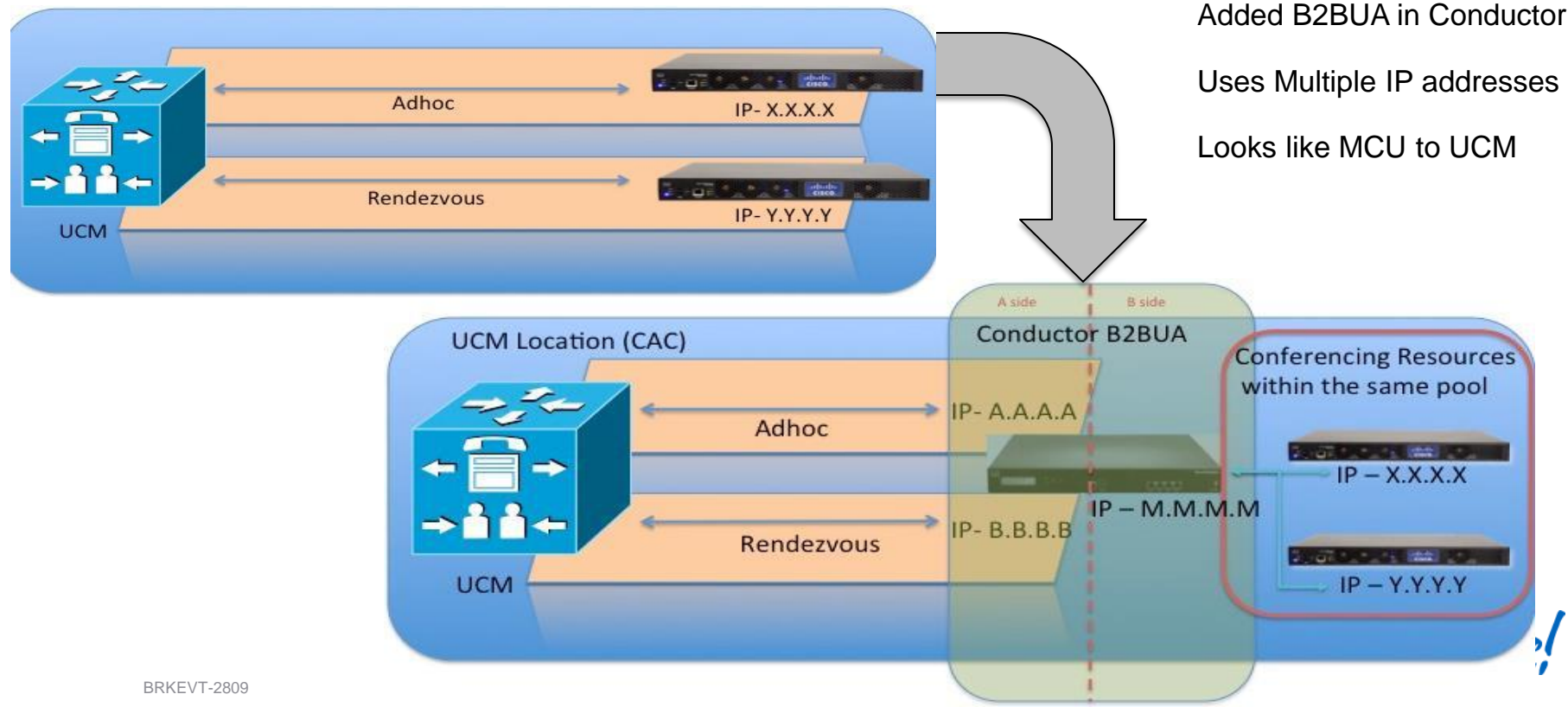
Unified CM Terminology

Media Resource

5310 or 5320

Stack of two 5300s

8510

Media Resource = Conference Bridge

Media Resource Group List

Media Resource Group 1

Media Resource Group 2

Media Resource Group List (MRGL) = Order List of MRGs

Media Resource Group

Media Resource 1 == UK 5320

Media Resource 2 == USA 5310

Media Resource 3 == Japan 5320

Media Resource Group (MRG) = List of Conference Bridges

Media Resource Group List → **Device Pool** →

MRGL are assigned to endpoints using Device Pools

Cisco live!

UCM Adhoc Configuration

1. Add Conference Bridge

MCU Conference Bridge Info

Conference Bridge Type*	Cisco TelePresence MCU
☑ Device is trusted	
Conference Bridge Name*	SJ_Conductor_Adhoc
Destination Address*	10.22.185.142
Description	San Jose Conductor for adhoc calls
Device Pool*	Default
Common Device Configuration	< None >
Location*	San Jose
Use Trusted Relay Point*	Default

Conference Bridges (1 - 2 of 2)

Find Conference Bridges where Name begins with [ ] (Find) (Clear Filter)

Conference Bridge Name*	Description	Device Pool	Status	IP Address
CFB_2	CFB_CUCM147	Default	Registered with 10.22.185.147	10.22.185.147
SJ_Conductor_Adhoc		Default	Registered with 10.22.185.147	10.22.185.142

2. Add Conference Bridge To MRG

Media Resource Group Information

Name*	MRG_San_Jose_Bridges
Description	Conductor controlled bridging resources

Devices for this Group

Available Media Resources**
ANN_2
CFB_2
MOH_2
MTP_2

Selected Media Resources*
SJ_Conductor_Adhoc (CFB)

Media Resource Group List Configuration

💾 Save

Status
ⓘ Status: Ready

Media Resource Group List Status
Media Resource Group List: New

Media Resource Group List Information

Name*	MRGL_San_Jose

Media Resource Groups for this List

Available Media Resource Groups

Selected Media Resource Groups   MRG_San_Jose_Bridges

4. Add MRGL to Device Pool

Device Pool Settings

Device Pool Name*	DP_San_Jose
Cisco Unified Communications Manager Group*	Default
Calling Search Space for Auto-registration	< None >
Adjunct CSS	< None >
Reverted Call Focus Priority	Default
Local Route Group	< None >
Intercompany Media Services Enrolled Group	< None >

Roaming Sensitive Settings

Date/Time Group*	CMLocal
Region*	Default
Media Resource Group List	MRGL_San_Jose
Location	< None >

Conductor
Configuration Concepts
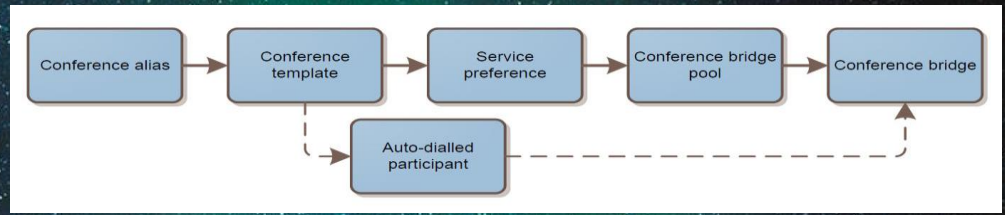
Conductor		UCM
Conf. Alias	≈	Route Pattern
Service Preference	≈	Route List/MRGL
Conf. Bridge Pool	≈	Route Group/MRG
Conf. Bridge	≈	Conference Bridge

Conductor Virtual IP Address

Location

Conference Alias (only needed for rendezvous conferences)

Conference Template

Service Preference (can be used in multiple Conference Templates)

#1 Pool
(can be used in multiple SP's)

TS/MCU	TS/MCU
TS/MCU	TS/MCU

#2 Pool

TS/MCU	TS/MCU

Prioritised

Cisco Public

Conductor

How it Works – Adhoc

8710 TS

Device Pool, MRGL, MRG lookup to select Conductor as a Conference Bridge

Conference Template assigned to .2 applied

172.16.100.20

create.conference command sent to .2

Management: 172.16.100.1
Adhoc: 172.16.100.2
Rendezvous: 172.16.100.3

Conductor creates conference on MCU

Service Preference applied

Prioritised pool selected

MCU from pool is chosen

Request adhoc conference

Endpoints redirected to new conference

Presses Conf softkey

172.16.100.50

SIP   HTTPs   Media
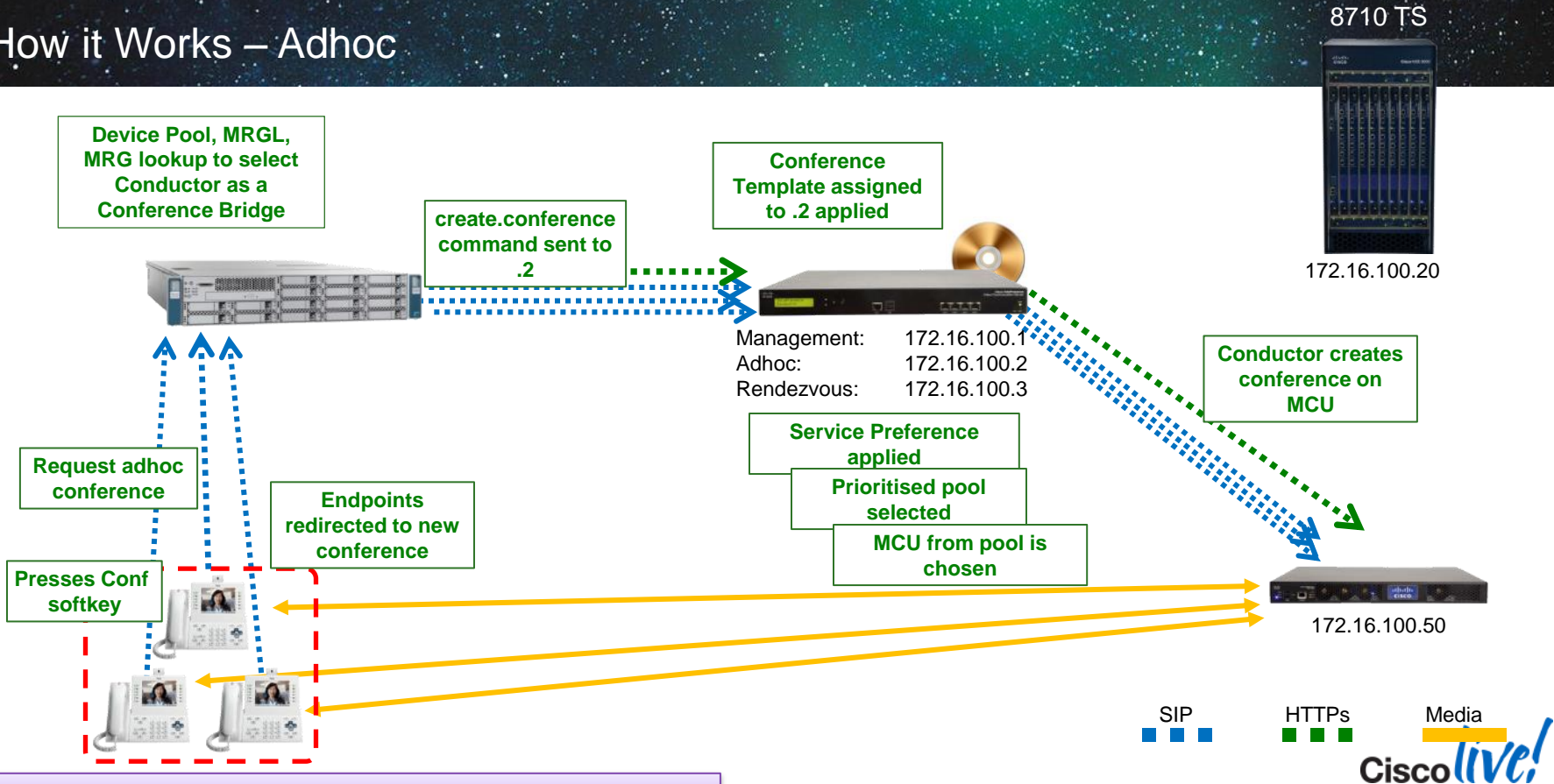
Adhoc UCM Configuration Video

UCM Rendezvous Configuration

3. Add Add Route Groups to Route List

1. Add SIP trunk to the Bridge

Trunk Information

Trunk Type*	SIP Trunk
Device Protocol*	SIP
Trunk Service Type*	None(Default)

Destination

☐ Destination Address is an SRV

| | Destination Address | Destination Address IPv6 | Destination Port | |
| 1* | 10.22.185.139 | | 5060 | ⊕ ⊖ |

MTP Preferred Originating Codec*	711ulaw
Presence Group*	Standard Presence group
SIP Trunk Security Profile*	Non Secure SIP Trunk Profile
Rerouting Calling Search Space	< None >
Out-Of-Dialog Refer Calling Search Space	< None >
SUBSCRIBE Calling Search Space	< None >
SIP Profile*	Standard SIP Profile
DTMF Signaling Method*	No Preference

2. Add trunk to Route Group

Route Group Information

| Route Group Name* | RG_San_Jose_Conductors |
| Distribution Algorithm* | Top Down |

Route Group Member Information

Find Devices to Add to Route Group

Device Name contains		Find
Available Devices**	Trunk_Rendezvous_to_Conductor
	Trunk_Rendezvous_to_Conductor_redundant

| Port(s) | None Available |

Add to Route Group

Route List Information

Registration	Registered with Cisco Unified Communications Manager 10.22.185.147
IP Address	10.22.185.147
☑ Device is trusted	
Name*	RL_Conductor_Rendezvous
Description	For Rendezvous meetings on Conductor
Cisco Unified Communications Manager Group*	Default

☑ Enable this Route List (change effective on Save; no reset required)
☐ Run On All Active Unified CM Nodes

Route List Member Information

| Selected Groups** | RG_San_Jose_Conductors |

Add Route Group

4. Add Route List for this Route Pattern

Pattern Definition

Route Pattern*	5XXX
Route Partition	< None >
Description	5 and 3 digits matched for Rendezvous meetings
Numbering Plan	-- Not Selected --
Route Filter	< None >
MLPP Precedence*	Default
☐ Apply Call Blocking Percentage	
Resource Priority Namespace Network Domain	< None >
Route Class*	Default
Gateway/Route List*	RL_Conductor_Rendezvous

Conductor
How it Works - Rendezvous

8710 TS

Based on endpoint's CSS, CUCM matches a Route Pattern or SIP Route Pattern in an allowed partition

Conductor matches conference alias (might be a generic alias with wildcards)

Conductor creates conference on TS

172.16.100.20

SIP INVITE sent to .3

Management: 172.16.100.1
Adhoc: 172.16.100.2
Rendezvous: 172.16.100.3

Any subsequent calls to that same DN or URI, conductor will direct to the same TS conference

Conference template is applied

Service Preference applied

Prioritised pool selected

TS from pool is chosen

Multiple endpoints dial pre-determined DN or URI

172.16.100.50

SIP   HTTPs   Media

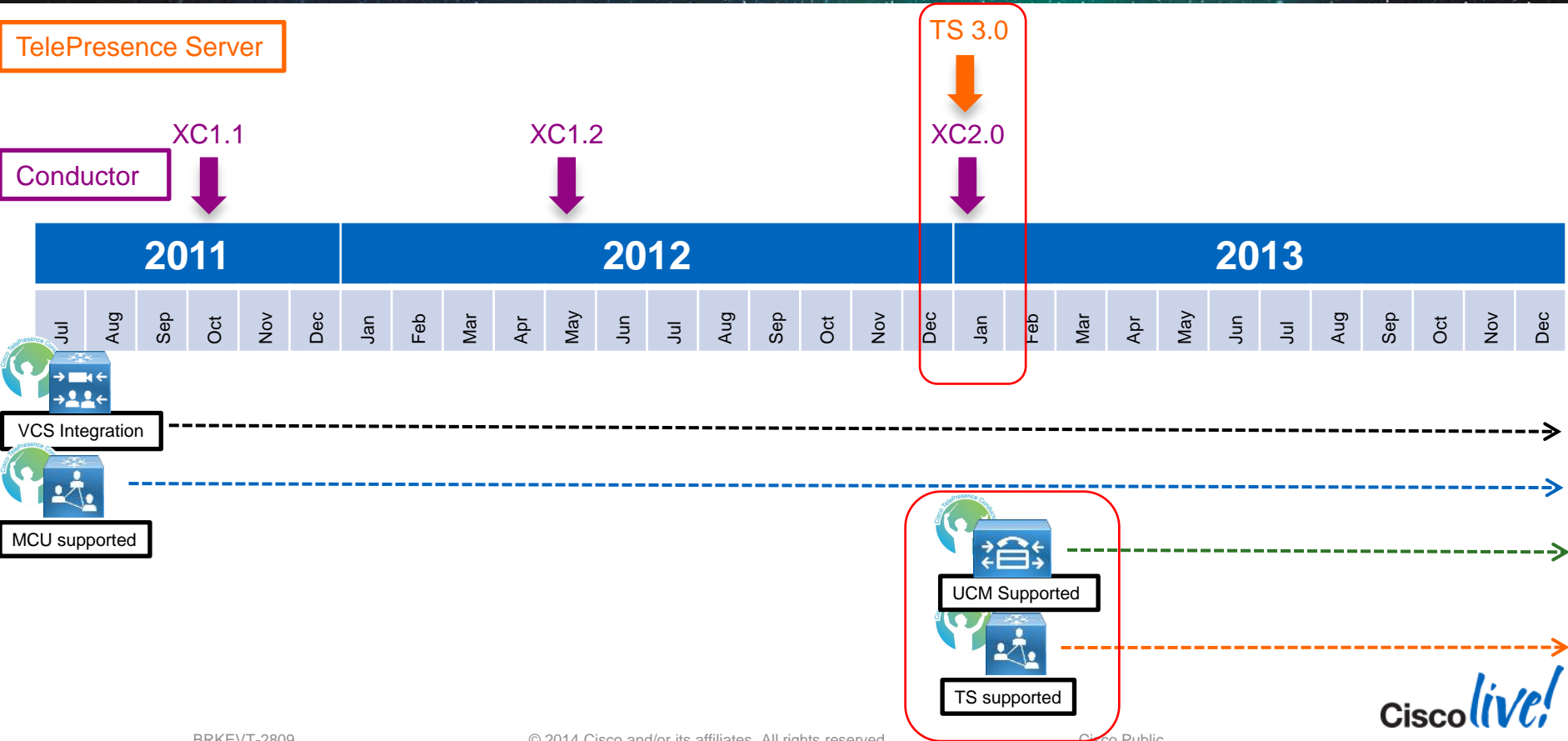**Note:** Conductor can cascade rendezvous conferences with MCUs only.

Rendezvous UCM Configuration Video

History of Conductor Releases

© 2014 Cisco and/or its affiliates. All rights reserved.

Cisco Public

Overview
Clustering, Cascading, and Stacking

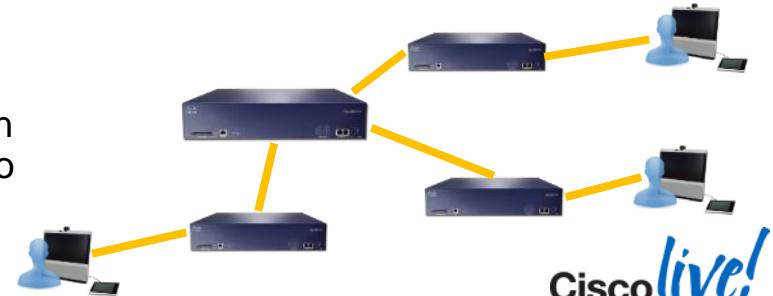| Device	Clustering	Cascading
TelePresence Server	✔*	✘
MCU	✔	✔

- **Clustering**
  - Combining similar multipoint resources into a single conferencing resource who's capacity is the combination of all individual instances

  - **Stacking**: A form of clustering that does not rely on a chassis based architecture (like the MSE 8000). With stacking, two appliance models can be combined in to a single cluster through use of a special "stacking" cable between the two devices. Currently only supported on the Cisco 5300 series MCUs.

- **Cascading**
  - Having two or more separate conferencing resources (can be standalone or clustered resources) call to each other to increase capacity. Cascading more than two resources is accomplished in a hub and spoke architecture.

TelePresence Server
Clustering and Cascading

Clustering

- A group of blades, hosted on the same Cisco TelePresence MSE 8000 chassis, that are linked together to behave as a single unit. The Supervisor MSE 8050 is used to configure and manage clusters.

- Cluster up to **four** 8710s in release 2.2 and later

- Slot 10 of the MSE 8000 **cannot** be used in a cluster but can be a standalone TelePresence Server.

Cascading

- TS is not currently supported. Only the MCU is capable of cascading to like devices.

TelePresence Server Overview

	TelePresence Server
Description	Flagship and lead conferencing bridge of the portfolio
Application	Everyday use on Immersive to single screen systems. Active Presence experience
Quality	Up to Full HD (1080p) for single screen, triple screens, and 3rd party endpoints
Unique Features	TIP, H.323*, and SIP support Optimised Conferencing**
Scalability	Up to 12 Full HD screens Up to 24 HD screens Flexible screens counts with Conductor

Active Presence

* 7010 and 8710

** Requires Conductor

Cisco Public

Conferencing
TelePresence Server Experience

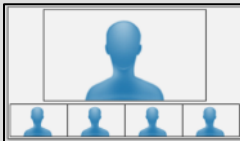**Single screen experience in release 2.3 and later**
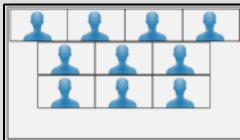
Single
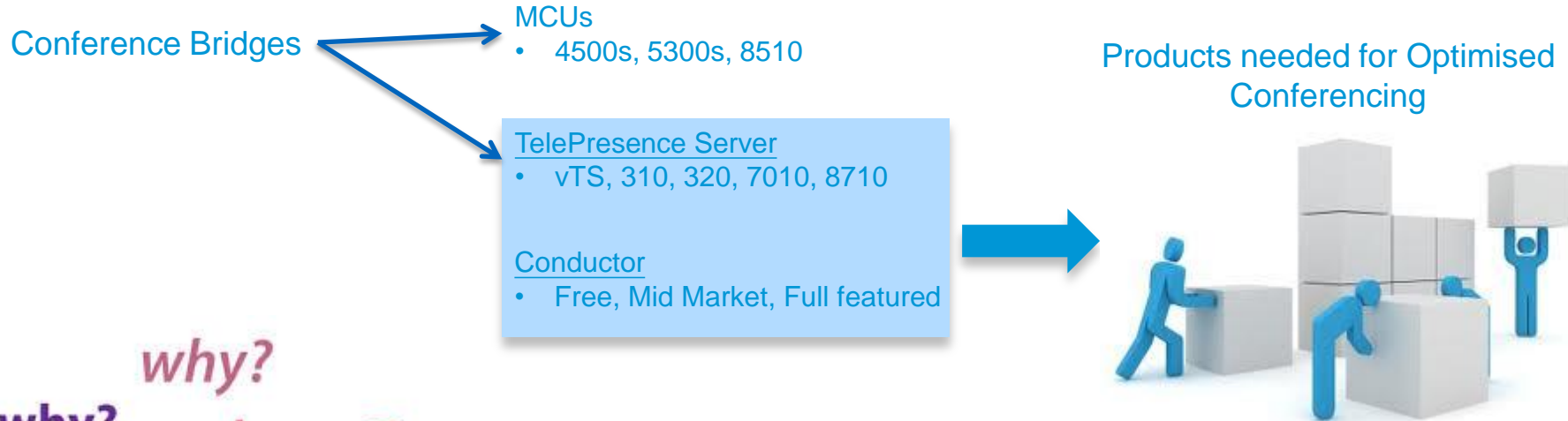
ActivePresence

Prominent

Equal

Multiscreen experience

Optimised Conferencing

What is Optimised Conferencing?

An Element of our Pervasive Conferencing Strategy

Conference Bridges

MCUs
- 4500s, 5300s, 8510

TelePresence Server
- vTS, 310, 320, 7010, 8710

Conductor
- Free, Mid Market, Full featured

Products needed for Optimised Conferencing

why? why? why? why? why?

1. Inline with CTG strategy to develop new innovations in the flagship products.
2. Differentiator between MCU and TS.
3. Allows TS to support conferences of different quality and only utilise the resources required.
4. Allows Conductor to recover unused TS resources and use them to increase the number of callers that are able to use the TS at the same time.
5. Increased scale of our solution.

Cisco live!

Optimised Conferencing

Before Optimised Conferencing

- TS standalone and uses locally managed mode

  - Fixed Configuration of ports

  - Full HD limited to 1080p30/stereo/720p15

  - HD limited to 720p30/stereo/720p5

- Participants are free to connect at resolutions below these maximums at each service level but they will always use one whole resource.

  - ex.: 9971 connection uses Full HD or HD port
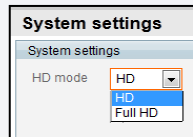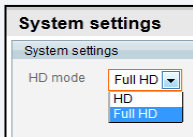
With Optimised Conferencing

- Uses TS remotely managed mode with Conductor

  - Supports conferences of different quality levels on a TS

  - 1080p, 720p, 480p, 360p for main video

  - 1080p and 720p content up to 30fps

  - increased capacity <= 104 participants in a TS conference

- For the first time main video quality modes below 720p are available to participants allowing administrators to provide lower cost and higher scale services.

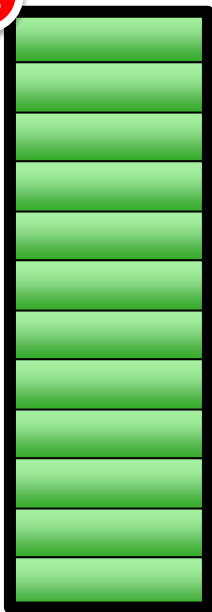- Requires Conductor to orchestrate the resources.

TelePresence Server

- Optimisation of resources

Locally Managed mode

Without Conductor (12)

Once full, additional endpoints cannot join

Operation mode   You are here: ▸ Configuration ▸ Operation mode

ⓘ This system is remotely managed

Operation mode

Operation mode   [Remotely managed ▾]

With Conductor (19)

EXTRA

Full HD (1080p30) 🟩   **SD** (480p30) 🟧

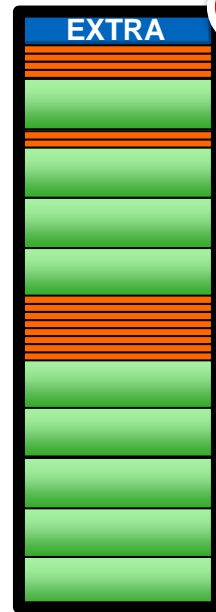Cisco live!
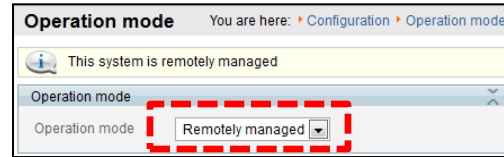
Optimised Conferencing

Optimised Conferencing is a framework for future scaling and is a core element of our Pervasive Conferencing strategy

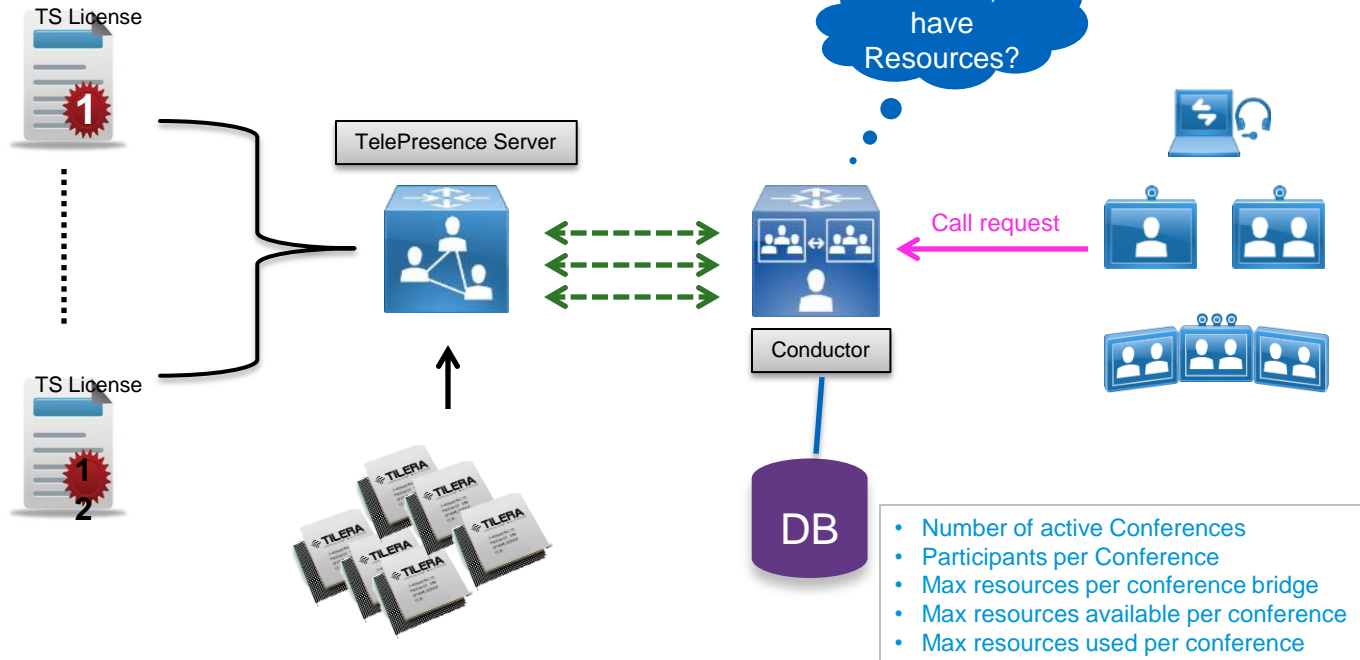Optimisation is based on endpoint maximum capabilities.

- Issue: An EX90 will use a Full HD resource even if connected at 512k in an uncapped 1080p conductor conference.

- Uncapped Conductor Conference – 1080p
  - Optimisation works for 9900 and 8900 series and any audio endpoint.

- Capped Conference – 720p, 480p, 360p
  - Greater number of endpoints affected and greater conference scale.

Overview of Integration

Product Activation Key

TS License

1

TelePresence Server

Allowed, have Resources?

Call request

Conductor

TS License

1

2

DB

- Number of active Conferences
- Participants per Conference
- Max resources per conference bridge
- Max resources available per conference
- Max resources used per conference

Install activation keys
Install Screen license
- Enables resources
Configure Conductor and
   TS communications

Communication Requirements

TS and Conductor

Https + XML/RPC
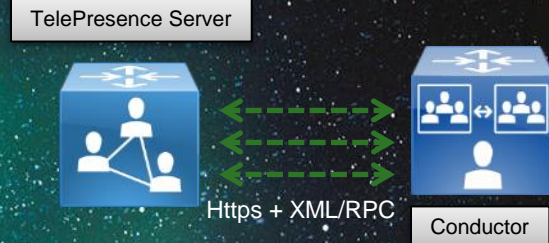
Conductor

Configuration > Operation Mode

- **TelePresence Server**
  - Version 3.0 or higher
  - Must be in Remotely Managed Mode
  - Create user for Conductor

Operation mode

Operation mode		Locally managed
		✓ Remotely managed

Apply changes

User

User ID	conductoradmin
Name	
Password	••••••••••••
Re-enter password	••••••••••••
Access rights	API access ▼

Modify user   Change password

System Information

System host name	ConductorXC2.2 -.145
IPv4 address	10.22.185.145
Hardware up time	3 hours 39 minutes 19 seconds
Product	Cisco TelePresence Conductor
Serial number	0061FEAD
Software version	XC2.2
Software build	303648
Software release date	2013-06-23 16:11
Software ID	s42800
Number of conference bridges	3
Number of active conferences	0

- **Conductor**
  - Version XC2.0 or higher
  - Apply TS user credentials

Protocol	HTTPS ▼ ⓘ
Port	★ 443
Conference bridge username	★ conductoradmin
Conference bridge password	••••••••

Communication Requirements
TS and Conductor
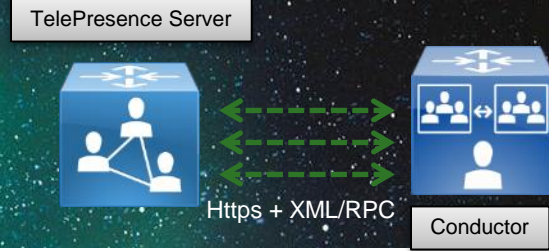
- **Conductor**
  - Use 5061 in bridge configuration
    - Needed to establish communications

- **TelePresence Server**
  - Have the encryption key installed
  - Enable Encrypted SIP (TLS)

TelePresence Conductor Configuration
Conference Templates Configuration

Conference templates

Modify conference template

Name	★ Management Meeting ⓘ
Description	Weekly management meeting ⓘ
Conference type	Meeting ▾ ⓘ
Call Policy mode	Off ▾ ⓘ
Service Preference	★ HD TS ▾ ⓘ Conference bridge type: TelePresence
Limit number of participants	☐ Maximum [____] ⓘ There are 0 auto-diale
Limit the conference duration (minutes)	☐ Maximum [____] ⓘ
Participant quality	Full HD (1080p 30fps / 720 60fps video, multi-channel audio) ▾
Allow multiscreen	No ▾ ⓘ
Optimize resources	Yes ▾ ⓘ
Content quality	Full HD (1080p 30fps / 720p 60fps) ▾ ⓘ
Scheduled conference	No ▾ ⓘ

Maximum Video Quality

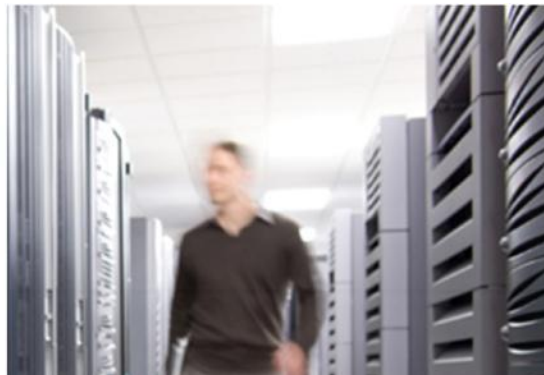- Full HD (1080p 30fps / 720p 60fps video, multi-channel audio)
- HD (720p 30fps video, stereo audio)
- SD (wide 448p 30fps video, mono audio)
- 360p (360p 30 fps video, mono audio)

Reclaim Resources after 5 seconds

Maximum Content Quality

- Full HD (1080p 30fps / 720p 60 fps)
- HD (720p 30fps)
- 1280 x 720p 15fps
- 1280 x 720p 5fps
- Off

Cisco *live!*

Example – Full HD/Uncapped Template

How Does it Work?
Participant Quality – Full HD

Uncapped 1080p Template

Conference Create – w/ 1080p Template parameters

Set per participant maximum resource = 10

Add Mike to Conf_1, max resources = 10

New Call

Call rate – 512K
EP advertises:
– 1080p, 720p, 576p,480p

Mike

Cisco TelePresence Conductor

Conf_1 – setup successful, Mike added

TS

DB

Active Conference - No

Update db, resources used= 10

- Active Conferences - Yes - 1
- Participants per Conference – 1
- Max resources available per conference - Conf_1 : 100*
- Resources used in Conf_1 - **10**
       (10 = 1080p, 7 = 720p, 5 = 480p, 3 = 360p, 1 = audio)
- Optimisation = On

Conference templates

Service Preference	★ HD TS ▾	ⓘ Conference bridge type: TelePresence
Limit number of participants	☐ Maximum [ ]	ⓘ There are 0 auto-diale
Limit the conference duration (minutes)	☐ Maximum [ ]	ⓘ
Participant quality	Full HD (1080p 30fps / 720 60fps video, multi-channel audio) ▾
Allow multiscreen	No ▾ ⓘ
Optimize resources	Yes ▾ ⓘ
Content quality	HD (720p 30fps) ▾ ⓘ

Cisco *live!*

How Does it Work?
Participant Quality – Full HD

Uncapped 1080p Template

Richard

New Call to Conf_1

Call rate – 1MB
EP advertises:
– 1080p, 720p, 576p,480p

Cisco TelePresence Conductor

Add Richard to Conf_1

Max resources for Richard = 10

Conf_1 - updated

TS

DB

Active Conference - Yes

Available Video Resources – Yes , update db resources being used

- Active Conferences - Yes - 1
- Participants per Conference – 2
- Max resources available per conference - Conf_1 : 100*
- Resources used in Conf_1 – **20**
       (10 = 1080p, 7 = 720p, 5 = 480p, 3 = 360p, 1 = audio)
- Optimisation = On

Conference templates

Service Preference	★ HD TS ⬍ ⓘ Conference bridge type: TelePresence
Limit number of participants	☐ Maximum [ ] ⓘ There are 0 auto-diale
Limit the conference duration (minutes)	☐ Maximum [ ] ⓘ
Participant quality	Full HD (1080p 30fps / 720 60fps video, multi-channel audio) ⬍
Allow multiscreen	No ⬍ ⓘ
Optimize resources	Yes ⬍ ⓘ
Content quality	HD (720p 30fps) ⬍ ⓘ

* Resource numbers are examples.

Cisco live!

How Does it Work?

Participant Quality – Full HD

Uncapped 1080p Template

New Call to Conf_1

Call rate – 384K
EP advertises:
– VGA, 360p

Andrew

Cisco TelePresence Conductor

Add Andrew to Conf_1

Max resource for Andrew = 10

Conf_1 - updated

TS

DB

Active Conference - Yes

Available Video Resources – Yes, update db resources being used

- Active Conferences - Yes - 1
- Participants per Conference – 3
- Max resources available per conference - Conf_1 : 100*
- Resources used in Conf_1 – **30**
  (10 = 1080p, 7 = 720p, 5 = 480p, 3 = 360p, 1 = audio)
- Optimisation = On

Conference templates

Service Preference	✱ HD TS ▾ ⓘ Conference bridge type: TelePresence
Limit number of participants	☐ Maximum [ ] ⓘ There are 0 auto-dialle
Limit the conference duration (minutes)	☐ Maximum [ ] ⓘ
Participant quality	Full HD (1080p 30fps / 720 60fps video, multi-channel audio) ▾
Allow multiscreen	No ▾ ⓘ
Optimize resources	Yes ▾ ⓘ
Content quality	HD (720p 30fps) ▾ ⓘ

* Resource numbers are examples

Cisco live!

How Does it Work?
Participant Quality – Full HD

Uncapped 1080p Template

Conference stabilised now time to poll TS

All in Conf_1

Resources used by in Conf_1?

5 sec

Answer = 25

TS

Andrew – 5
Mike – 10
Richard - 10

DB

Active Conference Stabilised - Yes

Update database with response

- Active Conferences - Yes - 1
- Participants per Conference – 3
- Max resources available per conference - Conf_1 : 100*
- Resources used in Conf_1 – **25**
    (10 = 1080p, 7 = 720p, 5 = 480p, 3 = 360p, 1 = audio)
- Optimisation = On

Note: Optimisation happens because Andrew's endpoint advertises VGA as maximum capability.

Conference templates

Service Preference	★ HD TS ⬍ (i)	Conference bridge type: TelePresence
Limit number of participants	☐ Maximum	(i) There are 0 auto-dial
Limit the conference duration (minutes)	☐ Maximum	(i)
Participant quality	Full HD (1080p 30fps / 720 60fps video, multi-channel audio) ⬍	(i)
Allow multiscreen	No ⬍ (i)	
Optimize resources	Yes ⬍ (i)	
Content quality	HD (720p 30fps) ⬍ (i)	

* Resource numbers are examples

Cisco live!

Audio Participant

How Does it Work?
Audio Only Participant

- TS does 104 audio participants?

- Locally managed mode has 10 dedicated audio ports

- Remotely managed mode uses pooled resources.

- **Issue**: Conductor does not support an audio only template. What happens?

Table 2: TelePresence Server conferencing capacity on various platforms

Call type description			Screen licenses required per call	Maximum calls by hardware type (with licenses to pro			
Main video	Audio	Content		7010	Media 310 or MCU 5310	Media 320 or MCU 5320	MSE 8710 MCU MSE
				12 screen licenses	5 screen licenses	10 screen licenses	12 screen licenses
-	Mono	-	1/52	104*	104*	104*	104*

Sip audio call to Conf_2

Add Sip phone to Conf_2

Max resource per participant = 3

Resources used by Conf_2?

Answer = 4

5 sec

DB

Cisco TelePresence Conductor

TS

Active Conference - Yes

Available Video Resources - Yes

SIP Phone – 1
EX90 - 3

Template Options
Full HD (1080p 30fps / 720 60fps video, multi-channel audio)
HD (720p 30fps video, stereo audio)
SD (wide 448p 30fps video, mono audio)
SD (wide 448p 15fps video, mono audio)
✓ 360p (360p 30fps video, mono audio)

Note: The SIP audio phone connects because there is enough video resources.
Optimisation happens because the sip phone advertises no video capabilities.

(10 = 1080p, 7 = 720p, 5 = 480p, 3 = 360p, 1 = audio)

Cisco *live!*

Summary of Optimisation Process

1. TS make the resources available based on licenses installed on it.

2. Conductor learns about the TS resources when the conference bridge is added into Conductor's bridge pool.

3. Conductor sends TS the maximum resources it can use per participant at conference creation.

4. Conductor assumes template level resources will be used and updates it database.

5. Conductor's B2BUA passes the incoming call to TS.

6. TS negotiates with endpoint for call setup, and allocates the resources based on the maximum capabilities of the endpoint.

7. If 5 seconds of conference stability has happened, Conductor polls for the actual conference utilisation.

8. Conductor updates its database tables with optimised resource response values.

Cisco live!

History of Conductor Releases

Cisco Public
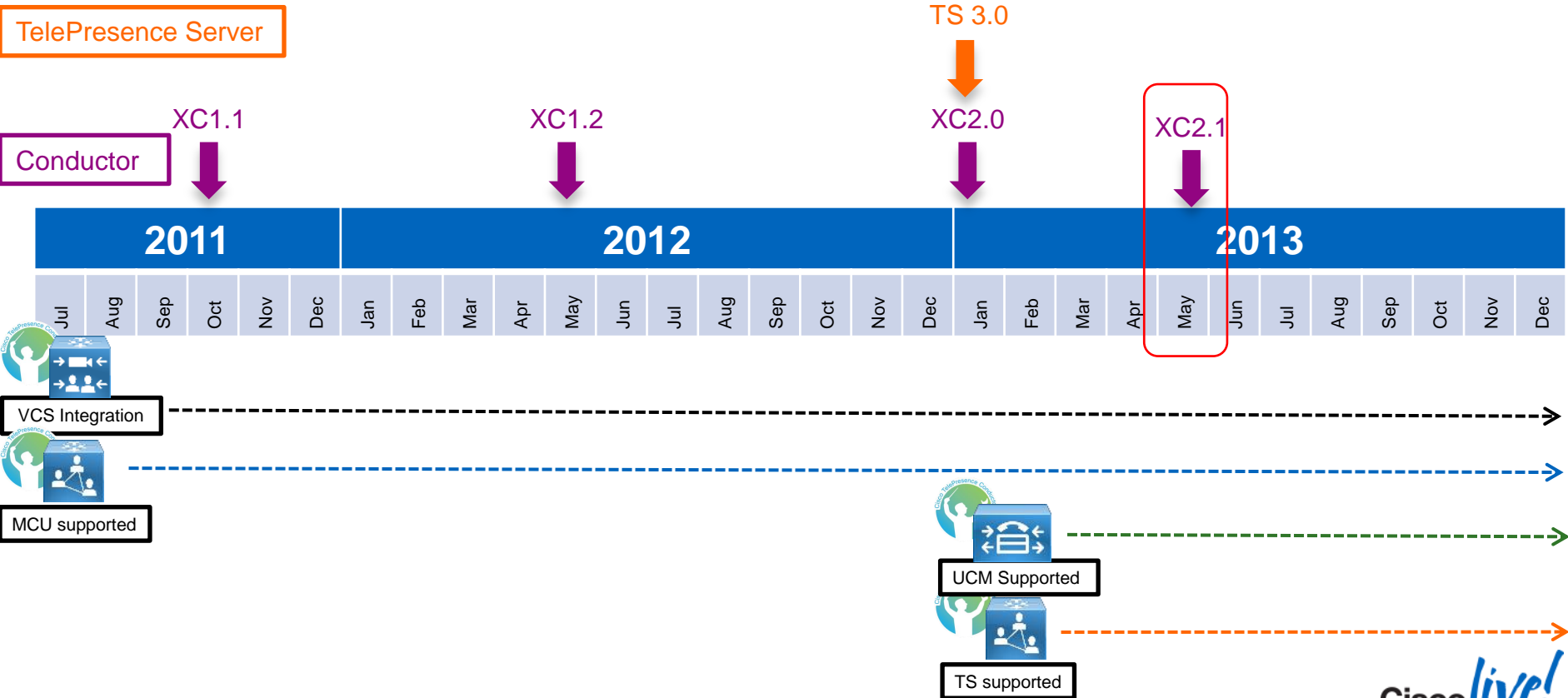
Virtualisation of Cisco TelePresence Conductor?

- Hardware:
  - ✓ Same Hardware platform as Video Communication Server
  - ✓ Serial numbers are different between Conductor and VCS.
  - ✓ **Note:** TelePresence Conductor application will not co-exist with the VCS application

- Software
  - ✓ Same base software platform as Video Communication Server but unique application built on the base software.

  Key point
  - ✓ **Conductor is not a VCS and a VCS is not a Conductor!**

- Software (Full featured VM version)
  - ✓ Available as a Virtual Machine (UCS or Spec based)
  - – Cisco UCS C200 – M2, UCS C210 – M2, or UCS B200 – M2 with:
    - Processor supporting AESNI feature
    - 6GB of RAM per VM
    - 132GB disc space per VM (for a 4GB virtual disc 1 and a 128GB virtual disc 2)
    - R2XX-LBBU (Raid disk battery backup to enable cache)
    - Four hard disks (450GB SAS 15K RPM 3.5in HDD/hot plug/C200 drive sled)
    - PCI card Intel Quad port GbE Controller (E1G44ETG1P20)
  - – VM Host operational and running ESXi 4.1 or ESXi 5.0 Update 1
    - 6GB of RAM per TelePresence Conductor VM
    - 132GB disc space per VM (for a 4GB virtual disc 1 and a 128GB virtual disc 2)
    - 2 Cores reserved per TelePresence Conductor VM; each core >= 2GHz processor

Cisco Public

History of Conductor Releases

© 2014 Cisco and/or its affiliates. All rights reserved. Cisco Public
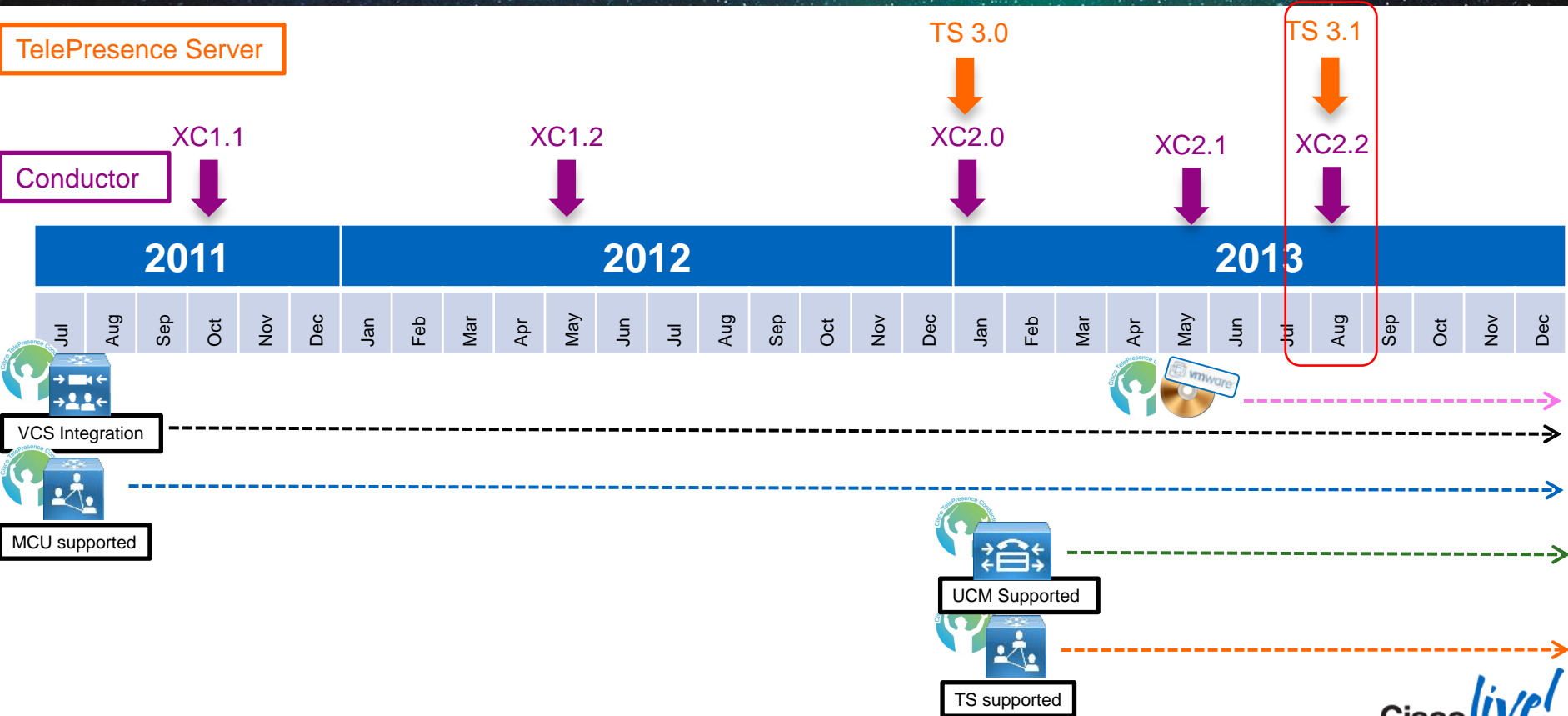
Conferencing

TelePresence Server Platform Form Factors

TelePresence Server on VMware

8-core/16vCPU

8 to 32 ports at 360p30
1 to 4 ports at 1080p30

10-core/20vCPU

6 to 48 ports at 360p30
1 to 6 ports at 1080p30

Appliances

310

8 to 41 ports at 360p30
1 to 5 ports at 1080p30

320

8 to 81 ports at 360p30
1 to 10 ports at 1080p30

**7010**

8 to 97 ports at 720p30
1 to 12 ports at 1080p30

Blade

8710

8 to 97 ports at 360p30
1 to 12 ports at 1080p30

Note: For simplicity only 1080p and 360p are shown. TS is capable of many other resolutions and frame rates with differing limits on capacity.
See release notes for further details.

All numbers represent remotely managed mode capabilities

Cisco live!

Cisco TelePresence Server on Virtual Machine (vTS)

- 20 logical core OVA (10 physical cores = 20 logical cores with hyperthreading enabled)

- 16 logical core OVA (8 physical cores = 16 logical cores with hyperthreading enabled)

- **Dependencies:**
  - ESXi 5.0 (update 1) or 5.1
  - Conductor **XC2.2** or later
  - Unified **CM 8.6(2)** or later
  - VCS **X7.2.2** or later
  - TMS **14.3** or later

- **Spec based:**
  - 2 x Intel Xeon processor E5-2600 series with 2.7GHz or equivalent processor.
  - 48 GB RAM
  - 60+ GB of local or SAN storage with minimum 20millisecond IOPS guaranteed
  - 1 GigE NIC
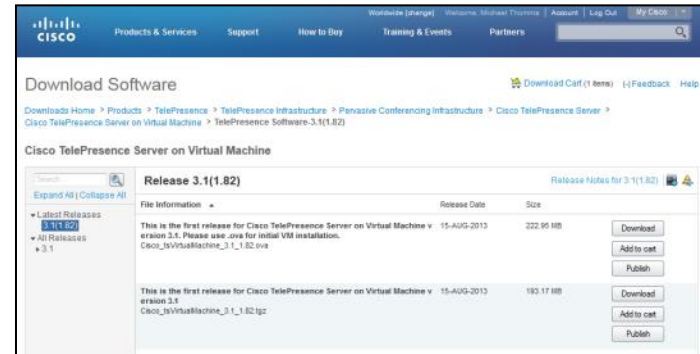
No Oversubscription of resources

Cisco TelePresence Server on Virtual Machine (vTS)

- Capacity of .OVAs

Important

		TS 3.1 (1.80)	TS 3.1 (1.96)	
Availability Date		August - 2013	October- 2013	
Video Resolution	Content	10 core	8 Core	10 Core
360p30	In main video	48	32	48
480p30	In main video	24	16	24
720p30	720p5	12	8	12
1080p30	720p15	6	4	6

Requires Conductor
- Remotely Managed Mode Only

SIP Only
- No Native H.323 Support
- Requires VCS for Interworking

Dedicated resources
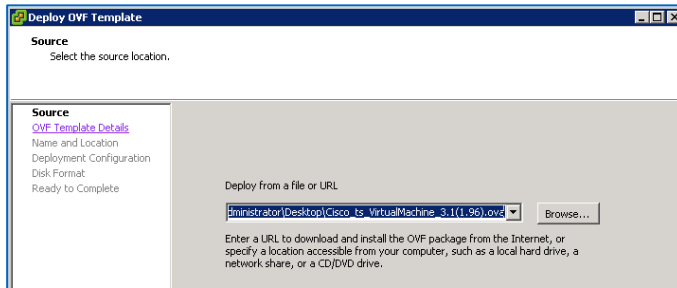- No oversubscription of resources

TelePresence Server
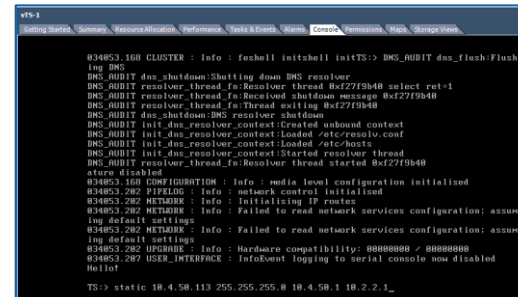## Initial Setup and Configuration – vTS

- Same OVA is used for both 10-core/20 HT cores and 8-core/16 HT variant of vTS
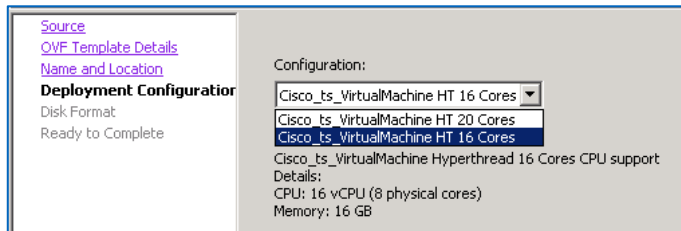
1. Download OVA and deploy on ESXi host

2. Choose number of cores to give vTS

3. Console in to vTS and assign IP
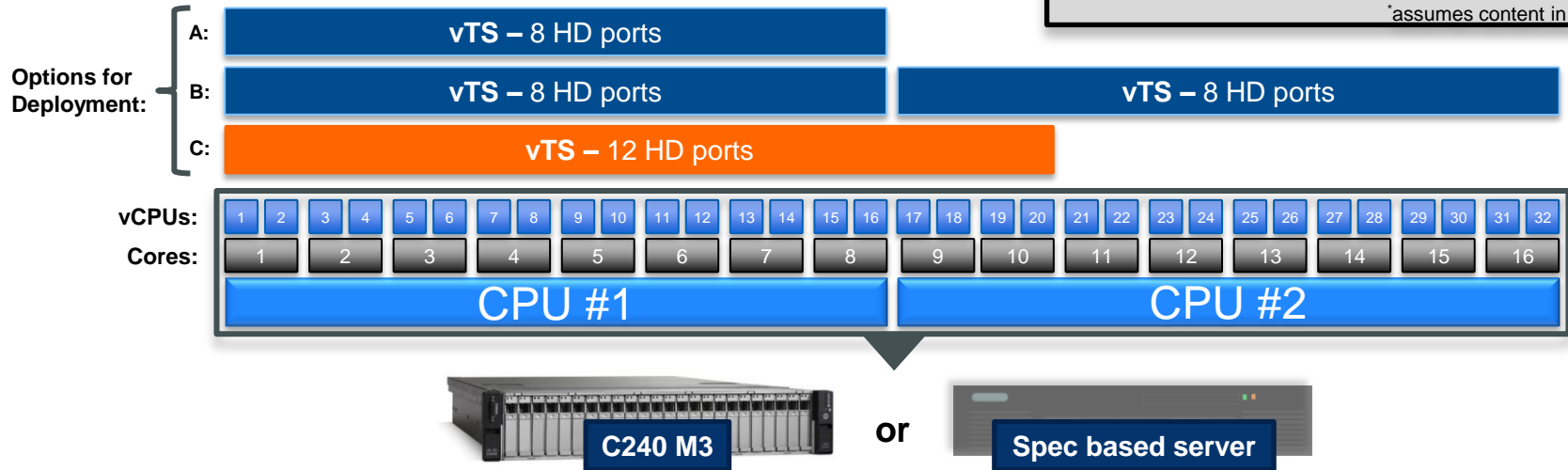

4. Use GUI to configure TS, same as other TS models

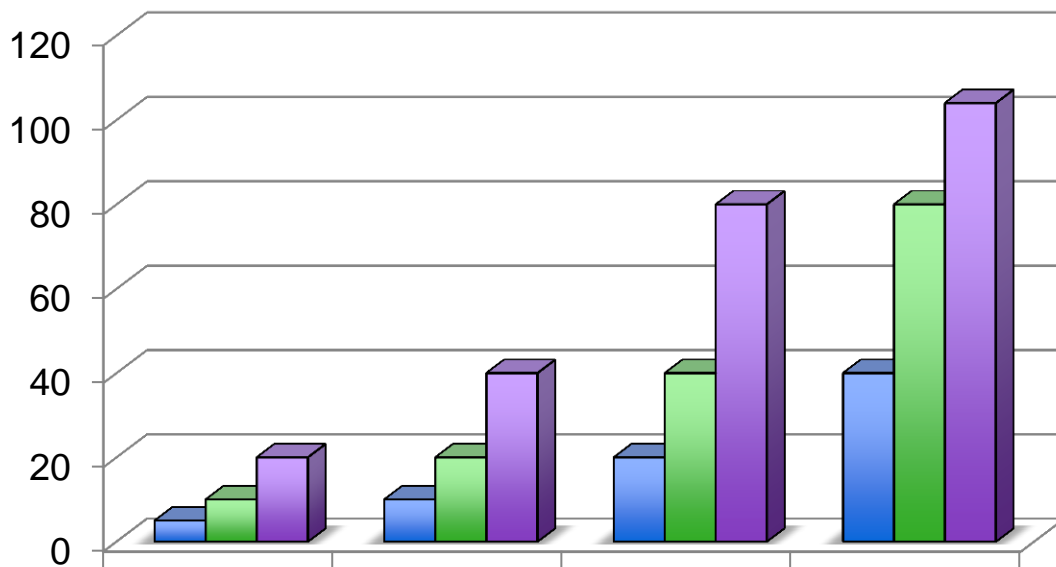Cisco live!

Virtual TelePresence Server

- Two different OVAs:
  - 8-core/16vCPU
  - 10-core/20vCPU

Port Capacity

All port numbers assume the following relationship between main video resolution and total capacity:

1 Full HD = 2 HD = 4 SD[*] = 8 nHD[*] ports

[*]assumes content in main video

Options for Deployment:

A: **vTS –** 8 HD ports

B: **vTS –** 8 HD ports | **vTS –** 8 HD ports

C: **vTS –** 12 HD ports

vCPUs: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Cores: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

CPU #1 | CPU #2

C240 M3 or **Spec based server**

Multiparty Media 300 Series

Legend: ■ 310 ■ 320 ■ 320s Stacked

	Full HD	HD	SD	360p
310	5	10	20	40
320	10	20	40	80
320s Stacked	20	40	80	104

Important

Requires Conductor
- Remotely Managed Mode Only

SIP Only
- No H.323 Support
- Requires VCS for Interworking

104
- is maximum conference limit

Cisco Public

TelePresence Server
Initial Setup and Configuration – 7010, 310/320

- Baud rate: 38400
- Data bits: 8
- Parity: none
- Stop bits:1
- Flow control: none

```
TS-7010:>static <IP address> <netmask> <default gateway address> <DNS server address>
Example:
TS-7010:>static 172.19.236.21 255.255.255.0 172.19.236.1 171.68.10.150
```

Status Network Configuration Conferences

Services

	Port A
TCP service	IPv4
Web	☑ 80
Secure web	☐ 443
Incoming H.323	☑ 1720
SIP (TCP)	☑ 5060
Encrypted SIP (TLS)	☑ 5061
FTP	☑ 21

	Port A
UDP service	IPv4
SIP (UDP)	☑ 5060

Apply changes

Feature management

Feature management

Activated features	**TelePresence Server 7010 activation** (MQV55-YWMHK-X8EKN-972EW)
	Encryption (VX8G5-Y5LJR-T8WKY-C692A) remove
	Third party interop (VXKG5-YRVV0-CWUQY-5A3C0) remove
License keys	**TS screen licenses x 16** (L7Y8H-UTP5A-X11GC-BPDU7-6B8F8)
Activation code	

Update features

Conference status	
Active TelePresence Servers	1
Active conferences	0
Active endpoints	0
Video ports	0 / 12
Audio ports	0 / 10
Content ports	0 / 10

History of Conductor Releases

© 2014 Cisco and/or its affiliates. All rights reserved.

Cisco Public
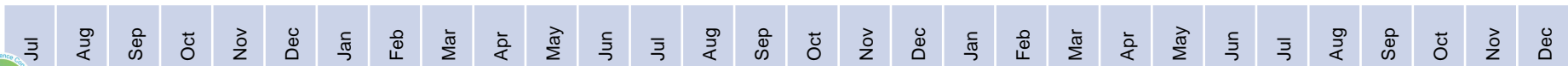
Architectures

How do we put the Pieces Together?

Cisco Public

Conductor Integration Choice?
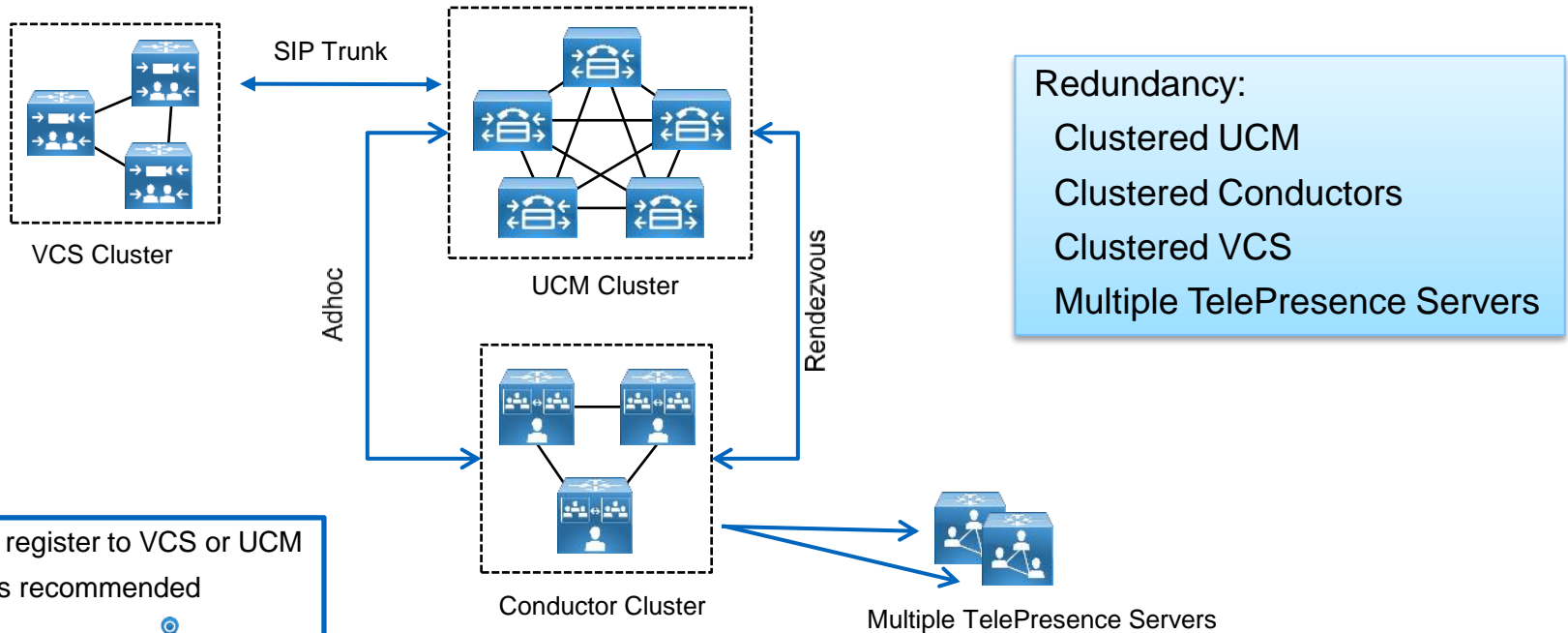
External Policy Server with CPL

- Works with VCS only
  - Conductor version 1.x or higher
  - VCS X7 or higher
- Original Conductor method of deployment
- VCS controls signalling
- Protocol independent
  - Supports H.323 and SIP

B2BUA

- Used in VCS and UCM integration
  - Conductor version 2.x or higher
  - UCM 8.6.2 or higher
- Newer implementation and long term strategy from Cisco
- SIP signalling is passed from Call control device to Conductor
- Better resource utilisation for 3 screen systems – detection versus using template configuration
- Requires an IP addresses for each location on Conductor
- Supports SIP only integration to conference bridges
- Conference bridge is trunked from Conductor

RECOMMENDED

 Cisco Public

Recommended Deployment – Adhoc/Rendezvous

VCS Cluster

SIP Trunk

UCM Cluster

Adhoc

Rendezvous

Conductor Cluster

Multiple TelePresence Servers

Redundancy:
Clustered UCM
Clustered Conductors
Clustered VCS
Multiple TelePresence Servers

Endpoints can register to VCS or UCM
UCM is recommended

Recommended Deployment – Adhoc/Rendezvous

Clustered

Management	10.10.10.10
Adhoc	10.10.10.20
Rendezvous	10.10.10.30

Management	10.10.10.40
Adhoc	10.10.10.50
Rendezvous	10.10.10.60

Adhoc and Rendezvous

TelePresence Servers

Legend:
- Primary Ad Hoc
- Primary Rendezvous
- Secondary Ad Hoc
- Secondary Rendezvous
- Ethernet
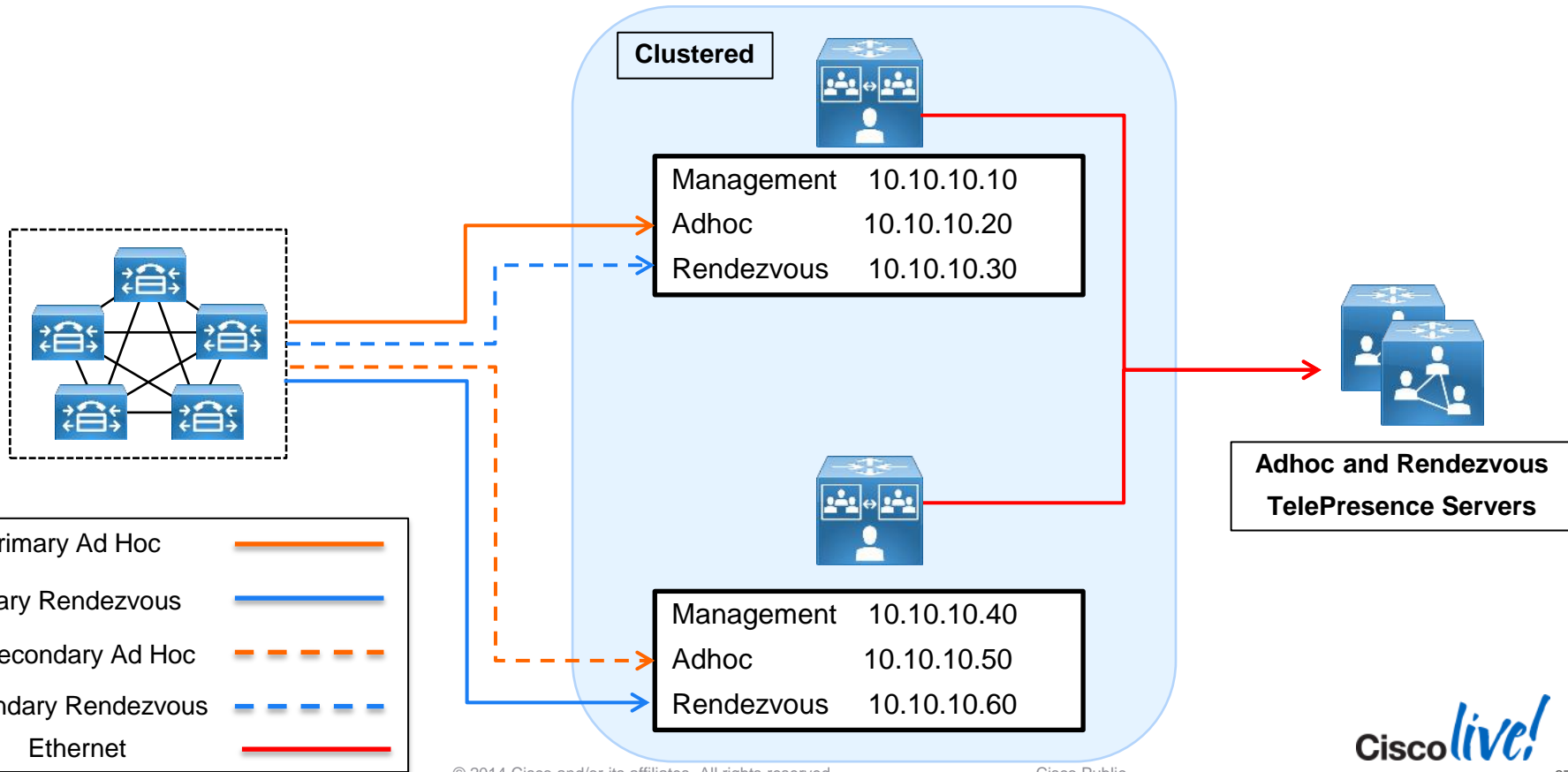
Multiple UCM Clusters and Conductor

- Conductor supports up to 3 in a cluster
- Multiple UCMs connect to the cluster
- Use local resources for adhoc and rendezvous

UCM Milan

Conf Bridge

Sip Trunk

Milan Pool

Conductor Rome

.1 Mgmt

Location Milan

.2 Adhoc

.3 Rendezvous

Location Rome

.4 Adhoc

.5 Rendezvous

Location Naples

.6 Adhoc

.7 Rendezvous

UCM Naples

Conf Bridge

Sip Trunk

Naples Pool

UCM Rome

Conf Bridge

Sip Trunk

Rome Pool

Location Milan uses Milan Pool

Location Rome uses Rome Pool

Location Naples uses Naples Pool

Cisco Public
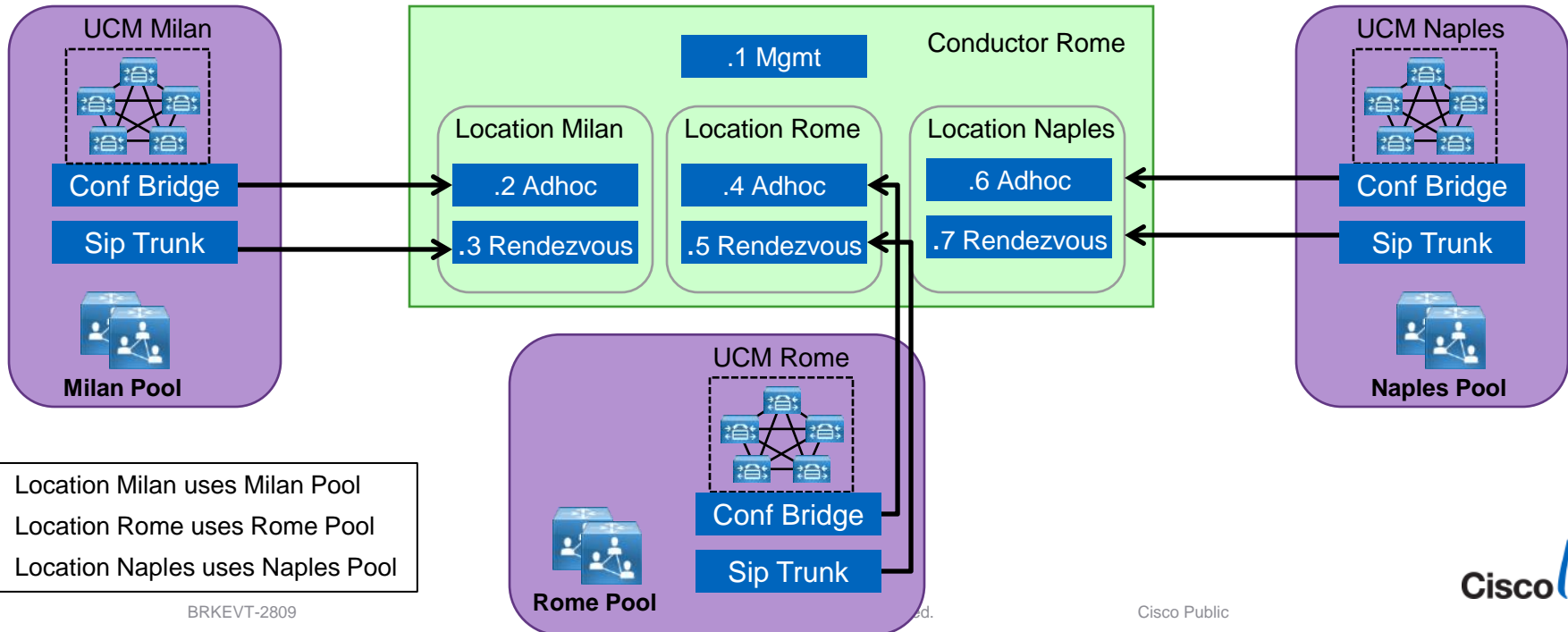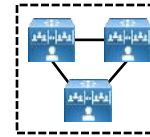
Scheduling

TMS Scheduling
Conference Bridge Support

- **Present version of TMS is 14.3**
  - Supports VCS registered conference bridges (TS and MCU)
    - TMS needs to make sure the conference bridges are registered or it can not schedule against them.
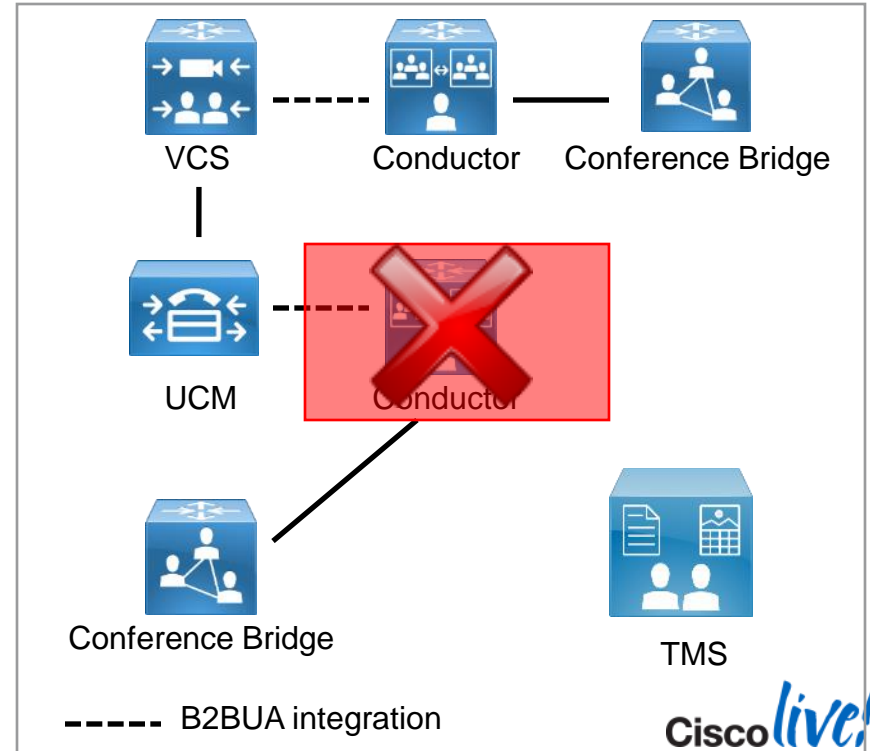 - Does not support UCM registered conference bridges (TS and MCU)

VCS

Conference Bridge

UCM

Conference Bridge

TMS

Cisco Public

Cisco live!
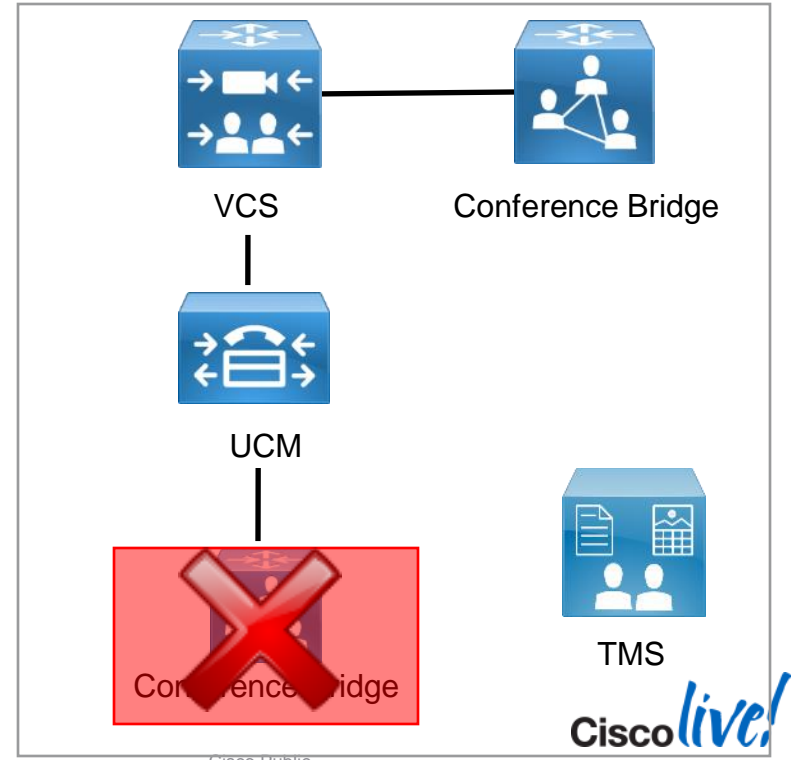
TMS Scheduling | Is possible, but not recommended at this time
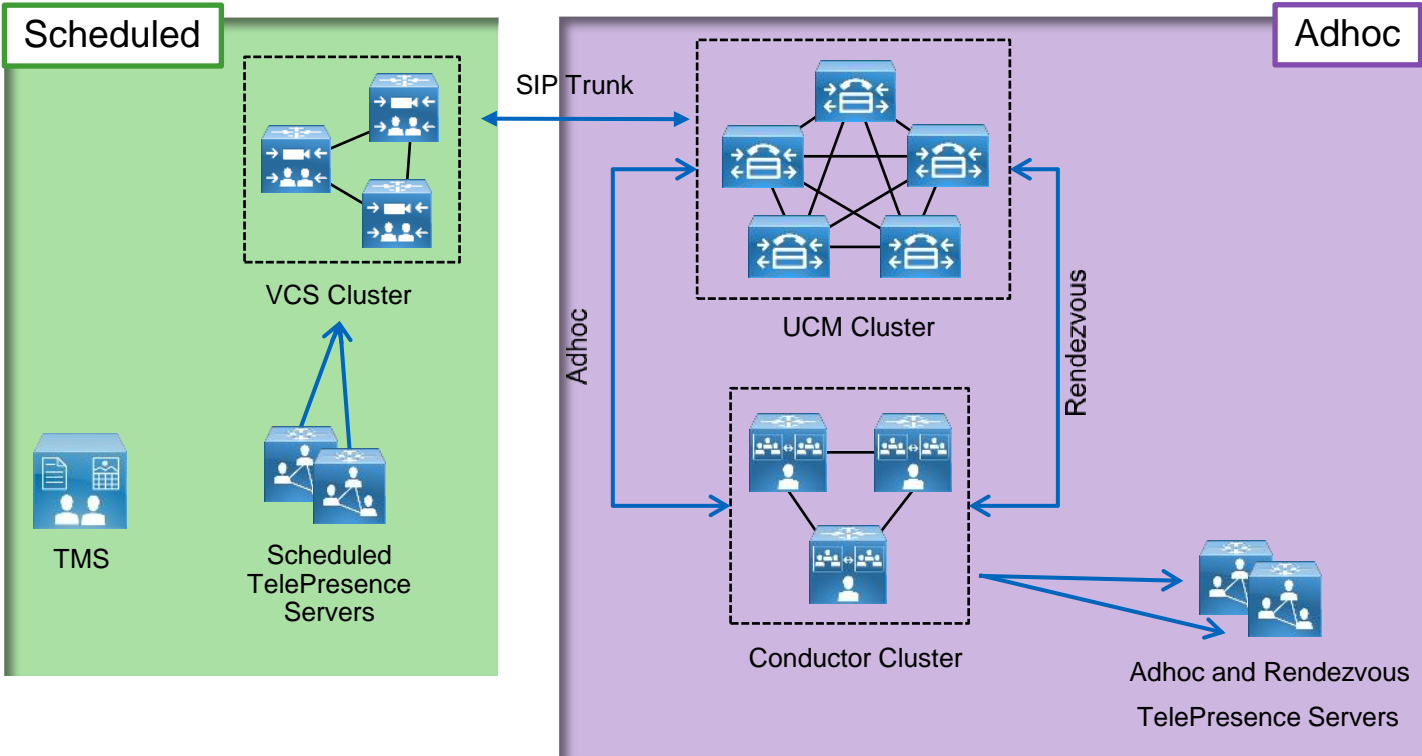
Conductor

- Conductor
  - Requires version XC2.2 and TMS 14.3 or higher
  - Deployment location
    - Inserted between VCS and Bridge (B2BUA)
  - Capabilities with TMS
    - Conductor is a managed device in TMS
    - Can configure booking alias used for scheduled calls
    - Configure a value that TMS uses for "ports" when booking a conference
  - Limitations with TMS
    - Limited configuration support of Conductor in TMS.
    - TMS does not know ports behind Conductor
    - TMS can not guarantee ports available at booking
    - TMS does not enforce Conductor Conference size limits
    - Conference Control Centre (CCC) not as feature rich as directly managed conference bridge

VCS   Conductor   Conference Bridge

UCM   Conductor

Conference Bridge

TMS

- - - - - B2BUA integration

Cisco live!

Recommended Deployment

Adhoc, Rendezvous, and Scheduled

Scheduled

VCS Cluster

TMS

Scheduled
TelePresence
Servers

SIP Trunk

Adhoc

Rendezvous

UCM Cluster

Conductor Cluster

Adhoc

Adhoc and Rendezvous

TelePresence Servers

- TMS schedules conference bridges directly and they are registered to the VCS

- Conductor manages adhoc calls and adhoc conference bridge

- Have separate dedicated scheduled and adhoc conference bridges

Cisco *live!*

History of Conductor Releases

TelePresence Server

TS 3.0
TS 3.1
vTS, TS 310, 320

XC1.1   XC1.2   XC2.0   XC2.1   XC2.2

Conductor

2011	2012	2013
Jul Aug Sep Oct Nov Dec	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
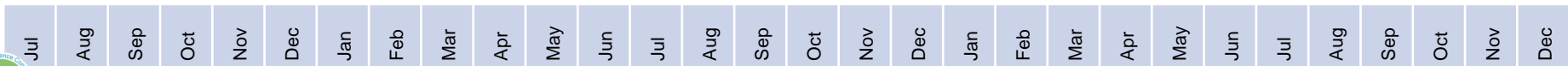
VCS Integration

MCU supported

UCM Supported

TS supported

vTS , TS310/320 supported

Cisco Public

Cisco Video Architecture

	Traditional VCS-Centric	Traditional UCM-Centric	Today	Strategic Direction
Call Control	VCS-C	UCM	UCM	UCM
SIP Registration	VCS-C	UCM	UCM	UCM
H.323 Registration	VCS-C	UCM	VCS-C (for legacy only)	VCS-C (for legacy only)
Conferencing Control	VCS-C	UCM	Conductor for Adhoc & Rendezvous / VCS-C for Scheduled	Conductor
Conferencing Bridge	MCU	CTMS	TS and MCU	TS
Conference Scheduling	TMS	CTS Manager	TMS	TMS
Remote Access	VCS-E	ASA	VCS-E and/or Expressway Series	Expressway Series
Provisioning	TMS	UCM	Prime Collaboration	Prime Collaboration
Management	TMS	UCM	Prime Collaboration	Prime Collaboration

Collaboration Architecture Overview

Key Takeaways

- Conductor
  - Orchestration device for multiparty bridges
  - Virtualised or appliance
  - Integrates with UCM and VCS, UCM is recommended call control
  - B2BUA on Conductor is the recommended deployment method
  - Adhoc and Rendezvous meetings
- TelePresence Server
  - Flagship conferencing multiparty product
  - Virtualised, appliance or blade
  - Optimised Conferencing
- TMS Scheduling
  - Basic Conductor functionality supported but not recommended today.
  - Have dedicated bridges for TMS scheduling and dedicated bridges for Conductor.

Cisco Public

Q & A

Complete Your Online Session Evaluation

Give us your feedback and receive a Cisco Live 2014 Polo Shirt!

Complete your Overall Event Survey and 5 Session Evaluations.

- Directly from your mobile device on the Cisco Live Mobile App
- By visiting the Cisco Live Mobile Site www.ciscoliveaustralia.com/mobile
- Visit any Cisco Live Internet Station located throughout the venue

Polo Shirts can be collected in the World of Solutions on Friday 21 March 12:00pm - 2:00pm

Learn online with Cisco Live!

Visit us online after the conference for full access to session videos and presentations.
www.CiscoLiveAPAC.com

Cisco Public

Cisco *live!*