Tehnologije, ki prihajajo (Cisco Emerging Technologies)

Beno Ceglar

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Bled, 19. marec 2008

Enable Your Network
Empower Your Business

Storage Networking

Content Networking

Security

Virtual Private Networks (VPN)

Core Routing and Switching

Wireless Local Area Networks (WLAN)

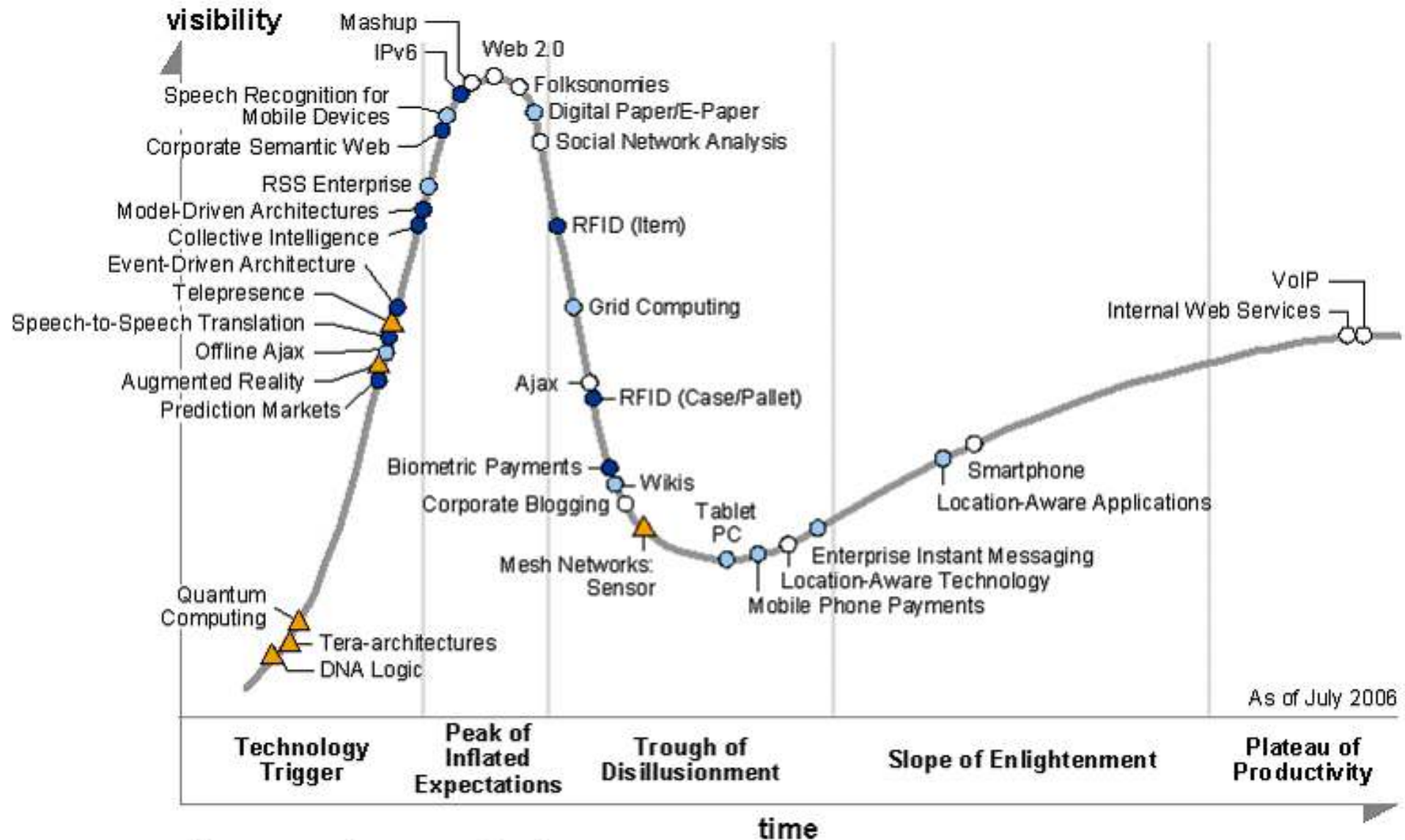**IP Contact Center**

IP Communications

Unity Voice Messaging

Vsebina

- Planiranje in uvajanje novih tehnologij

- Ciscove "Emerging" tehnologije

- TelePresence

- Digital Media System

- IP Interoperability and Collaboration System (IPICS)

Gartner- uvajanje "Emerging" tehnologij - 2006

Cisco: Vodilni tehnološki inovator

- **Več kot $4 milijarde letno namenjeno raziskavam in razvoju (14% prihodkov)**

- **Preko 17.000 razvojnih inženirjev dela na več kot 10 glavnih laboratorijev po celem svetu (vseh laboratorijev ww je okoli 1110)**

- **Več kot 2000 patentov (trenutno 400 inovacij čaka na patent)**

- **Preko 120 akvizicij za hiter vstop na nova tehnološka področja in diverzifikacijo**

Razvoj

Akvizicije

Global Internet
MONTEREY Intelligence in the Optical Core
Selsius Systems
WheelGroup corporation
CLASS Data Systems
ip MOBILE
webline
PIRELLI Optical Systems
jahi Networks

Compatible Systems
MaxComm TECHNOLOGIES INC.
Seagull
WORLDWIDE DATA SYSTEMS
Clarity Wireless

COCOM BROADBAND ACCESS TECHNOLOGY
LIGHTSTREAM
QEYTON SYSTEMS
VBITS
iEng INTERNET ENGINEERING GROUP
TGV
Sentient
NASHOBA NETWORKS

Calista
LIGHTSPEED
PRECEPT SOFTWARE INC.
VOVIDA networks
Cerent
HyNEX
StratumOne
Radiata
LINKSYS

ArrowPoint COMMUNICATIONS
infoGear
PIXStream Video Networking
TransMedia Communications, Inc.
CAIS SOFTWARE SOLUTIONS
fibex systems
SIGHTPATH
PentaCom
PROTEGO NETWORKS

ARDENT COMMUNICATIONS CORPORATION
IPCell
Metaplex
TeleSend
AuroraNetics, Inc.
DAGAZ TECHNOLOGIES
airespace
ExiO Communications Inc EXI

@mteva
Kalpana The EtherSwitch Company
PIPELINKS
TELEBIT

Allegro Systems, Inc.
ALTIGA NETWORKS
GROWTH NETWORKS
NetSpeed
Tazznet
atlantech
NuSpeed
perfigo

Aironet
KOMODO technology, inc.
NEWPORT SYSTEMS SOLUTIONS
summafour
AMERICAN INTERNET
GRAND JUNCTION
nti
BCN Systems, Inc
PARC TECHNOLOGIES

ACTIVE VOICE
GRANITE Systems
NETSYS Technologies, Inc
STRATACOM THE FASTPACKET COMPANY
NAVARRO NETWORKS
CRESCENDO COMMUNICATIONS
JetCell
COMBINET
P-CUBE

Hammerhead Networks
NETIVERSE
SkyStone SYSTEMS CORPORATION

Riverhead networks
PROCKET NETWORKS
andiamo
PSIONIC TECHNOLOGIES
OKENA
meetingplace By Latitude
Twingo Systems
NETSOLVE
dynamicsoft

arroyo
Reactivity
ACTONA TECHNOLOGIES
five across
Greenfield NETWORKS
Meetinghouse Network Access Security
audium
KiSS

TOPSPIN
TIVELLA
MiSecure
orative call.connect.collaborate
METREOS
SyPixx NETWORKS

IntelliShield
FineGround
Nemo The Network Memory Company
SIPURA technology, inc.
Sheer Networks
netsift
VIHANA

neopath NETWORKS
webex
cognio
spanslogic
IRONPORT
Scientific Atlanta
BroadWare

Ciscove "Emerging" tehnologije

- TelePresence

- Digital Media Systems

- IP Interoperability and Collaboration Systems (IPICS)

- IP Video Surveillance

Cisco Enterprise Video Strategy

Delivering an Intelligent, Converged Environment for Video

Desktop Video Streaming	Digital Signage	Cisco TelePresence	Video Surveillance	Infrastructure
12 Billion Streams in 2005	Market Size Estimated at $2B+ by 2010	Next-Gen Collaboration $4 to $5 in Network Upgrades for Every $1 Spent on TelePresence	$1282M Market Size by 2009	Optimized Network Infrastructure for Video Delivery

The Platform for the Human Network

Cisco

Cisco Enterprise Video

- Entered four new emerging markets
- Markets include:
    Desktop video
    Digital signage
    IP video surveillance
    Cisco TelePresence
- Leverage IP network as a platform

Cisco TelePresence
Redefining How People Communicate

Cisco TelePresence
Redefining How People Communicate

A New and Innovative Philosophy
The Cisco TelePresence Meeting

Why TelePresence?

- More than 60% of communication is non-verbal

- Existing collaborative technologies don't adequately replace a face-to-face meeting experience

Cisco TelePresence Design Principles

- Experience the meeting, not the technology

- Life size, high-definition, eye contact, discern body language

- Natural, multi-channel, full-duplex, spatial audio

Cisco Built from the Ground Up!

- It's all about the Experience

- 25 Patents: Video, Audio, Network Integration, User Experience

- Innovative, fully integrated system – leverage Unified Communications and the Network as the Platform

Displays   **Microphones**   **Environmentals**

Camera   **Codec**   **Furniture**

Cisco TelePresence
A Complete End-to-End Solution

Cisco TelePresence Solution

TelePresence Systems
- Group and Executive
- Auto Collaborate Peripherals
- Integrated voice and data

Multipoint Collaboration
- Multipoint Switching
- Unified Conferencing
- MeetingPlace / Webex integration

Management & Scheduling
- Cisco TelePresence System Manager
- Unified Operations Manager
- Remote Operate Services

Network as the Platform
- Cisco TelePresence B2B Connectivity
- Quality of Service
- NAT / Firewall Traversal

Cisco TelePresence eXperience
- Room and Network Readiness assessments
- Planning and design services
- CTX Verification

Cisco TelePresence
CTS-3000

- 12 participants at the virtual table

- Native 1080p cameras and 65" plasma displays

- Wideband microphones and speakers

- Cisco Unified IP Phone 7970G

- Auto-Collaborate

- Audio Add-In

Cisco TelePresence
CTS-1000

- 4 participants at the virtual table

- Native 1080p camera and 65" plasma display

- Wideband microphone and speaker

- Cisco Unified IP Phone 7970G

- Auto Collaborate

- Audio Add-In

Cisco TelePresence
Codec

- Runs embedded Linux on compact flash

- Leverages Cisco Unified Communications Manager

- Built on open standards
  - CDP and 802.1Q for VLAN assignment
  - 802.1p and DSCP for QoS
  - HTTP configuration and firmware downloads
  - SSH, HTTPs, and SNMPv2/3 for administration
  - SIP signaling
  - Video: H.264 @ 1080p or 720p
  - Audio: AAC-LD and G.711
  - XML for making/terminating scheduled and ad hoc calls
- Auto Collaboration for data sharing
- Audio Add-In for audio only participants

Cisco TelePresence
Primary Codec Connections

Center
Left
Right
Auxilliary
Left Codec
Right Codec
Document Camera In
Line in (from laptop)
Microphone
Speaker
Camera
IP Phone
To network
Display
Projector Out (CTS-3000) or LCD Out (CTS-1000)
DVI In (from laptop)
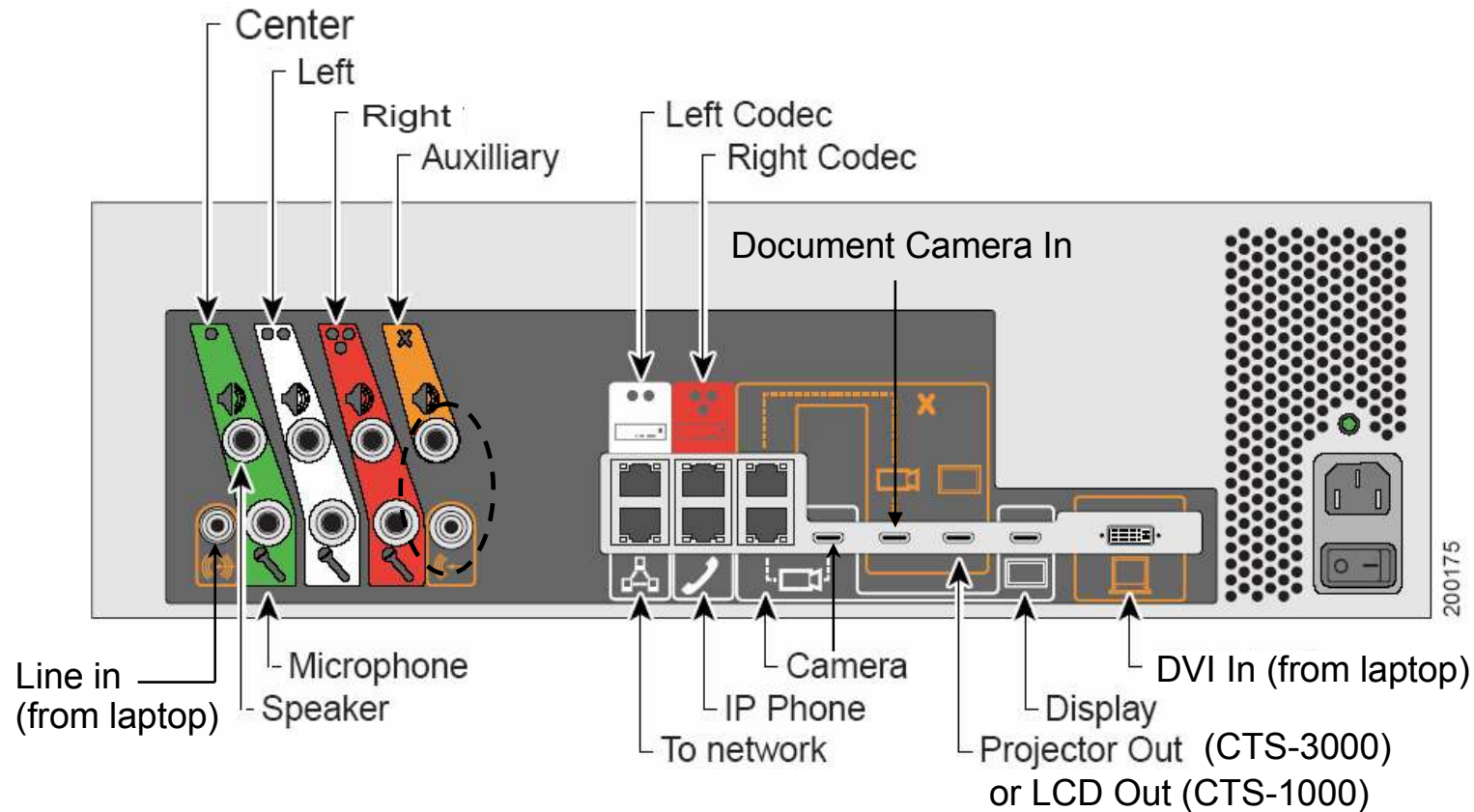
Cisco TelePresence
Video

- Cameras

  Native 1080p resolution

  Small form factor

  Clustered design for enhanced eye contact

  Purpose built by Cisco – managed by the CTS codec

- Displays

  65" Plasma technology

  Native 1080p resolution

  Life size - two people per screen

  Purpose built by Cisco – managed by the CTS codec

Cisco TelePresence
Audio

- Microphones

  Discrete audio by table segment

  Multi-channel spatial audio with echo cancellation

  AAC-LD audio codec

  G.711 for audio add-in

  4 audio channels per system

  Cell phone (GSM/GRPS) static elimination

- Speakers

  Designed to properly reproduce human speech

  Mounted under each 65" plasma display to provide the feeling that the sound is emanating from the person speaking (spatiality)

Cisco TelePresence
User Interface

- Cisco Unified IP Phone 7970G provided as part of system

- Provides the user interface to the CTS – touch screen

XML
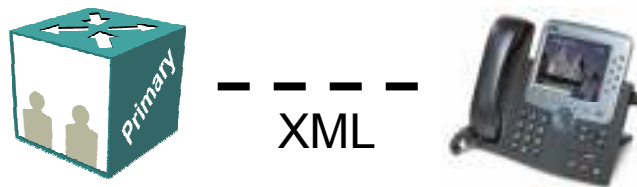
- Features:

    Ad hoc (manual) calls

    System speed dials

    "One Button to Push" call launch for scheduled meetings

    Conference/Join used to add audio participants to a TelePresence meeting (a.k.a. Audio Add-In)

Cisco TelePresence
Audio Add-in

Audio Add-in

- Audio add-in allows any CTS endpoint to add an audio only participant or audio bridge into a TelePresence meeting

- Envoked using Conf/Join softkey on 7970G IP Phone

- Uses 4th (auxiliary) audio channel using G.711 codec
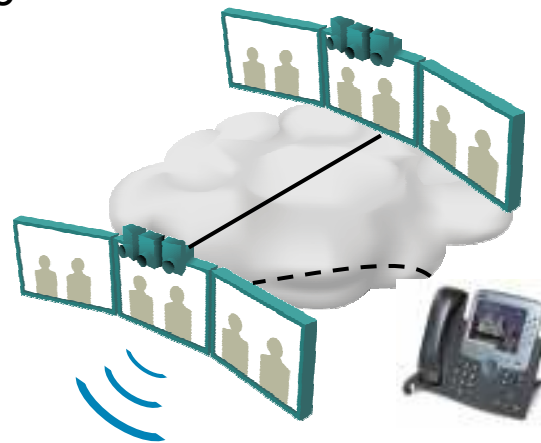
or
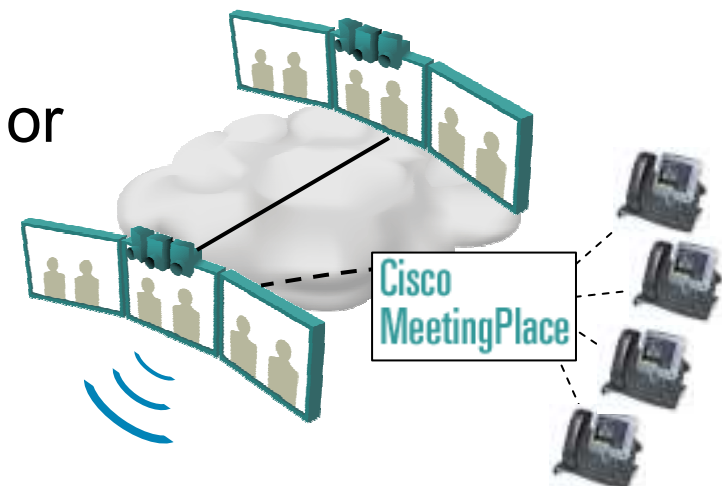
Cisco TelePresence
Resolution and Motion Handling

Quality (per Display)*

| Highest Detail, Best Motion: 4Mbps 1080p | ▼ |

Highest Detail, Best Motion: 4Mbps 1080p
Highest Detail, Better Motion: 3.5Mbps, 1080p
Highest Detail, Good Motion: 3Mbps, 1080p
High Detail, Best Motion: 3Mbps, 720p
High Detail, Better Motion: 2Mbps, 720p
High Detail, Good Motion: 1Mbps, 720p

◄ Part of CUCM Administration for each CTS

- CTS codec supports 1080p and 720p

- Three motion handling settings within each resolution: Good, Better, Best

- Flexibility for deploying systems in sites with bandwidth constraints

- Codec automatically steps down from Best Motion to Good Motion when network congestion occurs

Cisco TelePresence
CTS Media Path

7970   **Primary Codec**   **Cisco Unified CallManager**   **Primary Codec**   **7970**

XML "DIAL"

SIP "INVITE"

SIP "INVITE"

XML "RING"

XML "ANSWER"

SIP "200 OK"

SIP "200 OK"

RTP Media
(audio + video)

◄·····► Signaling

◄——► Media
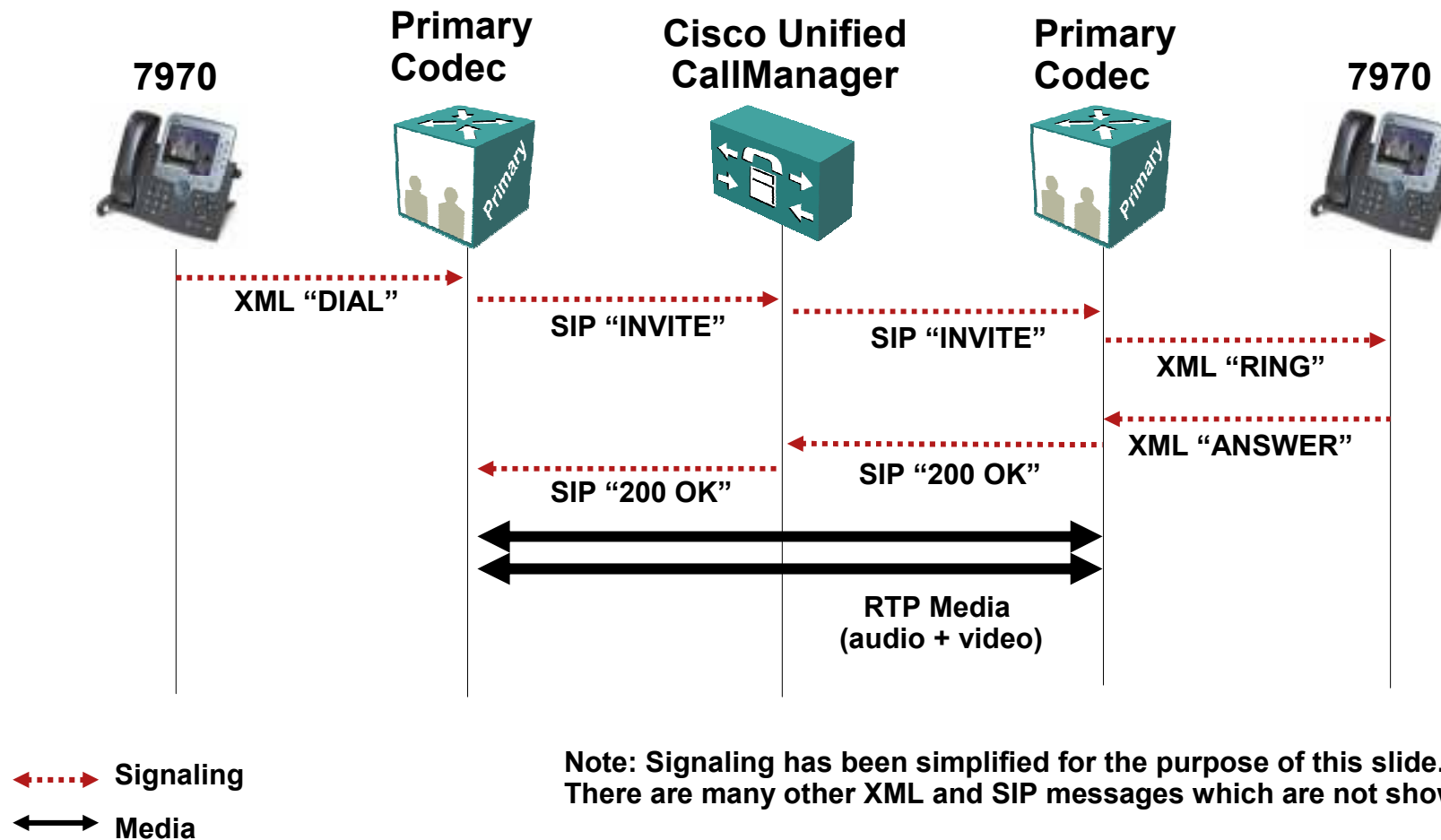
**Note: Signaling has been simplified for the purpose of this slide.
There are many other XML and SIP messages which are not shown.**

Cisco TelePresence
Video Flow CTS-3000
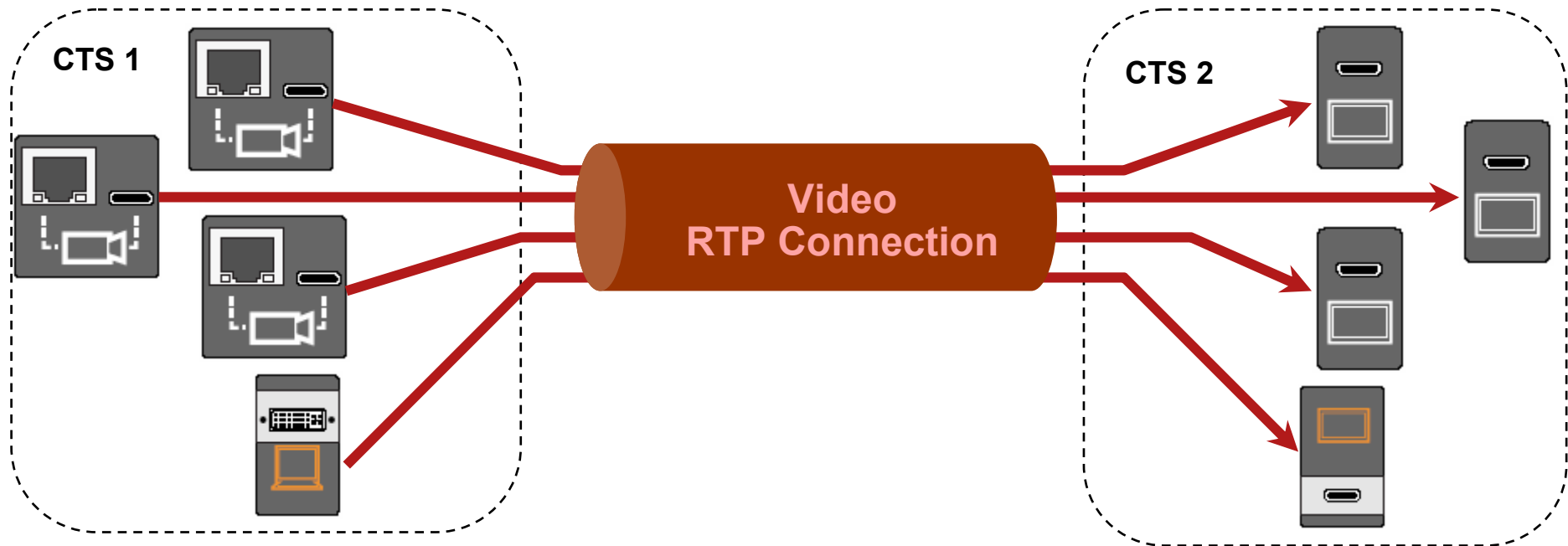
- Max 4 Video Streams

  Center, Left and Right Camera = 3 Video streams

  Data Video = 1 Video stream

- Each Camera stream is sent to the corresponding Display

- Data Video stream is sent to the Projector HDMI Output

- All Video Streams share 1 common RTP Connection

Cisco TelePresence
## Audio Flow CTS-3000

CTS 1 (In)

Audio
RTP Connection

CTS 2 (Out)
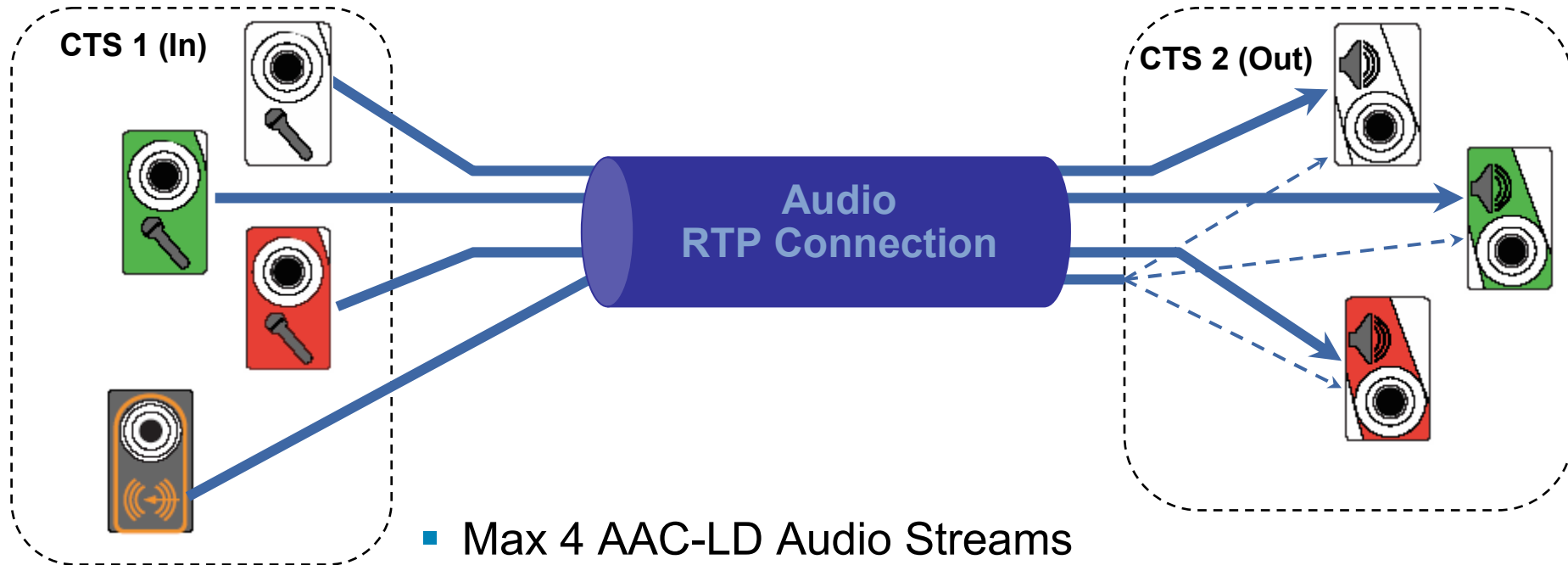
- Max 4 AAC-LD Audio Streams

- Center, Left and Right microphone = 3 streams

- Line in and Audio Add-in = 1 stream

- System audio sent to corresponding speaker

- Line In Split and Played out all speakers

- All Audio Streams share 1 common RTP Connection

Cisco TelePresence
Video Flow CTS-1000
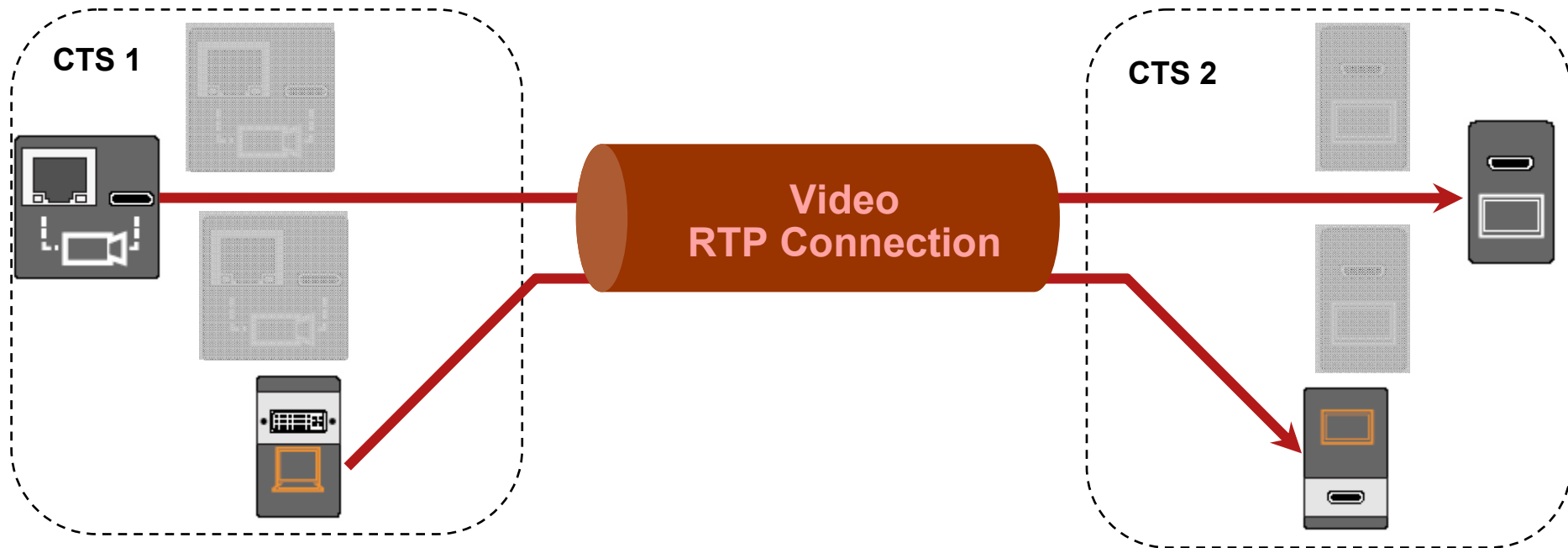
- Max 2 Video Streams

  Center Camera = 1 Video streams

  Data Video = 1 Video stream

- Camera stream is sent to the Display

- Data Video stream is sent to the LCD HDMI Outlet

- Both Video streams share 1 common RTP Connection

Cisco TelePresence
Audio Flow CTS-1000

CTS 1 (In)

CTS 2 (Out)

Audio RTP Connection
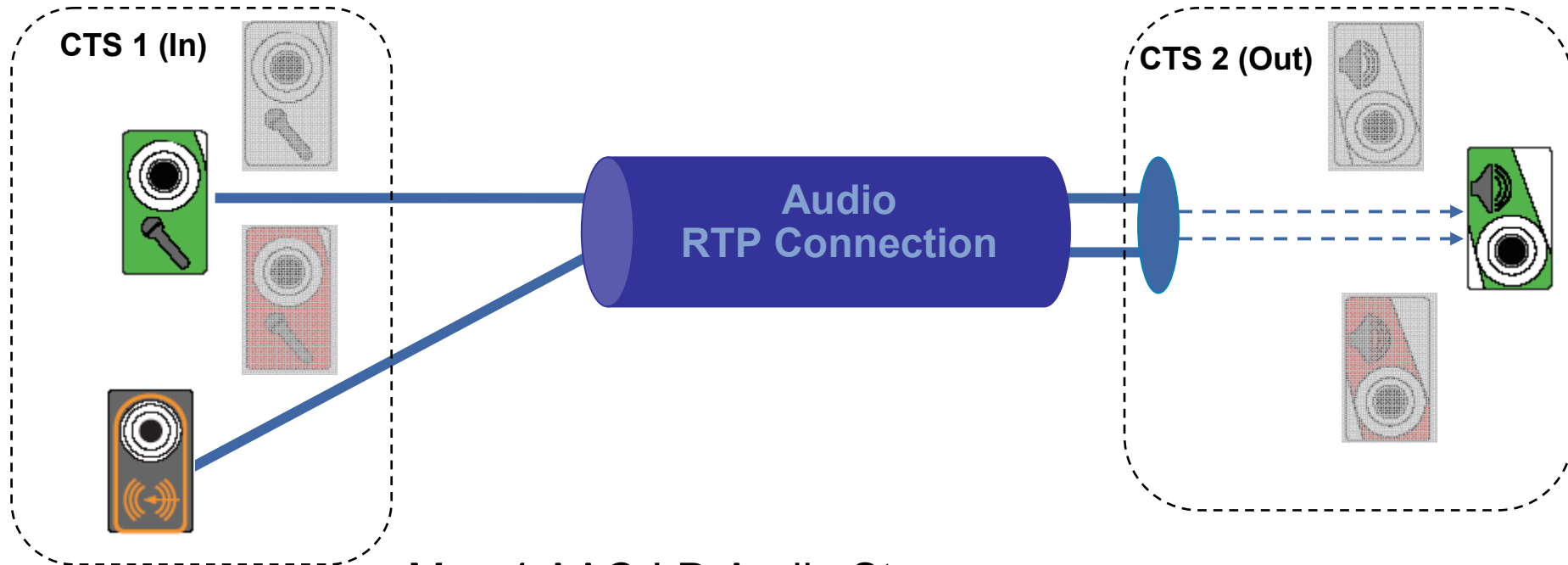
- Max 4 AAC-LD Audio Streams
- Center microphone = 1 stream
- Line In and Audio Add-in = 1 stream
- System and Line In Audio mixed and played out single CTS-1000 speaker
- All Audio Streams share 1 common RTP Connection

Cisco TelePresence
CTS-3000 to CTS-1000
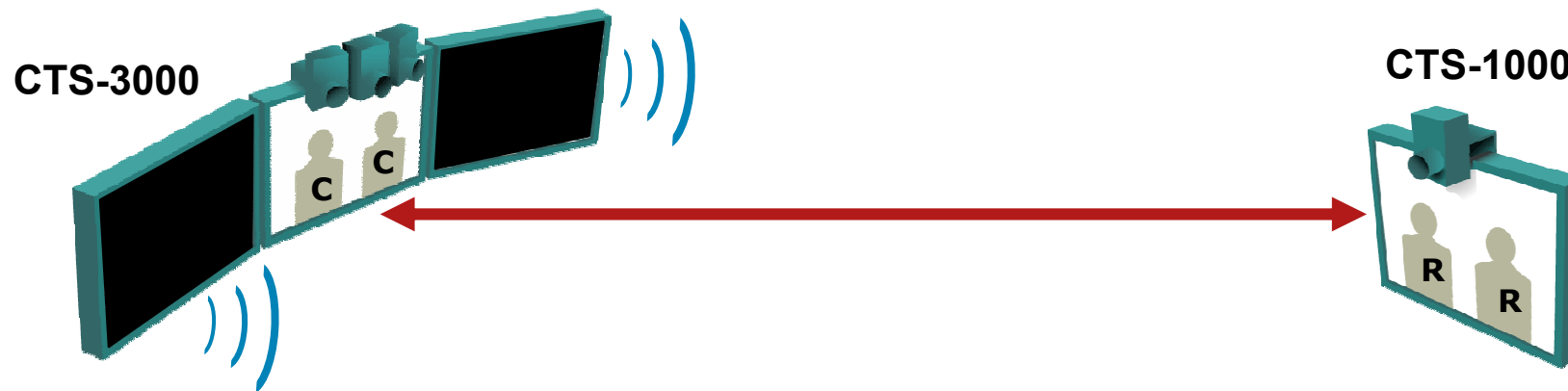
- CTS-1000 appears on center display of CTS-3000

- CTS-3000 transmits active segment to CTS-1000

- Video is switched based on active speaker/segment

- CTS-1000 hears all segments of CTS-3000 (CTS-3000 transmits all four audio channels to CTS-1000)

Cisco TelePresence Manager
Scheduling and Management Simplicity

Simple to Use

Automated Call Launch
"One Button to Push"

Concierge Services

Room Scheduling
Enterprise Groupware

Lotus Domino

Unified CallManager

Microsoft Exchange

CTM

Cisco TelePresence Manager

Multipoint Scheduling

User Experience

Unified Operations Manager

Reporting Billing Administration
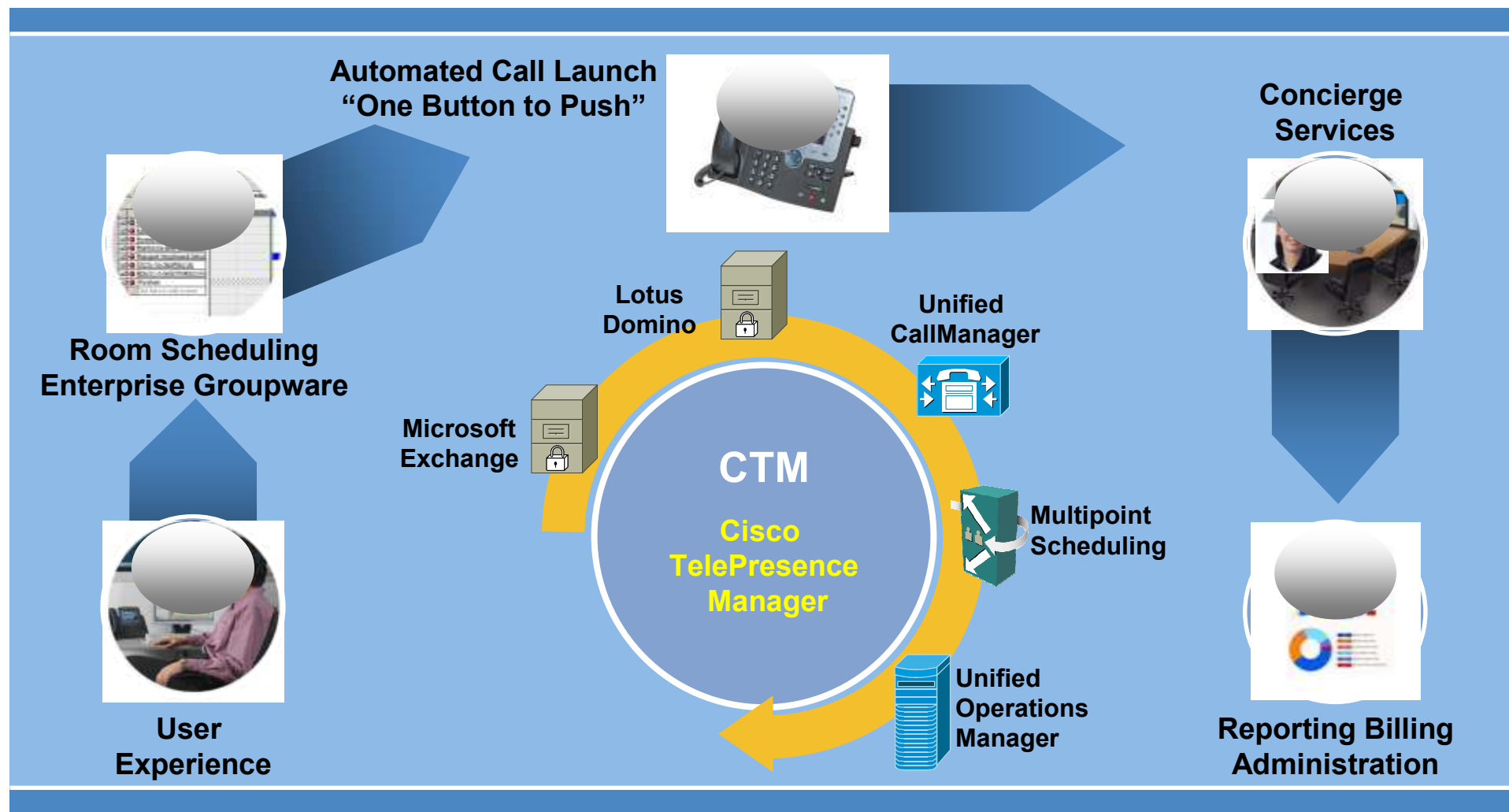
Cisco TelePresence Manager
Introduction

- **Similar in design to Cisco Unified CallManager 5.0:**

  Runs on Cisco MCS–7800 Series Media Convergence Servers

  Runs Cisco Linux Voice OS platform. Installed via Platform Configuration DVD or comes pre-installed from factory

  CLI interface accessible via SSH or local keyboard/monitor/console ports

  Web-based (HTTPs) interface for administration and monitoring

  SNMP v3 and CDP support for managing the server

- **System Requirements:**
  - **Cisco MCS-7835-H1/H2 Server**
  - **Customer provided Microsoft Active Directory 2000 or 2003 and Microsoft Exchange 2003**
  - **Cisco Unified CallManager 5.1(2b) or greater**
  - **Easy to deploy and configure:**
    - **no intrusive Active Directory or Exchange schema extensions**
    - **No client-side Outlook plugins to install**

Cisco TelePresence Manager

Protocol Interaction

- **CTM "discovers" meeting rooms by interrogating Cisco Unified CallManager via AXL/SOAP**

- **CTM "discovers" Exchange mailboxes by interrogating Active Directory via LDAP, then logs into Exchange using WebDAV**
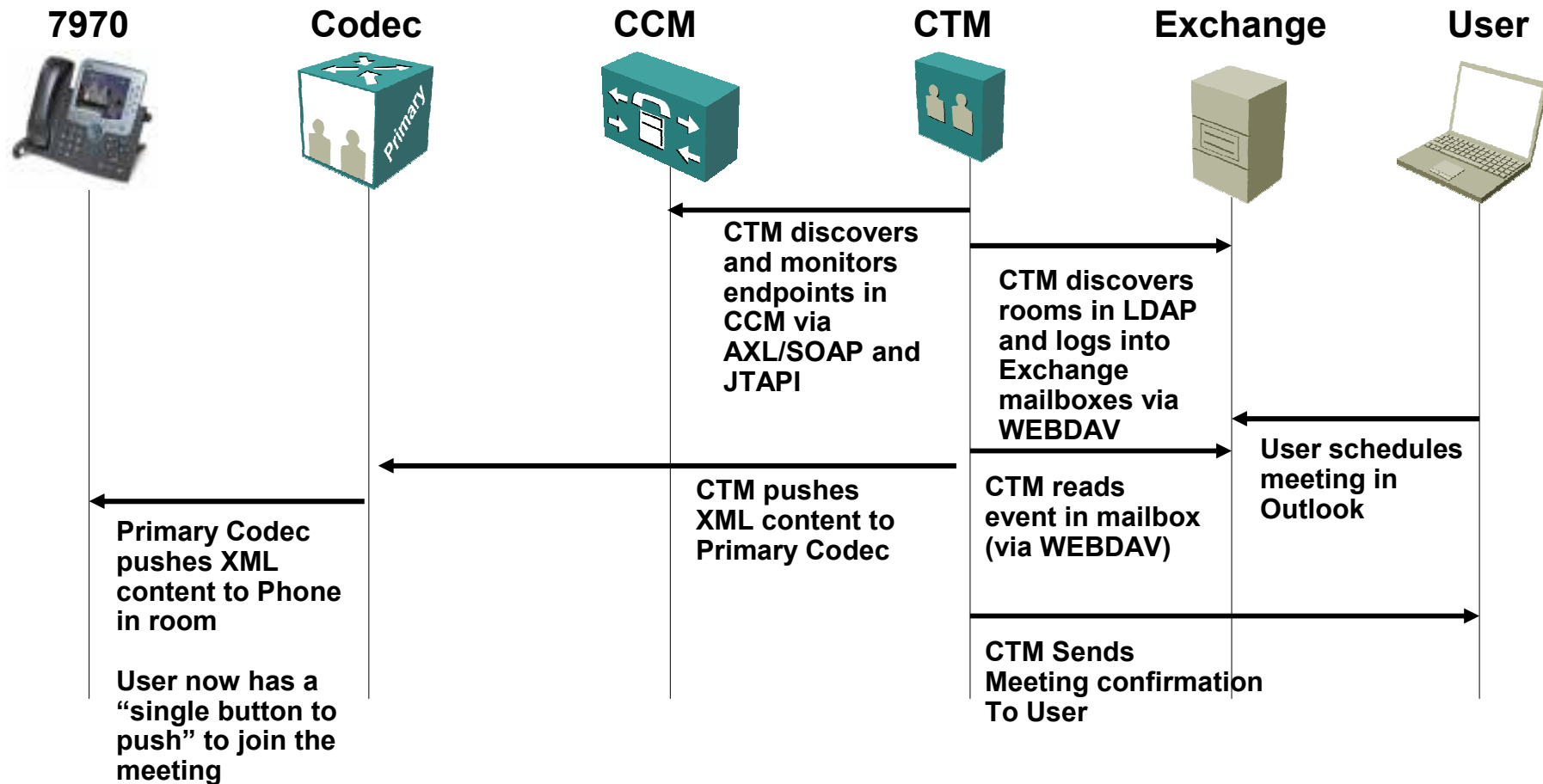
  Lotus Domino/Notes support in future release

- **CTM monitors mailboxes for each room and accepts or rejects meeting requests**

- **CTM pushes meeting schedules to the Codec using XML**

- **Codec pushes meeting schedules to the Cisco Unified IP Phone 7970G**

- **One button to push call launch**

Active Directory

Exchange

LDAP

Cisco Unified CallManager

Cisco TelePresence Manager

AXL/SOAP

WebDAV

AXL/SOAP

Codec

Primary
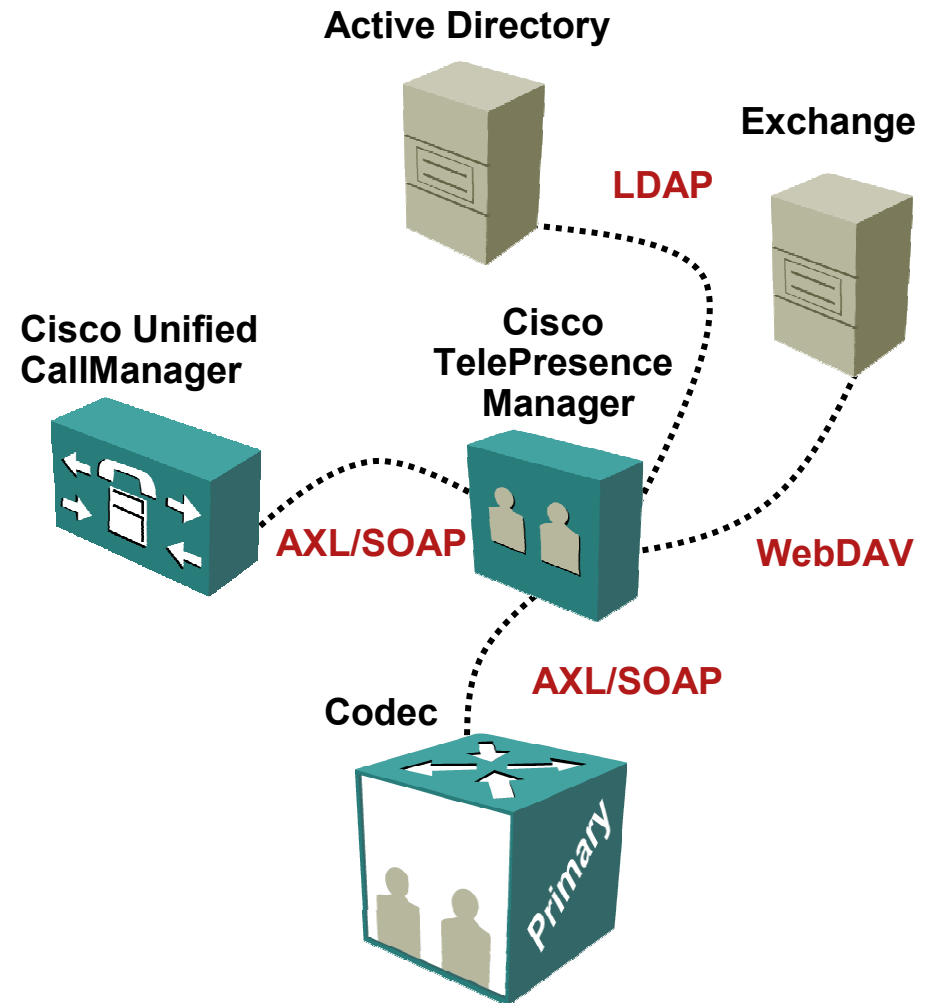
Cisco TelePresence System
Site to Site Meeting Example

7970 **Codec** **CCM** **CTM** **Exchange** **User**

CTM discovers and monitors endpoints in CCM via AXL/SOAP and JTAPI

CTM discovers rooms in LDAP and logs into Exchange mailboxes via WEBDAV

User schedules meeting in Outlook

CTM pushes XML content to Primary Codec

CTM reads event in mailbox (via WEBDAV)

Primary Codec pushes XML content to Phone in room

User now has a "single button to push" to join the meeting

CTM Sends Meeting confirmation To User

Cisco TelePresence Multipoint
CTMS Components

- CTMS
  - Video and Audio Switching
  - Non-Scheduled Meeting Man.

- CTS-Manager
  - Meeting Scheduling
  - "One Button to Push" Dialing
  - Resource and Location Management
  - Scheduled Meeting Man.
  - Required for Scheduled meetings

Cisco TelePresence Multipoint Switch (CTMS)

Cisco TelePresence Manager (CTS-Manager)

Cisco TelePresence
Site Switching

Previously Active
Active Site
Site

Video from the entire active site is switched to all other sites Table position is always maintained

Active site views last active sites video

Site becomes active site
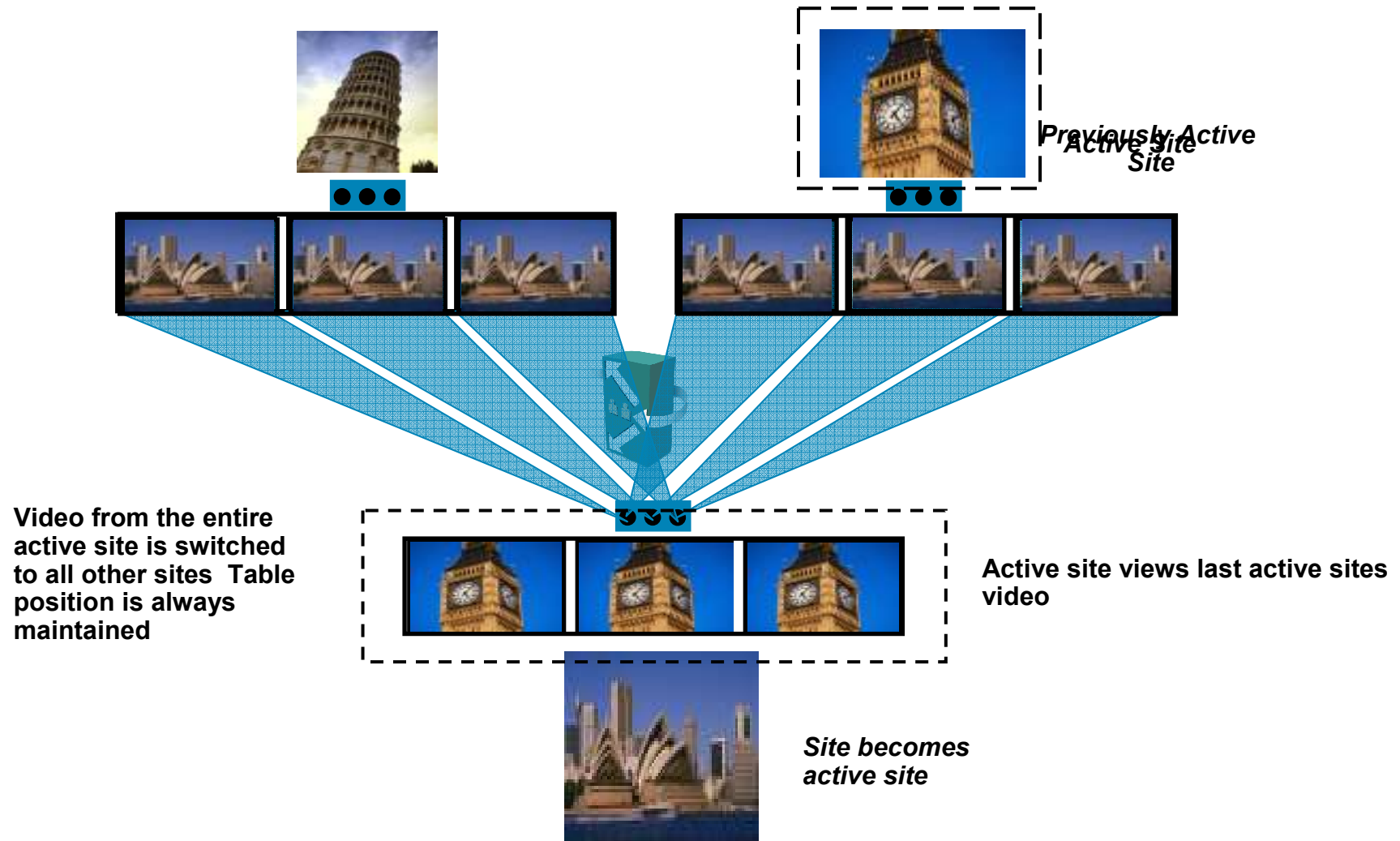
Cisco TelePresence
Segment Switching

Site 1

Site 2

Active Segments

Segments switched independently. Active segments video is displayed in its respective position on all CTS-3000's in the conference

Previously active segment remains displayed for the active segment

Site 3

Segment goes active
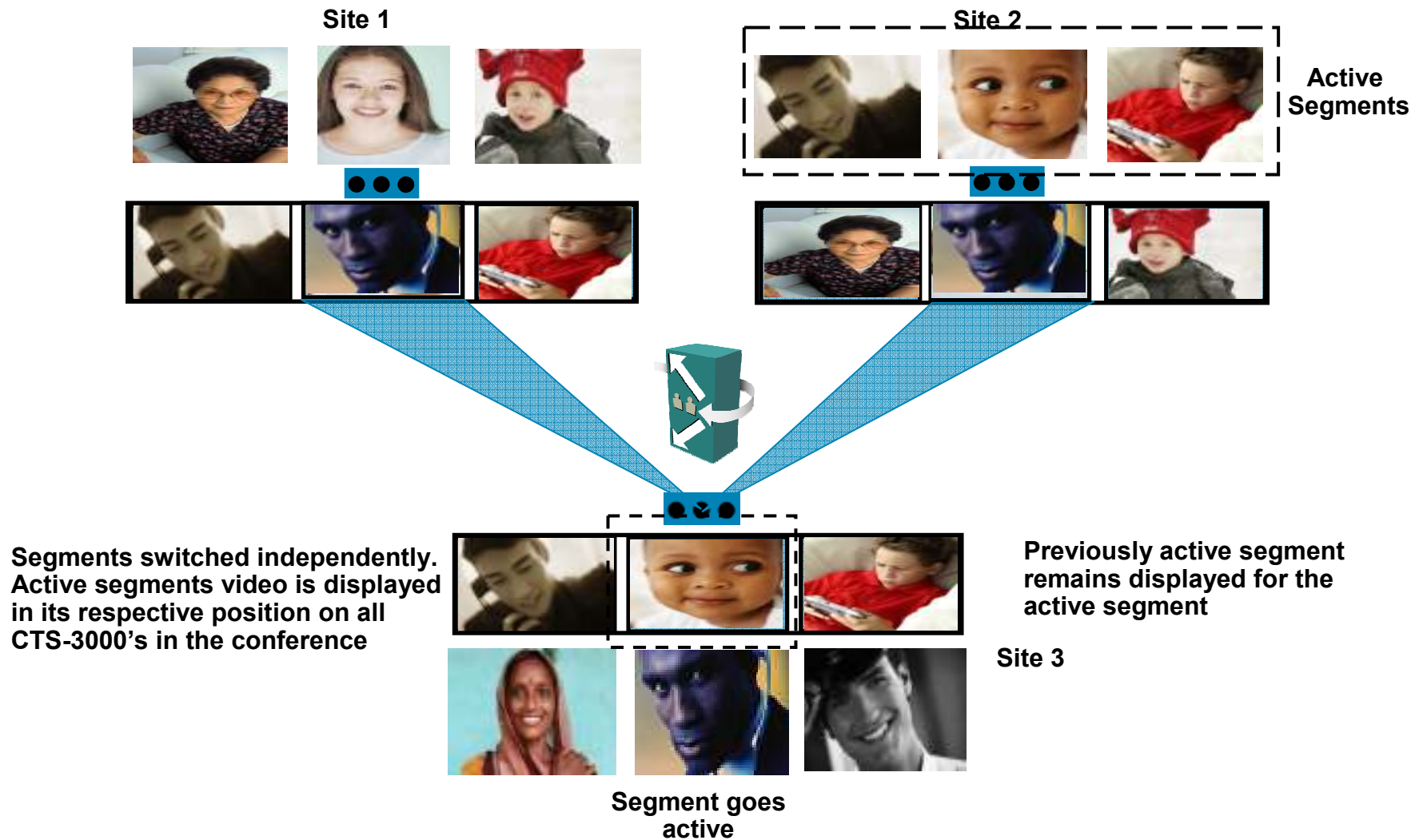
Cisco TelePresence Network Requirements
Traffic Characteristics Summary

- *One-Way, End-to-End* Service Level Targets

  Latency ≤ 150 ms

  Jitter ≤ 10 ms

  Loss ≤ 0.05%

- *Max* Bandwidth per Second

  CTS-1000 = 5.5 Mbps (at 1080p)

  CTS-3000 = 14.6 Mbps (at 1080p)

  CTMS = 198 Mbps (5.5 Mbps * 36 sites)

- *Average* Packet Size / Packets per Second

  Average 1100 bytes / packet

  CTS-1000 @ 5.5 Mbps = average 655 pps

  CTS-3000 @ 14.6 Mbps = average 1,740 pps

TelePresence Traffic Profile

bytes

33ms frame intervals
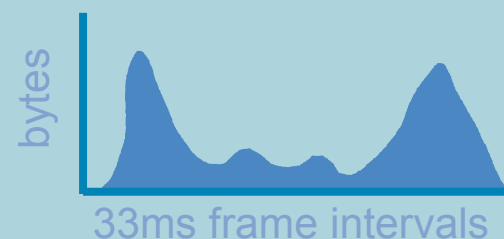
- 30 frames/sec
- Variable bit rate
- Large packet sizes
- High packets/sec
- See notes section for details

Cisco TelePresence Network Requirements
Bandwidth Details – Max Bandwidth (per second)

Average bandwidth utilization is much less. See notes section for details						
Resolution	**1080p**	**1080p**	**1080p**	**720p**	**720p**	**720p**
Motion Handling	**Best**	**Better**	**Good**	**Best**	**Better**	**Good**
Video per Screen (kbps)	4000	3500	3000	3000	2000	1000
Audio per Microphone (kbps)	64	64	64	64	64	64
Auxiliary Video channel (i.e. data projector (kbps)	500	500	500	500	500	500
Auxiliary Audio channel (i.e. audio add-in) (kbps)	64	64	64	64	64	64
CTS-1000 Total Audio and Video (kbps)	4,628*	4,128*	3,628*	3,628*	2,628*	1,628*
CTS-3000 Total Audio and Video (kbps)	12,756	11,256	9,756	9,756	6,756	3,756
CTS-1000 total bandwidth *includes Layer 2- 4 overhead*	5.5 Mbps*	4.9 Mbps*	4.3 Mbps*	4.3 Mbps*	3.1 Mbps*	2 Mbps*
CTS-3000 total bandwidth *includes Layer 2- 4 overhead*	15.3 Mbps	13.5 Mbps	11 .7 Mbps	11.7 Mbps	8.1 Mbps	4.5 Mbps

* The CTS-1000 transmits up to 128kbps of audio, but can receive up to 256kbps when participating in a meeting with a CTS-3000.

Digital Media System

"Simply Compelling Communications"

Enable Your Network
Empower Your Business

Cisco Digital Media System: Overview

A Comprehensive Solution for Creation, Management, and Access of Compelling Digital Media

- **Comprehensive**: One solution for desktop video and digital signage

- **Scalable**: To many thousands of users and signs

- **Centralized**: Web-based content management

- **Integrated**: With underlying network for optimal content delivery

Digital Media System: Across the Network

Media Capture/Creation	Media Management	Media Delivery and Distribution	Media Access

Cisco Digital Media Encoders

Third-Party Content Provider/ Creative Agency

Scientific-Atlanta Encoders

Content Author

Cisco Digital Media Manager

Network Administrator

Multicast-Enabled WAN: Satellite

Cisco NM-VSAT for the ISR

Unicast or Multicast WAN

Cisco WAEs

Caching/Pre-Positioning, Live Streaming

Cisco Video Portal

Corporate Offices, At-Home Desktop Users

Cisco Digital Media Players

On-Premise, Remote Location

Cisco Desktop Video and Digital Signage Components

Media Creation

Digital Media Encoder 1000

Digital Media Encoder 2000

Scientific-Atlanta D9032 Encoder

Media Management

Digital Media Manager

Video Portal Module

Digital Signage Module

Media Access

Cisco Video Portal

Cisco Digital Media Player

Media Delivery Networks (Cisco ACNS)
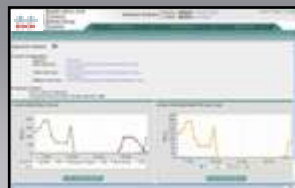
Content Distribution Manager (CDM)

WAE Appliance

ISR-NM

Media Delivery Engines (WAE)

DMS Basic Network overview / cont.

Digital Media Encoding

Video on Demand (VoD)
Video Files, Movies, etc.

Media production company

Cisco Digital Media Encoder 1000

Live Video Events
Single-channel encoding

Live video feed

Multichannel Encoding
For campus TV distribution
NBC, CBS, CNN, ESPN, etc.

Cisco Digital Media Encoder 2000

Video and Digital Signage Files Ingested Into DMM for Deployment.

VP Encode Feed

VP Encode Feed

Administration and Publishing

Cisco Digital Media Manager Appliance Server

Deployed Content

Dynamic Video Portal Updates

ActiveDirectory Profiles

Cisco Video Portal Appliance Server

Web and Streaming Server

Portal application and Channel Listings

Authentication

Content for Pre-position

Root Cisco WAE
Receive video data and distribute to various edge WAE servers that serve data to users.

CDM

ACNS Administration

Root WAE

Remote VP Authentication

ActiveDirectory

Content Distribution Manager
ACNS central management tool

WAN

Cisco Video Portal Users

Edge Cisco WAE
Receive video and re-publish data to nearby portal clients.

Edge WAE

Redirected VP Authentication

WCCP HTTP Redirection

Remote Cisco Digital Media Player

URL From DSM Scheduler

DMP HTTP Request

DMP HTTP Response

HTTP Video Portal Request
Video Portal Authentication
Cisco Video Portal
Video Request
Video

Desktop Video

Desktop Video Applications

Sales and Marketing	Corporate Communications	Training	Information Sharing
▪ Marketing videos that grab viewer attention ▪ Compelling product and service information ▪ Provide a human face on content ▪ Increased customer satisfaction	▪ Direct line of communications to employees or customers ▪ Global corporate messaging consistency ▪ Immediate executive communications ▪ Live broadcast of company events	▪ Cost-efficient training to remote employees ▪ Information consistency across channels ▪ Power of video— users retain more information ▪ Increased ability to absorb information in searchable segments	▪ Instant communications for rapid response ▪ Informational videos available on-demand ▪ Breaking news relevant to employees

Cisco Digital Media Encoders
Capture/Encode Video and Audio Feeds

DME 2000 Features

- Studio-level, dual channel encoding appliance

- Ideal for corporate offices or data centers

- Live encoding/transcoding of media into standard formats (WMV, Flash, H.264, etc.)

- Local or remote management

DME 1000 Features

- Portable, lightweight, single channel encoder

- Ideal for outdoor, classroom, and conference room use

- Support for all standard video formats

- Encodes video onto iPods

- Local or remote management

Cisco Digital Media Manager for Desktop Video
Centralized Digital Media Management and Publishing

- **Robust, Web-based content management features**

    Add, catalogue, and archive media

    Preview content and manage approval workflow

    Schedule instant and future deployments

- **Flexibly, remotely publish content to Cisco Video Portal endpoint**

- **Easily customize Cisco Video Portal interface**

- **Live Event Module allows for slide synchronization and Q&A**

- **Active Directory and LDAP integration**

- **Cisco ACNS for optimized network delivery**

Same Application for Managing and Publishing Cisco Digital Signage Content

Cisco Video Portal
Easy Access to Digital Media

- Customizable interface, program guide and search

- Personalized playlists and featured lineups

- Advanced player controls

- View synchronized slides

- Submit questions during live events

- Fully integrated with Cisco DMM and Video Portal reports

- Login and authentication through DMM

- Supports major formats: Windows Media, Flash, H.264, QuickTime
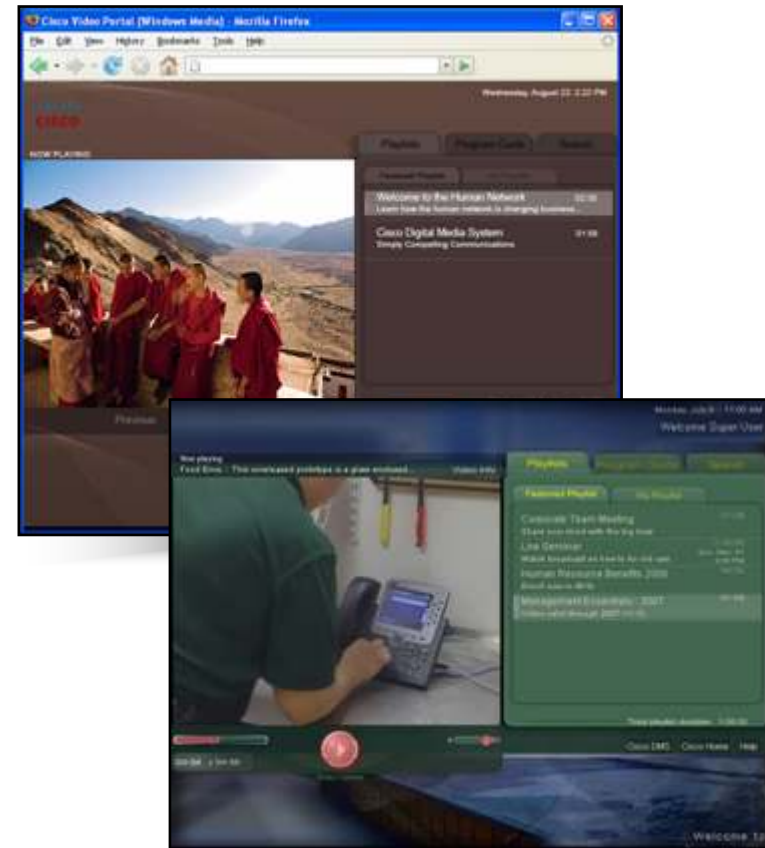
Customize the Look and Feel to Reflect the Organization Brand with the Digital Media Manager

Cisco Video Portal Reports
Real-Time Reporting to Measure Content Effectiveness

- Web-based reporting system

- Easily see trends, visitors, page views, streams, and downloads

  Real-time reports and traffic metrics

- Monitor referrals; track top referring pages

- Understand visitor statistics: operating system, browser, and media plug-in
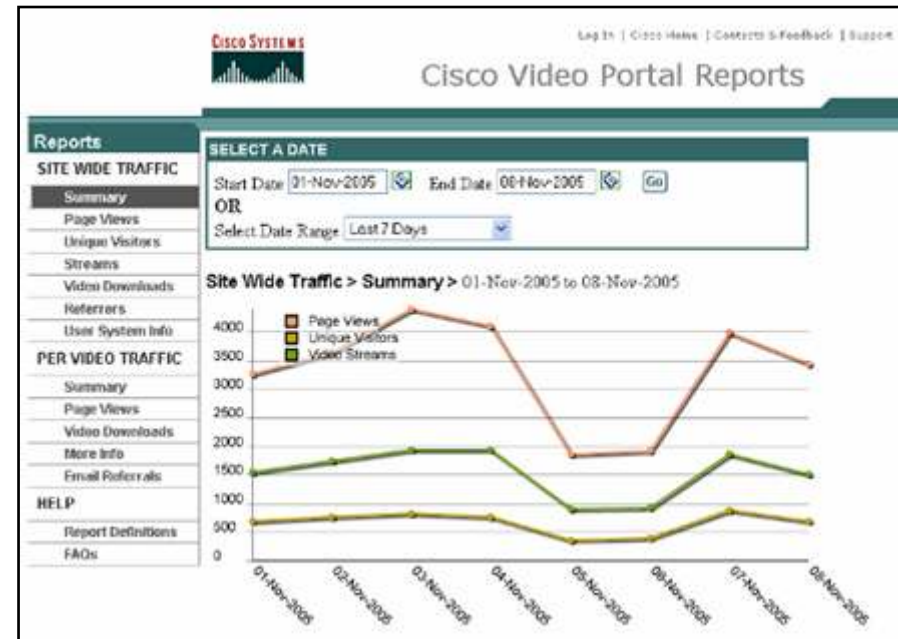
Cisco on Cisco
News at Cisco Corporate Newsroom

- Over 13.8 million unique visitors—global

  Downloaded by: press, analysts, partners, customers, instructors, investors, employees

- 500+ videos available

  Topics include: business highlights, product demos, customer testimonials, etc.

- 2+ million streams per year

- 32,000+ downloads per year

http://newsroom.cisco.com
Brought to You by the Cisco Digital Media System

"Cisco has taken aggressive steps to use video internally for marketing, PR, executive communications, e-learning, and field training. Cisco Digital Media System is a pivotal foundation for us to be able to effectively deliver digital media across the enterprise."

– Dan Scheinman, SVP and GM, Media Solutions Group

Digital Signage

Digital Signage: The Basics

Digital Display

Rich Media Content

Media Player

Media Management

Network
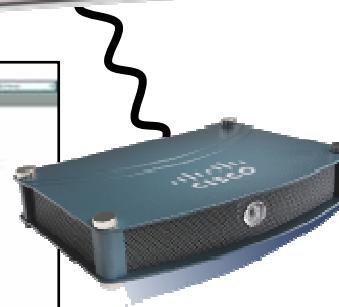
Digital Signage Applications

Sales and Marketing	Corporate Communications	Training	Information Sharing
- Promote, cross-sell, and up-sell - Product/service differentiation - Enhanced store experience - Reduce perceived wait time - Advertising revenue	- Direct line of communications to customers - Corporate messaging consistency - Internal, executive communications - Live broadcasting of company events	- Cost-efficient training to remote employees - Information to break rooms, lobbies, etc.	- Directional signage (way-finding) - Instant communications for rapid response - Emergency/crisis communications - Breaking corporate news relevant to employees

Digital Signage Technology Evolution

Yesterday:
High Operational Costs, Low Flexibility

Today:
High Reliability and Flexibility, Easy Deployment and Operations

Tomorrow:
Video Surveillance, RFID, Cisco TelePresence, etc.

Technology Evolution → **New Opportunities**

Phase 1:
Standalone PC-Based

Phase 2:
Networked PC-Based

Phase 3:
Networked Media Player-Based

Phase 4:
"Smart" Signage

Digital Signage Market

Cisco Digital Media Manager for Digital Signage
Centralized Digital Media Management and Publishing

- Web-based media management and publishing

- DMP discovery, configuration, grouping, management, reporting

- Create/design screen layouts and zones, manage playlists and schedule/update content

- Remotely control digital sign properties—on/off, contrast, brightness and volume

- Integrates with Cisco ACNS for optimized WAN delivery

- Role-based access control for users

Same Application for Managing and Publishing Cisco Desktop Video Content

Cisco Digital Media Player
Playback of Compelling Digital Media Content

- Controls graphics, Web content, text tickers on screen

- Supports full-screen or "zone" video in SD or HD resolutions

- Customizable on-screen templates

- Remote management of display properties

- IP-network addressable

- Local storage, high availability, automatic failover

- Small and lightweight

- Low power and high reliability

- Security: Hardened device
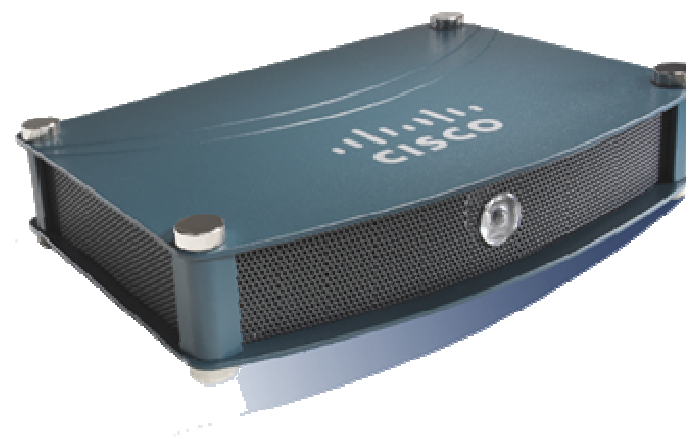
**Small Form Factor:
7.5" x 5" x 1.5" at 1 lb.**

Cisco on Cisco—
Cisco Digital Signage

Digital Signage at Cisco

- Digital signage at tradeshows for eye-catching dynamic content

- Digital signage in lobbies and in buildings for employee communications and entertainment for waiting visitors

Cisco IP Interoperability & Collaboration Solution (IPICS)

Enable Your Network
Empower Your Business

The Challenge

- Disparate, proprietary radio systems

- Proliferation of communications technologies

- Fragmented chain of command

- Isolated network and operational silos
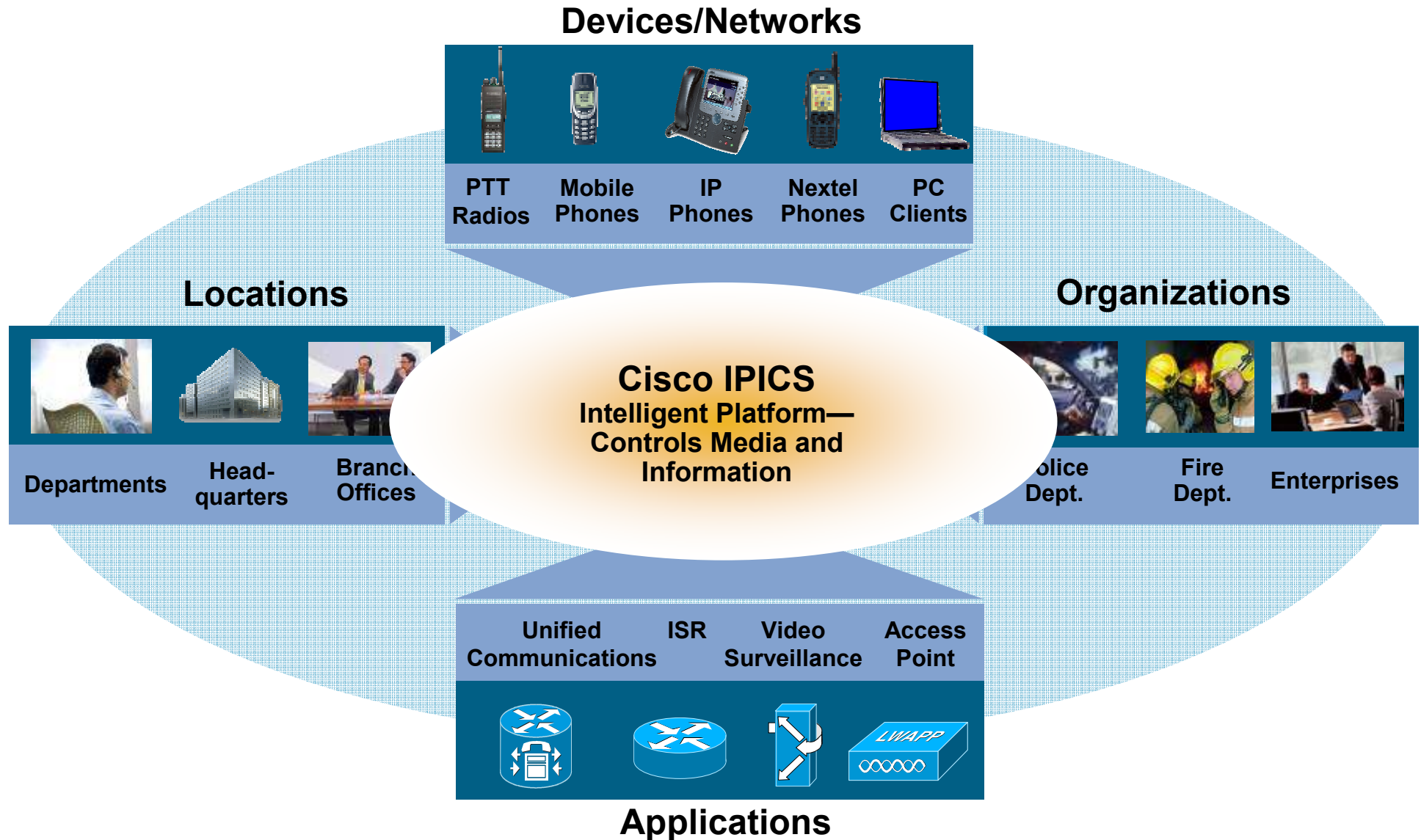
- Increased threats and responsibilities

A Broad-Based Problem

Enterprise Safety & Security

Public Safety

Transportation

State & Local Government

Industry Operations

Defense

Healthcare

"How to Deliver the Right Information in the Right Format to the Right Person at the Right Time"

Cisco IPICS
Dissolving communications silos

Devices/Networks

PTT Radios | Mobile Phones | IP Phones | Nextel Phones | PC Clients

Locations

Organizations

Departments | Head-quarters | Branch Offices

Cisco IPICS
Intelligent Platform—
Controls Media and
Information

Police Dept. | Fire Dept. | Enterprises

Unified Communications | ISR | Video Surveillance | Access Point

LWAPP

Applications

Cisco IPICS Benefits

- **Improved ease of use and management for comprehensive communications interoperability**

  Personnel in the same or different agencies can communicate across previously isolated radio, IP, and non-IP networks

- **Improved Response, Flexibility, and Reach**

  Delivers information to any type of communications device: radio, telephone, IP phone, cell phone, or PC client

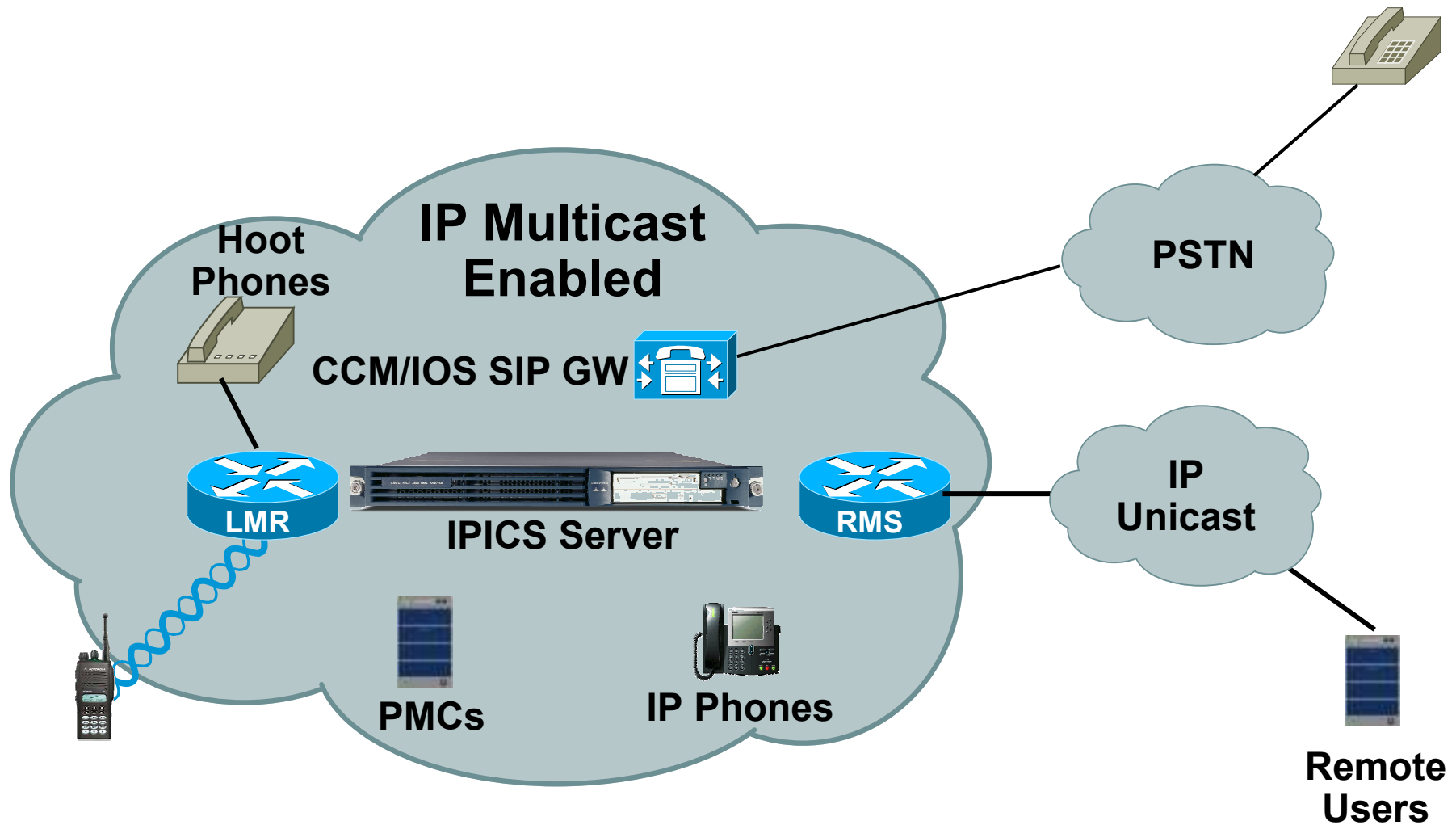- **Investment protection, reduced costs, enabling new applications and technologies**
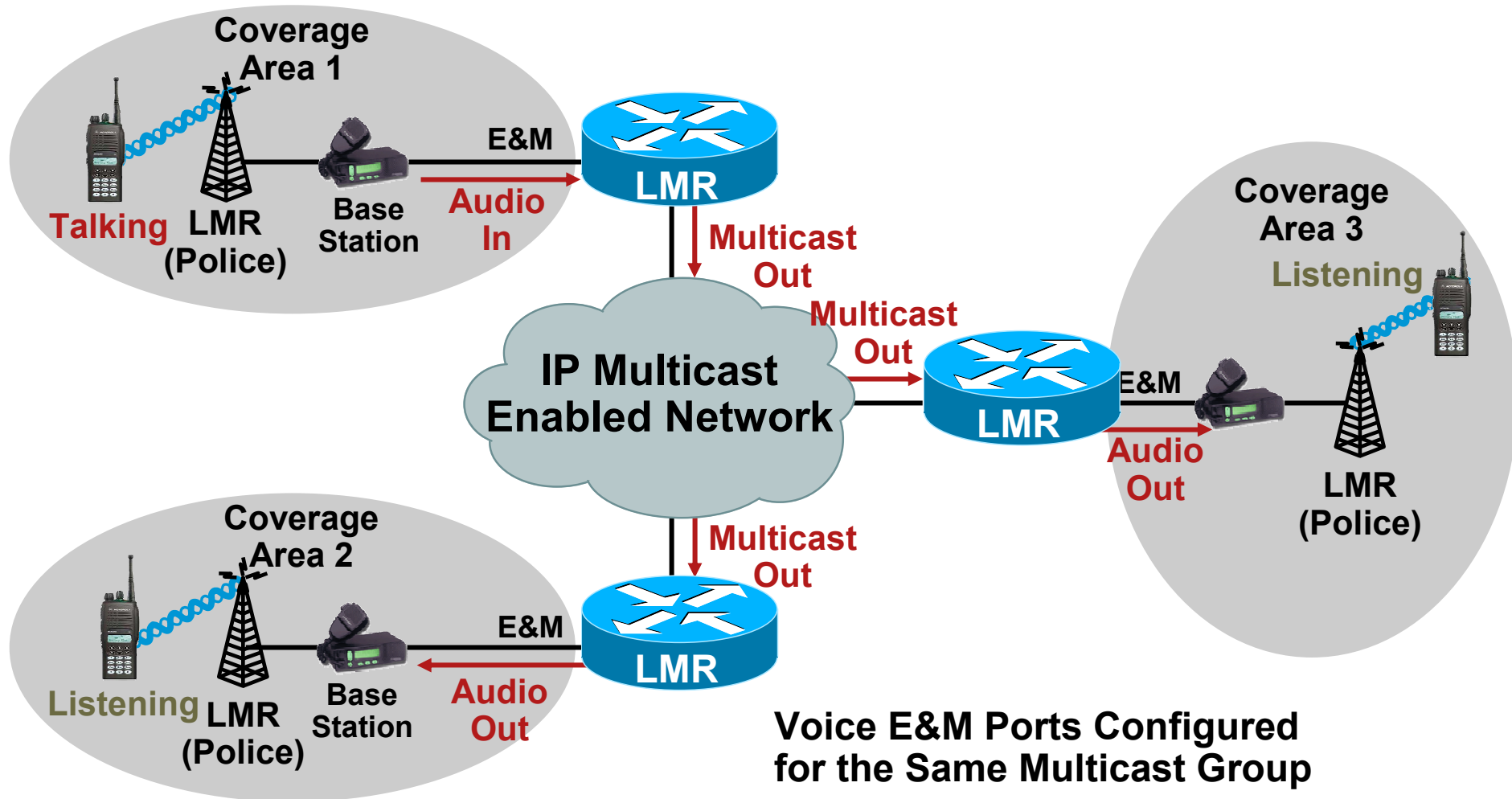
The Cisco IPICS Solution

Cisco IPICS Server and Policy Engine

IPICS Management Console

Server Administration Console

Ops Views

Policy Engine

Secure VoIP Network

LMR Gateway and Media Services VoIP

VoIP

VoIP

VoIP

VoIP Gateway

PSTN

VHF/UHF/Nextel PTT Radios

Cisco IPICS PMC Client

Cisco IP Phones w/ PTT Services

PSTN/Cellular Phones

Cisco IPICS Overview

IP Multicast Enabled

Hoot Phones

CCM/IOS SIP GW

LMR

IPICS Server

RMS

PMCs

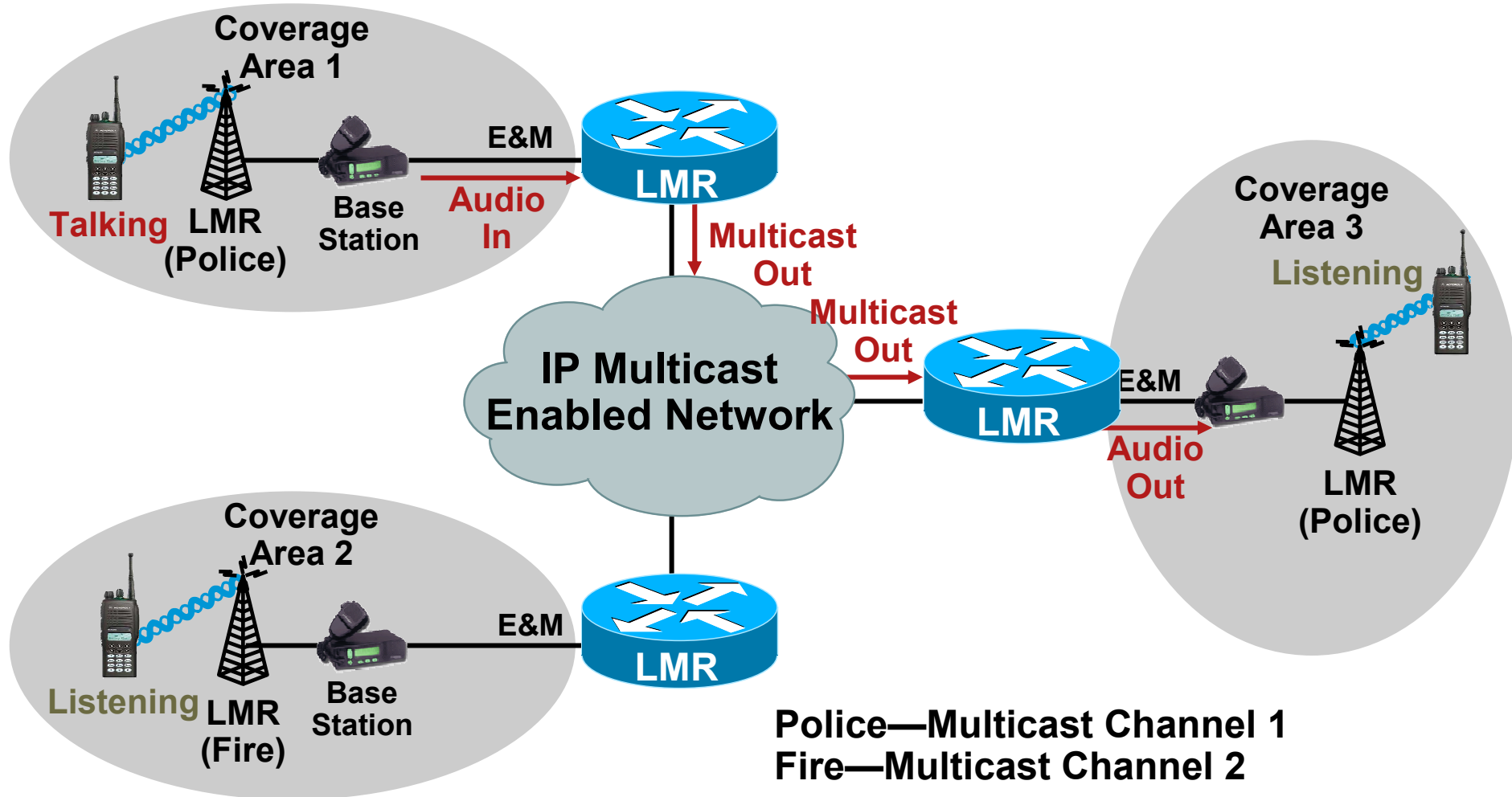**IP Phones**

PSTN

IP Unicast

Remote Users

Cisco IPICS components

- Land Mobile Radio (LMR) Gateway

- Cisco IPICS Server

- Push-to-Talk Management Center (PMC)

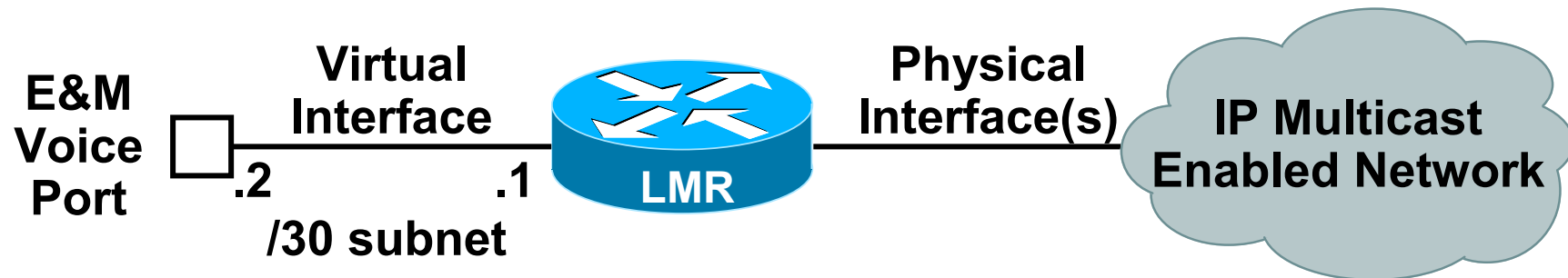- Router Media Service (RMS)

- IP Phones (CM and CME)

Land Mobile Radio—Single Channel

Coverage Area 1

Talking LMR (Police) Base Station E&M Audio In

LMR

Multicast Out

IP Multicast Enabled Network

Multicast Out

LMR

Multicast Out E&M Audio Out

Coverage Area 3

Listening LMR (Police)

Coverage Area 2

Listening LMR (Police) Base Station E&M Audio Out

LMR

Voice E&M Ports Configured for the Same Multicast Group

Land Mobile Radio—Multiple Channels

Coverage Area 1

E&M

LMR

Talking   LMR (Police)   Base Station   Audio In

Multicast Out

Multicast Out

IP Multicast Enabled Network

LMR

E&M

Audio Out

Coverage Area 3

Listening

LMR (Police)

Coverage Area 2

E&M

LMR

Listening   LMR (Fire)   Base Station

Police—Multicast Channel 1
Fire—Multicast Channel 2

Land Mobile Radio—Virtual Interface

E&M Voice Port — **Virtual Interface** .2 ... .1 **/30 subnet** — **LMR** — **Physical Interface(s)** — **IP Multicast Enabled Network**

```
interface Vif1

 ip address 10.1.1.1 255.255.255.252

 ip pim sparse-mode
```

Cisco IPICS Server
Cornerstone of the complete Cisco IPICS system

- **Web-based server that provides a simple to use incident management console**

- **"One Stop Shop" for coordination of all IPICS resources**

- **Built for real world deployments - scalable and secure**
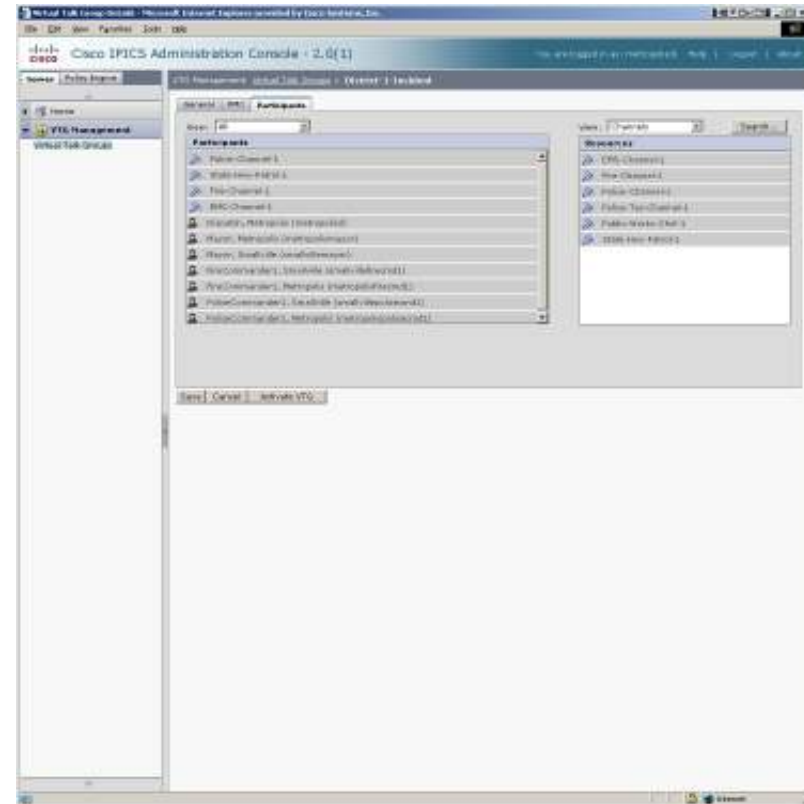
Intelligent resource management application that orchestrates resources, media and information

Cisco IPICS Server

- Secure HTTP and SSH for management/ user access

- Hosts the IPICS Administration Application (license management, centralized administration, log reports...)

- Enhanced incident management (users, channels, VTGs, add or remove resources depending on on incident status)

Definition—Channel

- Multicast RTP stream to/from a predefined/ configured multicast group address 224.0.0.0 -> 239.255.255.255

- An LMR channel multicast address is statically configured on the LMR gateway

- Cisco IPICS channels are configured on the IPICS server (name and multicast address)

- IPICS users (PMC, IP phone, and/or PSTN) are usually associated with one or more channels

Definition—Virtual Talk Group (VTG)

- A "mixed" or combined channel consisting of two or more "regular" channels

- VTGs are managed (create, delete, modify, activate, deactivate) from the Cisco IPICS server

- The VTG multicast channel address is dynamically selected from a multicast address pool configured on the server

Roles Within IPICS

- ## User

    Accesses channels and VTGs via PMC, IP Phone, or PSTN

- ## Dispatcher

    Manages and monitors Virtual Talk Groups (VTGs)

    Policy Management

- ## Operator

    Creates and assigns roles to users

    Associates users with one or more channels

- ## System Administrator

    Conf. and administration the server, features and all resources, licenses, ...

- ## Ops View Administrator

    Activity Log Management, Activity Log Options

Cisco IPICS Phone Client
Push-to-Talk service for Cisco Unified IP Phones

- **Enables push-to-talk (PTT) functionality on select Cisco Unified IP Phones**

- **Extends voice reachability of PTT radio-only or broadcast networks**

- **Allows communications over a channel with a push of a button**

Phone users can now respond to incidents or emergencies, boosting responsiveness and operational effectiveness

Cisco IPICS PMC

Push-to-talk (PTT) client for PC users

- **Allows PC users to monitor multiple channels simultaneously**

- **Enables PTT communication from the office or a remote site**

- **Provides flexibility through remote tone control, voice replay, multiple user interface options**

**Push-to-Talk
Management Center**

Extends to PC users PTT capabilities previously reserved for
radio-only users

PMC Features & Benefits (cont'd)

- **Quick access to various channel types**

  PTT radio channels

  Virtual talk groups made up of multiple channels

  Direct 2-way channels to other PMC users

  Direct dial channels for dial-out (requires dial ports)

  Listen only (broadcast) channels

PMC Features & Benefits (cont'd)

- **Multiple user interfaces** for user flexibility

  Touch-screen optimized

 Bright and dark environments

  18-channel advanced console

  36-channel radio console

- **Voice replay** for play back of buffered audio

- **Channel state indicators** for online or available channels

- **Channel Colors** to uniquely identify channels

Cisco Public
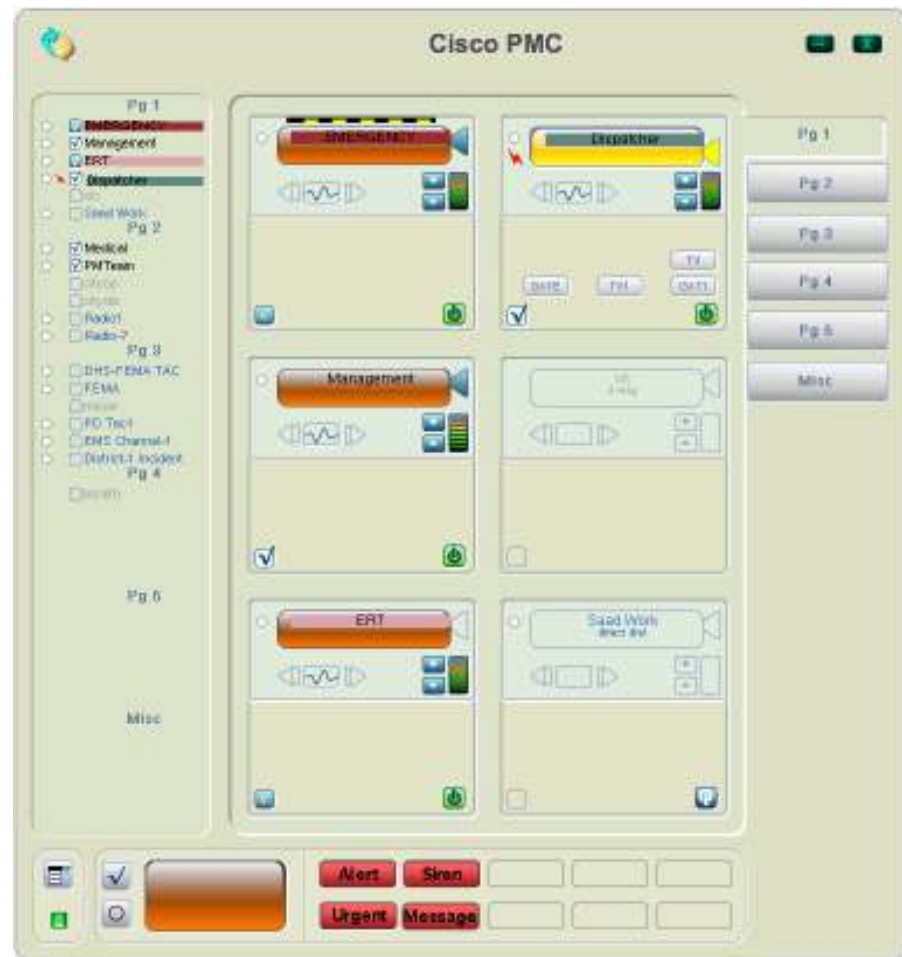
PMC Features & Benefits (cont'd)

Advanced Console

- **Up to 18 active channels** supported

- **Alert tones** for notification over specified channels

- **Channel select** button to select channels for simultaneous transmit

- **All talk** button to simultaneously transmit over multiple channels
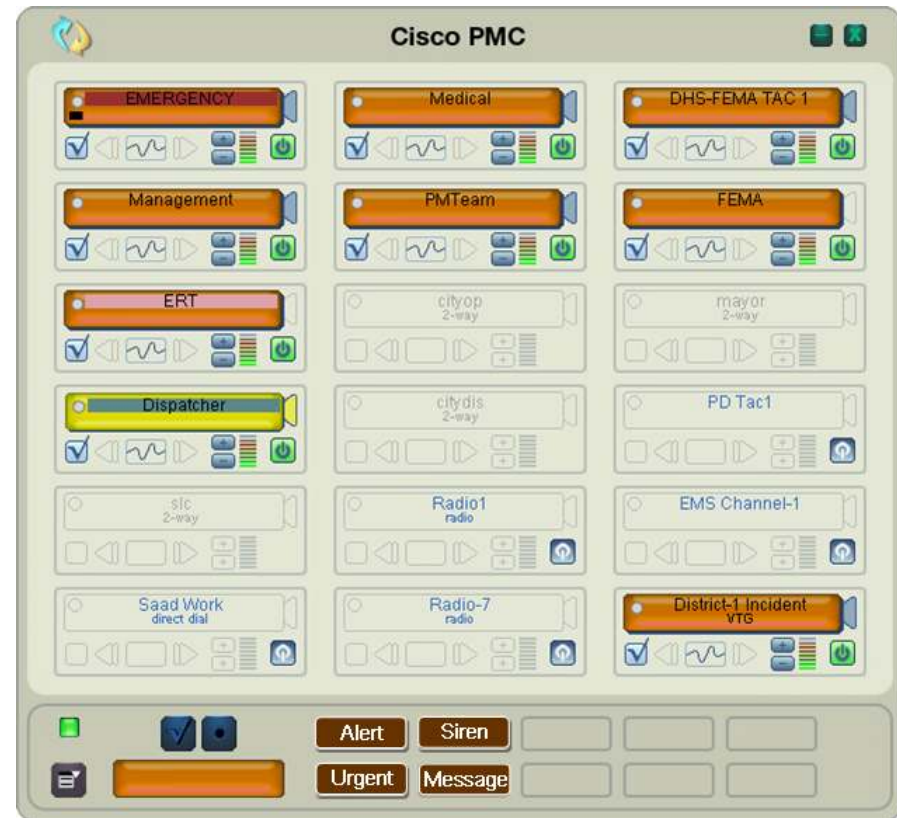
PMC Features & Benefits (cont'd)

Radio Console

- Up to 36 active channels supported

- Administratively assigned regions to organize channels

- Tone remote control to dynamically control functions of radios or other devices

- Tone signaling on per channel basis

PMC Features & Benefits

- Easy remote access from anywhere with VPN

- Rapidly deployable and easily managed remotely by Cisco IPICS server

  Privileges

  Configurations

  Channel associations

  Authorized downloads

- High jitter support for high latency and low bandwidth environments

- Uninterrupted communications through offline mode

Cisco IPICS Policy Engine
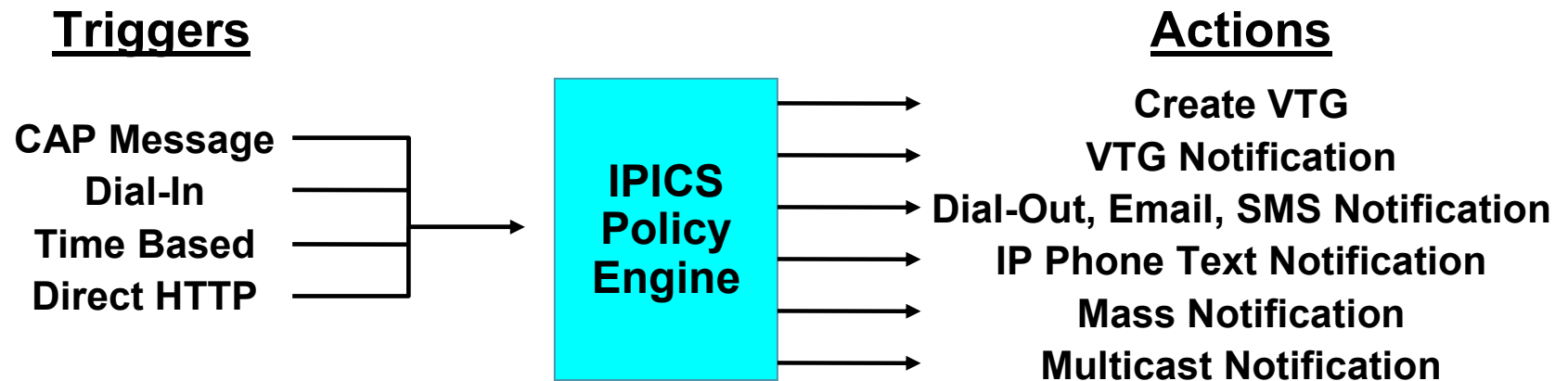## Enhanced application platform to streamline operations

Flexible IPICS application platform:

- **Supports user-defined rules to automate existing incident procedures**

- **Brings together the right people to address an incident**

- **Notifies the broader population when time is critical**
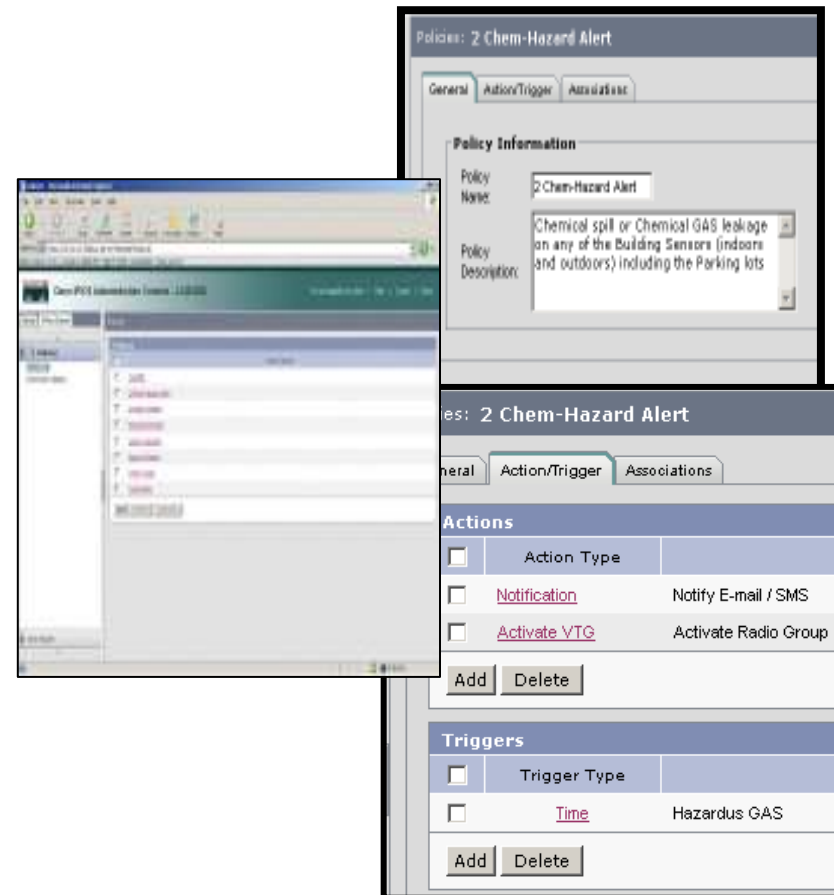
Flexible application platform to automate the most demanding public safety SOPs

The Policy Engine Drives Advanced Services

Triggers

CAP Message
Dial-In
Time Based
Direct HTTP

IPICS Policy Engine

Actions

Create VTG
VTG Notification
Dial-Out, Email, SMS Notification
IP Phone Text Notification
Mass Notification
Multicast Notification

Advanced Application Examples

• **Trigger: Accident w/injuries**

   ➢ **Action: Create VTG and notify responding agencies to join VTG**

• **Trigger: Security event at a University**

   ➢ **Action: Priority notification to first responders via phone and radio**

   ➢ **Action: Mass notification to student body via email, page, cell phone, text**

Cisco IPICS Operational Views

Enabling Inter-Agency Collaboration

- **Allows each entity to maintain visibility and control of its own resources**

- **Facilitates authorized sharing of resources and communications**

- **Provides authorized communications across ownership and organizational boundaries**
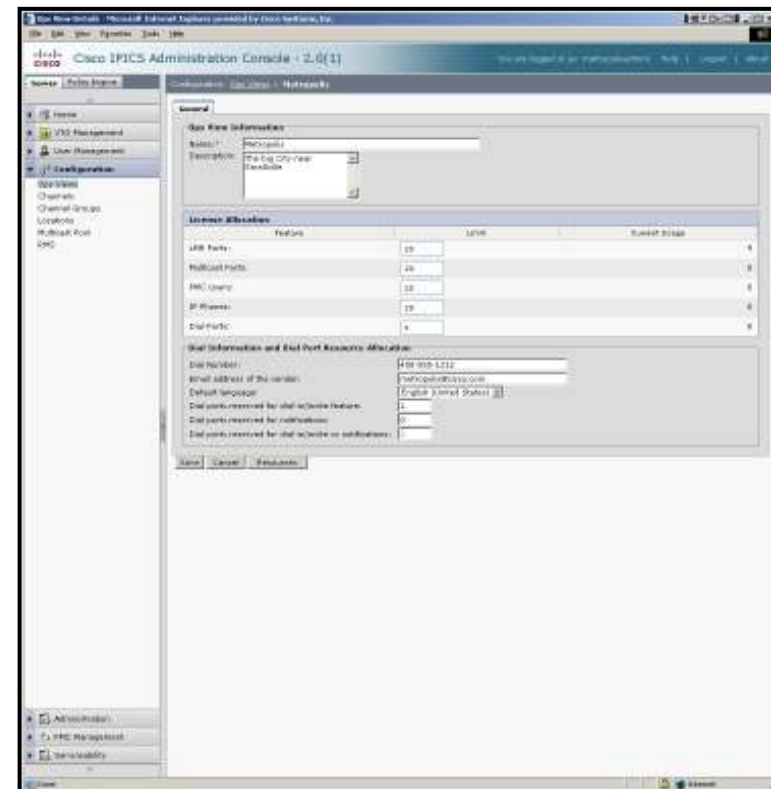
Only Available from Cisco, Only with Cisco IPICS

Q and A