Video over IP
Product Update

Session 2009
Agenda

- Cisco AVVID and Video over IP
- Cisco IP Video Solutions
  - Introducing the Cisco IP/VC Product Family
  - The New Cisco IP/TV Product Family
  - Plan a Trial Now
- Application Examples
  - Top Business Applications
  - Application Video Requirements
  - Planning a Video Network

Cisco IP Video: The Second “V” in Cisco’s AVVID

The Cisco Architecture for Voice, Video and Integrated Data (AVVID) enables an enterprise to converge both Voice and Video onto a data infrastructure.
Cisco AVVID—An End-to-End Architecture

Clients
- Conference Room Video
- Desktop Video
- IP Phones
- PCs
  (With Videoconferencing and IP/TV Clients)

Infrastructure
- Cisco IP Fabric
- Internet Application Technologies
- Network Services
  - Management
  - Policy
  - Directory
- Platforms
- Switch
- Router
- Gateway
- MCU

Applications
- CallManager Servers
- Message Servers
- VIDEO SERVERS
- Directory Servers
- Content Servers
- Calendar Server
- Paging Server
- Directory Servers
- Content Servers
- Message Servers
- CallManager Servers

• Distributed • Open
• Adaptive • Manageable

Videoconferencing (VC)
Live Two-Way, Small Groups
Bandwidth: One+ Streams per User

Broadcast Video (Scheduled)
One-Way, One-to-Many (Push Model)
Bandwidth: One Stream to Unlimited Users (IP Multicast)

Video-on-Demand (VOD)
One-Way, Point-to-Point (Pull Model)
Bandwidth: One Stream per User

IP Video Network Delivery Options
Applications by Delivery Models

<table>
<thead>
<tr>
<th>Applications</th>
<th>Broadcast Video</th>
<th>Video on Demand</th>
<th>Videoconferencing</th>
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Cisco IP Video—The Bottom Line:

Cisco IP video:

- Fits nicely into a data network,
- Looks good, and
- Is surprisingly cost-effective
Cisco Video Solutions

Cisco IP/VC Videoconferencing Family

Interactive Video Communications

Cisco IP/TV Streaming Video Family

Video Broadcasting and Video on Demand

Cisco IP/VC Product Family

- Network solutions for H.323-based videoconferencing
- Enables interactive video-over-IP networks
- Provides solutions for e-learning, distance meetings, telemedicine, and many other apps
Introducing the IP/VC Family

- Cisco IP/VC 3510
  Multipoint control unit
- Cisco IP/VC 3520, 3525
  H.320 to H.323 gateways
- Cisco IP/VC 3530
  Video terminal adapter
- Cisco Multimedia Conference Manager
  H.323 Gatekeeper/Proxy

Cisco IP/VC Product Family

Cisco IP/VC Videoconferencing Products

- Corporate LAN
  - Cisco MCM Gatekeeper/Proxy
  - IP WAN
  - Cisco MCM Gatekeeper/Proxy
  - H.323 Group System
  - H.323 Desktop
  - H.320 Desktop (Over ISDN)
  - H.320 Room System (Over ISDN)
  - Speech Only (Over PDTS)

- Cisco IP/VC 3510 MCU
  - IP WAN
  - PSTN

- Cisco IP/VC 352x Gateway
  - H.323 Group System
  - H.320 Group System
  - H.320 Desktop (Over ISDN)

- Cisco IP/VC 3530 Video Terminal Adapter
  - H.323 Terminal
  - H.320 Terminal (Over PDTS)
  - Speech Only (Over PDTS)
Cisco IP/VC 3510
Multipoint Control Unit

- Enables multiparticipant videoconferences
- Video, audio, and T.120 data bridging—from 128 kbps to 1.5 Mbps
- Up to 15 sessions per unit
- Scales easily by combining multiple units
- Supports ad hoc call-in or planned call-out conferences

IP/VC 3510
Multipoint Control Unit

- Flexible—Conference bandwidths of 128, 384, 512, 768 kbps or 1.5 Mbps
- Scalable—Create large conferences by cascading MCUs
- Easy-to-use—Offers “ad-hoc” conferencing, no reservations required
- Web-enabled—Access conference management functions through web browser
IP/VC 3510MCU
Release 2.1

- All H.323 Version 2 features
- H.263 video codec
- 4-way continuous presence
- Release target July 2000

Cisco IP/VC 3520 and 3525 Gateways

- Connects H.320 circuit-switched networks to H.323 IP networks
- Ties into existing H.320 conferencing networks
- Video, audio, and T.120 data calls up to 384 kbps
- Supports PRI, BRI, and V.35 interfaces
- Enables Worldwide Connectivity

PSTN
IP/VC 3520 Gateway Release 2.1

- Internal IMUX support for speeds up to 384K
- Parallel dialing on bonded calls
- High quality 768K calls (V.35 ports only)
- Support for G.722 high quality audio codec (for GW-GW or GW-VTA calls at/above 384K)
- Far end camera control (H.281 tunneling to H.320 systems through gateways or VTA)
- H.323 Version 2 and high speed T.120
- Release target late May 2000

IP/VC 3525 Gateway Release 2.1

- Parallel dialing on bonded calls
- Support for G.722 high quality audio codec (for GW-GW or GW-VTA calls at/above 384K)
- Far end camera control (H.281 tunneling to H.320 systems through gateways or VTA)
- H.323 Version 2 and High speed T.120
- Release target late May 2000
Cisco IP/VC 3530 Video Terminal Adapter

- Connects an H.320 system to an H.323 IP network
- Video, audio, and T.120 data calls up to 384 kbps
- Provides migration path to IP networks

IP/VC 3530 VTA Release 2.1

- High quality 768K calls
- Support for G.722 high quality audio codec (for GW-GW or GW-VTA calls at/above 384K)
- Far end camera control (H.281 tunneling to H.320 systems through gateways or VTA)
- H.323 Version 2 and High speed T.120
- Release target late May 2000
Cisco Multimedia Conference Manager

- H.323 Gatekeeper and Proxy on Cisco IOS®
- Performs call management
  Admission control
  Bandwidth management
  Authorization
  Call routing
- Enables quality of service
  RSVP
  IP precedence
- Enables security
  Authentication
  Firewall

Cisco IOS Multimedia Conference Manager

- Gatekeeper/proxy/router functions integrated in IOS on a range of router hardware platforms
- Scalable, flexible, cost-effective, standards-compliant
- Quality of Service (QoS) for IP videoconferencing
- LAN/WAN bandwidth management capabilities
- Authentication, authorization, and call accounting
- Address translation and resolution
- Interoperability with 35xx IP/VC gateways, MCUs, and H.323 videoconferencing endpoints
Cisco Router IOS MCM

- **MCM gatekeeper**
  - Address resolution
  - User authorization
  - Bandwidth management

- **MCM proxy**
  - QoS signaling for Video streams—RSVP
  - QOS for video via traffic classification—Diffserv
  - Address translation

Gatekeeper Zones

- A zone is the collection of all terminals, gateways, and Multipoint Control Units managed by one H.323 gatekeeper

- Gatekeeper zones are logical areas reflective of network topology, and provide administrative convenience
MCM Proxy Functions and Features

- MCM proxy is an “H.323-H.323 gateway”
  Terminates and re-initiates H.323 call legs
  Forwards video/audio media streams via fast switching
  Functions as a local intermediary for a “remote” H.323 endpoint (analogous to ftp and http proxies)
- Proxy provides QoS via IP precedence or RSVP
  Will leverage IP/ATM QoS features in future
- Proxy provides Security via address translation
  Works in conjunction with Cisco Firewalls
- Proxy supports bandwidth management (w/GK)
- Proxy offers H.323 application specific routing

Controlling QoS with MCM Gatekeeper and Proxy

- MCM gatekeeper routes calls through proxy
- MCM proxy negotiates RSVP for audio/video streams
- Proxy sets TOS bits in each packet for audio/video
- QoS policies are established by network administrator (not end-users) and enforced by MCM
- Gatekeeper/proxy can place limits on number of simultaneous calls and bandwidth of each call, providing bandwidth management on LAN and WAN network segments
- H.323 traffic segregation services: Gatekeeper/proxy can route conferences across separate facilities
MCM Proxy and Queuing and Congestion Management = QoS

- Negotiate RSVP for video/audio streams
  - Compute required bandwidth and buffer space
  - RSVP controlled load or guaranteed QoS
    - Between proxies or a proxy and endpoint
- Set IP TOS bits for classification of video/audio packets for call legs between two proxies
- Cisco queuing and congestion mgmt mechanisms work to deliver the specified QoS

MCM H.323 Gatekeeper and Proxy for Cisco Routers

- Cisco 7xxx, 26xx, or 36xx
- H.323 Room System
- H.323 Clients
- PBX
- Data Clients
- QoS -Enabled IP WAN- FR, ATM, Serial, Leased Line
MCM with Release 12.1(4)T: GK/Proxy and Routing and VoIP Gateway

QoS-Enabled IP WAN
(FR, ATM, Serial, Leased Line)

MCM GK/Proxy + Routing + VoIP Gateway

H.323 Room System

PBX

Cisco 7xxx, 26xx, 26xx, or 36xx

PBX

H.323 Room System

H.323 Clients

Data Clients

Data

H.323 Desktop Clients

MCM Summary

• High Capacity Gatekeeper for H.323 Video conferencing and VoIP
• High-throughput H.323 Proxy supports many videoconferences, guarantees quality and security
• Cisco Multiservice Networking: MCM Gatekeeper and proxy plus routing (+ VoX Gateway—future)
## MCM Performance on Various Cisco Routers

<table>
<thead>
<tr>
<th>Chassis</th>
<th>IP Routing</th>
<th>H.323 Endpoint Registration</th>
<th>Simultaneous Video Calls</th>
<th>Video Proxy Sessions</th>
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<td>50 @ 128 Kbps</td>
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## H.323 Client Systems

Cisco IP/VC Family Supports H.323-Compliant End Points
Key Benefits of the Cisco Videoconferencing Family

- **Worldwide Connectivity**
- **High Availability**
- **Interoperability through H.323**
- **Integrated with Intelligent Network Services**
- **Investment Protection for H.320 Equipment**
- **Cisco SMARTnet™ Service and Support**
- **Scalable Solution**

Cisco IP/TV Product Family

- Complete streaming video solution for online training, corporate communications, and business TV
- Offers comprehensive network video management
- Delivers live and prerecorded video broadcasts and video on demand
The New IP/TV Family

- Cisco IP/TV 3411 Control Server
- Cisco IP/TV 3422/3423 Broadcast Servers
- Cisco IP/TV 3431 Archive Server
- Cisco IP/TV 3415 Video Starter System
- Cisco IP/TV Viewer

IP/TV Is Standards-based

- IP multicast broadcasts video
  - Efficient one-stream-to-many technology
  - Enables highest quality using less bandwidth
- RTP provides a common transport
  - Provides intelligent network services for real-time voice and video streams
- RTSP enables client/server control

IP Multicasting
Cisco IP/TV Integrates Microsoft Windows Media

The Cisco IP/TV Solution is Now Built on Microsoft Windows Media

- Windows Media audio and MPEG-4 video for higher quality at lower bandwidths
- Common user interface to Windows Media and IP/TV delivered programs, expanding users choices
- Windows Media Format synchronizes Web pages with audio and video for multimedia presentations
- Windows Media Tools, Media Player, and Media Services are included

Cisco IP/TV Product Family—Video Solutions
Cisco IP/TV 3411 Control Server

- Centrally manages entire IP/TV system
- Provides bandwidth, server, and content management services
- Sends instructions to distributed broadcast and archive servers
- Communicates program information to Cisco IP/TV viewers

Easy to Use Web-Based Administration Tool

Cisco IP/TV 3411 Control Server

- Allows administrators to easily schedule on-demand and broadcast programs
- Lets managers quickly set up times and dates for initial and repeat showings
- Determines which servers will store what content
- Offers security features to control access

On-Demand and Scheduled Program Listings
Cisco IP/TV 3411 Control Server

- Ensures high-quality video delivery
  - Controls amount of bandwidth used
  - Distributes content to remote servers
  - Balances server load
  - Directs users to best server
- Centrally manages all aspects of video delivery and distribution

Cisco IP/TV 3422 and 3423 Broadcast Servers

- Capture and broadcast real-time and prerecorded content
- Ideal for live and scheduled broadcasts using IP multicasting
- Receive content from a variety of sources including cameras, satellite and cable feeds, DVDs, and ASF, AVI, and MPEG digital files
- Offer a full range of video formats: MPEG-1, MPEG-2, MPEG-4, and H.261 for a variety of bandwidth and quality requirements
Cisco IP/TV 3431 Archive Server

- Premium, high-performance platform for extensive use of video-on-demand
- Supports wide range of video formats including ASF, AVI, and MPEG
- Offers 120 hours of storage capacity at 1 Mbps
- Serves 50 high-quality 1-Mbps VoD streams concurrently

IP/TV Release 3.1

- 5 Encoder cards for Broadcast Servers, with 4 active at the same time
- QOS via IP Precedence setting by Servers
- Web-based Program Listing
- Interoperability with QuickTime & Real Networks players
IP/TV 3.1 Enhancements

- Windows 2000 IP/TV client support
- Service Pack 1 Customer specials & fixes
- Satellite delivery Starburst (now Adero) Evaluating replacements
- In the pipeline for CY’Q2 Customer specials Web-based program listing
- In the pipeline for CY’H2 Customer specials Dynamic feedback (RTCP) QoS with Windows 2000 Capture cards
- Interoperability QuickTime player Real Networks player Filter for Microsoft player Videoconferencing Live broadcast servers

Cisco IP/TV 3415 Starter System

- Affordable system for departmental deployments or initial trials
- Combines control, broadcast, and archive services into one box
- Supports MPEG-1, MPEG-2, MPEG-4, and H.261

All-in-One System for an Easy Introduction to Streaming Video
Cisco IP/TV Viewer

- IP/TV client-side software
- Easy-to-use, intuitive interface
- Presents program listing with search capabilities
- Separate viewing window appears with TV-like controls
- Includes the Microsoft Windows Media Player
- Encompasses a range of e-learning services

Viewers Get Point-and-Click Program Access and a Separate Viewing Window

Cisco IP/TV Viewer for E-Learning

Web-Based Training Materials

Presentation Synchronized to Slides

Web Presenter Runs IP/TV Video and Web Pages at the Same Time

Embed the IP/TV Plug-in into Your Web Page
We are looking for a push solution that could deliver content right to our employees’ desktops. We found IP/TV to be the best implementation available.

Keith McGarr
FedEx

Instead of having people spend half a day driving to campus and hunting for parking—or catching a plane—we deliver the sessions live to them at their desks.

Harold Ostrow
NIH
Key Benefits of Cisco IP/TV Family

- Highest-Quality Video and Audio
- Powerful Management
- Easy to Use
- Flexible Live, Scheduled, and Video-on-Demand
- Network Friendly
- Scalable Architecture
- Cisco SMARTnet Service and Support

Why Cisco for Video over IP?

- Intelligent network services
  - Quality of service
  - IP multicast
- Network management for video
- Open, standards based
- SMARTnet™
- Migration paths
- Videoconferencing, broadcasting, and on-demand video

- High quality
- High availability
- Rapid deployment
- Interoperability
- Investment protection
- Flexible communications
Getting Started

Cisco IP/VC Family
- Application suggestions
  - Virtual project team meetings
  - Remote group meetings
- Implementation
  - Evaluate VTA to bring H.320 terminals onto IP LAN
  - Add MCU and H.323 end points to add video to conference calls

Cisco IP/TV Family
- Application suggestions
  - Broadcast within one building
  - Replay training
- Implementation
  - Install the free Cisco IP/TV Demo CD
  - Purchase the affordable Cisco IP/TV 3415 Starter System

Evaluating the Return on Your Video Network Investment

- Examine costs
  - Moving people vs. data
- Measure costs over time
  - Cost per incident and number of incidents vs. deployment costs
- Identify success factors
  - Payback of 50% or more
  - Effectiveness and productivity
- Cost of waiting

Application Examples

Training for the Field
- Streaming media
- 3,053% ROI over four years
- More effective than CD-ROM

Business Meetings for Sales
- Videoconferencing
- 1,429% ROI over four years
- Increased yearly sales by 15%

Consider Your Own Business
Cisco IP Video:  
- Fits nicely into a data network,  
- Looks good, and  
- Is surprisingly cost-effective
Please Complete Your Evaluation Form
Session 2009