Deploying IP-Based Telephony Applications (Including Unified Messaging)

Session # VVT–212

Agenda

IP-Enabled Applications

• Personal Productivity Solutions
  Cisco IP Softphone
  Personal Assistant
  XML Services
  Unified Messaging

• Customer Response Solutions
  IP IVR (Integrated Voice Response),
  IP ICD (Integrated Contact Distribution)
IP Application Deployment Advantages

- Ease of integration
  Multi-vendor, multi-site
  Common protocols,
  Common transport

- Faster to deploy
  Quicker to add new users and services

- Intelligent scalable services
  Phone becomes IP appliance
  Simple to add new applications to all phones

- Leverage of intelligence of data applications
  Directories, web sites, message stores, calendars

Personal Productivity

- Collaboration (SoftPhone)

- Streamline Communications (Cisco PA)

- Desktop Information Services/Customized Services (XML)

- Anytime...Anywhere (Unified Communications)
**IP SoftPhone**

**PC Desktop Integration**

- Advanced GUI extends IP phone functions!
- Office phone mobility when travelling
- Directory integration with point-and-click dialing
- One-click, ad-hoc conferencing

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**Cisco IP SoftPhone**

**Platform Support**

- Windows IP phone client
- Standards-based: TAPI, DirectXMedia, and LDAP
- Drag-and-drop vcards to make calls
- Launches NetMeeting easily
- Integrates with IPVC
- Requires sound card full-duplex sound card—one that can capture and play back audio simultaneously
- DirectX Media 6.0 run-time; this is distributed and installed by the Cisco SoftPhone installer
SoftPhone in Action

Internals
Standalone Mode Features

- Support for Codecs:
  - G.711 (64kbps)
  - G.723 (5.3 and 6.4 kbps)
  - G.729A (8 kbps)
- Silence suppression (also called Voice Activity Detection—VAD): uses an algorithm similar to that used in IP phones

Cisco IP SoftPhone Virtual Conference Room

- Uses NetMeeting SDK for T.120
- Roster shows all conference participants
- Drag and drop users from directory to invite into conference
- Share documents by dragging and dropping onto conference
- Share applications currently running on desktop
Cisco SoftPhone: CCM Communication and Call Flows

- Cisco SoftPhone dials x1111 via TAPI
- CCM receives the dialed number from TAPISRV via CCM CTI
- CCM signals x1111 to connect; call completes

Deployment Considerations

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Personal Productivity

Streamline Communications
(Cisco PA)

Desktop Information Services/Customized Services (XML)

Anytime...Anywhere
(Unified Communications)

Cisco Personal Assistant
Enhanced Productivity

• Route calls by user-defined rules
  Time of day
  Calendar
  Who the caller is
• Send call to user-defined phone numbers
  Single number
  Series of numbers (i.e., office, cellular, home)
• Screen calls
  Select which calls to accept in real time
• Enhance productivity
  Unify how and where you receive calls
  Screen calls
  Forward calls
• Speech-enabled features
  Voicemail access
  Name dialing
  Conferencing
Cisco Personal Productivity Enhancements in Action

If I’m in a Meeting and It’s My Brother, Send to Voicemail
If I’m Not in a Meeting and It’s My Manager, Ring Me at Desk or Home Office
If It’s a Customer, Ring Me Wherever

Check My Calendar
Cisco Unity Voicemail
IP Network
Directory
Cell/PDA

Cisco Personal Assistant Features

• Route calls by user-defined rules
  - Time of day
  - Calendar
  - Who the caller is

• Send call to user-defined locations
  - Office, cellular, home (primary destination group)
  - Alternate office, hotel (alternate destination group)
  - Ring office phone; if no answer, ring secondary number

• Screen calls
  - Select which calls to accept in real-time
Cisco Personal Assistant Configuration

- Intuitive user interface
  Easy for user to configure using a URL and web browser
- User controls routing rules
  Change rules whenever needed without waiting for administrator assistance
  Keep default rules for months or change rules each day—it’s up to the user
- System and error reporting provided

Personal Assistant in Action

Welcome to Personal Assistant

The Cisco Personal Assistant can selectively forward your incoming calls and help you make outgoing calls.

To get started, click an action button below.

Create Rules

There’s an example rule:
- Receive voice calls,
- Forward calls to my cellular phone
- Create Message/Map.

VVT-212
3017_05_2001
Incoming Call

- Dial user’s telephone number
- Call routed to Cisco Personal Assistant
- Check user’s rules
- Apply user’s rules

Check Messages

- Dial Cisco PA number (JTAPI route point)
- Call routed to Cisco PA
- Check voice messages
Cisco Personal Assistant Scalability

- Cisco PA + Speech on Cisco 7835—up to 24 ports; i.e., approximately 600 users with 25:1 ratio
- Cisco PA only on Cisco 7835—up to 60 ports; i.e., approximately 1500 users with 25:1 ratio
- Speech only on Cisco 7835—up to 30 ports; i.e., approximately 750 with 25:1 ratio
- Above numbers can vary, depending on the usage within individual organizations
- No limit to number of Cisco PAs within a cluster

Cisco Personal Assistant Single Cluster/Multiple Servers

Primary CCM

Directory Sync

Secondary CCM

Cisco PA #6000

Cisco PA #7000
Cisco Personal Assistant Failure

- Dial Cisco PA #6000 (JTAPI route point)

CFB or CFNA to secondary Cisco PA server #7000

Cisco Personal Assistant Failure

CCM Failure

- Dial Cisco PA x6000 (JTAPI route point)

Cisco AVVID network converges

Connect to Cisco PA server x6000
Personal Productivity

Collaboration (SoftPhone)

Desktop Information Services/Customized Services (XML)

Streamline Communications (Cisco PA)

Anytime...Anywhere (Unified Communications)

What Are IP Phone Services?

- Adding data driven applications to the 7960 and 7940 phones
- Using predefined XML data tags, custom text, graphics, and Web-based services could be configured for the IP phone
- For example:
  - Flight information
  - Personal/corporate phone directory lookups
  - Stock and finance rate quotes
  - Class schedules (education)
Cisco IP Phone Services
Cisco CallManager Configuration

1. Web Developer Creates the Cisco IP Phone Services Application
2. Developer or Cisco CallManager Administrator Copies the Web Script Files to a Web (HTTP) Server that the Cisco CallManager Will Point to for Cisco IP Phone Services
3. Adds Cisco IP Phone Services and Makes Them Available to the Users
4. User Logs Into Cisco CallManager User Preferences and Configures the Services to Be Displayed on the Phone
5. User Presses the Services Button on the Cisco IP Phone to Display the Selected Cisco IP Phone Services on the LCD Screen

Cisco IP Phone Services Example
Getting the Cisco Stock Quote

1. Cisco IP Phone HTTP Client performs an “HTTP GET” for a specified URL
2. HTTP Web server processes the request and formats the data returned
3. HTTP Web server returns the HTTP response of XML objects or plaintext to the phone
4. Phone parses the HTTP response header for ContentType of “text/xml”
5. Phone presents data and options to the user per the server response
Cisco IP Phone Services
Another Possible Configuration...
Phone Has Direct Access to Internet

Caveats:
NAT required if private addressing is used for the phone
Queried URL must return properly formatted data (i.e., Cisco supported XML tags)
Phone must have valid DNS entries to resolve URLs

Where’s the Load?
CM Server: Minimal Load

Most of the Load Is on the Server Processing the Cisco IP Phone Web Scripts

Use Web Server Design Best Practices to Optimize Your Web Configuration
Design Guidelines

- Cisco IP phones support only text and Cisco-defined XML objects
- Graphics:
  - LCD screen size: 133 x 65 pixels
  - 2-bit graphics depth: four grayscale levels
- No push capability to phones today

Personal Productivity

Collaboration (SoftPhone)
Desktop Information Services/Customized Services (XML)
Streamline Communications (Cisco PA)

Anytime...Anywhere
(Unified Communications)
What Are the Benefits of Unified Messaging?

Employee Productivity
- Message access anywhere, any way, anytime
- One-stop message management
- Easy prioritization and foldering of all messages by user

Customer Satisfaction
- Increases speed and quality of responses to all types of communication
- Allows for flexible communication flow

Cost Reductions
- Moves/adds/changes are simpler and faster
- Single infrastructure to manage and maintain
- Single transport infrastructure for all media: data/voice/video

Cisco Unity Enterprise Messaging Solutions

- Cisco Unity Unified Messaging
  True unified messaging
  Works with Cisco CallManager
  Compatible with MS-Exchange 5.5
  Will also support Lotus Notes and Exchange 2000 (future)
  Auto Attendant
  Text to speech

- Cisco Unity Voicemail
  IP voice messaging
  Upgradeable to Cisco Unity UM
  Works with Cisco CallManager
  Independent of e-mail system
  Auto Attendant
Cisco Unity Voicemail and Unified Messaging

**Cisco Unity Voice Messaging**
- Message access
  - Voice from TUI
  - Notification via phone, Cisco pager or SMTP device
- Address book
  - Voice-mail users
- Administration
  - Two directories
- Installation
  - As separate NT domain server

**Cisco Unity Unified Messaging**
- Message access
  - Voice/fax/e-mail from MS Outlook and TUI
  - Notification via phone, Cisco pager, or SMTP device
- Address book
  - Global address list
- Administration
  - One directory
- Installation
  - As part of the Exchange network

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Cisco Unity Architectural Overview

- **Cisco Unity**
  - LDAP and MAPI
  - Exchange 5.5
- **Cisco Unity Administrator**
  - IE 4.01
  - IIS 4.0
- **Voice Boards**
- **PC Hardware**
- **Conversation**
- **WAV**
- **TSP**
- **Windows NT 4.0 and Windows 2000**
- **ASD**
- **IP Switch**
- **Telephone Switch**
Single-Site Deployments (SCCP Integration)

- Exchange 5.5 farm is database
- One CCM cluster per Cisco Unity
- 40 sessions tested
- 2500 users

Simple Fail Over (SCCP Integration)

- Must replicate from Cisco Unity A to Cisco Unity B
  - Routing rules
  - Schedules
  - Greetings
  - Databases are mirrored
  - Hunt group
One Exchange Site/Multiple Cisco Unity 2.45 Servers

- 40 ports (sessions), 2500 users for unified messaging have been tested
- The user limitation is the GAL (global address list) in Exchange 5.5

Cisco Unity with Centralized Call Processing

- Design Characteristics
  - 2500 users max
  - Choose campus connectivity best suited for requirements
  - Cisco CallManager cluster of three
  - Two Call Processing CallManagers and a dedicated publisher
- All agents/phones register to same CM
Looking Forward to…
Cisco Unity Messaging

• Support for MS Exchange 2000
• Support for Lotus Notes Domino
• Enhanced scalability
• AMIS-A support
  (Allows messaging to disparate voicemail systems)

Customer Response Solutions

IP IVR
Integrated Voice Response

IP ICD
Integrated Contact Distribution
**IP IVR**

Integrated Voice Response

- **IP IVR**
  - Offers menu prompts and database links
  - Provides dynamic announcements
  - Automates routine data requests
    - Account information, product status, etc.
  - E-notification services
    - Pager notification on periodic database checks
  - IP transport integration
  - Ethernet scalability

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**Business Solution Productivity**

**Voice Portal Solution**

- **CallManager IP IVR**
  - Extracts XML information from web page into IP IVR
  - Benefit
    - Only one place to configure and maintain data
    - Consistency
    - Lower administration costs

- **Press #1 to Hear Cisco Stock Quote**
**IP IVR**

- Eliminates repetitive service agent response tasks
- Functions 7x24
- Lower equipment costs via IP integration to data sources
- Features:
  - Easy script construction
  - Location independent
  - Many solutions can use same IP IVR
  - Can be deployed as workgroup IVR
  - Easily personalized

**Play Prompt**

"Welcome to First Bank"

"For account balance, press 1
To transfer funds, press 2
For loans, press 3
To speak with an agent, press 0"

"Please enter account number and PIN code"

**Packaged Solutions**

**Today:**
- IP IVR
- AutoAttendant

**Future:**
- Notification Services
- Queuing (ACD)
- Personalized Apps
- Customer Apps

**External Services**
- Cisco Via
- ICM
- LDAP
- E-Mail
- Paging
- Web Pages
- Enterprise Database

**Application Framework**
- Telephony
- Queuing
- ODBC
- Web Access
- Enterprise Database

**Packaged Solutions**
- **Today:**
  - IP IVR
  - AutoAttendant

**Future:**
- Notification Services
- Queuing (ACD)
- Personalized Apps
- Customer Apps
Application Editor and Application Engine

- **Application editor**
  - Windows application
  - Edit flows anywhere in the network
  - Download flows to any IP-IVR/IP AA
  - Any editor can edit flows on any engine

- **Application engines**
  - Executes IP IVR/IP AA flows
  - Executes on an MCS server
  - Windows 2000 server

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Application Editor

- **Step Library**
- **Steps**
- **Palette Window**
- **Step Library**
- **Variable Window**
- **Toolbar**
- **Design Window**
- **Flow**
Step Libraries

• What is a step?

Steps are JavaBeans that represent blocks of logic that are connected together to create flows and IVR solutions in the IP IVR

• What is a step library?

The step library is a folder of related steps; the application editor contains four step libraries: general steps, IVR steps, I/O steps, and ICM steps
Flow Repository/Reporting

- The IP IVR uses the same LDAP directory as Cisco CallManager for the flow repository; this is where all IP IVR/IP AA flows are stored.
- The IP IVR will query the LDAPv3 directory to obtain information such as dial-by-name information, flow steps, and configuration data.
- Real-time reports include total system activity and statistics regarding individual flows.

Application Editor Scripting Example
Cisco IP-IVR/IP AA Deployment

For Higher-Density Solutions, You Can Deploy Cisco IVR/IP AA Flows on the Cisco MCS-7835, which Scales Up to 48 Ports and Can Be Installed Anywhere in Your IP Network.

If Your Company Grows Beyond the Co-Resident Solution, Simply Add a MCS Application Server such as the Cisco MCS-7825, which Scales Up to 30 Ports.

For Higher-Density Solutions, You Can Deploy Cisco IVR/IP AA Flows on the Cisco MCS-7835, which Scales Up to 48 Ports and Can Be Installed Anywhere in Your IP Network.

Cisco IP Interactive Voice Response (Cisco IP IVR)

Calls May Be Routed From Anywhere Within the IP Network to the Cisco IP IVR; When the IVR Script Has Been Executed, Calls May Be Transferred or Terminated.

Calls from an IP Phone

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Presentation_ID.scr
Customer Response Solutions

IP IVR
Integrated Voice Response

IP ICD
Integrated Contact Distribution

- Addresses growing need for customer support across all organizations
- Offers quick installation and set-up
- Simple agent desktop for non-skilled agents
- Simple queuing algorithms
- Easy-to-configure agent groups
- Shared application technology with IP-IVR
IP Integrated Contact Distribution (IP ICD)

1. Call is received by CM and routed to IP ICD
2. IP ICD determines agent status and will queue the call and/or
3. Route call to an available agent

Calls may be routed from anywhere within the IP network to the Cisco IP ICD

Resource Group

Customer TDM Access

Calls via VoIP Gateways

Public Network

TDM Voice

IP Voice

Intranet

IP Phones

Cisco CallManager

Calls May Be Routed from Anywhere within the IP Network to the Cisco IP ICD

If IP IVR Functions Are Required, the IP ICD Can Be Resident on the Same Application Engine as the IP IVR, or on a Separate Server

Internet

IP

IP Phones
ICD Queue Features

- Queuing options:
  - Linear distribution with agent weighting
  - Circular distribution with order preservation
  - Longest available distribution

Custom Editor for Administration Changes
ICD Reporting Features

- Real-time reporting metrics
  - Listing by groups, agents
  - Active agents
  - Number of calls in queue
  - Number of calls handled
  - Calls abandoned
  - Average call lengths, wait length
  - Longest calls, wait length
- Database and historical reporting offered through third-party AVVID solutions program

ICD Agent Desktop

- Win32 application
- Easily installed across the network
- Agent can see availability status
- Calls routed to agents’ IP phone
- Agents calls not answered get added back to queue
- Agent is marked not available
ICD in Action

Call Queuing and Agent Capacity

- Up to 48 agents total per system
- Up to 48 calls in queue
- Unlimited number of agent groups
- Agent overlaps not supported
- Co-resident with CallManager for up to five agents
- Support 2 incoming calls per second on dedicated MCS server
E-Service Engine Architectural Overview

Cisco IP Contact Center

Create an open communications platform leveraging voice and data technologies to facilitate geographic- and media-independent customer interaction.
Media Convergence

Old World

- Voice Mail
- Data Network
- Video

New World

- Converged IP Network
- Unified Data
- Video Conf.
- Email

Cisco IPCC unifies Old World and New World applications

Advantages of IP

- Location independence
  Locate agents and workers anywhere

- Support multiple channels
  Voice, Email, Web, Fax, Video

- Rapid deployment of new applications

- Deploy and maintain one network
Conclusion—IP Applications

- Application synergy when deploying on a common transport
  - Unified Messaging, Personal Assistant
- IP phone applications are a true breakaway strategy
- Desktop message consolidation increases personal productivity
- Integration with directories and groupware build a total common communication solution
- Collaboration applications enhance productivity
- IP IVR and the entry market IP ICD offer ease of integration
- Extending centrally hosted applications out to the branches
For More Information

Websites:
• www.cisco.com/go/avvid

Networkers 2001 Breakout Sessions:
• VVT-120 introduction to IP-based call processing
• VVT-215 design and implementation of Enterprise IP telephony networks
• VVT-240 deploying IP-enabled contact centers
Cisco’s Online CommUnity

- Discussion Forums
- Live, Online Presentations
- Message board discussions with Cisco experts
- Biweekly Newsletter (6500+ subscribers)
- Calendar of events

www.cisco.com/go/netpro

Interact with Your Peers Worldwide, 24/7

- Join a Conversation
  - VPN
  - Voice and Video
  - More to Come
- Participate in Polls
- Links to Relevant Information

www.cisco.com/go/netpro
Member Benefits

- **Access to**
  - A “community” of professional peers
  - Timely, relevant information
- **Opportunity to**
  - Share expertise
  - Learn from more experienced professionals
  - Ask Cisco experts for answers

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