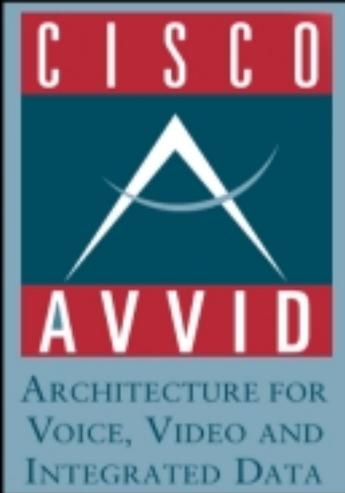




AVVID

Open for Business

Raymond Chu
Consulting Systems Engineer Multiservice/Asia Pac ELoB
raychu@cisco.com



CISCO

AVVID

ARCHITECTURE FOR
VOICE, VIDEO AND
INTEGRATED DATA



Architecture Voice Video Integrated Data

“AVVID”

Raymond Chu

Consulting Systems Engineer
Multiservice Solutions Asia Pacific

raychu@cisco.com

Cisco AVVID

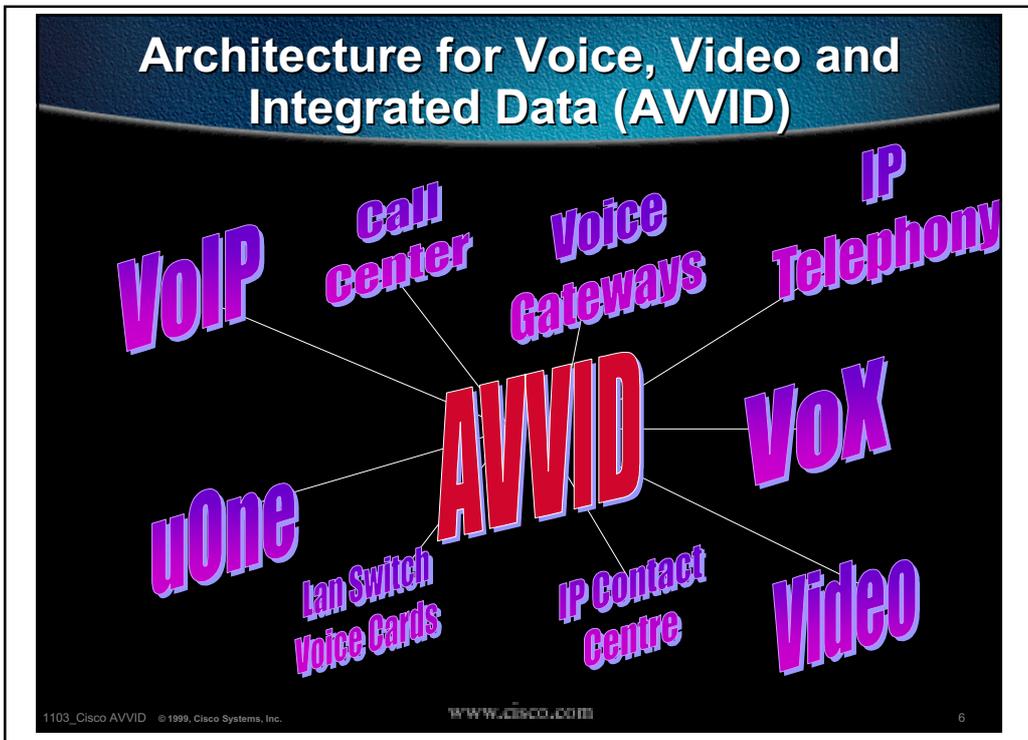
- What is AVVID?
- Industry Trends
- Cisco AVVID Architecture
- Business Applications
- Case Studies

F0_4339_c1

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4





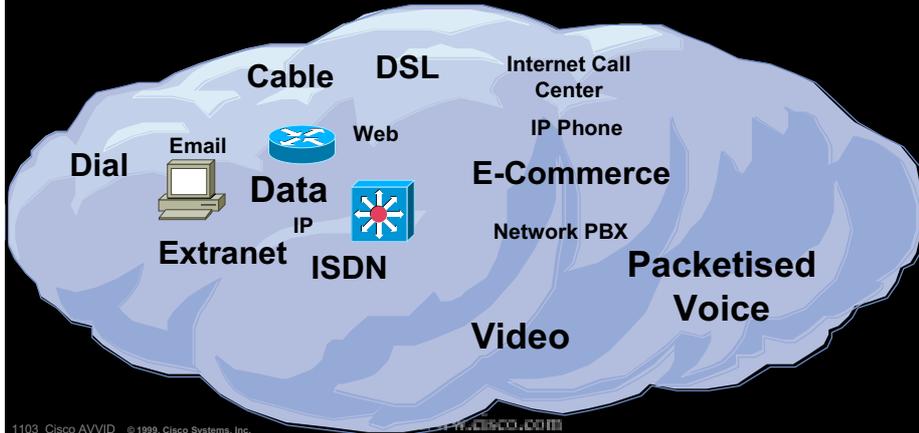
Today's Networks

- Separate infrastructures for voice, video and data
- Application integration difficult
- Voice network not designed to handle future converged voice, video and data demands

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Converging Ecosystem

**New World Architecture -
Highly Adaptive, Open, Scalable and Unified**



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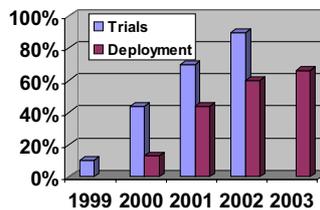
9

LAN Telephony Adoption

Business Communication Review

- Over 60% will deploy within 3 years
- Lower cost of ownership as drivers
 - Reduced administration costs
 - Simplicity of moves, adds, changes
 - CTI applications
 - “One system simplicity”
- Overall solutions savings (broader than cost/phone)

Timeframe of LAN Telephony Plans



The Phillips Group-InfoTech

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10

Communication Trends

“

Users will want the flexibility and new services they can't get from the PBX. ... Network managers must be prepared to re-architect their data infrastructures to accommodate such systems (Converged voice/data networks)

”

**Business Communications
Review, November 1999**

David Passmore

IP Telephony Growing Faster Than Expected

- **17% of US business began implementation of IP LAN Telephony in 2000 to replace or transform their existing phone systems**
- **30% more than previous anticipated**
- **More than 80% will adopt IP Telephony within 4 years**

Latest study by The Phillips Group InfoTech, 24 Jan 2001

Voice Market Trends

“For the first time since 1993 the Private Branch Exchange (PBX) market has declined significantly – shipments of PBX systems in the second quarter of 2000 dropped 16.2% from the same period in 1999. This is remarkable when compared with 10-15% growth rates for the previous 5 years.”

- Chris Stinson, The Phillips Group

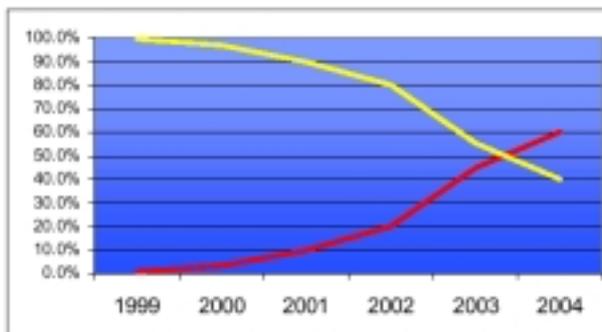
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Convergence is Coming

Figure 34: LAN Telephony vs. Circuit Switched Voice Traffic



	1999	2000	2001	2002	2003	2004
LAN	0.5%	3.0%	10.0%	20.0%	45.0%	60.0%
Circuit	99.5%	97.0%	90.0%	80.0%	55.0%	40.0%

Source: Cahners In-Stat Group

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VoIP Enterprise Adoption

- Cisco shipping >1700 IP Phones per day
- Deployments range from 10 – 13,000 seats
- Over a million VoIP gateway ports shipped



Menlo College



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© Ministry of Social Policy

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Customer Survey by Network Computing

“

According to the respondents, 64% will be re-evaluating their existing PBX infrastructure in the next 12 months, 48% believe that Cisco is the vendor best prepared to deliver IP Telephony.

”

Network Computing Nov 2000

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RFP Network Computing

“

**Cisco AVVID Voice Gets
Network Computing Vote for
Best IP Telephony Solution!**

”

Network Computing 7 Nov 2000

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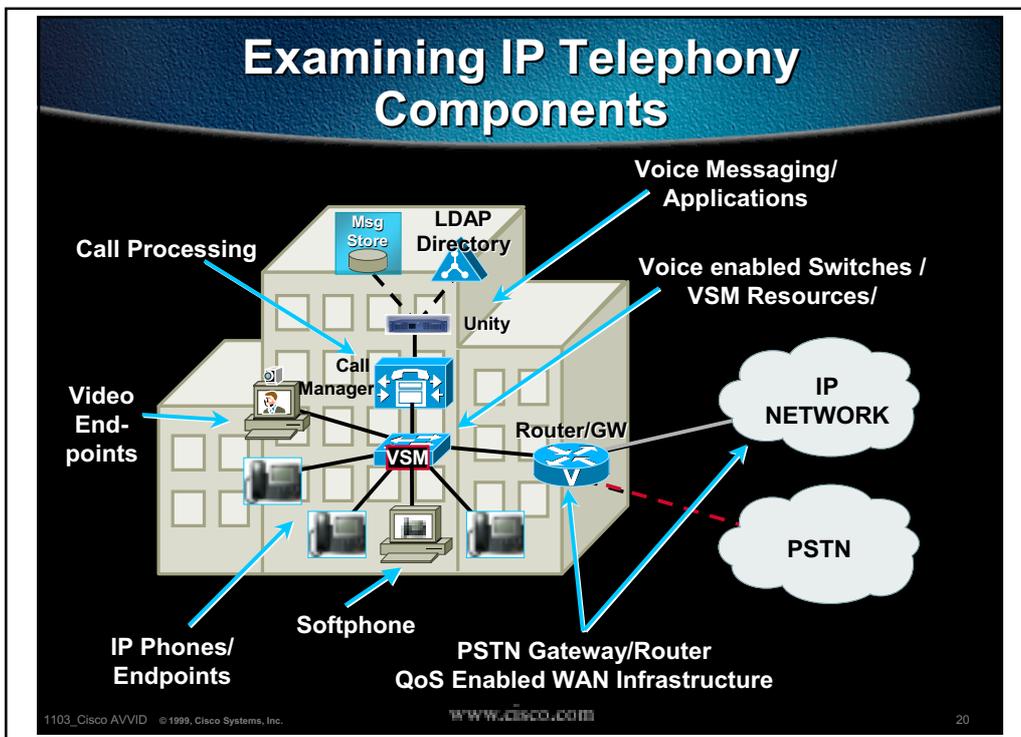
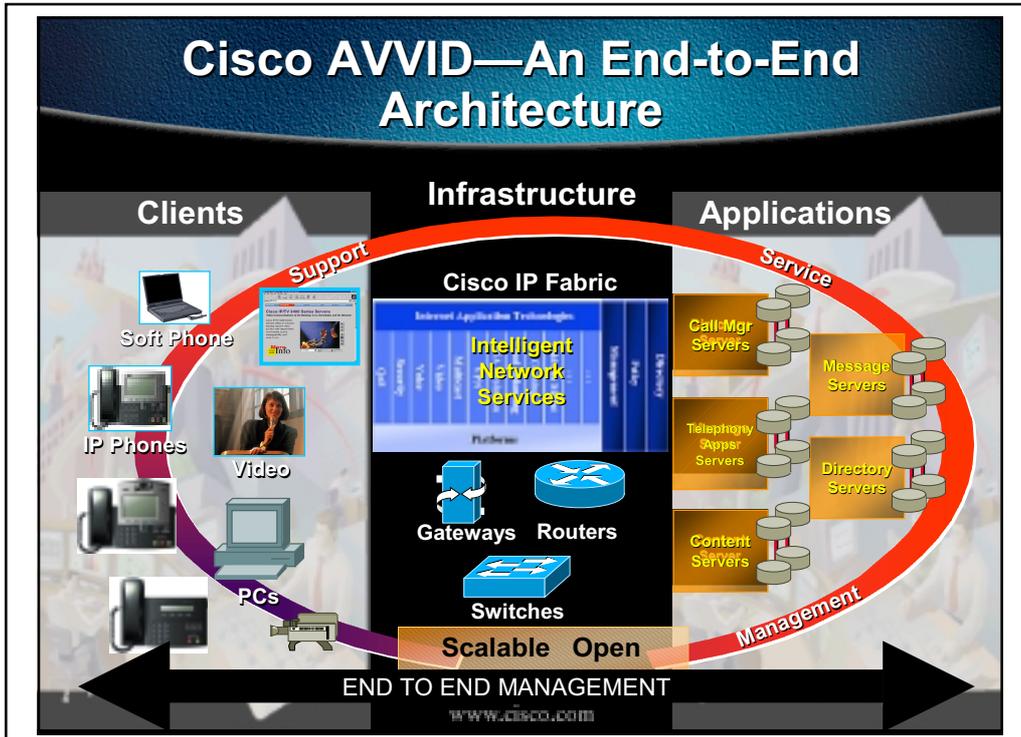
17

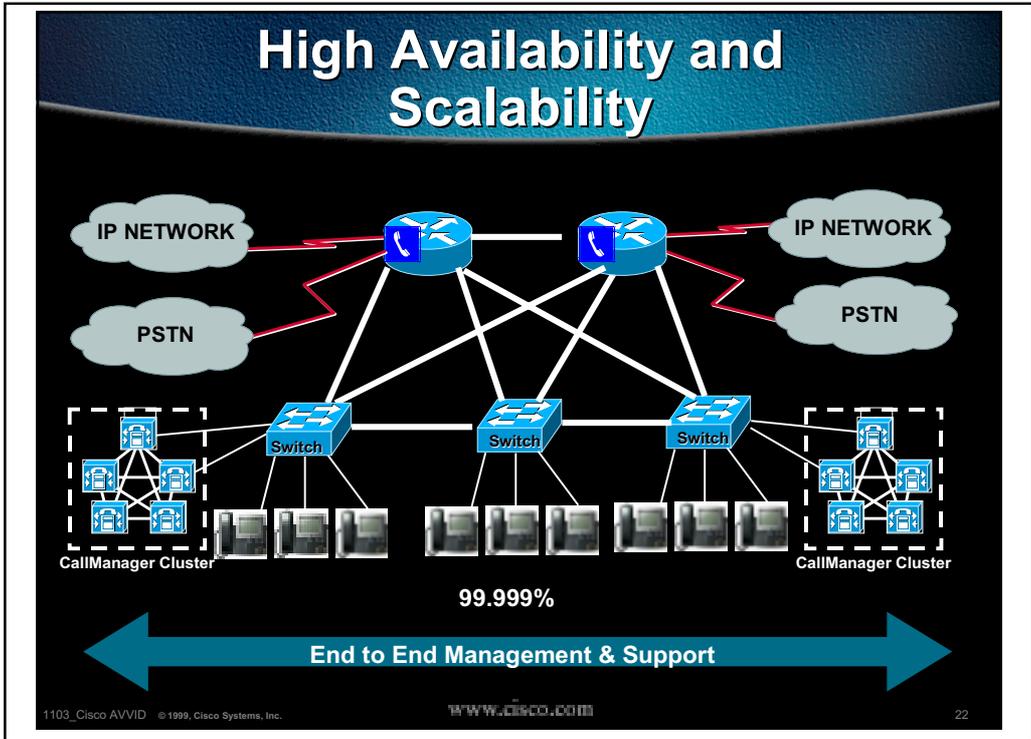
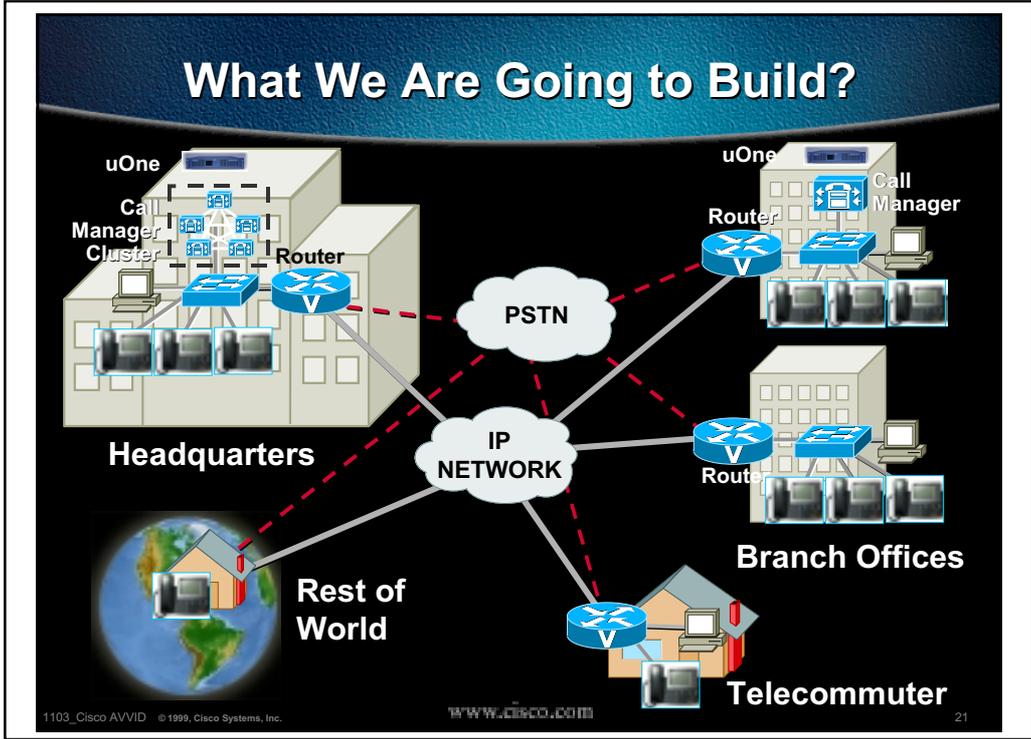


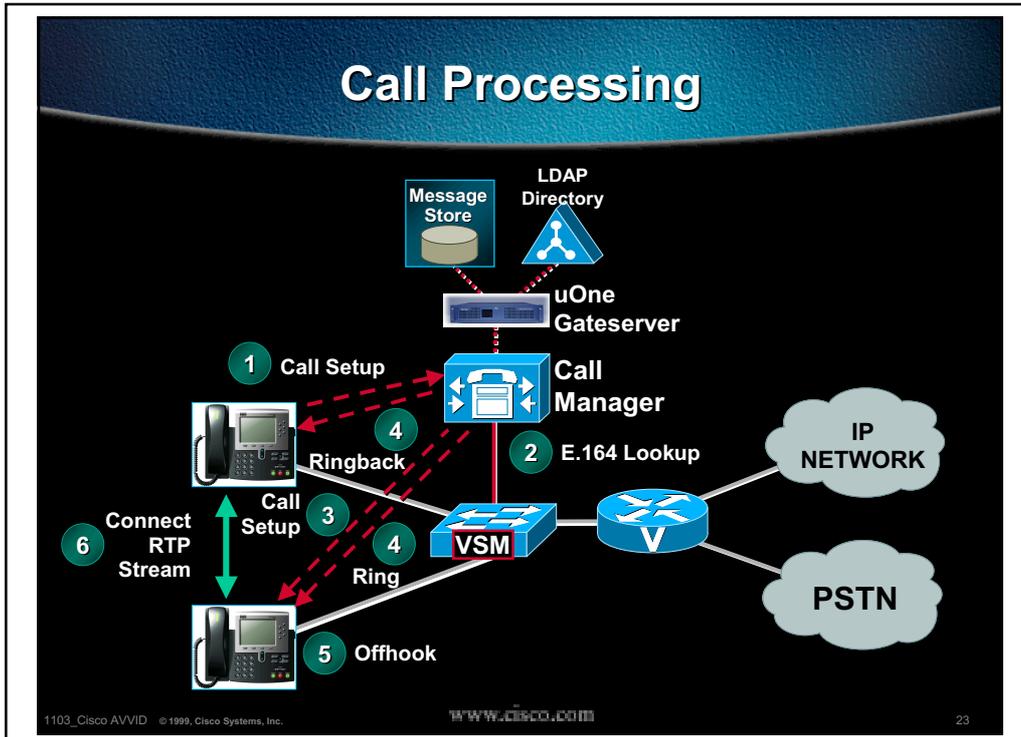
Cisco AVVID



**Architecture and
Network Design**







IP PBX: MCS 7835

- Call control and processing
- Support 2500 IP phones
- 10,000 IP phones per cluster
- Dual 18.2 Gig hot plug drives
- Dual hot swappable power supply
- 50,000 Busy Hours Call Completion



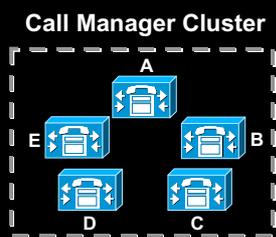
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Call Manager 3.0



- Standard HTML which minimizes training
- Pre-installed on Cisco platforms
- Comprehensive telephony features
- Remote administration simplified
- Extensive on-line help
- 50,000 Busy Hour Call Completion Setup per MCS server
- 125,000 Busy Hour Call Completion Setup per cluster
- Scalability, availability and redundancy

Call Manager Cluster Scalability



Call Manager Cluster Sizing

1. Five Call Managers max in a cluster—cluster is confined to a campus
2. 2500 users max per Call Manager (even under failure conditions)
3. Maximum of 10,000 users in a cluster
4. Provision for Call Manager failure

Call Manager Cluster IP Phone Provisioning

CM's in Cluster	Max users per cluster	Max users with N+1 Redundancy
1	2500	0
2	5000	2500
3	7500	5000
4	10,000	7500
5	10,000	10,000

CiscoWorks 2000 (New Voice Features)

- **Call Manager discovery:**
topology display and CM config launching
- **Phone Tracking:**
Discovery of handsets and reporting within User Tracking
- **End point analysis:**
Near real time path trace between handsets
- **E911 Location Tracking: (future)**
Database exchange of switch port location with PSAP organizations
- **Voice Health Monitor: (future)**
Real time fault checking of Call Manager servers.



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Call Accounting and Billing

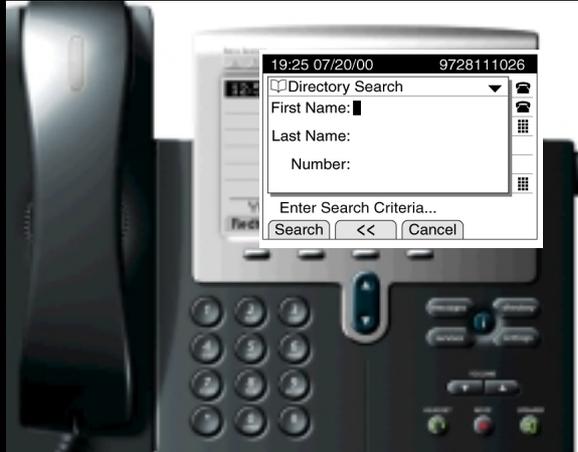
- **ART (Administrative Reporting Tools) included in Call Manager**
- **CDR (Call Detail Record) on Call Manager accessible via SQL**
- **3th Party Call Accounting Packages – MindCTI, MTS, etc**

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Individual Productivity IP 7960 Display Applications



IP Telephony Appliance

- Corporate directory integration via LDAP
- Web site integration via XML
- Personalized menu's via softkeys

Extensible interface with IP services offers clear differentiation to PBX connected devices



7960 IP Phone



Cisco IP Phone 7940



- Business user
- Medium to Busy Telephone Traffic
- Two Lines - Mix Directory Numbers or Speed Dial
- Will support two Simultaneous calls
- Display Area: Calling Information, Feature Access Via "Soft Keys," Additional Display Area for Value-added Services and Applications
- Full Duplex Handsfree by Polycom
- Built-in Headset Connection
- 10/100 BaseT, 2 Port Ethernet Switch
- Inline Power (discovery)

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Cisco IP Phone 7910

- 'Common area' instrument—hallway, break room, reception, or office cubicle
- Medium telephone traffic
- Display area:
2 x 24 character-based
- 10BaseT or 2x10/100BaseT configurations (with 802.1p/q)
- Message waiting indication
- Inline or local power



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Single Wire and Power Options

New Inline Power on Catalyst Switches



4 Wires
48V DC Power

10/100 Ethernet



4 Wires

10/100 Ethernet



Catalyst Switch with Regular 10/100 Ethernet Line Cards



Catalyst Power Patch Panel

8 Wires

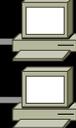
<- Injects DC Power

10/100 Ethernet



4 Wires

10/100 Ethernet



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Cabling

Single Cable

1



2

Multiple Cables



3

Soft Phone



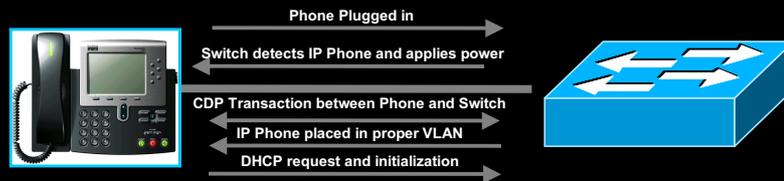
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Discovering Cisco IP phones

Endpoint/Infrastructure Integration

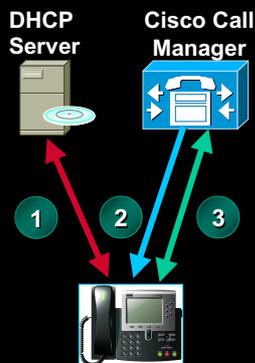


10/100 switch port
LDAP enabled
IP Prec = 5
802.1Q VLAN Support

48 Port Ethernet Line Card
Uses Pins 1,2,3,6
Catalyst 6K, 4K + 3500

Flexible Mobility

1. Phones make DHCP request to get an IP address, gateway, boot server, etc.
2. Phones make TFTP boot file request to get CM IP addresses
3. Phones register with CM and get Display Templates and ready to receive/place calls



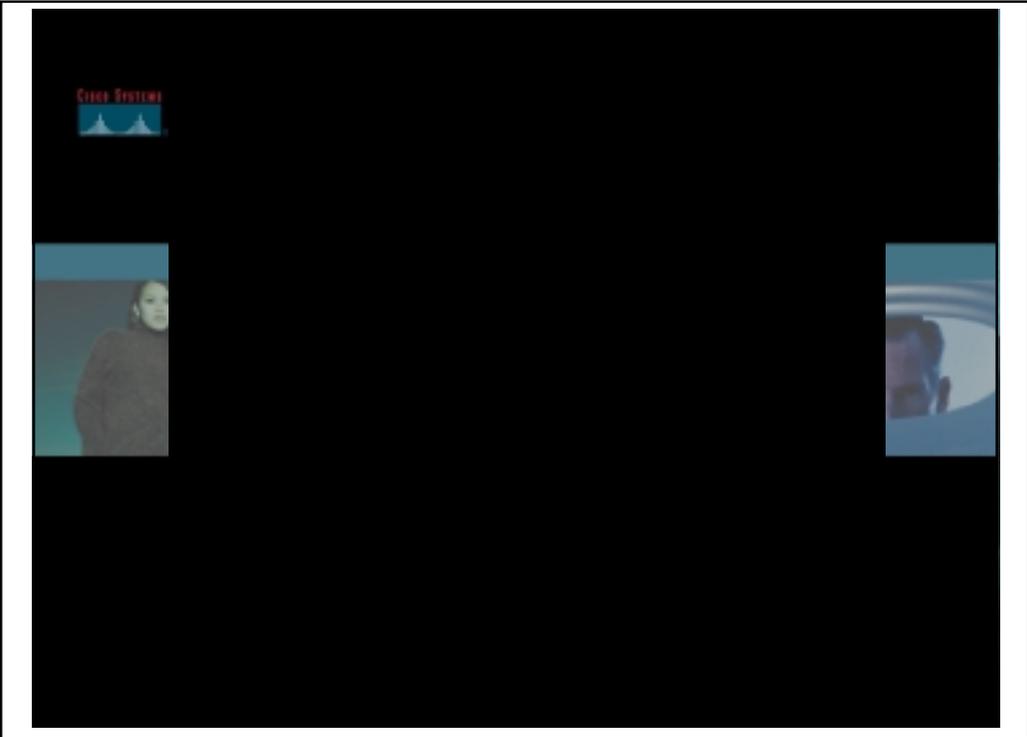
Ease of Moves, Adds, and Changes

- Add a new device
Plug it in out of the box
- Move a device
Unplug and plug in new location
- Changes
Simple web-based interface

New Cisco IP SoftPhone

Two Views:
Phone under Glass
PC drag and drop

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SoftPhone Modes

- **Controlling IP Phone**



User chooses to control lines on a phone co-located with client PC.

IP Phone terminates media streams

- **Standalone**



User chooses to control lines on CTI port devices (“virtual”)

Client PC terminates media streams (soundcard does I/O)

Lines need to be hosted on CTI port device

Values of Softphone

- **Easy of use via GUI**

Access to various features by Drag and Drop, Point and Click

- **Integration with PC applications**

Address Book, Corporate LDAP Directories Lookup, Collaboration, Play Audio File, etc

- **Mobility with Standalone Mode**

- **Should NOT position as “CHEAP” alternative to hard phone**

PC software with relatively high cost of ownership for maintenance and support

Softphone on Wireless LAN

- Increase mobility
- Softphone PC connected using 802.11b Wireless LAN Adaptors
- Currently lack of QoS to ensure good voice quality

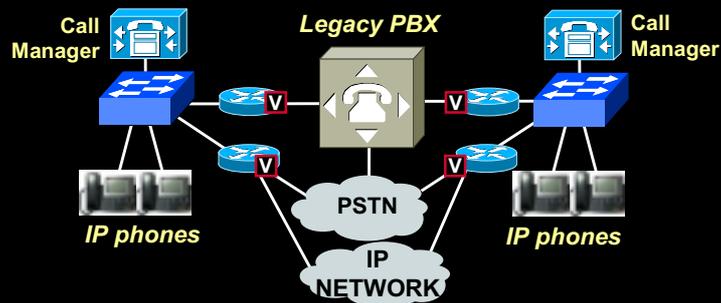


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Interoperability

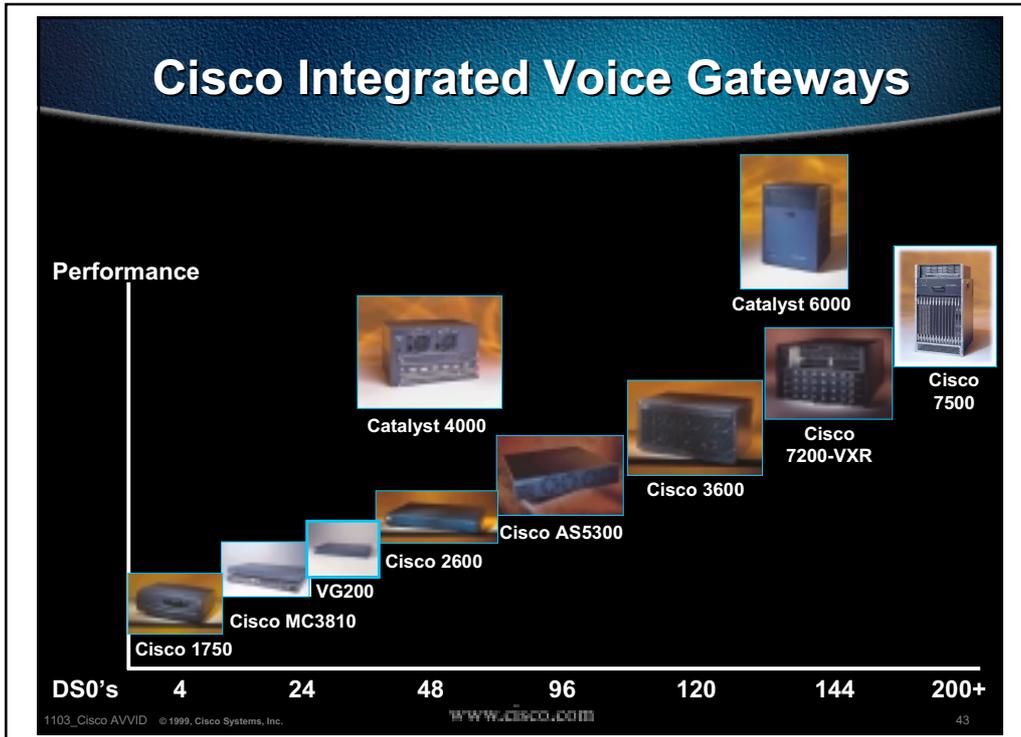


- Signaling: E1/T1 CAS, CCS, QSIG, PRI, BRI
- FXO, FXS, E&M
- H323, MGCP
- Standards based

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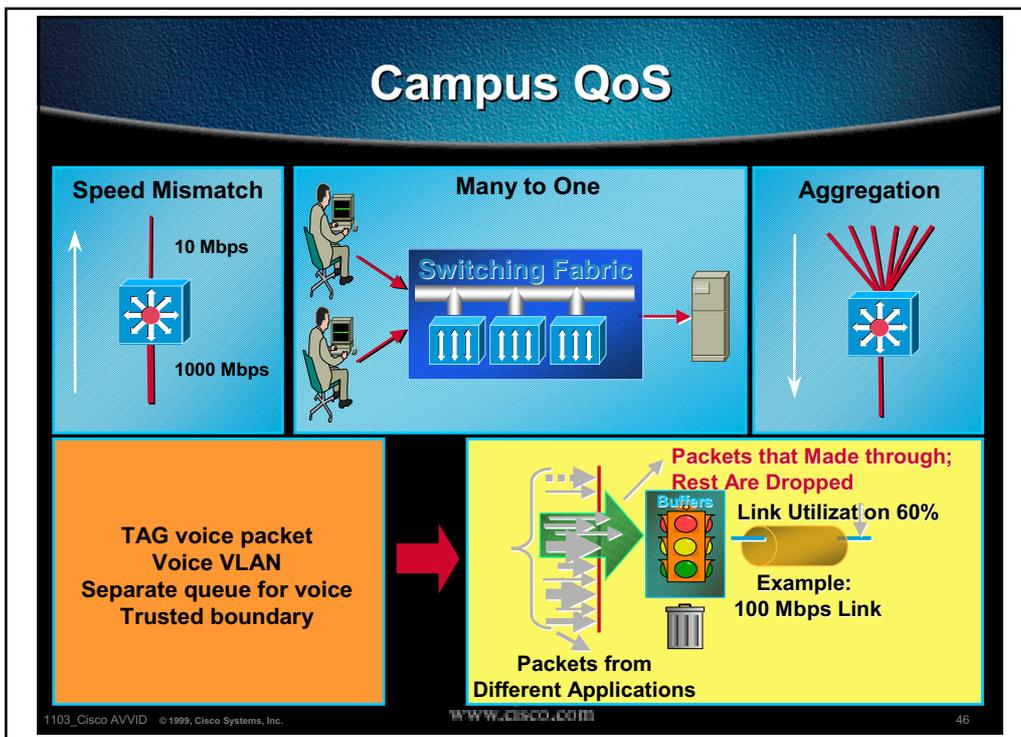
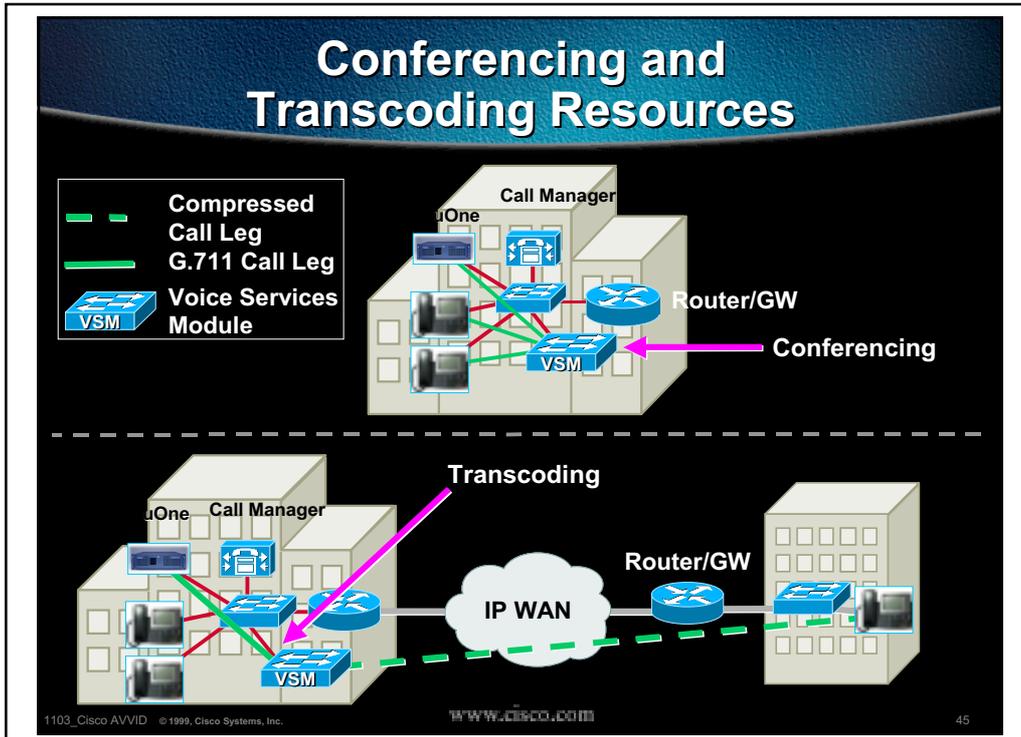
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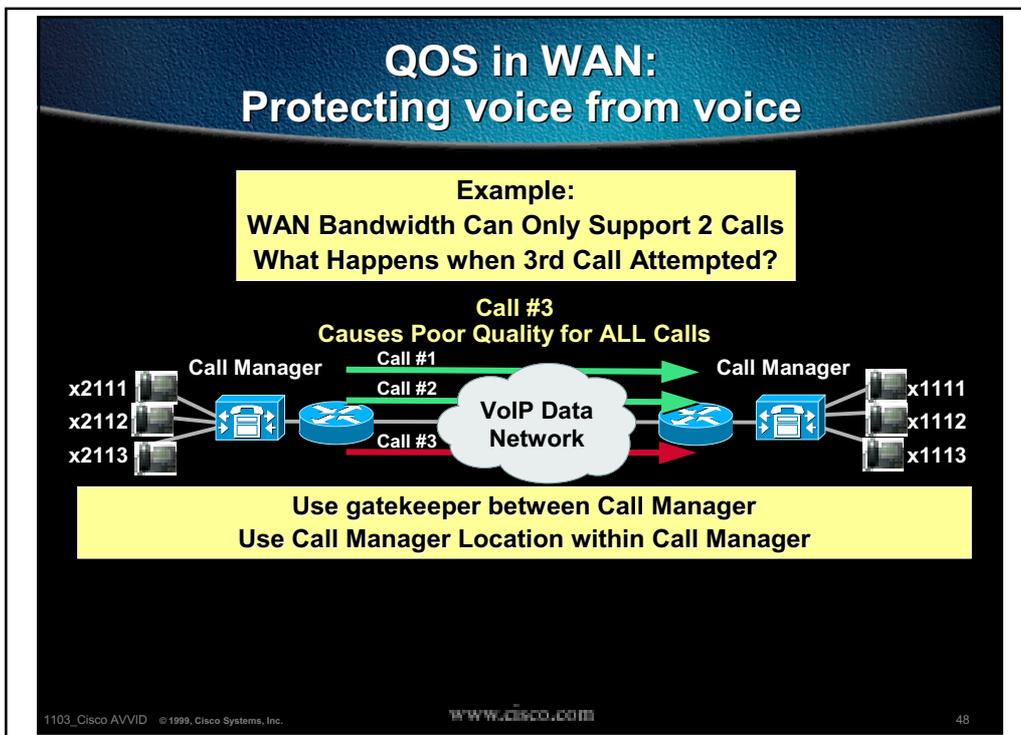
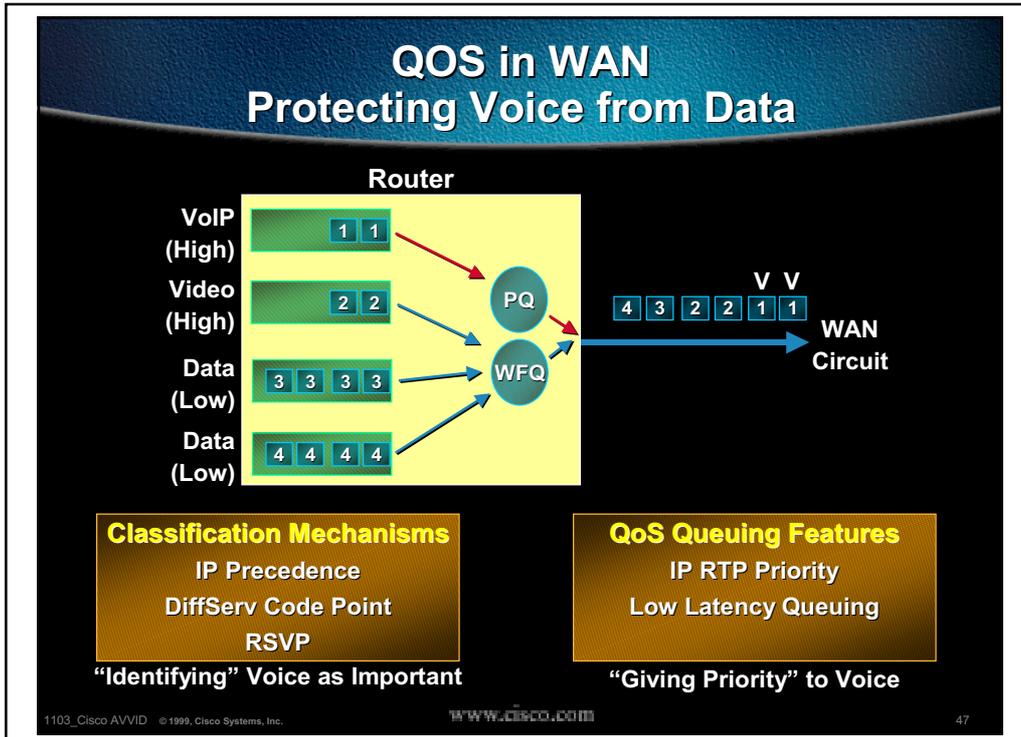


Catalyst 6000 8-Port Voice Services Module (VSM)

- Catalyst 6000 8-port voice T1 and services module:**
 Provides eight physical or logical ports (configured on a port by port basis)
 - When configured as a physical port:**
 T1 or E1 gateway for connections to the PSTN or PBX (built in CSU)
 Supports ISDN PRI at FCS
 - When configured as a logical port:**
 Provides voice services such as conferencing or transcoding

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Design considerations: WAN bandwidth requirement

How much bandwidth do I need for one voice call?

Link Header	IP Header	UDP Header	RTP Header	Voice Payload
X Bytes	20 Bytes	8 Bytes	12 Bytes	X Bytes

- G711 64K
- G729a 8K
- RTP/UDP/IP 16K
- CRTP 2K
- VAD uses less



- Use G711 in LAN
- Use G729a in WAN
- Consider transcoding from G711 to G729a
- With CRTP and G729a use 10K

10K

10K

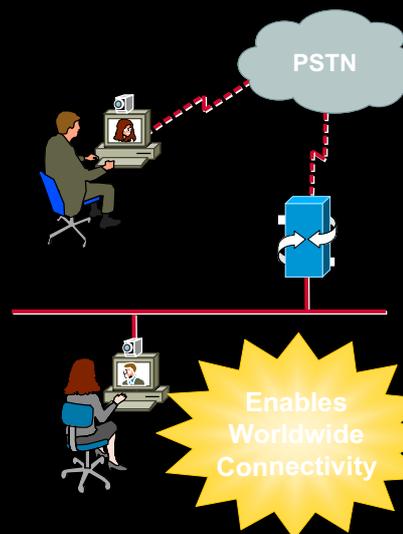
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Cisco IP/VC 3520 and 3525 Video Gateways

- 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



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Cisco AVVID Applications

- **Voice Messaging/UMS**
Embedded and stand alone
- **Cisco IP SoftPhone**
Enables dial-by-name, attributes other than number
- **IP Auto-Attendant**
After-hours pick-up, etc.
- **IP Interactive Voice Response**
Foundation for Auto-Attendant, other apps
- **Cisco WebAttendant**
Web analogue of PBX console

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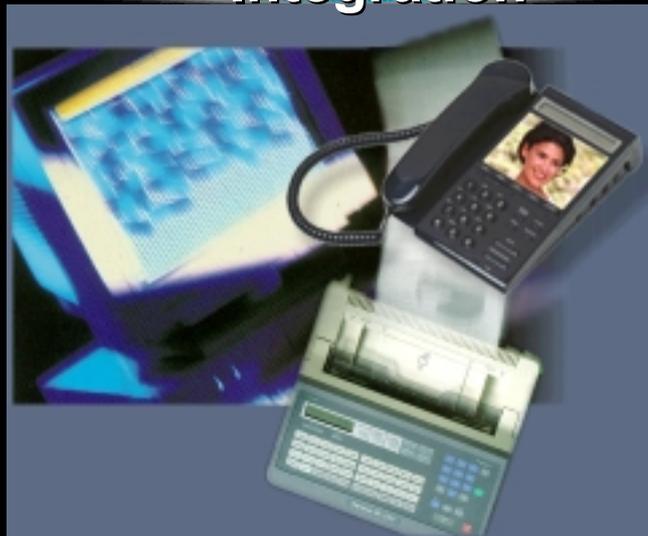
IP is Everywhere



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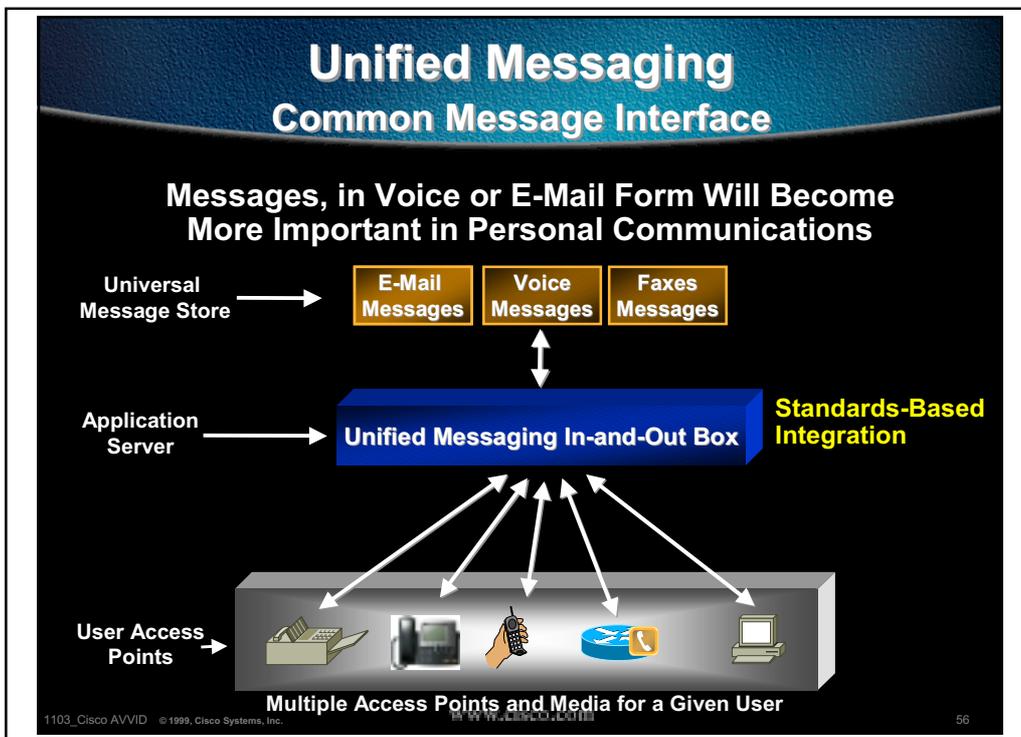
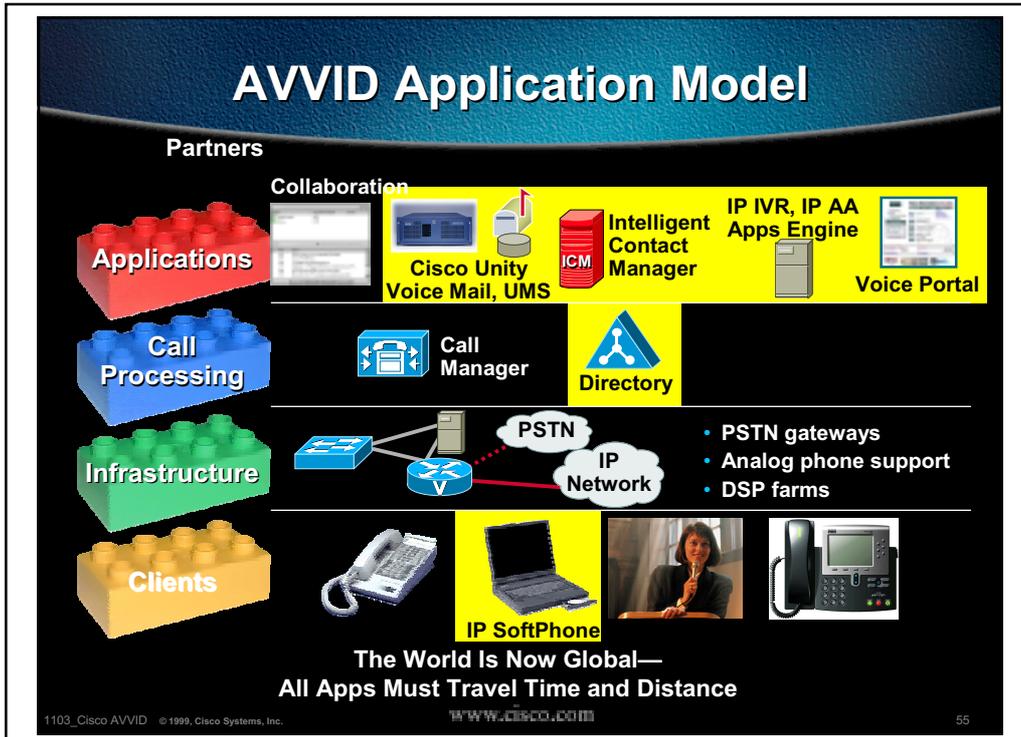
Voice, Video and Data Integration



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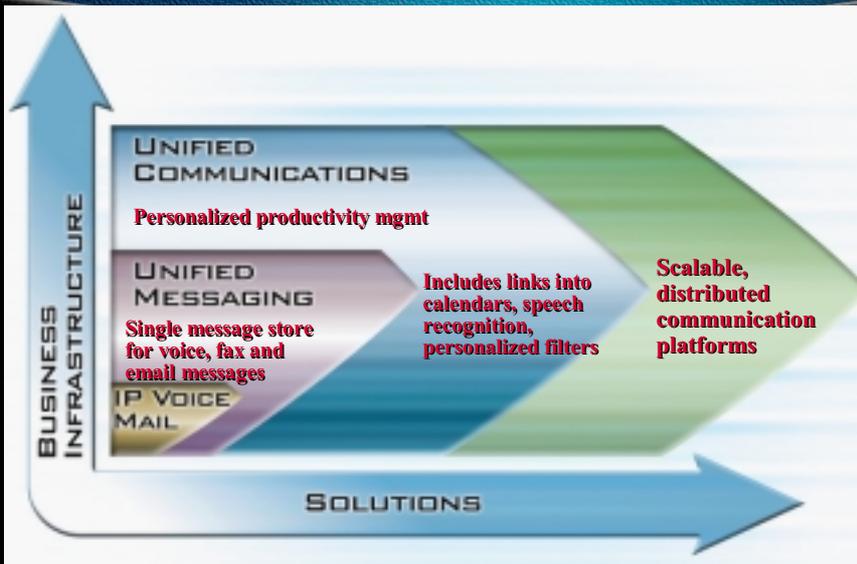
Unified Messaging

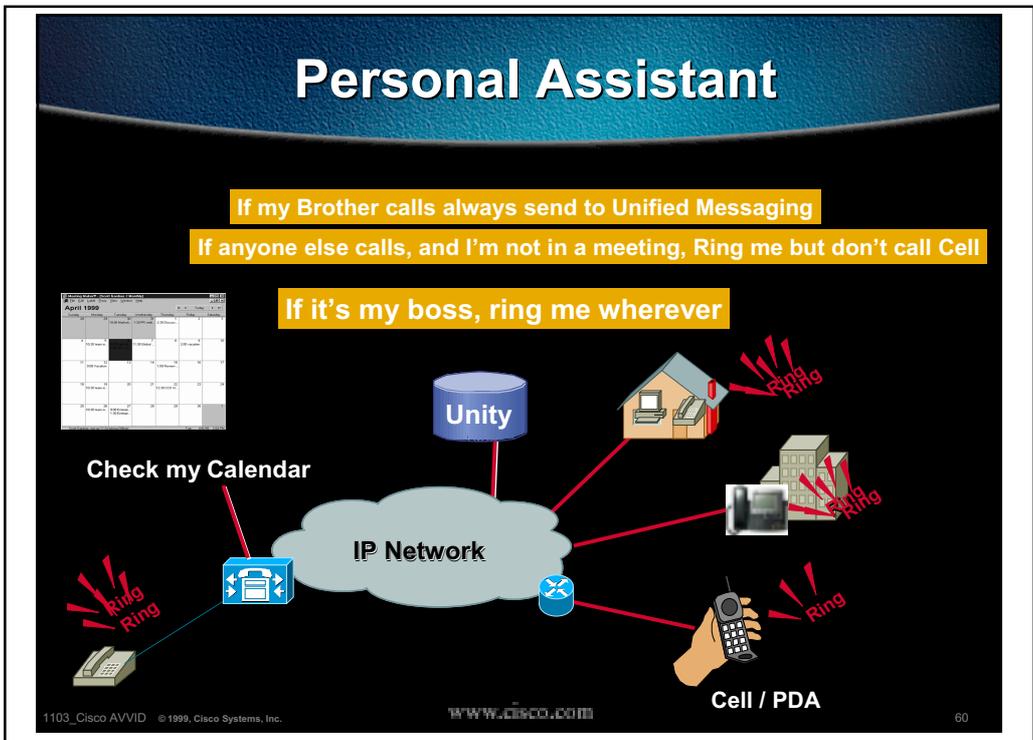
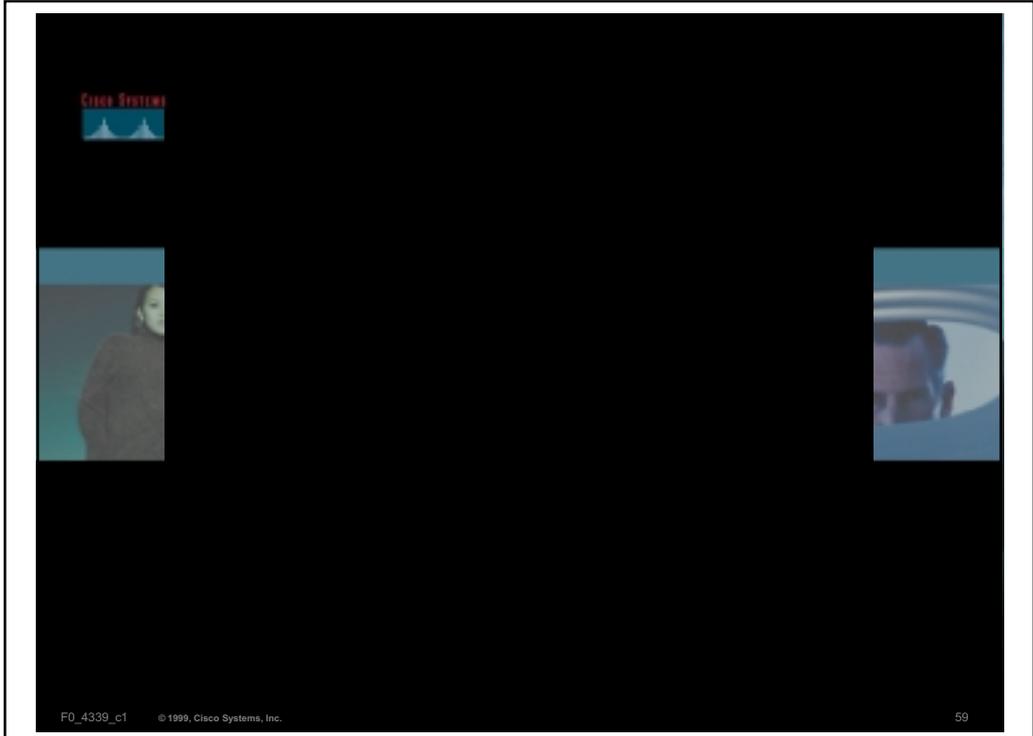


From	Subject	Date	Time	Priority	Read	Unread
Sarah@msn.com	Confirmation of orders for which I have...	17/09/2008	11:23	3		
Maria-Vila	Inform Conference for 1st	18/09/2008	10:58	3		
John Smith	Video call	18/09/2008	10:58	3		
Tim Deane	Re: AVVID-outbox, Germany 15th September	18/09/2008	10:58	3		
Heather Carly	PLEASE REPO: Urgent Package Order information	18/09/2008	10:58	3		
Roderick, W	UUU CreditCard of TBE	20/09/2008	10:58	4		
Paul Di Leo	Re: On schedule	20/09/2008	10:58	3		
Naim Ismailov	SPFO - Details	17/09/2008	10:58	3		
Naim Ismailov	CONCAT STATUS B LOWEST	17/09/2008	10:58	3		
London News	Re: AVVID-outbox, Germany 15th September	20/09/2008	10:58	6		
Mike Ward	Re: 2 - Europe Unread	20/09/2008	10:58	3		
Lisa LADDNER	Re: File marking problem	18/09/2008	10:58	3		
Mike Ward	METRO 2 in Loo III	11/09/2008	10:58	3		
Samantha M	Re: Antiferromagnetic for launch event	12/09/2008	10:58	3		
JERO@nortel	Re: Fwd: UUU CreditCard of TBE	20/09/2008	10:58	6		
Brian PUGH	Re: Datacenter report: European Call Centre Survey	13/09/2008	10:58	8		
Maria-Vila	Reply	18/09/2008	10:58	3		
Ferdinand B	Video File	20/09/2008	10:58	3		
Tim Deane	Re: AVVID-outbox, Germany 15th September	14/09/2008	10:58	4		
B/C Bookman	Open meeting site	20/09/2008	10:58	3		
Phil Deane	Re: AVVID-rem-reading	14/09/2008	10:58	3		

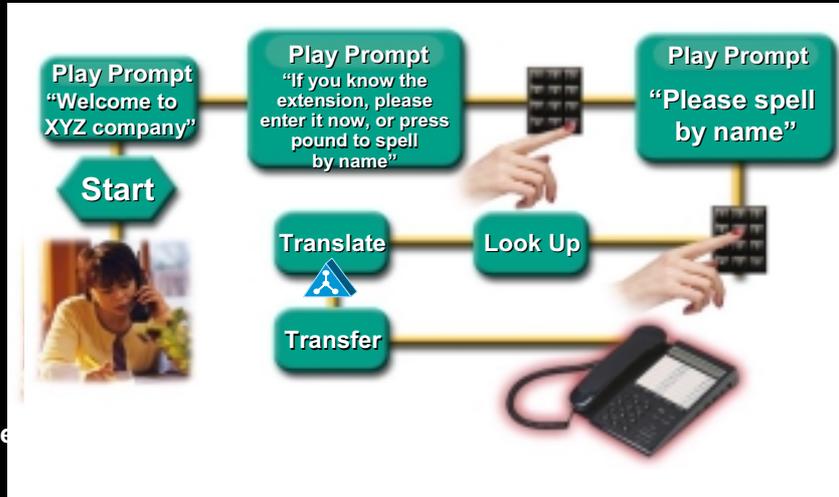


Unified Communications





IP Auto Attendant



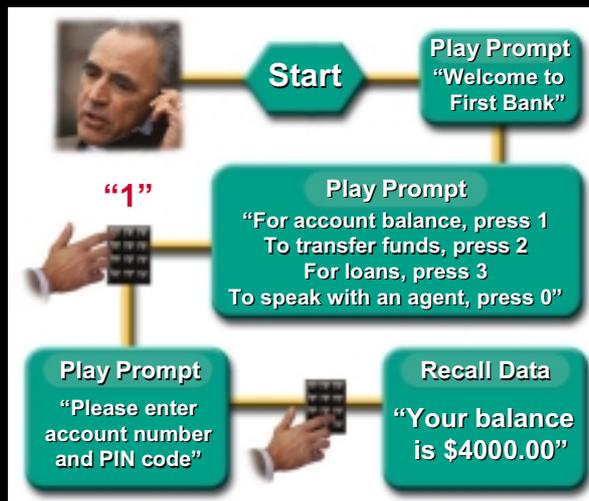
Benefit

Can be deployed anywhere in IP network

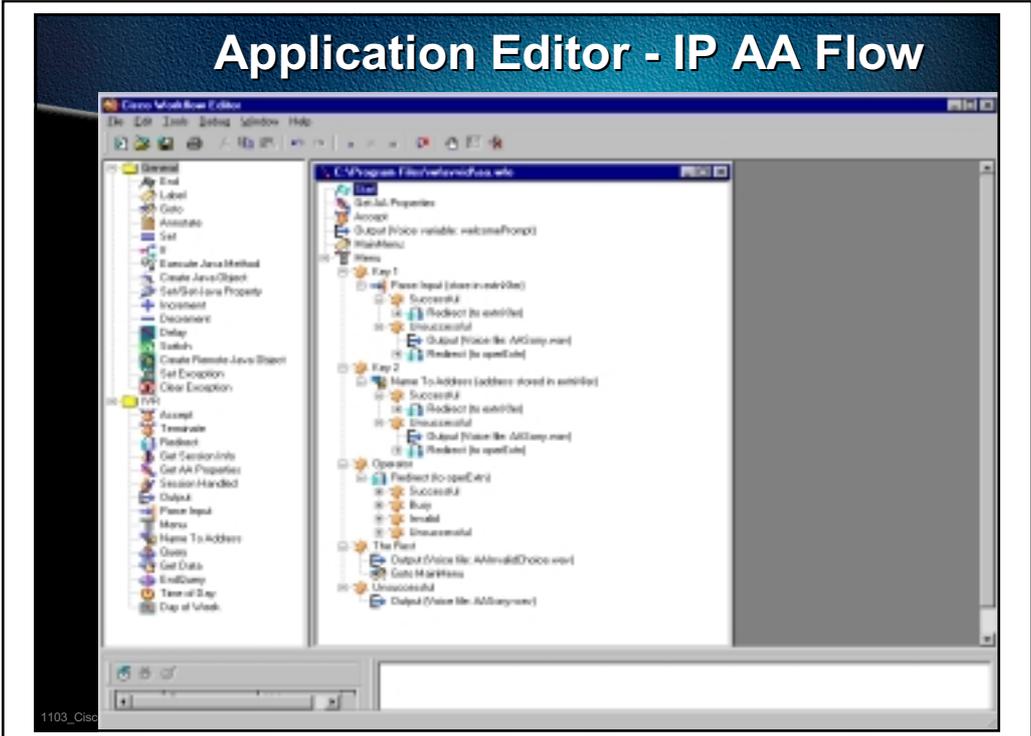
IP IVR



- 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



Application Editor - IP AA Flow



Notification Services



- Automatic notification when preset information threshold on Web page
- Use with or without telephone
- Benefits
 - Only one place to configure and maintain data
 - Provides basic e-CARE
 - Easily personalized



CM Apps



Page Me when Inventory Arrives

Business Solution Productivity Voice Portal Solution



Call Manager IP IVR



IP Intranet





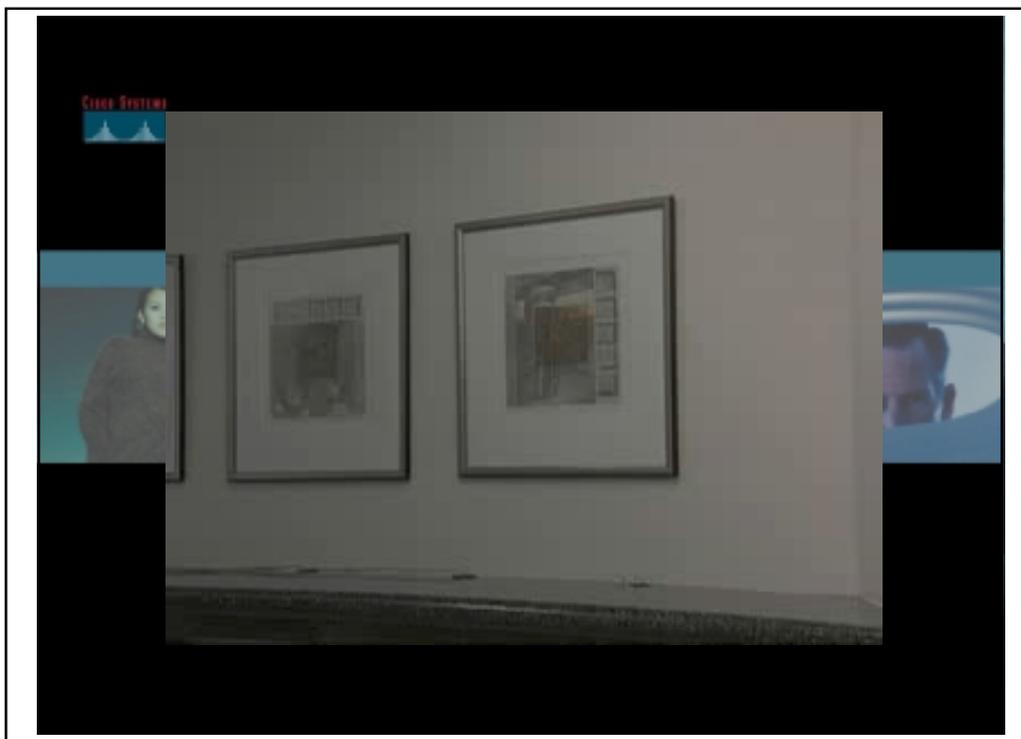
Cisco Stock Quote



**Press #1 to Hear
Cisco Stock Quote**

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

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www.cisco.com
★ 65



Cisco Web Attendant



Allows Receptionists to use any phone as attendant console

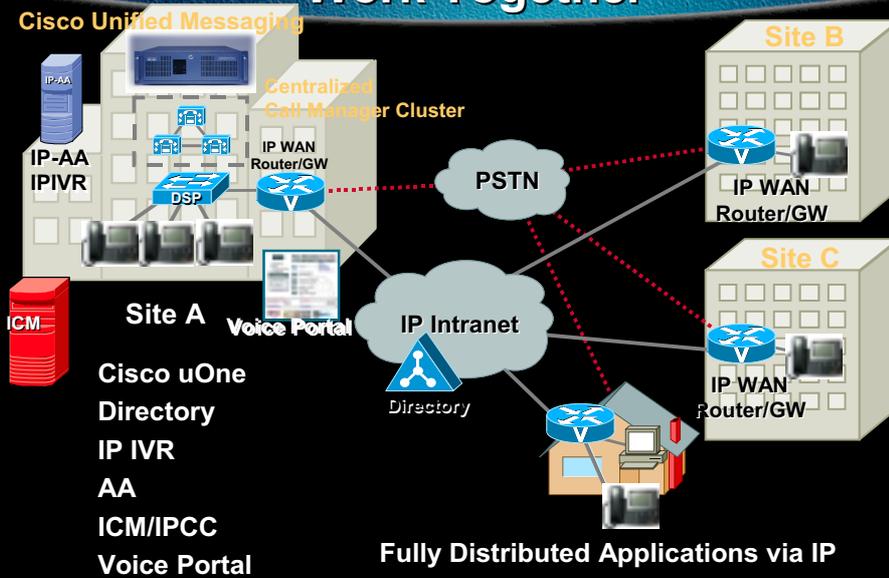
Drag and Drop users via LDAP

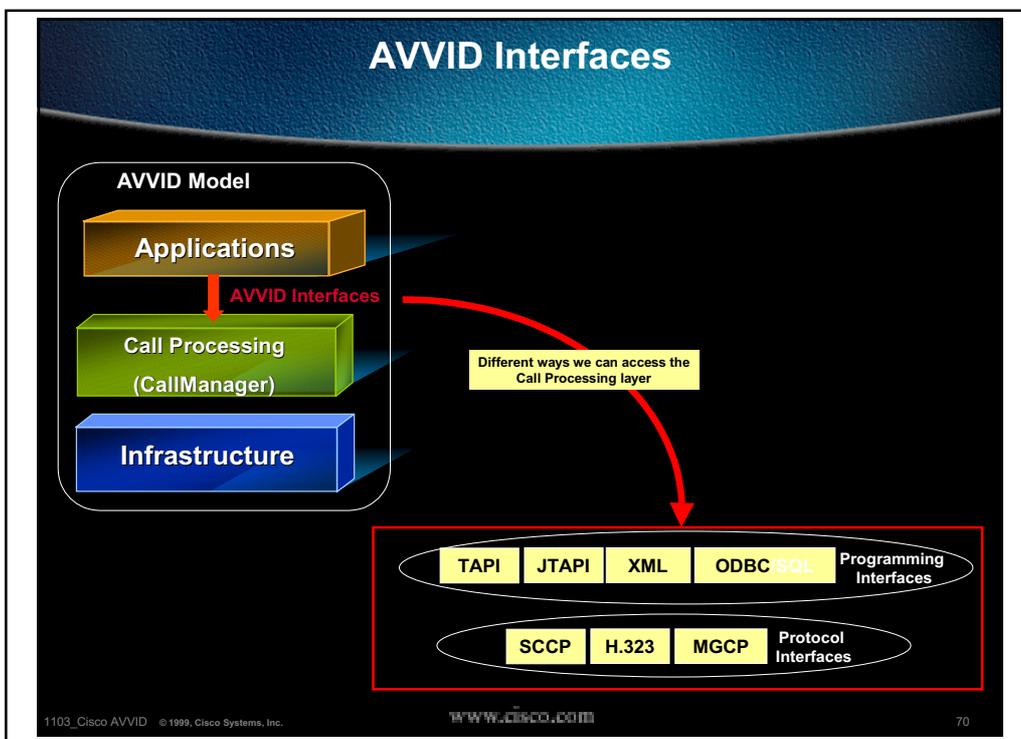
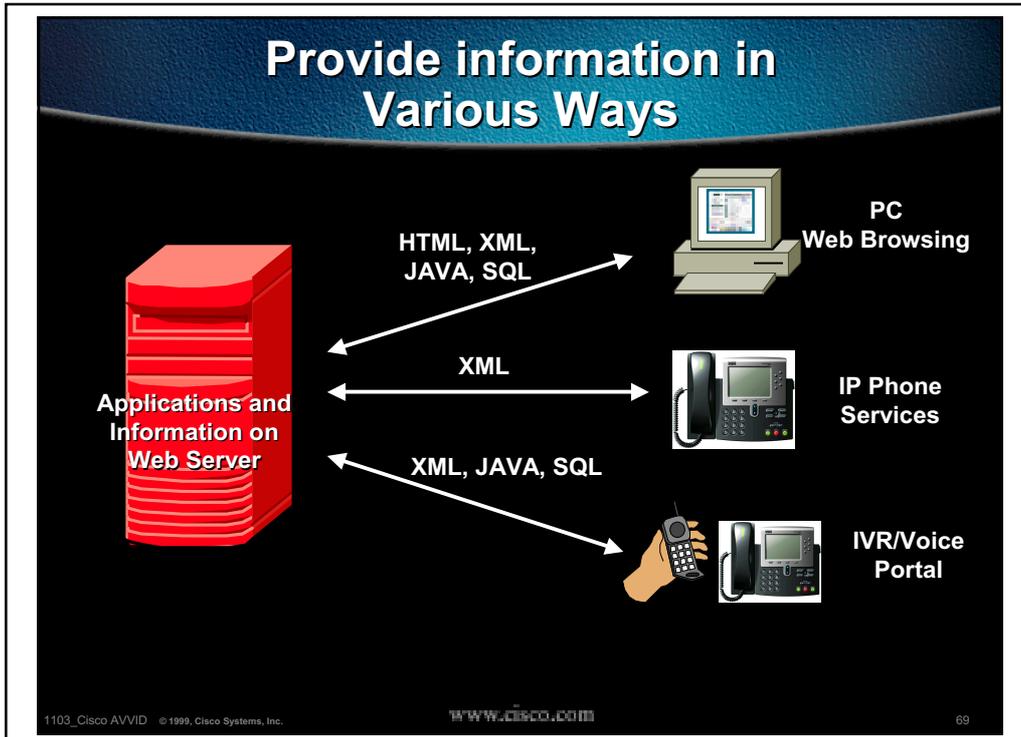
Benefits:

no expensive hardware on reception desk

Can be run from any connected desk

Applications Solutions Work Together



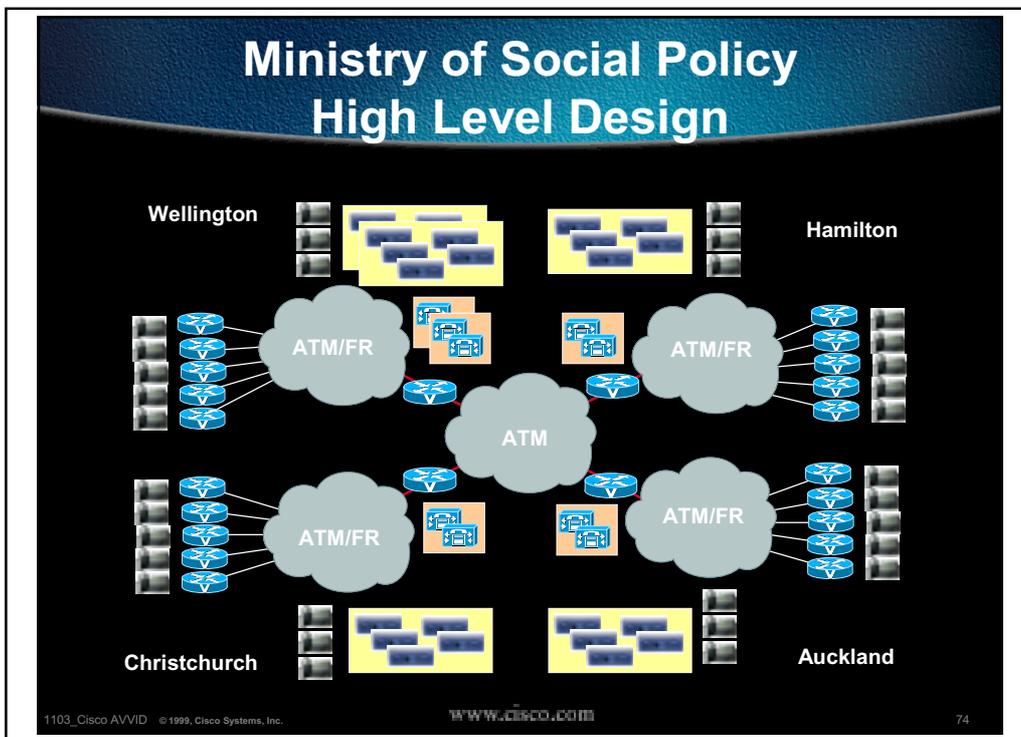




Ministry of Social Policy The Opportunity

- **Largest government organization in New Zealand**
 - 8000 Users**
 - 210 locations**
- **Existing network is 164 Nortel PBX's + some Centrex**
 - Largest networked enterprise in southern hemisphere**

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Project Review

- Only 4 weeks to deploy
- Approx. \$8M sale
- Cost justified by savings on WAN (plus adds, moves & changes)
- Availability improved
- Currently Handling 130,000 to 160,000 calls per day.
- http://www.cisco.com/warp/public/146/pressroom/2000/oct00/elob_102400.htm

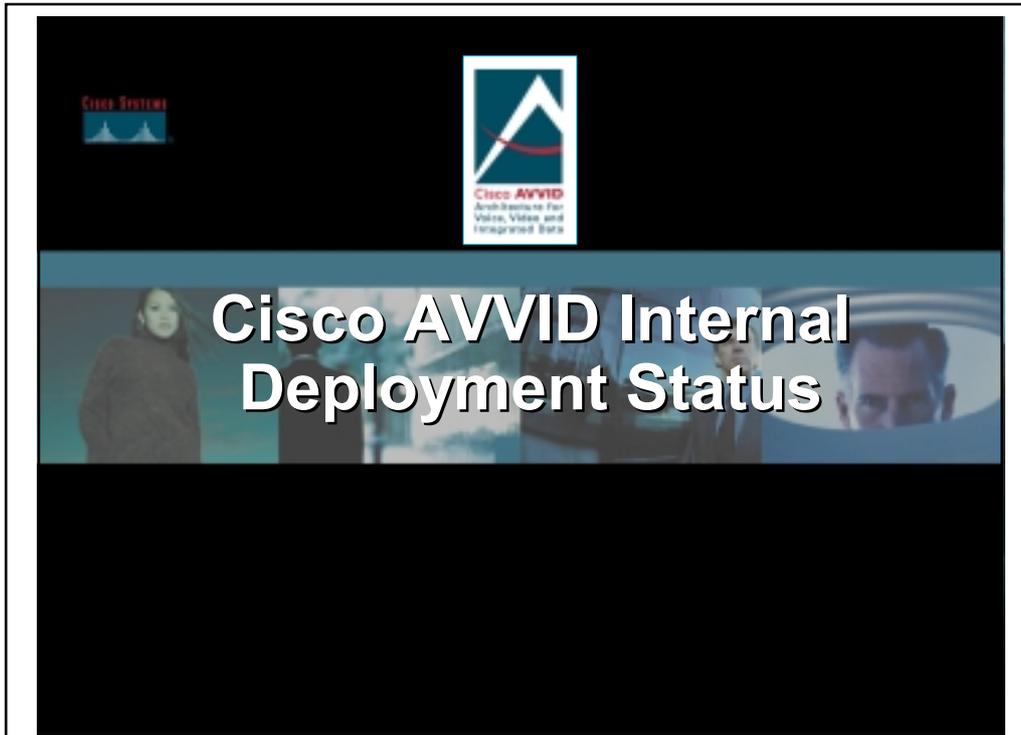
Customer Comments!

“

“We had more problems implementing our PABX network – and it took longer – than our Cisco IP Telephony solution”

”

Ministry of Social Policy Nov 2000



Cisco's Adoption of IP Telephony Today

- **99.93% availability on Call Manager 3.0**
- **8500 + users on Call Manager 853 CM3.0 Cluster in San Jose**
- **1000 + users on 525, 526, & 527 Call Manager Clusters CM 3.0(3)**

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Cisco's Adoption of IP Telephony Today

- Approx 130-150 new users added every week (new Hires)
- Retrofit of Legacy Phones to IP- Dec 2000
 - Initially 1 building a Week
 - Later 2 or more buildings/Week
- 13,000+ production Cisco users world wide on IP Telephony
- 45+ sites world wide in production

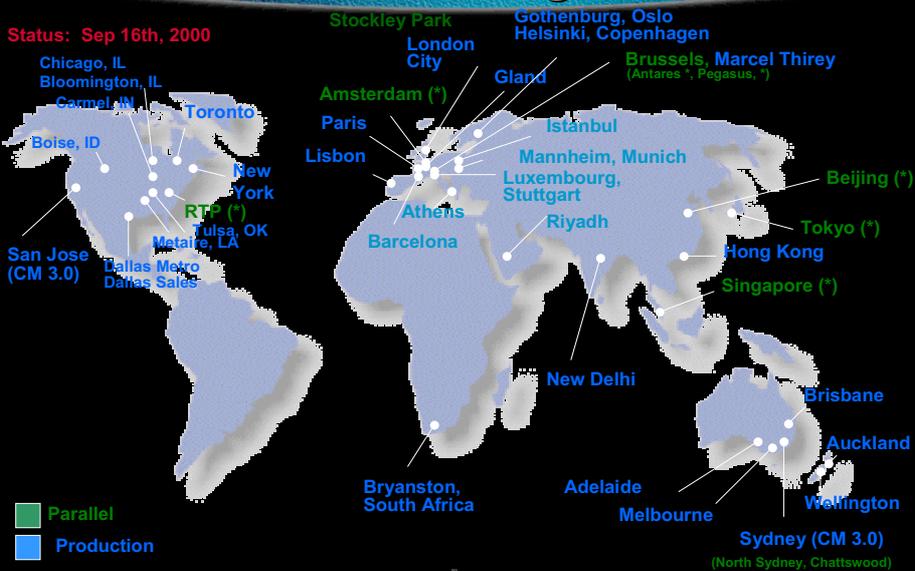
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Current Worldwide IP Telephony Cisco Call Manager Sites

Status: Sep 16th, 2000

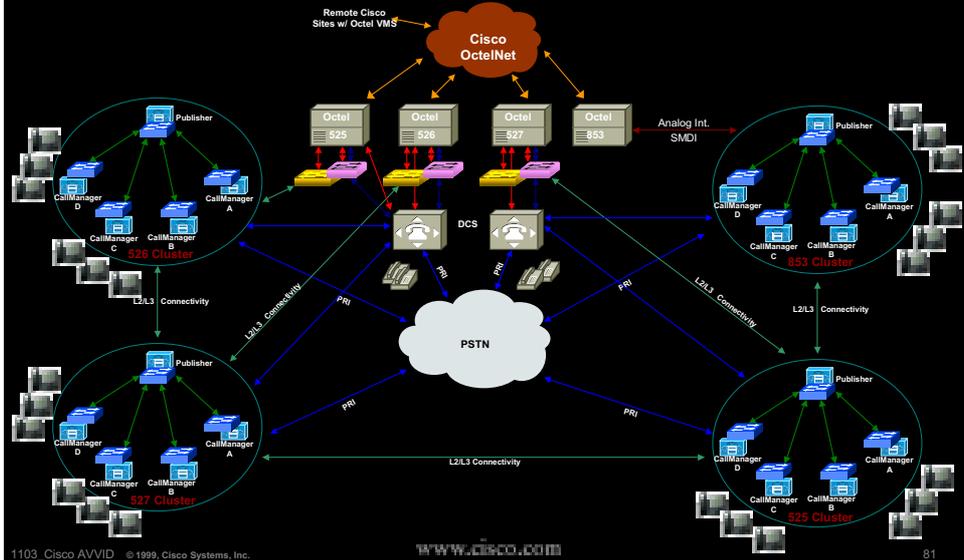


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Cisco CallManager 3.0 Today



Cisco CallManager 3.0 Final Picture

