



# AVVID

## Open for Business

Raymond Chu  
Consulting Systems Engineer Multiservice/Asia Pac ELoB  
[raychu@cisco.com](mailto:raychu@cisco.com)





# Architecture Voice Video Integrated Data



Raymond Chu

Consulting Systems Engineer  
Multiservice Solutions Asia Pacific

[raychu@cisco.com](mailto:raychu@cisco.com)

## Cisco AVVID

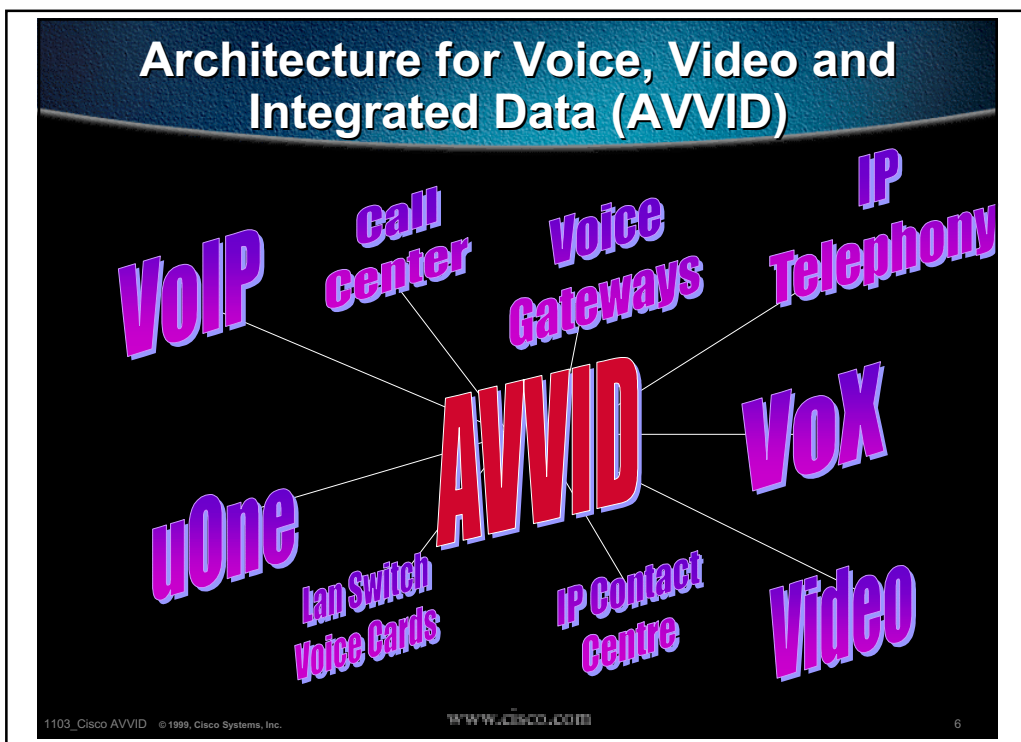
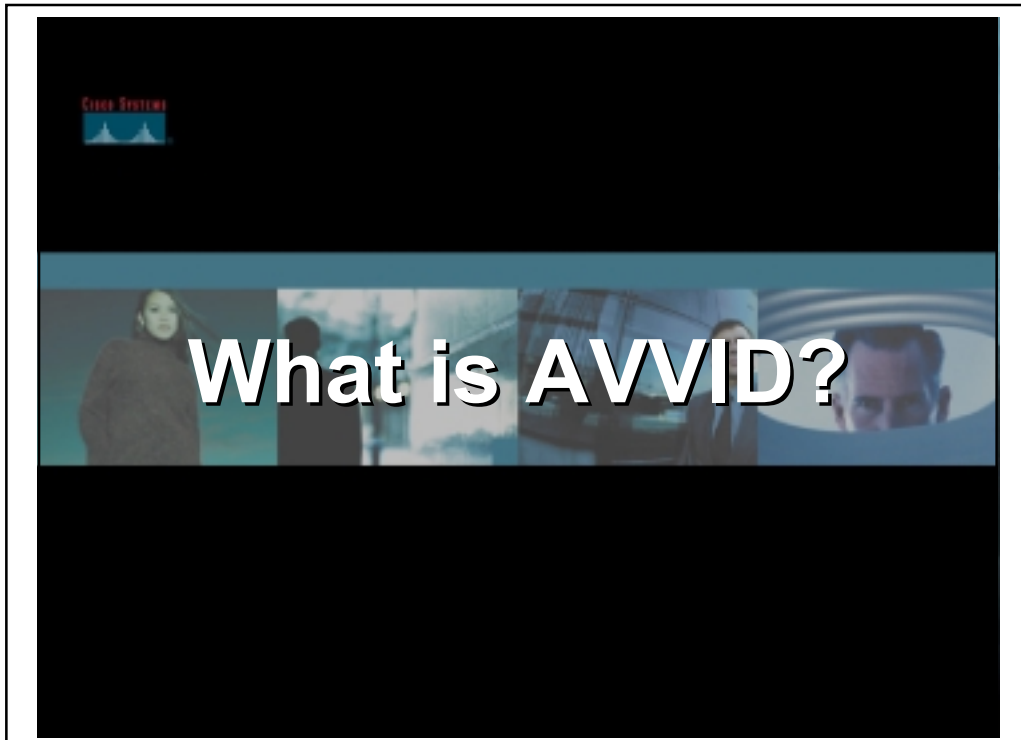
- What is AVVID?
- Industry Trends
- Cisco AVVID Architecture
- Business Applications
- Case Studies

FO\_4339\_c1

© 1999, Cisco Systems, Inc.

[www.cisco.com](http://www.cisco.com)

4

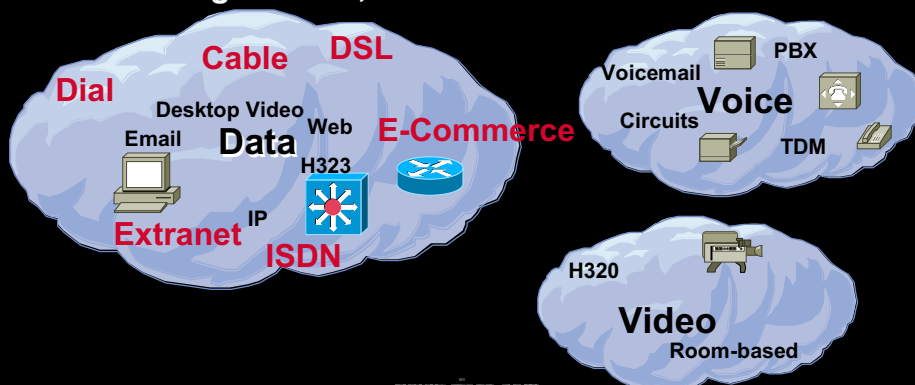




# Industry Trends

## 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



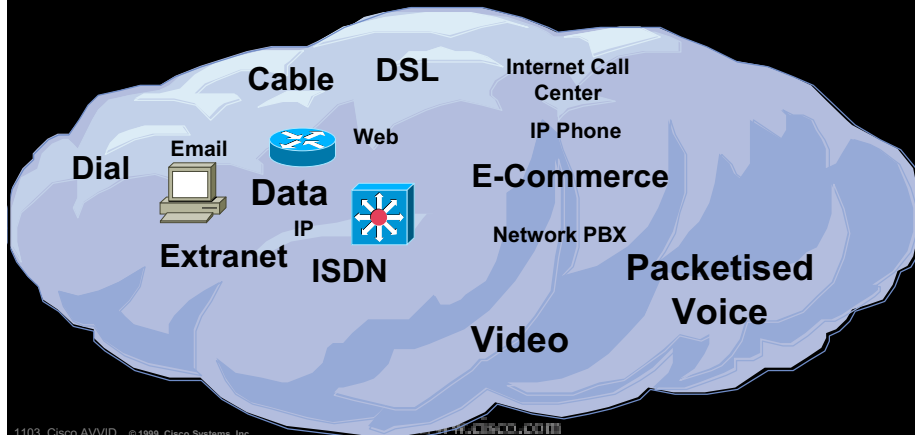
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

[WWW.CISCO.COM](http://WWW.CISCO.COM)

8

# Converging Ecosystem

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

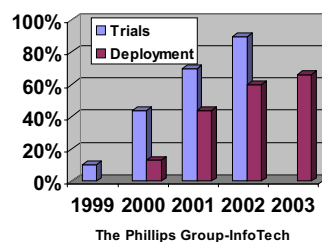


## LAN Telephony Adoption

### 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



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

www.cisco.com

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**

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

[www.cisco.com](http://www.cisco.com)

11

## 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**

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

[www.cisco.com](http://www.cisco.com)

12



## 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**

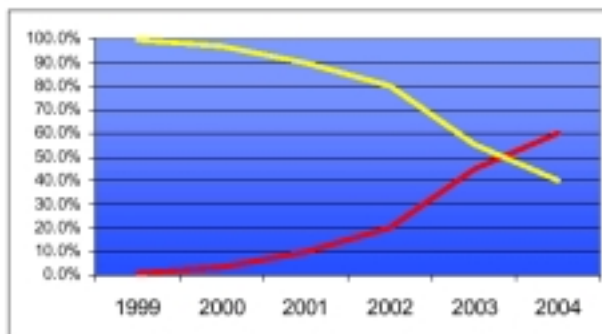
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

13

## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

14

## 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



1103\_Cisco AVVID © 1999, C

3 Maunā nā ngā Kāhuna Ohega Tāngata

WWW.CISCO.COM

15

## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

16



## RFP Network Computing

“

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

”

Network Computing 7 Nov 2000

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

[WWW.CISCO.COM](http://WWW.CISCO.COM)

17

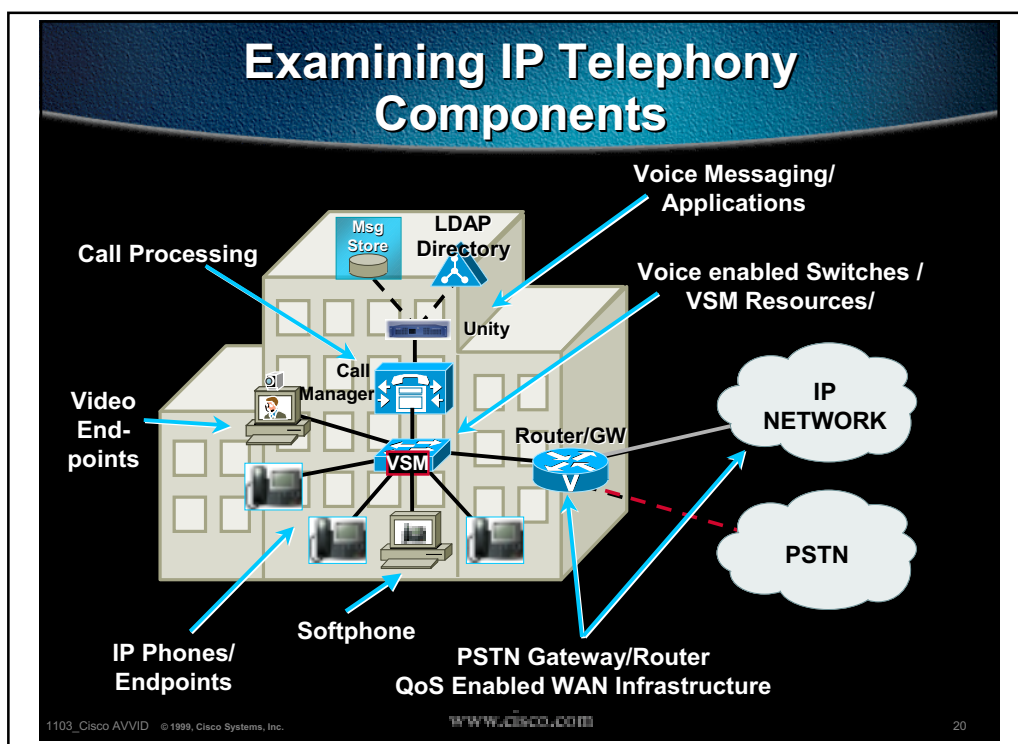
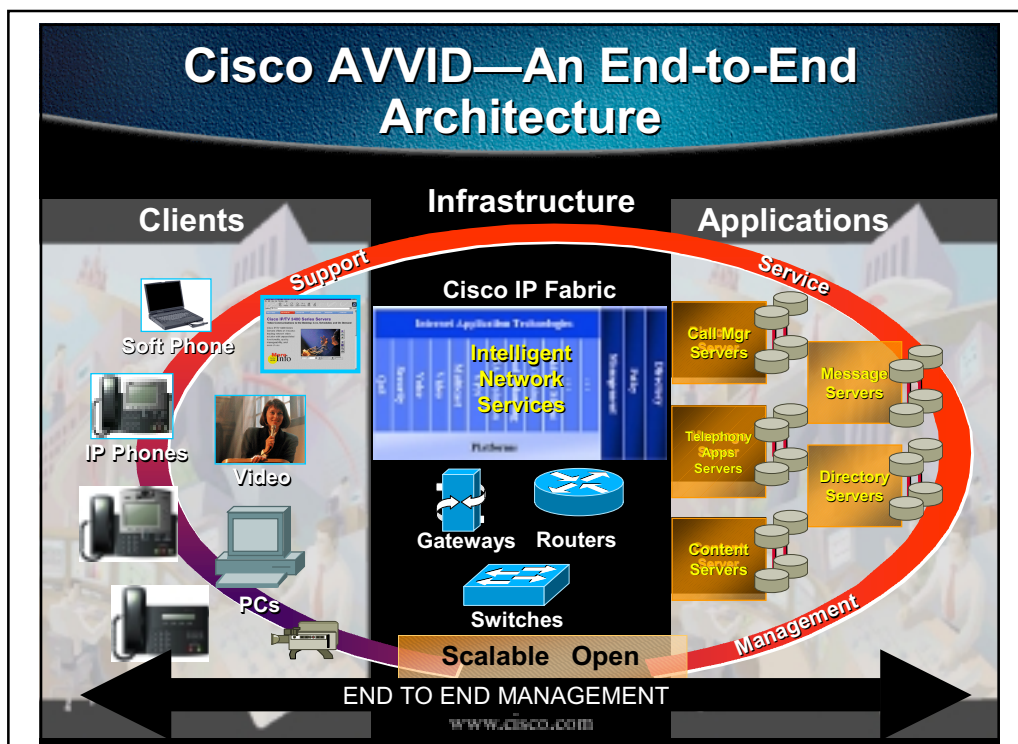


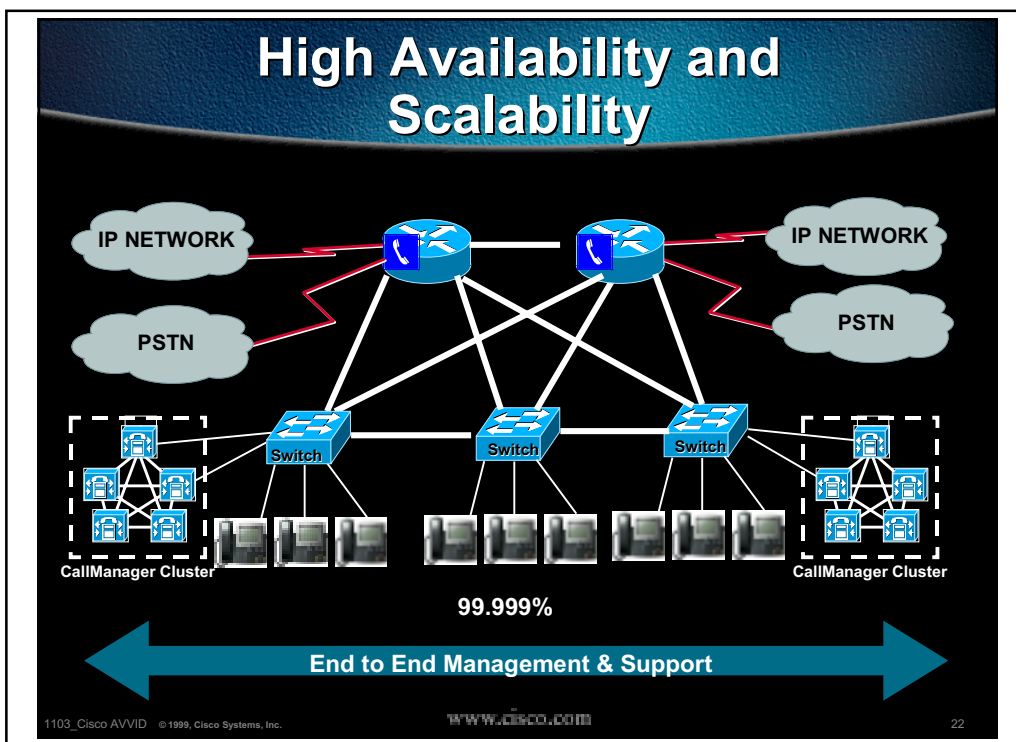
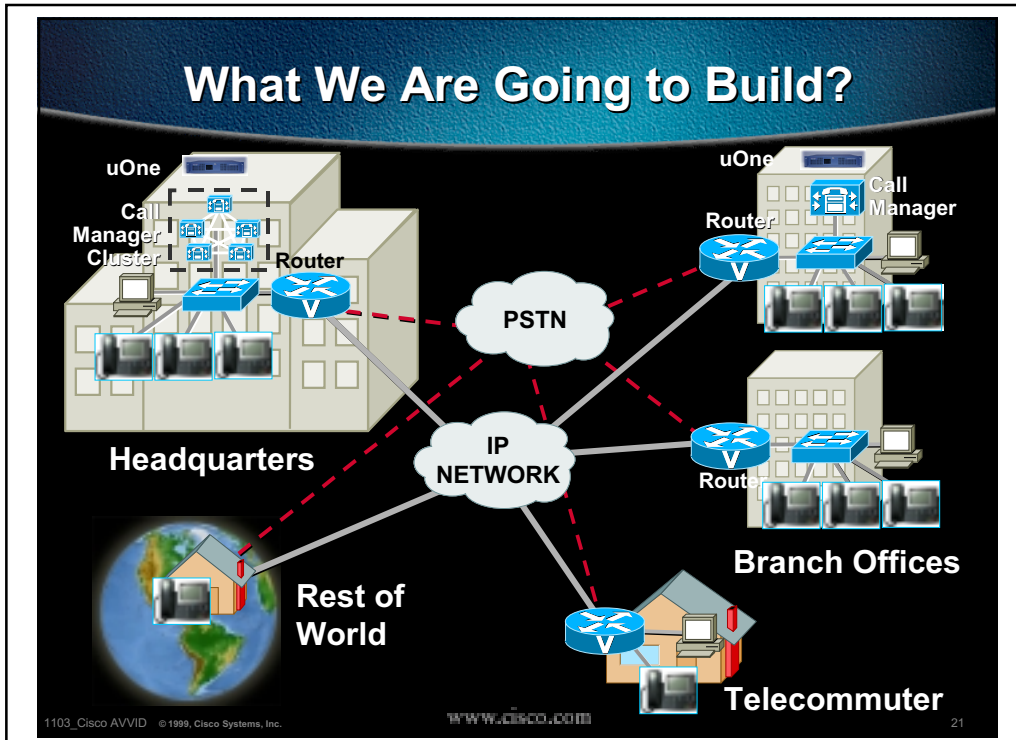
## Cisco AVVID

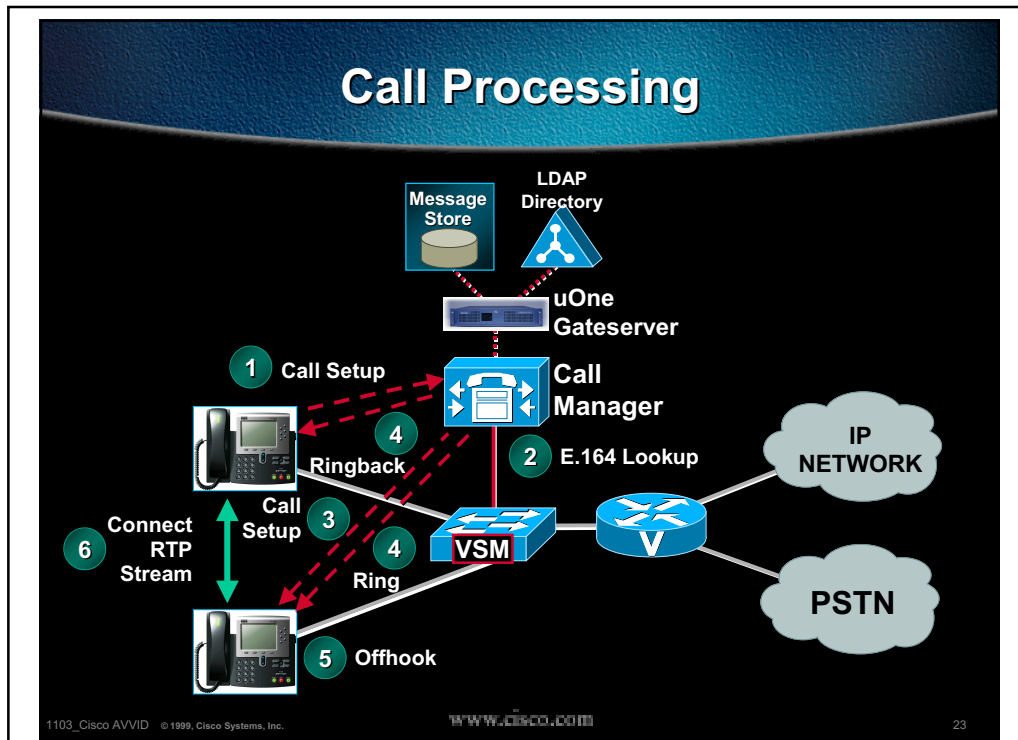


## Architecture and Network Design

Cisco Systems Confidential








## 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



1103\_Cisco AVVID © 1999, Cisco Systems, Inc. www.cisco.com 24

# Call Manager 3.0



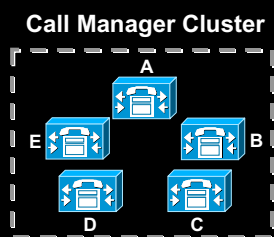
- Standard HTML which minimizes training
- Pre-installed on Cisco platforms
- Comprehensive telephony features
- Remote administration simplified
- Extensive on-line help
- 50,000 Busy Hour Call Completion Setup per MCS server
- 125,000 Busy Hour Call Completion Setup per cluster
- Scalability, availability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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

25

## 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                        |

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

26



## 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.



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

27

## 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**

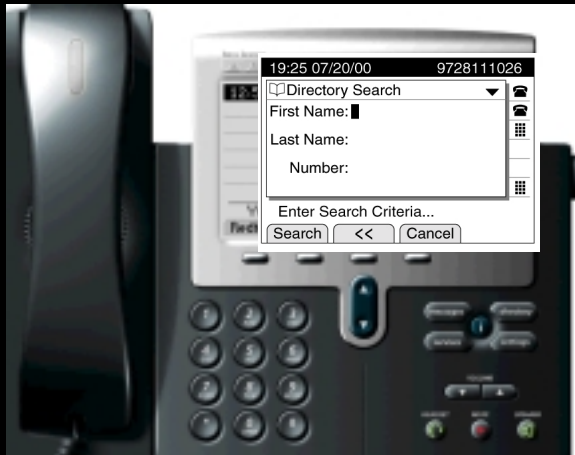
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

28



## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

★ 29



## 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)

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

31

## 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



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

32

## 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



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

33

## Cabling

### Single Cable

1



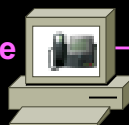
2

Multiple  
Cables



3

Soft Phone



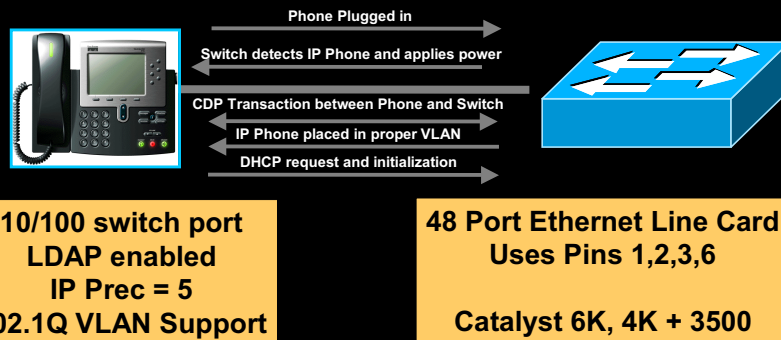
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

34

# Discovering Cisco IP phones

## Endpoint/Infrastructure Integration



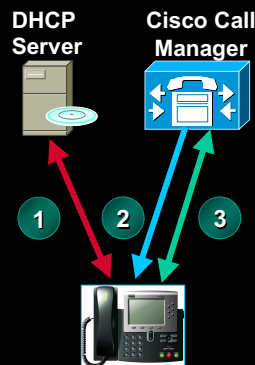
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

35

## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

36

## New Cisco IP SoftPhone

Two Views:

Phone under Glass

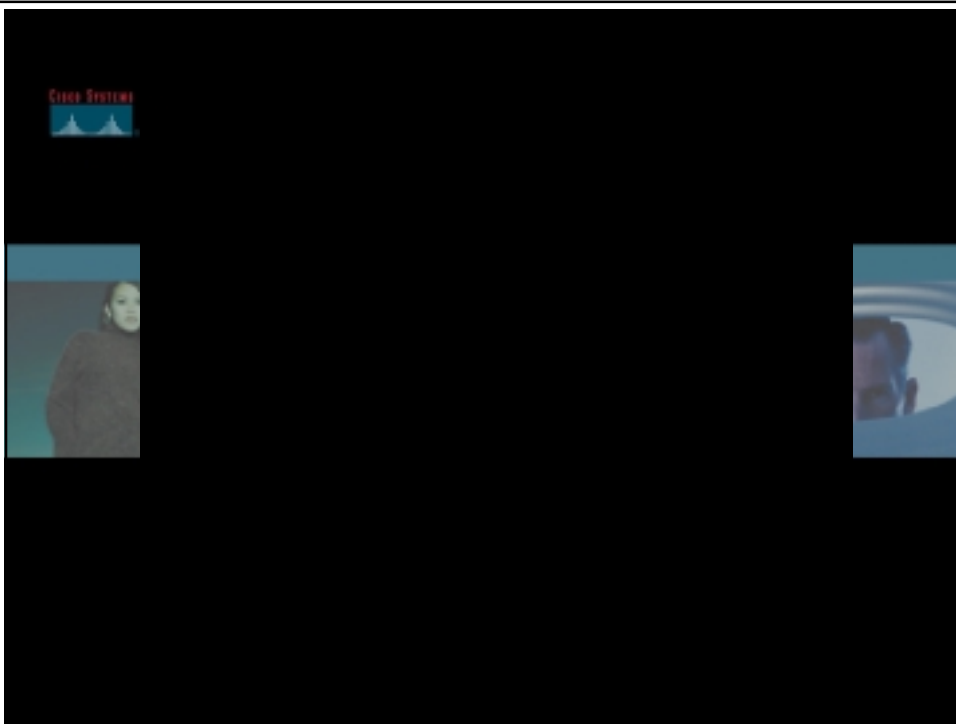
PC drag and drop



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

37



Cisco Systems Confidential

## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

39

## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

40



## Softphone on Wireless LAN

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

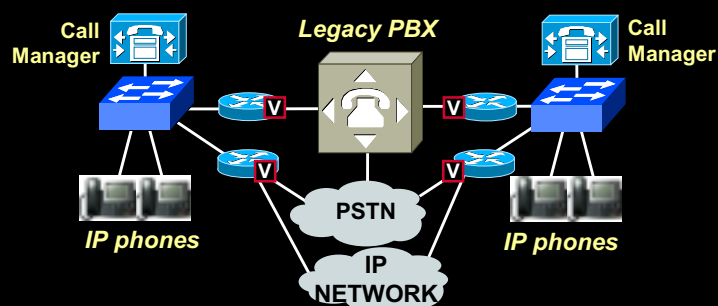


1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

41

## Interoperability

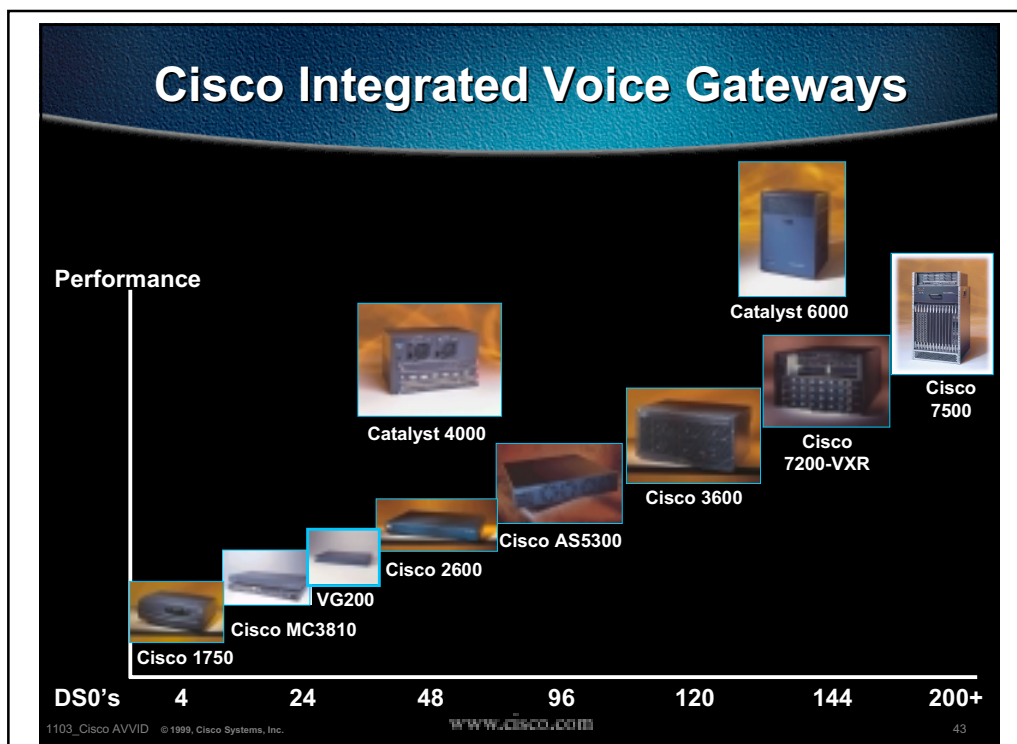


- Signaling: E1/T1 CAS, CCS, QSIG, PRI, BRI
- FXO, FXS, E&M
- H323, MGCP
- Standards based

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

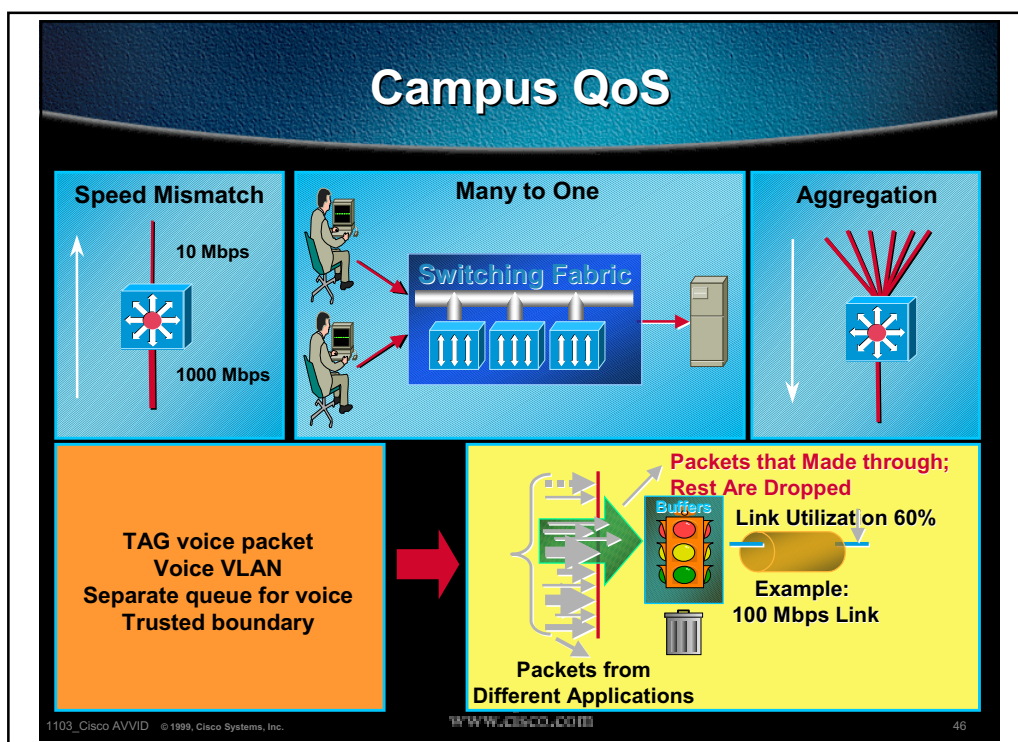
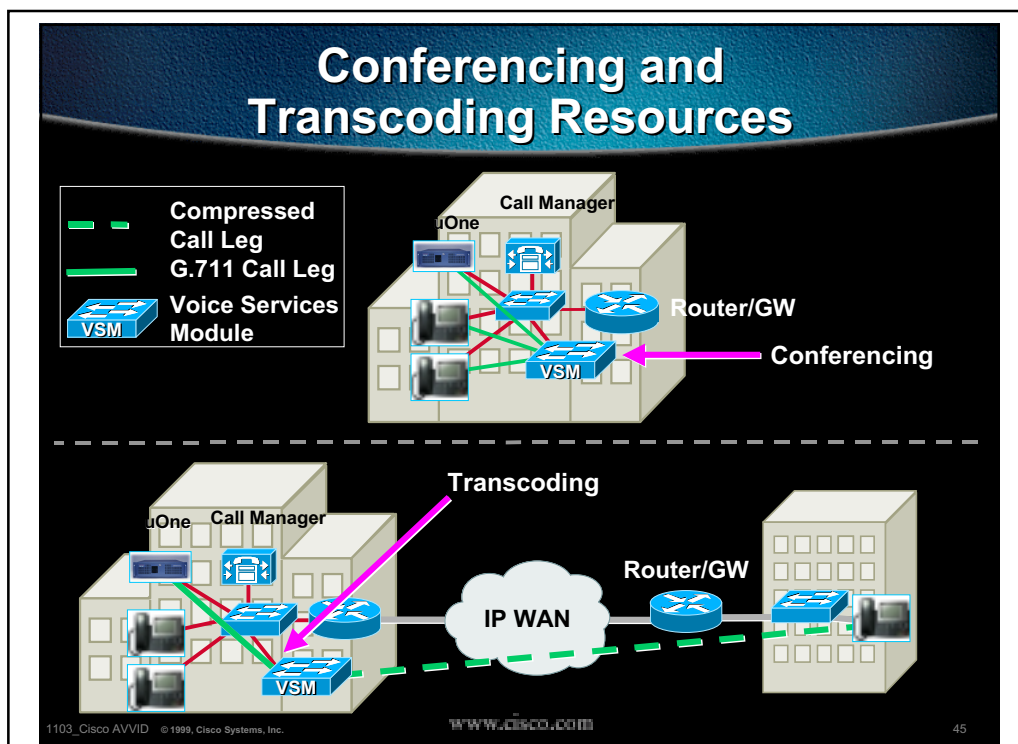
42

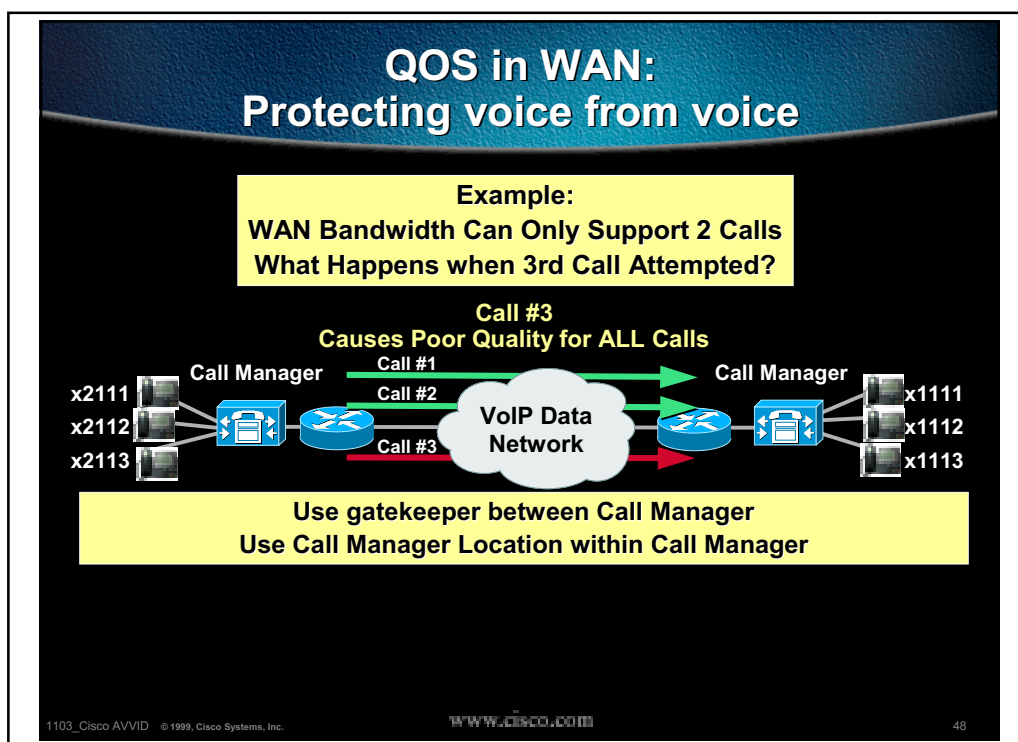
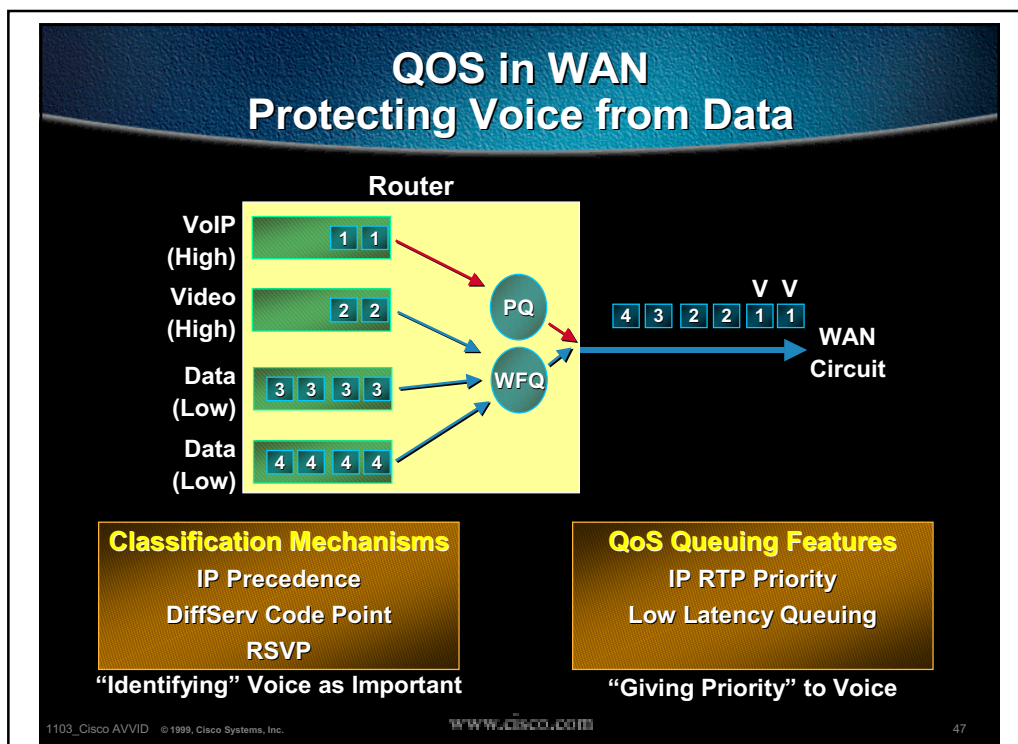


## Catalyst 6000 8-Port Voice Services Module (VSM)

- 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc. [www.cisco.com](http://www.cisco.com) 44







## 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

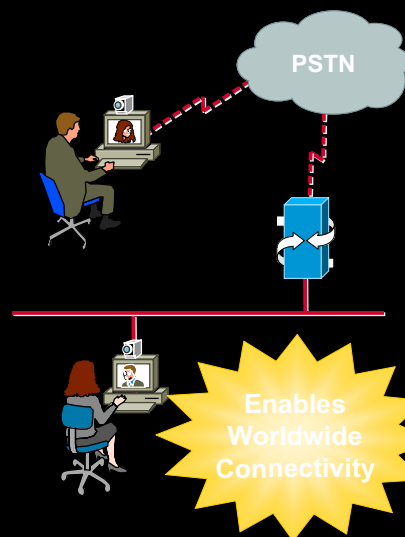
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

49

## 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



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

50



## 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

1103\_Cisco AVVID © 1999, Cisco Systems, Inc. [www.cisco.com](http://www.cisco.com) 52



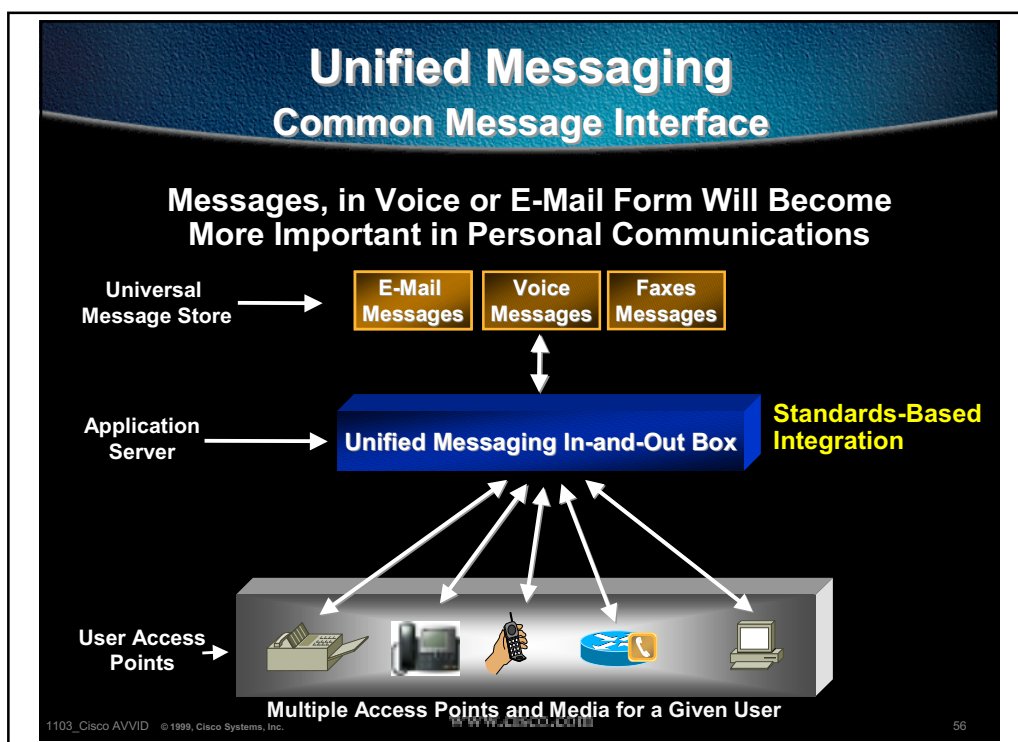
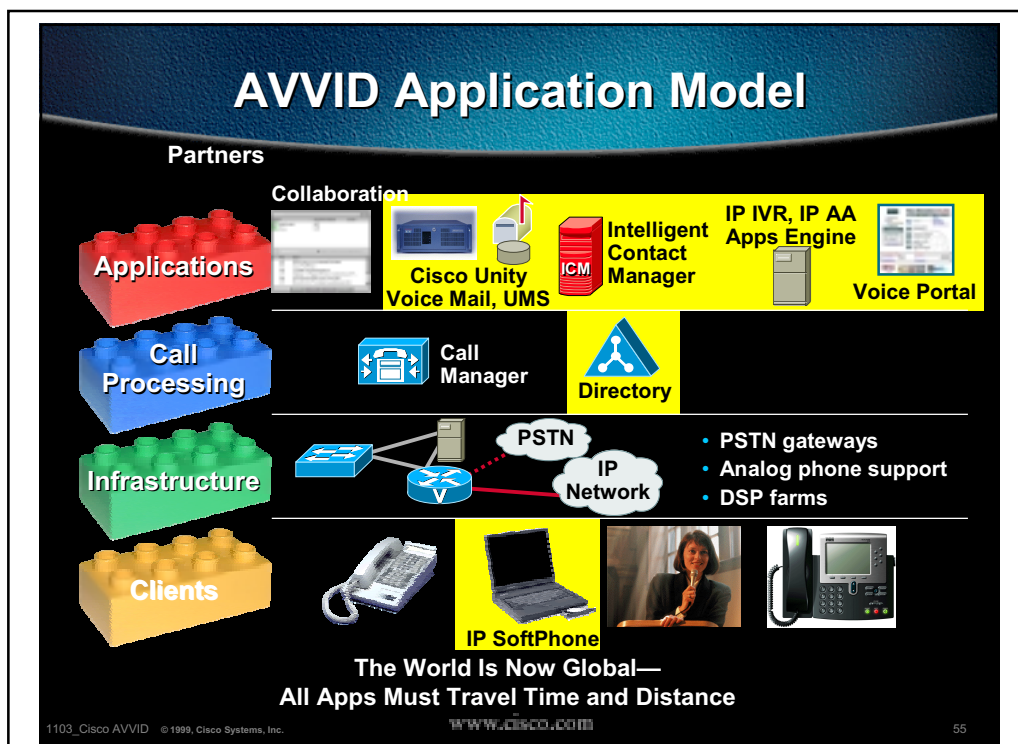
## IP is Everywhere



## Voice, Video and Data Integration



54



# Unified Messaging



| From           | To             | Subject | Date   | Time | Size | Status |
|----------------|----------------|---------|--|------|------|--------|
| Samantha M...  | 17:39 05/09/01 | 3       | Confirming all documents for AVVID launch          |      |      |        |
| Nicola V&A     | 18:28 05/09/01 | 2       | Internet Connection - urgent                       |      |      |        |
| John Mann      | 18:05 05/09/01 | 3       | Video-a-junk                                       |      |      |        |
| Tim Owen       | 18:03 05/09/01 | 3       | Re: AVVID-launch, Germany 15th September           |      |      |        |
| Heather Carly  | 18:17 05/09/01 | 3       | PLEASE REPO: Urgent Purchase Order information     |      |      |        |
| Robinson, A    | 20:33 05/09/01 | 4       | UUU Reseller Case of T&E                           |      |      |        |
| Paul O'Leary   | 20:46 05/09/01 | 2       | Re: On schedule                                    |      |      |        |
| Naimi S&H      | 17:39 05/09/01 | 2       | SPD - Details                                      |      |      |        |
| Naimi S&H      | 17:40 05/09/01 | 1       | Consultant's B. Lott                               |      |      |        |
| Robinson, A    | 20:33 05/09/01 | 6       | Re: AVVID-launch, Germany 15th September           |      |      |        |
| Mike Ward      | 20:34 05/09/01 | 3       | Re: 2 - Update: Unfinished                         |      |      |        |
| Lisa L&C       | 18:32 05/09/01 | 2       | Re: New marketing position                         |      |      |        |
| Mike Ward      | 11:47 05/09/01 | 2       | RETRD 2 is Live!!!                                 |      |      |        |
| Samantha M...  | 12:33 05/09/01 | 3       | Re: Architecture presentation for launch event     |      |      |        |
| John Mann      | 07:34 05/09/01 | 6       | Re: Fwd: UUU Reseller Case of T&E                  |      |      |        |
| Heather Carly  | 12:37 05/09/01 | 8       | Re: Datacenter report: European Call Centre Survey |      |      |        |
| Nicola V&A     | 14:39 05/09/01 | 1       | Reply  |      |      |        |
| Ferdinand R... | 06:19 05/09/01 | 1       | Video Film   |      |      |        |
| Tim Owen       | 14:40 05/09/01 | 4       | Re: AVVID-launch, Germany 15th September           |      |      |        |
| B/C Blackman   | 08:59 05/09/01 | 2       | Great meeting now                                  |      |      |        |
| Phil Owen      | 14:05 05/09/01 | 2       | Re: AVVID-launch meeting                           |      |      |        |

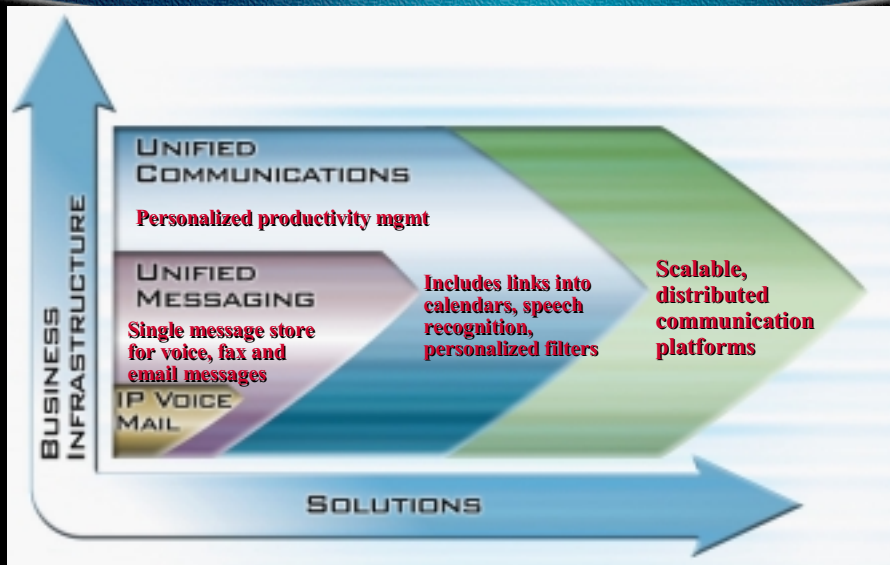


1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

57

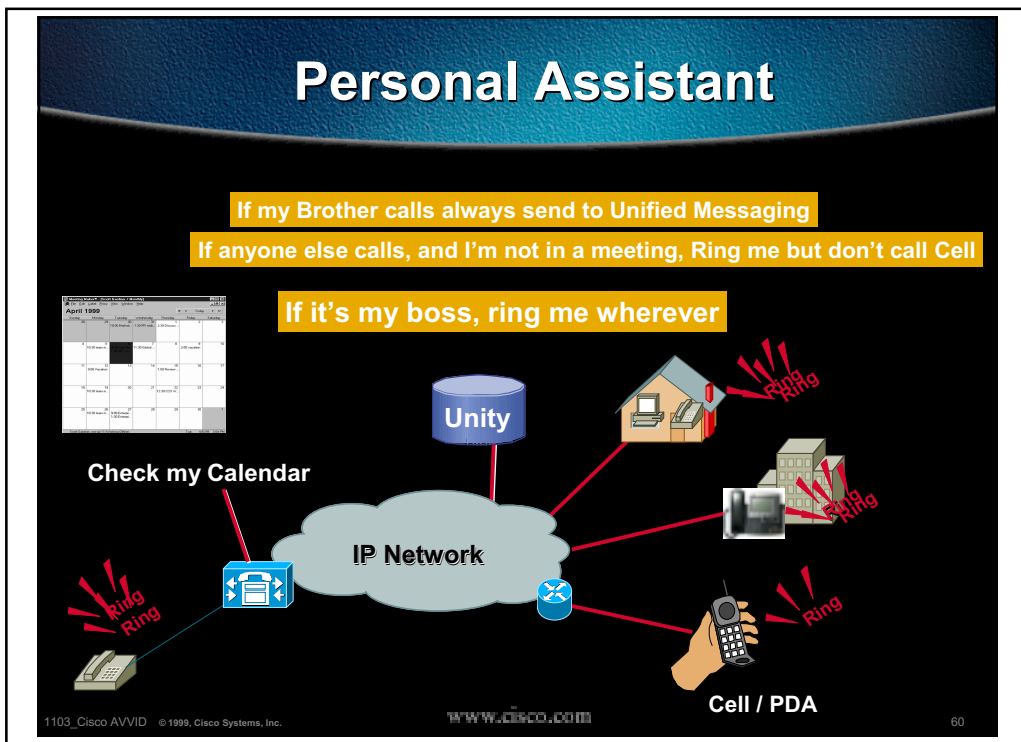
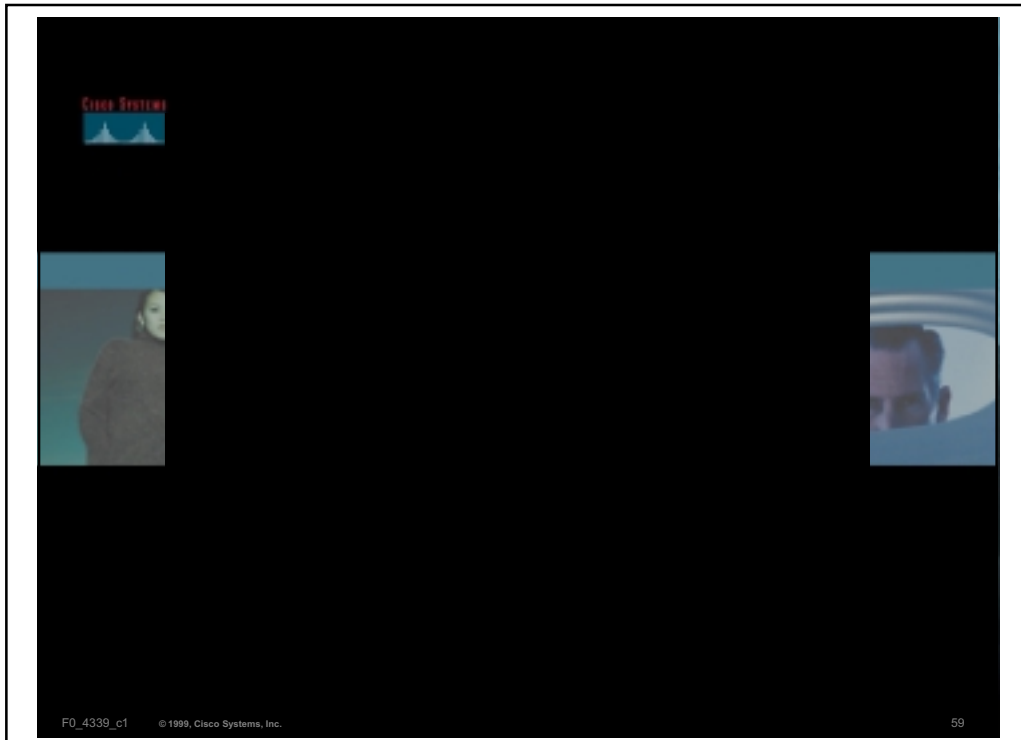
# Unified Communications



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

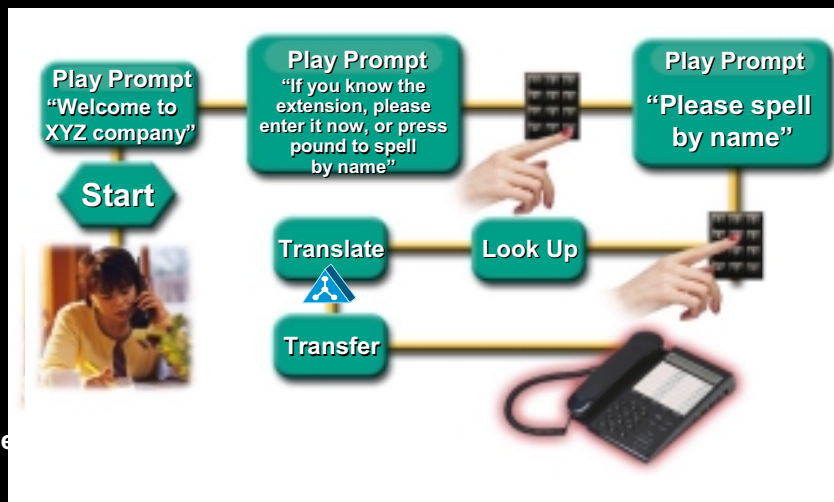
WWW.CISCO.COM

58





## IP Auto Attendant



Benefit

Can be deployed anywhere in IP network

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

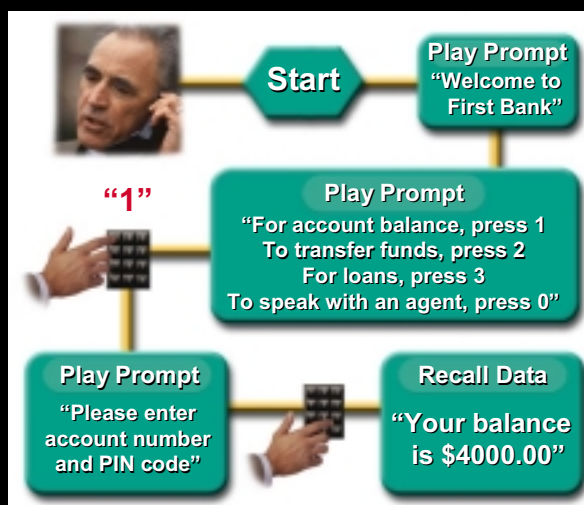
WWW.CISCO.COM

61

## 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

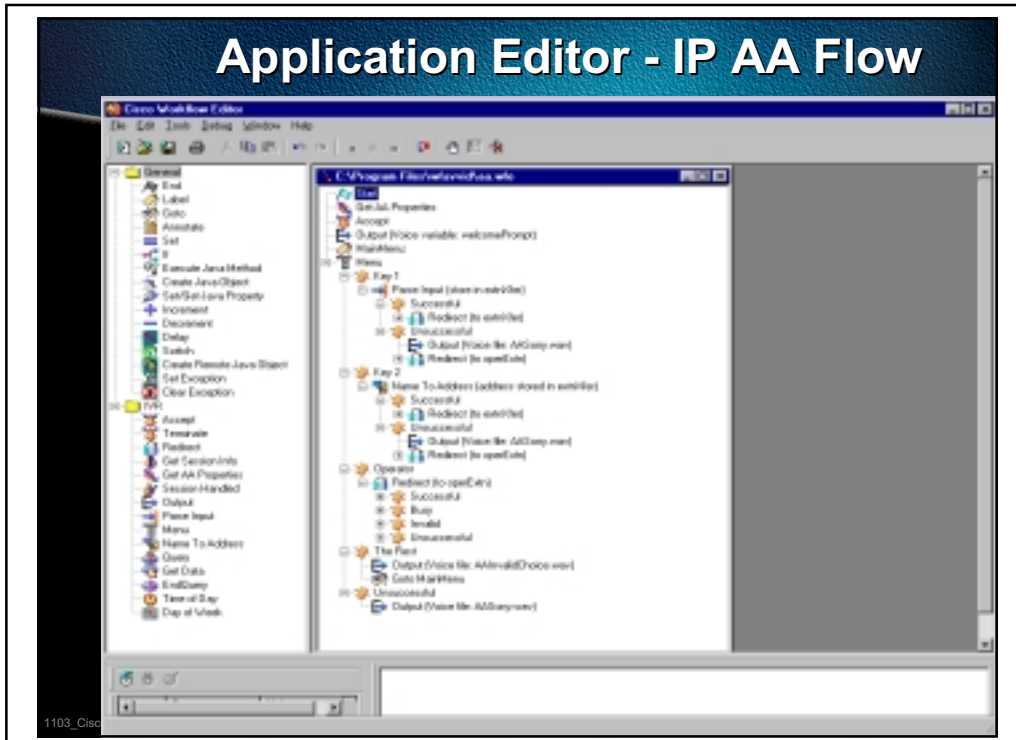


1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

62

## Application Editor - IP AA Flow



## Notification Services

- Automatic notification when preset information threshold on Web page
- Use with or without telephone
- Benefits

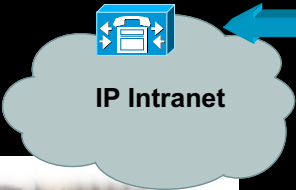
Only one place to configure and maintain data  
Provides basic e-CARE  
Easily personalized







# Business Solution Productivity Voice Portal Solution

**Call Manager IP IVR**




**IP Intranet**





**Cisco Stock Quote**



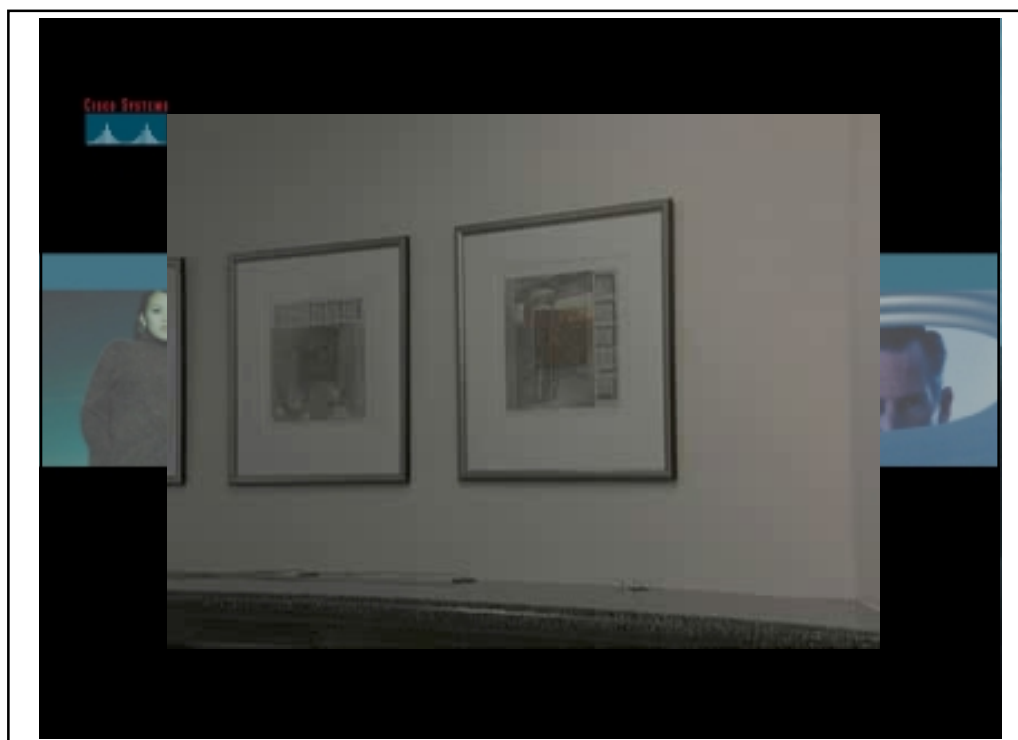
**Press #1 to Hear  
Cisco Stock Quote**

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

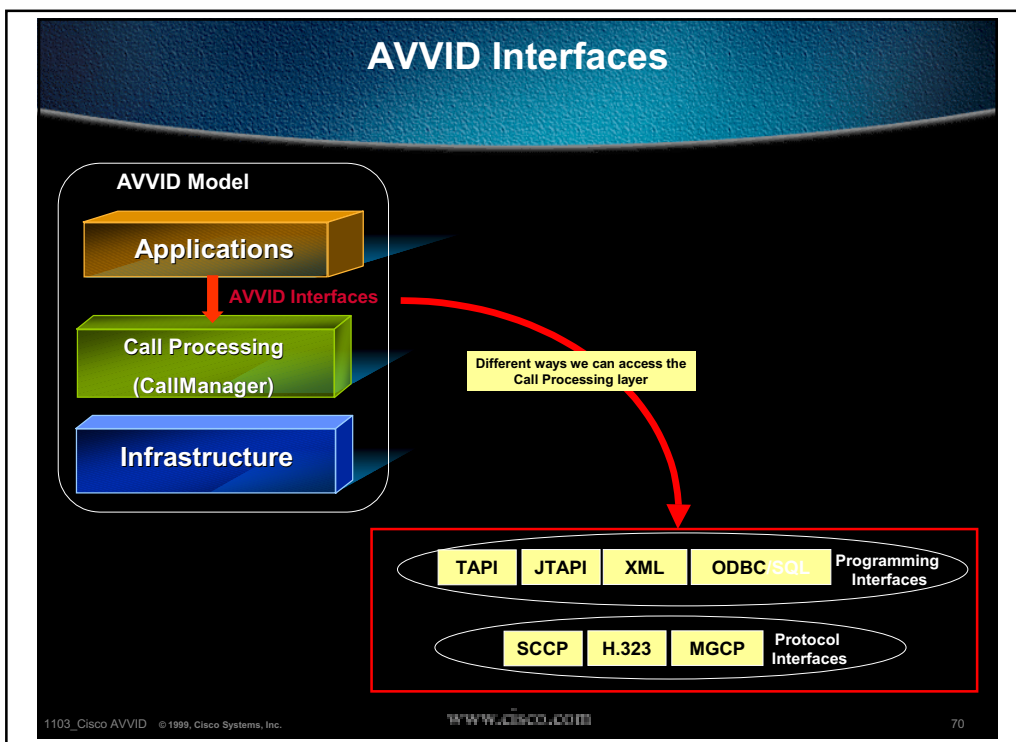
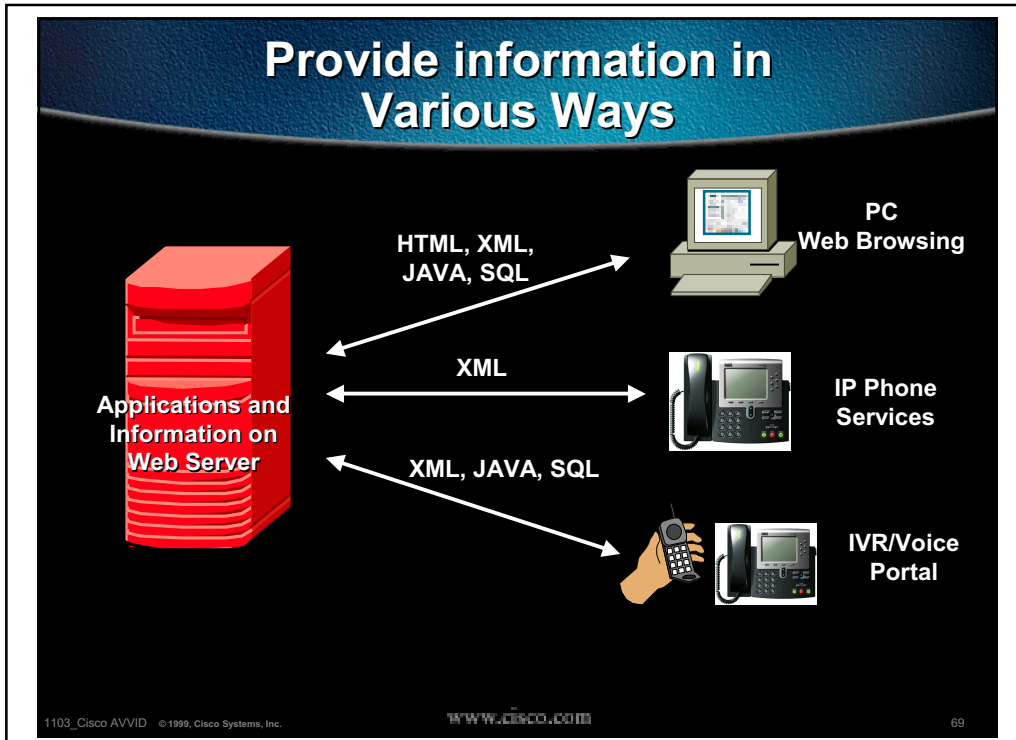
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

[www.cisco.com](http://www.cisco.com)

★ 65







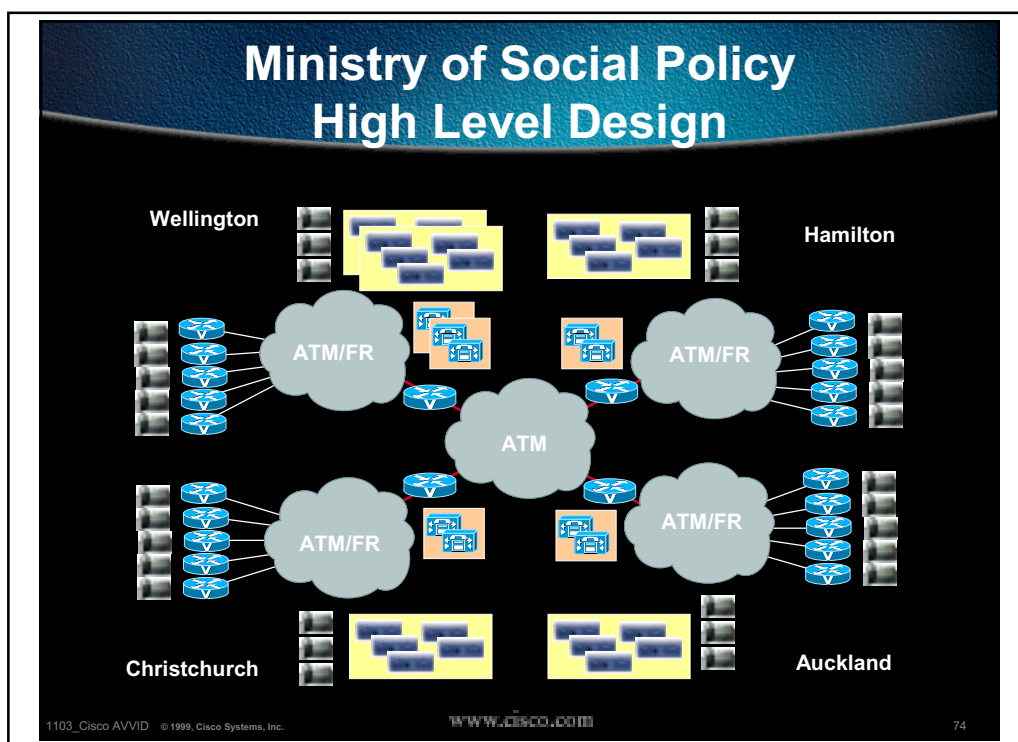


## **Cisco AVVID Case Study**

### **Ministry of Social Policy New Zealand**

#### **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**





## 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](http://www.cisco.com/warp/public/146/pressroom/2000/oct00/elob_102400.htm)

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

75

## Customer Comments!

“

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

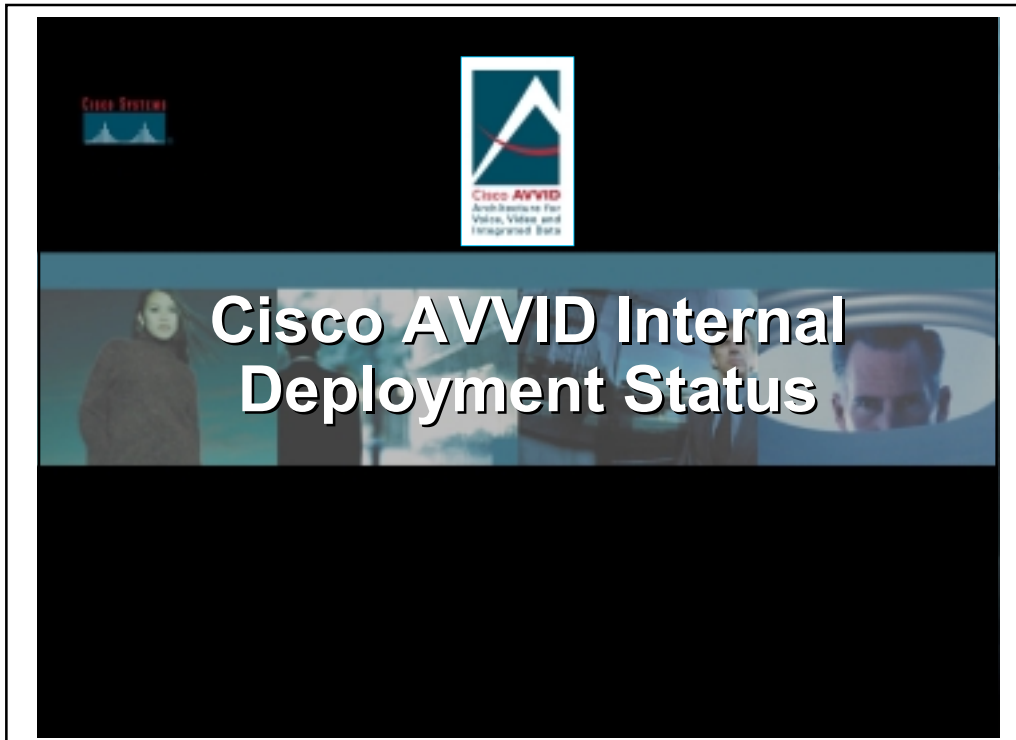
”

Ministry of Social Policy Nov 2000

1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

76



## 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)

1103\_Cisco AVVID © 1999, Cisco Systems, Inc. [www.cisco.com](http://www.cisco.com) 78

## 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

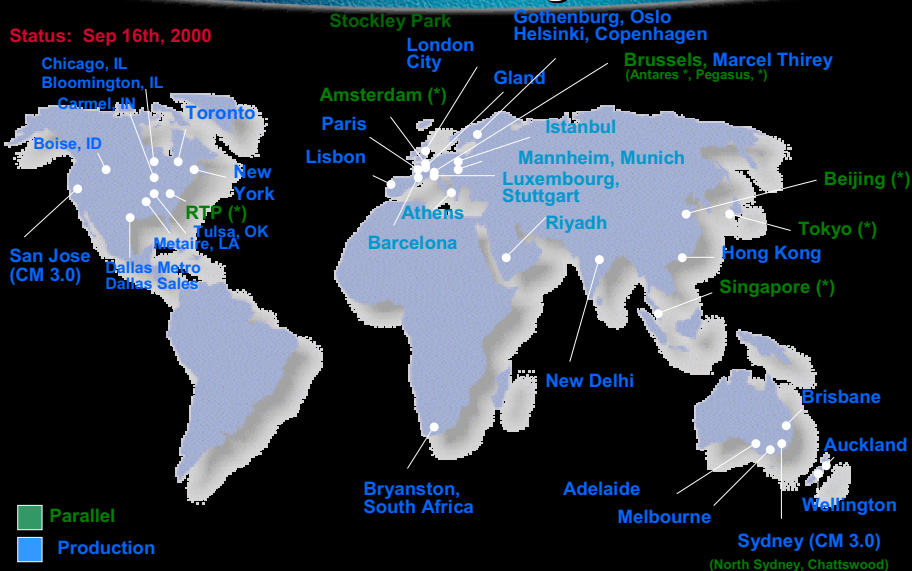
1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

79

## Current Worldwide IP Telephony Cisco Call Manager Sites

Status: Sep 16th, 2000



1103\_Cisco AVVID © 1999, Cisco Systems, Inc.

WWW.CISCO.COM

80

