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IP Telephony: The Road Ahead

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Agenda

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- **Where are we at?**
- **Where too next?**

1994: UNSW

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IP

Non IP

- Mail
 - News
 - FTP
 - Gopher
- Voice
 - VoiceMail*
 - IPX file/print
 - Appletalk
- Long live multigate!

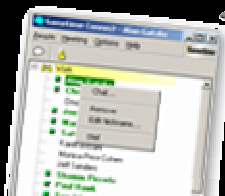
Small HTTP, non mission critical

Today

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IP

- Mail
- Web
- Calendar
- VoD
- Collaboration
- Video Conference
- IM



Non IP

- Voice
- VoiceMail

Consider:

Advances in IP based services
Number of them
Maybe too successful?

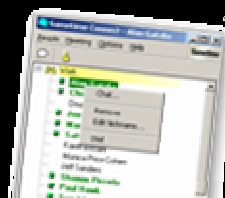
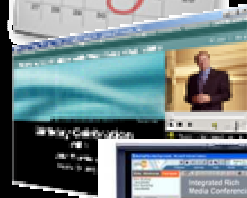
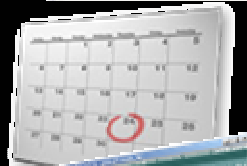
Convergence

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IP

IP

- Mail
- Web
- Calendar
- VoD
- Collaboration
- Video Conference
- IM



- Voice



- UM



Reasons:

Single Infrastructure to support
Productivity through app integration
Still some challenges

Hurdles to Deployment

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- **Eggs and Baskets**
- **Interoperability and Standards**
 - Who does SIP on all platforms?**
- **Cost/Value (need to integrate other forms of communication)**
- **Backend Application Support**

Famous Predictions

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“I think there is a world market for maybe five computers.”

Thomas Watson, Sr., CEO of IBM (1943)

Popular Mechanics



“Computers in the future may have only 1,000 vacuum tubes and perhaps only weigh 1.5 tons.”

Popular Mechanics (1949)

“There is no reason anyone would want a computer in their home.”

Ken Olson, Founder DEC (1969)

Not Just a Phone Call

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Applications Central

Cisco MeetingPlace

Retail

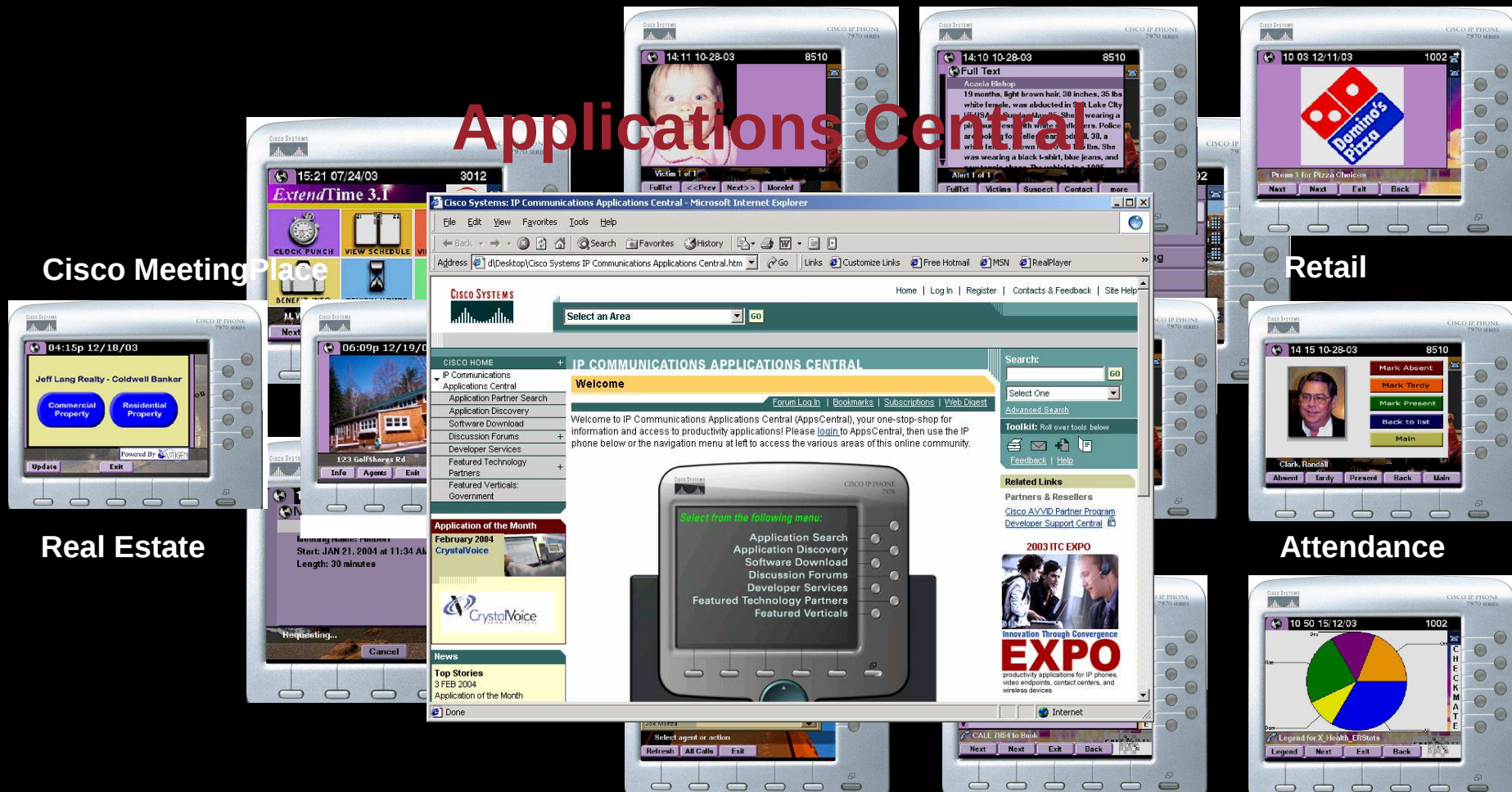
Real Estate

Attendance

Call Center

Health Care

ER Stats



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<http://www.pivod.com.au>

Next Step...

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Feb 27th, 2004

- **Aggregation of Corporate/Personal Information**
 - Summarization of email
 - Calendar
- **Speech Recognition**
 - Create/setup meeting, sms/email messages
- **Presence/Location information integration**

Video Telephony

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- **Traditional VC is:**
 - Hard to use**
 - Separately Managed**
 - ISDN quality**
- **Integrated IPT**
 - Simple, Integrated,**
 - High Quality (4M)**
 - AdHoc + Scheduled**



Now Just Use Your Existing IP Phone

WiFi Voice

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- Voice over WLAN
- Design WLAN for Voice NOT Data!
- Move to GSM Integration

Battery life

L8 issues ☺

Nokia 9500
CCX Compatible



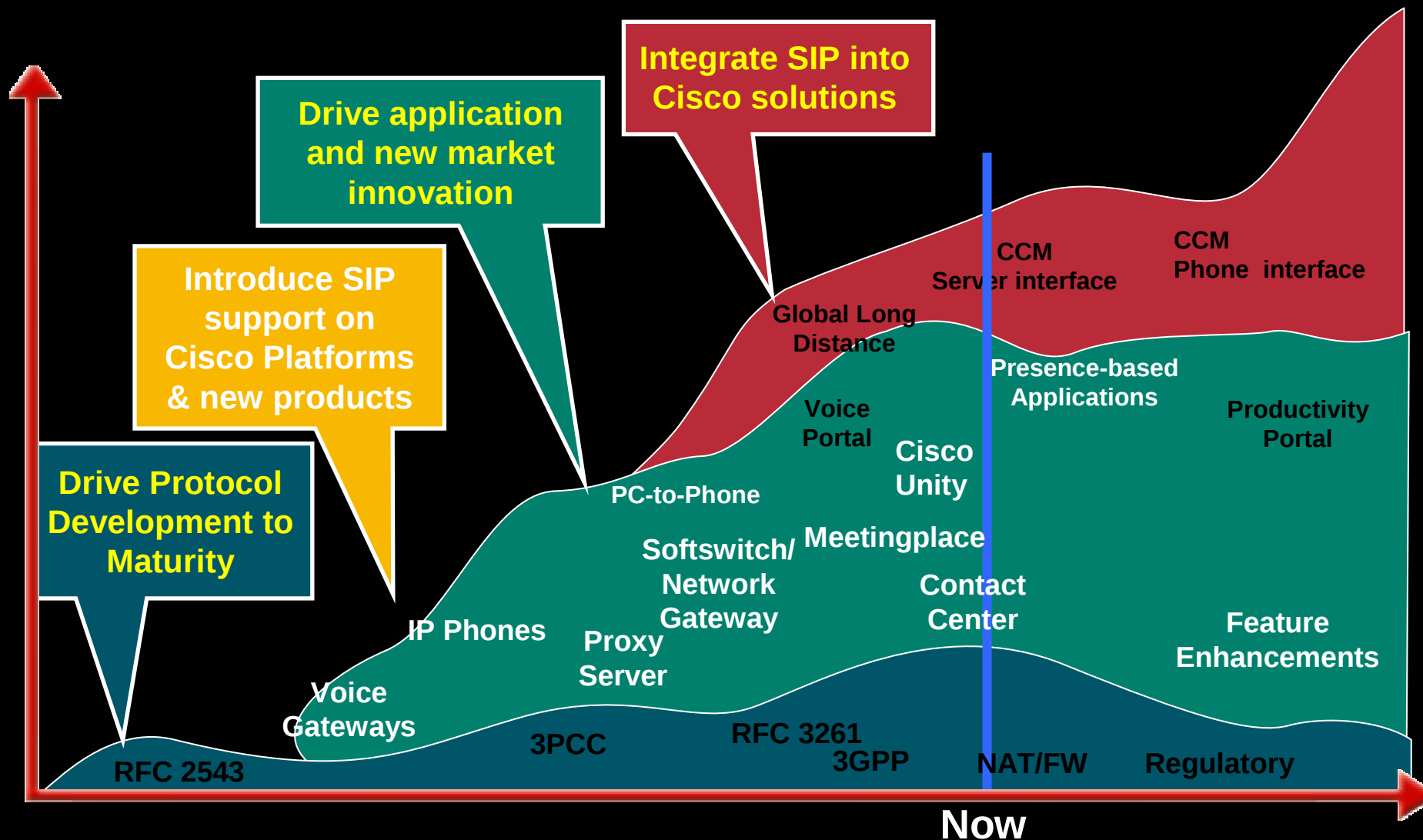
SIP Thoughts

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- **Remaining SIP standards work**
 - Conferencing
 - NAT traversal
 - IM & Presence
- **Notion of Proprietary SIP**
 - <http://www.bcr.com/bcrmag/2004/04/p30.asp>
 - QSIG....
 - HTML in the past (frames etc)
- **IPv6: Commercial v Research implementation**
- **Our Strategic Direction**

SIP & Cisco

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20 Years Ago

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Sandy Lerner & Leonard Bosack

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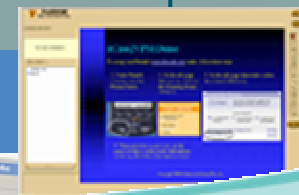
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- The diagram illustrates a Unified Communications Network Architecture. It shows the internal network components and their connections to external networks (T/E1/PI).
- Internal Network Components:**
- Core Network:** H.323, TCP-5003, TCP-5000, TCP-3334, TCP-1433, TCP-80, 1627 or 443, TCP-80, 1627 or 443, TCP-1433, TCP-80.
 - Gateways:** MPIP Gateway, CallManager, Video Gateway, Internal Web Conferencing Servers, Outlook or Notes Gateway, Directory Services Gateway.
 - Services:** Sametime Server and Connector, FaceTime IM Director, MP Web, Video Gateway, SQL Database, Admin, Exchange or Domino Server, Active Directory or Sun One/Planet (LDAP Directory).
 - Other:** MCU/EUC, End Users (VoIP, Telephone), PC.
- External Network (T/E1/PI):**
- Core Network:** H.323, TCP-5003, TCP-5000, TCP-3334, TCP-1433, TCP-80, 1627 or 443, TCP-80, 1627 or 443, TCP-1433, TCP-80.
 - Gateways:** MPIP Gateway, CallManager, Video Gateway, Internal Web Conferencing Servers, Outlook or Notes Gateway, Directory Services Gateway.
 - Services:** Sametime Server and Connector, FaceTime IM Director, MP Web, Video Gateway, SQL Database, Admin, Exchange or Domino Server, Active Directory or Sun One/Planet (LDAP Directory).
 - Other:** MCU/EUC, End Users (VoIP, Telephone), PC.
- Connections:**
- H.323:** Connects the MPIP Gateway and CallManager to the external network.
 - TCP-5003:** Connects the CallManager and MPIP Gateway to the external network.
 - TCP-5000:** Connects the MPIP Gateway and CallManager to the external network.
 - TCP-3334:** Connects the MPIP Gateway and CallManager to the external network.
 - TCP-1433:** Connects the MPIP Gateway and CallManager to the external network.
 - TCP-80, 1627 or 443:** Connects the MPIP Gateway and CallManager to the external network.
 - TCP-80:** Connects the MPIP Gateway and CallManager to the external network.



Security is Critical

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Collaboration E-Mail Calendar Audio-Conferencing Web Application



SECURITY

Video-on-Demand

Voice Messaging

Telephone Services

Instant Messaging

Contact Center

Security has Multiple Components

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- **Traditional**
Toll Fraud/Admin etc
- **IP Based Issues**
DoS/Worms/Viruses
Privacy/Fraud Issues
“Systems Approach”
Trusted Foundation Required

<http://www.nwfusion.com/reviews/2004/0524voipsecurity.html>

Why Trust The Foundation....

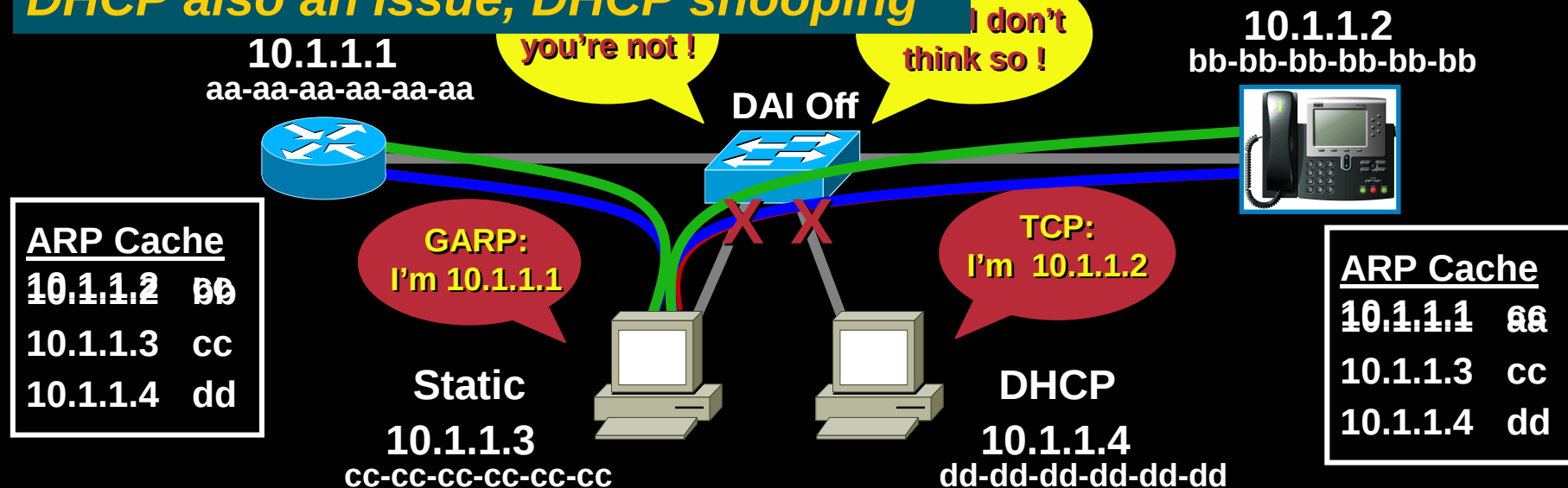
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- Built on DHCP Binding Table
- Dynamic ARP Inspection watches ARP / GARP for violations
- IP Source Guard examines every packet
- Will shun packets or disable port

Successfully stops ettercap, dsniff

DHCP also an Issue, DHCP snooping

10.1.1.1	aa-aa-aa-aa-aa-aa	1/0
10.1.1.2	bb-bb-bb-bb-bb-bb	1/1
10.1.1.4	dd-dd-dd-dd-dd-dd	1/3



Summary

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- **Applications converging into IP**
- **Moving from IPT to IP Communications (IPC)**
- **Multiple protocol, multiple media, multiple access – IPC Router**
- **Security and availability will be key**
- **Backend Application Integration needs Focus**