

IP Phones: Where's My Red "Hold" Button?

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The Evolving IP Telephone

Design Attribute	IP Telephone 2000	IP Telephone 2006
Communications Protocol	H.323, Proprietary	H.323, Proprietary, SIP
Typical Voice Codecs	G.711, G.723.1	G.711, G.723.1, G.729, G.722
Display	Traditional 2 - 4 line, LCD alphanumeric screen; grayscale	Large, backlit pixel-based graphics screen; color
Information Access	Telephony system, only, e.g., directory	Telephony system; Peripheral application server; Web-based server
Speakerphone	Two-way half-duplex, narrowband	Two-way full duplex, wideband
Peripheral Interfaces	10/100 Ethernet	10/100/1000 Ethernet; Infrared; BlueTooth; USB; 802.11

Sample: Today's IP Telephone



Siemens OpenStage 80

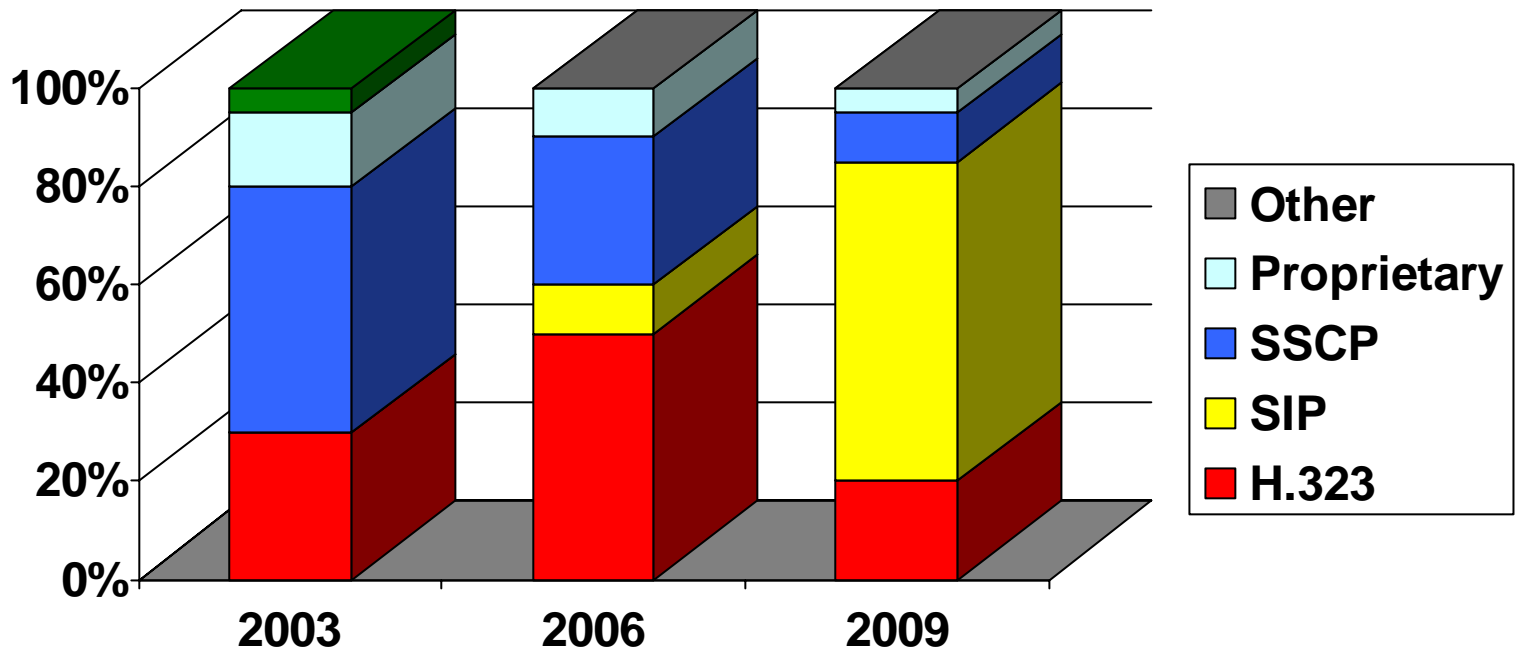
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IP Telephone Technology Basics

- Communications Protocol
 - **H.323**
 - **Proprietary**
 - **SIP**
 - **Other (Skinny, MCGP, et al)**
- Voice Codec
 - **G.711**
 - **G.723.1**
 - **G.729 variations**
 - **G.722 or other wideband algorithm, e.g., Broadvoice**
- Echo Cancellor
- Jitter Buffer
- QoS mechanisms, e.g., 802.1p/Q
- 802.af PoE

Forecasted Increased Deployment of SIP

Desktop IP Phone Communications Protocol



Some Current SIP Advantages

- SIP is the most widely supported communications protocol (95%+ current IPT systems)
- SIP is an application-layer control protocol that can establish, modify and terminate multimedia sessions or calls
- SIP is a true peer-to-peer communications protocol
- SIP is media independent, allowing the flexibility to initiate sessions for different media types
- SIP is superior to H.323 in several important technical areas (faster call set-up time, simpler protocol stack, loop detection, embedded proxy firewall, support of third party call control, et al)
- SIP has inherent presence recognition and notification capabilities for messaging, conferencing, collaboration applications
- SIP is the IMS communications protocol standard that will be used to integrate wired and wireless networks (FMC)

IP Phone Categories (1)

- Entry
 - Basic POTS requirements
 - Single line appearance
 - Limited display/speakerphone capabilities
 - User: lobby, conference room, common areas, factory floor
- Administrative
 - Full feature requirements
 - Multiple line appearances (10+) for call coverage applications
 - Full display capabilities; headset interface
 - Users: management support staff, group answering centers

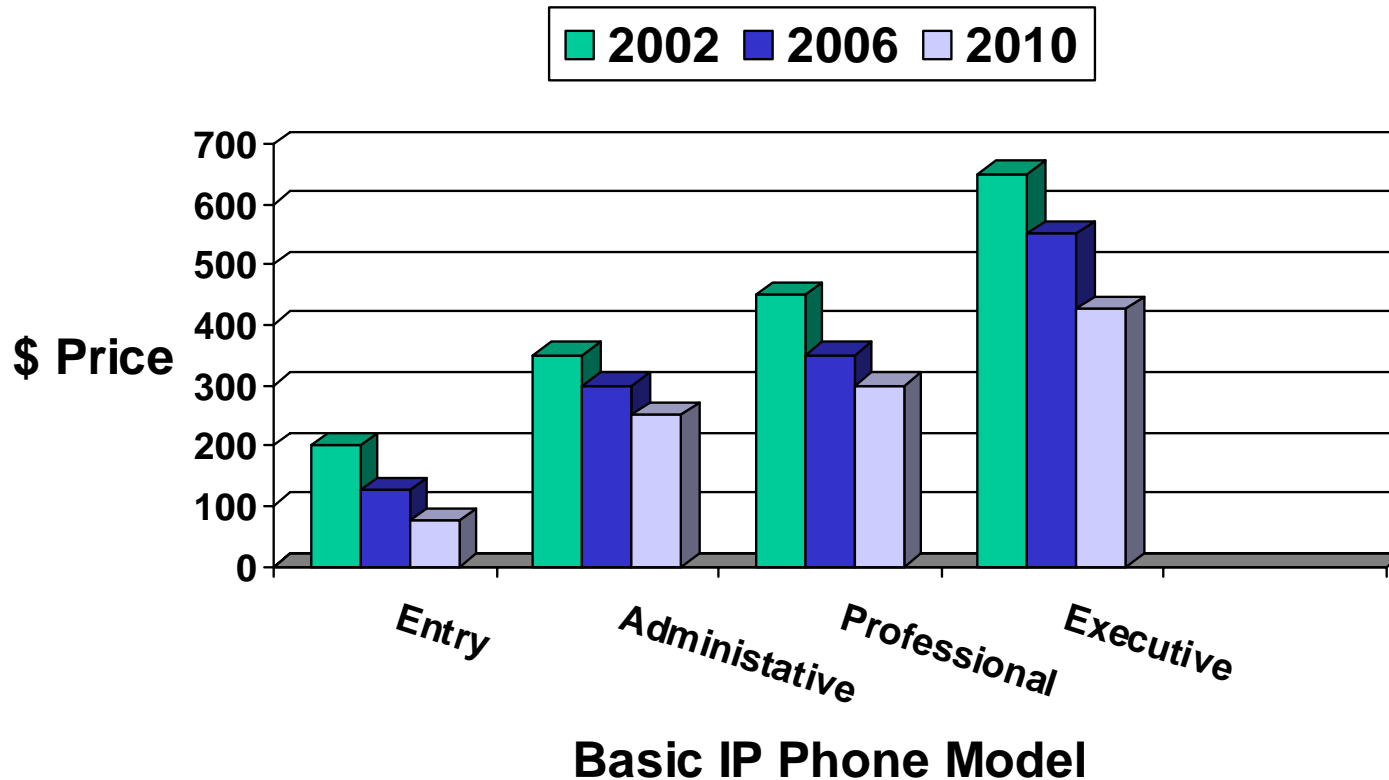
IP Phone Categories (2)

- **Professional**
 - Full feature requirements
 - Multiple programmable line/feature buttons (6 – 10)
 - Enhanced backlit monochromatic display
 - Wideband handset and speakerphone
 - Peripheral interfaces and embedded web browser
 - Users: management team members, technical staff
- **Executive**
 - Full feature requirements
 - Multiple programmable line/feature buttons (6 – 10)
 - Enhanced backlit color display capabilities
 - Wideband handset, speakerphone & headset
 - Peripheral interfaces and embedded web browser
 - Uses: executives, select personnel

IP Phone Pricing

- IP phone prices have been declining precipitously since their introduction in the late 1990s
 - Technology learning curve
 - Volume shipments
- Early IPT systems had limited phone portfolios without low cost entry models or high end executive models
 - Current portfolios typically include five or more current generation models
 - Older generation models are often available at lower prices

Typical IP Phone Prices (List)



IP Telephone Displays

- Color or monochromatic (gray-scale)
- Pixel-based imaging format
- High resolution, high contrast backlit display
- Multiple image types
 - **Text**
 - **Graphics**
 - **Video**
- User interface
 - **Cursor keys**
 - **Navigator wheel**
 - **Touch screen**
 - **Mouse**

Sample IP Phone Displays



Mitel 5340

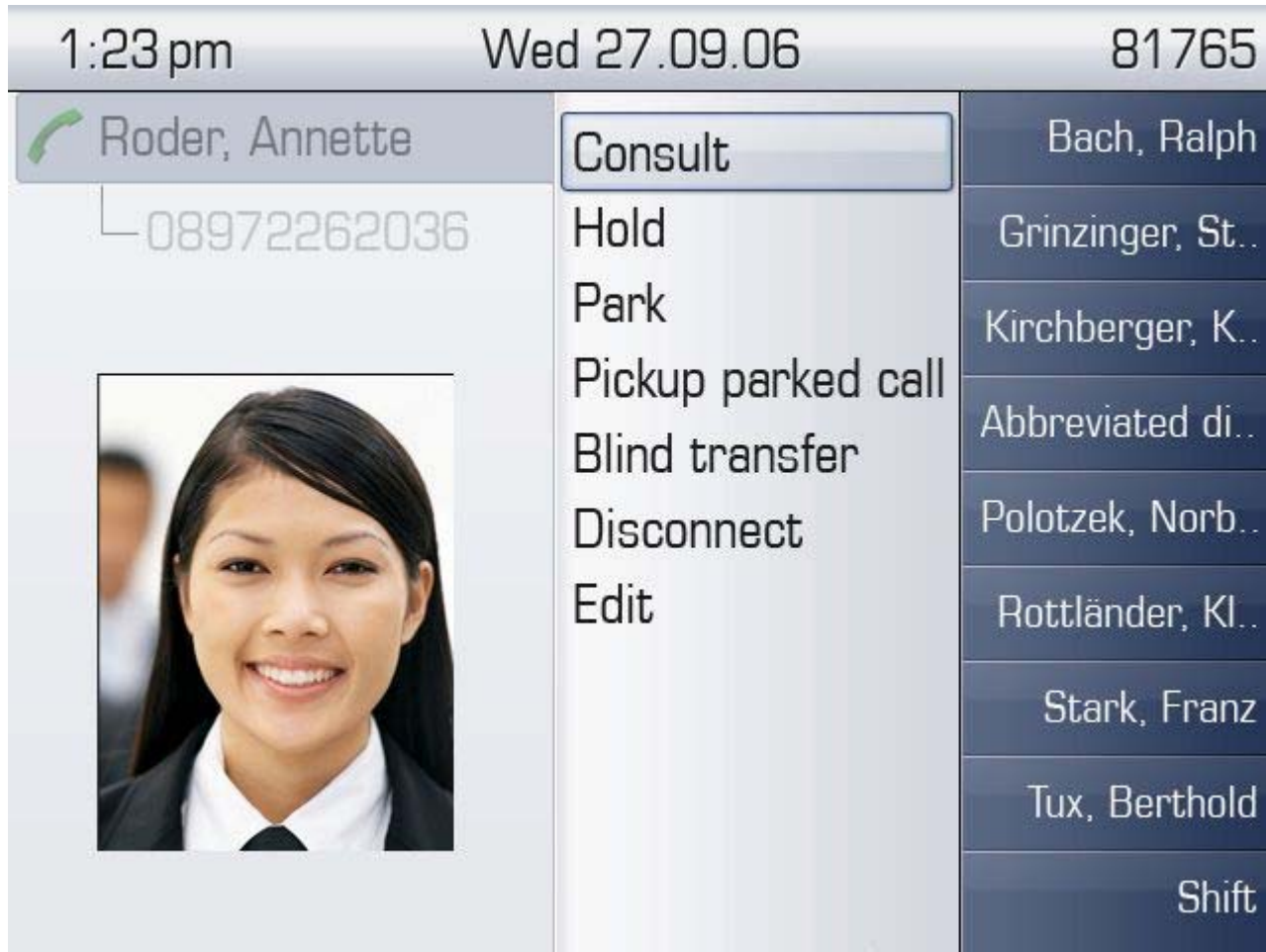
Monochromatic



Nortel 2007

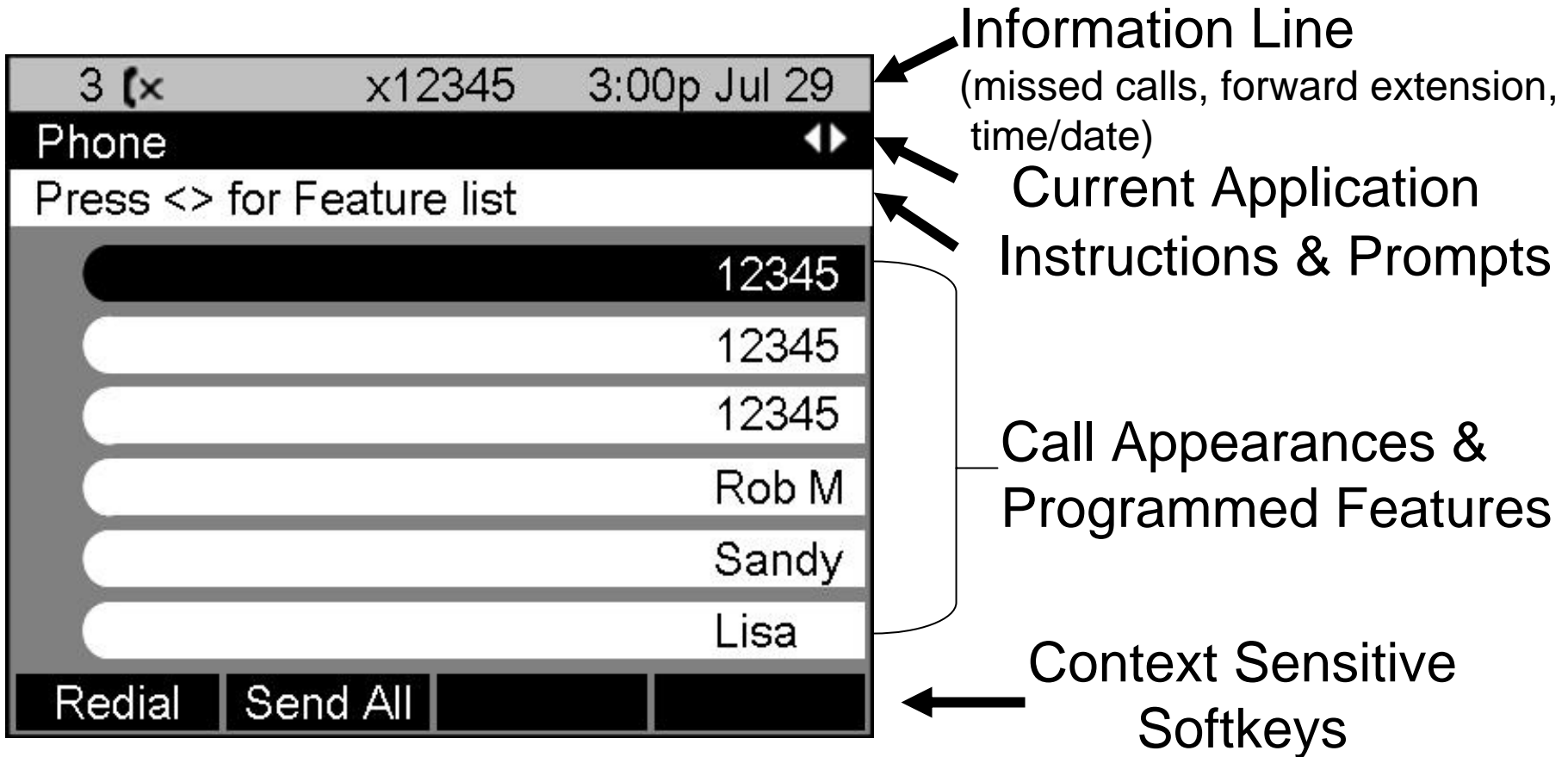
Color

On Screen Feature Access and Selection



Source: Siemens Enterprise Communications

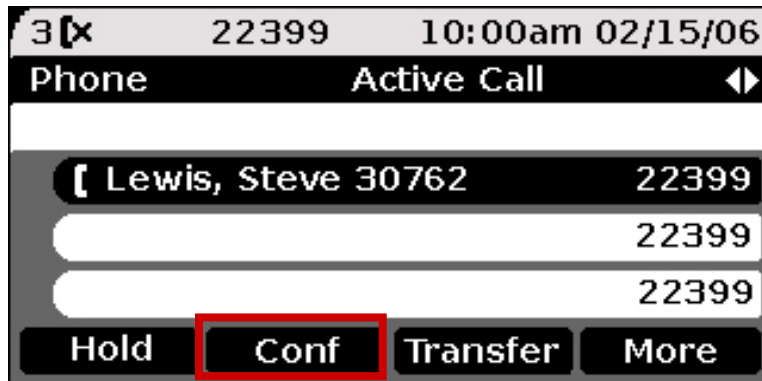
Enhanced & Intuitive Context Sensitive User Interface



Avaya 9630 Display

Simplified Conference Call Implementation

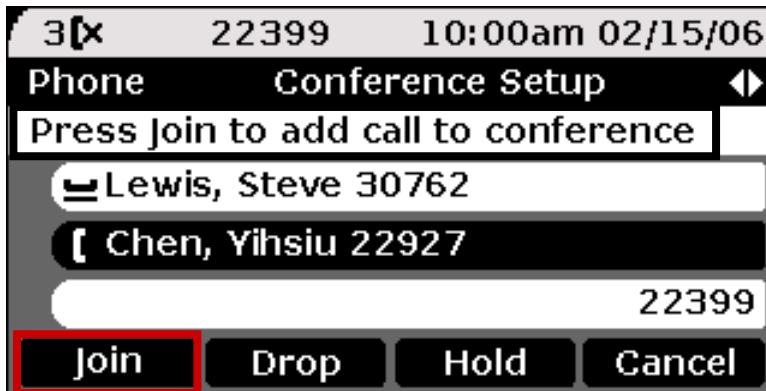
In a call



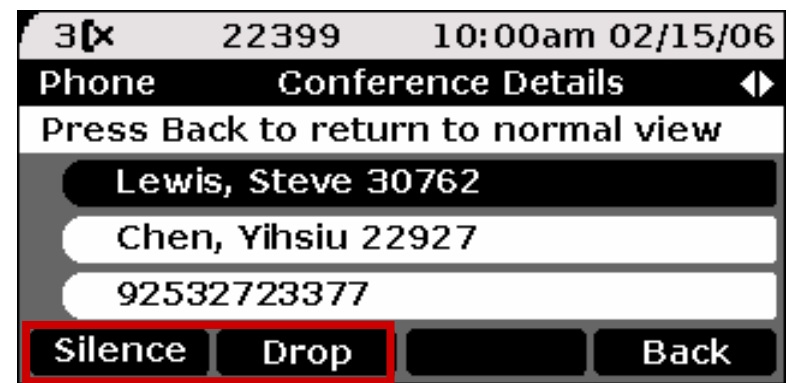
Look-up



Conference



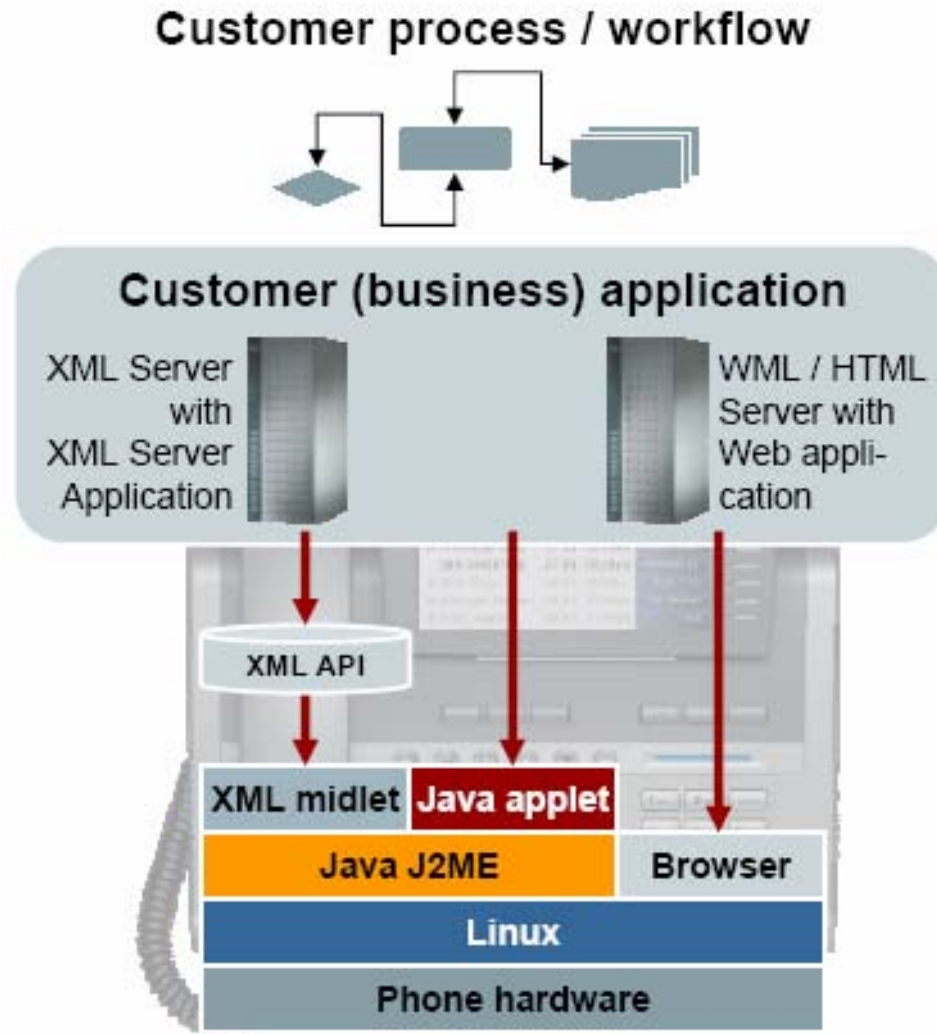
Control Conference



Embedded “Web Browser” Functionality

- Embedded processing and information access and download interfaces
 - Embedded O/S Web server and/or application database standards, such as XML, HTML, WML, WAP, LDAP, Java, TAPI
- Basic browser-based applications
 - Fixed menu or screen pop
 - Interactive station user/screen transactions
 - Push-through information & alerting
 - Text
 - Audio

Application Development Platform



Sample Web Browser Menu Display



Advanced Directory Applications

- External LDAP server
- Integrated directory/autodialing (call by name)
- Alpha entry procedures: single or multiple keystrokes
- Directory pruning
- Auto-display or menu list
- Multiple directory record fields
 - Name
 - Extension
 - Department
 - Personal information

Example of Intelligent Directory Access



Source: Nortel

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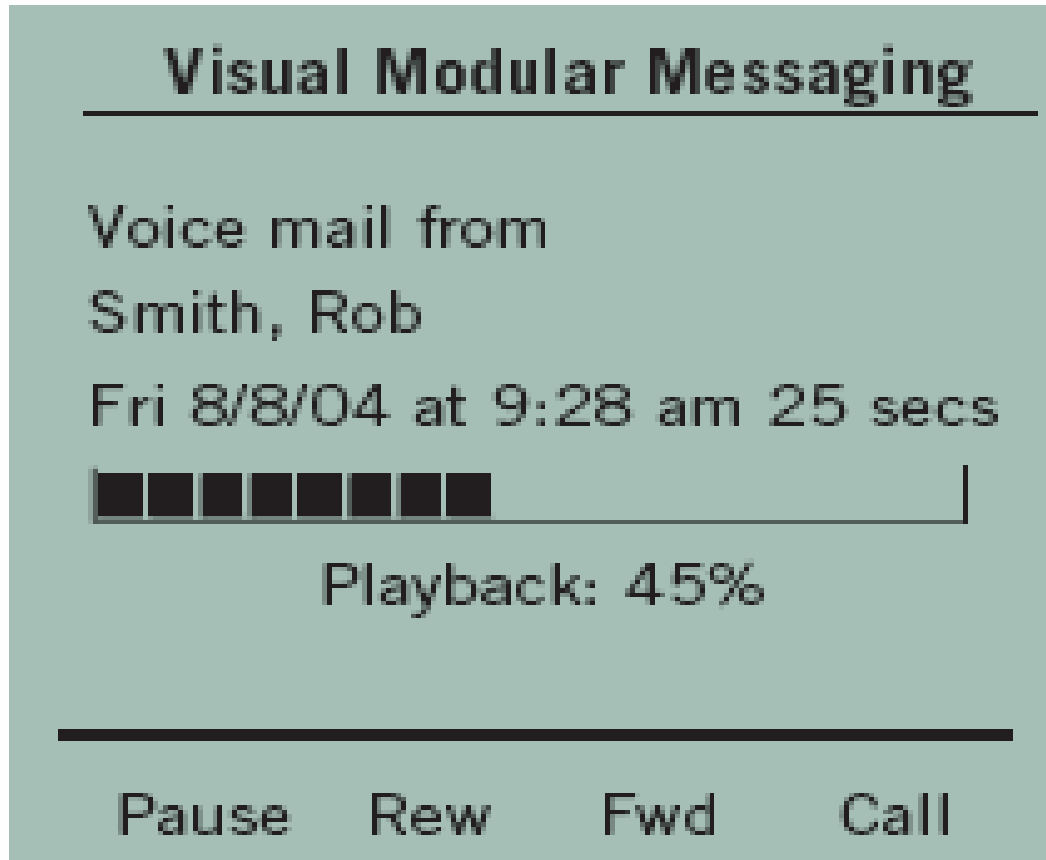
Sample Productivity Applications

- Web browsing
- Directories
- Time reporting
- Emergency alerts
- Travel reservations
- Account code entry
- Inventory lookups
- Visual voice mail
- Text messaging (Email, IM)
- Conferencing/Collaboration
- Announcements
- Branding via screensaver
- Zone paging
- Scheduling

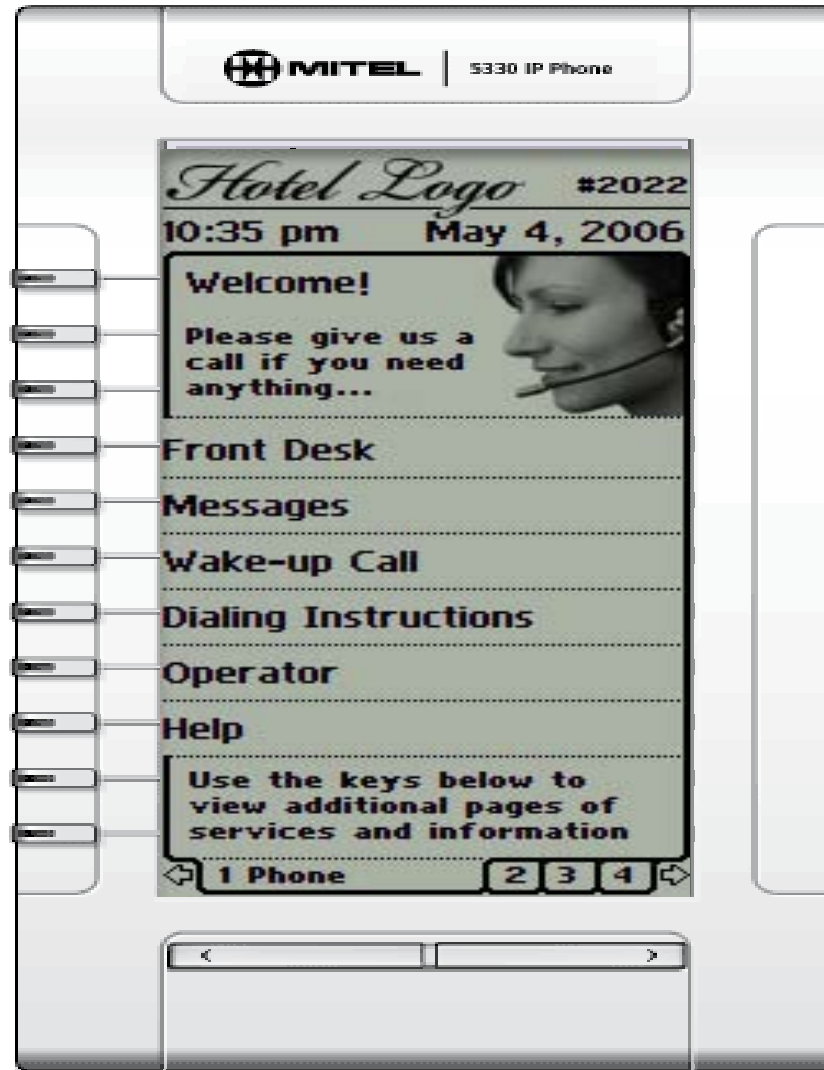
Sample ACD Agent Application



Sample Visual Messaging Application



Sample Hospitality Application



Source: Mitel Networks

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Sample Conferencing/Collaboration Application

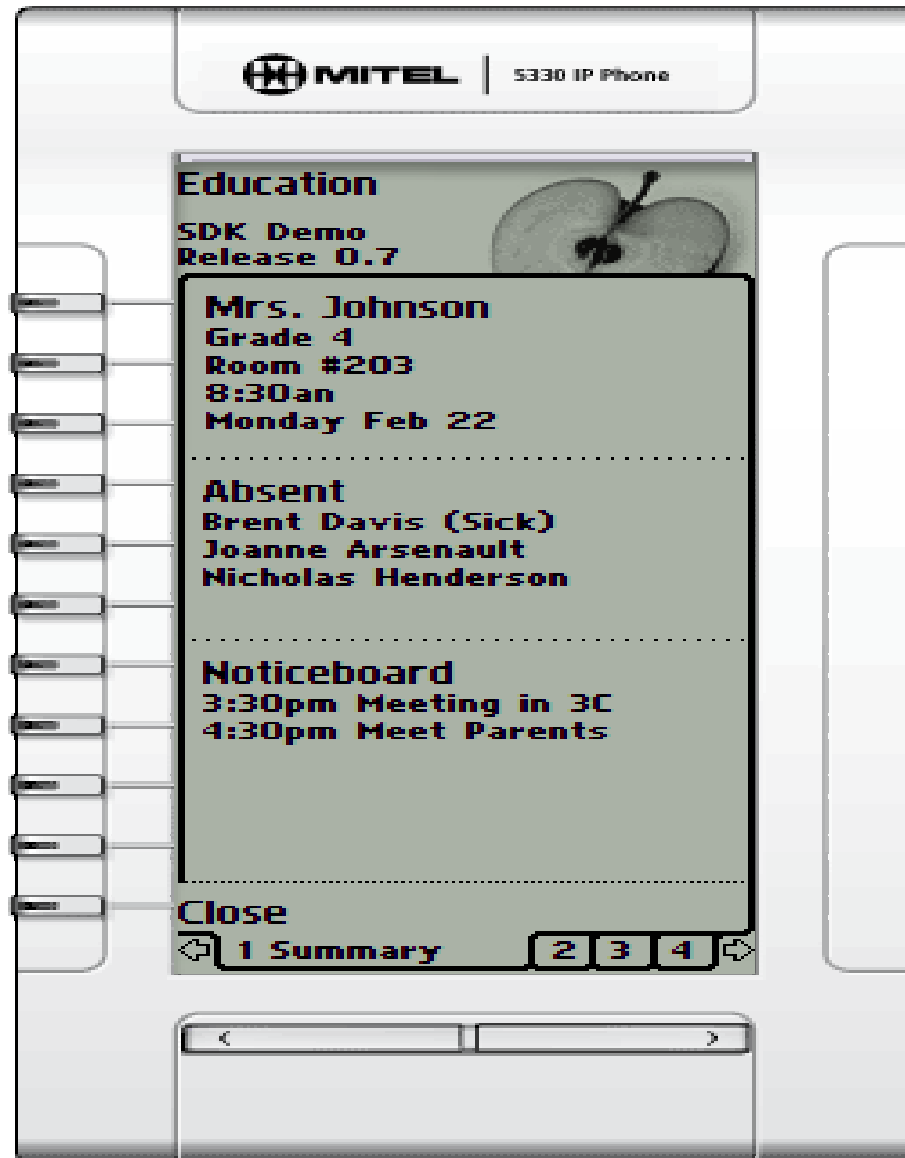


Source: Cisco Systems

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Sample Education Application



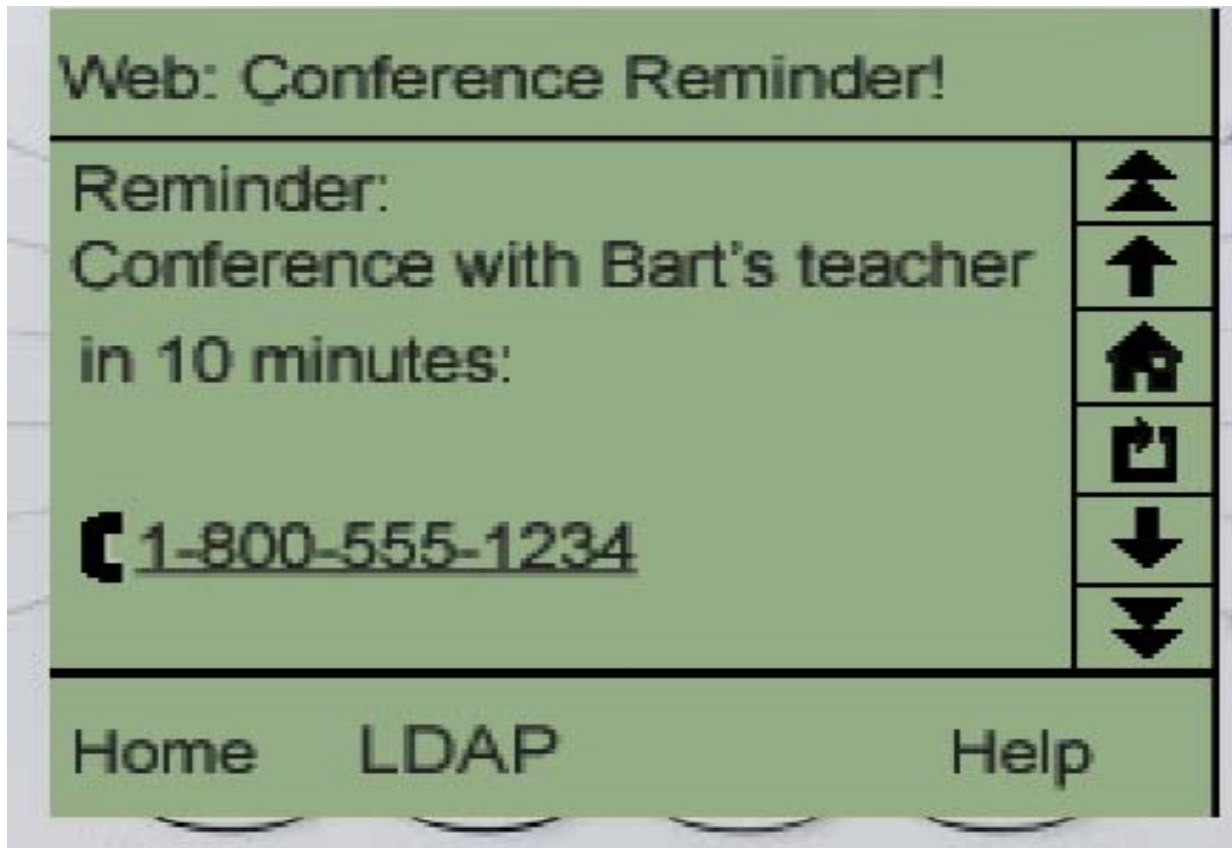
Sample Time Card Application



Desktop Alerts

- Security Alerts — i.e. **“Smoke in building D, please evacuate”**
- Weather Alerts — i.e. **“Severe weather expected at 2 pm. Please leave work early”**
- IT Alerts — i.e. **“E-mail server is down. Expected up time is 8 am”, “Update your anti-virus software”**
- Travel Advisories — i.e. **“Ice on highway 1”**
- Company Announcements — i.e. **“Meeting reminder — All hands meeting at 10 am”**

Sample Conference Alert

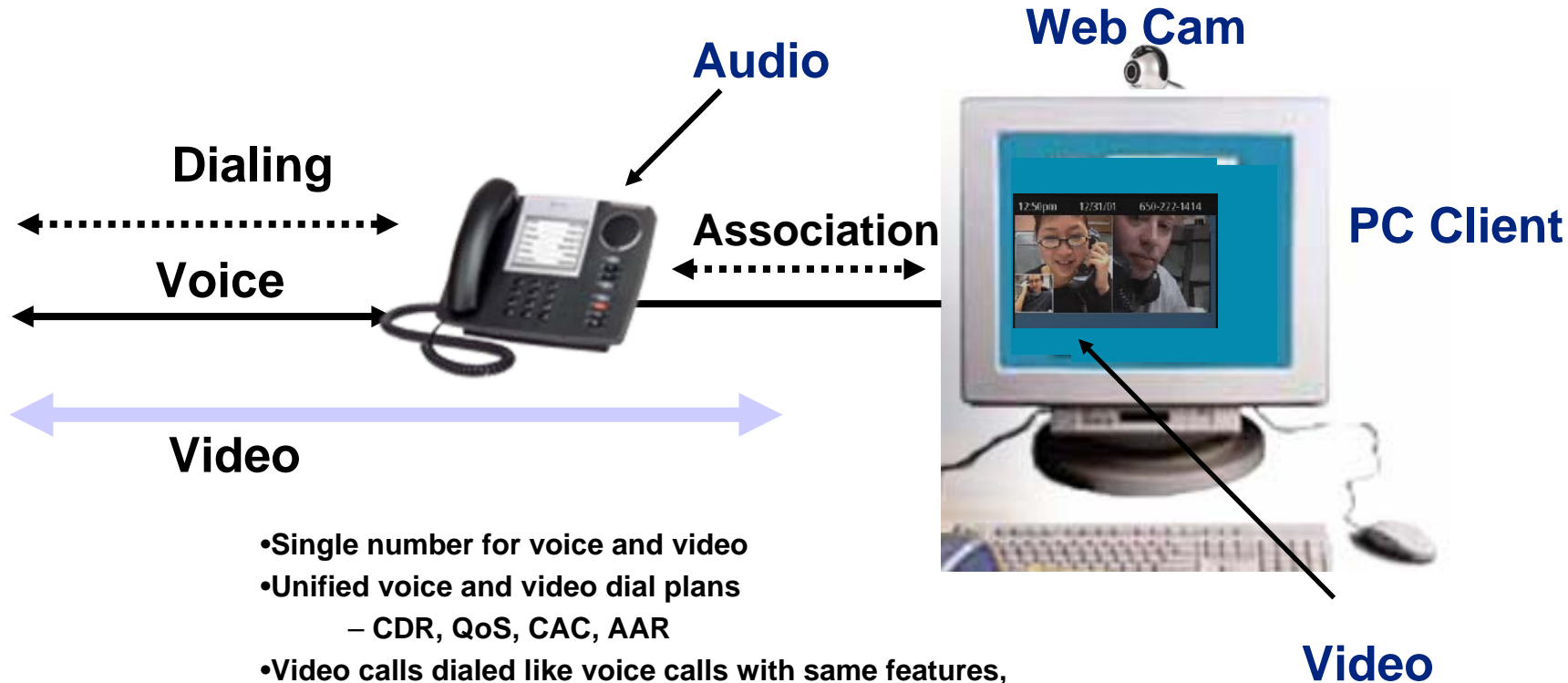


Source: Cisco Systems

Peripheral Interfaces

- Ethernet switch/connectors: 10/100 Mbps, Gigabit (integrated or add-on module)
 - Computing applications (PC behind phone)
 - Video applications
- Built-in VPN interface for teleworking applications
- Infrared: PDAs
- Bluetooth and/or USB:
 - Headsets
 - Speakers
 - Cameras (videoconferencing applications);
 - Keyboards/mouses (enhanced system interaction)
 - Printers (paper record of display information/graphics /graphics)
 - Flash Drives for memory storage
- WiFi 802.11

Integrated Desktop PC/Video Application



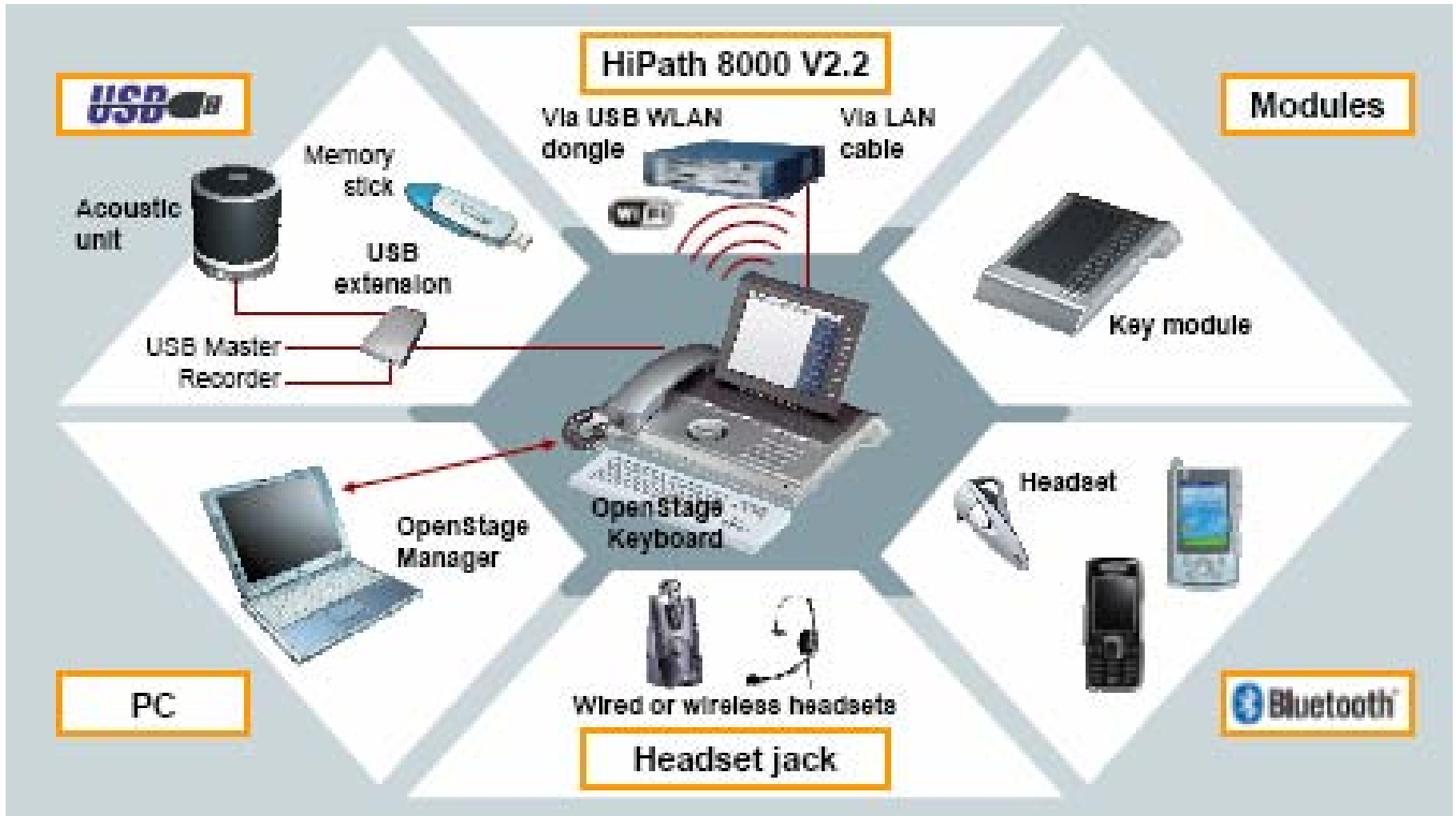
- Single number for voice and video
- Unified voice and video dial plans
 - CDR, QoS, CAC, AAR
- Video calls dialed like voice calls with same features, such as Mute, Hold, Park, Transfer, Conference, Forward)
- Single point of management and administration - Proven scalability enables affordable video at every desktop

Integrated IP VideoPhone



Source: Cisco Systems

Sample Peripheral Interfaces



Source: Siemens Enterprise Communications

Wireless LAN Stand Configuration

LAN



Source: Mitel Networks

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— Wired
..... Wireless

A Few Closing Statements

- Desktop IP phone instruments can account for 20% to 50% of the total IPT system price
- It is important to select an IP telephone model that best satisfies the needs of the individual user while taking into account price regardless of their job title or salary
- It is highly recommended that the selected phone be SIP-capable when required (firmware download)
- Know what peripheral options can be added, and at what price, when needed
- Test drive IP phone models before buying, because the complexity of today's offerings may limit their effectiveness if the individual station user is overwhelmed by their design and interfaces