

The Converging Public Network and the Services it Will Reap



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Presentation handouts

- Electronic copies (and updates) at Webtorials.Com
 - www.webtorials.com/main/eduweb/perspectives/
 - Background materials also at Webtorials.Com
 - Update notification for registered users

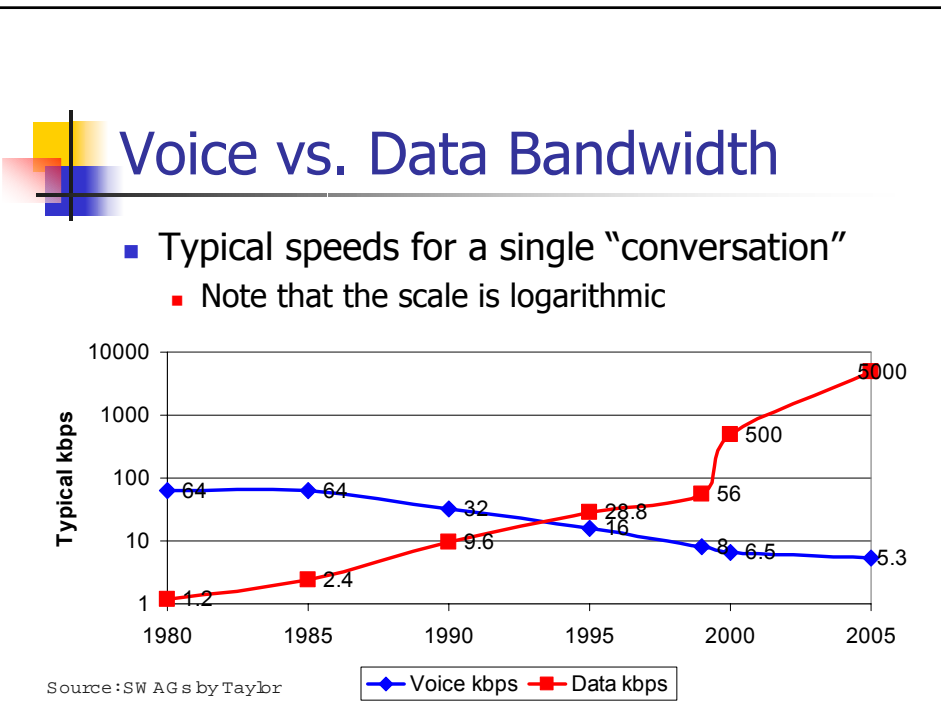


Agenda

- Defining Convergence
- Market Factors
- Making the Business Case
- Representative Current Services
- Representative New Services
- Conclusions

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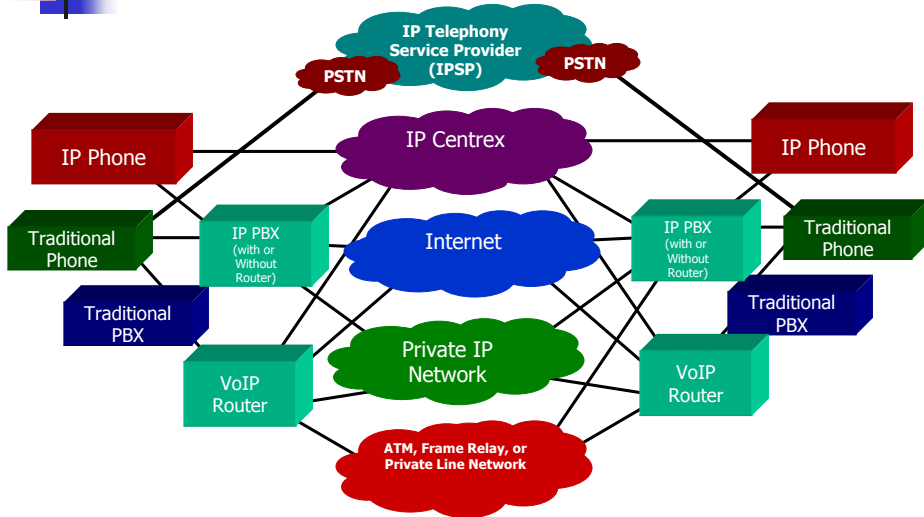


What is VoIP

- Voice that is transmitted over IP and some point in the network...
 - Very popular
 - Very broad
 - Very imprecise
- Digging deeper...



VoIP Network Architecture





VoIP Domains

- The Four Faces of VoIP
 - Network Transport
 - Internet, Private IP, IP over FR/ATM/MPLS
 - IP Telephony Service Providers (ITSP)
 - Network Edge
 - Routers/Frads with Voice, Gateways
 - CPE or managed service
 - Premises Infrastructure
 - IP PBX, IP Phones
 - Services and Applications
 - Distributed Call Center, Custom Calling Services / AIN
- An exhaustive treatment of VoIP requires that these areas be treated separately and as a whole

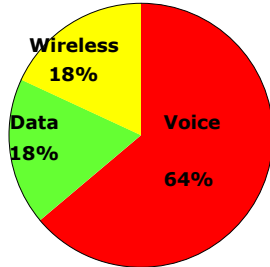


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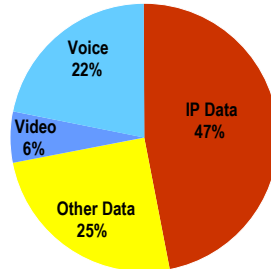
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Communications Services Spending vs. Traffic



Source:
JP Morgan & CSI 2001

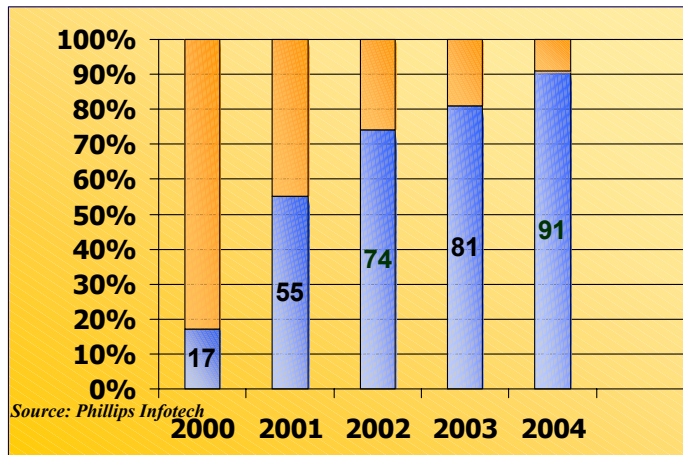


Source:
Vertical Systems & Webtorials, 2001



Enterprise IP Voice Adoption

% of Large Enterprises (500-100,000 Employees)

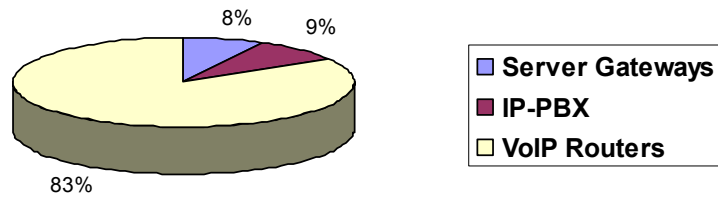


Source: Phillips Infotech



Enterprise IP Voice Adoption

Worldwide Enterprise VoIP Equipment Spending by Equipment Type



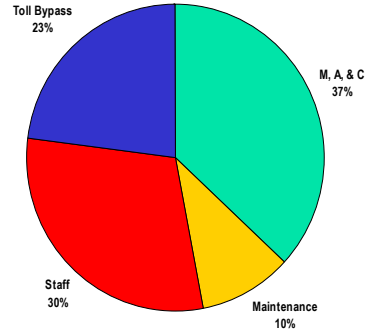
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VoIP Cost Savings

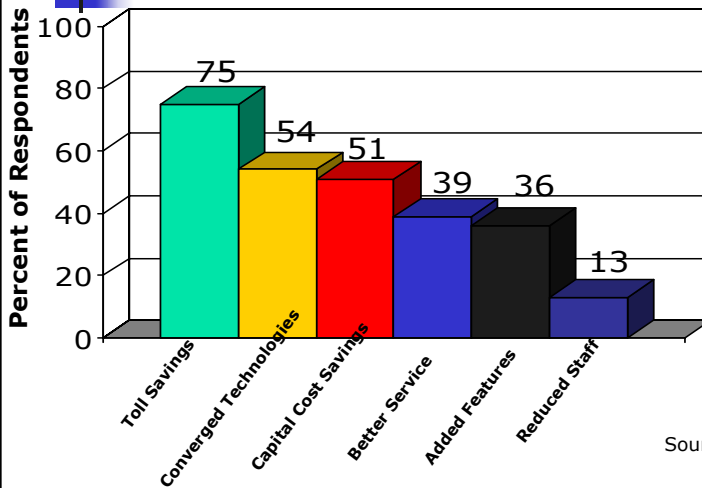
- Infrastructure (Toll Bypass) is a relatively small part of the impact
 - But 23% isn't bad...
- Other impact centers around the premises equipment
- The two areas above may or may not be linked
- Difficult to demonstrate hard saving on IP PBX and phone equipment alone
 - Individual results vary...



Source: Cisco Systems: For more information see http://www.cisco.com/warp/public/cc/so/neso/vvda/jptl/msipt_bc.pdf



Enterprise IP Telephony Benefits Expected (2000)



Source: Sage Research



The Big Four Cost Savers ?

- Toll Bypass
 - 2.2 cents for Net2Phone / 3.4 cents for Sam's Club
- PBX Installation and Maintenance Costs
 - very dependent on your network and contracts
- IP Network Management
 - the theory of managing one network
- Business Process Improvements
 - squishy numbers



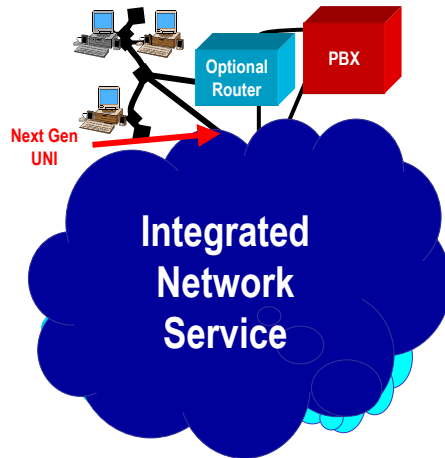
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ATM-based Converged Access

- Integrated access for all services
- Generic interface for:
 - Voice: T1/E1 for PBX
 - Data: Integral router (Ethernet interface) or frame relay
- Access method is transparent to customer

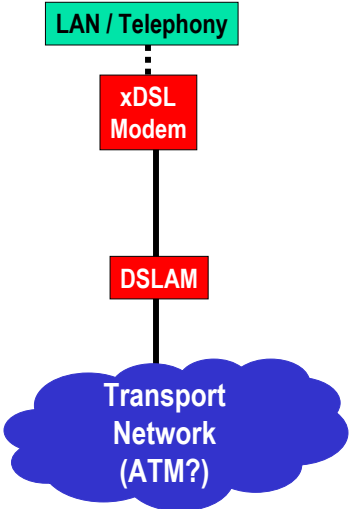


Integrated vs Separate Access Business Benefits

- Single source for
 - Ordering
 - Maintenance
 - Reliability
- Realistic SLAs
 - End-to-end Performance that is predictable and verifiable (measurable)
- Cost Savings
 - Reduced Time to Upgrade Access Services
 - Access to incrementally free bandwidth

Enhanced Access Options

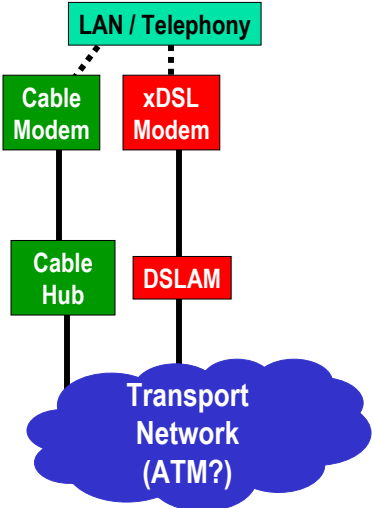
- xDSL
 - Data interfaces
 - Ethernet
 - Serial (Frame Relay)
 - Voice
 - "Baseband"
 - VoDSL
 - VoIP/VoFR
 - Video
 - Primarily conferencing



The diagram illustrates the xDSL access architecture. At the top, a green box labeled "LAN / Telephony" is connected via a dashed line to a red box labeled "xDSL Modem". A solid line connects the "xDSL Modem" to another red box labeled "DSLAM". Finally, a solid line connects the "DSLAM" to a blue cloud labeled "Transport Network (ATM?)".

Enhanced Access Options

- xDSL
- Cable Modem
 - Integrated with broadcast video
 - Voice options vary
 - Primarily VoInternet today
 - Data Options vary
 - Primarily Internet access today



The diagram illustrates the Cable Modem access architecture. At the top, a green box labeled "LAN / Telephony" is connected via a dashed line to two boxes: a green "Cable Modem" and a red "xDSL Modem". A solid line connects the "Cable Modem" to a green "Cable Hub". Another solid line connects the "xDSL Modem" to a red "DSLAM". Both the "Cable Hub" and the "DSLAM" are connected via solid lines to a blue cloud labeled "Transport Network (ATM?)".

Enhanced Access Options

- Cable Modem
- xDSL
- Wireless
 - Same fundamental options as Cable and xDSL

```

    graph TD
      LAN[LAN / Telephony] -.-> CM[Cable Modem]
      LAN -.-> xDSL[xDSL Modem]
      LAN -.-> WM[Wireless Modem]
      CM --- CH[Cable Hub]
      xDSL --- DSLAM[DSLAM]
      WM --- WH[Wireless Hub]
      CH --- TN((Transport Network ATM?))
      DSLAM --- TN
      WH --- TN
      WH -.-> lightning[⚡]
  
```

Enhanced Access Options

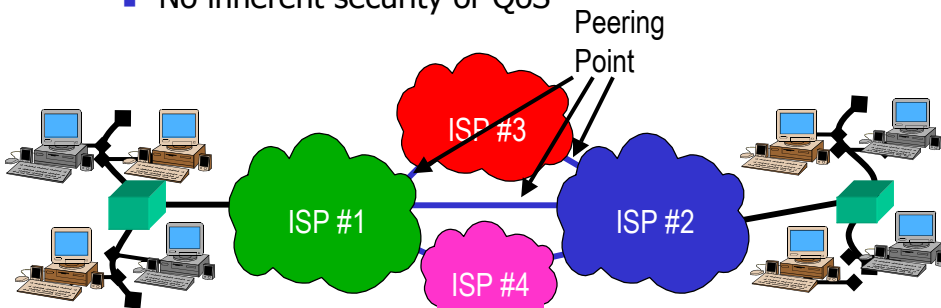
- Common Elements
 - Moving from residential to business service
 - "Business DSL" and "Business Cable" services for SOHO/ROBO
 - Typically deployed for Internet access
- Business Implications
 - Low Price
 - Pushes nets toward Internet-based VPNs

```

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Internet Backbone (IPsec) VPNs

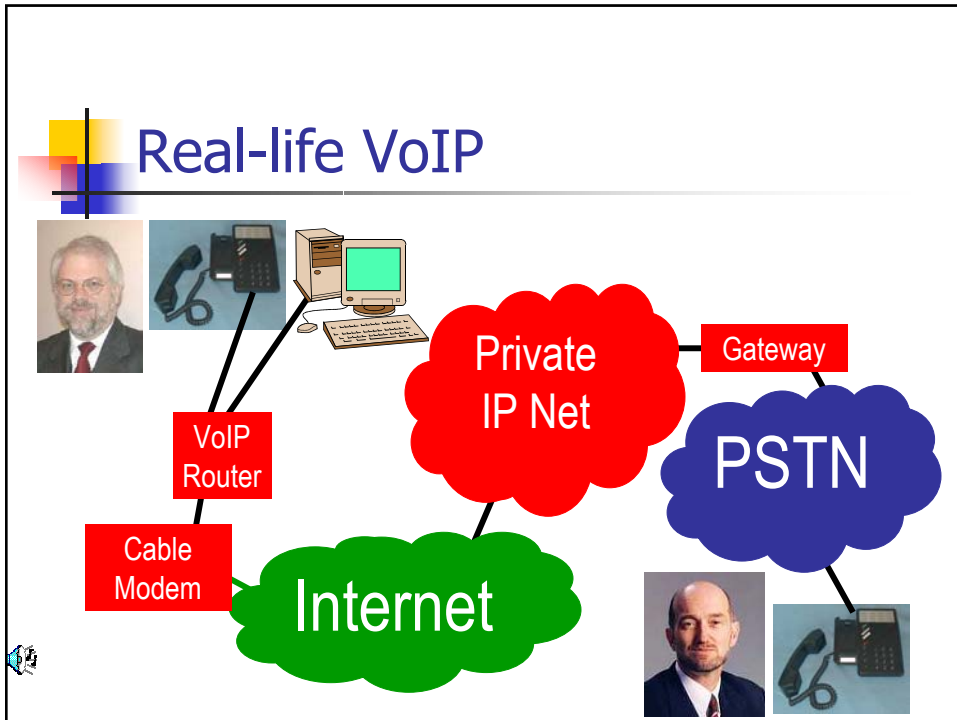
- Still has IP as the "UNI" to the network
- Multiple ISPs connected at "Peering Points"
- Any-to-Any connectivity
- No inherent security or QoS



Internet Backbone (IPsec) VPNs

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- ## VoInternet
- Technically works better than often advertised....
 - Usually....
 - Most economical for international calls
 - Works best as an alternative path
 - Pricing in flux
 - Price per minute?
 - Avoid/repurpose second line?



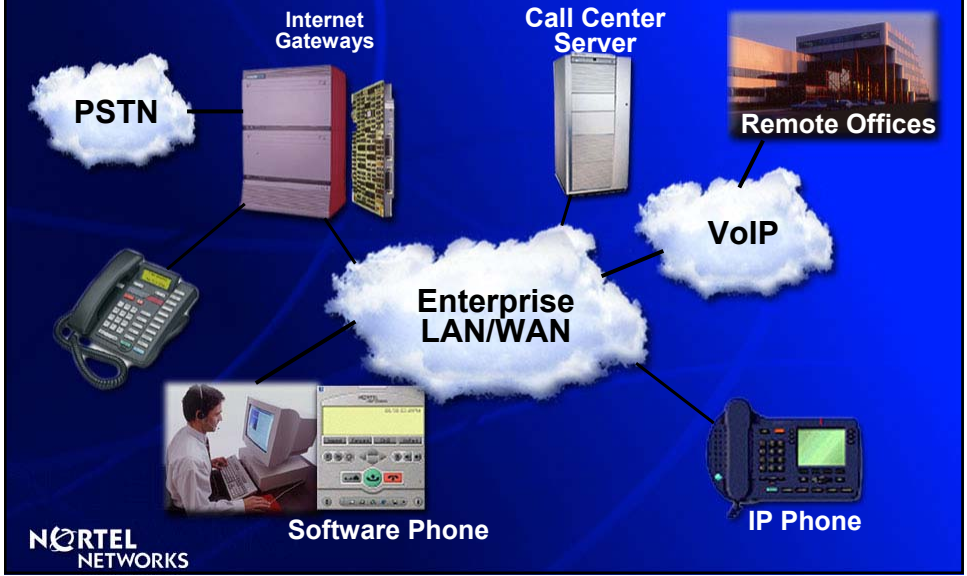
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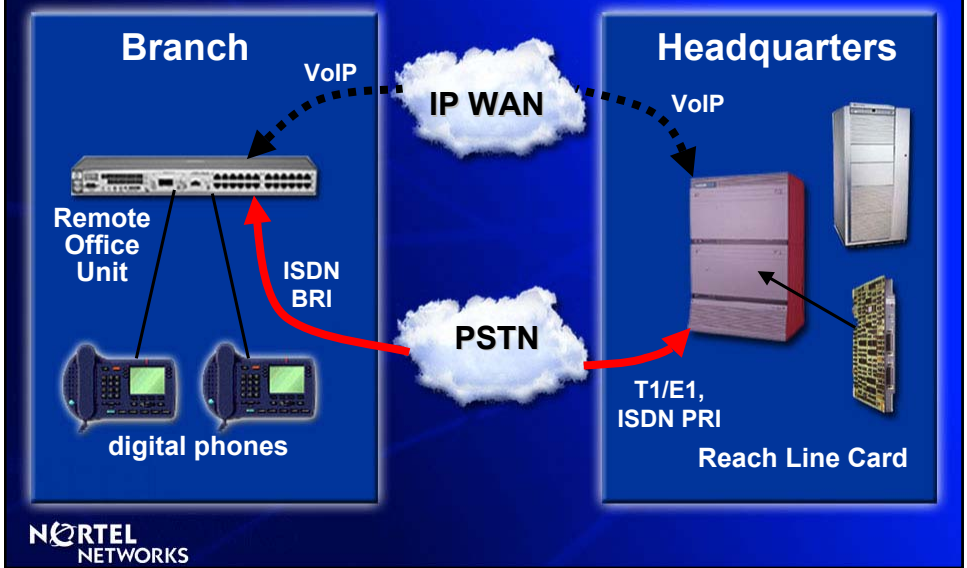


Distributed Call Center

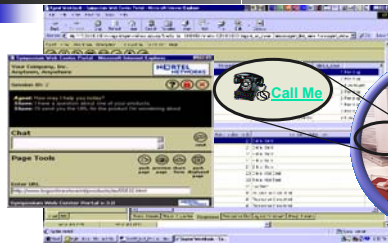
IP Contact Center Architecture



Contact Center to Branches



Advanced Call Center Applications

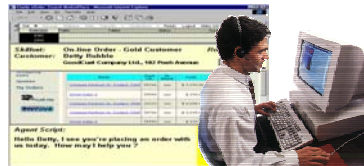


**Web push, Web chat,
Web to dial, Web
Collaboration, Click-
to-Call**



**Agent Desktop and
CTI Applications**

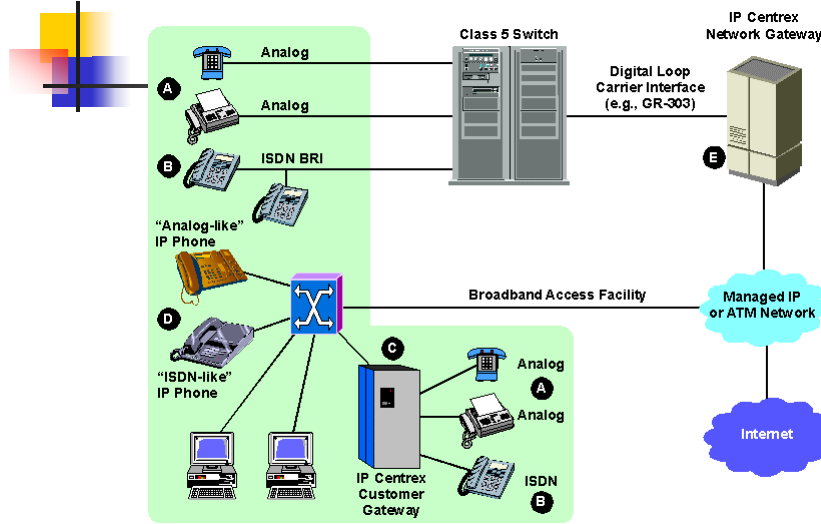
**CRM, Advanced
Speech and IVR**



**NORTEL
NETWORKS**

Service Provider Examples

IP Centrex



Source: Telcordia Technologies / www.ip-centrex.org 2001

GoBeam Features

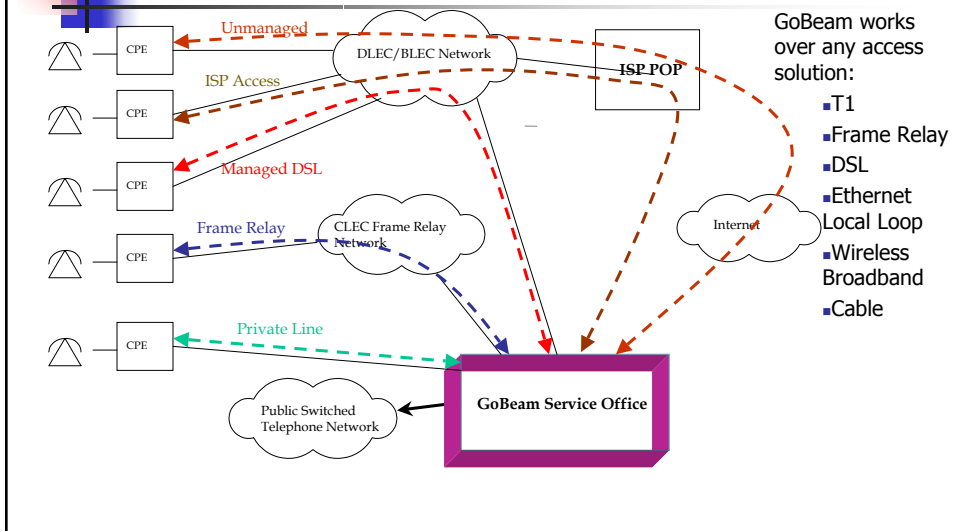
The screenshot shows the GoBeam web interface with several callout boxes highlighting key features:

- Category contacts by group to prioritize and control calls.** (Callout pointing to the 'Contacts' list)
- Instantly join your all decision makers in a demand Conference call using any phone.** (Callout pointing to the 'Join All' button in the Conferencing section)
- Only one number on your business card to receive calls and faxes anywhere.** (Callout pointing to the 'My Calls' section)
- Click to call or return a call from any telephone.** (Callout pointing to the 'Call' button in the Contacts list)
- Schedule recurring weekly meeting or one-time multi-person conference call. Easy to change times or add attendees.** (Callout pointing to the 'New' button in the Conferencing section)
- Chat with anyone in your company group, instantly.** (Callout pointing to the 'Instant Messenger' section)

Productivity Benefits

- Call Set-Up:
 - Eliminate Directory or PDA Transcription of called numbers
- Presence makes calls count
 - Reach the person you need, realtime
- Eliminate voicemail transcription:
 - Click on Calling Party Number to return call
 - Forward voicemail as an email attachment
 - Eliminate "memo-to-file" of important voicemail
- Get to important voicemail immediately
 - Do not serialize through unimportant voice messages
- Eliminate organizational latency with:
 - FindMe technology
 - Instant Messaging

Access Architecture Independence





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Conclusions: Business Benefits

- Save money
 - For both the Enterprise and the Service Provider?
 - Simpler support
 - Single service infrastructure
- Enables new voice functionality
- Enables new integrated voice/data converged applications



Final Conclusions

- Convergence is all about migration
 - You can leverage the best of the existing voice and data networks while deploying a convergence solution
 - No one knows what convergence will bring in the next few years, so a flexible solution is a must
- Converged Solutions, Not Technology are the Big Winners!



For more information...

- [Www.Webtorials.Com](http://www.webtorials.com)
- Network World Fusion "Convergence" Newsletter
 - Free
 - Twice weekly
 - Speakers are the authors
 - Archives at www.nwfusion.com/newsletters/converg

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