Voice (and more) over IP

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Outline

• VoIP basics
• Standards
• Network implications
• Computer implications
• (and more)
• Demonstrations
• More?
VoIP Basics

• Voice encoded in IP packets
• Used today
  – By carriers as a more efficient way to transport voice
  – By service providers to provide alternatives to POTS
• Protocols
  – RTP - Real-time Transport Protocol
    • for carrying voice or video
  – H.323 - Packet-Based Multimedia Communications Systems
    • actually a group of protocols
    • has been used widely for video conferencing
  – SIP – Session Initiation Protocol
    • more widely used for voice
    • supports any media
• CODECs
  – Voice: G.711, G.729, GSM, iLBC, etc.
  – Video: H.263, H.264, etc.
Protocol Layers

Application
- RTSP
- SIP
- RTP
- DNS(SRV)

Transport
- TCP
- UDP

Network
- IP

Physical/Data Link
- Ethernet
Network Implications

• Bandwidth
  – About 100kbps for G.711
  – Lower bandwidth CODECs are available
  – And higher bandwidth CODECs for better quality voice

• Packet loss

• Delay

• Jitter

• Network Address Translation (NAT)
  – Use STUN (Simple Traversal of UDP over NATs)
Computer Implications

- Processor speed

- Audio input/output
  - Analog
  - USB
  - Echo cancellation

- Video input
  - USB
(and more)

- Video (well, I let that one slip out already)
- Presence
- Rich-presence
Demonstrations

Now let’s have some fun!

• An IP phone
  – Pingtel xpressa

• A computer pretending to be a phone
  – Pingtel instant xpressa

• A computer not pretending to be a phone
  – Windows Messenger

• A communications appliance
  – Xten eyeBeam
  – pulver.Communicator
More?

• A peak under the covers

• Sign up for a free SIP account
  – Free World Dial-up (FWD)
    http://www.fwd.pulver.com/
  – iptel.org
    http://www.iptel.org/
  – SIPphone.com
    http://www.sipphone.com/

• Download a SIP client (Windows & Mac)
  – Xten X-Lite
    http://www.xten.com/

• Free POTS gateway services
Questions?