Voice Over IP
Protocols

ITS 220
VoIP - What do we need?

- Soft-Switch
  - All the functions of the PBX
  - No physical interfaces (other than the LAN)
- Telephones
  - Small computers
  - Can theoretically initiate direct calls (phone to phone)
    - But the usually do not
- Gateways to the circuit-switched networks
- Rules (protocols) on how these things communicate with each other.
Soft-Switches

• Based on a traditional PBX (Nortel, Avaya, etc)
  • Combines soft-switch and gateway
  • Uses VoIP protocols to communicate to phones and other devices

• Newly developed (Cisco and others)
  • Soft-Switch as a server
  • Expand routers to act as gateways
Protocols

- ISO standard: H.323
  - Developed for video conferencing
  - Very complex, very complete
- IETF: SIP
  - Relatively simple protocol for signaling
- Proprietary (Cisco, 3COM, ...)
- Everyone use RTP, RTCP
  - IETF standards for media flow and control
H.323
H.323 Specifications

Voice over IP Fundamentals
by Jonathan Davidson, James Peters, Brian Grace
The H.323 Protocol “Stack”

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SIP - simple example

SIP Call Flow - Redirect

1 INVITESalmon@cs.edcs.edu
   From: jz@cs.jamaica.ba
   To: salmon@cs.edcs.edu
   Call-ID: 19970627@parrot.cs

4 302 Moved Temporarily
   Location: jed@out.cs.edcs.edu
   From: jz@cs.jamaica.ba
   To: salmon@cs.edcs.edu
   Call-ID: 970627@parrot.cs

5 INVITEjed@out
   From: jz@cs.jamaica.ba
   To: salmon@cs.edcs.edu
   Call-ID: 980627@parrot.cs

7 200 OK
   From: jz@cs.jamaica.ba
   To: salmon@cs.edcs.edu
   Call-ID: 19970627@parrot.cs

8 CONNECTEded@out.cs.edcs.edu
   Call-ID: 970627@parrot.cs

200 OK

Source: Henning Schulzrinne, Columbia University

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