SIP
Session Initiation Protocol

HTTP
- Hypertext Transfer Protocol
  - For transfer of web pages encoded in html: Hypertext Markup Language
- Our interest: primarily as model for SIP
- HTTP is message-oriented.
  - Messages are ASCII text.

http: Hyper Text Transport Protocol
- Statelessness
  - The original intent, inherited from hypertext implementations, was that the server would serve up pages without knowing or caring who is viewing them or what pages a user had already visited.
  - At first, a TCP connection was established every time a link was clicked and torn down when the page was delivered.

http Requests
- Client sends an http message to server.
- Content of message:
  1. Method line
     - Method
     - Requested URL
     - HTTP version
  2. Blank Line
  3. Message body
     - Content varies, depending on method
  4. Blank Lines
Specific Methods

• GET
  - Requests a representation of the specified resource.

• HEAD
  - Like GET request, but requesting only header in response.

• POST
  - Submits user data (e.g., from a HTML form). The data is included in the body of the request.

• PUT
  - Uploads a representation of the specified resource.

• OPTIONS
  - Asks what HTTP methods the server supports.
    “What do you support?”
 & More

http Responses

• Server sends back to client.
• Content of message:
  1. Status line
     - HTTP version
     - Status code
     - Status explanation
  2. Headers
  3. Blank Line
  4. Message body
     - Content varies, depending on method
  5. Blank Line

Then...

• In the early days, TCP connection was then severed.
• In later versions of HTTP, the TCP connect is kept open.

Similarities between SIP & HTTP

• SIP addresses look like email addresses:
  - sip:john_doe@acme.com

• DNS is available to resolve domain names:
  - sip:john_doe@123.123.123.123

• SIP uses text messages.
User Agents

• Clients
  – Make requests
• Servers
  – Send responses

Let's Set Up a Call

sip Requests

• Client sends a sip message to server.
• Content of message:
  1. Method line
     – Method
     – Requested URI
     – SIP version
  2. Message Header
     – Content varies, depending on method
  3. Blank Line
  4. Message body
     – Content varies, depending on method
     – Important: Session Description Protocol, SDP (RFC2327 and RFC1890)

Specific sip Methods

• INVITE
  – Establishes a session
• ACK
  – Confirms an INVITE request
• BYE
  – Ends a session
• CANCEL
  – Cancels establishing of a session
• REGISTER
  – Communicates user location (host name, IP)
• OPTIONS
  – Communicates information about the capabilities of the calling and receiving SIP phones
  & More
**sip Responses**

- Server sends back to client.
- Content of message:
  1. Status line
     - sip version
     - Status code
     - Status explanation
  2. Headers
     - Content varies, depending on method
  3. Blank Line
  4. Message body
     - Content varies, depending on method

**Types of sip Status Codes**

- 1xx = informational responses
- 2xx = success responses
- 3xx = redirection responses
- 4xx = request failures
- 5xx = server errors
- 6xx = global failures

**A Few Status Codes**

- 100: Trying
- 180: Ringing
- 181: Call Is Being Forwarded
- 182: Queued
- 183: Session Progress
- 200: OK
- 202: Accepted
- 301: Moved Permanently
- 302: Moved Temporarily

**Great Site**

  - Search for "sip"
Don’t Know Address of Destination UA?

* In the SIP regime, what we generally call “Directory Servers” are Proxies or Redirectors.
Location Service

Call Proxy Scenario Revisited

Redirection Scenario

Gateway Scenario