Project 1
Web client and server

EECS 340
Jan 2015

Project Goals

- Implement a simple WWW client and server
  - Examples
- Use a restricted subset of HTTP
- Use socket programming
- To give you experience with HTTP and sockets programming
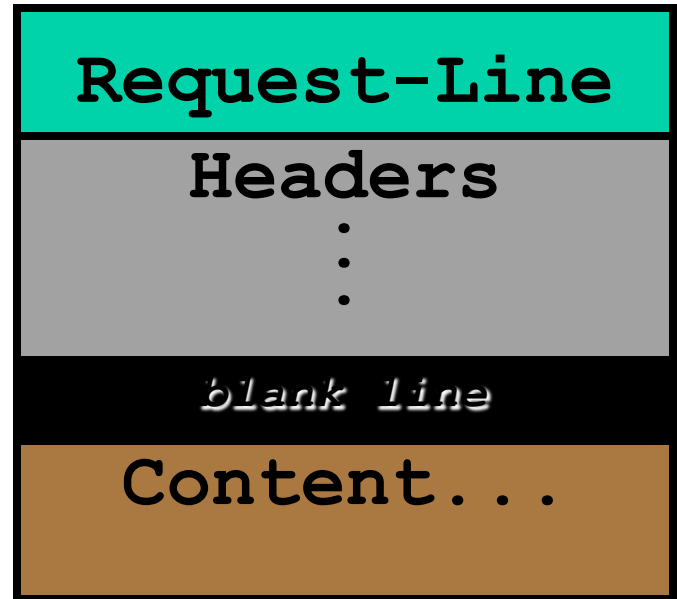
HTTP Protocol

Sockets

HTTP Usage

- HTTP is the protocol that supports communication between web browsers and web servers.

- A "Web Server" is a HTTP server

- Most clients/servers today speak version 1.1, but 1.0 is also in use.

Request - Response

- HTTP has a simple structure:
  - client sends a request
  - server returns a reply.

HTTP 1.0+ Request

Request-Line
Headers . . .
blank line
Content...

- Lines of text (ASCII).

- Lines end with CRLF **"\r\n"**

- First line is called "Request-Line"

Request Line

`Method URL HTTP-Version\r\n`

- The request line contains 3 *tokens* (words).

- space characters " " separate the tokens.

- Newline (\n) seems to work by itself (but the protocol requires CRLF)

The Header Lines

- After the *Request-Line* come a number (possibly zero) of HTTP *header lines*.

- Each header line contains an attribute name followed by a ":" followed by a space and the attribute value.

The Name and Value are just text.

Headers

- Request Headers provide information to the server about the client
  - what kind of client
  - what kind of content will be accepted
  - who is making the request

- There can be 0 headers (HTTP 1.0)
- HTTP 1.1 requires a `Host:` header

Example HTTP Headers

Accept: text/html

Host: www.northwestern.edu

From: neytmann@cybersurg.com

User-Agent: Mozilla/4.0

Example GET Request

```
GET /~akuzma/index.html HTTP/1.1
Accept: */*
Host: www.cs.northwestern.edu
User-Agent: Internet Explorer
From: cheater@cs.northwestern.edu
```

⟵ **There is a blank line here**

Well Known Address

- The "well known" TCP port for HTTP servers is port 80.

- Other ports can be used as well...

Four parts

- 0: Get build , configure and run the minet stack
- 1: HTTP Client
- 2: Connection-at-a-time HTTP Server
- 3: Simple select-based Multiple-connection-at-a-time server
- 4: Complex .... (Extra Credit)