

# Services 2

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## Standards (recap)

RFC Document

Interoperability + Replaceability

Results: synergies, vendor  
competition

## Email (recap)

Email writing style

Time and Location flexibility

Searchable, printable, indexable

"Transparent"

Inconvenience/Rarity Theory

Etiquette

Subject line

Action item?

To/CC

Relative nouns like "today"

Never delete

Say things you are willing to stand behind

## Client/Server (recap)

PC/Application model

Responsive but not shared

Client/Server model

Less responsive

Centralized

Shared

## Database: "Application" vs. "Client Server"

### Application

Code and data are right on my powerbook.  
Changes, searches .... happen in a fraction of a second

### Client Server (using CGI/HTTP)

I can be anywhere in the world. As long as there's a browser, I can connect to the database.

Search: hit button <DELAY> result comes back

Make edit: submit, <DELAY>, result comes back

Shared -- I'm hitting the database as the same time as others. We can see each other's changes.

## Demos

### 1. ping

ping elaine23.stanford.edu  
Tries to do one round-trip packet

### 2. traceroute

On the elaines, that's: /usr/pubsw/bin/traceroute  
Time-To-Live field

### 3. whois

Whois can be used for "finger" type lookups, but it also can do a sort of DNS query.

Give it a hostname or an IP addr

On the Mac, there's a free program called WhatRoute that does a nice job with DNS and traceroute queries.

### 4. finger

Old protocol to get info about user on host.

The client on the sockets handout was a simple little finger client

# HTTP

Tim Berners-Lee working at CERN -- a document distribution protocol.  
Hypertext Transfer Protocol.

From the original HTTP justification draft

(<http://www.w3.org/pub/WWW/Protocols/WhyHTTP.html>) ...

Why a new protocol?

Existing protocols cover a number of different tasks.

- \* Mail protocols allow the transfer of transient messages from a single author to a small number of recipients, at the request of the author.
- \* File transfer protocols allow the transfer of data at the request of either the sender or receiver, but allow little processing of the data at the responding side.
- \* News protocols allow the broadcast of transient data to a wide audience.
- \* Search and Retrieve protocols allow index searches to be made, and allow document access. Few exist: Z39.50 is one and could be extended for our needs.

The protocol we need for information access (HTTP) must provide

- \* A subset of the file transfer functionality
- \* The ability to request an index search
- \* Automatic format negotiation.
- \* The ability to refer the client to another server

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Tim Berners-Lee (1991)

**See...**

<http://www.w3.org/pub/WWW/Protocols/>

<http://www.w3.org/pub/WWW/Protocols/rfc2068/rfc2068>

## HTTP Overview...

### HTTP Server

Listens on Port 80

Gets HTTP requests, sends back responses

### Doc Tree on Server

Usually, the HTTP server is looking at tree of documents in the file system...

Suppose `/users/nick/WWW/` is the root of the document tree in the file system

There are subdirectories `"/users/nick/WWW/a/"`  
`"/users/nick/WWW/b/"` and `"/users/nick/WWW/c/"`, and each of  
 those contains an `"about.html"` file.  
 Incoming requests looking like `/a/about.html` and `/b/about.html` map to  
 the analogous file in the file system.

## URL

`http://www.stanford.edu/class/cs193i/index.html`

### Protocol

`http`

### Host

`www.stanford.edu`

### Path

`/class/cs193i/`

## Client

Has Url --> makes request

## Request

HTTP protocol

The client looks at the URL, contacts that host, and sends a short request  
 that includes the path

## Response

HTTP server, gets the request

Using doc root, maps the `/class/cs193i/index.html` path into the filesystem  
 as something more like `/usr/class/cs193i/WWW/index.html`

The server read that file and sends it back to the client as the HTTP response

## HTML on the Client

Most often the response is HTML

The HTML is designed to be **portable** -- it should be possible for many  
 different types of client to display it.. (Most web designers produce only  
 semi-portable HTML, but that's another lecture).

The browser displays the HTML as best it can. The HTML includes URL  
 links that, when clicked, lead to further HTTP transactions.