



UNIVERSITY OF SAN FRANCISCO
CHANGE THE WORLD FROM HERE

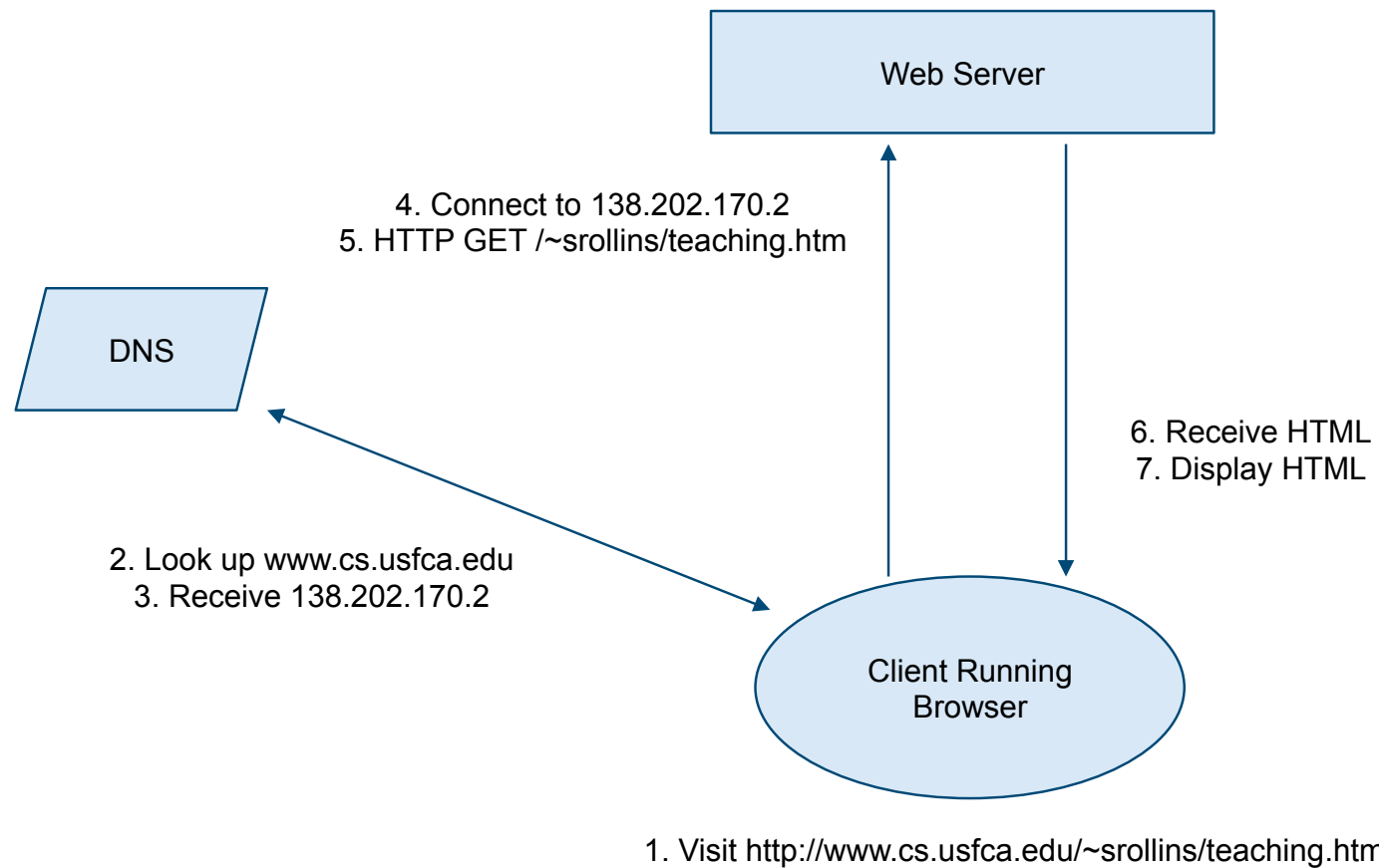
Web Services

Sami Rollins



...in the beginning

- **“Human web”**
 - HTTP + HTML
 - use a browser to access a web page



What is a web server?

- A web server is just a program
- It listens for incoming connections
- When a connection is made, it receives and processes requests made by a client
 - GET, POST, PUT, HEAD, DELETE

```
$ telnet www.cs.usfca.edu 80
Trying 138.202.170.2...
Connected to www.cs.usfca.edu.
Escape character is '^]'.
GET /~srollins/teaching.htm
```

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domain name
↙

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port number
↓
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IP address

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← HTTP method

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↑
path

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- **“Human web”**
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- **Writing a program to access data?**

...in the beginning

- **“Human web”**
 - HTTP + HTML
 - use a browser to access a web page
- **Writing a program to access data?**
 - Screen scraping
 - parse the HTML to extract relevant information
 - if the page changes your program breaks

Web services

- **Provide a programmatic interface to services accessible over the web**
- **Initially, the World Wide Web Consortium (W3C) tried to standardize**
 - Simple Object Access Protocol (SOAP)
 - Web Services Description Language (WSDL)
 - eXtensible Markup Language (XML)
 - HTTP

SOAP versus REST

- The RESTful approach has won
- **REST is a pattern for building web services**
 - Everything on the web is a resource
 - Web service allows you to put/get resource

Pure (original) REST

- **HTTP methods specify the remote methods you may invoke on the service**
 - GET/PUT/POST/HEAD/DELETE
- **Scoping information provided in the URI**
 - <http://www.flickr.com/photos/interesting/2008/01/05>
- **Query parameters used for algorithmic resources**
- **Request/response bodies specified in XML**
- **Flickr API**
 - <https://www.flickr.com/services/api/>

Modern examples

- <https://dev.twitter.com>
- **URI**
 - parameters required/optional
 - Example request
 - Example response
 - JSON

Using a web service

- **Sockets**
 - connect to port 80
 - construct the appropriate URL
 - authentication may be a pain
- **HTTP library**
 - OAuth libraries
- **Client libraries often available**
 - <https://dev.twitter.com/docs/twitter-libraries>