EECS 4413 BUILDING e-COMMERCE SYSTEMS

SERVER-SIDE WEB SERVICES

PROF H ROUMANI
Dept. of Electrical Engineering & Computer Science

1

HTTP SERVICES

2

HTTP CLIENT

Three Options: a TCP client, the URL class (below), or use/extend any web browser. Web browser = TCP client + HTTP + HTML/CSS/JS + DOM

- Find the server's URL
  `URL url = new URL(URL + "?" + QS);`
- Open an input stream to the server
  `inputStream = URL.openStream()`
- Read the server's response from that stream
  `new Scanner(inputStream).nextLine();`

3

3

HTTP SERVER

Two Options: a TCP server or use/extend any web server. Web server = TCP Server + Port 80 + HTTP. A web server such as Apache has:

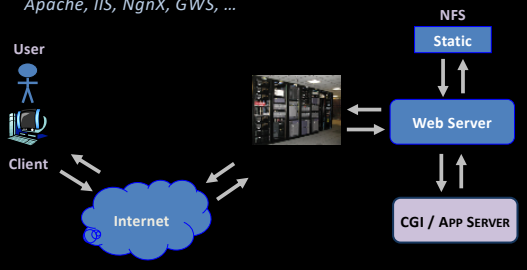
- Built-in static file serving
- Built-in scalability
- Built-in security (https + auth) via .htaccess
- Built-in telemetry (logs and error logs)
- Extensibility: PHP (violates view migration); CGI (good & language agnostic); App Servers (best): Tomcat JSP, WebSphere, WebLogic, NodeJS, ASP.NET, ...)

4

4

WEB SERVER

Apache, IIS, NgnX, GWS, …



5

CGI

See course repo

- Common Gateway Interchange
- Runs in a separate process per request*
- Any language with Standard Input / Output
- Access QS (for GET) via the environment
- Access payload (for POST) via standard input
- Serve via standard output

6

6

SESSION MANAGEMENT

HTTP cannot maintain state (restful) but we can:

- Client-Side
  State maintained by client and sent as needed to server
- Network Side
  State shuffled back and forth with every request/response
  Typically through hidden fields, URL Rewriting, or Cookies
- Server Side
  Server keeps it in memory or a database with a key derived from the client's credentials (known thru auth or assigned). The key (cookie) is stored in an http header (network side).

7

7

AUTHENTICATION

PROTOCOLS

8

REDIRECTION

```
GET /index.html HTTP/1.1
Host: www.example.com
```

```
HTTP/1.1 302 Found
Location: http://www.eecs.yorku.ca/index.cgi
```

```
GET /index.cgi HTTP/1.1
Host: www.eecs.yorku.ca
```

9

9

H-AUTH

```
GET /index.html HTTP/1.1
Host: www.example.com
```

```
HTTP 401 Not Authorized
WWW-Authenticate: Basic realm="some realm name"
```

```
GET /index.html HTTP/1.1
Host: www.example.com
Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==
```

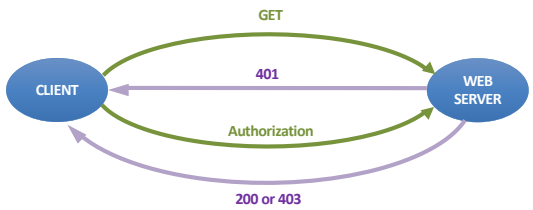
HTTP 200 OK OR HTTP 403 Forbidden

To explore, use .htaccess under www in your home directory.

10

10

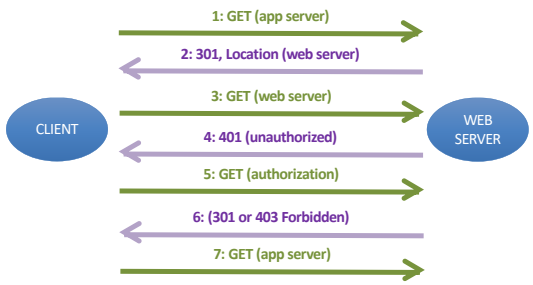
H-AUTH



11

11

O-AUTH (Single-Sign-on)



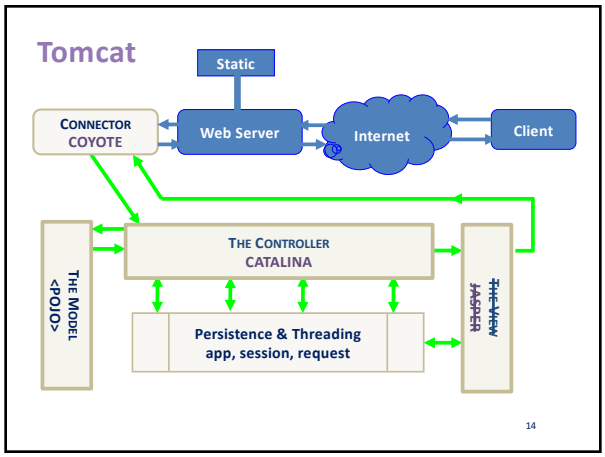
12

12

APP SERVER

TOMCAT

13



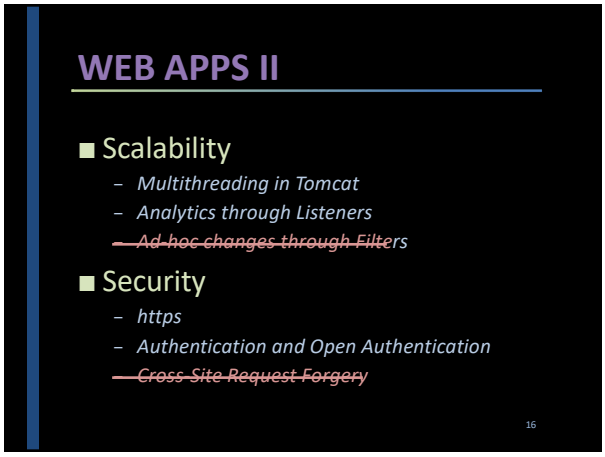
14

WEB APPS I

- Context, ~~WebContent, and WEB-INF~~
- The request, response, and context objects
- MVC and the normal operating cycle
- Migrating the V to the client (no JSP)
- ~~Request Forwarding~~ vs Redirecting
- The ~~three~~ persistence scopes

15

15


WEB APPS II
Scalability
Multithreading in Tomcat
Analytics through Listeners
Ad-hoc changes through Filters
Security
https
Authentication and Open Authentication
Cross-Site Request Forgery
16

16