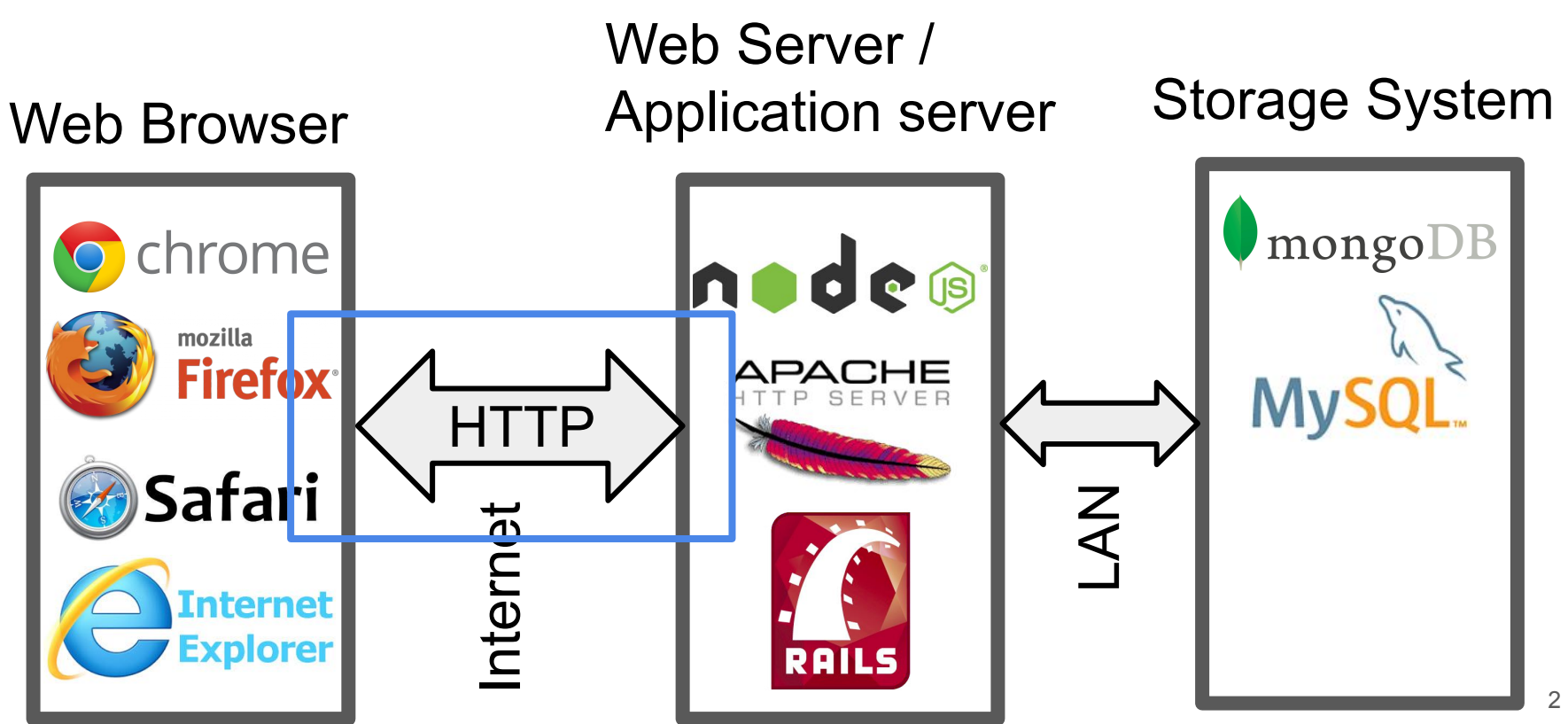


# Hypertext Transport Protocol (HTTP)

Mendel Rosenblum

# Web Application Architecture



# http://www.example.com:80/index.html

- To display page browser fetches the file `index.html` from a web server  
Same as `www.example.com` (Defaults: port 80, file `index.html`, http protocol)
- HTTP (**H**yper**T**ext **T**ransport **P**rotocol)
- HTTP - Simple request-response **protocol** layered on TCP/IP
  1. Establish a **TCP/IP connection** to `www.example.com:80`
  2. Send a http GET **request** along connection
  3. Read from the connection the **response** from the web server

# Send HTTP Request - Write lines to socket

Method      URL      Protocol Version

↓            ↓            ↓

Header { GET /index.html HTTP/1.1  
Host: www.example.com  
User-Agent: Mozilla/5.0  
Accept: text/html, \*/\*  
Accept-Language: en-us  
Accept-Charset: ISO-8859-1,utf-8  
Connection: keep-alive

*blank line*

Body (optional) {

# HTTP Methods (Verbs)

- GET - Fetch a URL
- HEAD - Fetch information about a URL
- PUT - Store to an URL
- POST - Send form data to a URL and get a response back
- DELETE - Delete a URL

GET and POST (forms) are commonly used.

REST APIs used GET, PUT, POST, and DELETE

# HTTP Response - Read lines from socket

**Version**      **Status**      **Status Message**

**Header** {  
HTTP/1.1 200 OK  
Date: Thu, 24 Jul 2008 17:36:27 GMT  
Server: Apache-Coyote/1.1  
Content-Type: text/html;charset=UTF-8  
Content-Length: 1846  
*blank line*  
**Body** {  
<?xml ... >  
<!DOCTYPE html ... >  
<html ... >  
...  
</html>

# Common HTTP Response Status Codes

|                           |   |
|---------------------------|---|
| 200 OK                    | Success   |
| 307 Temporary Redirect    | Redirection - Browser retries using Location header |
| 404 Not Found             | Famous one  |
| 503 Service Unavailable   | Something crashed on the server                     |
| 500 Internal Server Error | Something is messed up on the server                |
| 501 Not Implemented       | Coming  |
| 400 Bad Request           | Use if web app sends bogus request                  |
| 401 Unauthorized          | Use if user isn't logged in                         |
| 403 Forbidden             | Use if even logging in wouldn't help                |
| 550 Permission denied     | Not allow to perform request                        |

# Error 404

Whoops. Looks like this page doesn't exist.

# 404 NOT FOUND

Sorry, this page isn't available  
The link you followed may be broken, or the page may have been removed.



# 404

Not Found



404. That's an error.  
The requested URL /index.html was not found on this server. That's all we know.



# Not Found

The requested URL /somefolder was not found on this server.  
Additionally, a 404 Not Found error was encountered while trying to use an ErrorDocument to handle the request.

# 404 error

Page not found  
We are sorry but the page you are looking for does not exist. You could return to the homepage or search using the search box below.



# 404 - Not found

# Not Found

The requested URL /index.html was not found on this server.

Apache/1.3.37 Server at www.this-is-a-test.net Port 80

# 404

Page not found

# 404

Page not found



Ohh... You have requested the page that is no longer there.

# IT'S A 404

SOORY BUDDY, YOU ARE FUCKIN' LOST



# 404

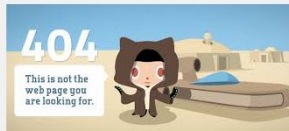
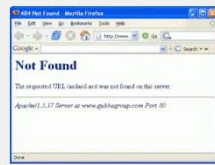
# NOT FOUND



# ERROR #404



FIND YOUR LACK OF NAVIGATION TEST BROWSER



# 404 NOT FOUND



# HTTP Error 404

404 Not Found  
The Web server cannot find the file or script you asked for. Please check the URL to ensure that the path is correct.  
Please contact the server's administrator if this problem persists.



# 404

OMG, page was not found





# Browser caching control

HTTP Response Header: Cache-Control: max-age=<Seconds>

Browser can reuse reply younger than the max-age

Cache-Control: max-age=120 - Age out in two minutes.

Frequently used on fetches of static content like images, templates, CSS, JavaScript.

Good: Reduce app startup latency and server load

Bad: Changes might not be picked up right away

Consider Web App changes?

# Browser spends its life fetching things using HTTP

- Some fetched immediately (processing paused while waiting for HTTP reply)

```
<link href="angular-material.css" rel="stylesheet" />  
<script src="compiled/p2.bundle.js" type="text/javascript" />  
window.location = "http://www.example.com";
```

- Some asynchronous and in parallel

```
  
  

```

- Some can be in background

```
<a href="http://www.example.com"></a>
```

```
GET http://localhost:3000/favicon.ico 404 (Not Found)
```

# What would this JavaScript do?

```
elm.innerHTML =  
    "<script src='http://www.example.com/myJS.js'  
        type='text/javascript' ></script>"
```

Uses HTTP to fetch `myJS.js` and runs it! Scary but useful.