

# Mobile Application Development

Higher Diploma in Science in Computer Science

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Produced  
by

Eamonn de Leastar (edeleastar@wit.ie)

Department of Computing, Maths & Physics  
Waterford Institute of Technology

<http://www.wit.ie>

<http://elearning.wit.ie>



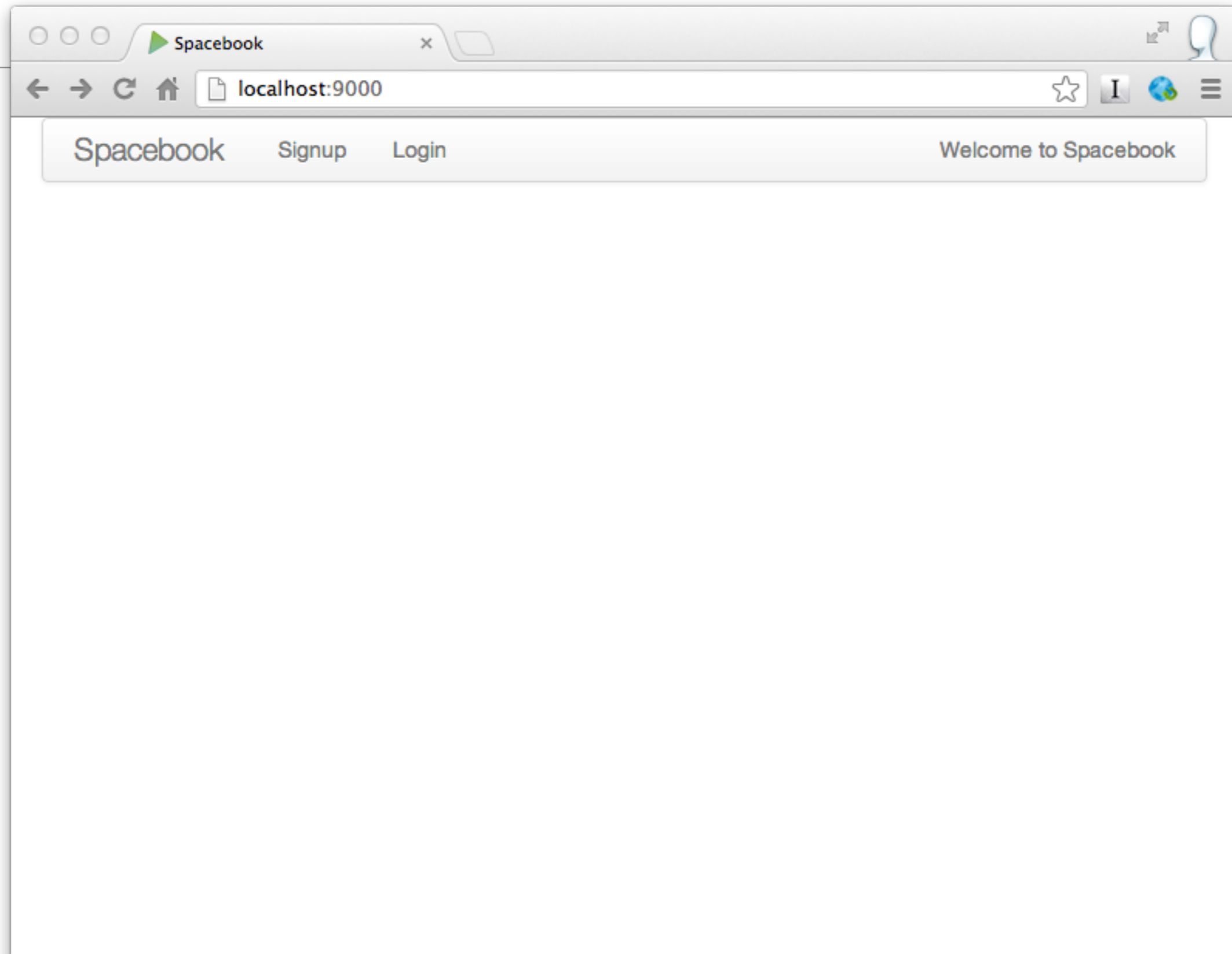
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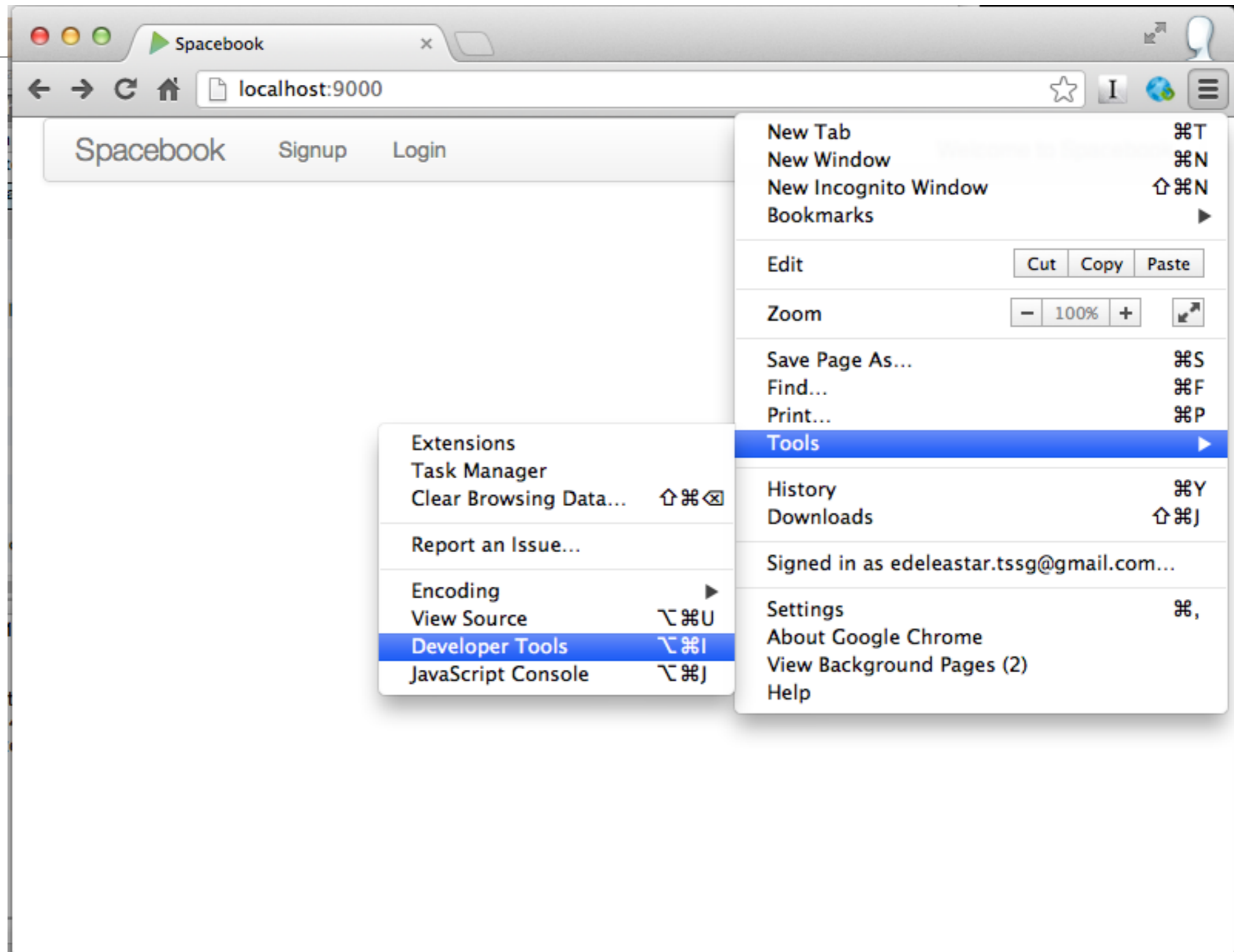
# Tracing the HTTP messages in a Web App

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# Spacebook-3 - Standard Chrome Browser



# Tools-Developer tools menu option...



Spacebook

localhost:9000

Spacebook Signup Login Welcome to Spacebook

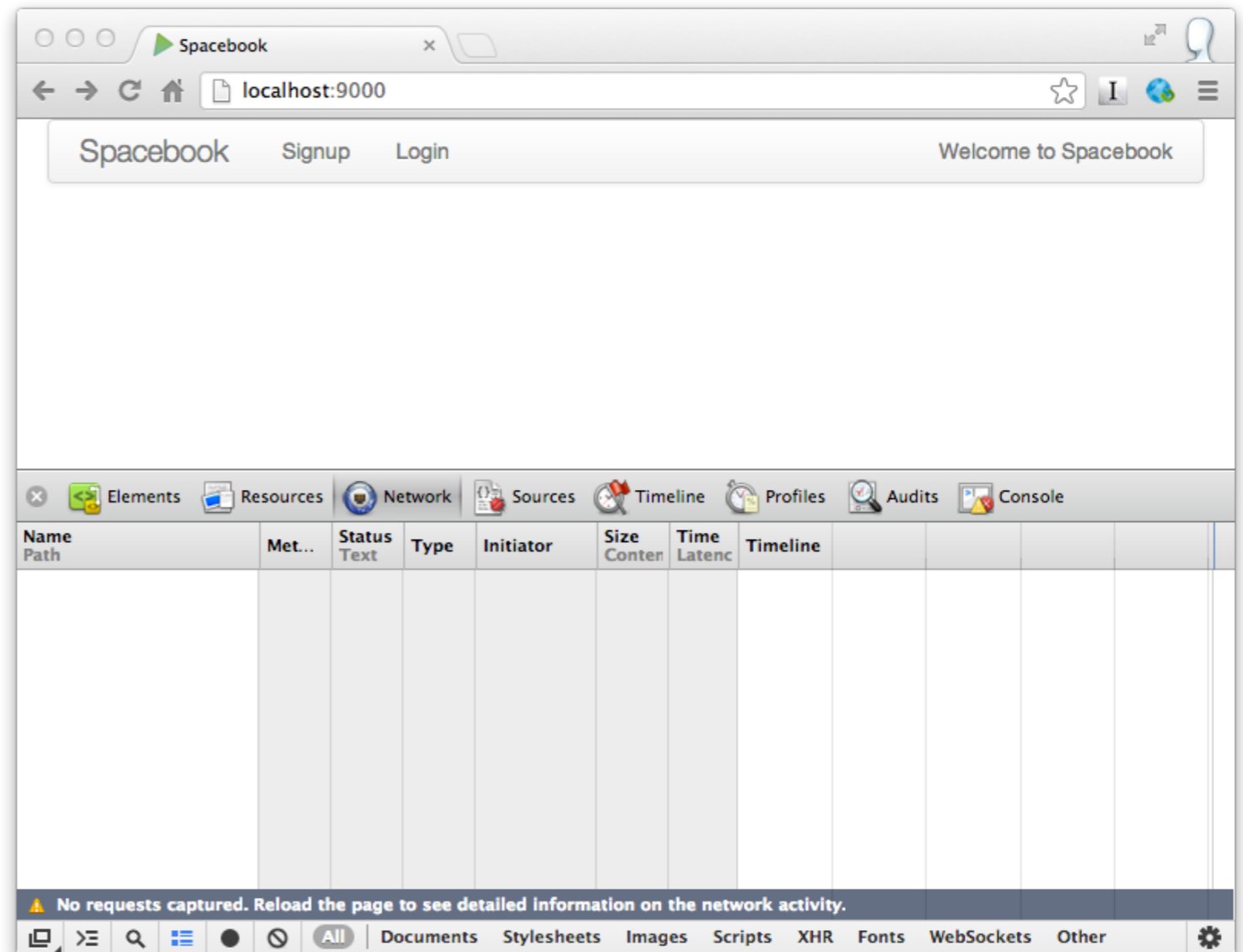
Elements Resources Network Sources Timeline Profiles Audits Console

Name Path	Met...	Status Text	Type	Initiator	Size Conter	Time Latenc	Timeline						
No requests captured. Reload the page to see detailed information on the network activity.													

Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

# Tracing HTTP Request/Response

- Operate Browser as normal
- Control panel shows considerable range of diagnostic information, including:
  - Html
  - CSS
  - Javascript
  - Network traces
  - + much more....



# Simple Trace Example

- Run spacebook from localhost:9000 as usual.

- “Network” activity shows requests/responses....

The screenshot shows a web browser window with the URL `localhost:9000`. The page content includes a navigation bar with links for "Spacebook", "Signup", and "Login", and a "Welcome to Spacebook" message. Below the browser window, the Chrome DevTools Network tab is open, displaying a list of network requests. The first request is to `localhost` (GET, 200 OK, text/html, 902B content, 555B total, 22ms latency). The second request is for `bootstrap.min.css` (GET, 304 Not Modified, text/css, 124B content, 98.89K total, 2ms latency). The timeline shows a blue bar for the first request and a green bar for the second. The status bar at the bottom indicates "2 requests | 1.00KB transferred | 63ms (onload: 65ms, DOMContentLoaded: 61ms)".

Name Path	Met...	Status Text	Type	Initiator	Size Content	Time Latenc	Timeline	26ms	39ms	52ms	65ms
localhost	GET	200 OK	text/...	Other	902B 555B	22ms 22ms					
bootstrap.min.css /public/bootstrap/cs:	GET	304 Not Mo	text/...	localhost:5 Parser	124B 98.89K	2ms 2ms					

# http://localhost:9000 - Request

---

- This is the actual text sent across the wire:

```
GET /login HTTP/1.1
Host: localhost:9000
Connection: keep-alive
Cache-Control: max-age=0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17
(KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
```



# http://localhost:9000 - Response

- This is the actual text sent back from the server....
- Response is '200 ok' + the html for the page

```
HTTP/1.1 200 OK
Server: Play! Framework;1.2.4;dev
Content-Type: text/html; charset=utf-8
Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Set-Cookie: PLAY_SESSION=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Cache-Control: no-cache
Content-Length: 876

!DOCTYPE html>
<html>
  <head>
    <title> Spacebook </title>
    <link rel="stylesheet" media="screen" href="/public/bootstrap/css/
bootstrap.min.css">
  </head>
  <body>
    <div class="container-fluid">
      <div class="navbar ">
        <div class="navbar-inner">
          <a class="brand pull-left" href="#">Spacebook</a>
          <ul class="nav">
            <li> <a href="/signup"> Signup </a></li>
            <li class="active"> <a href="/login"> Login </a></li>
          </ul>
          <p class="navbar-text pull-right"> Login to Spacebook </p>
        </div>
      </div>
      <form id="login" action="/authenticate" method="POST">
        <label>Email</label>
        <input type="text" name="email" id="email" />

        <label>Password</label>
        <input type="password" name="password" id="password" />

        <input class="formbutton" type="submit" value="Login" />
      </form>
    </div>
  </body>
</html>
```

Developer Tools - http://localhost:9000/login

Elements Resources Network Sources Timeline Profiles Audits Console

Name Path

- login
- bootstrap.min.css /public/bootstrap/css

Headers Preview Response Cookies Timing

Request URL: http://localhost:9000/login  
Request Method: GET  
Status Code: 200 OK

Request Headers [view source](#)

- Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8
- Accept-Charset: ISO-8859-1,utf-8;q=0.7,\*;q=0.3
- Accept-Encoding: gzip,deflate,sdch
- Accept-Language: en-US,en;q=0.8
- Cache-Control: max-age=0
- Connection: keep-alive
- Host: localhost:9000
- User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_8\_2) AppleWebKit/537.17 (KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17

Response Headers [view source](#)

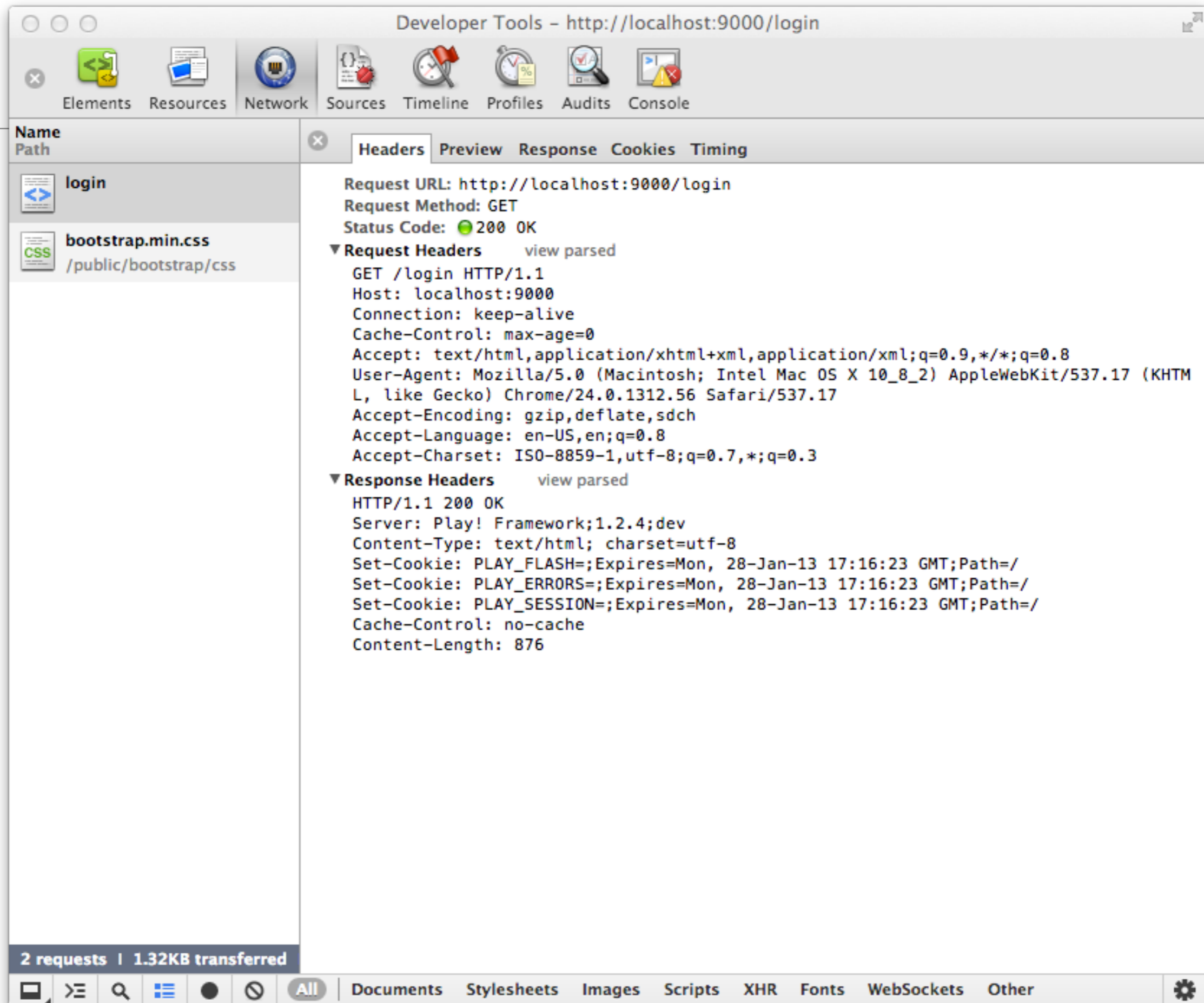
- Cache-Control: no-cache
- Content-Length: 876
- Content-Type: text/html; charset=utf-8
- Server: Play! Framework;1.2.4;dev
- Set-Cookie: PLAY\_FLASH=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
- Set-Cookie: PLAY\_ERRORS=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
- Set-Cookie: PLAY\_SESSION=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/

2 requests | 1.32KB transferred

Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

- View Source

# Developer Tools View of request/response



The screenshot shows the Chrome Developer Tools interface with the Network tab selected. The top toolbar includes icons for Elements, Resources, Network, Sources, Timeline, Profiles, Audits, and Console. The main area is divided into a left sidebar and a right pane. The sidebar shows a list of requests: 'login' (HTML) and 'bootstrap.min.css' (CSS). The right pane is currently displaying the 'Headers' tab for the selected 'login' request. The headers section shows the following information:

**Request Headers** (view parsed)

- GET /login HTTP/1.1
- Host: localhost:9000
- Connection: keep-alive
- Cache-Control: max-age=0
- Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8
- User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_8\_2) AppleWebKit/537.17 (KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
- Accept-Encoding: gzip, deflate, sdch
- Accept-Language: en-US,en;q=0.8
- Accept-Charset: ISO-8859-1,utf-8;q=0.7,\*;q=0.3

**Response Headers** (view parsed)

- HTTP/1.1 200 OK
- Server: Play! Framework;1.2.4;dev
- Content-Type: text/html; charset=utf-8
- Set-Cookie: PLAY\_FLASH=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
- Set-Cookie: PLAY\_ERRORS=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
- Set-Cookie: PLAY\_SESSION=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
- Cache-Control: no-cache
- Content-Length: 876

At the bottom of the Developer Tools window, a status bar indicates '2 requests | 1.32KB transferred'. The bottom-most toolbar shows various filter buttons and categories like 'All', 'Documents', 'Stylesheets', 'Images', 'Scripts', 'XHR', 'Fonts', 'WebSockets', and 'Other'.

Developer Tools - http://localhost:9000/login

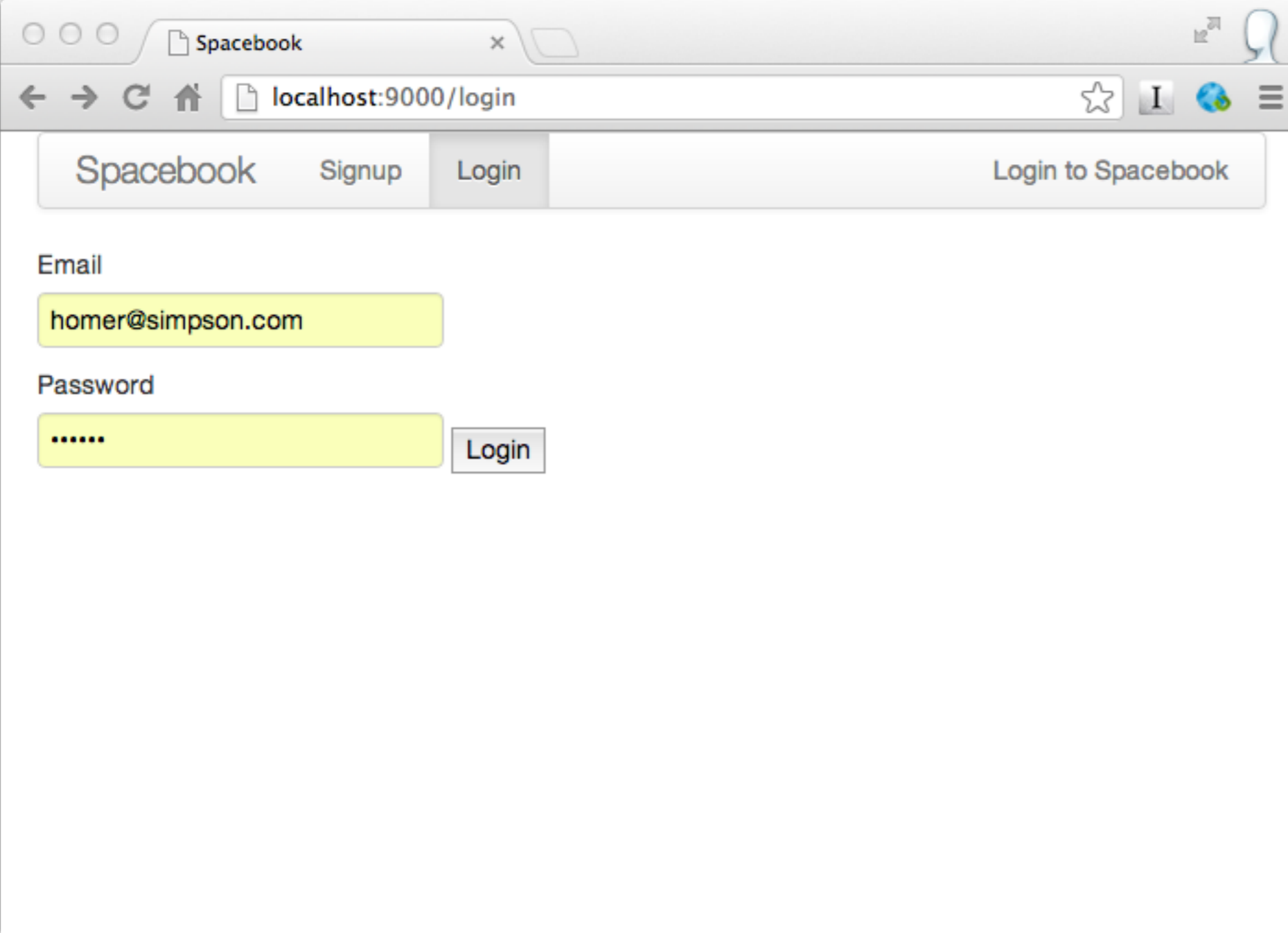
Elements Resources Network Sources Timeline Profiles Audits Console

Name Path	Headers Preview Response Cookies Timing
login	<pre> 1 &lt;!DOCTYPE html&gt; 2 &lt;html&gt; 3   &lt;head&gt; 4     &lt;title&gt; Spacebook &lt;/title&gt; 5     &lt;link rel="stylesheet" media="screen" href="/public/bootstrap/css/bootstrap.min.cs 6   &lt;/head&gt; 7   &lt;body&gt; 8     &lt;div class="container-fluid"&gt; 9 10 11 12     &lt;div class="navbar  "&gt; 13       &lt;div class="navbar-inner"&gt; 14         &lt;a class="brand pull-left" href="#"&gt;Spacebook&lt;/a&gt; 15         &lt;ul class="nav"&gt; 16           &lt;li&gt;           &lt;a href="/signup"&gt; Signup  &lt;/a&gt;&lt;/li&gt; 17           &lt;li class="active"&gt; &lt;a href="/login"&gt; Login  &lt;/a&gt;&lt;/li&gt; 18         &lt;/ul&gt; 19         &lt;p class="navbar-text pull-right"&gt; Login to Spacebook &lt;/p&gt; 20       &lt;/div&gt; 21     &lt;/div&gt; 22 23 24     &lt;form id="login" action="/authenticate" method="POST"&gt; 25       &lt;label&gt;Email&lt;/label&gt; 26       &lt;input type="text" name="email" id="email" /&gt; 27 28       &lt;label&gt;Password&lt;/label&gt; 29       &lt;input type="password" name="password" id="password" /&gt; 30 31       &lt;input class="formbutton" type="submit" value="Login" /&gt; 32     &lt;/form&gt; 33   &lt;/div&gt; 34 &lt;/body&gt; 35 &lt;/html&gt; </pre>
bootstrap.min.css /public/bootstrap/css	

2 requests | 1.32KB transferred

All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

# Try Submitting a Form...



The screenshot shows a web browser window with the following elements:

- Browser title: Spacebook
- Address bar: localhost:9000/login
- Navigation buttons: Back, Forward, Refresh, Home
- Page navigation: Spacebook, Signup, Login (highlighted), Login to Spacebook
- Form fields:
  - Email: homer@simpson.com
  - Password: ..... (masked)
- Submit button: Login

- When we press the button, we are generating a request...

Developer Tools - http://localhost:9000/home

Elements Resources Network Sources Timeline Profiles Audits Console

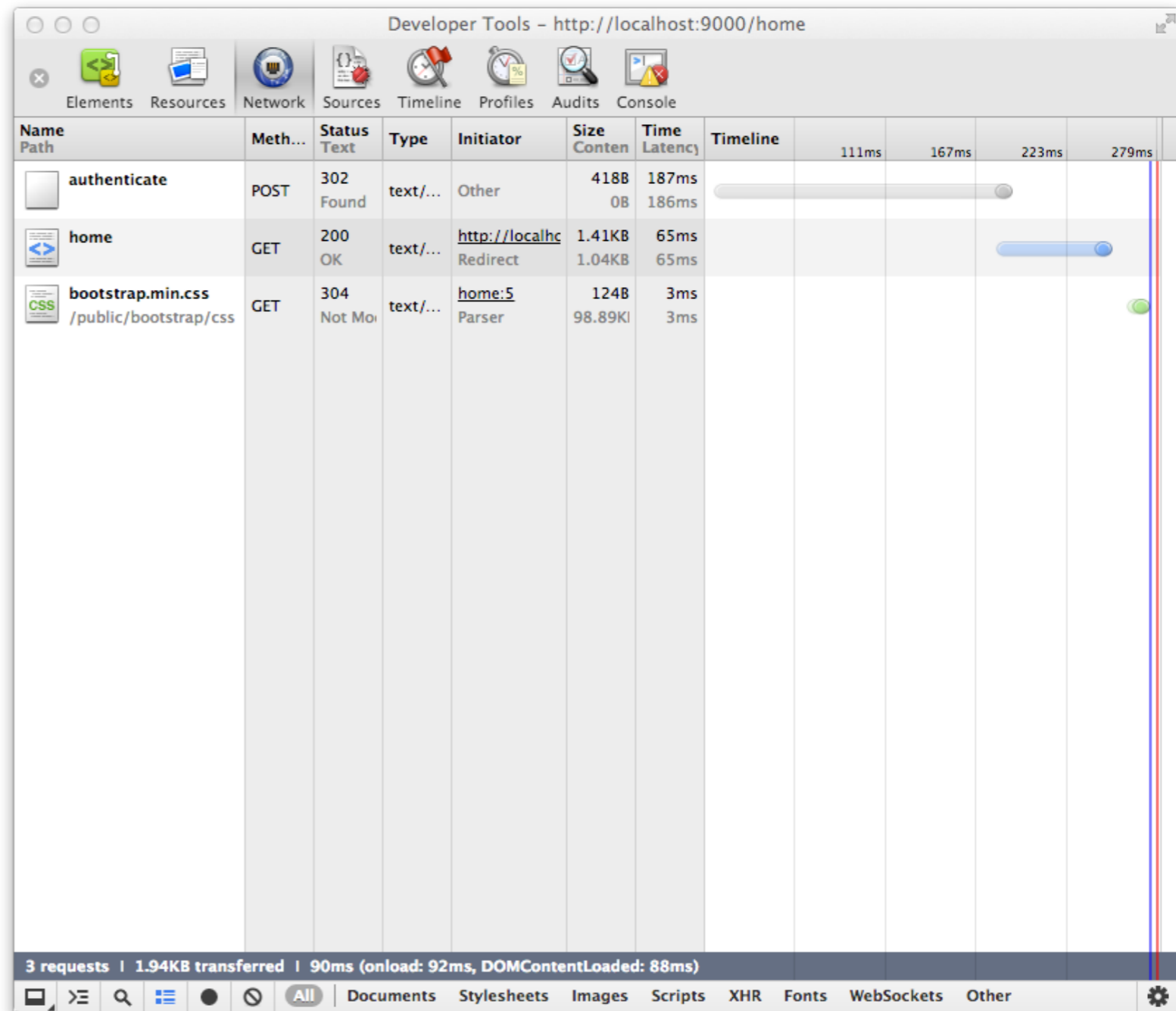
Name Path	Meth...	Status Text	Type	Initiator	Size Conten	Time Latency	Timeline	111ms	167ms	223ms	279ms
authenticate	POST	302 Found	text/...	Other	418B 0B	187ms 186ms					
home	GET	200 OK	text/...	http://localhc Redirect	1.41KB 1.04KB	65ms 65ms					
bootstrap.min.css /public/bootstrap/css	GET	304 Not Mo	text/...	home:5 Parser	124B 98.89KI	3ms 3ms					

3 requests | 1.94KB transferred | 90ms (onload: 92ms, DOMContentLoaded: 88ms)


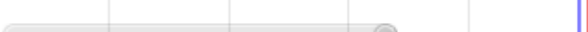

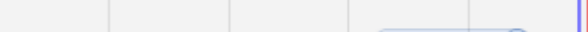


All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

# 3 Requests?

- First one is ok - this is the 'Action' from the form
- What about the other two?



The screenshot shows the Chrome Developer Tools Network tab for the URL `http://localhost:9000/home`. It displays three network requests:

Name Path	Meth...	Status Text	Type	Initiator	Size Conten	Time Latency	Timeline
 <b>authenticate</b>	POST	302 Found	text/...	Other	418B 0B	187ms 186ms	
 <b>home</b>	GET	200 OK	text/...	<a href="http://localhost:9000/home">http://localhc</a> Redirect	1.41KB 1.04KB	65ms 65ms	
 <b>bootstrap.min.css</b> <code>/public/bootstrap/css</code>	GET	304 Not Mo	text/...	<a href="#">home:5</a> Parser	124B 98.89KI	3ms 3ms	

At the bottom of the Network tab, a summary bar shows: **3 requests | 1.94KB transferred | 90ms (onload: 92ms, DOMContentLoaded: 88ms)**. The bottom of the Developer Tools window shows a filter menu with 'All' selected, and other categories like Documents, Stylesheets, Images, Scripts, XHR, Fonts, WebSockets, and Other.

# /authenticate Request

---

```
POST /authenticate HTTP/1.1
Host: localhost:9000
Connection: keep-alive
Content-Length: 41
Cache-Control: max-age=0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Origin: http://localhost:9000
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17
(KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
Content-Type: application/x-www-form-urlencoded
Referer: http://localhost:9000/login
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-
%00logged_in_userid%3A1%00
email=homer%40simpson.com&password=secret
```



# /authenticate Request - form data

---

```
POST /authenticate HTTP/1.1
Host: localhost:9000

...

email=homer%40simpson.com&password=secret
```

- Request encapsulate 'form data' as a single string, separated by '&'s

# /authenticate - Response

---

```
HTTP/1.1 302 Found
Server: Play! Framework;1.2.4;dev
Content-Type: text/plain; charset=utf-8
Location: http://localhost:9000/home
Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/
Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/
Set-Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-
%00logged_in_userid%3A1%00;Path=/
Cache-Control: no-cache
Content-Length: 0
```

- Response with '302 Found' (previous response was '200 ok')
- '302 Found' means the requested resource is present - but at another location.
- This is provided as 'Location: <http://localhost:9000/home>
- Once a browser sees this response - it make a second request to this new location...

# /home request

---

```
GET /home HTTP/1.1
Host: localhost:9000
Connection: keep-alive
Cache-Control: max-age=0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17 (KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
Referer: http://localhost:9000/login
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-%00logged_in_userid%3A1%00
```

- Notice the 'logged\_in\_userid' field... remember that?
- What is its purpose?




# /home response

```
HTTP/1.1 200 OK
Server: Play! Framework;1.2.4;dev
Content-Type: text/html; charset=utf-8
Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/
Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/
Set-Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-%00logged_in_userid%3A1%00;Path=/
Cache-Control: no-cache
Content-Length: 1067
<!DOCTYPE html>
<html>
  <head>
    <title> Spacebook </title>
    <link rel="stylesheet" media="screen" href="/public/bootstrap/css/bootstrap.min.css">
  </head>
  <body>
    <div class="container-fluid">

      <div class="navbar ">
        <div class="navbar-inner">
          <a class="brand pull-left" href="#">Spacebook</a>
          <ul class="nav">
            <li class="active"> <a href="/home"> Home </a></li>
            <li> <a href="/members"> Members </a></li>
            <li> <a href="/homeprofile"> Profile </a></li>
            <li> <a href="/logout"> Logout </a></li>
          </ul>
          <p class="navbar-text pull-right"> Spacebook Home Page for Homer Simpson </p>
        </div>
      </div>
    <div class="row-fluid">
      <div class="span4">
        <p>
          Homer Simpson, 0,
        </p>
        <h2> Friends </h2>
        <h2> Following (0) </h2>
        <ul>
          </ul>
        <h4> Followers </h4>
      </div>
      <div class="span8">
        <h2> Messages </h2>
      </div>
    </div>
  </div>
</body>
</html>
```

- This is a '200 ok' delivering to us the 'home' page...
- Which in turn requests the css file

-  Elements
-  Resources
-  Network
-  Sources
-  Timeline
-  Profiles
-  Audits
-  Console

Name Path	Method	Status Text	Type	Initiator	Size Content	Time Latenc	Timeline
 <b>authenticate</b>	POST	302 Found	text/plain	Other	418B 0B	187ms 186ms	<input type="checkbox"/>
 <b>home</b>	GET	200 OK	text/html	<a href="http://localhost:9000/authenticate">http://localhost:9000/authenticate</a> Redirect	1.41KB 1.04KB	65ms 65ms	<input checked="" type="checkbox"/>
 <b>bootstrap.min.css</b> /public/bootstrap/c:	GET	304 Not Modifi	text/css	<a href="#">home:5</a> Parser	124B 98.89KB	3ms 3ms	<input checked="" type="checkbox"/>





3 requests | 1.94KB transferred | 90ms (onload: 92ms, DOMContentLoaded: 88ms)

- 
- 
- 
- 
- 
- 
- All**
- Documents
- Stylesheets
- Images
- Scripts
- XHR
- Fonts
- WebSockets
- Other
- 

# Visiting the Members Page

Developer Tools - http://localhost:9000/members

Elements Resources Network Sources Timeline Profiles Audits Console

Name Path	Met...	Status Text	Type	Initiator	Size Content	Time Latency	Timeline	413ms	620ms	826ms
 members	GET	200 OK	text...	Other	1.63KE 1.26KE	800ms 799ms				
 bootstrap.min.css /public/bootstrap/c	GET	304 Not Modified	text...	members:5 Parser	124B 98.89k	2ms 2ms				

2 requests | 1.75KB transferred | 822ms (onload: 826ms, DOMContentLoaded: 820ms)

All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

# Visiting the Home Profile

The screenshot shows the Chrome Developer Tools Network tab for the URL `http://localhost:9000/homeprofile`. The interface includes tabs for Elements, Resources, Network, Sources, Timeline, Profiles, Audits, and Console. The Network tab is active, displaying a list of requests with a corresponding timeline.

Name Path	Met...	Status Text	Type	Initiator	Size Content	Time Latenc	Timeline
homeprofile	GET	200 OK	text/html	Other	2.14KB 1.77KB	2.18s 2.15s	
bootstrap.min.css /public/bootstrap/c	GET	304 Not Moc	text/css	homeprofile:5 Parser	124B 98.89KB	24ms 3ms	
1 /homeprofile/getpic	GET	200 OK	image/jpeg	homeprofile:24 Parser	1.52MB 1.52MB	397ms 321ms	
1 /homeprofile/getthu	GET	200 OK	image/jpeg	homeprofile:31 Parser	838.85KB 838.46KB	676ms 672ms	

4 requests | 2.34MB transferred | 2.88s (onload: 2.92s, DOMContentLoaded: 2.20s)

Navigation: All | Documents | Stylesheets | Images | Scripts | XHR | Fonts | WebSockets | Other

# Logging out

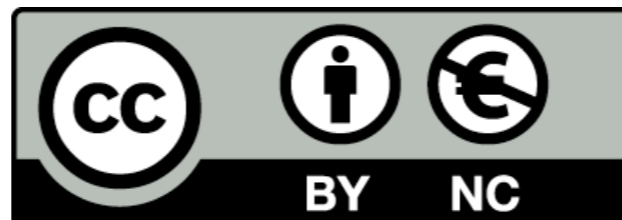
The screenshot shows the Chrome Developer Tools Network tab for the URL `http://localhost:9000/`. The 'Network' panel is active, displaying a list of requests. The 'logout' request is selected, showing a GET method, 302 Found status, and a text type. The initiator is 'Other'. The size is 383B and the time is 199ms. The timeline shows a single bar for this request. The status bar at the bottom indicates 3 requests, 1.38KB transferred, and 29ms total time (onload: 30ms, DOMContentLoaded: 27ms).

Name Path	Met...	Status Text	Type	Initiator	Size Contei	Time Latenc	Timeline	92ms	138ms	183ms	229ms
<b>logout</b>	GET	302 Found	text...	Other	383B 0B	199ms 198ms					
<b>localhost</b>	GET	200 OK	text...	<a href="http://localhost">http://localh</a> Redirect	902B 555B	6ms 5ms					
<b>bootstrap.min.css</b> <code>/public/bootstrap/c</code>	GET	304 Not Mo	text...	<a href="localhost:5">localhost:5</a> Parser	124B 98.89k	2ms 2ms					

3 requests | 1.38KB transferred | 29ms (onload: 30ms, DOMContentLoaded: 27ms)

Documents Stylesheets Images Scripts XHR Fonts WebSockets Other





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