

Making Sense of CORS using web.py

zach wick
zwick@bareo.io

July 28, 2015

Agenda

- ▶ About the speaker
- ▶ HTTP Primer
- ▶ What is CORS
- ▶ Why is CORS useful
- ▶ How does CORS work
 - ▶ HTTP
 - ▶ Simple Requests
 - ▶ Other Requests
- ▶ Worked Example
- ▶ Best Practices
- ▶ Questions (and hopefully answers)

About the Speaker



HTTP Primer

- ▶ application protocol

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD
 - ▶ HTTP/1.1 — OPTIONS PUT DELETE TRACE CONNECT

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD
 - ▶ HTTP/1.1 — OPTIONS PUT DELETE TRACE CONNECT
 - ▶ RFC 5789 — PATCH

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD
 - ▶ HTTP/1.1 — OPTIONS PUT DELETE TRACE CONNECT
 - ▶ RFC 5789 — PATCH
 - ▶ Other specs & RFC's

HTTP Primer

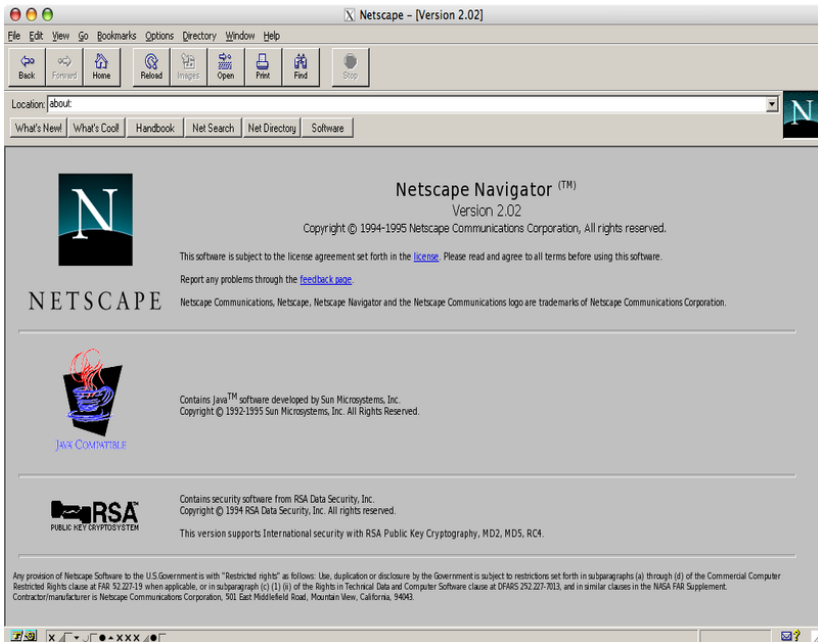
- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD
 - ▶ HTTP/1.1 — OPTIONS PUT DELETE TRACE CONNECT
 - ▶ RFC 5789 — PATCH
 - ▶ Other specs & RFC's
 - ▶ * Other user defined verbs *

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD
 - ▶ HTTP/1.1 — OPTIONS PUT DELETE TRACE CONNECT
 - ▶ RFC 5789 — PATCH
 - ▶ Other specs & RFC's
 - ▶ * Other user defined verbs *
- ▶ idempotent vs. non-idempotent

HTTP Primer

- ▶ application protocol
- ▶ uses request verbs
 - ▶ HTTP/1.0 — GET POST HEAD
 - ▶ HTTP/1.1 — OPTIONS PUT DELETE TRACE CONNECT
 - ▶ RFC 5789 — PATCH
 - ▶ Other specs & RFC's
 - ▶ * Other user defined verbs *
- ▶ idempotent vs. non-idempotent
- ▶ status codes



In the Beginning There Was Netscape Navigator 2

- ▶ LiveScript (now called JavaScript)

In the Beginning There Was Netscape Navigator 2

- ▶ LiveScript (now called JavaScript)
- ▶ Plugin Support

In the Beginning There Was Netscape Navigator 2

- ▶ LiveScript (now called JavaScript)
- ▶ Plugin Support
- ▶ HTML Frames (iframes)

In the Beginning There Was Netscape Navigator 2

- ▶ LiveScript (now called JavaScript)
- ▶ Plugin Support
- ▶ HTML Frames (iframes)
- ▶ Same-Origin Policy

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Compared URL	Reason
<code>http://www.example.com/dir/p2.html</code>	

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

http://www.example.com/dir/page.html

Compared URL	Reason
http://www.example.com/dir/p2.html	Origin Tuple Matches
http://www.example.com/d2/p3.html	

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Compared URL	Reason
<code>http://www.example.com/dir/p2.html</code>	Origin Tuple Matches
<code>http://www.example.com/d2/p3.html</code>	Origin Tuple Matches
<code>https://www.example.com/dir/p2.html</code>	

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Compared URL	Reason
<code>http://www.example.com/dir/p2.html</code>	Origin Tuple Matches
<code>http://www.example.com/d2/p3.html</code>	Origin Tuple Matches
<code>https://www.example.com/dir/p2.html</code>	Protocol Differs
<code>http://www.example.com:82/dir/p2.html</code>	

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Compared URL	Reason
<code>http://www.example.com/dir/p2.html</code>	Origin Tuple Matches
<code>http://www.example.com/d2/p3.html</code>	Origin Tuple Matches
<code>https://www.example.com/dir/p2.html</code>	Protocol Differs
<code>http://www.example.com:82/dir/p2.html</code>	Port Differs
<code>http://example.com/dir/p2.html</code>	

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Compared URL	Reason
<code>http://www.example.com/dir/p2.html</code>	Origin Tuple Matches
<code>http://www.example.com/d2/p3.html</code>	Origin Tuple Matches
<code>https://www.example.com/dir/p2.html</code>	Protocol Differs
<code>http://www.example.com:82/dir/p2.html</code>	Port Differs
<code>http://example.com/dir/p2.html</code>	Host Differs
<code>http://www.example.com:80/dir/p2.html</code>	

Same-Origin Policy

- ▶ Applies to DOM manipulation and others (XMLHttpRequest)
- ▶ (protocol, host, port) = Origin
- ▶ Tuples must match

`http://www.example.com/dir/page.html`

Compared URL	Reason
<code>http://www.example.com/dir/p2.html</code>	Origin Tuple Matches
<code>http://www.example.com/d2/p3.html</code>	Origin Tuple Matches
<code>https://www.example.com/dir/p2.html</code>	Protocol Differs
<code>http://www.example.com:82/dir/p2.html</code>	Port Differs
<code>http://example.com/dir/p2.html</code>	Host Differs
<code>http://www.example.com:80/dir/p2.html</code>	Implementation Based

How to Get Around Same-Origin Policy



What Do We Want?

Any Domain

What Do We Want?

Any Domain

- ▶ images

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets
- ▶ iframes

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets
- ▶ iframes
- ▶ videos

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets
- ▶ iframes
- ▶ videos
- ▶ some plugin content

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets
- ▶ iframes
- ▶ videos
- ▶ some plugin content

Only Special Domains

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets
- ▶ iframes
- ▶ videos
- ▶ some plugin content

Only Special Domains

- ▶ embedded web fonts

What Do We Want?

Any Domain

- ▶ images
- ▶ scripts
- ▶ stylesheets
- ▶ iframes
- ▶ videos
- ▶ some plugin content

Only Special Domains

- ▶ embedded web fonts
- ▶ AJAX

What about JSONP?

- ▶ JSON with padding

What about JSONP?

- ▶ JSON with padding
- ▶ works via HTML script tags (in the 'Any Domain' column)

What about JSONP?

- ▶ JSON with padding
- ▶ works via HTML script tags (in the 'Any Domain' column)
- ▶ only GET

Why is CORS useful?

- ▶ AJAX to non-origin domains

How does CORS work?