

Mastering*

Chrome Developer Tools





@jkup

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* SUBJECT TO
CHANGE

History

In the beginning...



[illegible]

nodecasts.io says:

[object Object]

☐ Prevent this page from creating additional dialogs.

OK

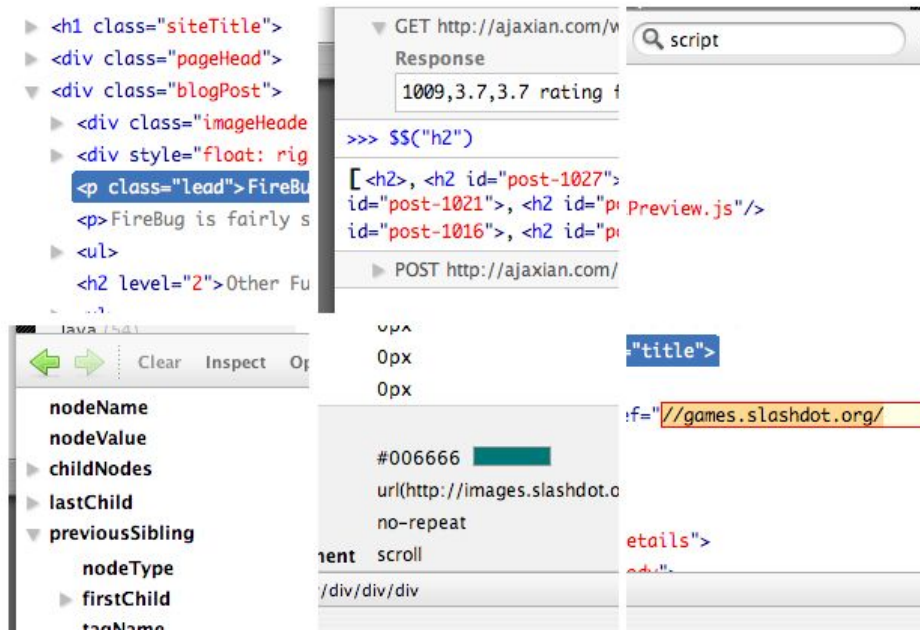
node.js quickly with these free JavaScript cour

Live DOM Viewer

<http://software.hixie.ch/utilities/js/live-dom-viewer/>

FIREBUG 0.3 PREVIEW

Words and bytes coming soon... For now, pictures.



Firefox

The screenshot shows the Firefox Developer Tools interface. The top bar includes icons for the Inspector, Console, Debugger, Style Editor, Performance, and Network panels. The 'Debugger' panel is active, showing a search bar for scripts. The 'Sources' panel on the left lists various files, with 'ga.js' selected. The main code editor displays the following JavaScript code:

```
98     anchor: ''
99   };
100   if (!a) return d;
101   c = a.indexOf('/:');
102   0 <= c && (d.protocol = a.substring(0, c), a = a.substring(c + 3));
103   c = a.search('/\\|\\?|#');
104   if (0 <= c) d.host = a.substring(0, c).toLowerCase(),
105   a = a.substring(c);
106   else return d.host = a.toLowerCase(),
107   d;
108   c = a.indexOf('#');
109   0 <= c && (d.anchor = a.substring(c + 1), a = a.substring(0, c));
110   c = a.indexOf('?');
111   0 <= c && (Na(d.R, a.substring(c + 1)), a = a.substring(0, c));
112   d.anchor && b && Na(d.R, d.anchor);
113   a && '/' == a.charAt(0) && (a = a.substring(1));
114   d.path = a;
115   return d
116 }
117 function Oa(a, b) {
118   function c(a) {
119     var b = (a.hostname || '').split(':')[0].toLowerCase(),
120     c = (a.protocol || '').toLowerCase(),
121     c = 1 * a.port || ('http:' == c ? 80 : 'https:' == c ? 443 : '');
122     a = a.pathname || '';
123     0 == a.indexOf('/') || (a = '/' + a);
124     return [b,
125     '' + c,
126     a]
127   }
128   var d = b || J.createElement('a');
129   d.href = J.location.href;
130   var e = (d.protocol || '').toLowerCase(),
131   f = c(d).

```

Chrome

The screenshot displays the Chrome DevTools interface. The top navigation bar includes tabs for Elements, Network, Sources, Timeline, Profiles, Resources, Audits, and Console. The Elements panel is active, showing the DOM tree with the following structure:

```
<!DOCTYPE html>
<html lang="en">
  <head>...</head>
  <body class="main--body container-fluid">
    ::before
    <div class="row header">...</div>
    <div class="container container-full">...</div>
    <footer>...</footer>
    <script id="twitter-wjs" src="http://platform.twitter.com/widgets.js"></script>
    <script type="text/javascript" async src="http://www.google-analytics.com/qa.js"></script>
    <script type="text/javascript">...</script>
    <script>...</script>
    <script src="/is/prism.js"></script>
    <script src="//code.jquery.com/jquery-2.1.4.min.js"></script>
    <script src="//maxcdn.bootstrapcdn.com/bootstrap/3.3.5/js/bootstrap.min.js"></script>
    <iframe id="rufous-sandbox" scrolling="no" frameborder="0" allowtransparency="true"
      allowfullscreen="true" style="position: absolute; visibility: hidden; display: none; width:
      0px; height: 0px; padding: 0px; border: none;">...</iframe>
    ::after
  </body>
</html>
```

The Styles pane on the right shows the following CSS rules:

- element.style { }**
- .container-fluid { }** (Source: [bootstrap.min.css:5](#))
 - `padding-right: 15px;`
 - `padding-left: 15px;`
 - `margin-right: auto;`
 - `margin-left: auto;`
- media="screen"**
- .main--body { }** (Source: [ionkuperman.com/style.css:1](#))
 - `font-family: "HelveticaNeue-Light", "Helvetica Neue Light", "Helvetica Neue", Helvetica, Arial, "Lucida Grande", sans-serif;`
- body { }** (Source: [bootstrap.min.css:5](#))
 - `font-family: "Helvetica-Neue", Helvetica, Arial, sans-serif;`
 - `font-size: 14px;`
 - `line-height: 1.42857143;`
 - `color: #333;`
 - `background-color: #fff;`
- body { }** (Source: [bootstrap.min.css:5](#))

Outside of Chrome



This repository Search

[Pull requests](#) [Issues](#) [Gist](#)



[node-inspector](#) / [node-inspector](#)

Watch ▾

264

Unstar

8,858

Fork

556

Code

Issues 113

Pull requests 15

Wiki

Pulse

Graphs

Node.js debugger based on Blink Developer Tools

582 commits

2 branches

50 releases

52 contributors

Branch: master ▾

[New pull request](#)

[New file](#)

[Find file](#)

HTTPS ▾

<https://github.com/node-i>



[Download ZIP](#)



3y3 Added frontend ping

Latest commit bd73370 2 days ago



[bin](#)

Support listening on unix socket

7 days ago



[docs](#)

Fixed misspelled word "Visit" in docs

2 years ago



[front-end-node](#)

fix ws url

2 days ago



[front-end](#)

Fix css issue with debugger window cut off #699

6 months ago



[lib](#)

Added frontend ping

2 days ago



[test](#)

Remove registerDebuggerEventHandlers

2 days ago



[tools](#)

Update release.sh

5 months ago



[.gitattributes](#)

Fix release logic

a year ago



[.gitignore](#)

Plugins: merging InspectorJson

7 months ago



[.jshintignore](#)

Plugins: merging InspectorJson

7 months ago



[.jshintrc](#)

Use jshint instead of gjslint

2 years ago



This repository

Search

Pull requests

Issues

Gist



nodejs / node

Watch

1,635

★ Unstar

23,502

Fork

3,373

<> Code

! Issues 454

🔗 Pull requests 228

📖 Wiki

⚡ Pulse

📊 Graphs

Add v8_inspector support #6792



Open

ofrobots wants to merge 3 commits into nodejs:master from ofrobots:v8-inspector



Conversation 161



Commits 3



Files changed 271

+19,995 -0



ofrobots commented 10 days ago

For background see: [#2546 \(comment\)](#)

This PR brings in v8_inspector support to Node.js (currently behind a compile time flag.) This means Node.js can now be debugged and profiled via the [Chrome Debugging Protocol](#), which enables inspection via Chrome DevTools and other tools & IDEs. So far, v8_inspector includes support for the following protocol domains: [Debugger](#), [Profiler](#), [Runtime](#), [HeapProfiler](#)

In the Chrome DevTools client, the following is now available:

Labels

ctc-agenda

debugger

doc

semver-minor

Milestone

No milestone

RECENT POSTS

Discontinuing IE 8 Support in React DOM

(A => B) !=> (B => A)

React v0.14.4

React Components, Elements, and Instances

isMounted is an Antipattern

React.js Conf 2016 Diversity Scholarship

React v0.14.3

React v0.14.2

React v0.14.1

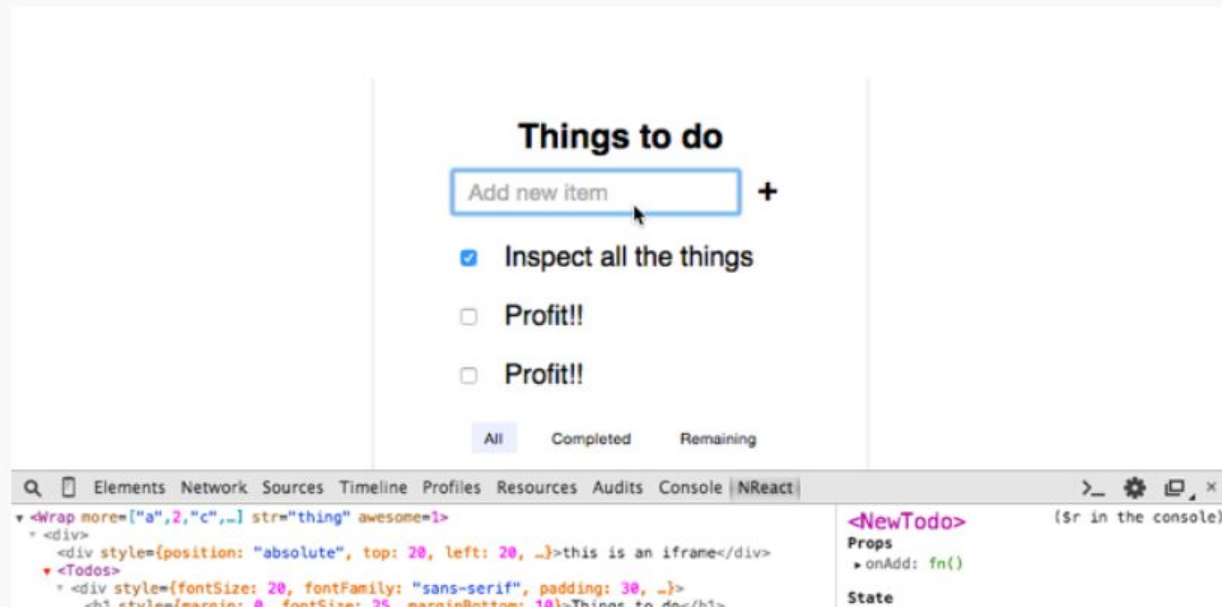
Reactiflux is moving to Discord

All posts ...

New React Developer Tools

September 2, 2015 by [Ben Alpert](#)

A month ago, we [posted a beta](#) of the new React developer tools. Today, we're releasing the first stable version of the new devtools. We're calling it version 0.14, but it's a full rewrite so we think of it more like a 2.0 release.



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☐ ★ ★ ★ ★ ★ & up

Ember Inspector

offered by www.emberjs.com

★★★★★ (264)

[Developer Tools](#)

73,065 users

+ ADD TO CHROME






OVERVIEW

REVIEWS

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Latest Categories

Topic	Category	Participants	Posts	Likes	Views	Activity
Welcome to the Ember.js Discussion Forum Welcome to the Ember.js discussion forum. We're running on the open source, Ember.js-powered Discourse forum software. They are also providing the hosting for us. Thanks guys! Please use this space for discussion about... read more						
How to create a subnav in ember.js			2		8	2h 9m
Deploying Ember with Django	design		1		3	36m
Ember & Bootstrap in love			4	6	188	3d 1h
Support for paradigm like nested UIViewControllers in Cocoa?	design		2	1	37	3d 1h
Before leaving route			7	3	31	9h 2h
How to dirty parent record when belongsTo relationship changes	ember-data		6		57	3d 5h
How to append string to bound img src?			2		16	5h 5h

Elements Resources Network Sources Timeline Profiles Audits Console Ember

	Route Name	Route	Controller	Template	URL
View Tree	application	ApplicationRoute	ApplicationController	application	
# Routes	topic	TopicRoute	TopicController	topic	
	topic.fromParams	TopicFromParamsRoute	TopicFromParamsController	topicFromParams	/t/:slug/:id/:nearPost
	faq	FaqRoute	FaqController	faq	/faq
	tos	TosRoute	TosController	tos	/tos
	privacy	PrivacyRoute	PrivacyController	privacy	/privacy
	login	LoginRoute	LoginController	login	/login



Compatible with your device

Tool for debugging Ember applications.

The Ember Inspector is a plug-in for the Chrome developer tools that makes understanding and debugging your Ember.js application a snap.

After installing this extension, you'll be able to easily:

- View all of the routes defined in your application.
- Reference Ember's naming conventions for your URLs, including what to name your controller, template, route, and more.

[Website](#)[Report Abuse](#)

Version: 1.9.5

Updated: February 3, 2016

Size: 751KiB

Language: English

What
Can DevTools Do?

- **Create Files**
- **Write Code**
- **Persist Changes to Disk**
- **Step Through Debug**
- **Audit Pages**
- **Emulate Devices**

- **Simulate Network Conditions**
- **Find Memory Leaks**
- **Profile Your Code**
- **Analyze JavaScript performance**
- **Spot page jank**

Resources

<https://developers.google.com/web/tools/chrome-devtools/>





This repository

Search

Pull requests

Issues

Gist



jkup / **mastering-chrome-devtools**

Unwatch

2

Unstar

6

Fork

4

Code

Issues 0

Pull requests 0

Wiki

Pulse

Graphs

Settings

Website for teaching Chrome DevTools — Edit

42 commits

1 branch

0 releases

1 contributor

Branch: master

New pull request

Create new file

Upload files

Find file

Clone or download



jkup fixed profiling page

Latest commit a6339e8 20 minutes ago



public

fixed profiling page

20 minutes ago



views

fixed profiling page

20 minutes ago



.gitignore

Initial commit

3 months ago



LICENSE

Initial commit

3 months ago



README.md

updated readme and linkified home page

a day ago



package.json

refactor views

3 days ago



server.js

added basic service worker

6 hours ago

A vibrant, painterly image of a park path. The path is paved and covered with fallen pink cherry blossom petals. On either side of the path are black metal fences. To the left, a body of water is visible behind the fence. To the right, there is a green lawn and several park benches. The path is flanked by large trees with thick trunks and dense canopies of bright pink cherry blossoms. The sky is a clear, bright blue. A dark grey rectangular box is superimposed over the middle of the image, containing the text "A quick walk through the panels" in a bold, orange, sans-serif font.

A quick walk through the panels

Device

Emulation

Editing

Elements

The screenshot shows a web browser's developer tools interface. The top navigation bar includes tabs for Elements, Network, Sources, Timeline, Profiles, Resources, Audits, and Console. The Elements panel is active, displaying the DOM tree. The selected element is `<body class="main--body container-fluid">`. The Styles pane on the right shows the default styles for the `body` element, including font-family, font-size, line-height, color, and background-color. The styles are sourced from `bootstrap.min.css:5` and `ionkuperman.com/style.css:1`.

Elements Panel:

```
<!DOCTYPE html>
<html lang="en">
  <head>...</head>
  <body class="main--body container-fluid">
    ::before
    <div class="row header">...</div>
    <div class="container container-full">...</div>
    <footer>...</footer>
    <script id="twitter-wjs" src="http://platform.twitter.com/widgets.js"></script>
    <script type="text/javascript" async src="http://www.google-analytics.com/qa.js"></script>
    <script type="text/javascript">...</script>
    <script>...</script>
    <script src="/is/prism.js"></script>
    <script src="//code.jquery.com/jquery-2.1.4.min.js"></script>
    <script src="//maxcdn.bootstrapcdn.com/bootstrap/3.3.5/js/bootstrap.min.js"></script>
    <iframe id="rufous-sandbox" scrolling="no" frameborder="0" allowtransparency="true"
      allowfullscreen="true" style="position: absolute; visibility: hidden; display: none; width:
      0px; height: 0px; padding: 0px; border: none;">...</iframe>
    ::after
  </body>
</html>
```

Styles Pane:

element.style { }

.container-fluid {
padding-right: 15px;
padding-left: 15px;
margin-right: auto;
margin-left: auto;
}

media="screen"
.main--body {
font-family: "HelveticaNeue-Light", "Helvetica Neue Light", "Helvetica Neue", Helvetica,
Arial, "Lucida Grande", sans-serif;
}

body {
font-family: "Helvetica-Neue", Helvetica, Arial, sans-serif;
font-size: 14px;
line-height: 1.42857143;
color: #333;
background-color: #fff;
}

body { }

Scroll into view

Hide & Show Elements

Computed Styles

Break on...

Color Formats

CSS Specificity

Style
attribute

ID

Class,
psuedo-class,
attribute

Elements



,



,



,



Most
specificity
value

Least
specificity
value

Sources

The screenshot shows the Chrome DevTools Sources panel. The left sidebar lists the file tree for 'jonkuperman.com', with 'style.css' selected. The main pane displays the CSS code from 'style.css', starting with the 'body' selector. The right sidebar shows the 'Watch' panel with 'this: Window' and 'status: ""', and the 'Call Stack' panel which is 'Not Paused'. The 'Scope' panel is also 'Not Paused'. The 'Breakpoints' panel shows 'No Breakpoints'. The 'DOM Breakpoints' panel has a '+' icon. The 'XHR Breakpoints' panel has a '+' icon. The 'Event Listener Breakpoints' panel has a '+' icon. The 'Event Listeners' panel has a refresh icon.

Elements Network Sources Timeline Profiles Resources Audits Console

Sources Content Snippets end.min.js style.css x

jonkuperman.com

- js
- (index)
- prism.css
- style.css
- (no domain)
- cdn.syndication.twimg.com
- code.jquery.com
- gppongmhjpkfnbhagpmjfk
- maxcdn.bootstrapcdn.com
- platform.twitter.com
- platform.twitter.com
- www.google-analytics.com

```
1 .main--body { font-family: "HelveticaNeue-Light", "Helvetica Neue Light", "Helvetica Neue", Helvetica,
2
3 .content { letter-spacing: 0; font-weight: 400; font-style: normal; text-rendering: optimizeLegibility;
4 .content h1, .content h2, .content h3, .content h4, .content h5 { margin-top: 65px; }
5 .content p { font-size: 21px; margin-top: 30px; }
6 .content img { display: block; margin: 0 auto; max-width: 100%; }
7
8 nav.navbar-default { background-color: transparent; border-color: transparent; }
9
10 .header { background: #fc00ff; background: -webkit-linear-gradient(to left, #fc00ff, #00dbde); background
11 .header h1, .header h2, .header h3 { color: #FFF; }
12
13 .navbar-default .navbar-nav.navbar-right > li > a { color: #FFF; padding: 15px 25px; }
14 .navbar-default .navbar-nav.navbar-right > li > a:hover { color: #FFF; opacity: .75; }
15
16 .fancy-title { margin: 50px auto 25px auto; text-align: center; position: relative; width: 175px; }
17 .fancy-title:before, .fancy-title:after { content: ""; position: absolute; border-top: 1px solid #d6d6d6;
18 .fancy-title:before { right: 100%; margin-right: 40px; }
19 .fancy-title:after { left: 100%; margin-left: 40px; }
20
21 .list-group a.list-group-item { color: #905DF1; font-size: 18px; line-height: 30px; }
22 .list-group a.list-group-item .badge { margin-top: 8px; }
23 .list-group a.list-group-item:hover { color: #5F89EB; text-decoration: none; }
24 .list-group a.list-group-item .see-more { color: #5F89EB; }
```

{} Line 1, Column 1

Watch +

- this: Window
- status: ""

Call Stack

Not Paused

Scope

Not Paused

Breakpoints

No Breakpoints

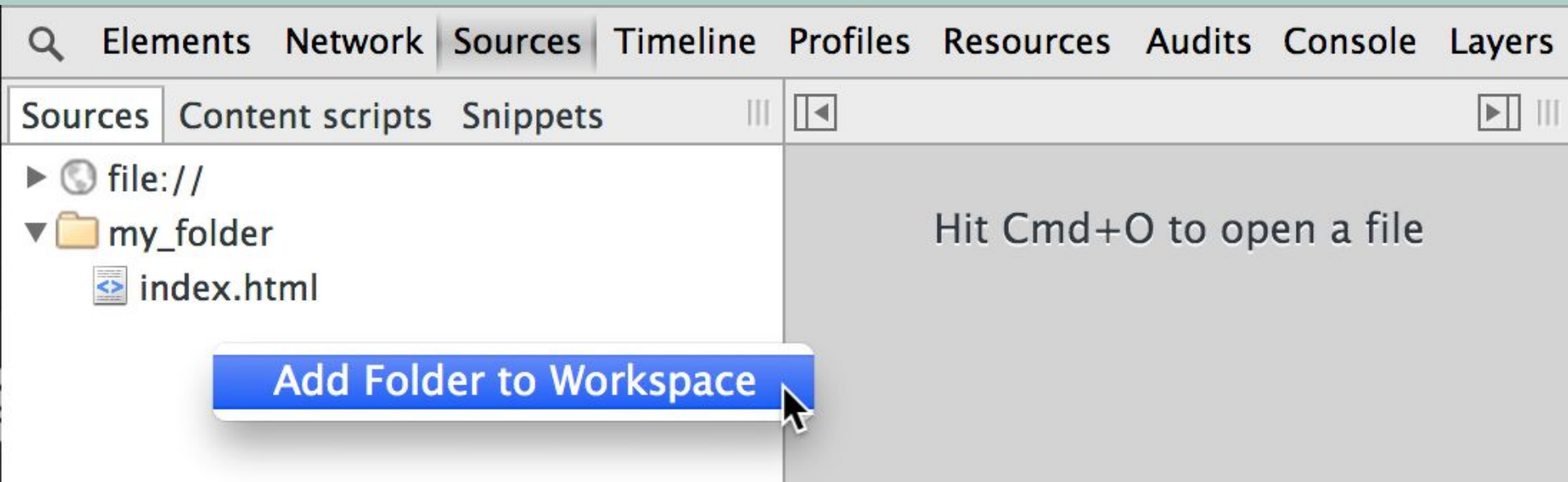
DOM Breakpoints

XHR Breakpoints +

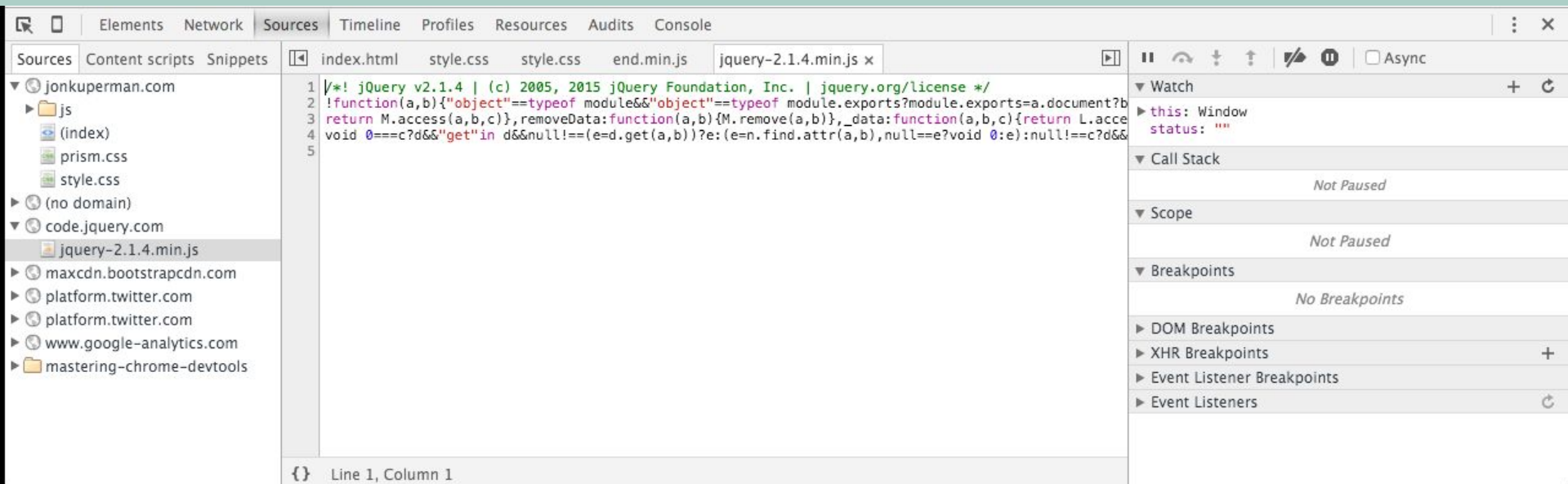
Event Listener Breakpoints

Event Listeners ↺

Workspaces



Pretty Print



The screenshot shows the Chrome DevTools interface. The 'Sources' panel is active, displaying the file 'jquery-2.1.4.min.js' with syntax-highlighted code. The left sidebar shows the file tree for 'jonkuperman.com'. The right sidebar contains the 'Watch', 'Call Stack', 'Scope', and 'Breakpoints' panels, all of which are currently empty or show 'Not Paused' status.

Sources Panel:

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

File Tree (Left):

- jonkuperman.com
 - js
 - (index)
 - prism.css
 - style.css
 - (no domain)
 - code.jquery.com
 - jquery-2.1.4.min.js
 - maxcdn.bootstrapcdn.com
 - platform.twitter.com
 - platform.twitter.com
 - www.google-analytics.com
 - mastering-chrome-devtools

Code (Center):

```
1 | /*! jQuery v2.1.4 | (c) 2005, 2015 jQuery Foundation, Inc. | jquery.org/license */
2 | !function(a,b){"object"==typeof module&&"object"==typeof module.exports?module.exports=a.document?b
3 | return M.access(a,b,c)},removeData:function(a,b){M.remove(a,b)},_data:function(a,b,c){return L.acce
4 | void 0==c?d&&"get"in d&&null!=(e=d.get(a,b))?e:(e=n.find.attr(a,b),null==e?void 0:e):null!=c?d&&
5 | }
```

Right Sidebar:

- Watch
 - + this: Window
 - status: ""
- Call Stack
 - Not Paused
- Scope
 - Not Paused
- Breakpoints
 - No Breakpoints
- DOM Breakpoints
- XHR Breakpoints
- Event Listener Breakpoints
- Event Listeners

Status Bar: Line 1, Column 1

Challenge Time!

Debugging

Step Through Debugging

The screenshot displays the Chrome DevTools interface with the 'Sources' panel active. The left sidebar shows a file tree with 'end.min.js' selected. The main pane shows the JavaScript code of 'end.min.js', with line 104 highlighted. The code defines functions I, K, and ha. The right sidebar contains the 'Watch' panel with 'this: Window' and 'status: ""', the 'Call Stack' panel showing 'Not Paused', the 'Scope' panel showing 'Not Paused', and the 'Breakpoints' panel with a breakpoint set at 'end.min.js:7'. The status bar at the bottom indicates 'Line 1, Column 1'.

Sources Content scripts Snippets

end.min.js end.min.js:formatted x

```
93 }
94 function I(a, b) {
95   var c;
96   c = '';
97   3 === b.nodeType ? c = b.nodeValue : 1 === b.nodeType && (c = H(b));
98   (c = ga(c)) && a.push(c)
99 }
100 function K(a) {
101   return a && void 0 !== a ? L(a, 'select option input form textarea button table iframe body he
102 }
103 function ha(a, b, c) {
104   var d;
105   for (c || (c = 0); a && a.previousSibling; ) {
106     a = a.previousSibling;
107     if (K(a))
108       return;
109     I(b, a)
110   }
111   if (a && 0 === b.length) {
112     for (d = null; !d; ) {
113       a = a.parentNode || a.parentElement;
114       if (!a)
115         return;
116       for (d = a.previousSibling; d && !K(d) && d.lastChild; )
```

Line 1, Column 1

Watch

- this: Window
- status: ""

Call Stack

Not Paused

Scope

Not Paused

Breakpoints

- ☒ end.min.js:7
function ha(a,b,c){var d;for(c||(c=0);a&&a.previous...

DOM Breakpoints

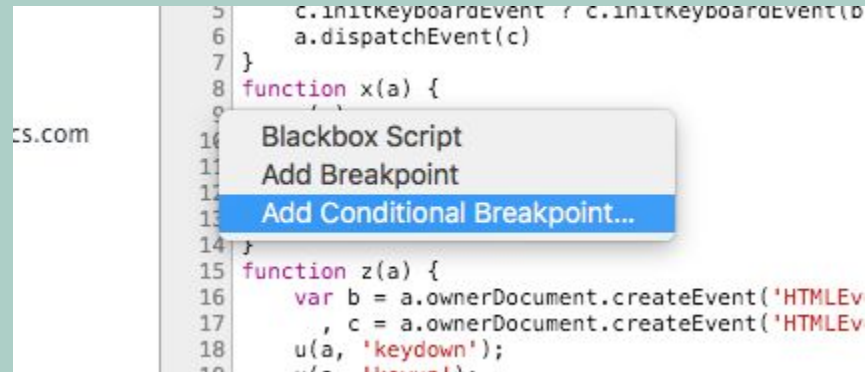
XHR Breakpoints

Event Listener Breakpoints

Event Listeners

Breakpoints

Conditional Breakpoints

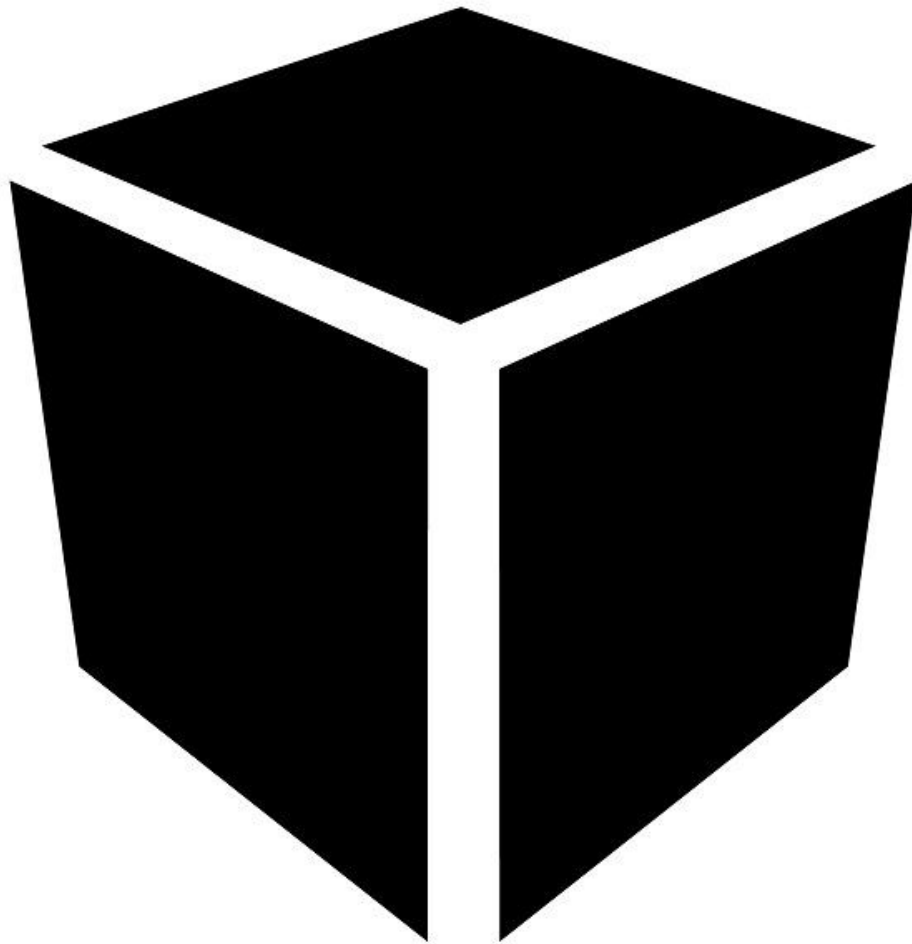


XHR

Breakpoints

Blackboxing

Scripts



Challenge Time!



Profiling

**How important
is load time?**

- Google.com: **+500 ms** (speed decrease) -> **-20% traffic loss**
- Yahoo.com: **+400 ms** (speed decrease) -> **-5-9% full-page traffic loss** (visitor left before the page finished loading)
- Amazon.com: **+100 ms** (speed decrease) -> **-1% sales loss**

Audit



Audits

RESULTS

Select audits to run

- ☒ Select All
- ☒ Network Utilization
- ☒ Web Page Performance

- ☒ Audit Present State
- ☐ Reload Page and Audit on Load

Run

Clear

PageSpeed Insights



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PageSpeed Insights analyzes the content of a web page, then generates suggestions to make that page faster. [Learn more](#).

Common Audit Problems

1. Combine external CSS and JS
2. Enable gzip compression (Apache, Node, WordPress)
3. Compress images (<https://imageoptim.com/>)
4. Leverage Browser Caching
5. Put CSS in document head
6. Unused CSS rules (Old CSS that can be pruned)

Network

Terminology

Queuing

If a request is queued it indicated that:

- The request was postponed by the rendering engine because it's considered lower priority than critical resources (such as scripts/styles). This often happens with images.
- The request was put on hold to wait for an unavailable TCP socket that's about to free up.
- The request was put on hold because the browser only allows [six TCP connections](#) per origin on HTTP 1.
- Time spent making disk cache entries (typically very quick.)

Stalled/Blocking

Time the request spent waiting before it could be sent. It can be waiting for any of the reasons described for Queueing. Additionally, this time is inclusive of any time spent in proxy negotiation.

Proxy Negotiation

Time spent negotiating with a proxy server connection.

DNS Lookup

Time spent performing the DNS lookup. Every new domain on a page requires a full roundtrip to do the DNS lookup.

Initial Connection / Connecting

Time it took to establish a connection, including TCP handshakes/retries and negotiating a SSL.

SSL

Time spent completing a SSL handshake.

Request Sent / Sending

Time spent issuing the network request. Typically a fraction of a millisecond.

Waiting (TTFB)

Time spent waiting for the initial response, also known as the Time To First Byte. This time captures the latency of a round trip to the server in addition to the time spent waiting for the server to deliver the response.

Content Download / Downloading

Time spent receiving the response data.

Common Problems

Queued or Stalled

This indicates that too many resources are being retrieved from a single client. On HTTP 1.0/1.1 connections, Chrome enforces a maximum of six TCP connections per host.

Slow Time to First Byte

1. Bad network conditions between client and server, or
2. A slowly responding server application

Network

Simulation

Timeline



CPU Throttling

Challenge Time!

Timing

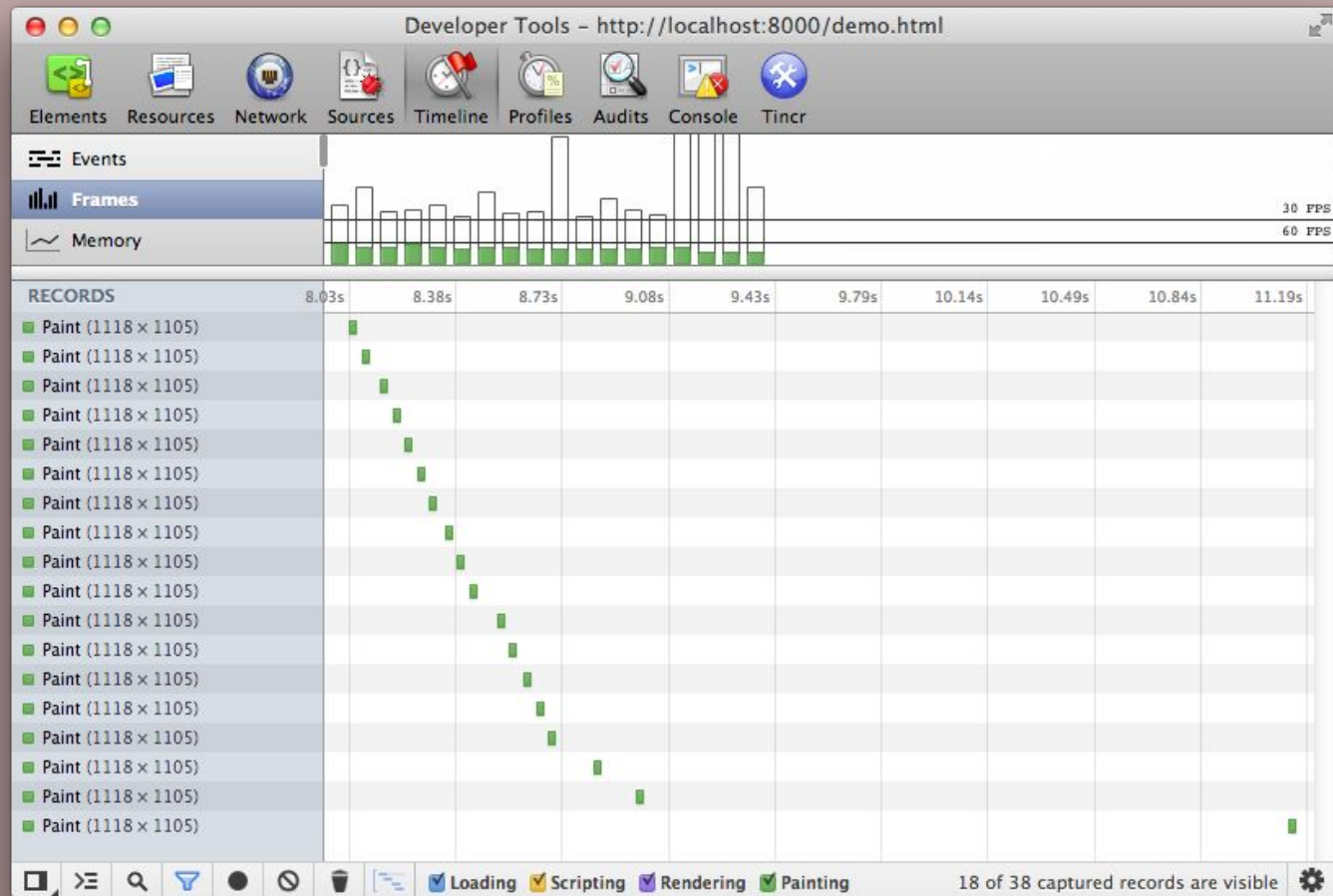
```
1      0.1 ms function doSomeWork() {  
2          createSomeNodes()  
3          readSomeHeights()  
4      0.3 ms writeSomeHeights()  
5      0.1 ms countSoHigh()  
6      }  
7  
8      function createSomeNodes() {  
9          for (var i = 0; i < 10; i++) {  
10             var div = document.createElement('div')  
11             div.classList = 'list-group-item'  
12      0.1 ms var divContent = document.createTextNode(i)  
13             div.appendChild(divContent)  
14             var list = document.querySelector('#timing')  
15             list.appendChild(div)  
16         }  
    }
```

{ } Line 23, Column 24

Challenge Time!

Page Jank

Jank is any stuttering, juddering or just plain halting that users see when a site or app isn't keeping up with the refresh rate.



60

Frames Per Second

Most devices today refresh their screens 60 times a second. The browser needs to match the device's refresh rate and put up 1 new picture, or frame, for each of those screen refreshes.

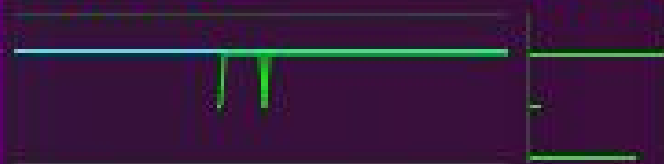
Each of those frames has a budget of just over 16ms ($1 \text{ second} / 60 = 16.66\text{ms}$). In reality, however, the browser has housekeeping work to do, so all of your work needs to be completed inside 10ms.

Timeline (again)

Frame Rate

59.9 fps

30-60



GPU Raster

off (-40>100)

GPU Memory

3.8 MB used

512.0 MB max



```
// Read
var h1 = element1.clientHeight;

// Write (invalidates layout)
element1.style.height = (h1 * 2) + 'px';

// Read (triggers layout)
var h2 = element2.clientHeight;

// Write (invalidates layout)
element2.style.height = (h2 * 2) + 'px';

// Read (triggers layout)
var h3 = element3.clientHeight;

// Write (invalidates layout)
element3.style.height = (h3 * 2) + 'px';
```



```
Window.requestAnimationFrame()
```



This repository

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Pull requests

Issues

Gist



wilsonpage / fastdom

Watch

119

★ Unstar

3,302

Fork

128

<> Code

Issues 2

Pull requests 1

Wiki

Pulse

Graphs

Eliminates layout thrashing by batching DOM measurement and mutation tasks

246 commits

9 branches

22 releases

15 contributors

Branch: master

New pull request

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wilsonpage Merge pull request #83 from wilsonpage/81-fastdom-promised-ctx

Latest commit bbd191 23 days ago

examples	V1	5 months ago
extensions	Fixed incorrect context in fastdom-promised (closes #81)	23 days ago
src	V1	5 months ago
test	Fixed incorrect context in fastdom-promised (closes #81)	23 days ago
.gitignore	V1	5 months ago
.jshintignore	V1	5 months ago

Show Paint Rectangles



koalastothemax.com

will-change

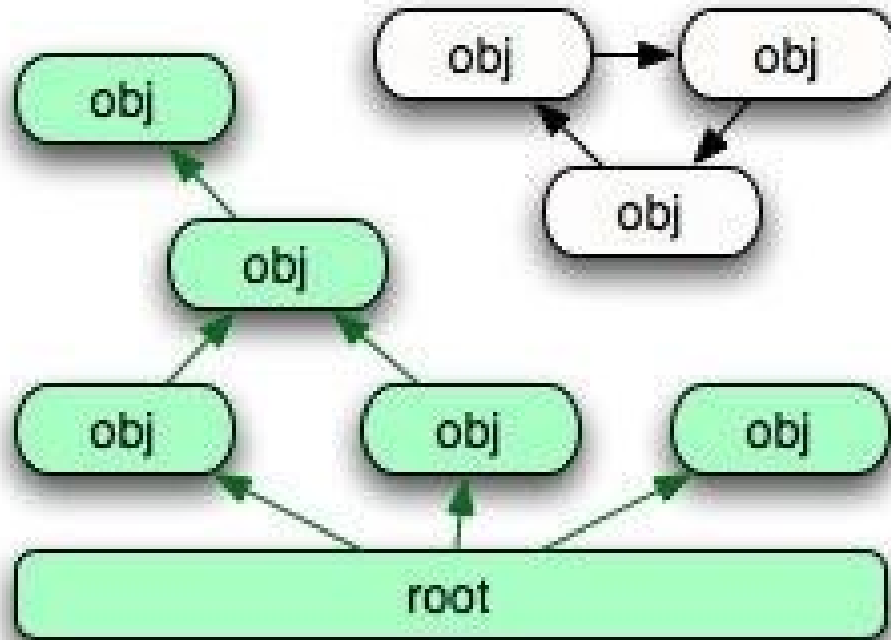
will-change?

Challenge Time!

Memory Leaks



Garbage Collection



Common JavaScript Memory Leaks

The Accidental Global

```
1  
2  function foo() {  
3      bar = "this is probably not what you meant";  
4  }
```

The Forgotten Interval

```
1  
2  var bigData = getData();  
3  setInterval(function() {  
4      document.body.innerHTML = JSON.stringify(bigData);  
5  }, 1000);
```

The DOM and not the DOM

```
1
2  var button = document.getElementById('button');
3  // Then later..
4  function removeButton() {
5      document.body.removeChild(document.getElementById('button'));
6  }
```

Challenge Time!

Experiments!



Where do we go
from here?

@ChromeDevTools

@firefoxdevtools

@EdgeDevTools

@paul_irish

@addyosmani

<http://jankfree.org/>

<https://developers.google.com/web/tools/chrome-devtools/>



Browser Rendering Optimization



Advanced

This course will demystify the browser's rendering pipeline and make it easy for you to build high performance web apps.

BUILT BY **Google**

Thanks!



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