Using Safari to Deliver and Debug a Responsive Web Design

Session 505

Jono Wells Safari and WebKit Engineer

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WebKit

Safari

NEW

NEW

Web Inspector

NEW

Web Inspector

+

Responsive Design Mode

Web Inspector

Web Inspector — index.html

Resources | Timelines | Debugger | Console | 8 | – | – | 0 | 4 | 0 | Inspect | Layers | Styles | Node | Resource

fifth

- index.html
  - logo-white.png
  - AnimationClip.js
  - galleryData.js
  - index.js
  - NavigationGalleriesController.js
  - NavigationGallery.js
  - style.css
- Local Storage
- Session Storage

Filter Resource List

index.html 〉 DOM Tree 〉 html 〉 body

```
<!DOCTYPE html>
▼<html>
  ▼<head>
    <title>M</title>
    <link rel="stylesheet" href="styles/style.css">
  </head>
  ▼<body>
    ▼<nav class="overlay-navigation">
      <img class="site-icon" src="assets/logo-white.png"
      height="80" width="96" alt>
      <div class="overlay-backdrop"></div>
      ▼<ul>
        ▶<li>…</li>
        ▶<li>…</li>
        ▶<li>…</li>
        ▶<li>…</li>
      </ul>
    </nav>
    ▼<nav class="main-navigation">
      ▼<ul>
        <li data-gallery-key="places"> </li>
        <li data-gallery-key="still_life"> </li>
        <li data-gallery-key="fashion"> </li>
        <li data-gallery-key="people"> </li>
      </ul>
    </nav>
    <script src="scripts/NavigationGallery.js"></script>
    <script src="scripts/
    NavigationGalleriesController.js"></script>
    <script src="scripts/AnimationClip.js"></script>
    <script src="scripts/galleryData.js"></script>
    <script src="scripts/index.js"></script>
  </body>
</html>
```

Computed | Rules | Metrics

☐ Active ☐ Focus ☐ Hover ☐ Visited

body — Style Attribute
No Properties — Click to Edit

+ New Rule

body — style.css:2

```
margin: 0;
font-family: Helvetica;
font-size: 16px;
font-weight: 100;
background-color: #000;
```

body — User Agent Stylesheet

```
display: block;
margin-top: 8px;
margin-right: 8px;
margin-bottom: 8px;
margin-left: 8px;
```

Web Inspector — mphotographyanddesign.com

7 0 1 0

Search

Elements | Resources | Timelines | Debugger | Storage | Console

html > body

```
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      </ul>
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    <script src="scripts/NavigationGalleriesController.js"></script>
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Node | Styles | Layers

Computed | Rules | Metrics

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~~margin-bottom: 8px;~~
~~margin-left: 8px;~~
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Web Inspector — mphotographyanddesign.com

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Elements | Resources | Timelines | Debugger | Storage | Console

html > body

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        ▶ <li>…</li>
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Node | Styles | Layers

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```

Great Performance

60fps

16.67ms

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Search

Elements | Debugger | Timelines | Console

html.js.no-touch.svg.no-ie.no-ie9.no-oldie.sticky 〉 body.page-home

```
<!DOCTYPE html>
▼ <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en-US" lang="en-US" prefix="og: http://ogp.me/ns#"
class="js no-touch svg no-ie no-ie9 no-oldie sticky">
  ▶ <head>…</head>
  ▶ <body class="page-home">…</body>
  </html>
```

www.apple.com

0 0

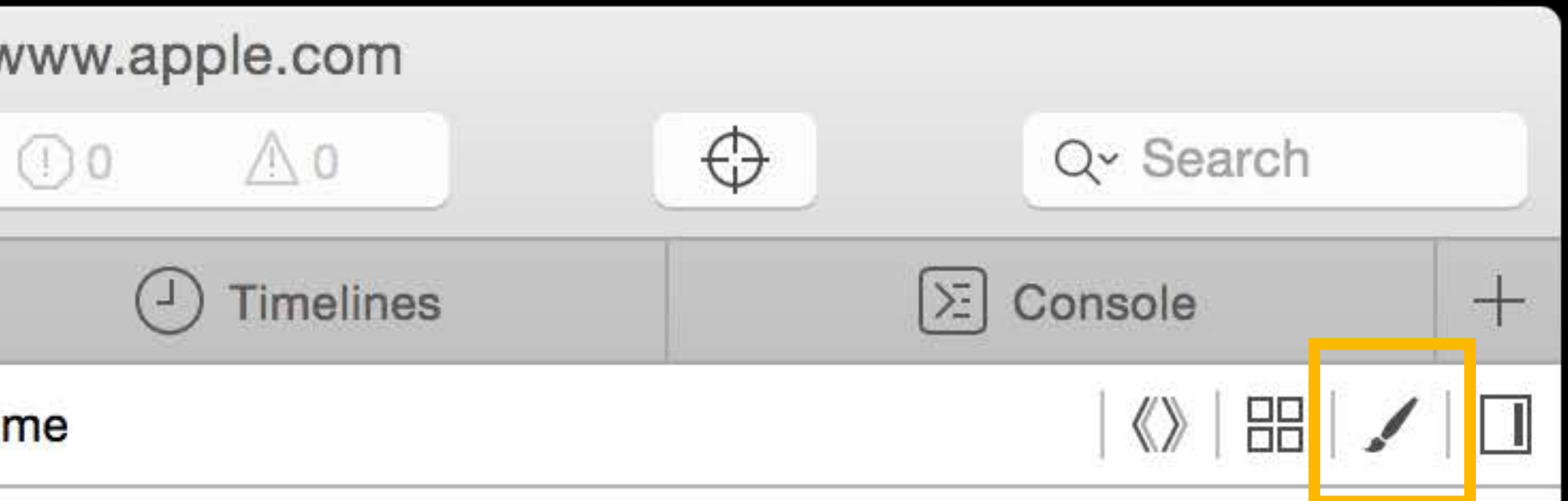
Search

Timelines

Console

me

```
n-US" lang="en-US" prefix="og: http://ogp.me/ns#"
```




```
n-US" lang="en-US" prefix="og: http://ogp.me/ns#"
```

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Timelines

Console

me

n-US" lang="en-US" prefix="og: http://ogp.me/ns#"

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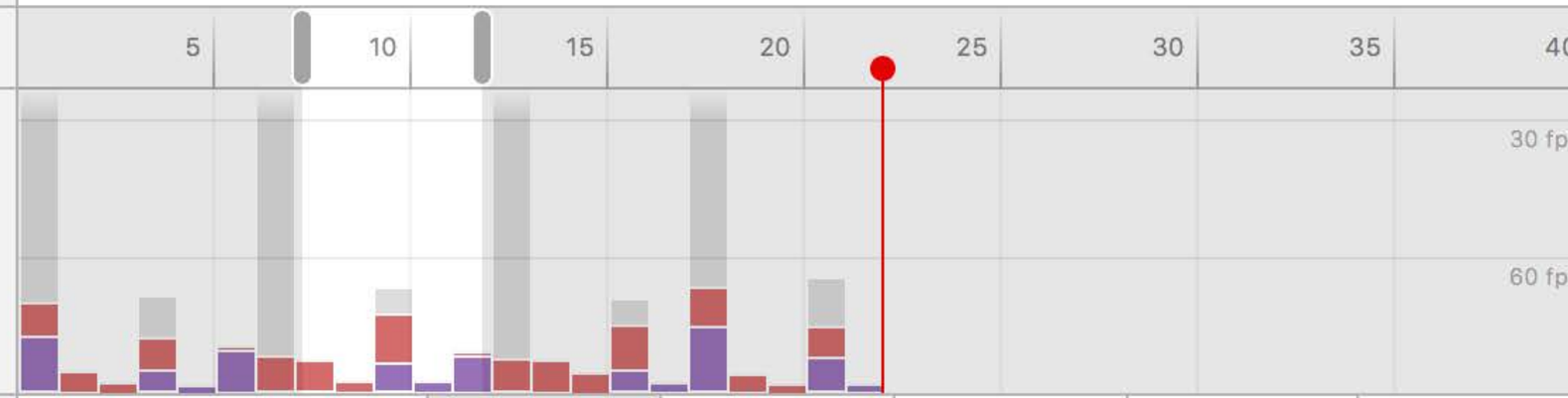
Elements | Resources | Timelines | Debugger | Storage | Console

Timeline Recording 1 〉 Rendering Frames 〉 Frame 10

Timelines **Rendering Frames**

Frames: 8 – 12 (8.15s – 12.96s)

Layout 11.1ms
Script 8.35ms
Other 3.80ms



Records	Location	Start Time	Layout	Script	Other	Total Time
Frame 8	—	5.21s	3.565ms	—	0.259ms	3.824ms
Frame 9	—	5.21s	1.036ms	—	0.106ms	1.142ms
Frame 10	—	5.91s	6.035ms	3.131ms	3.215ms	12.38ms
Styles Invalidated	—	5.91s	—	—	—	0ms
Styles Recalculated	—	5.91s	—	—	—	1.835ms
Layout Invalidated	—	5.91s	—	—	—	0ms
Transition End Event Dispatched	home.built.js:856	5.91s	—	—	—	1.875ms
Styles Invalidated	__setStyle — head.b...	5.91s	—	—	—	0ms
Animation Frame Requested	a — home.built.js:857	5.91s	—	—	—	0ms
Transition End Event Dispatched	home.built.js:856	5.91s	—	—	—	0.413ms

Filter Records

Web Inspector — www.apple.com

45 0 0 30

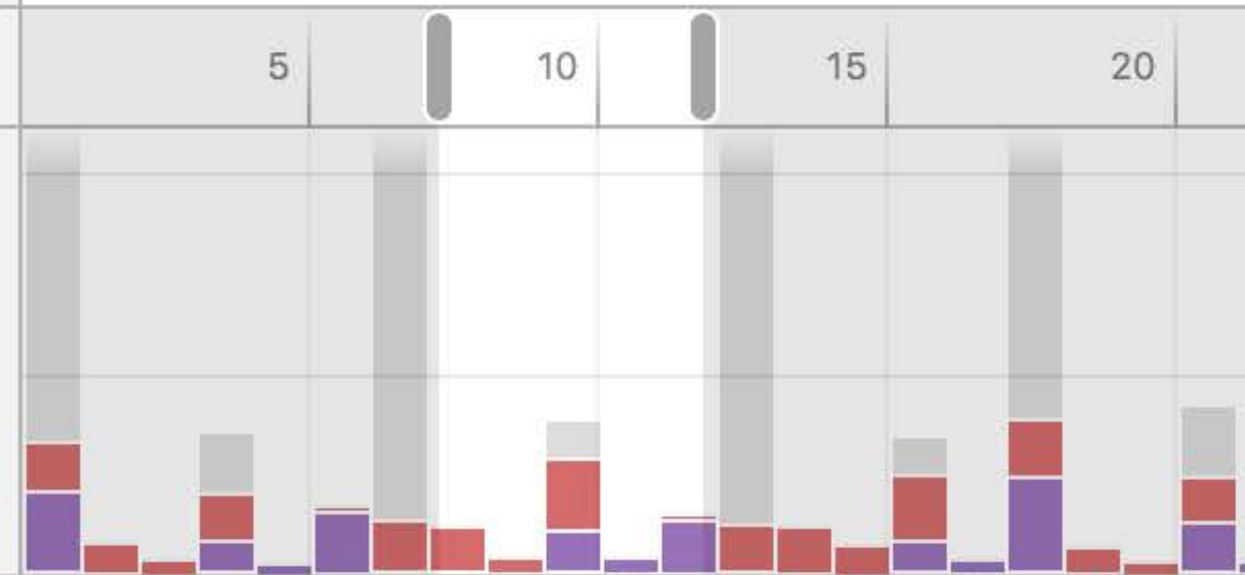
Elements | Resources | Timelines | Debugger

Timeline Recording 1 〉 Rendering

Timelines | Rendering Frames

Frames: 8 – 12 (8.15s – 12.96s)

Layout	11.1ms
Script	8.35ms
Other	3.80ms



Records	Location	Start Time	Layou
Frame 8	—	5.21s	3.565m
Frame 9	—	5.21s	1.036m
Frame 10	—	5.91s	6.035m
Styles Invalidated	—	5.91s	-

Web Inspector — www.apple.com

45 0 0 30

Elements | Resources | Timelines | Debugger

Timeline Recording 1 〉 Rendering

Timelines | Rendering Frames

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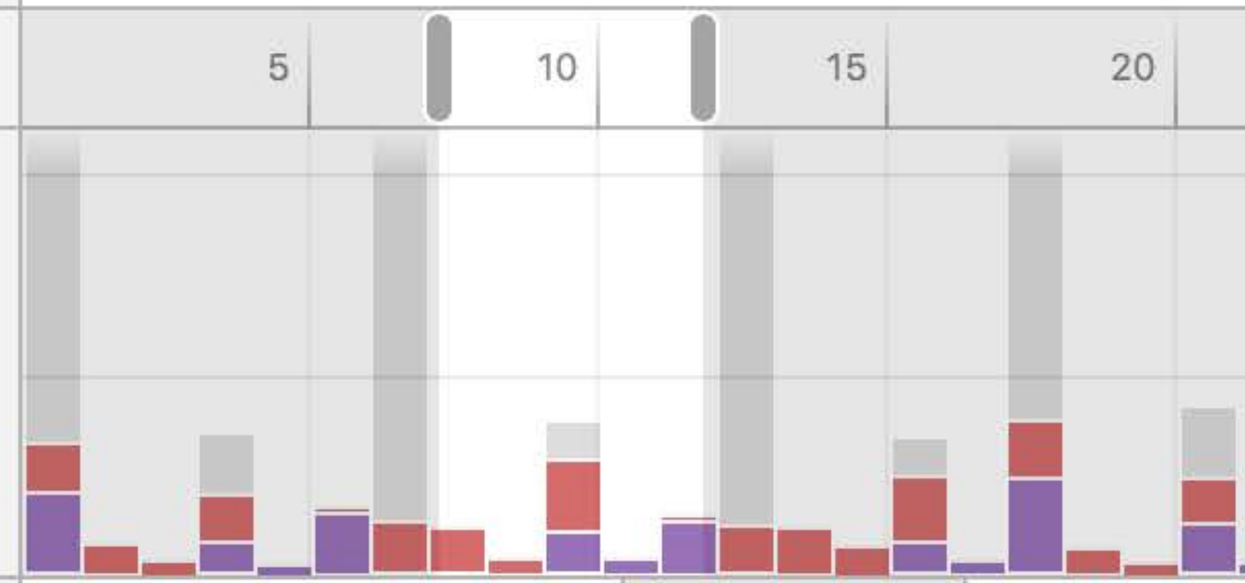
Other	3.80ms



Records	Location	Start Time	Layou
Frame 8	—	5.21s	3.565m
Frame 9	—	5.21s	1.036m
Frame 10	—	5.91s	6.035m
Styles Invalidated	—	5.91s	-

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Timeline Recording 1 〉 Rendering Frames 〉 Frame 10

mes

5 10 15 20 25 30 35

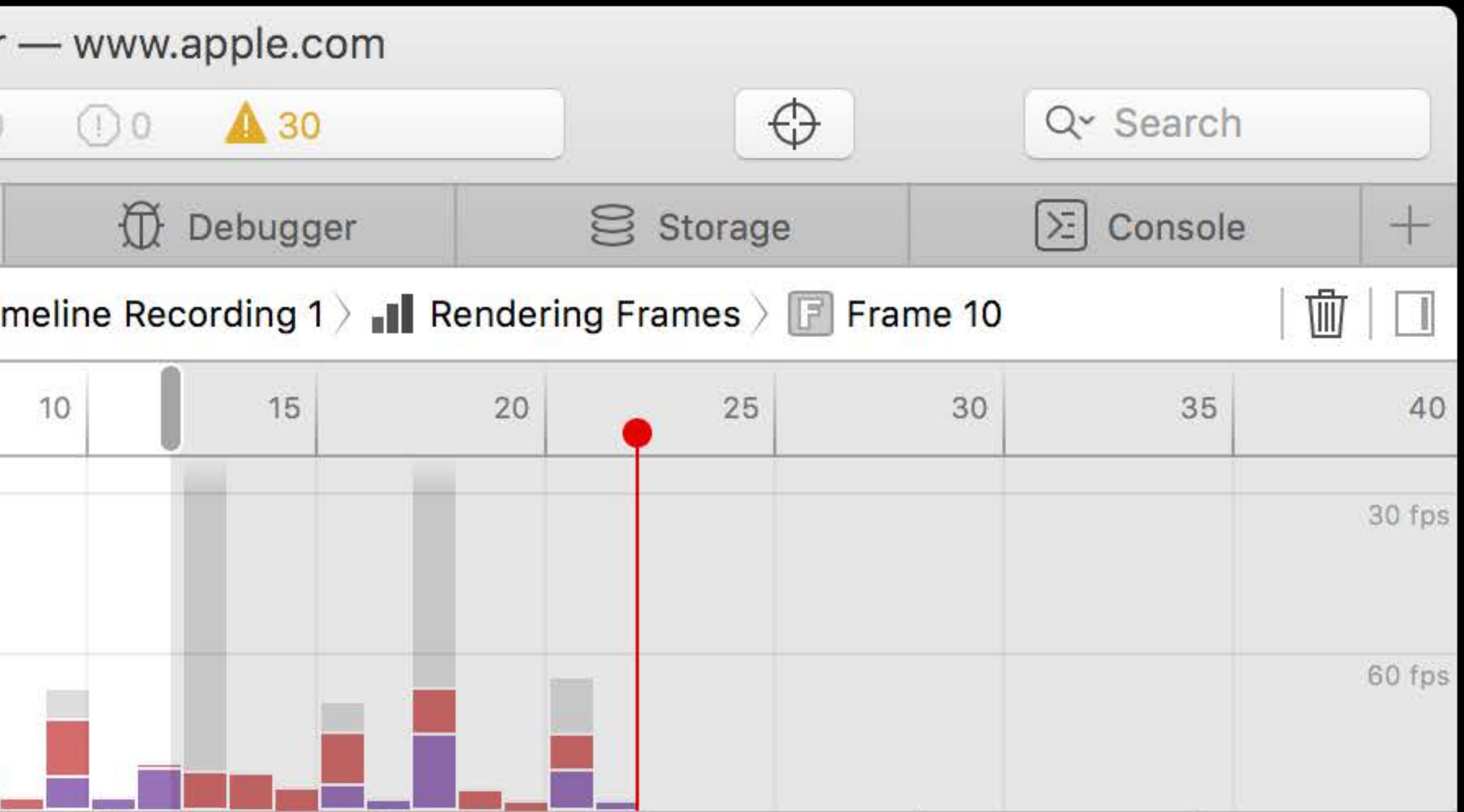
96s)

1.1ms

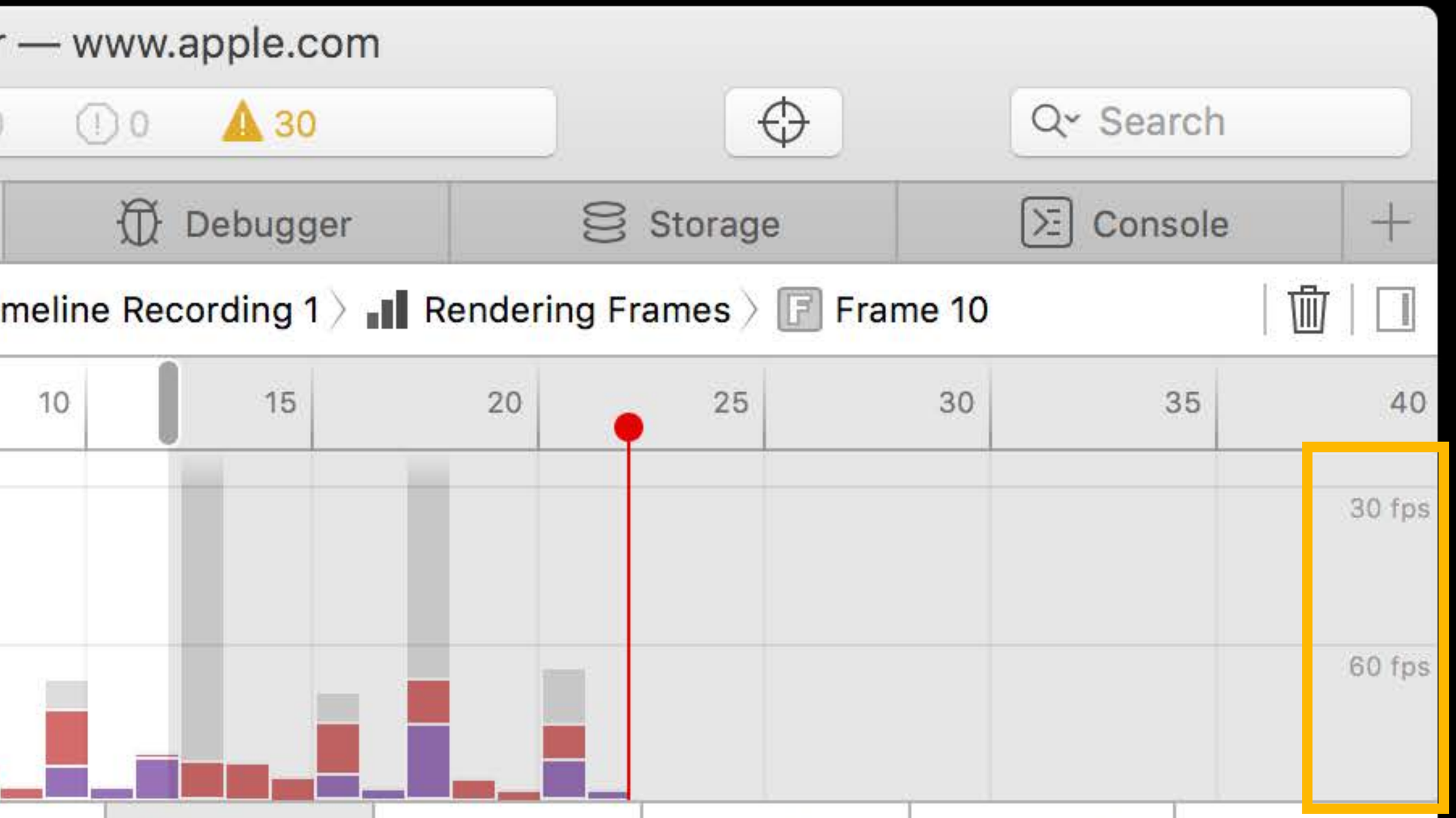
.35ms

.80ms

Location	Start Time	Layout	Script	Other	Total Ti
—	5.21s	3.565ms	—	0.259ms	3.824
—	5.21s	1.036ms	—	0.106ms	1.142
—	5.91s	6.035ms	3.131ms	3.215ms	12.38
—	5.91s	—	—	—	0
—	5.91s	—	—	—	1.835



	Start Time	Layout	Script	Other	Total Time
	5.21s	3.565ms	—	0.259ms	3.824ms
	5.21s	1.036ms	—	0.106ms	1.142ms



Start Time	Layout	Script	Other	Total Time
5.21s	3.565ms	—	0.259ms	3.824ms
5.21s	1.036ms	—	0.106ms	1.142ms

Web Inspector — www.apple.com

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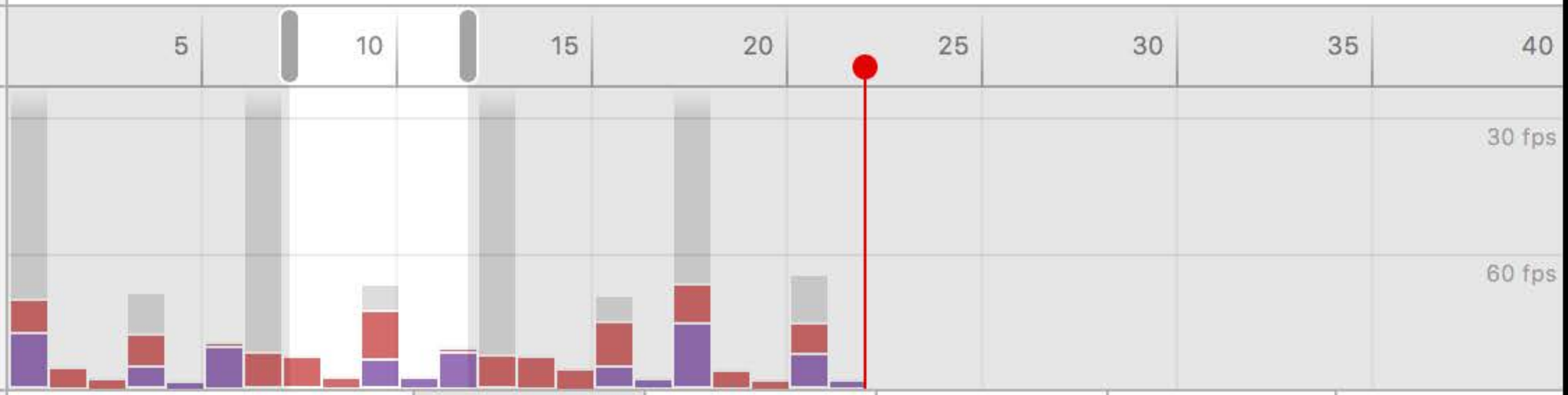
Search

Timelines | Debugger | Storage | Console

Timeline Recording 1 〉 Rendering Frames 〉 Frame 10



Location	Start Time	Layout	Script	Other	Total Time
—	5.21s	3.565ms	—	0.259ms	3.824ms
—	5.21s	1.036ms	—	0.106ms	1.142ms
—	5.91s	6.035ms	3.131ms	3.215ms	12.38ms
—	5.91s	—	—	—	0ms
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Web Inspector — www.apple.com

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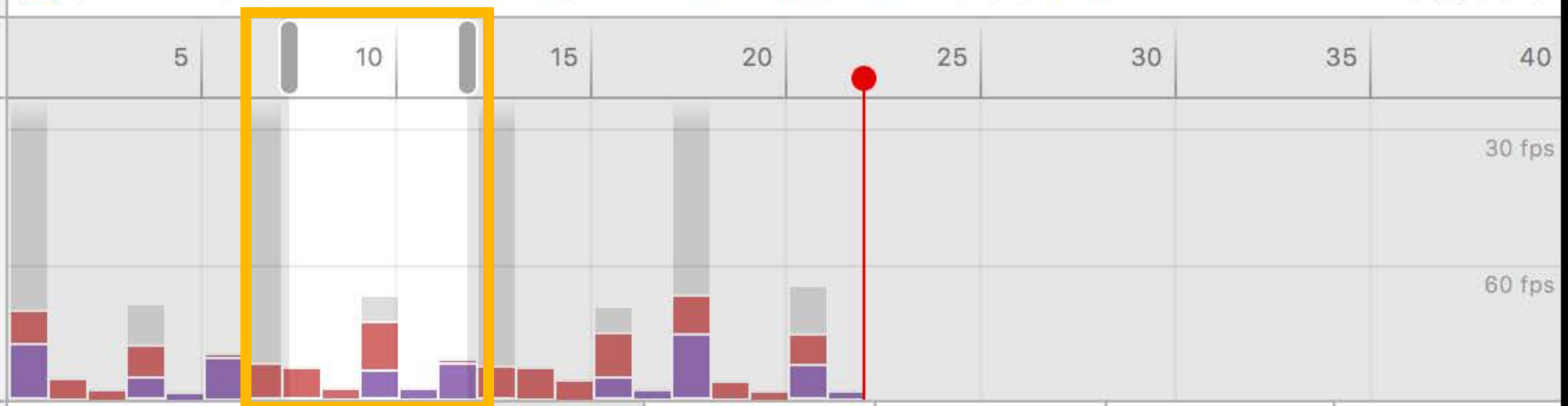
Timelines | Debugger | Storage | Console

Timeline Recording 1 〉 Rendering Frames 〉 Frame 10



Location	Start Time	Layout	Script	Other	Total Time
—	5.21s	3.565ms	—	0.259ms	3.824ms
—	5.21s	1.036ms	—	0.106ms	1.142ms
—	5.91s	6.035ms	3.131ms	3.215ms	12.38ms
—	5.91s	—	—	—	0ms
—	5.91s	—	—	—	1.835ms

Timelines | Rendering Frames

5 10 15

Frames: 8 – 12 (8.15s – 12.96s)

Layout	11.1ms
Script	8.35ms
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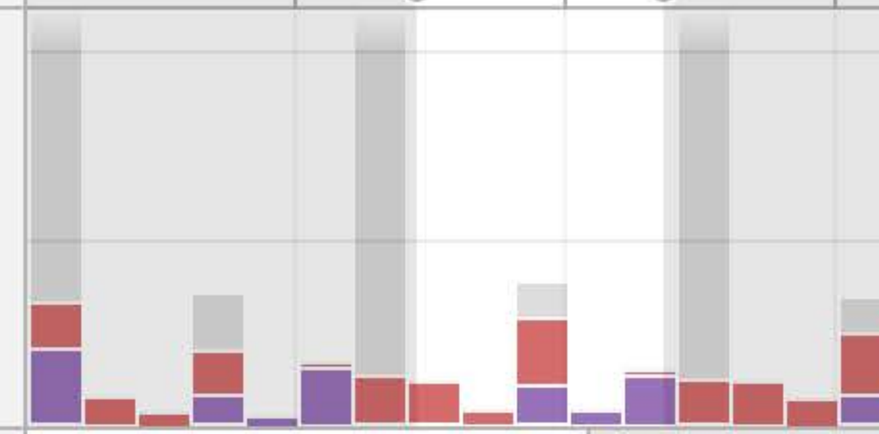

Records	Location	Start Time
Frame 8	—	5.21s
Frame 9	—	5.21s
Frame 10	—	5.91s
Styles Invalidated	—	5.91s
Styles Recalculated	—	5.91s
Layout Invalidated	—	5.91s
Transition End Event Dispatched	home.built.js:856	5.91s
Styles Invalidated	__setStyle — head.b...	5.91s
Animation Frame Requested	a — home.built.js:857	5.91s
Transition End Event Dispatched	home.built.js:856	5.91s

Filter Records

Timelines | Rendering Frames

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Layout	11.1ms
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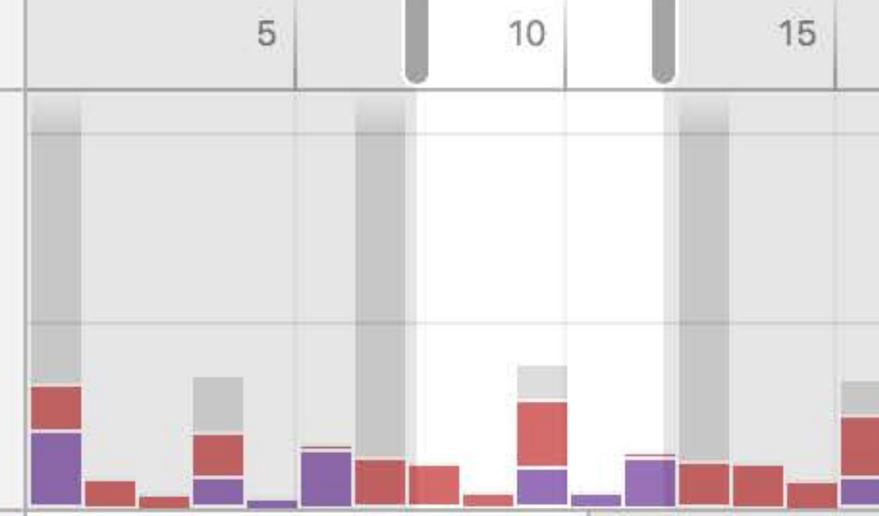

Records	Location	Start Time
Frame 8	—	5.21s
Frame 9	—	5.21s
Frame 10	—	5.91s
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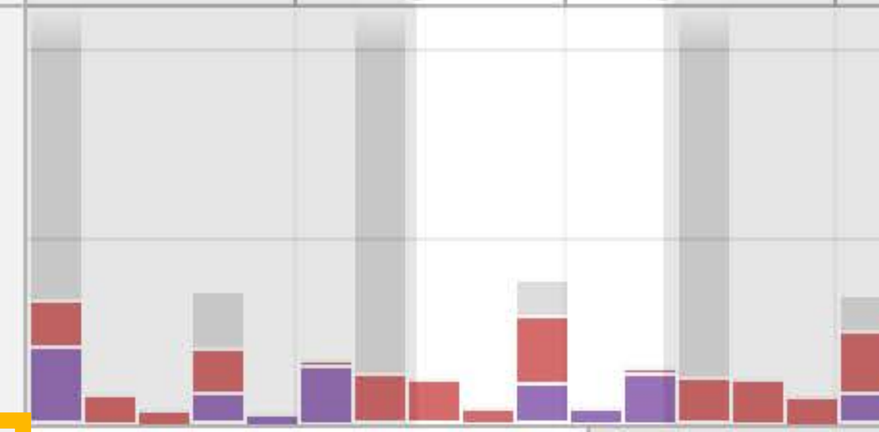

Records	Location	Start Time
Frame 8	—	5.21s
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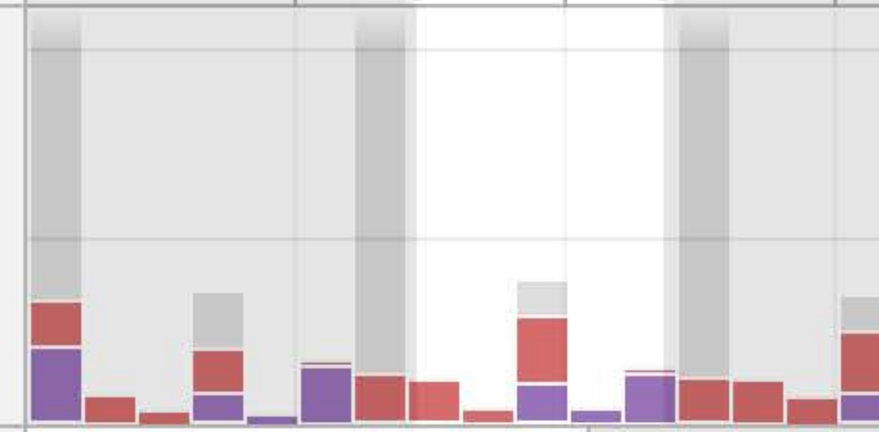

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Filter Records

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Timeline Recording 1 › Rendering Frames

Timelines **Rendering Frames**

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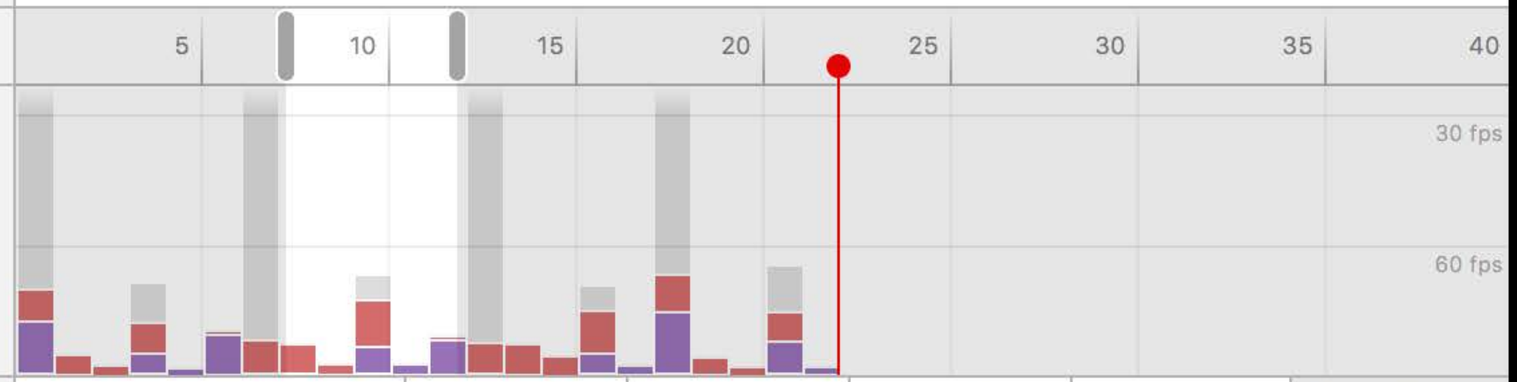
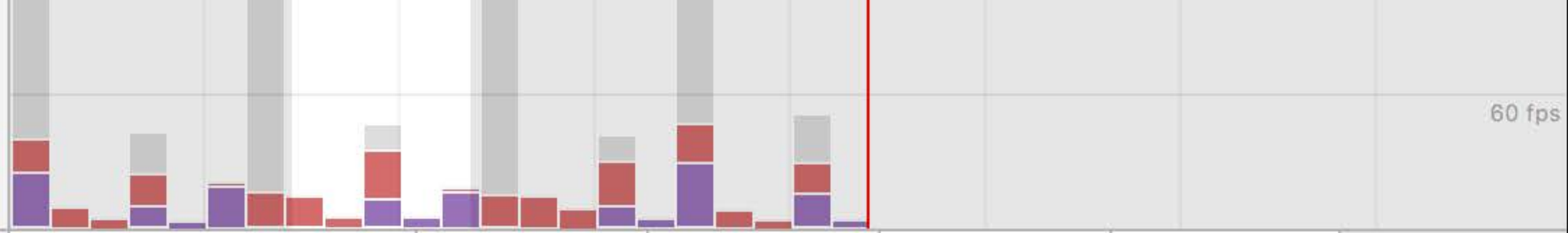


Records	Location	Start Time	Layout	Script	Other	Total Time
Frame 10	—	5.91s	6.035ms	3.131ms	3.215ms	12.38ms
Frame 12	—	10.02s	0.427ms	4.196ms	0.116ms	4.739ms
Frame 8	—	5.21s	3.565ms	—	0.259ms	3.824ms
Frame 9	—	5.21s	1.036ms	—	0.106ms	1.142ms
Frame 11	—	5.93s	—	1.023ms	0.106ms	1.129ms

Filter Records



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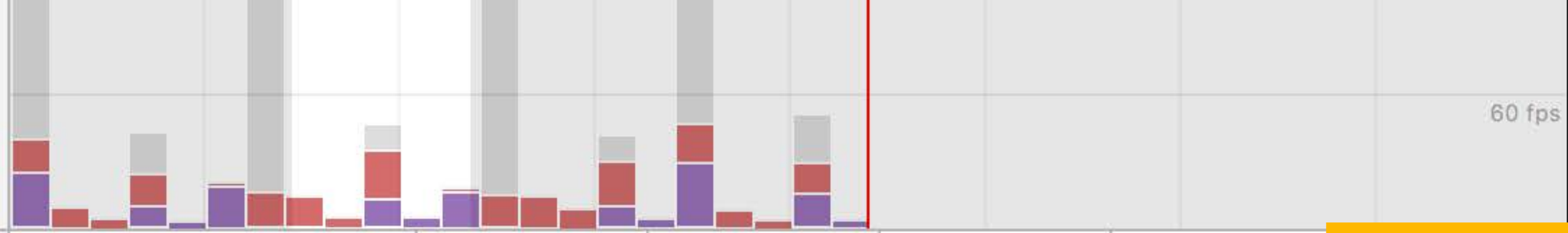

Location	Start Time	Layout	Script	Other	Total Time
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—	10.02s	0.427ms	4.196ms	0.116ms	4.739ms
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—	5.21s	1.036ms	—	0.106ms	1.142ms
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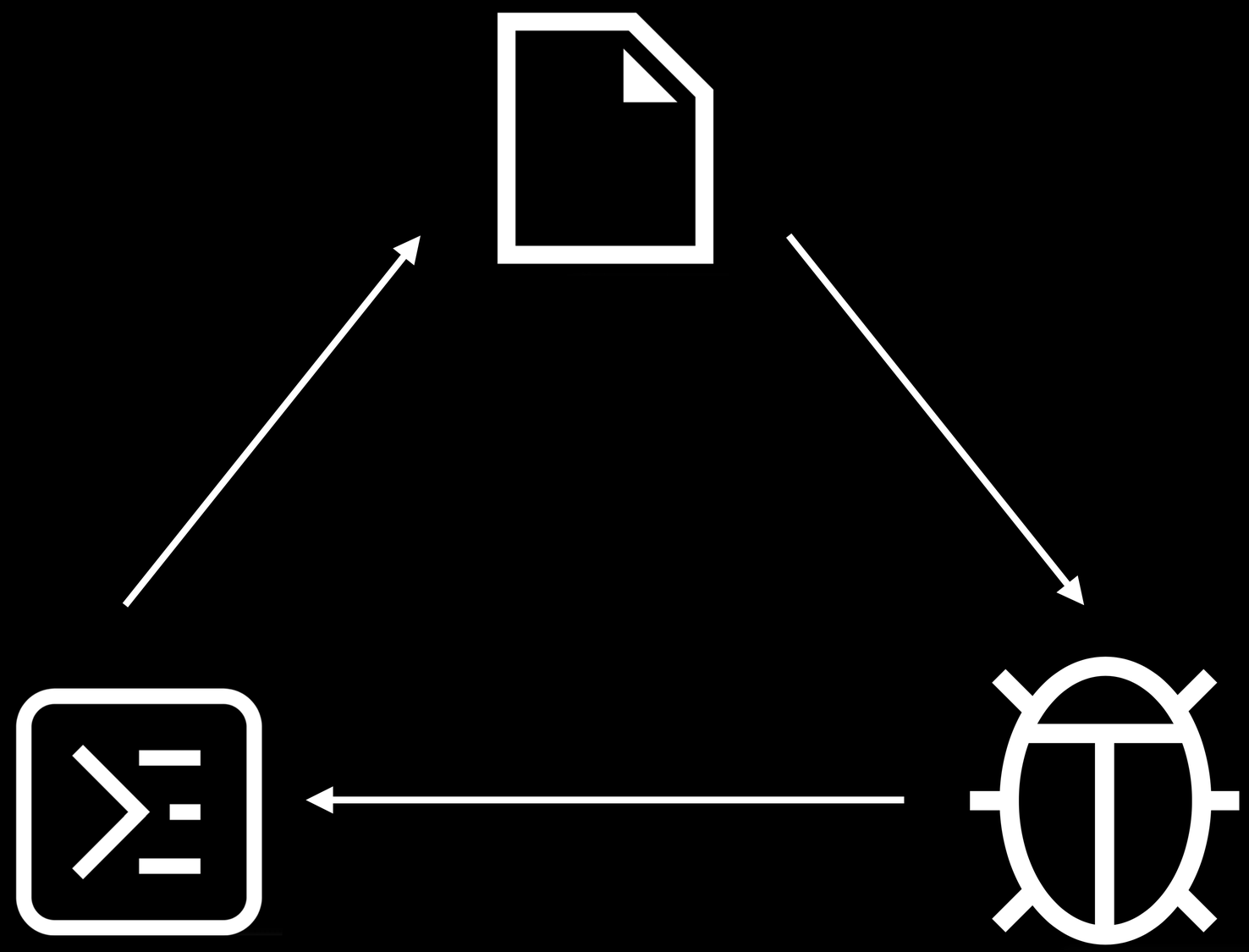
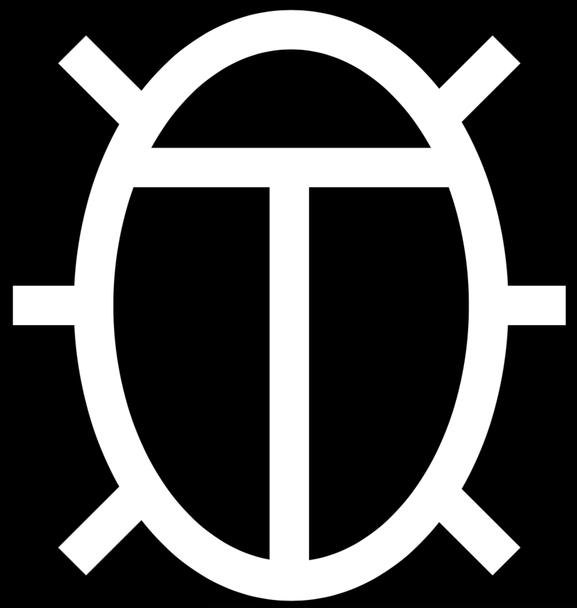
Do Without Thinking





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Global Breakpoints
- All Exceptions
- All Uncaught Exceptions

index.js
- Line 13:16 There may be a problem below.
- Line 15:33 Can't find variable: opptions

Filter Breakpoint List

index.js

```
1  // Define a Main class, that has static methods for instantiating page content
2  class Main {
3      static initialize() {
4          // Create navigation galleries with a controller for updating images
5          this.navigationGalleriesController = new NavigationGalleriesController({
6              galleryData : window.galleryData
7          });
8
9          this._boundOnFadeInComplete = this._onFadeInComplete.bind( this );
10         this.mainNavigation = document.querySelector('.main-navigation');
11
12         this.mainNavigation.addEventListener( 'transitionend', this._boundOnFadeInComplete );
13         console.warn("There may be a problem below.");                    ⚠ There may be a problem below.
14         document.querySelector('.main-navigation').classList.add('ready');
15         this.animationType = opptions.animationType;                      ⊗ Can't find variable: opptions
16     }
17
18     static _onFadeInComplete() {
19         this.navigationGalleriesController.startAnimationTimeout();
20         this.mainNavigation.removeEventListener('transitionend', this._boundOnFadeInComplete );
21     }
22 }
23
24 // When window content is loaded, run Main's initialize method
25 window.addEventListener( 'load', Main.initialize.bind( Main ) );
```

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Global Breakpoints

- All Exceptions
- All Uncaught Exceptions
- index.js
  - Line 13:16 There may be a problem below.
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9          this._boundOnFadeInComplete = this._onFadeInComplete.bind( this );
10         this.mainNavigation = document.querySelector('.main-navigation');
11
12         this.mainNavigation.addEventListener( 'transitionend', this._boundOnFadeInComplete );
13         console.warn("There may be a problem below.");
14         document.querySelector('.main-navigation').classList.add('read');
15         this.animationType = opptions.animationType;
16     }
17
18     static _onFadeInComplete() {
19         this.navigationGalleriesController.startAnimationTimeout();
20         this.mainNavigation.removeEventListener('transitionend', this._boundOnFadeInComplete );
21     }
22 }
23
24 // When window content is loaded, run Main's initialize method
25 window.addEventListener( 'load', Main.initialize.bind( Main ) );
```

There may be a problem below.

Can't find variable: opptions

Web Inspector — mphotographyanddesign.com

229 0 1 1

Search

Elements | Resources | Timelines | Debugger | Storage | Console

Filter Console Log | All | Errors | Warnings | Logs

There may be a problem below. index.js:13

ReferenceError: Can't find variable: opptions index.js:15

```
var name = "Trevor";

var age = 28;

var obj = {};
```

```
var String name = "Trevor";

var Integer age = 28;

var Object obj = {};
```

```
function add(value1, value2) {
    var result = value1 + value2;
    return result;
}
```

```
var v1 = 2.3, v2 = "2.7";
add(v1, v2); // => "2.32.7"
```

```
function add(value1, value2) {
    var result = value1 + value2;
    return result;
}
```

```
var v1 = 2.3, v2 = "2.7";
add(v1, v2); // => "2.32.7"
```

```
function add( Double value1, String value2) String {
    var String result = value1 + value2;
    return result;
}
```

```
var v1 = 2.3, v2 = "2.7";
add(v1, v2); // => "2.32.7"
```

```
function add( Double value1, String value2) String {
    var String result = value1 + value2;
    return result;
}
```

```
var v1 = 2.3, v2 = "2.7";
add(v1, v2); // => "2.32.7"
```

Web Inspector — index.html

7 0 0 0

Search

Elements | Resources | Timelines | Storage | Console

index.html | script.js

```
    addSibling(person) {
        if (this._siblings.indexOf(person) < 0) {
            this._siblings.push(person);
            person.siblings.push(this);
        }
    }

    isRelatedTo(person) {
        return this._siblings.indexOf(person) > -1;
    }

    changeName(firstName, lastName) {
        this._firstName = firstName;
        this._lastName = lastName;
    }
}

class DeveloperPerson extends Person {
    constructor(firstName, lastName, age, editor) {
        super(firstName, lastName, age);
        this._editor = editor;
    }

    get editor() {
        return this._editor;
    }
```

Web Inspector — index.html

7 0 0 0

Search

Resources | Timelines | Storage | Console

cript.js

```
gs.indexOf(person) < 0) {
gs.push(person);
ngs.push(this);


{
lings.indexOf(person) > -1;


, lastName) {
= firstName;
lastName;
```

Web Inspector — index.html

7 0 0 0

Search

Resources | Timelines | Storage | Console

cript.js

```
gs.indexOf(person) < 0) {
gs.push(person);
ngs.push(this);


{
lings.indexOf(person) > -1;


, lastName) {
= firstName;
lastName;
```

Web Inspector — index.html

Elements | Resources | Timelines | Storage | Console

index.html | script.js

```
    addSibling(person) {
        if (this._siblings.indexOf(person) < 0) {
            this._siblings.push(person);
            person.siblings.push(this);
        }
    }

    isRelatedTo(person) {
        return this._siblings.indexOf(person) > -1;
    }

    changeName(firstName, lastName) {
        this._firstName = firstName;
        this._lastName = lastName;
    }
}

class DeveloperPerson extends Person {
    constructor(firstName, lastName, age, editor) {
        super(firstName, lastName, age);
        this._editor = editor;
    }

    get editor() {
        return this._editor;
    }
```

Web Inspector — index.html

7 0 0 0

Search

Elements | Resources | Timelines | Storage | Console

index.html | script.js

```
42      addSibling( Person person) Undefined {
43          if (this._siblings.indexOf(person) < 0) {
44              this._siblings.push(person);
45              person.siblings.push(this);
46          }
47      }
48
49      isRelatedTo(person) {
50          return this._siblings.indexOf(person) > -1;
51      }
52
53      changeName( String firstName, String lastName) Undefined {
54          this._firstName = firstName;
55          this._lastName = lastName;
56      }
57  }
58
59  class DeveloperPerson extends Person {
60      constructor( String firstName, String lastName, Number age, String editor) DeveloperPerson {
61          super(firstName, lastName, age);
62          this._editor = editor;
63      }
64
65      get editor() {
66          return this._editor;
67      }
```

```
ngs.indexOf(person) > -1;

rstName, String lastName) Undefined {
firstName;
astName;


ds Person {
irstName, String lastName, Number age, String editor) DeveloperPerson {
astName, age);
tor;

;
```

```
gs.indexOf(person) > -1;

rstName, String lastName) Undefined {
firstName;
astName;


ds Person {
irstName, String lastName, Number age, String editor) DeveloperPerson {
astName, age);
tor;

;
```

```
function Person() { … }
function DeveloperPerson() {
    Person.call(this);
}
DeveloperPerson.prototype = Object.create(Person.prototype);
DeveloperPerson.prototype.constructor = DeveloperPerson;
```

```
var employee = new DeveloperPerson();
```

```
function Person() { … }
function DeveloperPerson() {
    Person.call(this);
}
DeveloperPerson.prototype = Object.create(Person.prototype);
DeveloperPerson.prototype.constructor = DeveloperPerson;
```

```
var employee = new DeveloperPerson();
```

```
function Person() { … }
function DeveloperPerson() {
    Person.call(this);
}
DeveloperPerson.prototype = Object.create(Person.prototype);
DeveloperPerson.prototype.constructor = DeveloperPerson;
```

```
var DeveloperPerson employee = new DeveloperPerson();
```

```
function Person() { … }
function DeveloperPerson() {
    Person.call(this);
}
DeveloperPerson.prototype = Object.create(Person.prototype);
DeveloperPerson.prototype.constructor = DeveloperPerson;
```

```
var DeveloperPerson employee = new DeveloperPerson();
```

NEW

```
class Person { … }
class DeveloperPerson extends Person { … }
class ManagerPerson extends Person { … }
```

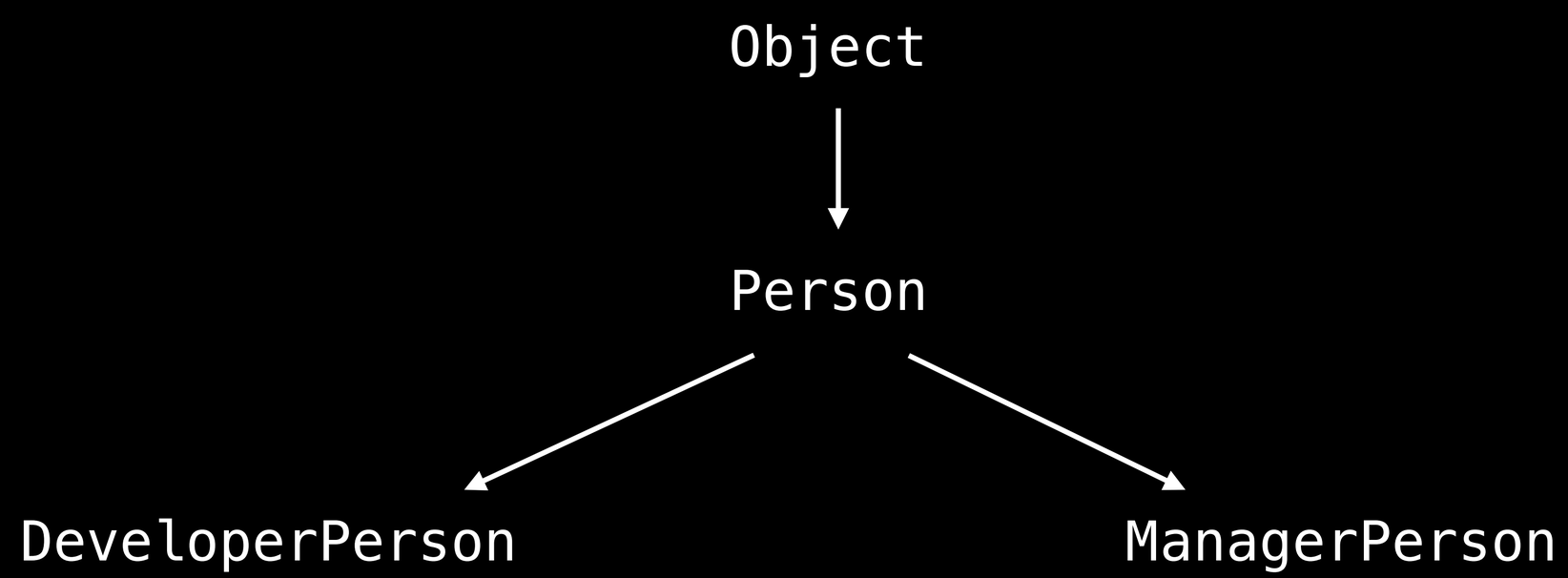
```
var DeveloperPerson employee = new DeveloperPerson();
```

NEW

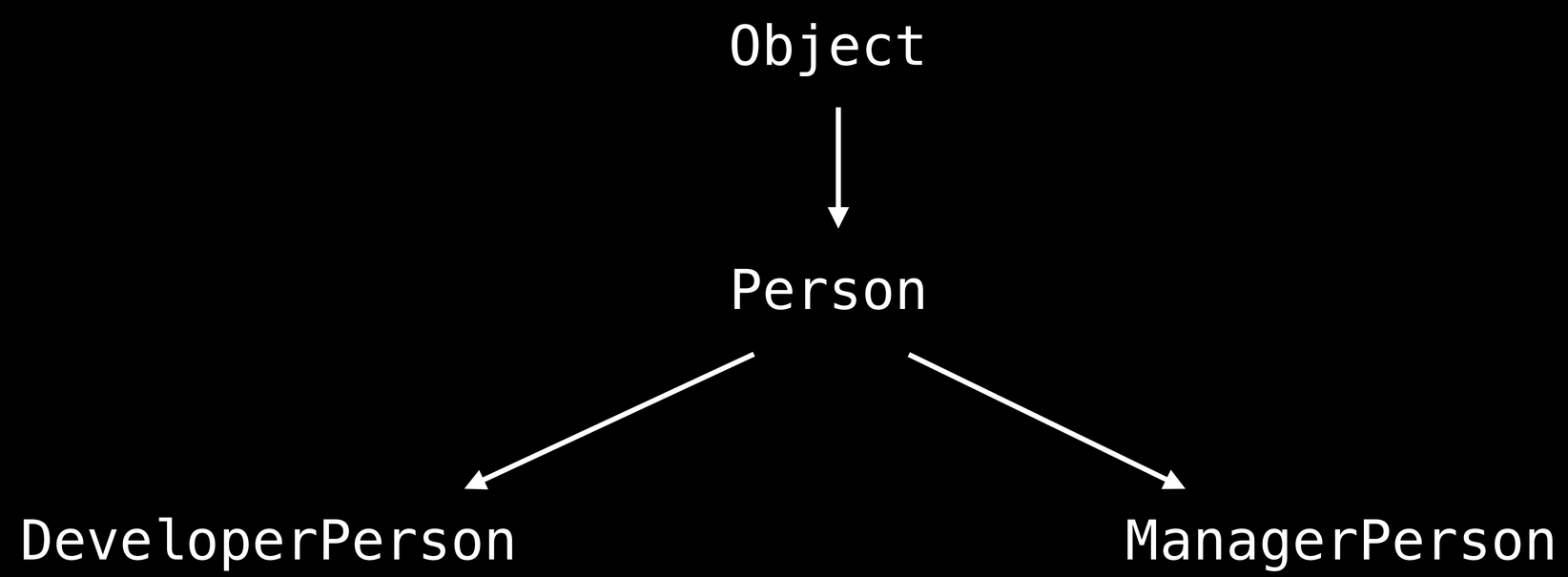
```
class Person { … }
class DeveloperPerson extends Person { … }
class ManagerPerson extends Person { … }
```

```
var DeveloperPerson employee = new DeveloperPerson();
```

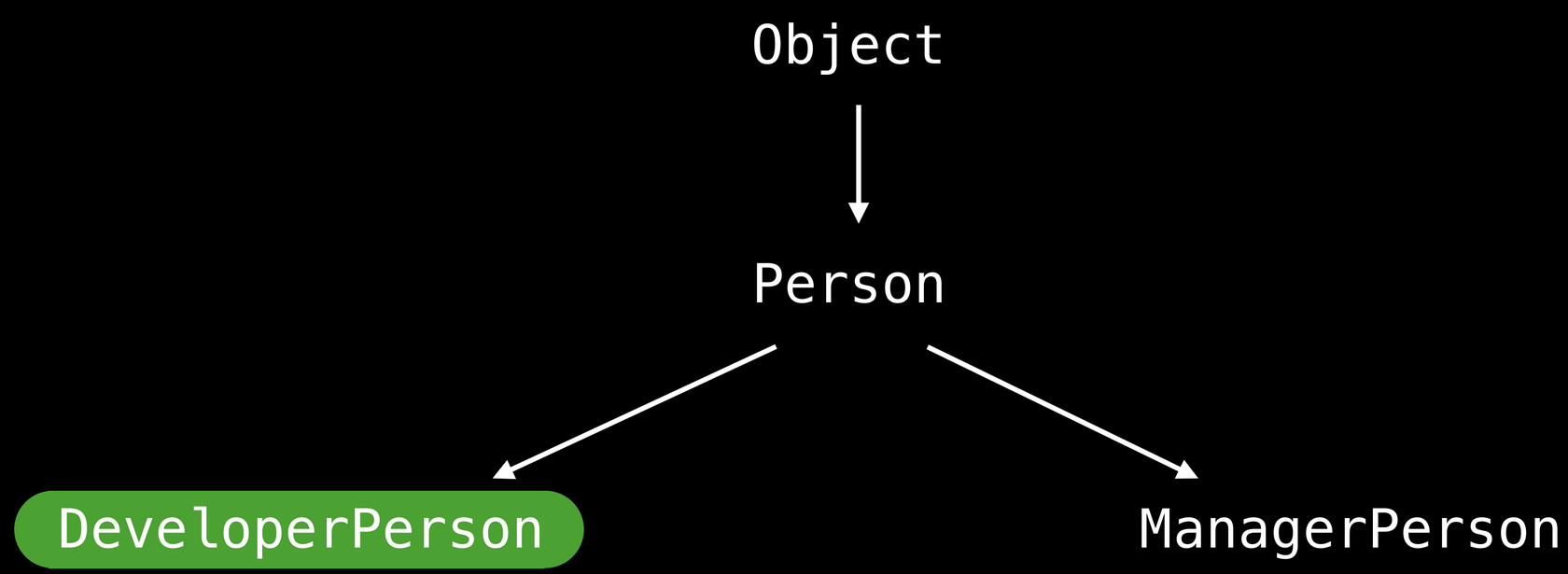
```
function register(person) …
```



```
function register(person) …
```

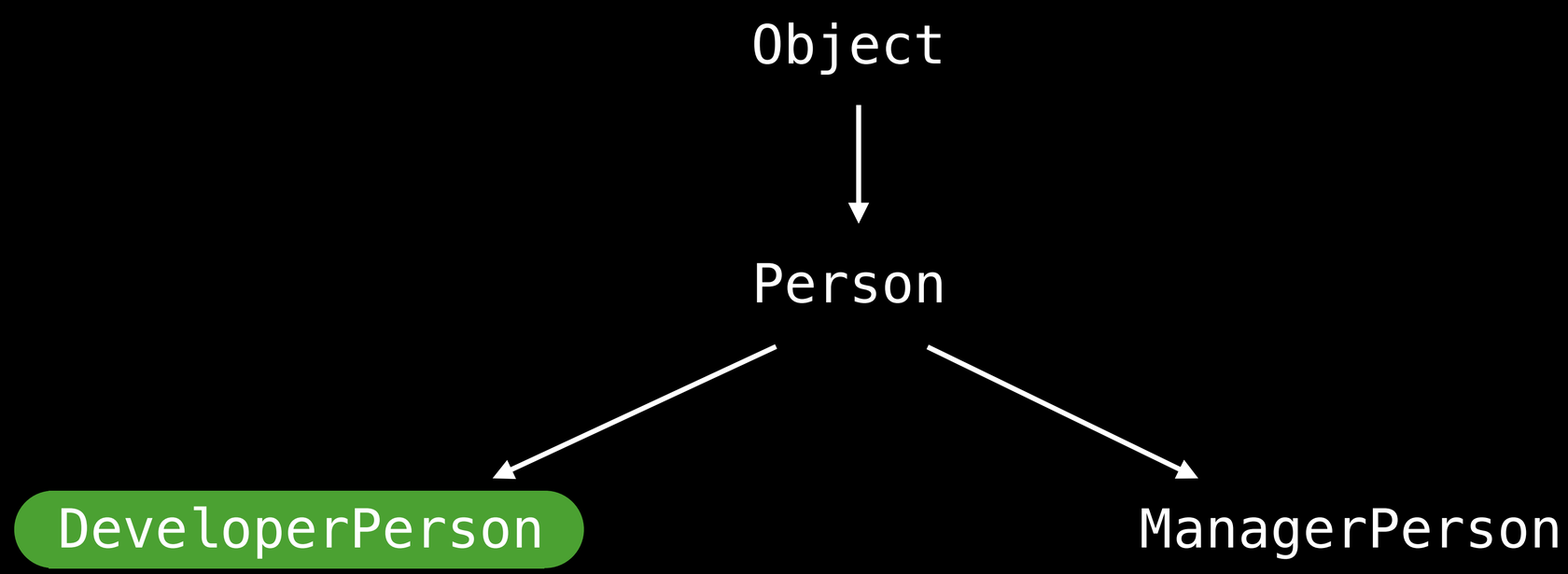


```
function register( DeveloperPerson attendee) …
```



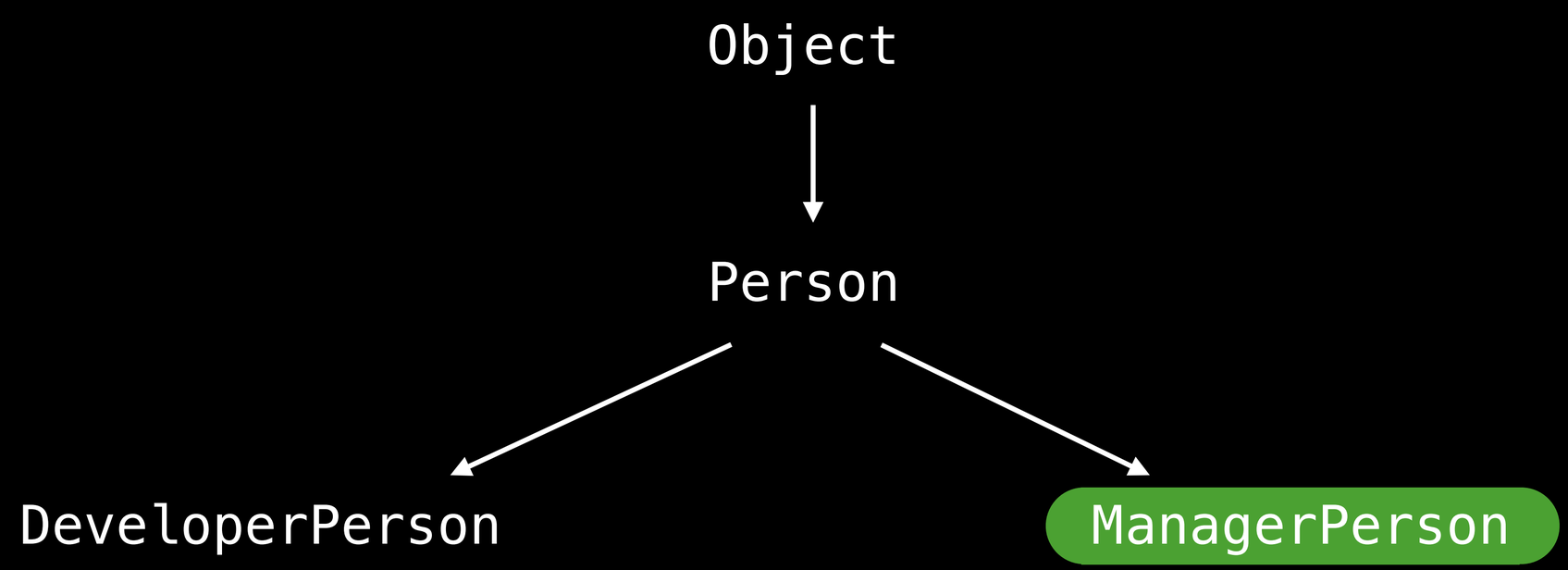

```
register(new DeveloperPerson());
```

```
function register( DeveloperPerson attendee) …
```



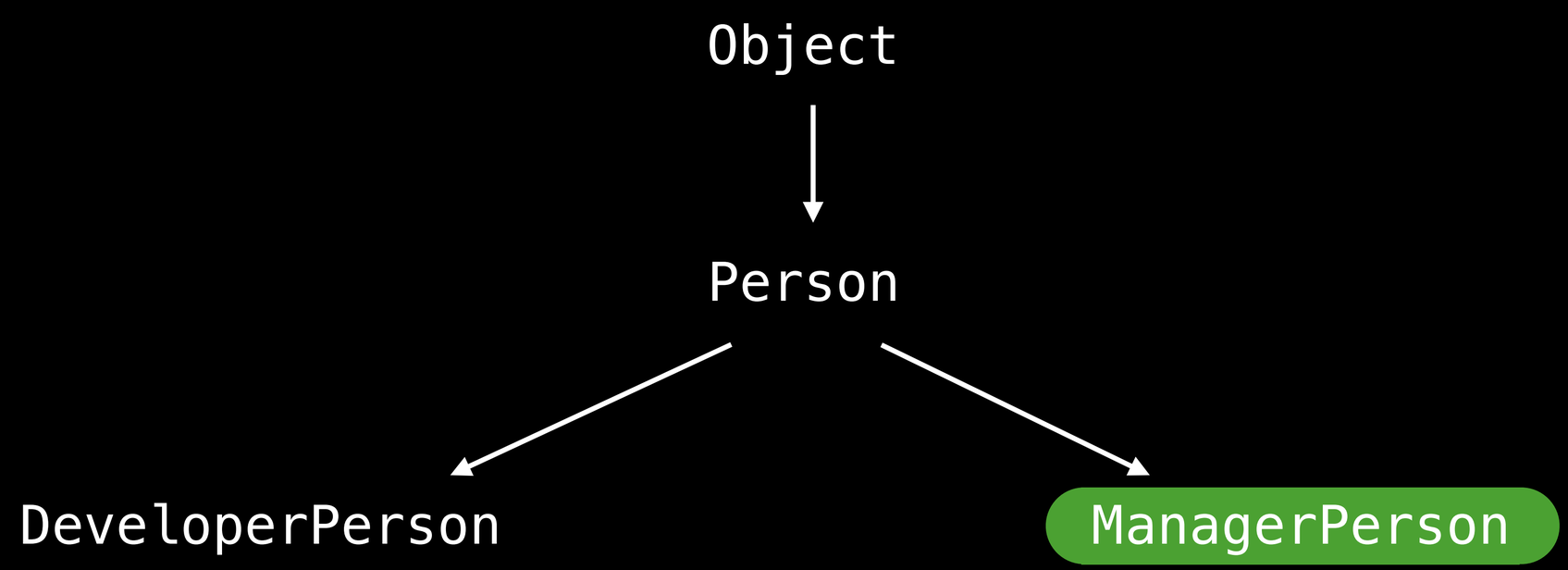

```
register(new DeveloperPerson());
```

```
function register( ManagerPerson attendee) …
```



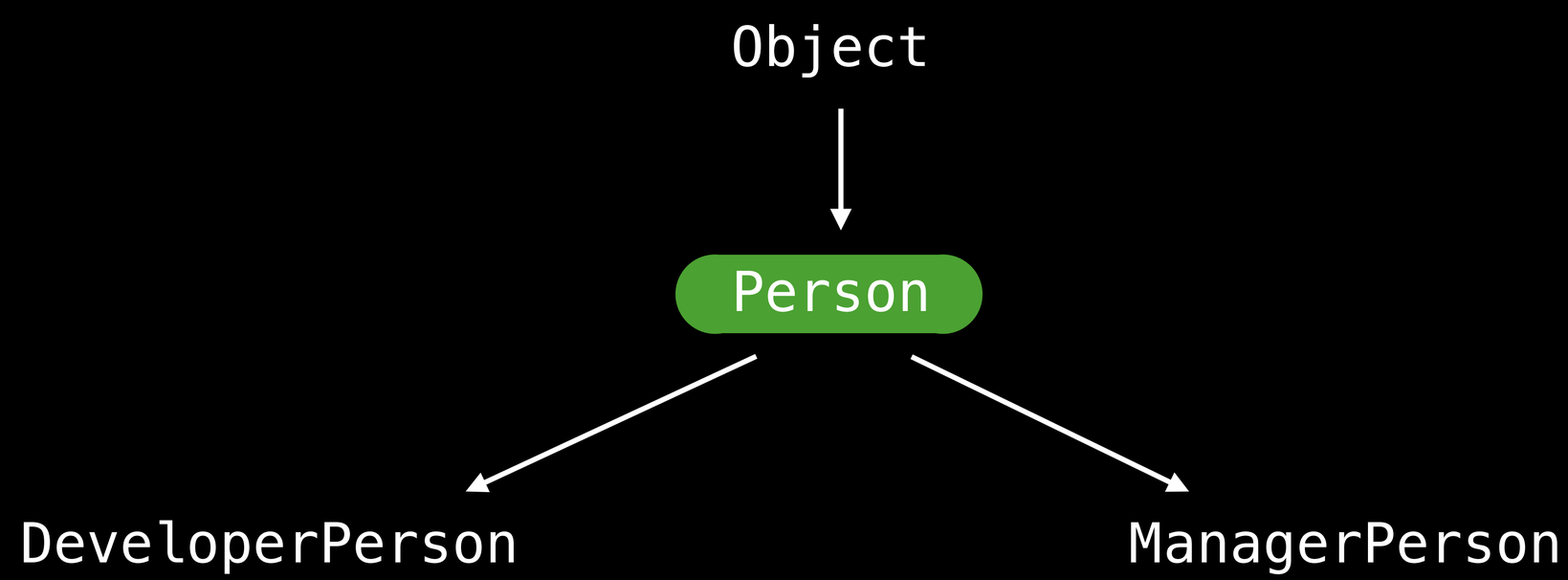

```
register(new ManagerPerson());
```

```
function register( ManagerPerson attendee) …
```



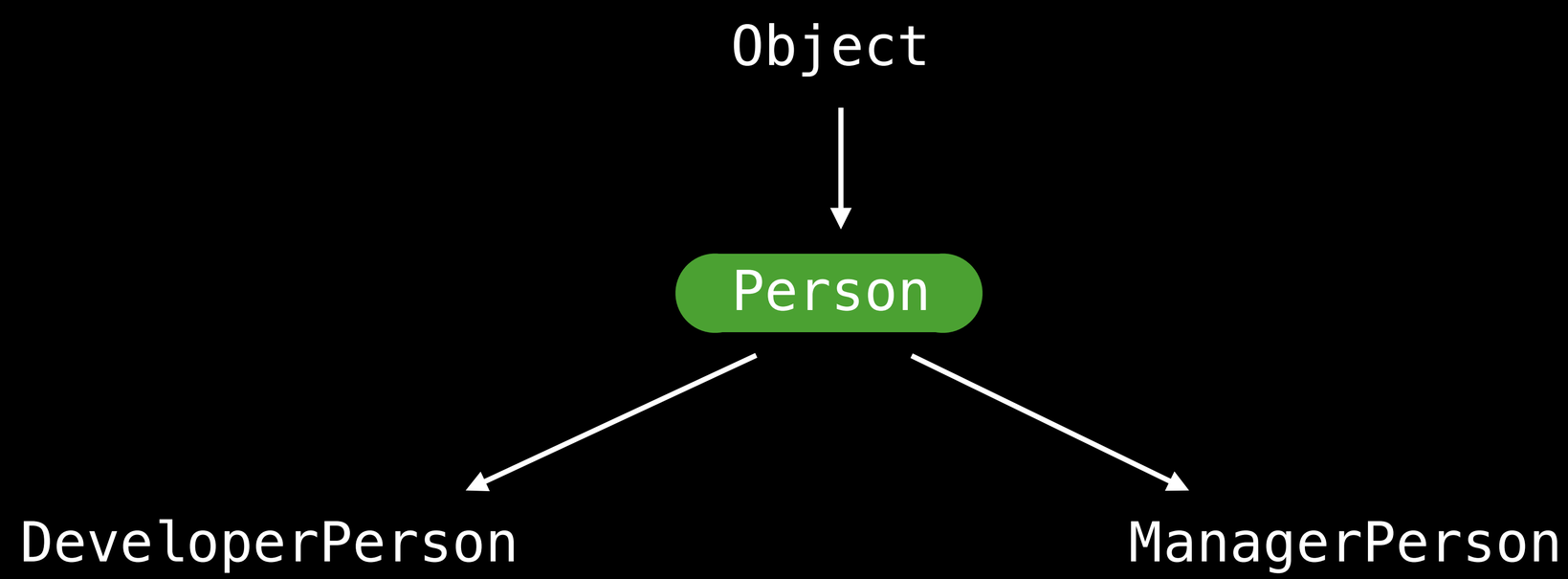

```
register(new ManagerPerson());
```

```
function register( Person attendee) …
```



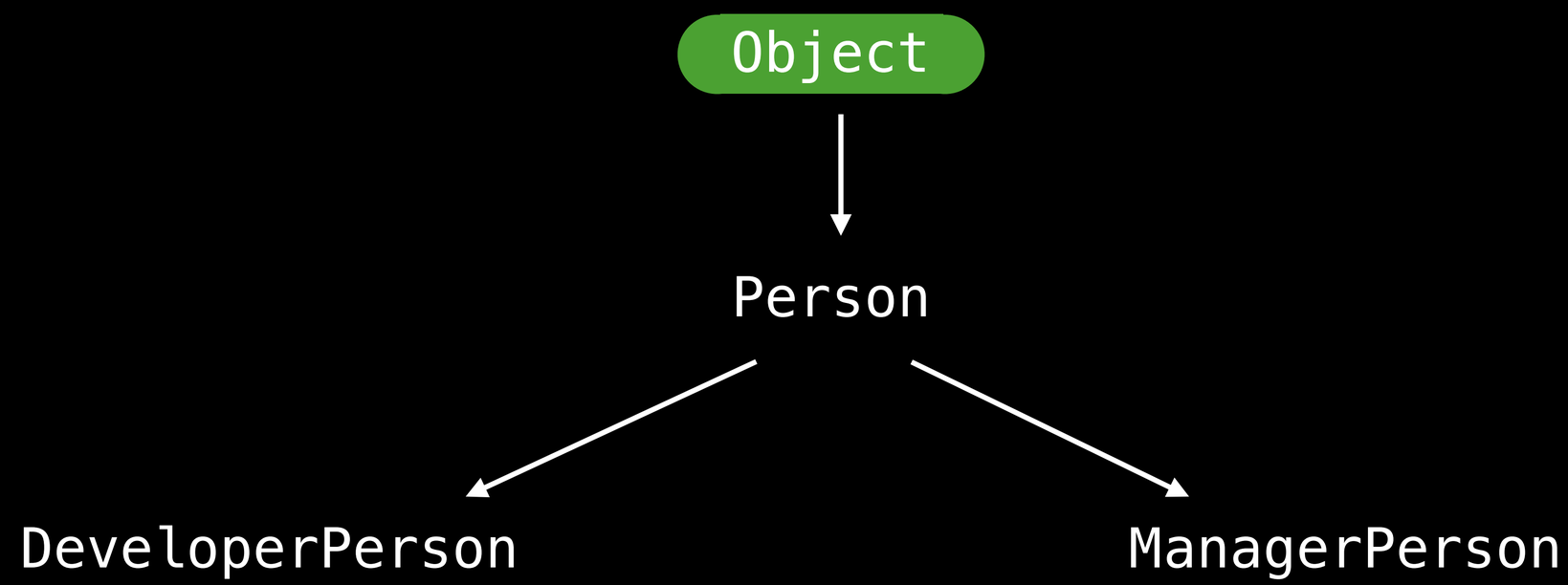

```
register(new DeveloperPerson());
register(new ManagerPerson());
```

```
function register( Person attendee) …
```



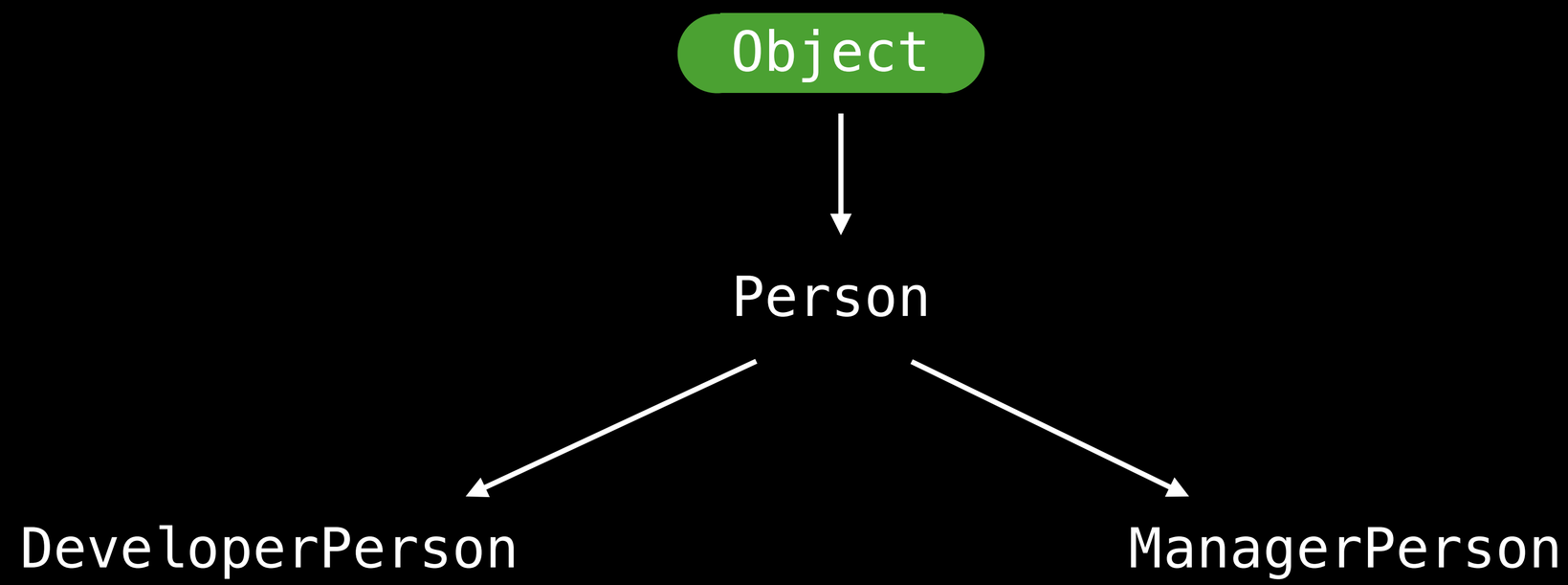

```
register(new DeveloperPerson());
register(new ManagerPerson());
```

```
function register( Object attendee) …
```




```
register(new DeveloperPerson());
register(new ManagerPerson());
register(new Extraterrestrial());
```

```
function register( Object attendee) …
```




```
register(new DeveloperPerson());
register(new ManagerPerson());
register(new Extraterrestrial());
```

Object String Array

Function Null Undefined Boolean

Integer Number Double

(many)

Double

Null

Double

Null

Double?

```
    return WebInspector.Object.removeAllListeners.apply(this, arguments);
}
hasEventListeners() {
    return WebInspector.Object.hasEventListeners.apply(this, arguments);
}
dispatchEventToListeners( String eventType, (many) eventData) Boolean
{
    var Event event = new WebInspector.Event(this, eventType, eventData);
    function dispatch( Object object) Undefined
    {
        if (!object ||!object._listeners ||!object._listeners[eventType] || event._stoppedP
            return;
        var Array listenersForThisEvent = object._listeners[eventType].slice(0);
        for (var Integer i = 0; i < listenersForThisEvent.length; ++i) {
            listenersForThisEvent[i].listener.call(listenersForThisEvent[i].thisObject, eve
            if (event._stoppedPropagation)
                break;
        }
    }
    dispatch(this);
    event._stoppedPropagation = false;
    var Function constructor = this.constructor;
    while (constructor) {
        dispatch(constructor);
        if (!constructor.prototype.__proto__)
            break;
        constructor = constructor.prototype.__proto__.constructor;
    }
    return event.defaultPrevented;
}
```

```
    var Undefined cachedSVGText = svgImageCache[url];
    if (cachedSVGText) {
        invokeCallbackWithDocument(cachedSVGText);
        return;
    }
    var XMLHttpRequest xhr = new XMLHttpRequest;
    xhr.open("GET", url, true);
    xhr.addEventListener("load", imageLoad);
    xhr.addEventListener("error", imageError);
    xhr.send();
}
function wrappedSVGDocument( String url, String className, String? title, Function call
{
    loadSVGImageDocumentElement(url, function( SVGSVGElement svgDocument) Undefined {
        if (!svgDocument) {
            callback(null);
            return;
        }
        var HTMLDivElement wrapper = document.createElement("div");
        if (className)
            wrapper.className = className;
        if (title)
            wrapper.title = title;
        wrapper.appendChild(svgDocument);
        callback(wrapper);
    });
}(function() Undefined {
    if (WebInspector.dontLocalizeUserInterface)
        return;
    var String localizedStringsURL = InspectorFrontendHost.localizedStringsURL();
```

```
url = url ? url.trim() : "";
var Object? match = url.match(/^([^:]+):\/\/([^\/:]*)(?::([\d]+))?(?:(\/[^#]*)(?:#(
if (!match)
    return {
        scheme: null,
        host: null,
        port: null,
        path: null,
        queryString: null,
        fragment: null,
        lastPathComponent: null
    };
var String scheme = match[1].toLowerCase();
var String host = match[2].toLowerCase();
var Null port = Number(match[3]) || null;
var String wholePath = match[4] || null;
var Null fragment = match[5] || null;
var String path = wholePath;
var String? queryString = null;
if (wholePath) {
    var Integer indexOfQuery = wholePath.indexOf("?");
    if (indexOfQuery!==-1) {
        path = wholePath.substring(0, indexOfQuery);
        queryString = wholePath.substring(indexOfQuery + 1);
    }
    path = resolveDotsInPath(path);
}
```

```
WebInspector.EventListenerSet = class EventListenerSet
{
    constructor( Object defaultThisObject, String name) EventListenerSet
    {
        this.name = name;
        this._defaultThisObject = defaultThisObject;
        this._listeners = [];
        this._installed = false;
    }
    register( Object emitter, String type, Function callback, Undefined thisObject,
    {
        var Boolean emitterIsValid = emitter && (emitter instanceof WebInspector.Object
emitter.addEventListener === "function"));
        if (!emitterIsValid ||!type ||!callback)
            return;
        this._listeners.push({
            listener: new WebInspector.EventListener(thisObject || this._defaultThisObjec
            emitter,
            type,
            callback,
            usesCapture
        });
    }
    unregister()
    {
        if (this._installed)
            this.uninstall();
        this._listeners = [];
    }
```

```
        for (var i = this._revisions.length - 1; i >= 0; --i)
            this._revisions[i].revert();
    }
    lock()
    {
        this._locked = true;
    }
    unlock()
    {
        this._locked = false;
    }
};
WebInspector.Breakpoint = class Breakpoint extends WebInspector.Object
{
    constructor( Object sourceCodeLocationOrInfo, Boolean? disabled, Undefined condit
    {
        super ();
        if (sourceCodeLocationOrInfo instanceof WebInspector.SourceCodeLocation) {
            var Null sourceCode = sourceCodeLocationOrInfo.sourceCode;
            var String? url = sourceCode ? sourceCode.url: null;
            var (?) scriptIdentifier = sourceCode instanceof WebInspector.Script ? sour
            var SourceCodeLocation location = sourceCodeLocationOrInfo;
        } else if (sourceCodeLocationOrInfo && typeof sourceCodeLocationOrInfo === "objec
            var String? url = sourceCodeLocationOrInfo.url;
            var Integer lineNumber = sourceCodeLocationOrInfo.lineNumber || 0;
            var Integer columnNumber = sourceCodeLocationOrInfo.columnNumber || 0;
            var SourceCodeLocation location = new WebInspector.SourceCodeLocation(null,
            var Boolean? autoContinue = sourceCodeLocationOrInfo.autoContinue || false;
```

```
 this._revisions.length - 1; i >= 0; --i)
visions[i].revert();


 = true;


 = false;

int = class Breakpoint extends WebInspector.Object

ject sourceCodeLocationOrInfo, Boolean? disabled, Undefined condition) Breakpoint


deLocationOrInfo instanceof WebInspector.SourceCodeLocation) {
l sourceCode = sourceCodeLocationOrInfo.sourceCode;
ing? url = sourceCode ? sourceCode.url: null;
 scriptIdentifier = sourceCode instanceof WebInspector.Script ? sourceCode.id: null;
rceCodeLocation location = sourceCodeLocationOrInfo;
ourceCodeLocationOrInfo && typeof sourceCodeLocationOrInfo === "object") {
ing? url = sourceCodeLocationOrInfo.url;
eger lineNumber = sourceCodeLocationOrInfo.lineNumber || 0;
eger columnNumber = sourceCodeLocationOrInfo.columnNumber || 0;
rceCodeLocation location = new WebInspector.SourceCodeLocation(null, lineNumber, columnNumb
lean? autoContinue = sourceCodeLocationOrInfo.autoContinue || false;
```

Better Console

```
> person1
<· ▶ Person {_firstName: "Jono", _lastName: "Wells", _age: NaN, _siblings: Array} = $1
> person2
<· ▶ Person {_firstName: "Julia", _lastName: "Wells", _age: 28, _siblings: Array} = $2
> person3
<· ▶ Person {_firstName: "Jordan", _lastName: "Wells", _age: 36, _siblings: Array} = $3
> $1
<· ▶ Person {_firstName: "Jono", _lastName: "Wells", _age: NaN, _siblings: Array} = $1
> $2
<· ▶ Person {_firstName: "Julia", _lastName: "Wells", _age: 28, _siblings: Array} = $2
> $3
<· ▶ Person {_firstName: "Jordan", _lastName: "Wells", _age: 36, _siblings: Array} = $3
>
```

```
> person1
<· ▶ Person {_firstName: "Jono", _lastName: "Wells", _age: NaN, _siblings: Array} = $1
> person2
<· ▶ Person {_firstName: "Julia", _lastName: "Wells", _age: 28, _siblings: Array} = $2
> person3
<· ▶ Person {_firstName: "Jordan", _lastName: "Wells", _age: 36, _siblings: Array} = $3
> $1
<· ▶ Person {_firstName: "Jono", _lastName: "Wells", _age: NaN, _siblings: Array} = $1
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>
```

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<· ▶ Person {_firstName: "Jono", _lastName: "Wells", _age: NaN, _siblings: Array} = $1
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> $3
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>
```

```
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> $1
<· ▶ Person {_firstName: "Jono", _lastName: "Wells", _age: NaN, _siblings: Array} = $1
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> $3
<· ▶ Person {_firstName: "Jordan", _lastName: "Wells", _age: 36, _siblings: Array} = $3
>
```

`$0` Is Still the Currently Selected DOM Element

```
> person1

<· ▼ DeveloperPerson = $1
      N _age: NaN
      S _editor: "Web Inspector"
      S _firstName: "Jono"
      S _lastName: "Wells"
    ▶ O _siblings: [DeveloperPerson, Person] (2)
    ▶ DeveloperPerson Prototype

>
```

```
> person1

<· ▼ DeveloperPerson = $1
      N _age: NaN
      S _editor: "Web Inspector"
      S _firstName: "Jono"
      S _lastName: "Wells"
    ▶ O _siblings: [DeveloperPerson, Person] (2)
    ▶ DeveloperPerson Prototype

>
```

```
> person1

<· ▼ DeveloperPerson = $1
      N _age: NaN
      S _editor: "Web Inspector"
      S _firstName: "Jono"
      S _lastName: "Wells"
    ▼ O _siblings: Array (2)
        0 ▶ DeveloperPerson {_firstName: "Julia", _lastName: "Wells"
        1 ▶ Person {_firstName: "Jordan", _lastName: "Wells", _age:
      ▶ Array Prototype
    ▶ DeveloperPerson Prototype

>
```

```
> person1

<· ▼ DeveloperPerson = $1
    N _age: NaN
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    S _firstName: "Jono"
    S _lastName: "Wells"
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      0 ▶ DeveloperPerson {_firstName: "Julia", _lastName: "Wells"
      1 ▶ Person {_firstName: "Jordan", _lastName: "Wells", _age:
    ▶ Array Prototype
    ▶ DeveloperPerson Prototype

>
```

```
> person1
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    S _editor: "Web Inspector"
    S _firstName: "Jono"
    S _lastName: "Wells"
  ▶ O _siblings: [DeveloperPerson, Person] (2)
  ▼ DeveloperPerson Prototype
  ▶ f constructor: function()
    ? editor
  ▼ Person Prototype
    f addSibling(person)
    ? age
    f changeName(firstName, lastName)
  ▶ f constructor: function()
    ? firstName
    ? fullName
    f isRelatedTo(person)
    ? lastName
    ? siblings
  ▶ Object Prototype
>
```

```
> person1
<· ▼ DeveloperPerson = $1
    N _age: NaN
    S _editor: "Web Inspector"
    S _firstName: "Jono"
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  ▼ DeveloperPerson Prototype
  ▶ f constructor: function()
    ? editor
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    f addSibling(person)
    ? age
    f changeName(firstName, lastName)
  ▶ f constructor: function()
    ? firstName
    ? fullName
    f isRelatedTo(person)
    ? lastName
    ? siblings
  ▶ Object Prototype
>
```

```
> person1
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    S _firstName: "Jono"
    S _lastName: "Wells"
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  ▼ DeveloperPerson Prototype
  ▶ f constructor: function()
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    ? siblings
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>
```

```
> person1
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    S _editor: "Web Inspector"
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  ▶ O _siblings: [DeveloperPerson, Person] (2)
  ▼ DeveloperPerson Prototype
  ▶ f constructor: function()
    ? editor
  ▼ Person Prototype
    f addSibling(person)
    ? age
    f changeName(firstName, lastName)
  ▶ f constructor: function()
    ? firstName
    ? fullName
    f isRelatedTo(person)
    ? lastName
    ? siblings
  ▶ Object Prototype
>
```

```
> person1
<· ▼ DeveloperPerson = $1
    N _age: NaN
    S _editor: "Web Inspector"
    S _firstName: "Jono"
    S _lastName: "Wells"
  ▶ O _siblings: [DeveloperPerson, Person] (2)
  ▼ DeveloperPerson Prototype
  ▶ f constructor: function()
    ? editor
  ▼ Person Prototype
    f addSibling(person)
    ? age
    f changeName(firstName, lastName)
  ▶ f constructor: function()
    ? firstName
    S fullName: "Jono Wells"
    f isRelatedTo(person)
    ? lastName
    ? siblings
  ▶ Object Prototype
>
```

Great for Native API Exploration!

```
> window.localStorage
<· ▼ Storage = $1
    ▶ O constructor: StorageConstructor {prototype: StoragePrototype, length: 0}
      N length: 0
    ▼ Storage Prototype
      f clear()
      f getItem(key)
      f key(index)
      f removeItem(key)
      f setItem(key, data)
    ▶ Object Prototype
>
```

Web Inspector — index.html

Debugger Paused | changeName — script.js:...

Search

Elements | Resources | Timelines | Debugger | Storage | Console

script.js

```
42      addSibling( Person person) Undefined {
43          if (this._siblings.indexOf(person) < 0) {
44              this._siblings.push(person);
45              person.siblings.push(this);
46          }
47      }
48
49      isRelatedTo(person) {
50          return this._siblings.indexOf(person) > -1;
51      }
52
53      changeName( String firstName, String lastName) {
54          this._firstName = firstName;
55          this._lastName = lastName;
56      }
57  }
58
59  class DeveloperPerson extends Person {
60      constructor( String firstName, String lastName, Number age,
    String editor) DeveloperPerson {
61          super(firstName, lastName, age);
62          this._editor = editor;
63      }
64
```

Resource | Scope Chain

Local Variables

- changeName: function(firstName, las
- firstName: "Rob"
- lastName: "Wells"
- this: DeveloperPerson

Global Variables

- Infinity: Infinity
- AnalyserNode: AnalyserNodeConstructor
- AnimationEvent: AnimationEventConstru
- Array: function()
- ArrayBuffer: function()
- Attr: AttrConstructor {prototype: Att
- Audio: AudioConstructor {prototype: H
- AudioBuffer: AudioBufferConstructor {
- AudioBufferSourceNode: AudioBufferSou
- AudioDestinationNode: AudioDestinatio
- AudioListener: AudioListenerConstructo
- AudioNode: AudioNodeConstructor {pro

Web Inspector — index.html

Debugger Paused | changeName — script.js:...

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script.js

```
42      addSibling( Person person) Undefined {
43          if (this._siblings.indexOf(person) < 0) {
44              this._siblings.push(person);
45              per
46          }
47      }
48
49      isRelatedTo
50          return
51      }
52
53      changeName(
54          this._
55          this._
56      }
57  }
58
59  class Developer
60      constructor                                  age,
    String editor
61          super(f
62          this._e
63      }
64
```

DeveloperPerson

- _age: NaN
- _editor: "Web Inspector"
- _firstName: "Jono"
- _lastName: "Wells"
- _siblings: [DeveloperPerson, Person] (2)
- DeveloperPerson Prototype

Resource | Scope Chain

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- AudioBufferSourceNode: AudioBufferSou
- AudioDestinationNode: AudioDestinatio
- AudioListener: AudioListenerConstructo
- AudioNode: AudioNodeConstructor {pro

N Number

B Boolean

S String

O Object

N Null

R RegExp

S Symbol

E Element

f Function

? Custom Getter

Demo

Web Inspector

Andy Estes
Safari and WebKit Engineer

Make Your Site Faster

Make Your Site Faster

Turn on paint flashing on

Run Rendering Frames Timeline

Try in iOS

Make Your Code Better

Make Your Code Better

Use the type profiler on your JavaScript

Explore your JS objects in the console

Explore the DOM APIs (`window`, `HTMLElement`, etc.)

Web Inspector

Web Inspector

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NEW

Responsive Design Mode

Responsive Design

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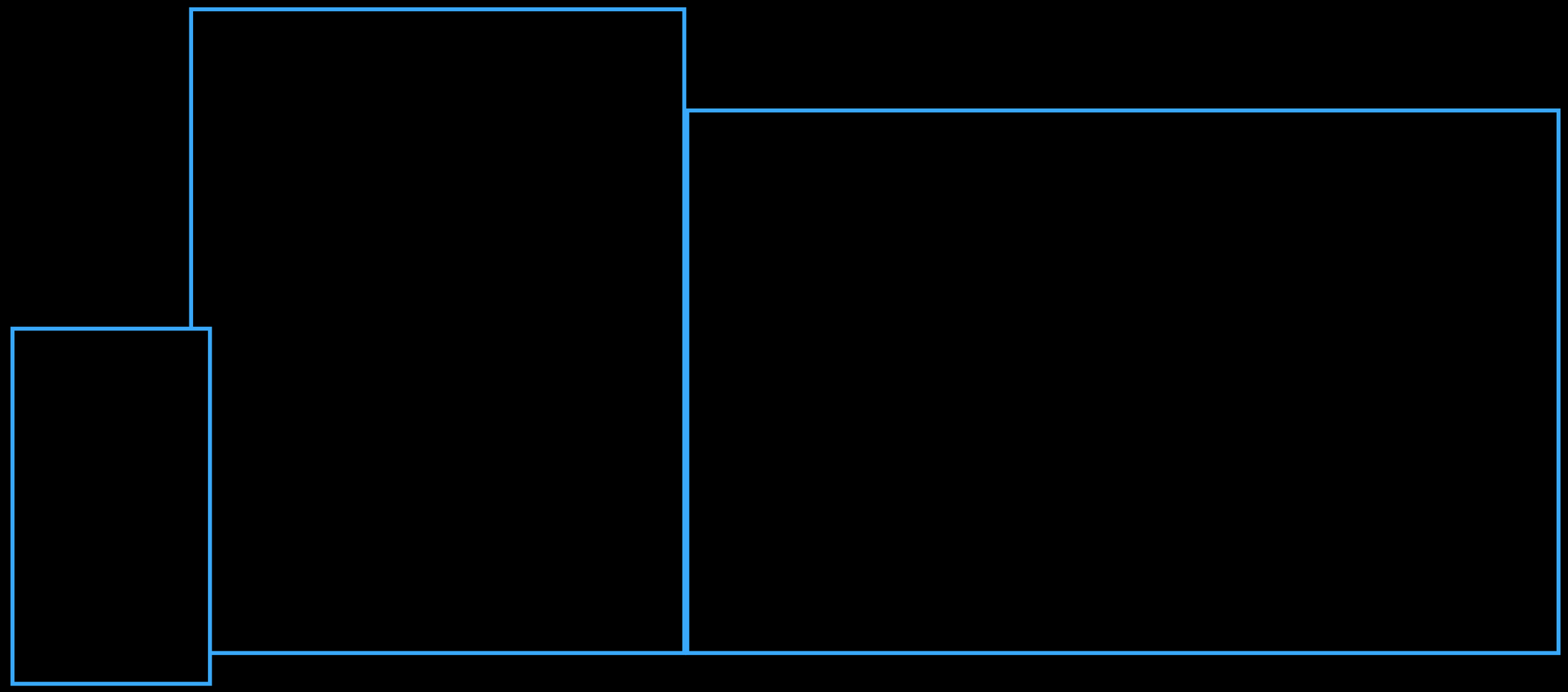

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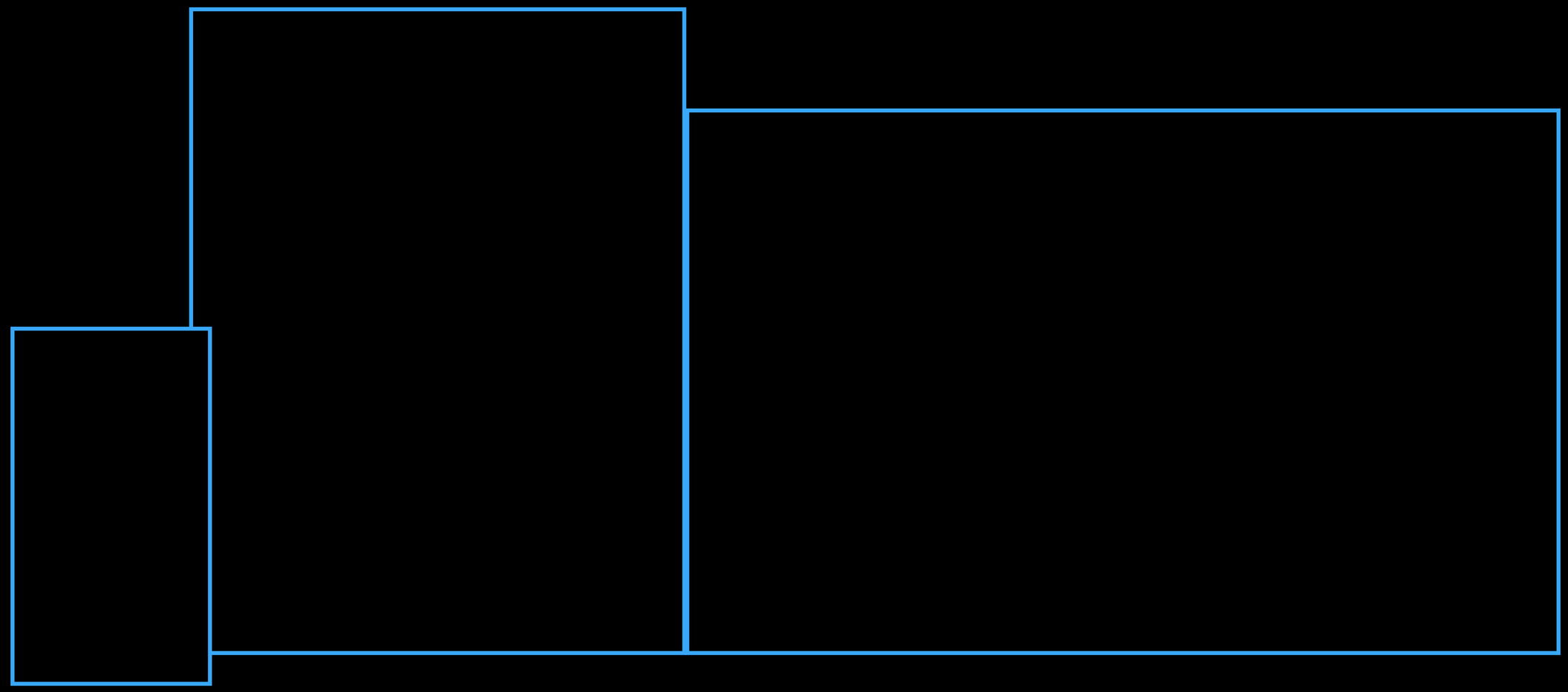

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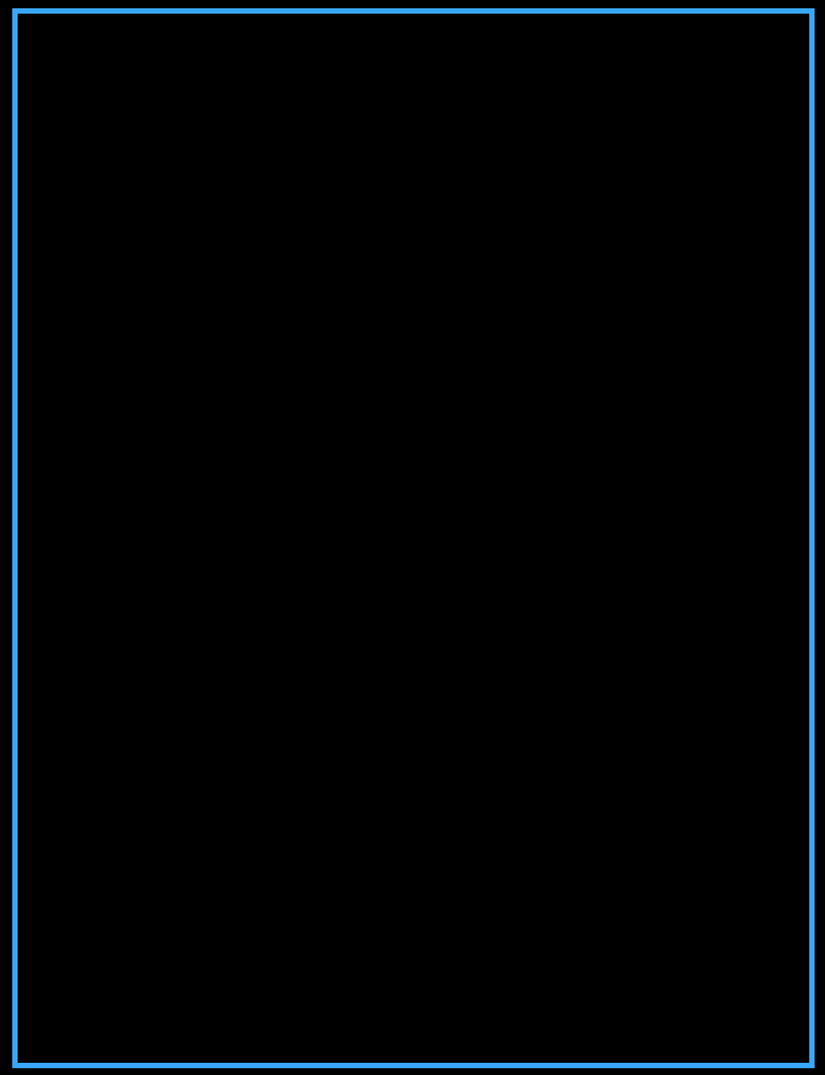

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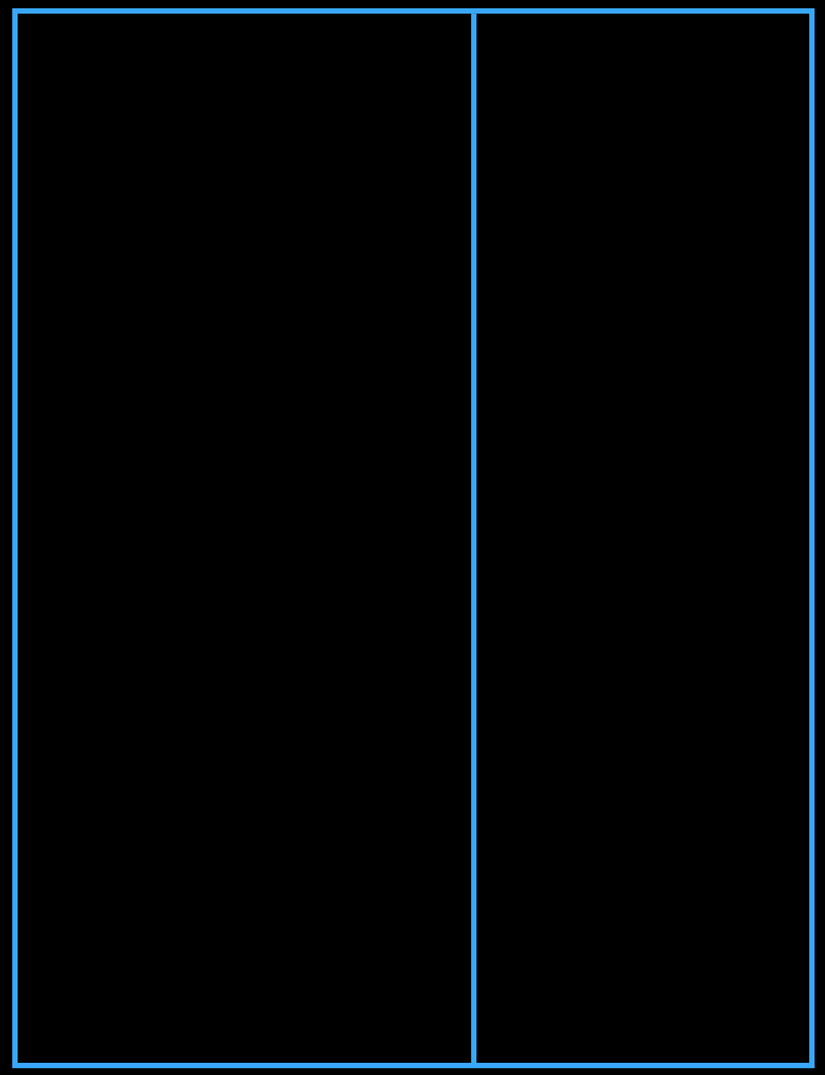

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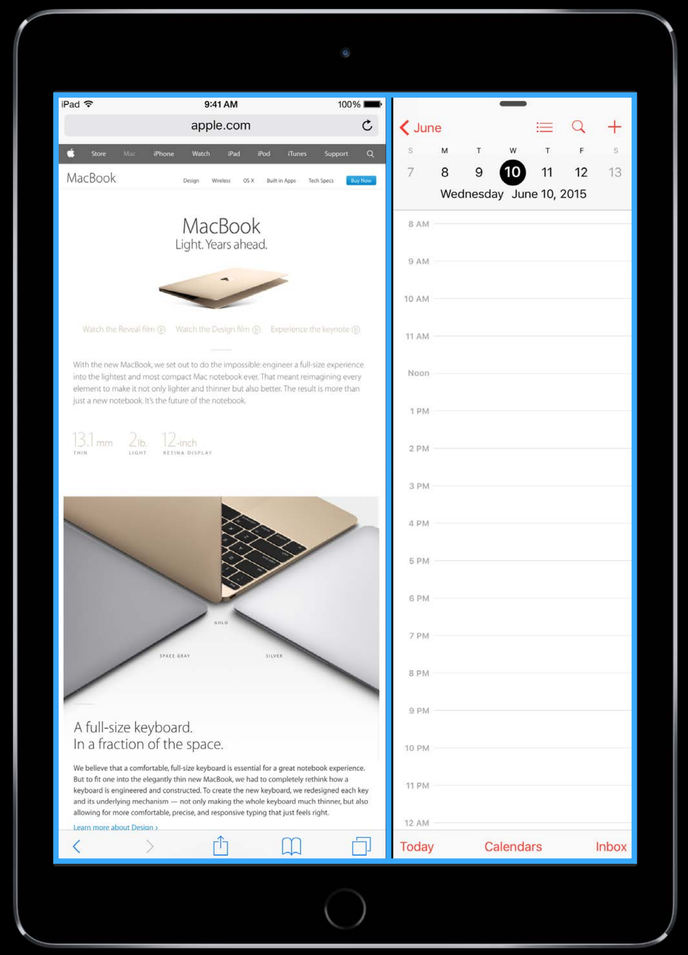

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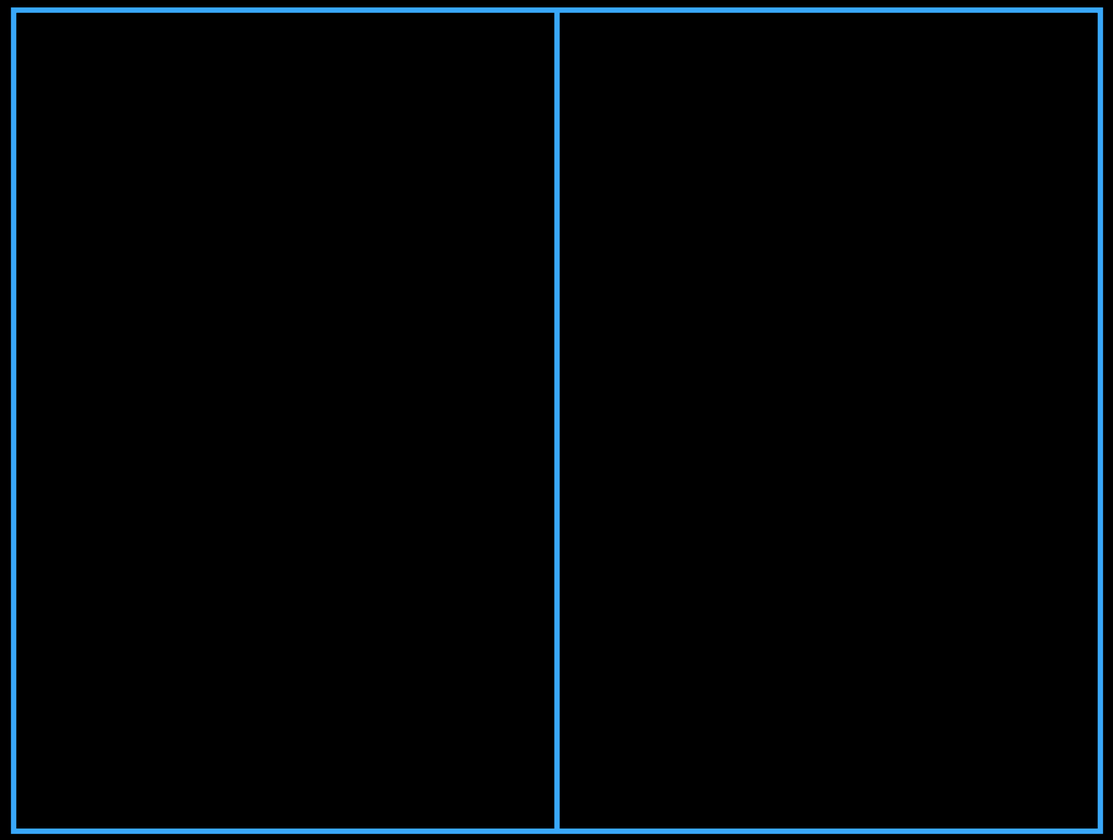

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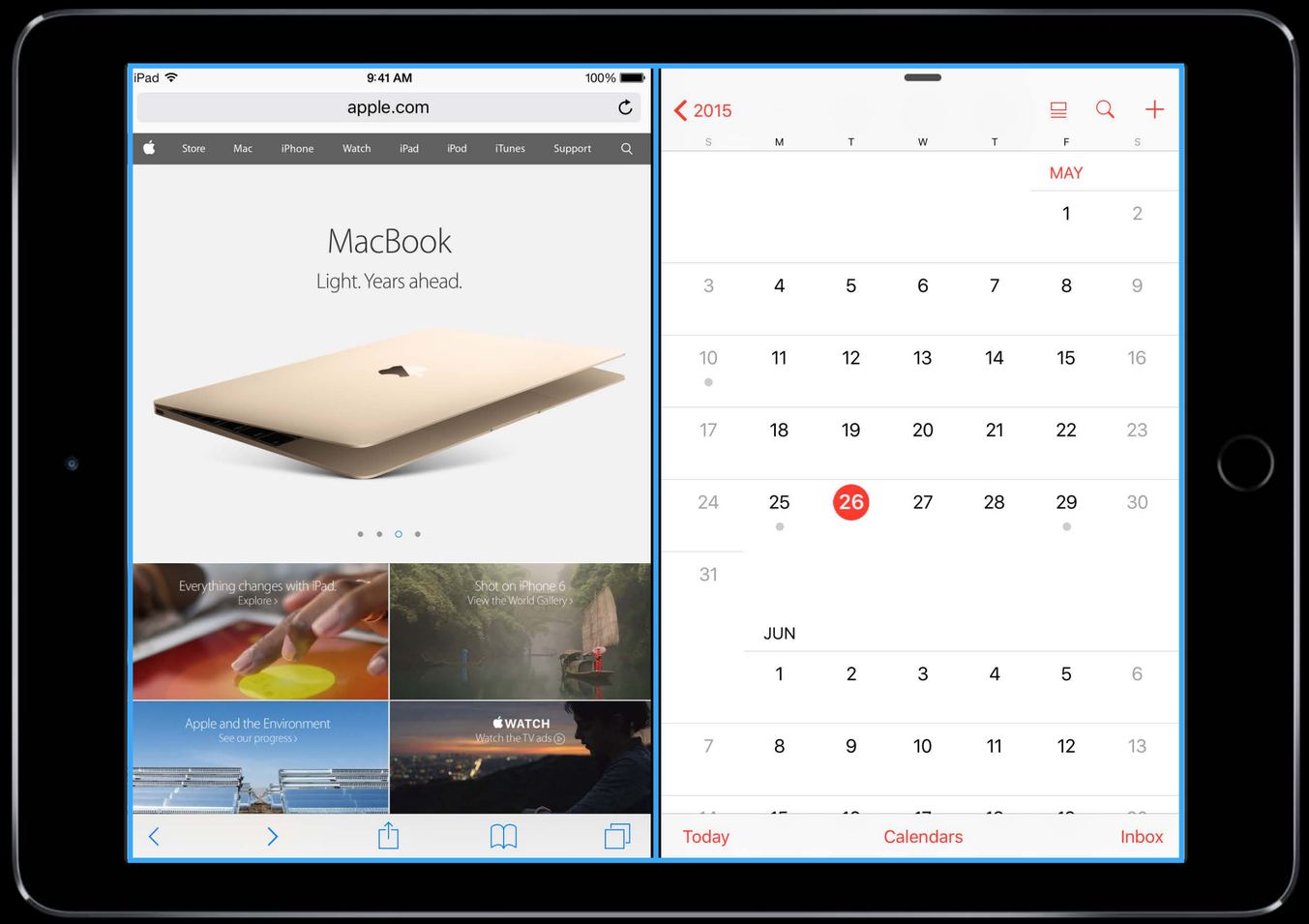

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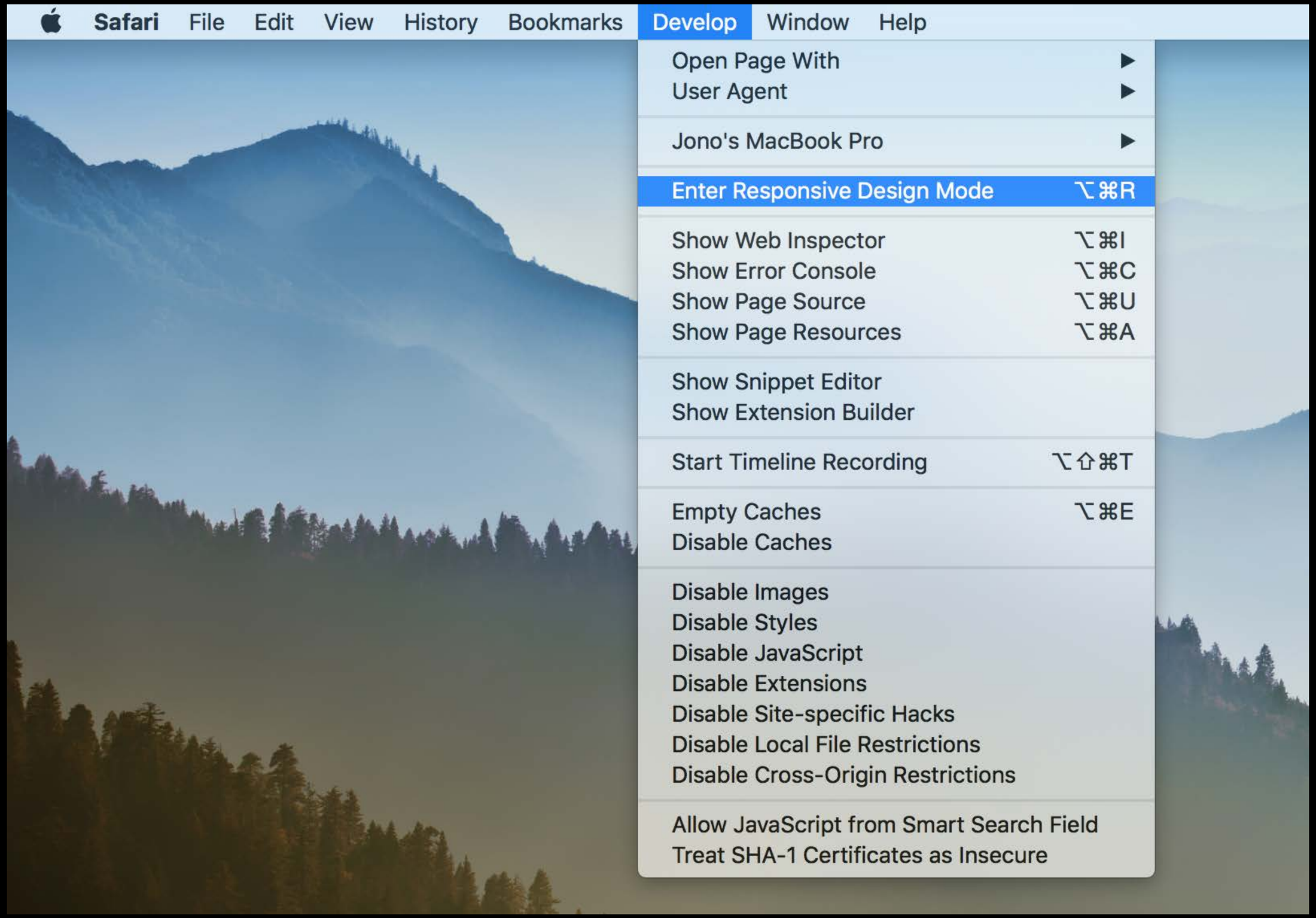
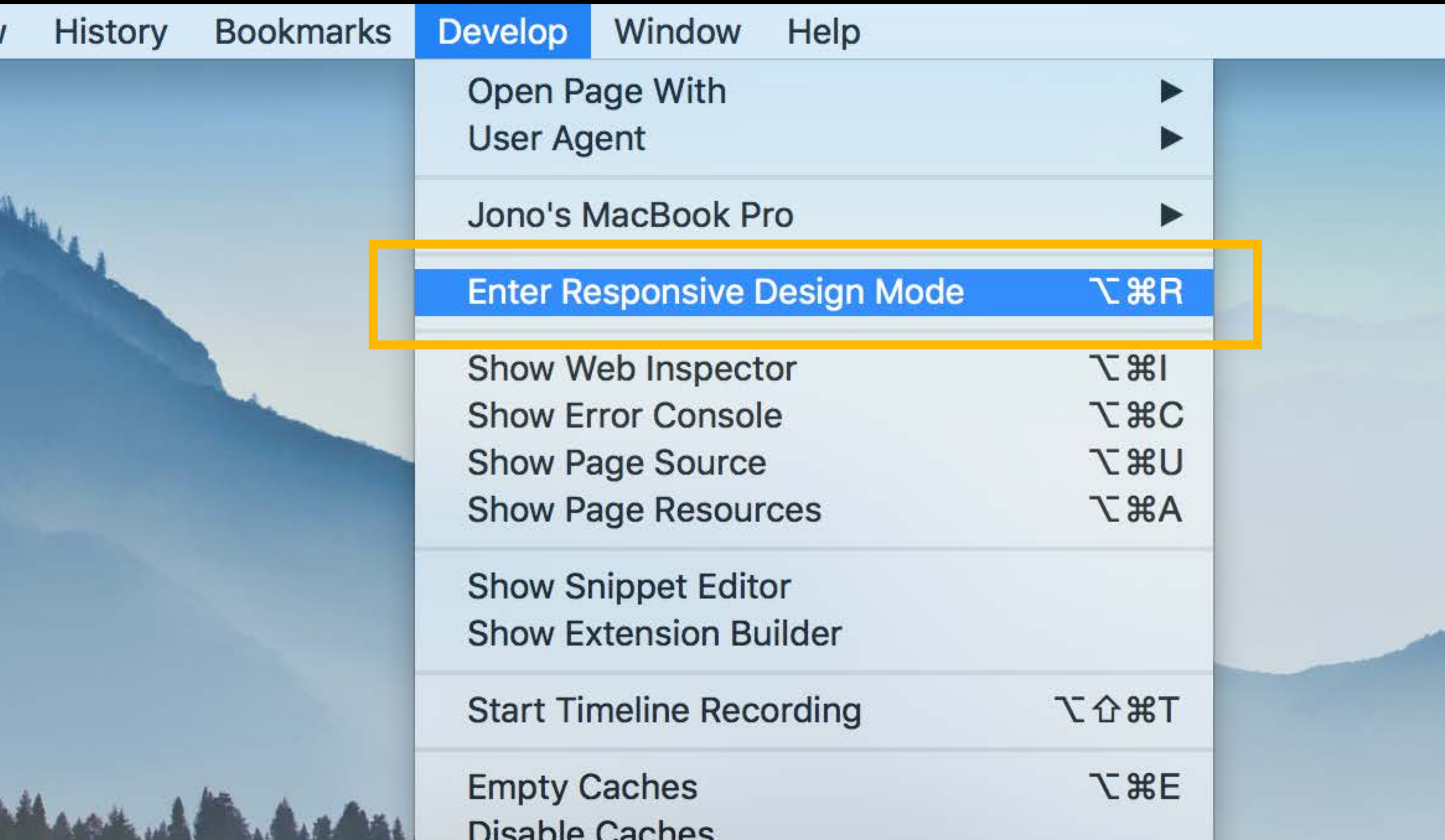
@supports

@media

srcset


Safari
File
Edit
View
History
Bookmarks
Develop
Window
Help
Open Page With
User Agent
Jono's MacBook Pro
Enter Responsive Design Mode ⌥⌘R
Show Web Inspector ⌥⌘I
Show Error Console ⌥⌘C
Show Page Source ⌥⌘U
Show Page Resources ⌥⌘A
Show Snippet Editor
Show Extension Builder
Start Timeline Recording ⌥⇧⌘T
Empty Caches ⌥⌘E
Disable Caches
Disable Images
Disable Styles
Disable JavaScript
Disable Extensions
Disable Site-specific Hacks
Disable Local File Restrictions
Disable Cross-Origin Restrictions
Allow JavaScript from Smart Search Field
Treat SHA-1 Certificates as Insecure


History
Bookmarks
Develop
Window
Help
Open Page With
User Agent
Jono's MacBook Pro
Enter Responsive Design Mode ⌥⌘R
Show Web Inspector ⌥⌘I
Show Error Console ⌥⌘C
Show Page Source ⌥⌘U
Show Page Resources ⌥⌘A
Show Snippet Editor
Show Extension Builder
Start Timeline Recording ⌥⇧⌘T
Empty Caches ⌥⌘E

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Responsive Design Mode

Andy Estes
Safari and WebKit Engineer

Responsive Design Mode

Focus is on layout and resolution

Scalable page preview

Screen size presets

iOS Multitasking screen size presets

Custom sizes

Works alongside Web Inspector

New in Safari 9

Responsive Design Mode

Web Inspector

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Resources for Safari Developers
http://developer.apple.com/safari/

Safari Developer Library
http://developer.apple.com/library/safari/

General Inquiries
Jon Davis, Web Technologies Evangelist
web-evangelist@apple.com

Related Labs

Safari and WebKit Lab	Graphics, Games, and Media Lab A	Wednesday 10:00AM
Safari and WebKit Lab	Graphics, Games, and Media Lab A	Friday 12:00PM

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