

# Introducing the Modern WebKit API

Session 206

Anders Carlsson

Safari and WebKit Engineer

# WebKit Overview

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**Wild Beasts**  
 Present Tense  
 By Ian Cohen APR 20

Much has been made about how Wild Beasts have drastically reduced the musical drama since their swashbuckling, chandelier-swinging debut *Limbo*. *Present Tense* doesn't reverse that trend, but without much left to discard sonically, Wild Beasts make their most radical and daring subtraction: emotional drama.

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- White Lung Announce New Album *Deep Fantasy*
- Listen to Nicolas Jaar and Sasha Spielberg's Just Friends Track "Don't Tell Me"
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- Todd Rundgren, Lindstrom, Serena-Maneesh's Emil Nikolasen to Release Collaborative Album *Runddars*
- Video: Thundercat: "Evangelion"/"We'll Die"
- The Notwid Share "Kong" Video, Announce Tour

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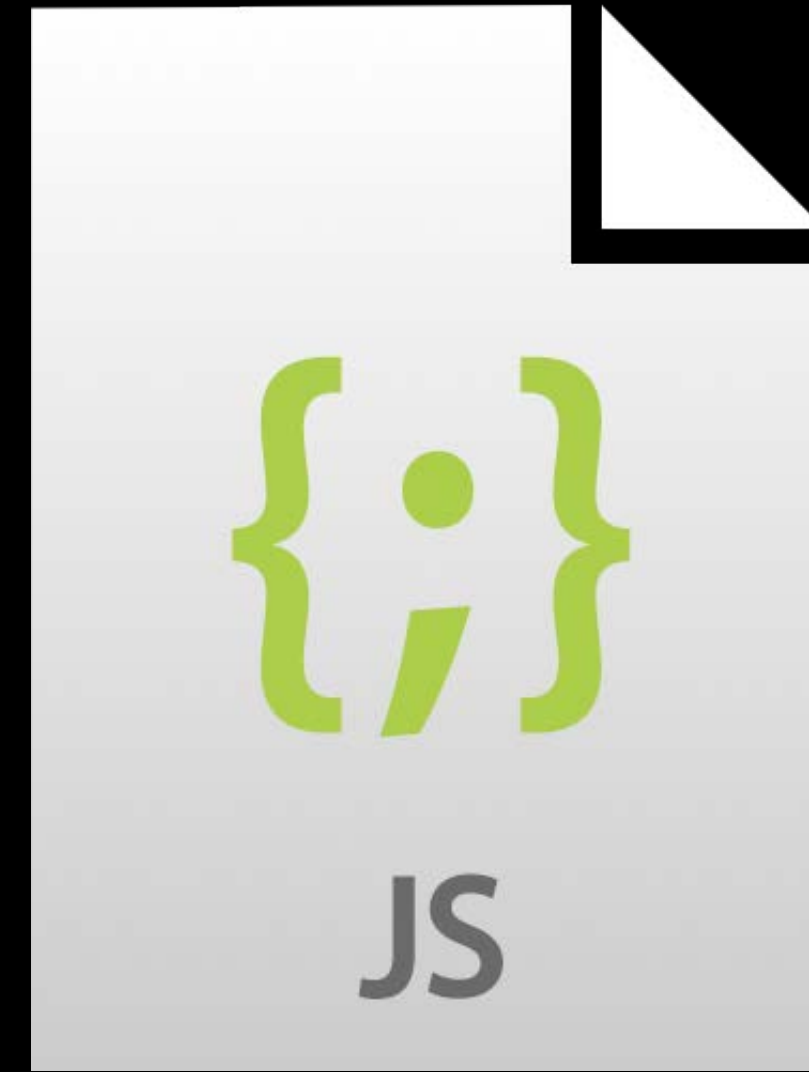
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**Chance Graham**   
To: Erin Steed  
Trip to South America

October 22, 2013 at 9:41 AM



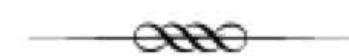
Day three of our vacation is starting off great. We had an amazing breakfast then took a hike. I wanted to share this photo of David kayaking on the lake yesterday. I'm pretty sure this is the most excited he's ever been. Tomorrow we're headed into town to check out the local shops. Anything I should bring back for you? I know you said you wanted something authentic. Anything but a refrigerator magnet, right?

I've taken about a thousand photos and we haven't even been here a week. So I'll have many more photos and stories to share when we get home. But for now, we're off to dinner. Adios!





## Adventure III



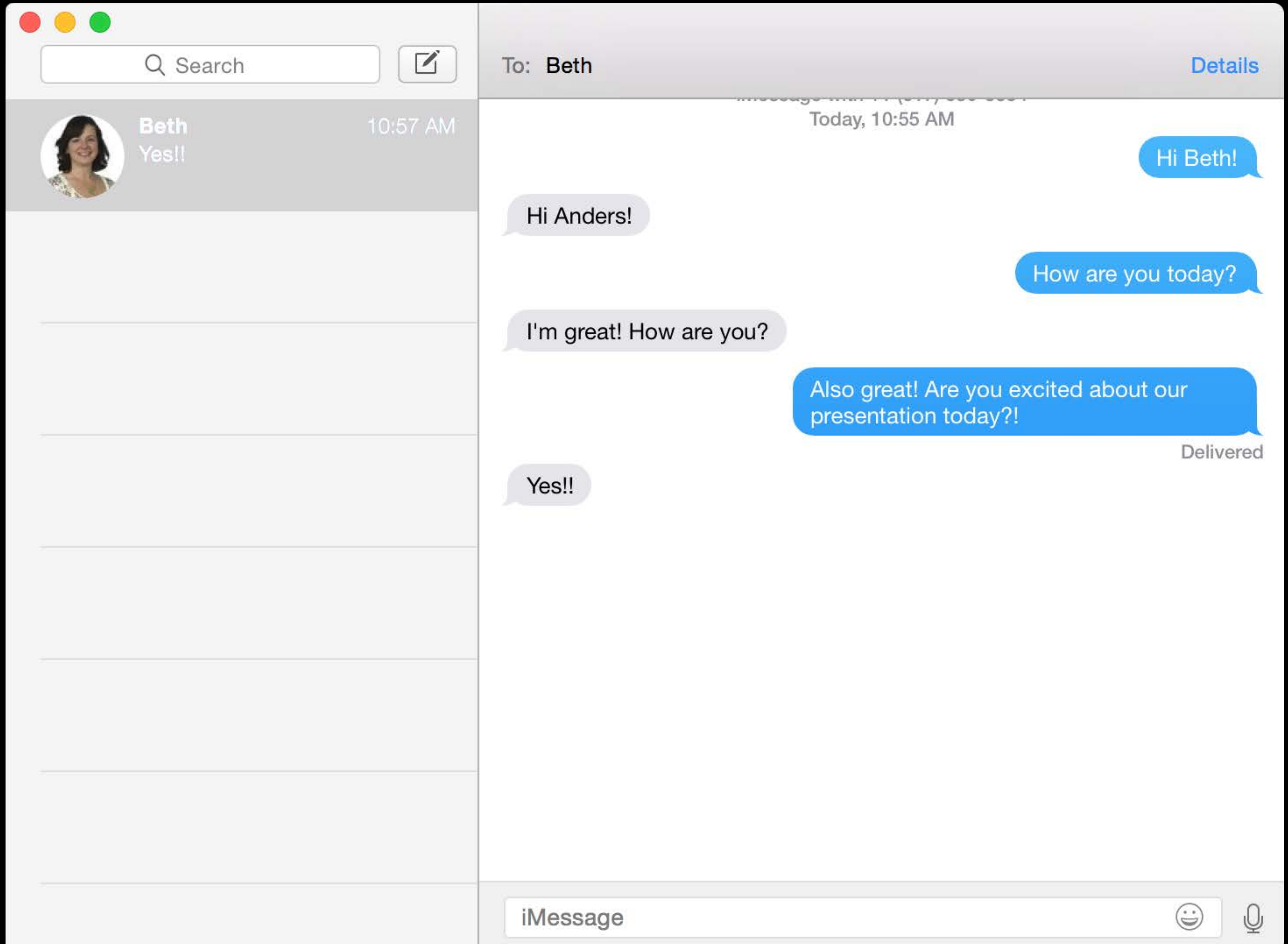
### *A Case of Identity*

“My dear fellow,” said **Sherlock Holmes** as we sat on either side of the fire in his lodgings at Baker Street, “life is infinitely stranger than anything which the mind of man could invent. We would not dare to conceive the things which are really mere commonplaces of existence. If we could fly out of that window hand in hand, hover over this great city, gently remove the roofs, and peep in at the queer things which are going on, the strange coincidences, the plannings, the cross-purposes, the wonderful chains of events, working through generations, and leading to the most *outré* results, it would make all fiction with its conventionalities and foreseen conclusions most stale and unprofitable.”

“And yet I am not convinced of it,” I answered. “The cases which come to light in the papers are, as a rule, bald enough, and vulgar enough. We have in our police reports realism pushed to its extreme limits, and yet the result is, it must be confessed, neither fascinating nor artistic.”

“A certain selection and discretion must be used in producing a realistic effect,” remarked Holmes. “This is wanting in the police report, where more stress is laid, perhaps, upon the platitudes of the magistrate than upon the details, which to an observer contain the vital essence of the whole matter. Depend upon it, there is nothing so unnatural as the commonplace.”

I smiled and shook my head. “I can quite understand your thinking so,” I said. “Of course, in your position of unofficial adviser and helper to everybody who is absolutely puzzled, throughout three continents, you are brought in contact with all that is strange and bizarre. But here”—I



Search



To: Beth

Details



Beth  
Yes!!

10:57 AM

Today, 10:55 AM

Hi Beth!

Hi Anders!

How are you today?

I'm great! How are you?

Also great! Are you excited about our presentation today?!

Delivered

Yes!!

iMessage





# WebKit in Your App

# WebKit in Your App



UIWebView  
UIKit.framework

# WebKit in Your App



**UIWebView**  
UIKit.framework



**WebView**  
WebKit.framework

# What You Will Learn

# What You Will Learn

Embedding web content in your app



# What You Will Learn

Embedding web content in your app

Taking advantage of new features of the WebKit API

# What You Will Learn

Embedding web content in your app

Taking advantage of new features of the WebKit API

Customizing how your app interacts with web content

# The Modern WebKit API

# The Modern WebKit API



# The Modern WebKit API



Same on iOS and OS X

# The Modern WebKit API



Same on iOS and OS X

Modern

# The Modern WebKit API



Same on iOS and OS X

Modern

Streamlined

# The Modern WebKit API



Same on iOS and OS X

Modern

Streamlined

Multi-process architecture



# The Modern WebKit API

Features

# The Modern WebKit API

## Features

Responsive scrolling



# The Modern WebKit API

## Features

Responsive scrolling

Fast JavaScript



# The Modern WebKit API

## Features

Responsive scrolling

Fast JavaScript

Built-in gestures



# The Modern WebKit API

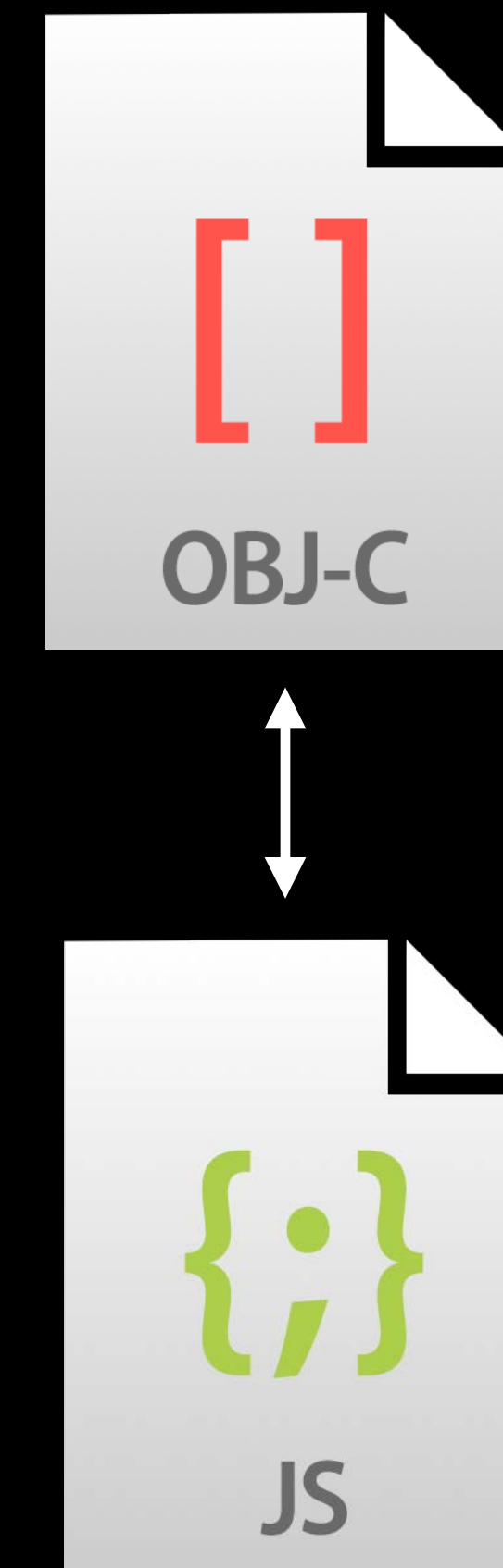
## Features

Responsive scrolling

Fast JavaScript

Built-in gestures

Easy app-webpage communication



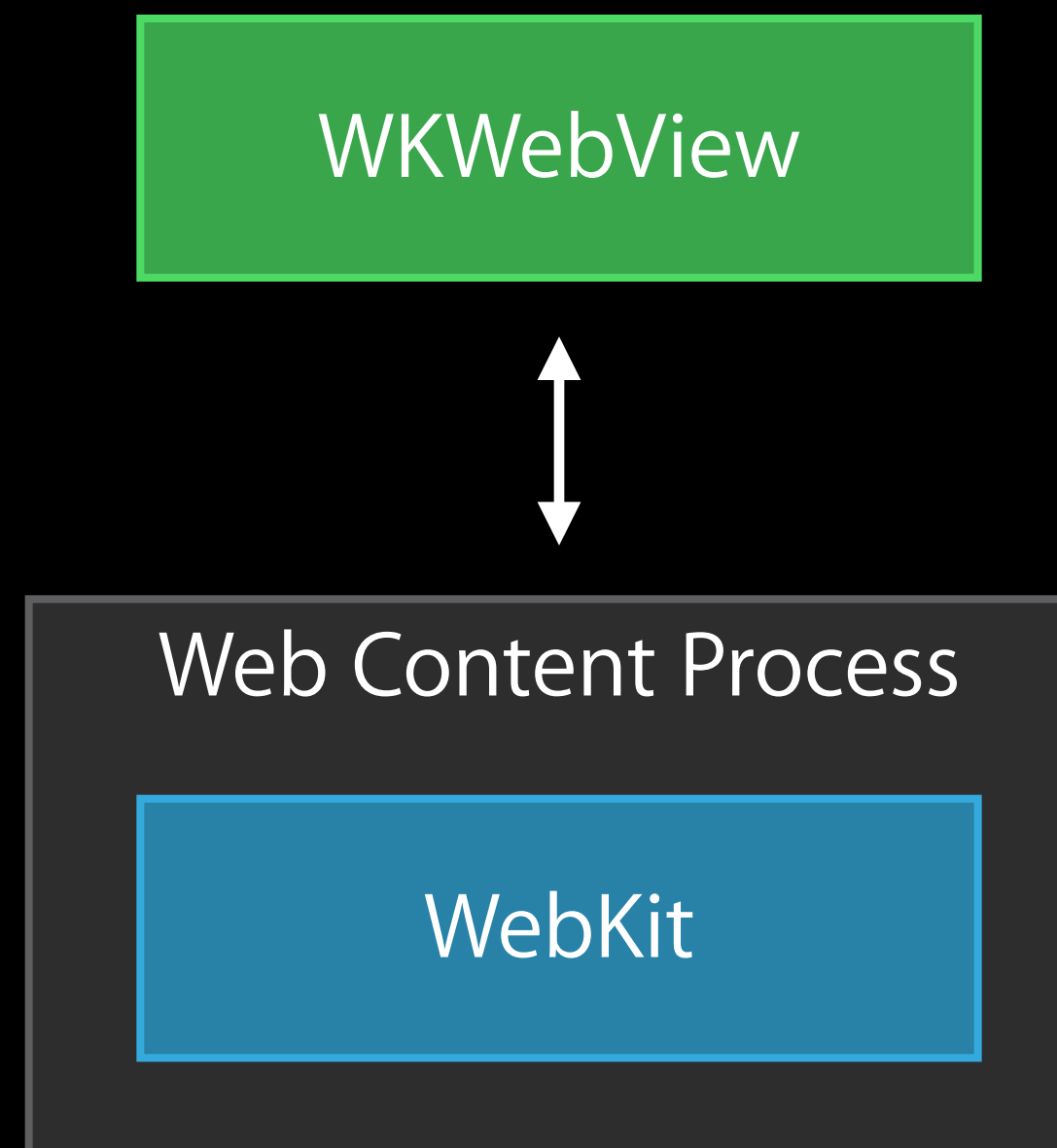
# Multi-process Architecture

# Multi-process Architecture

Web content runs in its own process

# Multi-process Architecture

Web content runs in its own process





# Multi-process Architecture

Consistently responsive



# Multi-process Architecture

Consistently responsive

Energy efficient

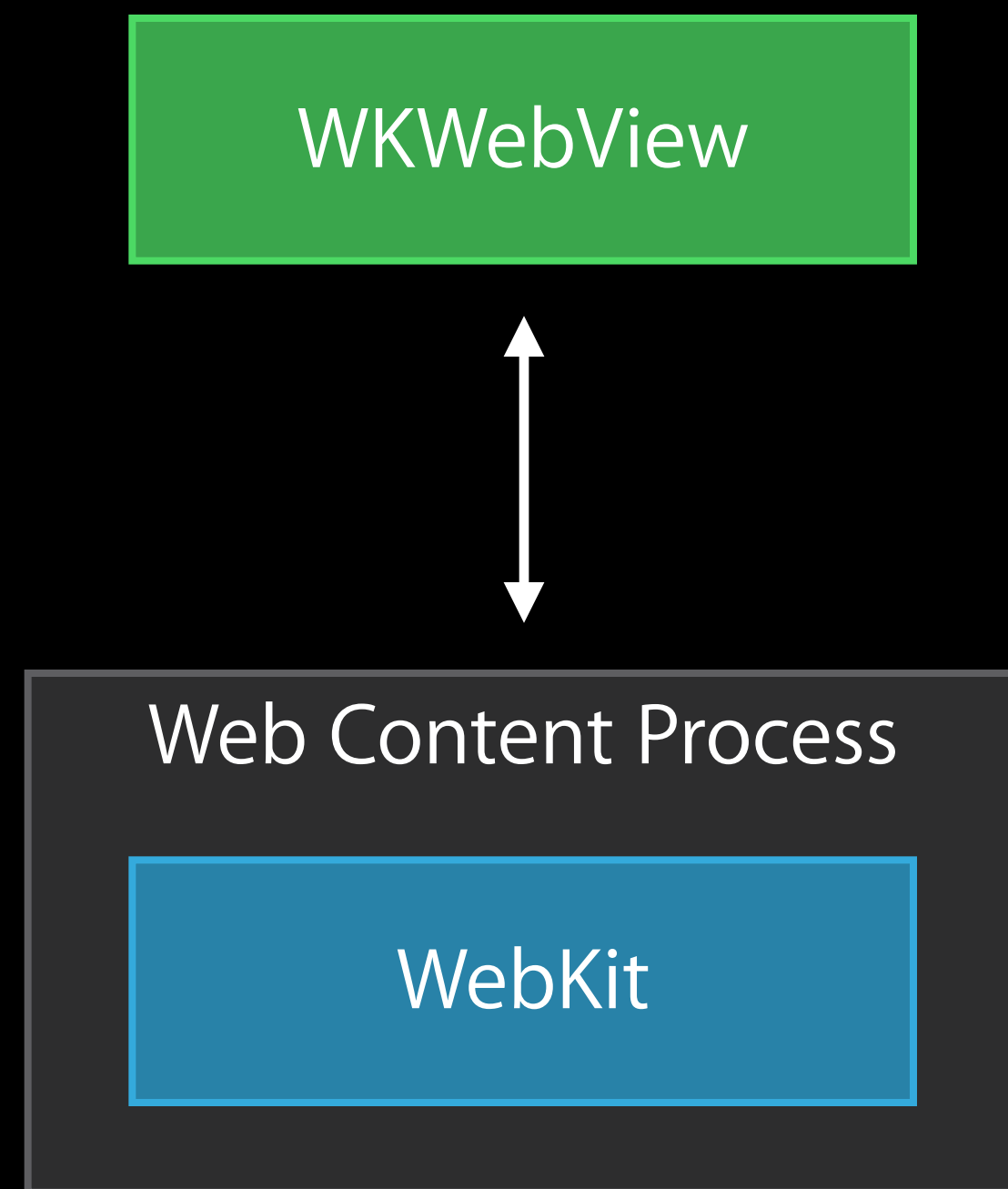


# Multi-process Architecture

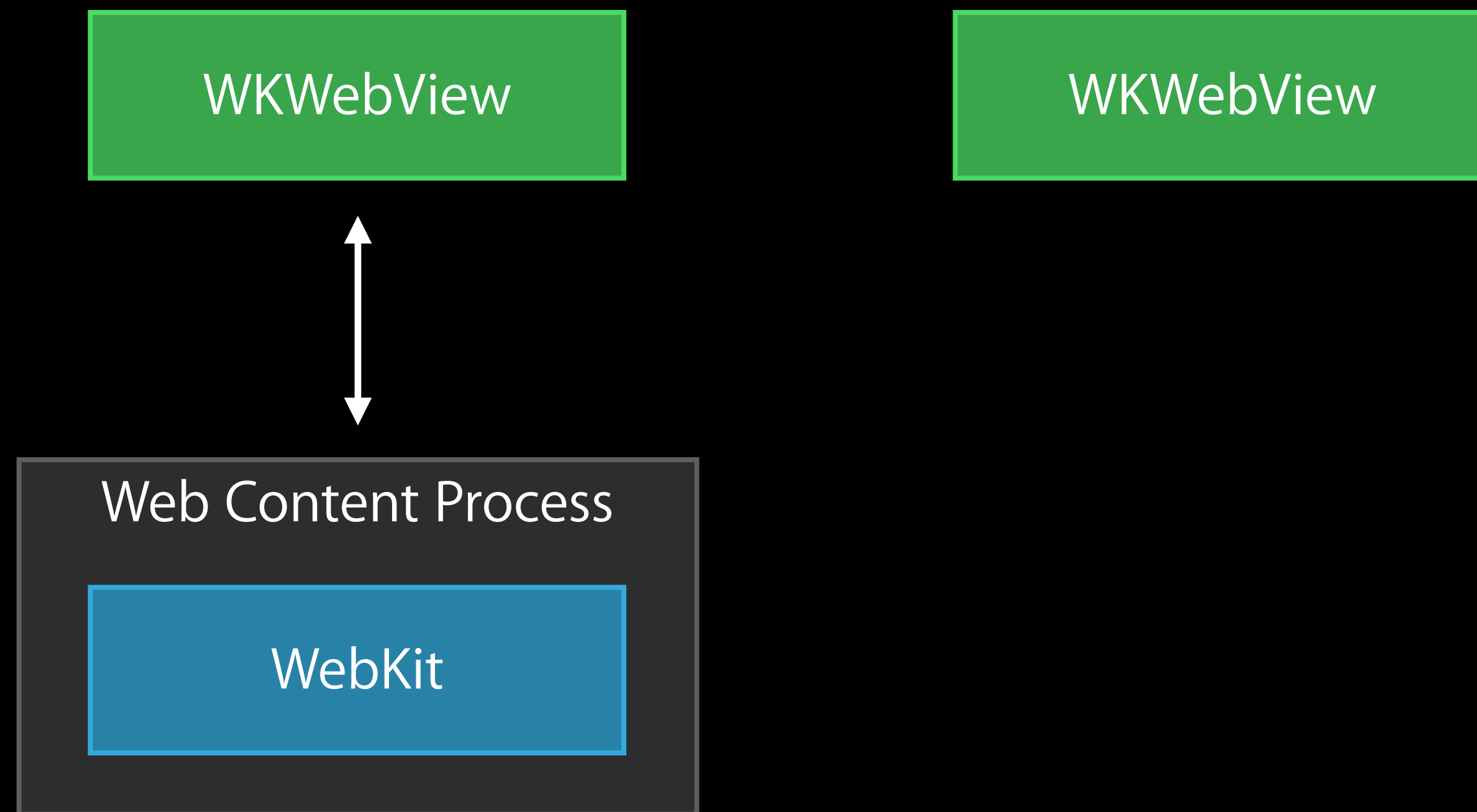
# Multi-process Architecture

WKWebView

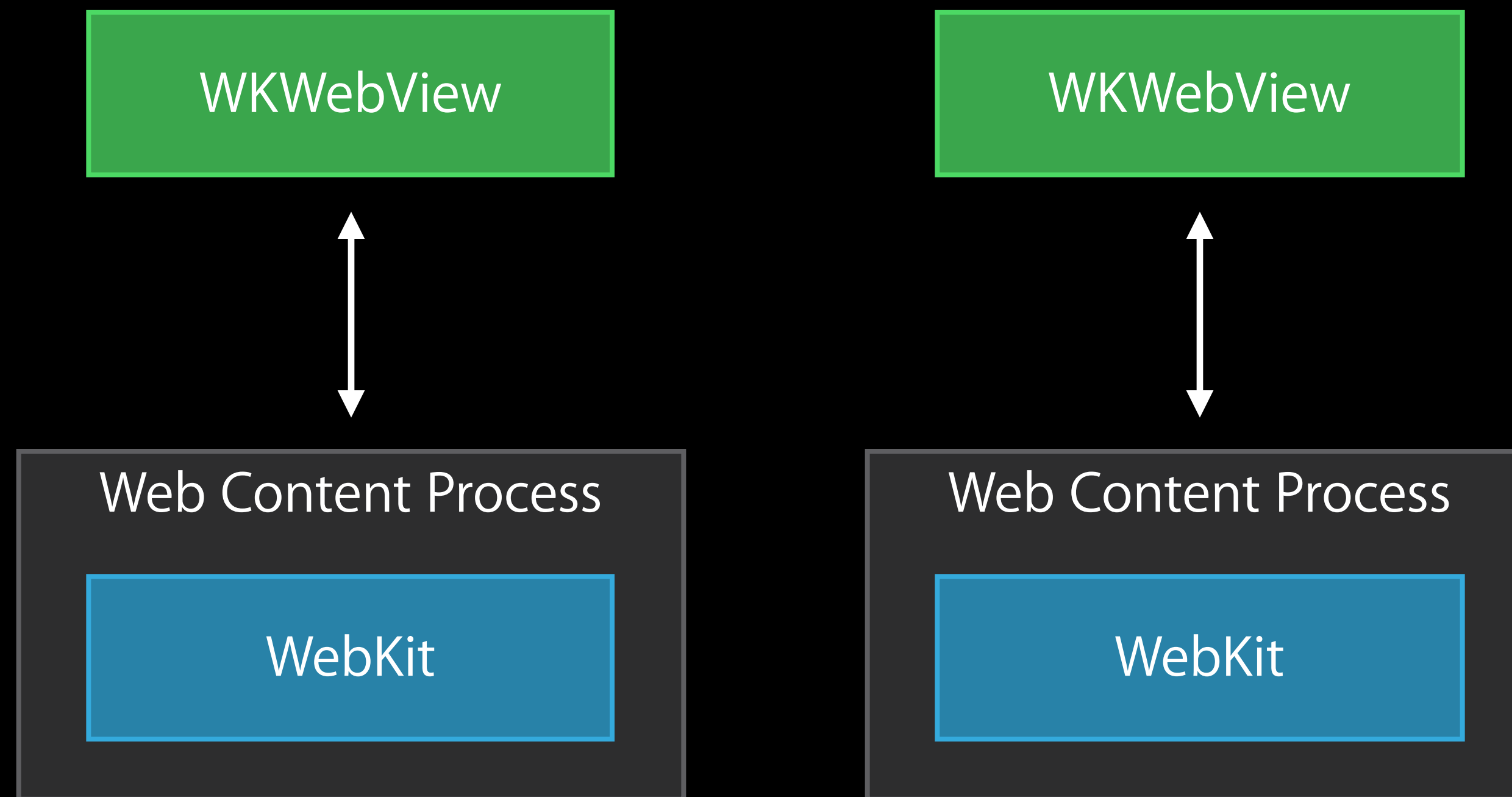
# Multi-process Architecture



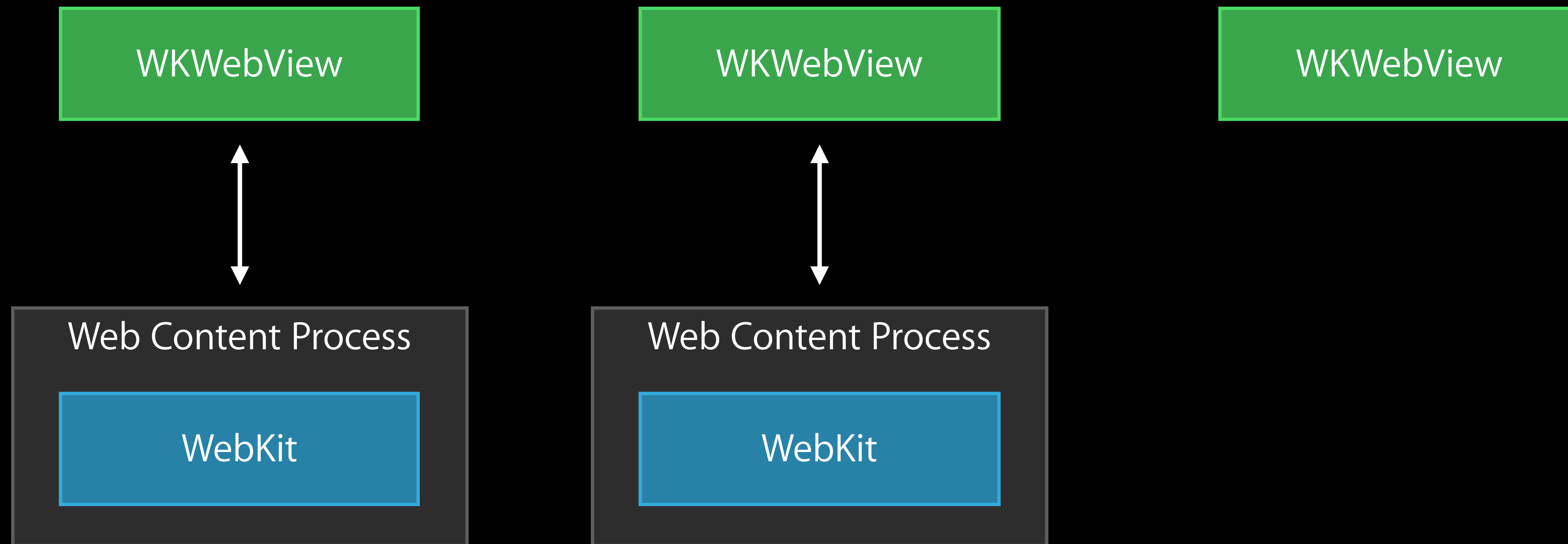
# Multi-process Architecture



# Multi-process Architecture

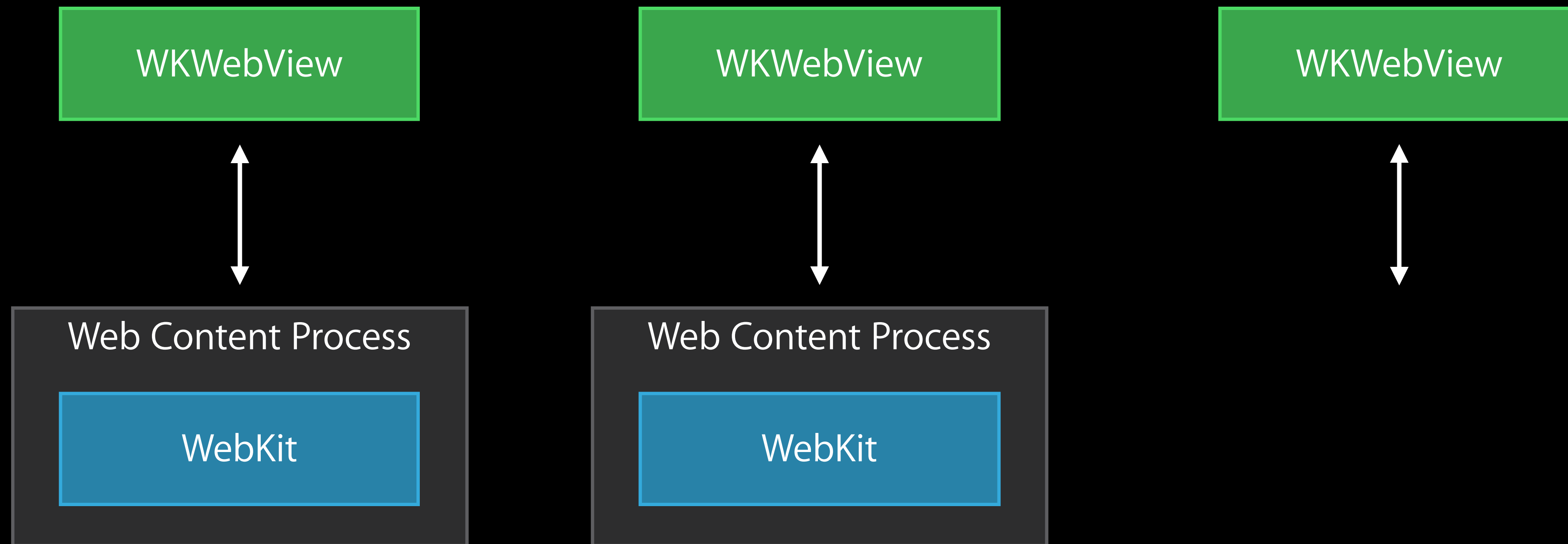


# Multi-process Architecture

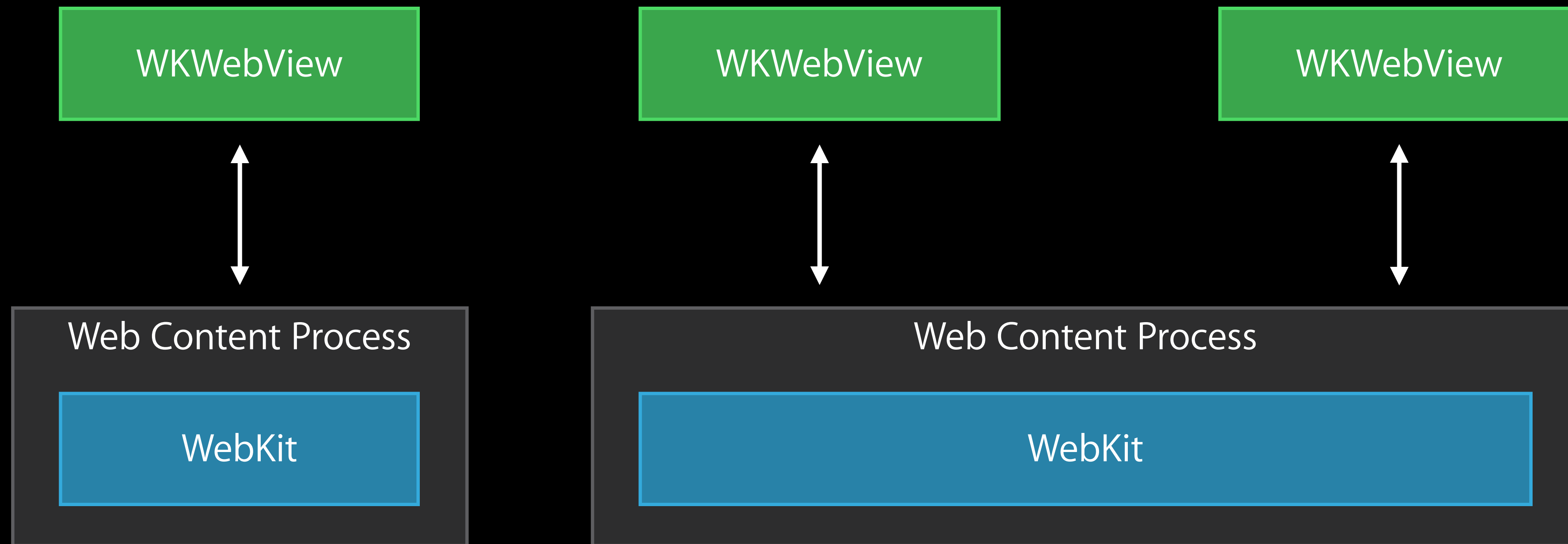




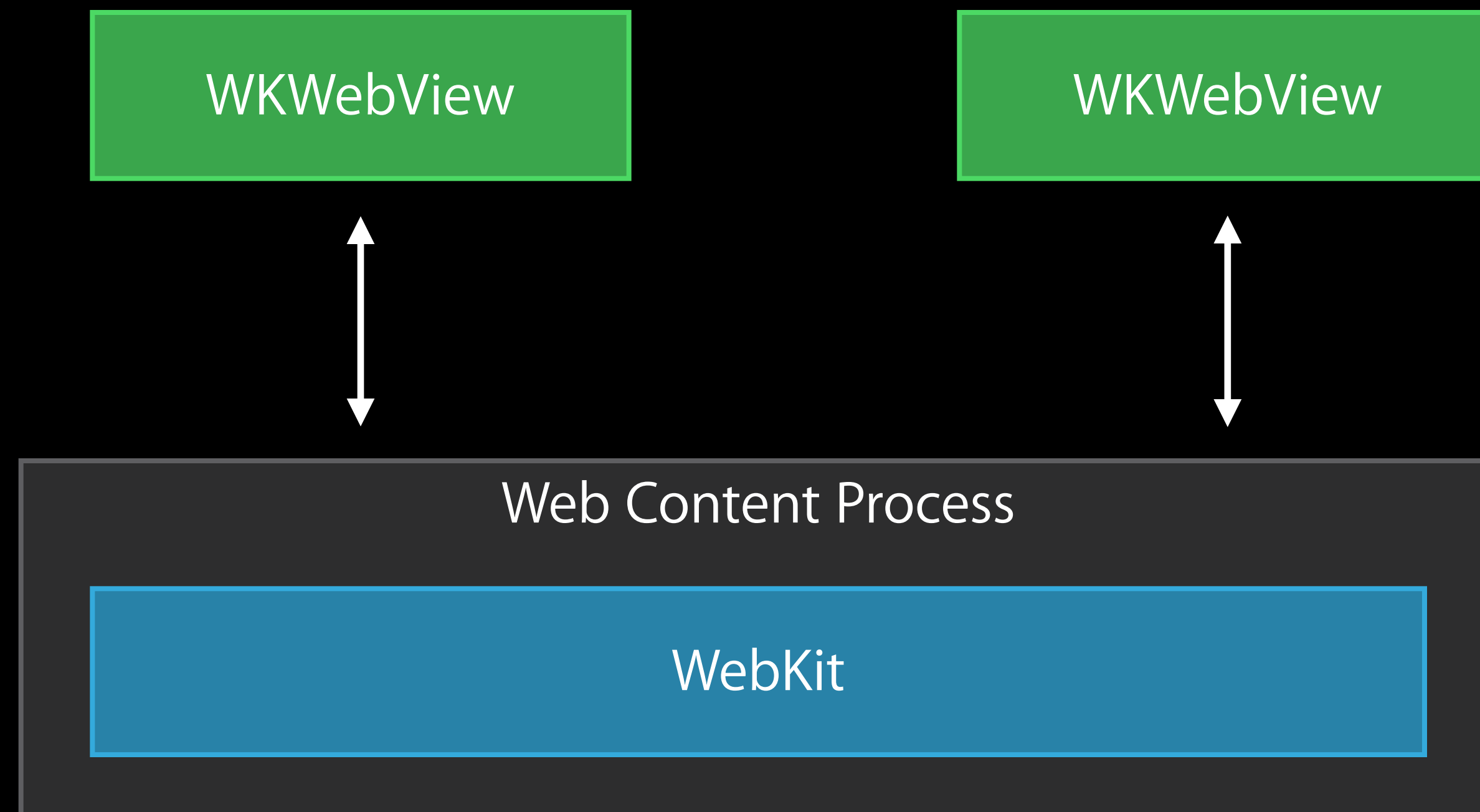
# Multi-process Architecture



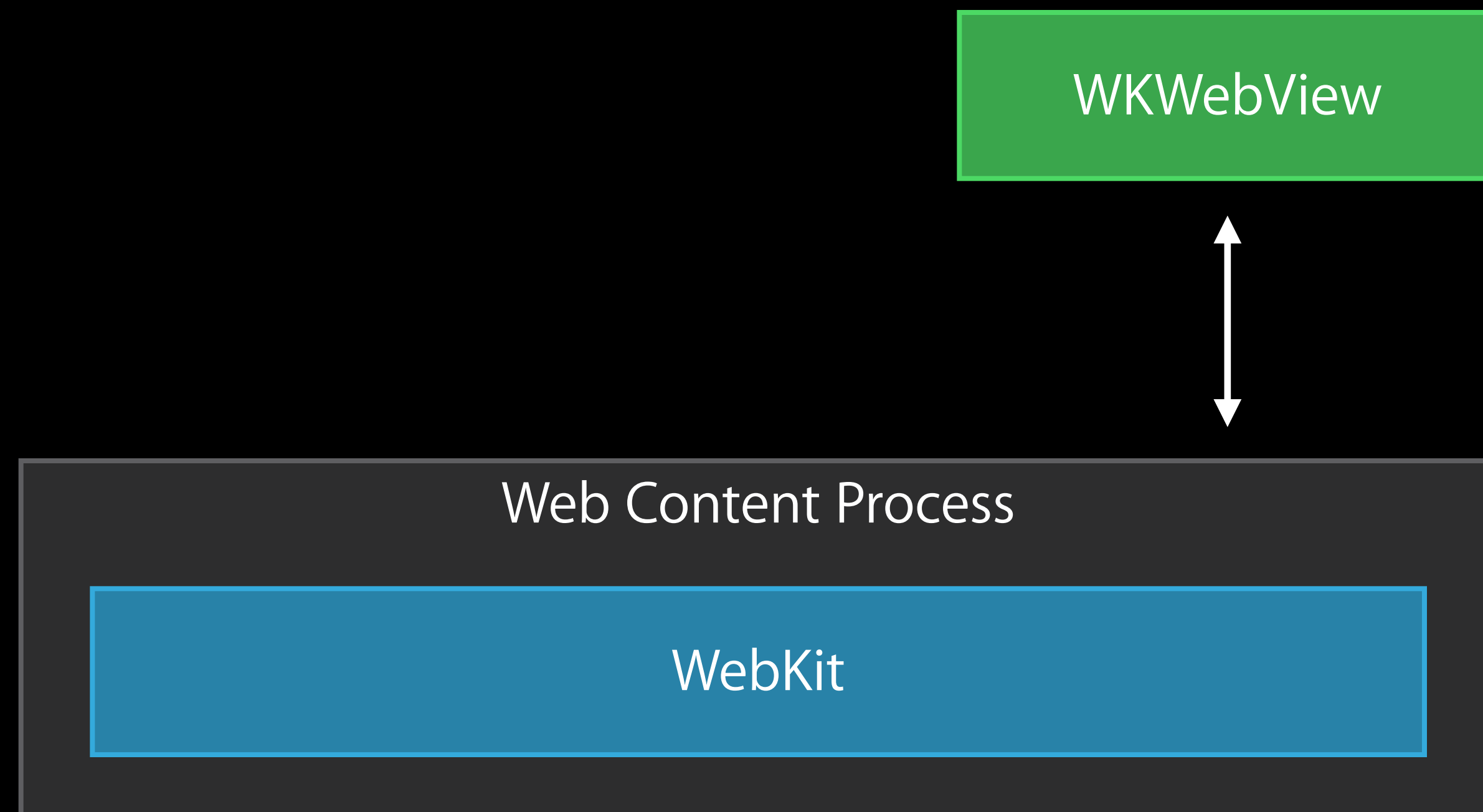
# Multi-process Architecture



# Multi-process Architecture



# Multi-process Architecture



# Multi-process Architecture

# Adopting the Modern WebKit API

# Adopting the Modern WebKit API

## WKPedia—a Wikipedia browsing app



The screenshot shows the Wikipedia article for San Francisco on a mobile device. The page layout includes a top navigation bar with "Article" and "Talk" tabs, and "Read", "Edit", and "View history" buttons. A search bar is located on the right. The main content area features the title "San Francisco" with a star icon and coordinates "37°47'N 122°25'W". The article text describes San Francisco as the cultural center and a leading financial hub of the San Francisco Bay Area and Northern California. It mentions that San Francisco is the only consolidated city-county in California, with a population of 837,442 in 2013. The article also notes that San Francisco is the fourth-most populous city in California and the 14th-most populous city in the United States. The article was founded on June 29, 1776, when colonists from Spain established a fort at the Golden Gate.

**San Francisco**  
From Wikipedia, the free encyclopedia

*This article is about the city and county in California. For other uses, see [San Francisco \(disambiguation\)](#).*

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San Francisco (Spanish for "Saint Francis") was founded on June 29, 1776, when [colonists from Spain](#) established a fort at the [Golden Gate](#)

**San Francisco**  
City and county

City and County of San Francisco



San Francisco from the Marin Headlands, with the [Golden Gate Bridge](#) in the foreground



# Adopting the Modern WebKit API

Creating a WKWebView



# Adopting the Modern WebKit API

## Creating a WKWebView

```
WKWebView *webView = [[WKWebView alloc] initWithFrame:myFrame];
```

# Adopting the Modern WebKit API

Loading a webpage

# Adopting the Modern WebKit API

Loading a webpage

```
NSURL *URL = [NSURL URLWithString:@"http://en.wikipedia.org/wiki"];
```

# Adopting the Modern WebKit API

## Loading a webpage

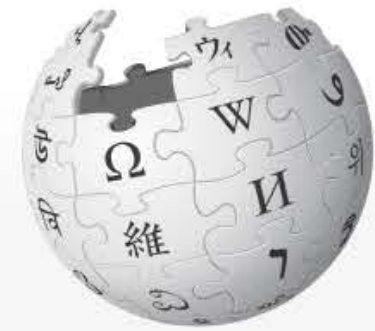
```
NSURL *URL = [NSURL URLWithString:@"http://en.wikipedia.org/wiki"];  
NSURLRequest *request = [NSURLRequest requestWithURL:URL];
```

# Adopting the Modern WebKit API

## Loading a webpage

```
NSURL *URL = [NSURL URLWithString:@"http://en.wikipedia.org/wiki"];
NSURLRequest *request = [NSURLRequest requestWithURL:URL];

[webView loadRequest:request];
```



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San Francisco (Spanish for "Saint Francis") was founded on June 29, 1776, when [colonists from Spain](#) established a fort at the [Golden Gate](#)

## San Francisco

### City and county

#### City and County of San Francisco



San Francisco from the Marin Headlands, with the [Golden Gate Bridge](#) in the foreground



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Golden Gate Bridge

From Wikipedia, the free encyclopedia

The **Golden Gate Bridge** is a suspension bridge spanning the Golden Gate strait, the mile-wide, three-mile-long gap between the north and south sides of the San Francisco Peninsula at the northern tip of the San Francisco Bay. The bridge is one of the most internationally recognized symbols of California, and the United States. The *Frommers* travel guide considers it one of the most beautiful, certainly the most photographed, in the world, at 4,200 feet (1,300 m) in length.

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Transamerica Pyramid

From Wikipedia, the free encyclopedia

*"Transamerica Tower" redirects here. For the skyscraper in San Francisco, see Transamerica Pyramid.*

The **Transamerica Pyramid** is a skyscraper in San Francisco, California. The building no longer has the Transamerica Corporation, who moved their headquarters to the Transamerica Pyramid in 1981. It is still associated with the company. Designed by architect William Pereira, it was built by the Transamerica Construction Company, at 853 Market Street. It is the eighth tallest building in the world.

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San Francisco

From Wikipedia, the free encyclopedia

Coordinates: 37°47′N 122°25′W﻿ / ﻿37.783°N 122.417°W﻿ / 37.783; -122.417

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**San Francisco**

**City and county**

**City and County of San Francisco**



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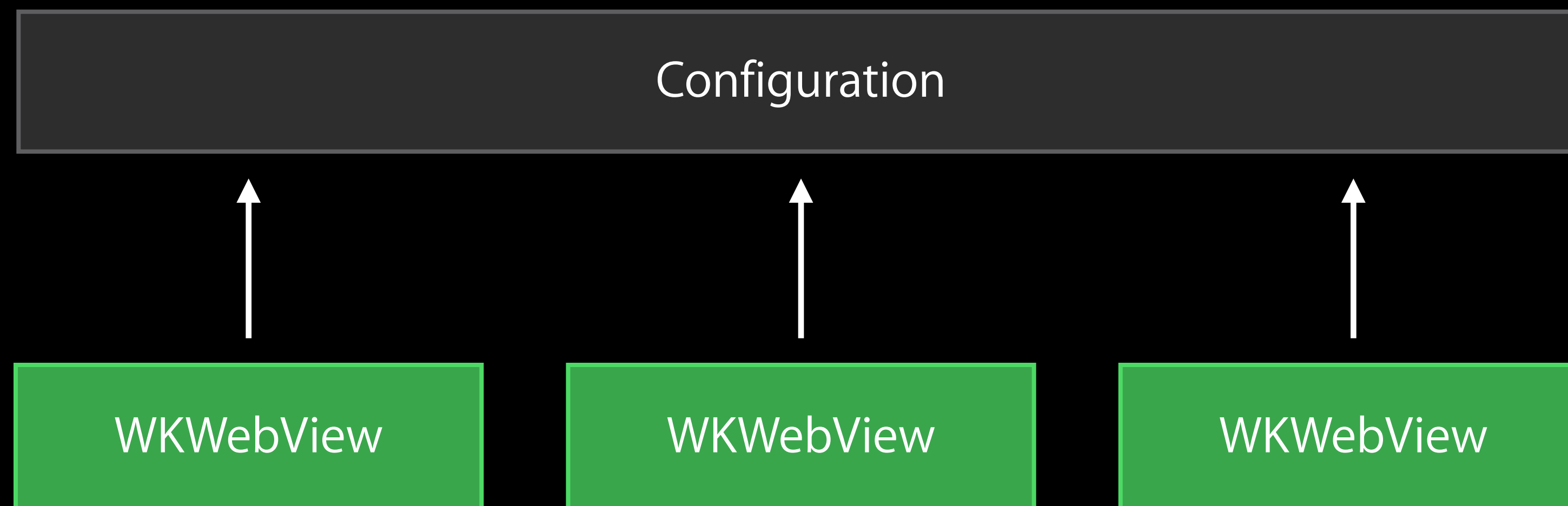
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# Adopting the Modern WebKit API

## Configurations





# Adopting the Modern WebKit API

## Configurations

```
WKWebViewConfiguration *configuration =  
    [[WKWebViewConfiguration alloc] init];
```

# Adopting the Modern WebKit API

## Configurations

```
WKWebViewConfiguration *configuration =  
    [[WKWebViewConfiguration alloc] init];  
  
WKWebView *webView = [[WKWebView alloc] initWithFrame:myFrame  
    configuration:configuration];
```



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The only [consolidated city-county](#) in [California](#),<sup>[11]</sup> San Francisco encompasses a land area of about 46.9 square miles (121 km<sup>2</sup>)<sup>[12]</sup> on the northern end of the [San Francisco Peninsula](#), giving it a density of about 17,867 people per square mile (6,898 people per km<sup>2</sup>). It is the most densely settled large city (population greater than 200,000) in the state of California and the [second-most densely populated](#) major city in the [United States](#) after [New York City](#).<sup>[13]</sup> San Francisco is the [fourth-most populous city](#) in California, after [Los Angeles](#), [San Diego](#) and [San Jose](#), and the [14th-most populous city](#) in the United States—with a Census-estimated 2013 population of 837,442.<sup>[10]</sup> The city is also the financial and cultural hub of the larger [San Jose-San Francisco-Oakland](#) combined statistical area, with a population of 8.5 million.

San Francisco (Spanish for "Saint Francis") was founded on June 29, 1776, when [colonists from Spain](#) established [a fort](#) at the [Golden Gate](#)

## San Francisco

### City and county

#### City and County of San Francisco



San Francisco from the Marin Headlands, with the [Golden Gate Bridge](#) in the foreground



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Coordinates: 37°47′N 122°25′W﻿ / ﻿37.783°N 122.417°W﻿ / 37.783; -122.417

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### San Francisco

#### City and county

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## San Francisco

### City and county

#### City and County of San Francisco



San Francisco from the Marin Headlands, with the Golden Gate Bridge in the foreground



# WKWebView Actions

# WKWebView Actions

- goBack:
- goForward:
- reload:
- stopLoading:



# WKWebView Actions

- goBack:
- goForward:
- reload:
- stopLoading:

# Adding App UI

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## San Francisco

### City and county

#### City and County of San Francisco



San Francisco from the Marin Headlands, with the Golden Gate Bridge in the foreground



# WKWebView Properties

# WKWebView Properties

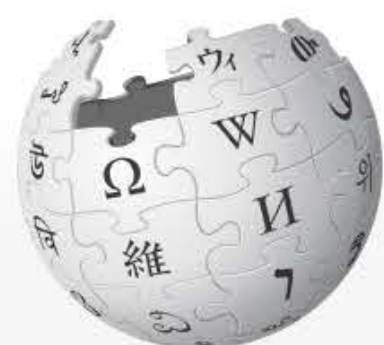
Name	Type
title	NSString
URL	NSURL
loading	BOOL
estimatedProgress	double

# WKWebView Properties

Name	Type
<code>title</code>	<code>NSString</code>
<code>URL</code>	<code>NSURL</code>
<code>loading</code>	<code>BOOL</code>
<code>estimatedProgress</code>	<code>double</code>

# WKWebView Properties

Name	Type
title	NSString
URL	NSURL
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estimatedProgress	double



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San Francisco (Spanish for "Saint Francis") was founded on June 29, 1776, when [colonists from Spain](#) established a [fort](#) at the [Golden Gate](#) and a [mission](#) named for [St. Francis of Assisi](#) a few miles away.<sup>[14]</sup> The [California Gold Rush](#) of 1849 brought rapid growth, making it the largest city on the [West Coast](#) at the time. Due to the growth of its population, San Francisco became a consolidated city-county in 1856.<sup>[15]</sup> After three-quarters of the city was destroyed by the [1906 earthquake and fire](#),<sup>[16]</sup>

## San Francisco

### City and county

#### City and County of San Francisco



San Francisco from the Marin Headlands, with the [Golden Gate Bridge](#) in the foreground



Flag



Seal

Nickname(s): *The City by the Bay*; *Fog City*; *San Fran*; *Frisco*;<sup>[1][2][3][4]</sup> *The City that Knows How*



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# WebKit

From Wikipedia, the free encyclopedia  
(Redirected from [Webkit](#))

**WebKit** is a [layout engine software component](#) for [rendering web pages](#) in [web browsers](#). It powers [Apple's Safari web browser](#) and was previously used in [Google's Chrome web browser](#). As of September 2013 [WebKit browser market share](#)<sup>[4]</sup> was larger than that of both the [Trident engine](#) used by [Internet Explorer](#), and the [Gecko engine](#) used by [Firefox](#).

WebKit is also used as the basis for the experimental browser included with the [Amazon Kindle e-book reader](#), as well as the default browser in the [Apple iOS](#), [Android](#), [BlackBerry 10](#), and [Tizen](#) mobile operating systems. WebKit's [C++ application programming interface](#) provides a set of [classes](#) to display web content in windows, and implements browser features such as following links when clicked by the user, managing a back-forward list, and managing a history of pages recently visited.

WebKit's HTML and JavaScript code originally began as a [fork](#) of the [KHTML](#) and [KJS](#) libraries from [KDE](#),<sup>[5]</sup> and has now been further developed by individuals from [KDE](#), [Apple](#), [Google](#), [Nokia](#), [Bitstream](#), [BlackBerry](#), [Igalia](#), and others.<sup>[6]</sup> [OS X](#), [Windows](#), [GNU/Linux](#), and some other [Unix-like operating systems](#) are supported by the project.<sup>[7]</sup> On April 3, 2013 Google announced that it had forked [WebCore](#), a component of WebKit to be used in future versions of [Google Chrome](#) and [Opera](#) under the name [Blink](#).<sup>[8][9]</sup>

WebKit is available under a [BSD-form license](#) <sup>[10]</sup> with the exception of the [WebCore](#) and [JavaScriptCore](#) components, which are available under the [GNU Lesser General Public License](#). As of March 7, 2013, WebKit is a trademark of

## WebKit



<b>Original author(s)</b>	<a href="#">KDE</a> <sup>[1][2]</sup>
<b>Developer(s)</b>	<a href="#">Apple</a> , <a href="#">Adobe</a> , and others
<b>Initial release</b>	November 4, 1998; 15 years ago (KHTML released) June 7, 2005; 8 years ago (WebKit open sourced)
<b>Written in</b>	<a href="#">C++</a>
<b>Operating system</b>	<a href="#">Cross-platform</a> <sup>[3]</sup>
<b>Type</b>	<a href="#">Layout engine</a>
<b>License</b>	<a href="#">BSD v2.0</a> (most of browser engine), <a href="#">GNU LGPL v2.1</a> (some files in the JavaScriptCore & WebCore components)
<b>Website</b>	<a href="http://www.webkit.org">www.webkit.org</a>





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WebKit's HTML and JavaScript code originally began as a fork of the KHTML and KJS libraries from KDE,<sup>[5]</sup> and has now been further developed by individuals from KDE, Apple, Google, Nokia, Bitstream, BlackBerry, Igalia, and others.<sup>[6]</sup> OS X, Windows, GNU/Linux, and some other Unix-like operating systems are supported by the project.<sup>[7]</sup> On April 3, 2013 Google announced that it had forked WebCore, a component of WebKit to be used in future versions of Google Chrome and Opera under the name Blink.<sup>[8][9]</sup>

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<b>Type</b>	Layout engine
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<b>Website</b>	<a href="http://www.webkit.org">www.webkit.org</a>



# The WebKit Open Source Project

- Home
- Surfin' Safari Blog
- Planet WebKit
- Project Goals
- Keeping in Touch
- Trac
- Contributors Meeting
- Working with the Code**
- Installing Developer Tools
- Getting the Code
- Building WebKit
- Running WebKit
- Debugging WebKit
- Contributing Code
- Commit and Review Policy
- Adding Features
- Security Policy
- Documentation**
- Wiki
- Projects
- Code Style Guidelines
- Technical Articles
- Web Inspector
- Web Developer Resources
- Demos
- Testing**
- Regression Testing
- Leak Hunting
- Writing New Tests

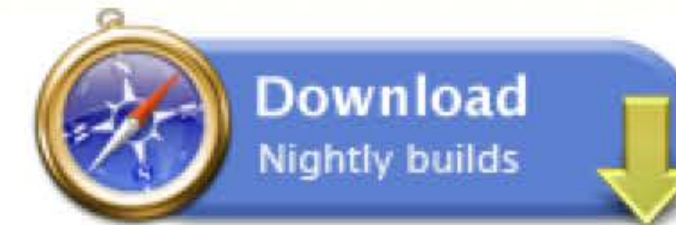
## Welcome to the website for the WebKit Open Source Project!

WebKit is an open source web browser engine. WebKit is also the name of the Mac OS X system framework version of the engine that's used by [Safari](#), Dashboard, Mail, and many other OS X applications. WebKit's HTML and JavaScript code began as a branch of the [KHTML](#) and [KJS](#) libraries from [KDE](#).

## Getting involved

There are many ways to get involved. You can:

- download the latest nightly build
- install developer tools and then check out and build the source code



Once you have either of these, you can help by:

- reporting bugs you find in the software
- providing reductions to bugs
- submitting patches for review

## More info

More information about WebKit can be found on its [wiki](#). You can help here too, by adding information that can help others learn about WebKit. If you have more questions, [contact us](#).

## Projects

There are many exciting (new) [projects](#) that you can contribute to:

- help us improve [Website compatibility](#)
- write [documentation](#)
- SVG
- MathML
- CSS
- DOM

# Customizing Page Loading

# Page Loading

# Page Loading

Action

# Page Loading

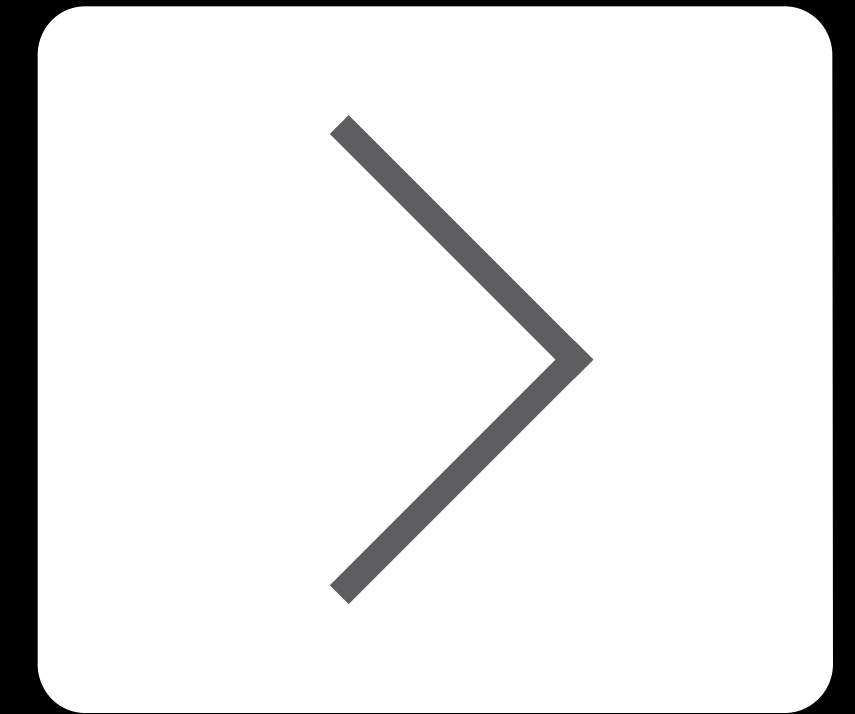
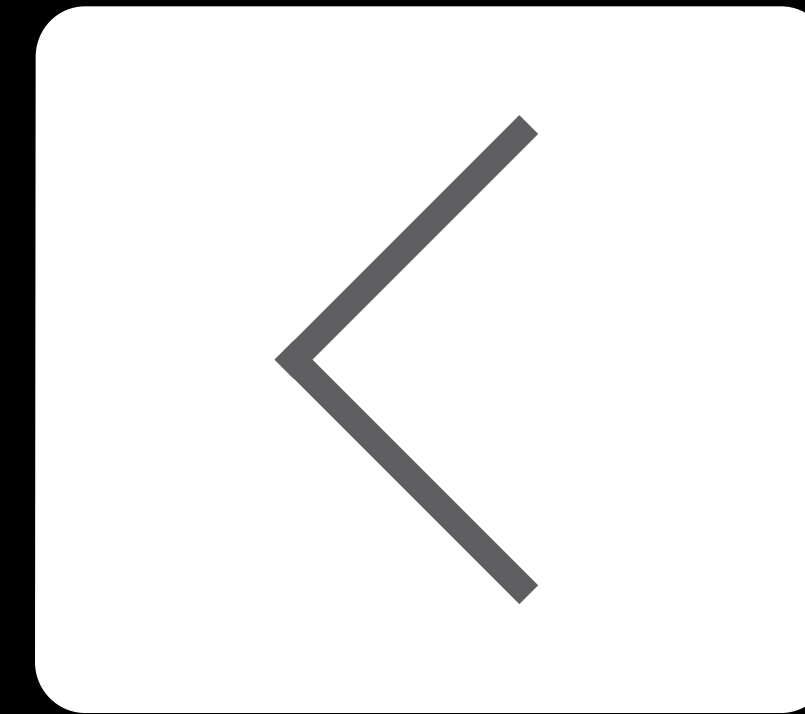
Action

Link



# Page Loading

Action



# Page Loading

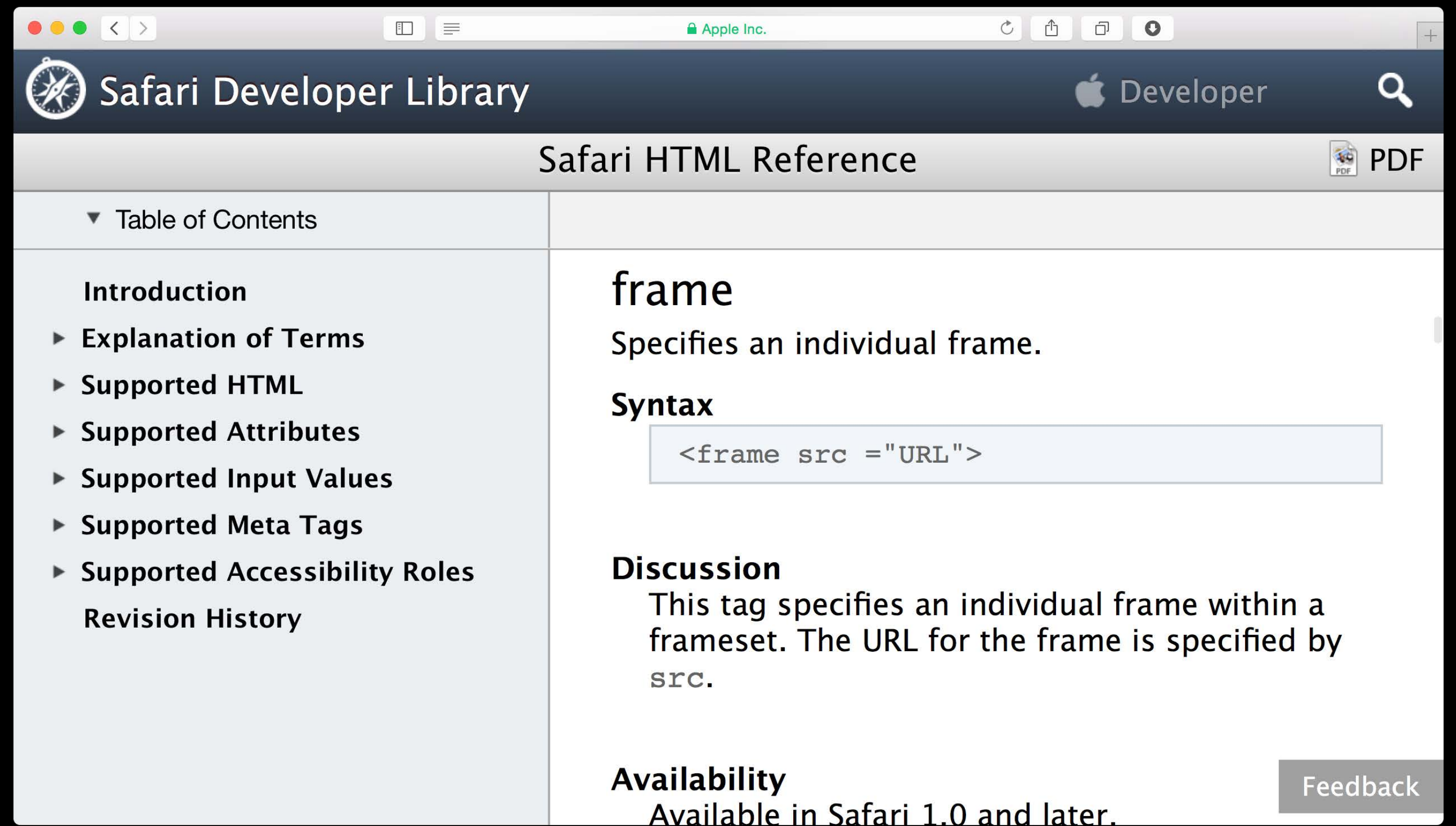
Action

```
window.location = 'http://www.apple.com/';
```



# Page Loading

Action



The screenshot shows the Safari Developer Library interface. The browser's address bar displays 'Apple Inc.' and the page title is 'Safari HTML Reference'. The left sidebar contains a 'Table of Contents' with the following items: Introduction, Explanation of Terms, Supported HTML, Supported Attributes, Supported Input Values, Supported Meta Tags, Supported Accessibility Roles, and Revision History. The main content area is titled 'frame' and includes the following sections: 'frame' (Specifies an individual frame.), 'Syntax' (with a code block: `<frame src = "URL">`), 'Discussion' (This tag specifies an individual frame within a frameset. The URL for the frame is specified by `src`.), and 'Availability' (Available in Safari 1.0 and later.). A 'Feedback' button is located in the bottom right corner of the content area.

# Page Loading

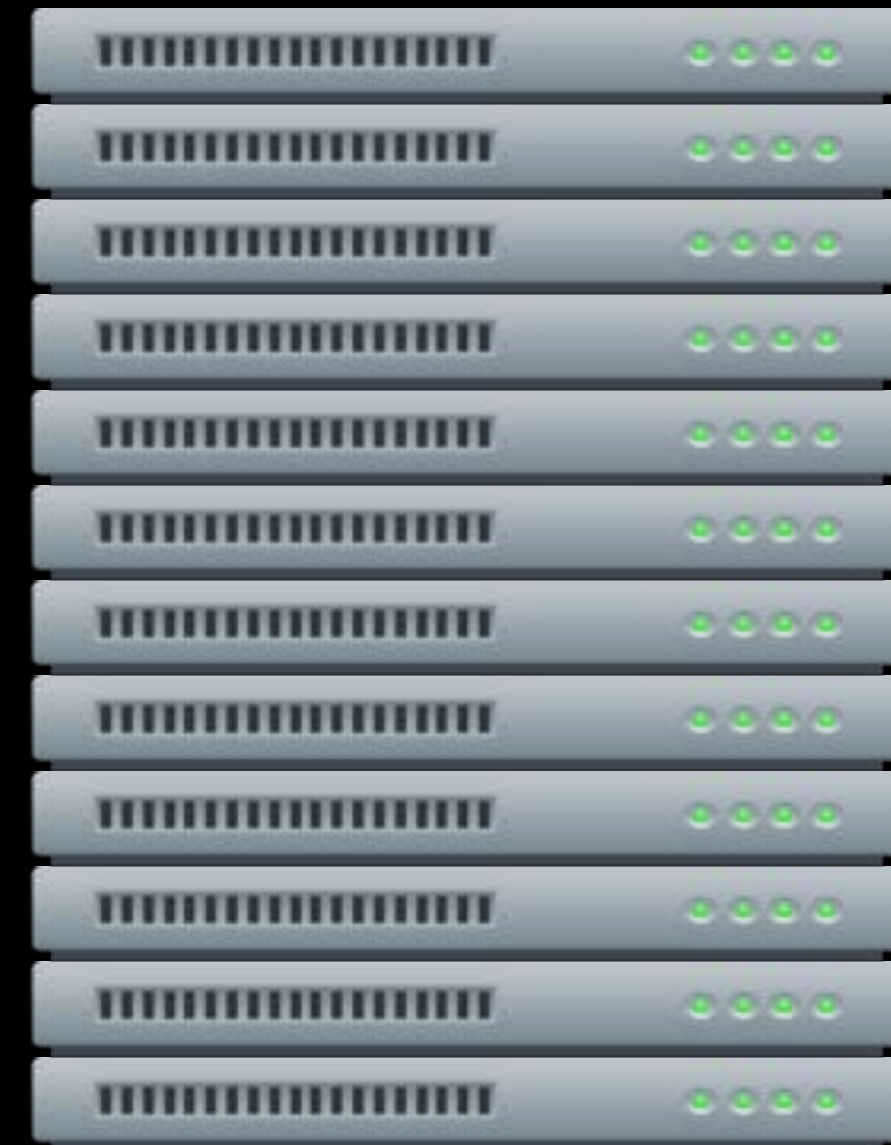
Action

```
-[WKWebView loadRequest:]
```

# Page Loading

Action

Request

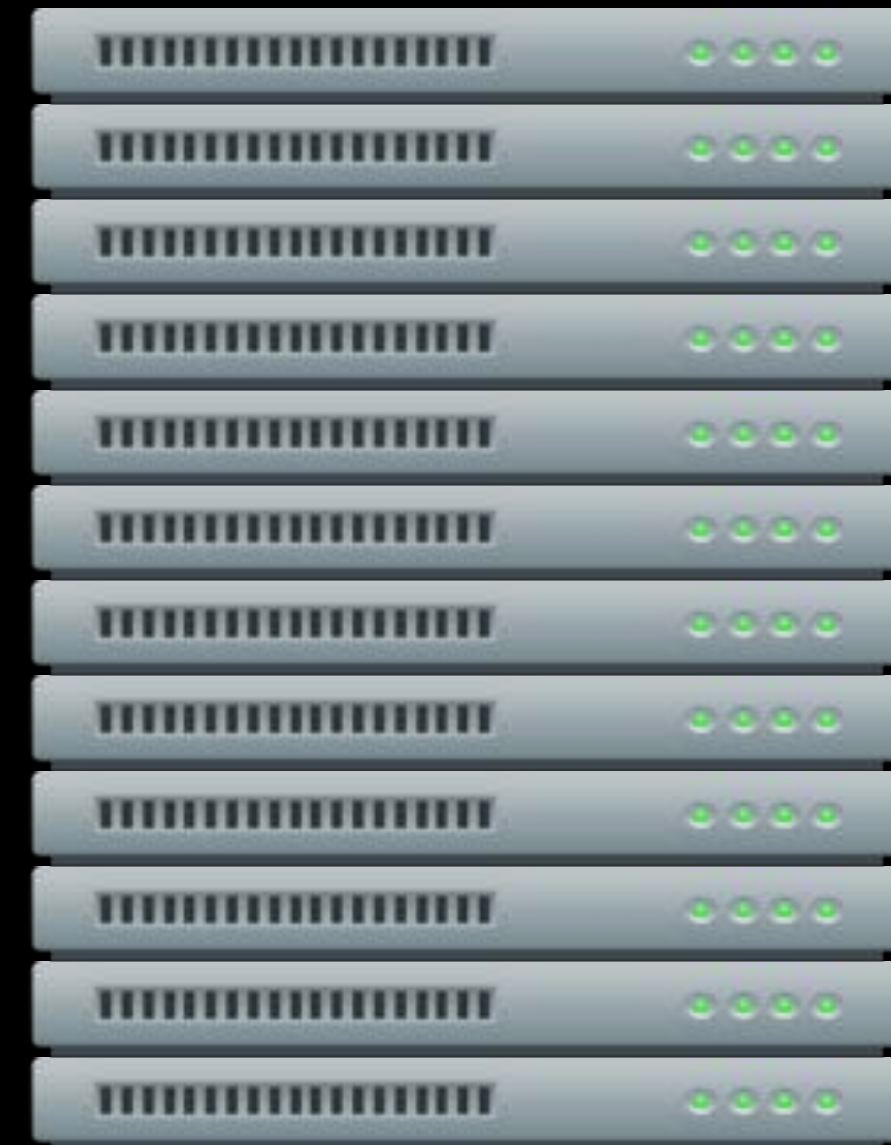


# Page Loading

Action

Request

Response



# Page Loading

Action

Request

Response



# Page Loading

Action

Request

Response



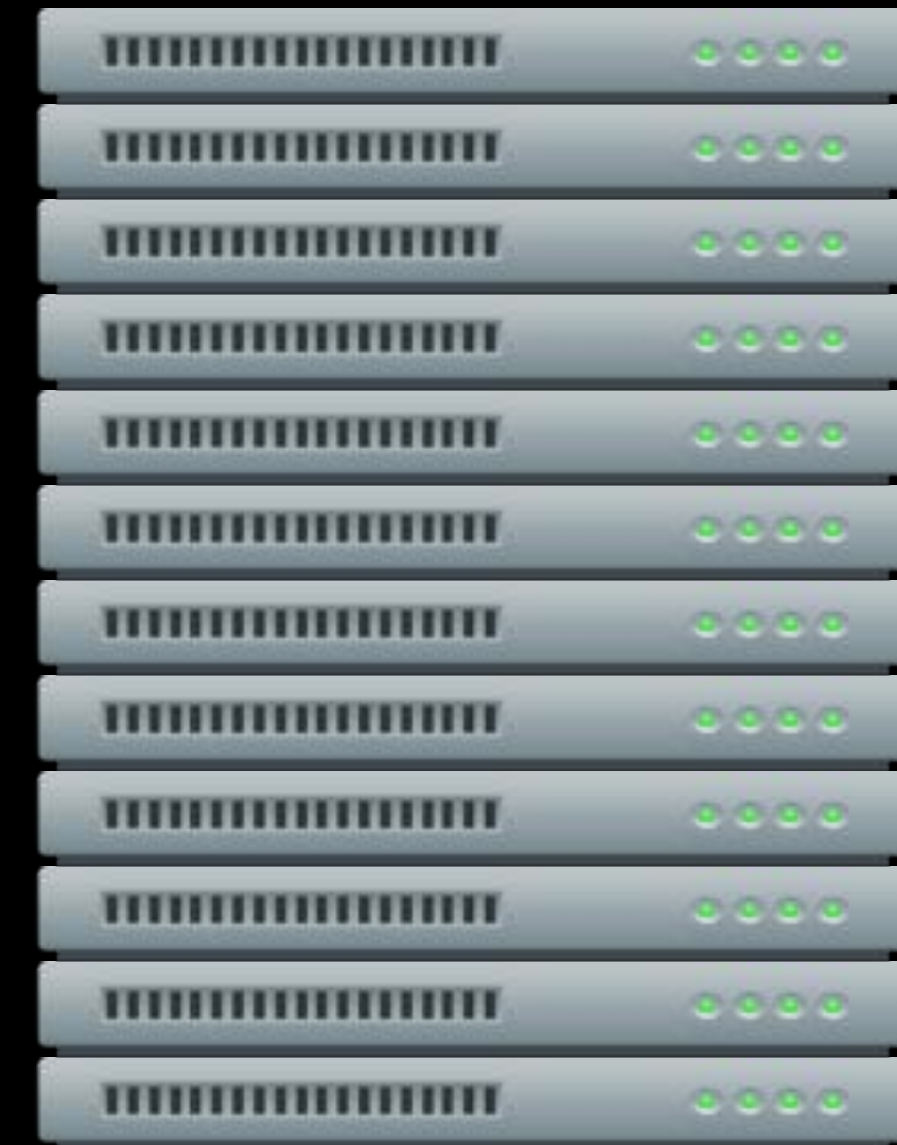
# Page Loading

Action

Request

Response

Data



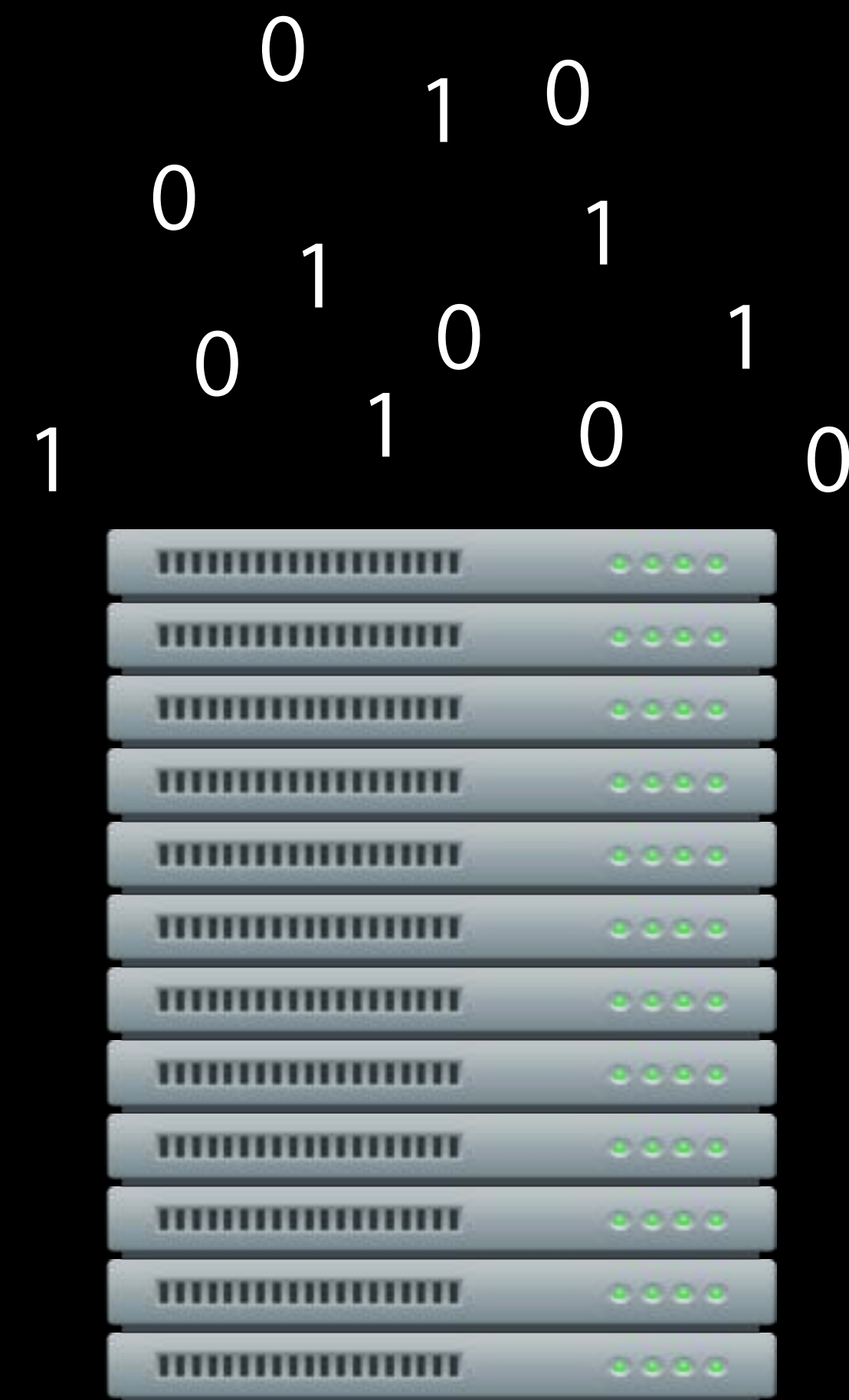
# Page Loading

Action

Request

Response

Data





# Page Loading

Action

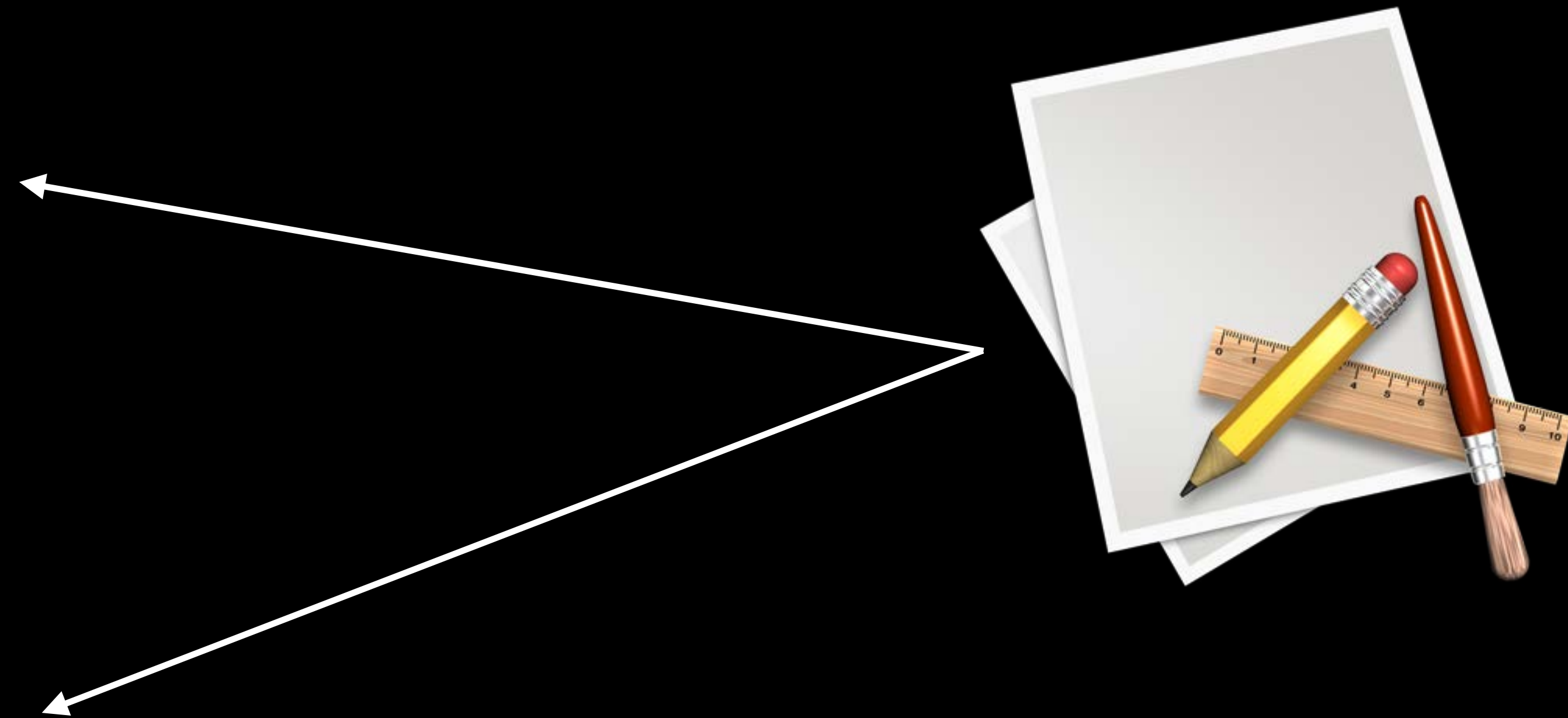
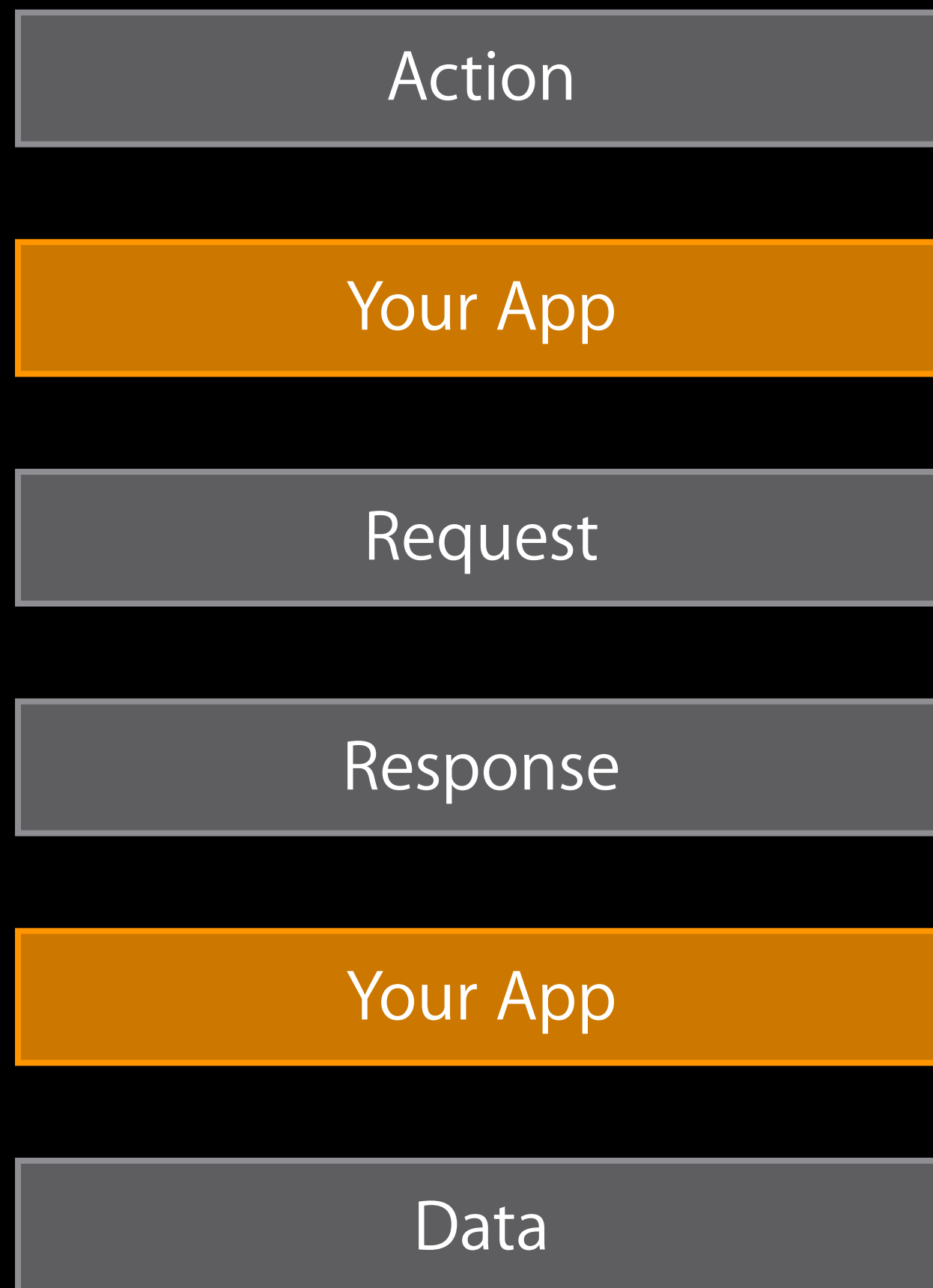
Request

Response

Data



# Page Loading



# Customizing Page Loading

```
@property (nonatomic, weak) WKNavigationDelegate *navigationDelegate;
```

# Customizing Page Loading

```
@property (nonatomic, weak) WKNavigationDelegate *navigationDelegate;
```

```
- webView:decidePolicyForNavigationAction:decisionHandler:
```

# Customizing Page Loading

```
@property (nonatomic, weak) WKNavigationDelegate *navigationDelegate;
```

- webView:`decidePolicyForNavigationAction`:decisionHandler:
- webView:`decidePolicyForNavigationResponse`:decisionHandler:

# Customizing Page Loading

WKNavigationAction

# Customizing Page Loading

## WKNavigationAction

Name	Type
navigationType	WKNavigationType
sourceFrame	WKFrameInfo
destinationFrame	WKFrameInfo
request	NSURLRequest
modifierFlags	NSEventModifierFlags

# Customizing Page Loading

## WKNavigationAction

Name	Type
<code>navigationType</code>	<code>WKNavigationType</code>
<code>sourceFrame</code>	<code>WKFrameInfo</code>
<code>destinationFrame</code>	<code>WKFrameInfo</code>
<code>request</code>	<code>NSURLRequest</code>
<code>modifierFlags</code>	<code>NSEventModifierFlags</code>

Link



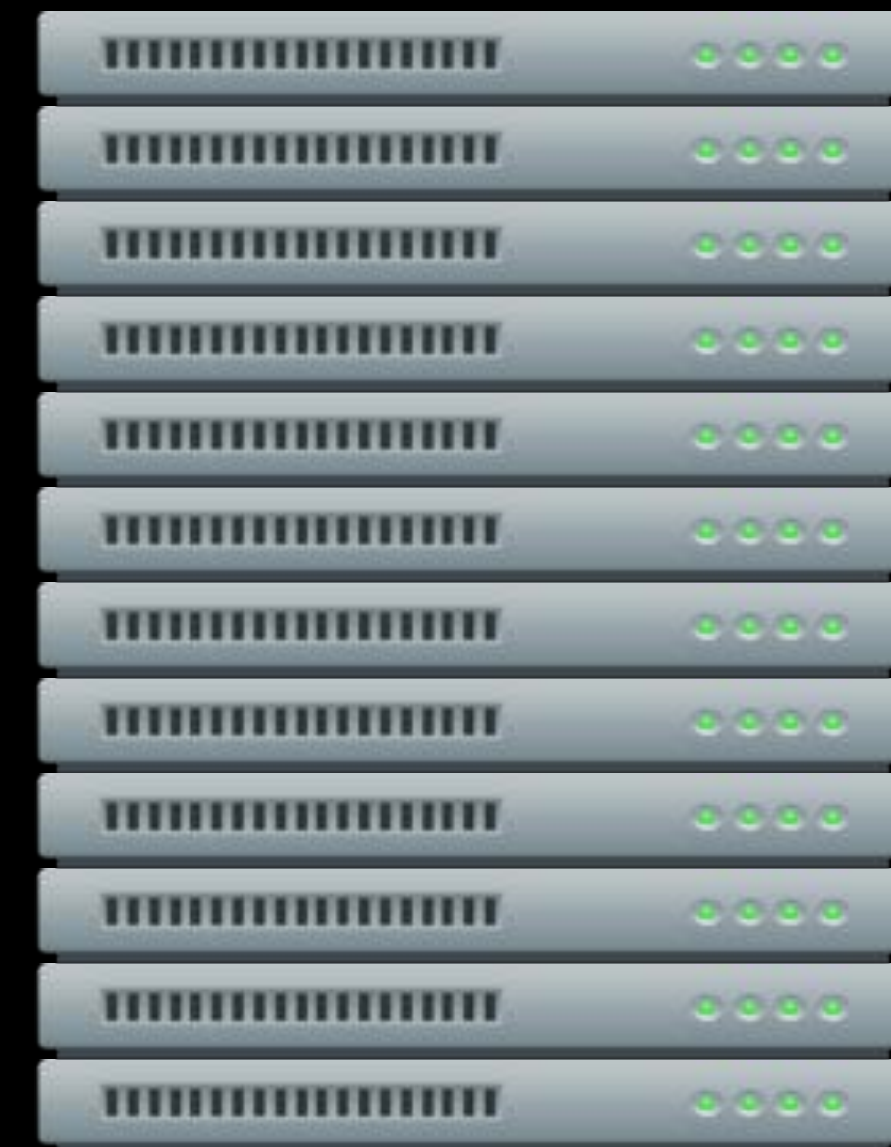
```
-[WKWebView loadRequest:]
```



# Customizing Page Loading

## WKNavigationAction

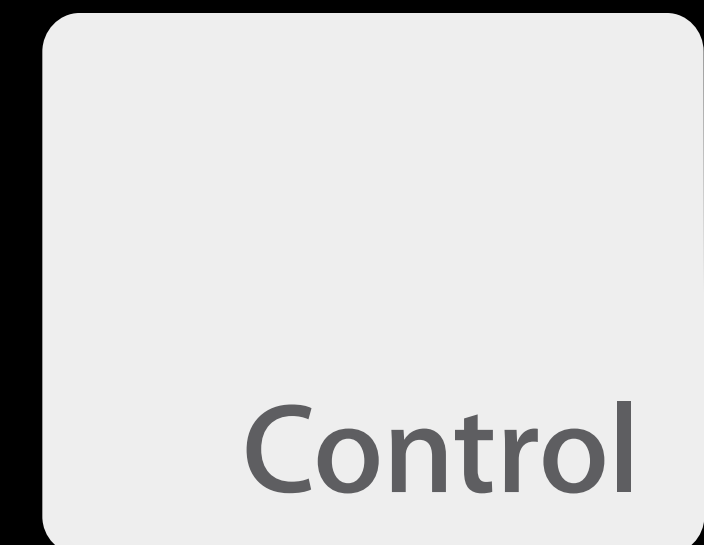
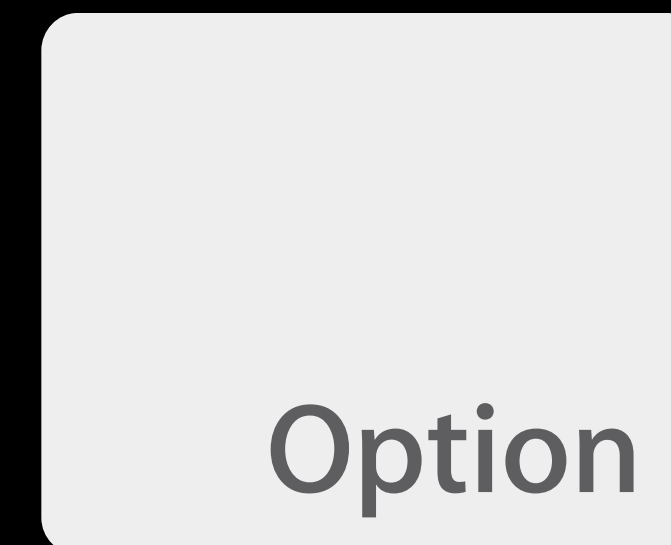
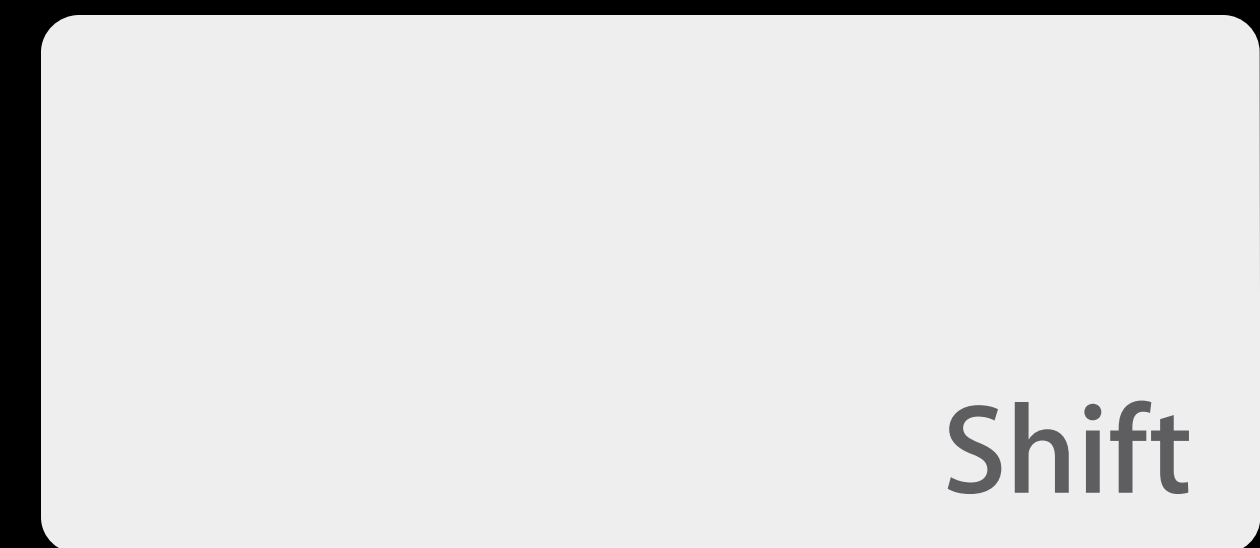
Name	Type
navigationType	WKNavigationType
sourceFrame	WKFrameInfo
destinationFrame	WKFrameInfo
<b>request</b>	<b>NSURLRequest</b>
modifierFlags	NSEventModifierFlags



# Customizing Page Loading

## WKNavigationAction

Name	Type
navigationType	WKNavigationType
sourceFrame	WKFrameInfo
destinationFrame	WKFrameInfo
request	NSURLRequest
modifierFlags	NSEventModifierFlags



# Customizing Page Loading

WKNavigationResponse

# Customizing Page Loading

## WKNavigationResponse

Name	Type
response	NSURLResponse
forMainFrame	BOOL
canShowMIMETYPE	BOOL

# Customizing Page Loading

## WKNavigationResponse

Name	Type
<code>response</code>	<code>NSURLResponse</code>
<code>forMainFrame</code>	<code>BOOL</code>
<code>canShowMIMETYPE</code>	<code>BOOL</code>



# Customizing Page Loading

Decision Handler

# Customizing Page Loading

## Decision Handler

You decide whether to cancel or allow

# Customizing Page Loading

## Decision Handler

You decide whether to cancel or allow

Navigation action

`WKNavigationActionPolicyCancel`

`WKNavigationActionPolicyAllow`



# Customizing Page Loading

## Decision Handler

You decide whether to cancel or allow

Navigation action

`WKNavigationActionPolicyCancel`

`WKNavigationActionPolicyAllow`

Navigation response

`WKNavigationResponsePolicyCancel`

`WKNavigationResponsePolicyAllow`

# Customizing Page Loading

## Decision Handler

You decide whether to cancel or allow

Navigation action

`WKNavigationActionPolicyCancel`

`WKNavigationActionPolicyAllow`

Navigation response

`WKNavigationResponsePolicyCancel`

`WKNavigationResponsePolicyAllow`

Asynchronous

*Demo*

WKpedia

Beth Dakin

Safari and WebKit Engineer

# Gestures

## Navigation Gestures

# Gestures

## Navigation Gestures

```
webView.allowsBackForwardNavigationGestures = YES;
```

# Gestures

Zoom Gestures

# Gestures

## Zoom Gestures

OS X

```
webView.allowsMagnification = YES;
```

# San Francisco



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- Bân-lâm-gú
- Беларуская
- Беларуская (тарашкевіца)
- Български
- Boarisch
- བོད་ཡིག
- Bosanski
- Brezhoneg
- Català
- ЧӀавашла
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## San Francisco

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Coordinates: 37°47′N 122°25′W﻿ / ﻿37.783°N 122.417°W﻿ / 37.783; -122.417

*This article is about the city and county in California. For other uses, see San Francisco (disambiguation).*

**San Francisco** <sup>i</sup>/sæn frənˈsɪskoʊ/, officially the **City and County of San Francisco**, is the cultural center and a leading financial hub of the San Francisco Bay Area and Northern California.

The only consolidated city-county in California,<sup>[1]</sup> San Francisco encompasses a land area of about 46.9 square miles (121 km<sup>2</sup>)<sup>[12]</sup> on the northern end of the San Francisco Peninsula, giving it a density of about 17,867 people per square mile (6,898 people per km<sup>2</sup>). It is the most densely settled large city (population greater than 200,000) in the state of California and the second-most densely populated major city in the United States after New York City.<sup>[13]</sup> San Francisco is the fourth-most populous city in California, after Los Angeles, San Diego and San Jose, and the 14th-most populous city in the United States—with a Census-estimated 2013 population of 837,442.<sup>[10]</sup> The city is also the financial and cultural hub of the larger San Jose-San Francisco-Oakland combined statistical area, with a population of 8.5 million.

San Francisco (Spanish for "Saint Francis") was founded on June 29, 1776, when colonists from Spain established a fort at the Golden Gate and a mission named for St. Francis of Assisi a few miles away.<sup>[14]</sup> The California Gold Rush of 1849 brought rapid growth, making it the largest city on the West Coast at the time. Due to the growth of its population, San Francisco became a consolidated city-county in 1856.<sup>[15]</sup> After three-quarters of the city was destroyed by the 1906 earthquake and fire,<sup>[16]</sup> San Francisco was quickly rebuilt, hosting the Panama-Pacific International Exposition nine years later. During World War II, San Francisco was the port of embarkation for service members shipping out to the Pacific Theater.<sup>[17]</sup> After the war, the confluence of returning servicemen, massive immigration, liberalizing attitudes, and other factors led to the Summer of Love and the gay rights movement, cementing San Francisco as a center of liberal activism in the United States.

San Francisco is a popular tourist destination,<sup>[18]</sup> known for its cool summers, fog, steep rolling hills, eclectic mix of architecture, and landmarks including the Golden Gate Bridge, cable cars, the former prison on Alcatraz Island, and its Chinatown district. San Francisco is also the headquarters of five major banking institutions and various other companies such as Gap Inc., Pacific Gas and Electric Company, Yelp, Twitter, Instagram, and Craigslist.

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2 Geography
2.1 Cityscape
2.1.1 Neighborhoods
2.2 Climate
3 Demographics
3.1 Race and ethnicity
3.2 Education, households, and income





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## History [edit]

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*See also: Timeline of San Francisco history*

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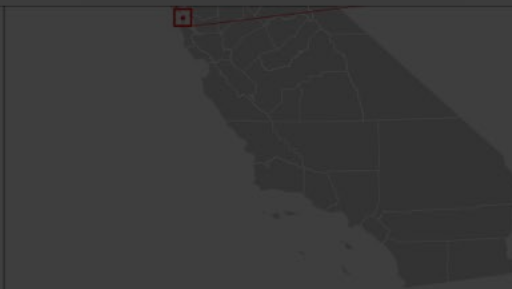
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*Main article: History of San Francisco*

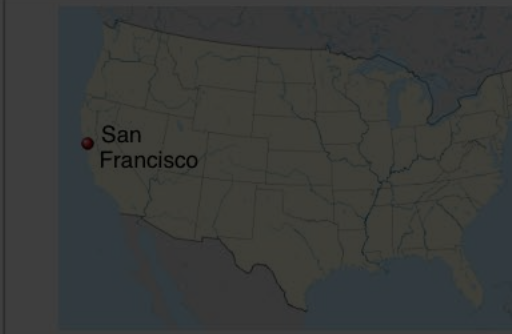
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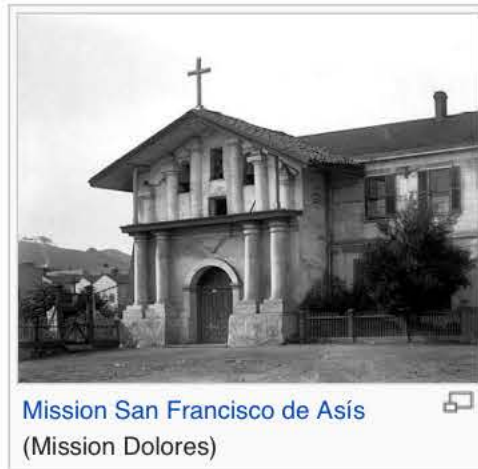
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Mission San Francisco de Asís (Mission Dolores)

*Spanish exploration party*, led by *Don Gaspar de Portolà* arrived on November 2, 1769, the first documented European visit to *San Francisco Bay*.<sup>[20]</sup> Seven years later, on March 28, 1776, the Spanish established the *Presidio of San Francisco*, followed by a mission, *Mission San Francisco de Asís* (*Mission Dolores*), established by the Spanish explorer *Juan Bautista de Anza*.<sup>[14]</sup>

Upon *independence* from Spain in 1821, the area became part of *Mexico*. Under Mexican rule, the mission system gradually ended, and its lands became *privatized*. In 1835, Englishman *William Richardson* erected the first independent homestead,<sup>[21]</sup> near a boat anchorage around what is today *Portsmouth Square*. Together with *Alcalde Francisco de Haro*, he laid out a street plan for the expanded settlement, and the town, named *Yerba Buena*, began to attract American settlers. Commodore *John D. Sloat* claimed California for the United States on July 7, 1846, during the *Mexican-American War*, and Captain *John B. Montgomery* arrived to claim Yerba Buena two days later. Yerba Buena was renamed San Francisco on January 30 of the next year,<sup>[22]</sup> and Mexico officially *ceded the territory* to the United States at the *end of the war*. Despite its attractive location as a port and naval base, San Francisco was still a small settlement with inhospitable geography.<sup>[23]</sup>



Port of San Francisco in 1851

The *California Gold Rush* brought a flood of treasure seekers. With their *sourdough bread* in tow,<sup>[24]</sup> prospectors accumulated in San Francisco over rival *Benicia*,<sup>[25]</sup> raising the population from 1,000 in 1848 to 25,000 by December 1849.<sup>[26]</sup> The promise of fabulous riches was so strong that crews on arriving vessels deserted and



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## San Francisco

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Coordinates: 37°47′N 122°25′W﻿ / ﻿37.783°N 122.417°W﻿ / 37.783; -122.417

*This article is about the city and county in California. For other uses, see [San Francisco \(disambiguation\)](#).*

**San Francisco** /ˌsænˈfrɑːnˈsikoʊ/, officially the **City and County of San Francisco**, is the cultural center and a leading financial hub of the [San Francisco Bay Area](#) and [Northern California](#).

The only consolidated city-county in California,<sup>[1]</sup> San Francisco encompasses a land area of about 46.9 square miles (121 km<sup>2</sup>)<sup>[12]</sup> on the northern end of the [San Francisco Peninsula](#), giving it a density of about 17,867 people per square mile (6,898 people per km<sup>2</sup>). It is the most densely settled large city (population greater than 200,000) in the state of California and the second-most densely populated major city in the United States after [New York City](#).<sup>[13]</sup> San Francisco is the fourth-most populous city in California, after [Los Angeles](#), [San Diego](#) and [San Jose](#), and the 14th-most populous city in the United States—with a Census-estimated 2013 population of 837,442.<sup>[10]</sup> The city is also the financial and cultural hub of the larger [San Jose-San Francisco-Oakland](#) combined statistical area, with a population of 8.5 million.

San Francisco (Spanish for "Saint Francis") was founded on June 29, 1776, when colonists from Spain established a fort at the [Golden Gate](#) and a mission named for [St. Francis of Assisi](#) a few miles away.<sup>[14]</sup> The [California Gold Rush](#) of 1849 brought rapid growth, making it the largest city on the West Coast at the time. Due to the growth of its population, San Francisco became a consolidated city-county in 1856.<sup>[15]</sup> After three-quarters of the city was destroyed by the 1906 earthquake and fire,<sup>[16]</sup> San Francisco was quickly rebuilt, hosting the [Panama-Pacific International Exposition](#) nine years later. During [World War II](#), San Francisco was the port of embarkation for service members shipping out to the [Pacific Theater](#).<sup>[17]</sup> After the war, the confluence of returning servicemen, massive immigration, liberalizing attitudes, and other factors led to the [Summer of Love](#) and the [gay rights](#) movement, cementing San Francisco as a center of liberal activism in the United States.

San Francisco is a popular tourist destination,<sup>[18]</sup> known for its cool summers, fog, steep rolling hills, eclectic mix of architecture, and landmarks including the [Golden Gate Bridge](#), cable cars, the former prison on [Alcatraz Island](#), and its [Chinatown](#) district. San Francisco is also the headquarters of five major banking institutions and various other companies such as [Gap Inc.](#), [Pacific Gas and Electric Company](#), [Yelp](#), [Twitter](#), [Instagram](#), and [Craigslis](#)t.

### History [edit]

*Main article: [History of San Francisco](#)*

*See also: [Timeline of San Francisco history](#)*

#### Historical Affiliations

- [Spanish Empire](#) 1776–1821
- [First Mexican Empire](#) 1821–1823

The earliest archaeological evidence of human habitation of the territory of the city of San Francisco dates to 3000 BC.<sup>[19]</sup>

### San Francisco

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#### City and County of San Francisco



San Francisco from the Marin Headlands, with the Golden Gate Bridge in the foreground



Flag



Seal

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Location of San Francisco in California



Location in the United States  
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Upon [independence](#) from Spain in 1821, the area became

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San Francisco from the Marin Headlands, with the Golden Gate Bridge in the foreground



Flag



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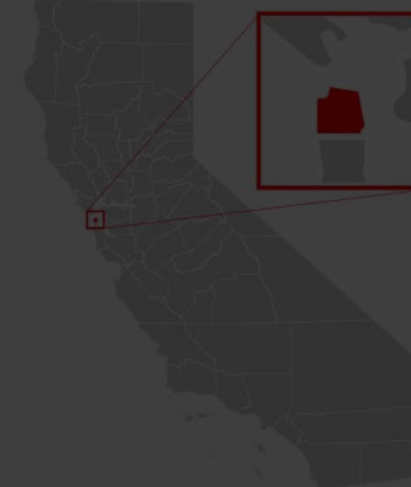


Flag

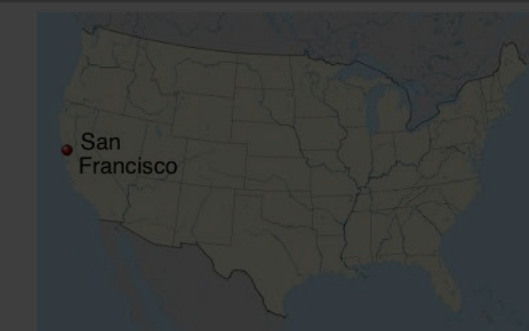


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For other uses, see San Francisco (disambiguation).

County of San Francisco, is the San Francisco Bay Area and Northern California. San Francisco encompasses a land area of 46.9 square miles (122 km<sup>2</sup>) of the San Francisco Peninsula, giving it a population density of 17,330 people per km<sup>2</sup>. It is the most densely populated city in California and the second-most densely populated city in the United States, behind New York City.<sup>[13]</sup> San Francisco is the fourth largest city in California, behind San Diego and San Jose, and the 14th largest city in the United States, with an estimated 2013 population of 837,442.<sup>[10]</sup> The San Francisco-Oakland-San Jose Metropolitan Area is the eighth largest in the United States.

San Francisco was founded on June 29, 1776, when colonists from Spain, led by Don Gaspar de Puelato, named for St. Francis of Assisi a few days after the city's founding. Rapid growth, making it the largest city in California. In 1846, San Francisco became a city. In 1906, the city was destroyed by the 1906 San Francisco earthquake, which destroyed the city and destroyed the city. Following the earthquake, the city was rebuilt and became a center of commerce. The city was also a center of culture and contemporary life. The city was also a center of entertainment and performing arts. The city was also a center of museums. The city was also a center of sports and recreation. The city was also a center of beaches and parks. The city was also a center of law and government. The city was also a center of crime. The city was also a center of education. The city was also a center of colleges and universities. The city was also a center of primary and secondary schools. The city was also a center of media. The city was also a center of transportation.

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San Francisco from the Marin Headlands, with the Golden Gate Bridge in the foreground



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# Customizing Webpage Content

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User Scripts

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Script Messages

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Managed by `WKUserContentController`

# WKUserController

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Part of WKWebViewConfiguration

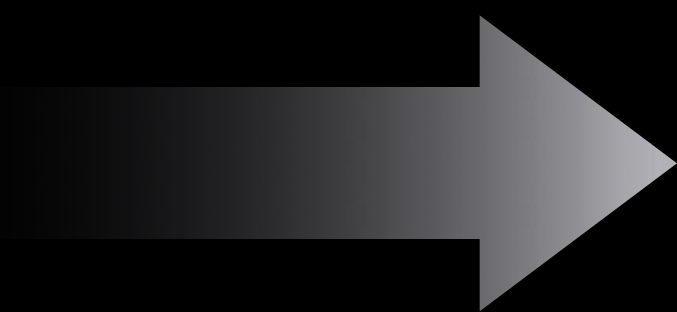
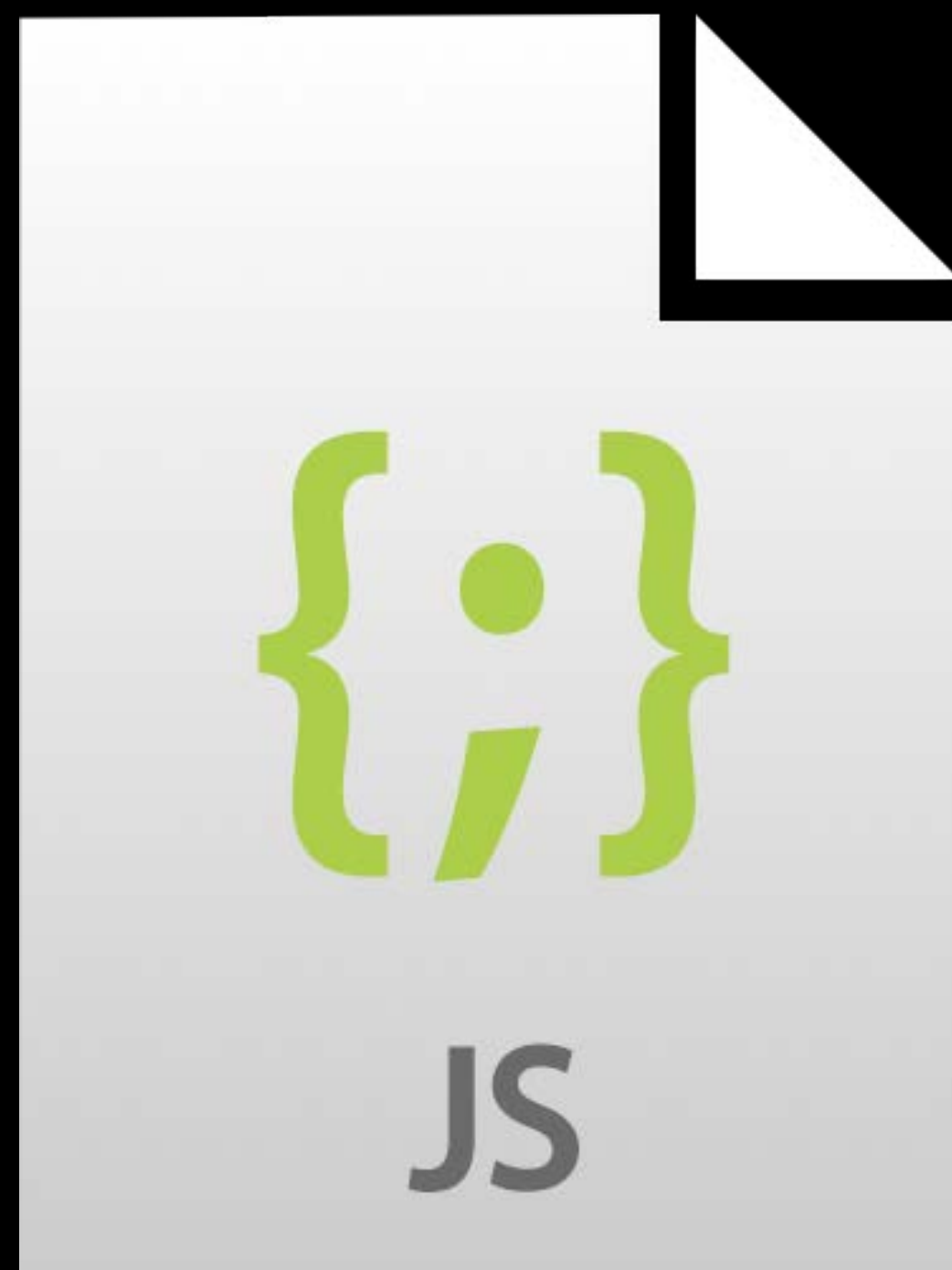
# WKUserController

Part of WKWebViewConfiguration

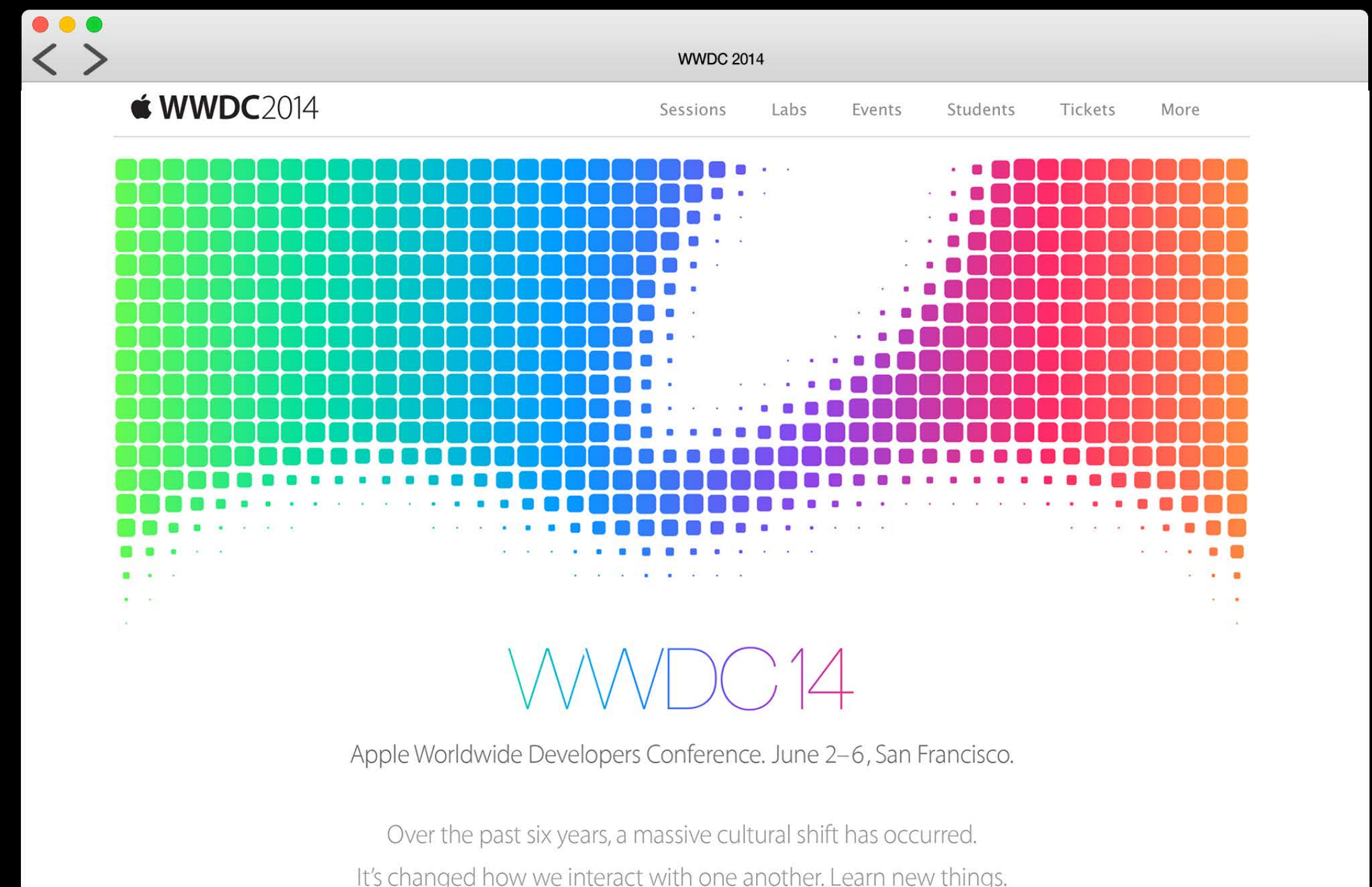
```
@property (nonatomic, strong) WKUserController *userContentController;
```



# User Scripts



# User Scripts



# User Scripts

# User Scripts

When they run

# User Scripts

When they run

- Document start

# User Scripts

When they run

- Document start
- Document end

# User Scripts

When they run

- Document start
- Document end

Where they run

# User Scripts

When they run

- Document start
- Document end

Where they run

- All frames



# User Scripts

## When they run

- Document start
- Document end

## Where they run

- All frames
- Main frame only

# User Scripts

# User Scripts

```
NSString *myScriptSource = @"alert('Hello, World!');";
```

# User Scripts

```
NSString *myScriptSource = @"alert('Hello, World!')";  
  
WKUserScript *myUserScript = [[WKUserScript alloc]  
    initWithSource:myScriptSource  
    injectionTime:WKUserScriptInjectionTimeAtDocumentStart  
    forMainFrameOnly:YES];
```

# User Scripts

```
NSString *myScriptSource = @"alert('Hello, World!')";

WKUserScript *myUserScript = [[WKUserScript alloc]
    initWithSource:myScriptSource
    injectionTime:WKUserScriptInjectionTimeAtDocumentStart
    forMainFrameOnly:YES];

[userContentController addUserScript:myUserScript];
```

# What Can User Scripts Do?

# What Can User Scripts Do?

Incredibly powerful

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Incredibly powerful

- Modify the document



# What Can User Scripts Do?

Incredibly powerful

- Modify the document
- Listen for events

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Incredibly powerful

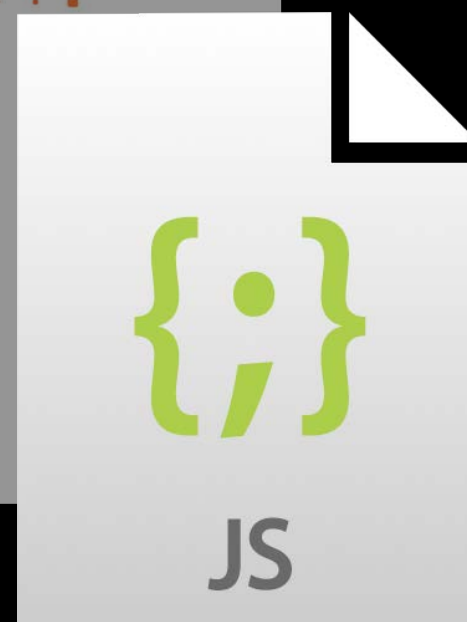
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- Listen for events
- Load resources

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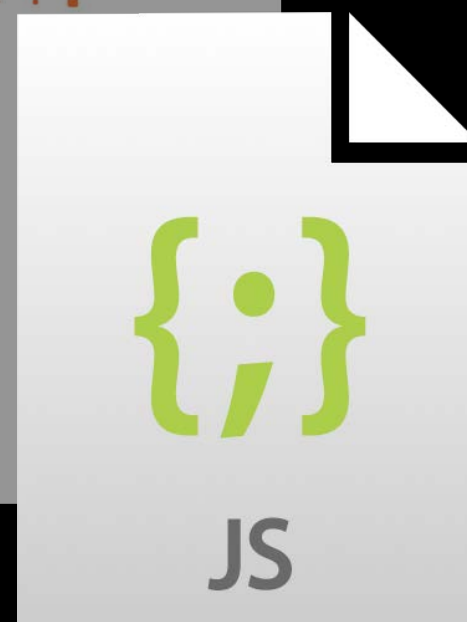
Incredibly powerful

- Modify the document
- Listen for events
- Load resources
- Communicate back to your application

# Script Messages



# Script Messages



# Script Messages

# Script Messages

Sent as JSON

# Script Messages

Sent as JSON

Converted to Objective-C types



# Script Messages

Registering a Script Message Handler

# Script Messages

Registering a Script Message Handler

`WKScriptMessageHandler` protocol

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## Registering a Script Message Handler

WKScriptMessageHandler protocol

```
– (void)userContentController:(WKUserContentController  
*)userContentController didReceiveScriptMessage:(WKScriptMessage *)message;
```

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WKScriptMessageHandler protocol

```
– (void)userContentController:(WKUserContentController  
*)userContentController didReceiveScriptMessage:(WKScriptMessage *)message;
```

```
[userContentController addScriptMessageHandler:handler name:@"myName"];
```

# Script Messages

Posting messages

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```
window.webkit.messageHandlers.<name>.postMessage();
```

# Script Messages

## Posting messages

```
window.webkit.messageHandlers.<name>.postMessage();
```

```
function postMyMessage()  
{  
    var message = { 'message' : 'Hello, World!', 'numbers' : [ 1, 2, 3 ] };  
    window.webkit.messageHandlers.myName.postMessage(message);  
}
```

# Script Messages

Receiving messages



# Script Messages

## Receiving messages

```
- (void)userContentController:(WKUserContentController
*)userContentController didReceiveScriptMessage:(WKScriptMessage *)message
{
    NSLog(@"Message: %@", message.body);
}
```

# Script Messages

## WKScriptMessage

Name	Type
body	id
webView	WKWebView
name	NSString

# Script Messages

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The webpage can call `postMessage`

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- Great for allowing webpages to interact with your app

# Script Messages

The webpage can call `postMessage`

- Great for allowing webpages to interact with your app
- Handle invalid messages

*Demo*

WKpedia for iPad

Beth Dakin

Safari and WebKit Engineer

# The Modern WebKit API

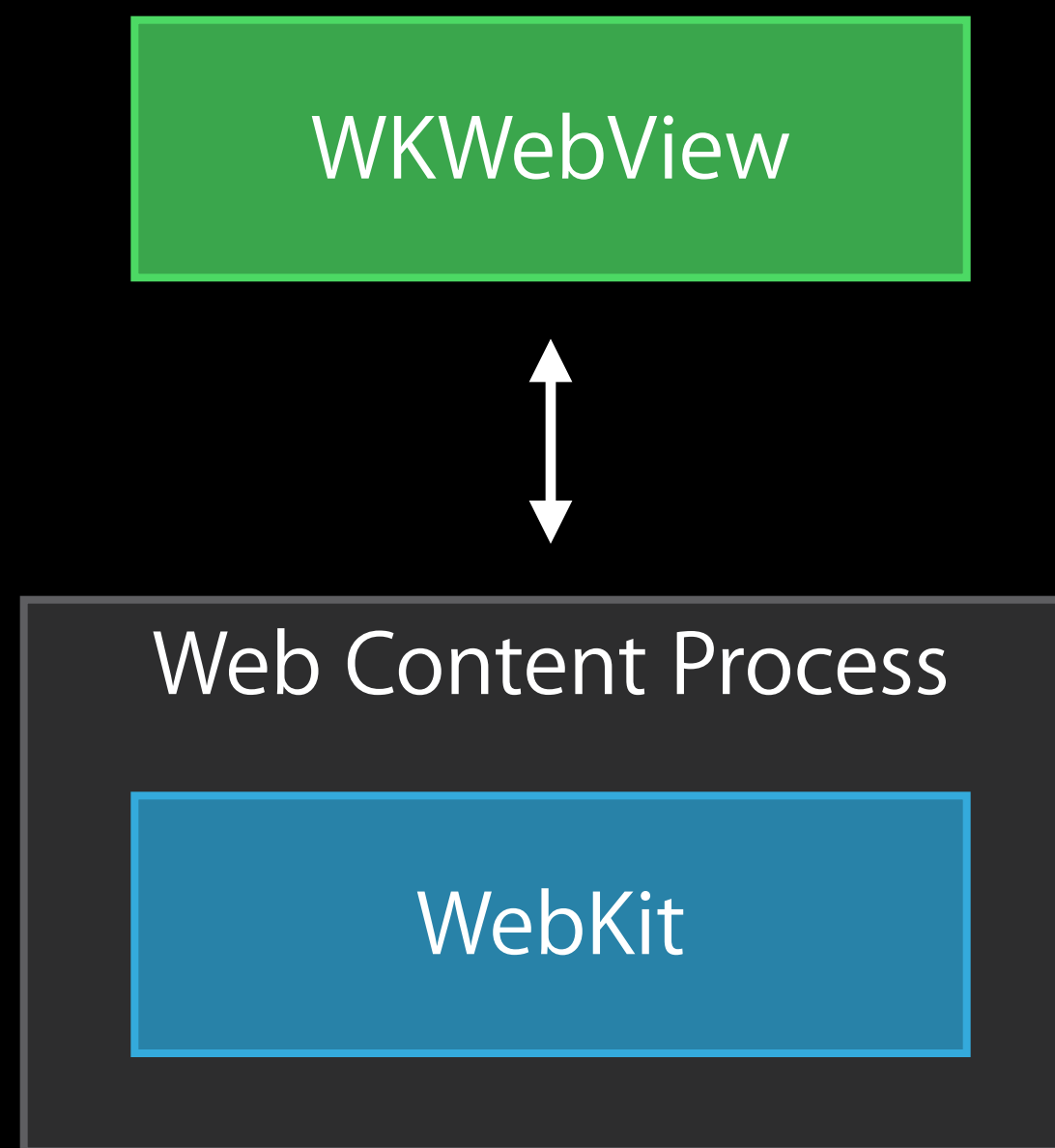




# The Modern WebKit API



# The Modern WebKit API



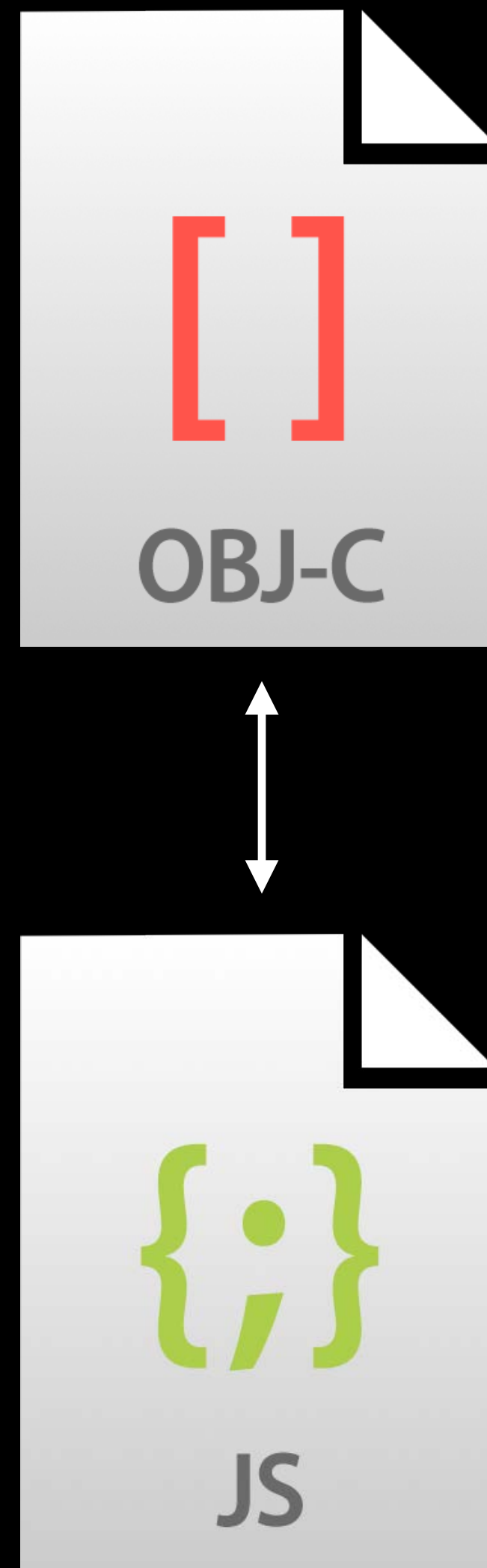
# The Modern WebKit API



# The Modern WebKit API



# The Modern WebKit API





*WKScriptMessageHandler*

*WKWebView*

*WKBackForwardListItem*

*WKFrameInfo*

*WKNavigationDelegate*

*WKUserController*

*WKBackForwardList*

*WKNavigation*

*WKScriptMessage*

*WKPreferences*

*WKUIDelegate*

*WKNavigationType*

*WKProcessPool*

*WKUserScript*



*WKNavigationAction*

*WKNavigationResponse*

*WKWebViewConfiguration*

*WKWindowFeatures*

# Next Steps



# Next Steps

Adopt the modern WebKit API

# Next Steps

Adopt the modern WebKit API

Give us feedback

# More Information

Evangelism

[evangelism-frameworks@apple.com](mailto:evangelism-frameworks@apple.com)

Safari Dev Center

<http://developer.apple.com/safari/>

WebKit Open Source Project

<http://www.webkit.org/>

Apple Developer Forums

<http://devforums.apple.com/>

# Related Sessions

- 
- |                                       |              |                  |
|---------------------------------------|--------------|------------------|
| ● Your App, Your Website, and Safari  | Nob Hill     | Tuesday 4:30PM   |
| ● Web Inspector and Modern JavaScript | Russian Hill | Thursday 10:15AM |
| ● Sharing Code Between iOS and OS X   | Presidio     | Friday 9:00AM    |
-

# Labs

- 
- |                         |             |                  |
|-------------------------|-------------|------------------|
| ● Safari and WebKit Lab | Media Lab B | Tuesday 4:30PM   |
| ● Safari and WebKit Lab | Media Lab B | Wednesday 4:30PM |
| ● Safari and WebKit Lab | Media Lab B | Thursday 2:00PM  |
-

 WWDC14