

Adding **HTML5** to your **Android** applications

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- Mobility expert, Axis Communications
- Øredev Program Committee member
- JavaOne Rock Star
- Beer aficionado
- @gunnarsson



Pär Sikö

- I'm the poor guy who has to live with all the stupid stuff that Martin does



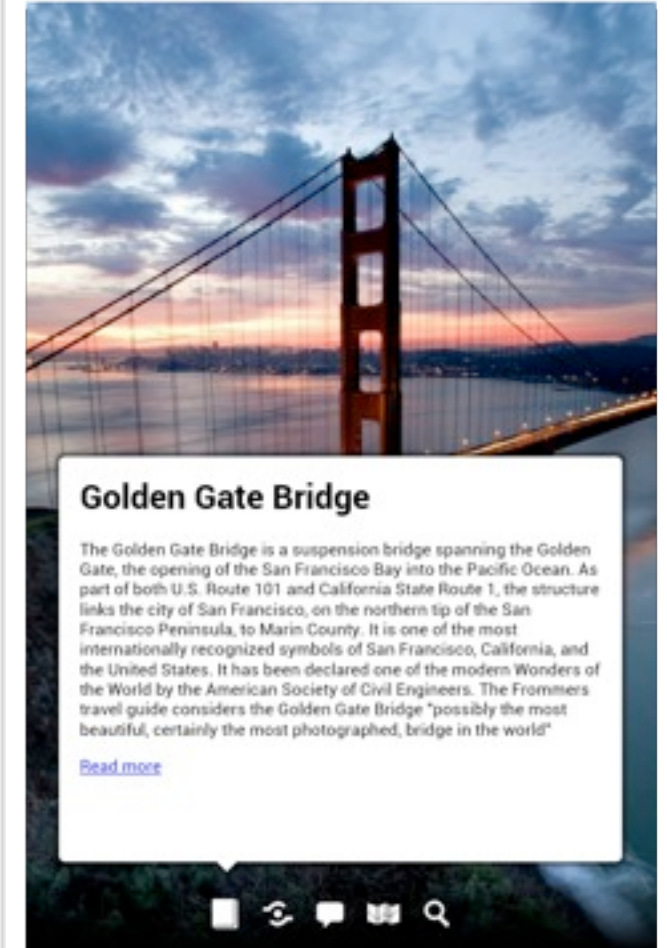
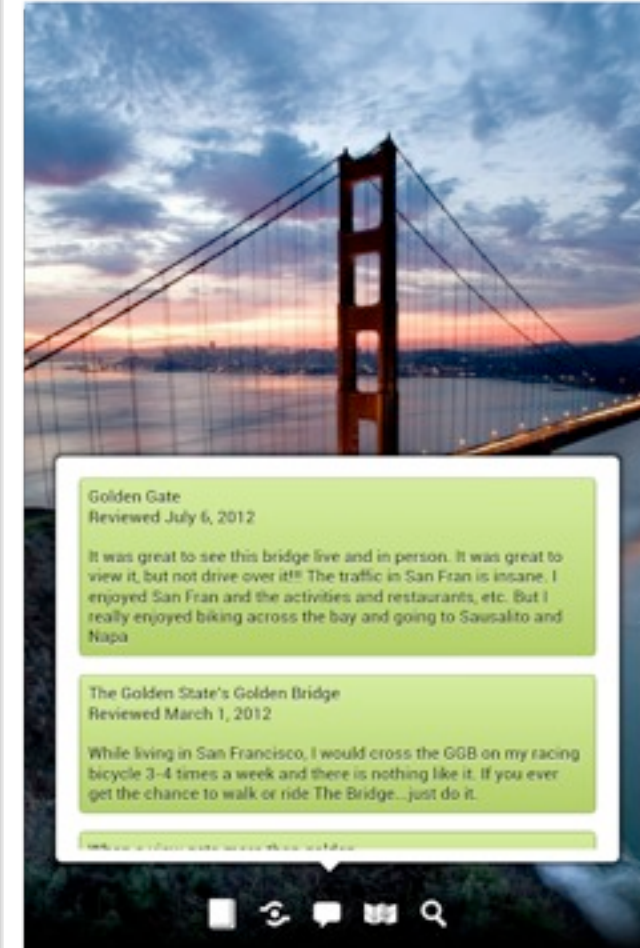
Objective

Demo

What we need to learn

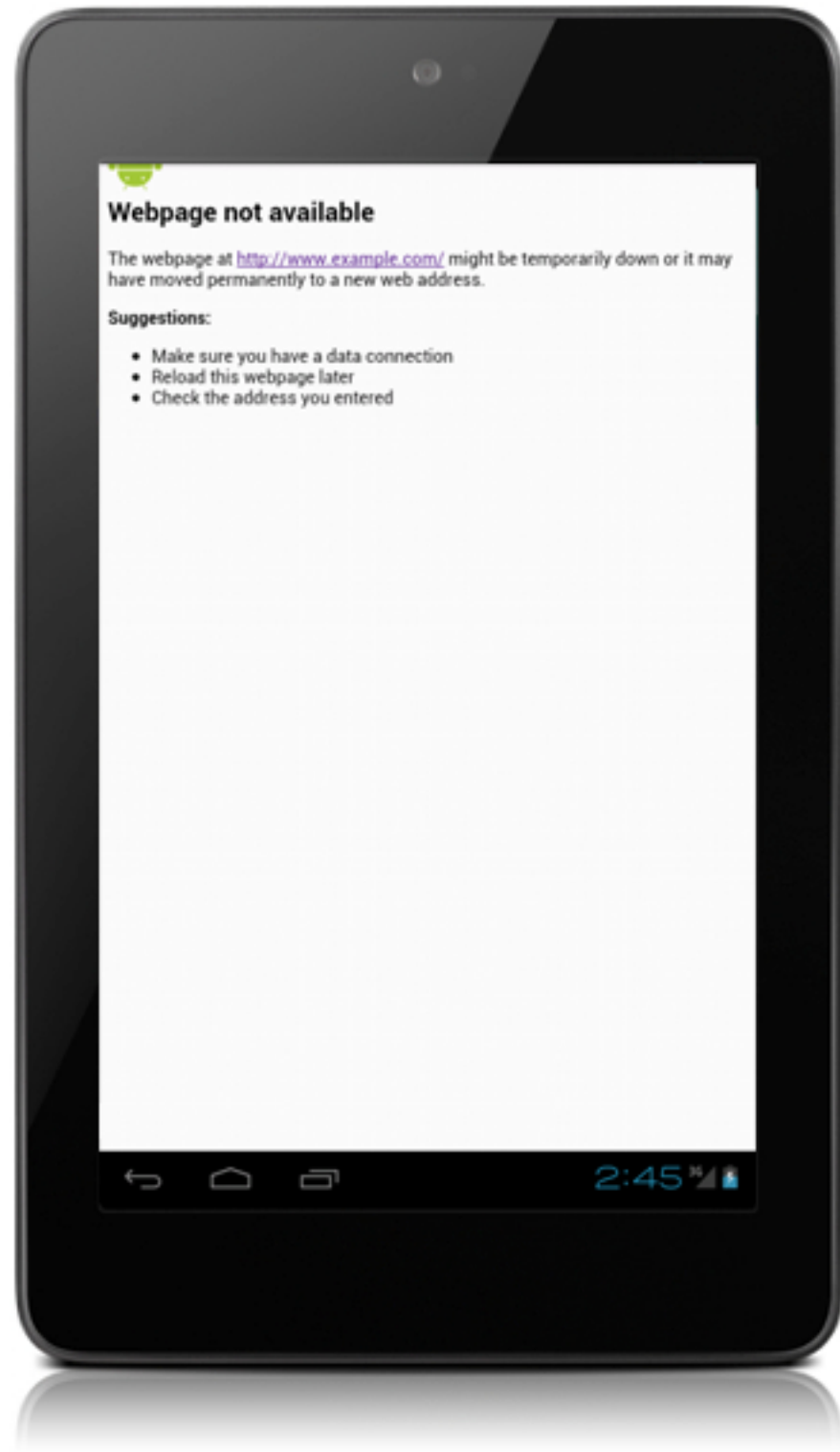
- Loading a web page
- Under the hood
- Communication
 - Android \longleftrightarrow Javascript
 - Javascript \longleftrightarrow Android
- Modifying web content
- Debugging
- Error handling

Loading a web page



Loading a web page

```
public void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
  
    WebView webView = new WebView(this);  
    webView.loadUrl("http://www.example.com");  
  
    setContentView(webView);  
}
```



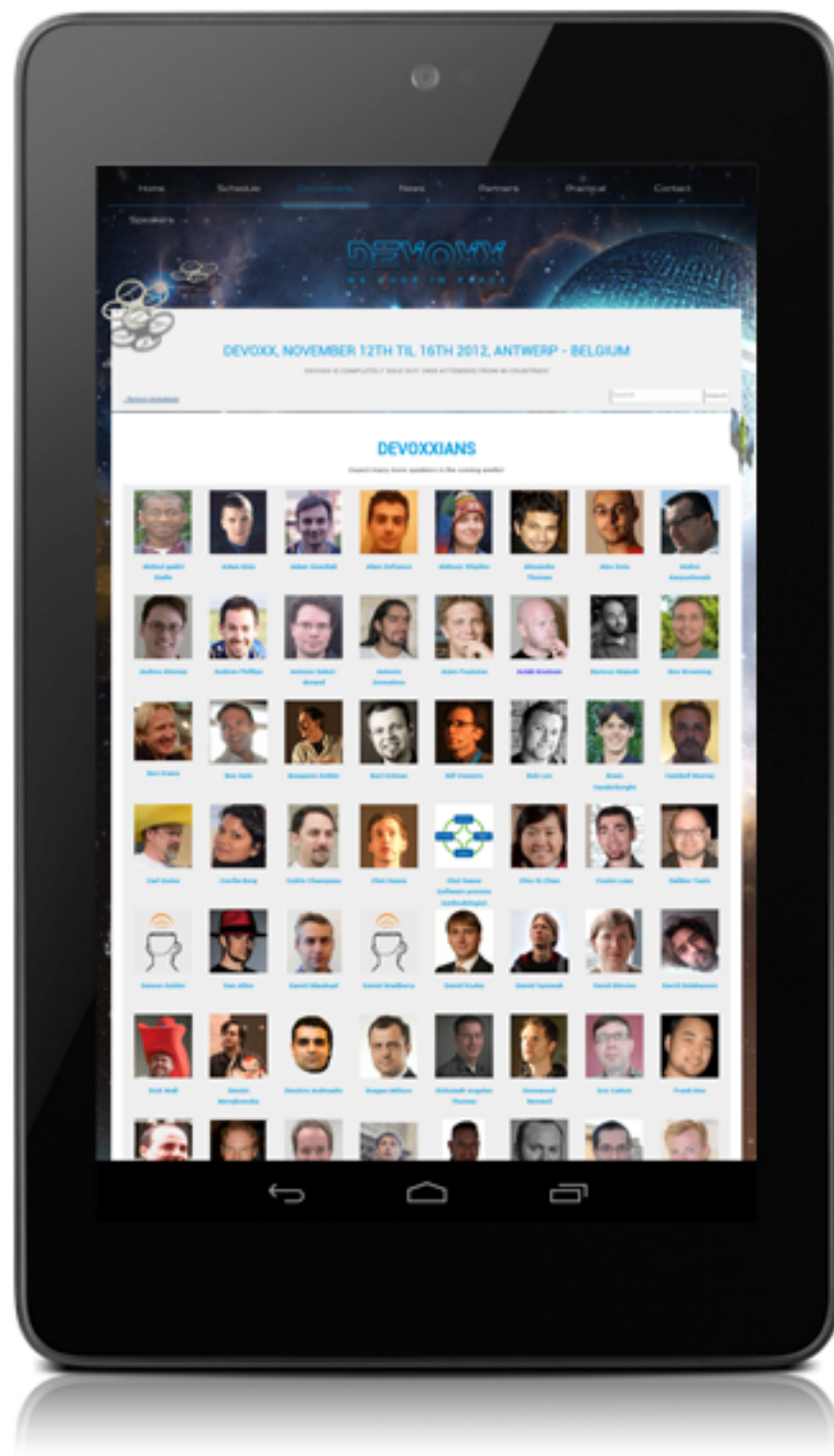


WTF?



Enable internet connection

```
<uses-permission android:name="android.permission.INTERNET" />
```



Loading a web page

```
public void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
  
    WebView webView = new WebView(this);  
  
    webView.loadUrl("file:///android_asset/page.html");  
  
    setContentView(webView);  
}
```

Loading a web page

```
public void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
  
    WebView webView = new WebView(this);  
    String text = "<html><body><b>I wish I was surfing in Hawaii</b></body></html>";  
    webView.loadData(text, "text/html", null);  
  
    setContentView(webView);  
}
```

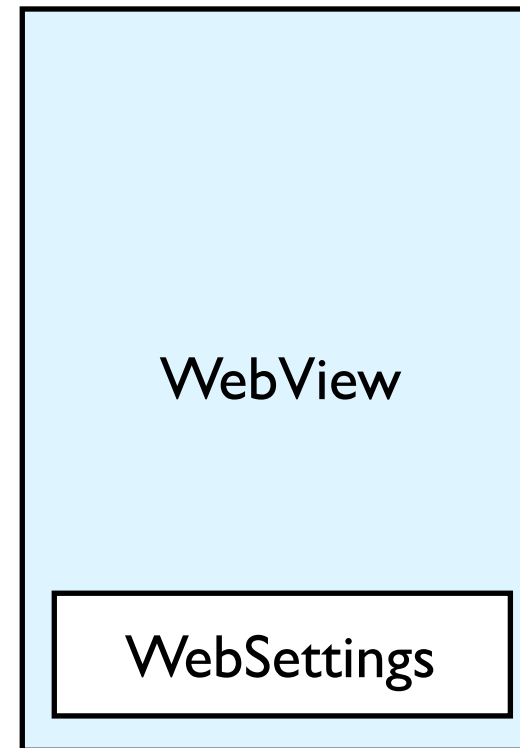
Under the hood

The web view

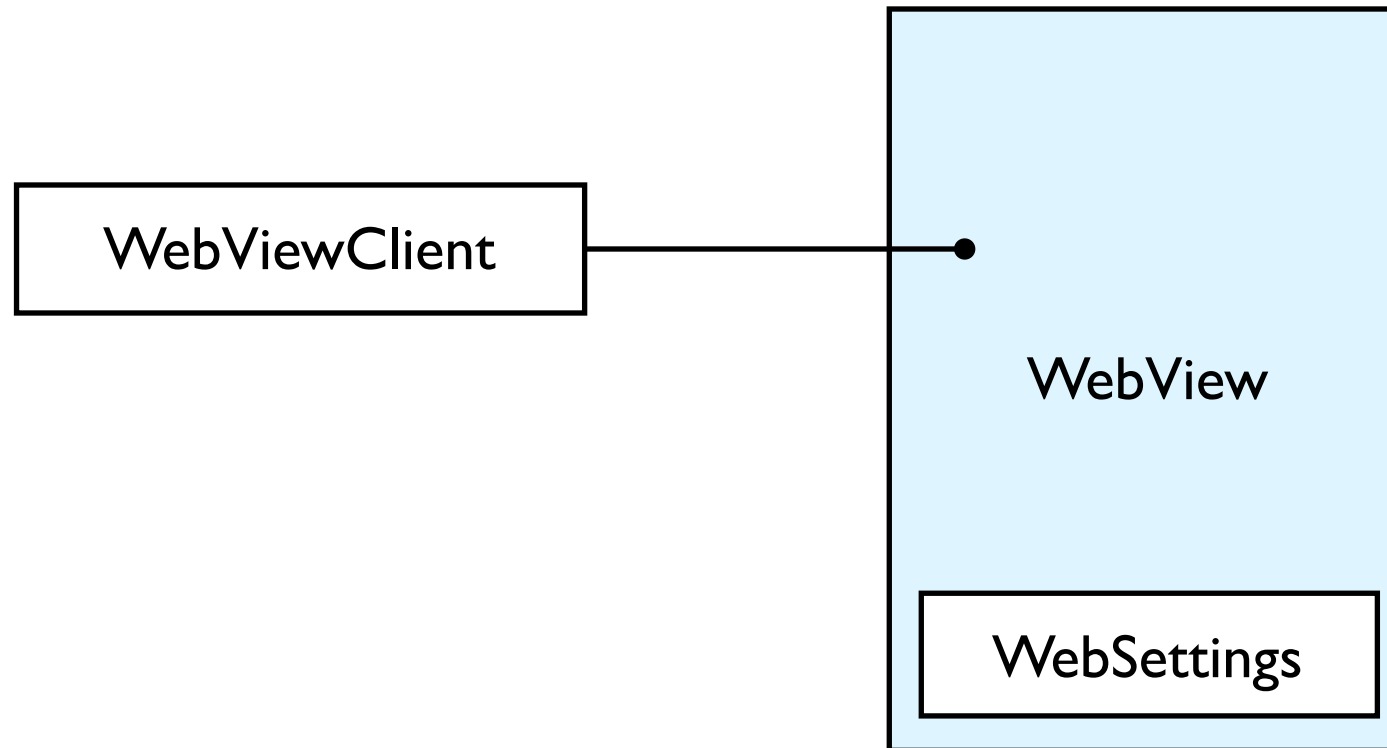


WebView

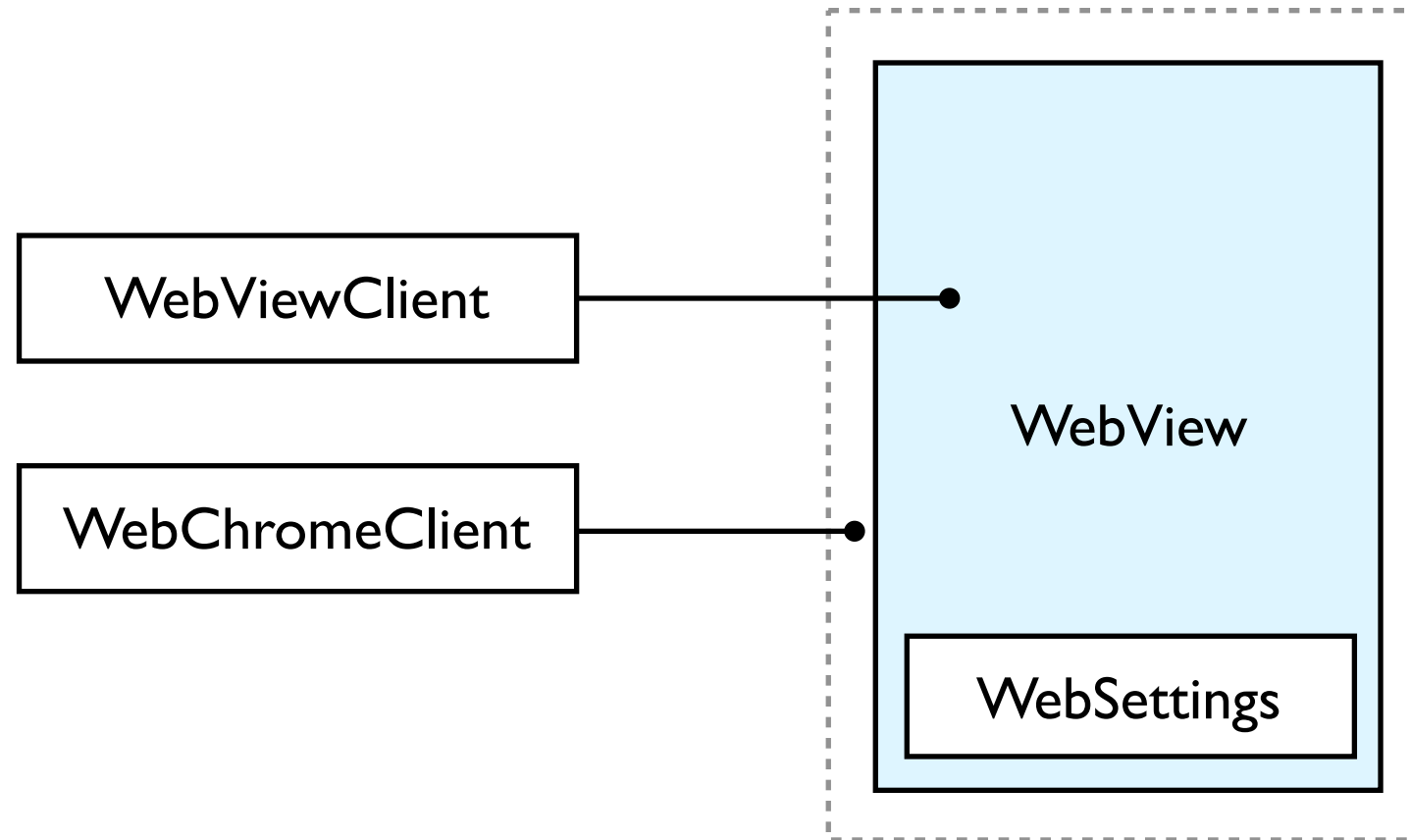
The web view



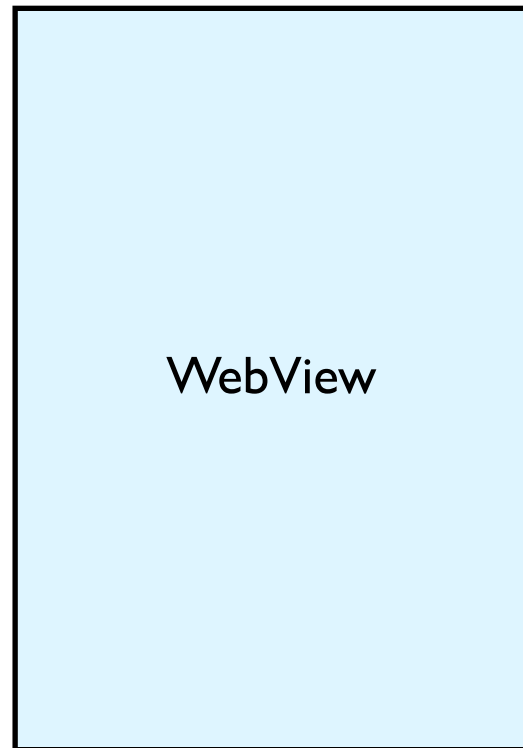
The web view



The web view

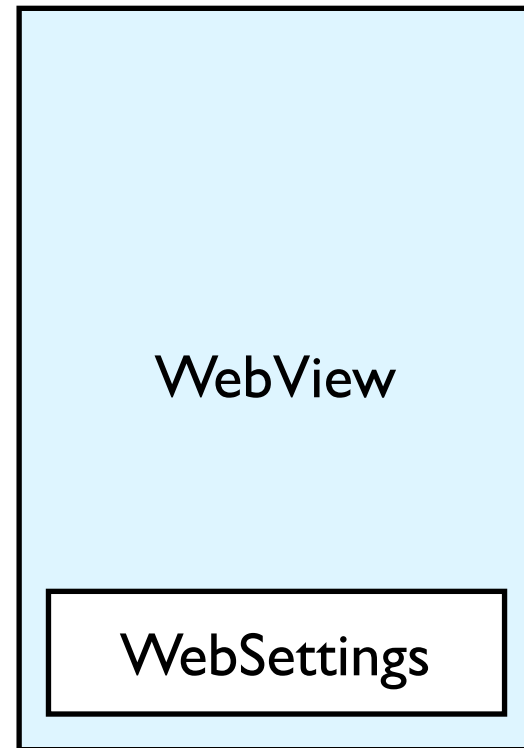


WebView



```
public void goBack();  
public String getUrl();  
public String getTitle();  
public void loadUrl(String url);  
public void reload();  
...
```

WebSettings



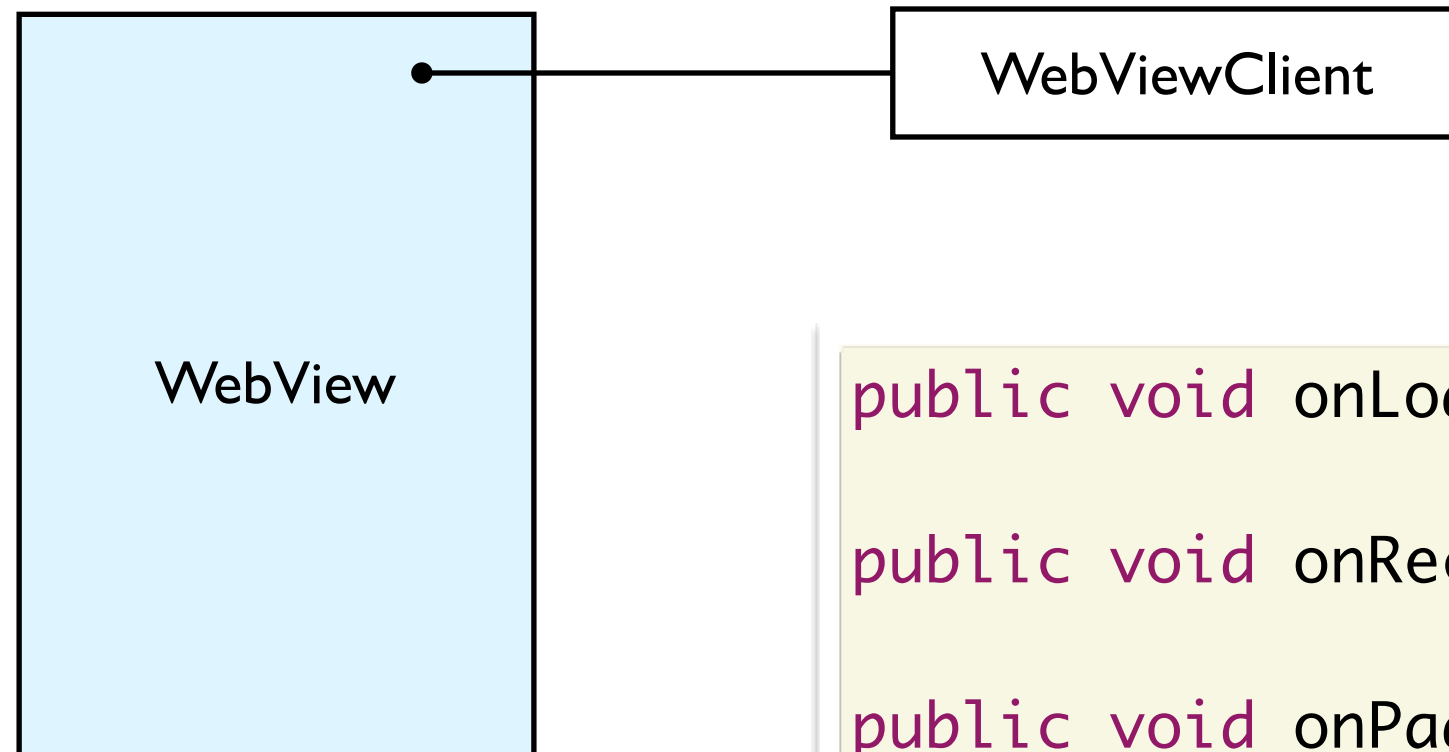
```
WebSettings settings = webView.getSettings();

// Disable plugins
settings.setPluginState(PluginState.OFF);

// Configure cache
settings.setAppCacheEnabled(true);
settings.setAppCacheMaxSize(1000 * 1000 * 1);

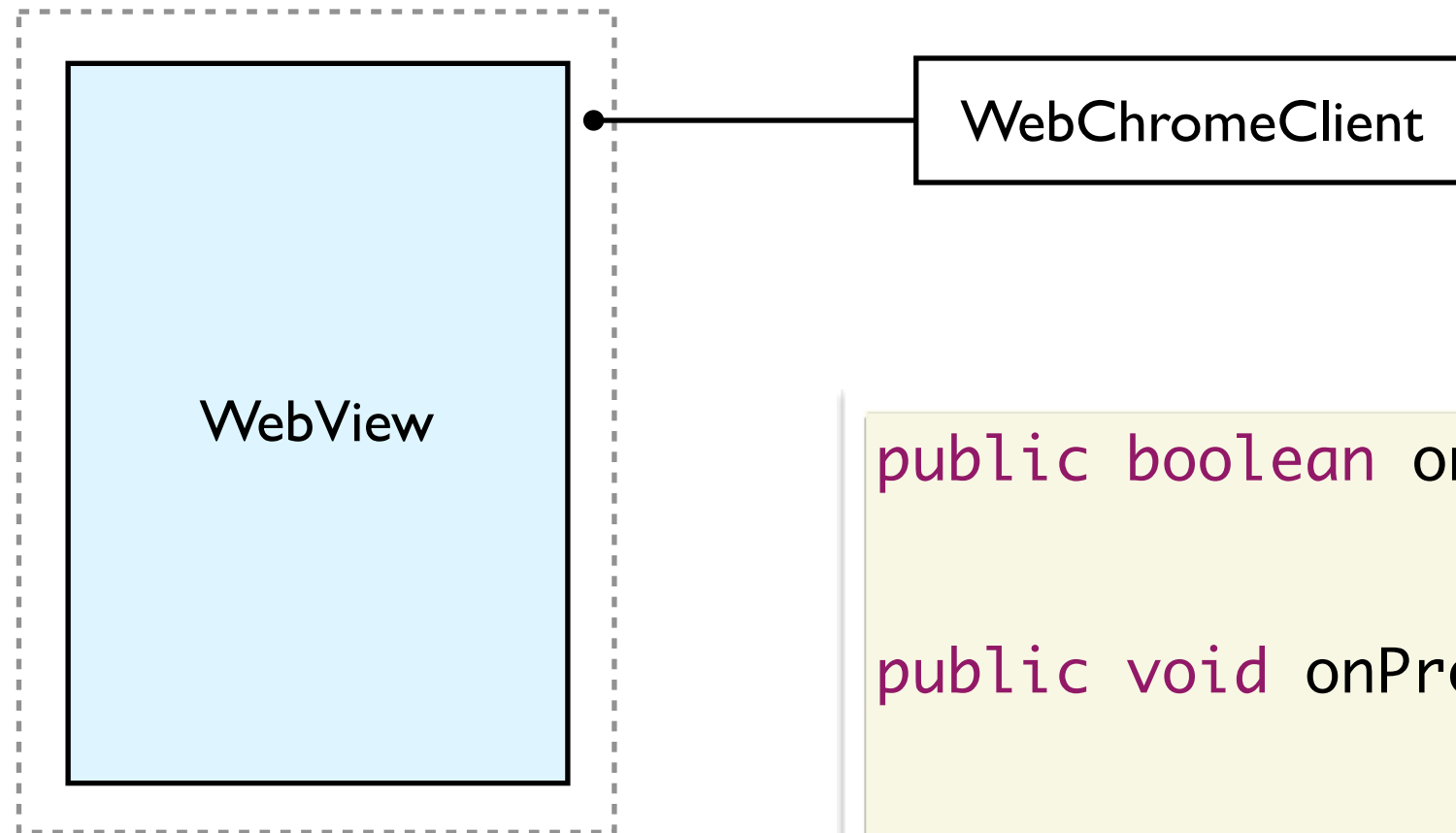
// Handle zoom controls
settings.setDefaultZoom(ZoomDensity.FAR);
settings.setBuiltInZoomControls(true);
settings.setDisplayZoomControls(true);
```

WebViewClient



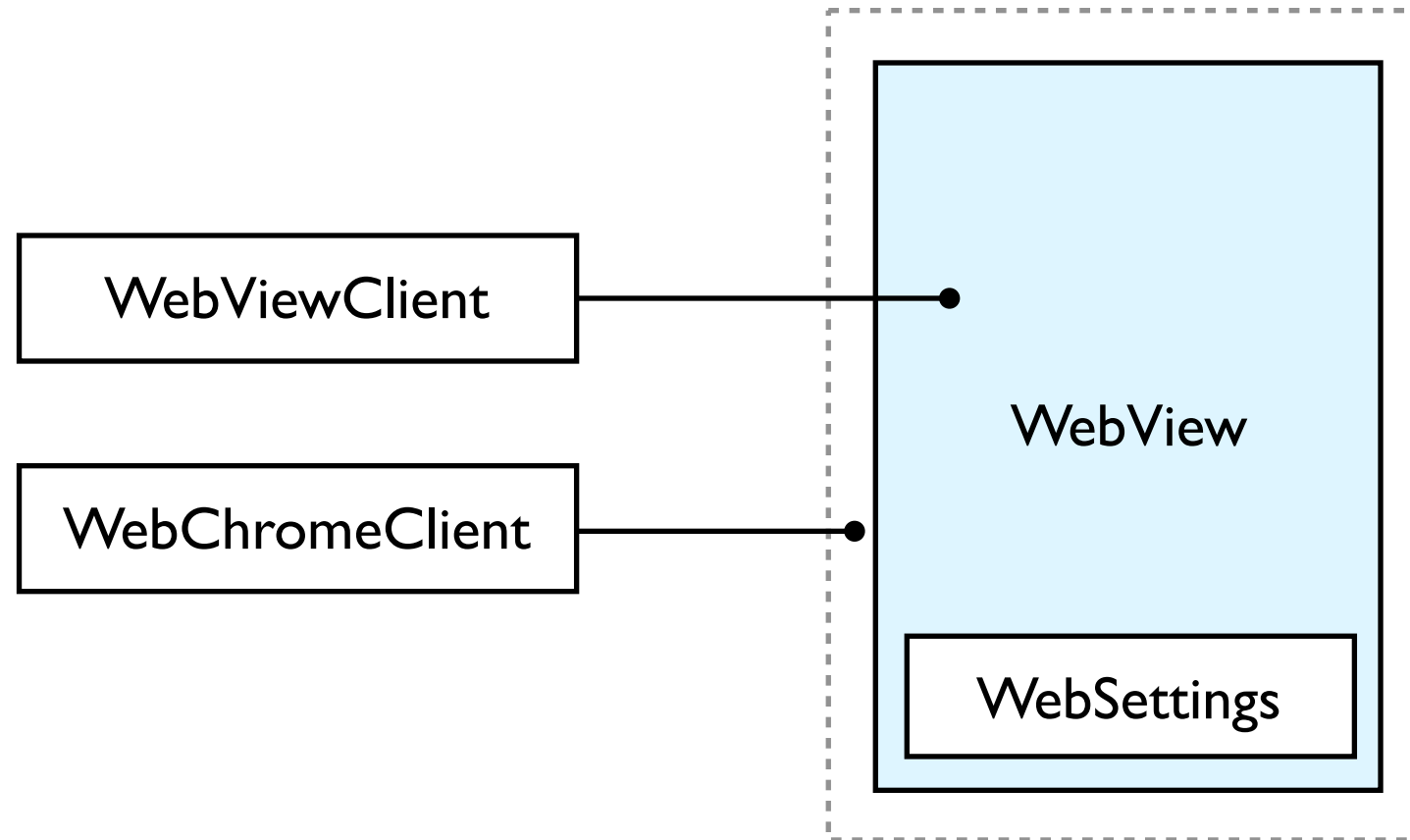
```
public void onLoadResource(...)
public void onReceivedError(...)
public void onPageFinished(...)
public boolean shouldOverrideUrlLoading(...)
...
```

WebChromeClient



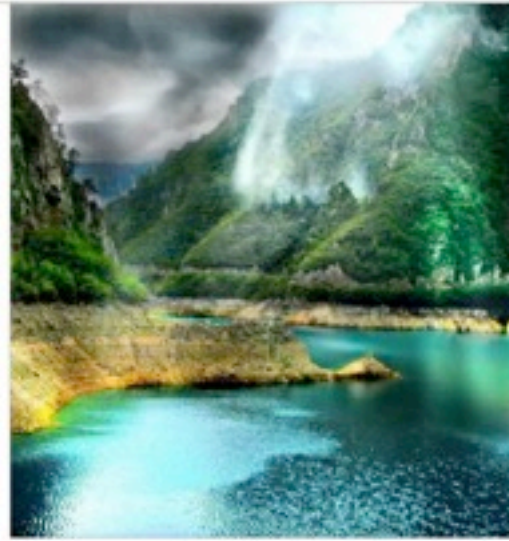
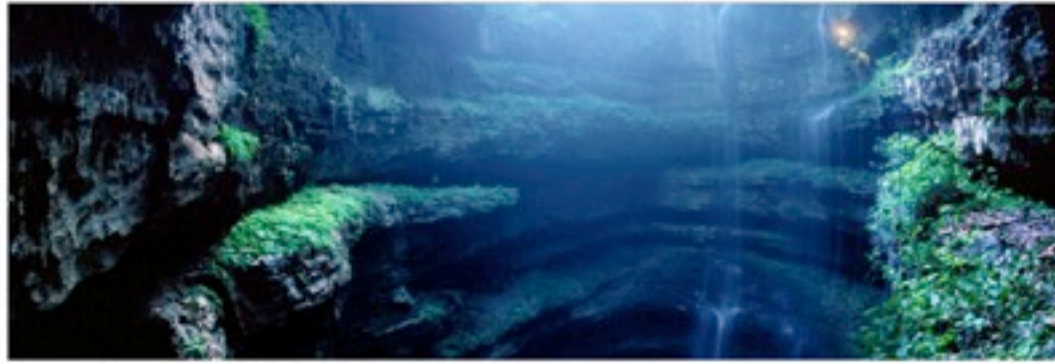
```
public boolean onJsAlert(...);  
  
public void onProgressChanged(...);  
  
public void getVisitedHistory(...);  
  
...
```


The web view



Communication

Android → Javascript



Executing Javascript

Android

```
WebView webView = new WebView(this);  
webView.getSettings().setJavaScriptEnabled(true);  
webView.loadUrl("javascript:someFunction()");
```

Executing Javascript

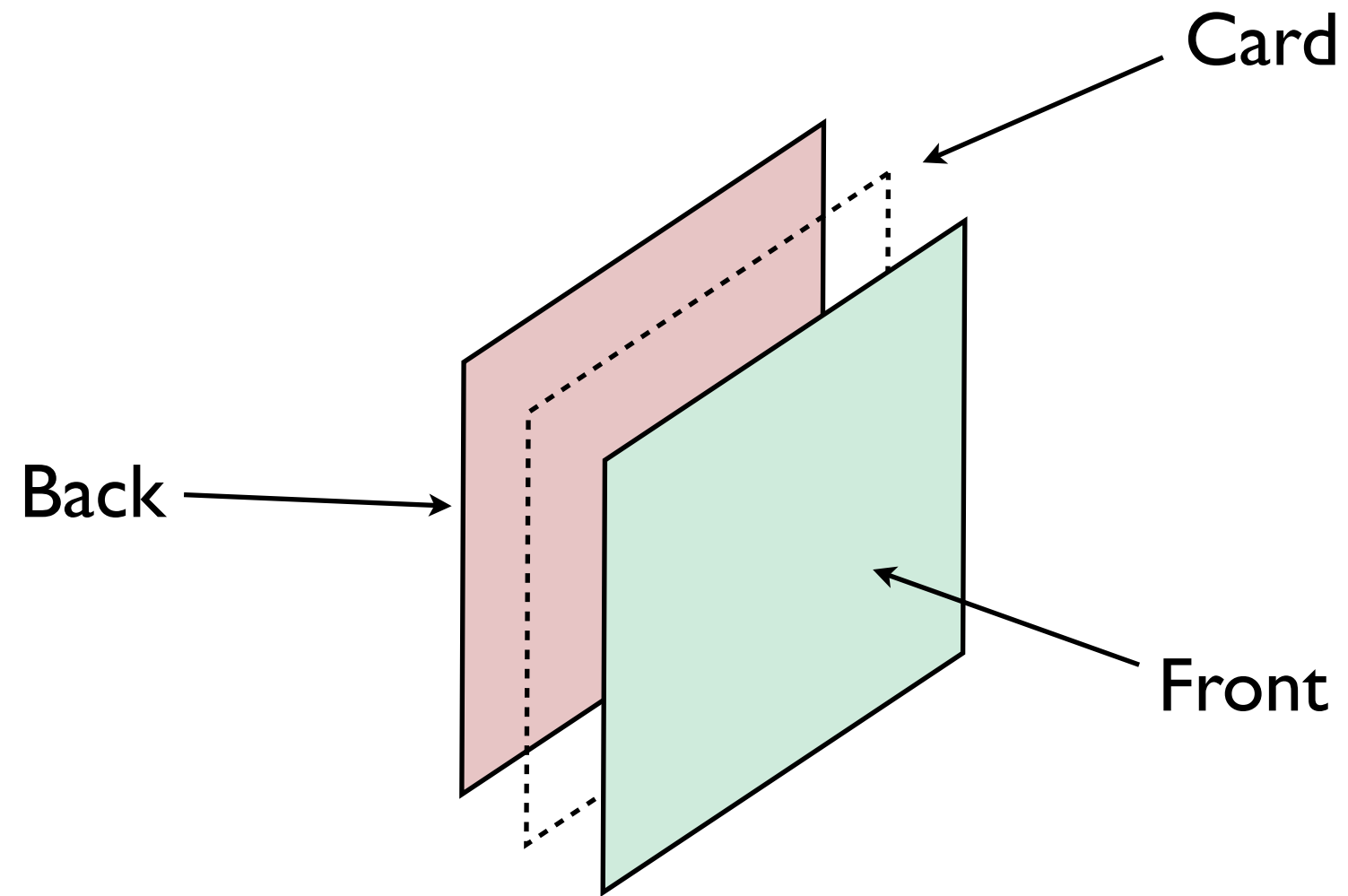
HTML

```
<h1 id="head">Headline</h1>
```

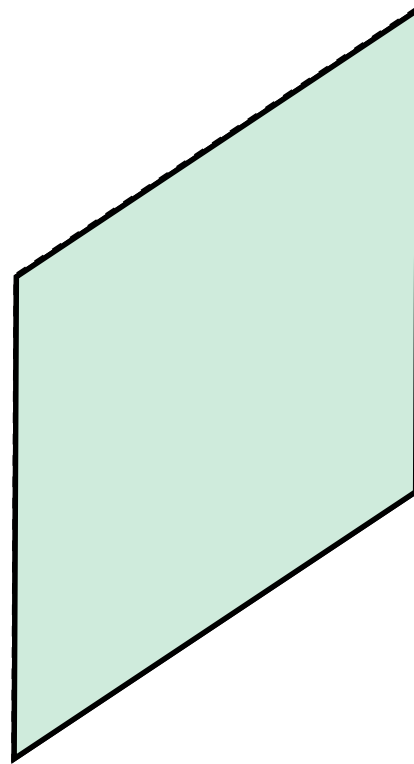
Android

```
WebView webView = new WebView(this);  
webView.getSettings().setJavaScriptEnabled(true);  
webView.loadUrl("javascript:document.getElementById('head').innerHTML='Hello!';");
```

Flipping images



Flipping images



Flipping images

HTML

```
<div id="card_1" class="card">  
  <img id="1_front" class="front" />  
  <img id="1_back" class="back" />  
</div>
```


Flipping images

HTML

```
<div id="card_1" class="card">
  <img id="1_front" class="front" />
  <img id="1_back" class="back" />
</div>
```

CSS

```
.card {
  -webkit-transition: -webkit-transform 2s;
  -webkit-transform-style: preserve-3d;
}

.card > img {
  -webkit-backface-visibility: hidden;
}

.card > img.back {
  -webkit-transform: rotateX(180deg);
}
```

Flipping images

JavaScript

```
function changeImage(source, index, degrees) {  
    var card = document.getElementById('card_' + index);  
    var side = (degrees % 360 == 0) ? '_front' : '_back';  
    var image = document.getElementById(index + side);  
  
    image.src = source;  
    card.style.webkitTransform = "rotateX(" + degrees + "deg)";  
}
```

Flipping images

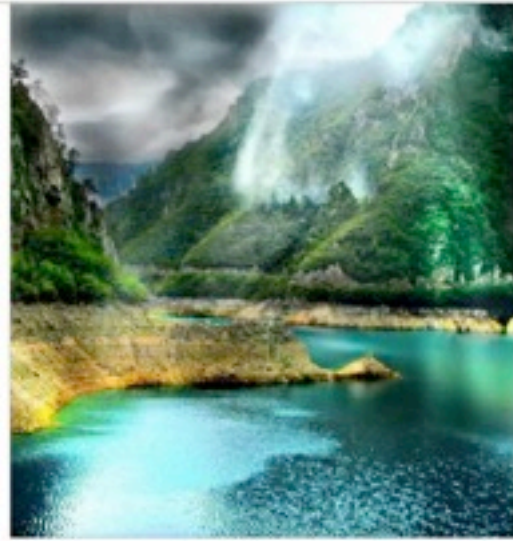
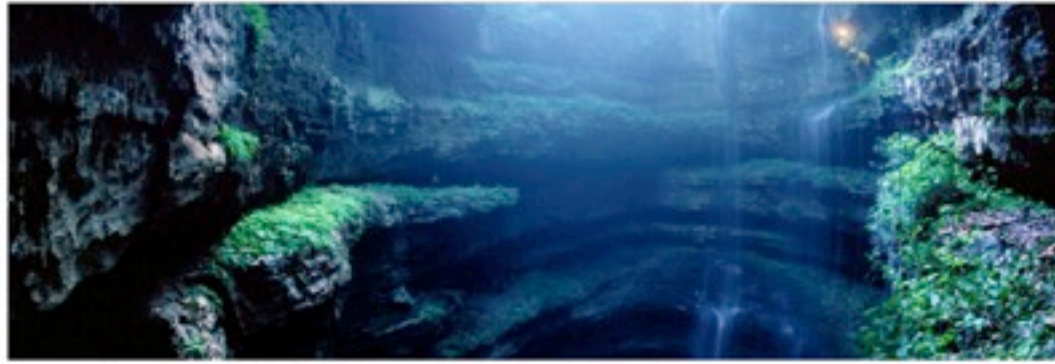
Javascript

```
function changeImage(source, index, degrees) {  
    var card = document.getElementById('card_' + index);  
    var side = (degrees % 360 == 0) ? '_front' : '_back';  
    var image = document.getElementById(index + side);  
  
    image.src = source;  
    card.style.webkitTransform = "rotateX(" + degrees + "deg)";  
}
```

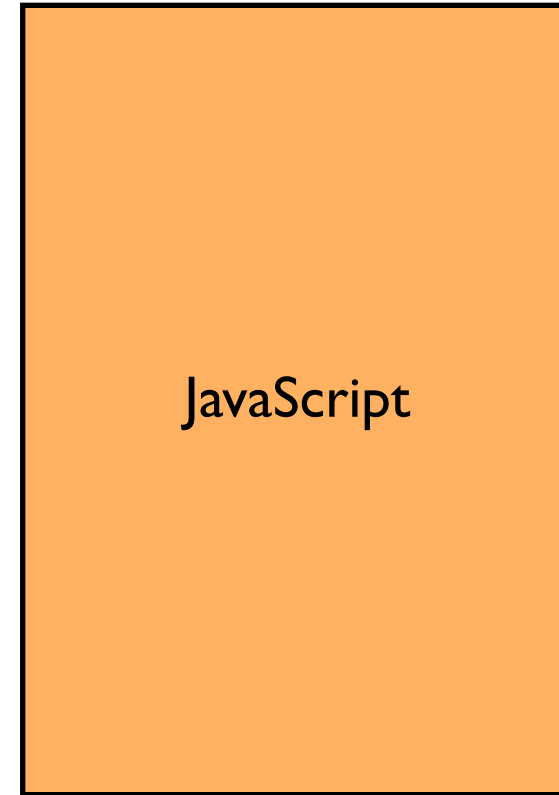
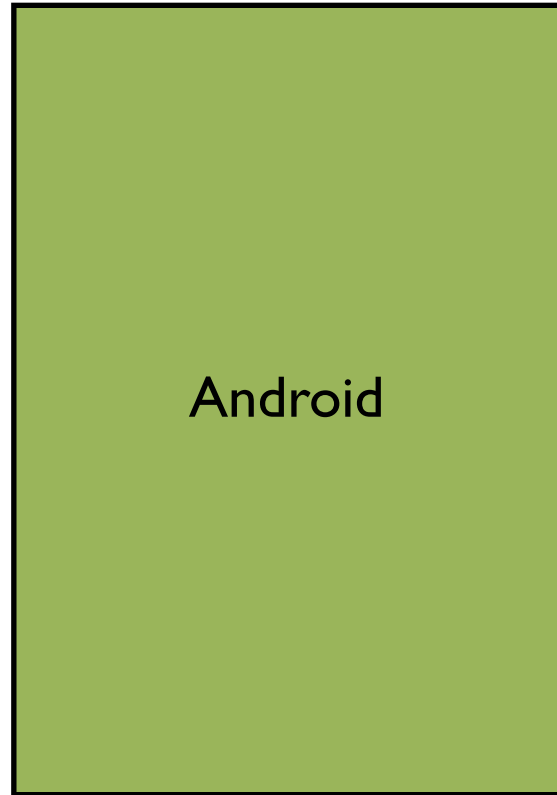
Android

```
webView.loadUrl("javascript:changeImage(url, 2, 180)");
```

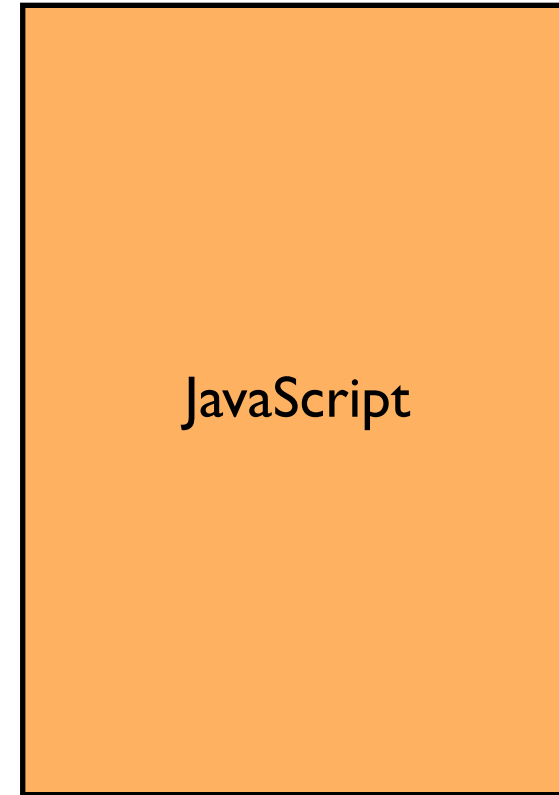
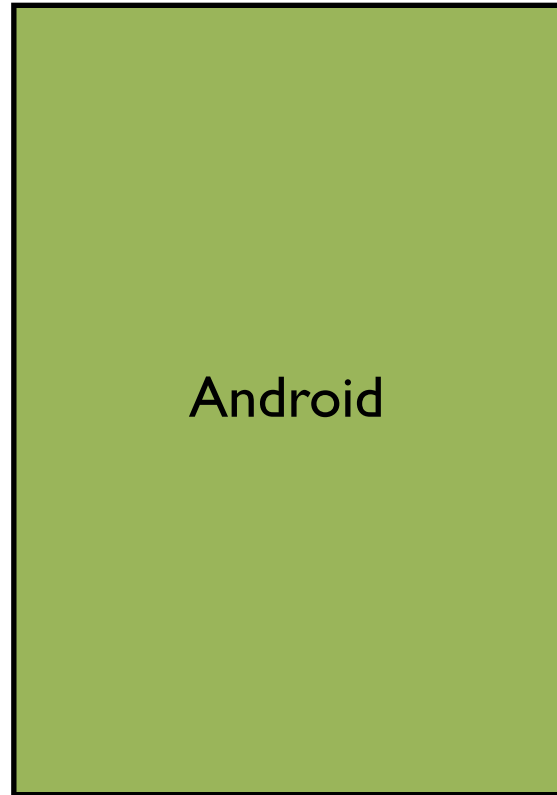
Communication
Javascript → Android



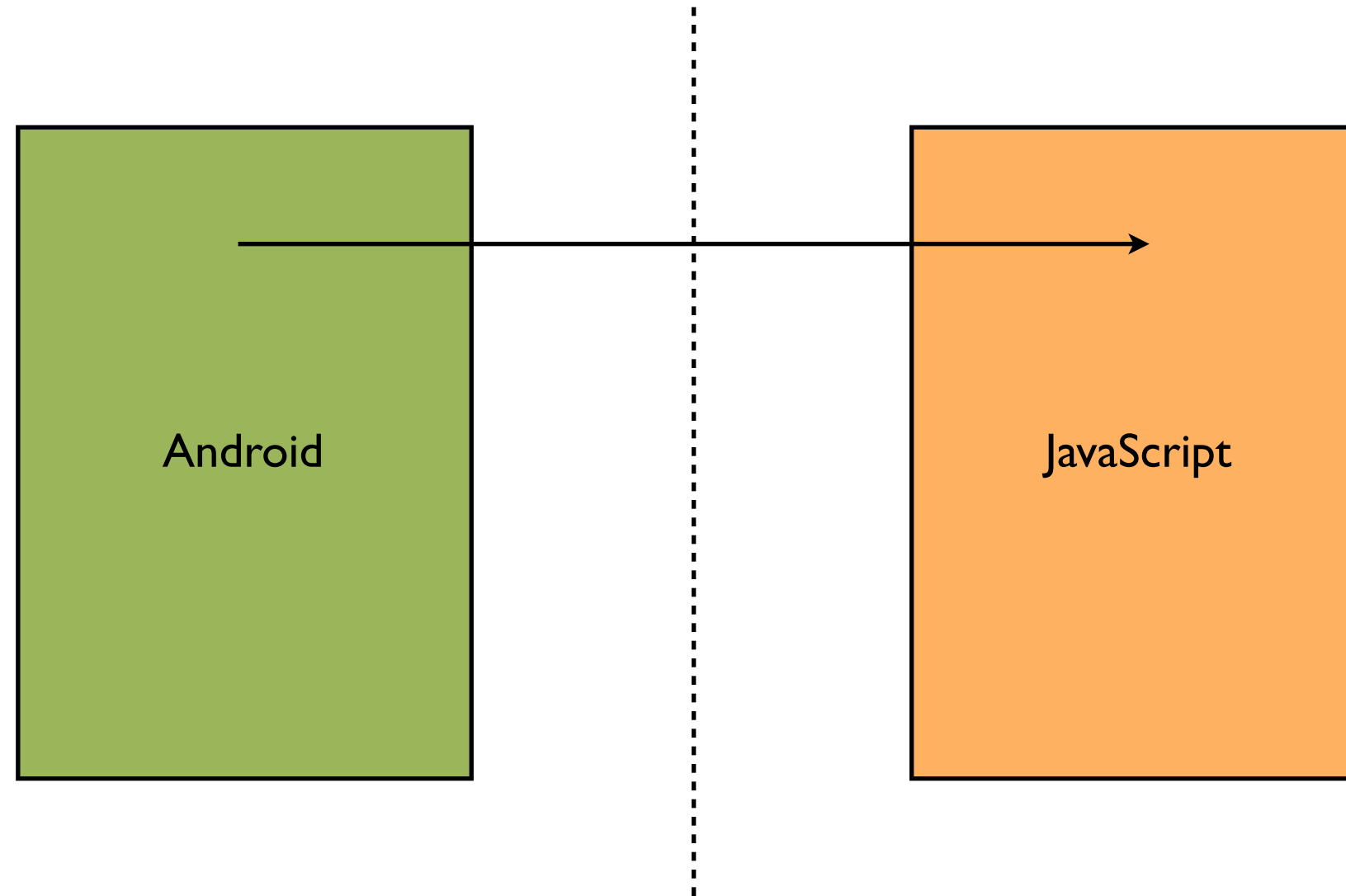
Javascript → Android



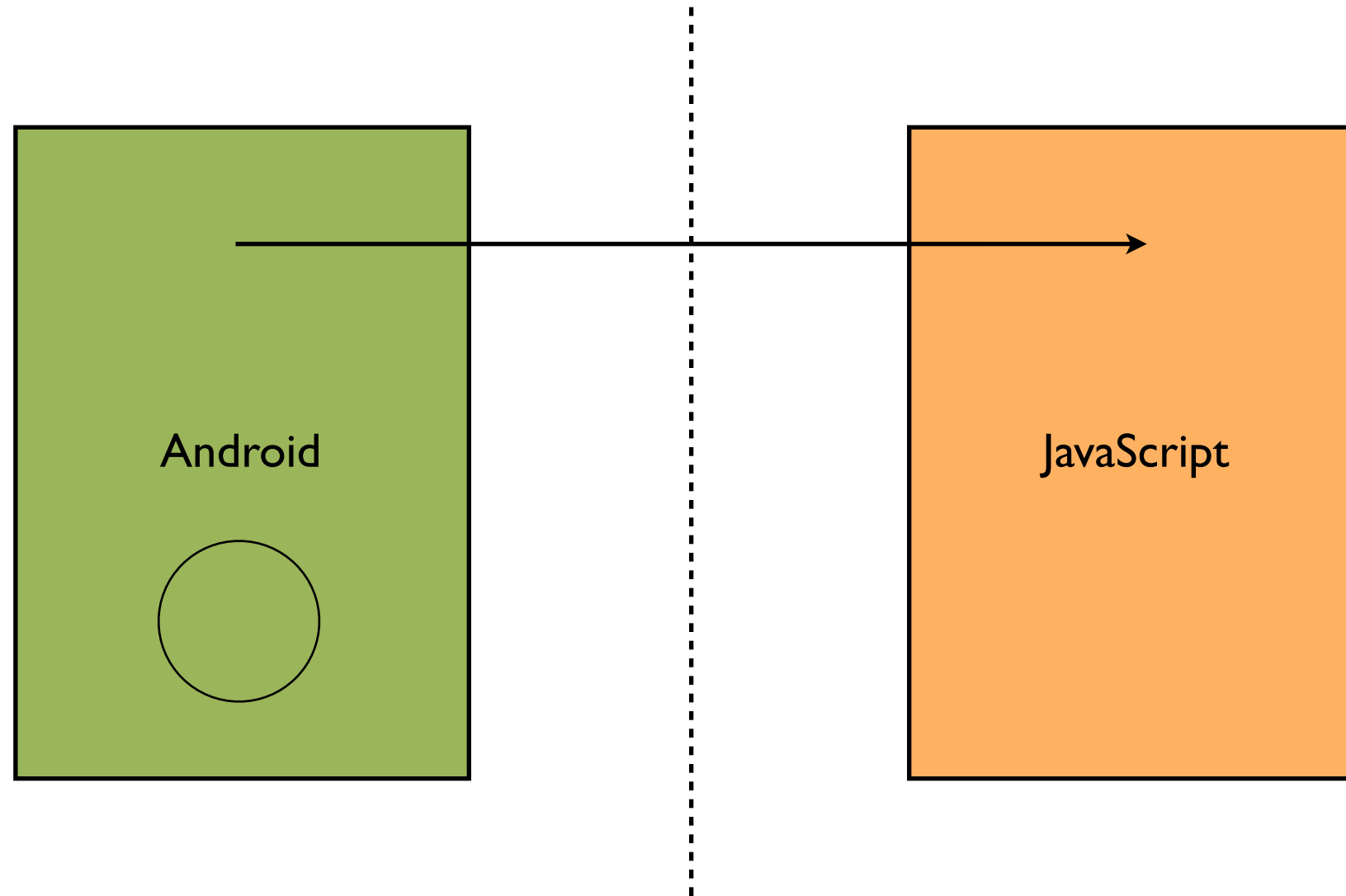
Javascript → Android



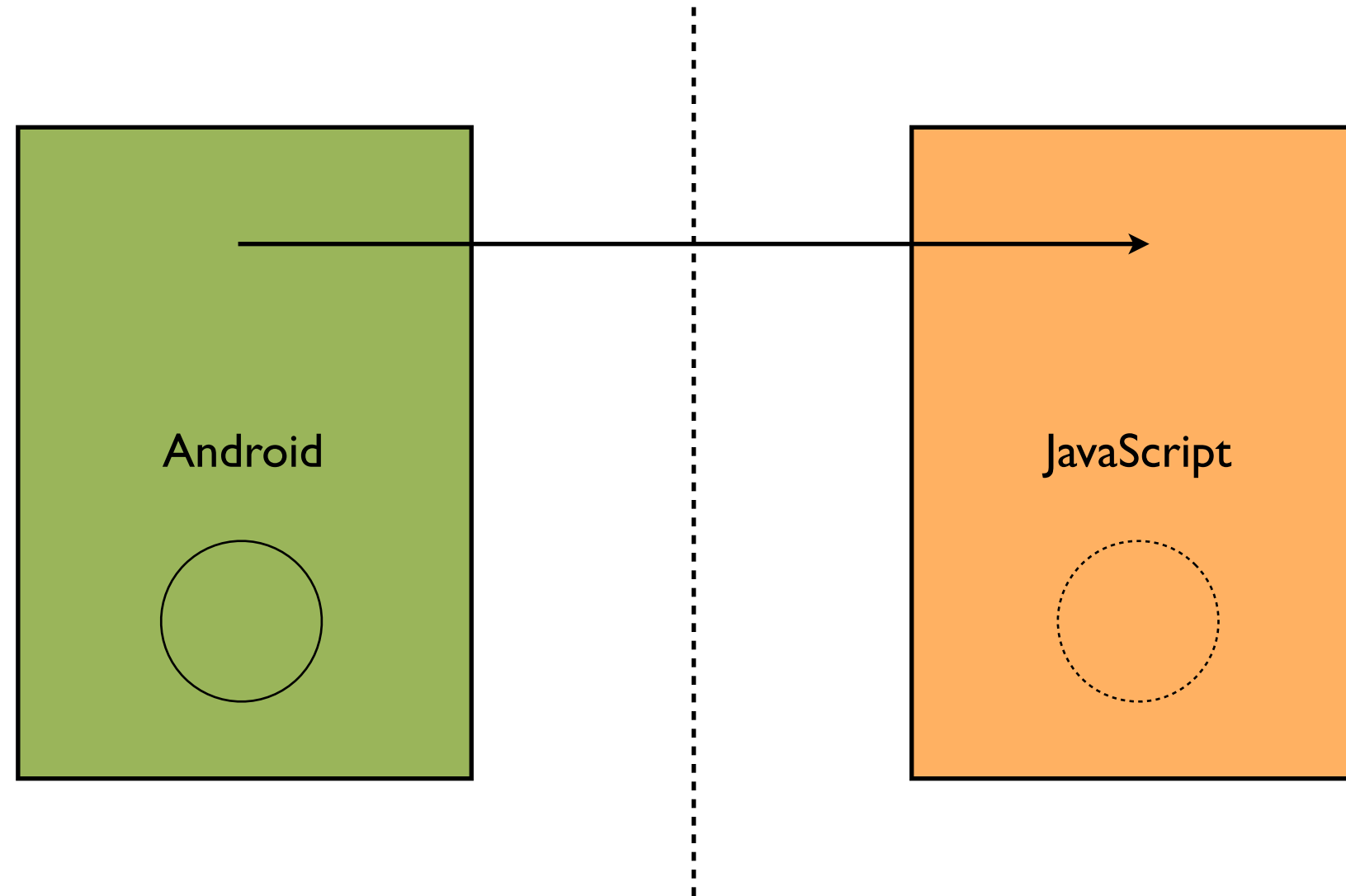
Javascript → Android



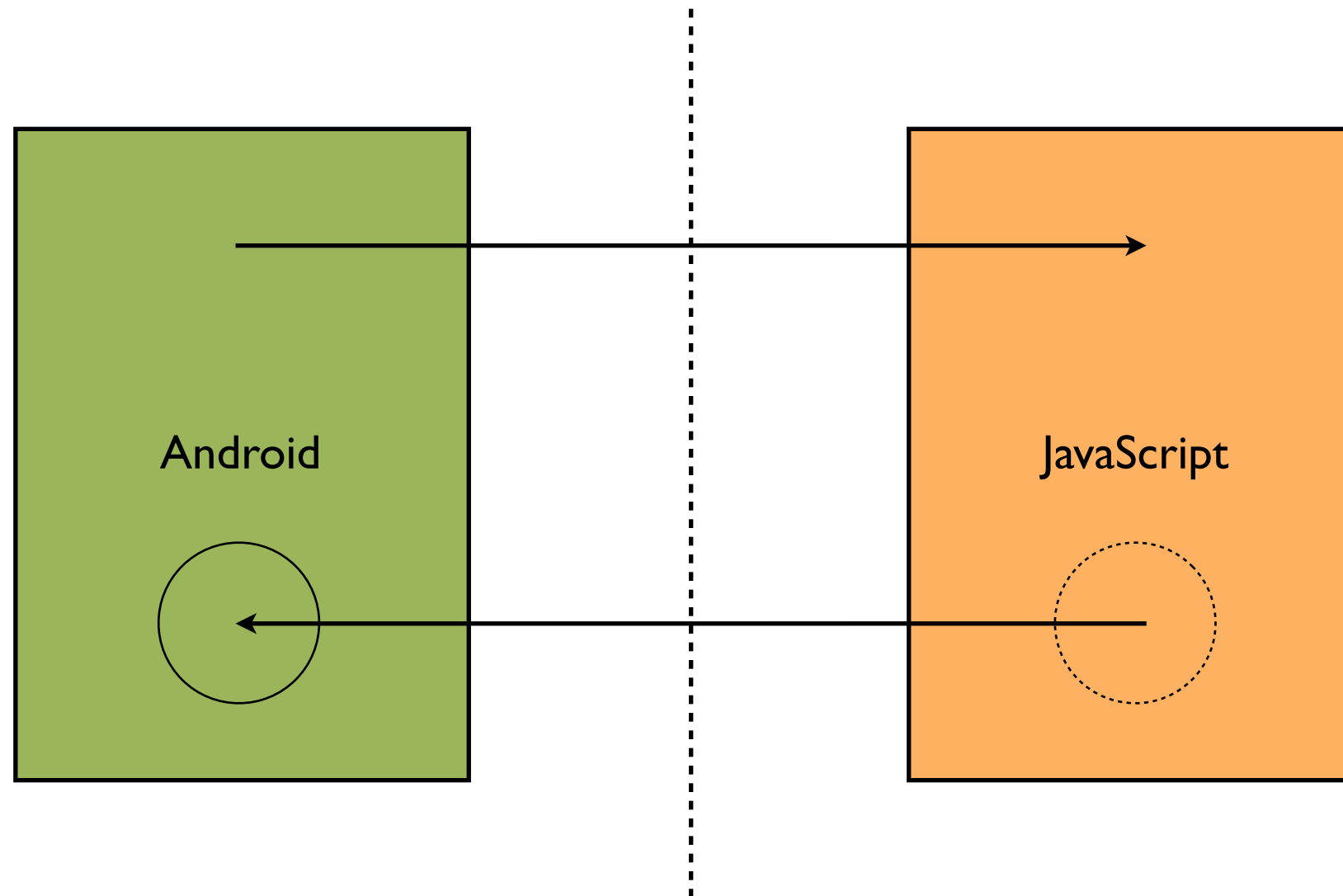
Javascript → Android



Javascript → Android



Javascript → Android



Javascript → Android

Android

```
class Callback {  
  
    public void openImage(String url) {  
        Intent showImage = new Intent();  
        showImage.setClass(context, ImageActivity.class);  
        startActivity(showImage);  
    }  
}
```

Javascript → Android

```
class Callback {  
  
    public void openImage(String url) {  
        Intent showImage = new Intent();  
        showImage.setClass(context, ImageActivity.class);  
        startActivity(showImage);  
    }  
}
```

Android

```
webView.addJavascriptInterface(new Callback(), "android");
```

Android

Opening images

```
function openImage(index) {  
    var card = document.getElementById('card_' + index);  
    android.openImage(card.currentImage.src);  
}
```

Javascript

Opening images

```
function openImage(index) {  
    var card = document.getElementById('card_' + index);  
    android.openImage(card.currentImage.src);  
}
```

Javascript

```
<div id="card_1" class="card" onclick="openImage(1)" >  
    <img id="1_front" class="front" />  
    <img id="1_back" class="back" />  
</div>
```

HTML

Modifying web content

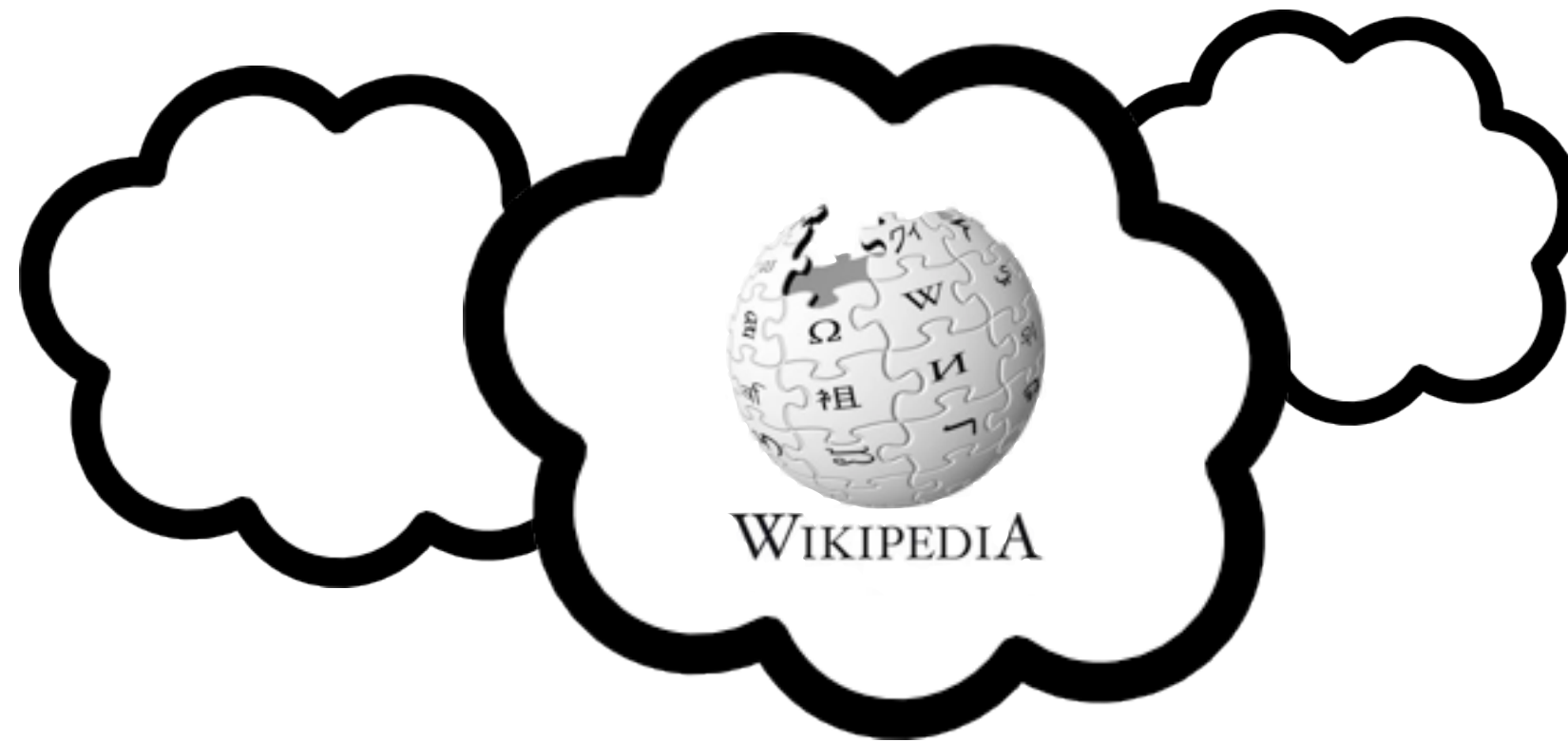


Golden Gate Bridge

The Golden Gate Bridge is a suspension bridge spanning the Golden Gate, the opening of the San Francisco Bay into the Pacific Ocean. As part of both U.S. Route 101 and California State Route 1, the structure links the city of San Francisco, on the northern tip of the San Francisco Peninsula, to Marin County. It is one of the most internationally recognized symbols of San Francisco, California, and the United States. It has been declared one of the modern Wonders of the World by the American Society of Civil Engineers. The Frommers travel guide considers the Golden Gate Bridge "possibly the most beautiful, certainly the most photographed, bridge in the world"

[Read more](#)





↓ JSON



Modifying web content

Android

```
String line;
StringBuilder builder = new StringBuilder();
BufferedReader reader = new BufferedReader(new InputStreamReader(url.openStream()));
while ((line = reader.readLine()) != null) {
    builder.append(line);
}

JSONObject jsonObj = new JSONObject(builder.toString());
JSONObject item = jsonObj.getJSONObject("entry");

...
```

Modifying web content

HTML

```
<html>
<head>...</head>
<body>

<h1 id="headline"></h1>

<p id="snippet"></p>

<a id="link" href="">Read more</a>

</body>
</html>
```

Modifying web content

Android

```
String headline = item.getString("title");  
webView.loadUrl("javascript:  
    document.getElementById('headline').innerHTML = '\"' + title + '\"');");
```

Debugging

Debugging

Javascript

Debugging

```
console.error('Oh noes!');
```

JavaScript

Debugging

JavaScript

```
console.error('Oh noes!');
```

```
11-13 16:24:14.147: E/Web Console(23749): Oh noes! at file:///android\_asset/file.html:5
```

Debugging

Javascript

```
console.error('Oh noes!');
```

```
11-13 16:24:14.147: E/Web Console(23749): Oh noes! at file:///android\_asset/file.html:5
```

Android

```
// WebChromeClient
```

```
@Override
```

```
public boolean onConsoleMessage(ConsoleMessage message) {
```

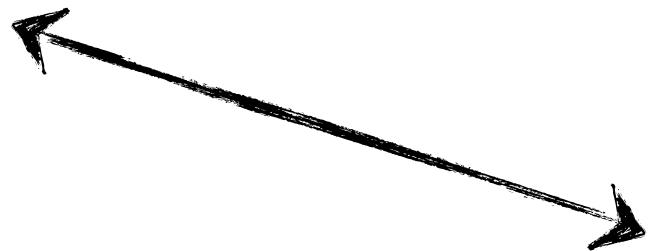
```
    // Handle message
```

```
}
```

Weinre



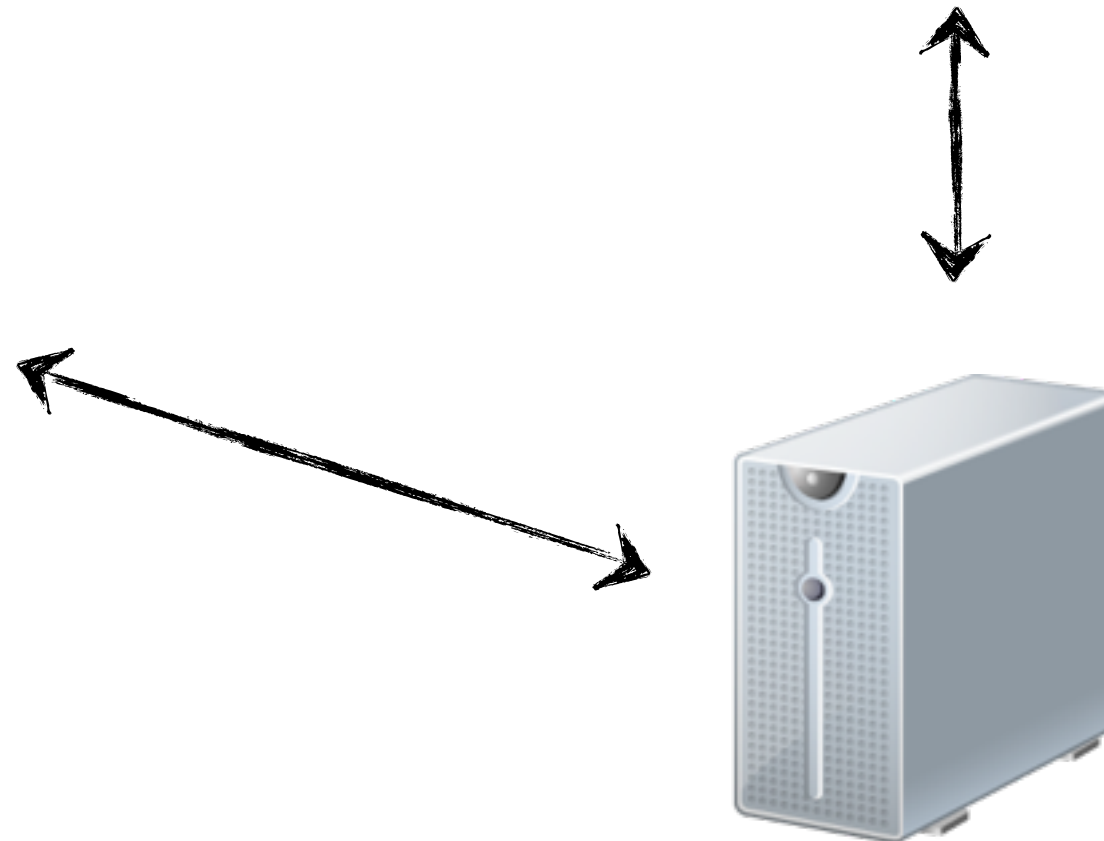
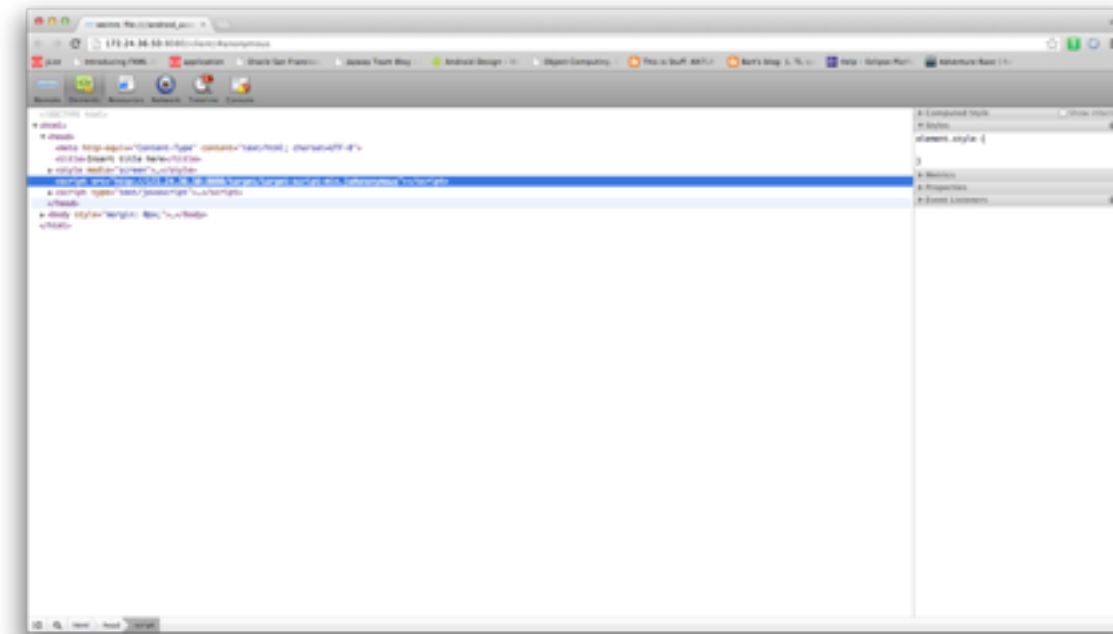
Weinre



weinre

nodejs

Weinre



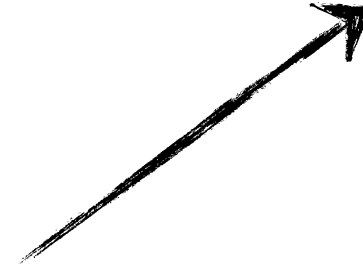
weinre

nodejs

Demo

Error handling

Error handling



Error handling



Error handling



Error handling

Android

```
// WebViewClient

@Override
public boolean shouldOverrideUrlLoading(WebView view, String url) {

    // Check if URL is the one we expect

    return true;
}
```

Error handling

Android

```
// WebViewClient

@Override
public boolean shouldOverrideUrlLoading(WebView view, String url) {

    // Check if URL is the one we expect

    return true;
}
```

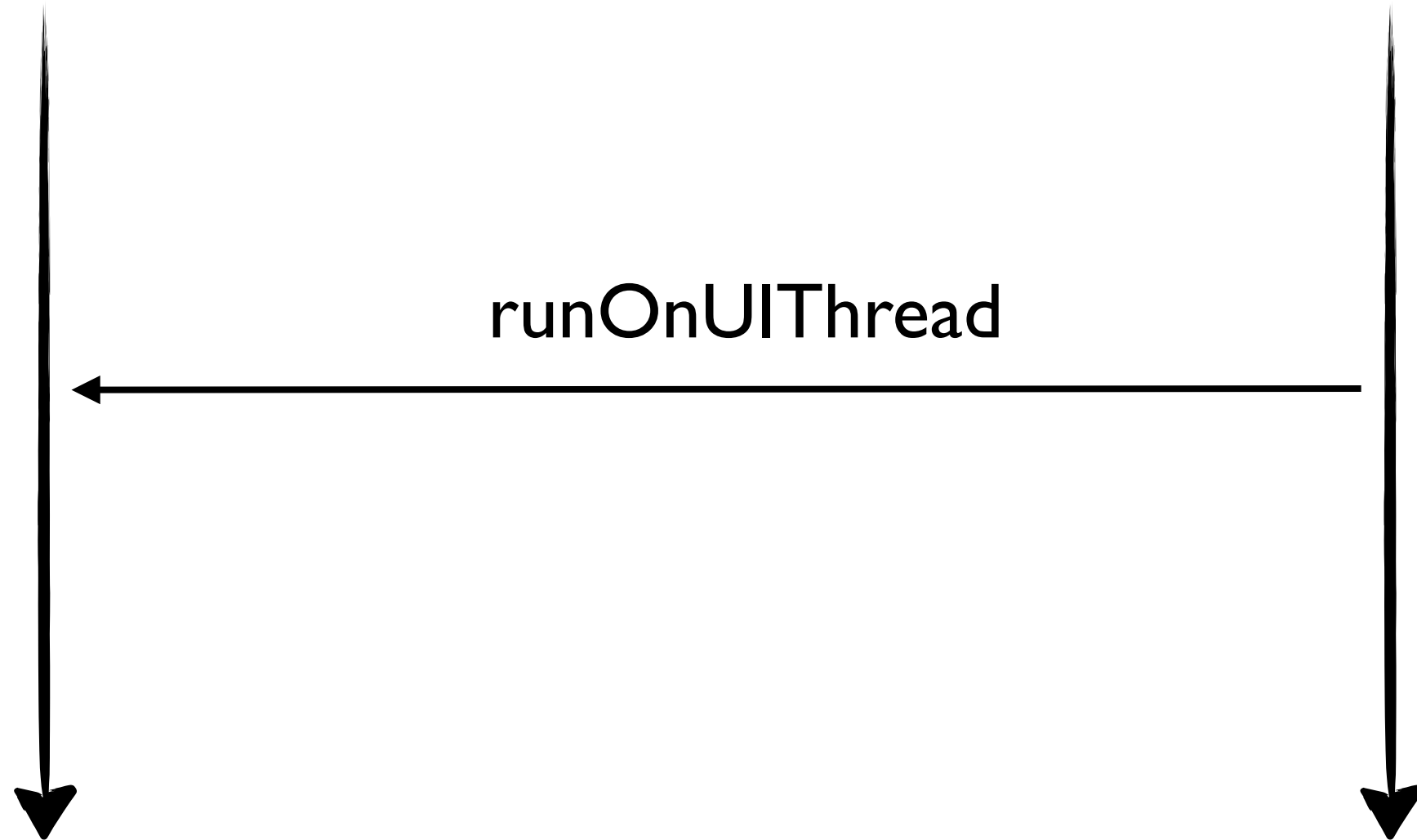
Android

```
@Override
public void onReceivedError(WebView view, int code, String desc, String url) {
    webView.loadUrl("file:///android_asset/error_page.html");
}
```

Threading issues

UI thread

Callback



Threading issues

Android

```
runOnUiThread(new Runnable() {  
  
    @Override  
    public void run() {  
        // Do stuff  
    }  
});
```

To sum things up ...

Q&A

Thank you!