

The background features a dark grey map of Berlin with a grid overlay. Two large orange arrow shapes point towards each other, framing the central text. Small orange and grey arrow icons are scattered across the map.

ESRI DEVELOPER SUMMIT

10-12 November | Berlin, Germany



ArcGIS API for JavaScript Tips and Tricks for Debugging Apps

Andy Gup, Esri US

Cédric Despierre Corporon, Esri FR

Agenda

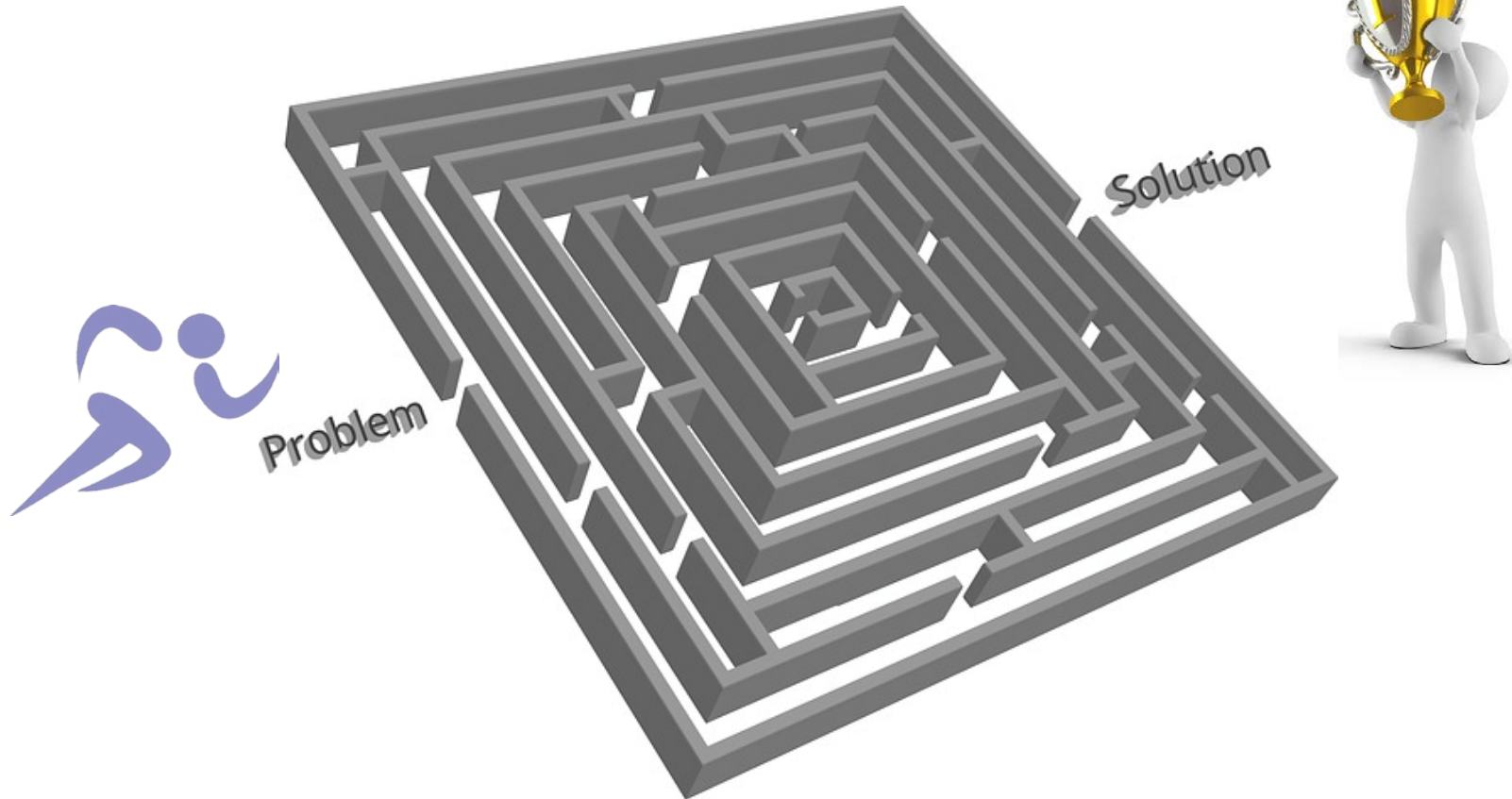
- Error prevention “tools”
- Front-end debugging
- Back-end debugging
- Internet Resources



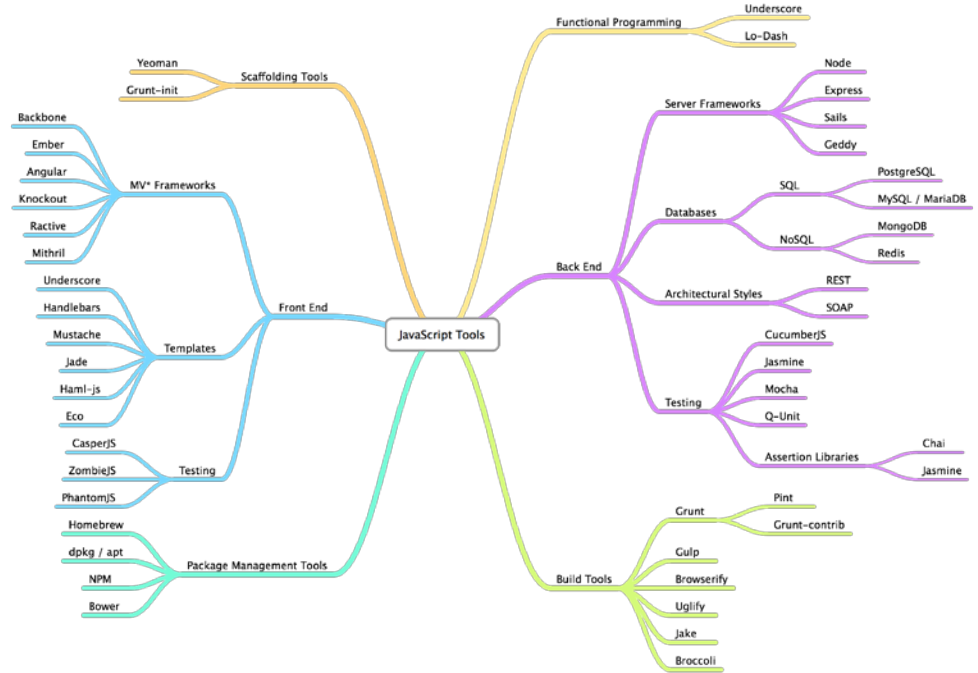
Demo files on GitHub :

<https://github.com/andygup/devsummit-berlin-2015>

Debugging Patterns

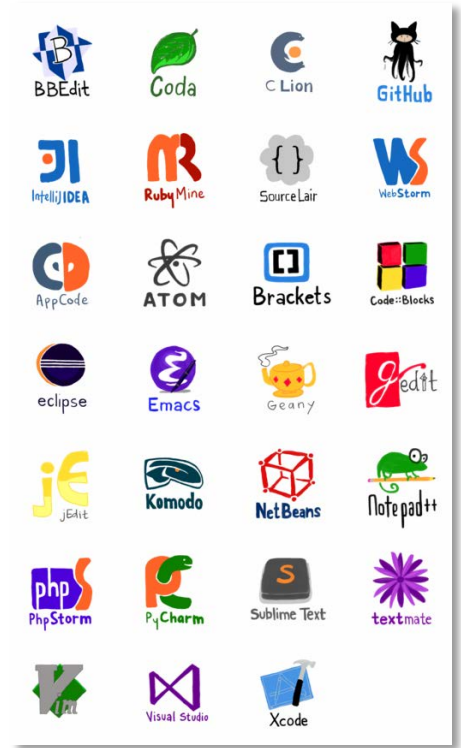


Tools



Choose your Editor

- There is lots of them !
- Use one with plugin support
 - Productivity
 - Errors preventions
- In a team : use the same config
 - <http://editorconfig.org/>



Code quality tools

- Use a linter
 - JSHint
 - JSLint
- Available :
 - As a plugin in your IDE
 - Or inside continuous integration

```
defaultSnowRenderer = snowLayer.renderer;  
var snow3DRenderer = new SimpleRenderer({  
  symbol: new PolygonSymbol3D({  
    symbolLayers: [new ExtrudeSymbol3DLayer()  
  ]),  
  visualVariables: [{  
    type: 'sizeInfo',  
    field: "height",  
    minDataValue: 0,  
    maxDataValue: 300,  
    minSize: 0,  
    maxSize: 400  
  }, {  
    type: "colorInfo",  
    field: "height",  
    minDataValue: 0,  
    maxDataValue: 300,  
    colors: [new Color("white"), new Color("10DDF0")]  
  }],  
});  
snowLayer.renderer = snow3DRenderer;
```

JSHint Warning W070 - Extra comma. (it breaks older versions of IE)

<https://github.com/Esri/jsapi-resources/tree/master/jshint>

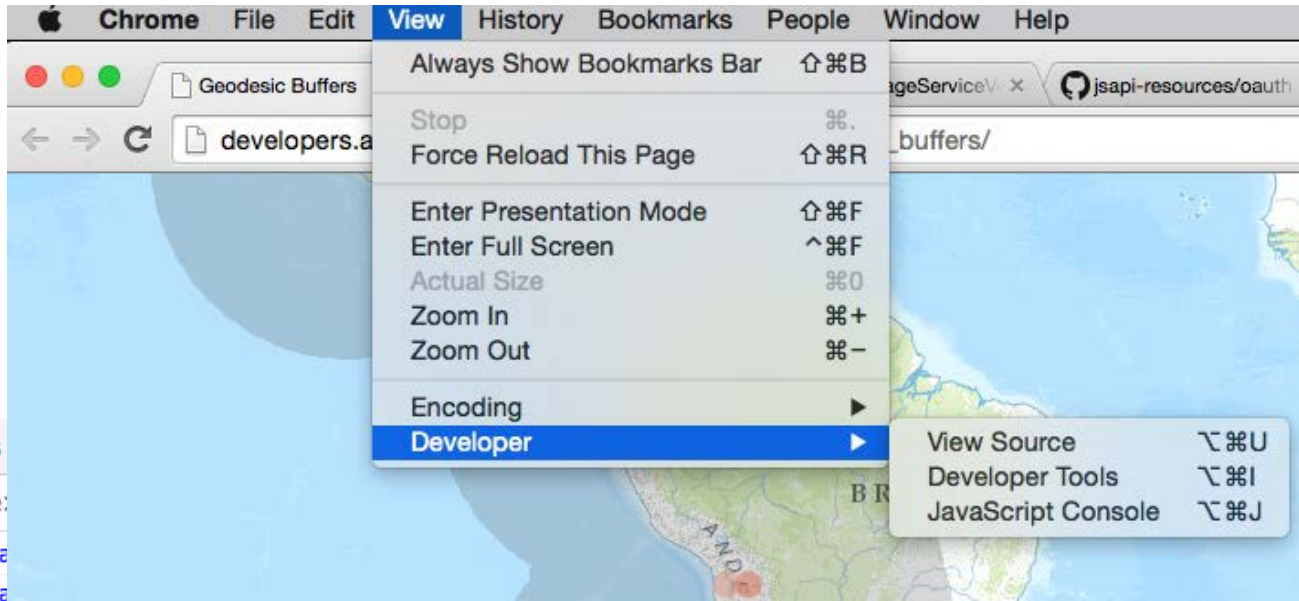
Additional tools

- Continuous Integration
 - Automate tasks using [Grunt](#), [Gulp](#), etc.
 - Run linter, beautify, minify your code
 - And of course, test your code
- Esri [TypeScript](#)



TypeScript

Browser Developer Tools



```
XHR finished loading: GET "http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer?f=json".  
XHR finished loading: GET "http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer/tilemap/1/0/0/8/8".  
XHR finished loading: GET "http://static.arcgis.com/attribution/World_Topo_Map?f=json".  
XHR finished loading: GET "http://developers.arcgis.com/proxy/?http://earthquake.usgs.gov/earthquakes/feed/v1.0/summary/4.5_week.csv".
```

Front-end



Common front-end errors

- Page failed to load or partial loaded
- Items not displaying properly
- Map is missing
- Features are missing
- Parsing errors
- Life-cycle (order of code execution)

Use a Web Server for testing

Use `http://` or `https://`

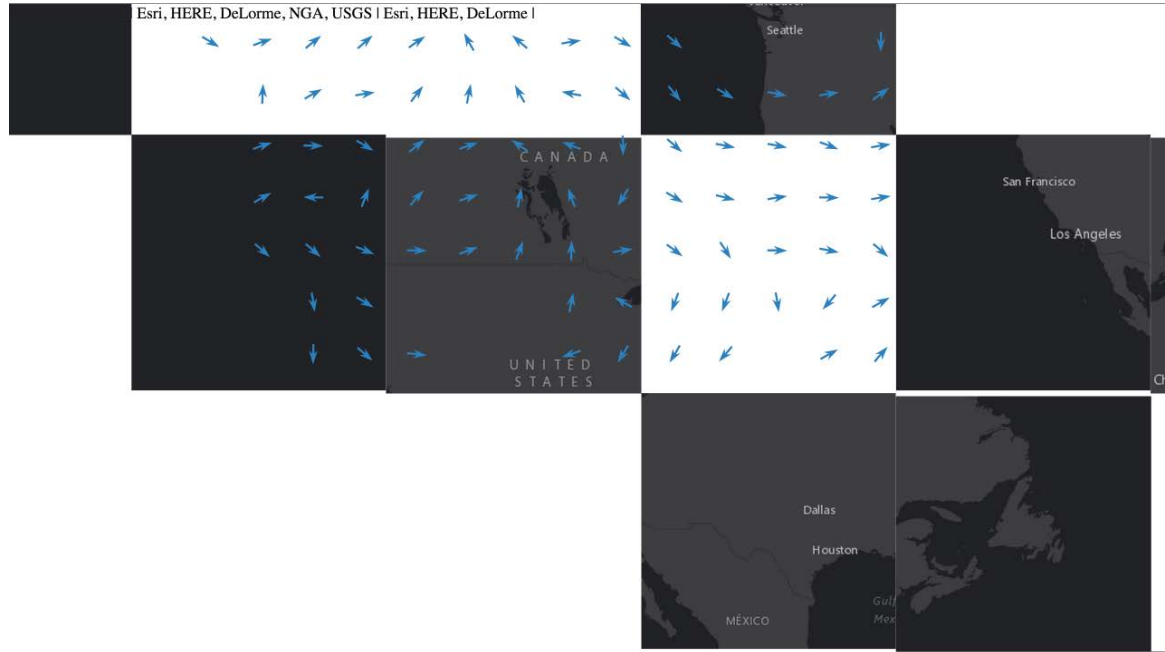
IIS, Apache or similar

Don't use filesystem accessor: `file://`



- Direct file access – bypass web server
- Web security prevents AJAX direct requests

Map in pieces – missing esri.css



DEMO

Using file:/// for web development



The screenshot shows a web browser window with a map titled "HTML5 Geolocation". The map area is mostly obscured by a large, semi-transparent error console window. The console displays the following error messages:

- ✘ GET `file:///js.arcgis.com/3.13/esri/css/esri.css` `net::ERR_FILE_NOT_FOUND`
- ✘ GET `file:///code.jquery.com/mobile/1.4.0/jquery.mobile-1.4.0.min.css` `net::ERR_FILE_NOT_FOUND`
- ✘ GET `file:///ajax.googleapis.com/ajax/libs/jquery/2.1.3/jquery.min.js` `net::ERR_FILE_NOT_FOUND`
- ✘ GET `file:///code.jquery.com/mobile/1.4.5/jquery.mobile-1.4.5.min.js` `net::ERR_FILE_NOT_FOUND`
- ✘ ▶ Uncaught ReferenceError: \$ is not defined

The browser's developer tools are open to the Console tab, showing 5 errors and 3 warnings. The error messages are repeated in a larger font in a separate window above the console. The map in the background shows a location with a blue marker and a light blue area, with a vertical scale on the left side ranging from 100 to 400.

DEMO

ReferenceError: require not defined

Life-cycle issues

```
✘ GET http://js.arcgis.com/3.14/dijit/themes/claro/claro.css net::ERR_INTERNET_DISCONNECTED
✘ GET http://js.arcgis.com/3.14/esri/css/esri.css net::ERR_INTERNET_DISCONNECTED
✘ GET http://js.arcgis.com/3.14/ net::ERR_INTERNET_DISCONNECTED
✘ ▶ Uncaught ReferenceError: require is not defined
```

DEMO

TypeError: ____ is not a function

Missing module and/or alias

```
✖ ▼ Uncaught TypeError: HomeButton is not a function
  (anonymous function) @ require-not-defined2.html:43
  ha @ init.js:22
  (anonymous function) @ init.js:23
  ia @ init.js:23
  fa @ init.js:23
  g @ init.js:25
  (anonymous function) @ init.js:30
```

DEMO

Parsing errors

```
dojo.io.script error Error: Internal kml parser error.  
  at Error (native)  
  at Object.h.load (http://js.arcgis.com/3.14/init.js:896:343)  
  at http://js.arcgis.com/3.14/init.js:181:69  
  at c (http://js.arcgis.com/3.14/init.js:66:221)  
  at d (http://js.arcgis.com/3.14/init.js:66:10)  
  at resolve.callback (http://js.arcgis.com/3.14/init.js:67:350)  
  at c (http://js.arcgis.com/3.14/init.js:66:436)  
  at d (http://js.arcgis.com/3.14/init.js:66:10)  
  at resolve.callback (http://js.arcgis.com/3.14/init.js:67:350)  
  at http://js.arcgis.com/3.14/init.js:1486:46
```

CONSOLE

Name
Path

MapServer?f=json
services.arcgis.com/...

kml?url=http%3A%2F%2...
utility.arcgis.com/sharing

× Headers Preview **Response** Cookies Timing

1 rror.", "details": ["The content of elements must consist of well-formed character data or markup."]]});

NETWORK

DEMO

ReferenceError: _____ not defined

```
▶ ReferenceError: deferred is not defined(...) "ReferenceError: deferred is not defined"
  at http://web.local/devsummit-berlin-2015/broken-promises.html:54:21
  at k (http://js.arcgis.com/3.14/init.js:189:431)
  at m (http://js.arcgis.com/3.14/init.js:189:357)
  at resolve (http://js.arcgis.com/3.14/init.js:191:441)
  at http://js.arcgis.com/3.14/esri/geometry/geometryEngineAsync.js:27:460
  at k (http://js.arcgis.com/3.14/init.js:189:431)
  at m (http://js.arcgis.com/3.14/init.js:189:357)
  at resolve (http://js.arcgis.com/3.14/init.js:191:441)
  at a.i.postMessage.then.a.c (http://js.arcgis.com/3.14/esri/geometry/geometryEngineAsync.js:10:422)
  at k (http://js.arcgis.com/3.14/init.js:189:431)

rejected at a (http://js.arcgis.com/3.14/init.js:190:337)
  at k (http://js.arcgis.com/3.14/init.js:190:89)
  at m (http://js.arcgis.com/3.14/init.js:189:357)
  at resolve (http://js.arcgis.com/3.14/init.js:191:441)
  at http://js.arcgis.com/3.14/esri/geometry/geometryEngineAsync.js:27:460
  at k (http://js.arcgis.com/3.14/init.js:189:431)
  at m (http://js.arcgis.com/3.14/init.js:189:357)
  at resolve (http://js.arcgis.com/3.14/init.js:191:441)
  at a.i.postMessage.then.a.c (http://js.arcgis.com/3.14/esri/geometry/geometryEngineAsync.js:10:422)
  at k (http://js.arcgis.com/3.14/init.js:189:431)

Error
  at then.b.then (http://js.arcgis.com/3.14/init.js:192:253)
  at doSomething (http://web.local/devsummit-berlin-2015/broken-promises.html:53:70)
  at http://web.local/devsummit-berlin-2015/broken-promises.html:45:13
  at ha (http://js.arcgis.com/3.14/init.js:22:473)
  at http://js.arcgis.com/3.14/init.js:23:202
  at ia (http://js.arcgis.com/3.14/init.js:23:89)
  at fa (http://js.arcgis.com/3.14/init.js:23:144)
  at g (http://js.arcgis.com/3.14/init.js:25:375)
  at HTMLScriptElement.<anonymous> (http://js.arcgis.com/3.14/init.js:30:98)"
```

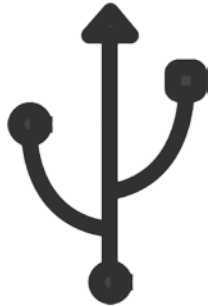
DEMO

Device browser debugging

Connect laptop to device via USB

Chrome for Android

Safari for iOS (works best on Mac)



Device browser debugging - Chrome



ols

Devices

Discover USB devices Port forwarding...

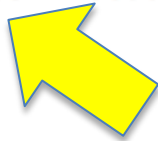
Nexus 5 #0943DB2B012AA901

S

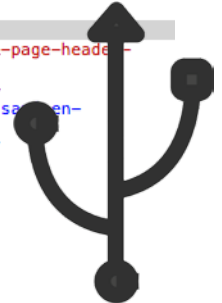
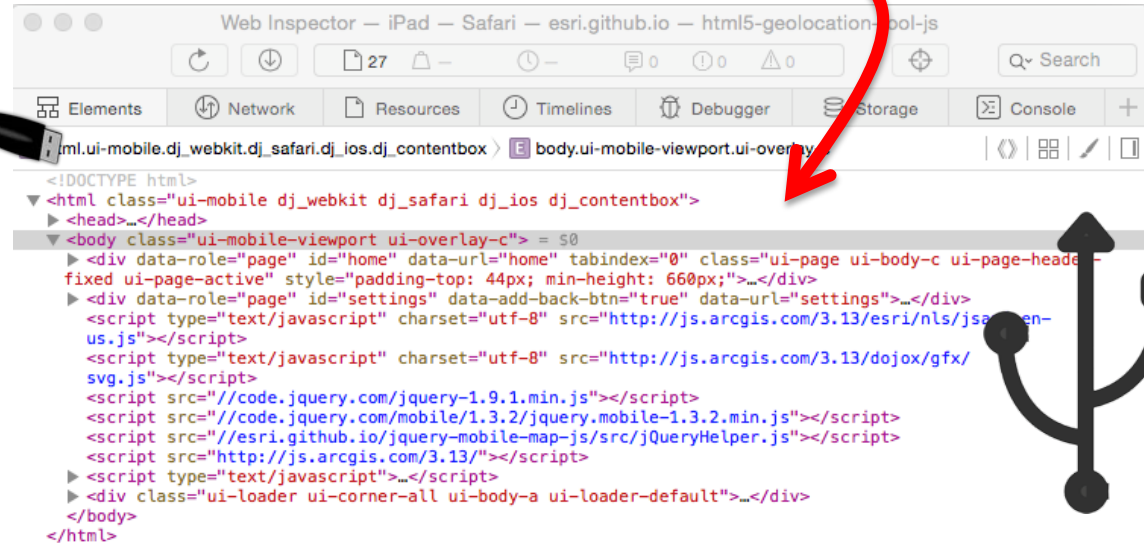
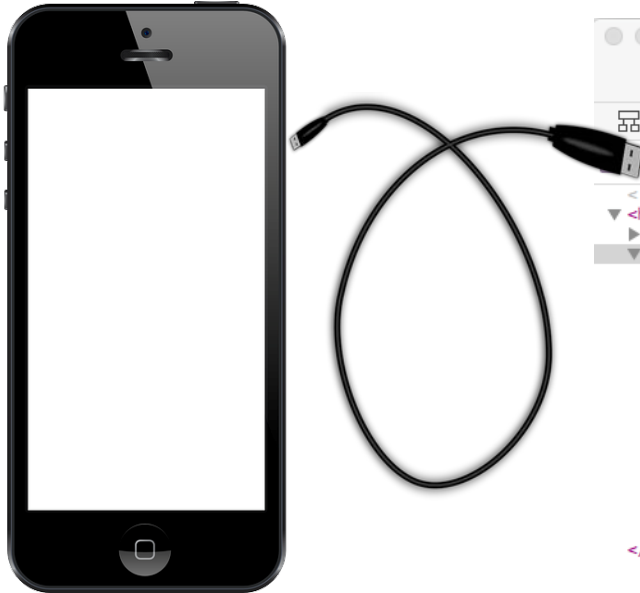
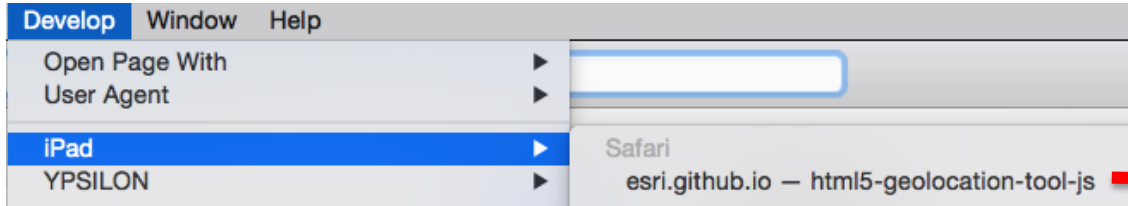
Chrome

orkers

HTML5 Geolocation <http://esri.github.io/html5-geolocation-tool-js/>
[inspect](#) [focus tab](#) [reload](#) [close](#)



Device browser debugging - Safari



Clearing Cache

“Sticky cache” means new changes don't show

Key-board Shortcuts

Browser settings

URL caching

```
url: function() {  
  return 'http://esri.github.io/offline-editor-js/tiny-image.png?_=' +  
    (Math.floor(Math.random() * 1000000000));  
}
```

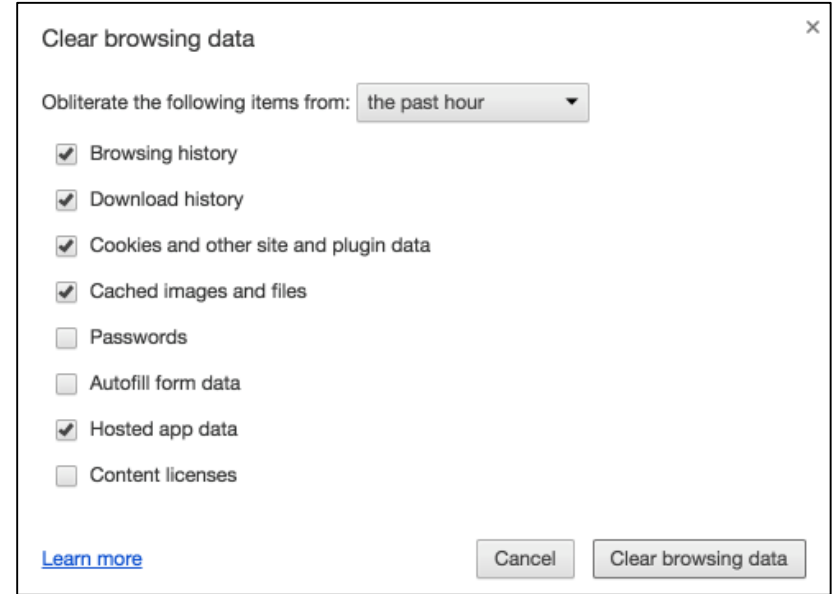
Clearing Cache - Chrome

Mac

Shift+Command+Delete

Windows

Ctrl+Shift+Delete



Clearing Cache - Chrome

Settings

General

General

Devices

Throttling

Workspace

Shortcuts

Disable cache (while DevTools is open)

Disable JavaScript

Appearance

Don't show Chrome Data Saver warning

Panel layout:

Sources

Search in content scripts

Detect indentation

Autocompletion

Bracket matching

Show whitespace characters:

Set code breakpoints

- Manually via the browser
- In-line via `debugger` statement
- Make good use of `console.log()`

Common back-end errors

- HTTP & REST request errors
- Slow and intermittent internet
- Authorization errors
- Cross domain requests errors

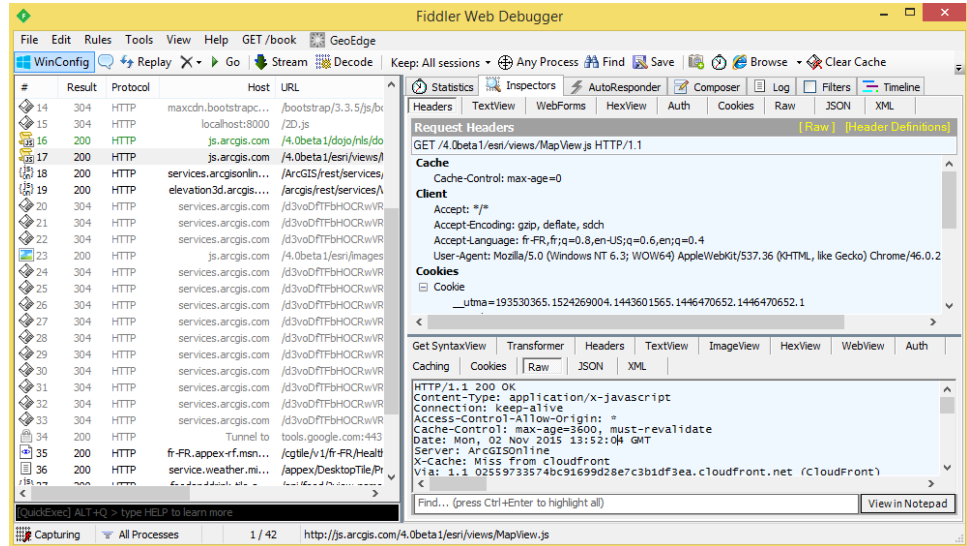


Debugging Proxies

Detailed HTTP inspection

Show ALL HTTP/HTTPS traffic

- Fiddler
- Charles



Developer Tools – Network Tab

HTTP status codes

- 200 – Okay
- 302 – Redirect
- 403 – Forbidden
- 404 – Not Found
- 500 – Internal Server Error

ArcGIS REST API Documentation

Operator descriptions

Attribute/Value pairs

Request/Response

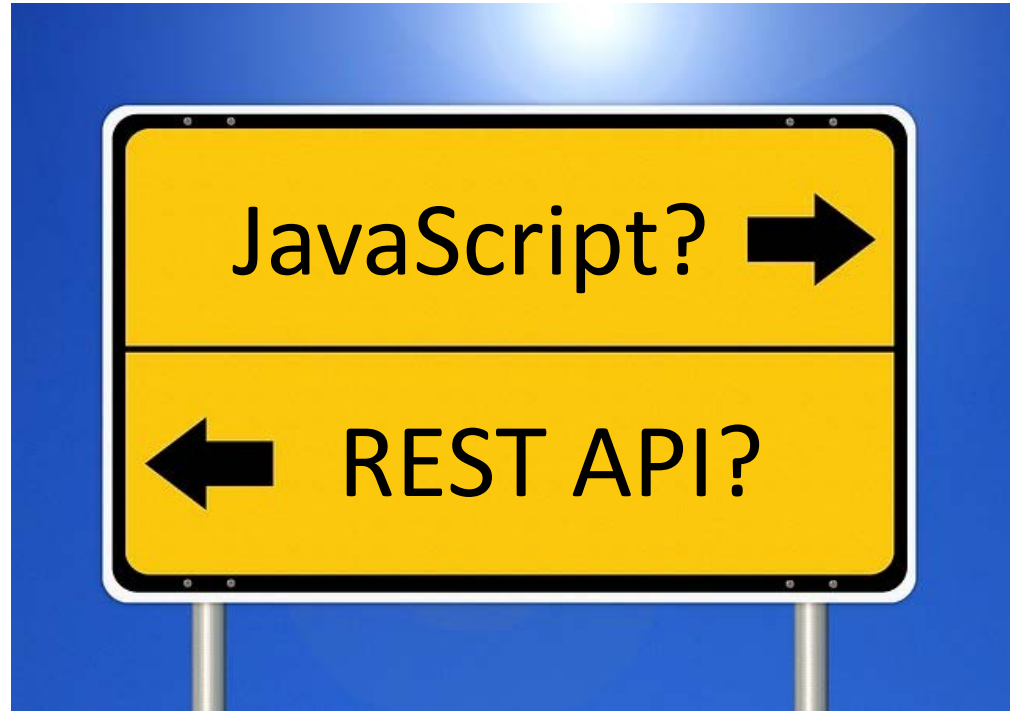
JSON output

[REST API Web Site](#)

REST request – example scenario

200 – Okay

BUT...my code is
still failing?



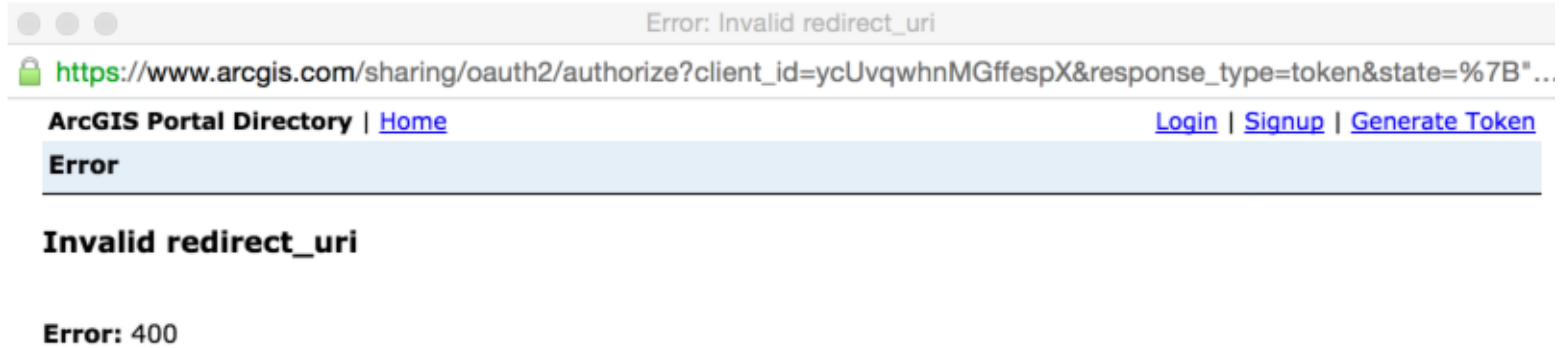
Cross domain requests : CORS and proxy page

- Cross-Origin Resource Sharing (CORS)
 - Implemented on both server side and client side
 - <http://enable-cors.org/>

```
require(["esri/config"], function(esriConfig) {  
  esriConfig.defaults.io.corsEnabledServers.push("servicesbeta.esri.com");  
  esriConfig.defaults.io.corsEnabledServers.push("server.organization.com");  
});
```


- [Proxy page](#)
 - Allow cross domain request
 - Manage security (tokens)
 - Go over the GET URL limit length
 - <https://github.com/Esri/resource-proxy>

Localhost OAuth 400 error




Localhost OAuth 400 error

Current Redirect URIs

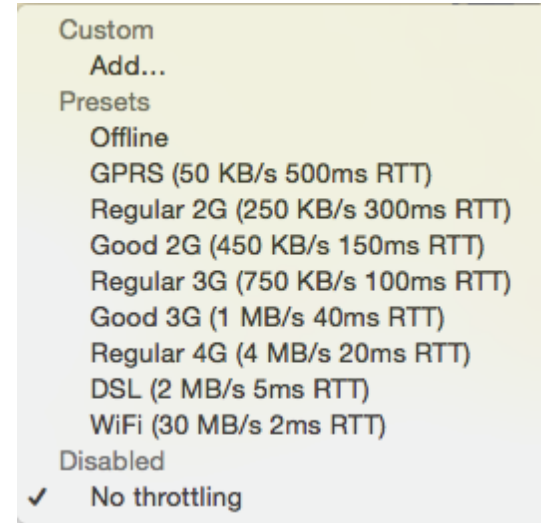
http://localhost/mySuperApp 

Add Redirect URI

 Add

Throttling – slow network testing

- Most important for mobile
- But important for every application (public app, used on remote site)
- Test it early in the app development process

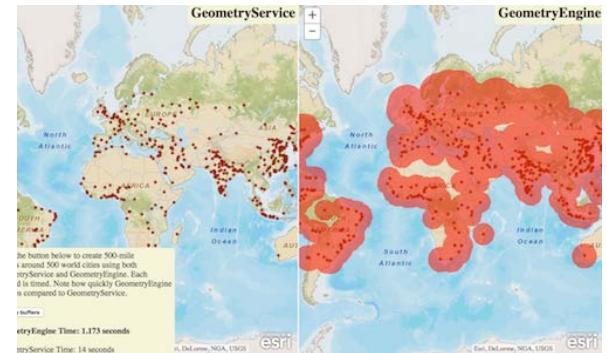


Slow network troubleshooting - 1

- Try to request only what you need
- Simplify geometries
 - In your database
 - Or client side using the [maxAllowableOffset](#) parameter
- If you need geometry operations, give the new [GeometryEngine](#) a try !

```
    {
      "name": "STATE_NAME",
      "type": "esriFieldTypeString",
      "alias": "STATE_NAME",
      "sqlType": "sqlTypeVarchar",
      "length": 35,
      "domain": null,
      "defaultValue": null
    }
    {
      "name": "POP2010",
      "type": "esriFieldTypeInteger",
      "alias": "POP2010",
      "sqlType": "sqlTypeInteger",
      "domain": null,
      "defaultValue": null
    }
  }
  "name": "POP10_SQMI",
}
```




Name	Sta...	Type	Initiator	Size	Time	Timeline - Start Time
query?where=f...	200	do...	Other	5.4 MB	26.95 s	



Slow network troubleshooting - 2

- Minimize, concatenate your .js and .css
- Use [ArcGIS JavaScript Optimizer](#)
- (or build [your own](#) !)
- Enable webserver [gzip compression](#)

Use	CDN: Size	CDN: Number of Requests	Optimized: Size	Optimized: Number of Requests
Feature Layer	312.5 KB	13	206.2 KB 34% smaller	2 85% less requests
ArcGIS.com Map	351.0 KB	14	266.1 KB 24% smaller	2 86% less requests
Map with Legend + Layout Widgets	337.8 KB	24	231.3 KB 31% smaller	2 92% less requests
Editing Widgets	537.1 KB	130	364.8 KB 32% smaller	2 98% less requests

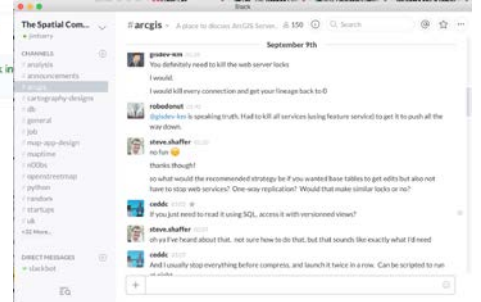
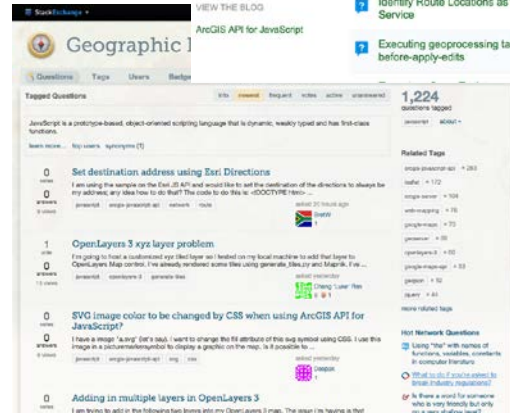
Name Path	Status Text	Type	Initiator	Size Content	Tim- Late
 query?f=json&where=&returnGeometry=true&s... services.arcgis.com/V6ZHFr6zdgNZuVG0/ArcGIS/r...	200 OK	xhr	init.js:152 Script	32.1 KB 124 KB	
 buffer utility.arcgisonline.com/ArcGIS/rest/services/Geo...	200 OK	xhr	init.js:152 Script	1.3 MB 3.3 MB	
 query?f=json&where=&returnGeometry=true&s... services.arcgis.com/V6ZHFr6zdgNZuVG0/ArcGIS/r...	200 OK	xhr	init.js:152 Script	21.8 KB 84.3 KB	
...

Internet Resources

- Search Engine
- GeoNet
- GIS StackExchange



Title	Author	Latest activity	Views	0	0	1	0
How do get my modification of the responsive-citizens app to work?	Chris Sargent	April 7, 2015 9:22:02 AM	63	0	0	1	0
javascript api 3.13 geometryEngine.geodesicBuffer error	Bryan Westphal	April 7, 2015 8:09:21 AM	10	0	0	0	0
How to programmatically restart Map service??	Peter Lee	April 7, 2015 8:08:22 AM	25	0	0	1	0



Andy Gup

agup@esri.com

@agup

Cédric Despierre Corporon

cdespierre@esrifrance.fr

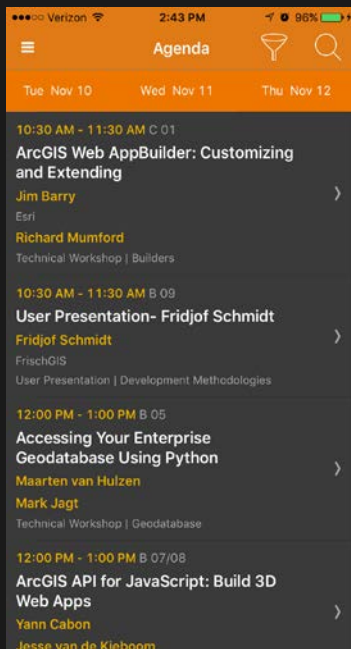


Please Take Our Survey!

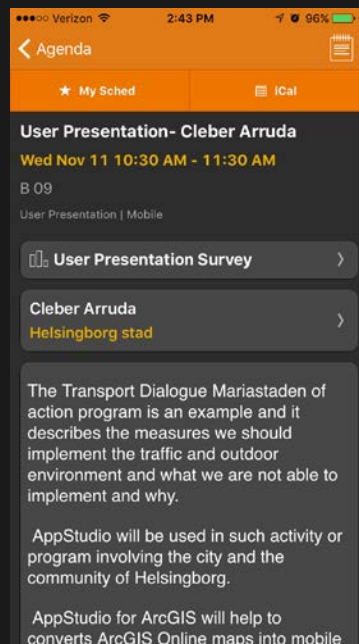
Download the Esri Events app
and find your event



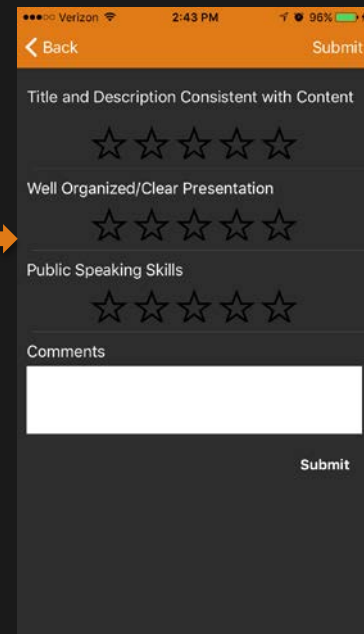
Select the session you
attended



Select
"User Presentation Survey"
or
"Technical Workshop Survey"



Complete Answers
and Select "Submit"





esri®