



Web AppBuilder for ArcGIS: A Deep Dive in Enterprise Deployments

Nick Brueggemann and Mark Torrey

2018 Esri DEVSummit Conference | Palm Springs, CA

Agenda

Subhead Here

- Patterns
- Installation
- Configuration
- Security
- Application Development
- Deployment
- Post-Deployment

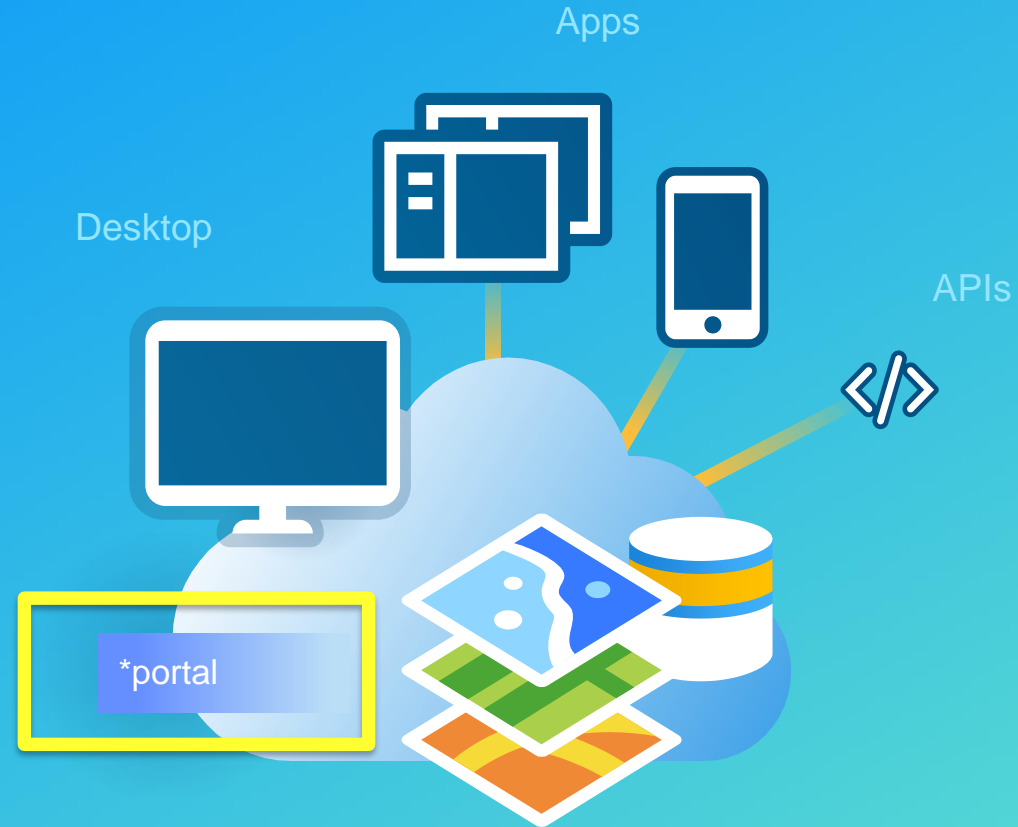
Enterprise Deployment

What is it and what does it mean?

Implementation Patterns

Web GIS

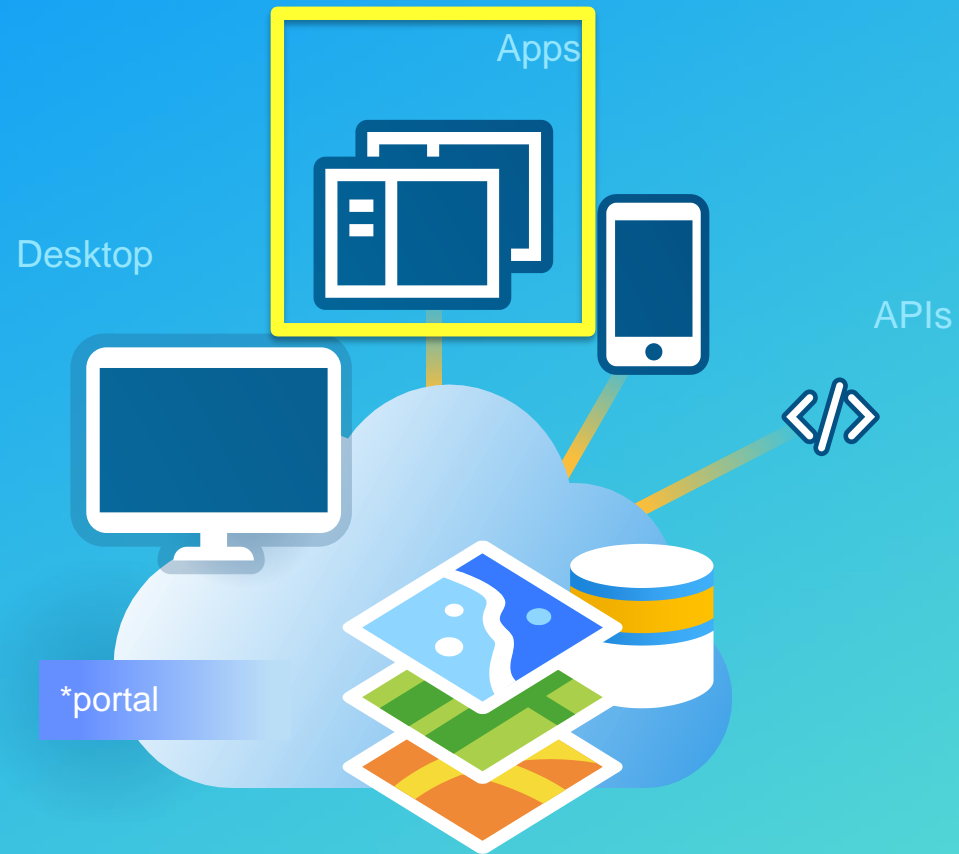
- ArcGIS Online
 - Esri Managed
 - Multi-tenant
 - Scale
 - Automatic Updates
- ArcGIS Enterprise
 - Your infrastructure
 - Customization
 - You control SLA
 - Integrated security
- Hybrid
 - Use technologies from both implementations



Implementation Patterns

Web AppBuilder

- Embedded Version
 - Hosted
 - Fully – integrated
 - Built In
- Developer Edition
 - Required for customization
 - Widgets
 - Themes
 - Direct Access
 - Doesn't require launching from a webmap
 - Widgets



Common Enterprise Patterns

Most Common



Portal for ArcGIS with Dev Edition



ArcGIS Online with Dev Edition



Portal for ArcGIS with Embedded Version



ArcGIS Online Embedded Version

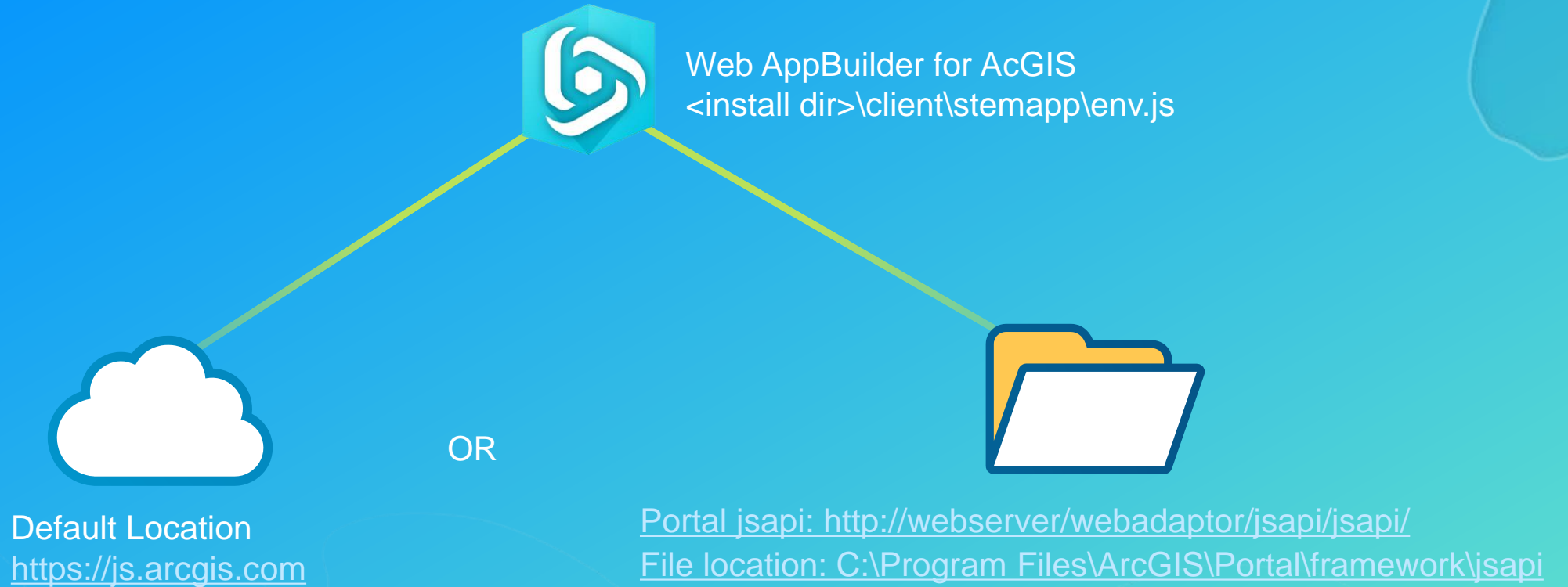
Less Common

Installation

Getting Started...

Installation...

Where do we get the JSAPI?



Installation...

Nodejs

- Two options
 - Windows Service
 - Run as user
- As User
 - Startup.bat
 - Command Line
 - Add node.js to PATH
 - Navigate to <wab install>/server
 - node server.js
- Windows Service
 - Navigate to <wab install>/server
 - Install npm
 - npm run-script install-windows-service



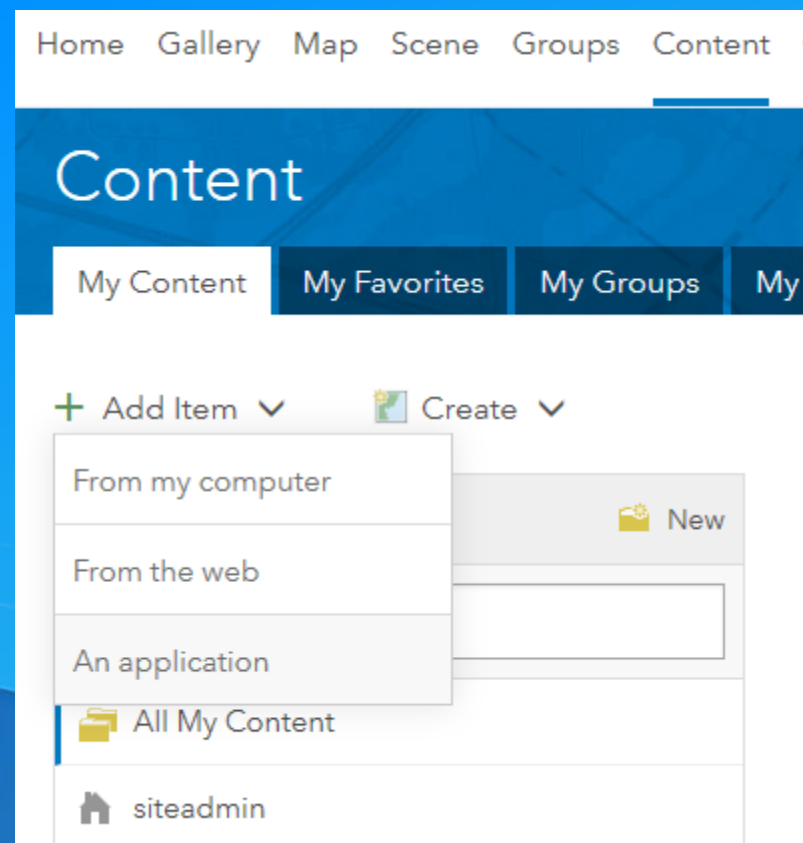
```
c:\WAB\2.7
λ cd server\

c:\WAB\2.7\server
λ ls
apps          config.json  dbutils.js  logs          node_x86.exe  proxy.js     server.js     uploads
cacert.pem    db           license.txt  node_modules  package-lock.json  rest         signininfo.json  utils.js
cakey.pem     db-engine.js log4js.json  node_x64.exe  package.json  routes       upgrade.js

c:\WAB\2.7\server
λ node server.js
body-parser deprecated undefined extended: provide extended option server.js:205:22
Server listening tcp connection on port 3344 in development mode
[2018-03-04T11:16:57.779] [INFO] repo - Read repository items: c:\WAB\2.7\client\stemapp\widgets
Server listening http connection on port 3345 in development mode
Server listening https connection on port 3346 in development mode
[2018-03-04T11:17:05.975] [INFO] repo - Read repository items: c:\WAB\2.7\client\stemapp\themes
[2018-03-04T11:17:07.284] [INFO] repo - Read repository items: c:\WAB\2.7\client\stemapp3d\widgets
```

Installation...

Adding the app to portal



Add an application ?

Add an item from your computer or reference an item on the Web.

Type:

- ☐ Web Mapping
- ☐ Mobile
- ☐ Desktop
- ☒ Application
- ☐ Application Extension (Operations Dashboard)
- ☐ Application Extension (AppBuilder)

Title:

Web AppBuilder

Tags:

WAB × web appbuilder × appid ×

Add tag(s)

Add Item Cancel

Installation...

Registering the app with portal (not necessary on web-tier-authenticated portals)

Web AppBuilder

[Overview](#)[Settings](#)

General Settings

Application Settings

General Settings

Delete Protection

☐ Prevent this item from being accidentally deleted.

Delete Item

Extent

No extent has been set for this item.

Set Extent

Save

Cancel

Application Settings

Data Source

URL

App Registration

Update

Unregister App

Registered Info

Registered Info



App ID:
UtxmlforE35tjX6h

App Secret:
[Show Secret](#)

App Type:
Multiple

Redirect URI:

https://<server>[:port]

Add

Delete

urn:ietf:wg:oauth:2.0:oob

Update

Reset Secret

Cancel

Installation...

OAuth

Updated Item Page

Application Settings

Data Source

URL

App Registration

App ID:

UtxmlforE35tjX6h

App Secret:

Show Secret

App Type:

Multiple

Redirect URI's:


urn:ietf:wg:oauth:2.0:oob

Update


Unregister App

Web AppBuilder Authorization

Specify the URL to your organization or Portal for ArcGIS



Provide the App ID for Web AppBuilder registered in the portal you specify above (?)



Continue

Signininfo.json

```
[{  
  "portalUrl": "http://[webserver]/[webadaptor]",  
  "appId": "UtxmlforE35tjX6h",  
  "supportsOAuth": true,  
  "isWebTier": false  
}]
```

Configuration

Updating the defaults

Configuration...

Sharing the app to your portal

Home page

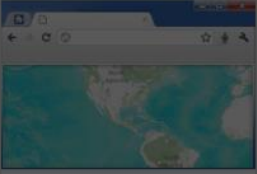
Share Item

Home Gallery Map Scene Groups Content Organization

Web AppBuilder (Dev Edition) [Edit](#)

Overview Settings

Edit Thumbnail




★ Add to Favorites

Add a brief summary about the item.

by siteadmin

Last Modified: March 4, 2018

 Web Mapping Application

Description


Add an in-depth description of the item.

Access and Use Constraints

Add any special restrictions, disclaimers, terms and conditions, or li

Comments (0)

Featured Maps and Apps



Web AppBuilder

Share

Share the item(s) with:

☒ Everyone

☒ Portal for ArcGIS

☒ These groups:

☐ Dev Summit 2018

☒ Featured Maps and Apps

These settings will replace the current settings.

OK

Cancel

Tags

[web, app, builder](#)

[Edit](#)


Credits (Attribution)

[Acknowledge this item's source.](#)

[Edit](#)

URL

<https://clt-mtorrey10l.esri.com:3344/we>



[View](#)

Configuration...

Disabling embedded Web AppBuilder

Share

Choose who can view this map.
Your map is currently shared with these people.

☒ Everyone
☒ Portal for ArcGIS
☐ Members of these groups:

☐ Featured Maps and Apps
☐ Web App Templates

Link to this map
[http://\[redacted\].esri.com/portal/home/webmap/viewer.html?webmap=09f80339f939442f9df43d5ef4f06ce7&extent=-126.6804,21.005,-81.3288,56.196](http://[redacted].esri.com/portal/home/webmap/viewer.html?webmap=09f80339f939442f9df43d5ef4f06ce7&extent=-126.6804,21.005,-81.3288,56.196)

☒ Share current map extent

Embed this map

EMBED IN WEBSITE CREATE A WEB APP

webmap > Save > Share

Create a New Web App

Configurable Apps Web AppBuilder

To create a new app with Web AppBuilder, enter a title, tags and summary.

Title: Demo Map: Cropland vs Household Size

Tags: demo x
Add tag(s)

Summary: Enter a summary (Optional)

Save in folder: asizer_ljcdev

☒ Share this app in the same way as the map (Everyone)

Create a Web App > Web AppBuilder tab

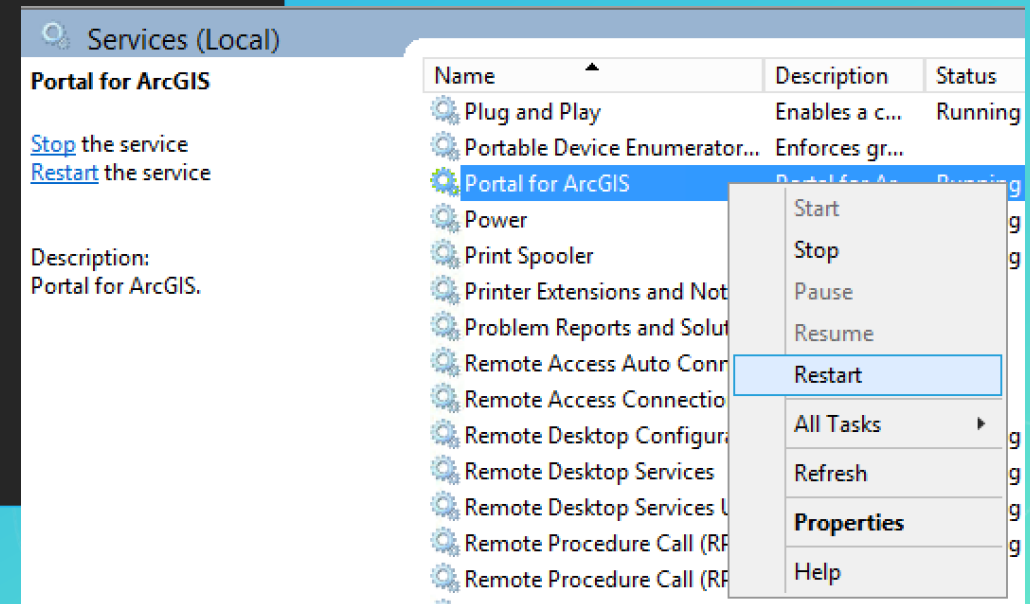
Configuration...

Disabling embedded Web AppBuilder...

C:\Program Files\ArcGIS\Portal\customizations\
10.4\webapps\arcgis#home\js\arcgisonline\config.json

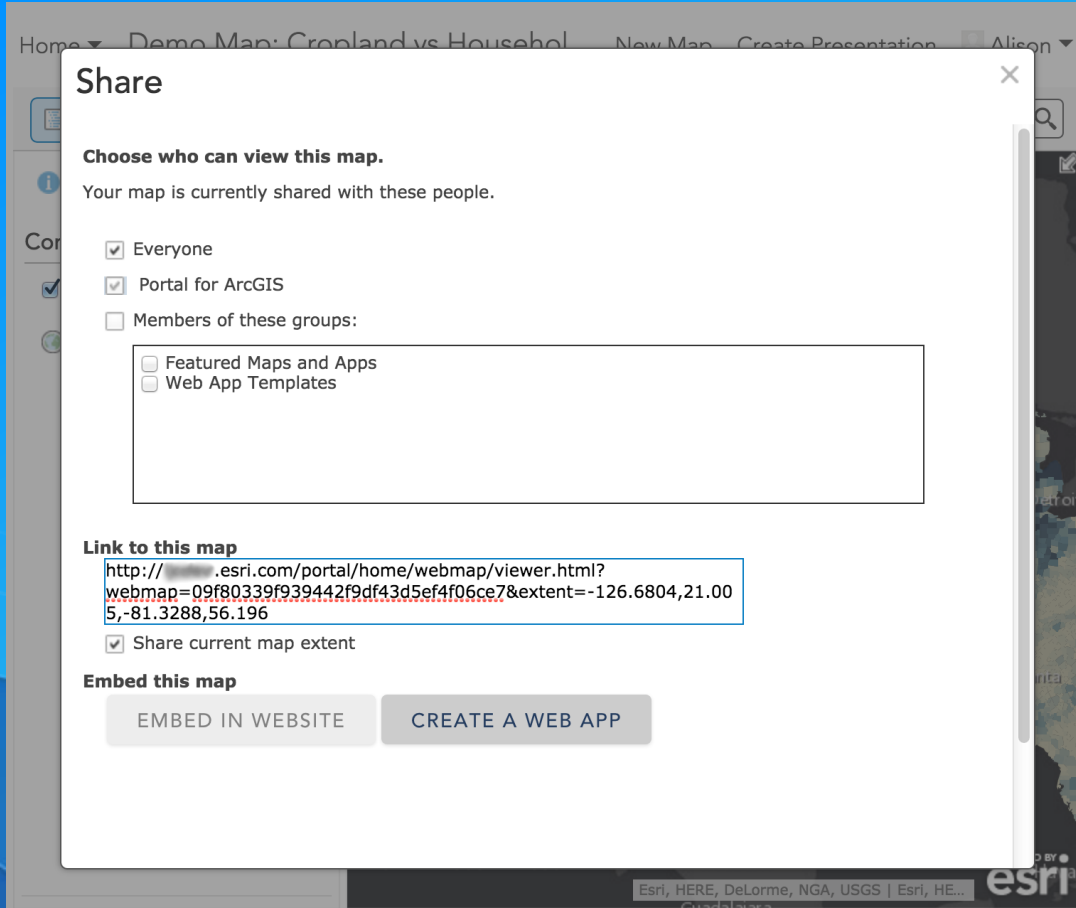
```
...  
searchArcGISOnlineEnabled: true,  
publishTilesFromFeaturesEnabled: true,  
federatedServerConfigEnabled: true,  
hostedServerConfigEnabled: true,  
findFeaturesWebMapEnabled: true,  
webAppBuilderEnabled: true,  
sceneViewerEnabled: true,  
restrictOrganizationPageToAdmin: false, ...
```

Restart Portal Service

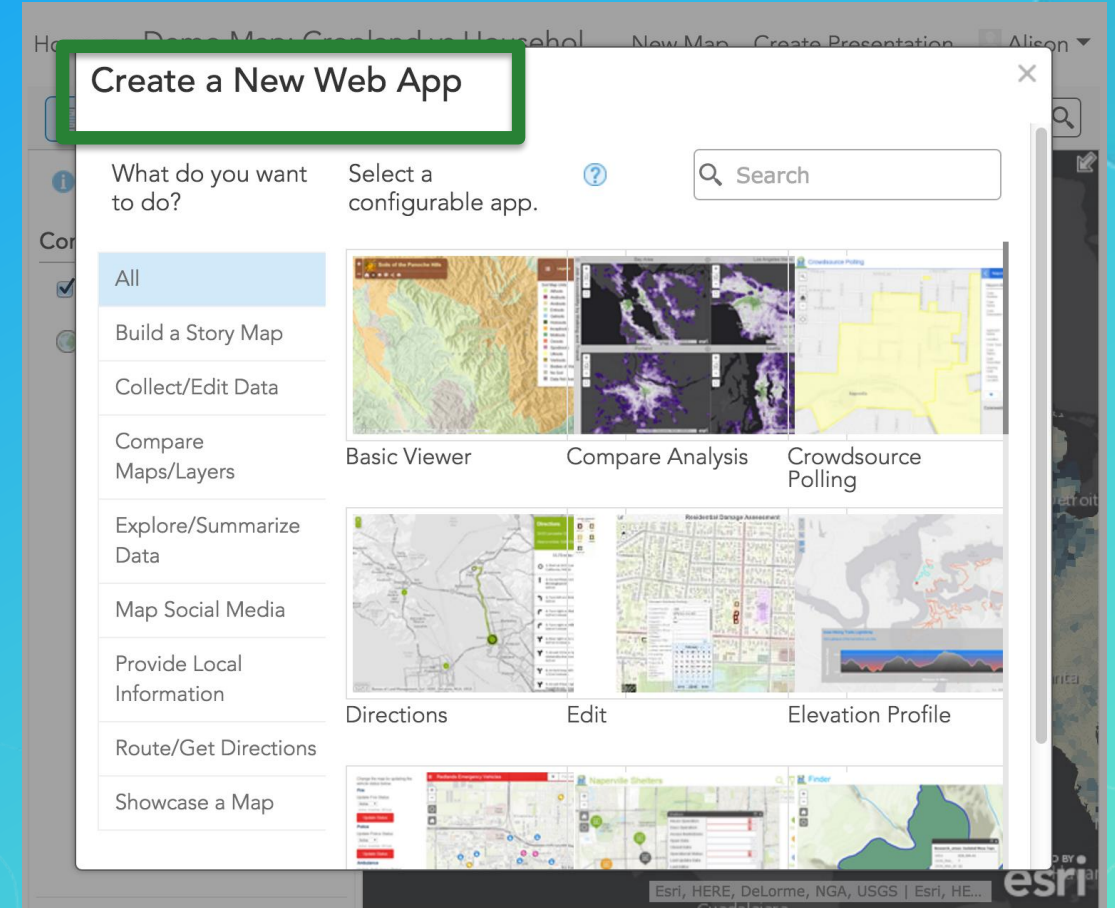


Configuration...

Disabling embedded Web AppBuilder...



webmap > Save > Share

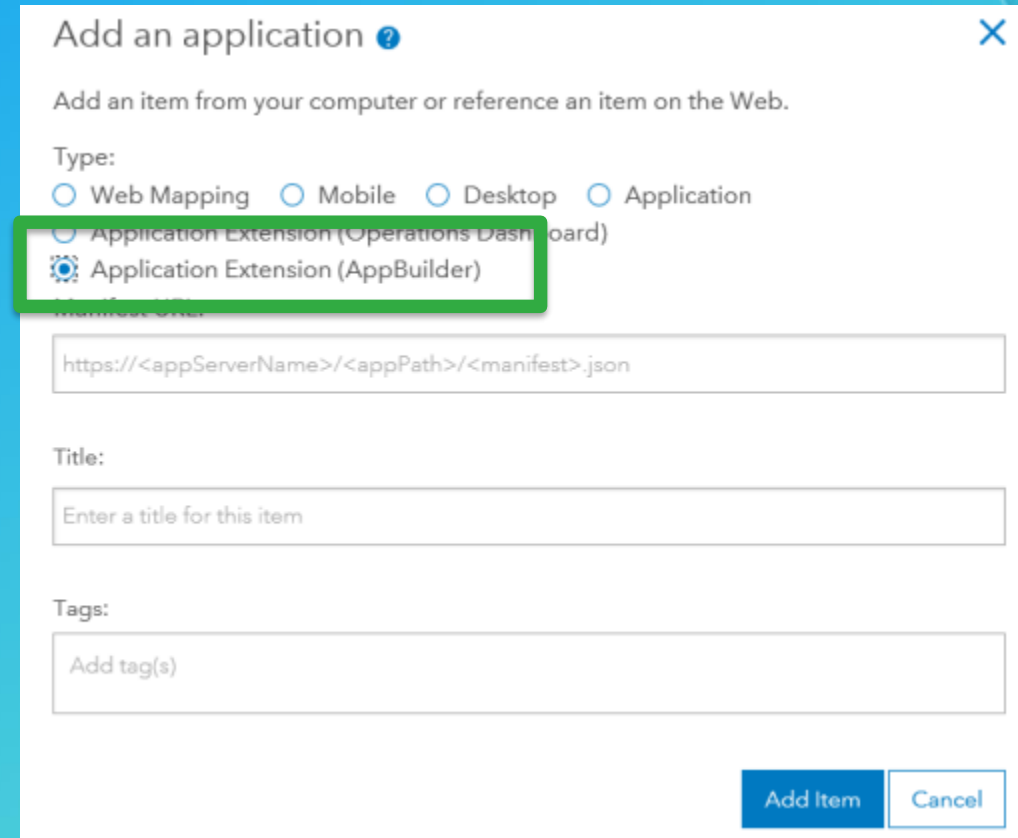
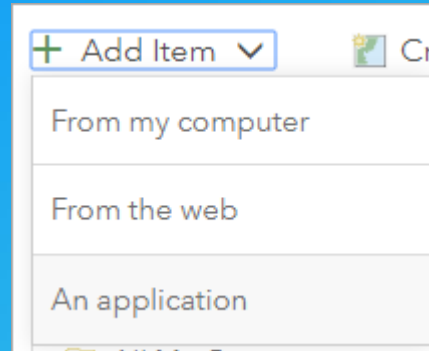


Create a Web App > Web AppBuilder tab

Configuration

Add custom widgets to you portal

- Add virtual directory
 - Enable
 - anonymous access
 - HTTPS
 - CORS
 - JSON Handler
- Register widget manifest
- Share to Users

A screenshot of a dialog box titled 'Add an application'. The dialog box contains the following fields and options:

- Type:** A group of radio buttons with the following options: 'Web Mapping', 'Mobile', 'Desktop', 'Application', 'Application Extension (Operations Dashboard)', and 'Application Extension (AppBuilder)'. The 'Application Extension (AppBuilder)' option is selected and highlighted with a green box.
- Manifest URL:** A text input field containing the placeholder text 'https://<appServerName>/<appPath>/<manifest>.json'.
- Title:** A text input field with the placeholder text 'Enter a title for this item'.
- Tags:** A text input field with the placeholder text 'Add tag(s)'.
- Buttons:** At the bottom right, there are two buttons: 'Add Item' and 'Cancel'.

Configuration...

Use Your Certificates

- **WAB ships with a self-signed cert**
 - Functional, but not ideal for enterprise users, not allowed elsewhere
- **You can use your own certificate and replace the default cert**
 - Domain or commercially-signed “CA cert”
 - You’ll need server certificate and key pair
- **Create .pem files**
 - Convert .pfx certificate into a certificate/key pair
 - Replace cacert.pem and cakey.pem in \server
 - Restart WAB

```
c:\WAB\2.7-ds\server
λ ls -al
total 41059
drwxr-xr-x 1 mark4582 1049089      0 Mar  4 12:33 .
drwxr-xr-x 1 mark4582 1049089      0 Mar  2 18:24 ..
drwxr-xr-x 1 mark4582 1049089      0 Mar  2 18:27 .vscode
-rw-r--r-- 1 mark4582 1049089    2948 Mar  2 15:38 cacert.pem
-rw-r--r-- 1 mark4582 1049089   1344 Mar  2 07:58 cacert.pem_orig
-rw-r--r-- 1 mark4582 1049089   1675 Mar  2 11:54 cakey.pem
-rw-r--r-- 1 mark4582 1049089   1702 Mar  2 07:58 cakey.pem_orig
-rw-r--r-- 1 mark4582 1049089    294 Mar  2 07:58 config.json
```

Enterprise Development

Enterprise Development

What do we consider to be “Enterprise” Development?

- Generally it's a project that has more than one developer contributing
- Typically it's a project that is deployed into multiple environments (i.e development, staging, and production)
- Usually it's a project that has grown into a significant amount of complexity
 - Application code that doesn't “fit” cleanly into a single widget
 - Out of the Box widgets have been customized or extended
 - WAB code itself may have been modified

Source Code Management Paradigms

- Essential for team collaboration
- There are a few different ways to do this
- We have a recommended approach but one size doesn't always fit all.



Source Code Management Paradigms

No Source Control



Source Control Everything

- arc-gis-web-appbuilder
 - client
 - stemapp
 - ...
 - docs
 - server

Source Control a Single Application

- arc-gis-web-appbuilder
 - client
 - stemapp
 - ...
 - docs
 - server
 - apps
 - 2

Source Control Only your Code

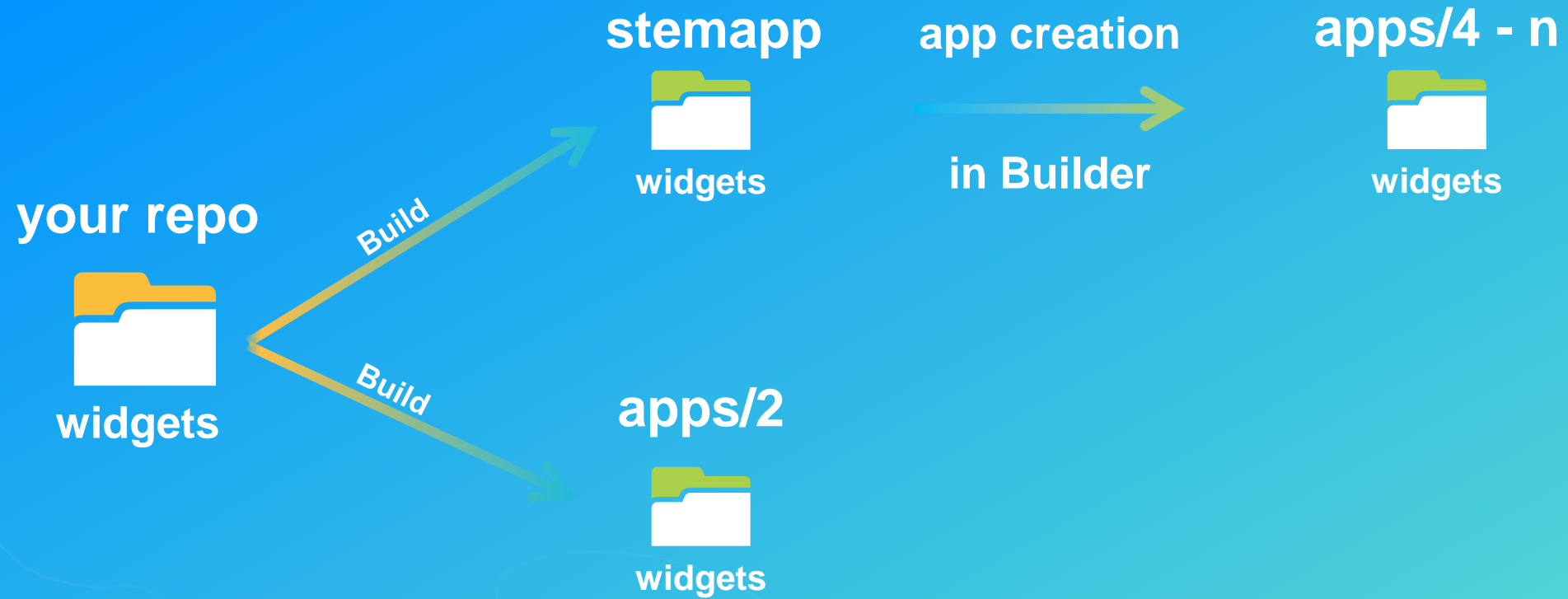
- my-project
 - build
 - src
 - custom
 - libs
 - widgets
 - wab *

* Added to gitignore



App Build Process

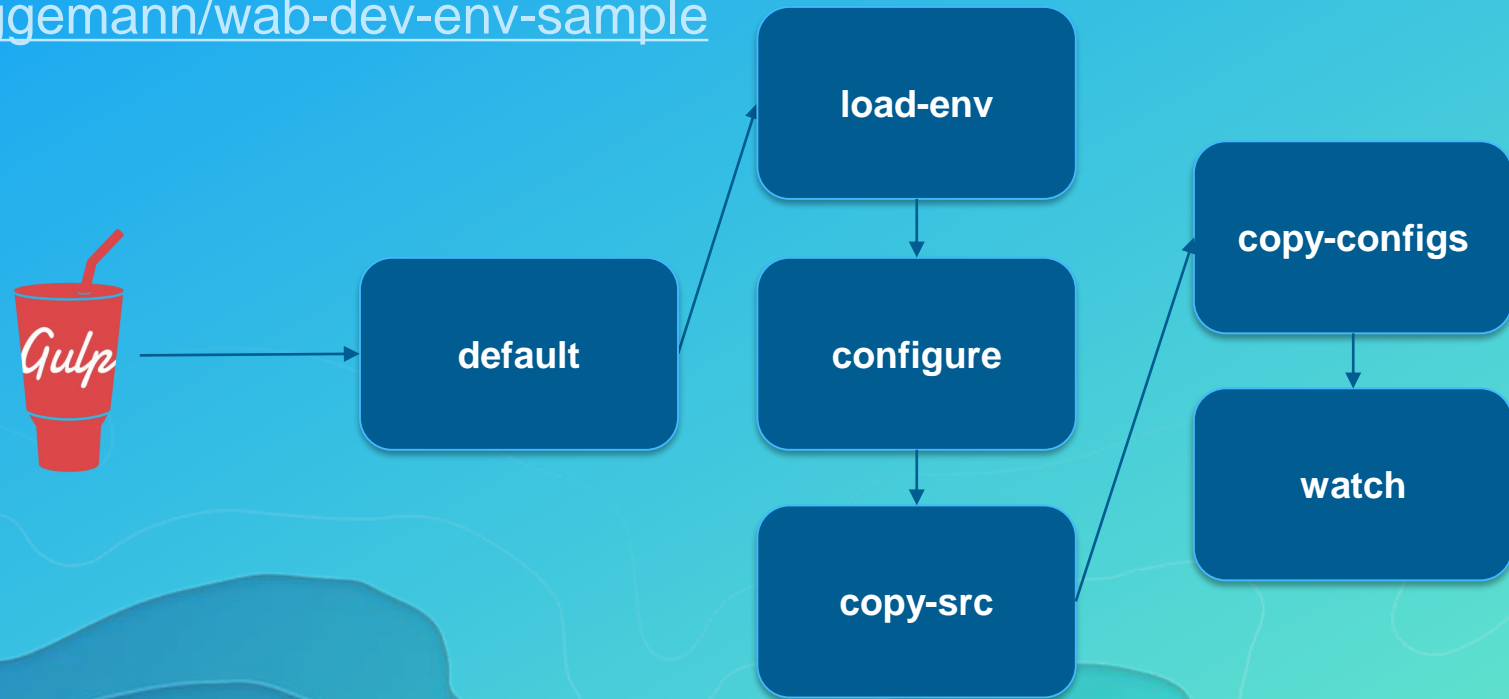
Overview



App Build Process

Digging into the build process

- With Gulp you build concise tasks for each build step
- Build as many as you need
- Checkout other WAB sessions for more on this
- <https://github.com/nbrueggemann/wab-dev-env-sample>



App Build Process

Multi-Environment Configuration

- Typically configurations point to services your widget depend on
- There may need to change for deployments to different environments

Typical Config

```
{  
  "service": {  
    "url": "https://sampleserver6.arcgisonline.com/arcgis/rest/serv..."  
  }  
}
```

But We Need

```
{  
  "service": {  
    "url": "dev-service-url"  
  }  
}
```

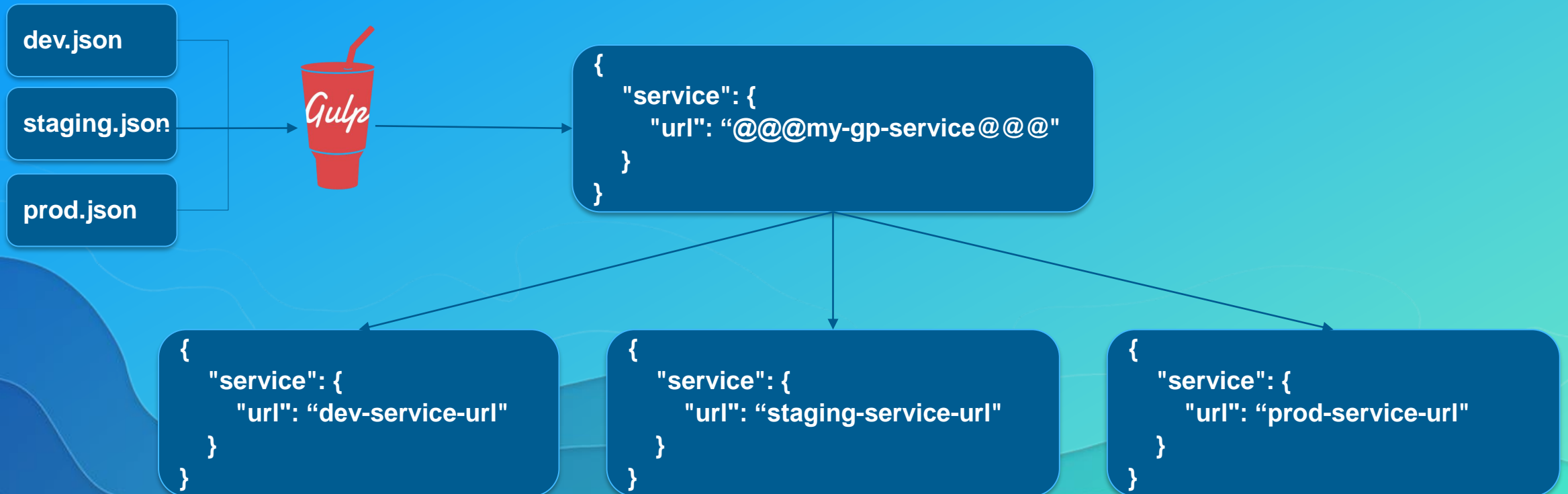
```
{  
  "service": {  
    "url": "staging-service-url"  
  }  
}
```

```
{  
  "service": {  
    "url": "prod-service-url"  
  }  
}
```

App Build Process

Multi-Environment Configuration

- We use gulp-replace as a way to build these configurations for us
- Target one env at a time: `gulp --env=dev` (yargs for arguments)

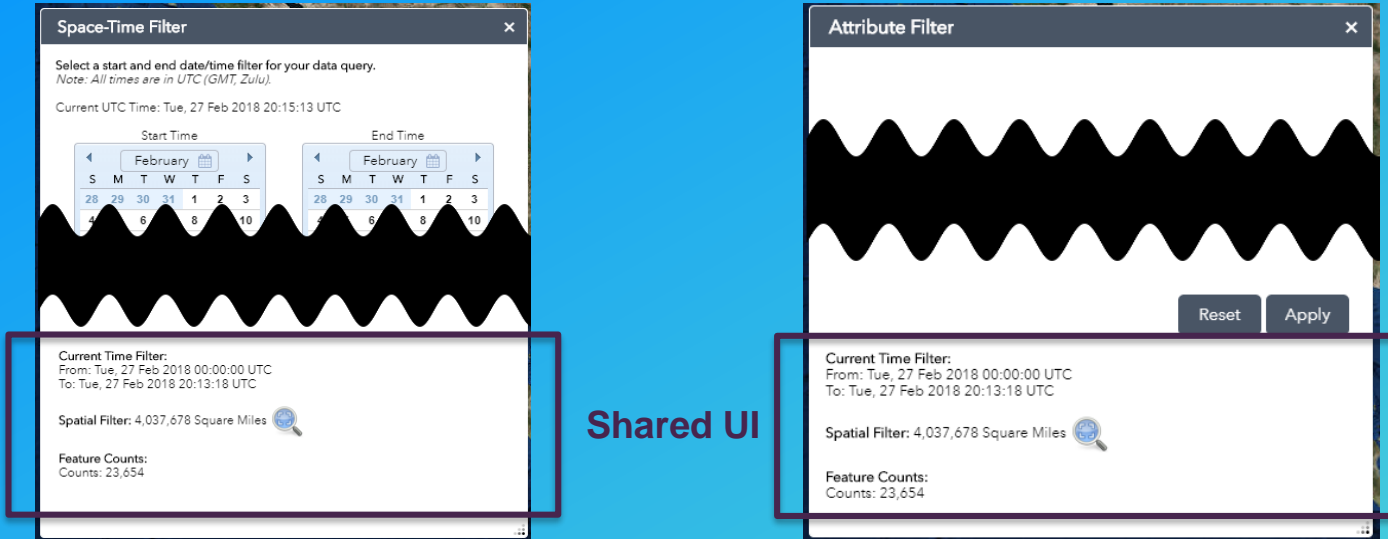


Code Beyond Widgets

- Focus is typically on widgets and themes but customizing doesn't have to stop there
- Very valid reasons for putting code outside of widget
 - Shared code between widgets
 - Core application business logic
- Where should this code go?
 - custom/libs
 - “custom” folder is used so your code doesn't end up in the root of libs folder in wab.

Code Beyond Widgets

Shared code between widgets

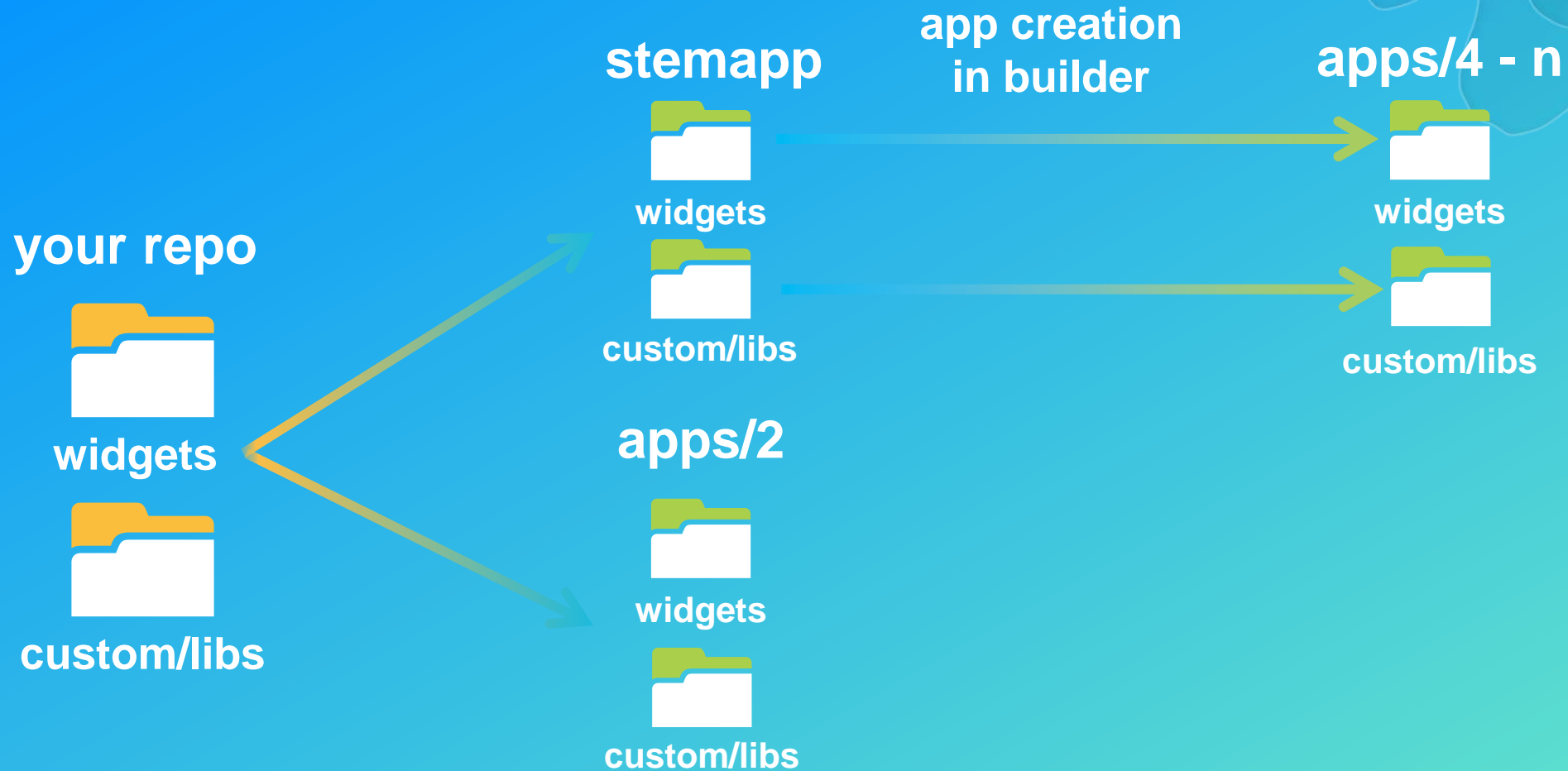


Shared UI

- my-project
 - src
 - custom
 - libs
 - filter-status
 - Dijit files...

Code Beyond Widgets

Update build process to handle libs folder



Code Beyond Widgets

Drawbacks

- You lose the ability to pick up your widget and share it by itself.

Additional Tips and Tricks

- Peek into WAB and take a look around
- Understanding WAB configs

Getting to know jimv.js Better

- Web App Builder dev docs are good. But we have the code so we might as well dig into it!
- There's some good utilities available that aren't talked about. Examples:
 - CSVUtils
 - GeoJsonConverters
 - A whole slew of dijits

Deployment

The background of the slide is a solid blue color. In the top right corner, there is a faint, light blue topographic map pattern with concentric, irregular lines. Along the bottom edge, there are several overlapping, wavy shapes in shades of purple and teal, creating a layered, organic effect.

Proxies

Overview

- Cross Domain Resources
- Oauth 2.0 app logins
- Referrer limiting
- Rate Limiting
- Token Based authentication
- logging



php



.NET



Java

<https://github.com/esri/resource-proxy/>

Deploy to the same web server as your Deployed App

Proxies

Configure Web AppBuilder App to use proxy

[downloaded-app]/config.json

```
. . .  
"httpProxy": {  
  "useProxy": true,  
  "alwaysUseProxy": false,  
  "url": "",  
  "rules": [{  
    "urlPrefix": "http://yourwebserver/yourwebadaptor/sharing/rest",  
    "proxyUrl": "http://yourproxyfolder/proxy.php"  
  }]  
}  
. . .
```

Proxies

Accessing Secure Services

[proxy-folder]/proxy.config

```
<serverUrls>
  <serverUrl
    url="http://services.arcgisonline.com"
    matchAll="true"
  />
  <serverUrl
    url="http://webserver/portal/sharing/rest"
    matchAll="true"
    clientid="xxxyyy12345"
    clientsecret="aaabbbccc987654321"
    oauth2Endpoint="https://webserver/portal/
                    sharing/rest/oauth2/token"
  />
</serverUrls>
```

Other WAB Presentations

Check These Out!

Web AppBuilder for ArcGIS: Advanced Development Tools and Techniques

Thursday 2:30 pm - 3:30 pm Primrose C-D

Gavin Rehkemper and George Bochenek

Javascript Applications for the Enterprise: Building for Production

Thursday 5:30 pm - 6:30 pm Pasadena/Sierra/Ventura

Randy Jones and George Bochenek

Thank You!
Questions?

Nick Brueggemann
NBrueggemann@esri.com

Mark Torrey
mtorrey@esri.com

Please rate this session in the Esri
Events mobile app!



esri

THE
SCIENCE
OF
WHERE