Esri Developer Summit

March 8–11, 2016 | Palm Springs, CA

Enabling High-Quality Printing in Web Applications

Craig Williams & Tanu Hoque

High Quality Printing on the Web

- Primary Goals:
  - Create a printable document (PDF preferably)
  - Have that document printed to ‘exact’ scale
  - Leverage ArcMap layouts
  - Support large format plots
  - Display ALL contents of my Web map
    - Services, graphics, feature layers, etc.
  - Be able to modify the map content during the process
  - High DPI

- We created a 3 tiered approach to meet these needs

High Quality Printing – 3 Tiered Approach : Tier 1

- *Simple printing*
  - Out of the box Geoprocessing Service with ArcGIS Server
  - Small format
  - Synchronous
  - Token based secure services

High Quality Printing – 3 Tiered Approach : Tier 2

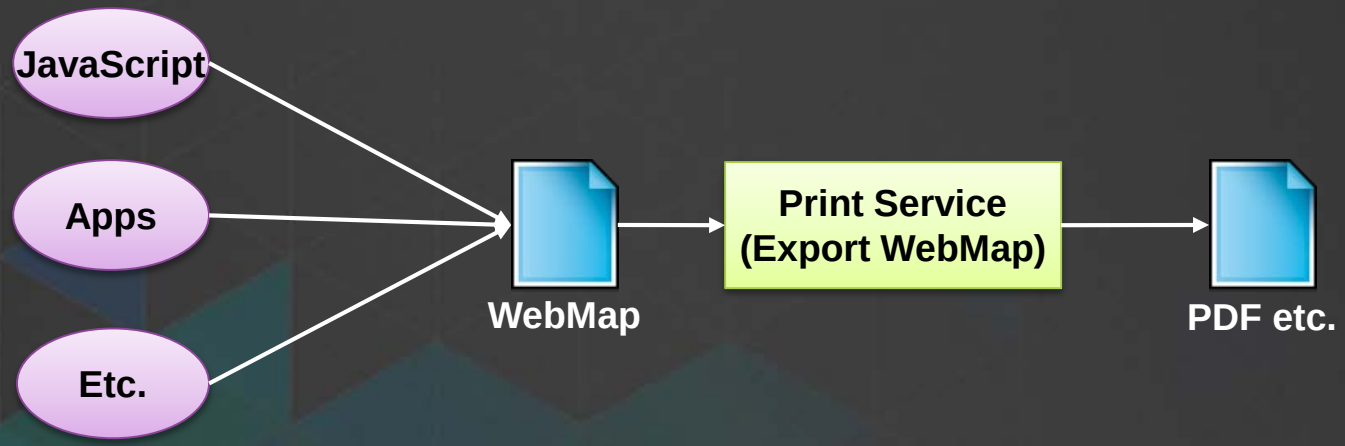
- *Custom configuration*
  - Ability to supply your own templates
  - Asynchronous if desired
  - Handle HTTP secure services
  - Large format

High Quality Printing – 3 Tiered Approach : Tier 3

- ***Advanced cases***
  - **Supported via ArcPy.Mapping**
  - **Map/Layer addition, replacement, etc.**

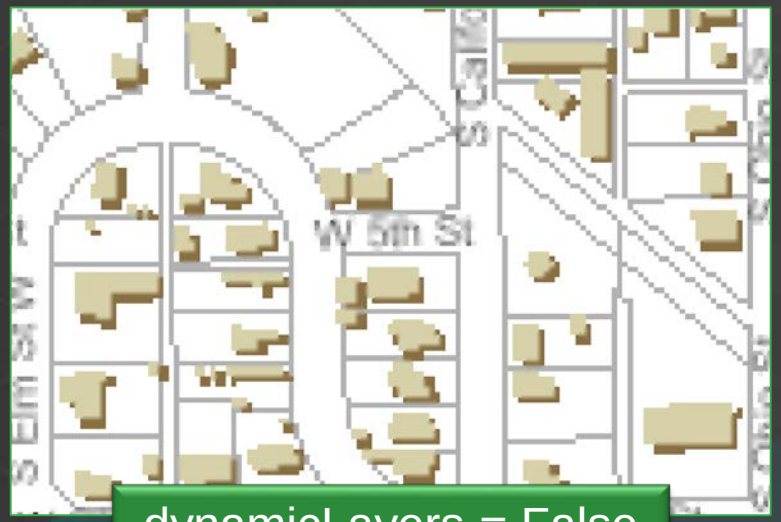
Printing Service Overview

- Print services are powered by WebMaps
  - Consistent format produced by all the ArcGIS APIs
  - JSON based spec for sharing services, graphics, symbols etc.
- Note: The services in the WebMap must be accessible to the Print Service
  - HTTP security is a special case

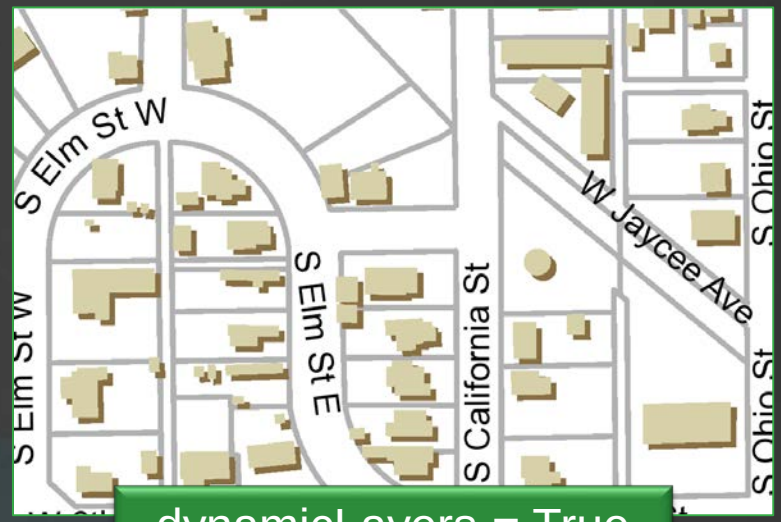


Printing Cached Services

- **Tiles typically created at 96 DPI**
- **10.1 added dynamic layer support for Map Services**
  - **Allows for printing at higher DPI than cached images**
  - **You must have Publisher or Admin privileges to update the service**



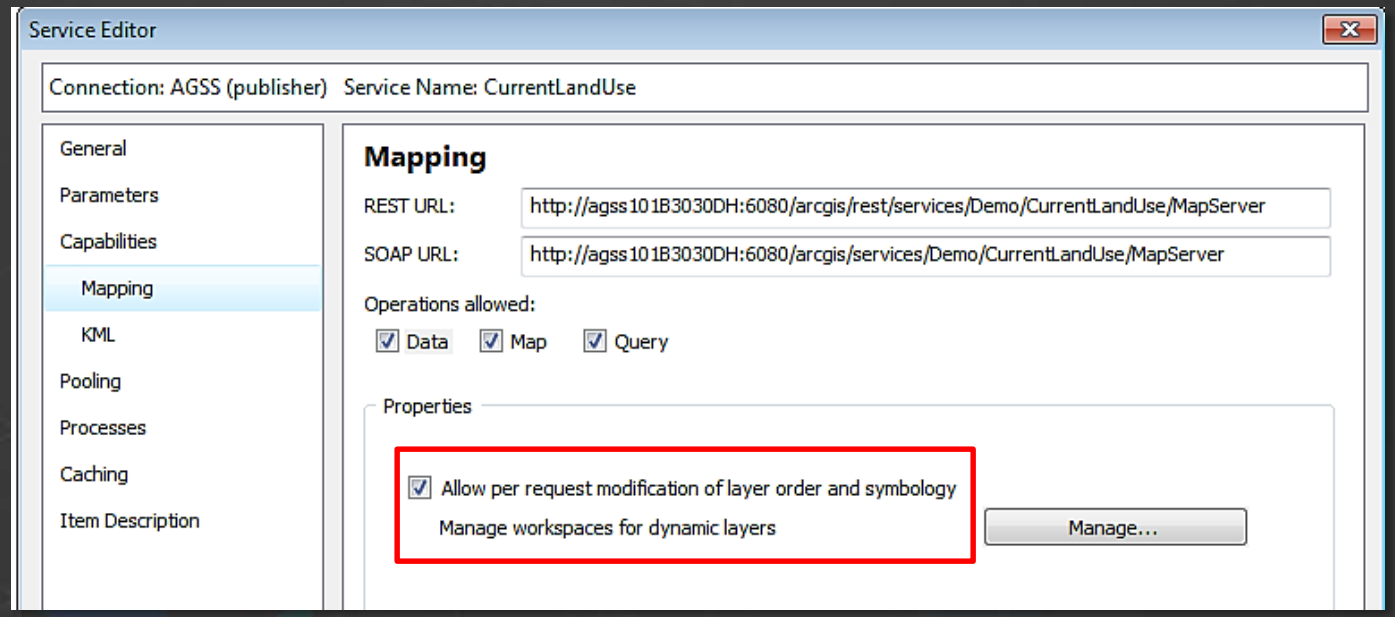
dynamicLayers = False
(600 DPI)



dynamicLayers = True
(600 DPI)

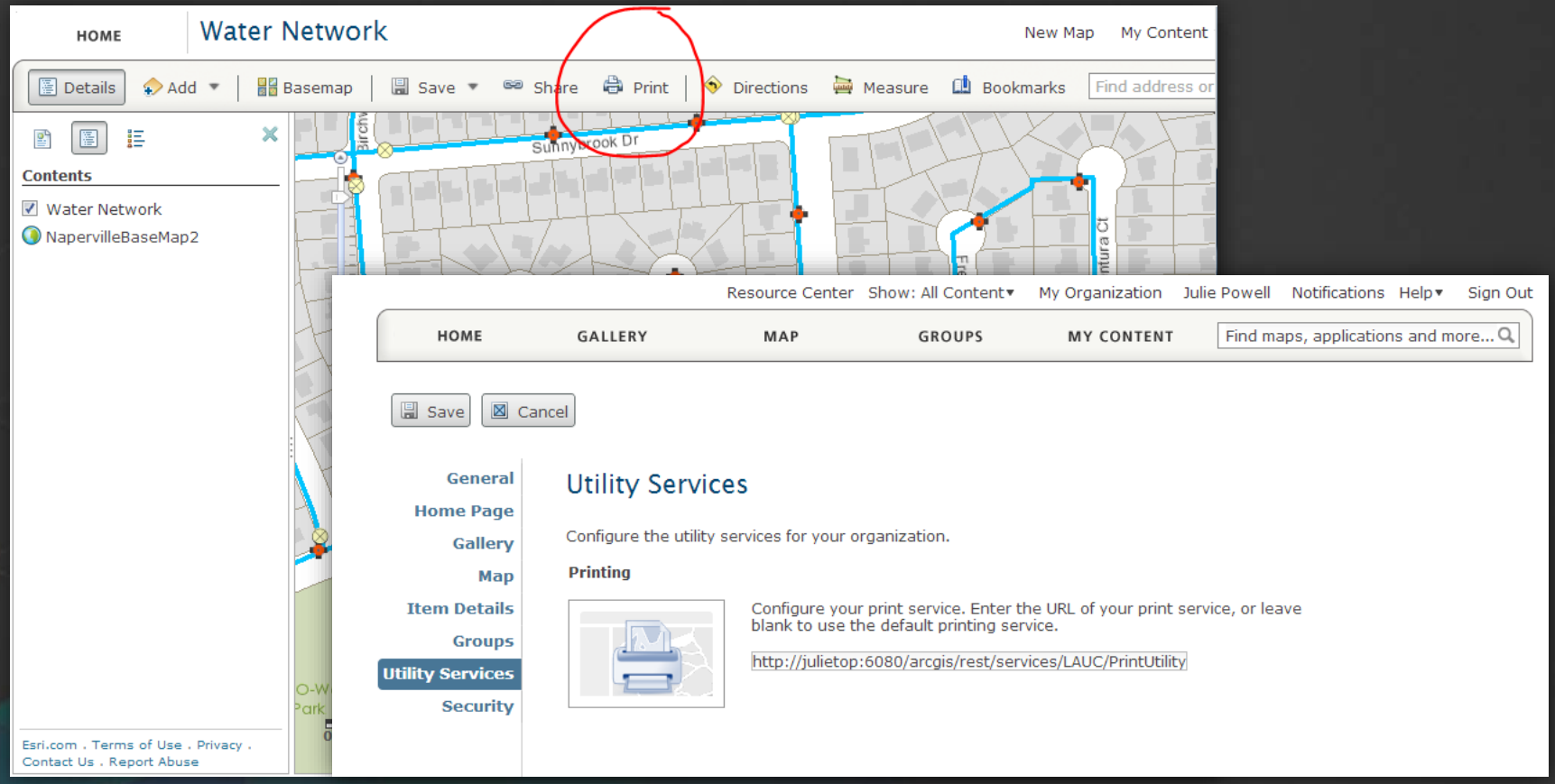
Enabling Dynamic Layers

- Option in properties of cached service



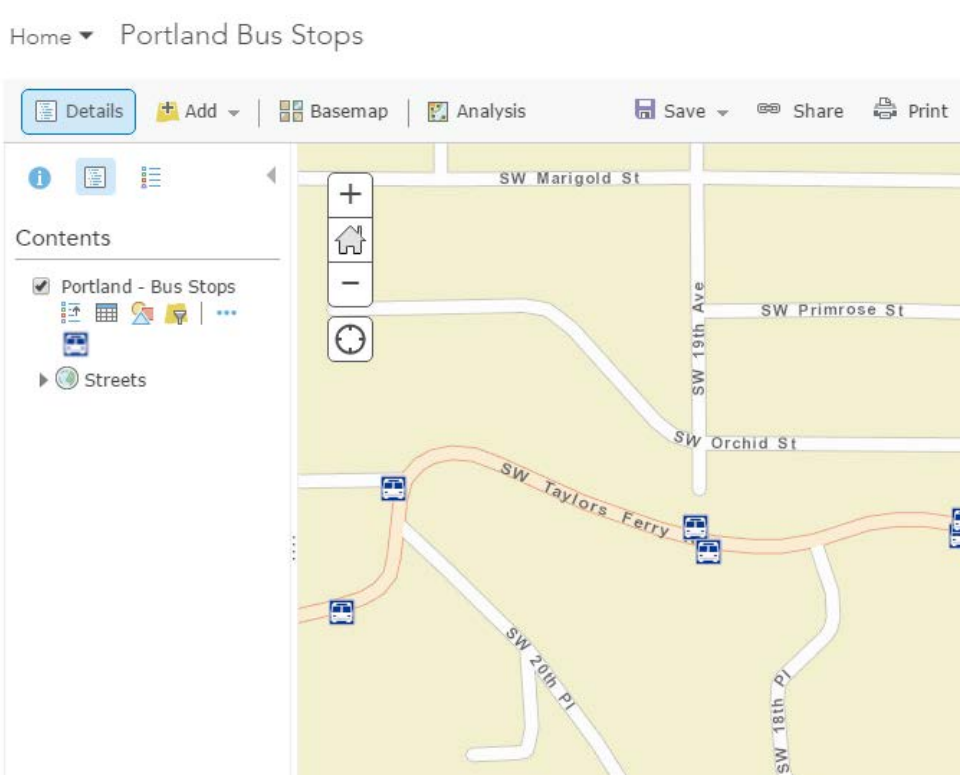
ArcGIS Online Organization & Portal

- Register your own print service
- Print on-premises services behind a firewall



Demo

Out of Box Print Service



ArcGIS REST Services Directory Login | Get Token

Home > services > Utilities > PrintingTools (GPServer) Help | API Reference

JSON | SOAP

Utilities/PrintingTools (GPServer)

Service Description: The PrintingTools service is used by web application developers to export the contents of a webmap to pdf, jpeg, png or other formats. This service is generally used in the context of providing applications with printing functionality.

Tasks:

- Export Web Map Task

Execution Type: esriExecutionTypeSynchronous

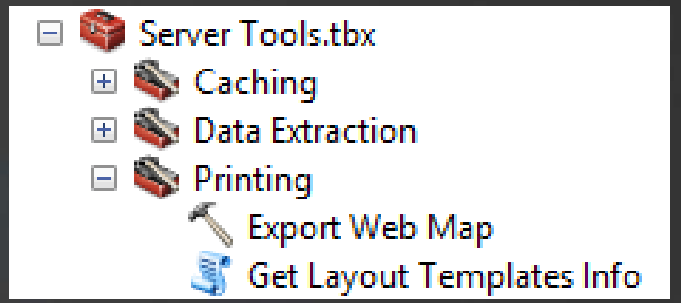
Result Map Server Name:

MaximumRecords: 1000

Child Resources: Info

Custom Configuration

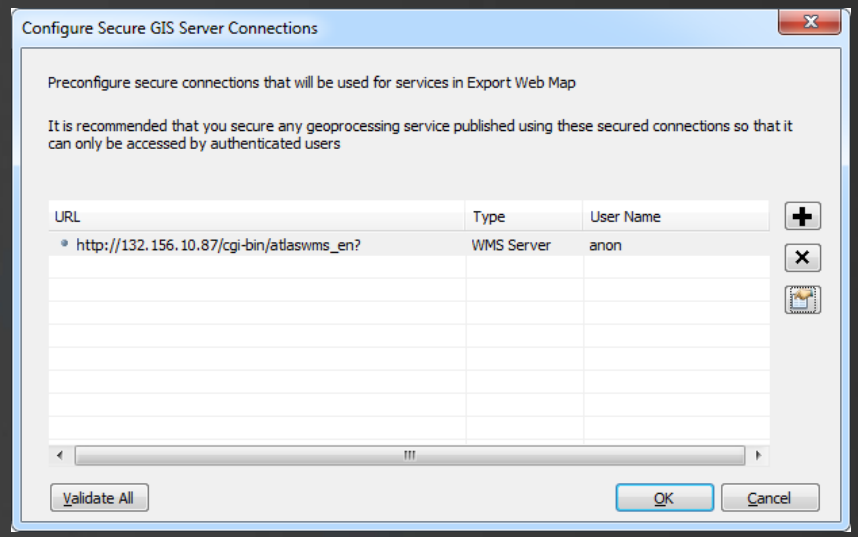
- Publish the Export Web Map tool as your own service
  - Use your own layout templates
  - Choose to make the service asynchronous if desired
    - This choice depends on the size of your prints and the length of time they'll take
  - Configure service security
    - Token security handled automatically
    - HTTP security must be configured



Configuring Secured Services

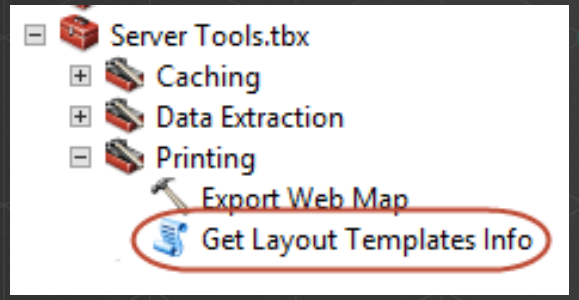
- HTTP security requires configuration
  - Add service connections for each secure service before publishing
    - “Edit” the tool to edit security configurations

- Secure the print service itself if you configure security for services



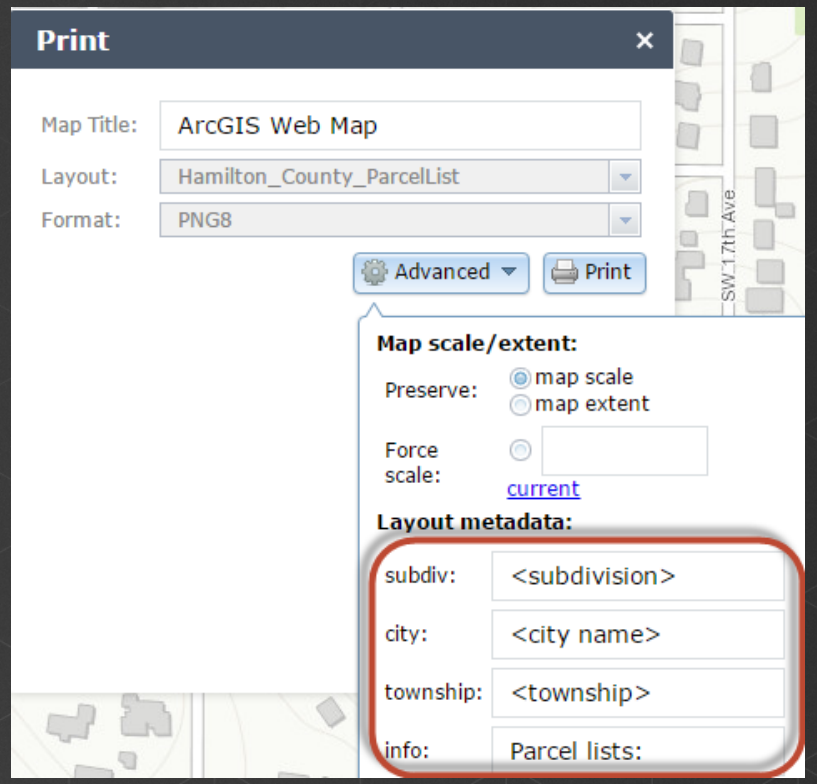
What's new in 10.4?

- New task with Printing Services to return metadata about available layout templates
  - It is an ArcPy script tool.
  - Can be used any ArcGIS Version from 10.1



Tools in Desktop

Tasks in Service Directory



Custom Text Elements showing up in WAB

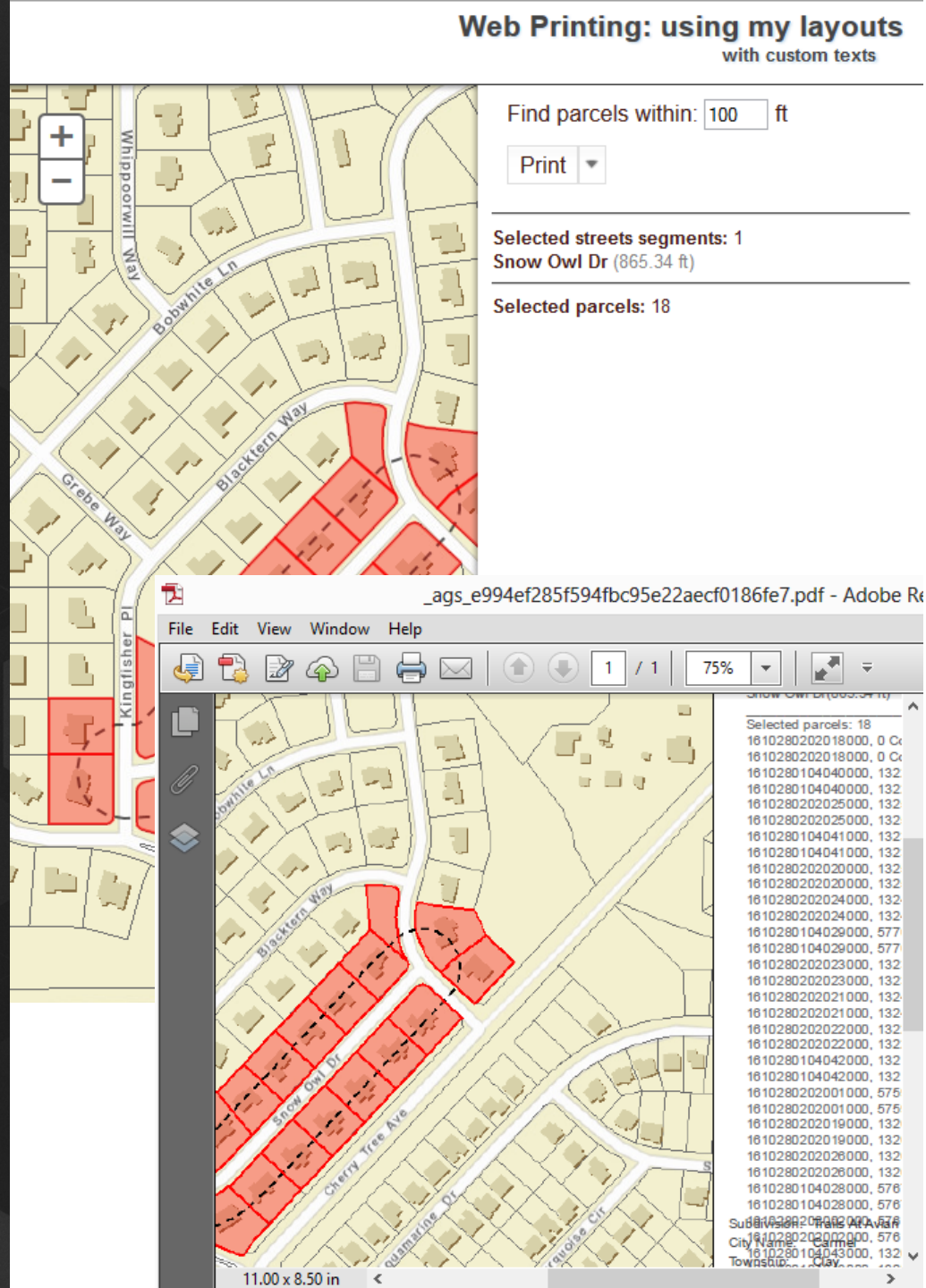
What’s new in 10.4?

Results of Get Layout Templates Info Task


```
{
    "pageSize": [ 8.5, 11.0 ],
    "layoutTemplate": "Hamilton_County_Portrait",
    "activeDataFrameSize": [ 7.75, 8.0 ],
    "layoutOptions": {
        "hasAuthorText": false,
        "hasCopyrightText": false,
        "hasTitleText": false,
        "hasLegend": false,
        "customTextElements":
            [{ "subdiv" : "" }, { "city" : "" }, { "township" : "" }, { "info“ : "Parcel lists:" }]
}
```

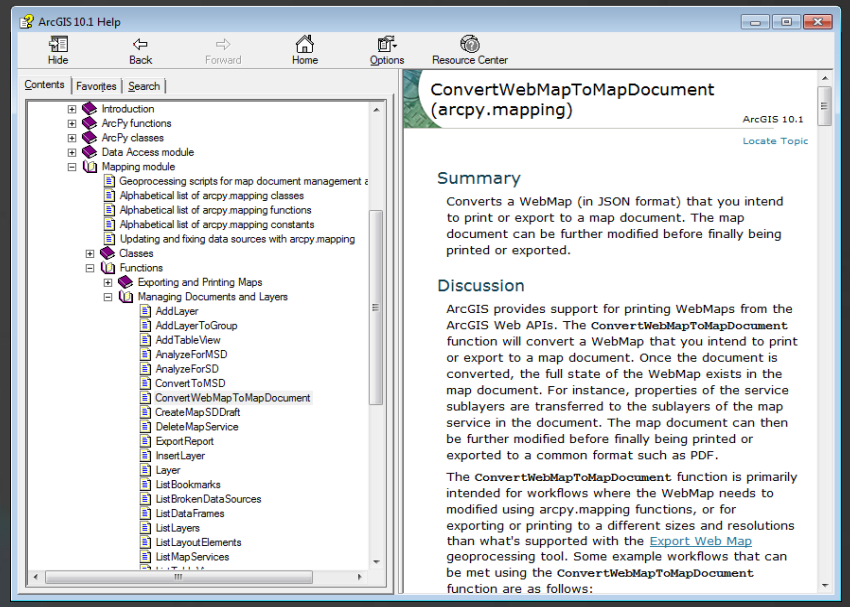
Demo

Printing with custom templates



Custom Print Workflows: ArcPy.Mapping

- New ArcPy.Mapping method for converting Web Maps to MapDocuments
- `ConvertWebMapToMapDocument (webmap_json, {template_mxd}, {notes_gdb}, {extra_conversion_options})`
- Secure services handled via the *extra conversion options* parameter



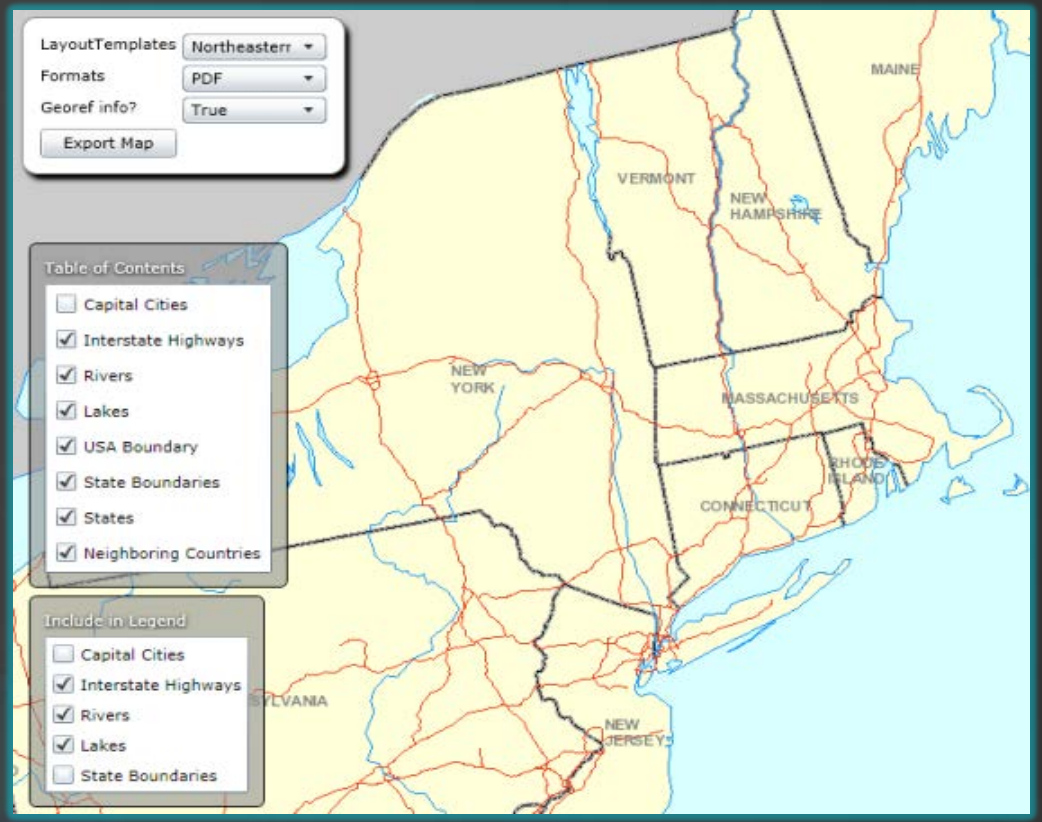
ArcPy.Mapping Workflows

- Once a WebMap is converted to a map document
  - Full capabilities of ArcPy.Mapping on the document
  - Modify content
  - Add content
  - Export using custom options
  - etc.

- See the ArcPy.Mapping help for examples…

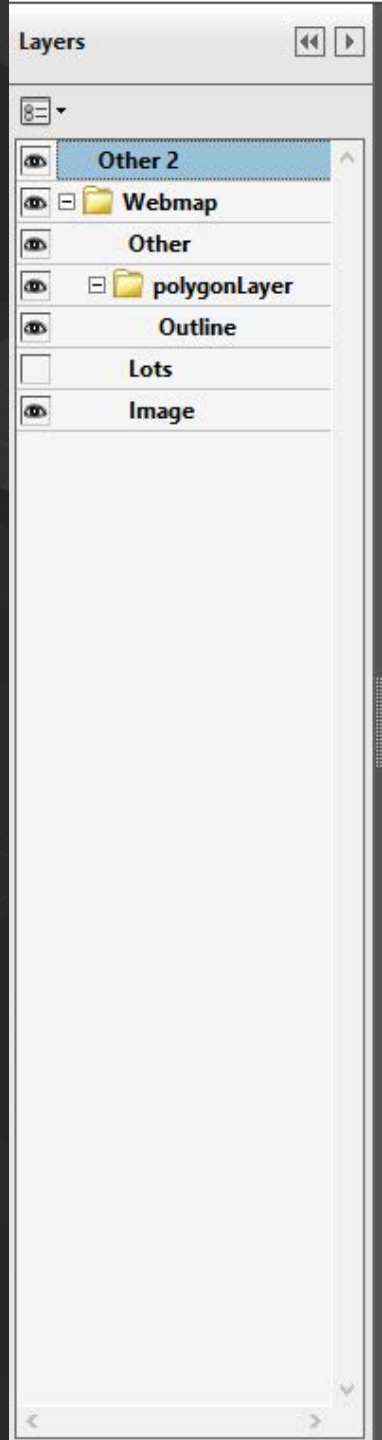
ArcPy.Mapping Help Examples

- Use the web help
  - updated samples and discussion
  - two new tutorials:
    - Basic high-quality web map printing: http://bit.ly/XEwg8p
    - Advanced web map printing: http://bit.ly/WU1nQh



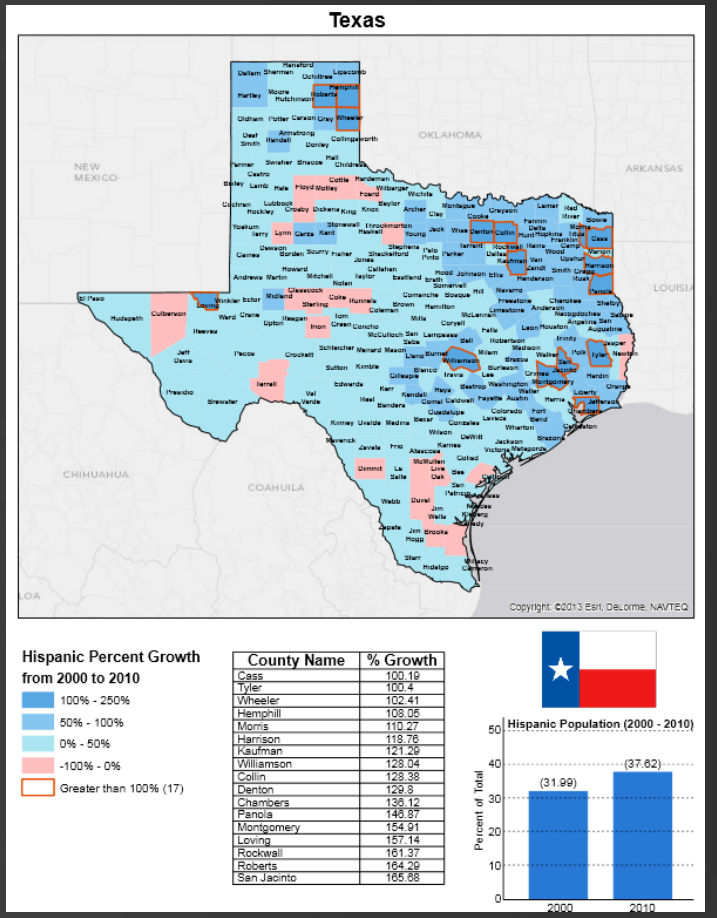
Demo

Vector printing



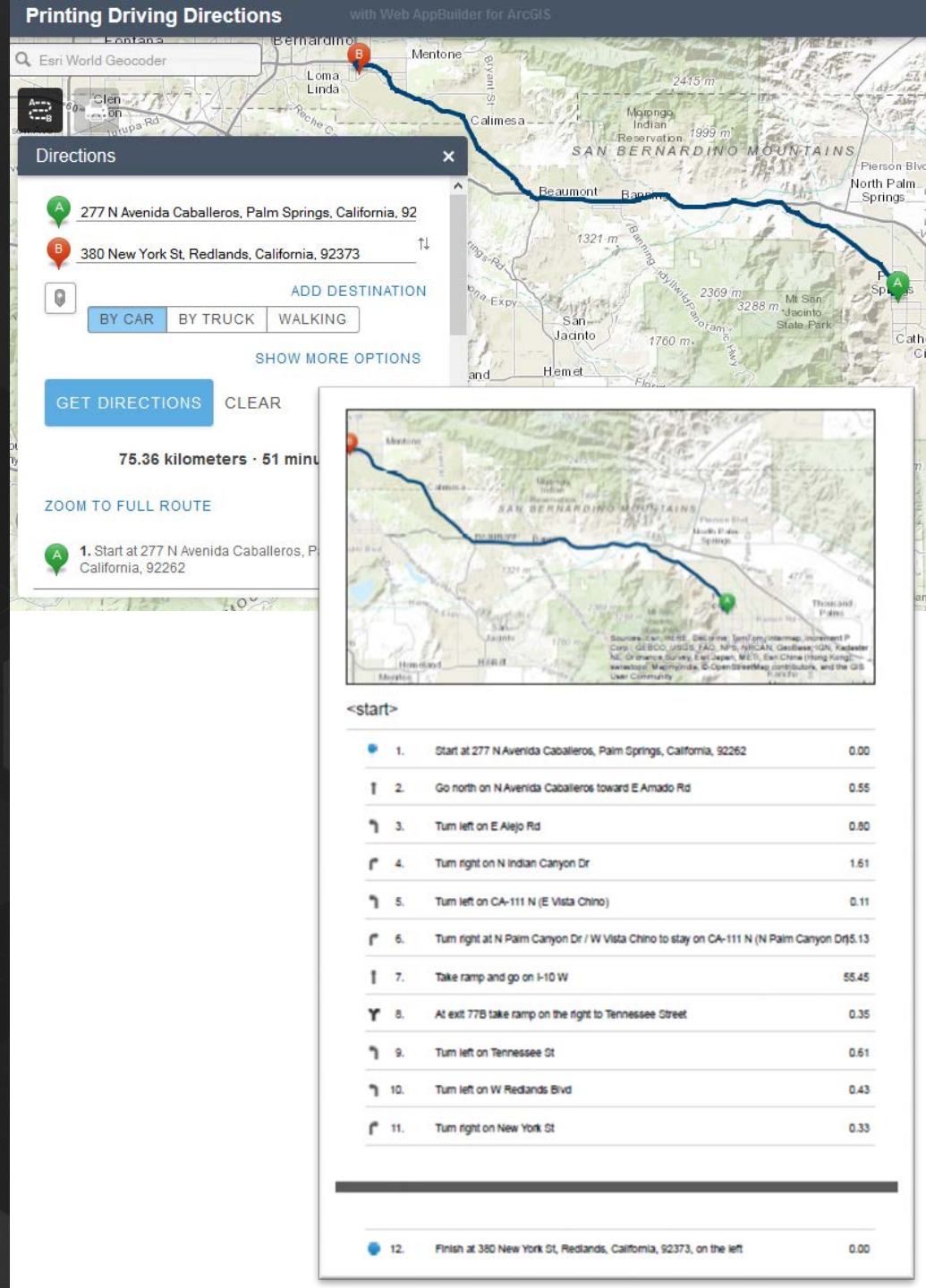
Tables with ArcPy.Mapping

- Data Driven Pages with Dynamic Tables and Charts Sample
  - http://bit.ly/11Hwtur
  - Took the sample code and customized it for my needs



Demo

ArcPy.Mapping



API Status for Printing

- Printing support in ArcGIS Web and Mobile APIs:

- JavaScript: Print Dijit
- ArcGIS Runtime SDK for Java: PrinterJob
- .NET SDK (Desktop, Store, and Phone APIs): Print Task

- Samples on developers.arcgis.com

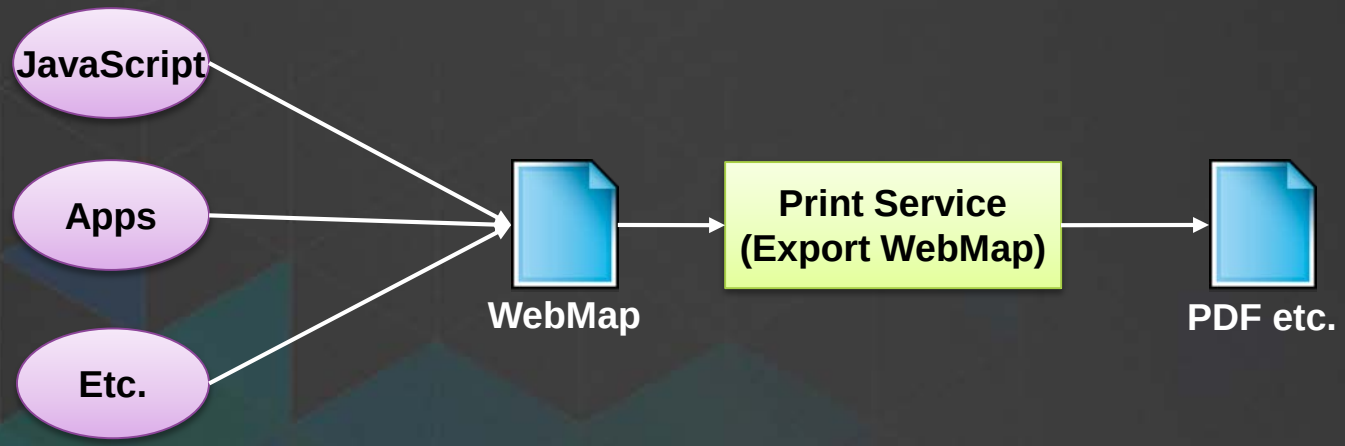
Wait! You didn’t actually print anything

- Printing services are about generating printable documents (PDF etc.)

- If you wish to send the output to a physical printer automatically
  - Use the ArcPy.Mapping workflow
  - Local printers – xcopy to local share on some printers
  - Cloud printing workflows (e.g. Google Cloud Print)
    - Driverless printing
    - Simple APIs that can be called from Python

Printing Service Recap

- Print services are powered by WebMaps
  - Consistent format produced by all the WebAPIs
  - JSON based spec for sharing services, graphics, symbols etc.
- You can use the out of the box tool, a custom configuration, or an ArcPy.Mapping approach



Esri Developer Summit

March 8–11, 2016 | Palm Springs, CA

Questions?

Please fill out survey

esri®