Using Arcpy.mapping and ArcGIS Server Admin API to Automate Services

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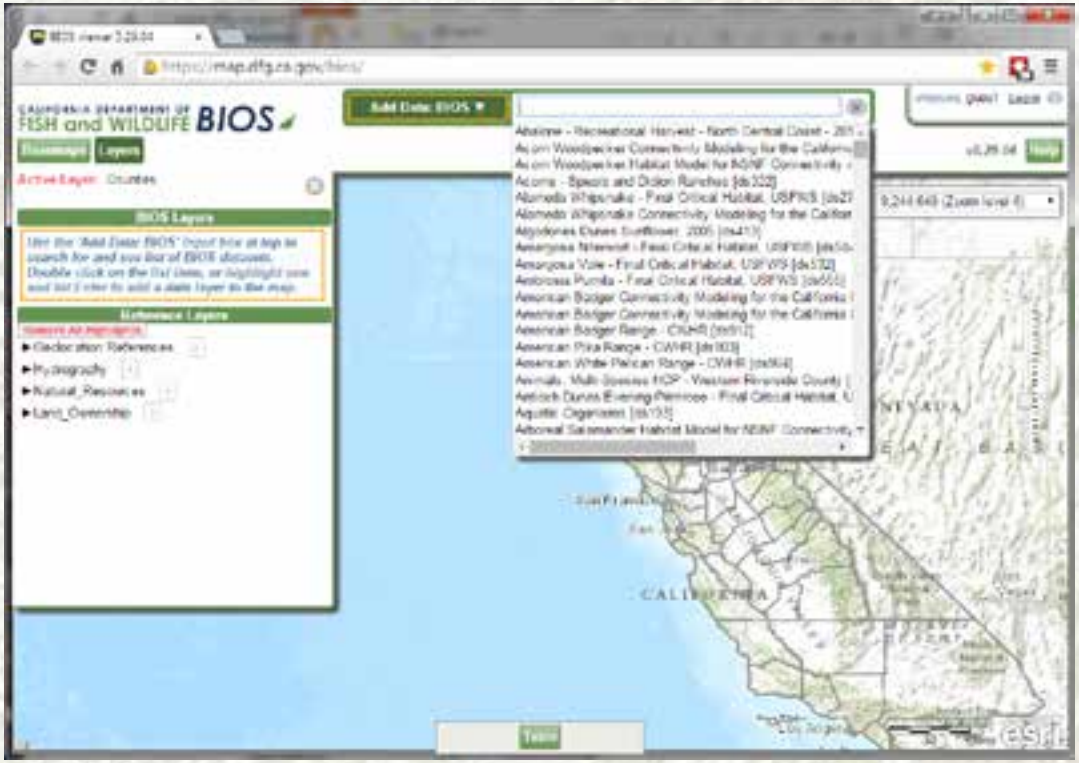
Problem

Complexity!

BIOS Web Mapping Application:

- 1,000+ natural resources datasets, weekly updates.
- 60 map services.
- Public/Secure content



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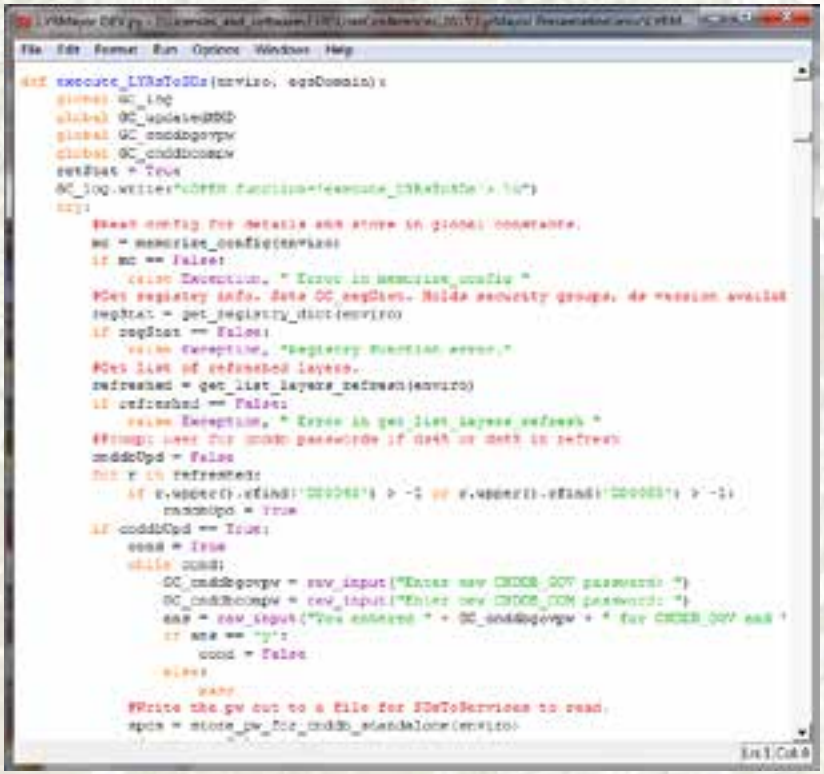
Solution

Automate!

Scripting:

- Reduced staff time from several hours to minutes per dataset.
- Allowed us to perform operations that would've been restrictively time-consuming by hand.



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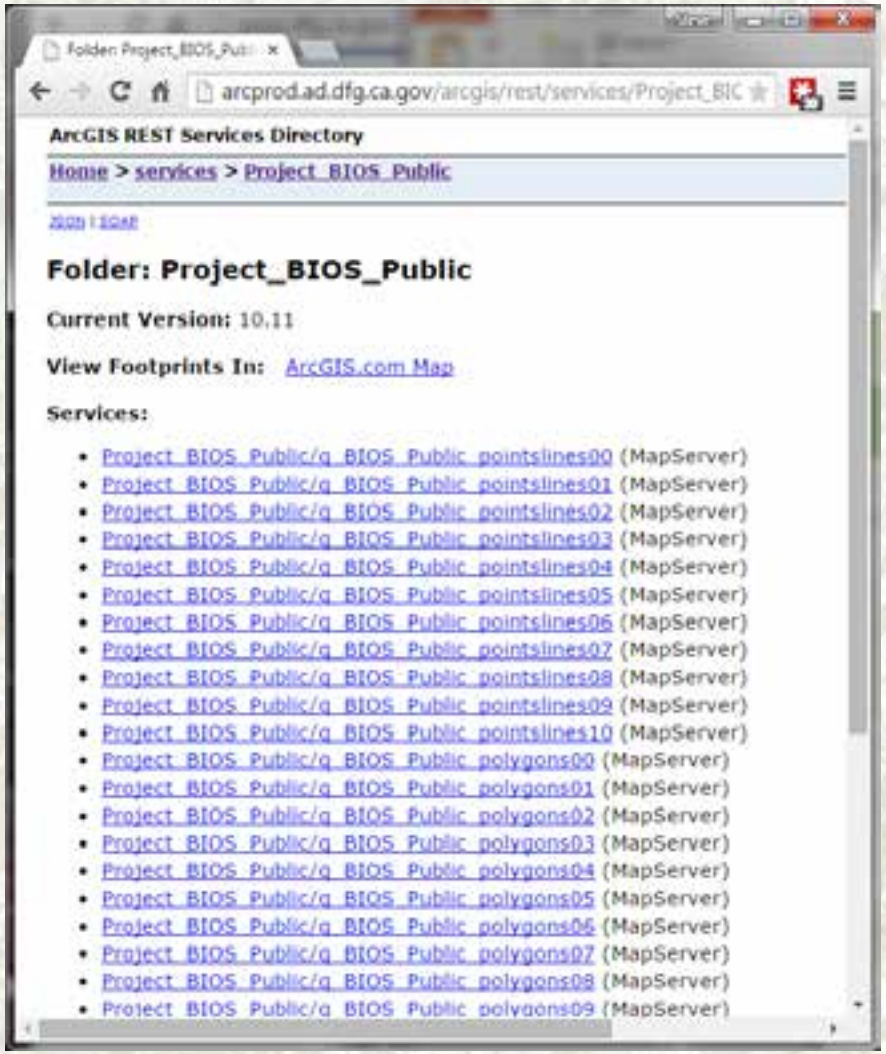
How

Scripting

LyrMayor (“Layer Mayor”)

Input = a .lyr file for a dataset

Output = dataset published in the correct map service.



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Details

Architecture / Workflow

MS Access front-end “Registry” database (SQL Server)
(Dataset Number assignment, title and security)

Dataset loaded into SDE (DEV/TEST/PROD)

Individual Lyr file created and saved in “LyrFiles” folder

LyrMayor script is then run

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Details

Script steps

For every lyr file in LyrFiles folder (new or updated dataset)

- Spatially index features to statewide grid
- Index attribute values for search
- Build MXD for applicable Service (arcpy.mapping)
- Export dataset HTML Metadata page (arcpy)
- Publish MXD to SD, then to Service (arcpy.mapping)
- Modify Service properties (AGS Admin API)

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Details

MXD Building

Full MXDs built from scratch each time

Up to 100 datasets per MXD

Datasets are placed into MXDs based on:

- Security: Public vs Secure dataset/service
- Feature Type: Point/line/polygon/raster
- Internal Dataset Number (blocks of 100)

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Details

MXD Building (arcpy.mapping)

```
#Handle layerfile
lyrObj = arcpy.mapping.Layer(<path to layer>)
lyrObj.visible = False
lyrObj.name = 'hungry causeway bats'

#Set datasource for enviro specified.
ws = lyrObj.workspacePath
if enviro == 'dev':
    lyrObj.findAndReplaceWorkspacePath(ws, <appropriate .sde file>, False)
if enviro == 'test':
    lyrObj.findAndReplaceWorkspacePath(ws, <appropriate .sde file>, False)
if enviro == 'prod':
    lyrObj.findAndReplaceWorkspacePath(ws, <appropriate .sde file>, False)
lyrObj.save()

#Handle doc and add layer.
doc = arcpy.mapping.MapDocument(<path to appropriate mxd>)
df = arcpy.mapping.ListDataFrames(doc)[0]
arcpy.mapping.AddLayer(df, lyrObj, "BOTTOM")
doc.save()
```

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Details

Staging an SD file (arcpy and arcpy.mapping)

```
#Create the sdDraft
arcpy.mapping.CreateMapSDDraft(doc, sdDraft, service, serverType, conFile, \
    copyData, agsFolder, summary, flags)

#Analyze the sdDraft
analysis = arcpy.mapping.AnalyzeForSD(sdDraft)
if analysis['errors'] == {}:
    sys.stdout.write("Analysed W/O errors. \n")
else:
    sys.stdout.write("Analysed WITH errors. \n")
    raise SDDraftAnalysis, "SD could not be staged for " + mxd + ". \n“

#Stage the service to an SD file
arcpy.StageService_server(sdDraft, sd)
```

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Details

Publish the SD file (arcpy and AGS Admin)

```
#Publish the SD to create the service
arcpy.UploadServiceDefinition_server(<path to sd>, conFile, service, "#", \
    'EXISTING', agsFolder)

#Obtain current properties from the newly published service
url = "http://" + server + ":port/arcgis/admin/services/folder/service-type>
params = urllib.urlencode({'token': GC_token, 'f': 'json'})
headers = {"Content-type": "application/x-www-form-urlencoded", "Accept":
"text/plain"}
httpConn = httplib.HTTPConnection(server, port)
httpConn.request("POST", url, params, headers)

#Read http response
response = httpConn.getresponse()
data = response.read()
dataObj = json.loads(data)
```

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Details

Edit service properties (AGS Admin)

```
#Make a python dictionary of your desired properties.
desiredProp[key] = x

#Alter the current properties  given in response with desired values
dataObj['properties'][realkey] = desiredProp[key]
updatedSvcJson = json.dumps(dataObj)

#Call the service 'edit' endpoint
#Send the updated properties object through it to update the service
editSvcURL = "http://" + server + ":port/arcgis/admin/services/folder/service-
type + "/edit"
params = urllib.urlencode({'token': GC_token, 'f': 'json', 'service':
updatedSvcJson})
httpConn.request("POST", editSvcURL, params, headers)
```

Questions?

http://bios.dfg.ca.gov/

Google “CDFW BIOS”

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