

ArcGIS Python API:

Introduction to Scripting your Web GIS

ROHIT SINGH rsingh@esri.com

ATMA MANI amani@esri.com

ArcGIS API for Python

- What is it?
 - Pythonic representation of your GIS
 - Powerful, modern and easy to use
 - Implemented using REST + local capabilities

ArcGIS API for Python

- Who is it for?

Platform API
**Power Users
Developers**

Enterprise Integration

Users, Roles & Group management



**Administrators
DevOps**

Analysts

Spatial Analysis

Imagery

Location Analytics

Big Data

Raster Analytics

Feature Analytics

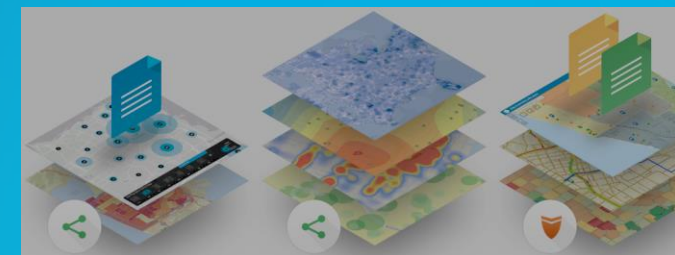
Data Scientists

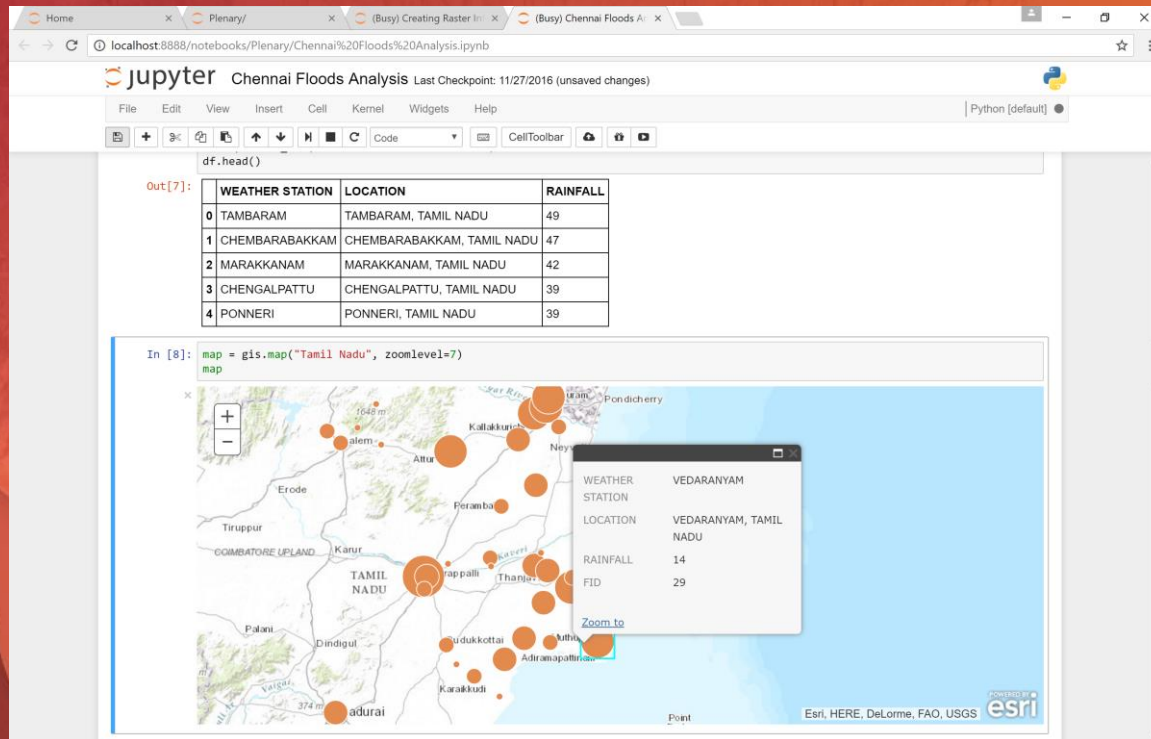
Content Publishers

Your Web GIS

Script and automate your Web GIS

Data Management





Demo

Quick start



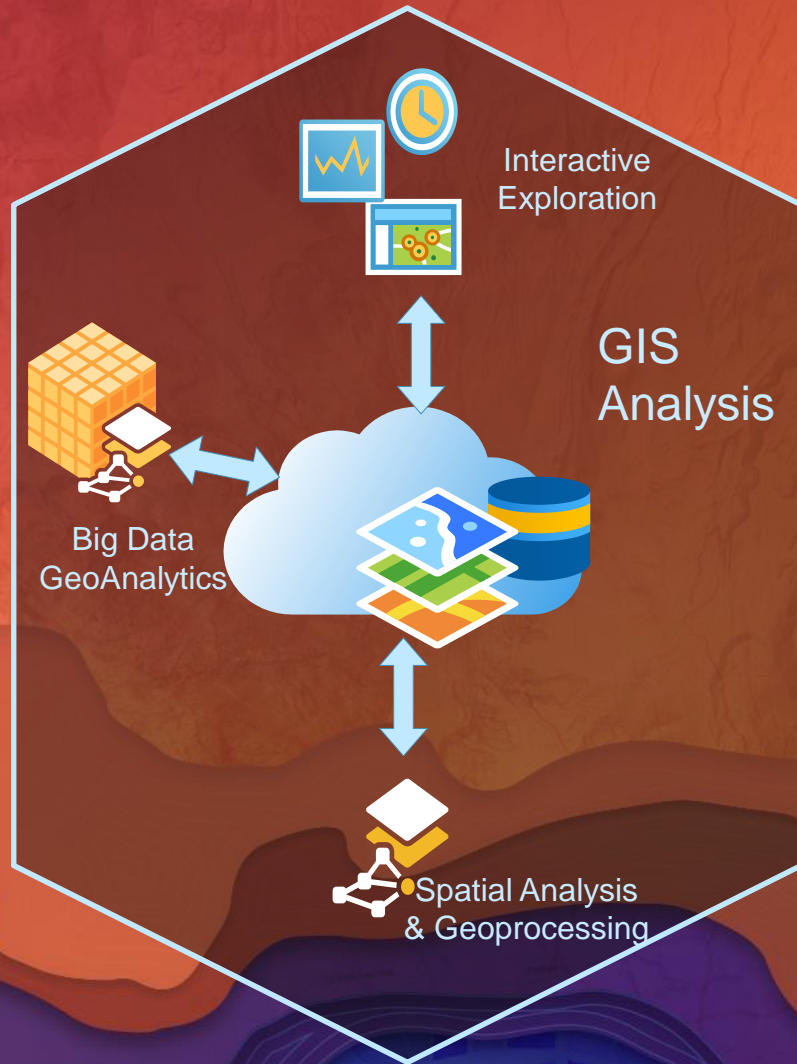
Demo

Automating
administrative
workflows with
Python API



Demo

**Automating
content creation
with Python API**



Demo

Analysis with Python API

Automate WebGIS management

- Populate portal with users, groups
- Clone portals
- Reassign user content
- Perform comprehensive content search
- Determine item relationship
- Create reports of users, their items

What can it do for you?

Automate content creation

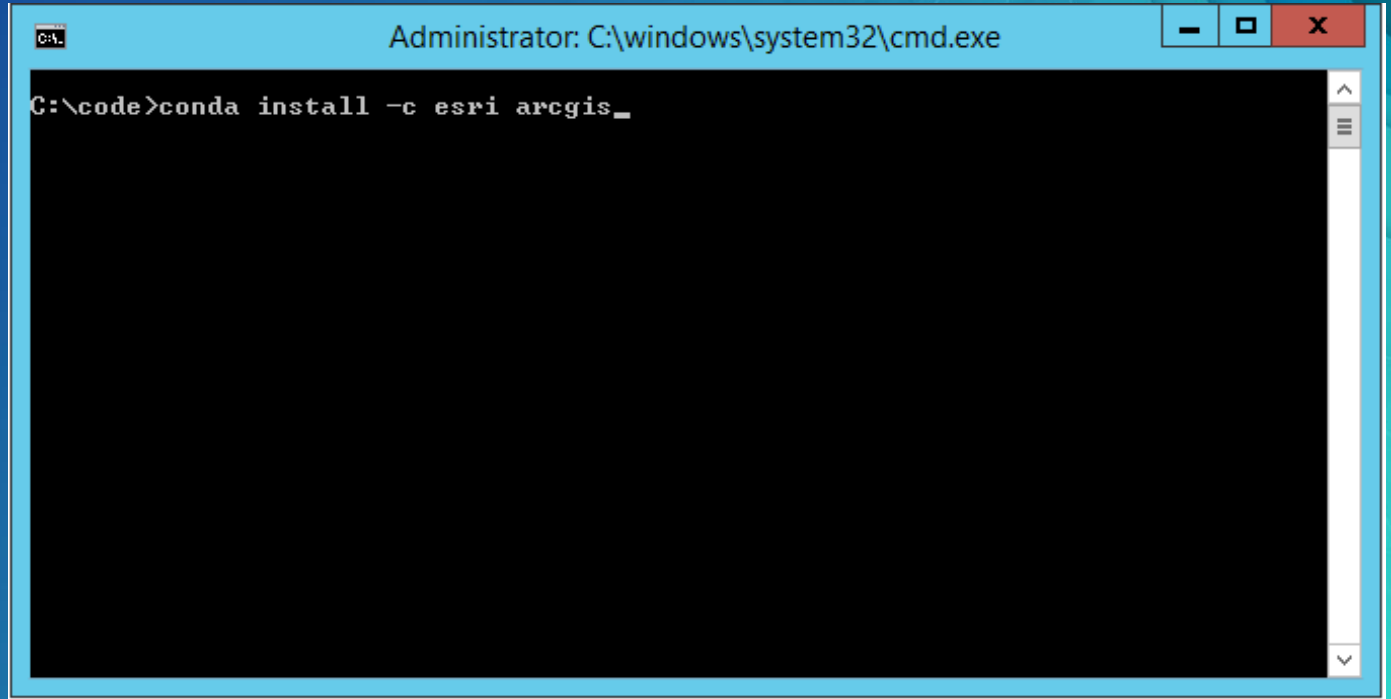
- Automate content publishing during off peak hours
- Update tiles and features from a known database
- Replicate development environment content to production
- Inspect and update items with broken service links

Reproducible research

- Access big data tools programmatically
- Utilize rich 3rd party Python packages for data analysis
- Create rich charts, graphs, embed 2D and 3D maps in Jupyter Notebook environment
- Share your research with data and notes with peers

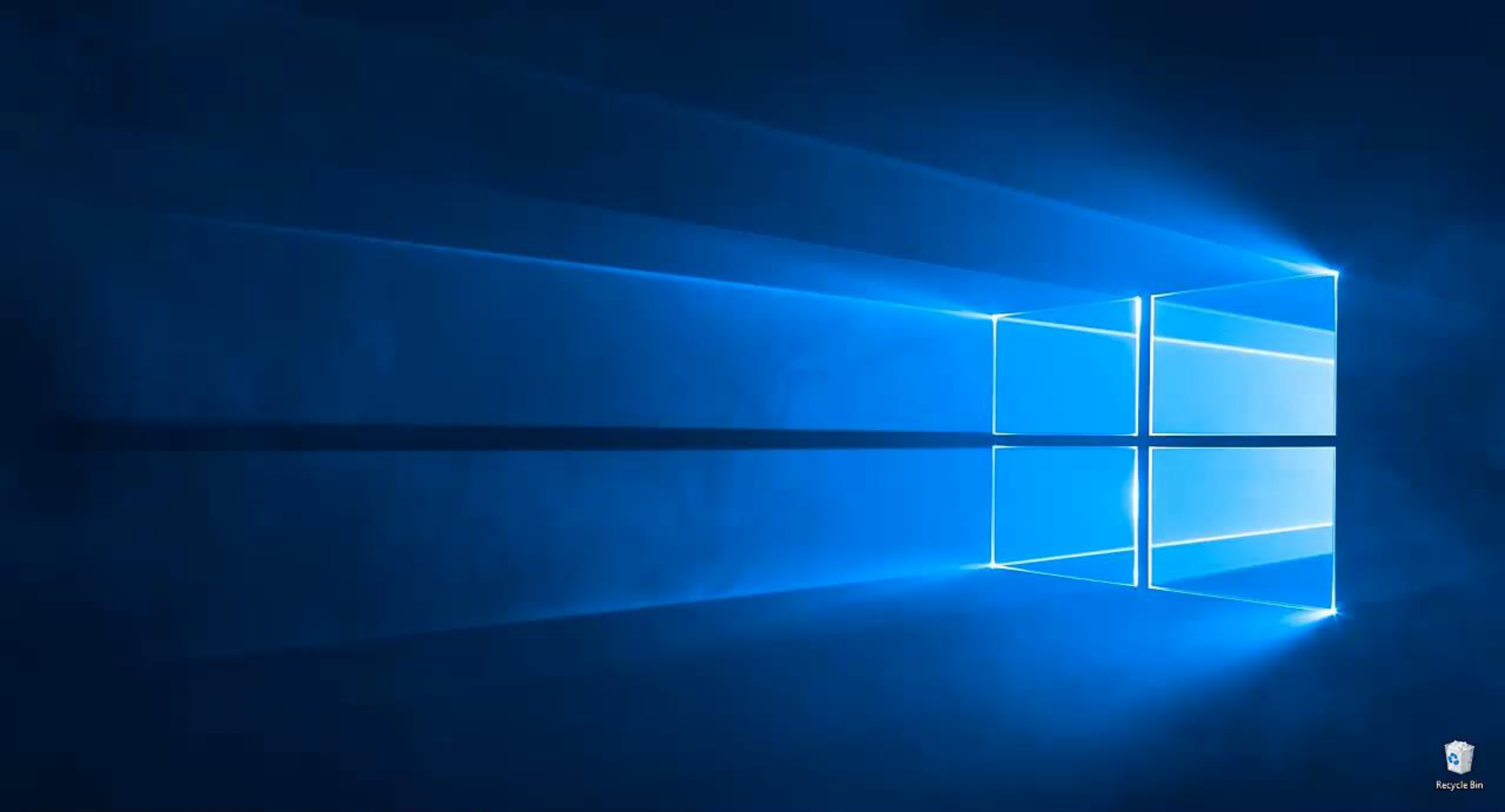
How do you get this?

- **Distributed via Conda**
 - Simplifies installs & updates
 - Installs dependencies
 - Avoids conflicts
- **Install steps:**
 - Download Anaconda
 - `conda install -c esri arcgis`



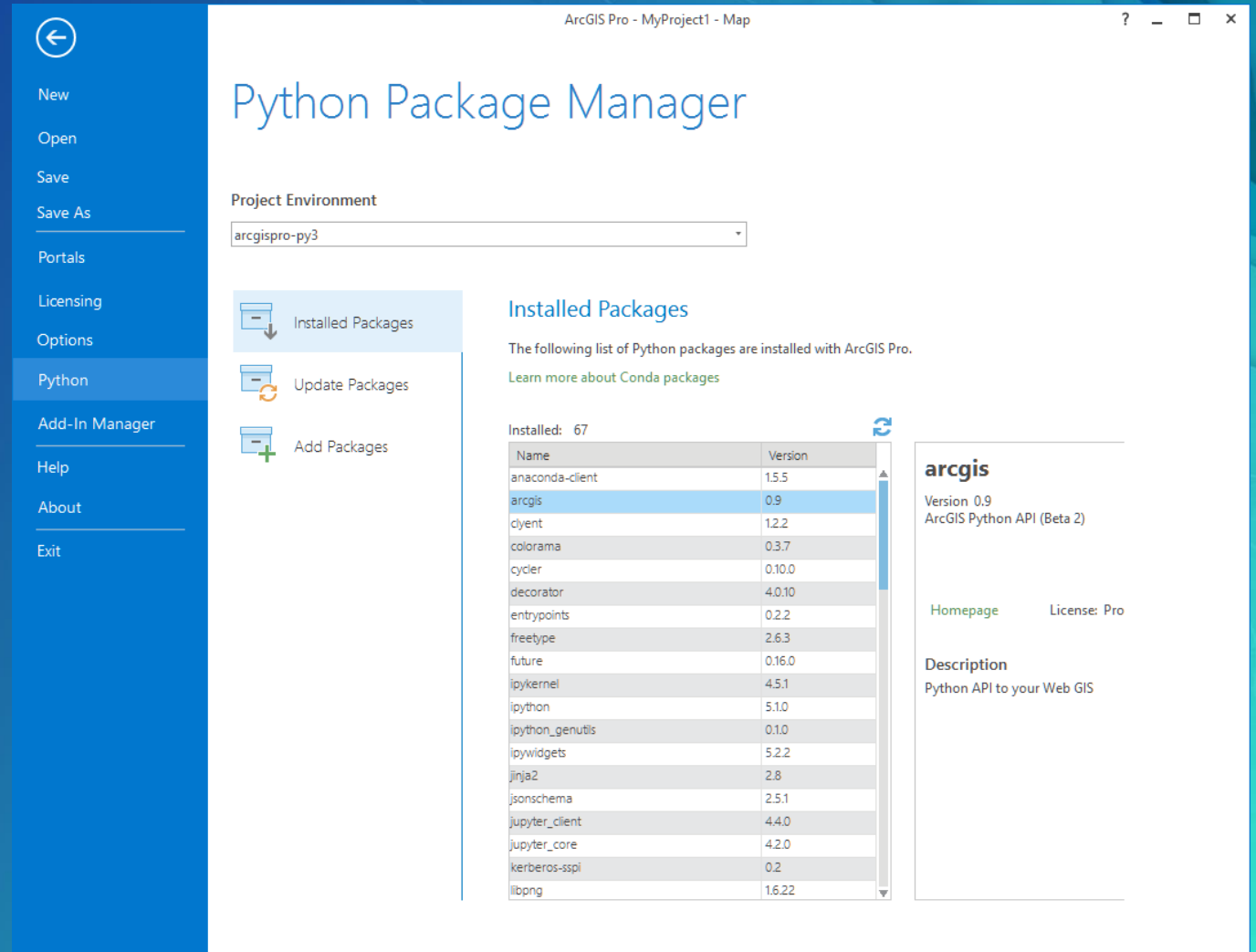
A screenshot of a Windows command prompt window titled "Administrator: C:\windows\system32\cmd.exe". The window has a black background with white text. The command prompt shows the current directory as "C:\code" and the command "conda install -c esri arcgis_" being entered. The cursor is at the end of the command. The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

```
Administrator: C:\windows\system32\cmd.exe  
C:\code>conda install -c esri arcgis_
```



Have ArcGIS Pro?

- ArcGIS Pro includes conda
- Follow steps from [install guide](#) to install arcgis package...



The screenshot shows the ArcGIS Pro Python Package Manager window. The left sidebar contains navigation options: New, Open, Save, Save As, Portals, Licensing, Options, Python (selected), Add-In Manager, Help, About, and Exit. The main area is titled 'Python Package Manager' and shows the 'Project Environment' set to 'arcgispro-py3'. Below this are three buttons: 'Installed Packages', 'Update Packages', and 'Add Packages'. The 'Installed Packages' section displays a list of 67 installed packages. The 'arcgis' package is highlighted in blue. To the right of the list, details for the 'arcgis' package are shown, including its version (0.9) and license (Pro).

ArcGIS Pro - MyProject1 - Map

Python Package Manager

Project Environment: arcgispro-py3

Installed Packages

The following list of Python packages are installed with ArcGIS Pro.
[Learn more about Conda packages](#)

Installed: 67

Name	Version
anaconda-client	1.5.5
arcgis	0.9
clyent	1.2.2
colorama	0.3.7
cycler	0.10.0
decorator	4.0.10
entrypoints	0.2.2
freetype	2.6.3
future	0.16.0
ipykernel	4.5.1
ipython	5.1.0
ipython_genutils	0.1.0
ipywidgets	5.2.2
jinja2	2.8
jsonschema	2.5.1
jupyter_client	4.4.0
jupyter_core	4.2.0
kerberos-sspi	0.2
libpng	1.6.22

arcgis

Version 0.9
ArcGIS Python API (Beta 2)

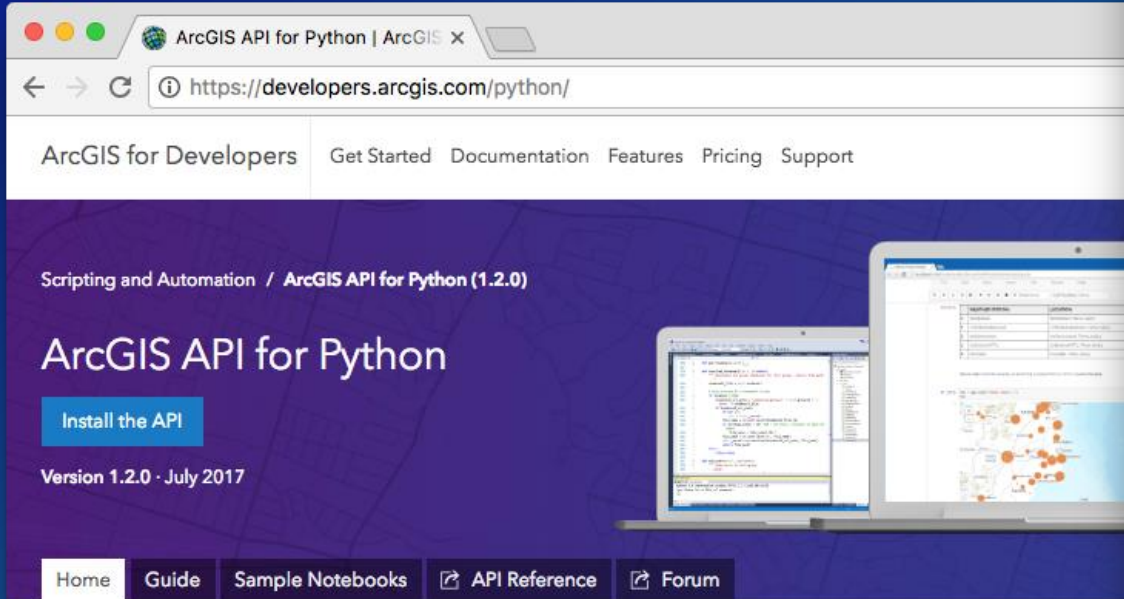
[Homepage](#) License: Pro

Description
Python API to your Web GIS

github.com/Esri/arcgis-python-api

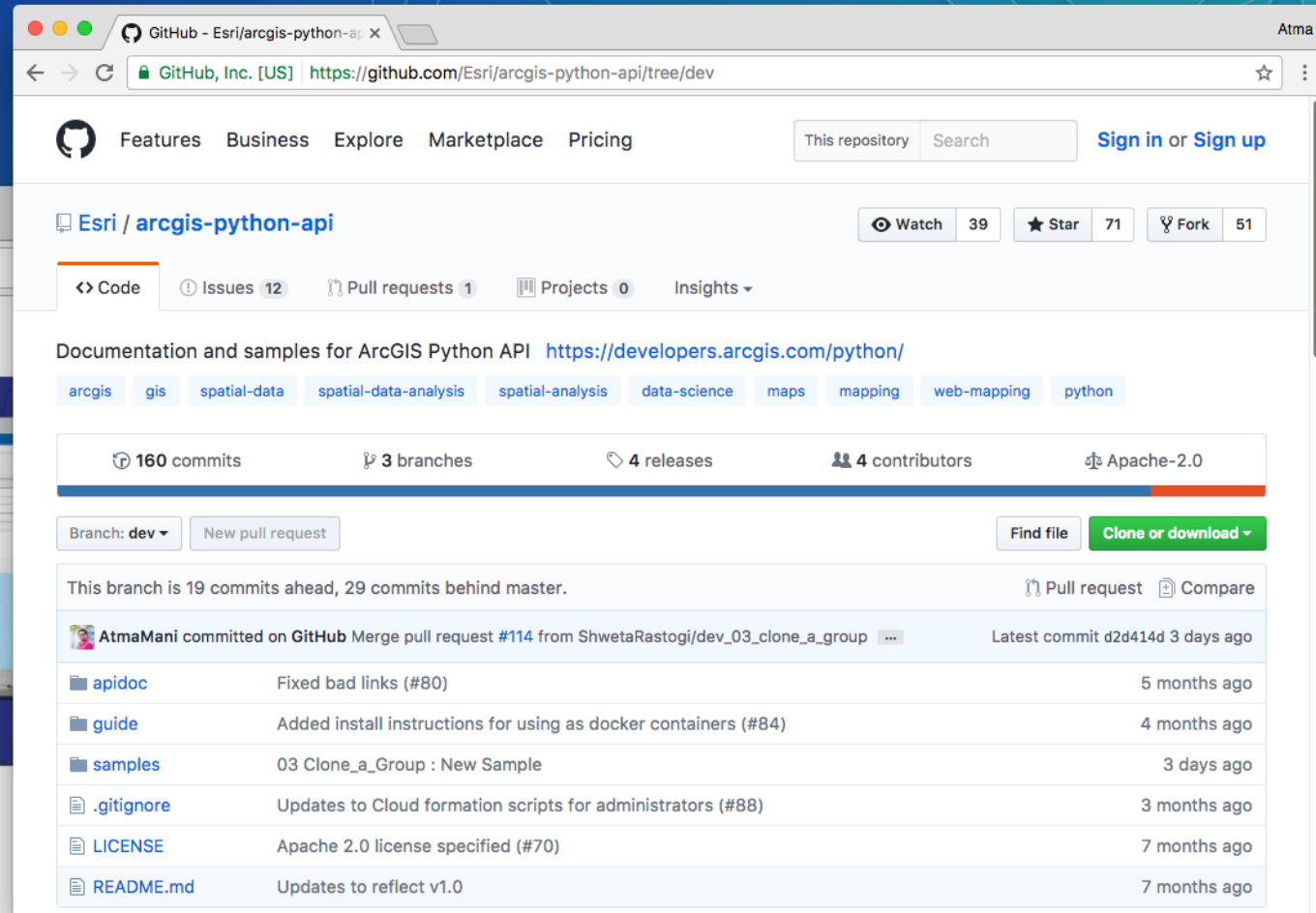
Resources

developers.arcgis.com/python



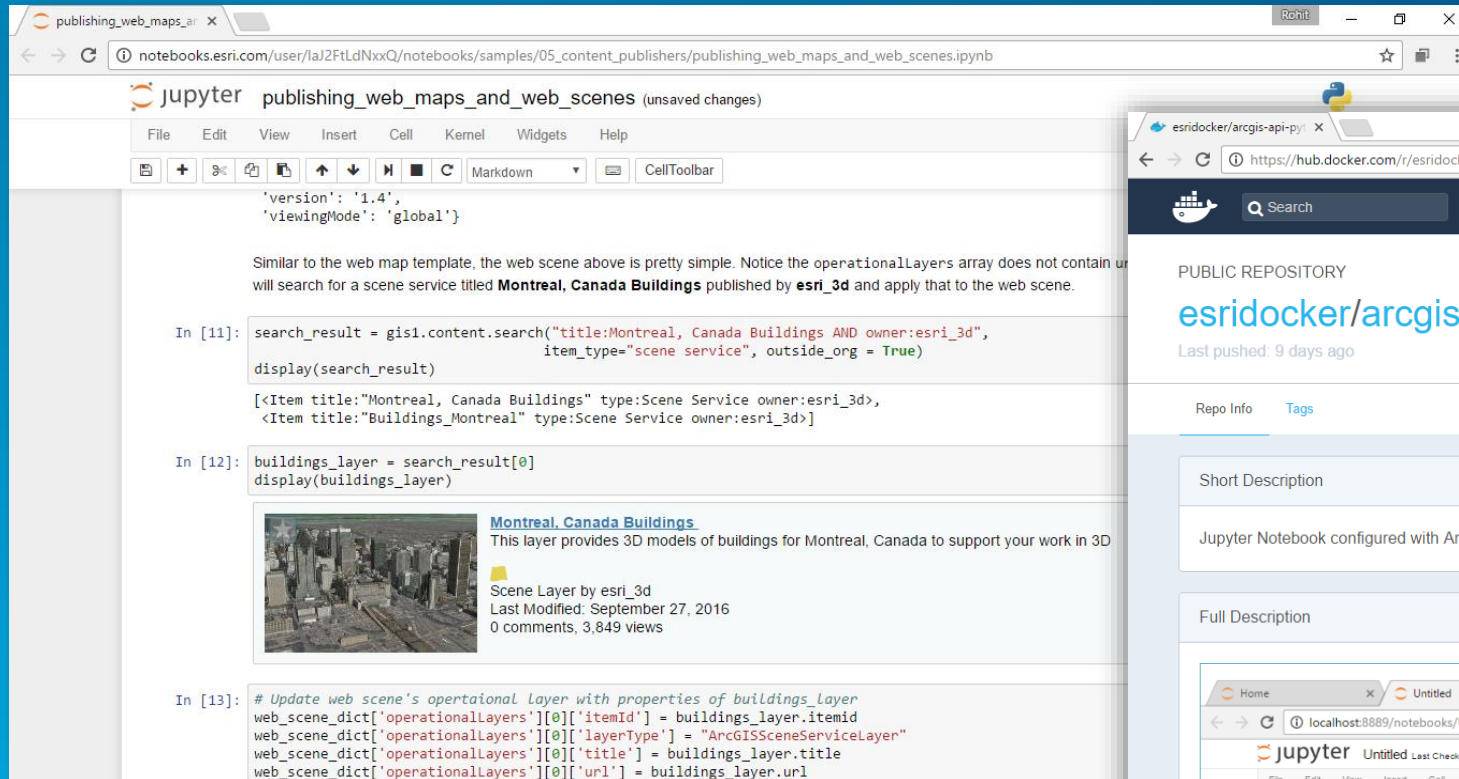
Script and automate your Web GIS

The ArcGIS API for Python lets ArcGIS Online and ArcGIS Enterprise users, analysts, developers and administrators script and automate tasks ranging from performing big data analysis to content management and administration of their web GIS. The API integrates well with the [Jupyter Notebook](#) and the [SciPy](#) stack and enables academics, data scientists, and GIS analysts to share programs and reproducible research with others.



Resources

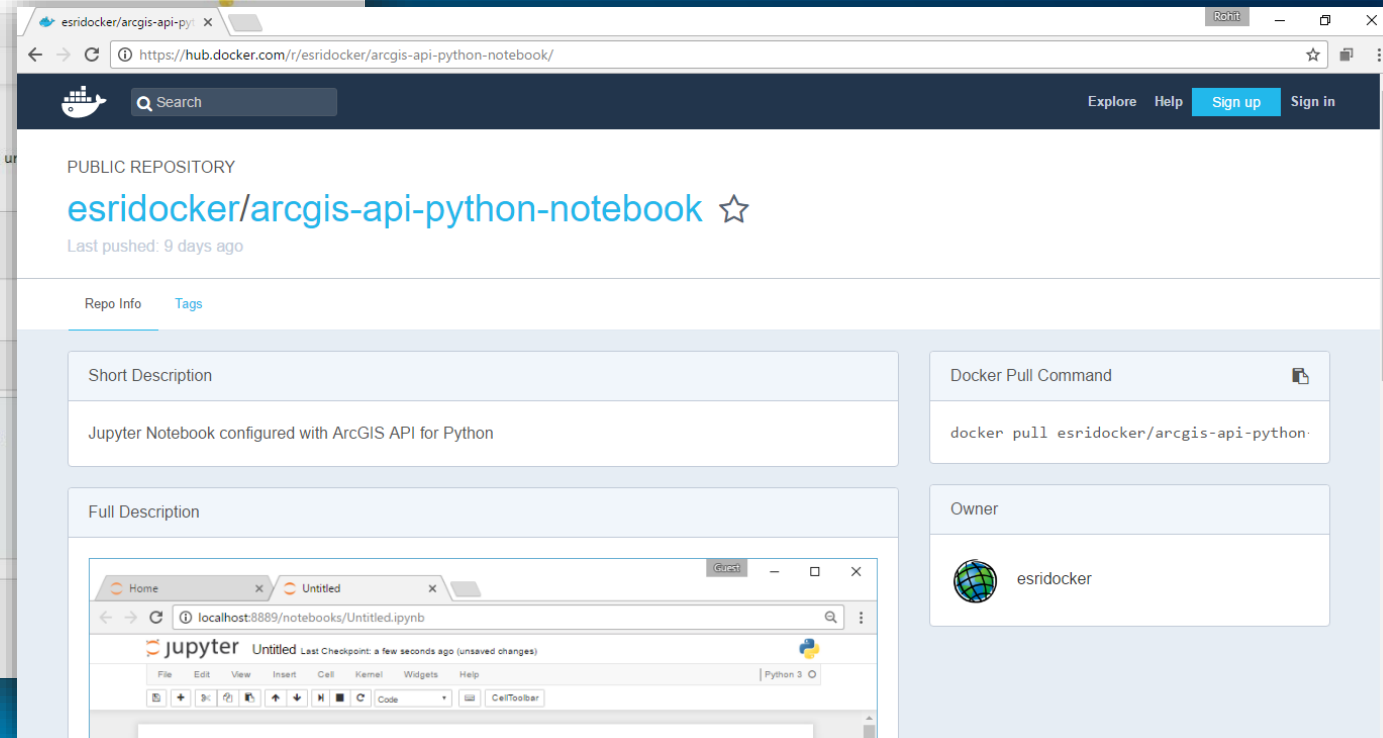
Notebooks.esri.com



The screenshot shows a Jupyter Notebook interface with the following content:

```
'version': '1.4',  
'viewingMode': 'global'}  
  
Similar to the web map template, the web scene above is pretty simple. Notice the operationalLayers array does not contain ur  
will search for a scene service titled Montreal, Canada Buildings published by esri_3d and apply that to the web scene.  
  
In [11]: search_result = gis1.content.search("title:Montreal, Canada Buildings AND owner:esri_3d",  
display(search_result)  
[<Item title:"Montreal, Canada Buildings" type:Scene Service owner:esri_3d>,  
<Item title:"Buildings_Montreal" type:Scene Service owner:esri_3d>]  
  
In [12]: buildings_layer = search_result[0]  
display(buildings_layer)  
  
Montreal, Canada Buildings  
This layer provides 3D models of buildings for Montreal, Canada to support your work in 3D  
  
Scene Layer by esri_3d  
Last Modified: September 27, 2016  
0 comments, 3,849 views  
  
In [13]: # Update web scene's operational layer with properties of buildings_layer  
web_scene_dict['operationalLayers'][0]['itemId'] = buildings_layer.itemId  
web_scene_dict['operationalLayers'][0]['layerType'] = "ArcGISSceneServiceLayer"  
web_scene_dict['operationalLayers'][0]['title'] = buildings_layer.title  
web_scene_dict['operationalLayers'][0]['url'] = buildings_layer.url
```

hub.docker.com/r/esridocker



The screenshot shows the Docker Hub repository page for **esridocker/arctgis-api-python-notebook**. The page includes the following information:

- Short Description:** Jupyter Notebook configured with ArcGIS API for Python
- Full Description:** A screenshot of the Jupyter Notebook interface showing the same code as the first image.
- Docker Pull Command:** `docker pull esridocker/arctgis-api-python-`
- Owner:** esridocker

Resources

www.esri.com/training

[youtube.com playlist](https://www.youtube.com/watch?v=SyFebn8ZgbU&list=PLGZUzt4E4O2JaOMx_XZc85VdMirqLGaVf)

The screenshot shows the Esri Training Catalog search results for "arcgis api for python". The search bar contains the text "arcgis api for python". Below the search bar, there are filters for "All GIS Capabilities", "Developer", and "All Learning Formats". There are also checkboxes for "Available with maintenance" and "Free training". The results are sorted by "Relevance". The first three results are videos:

- Video** (59 Minutes): Introduction to Scripting Your WebGIS with ArcGIS API for Python. Created March 23, 2017. ArcGIS Python API lets ArcGIS users, developers, and anyone with an ArcGIS Online subscription or a portal use the Python...
- Video** (5 Minutes): ArcGIS API for Python in 5 Minutes. Created December 16, 2016. The ArcGIS API for Python is powerful, modern, and easy to use. This video gives you a quick overview the API. See how you can use the API to automate your workflow and...
- Video** (64 Minutes): ArcGIS API for Python: Advanced Scripting. Created March 23, 2017. In addition to developing applications, the ArcGIS API for Python empowers administrators, content publishers, analysts...

Each video result has a "Wish List" button and a "View Details" button. The "View Details" button for the second video is labeled "FREE".

The screenshot shows a YouTube video player for the video "ArcGIS Python API in 5 minutes" by the channel "ArcGIS". The video has 3,650 views and was published on Dec 16, 2016. The video description states: "The ArcGIS Python API is a powerful, modern and easy to use Pythonic API for GIS professionals, developers, org administrators, content publishers and anyone with access to a Web GIS (which could be an ArcGIS Online organization or an ArcGIS Portal) to leverage the Python ecosystem and automate their...". The video player shows the video progress at 0:57 / 5:05. The video content shows a hexagonal diagram with "gis" in the center, surrounded by various GIS capabilities: geo analytics, geo processing, geocoding, geometry, features, realtime, env, widgets, mapping, raster, and network.

ArcGIS Python API
ArcGIS • 1/5 videos

- 1. ArcGIS Python API in 5 minutes (ArcGIS)
- 2. Introduction to Scripting Your WebGIS with ArcGIS API for Python (Esri Events)
- 3. ArcGIS API for Python: Advanced Scripting (Esri Events)
- 4. ArcGIS Python API for Administrators and Content Publishers (Esri Events)
- 5. ArcGIS Python API for GIS Analysts and...

Automating and Scripting ArcGIS
Esri Events
1,787 views

Arcpy Getting Started (Python in ArcGIS)
Jido Heroux
2,485 views

Introduction to Scripting

Title	Date & time	Room	Repeat Date & time	Repeat Room
Administering ArcGIS Enterprise and ArcGIS Online with Python	Tuesday (July 11) 8:30 – 9:45 AM	SDCC – Ballroom 06 D		
Mapping, Visualization and Analysis using ArcGIS API for Python	Tuesday (July 11) 8:30 – 9:45	SDCC – Room 01 A		
ArcGIS Python API: Introduction to scripting your Web GIS	Tuesday (July 11) 10:15 – 11:30 am	SDCC – Room 09	Wed (July 12) 10:15 – 11:30	Hilton – Sapphire Ballroom M
Cloning your Portal users, groups and content using ArcGIS API for Python	Tuesday (July 11) 12:30 - 1:15 pm	SDCC – Demo Theater 11	Wed (July 12) 2:30 – 3:15 pm	SDCC – Demo Theater 11
ArcGIS API for Python for GIS Analysts and Data Scientists	Tuesday (July 11) 2:30 - 3:15 pm	SDCC – Demo Theater 11		
Automating Enterprise GIS Administration using Python	Tuesday (July 11) 4:30 pm – 5:15 pm	SDCC – Demo Theater 11		
Scripting and Automation for the Web GIS power user	Tuesday (July 11) 5:30 pm – 6:15 pm	SDCC – Demo Theater 11	Wed (July 12) 4:30 – 5:15 pm	SDCC – Demo Theater 11
Administering ArcGIS Enterprise and Online with Python	Thu (July 13) 8:30 – 9:45 am	SDCC – Ballroom 06 C		
ArcGIS Python API – Advanced Scripting	Thu (July 13) 10:15 – 11:30 am	SDCC - Room 02	Friday (July 14) 9:00 – 10:15	SDCC Ballroom 06 B
ArcGIS Python API for Administrators and Content Publishers	Thu (July 13) 12:20 – 1:15 pm	SDCC – Demo Theater 08		

Please Take Our Survey on the Esri Events App!

Download the Esri Events app and find your event



Select the session you attended



Scroll down to find the survey



Complete Answers and Select "Submit"



Questions?

Thank you



esri

THE
SCIENCE
OF
WHERE