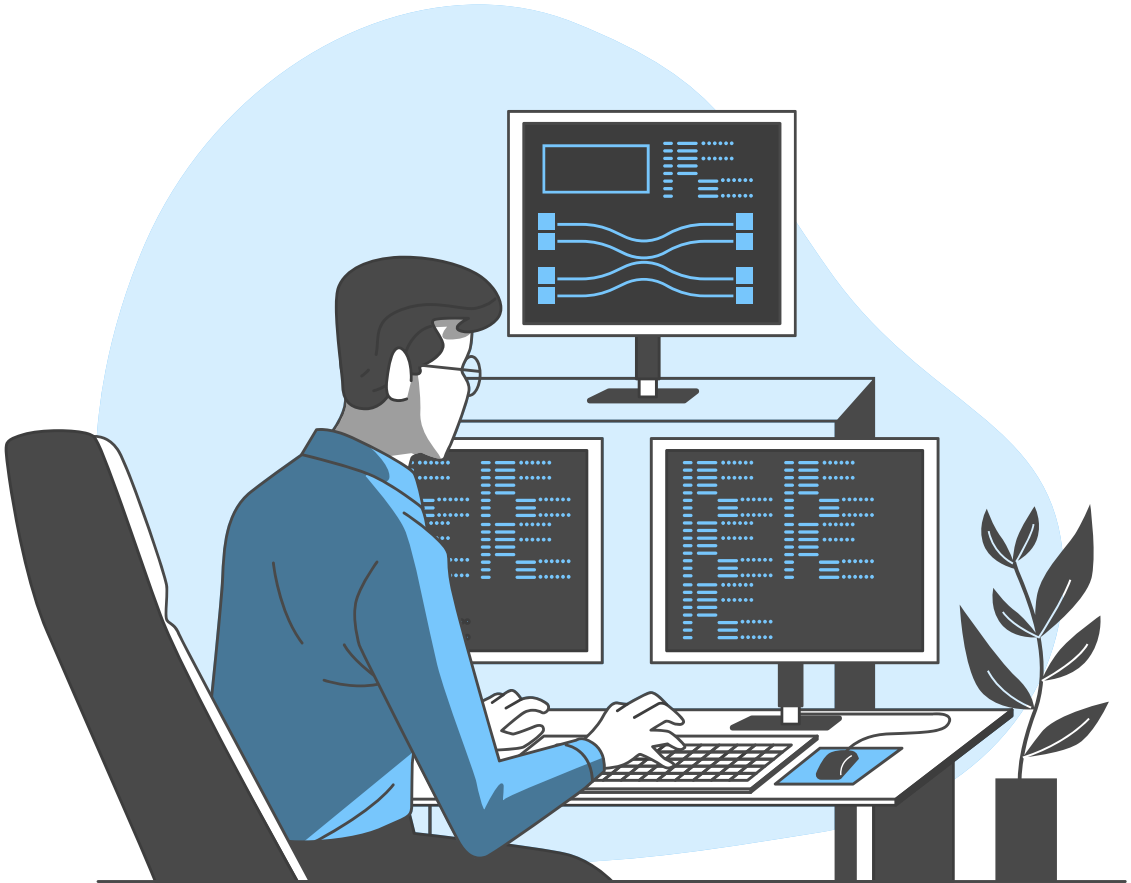

DATA/ESRI TEAM

Technical Presentation

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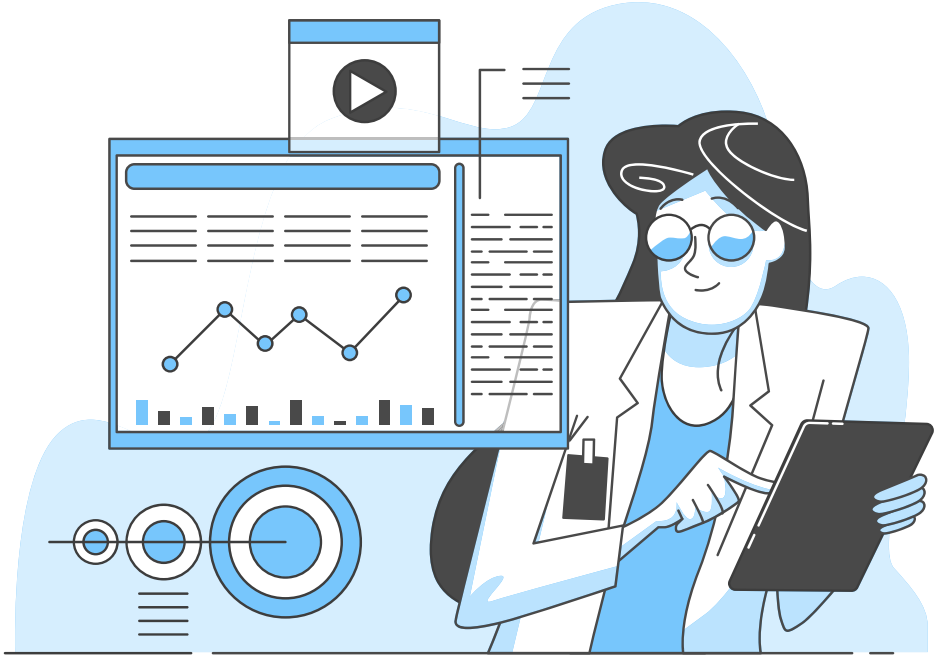


Data Generation

- Generation done in Python using Pandas
- Three types of data to generate (same as it is stored within the database)
  - User Data
  - Sensor Metadata
  - Sensor Readings
- User Data and Sensor Metadata both have fields which are dependent upon the other
  - Therefore: non-dependent fields are filled and then dependent fields are filled secondarily
- Shell Script to run other scripts in a collated manner (generation scripts require arguments to run - paths and counts; simplified with shell script)
- 28 seconds to generated 61k entries

Data Conversion

- Data needed to be in multiple formats for different uses (e.g. JSON or CSV [and sometimes others])
  - Some data readings are in .txt form and need to be converted to a form easily used by other teams
- Specialized scripts created to convert between types of data
  - Abstracted as much a possible to allow compatibility with changes in data formatting
- Primarily text to CSV and CSV to JSON
- Python scripts intended to run effectively and efficiently
- CSV to JSON functions instantly with 50k entries

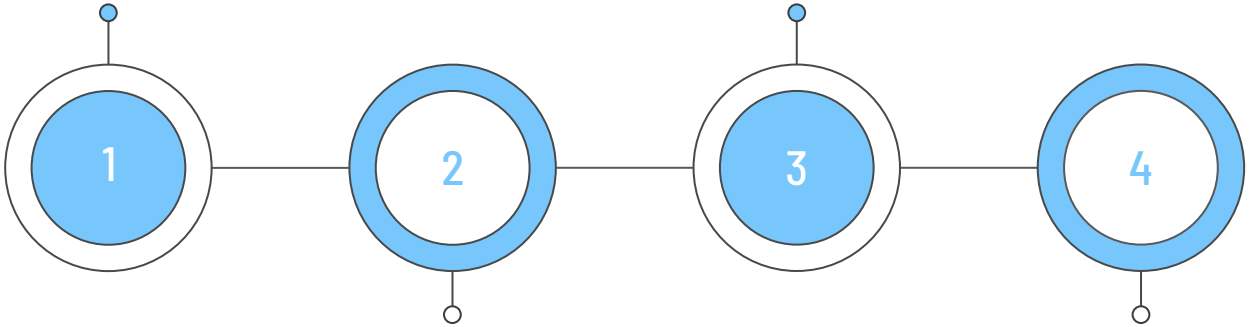
Dashboard Process

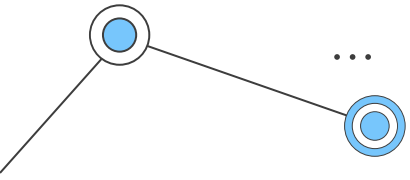
Start the base map with an initial file that is in the format of the official data from database

Create a feature layer with point layer with locations from latitudes and longitudes

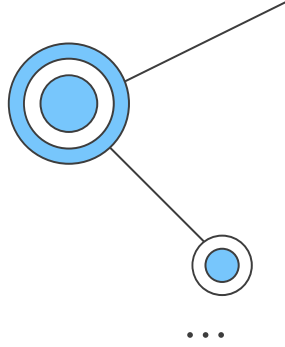
Generate a Web Map based on the feature layer and choose base layer details

Generate a dashboard from the Web Map, creating a web feature and add additional features to the dashboard with actions on maps and features





Modules



Pandas

Python module that generate, edit, and convert dataframes.

Boto3

-Amazon Web Services (AWS) Software Development Kit (SDK) for Python
-Connect to S3 database and EC2 instances

Requests

-Sends HTTP requests using Python.
-Returns a Response Object with all the response data which can then be converted into dataframes

GIS

-Geographic information system (GIS)
-Visualize, analyze, and interpret data
-Understand spatial relationships, patterns, and trends.

Dashboard Backend Code Showcase

In [2]:

```
# Import GIS and modules
import pandas as pd
from arcgis.gis import GIS
import requests
import boto3
gis = GIS("home")
```

```
/opt/conda/lib/python3.7/site-packages/arcgis/gis/__init__.py:575: UserWarning:

You are logged on as zheng.yuti_NU2 with an administrator role, proceed with caution.
```

Now you are ready to start!

In [1]: injected-parameters

```
# Set up parmeters
url = "https://test-data452e1421.s3.eu-west-2.amazonaws.com/permanent_csv.csv"
```

In [6]:

```
# Import feature layer item
feature_layer_item = gis.content.get("2c2ad8b485c74e3cba336b459261a800")
feature_layer_item
```

Out[6]: sensorData

Thanks!

Do you have any questions?