ANALYZING AIS DATA WITH THE UN GLOBAL PLATFORM

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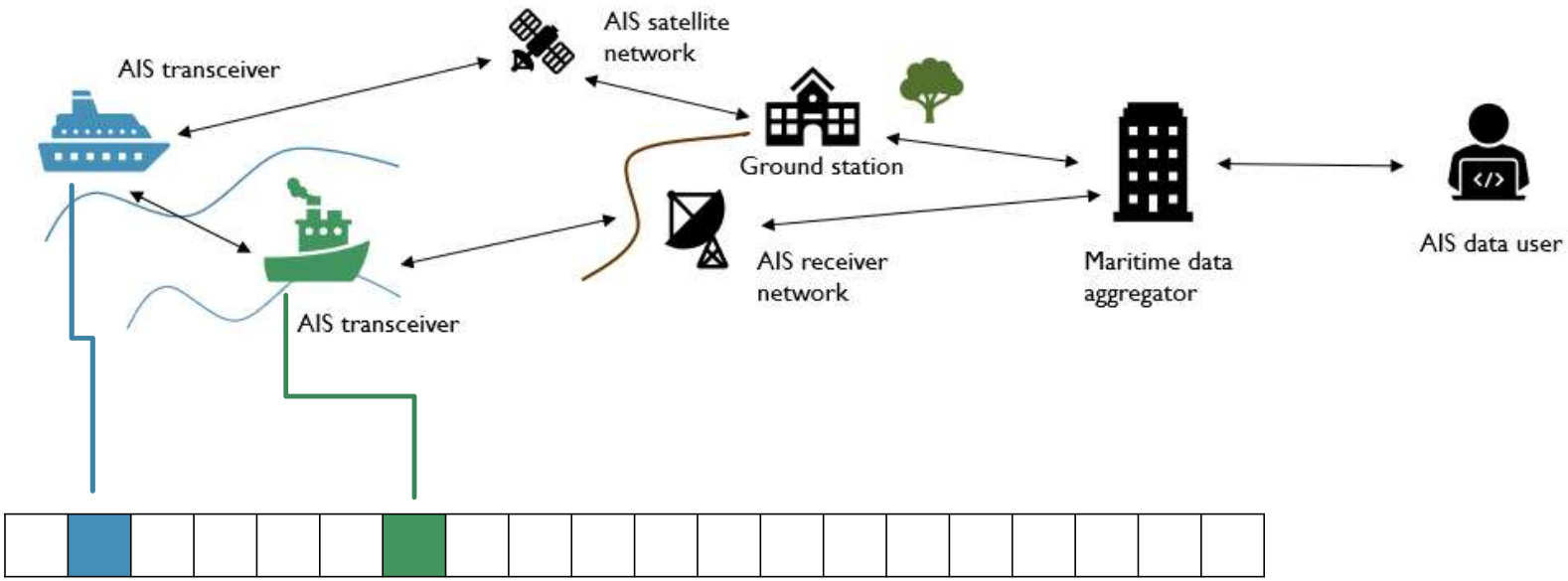
UNITED NATIONS

WHAT IS AIS DATA – BASIC INFORMATION

- The automatic identification system (AIS) is a tracking system for ships, originally developed for collision avoidance



Time slots of 26.6 milliseconds

Reference: Lloyd's List Intelligence (2017). Understanding AIS.

WHAT IS AIS DATA – BASIC INFORMATION

Dynamic information

- Automatically transmitted
- Every 2 to 10 seconds when moving
- Every 3 to 6 minutes when anchored

- Maritime Mobile Service Identity number (MMSI) – nine-digit number
- AIS navigational status
- Rate of turn
- Speed over ground
- Position coordinates (longitude/latitude)
- Course over ground
- Heading
- Bearing at own position
- UTC second

Static information

- Manually transmitted
- Every 6 minutes

- International Maritime Organisation number (IMO)
- Call sign
- Name
- Type
- Dimensions
- Location of the positioning system's antenna on board the vessel
- Type of positioning system
- Draught
- Destination
- ETA (estimated time of arrival)

Reference: MarineTraffic (2018). What kind of information if AIS-transmitted?

WHAT IS THE UN GLOBAL PLATFORM

- Global platform for
  - Exchanging ideas and methods for processing, analyzing and visualizing Big Data
  - Storing Big Data sources and enable processing, analyzing and visualizing the data
  - Demonstrating the value of Big Data in better decision making through pilots and case studies
  - Providing training materials and workshops for capacity building

MOST IMPORTANT SYSTEMS FOR AIS ANALYSIS AT THE UN GLOBAL PLATFORM

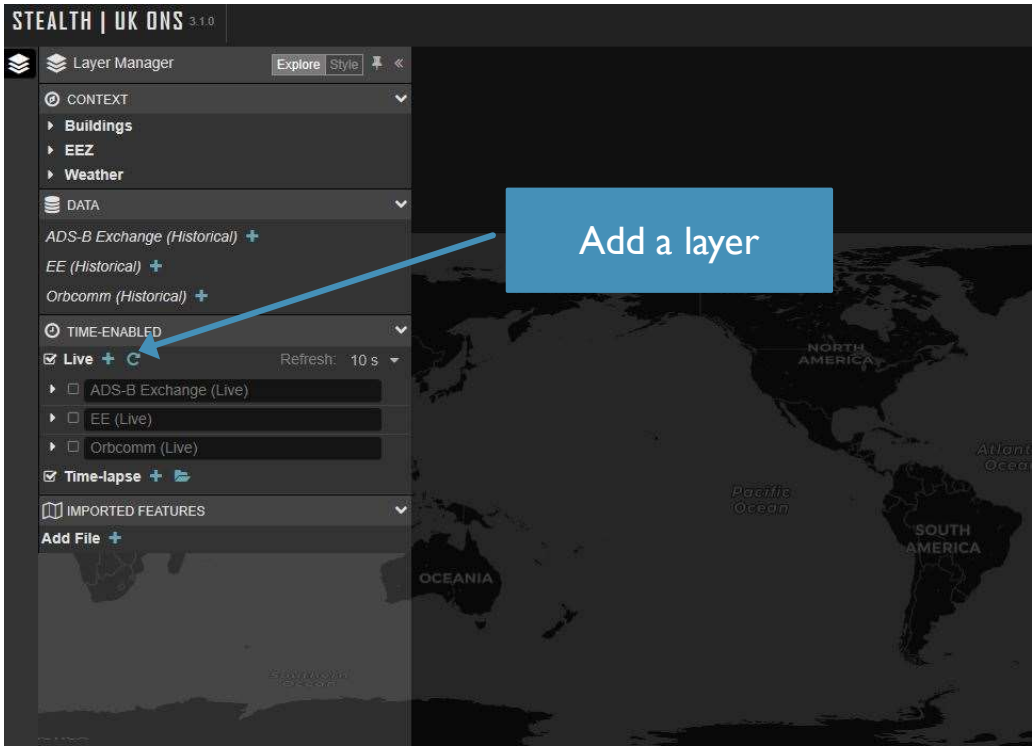
Stealth

- https://location.officialstatistics.org//stealth/
- browser-based dynamic spatial visualization tool that can represent many layers of geospatial data along with their relationships, often with animation of up to millions of entities in your browser

JupyterHub

- https://location.officialstatistics.org/jupyter
- Console-based, interactive web application that streamlines developing, documenting and executing code.

STEALTH: HOW DOES IT WORK

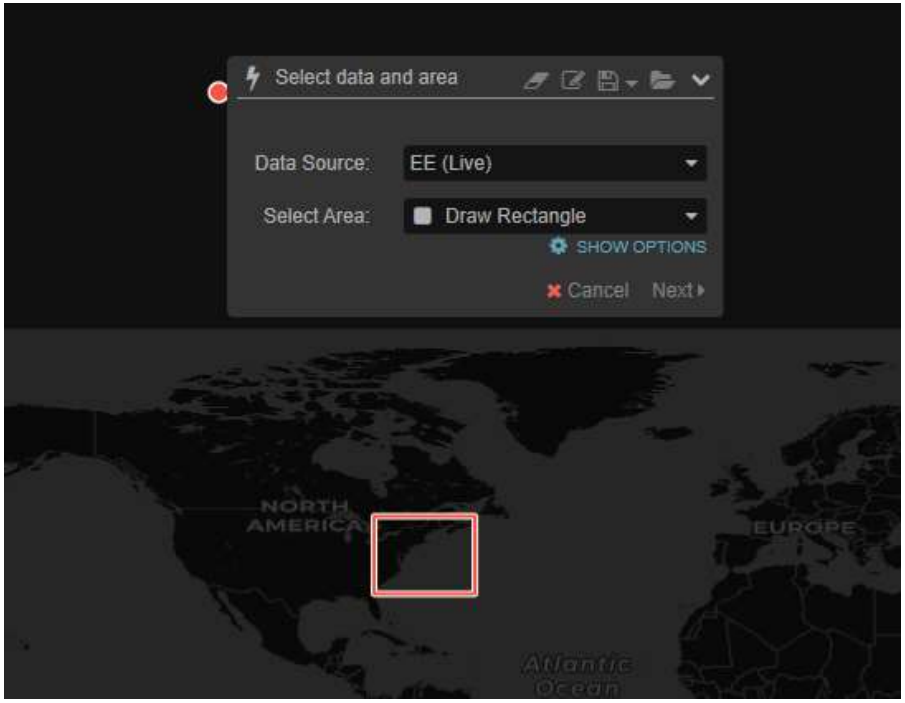


- ADS-B: current information on aircrafts
- EE: AIS data from the provider exactEarth
- Orbcomm: AIS data from the provider Orbcomm

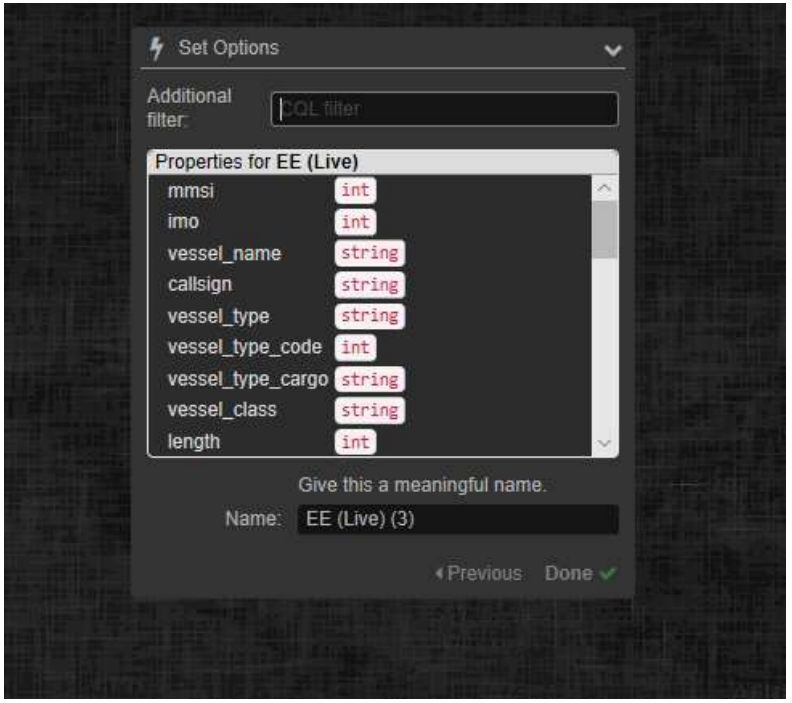
- For all data sources, historical and live data is available

STEALTH: HOW DOES IT WORK

1. Choose data source
2. Select area

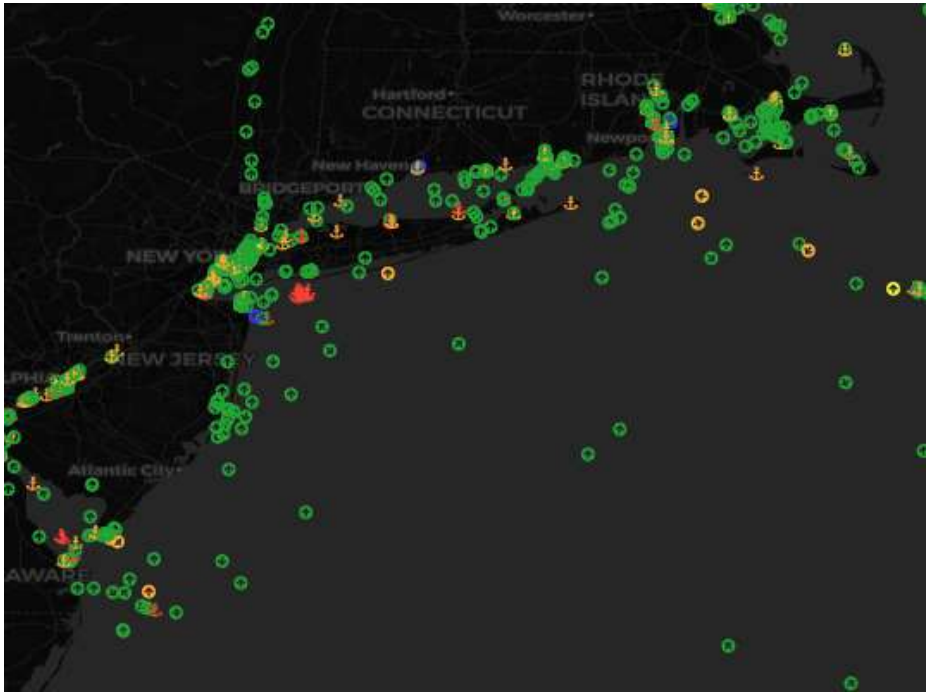


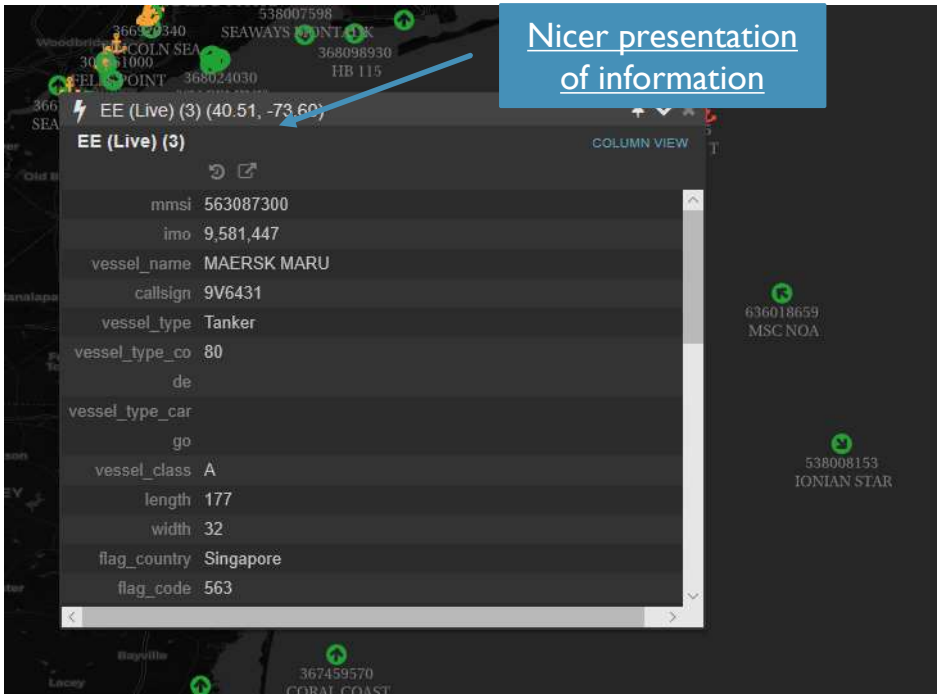
3. See and set options



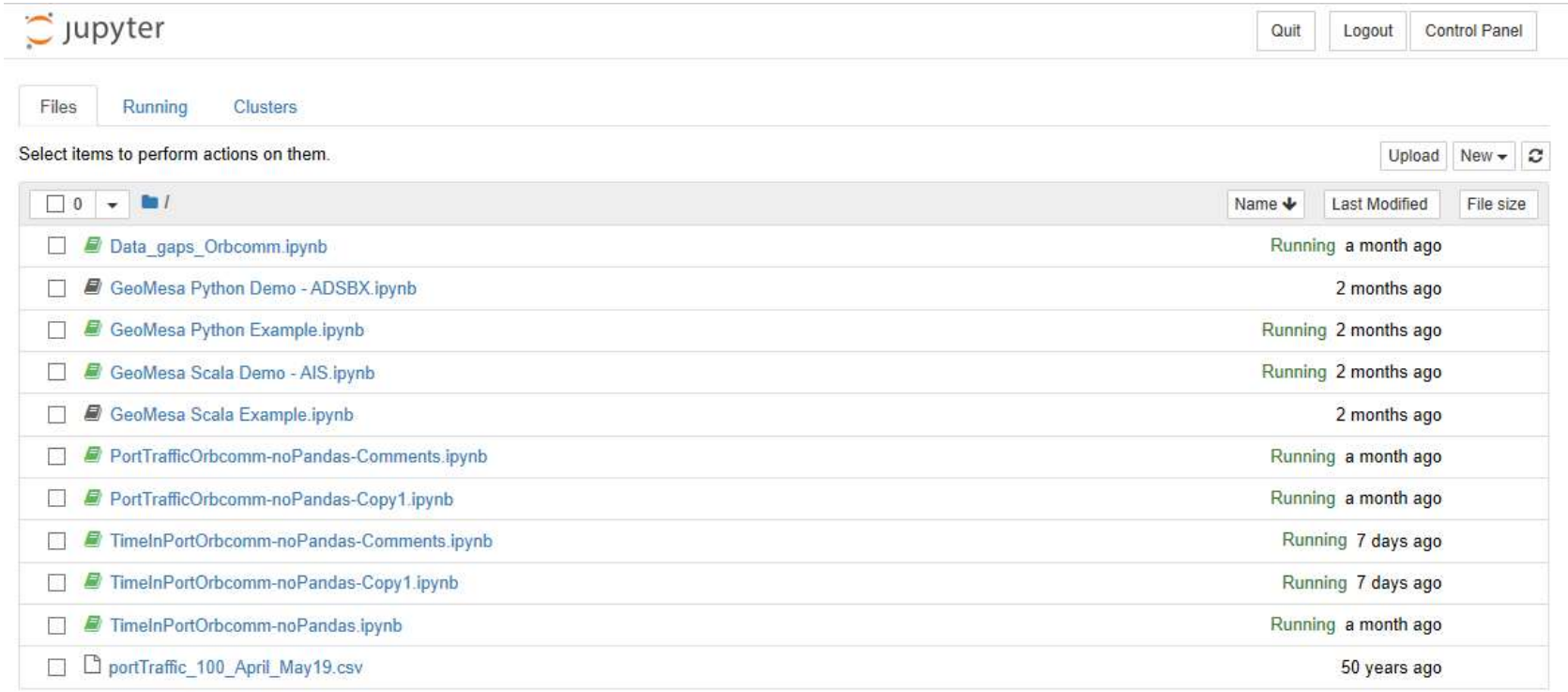
STEALTH: HOW DOES IT WORK

- Get a first overview on ships in the selected area
- Get more information by clicking on a single vessel

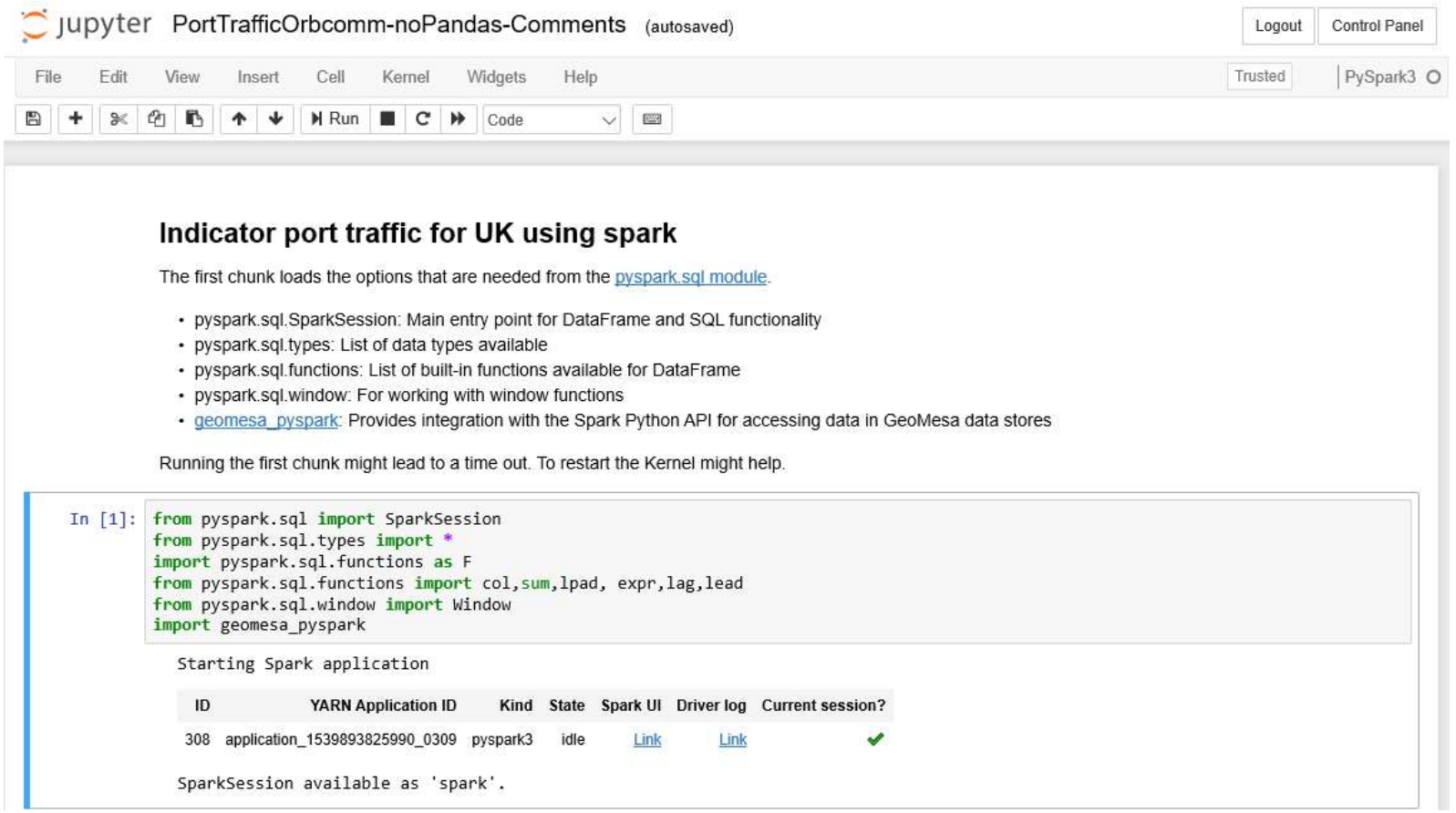




JUPYTER HUB: HOW TO WORK WITH



JUPYTER HUB: HOW TO WORK WITH



OVERVIEW AND MORE SYSTEMS/TOOLS

BigData UN Global Working Group

Platform providing data, methods and code for various fields of official statistics

Receiving and providing AIS data	Storage of data	Processing and visualizing data	Tools for analysis

ORBCOMM
Data aggregator

exactEarth
Data aggregator

Apache HBase
Database storing AIS data

CCRi Data to Knowledge
Service provider for advanced analytical techniques

STEALTH
Browser-based visualization

Apache Spark
Analytics engine for large-scale data processing

Same credentials

geomesa
Tool for large-scale geospatial analytics

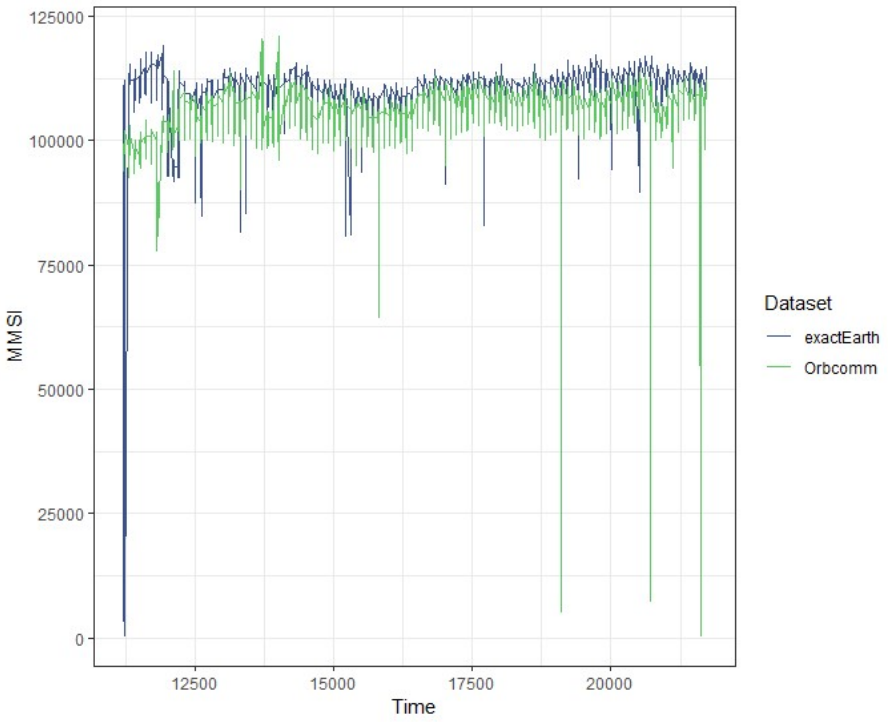
jupyter
Interactive web-application for creating documents

Credentials differ

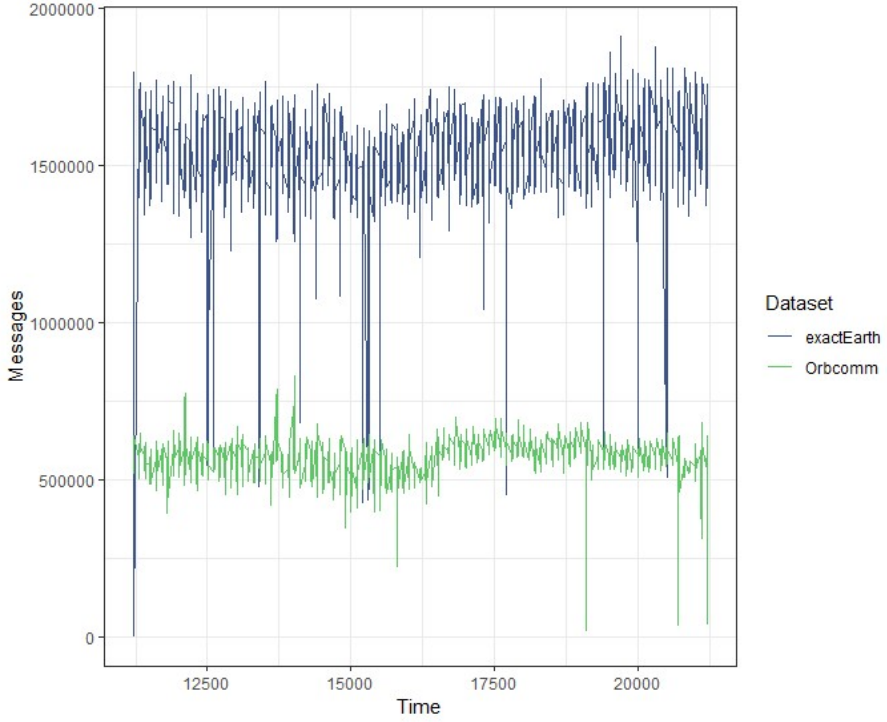
GitLab
Version control and code sharing

Most apparent tools

COMPARISON OF MARITIME DATA AGGREGATOR



	Median	Mean
exactEarth	109894	109089
Orbcomm	105550	104976



	Median	Mean
exactEarth	1548598	1527333
Orbcomm	574140	571359