WHAT IS AIS DATA – BASIC INFORMATION

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

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 is 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/](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](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

Nicer presentation of information
JUPYTER HUB: HOW TO WORK WITH

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Indicator port traffic for UK using spark

The first chunk loads the options that are needed from the `pyspark.sql.module`.

- `pyspark.sql.SparkSession`: Main entry point for DataFrame and SQL functionality
- `pyspark.sql.types`: List of data types available
- `pyspark.sql.functions`: List of built-in functions available for DataFrame
- `pyspark.sql.window`: For working with window functions
- `geomesa_pyspark`: Provides integration with the Spark Python API for accessing data in GeoMesa data stores

Running the first chunk might lead to a time out. To restart the Kernel might help.

```python
In [1]:
from pyspark.sql import SparkSession
from pyspark.sql.types import *
import pyspark.sql.functions as F
from pyspark.sql.functions import col, sum, pad, expr, lag, lead
from pyspark.sql.window import Window
import geomesa_pyspark

Starting Spark application

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SparkSession available as 'spark'.

OVERVIEW AND MORE SYSTEMS/TOOLS

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
- HBASE: Database storing AIS data
- CCRi: Service provider for advanced analytical techniques
- Apache Spark: Analytics engine for large-scale data processing
- Stealth: Browser-based visualization
- GeoMesa: Tool for large-scale geospatial analytics
- Jupyter: Interactive web-application for creating documents
- GitLab: Version control and code sharing

Most apparent tools

Credentials differ
COMPARISON OF MARITIME DATA AGGREGATOR

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