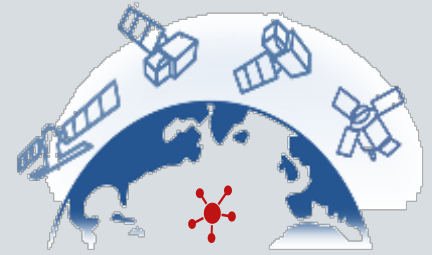


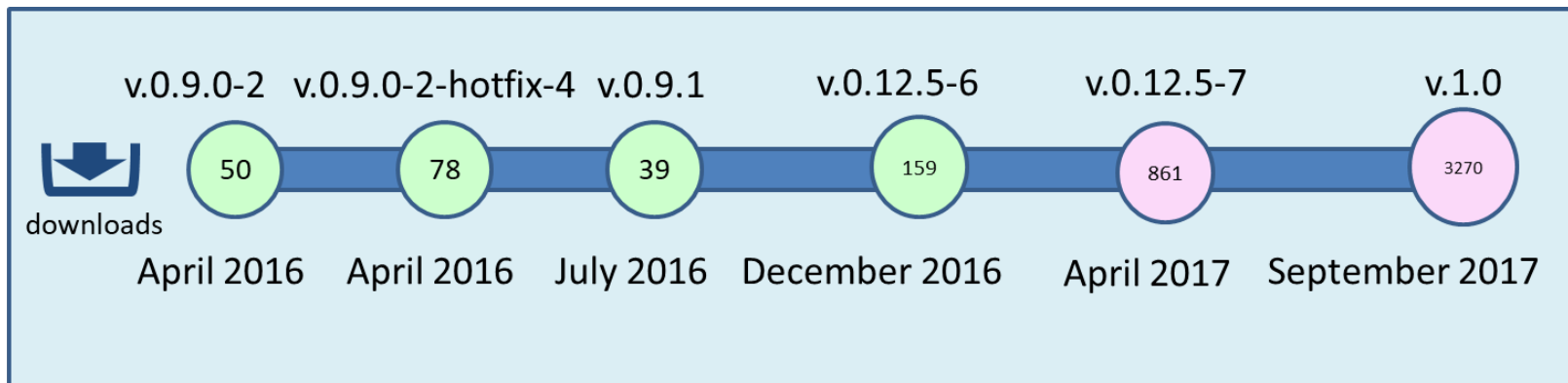
# ESA Sentinels Data Hub Service



## **Collaborative Ground Segment Workshop** *ESRIN, 4-5 December 2018*



# DHuS Open Source Release history



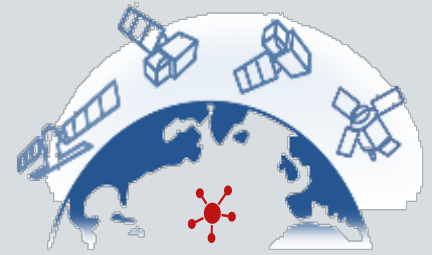
## Notable users:

- National mirrors
- Eumetsat
- CMEMS



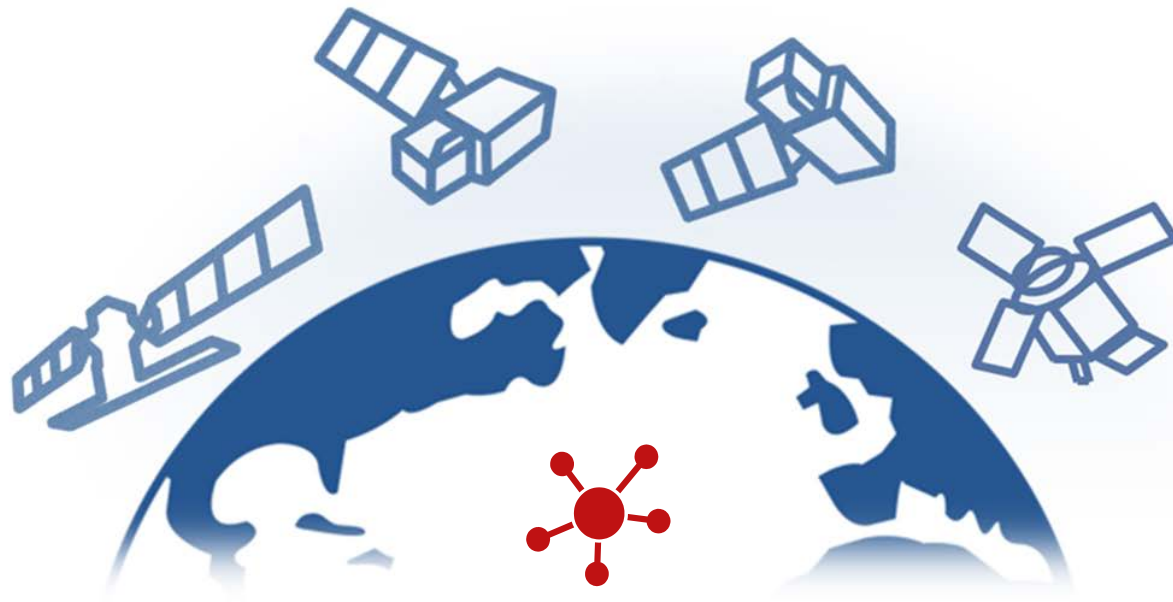
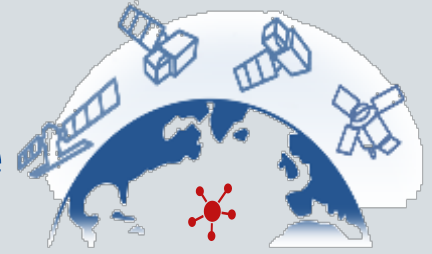
**Total Downloads**  
**4457**

# Top 10 Active Countries for OSF Download

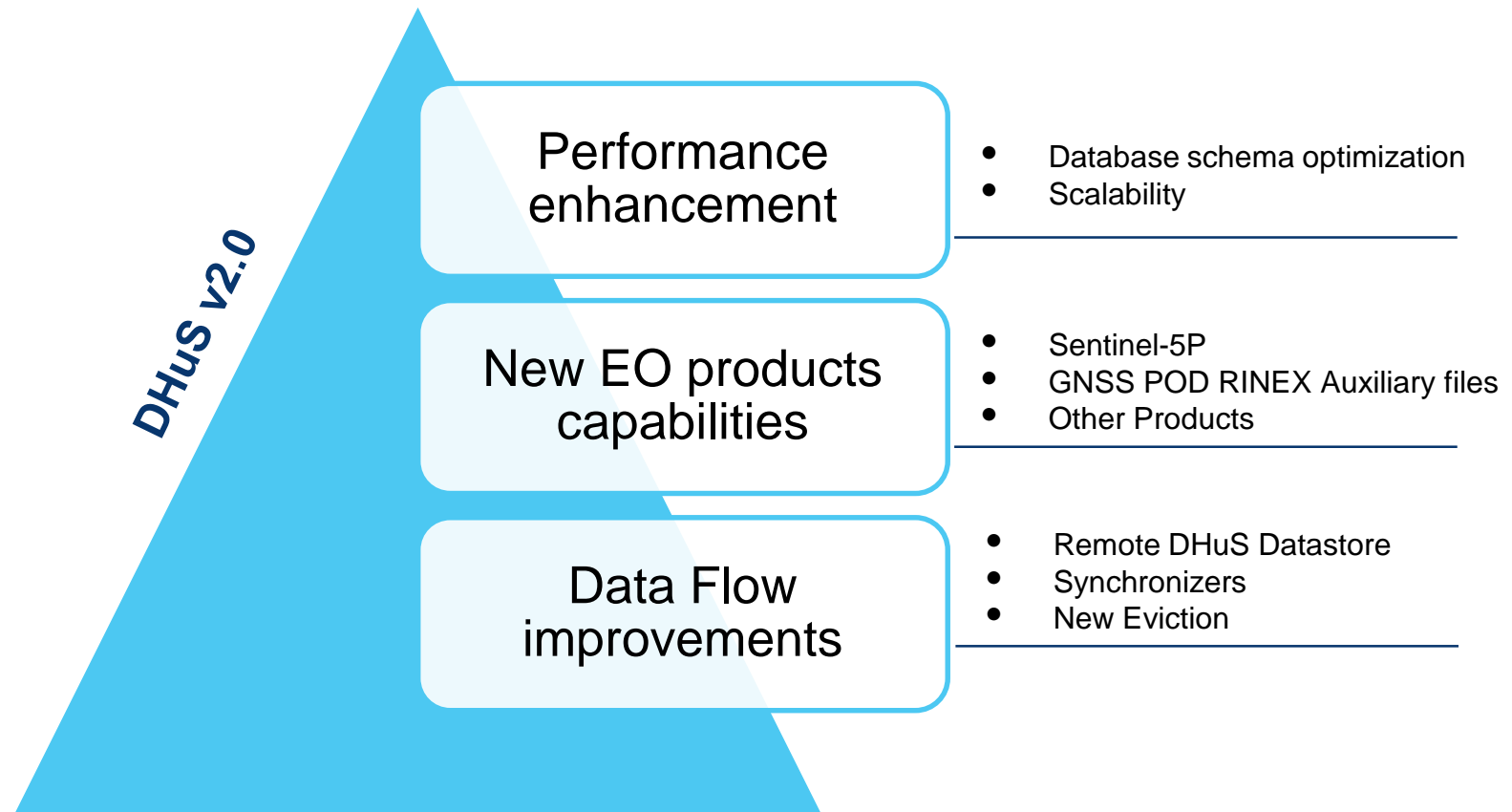
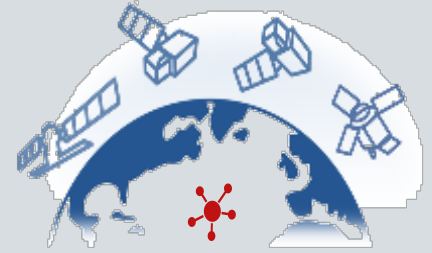


1.		Italy
2.		United States
3.		India
4.		Germany
5.		France
6.		Brazil
7.		Canada
8.		Spain
9.		Netherlands
10.		Portugal

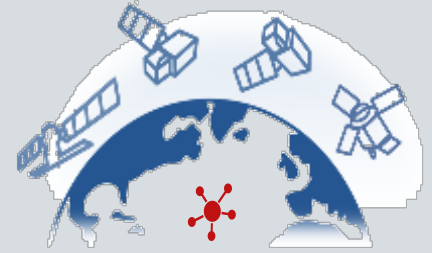
# Preview of the next DHuS Open Source Software release



# Next DHuS Open source release: DHuS v2.0



# Next DHuS Open source release



## Earth Observation products support:

- Sentinel-5P products support (L1B, L2, AUX)
- GNSS POD RINEX Auxiliary files support
- Products from projects:
  - DAME
  - CMEMS



## Enhanced algorithm for Footprint management:

- New algorithm to manage Sentinel product footprints

## DHuS Architectural changes:

- Scalability 2.0: possibility to deploy DHuS instances in cluster mode to act as one
- New features for supporting Relational Database e.g. PostgreSQL

## Performance improvements:

- DHuS database optimization schema to improve performances and to reduce the occupied size on disk
- Nodes inspection for products stored on Openstack Swift
- netCDF products (S-3, S-5P, COSMO-SkyMed)

# Next DHuS Open source release



## Synchronization improvements:

- Synchronization robustness improvements
- Synchronization collection to collection
- OData filters with Boolean operators

## Internal DHuS- Sentinel-1 PDGS LTA interface:

- Allow the possibility to retrieve data from Sentinel-1 PDGS LTA.

## Remote DHuS Datastore:

- Allows to configure a remote DHuS instance as a DataStore for downloads and nodes browsing. → see next presentation

## Eviction mechanism enhancement:

- Re-design and implementation of the Eviction mechanism. The following features are now available in DHuS:
  - Hard-Eviction: deleting all reference to product
  - Soft-Eviction: deleting only physical product leaving catalogue untouched
  - Safe eviction: updating the product path (RDDS)→see next slides

# Next DHuS Open source release



## AJS UI

- Shape file management
- Map:
  - New Pan/Draw Management
  - Map layer switcher restyling
- Advanced search filters for Sentinel-5p auxiliary files
- Login dialog in user badge
- Preserve user session after page refresh
- DHuS-LTA: Manage offline product download
- New cart panel in the main page

## Events implementation:

- Allow publication of Events and News in the Data Hub
- Synchronization of Events from DHuS to DHuS

*Additional details will be provided during dedicated trainings*



## Next steps



Save  
the  
Date

**December 2018:** Deploy of DHuS v2.0 in operations



**January 2019:** DHuS OSF Release



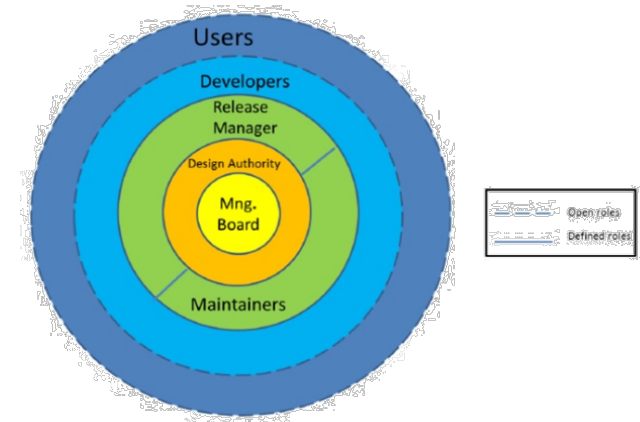
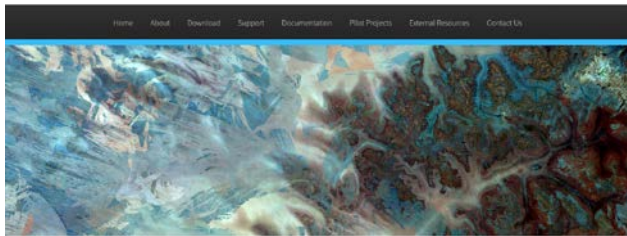
**January 2019:** Webex training or workshop collocation

# Future activities



## Development approach evolution

- Planning the migration from private repository to the public one
- Application of the governance model published on <http://sentineldatahub.github.io/DataHubSystem/governance.html>



## DHuS Release v3.0: Summer 2019

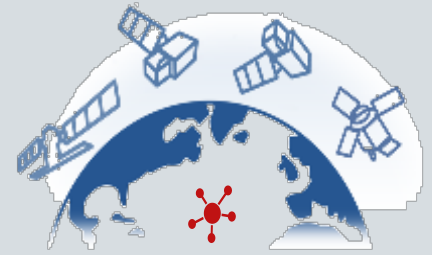
- New DHuS-LTA Broker interface
- Sentinel-2 L2A on-demand Processing
- Integration of WMS service in DHuS UI
- Request quotas
- DHuS Monitoring function
- Introduction of OData v4
- Smart Synchronizers

# Smart Synchronizers

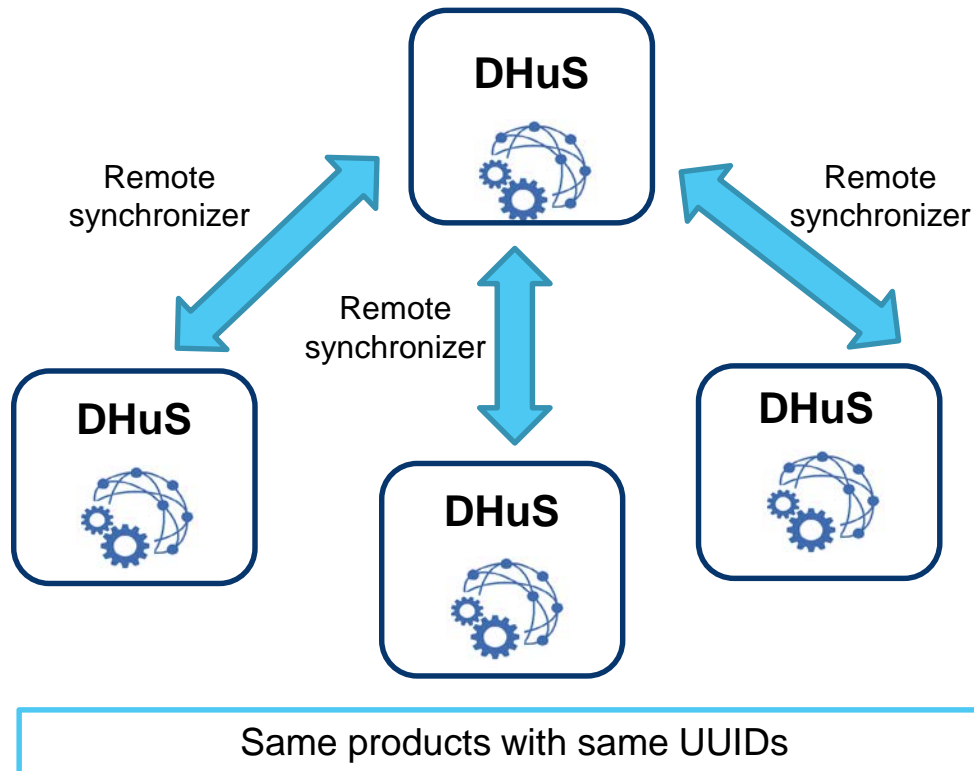


# Smart Synchronizers

DHuS v3.0  
Summer 2019



## New generation of synchronizers capable of handling multiple remote hubs as data sources in optimized way



### New features:

- Product synchronization from multiple sources
- Transfer from multiple sources simultaneously
- Error resilience
- Download speed management

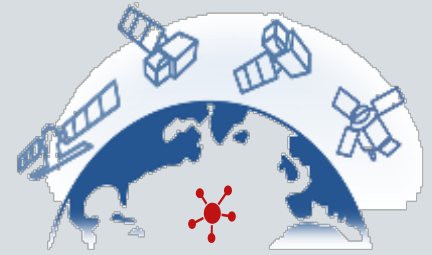
### GUI Component

Visualize the DHuS network status for the end users in terms of:

- Network connections
- Publication status

# Smart Synchronizers

DHuS v3.0  
Summer 2019

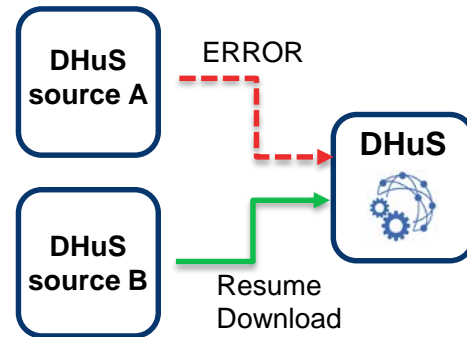


## Error Management

In case of error during a product transfer, the Smart Synchronizer automatically switches to another source.

Source switching can happen in case of:

- Transfer error
- Transfer timeout
- Slow transfer

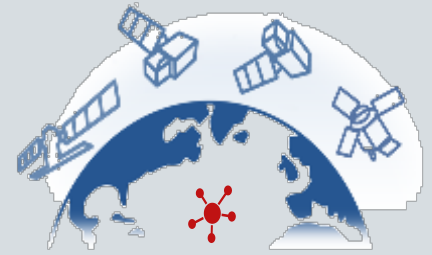


## Ensures optimal transfer performance without saturating sources

The Smart Synchronizer allocates transfers in the most efficient way to the different sources:

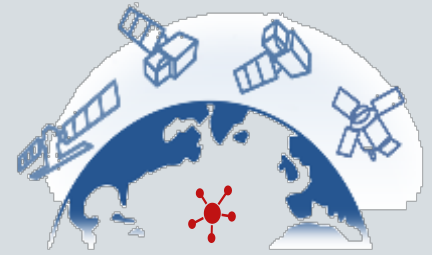
- Speed of each transfer is monitored
- Total speed of each source is monitored
- New transfers are assigned to the fastest potential source

# DHuS OData v4 Interface



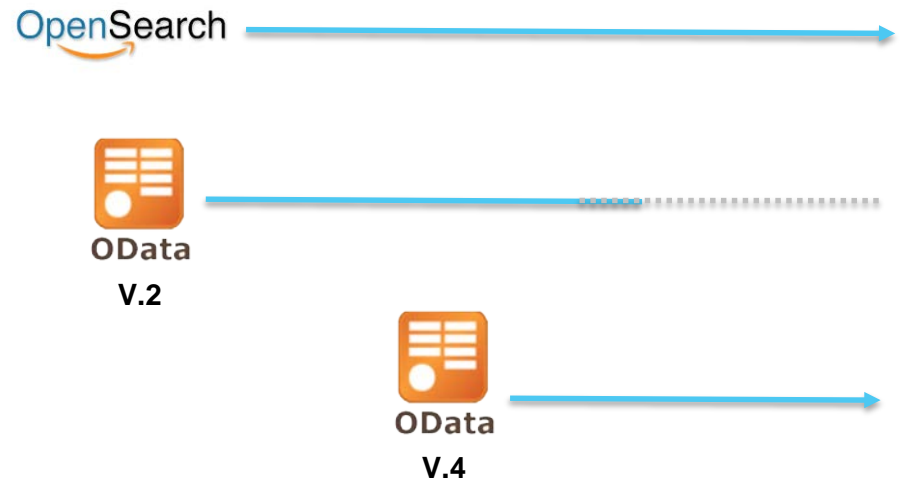
# OData API evolution: introduction of OData v4

DHuS v3.0  
Summer 2019



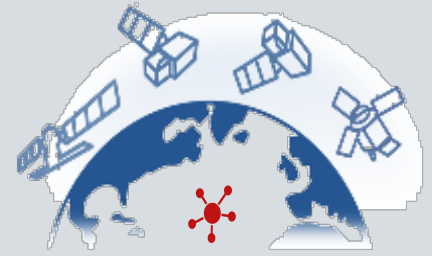
## New features coming with OData v4:

- Geographical search
- Attributes filtering
- User-friendly functions and actions
  - On-Demand processing
  - Improved LTA order interface
- Improved performance



The current OData implementation (v2) will be maintained in the DHuS in parallel with the new one (v4) to allow user migration. Following this, OData v2 will be deprecated & decommissioned.

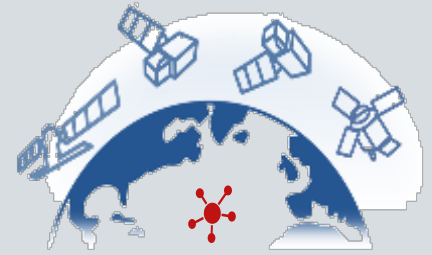
# DHuS Monitoring





# DHuS Monitoring function

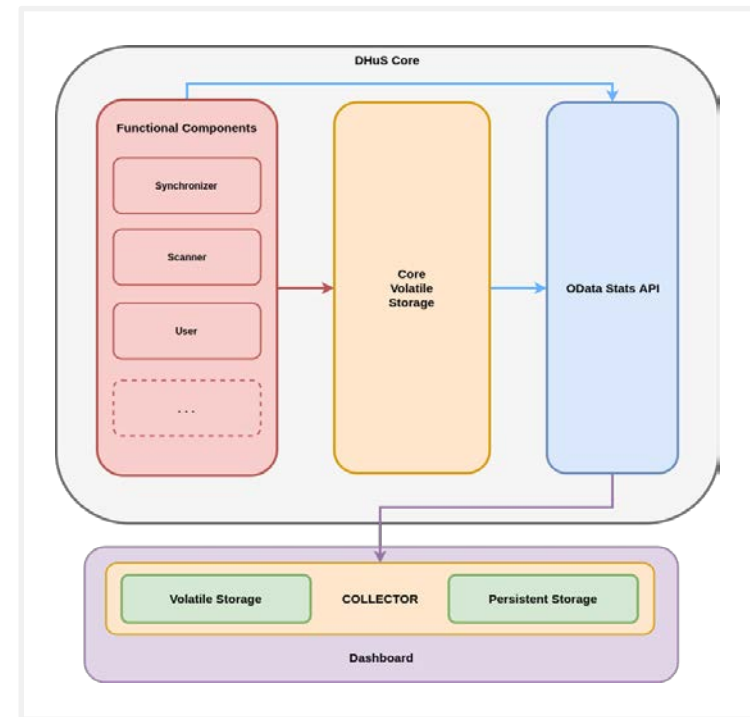
DHuS v3.0  
Summer 2019



## New DHuS functionality to perform monitor, analytics and data mining activities on the Hub

### High level functional overview:

- **Data Gathering**
  - A function to collect all parameters with a configurable frequency per parameter.
- **Data Processing and Aggregation**
  - A function to provide the following operations to be applied to the collected data: sum, average, min, max, count and at least the following operations domains: mission, instrument, product type, time, geographic area.
- **Data Storage**
  - A function to store the aggregated data in a rolling store.
- **Data Mining**
  - A function to access the aggregated data via OData API



# DHuS Monitoring function

DHuS v3.0  
Summer 2019



## Reporting of the performance of various components of the DHuS at a certain date

- JVM
- HTTP requests
  - DHuS query performance
  - Total number of download
  - Overall Download performance
  - Download performance per status and per username
- Eviction performances
- Synchronization performances
  - total number of download in the queue
  - number of downloads in the queue per synchronizer
  - overall synchronization performance
  - performances per synchronizer
- Ingestion
  - Ingestion performance
  - Number of products ingested

*... and much more!*



### Metrics

<https://metrics.dropwizard.io/4.0.0/>