

DHuS 2.0.0 Webinar



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Outline

Purpose
Introduction
New supported Sentinel Mission (S-5P)
New DHuS core features
New DHuS AJS UI features
Major Bug Fixes
Performances Improvements
Known Limitations
New management of configuration files

 **45min**

Break

 **15min**


Focus On

 **30min**

Break

 **15min**

Q&A session

 **1h**

Purpose

The objectives of this Webinar are the following:

- a) Illustrate the improvements and new features brought by the new DHuS 2.0.0 release.
- b) Explaining the passage from older DHuS version (e.g. 1.0-OSF, 0.13.4-22) to DHuS 2.0.0.

Introduction

DHuS Overview



The Data Hub Software (DHuS) is a Java software developed by a Serco-Gael consortium to the purpose of supporting the ESA Copernicus data access.

The DHuS provides a simple Graphical User Interface (GUI) to allow interactive data discovery and download, and a powerful Application Programming Interface (API) that allows users to access the data via their own computer programs, scripts or client applications.

Open Source Portal:

- <https://sentineldatahub.github.io/DataHubSystem/>

Copernicus Open Access Hub:

- <https://scihub.copernicus.eu/>

Collaborative Data Hub:

- <https://colhub.copernicus.eu/>

New supported Sentinel Mission

Sentinel-5P



The Copernicus Sentinel-5 Precursor mission is the first Copernicus mission dedicated to monitoring our atmosphere.

The mission consists of one satellite carrying the TROPOspheric Monitoring Instrument (TROPOMI) instrument.

The **main objective** of the Copernicus Sentinel-5P mission is to perform atmospheric measurements with high spatial-temporal resolution, to be used for air quality, ozone & UV radiation, and climate monitoring & forecasting.

The Sentinel-5P data offer for the Open Access Hub will consist of Level-1B and Level-2 user products for the TROPOMI instrument.

Sentinel-5P Pre-Operations Data Hub:

- <https://s5phub.copernicus.eu/dhus>

New supported Sentinel Mission

Sentinel-5P



DHuS 2.0.0 fully supports dissemination of Sentinel-5P products, i.e. ingestion, metadata synchronization and remote synchronization are allowed.

Important notes:

- Dissemination File Type: netCDF (.nc)
- No quicklooks available.
- Footprint:
 - L1B Irradiance (S5P_L1B_IR) products have no footprint.

New DHuS core features

Eviction mechanism enhancement



Focus On available.

DHuS 2.0.0 introduces a re-design and implementation of the Eviction mechanism.

The following new features are now available in DHuS:

- **Customizable Eviction:**
 - **Hard Eviction:** it removes both physical products, product metadata, quicklooks and thumbnails.
 - **Soft Eviction:** it keeps the metadata, quicklook and thumbnail of the evicted products in the database and Solr.
- **Automatic On-Insert Eviction:** it allows a DataStore to automatically manage its size and perform a Soft Eviction if necessary.

New DHuS core features

Eviction mechanism enhancement

Relevant **enhancements**:

- **Multiple Customizable Evictions in a DHuS instance:** it is possible to configure different Evictions running according to different cron schedules.
- **Customizable Eviction with filters:** several properties (Filter, TargetCollection, KeepPeriod, Schedule, OrderBy, etc) can be configured to determine which products will be affected by a Customizable Eviction.
- **Eviction linking:** it is possible to link a Customizable existing eviction to a DataStore's configuration.

New DHuS core features

DataStores management



Focus On available.

DHuS 2.0.0 introduces an upgrade in the DataStores management.

A DataStore is a layer used by the DHuS to interface its data storage/s, local or remote.

The following DataStores are supported by DHuS:

- HFS DataStore
- Openstack DataStore
- GMP DataStore
- RemoteDHuS DataStore

New DHuS core features

DataStores management

HFS DataStore

DHuS can be configured to use an Hierarchical File System storage to archive products ingested or synchronized with copy.

This DataStore allows the correct interface towards the storage.

Openstack DataStore

DHuS can be configured to use an OpenStack Swift Object storage to archive products ingested or synchronized with copy.

Currently only OpenStack Swift Object storage is supported.

This DataStore allows the correct interface towards the storage.

New DHuS core features

DataStores management

GMP DataStore

DHuS implements a Sentinel-1 PDGS LTA component interface that allows the possibility to retrieve back from LTA Soft evicted products, restoring them on DHuS to be available for users.

The retrieval of Sentinel-1 products from PDGS components (ODA PACs and LTA) is possible via “Get My Products” (GMP) system.

Thanks to GMP DataStore, DHuS supports an interface with GMP software and it is able to correctly retrieve products from PDGS.

RemoteDHuS DataStore

DHuS implements an interface that allows the possibility to use another DHuS instance as if it is a read-only archive; it uses the OData interface of a remote DHuS instance in order to retrieve the data of products for downloads and nodes browsing.



Focus On available.

New DHuS core features

Footprint algorithm

DHuS 2.0.0 implements a new improved algorithm to manage footprints, including Sentinel-5P footprints.

It is applied on both DHuS core side, during ingestion, and AJS UI, for visualization on map.



New DHuS core features

netCDF cache

DHuS implements a temporary cache feature whose objective is to allow the support for the ingestion/inspection function of NetCDF-based files (e.g. Sentinel-5P, COSMO-SkyMed). This mechanism can be applied both in Single Instance and Scalability 2.0 modes.

New **configuration file**: `temporary_files_ehcache.xml`

New options in the `start.sh`:

- Enable/disable
- Cached files location

Ingestion (Back-End side)

The netCDF cache should be configured (on NAS or on local partition).

Inspection (Front-End side)

The netCDF cache should be configured only on local partition. If it is not possible to configure the netCDF cache on local partition, the suggestion is to not configure it at all.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 6.13, 7.18

New DHuS core features

Scalability 2.0



Focus On available.

Scalability is a DHuS application's ability to function correctly and maintain an acceptable user experience when used by a **large number of clients**.

The configuration reckon on **externalized SQL database** and **Solr** in order to have several DHuS instances acting as a **cluster** to share the workload.

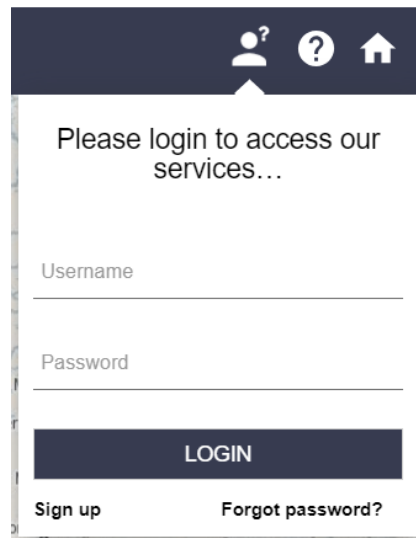
New DHuS AJS UI features

New login badge

DHuS 2.0.0 implements an improved login badge.

"Sign up" and "Forgot Password" links are now included in this new badge.

Text message to be displayed as Title is configurable via `appconfig.json` file.



Please login to access our services...

Username

Password

LOGIN

Sign up Forgot password?



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1.1

New DHuS AJS UI features

Map pan function and polygon selection upgrade

The management of the map pan function and polygon selection has been upgraded in DHuS 2.0.0.

New button on the up-right of the map.

This button allows the activation of the pan functionality and the draw selection functionality when the user clicks on it.



Two different **Modes**:

- Navigation Mode
- Area Mode



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1.8

New DHuS AJS UI features

Map pan function and polygon selection upgrade

Navigation Mode

- move the map using left button of the mouse.
- draw a polygon clicking on the right button of the mouse (each click draws a vertex) and closing the polygon on double click.
- draw a squared polygon clicking and shifting the mouse on the map (holding the click).

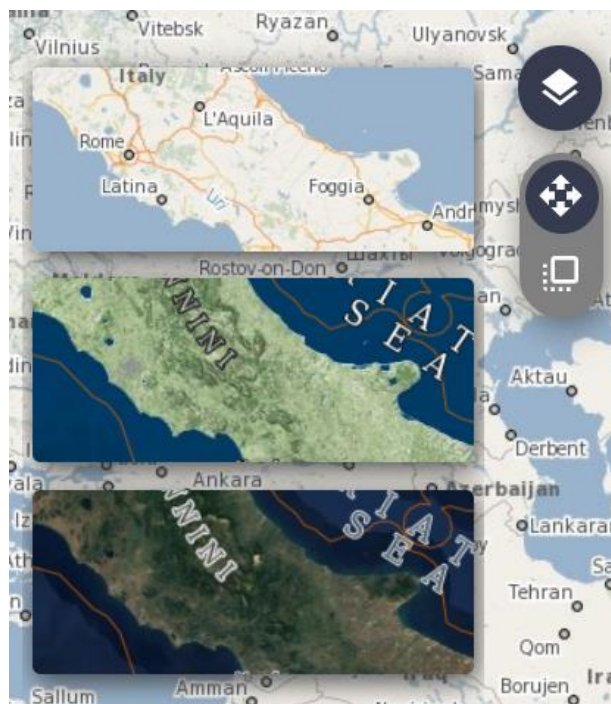
Area Mode

- move the map with the right button of the mouse.
- draw a polygon clicking on the left button of the mouse (each click draws a vertex) and closing the polygon on double click.
- draw a squared polygon when clicking and shifting the mouse on the map (holding the click).

New DHuS AJS UI features

Layer selection

The map layer panel presents a preview of the configured layers, centered on central Italy.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1.11

New DHuS AJS UI features

Layer attributions

With DHuS 2.0.0 it is possible to configure map layers attributions in order to display them in the lower right corner of the map.

Attributions can be configured properly in the `appconfig.json` file.

 Terrain: { Data © [OpenStreetMap](#) contributors and [others](#), Rendering © [MapServer](#) and [EOX](#) }; Overlay: { Data © [OpenStreetMap](#) contributors, Processing & Rendering © [MapServer](#) and [EOX](#) }



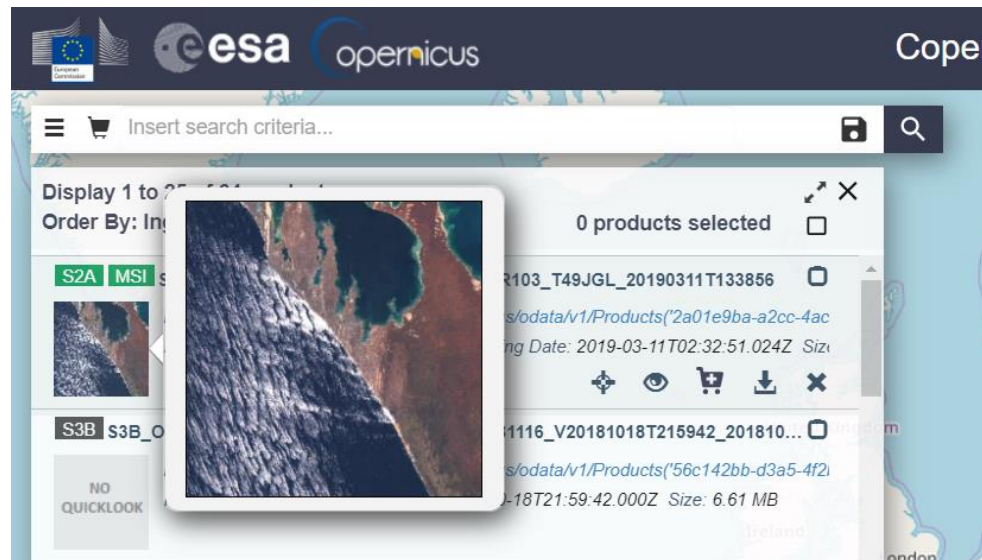
Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1.9

New DHuS AJS UI features

Thumbnail enlargeable at mouseover

DHuS 2.0.0 allows enabling the popover feature to enlarge thumbnail on mouseover.

This feature can be enabled in the `appconfig.json` file.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1.14

New DHuS AJS UI features

Cart feature improvement

DHuS 2.0.0 implements an improvement in the Cart feature.

Cart can be viewed as result, with relevant products footprints loaded on the map.

The screenshot displays the Copernicus Open Access Hub interface. On the left, a sidebar titled "Your cart contains 5 products. Display 1 to 5 of 5 products." lists four products (the fifth is partially obscured):

- S2A MSI** S2A_MSIL1C_20190418T113321_N0207_R080_T28RFT_20190418T...
Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('861ca...](https://scihub.copernicus.eu/dhus/odata/v1/Products('861ca...)
Mission: Sentinel-2 Instrument: MSI Sensing Date: 2019-04-18T11:33:21.024.
- S1B SAR-C** S1B_IW_SLC__1SSV_20190418T170031_20190418T170057_015...
Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('24937c...](https://scihub.copernicus.eu/dhus/odata/v1/Products('24937c...)
Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2019-04-18T17:00:31.2.
- S3A OLCI** S3A_OL_2_LRR____20190418T144837_20190418T153252_201904...
Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('4cd6ff...](https://scihub.copernicus.eu/dhus/odata/v1/Products('4cd6ff...)
Mission: Sentinel-3 Instrument: OLCI Sensing Date: 2019-04-18T14:48:36.913
- S1A SAR-C** S1A_WV_SLC__1SSV_20190417T230618_20190417T232243_02...
Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('608be...](https://scihub.copernicus.eu/dhus/odata/v1/Products('608be...)
Mission: Sentinel-1 Instrument: SAR-C Sensing Date: 2019-04-17T23:06:18.7

At the bottom of the list, it says "Products per page: 25 << < page: 1 of 1 > >>".

On the right, a world map shows the footprints of these products as colored polygons. A blue footprint is visible in the North Atlantic, an orange footprint in the Mediterranean, and a red footprint in the Indian Ocean. The map includes standard navigation controls on the right side.

New DHuS AJS UI features

Shapefile support

DHuS 2.0.0 supports Shapefile in AJS UI as geographical filter to select an AOI on the map.

Shapefile can be loaded:

- via drag&drop on map;
- Via Advanced Search Panel.

Maximum size and maximum number of points used by DHuS to re-construct the AOI are configurable in the `appconfig.json` file.

Limitations:

- Only files with extension `.shp` are supported;
- Only boundaries Shapefiles, i.e. containing one record of type POLYGON, are supported.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1.4

Major Bug Fixes

OData filters with boolean operators

DHuS 2.0.0 allows to perform properly OData queries mixing AND and OR operators.

This fix can enhance also the Synchronizers filter configuration.

Synchronizers stuck due to OData failure

Synchronizer Last Creation Date no more stuck after an OData failure occurred with DHuS 2.0.0.

Synchronizer no more slowed due to products skipping action before getting new fresh products.

Synchronization gaps

No more synchronization gaps are present with DHuS 2.0.0.

Synchronizer has been improved avoiding this problem.

Performances Improvements

Database optimization

DHuS 2.0.0 implements an optimization of the DHuS database schema to improve performances and to reduce the occupied size on disk.

The optimization has been achieved performing the following modifications:

- Upgrade of HSQLDB to v2.4.0;
- Removal of unused indexes;
- Removal of unused tables;
- Modification of some tables:
 - field "processed" removed from table `PRODUCTS`
 - METADATA tables rework (Create table `METADATA_DEFINITION`, Drop columns in table `METADATA_INDEXES`)
- Addition of some indexes:
 - on `user_roles` (`roles`, `user_uuid`)
 - on `collections` (`name`)

Because of the optimization, Database migration from DHuS old versions is needed. This action has an impact on DHuS start, requiring a certain amount of time to execute the migration and this shall be taken into account when planning the TTO.

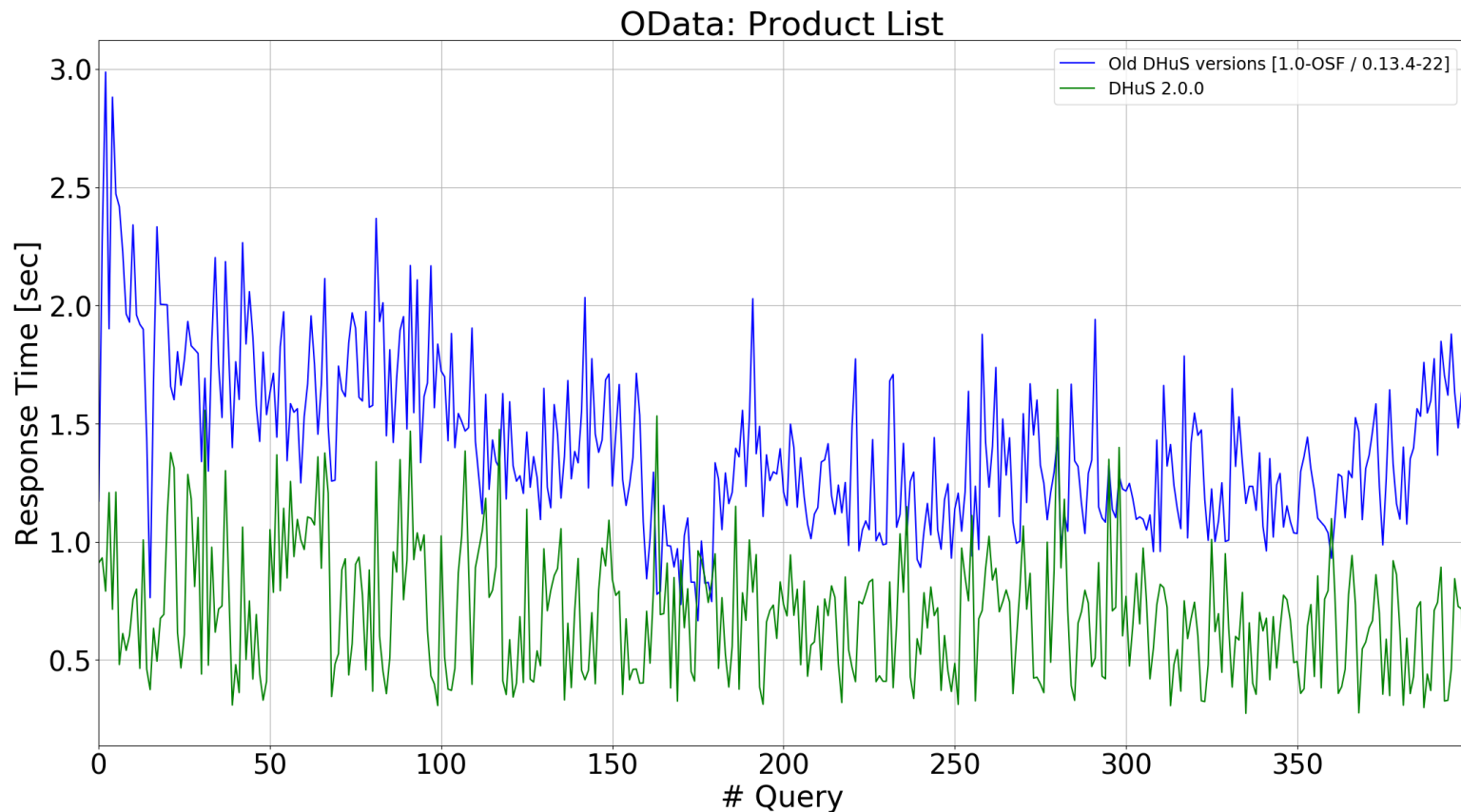
Database migration will be performed just during the first DHuS start action with DHuS 2.0.0 release.



Performances Improvements

Query response times optimization

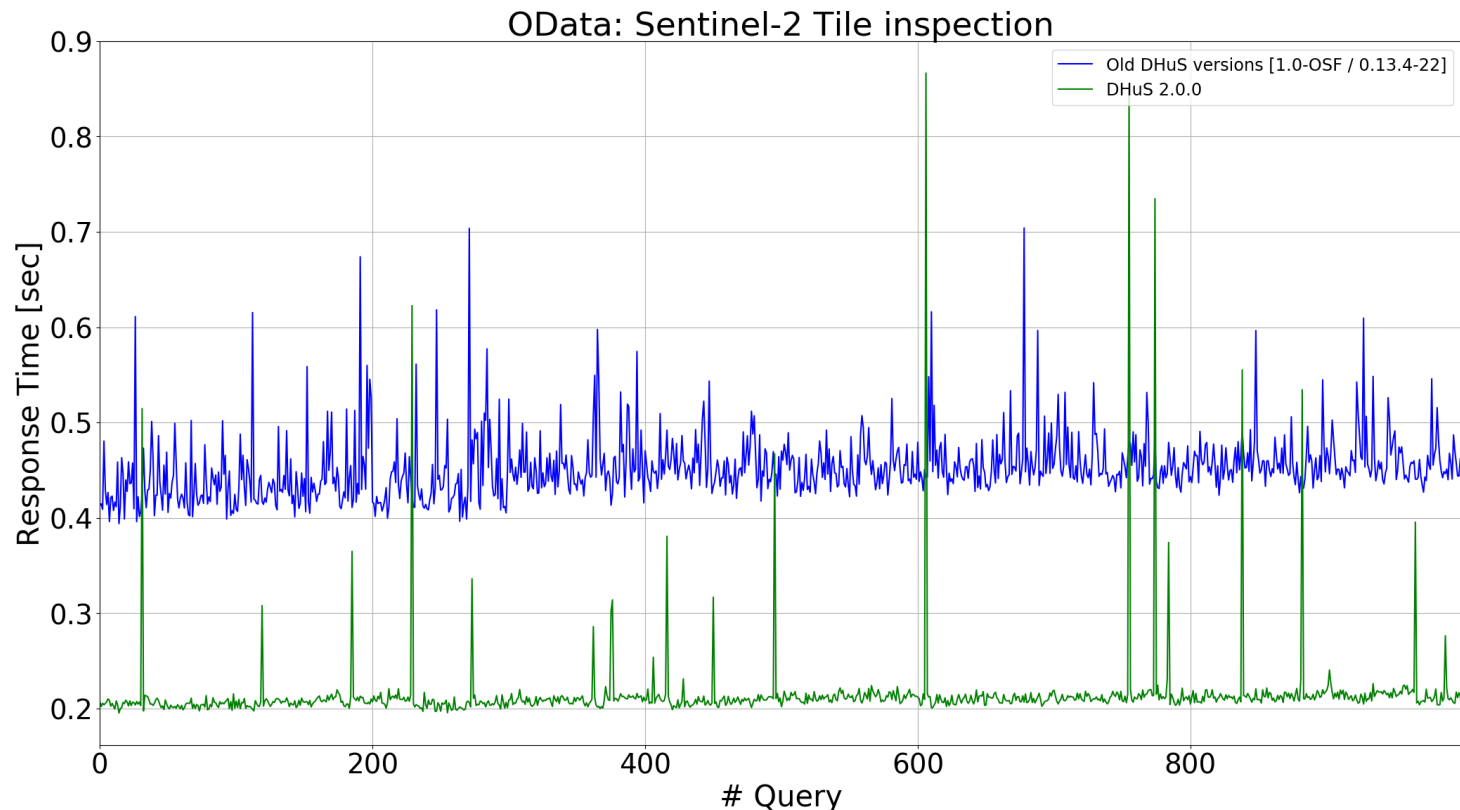
```
http://[DHUS_HOST]/Products?$skip=50i&$top=50
```



Performances Improvements

Query response times optimization

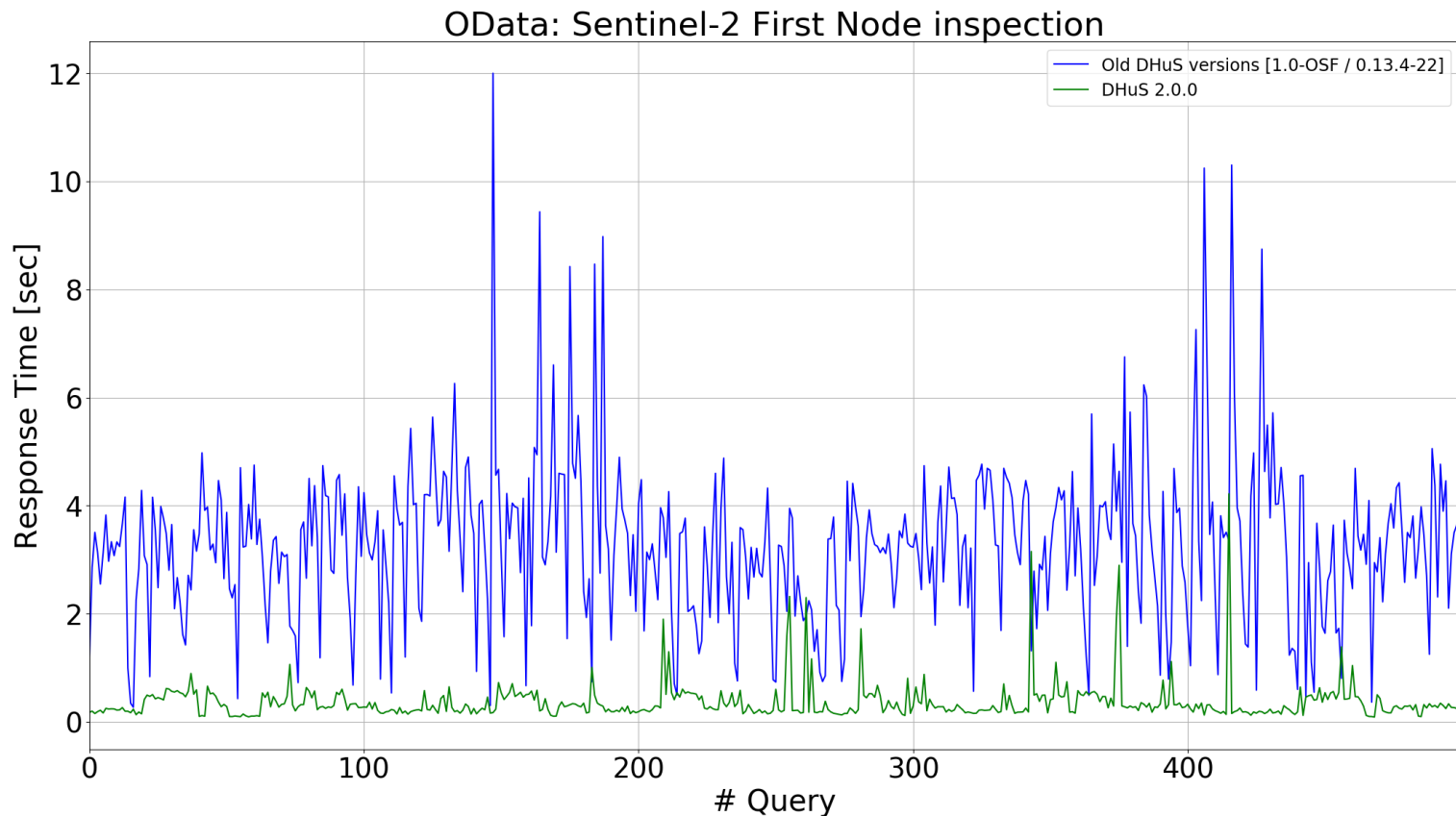
```
http://[DHUS_HOST]/Products('UUID')/Nodes('PRODUCTNAME.SAFE')/  
Nodes('GRANULE')/Nodes('TILE ID')/Nodes('IMG_DATA')/Nodes
```



Performances Improvements

Query response times optimization

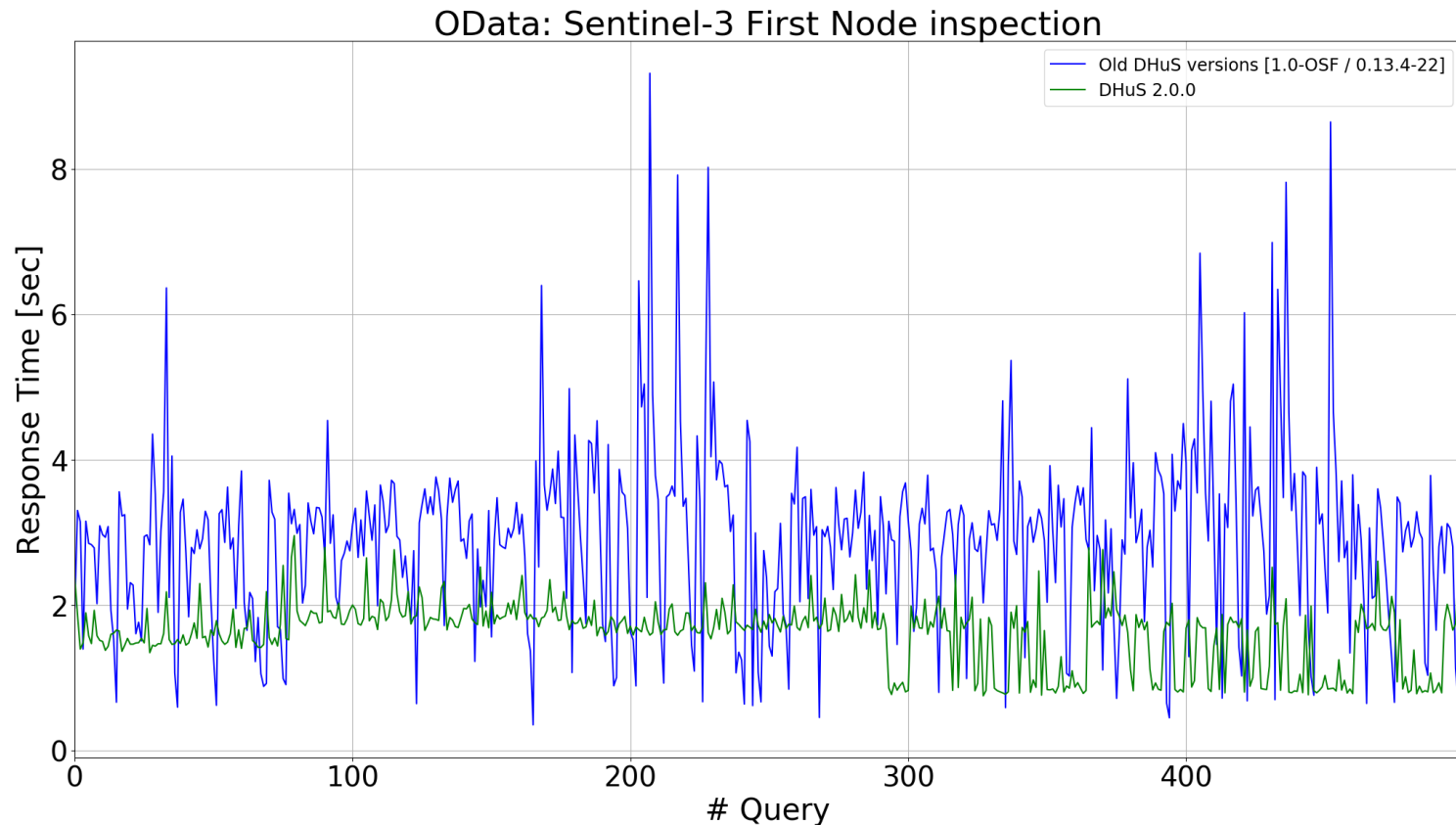
```
http://[DHUS_HOST]/Products('UUID')/Nodes('PRODUCTNAME.SAFE')/Nodes
```



Performances Improvements

Query response times optimization

```
http://[DHUS_HOST]/Products('UUID')/Nodes('PRODUCTNAME.SEN3')/Nodes
```



Known Limitations

AJS Graphical User Interface

- Enlarged thumbnails loaded in wrong position.
- Login session not correctly managed using multiple users at login actions.
- Shapefile import feature not working well. Reconstructed polygons present some intersection. It is recommended to disable it.
- DataStore management via GUI: DHuS 2.0.0 implements a beta-version not fully tested. The use is not recommended.
- Graticule implementation on map not working well. It is recommended to disable it.

Known Limitations

Performances

- RemoteDHuS DataStore functionality: “Connection Closed” errors avoid overload during parallel inspection of Safe evicted products but prevent user are properly served: empty nodes or exception occurrences are returned to users.

Sentinel-1 Quicklooks

- Quicklook generation exceptions could occur during ingestion process for Sentinel-1 products. As result, ingestion process for S-1 products is successfully achieved but products could not present quicklooks in the catalogue.

New management of configuration files

updateConfiguration.sh

A script named `updateConfiguration.sh` for converting the `dhus.xml` file of previous DHuS version is included in the DHuS 2.0.0 distribution.

This script converts the `dhus.xml` file coming from previous DHuS versions in order to make it compliant with the current configuration implementation.

The `<system:archive><system:archive/>` section will be automatically modified in order to remove, if present, the `OldIncoming` configuration and convert the `OldIncoming` storage in the related `HFSDataStore` storage.

How to launch:

```
./updateConfiguration.sh /path/to/DHuS_inst_folder/etc/dhus.xml
```



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 11

New management of configuration files

dhus.xml

With DHuS 2.0.0, configurations previously stored in the database are available in the dhus.xml file.

Details concerning a subset of functionalities are displayed in the dhus.xml: Scanners, Synchronizers, DataStores, Evictions

When configurations are updated by administrator, via OData or GUI, changes are reported in the dhus.xml file.

After the first DHuS start, dhus.xml file is automatically reshaped by the DHuS.

As the dhus.xml is automatically saved by the DHuS, comments cannot be preserved and the variables are replaced by their value when parsing the XML at boot.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 8.1

New management of configuration files

temporary_files_ehcache.xml

It allows to configure the size management for netCDF cache.

It is possible to:

- limit the number of files that can be created in the cache (`maxBytesLocalDisk` parameter)
- limit the total size of the cache (`maxBytesLocalDisk` parameter)

In order to configure the `maxBytesLocalDisk` parameter with the appropriate size preventing errors due to cache too small, please refer to the following formula:

$$\text{maxBytesLocalDisk [byte]} = \text{corePoolSize} * \text{maximumSize} * 1.3$$


netCDF cache can be shared between the DHuS nodes deployed in Scalability 2.0 via a proper configuration.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 8.7

New management of configuration files

dhus_ehcache.xml

DHuS 2.0.0 supports Ehcache caching mechanism.

A default configuration is loaded at DHuS start; details are present in the `dhus_ehcache_distributed.xml` file in the `etc` folder.

Ehcache has the notion of a group of caches that can be configured individually.

To change the cache configuration, a dedicated `dhus_ehcache.xml` file should be created.

New management of configuration files

AJS UI appconfig.json

The configurability of the AJS UI allows a wide set of configuration actions, which do not need a restart of DHuS to be applied.

The file in charge of the GUI configuration management is located in:

- `<DHuS_INST_FOLDER>/etc/conf/appconfig.json`



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Section 9.1

Break



15min

Focus On: Database migration procedure

Recommendation

- Stop the old DHuS version present in the VM.
- Perform a backup of SQL database and Solr (contained in the `var` folder) before migrating to DHuS 2.0.0 version.
- Read documentation provided (i.e. Administration Manual and software Release Note).

Procedure

- a) Download and install DHuS 2.0.0.
- b) Backup configuration files (`start.sh`, `dhus.xml`, `server.xml`, etc) coming from the distribution.
- c) Copy configuration files from previous DHuS version in the DHuS 2.0.0 installation folder.
- d) Create the `var` folder and copy in it the backedup SQL database and Solr.
- e) Run the `updateConfiguration.sh` script.
- f) Start DHuS.

Focus On: Database migration procedure

After the migration

The `dhus.xml` file will be modified as follows:

- The Incoming folder configuration, if present, is moved in the `datastore` section;
- All DataStores are displayed and reported in the proper section;
- Configured eviction is moved in the eviction section;
- All Synchronizers present in the database are reported in the proper section;
- A section dedicated to fileScanners is present containing all the Scanners configured in the database;
- the `errorPath` and `trashPath` folders configuration are isolated and present in the system section.

Focus On: Eviction management

Customizable Eviction

Evictions can be inspected and configured, by users with the role `SYSTEM_MANAGER`, using the Evictions Entity on the DHuS OData v4 API:

- `https://[DHUS_HOST]/odata/v2/Evictions`

Customizable Evictions can be managed via OData API and AJS UI.

Possible **Actions**:

- Creation
- Update
- Stop
- Deletion
- Queuing

Actions can be performed at runtime, when DHuS is running.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 5.9.1, 7.10.1, 7.10.2

Focus On: Eviction management

Automatic On-Insert Eviction

DataStores can automatically manage its size and perform a **Soft Eviction** if necessary.

This eviction is tied to the DataStore configuration and all related actions can be performed via OData API when DHuS is running or before startup using dhus.xml.

Relevant **Properties**:

- AutoEviction
- MaximumSize
- CurrentSize

Trigger = insertion of products in the DataStore.

Eviction **Strategy** = FIFO



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 5.9.2, 7.10.4

Focus On: Eviction management

Automatic On-Insert Eviction

An On-Insert Automatic Eviction can be configured so that it can follow the same eviction rules allowed using a Customizable eviction.

Products contained in a specific DataStore can be evicted following the rules defined by the properties of the linked Customizable eviction.

Trigger = same as the Automatic On-Insert Eviction, i.e. insertion of products in the DataStore.

Linking Eviction: an existing eviction configuration can be linked to a DataStore configuration.

Products can be evicted on the basis of the KeepPeriod property together with size criteria, meaning that products will be evicted only if the size threshold is exceeded and the selected KeepPeriod is elapsed as well.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 5.9.2, 7.10.4

Focus On: DataStores management

Overview

Users with the role SYSTEM_MANAGER can access the DataStore Entity and update its entries using the DHuS OData v4 API:

- `https://[DHUS_HOST]/odata/v2/DataStores`

DataStores can be managed via OData API and AJS UI.

Possible **Actions**:

- Creation
- Update
- Delete
- List products contained in the Datastore

Actions can be performed at runtime, when DHuS is running.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 6.1.2, 7.16

Focus On: DataStores management

DataStores properties

Common properties

PROPERTY	DESCRIPTION
Name	The reference property. It is unique, cannot be null, and cannot be updated.
ReadOnly	Determines whether data can be written on this DataStore. Please note that it does not mean that the entity itself is read-only.
Priority	Represents the priority with which DataStores are accessed within the system. DataStores with the smallest priority are accessed first.
MaximumSize	Represents the threshold beyond which a DataStore will attempt to free enough space during Automatic On-Insert Eviction.
CurrentSize	Counter of the current size of a DataStore.
AutoEviction	Parameter that allows to active an Automatic On-Insert Eviction on the DataStore.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 6.1.2, 7.16

Focus On: DataStores management

DataStores properties

HFS DataStore properties

PROPERTY	DESCRIPTION
Path	Local storage path.
MaxFileDepth	Maximum number of sub-folder for each stage.
MaxItems	Maximum number of file stored in each folder.

```
{
  "@odata.type": "#OData.DHuS.HFSDataStore",
  "Name": "HFSDataStore_Name",
  "ReadOnly": false,
  "Priority": 0,
  "MaximumSize": 1000000,
  "CurrentSize": 0,
  "AutoEviction": true,
  "Path": "/path/to/incoming/folder",
  "MaxFileDepth": 10,
  "MaxItems": 1024
}
```



Focus On: DataStores management

DataStores properties

Openstack DataStore properties

PROPERTY	DESCRIPTION
Provider	Provider service to use, only "openstack-swift" is currently available.
Identity	Identifier for the authentication service. The syntax is the following: tenantName:tenantId
Credential	Credential of the Openstack account to be used.
Url	URL of Openstack authentication service.
Region	The region is linked to the Openstack account.
Container	Name of the container to be used.

```
{
  "@odata.type": "#OData.DHuS.OpenStackDataStore",
  "Name": "Openstack_DataStore_Name",
  "ReadOnly": false,
  "Priority": 0,
  "MaximumSize": 1073741824,
  "CurrentSize": 0,
  "AutoEviction": false,
  "Provider": "openstack-swift",
  "Identity": "tenantName:tenantId",
  "Credential": "password",
  "Url": "https://auth.cloud.ovh.net/v2.0",
  "Region": "SBG3",
  "Container": "Container_Name"
}
```



Focus On: DataStores management

Useful notes

In an BE-FE scenario with HFS storage, when a metadata synchronizer is created on FE, an HFS DataStore is automatically created pointing to the Remote Incoming folder containing the products ingested by BE.



Multiple DataStores can coexist in DHuS; each DataStore is independent from the others.



During the ingestion or remote synchronization process, products are stored in all DataStores with write access (i.e. "ReadOnly": false).

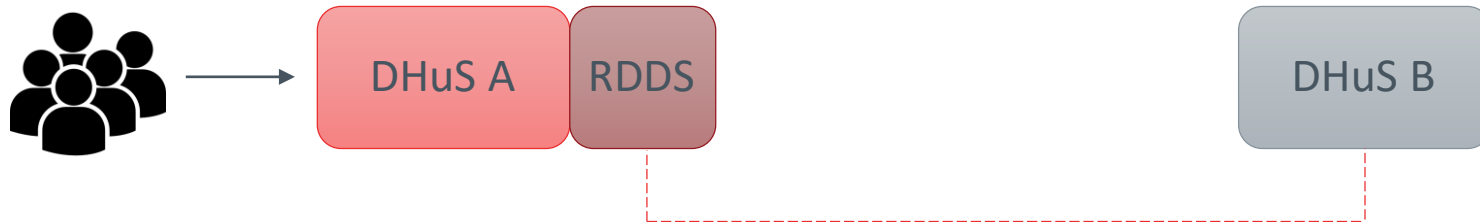


Focus On: RemoteDHuS DataStore

Overview

DHuS implements an interface that allows the possibility to use another Remote DHuS instance as a read-only archive.

The connection between the DHuS and Remote DHuS is possible via the configuration of a RemoteDHuS DataStore in the DHuS instance exposed to the end users.



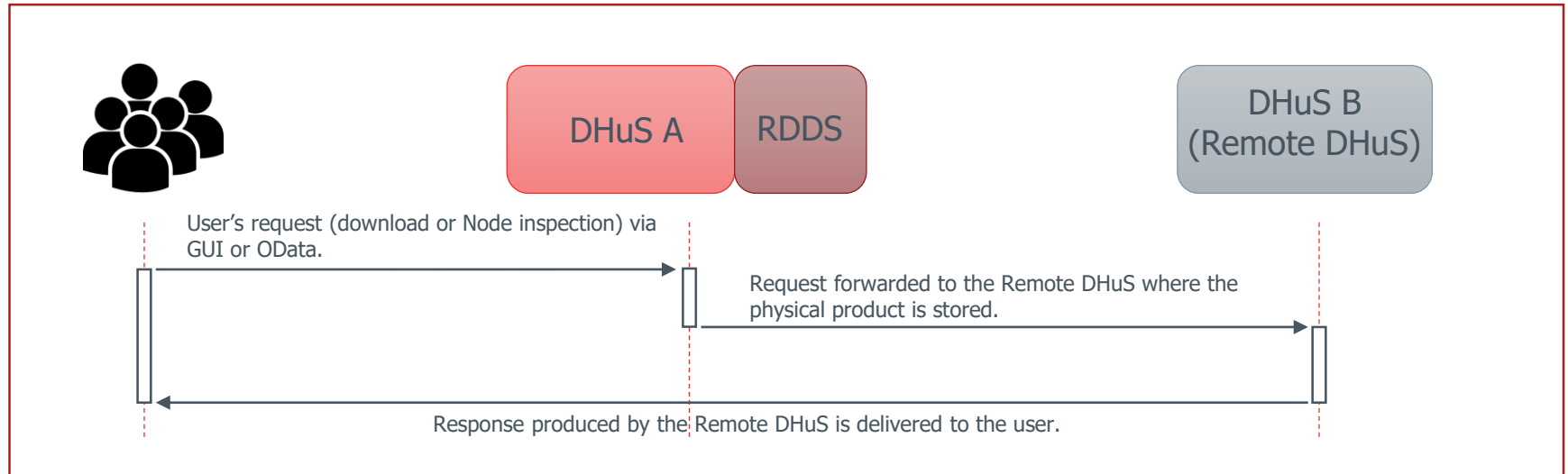
The OData interface of the Remote DHuS instance is used to retrieve the data of products for downloads and nodes browsing.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 5.12, 7.20

Focus On: RemoteDHuS DataStore

Overview



In this scenario, products are physically removed from DHuS A thanks to a dedicated Eviction, i.e. **Safe Eviction**.

Products UUIDs must be the same between Front-End instance (DHuS A) and Remote DHuS.

DHuS A acts as a user of DHuS B; there should be no download quotas configured on DHuS B. DHuS B should not be exposed to end users.



Focus On: RemoteDHuS DataStore

RemoteDHuS DataStores properties

PROPERTY	DESCRIPTION
ServiceUrl	The URL of the OData "v1" service of the Remote DHuS instance.
Login	The login to be used to request the Remote DHuS instance.
Password	The password to be used to request the Remote DHuS instance.

```
{
  "@odata.type": "#OData.DHuS.RemoteDHuSDataStore",
  "Name": "RemoteDHuSDataStore_name",
  "ServiceUrl": "https://[REMOTE_DHUS_HOST]/odata/v1",
  "Login": "testuser",
  "Password": "testpassword",
  "Priority": 150,
  "ReadOnly": true
}
```



The RemoteDHuS DataStore behaves as read-only regardless of its ReadOnly parameter.

Focus On: RemoteDHuS DataStore

Safe Eviction

A dedicated functionality in the OData v4 Eviction API is present in order to allow the physical deletion of products from the original storage in a **safe** way.

This operation Soft-evicts products from a single DataStore **only** if those products are available in another DataStore (e.g. the RemoteDHuS DataStore).

After a successful Safe Eviction, the Data Hub updates the LocalPath OData property showing the OData download path of the Remote DHuS instance:

- `<d:LocalPath>`
`https://[REMOTE_DHUS_HOST]/odata/v1/Products('UUID')/$value`
`</d:LocalPath>`

This kind of eviction can be only queued manually.
Every Customizable Soft Eviction can be triggered in Safe mode targeting only a specific DataStore.



Administration Manual, SPA-COPE-DHUS-UM-001, Issue 2.3.2
Sections 5.12, 7.10.3

Focus On: Scalability 2.0

The actors for the deployment of DHuS in Scalability 2.0 are:

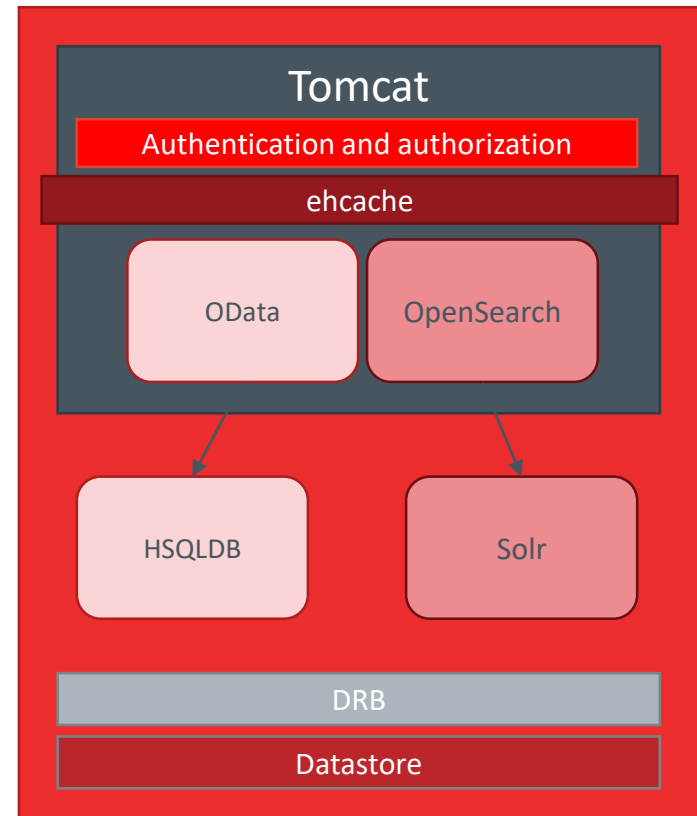
- **SQL Database:** it is installed as service on a machine different from the ones hosting DHuS services.
- **No-SQL Database:** it is installed as service on a machine different from the ones hosting DHuS services. So far, only Solr software is supported.
- **DHuS Master:** The DHuS master is the one in charge of the ingestion/synchronization of products. Please note that the DHuS master is functionally equivalent to the DHuS nodes.
- **DHuS Nodes:** The DHuS nodes are DHuS instances towards which the user traffic is redirected from proxy. It is mandatory that master and nodes share the same DataStores to allow access to ingested/synchronized products.
- **Proxy:** A proxy is needed for load balancing the requests among the nodes. It must be configured to redirect incoming traffic to the DHuS nodes based on a load balancing algorithm.

Focus On: Scalability 2.0

DHuS Architecture

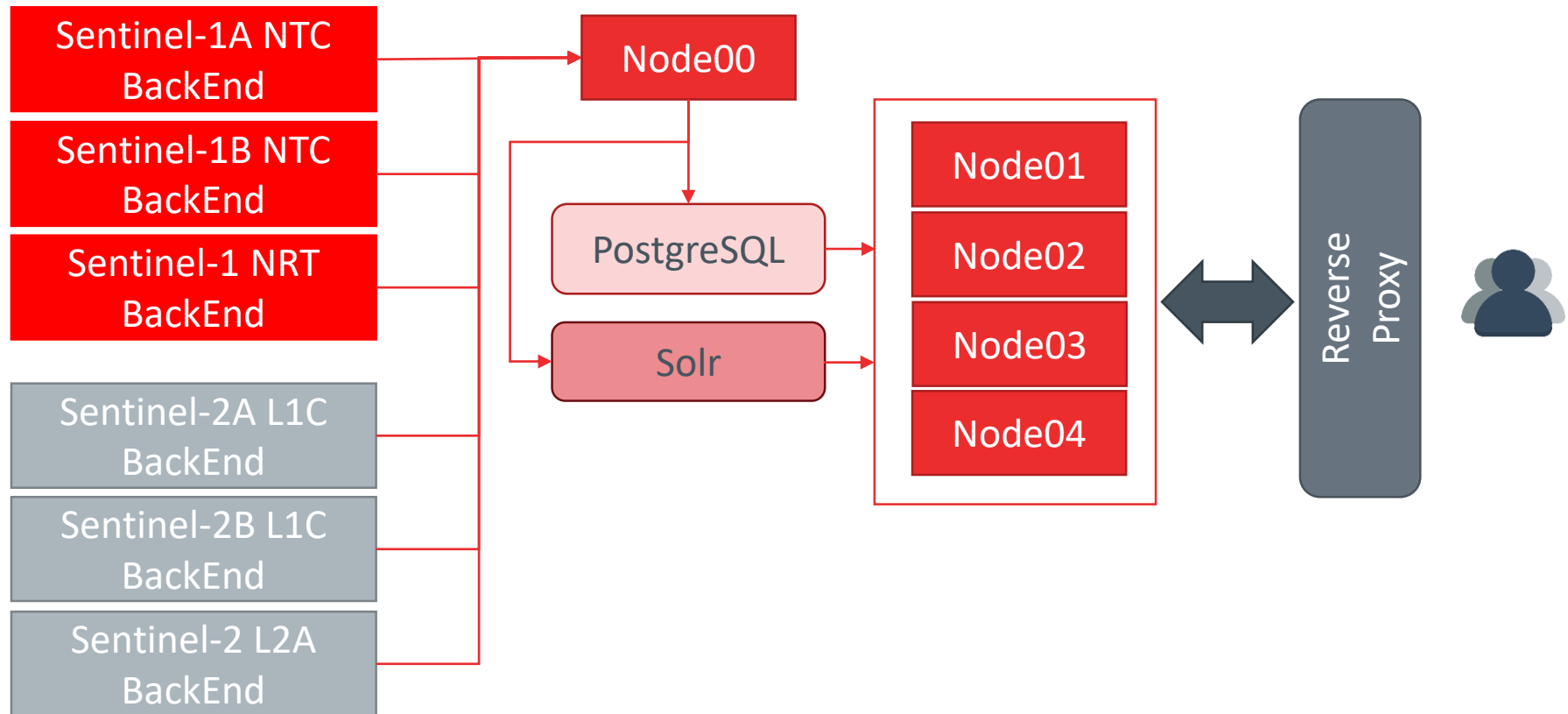
Software technologies used in DHuS:

- A web server – **Tomcat embedded**
- A authentication and authorization layer – **Spring Framework**
- A cache layer – **ehcache embedded**
- An ORM (Object/Relational Mapping) – **Hibernate**
- A relational data base – **HSQLDB embedded**
- A full text search database – **Solr embedded**
- A data and metadata replication system – **Synchronizers**
- A data processor – **DRB**
- A data storage interface – **Datastore**



Focus On: Scalability 2.0

Deploy example



Focus On: Scalability 2.0

Configurations file – dhus.xml

The dhus.xml contains the configuration of which type of SQL database the DHuS will use, the URI and the credential to access it.

```
<system:database
  dumpPath=""
  JDBCDriver="org.postgresql.Driver"
  hibernateDialect="org.hibernate.dialect.PostgreSQLDialect"
  JDBCUrl="jdbc:postgresql://XXX.XXX.XXX.XXX:5432/datahub"
  login="dhus" password="password"
/>
```



DHuS external DB Installation and Configuration Manual
COPE-SERCO-TN-17-0140, Issue 1.2, Sections 3.2.4.3

Focus On: Scalability 2.0

Configurations file – dhus.xml

The dhus.xml contains the configuration of which method the DHuS will use to connect with Solr, the URL and the core of Solr.

The simplest way to use Solr in the Scalability 2.0 is solrStandalone:

```
<search:solrStandalone  
  serviceURL=http://XXX.XXX.XXX.XXX:8983/solr/dhus  
>
```

SolrCloud and Apache zookeeper are also supported.



DHuS external DB Installation and Configuration Manual,
COPE-SERCO-TN-17-0140, Issue 1.2, Sections 3.2.4.3

Focus On: Scalability 2.0

Configurations file – server.xml

The server.xml will configure the embedded Tomcat server. Tomcat will be configured to create a cluster to allow the replication of sessions among the DHuS nodes.



DHuS external DB Installation and Configuration Manual,
COPE-SERCO-TN-17-0140, Issue 1.2, Sections 3.2.4.4

Focus On: Scalability 2.0

Configurations file – dhus_ehcache.xml

The dhus_ehcache.xml is the configuration file for the caching layer, internally the DHuS is using Ehcache.

Ehcache will be configured to replicate point-to-point the items from one DHuS node to another DHuS node via RMI protocol.

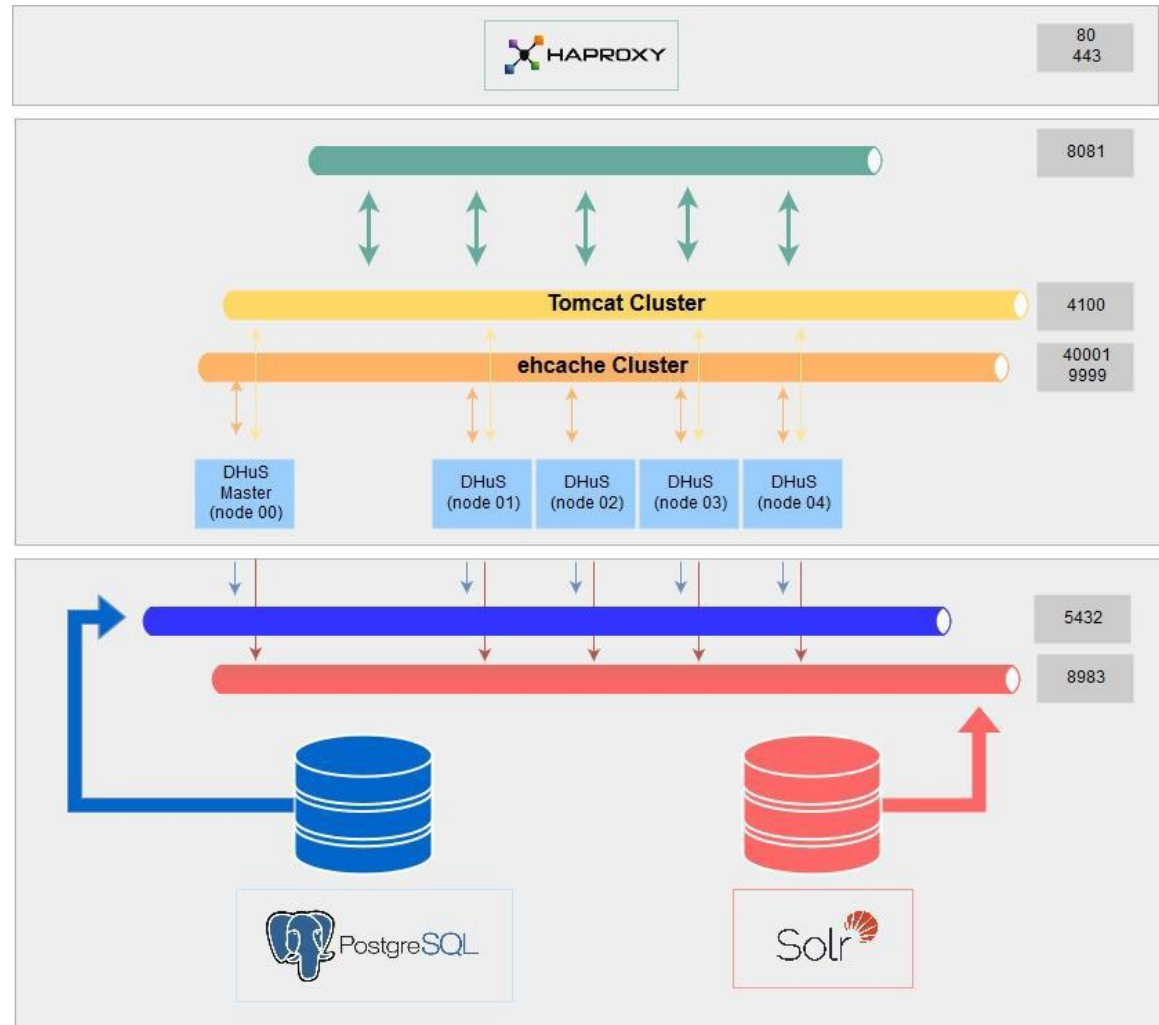


DHuS external DB Installation and Configuration Manual,
COPE-SERCO-TN-17-0140, Issue 1.2, Sections 3.2.4.5

Focus On: Scalability 2.0

Network requirements

- 80/443 TCP – HTTP/HTTPS connection between users and the proxy
- 8081 TCP – Tomcat incoming connection
- 4100 TCP – Tomcat cluster session replication, heartbeat, etc ...
- 40001/9999 TCP – ehcache cluster replication
- 5432 TCP – PostgreSQL connections
- 8983 TCP – Solr connections



Break



15min



Q&A session

