SOFTWARE USER MANUAL

Role/Title	Name	Signature	Date
Author	DAFNE Team		27/07/2022
Verified/Approved	DAFNE Team		27/07/2022

Change Register

Version/Rev.	Date	Change	Reason
1.0	18/12/2021	All	First Release
1.1	02/02/2022	Add section 2 Improved sections: 1, 4.1, 4.2, 4.3, 4.4	Updated for OSF release
1.2	28/03/2022	Add section 6	Updated for metrics addition
1.3	24/05/2022	Improved sections: 1, 2, 3, 4, 6	Update for DAFNE 2.0.2 release
1.4	30/06/2022	Improved section: 6	Update for DAFNE 3.0.0 release
1.5	27/07/2022	Improved all sections and updated pictures.	Update for DAFNE 3.0.2 release

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1. Introduction

The Dataflow Network Environment (*DAFNE*) is the Consortium response to the Collaborative GS users need for a strong dataflow visualization and control solution.

The aim of DAFNE is to give to DHS stakeholders an intuitive and modern interface for managing the dataflow massively lowering down the need for log checking or manual interventions.

It is designed as a powerful plug-and-play visualization tool exposing a standard HTTP interface for harvesting data to be visualized.

In terms of visualization and control the system oversees:

- **Archive Info**
  - o *Visualization* of the Rolling Policy of the Front-End instance of the local centre (or single instance) managed by DAFNE
- **Data Sources Info**
  - o *Active data sources*: visualization on a dedicated panel and over a network map of the data providers from which the Back-End instances of the local centre retrieves data (or single instance)
  - o *Number of DHS connected*: visualization on a dedicated panel and over network map of the centres that retrieve the data from the Front-End instance of the local centre (or single instance)
- **Synchronization Info**
  - o *Visualization* on a dedicated panel and over a network map of the configured synchronizers of the local centre
  - o *Configuration* of the synchronizers: it is possible, through specific panel, to change the current configuration of the synchronizers. In addition, it is also possible to add, edit or remove a new synchronizer to the local centre, directly from the DAFNE GUI
  - o *Control* of the synchronizers: it is possible, through specific panel, to start/stop the synchronization processes
- **Completeness**
  - o *Visualization* of the number of products published in every configured centres.
- **Service Availability**
  - o *Visualization* of the availability of the local centre (Front-End or Single Instance) over a limited period, shown on a chart.
- **Publication Latency**
  - o *Visualization* of the products publication latency referred to a given centre, over a limited period.

1.1.   Purpose and Scope

This document is a comprehensive guide of the Data Flow Network Environment (*DAFNE*) and provides help for interpreting the information presented. This document has been prepared in the frame of the Collaborative Data Hub Software Maintenance and Evolution Services for Digital Twin Earth (*hereinafter referred to as the "Service"*). This document applies to DAFNE version 3.0.0.

The overall structure of the document is described below:

- Chapter 1 is an introduction with reference and applicable documents

- Chapter 2 explains the concepts
- Chapter 3 contains the getting started section
- Chapter 4 describes the configuration details about the system
- Chapter 5 explains the dataflow visualization
- Chapter 6 refers to the metrics

1.2. Applicable and Reference Documents

ID	Document Title	Reference	Issue
AD-1.	Statement of Work: Collaborative Data Hub Software - Maintenance and Evolution Services - Ready for Digital Twin Earth	ESA-EOPG-EOPGC-SOW-12	1.0
AD-2.	Collaborative Data Hub Software - Maintenance and Evolution Services - Ready for Digital Twin Earth - System Requirements Specification (SRS)	COPE-SERCO-RD-21-1177	3.0

Table 1 Applicable Documents

ID	Document Title	Reference	Issue
RD-1.	DHS Operational Concept Document	COPE-SERCO-TN-21-1174	
RD-2.	DAFNE System Design Document_1.3	ALIA-DAFNE-SDD-21-0001 DAFNE System Design Document	1.3
RD-3.	DAFNE Installation and Configuration Manual	ALIA-DAFNE-ICM-2021-0001_Installation_and_Configuration_Manual	1.5
RD-4.	DHuS Administration Manual	SPA-COPE-DHUS-UM-001-DHuS-Administration Manual	2.11
RD-5.	Collaborative Data Hub Software - Maintenance and Evolution Services - Ready for Digital Twin Earth - System Requirements Specification (SRS)	COPE-SERCO-TN-21-1171	1.0

Table 2 Reference Documents

1.3. Acronyms

Acronym	Description
API	Application Programming Interface
CPU	Central Processing Unit
DB	Database
DAFNE	Data Flow Network Environment
DHS	Data Hub Software
DHR	Data Hub Relay
DHuS	Data Hub Service
EO	Earth Observation
ESA	European Space Agency
HTTP	Hyper Text Transfer Protocol
IDP	Identity Provider
JSON	JavaScript Object Notation
RAM	Random Access Memory
TCP	Transmission Control Protocol
URL	Uniform Resource Locator
VM	Virtual Machine

2. Concepts

This section describes the fundamental concepts behind DAFNE.

- **Local Centre**
    - o It is the centre that DAFNE will monitor allowing to visualize for that centre:
        - ▪ Synchronization from external data hubs towards all the local Back-Ends
        - ▪ Eviction configured in the local Front-End
        - ▪ External data hubs that retrieve data from the local Front-End
    - o The kind of services that can be associated to the local centre, i.e.: the services that DAFNE will be able to monitor are:
        - ▪ Multiple Back-End instances
        - ▪ 1 Front-End instance

        or alternatively

        - ▪ 1 Single Instance
        - ▪ 1 DAS Instance
        - ▪ 1 PRIP Instance
        - ▪ 1 LTA Instance
- **Synchronization**
    - o In the context of DAFNE the synchronization is always related to Back-End instances or Single Instance associated to the local centre (*i.e.: services configured with Service Type: Back-End associated to the local centre*)
    - o When a synch is created via DAFNE, the URL of the desired Back-End associated to the local centre can be selected.
- **Completeness**
    - o In the context of DAFNE the completeness is related to Front-End, DAS, PRIP or LTA instances, meaning that DAFNE will report the results of the selected query for all the services configured with Service Type: Front-End, DAS, PRIP, LTA in the Service page (*or single instance*)
- **Metrics**
    - o There are two measurements taken by DAFNE: Service Availability of the Local Centre Front-End or Single Instance and Publication Latency of its products.

3. Getting Started

This section describes the first steps in the DAFNE application: how to access and navigate between panels and a general description of the graphical user interface.

3.1.　Accessing DAFNE

DAFNE is a web application and is accessible from the web browser. It can be installed on a local VM or it can be hosted on a web server (*Please refer to RD-3 for installation details*).
First time the user reaches the application URL, a login dialog is displayed.
DHS Admin or DHS User logins into DAFNE and credentials are checked thanks to the interface between DHS IAM and DAFNE.

DAFNE manages two user roles as defined in RD-1:

- **Dataflow Manager** (*this role allows DHS Actors to visualize, manage, configure DAFNE*)
- **Dataflow Viewer** (*this role allows DHS Actors to visualize all the information shown and reported by DAFNE*)
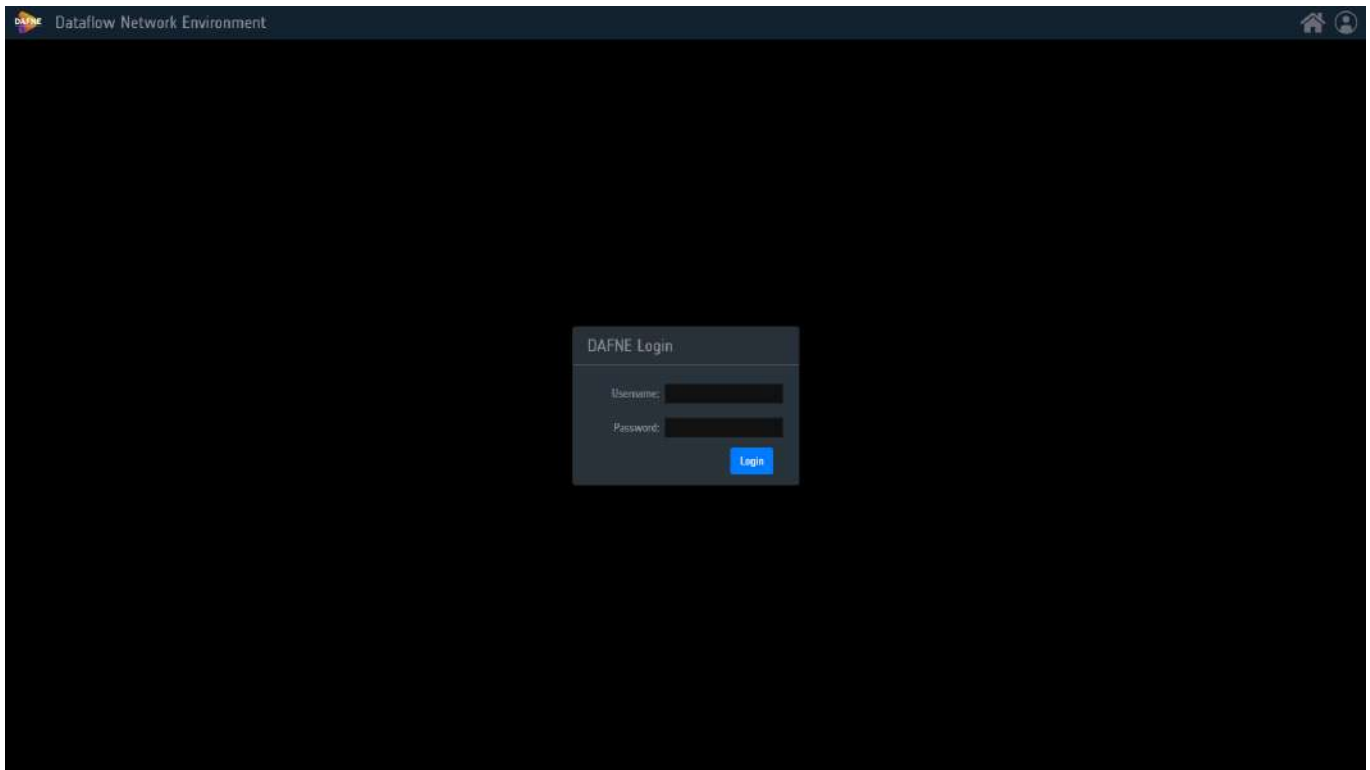

Figure 1 – Login Dialog

Once logged-in DAFNE, the home view appears showing the default centres configuration as shown in the picture below:
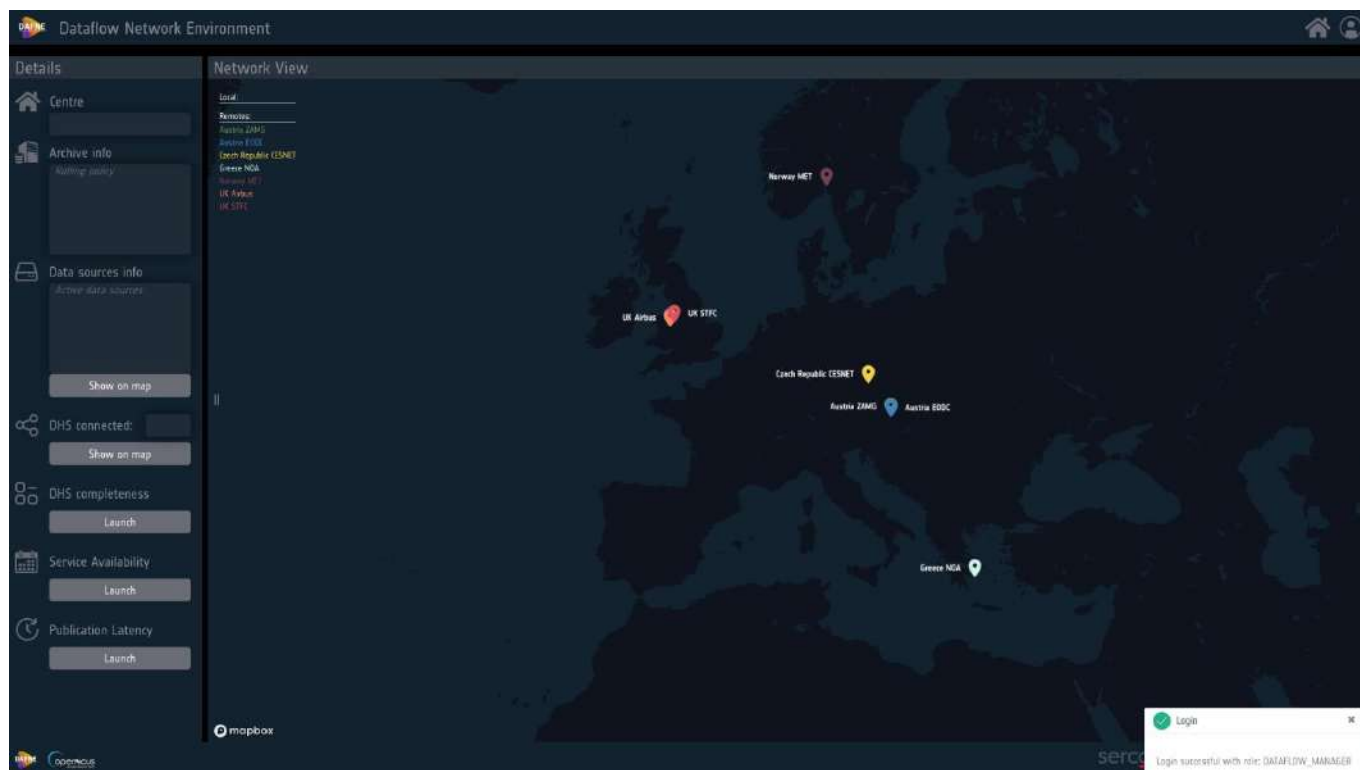
Figure 2 – Home View with default centres

3.2. Structure of DAFNE

DAFNE application GUI is divided in four panels:

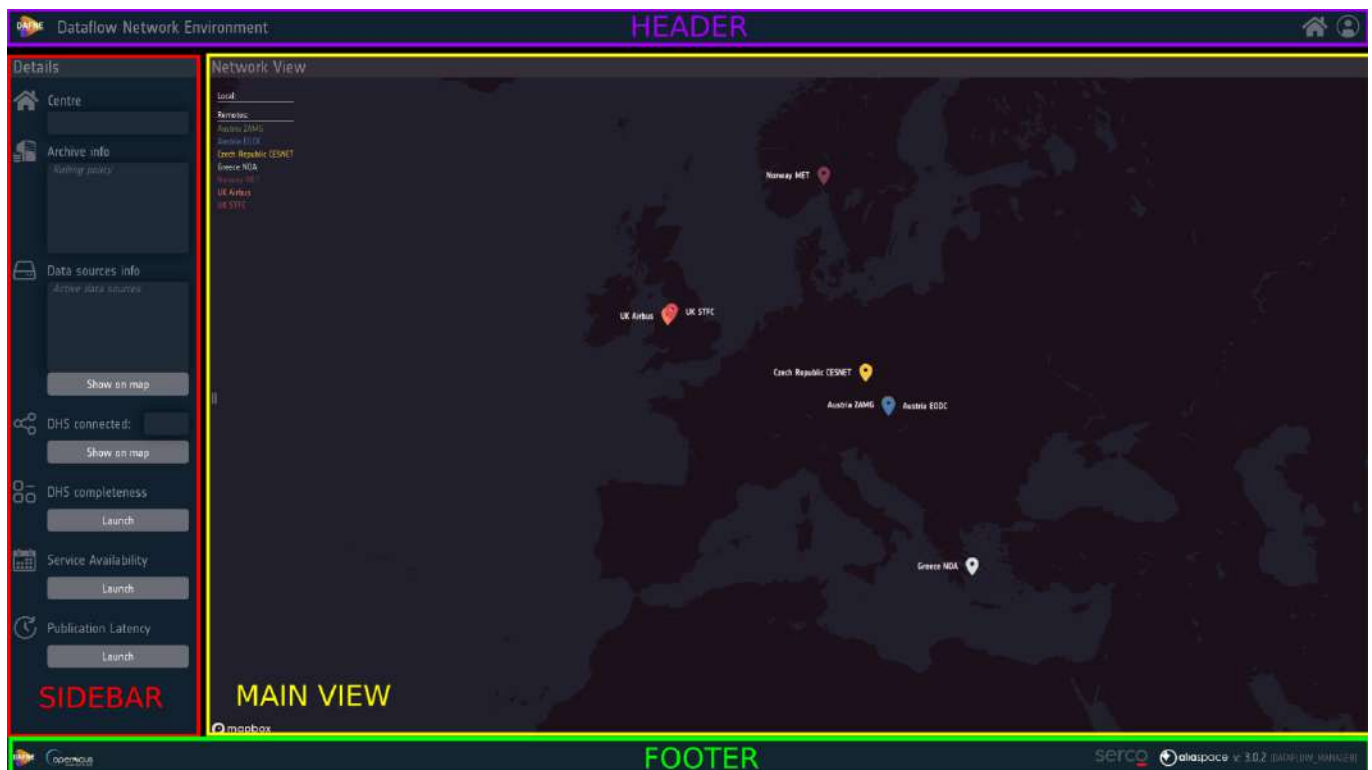- Header
- Sidebar
- Main View
- Footer

Figure 3 – GUI Structure

HEADER panel contains the DAFNE logo, the application title, the home icon (*for return to the main page*) and the user icon (*to access the navigation menu*).

SIDEBAR panel contains information about the local centre (*i.e. the DHS centre managed by DAFNE*)

- *Centre*: name of the "local" centre. The local centre is the one on which the synchronization dataflow and archive information will be shown and on which metrics are calculated

- *Archive info*: the local centre rolling policy

- *Data sources info*: the active data sources (*i.e. the data providers from which the local centre retrieves the data*). It visualizes the name and the last creation date, plus when hovering with the mouse, products filter details are shown; clicking on the "Show on map" button the nodes connections are visualized on the map (*the represented arch goes from DHS to Local*)

- *DHS connected*: number of the DHS that retrieve the data from the local centre; clicking on the "Show on map" button the nodes connections are visualized on the map (*the represented arch goes from the Local to DHS*)

- *DHS completeness*: the status for a certain time period shown as the amount of product published per day on all selected data sources; clicking on the "Launch" button a new panel appears in the Main Panel with products filter and graph types

- *Service Availability*: the average daily availability of the local Centre Front-End or Single Instance; clicking on the "Launch" button a new panel appears in the Main Panel with a start and stop date filter and the possibility to show weekly or daily aggregation

- *Publication Latency*: the time difference in the publication of the local Centre products, compared to the origin on a single synch base; clicking on the "Launch" button a new panel appears in the Main Panel with a start and stop date filter, a selector for the synch to be checked and a checkbox to show weekly or daily aggregation.

MAIN VIEW panel shows the map, the centres and the dataflow connections among them or the completeness and metrics data charts

FOOTER panel contains the configurable local centre logo, the Copernicus logo, the SERCO logo, the Alia Space logo, the application version number and the current logged-in user role

4. Configuration details

The following section shows the detailed panels to configure centres, services and synchronizers entities. Please note that users with System Manager role shall be present in the instance from which DAFNE shall be read the synch or the eviction configuration, i.e.:

- The Back-End instances (*or Single Instance*) associated to the local centre to visualize Data Source Info
- Back-End (*or Single Instance*) of centres that are retrieving data from my Front-End to visualize DHS connected info
- Front-End (*or Single Instance*) associated to the local centre to view eviction configuration
- The other service configured, as an example the operational FE nodes from which local Back-Ends are synchronizing from, can be configured in DAFNE with search/download users that shall be present in the operational instances.

4.1.　　Centres

Centre is the entity representing the local or remote node in the network. DAFNE comes with a predefined centre configuration on board, including the following centres:

- Austria ZAMG, https://vsentdhr.zamg.ac.at
- Austria EODC, https://dhr.datahub.eodc.eu
- Czech Republic CESNET, https://fe1.dhr.cesnet.cz
- Greece NOA, https://dhr.copernicus.grnet.gr
- Norway MET, https://sentinelhub2.met.no
- UK Airbus, https://ukdhr.co.uk
- UK STFC, https://srh-services8.ceda.ac.uk

Users with "Dataflow Manager" role can add, edit or remove a center by accessing the Centers page from the user menu, as shown in the following figures:
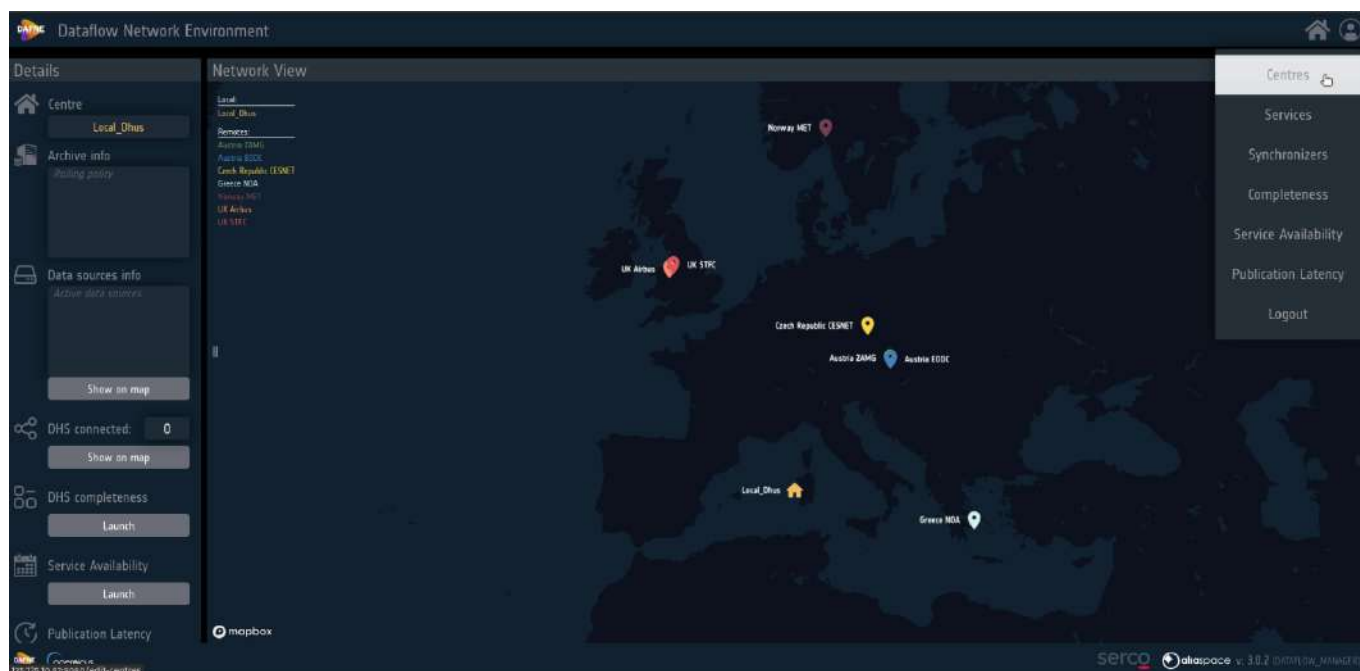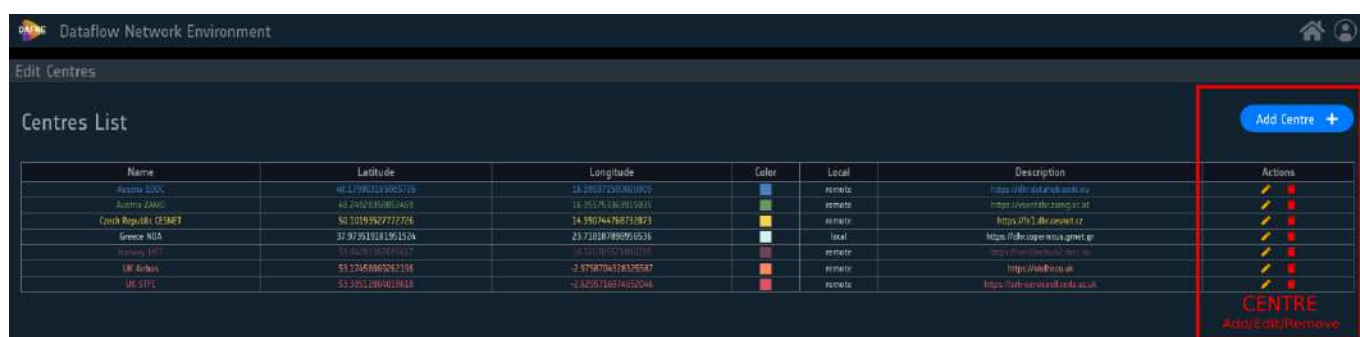
Figure 4 – Accessing to the centres page

Figure 5 – Centres page

4.1.1.1. Add a Centre

To add a new centre you have to click on "Add Centre" button on the Centres page.
A new dialog appears, containing the centre fields to fill, as shown in the figure below:
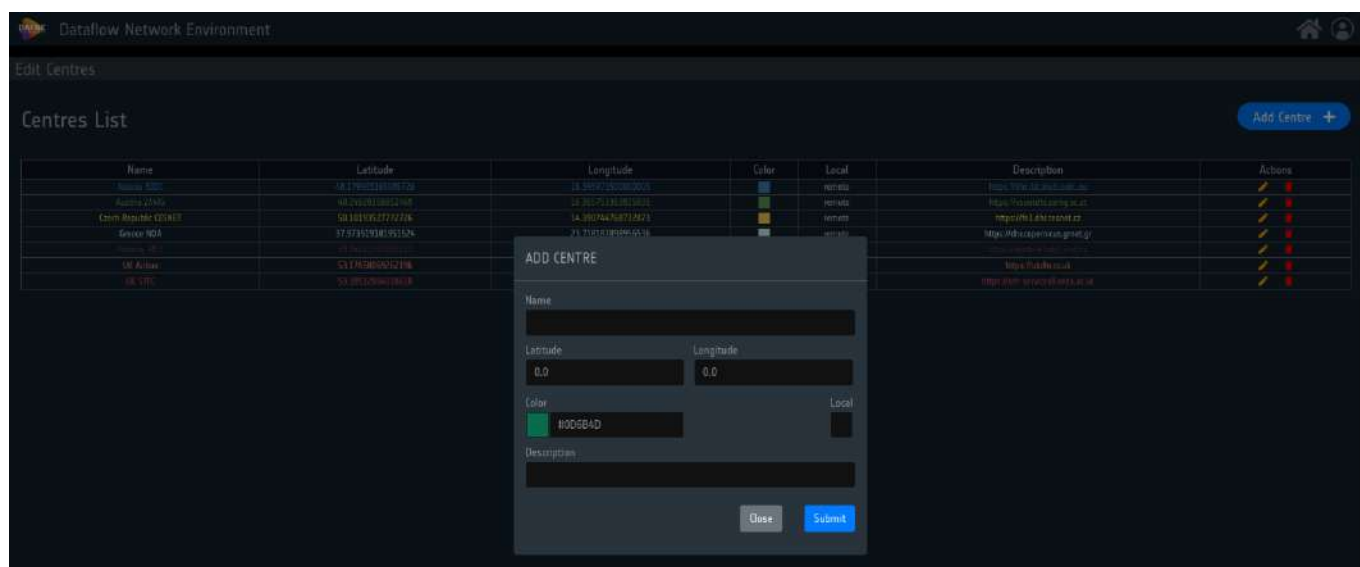
Figure 6 – Add centre dialog

Name – Name of the new centre

Latitude, Longitude – Coordinates of the centre to visualize on the map. The coordinates must be inserted in decimal degree inside their range [Latitude: (-90.0, 90.0), Longitude: (-180.0, 180.0)]

Color – Color of the Centre Icon and connection arcs on the map

Local – Local or Remote flag (this flag will also make the Centre Icon change from "place" to "home"); only one local centre can be configured at a time.

Description – Description of the new centre

4.1.1.2. Edit a Centre

To edit an existing centre, you have to click on the relative "pencil" icon in the row. A new dialog appears containing all the fields filled with the current centre values, as shown in the following picture:
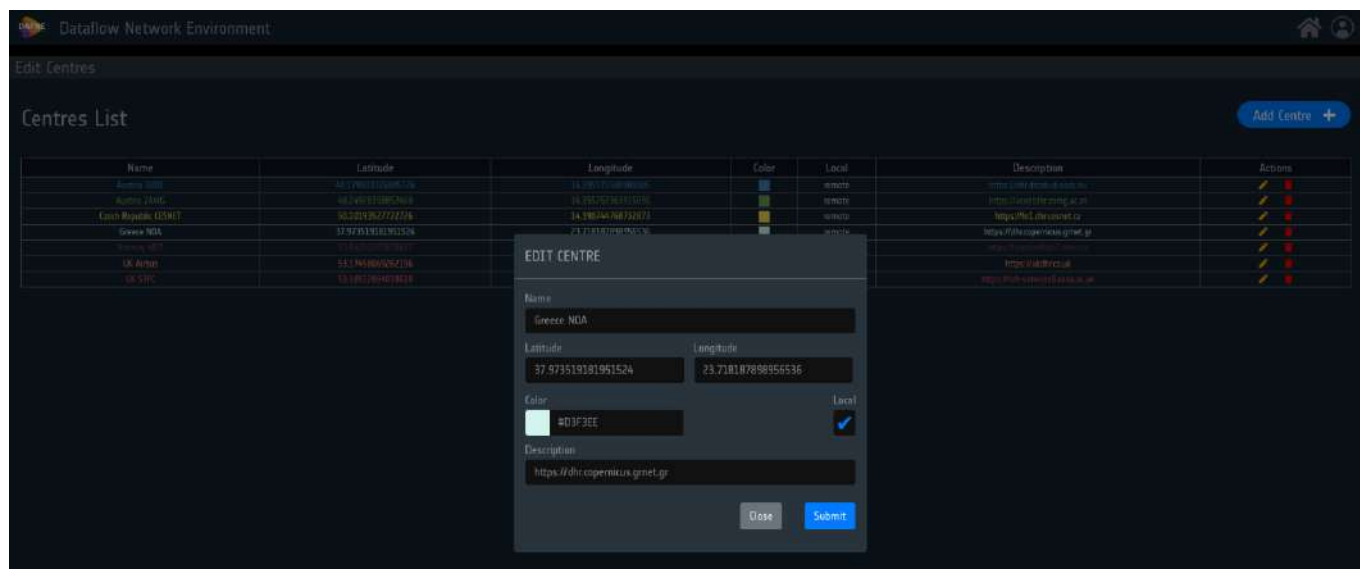
Once you have edit one or more fields you have to click on the "Submit" button to confirm the change or on the "Close" button to cancel the operation.

4.1.1.3.   Delete a Centre

To remove an existing centre you have to click on the related red bin icon, as shown in the picture below. Please note that when deleting a Centre, all Services associated to that Centre are deleted as well.
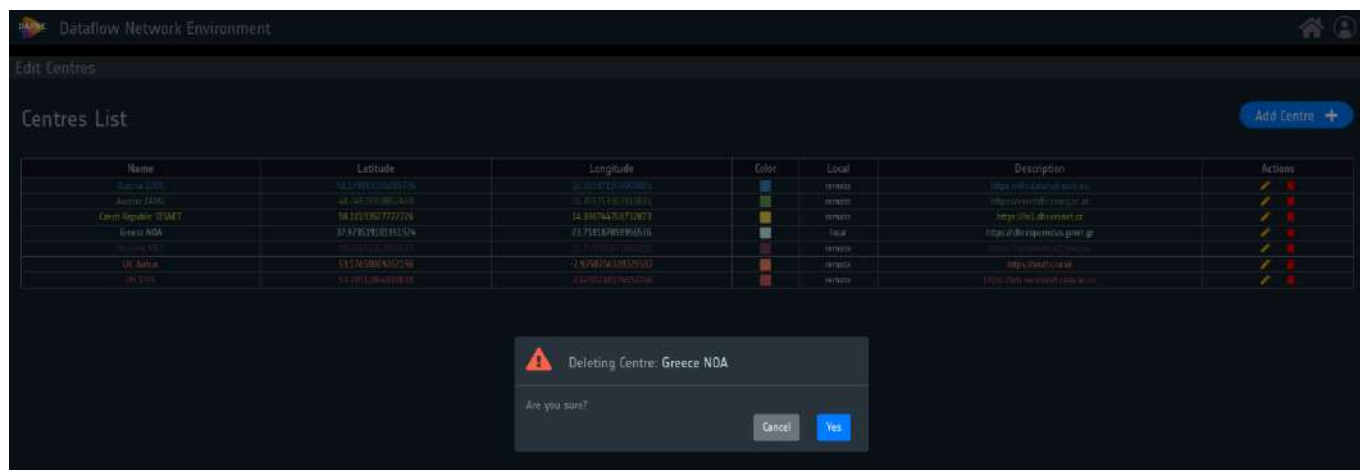

Figure 8 – Delete centre dialog

4.2.   Services

Service is the DAFNE entity representing every local or remote DHS network node with an established interface with other configured network nodes.
For example, in a network topology where a Centre A (*local*) retrieves the data from Centre B and Centre C (*via synchronizers*) while Centre D retrieves data from Centre A (*via synchronizer*) the services you have to configure are: Centre A, Centre B, Centre C, Centre D with relative associations. Please note that more services can be associated to the local centre, with the limitation of only one Front-End or Single Instance, but unlimited Back-End Instances.
Users with "Dataflow Manager" role can add, edit or remove a service by clicking on the Services item from the user menu as shown below:
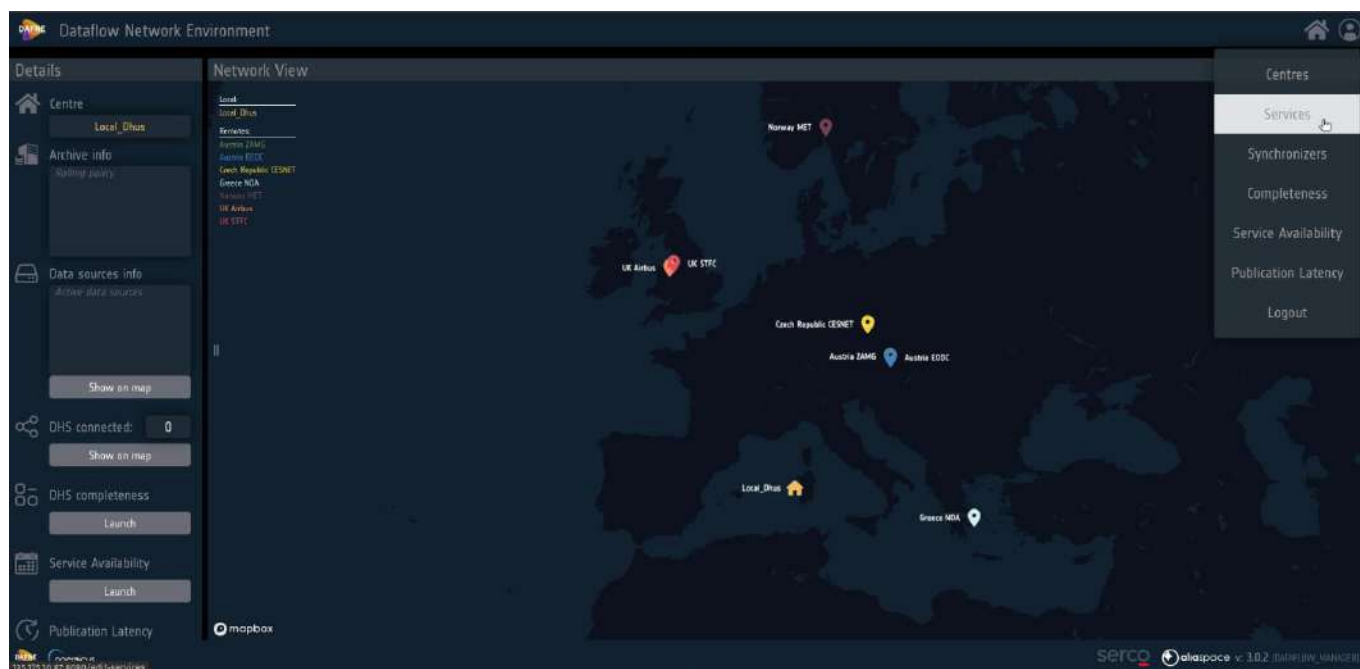
Figure 9 – Accessing to the services page
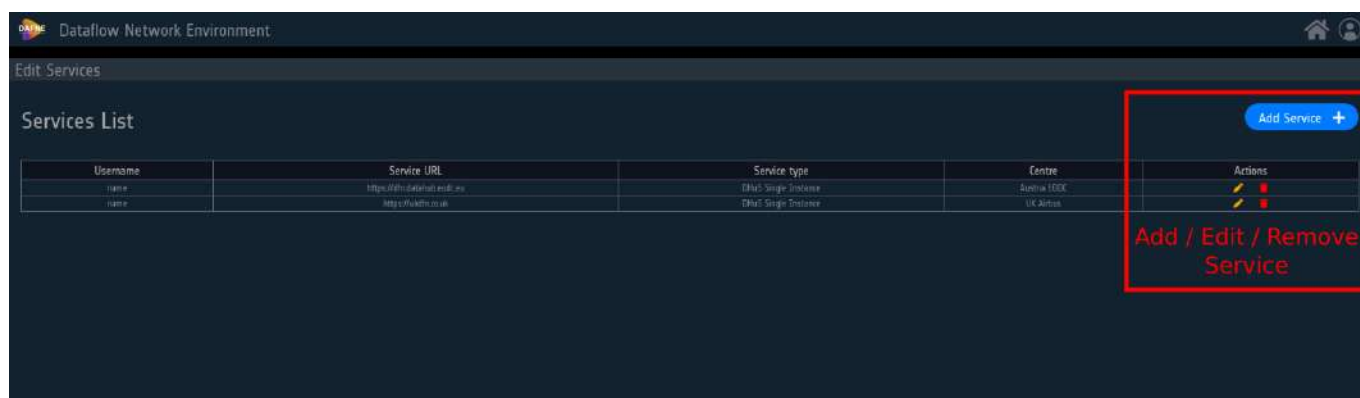

Figure 10 – Services page

4.2.1.1.   Add a Service

To add a new service you have to click on "Add Service" button on the Services page.
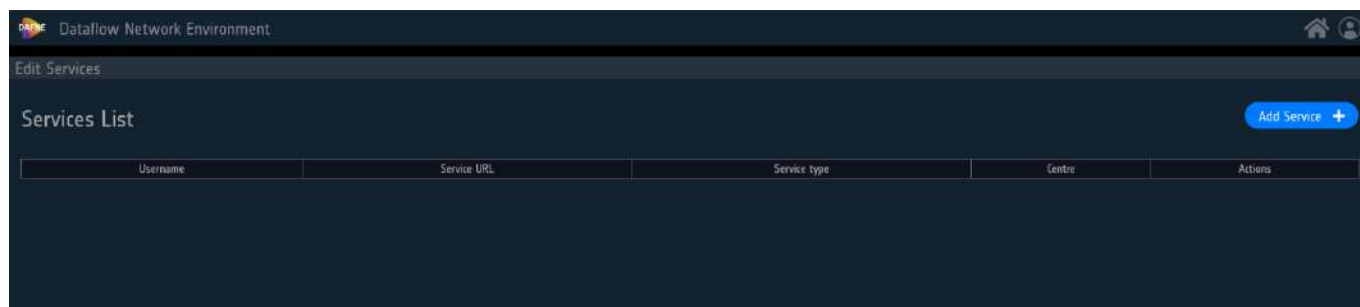

Figure 11 – Services page

A new dialog appears, containing the service fields to fill:

Username – Username authorized to use the service

Password – Password of the user authorized to use the service

Service URL – HTTP end point of the service

Service type - Type of DHuS (*DHuS Single Instance, DHuS Front-End or DHuS Back-End*) or CSC Services (*DAS, PRIP or LTA*)

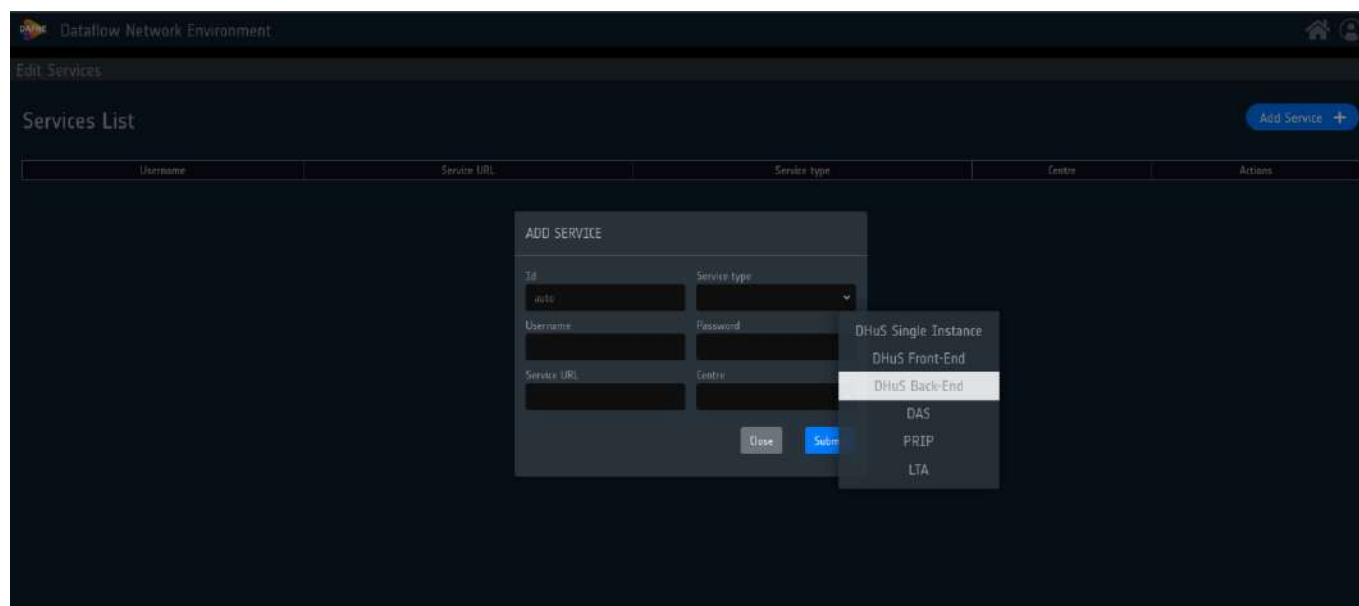**Centre** – Centre to which the service is to be associated

Figure 12 – Add service dialog

4.2.1.2. Edit a Service

To edit an existing service, you have to click on the relative "pencil" icon in the row. A new dialog appears containing all the fields filled with the current service values, as shown in the following picture:
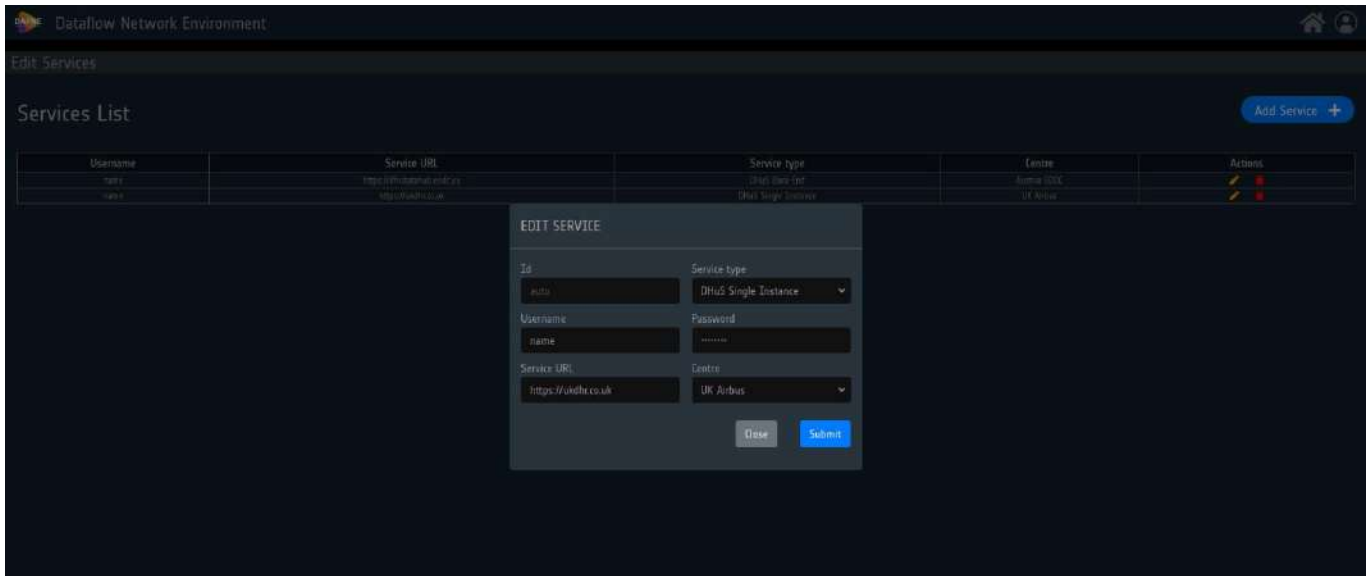
Figure 13 – Edit service dialog

Once you have edit one or more fields you have to click on the "Submit" button to confirm the change or on the "Close" button to cancel the operation.

4.2.1.3.   Delete a Service

To remove an existing service, you have to click on the related red bin icon, as shown in the picture below (*Yes to confirm, Cancel to exit*):
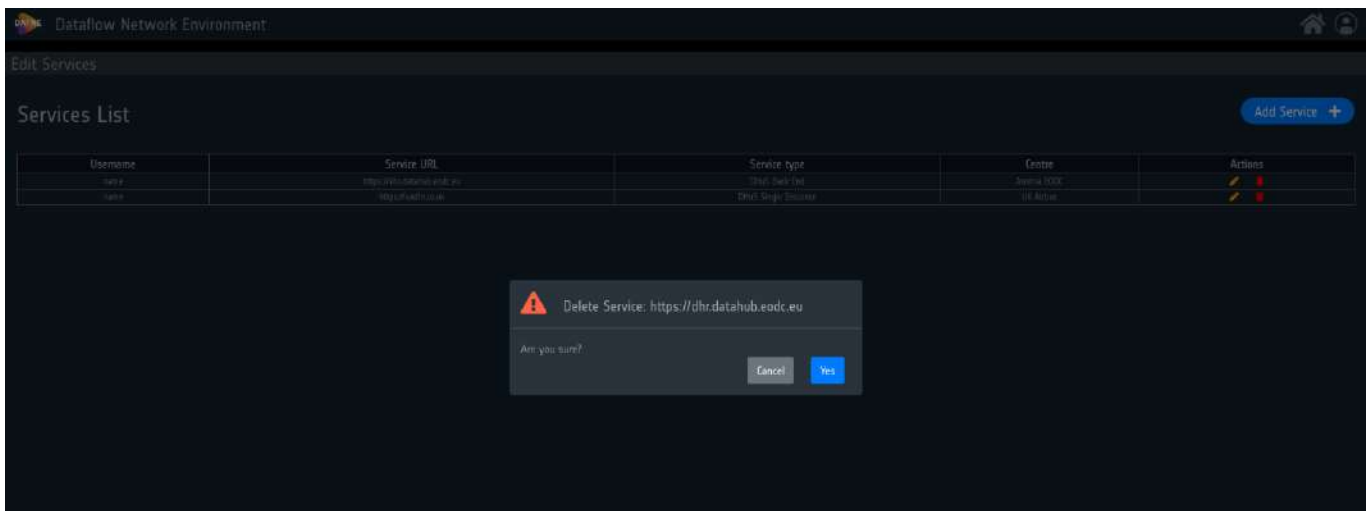
Figure 14 – Delete service dialog

4.3.   Synchronizers

Users with "Dataflow Manager" role can manage and configure a remote synchronization via DAFNE Synchronizers page. In particular for DHuS version < 3.1.x it is possible:

- manage synchronizers in terms of creation, updating and deletion
- configure the synchronization selection criteria (*filter*)
- configure the synchronization schedule

- manage all the synchronizer metadata

Intelligent synchronizers (DHuS version >= 3.1.x) are supported too, but it is not yet possible to start, stop, modify or delete them.

Figure 15 – Accessing to the Synchronizers page

Figure 16 – Synchronizers page

4.3.1.1.   Add a Synchronizer

To add a new synchronizer you have to click on "Add Synch" button on the Synchronizers page.
A new dialog appears, containing the synchronizer fields to fill, as shown in the figure below:

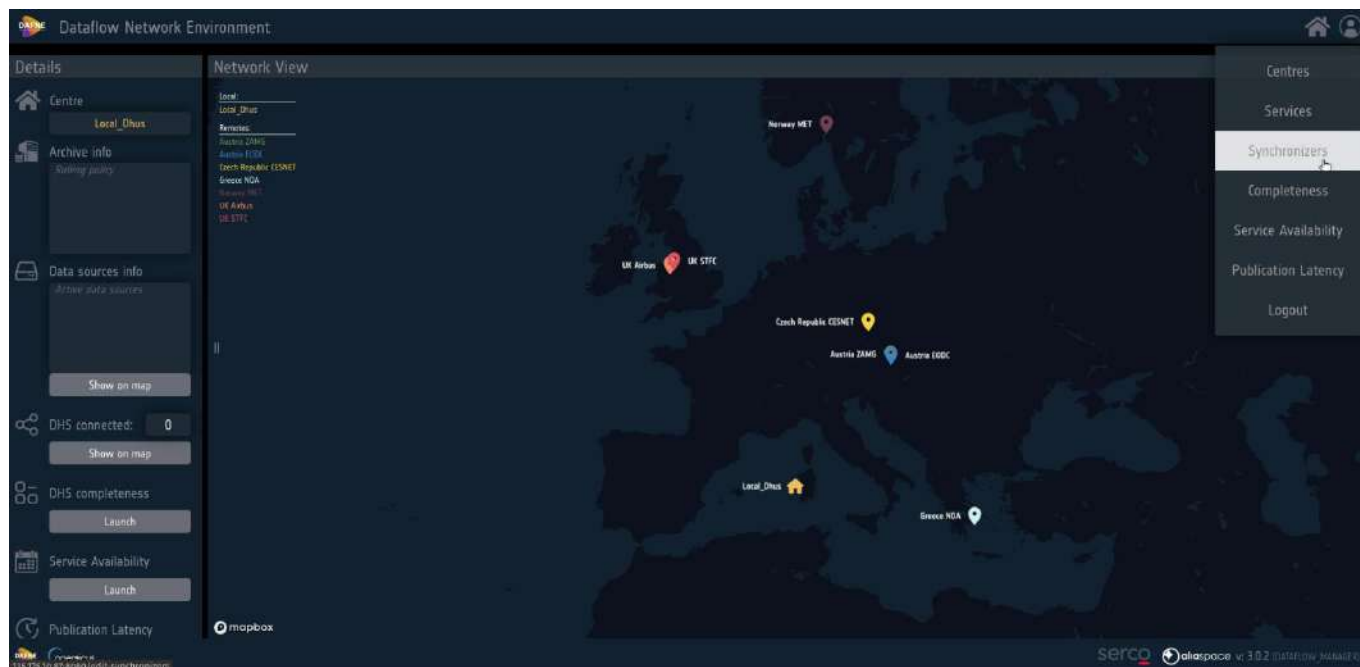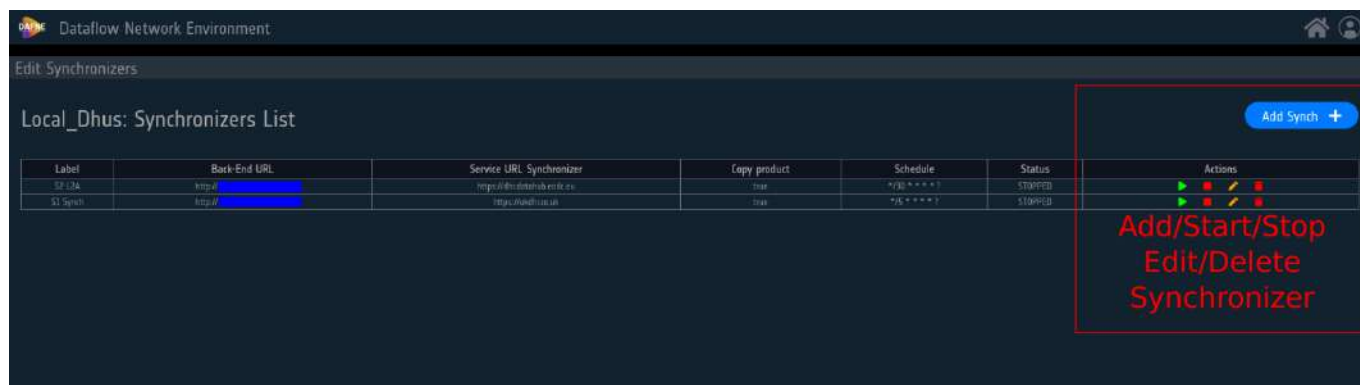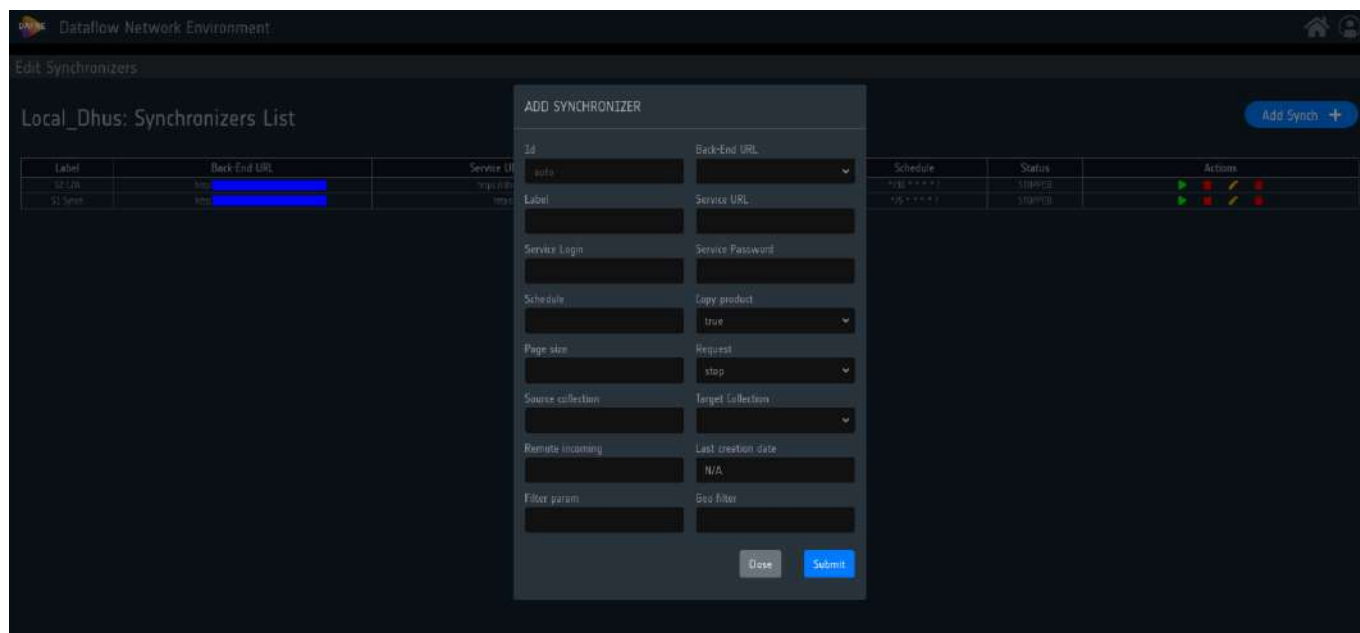**Figure 17 – Synchronizers Add dialog**

Label - Name of the synchronizer. Must be unique

Service URL – HTTP API Endpoint of the Data Source (*e.g.* https://[Back-End_DHuS_address]/odata/v1)

Service URL Back-End – Configured service on which the synchronizer will be created

Service Login – Username used to connect to the Data Source

Service Password – Password used to login to the Data Source

Schedule – How often the synchronizer shall be running. This shall be configured according to the crontab syntax (*e.g. 0 0/2 * * * ?*)

Copy product – This parameter determinates if the synchronization is a metadata synchronization or is a products synchronization:

- *False*: the synchronizer will synchronize only the metadata of the products (*the products are stored only in the Back-End incoming folder*).
- *True*: the synchronizer will make a copy of the products in the Front-End incoming folder during the synchronization.

Note that if this parameter is set as true, the "Remote Incoming" field shall be set as empty

Page size – Maximum number of the product synchronizations that can be performed by the Synchronizer simultaneously (*default value: 30*)

Request – "start" or "stop"

Source collection – DHuS Data Source Collection filter: only the products on the Data Source instances, which are belonging to the configured collection, will be synchronized to the configured hub. Example:

Collections('collection_name'). If this field is left empty, the synchronizer will synchronize every product without any check on their Data Source collection

Target collection – Nullable and modifiable property with no default value. If specified, the synchronized products will be filled in the referenced Configured Hub Collection. Please note that when a collection is inserted, it cannot be removed anymore.

Remote incoming – Path of the incoming folder configured for the DHuS installed as the Back End instance. Please note that, in case of synchronization with copy, this must be empty

Last creation date – Filter on the CreationDate of the products stored in the Data Source instances

Filter param – Following the OData filters syntax, it filters the products and synchronizes only the ones respecting the filter (*e.g. substringof('S1A_',Name)*)

Geo filter – Geographical filter to synchronize only products belonging to a specific area from the Data Source. This filter is a post-filter, which means that it is executed client-side, not server-side. Please refer to RD-4 for further details.

4.3.1.2. Edit a Synchronizer

To edit an existing synchronizer, you have to click on the relative "pencil" icon in the row. A new dialog appears containing all the fields filled with the current synchronizer values, as shown in the following picture:
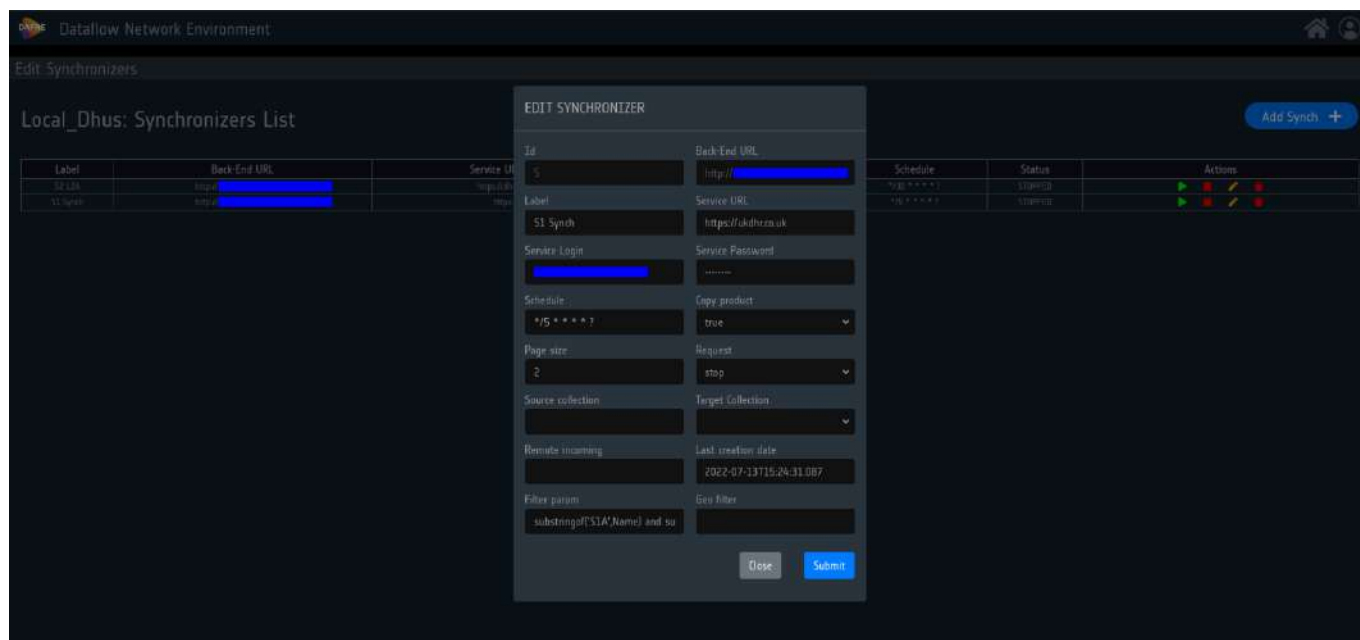

Figure 18 – Synchronizers Edit dialog

Once you have edit one or more fields you have to click on the "Submit" button to confirm the change or on the "Close" button to cancel the operation.

4.3.1.3. Start a Synchronizer

To start a synchronizer, users have to click on the related green "play" arrow in the row. If the operation is successful, the Status column in the table shows a "PENDING" label. In case of failure an error dialog appears reporting the error status and description.

4.3.1.4. Stop a Synchronizer

To stop a synchronizer, users have to click on the related red "stop" square in the row. If the operation is successful, the Status column in the table shows a "STOPPED". In case of failure an error dialog appears reporting the error status and description.

4.3.1.5. Delete a Synchronizer

To remove an existing synchronizer you have to click on the related red bin icon, as shown in the picture below (*Yes to confirm, Cancel to exit*):
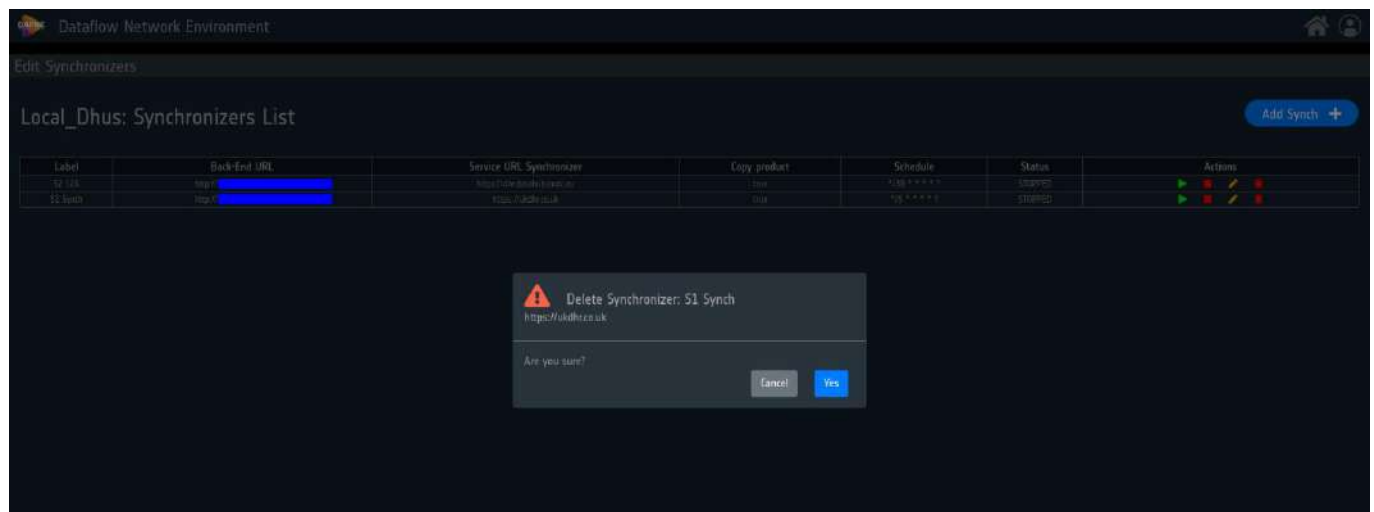
Figure 19 – Delete synchronizer dialog

5. Dataflow Visualization

5.1. Network View

Once all services and synchronizers have been configured, DAFNE visualizes the dataflow information of the configured network, in particular for:

Archive info: the local DHS centre (*i.e. DHuS Front-End*) rolling policy

Data sources info: the active data sources (*i.e. the DHuS Front-End or single instance from which the local centre retrieves the data*). It visualizes the name and the current last creation date, plus the products filter details when hovering with the mouse; clicking on the "Show on map" button the nodes connections are visualized on the map (*the represented arch goes from DHS to Local*). In this case each arc is rendered with the color of the center from which it starts, helping to visualize the direction of the data, as shown in the picture below:
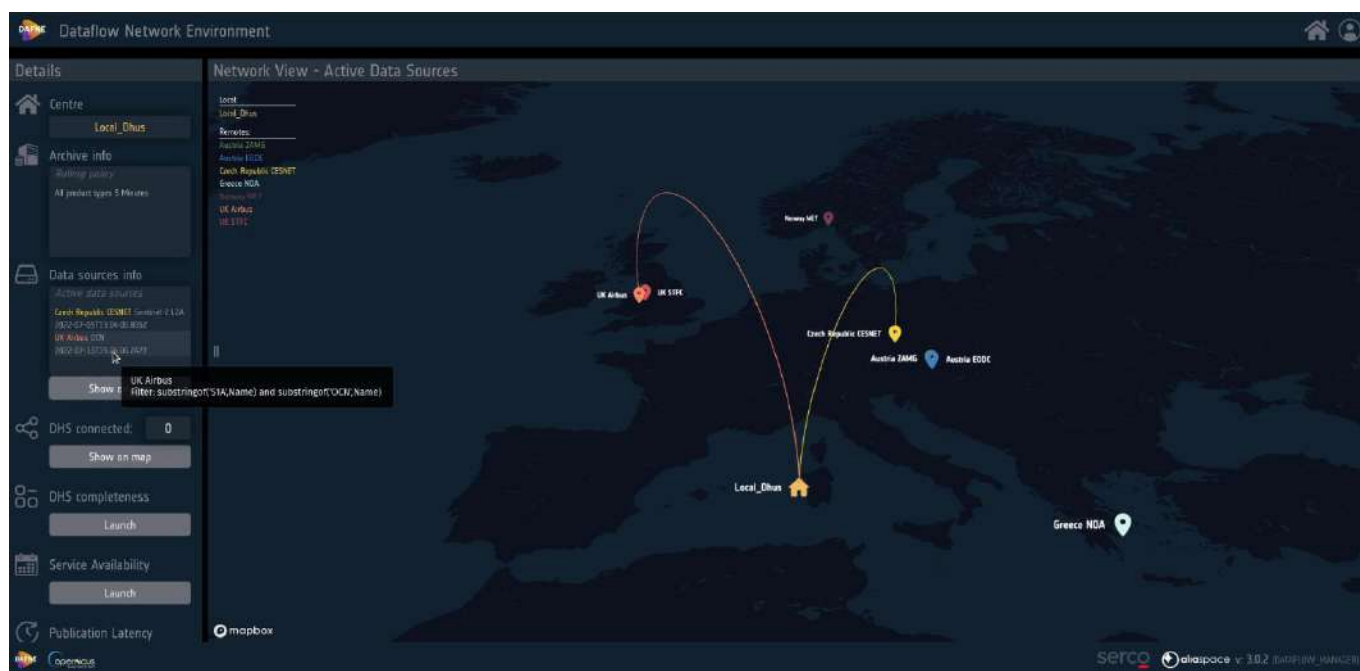
Figure 20 – Data sources info visualization

Please note that, in case of Intelligent Synchronizer, the arches are shown for all configured listable Data Source and not only for the active ones.

DHS connected: number of the DHS (*i.e. the DHuS Back-End or single instance*) that retrieve the data from the local centre; clicking on the "Show on map" button the nodes connections are visualized on the map (*the represented arch goes from Local to DHS*). In this case the arcs are rendered with the same color of the local centre, helping to visualize the data direction, as shown in the following picture:
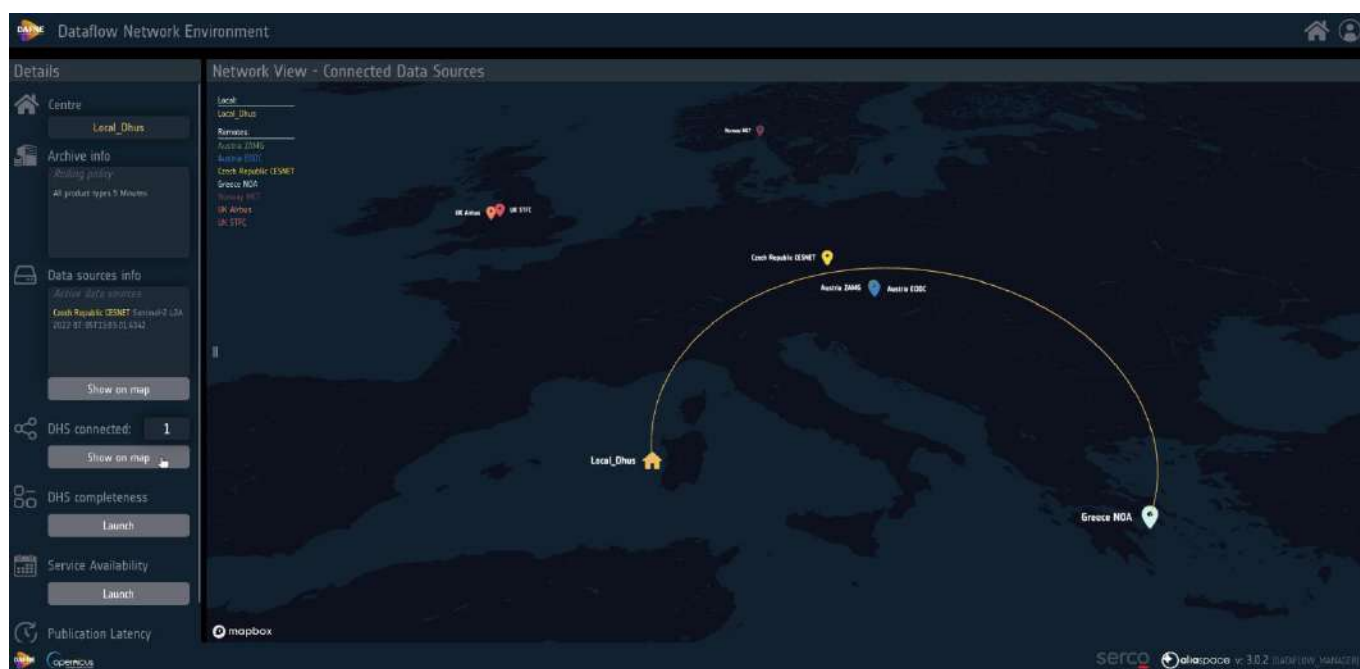

Figure 21 – DHS connected visualization

6. Metrics

DAFNE can collect different types of measurements related to DHR services, that will be drawn as different kinds of charts.

In each metric panel there is a filter area where the user can choose which data to be seen. After clicking on the Filter submit button, the chart and the bottom table will be filled with the requested data. If a value cannot be retrieved, the "NaN" acronym will be displayed instead.

Clicking on the buttons on the right, user can change the chart type.

Clicking on the left or bottom handles the side panel or the table will be hidden to let more space to the chart.

A csv file containing the table data can be exported clicking on the relative button.

An image of the shown chart can be exported too, through the right-click context menu.

6.1.   Completeness

The completeness in DAFNE is shown as the amount of product published per day on all selected Front-End, Single-Instance or CSC services configured within DAFNE and it is useful to compare the status of their archive in respect to the primary nodes and/or to other network nodes.

The visualization of the completeness information is computed using a filter. The user can select with a checkbox if the filter should be based on a choosen mission and product-type, or if the filter should be taken from a configured synchronizer. In both cases a data range must be choosen to retrieve daily product numbers to compare.

The chosen synchronizer with its associated filter can be selected among the synchronizers present in all the local service types (Back-End, Front-End and Single-Instance) but the number of products matching the selected filter is always referred to the products on the Front-End service. In the same way if, for example, a synchronizer of a Back-End instance without filter is selected, all product missions and product types present in the Front-End services will be reported as results.

Figure 22 – Completeness page

DATA FILTER - It gives the possibility to choose the filter on which the data shown is based, in a maximum range of 15 days. The filter parameters can be entered manually (i.e. mission or product type) or it is possible to choose from a list of configured synchronizers and use its filter to show data.

CHART AREA - It represents the main view of the completeness, showing the different charts. In this area you can zoom, pan or save the chart as an image with the mouse:

Central or wheel button to move the pan

Figure 23 – Pan on chart

Use the mouse wheel to zoom in/out

Figure 24 – Zoom on chart

Right-click to save the chart as image

Figure 25 – Save image on right mouse click

Double click to reset the view

Figure 26 – Double click resets the view

DATA TABLE – It contains the chart data in tabular form. Users can export the data in csv (*comma separated values)* file format as depicted in the following picture:
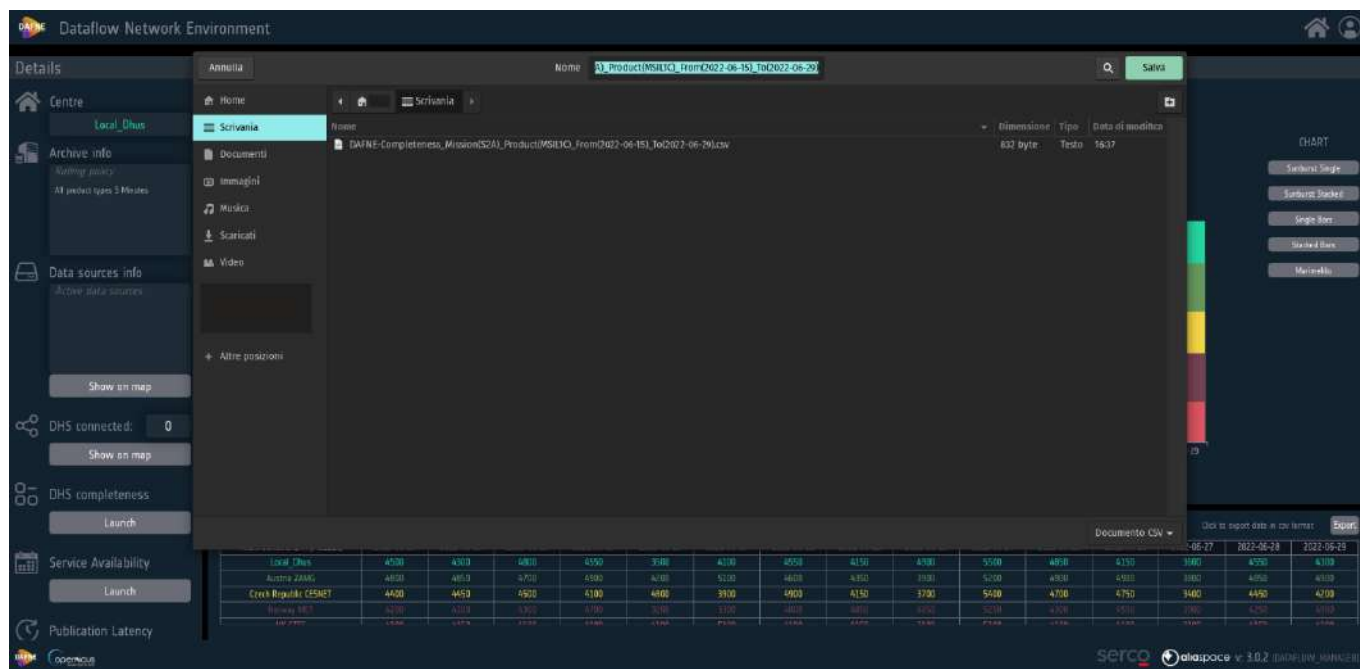
Figure 27 – Save data in csv file

The file will be saved with the following name convention:
```
DAFNE-Completeness_Mission(MM)_Product(PRD)_From(YYYY-MM-DD)_To(YYYY-MM-DD).csv
in case of manually entered filter, or:
DAFNE-Completeness_Sync(SYNC-LABEL)_From(YYYY-MM-DD)_To(YYYY-MM-DD).csv
In case of Synchronizer-based filter.

Example:
DAFNE-Completeness_Mission(S1)_Product(OCN)_From(2021-12-04)_To(2021-12-18).csv
DAFNE-Completeness_Sync(S1 Synch)_From(2021-12-04)_To(2021-12-18).csv
```

CHART TYPE – users can choose among different available charts:

- Sunburst Single
    - It is a circular statistical graph divided into slices. Each slice represents a specific day and the colored sections depict the number of products for each hub for that specific day, scaled using the maximum value received between the hubs for the requested days as a reference for the maximum chart value. In both Single and Stacked Sunburst charts some labels are present to show relative values for 25%, 50%, 75% and 100% of the maximum value and when hovering with the mouse over a section, a bubble appears showing that hub product number for that day.
- Sunburst Stacked
    - Same graph as the Sunburst Single but the number of products for each hub is stacked on each other for the same day as colored sections of a slice. The product sum per day is scaled using the maximum sum of products between the requested days as a reference for the maximum chart value.
- Single Bars

- It is a bar graph showing days on the x-axis and the number of products on the y-axis. For every day all the requested hub products are displayed as single-colored bars, scaled in percentage on the maximum value received.
- Stacked Bars
  - Same graph as the Single Bars but the requested hubs products numbers are displayed as colored blocks stacked on each other for the same day and scaled in percentage on the maximum day product sum.
- Marimekko
  - It is a peculiar Stacked Bars chart, in which on the Y axis, for each day, the sum of the products of that day represents the 100% and every section of each bar is colored and scaled according to the number of products of that hub relative to the day sum. The number of products of each hub is also reported over the colored part. The X axis reports the sum of the products of that day and the width of the bar is scaled in percentage with respect to the total of products retrieved from all the hubs for the entire selected period.

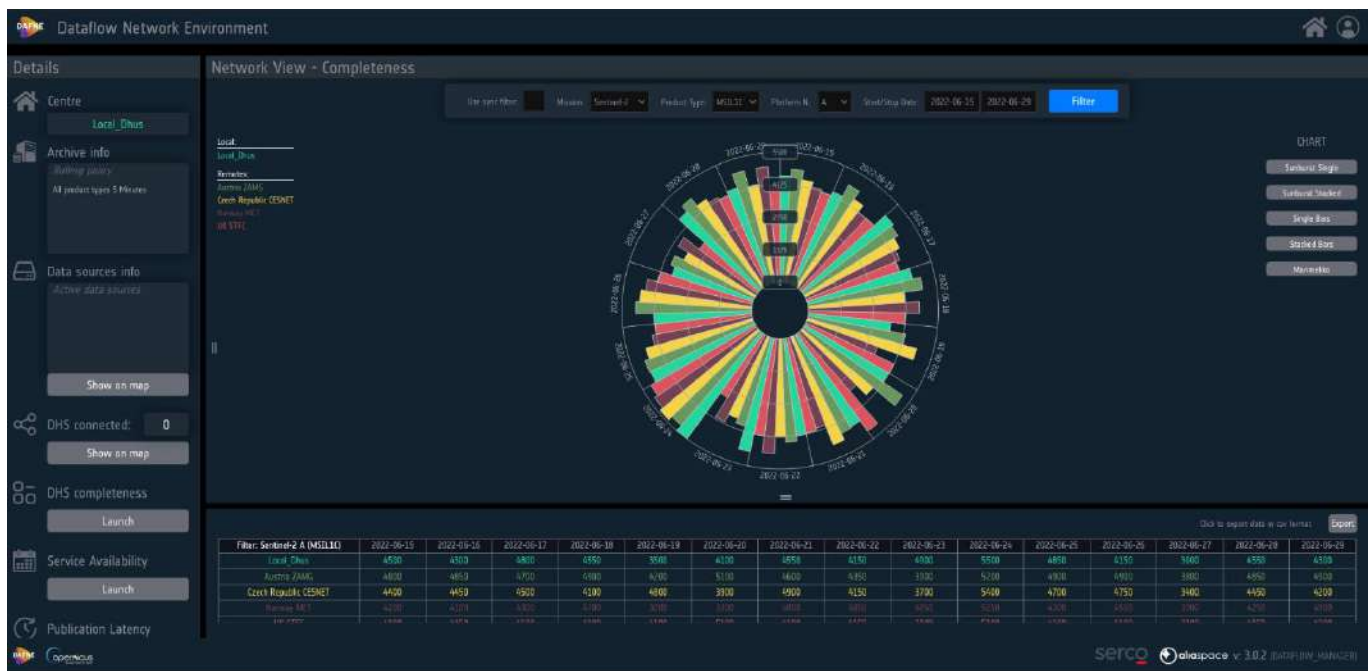The following pictures show the different charts:
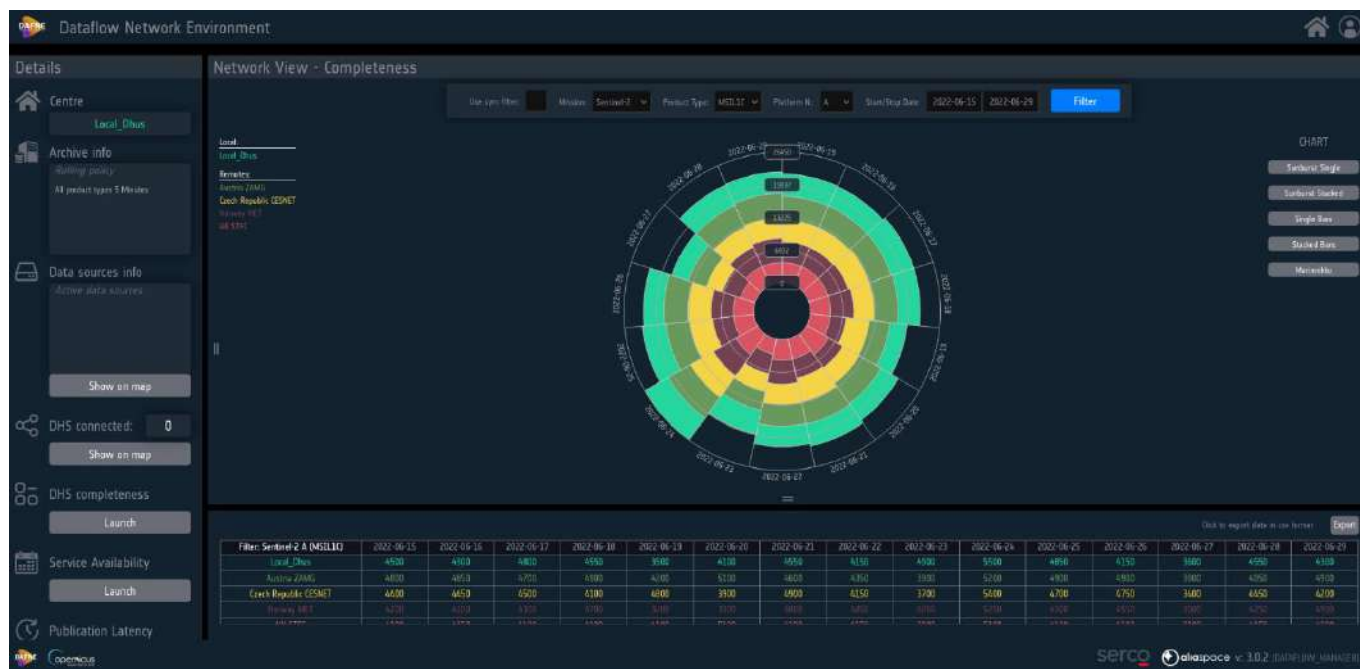

Figure 28 – Sunburst Chart single

Figure 29 – Sunburst Chart Stacked

Figure 30 – Bar Chart Single

Figure 31 – Bar Chart Stacked

Figure 32 – Marimekko Chart

Figure 33 – Chart in Full Screen Mode

6.2. Service Availability

The Service Availability in DAFNE is shown as the weekly or daily average of the local centre Front-End or Single Instance availability, which is recorded in a configurable interval which defaults to 10 minutes. Please bear in mind that setting a very low value, depending on the connection speed and on the number of services, DAFNE Back-End could be overloaded.

The visualization of the service availability information is computed using a filter based on a time range. The last 90 days are stored in the DAFNE Database and the user can visualize the whole period in the weekly aggregation view and a maximum of 31 days in that range in the daily aggregation view.

Every week starts on Monday and ends on Sunday, therefore if days other than those have been selected as the start and stop date, in the weekly visualization the user will see, as first and last week dates, those matching with Mondays and Sundays, but only data between the selected dates will be taken in account.

Thanks to the service availability data, users can monitor eventual DHR DHuS malfunctions or inoperability.

The service availability chart can be shown as a Bar Chart or a Calendar Chart.

Through a checkbox in the filter the operator can choose whether group the data weekly or daily. If weekly aggregation is choosen only the bar chart is active, while both charts are available for the daily data aggregation.

In the bar chart, when weekly aggregation is choosen, every bar represents the related week service availability average percentage, which is shown in the table and also when hoovering with the mouse on a bar, and will be colored in respect of the configured thresholds and colors.

If the operator clicks on a bar the chart turns to the daily visualization of that week. A button on the right appears to go back to the weekly visualization in case the user wants to check other weeks results.
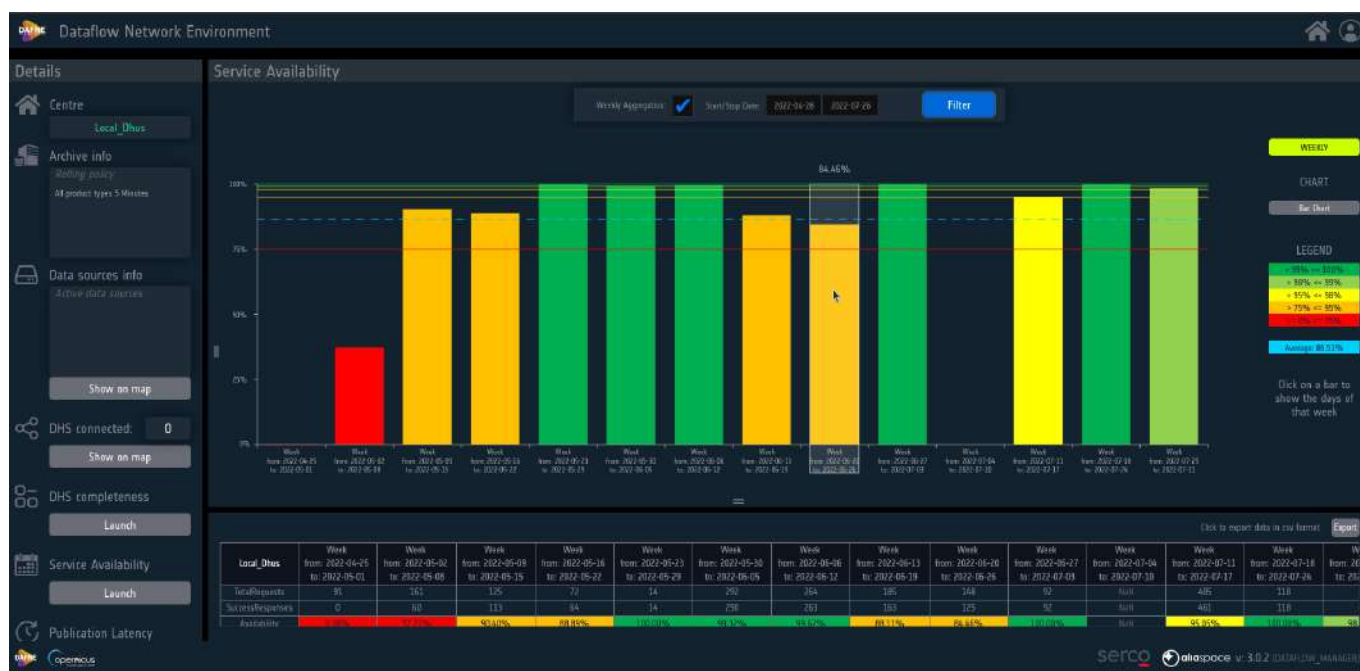
Figure 34 – Weekly Service Availability Bar Chart page

In the daily bar chart, every bar represents the related day service availability average percentage and will be again colored in respect of the configured thresholds and colors. Those thresholds are also drawn as colored lines directly over the chart, on the relative y position.
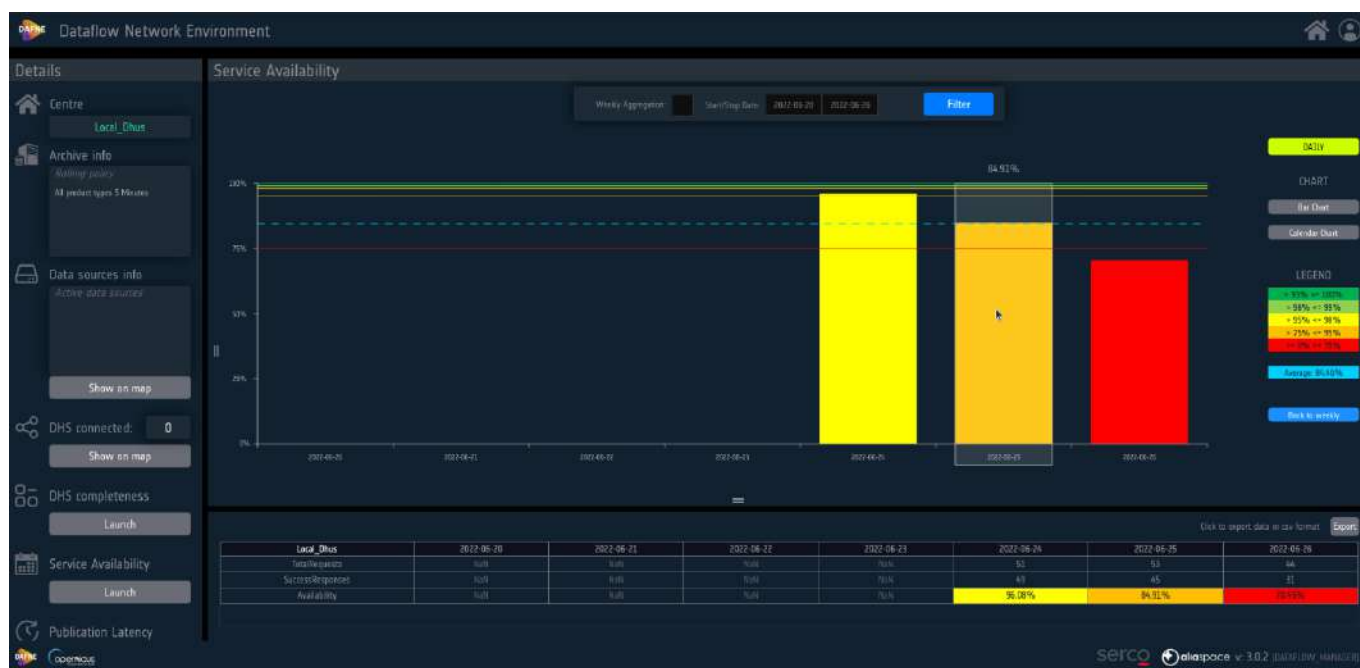

Figure 35 – Daily Service Availability Bar Chart page

In the calendar chart the same daily data are shown in a calendar form, on a weekly iteration. This can be useful to see if there are weekly repetitions of a malfunction.

Every cell represents the relative day availability with the corresponding percentage value and threshold color.
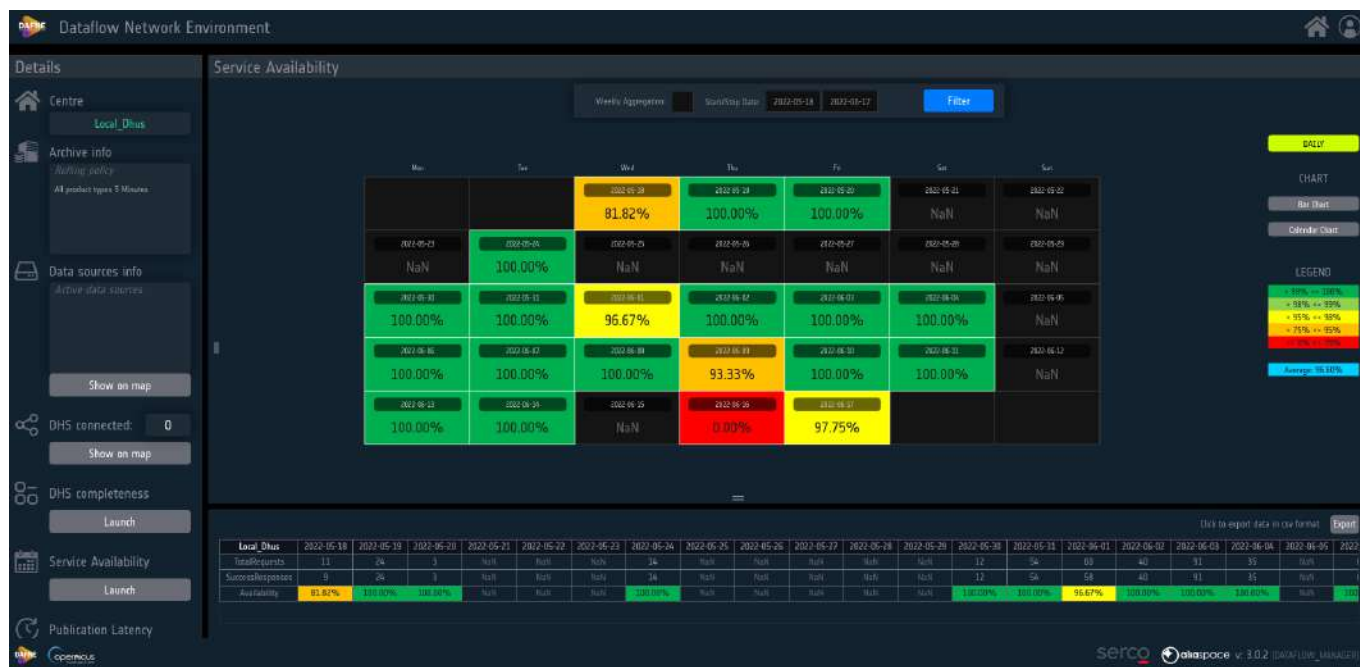

Figure 36 - Service Availability Calendar page

As in the other metrics panels data shown in the table can be exported as a csv file. The name of the service availability csv file will follow this convention:
DAFNE-Service_TIMING_Availability_Centre(NAME)_From(YYYY-MM-DD)_To(YYYY-MM-DD).csv

Examples:
DAFNE-Service_Weekly_Availability(DHuS Local)_From(2022-04-01)_To(2022-05-29).csv
DAFNE-Service_Daily_Availability(DHuS Local)_From(2022-05-23)_To(2022-05-29).csv

6.2.1.1.   Calculation details

The Service Availability computation is based on the following steps:

1) Collect the measures of the FE Service of the local centre at configurable scheduled time *(every 10 minutes by default)*. In this context, the FE Service represents the catalogue exposing the products to the users, so it is important to check if this kind of service is up or down. In order to check the availability of the service, the back-end side of DAFNE sends a HTTP request to the FE and catches the HTTP response to establish which is the status of the service

2) An average value of the requested period, both in weekly and daily visualization, is shown both as a number and as a dotted line in the chart, and it is calculated using this formula: (SuccessResponses / TotalRequests) * 100

3) Group the measures by date for a given date range, for a maximum of 31 days in a rolling window

4) Roll measures older than a configurable number of days (*default rolling window: 90 days*)

6.3. Publication Latency

The Publication Latency in DAFNE is shown as the weekly or daily average of the time difference between the local centre products creation date and the related synchronized data source products creation date, which is recorded at a configurable interval, which defaults to one hour. Please bear in mind that setting a very low value, depending on the connection speed and on the number of services, DAFNE Back-End could be overloaded.

The visualization of the publication latency information is computed using a filter based on a synchronizer and a time range. The selectable synchronizers in a dropdown menu are those present in the Back-End services associated to the local centre.

The last 90 days are stored in the DAFNE Database and the user can visualize the whole period in the weekly aggregation view and a maximum of 31 days in that range in the daily aggregation view.

Every week starts on Monday and ends on Sunday, therefore if days other than those have been selected as the start and stop date, in the weekly visualization the user will see, as first and last week dates, those matching with Mondays and Sundays, but only data between the selected dates will be taken in account. All the configured synchronizers are computed, but only one at a time can be chosen in the filter and shown in the chart, and the user has to check that the synchronizer is running.

The publication latency chart can be shown as a Bar Chart or a Line Chart.

In the bar chart, every bar represents the related week or day Latency and will be colored in respect of the configured thresholds and colors. Those thresholds are also drawn as colored lines directly over the chart, on the relative y position. Latencies are calculated over Frontend products by default, but if frontend is unavailable, those are calculated over Backend product and user is informed of this difference by a little tag under the date either in the chart and the table.

In the lower part of the screen there is a table showing all the computed latency values in respect of the applied filter and clicking on the export button it is possible to save the table in csv format.

The name of the publication latency csv file will follow this convention:
`DAFNE-Publication_`TIMING`_Latency(`CENTRE NAME`)_Sync(`SYNC NAME`)_From(`YYYY-MM-DD`)_To(`YYYY-MM-DD`).csv`

Example:
`DAFNE-Publication_Weekly_Latency(DHuS Local)_Sync(S2 L2A)_From(2022-04-01)_To(2022-06-19).csv`
`DAFNE-Publication_Daily_Latency(DHuS Local)_Sync(S2 L2A)_From(2022-06-13)_To(2022-06-19).csv`

In the weekly aggregation chart, every bar or line-point represents the latency average on one week. Hoovering with the mouse on one section shows that week latency value.

Figure 37 - Publication Latency Weekly Bar Chart

The Line Chart is similar to the bar chart, but there are lines connecting all the values, which are not colored.

Figure 38 - Publication Latency Weekly Line Chart

In both Bar and Line weekly charts user can click on the highlighted week to change to a daily chart, in which every bar or line-point represents the average latency of one day.
A button on the right appears to go back to the weekly visualization in case the user wants to check other weeks results.

Figure 39 - Publication Latency Daily Bar Chart

Then, in the daily representation of the latency, the operator can click again on one day highlighted section to change the chart to a detailed view of the single values of that day, as configured by the user (defaults to one reading every hour).

User can then click on the right-side Back to Daily button to go back to the daily visualization.

Figure 40 - Publication Latency Detail Bar Chart

6.3.1.   Calculation details

The Publication Latency computation is based on the following steps:

1) Collect the measures of the BE Services of the local centre at configurable scheduled time (*every hour by default*)

2) Calculate the average latency for every selected day, using the formula (SumOfDayAverages/NumberOfDayReadings)

3) Calculate the average latency for every week in the whole period, using the formula (SumOfWeekAverages/NumberOfWeekReadings)

4) Roll measures older than a configurable number of days (*default rolling window: 90 days*)

6.3.1.1. Algorithm description

1) Retrieve the synchronizers configured in the BEs of the local center

2) Retrieve the more recent CreationDate for each synch

3) Identify the last product synchronized in the DataSource according to the retrieved CreationDate, with a configurable tolerance that defaults to 1 second.

4) Retrieve the corresponding product synchronized in the BE instance associated to the local centre and the corresponding product synchronized in the FE instance associated to the local centre

5) Compute the Publication Latency as difference between the CreationDate of the product on the DataSource and the product on FE

6.3.1.2. Algorithm optimization

From an operational point of view, DAFNE has to manage some special cases:

1) If a product identified on the BE is not found at first attempt on the FE, DAFNE supports a retry mechanism, configurable in terms of maximum number of retries and frequency of each retry (defaults are: *5 retries/10 minutes*), running in background.

2) If the product is not found in the FE, DAFNE reports the timeliness computed with respect to the BE, putting in evidence this info in the latency chart

END OF DOCUMENT