

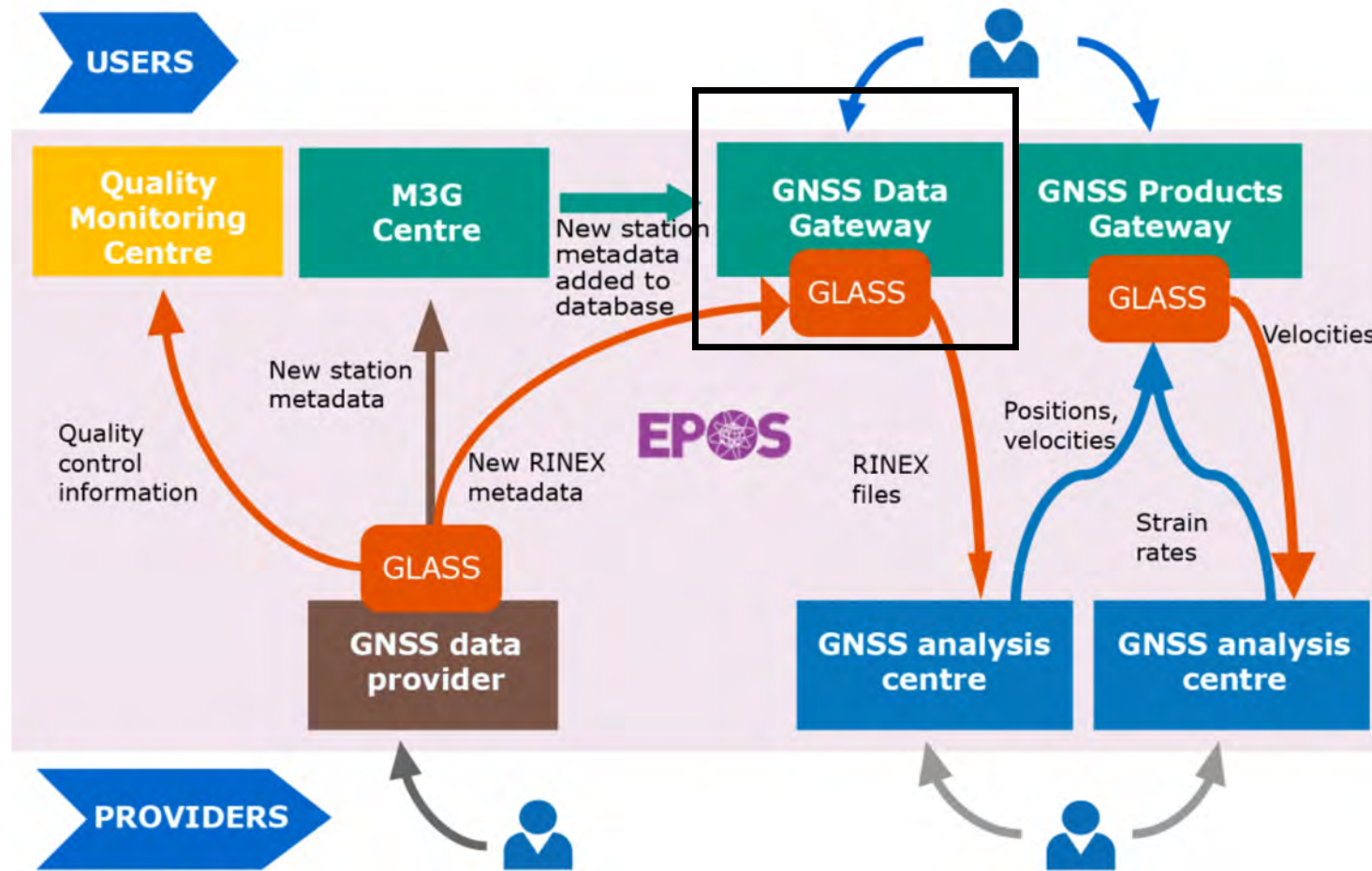
The EPOS GNSS Data Gateway

- Presentation of the EPOS-GNSS Data Gateway
- How to explore and download data & metadata
 - with the EPOS GNSS web client
 - with the command line client

Presenters : M. Vergnolle and J.L. Menut

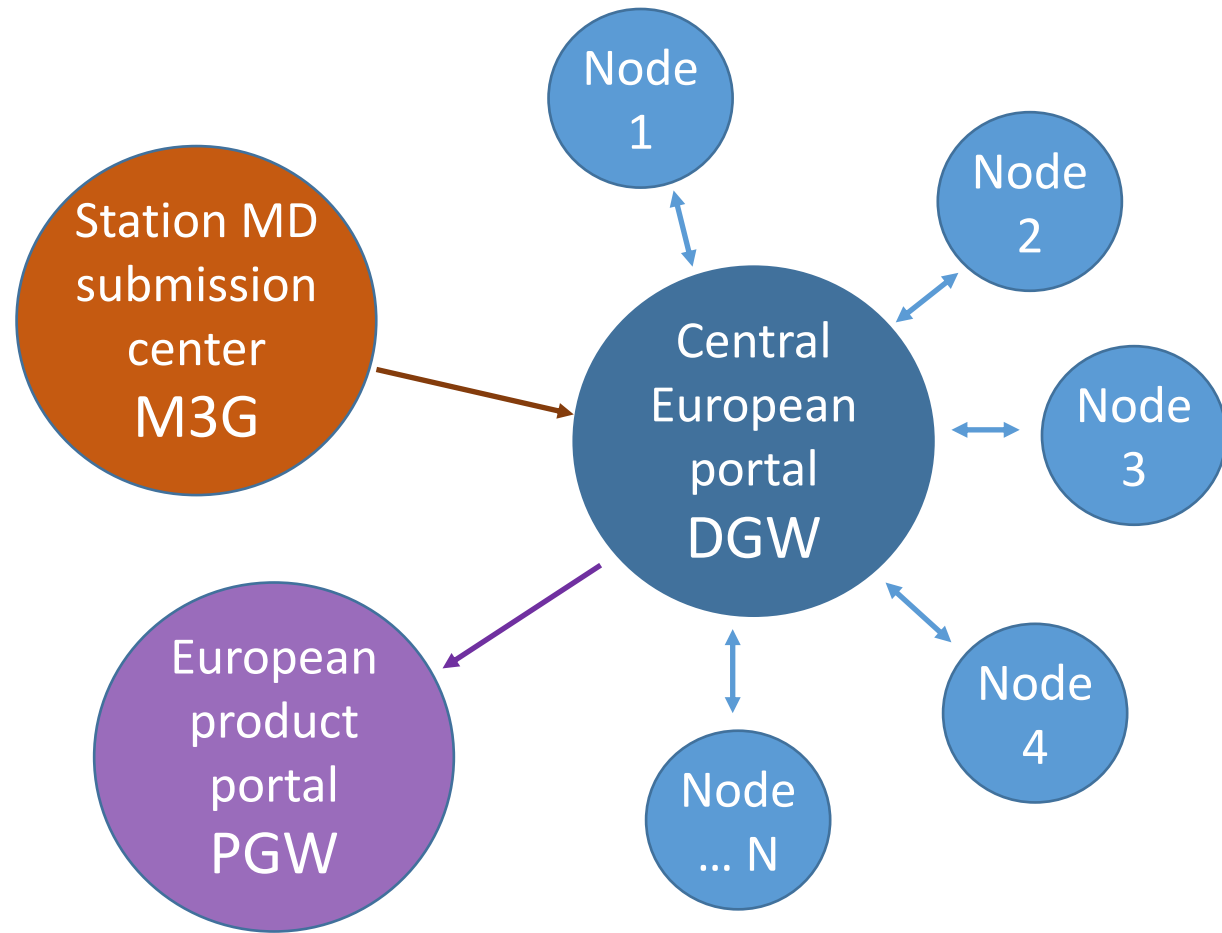
Collaborators : K.M. Ngo, A. Fontaine

The EPOS GNSS Data Gateway (DGW)



- The portal where users can request for GNSS metadata and data of all the GNSS stations integrated to the EPOS network
- System supporting the portal is hosted at the Côte d'Azur Observatory and maintained by CNRS (Fr)
- What is it?
- How does it work?
- What is its current status?

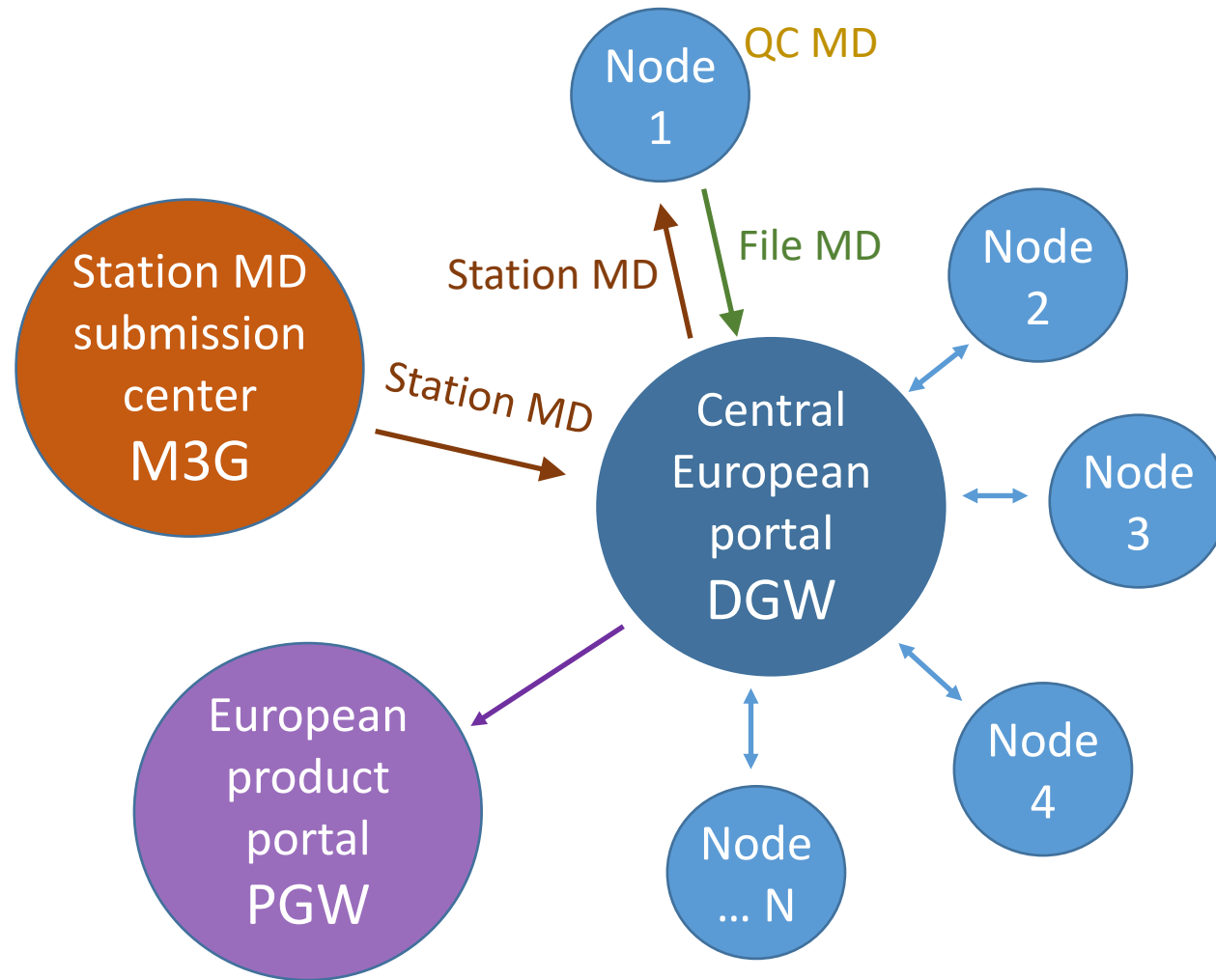
The DGW : What is it?



- The EPOS GNSS distribution system:
 - developed in the framework of the EPOS-IP project
 - designed to provide access to data from 2000+ GNSS stations from data centers across Europe

- Principle : a European portal system integrating data and metadata from independent local nodes

The DGW : How does it works?



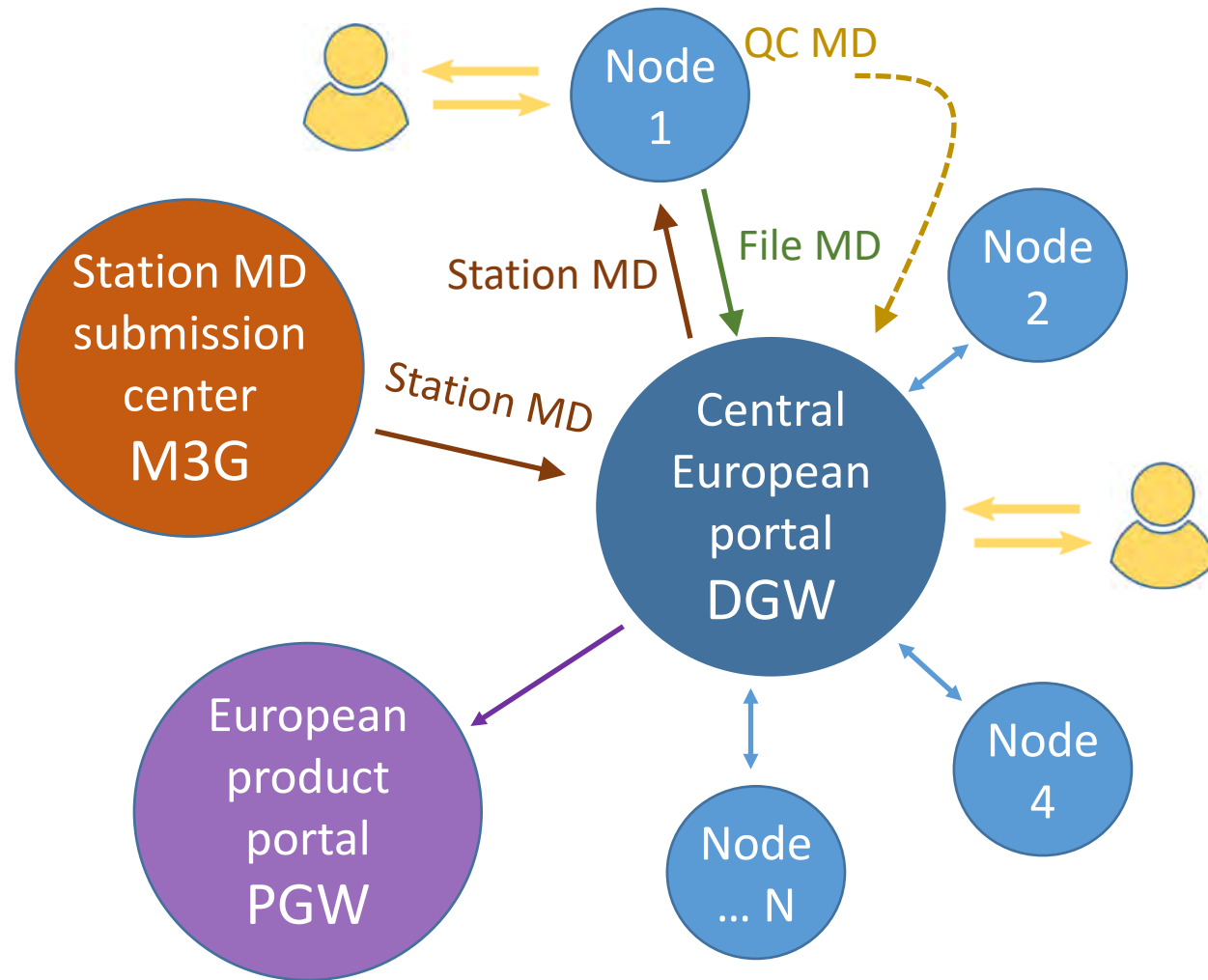
It works with **transfers of metadata** :

- **station metadata** from the submission center (M3G) to the Data Gateway
- **station metadata** from the Data Gateway to the local node
- **file metadata** from the local nodes to the Data Gateway, **if** their **QC** are validated

The QC metadata stay at the local node

The (rinex) **files** stay in their data center

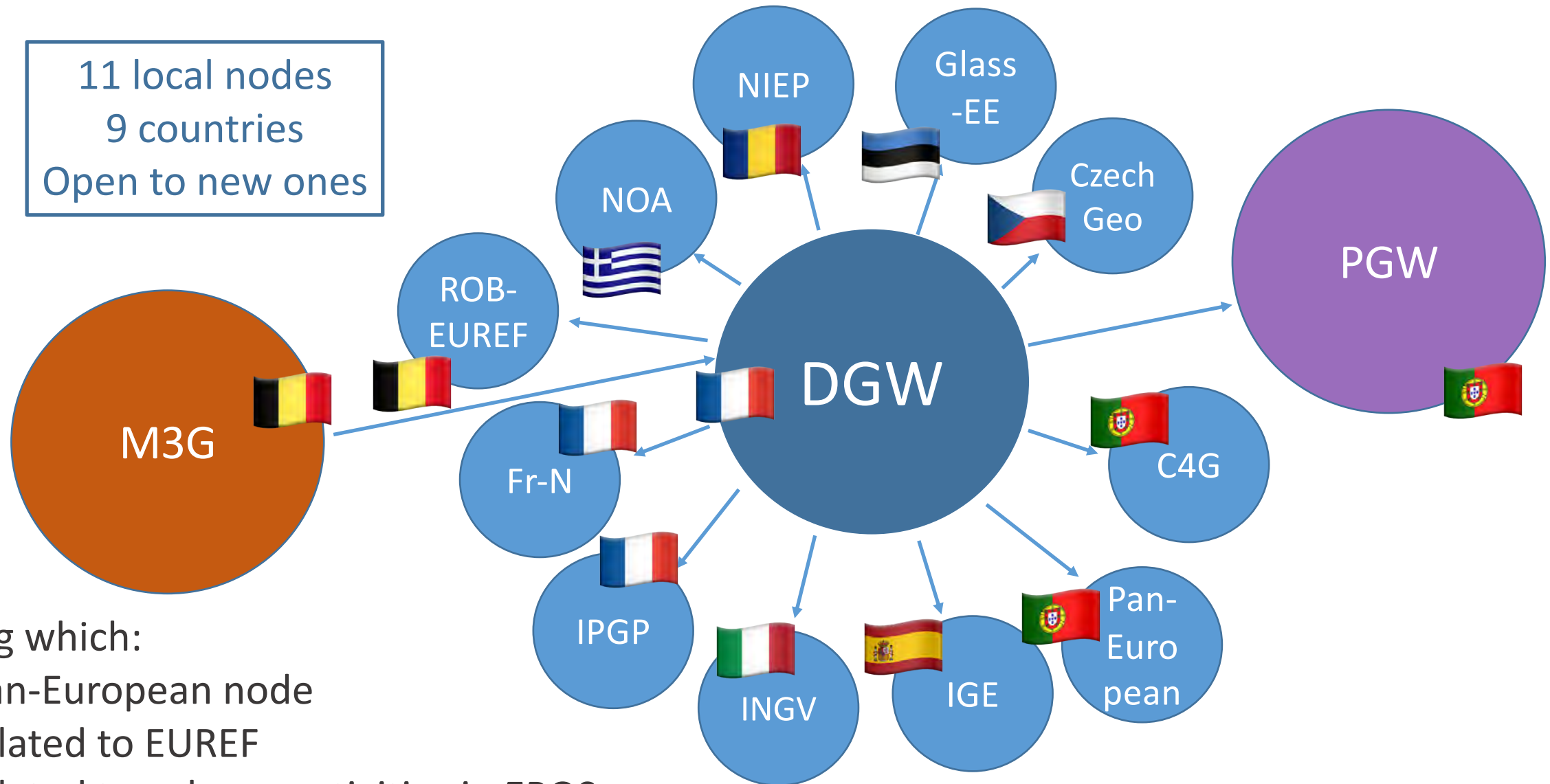
The DGW : How does it work?



What does it mean?

- *All data and metadata* can be found and requested *through the Data Gateway* (even QC metadata)
- *“Local” data and metadata* can be found and requested *at the local nodes*
- **Unique metadata for a data file over the system**

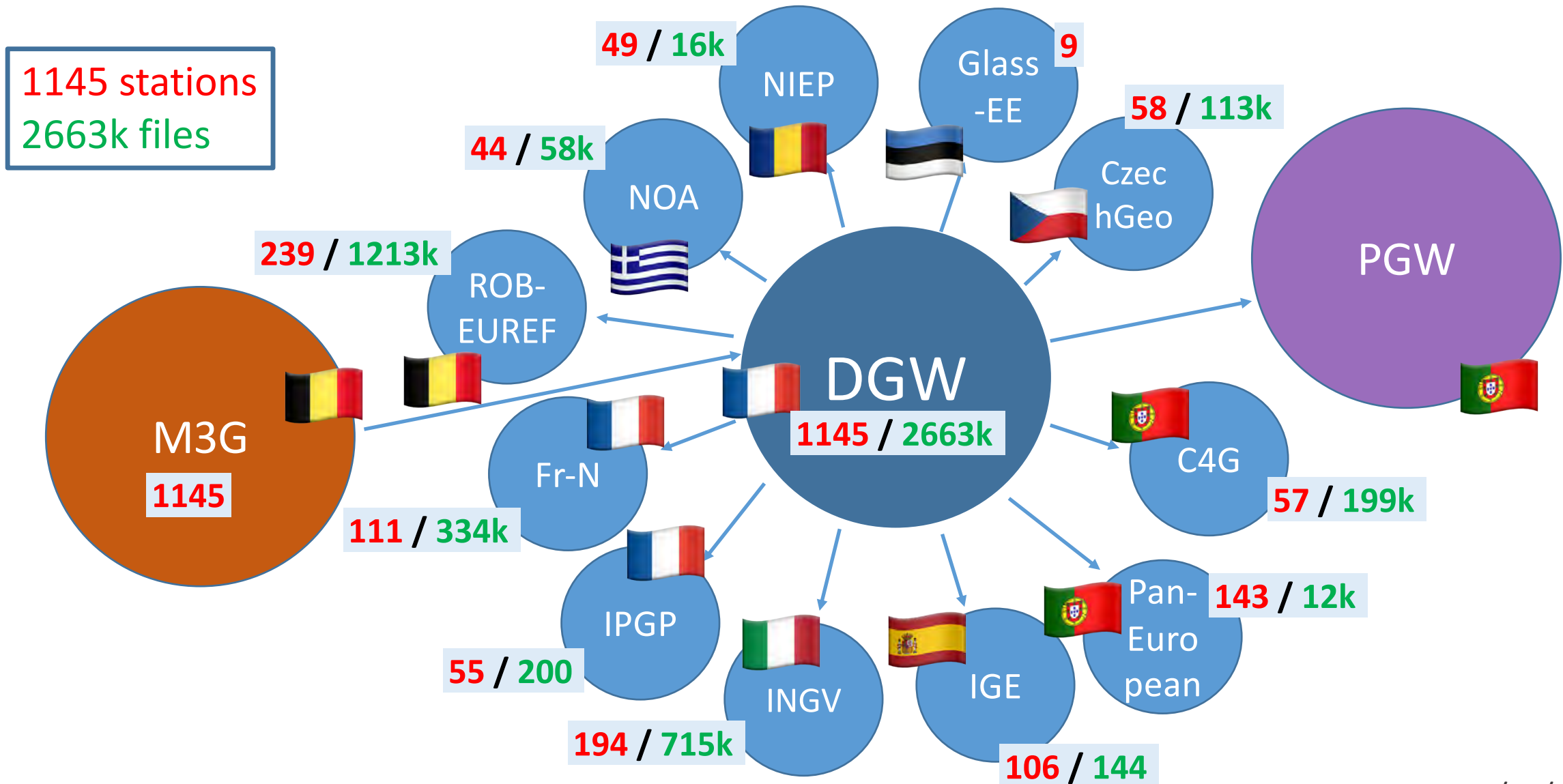
Current status of the node network as seen by the DGW



Among which:

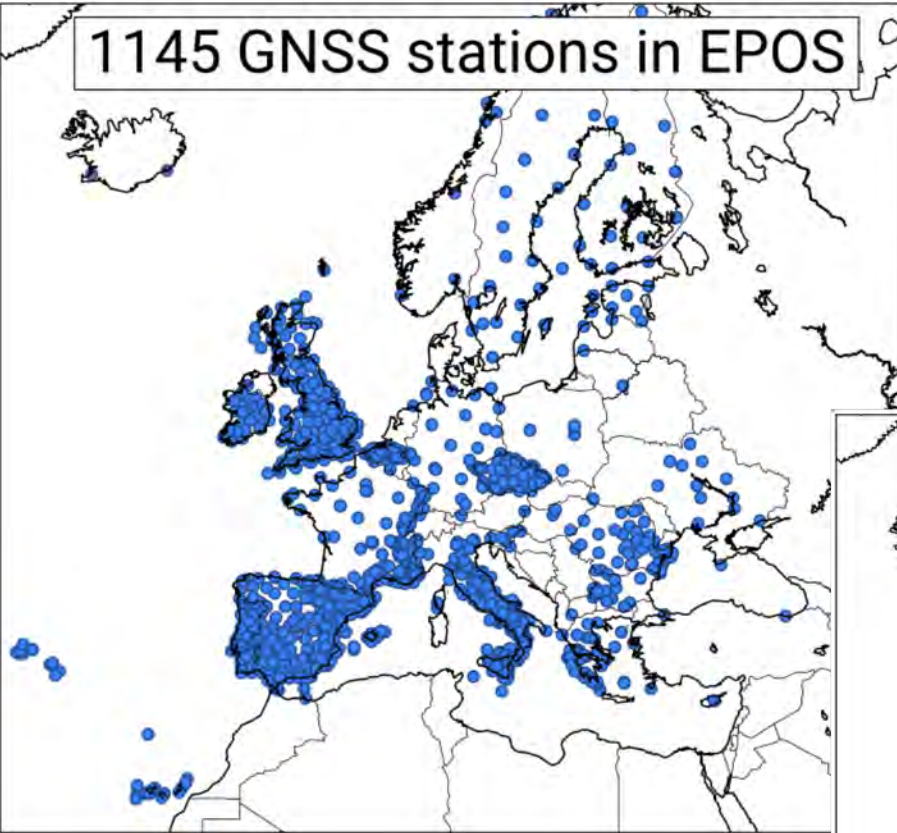
- 1 pan-European node
- 1 related to EUREF
- 1 related to volcano activities in EPOS

What is currently available?

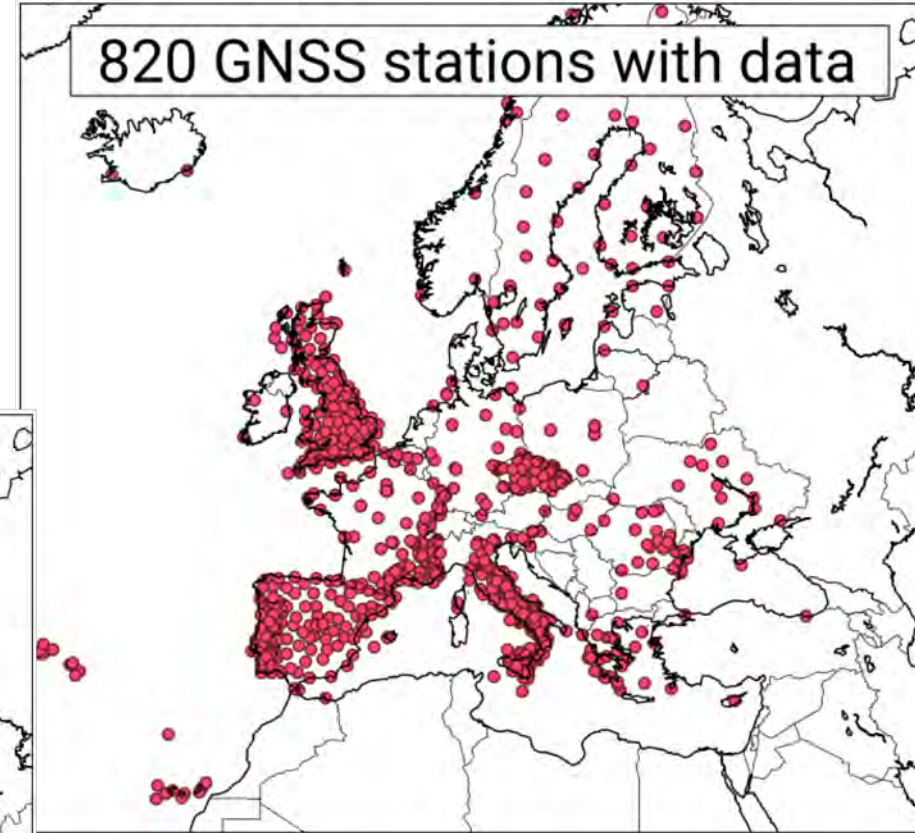


What is currently available?

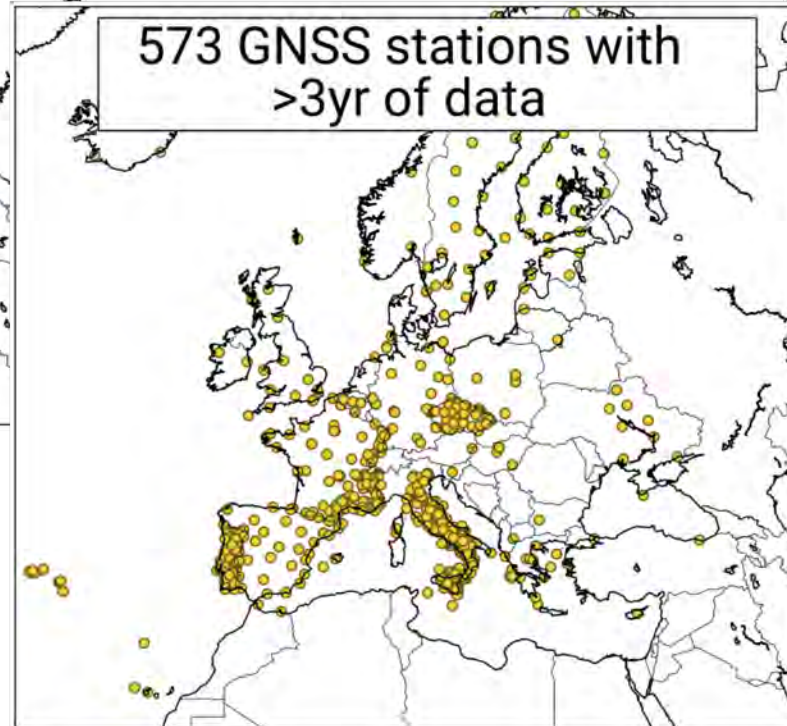
1145 GNSS stations in EPOS



820 GNSS stations with data



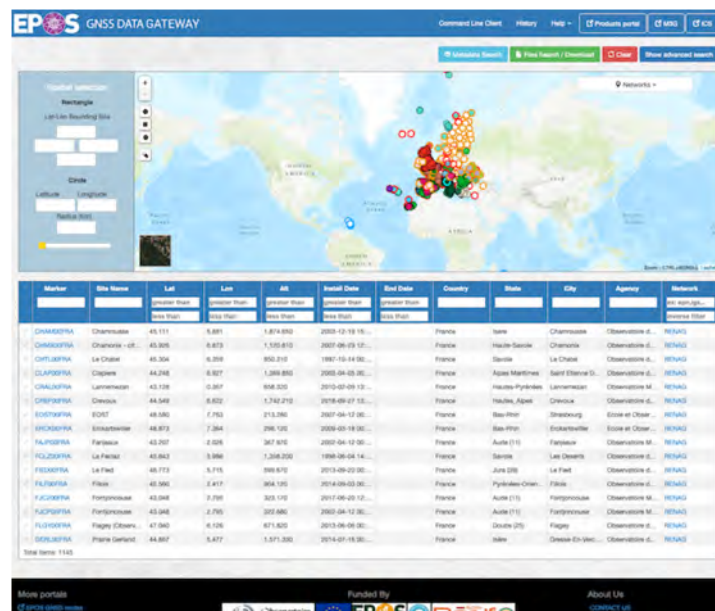
573 GNSS stations with
>3yr of data



How to use the EPOS GNSS web and command line clients to get GNSS data and metadata

Web Client

Command Line Client



```
(base) --- EPOS/pyglass master $ python pyglass.py -h
usage: pyglass.py [-h] [-u URL] [-cf [CONFIG_FILE]] [-m MARKERS [MARKERS ...]]
                  [-sn SITE_NAME [SITE_NAME ...]]
                  [-rs RECT_SELECT [RECT_SELECT ...]] [-cs CIRCLE_SELECT
                  [CIRCLE_SELECT ...]] [-ps POLYGON_SELECT
                  [POLYGON_SELECT ...]] [-lmin MIN_LAT] [-lmax MAX_LAT]
                  [-lmin MIN_LON] [-lmax MAX_LON] [-lmin MIN_ALT]
                  [-lmax MAX_ALT] [-lmin INSTALLED_DATE_FROM]
                  [-lmax INSTALLED_DATE_TO] [-lmin REMOVED_DATE_FROM]
                  [-lmax REMOVED_DATE_TO] [-m NETWORK [NETWORK ...]]
                  [-m INVERSE_NETWORKS [INVERSE_NETWORKS ...]]
                  [-ag AGENCY [AGENCY ...]] [-ss SATELLITE [SATELLITE ...]]
                  [-rt RECEIVER_TYPE [RECEIVER_TYPE ...]]
                  [-at ANTENNA_TYPE [ANTENNA_TYPE ...]]
                  [-rad RADOME_TYPE [RADOME_TYPE ...]]
                  [-co COUNTRY [COUNTRY ...]] [-pv PROVINCE [PROVINCE ...]]
                  [-ct CITY [CITY ...]] [--all] [--debug] [--print-url]
                  [-dds DATA_DATE_START] [-dde DATA_DATE_END]
                  [-da DATA_AVAILABILITY] [-sw SAMPLING_WINDOW]
                  [-sf SAMPLING_FREQUENCY] [-ft FILE_TYPE]
                  [-da DATA_AVAILABILITY] [-m MINIMUM_OBSERVATION_DAYS]
                  [-moy MINIMUM_OBSERVATION_YEARS] [-fs STATUS_FILES]
                  [-o OUTPUT] [--download-dir DOWNLOAD_DIR] [--version]
                  [-s statusfiles]
                  target

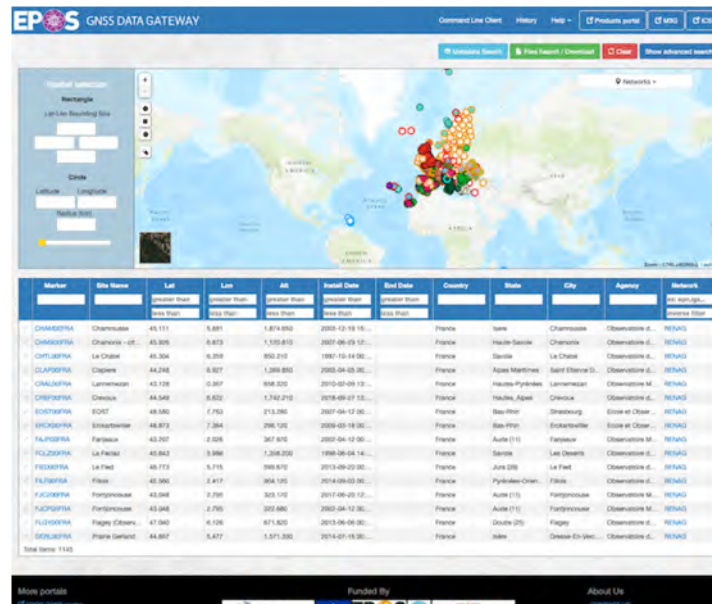
Command line client for a GLASS-API server. Note that space is used as
delimiter.

positional arguments:
  target                stations or files. Choose between the station metadata
                        or the file metadata.

optional arguments:
  -h, --help            show this help message and exit
  -u URL                GLASS server url
  -cf [CONFIG_FILE]     Use a configuration file. Default path Path to
                        configuration file
  -m MARKERS [MARKERS ...]
                        4 characters code of the station. The option can take
                        more than one marker and 1 to 4 characters per marker
```

How to use the EPOS GNSS web and command line clients to get GNSS data and metadata

Web Client



Command Line Client

```
(base) --- EPOS/pyglass master M3: ~ -- pyglass.py -h
usage: pyglass.py [-h] [-u URL] [-cf [CONFIG_FILE]] [-m MARKERS [MARKERS ...]]
                  [-sn SITE_NAME [SITE_NAME ...]]
                  [-rs RECT_SELECT [RECT_SELECT ...]] [-cs CIRCLE_SELECT
                  [CIRCLE_SELECT ...]] [-ps POLYGON_SELECT
                  [POLYGON_SELECT ...]] [-lmin MIN_LAT] [-lmax MAX_LAT]
                  [-lmin MIN_LON] [-lmax MAX_LON] [-lmin MIN_ALT]
                  [-lmax MAX_ALT] [-lmin INSTALLED_DATE_FROM]
                  [-lmax INSTALLED_DATE_TO] [-lmin REMOVED_DATE_FROM]
                  [-lmax REMOVED_DATE_TO] [-m NETWORK [NETWORK ...]]
                  [-m INVERSE_NETWORKS [INVERSE_NETWORKS ...]]
                  [-ag AGENCY [AGENCY ...]] [-ss SATELLITE [SATELLITE ...]]
                  [-rt RECEIVER_TYPE [RECEIVER_TYPE ...]]
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                  [-co COUNTRY [COUNTRY ...]] [-pv PROVINCE [PROVINCE ...]]
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                  [-da DATA_AVAILABILITY] [-sw SAMPLING_WINDOW]
                  [-sf SAMPLING_FREQUENCY] [-ft FILE_TYPE]
                  [-da DATA_AVAILABILITY] [-mod MINIMUM_OBSERVATION_DAYS]
                  [-moy MINIMUM_OBSERVATION_YEARS] [-fs STATUS_FILES]
                  [-o OUTPUT] [--download-dir DOWNLOAD_DIR] [--version]
                  [-s statusfiles]
                  target

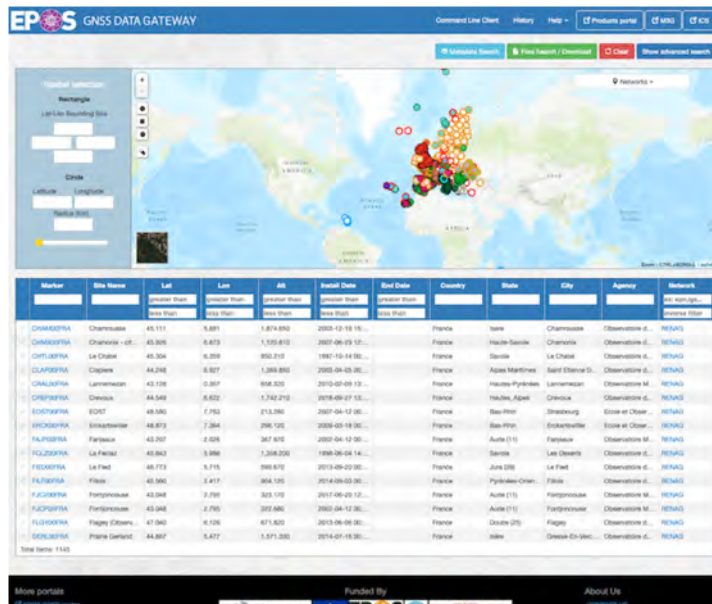
Command line client for a GLASS-API server. Note that space is used as
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positional arguments:
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  -m MARKERS [MARKERS ...]
                        4 characters code of the station. The option can take
                        more than one marker and 1 to 4 characters per marker
```

How to use the EPOS GNSS web client

Web Client



Marker	Site Name	Lat	Lon	Alt	Install Date	End Date	Country	State	City	Agency	Network
CHAM001	Chamotte	43.111	5.841	1,814.000	2008-12-18 18:10		France	Isère	Chamotte	Observatoire d...	RTN043
CHAM002	Chamotte - 02	43.365	6.873	1,335.810	2007-09-19 10:10		France	Isère	Chamotte	Observatoire d...	RTN043
CHAM003	La Chaise	43.304	6.205	850.210	1997-10-14 08:10		France	Isère	La Chaise	Observatoire d...	RTN043
CHAM004	Chapelle	44.248	6.327	1,389.850	2005-04-05 08:30		France	Alpes-Maritimes	Saint-Etienne D...	Observatoire d...	RTN043
CHAM005	Lambrun	43.128	0.267	858.520	2010-02-09 13:10		France	Hautes-Pyrénées	Lambrun	Observatoire d...	RTN043
CHAM006	Chesnay	44.549	6.820	1,742.210	2018-09-27 13:10		France	Hautes-Alpes	Chesnay	Observatoire d...	RTN043
CHAM007	EST	48.080	7.750	213.280	2007-04-12 08:10		France	Bas-Rhin	Strasbourg	Observatoire d...	RTN043
CHAM008	Estimote	48.873	7.264	284.100	2006-05-18 08:10		France	Bas-Rhin	Estimote	Observatoire d...	RTN043
CHAM009	Estimote	43.307	0.028	367.810	2007-04-12 08:10		France	Aude (11)	Estimote	Observatoire d...	RTN043
CHAM010	La Paille	43.043	5.980	1,308.200	1998-08-04 14:10		France	Savoie	La Paille	Observatoire d...	RTN043
CHAM011	La Paille	43.773	5.715	898.870	2013-09-20 08:10		France	Jura (39)	La Paille	Observatoire d...	RTN043
CHAM012	Fléac	43.080	2.817	364.170	2014-09-03 08:10		France	Pyrénées-Orientales	Fléac	Observatoire d...	RTN043
CHAM013	Fontgrouse	43.048	2.739	303.170	2017-09-20 12:10		France	Aude (11)	Fontgrouse	Observatoire d...	RTN043
CHAM014	Fontgrouse	43.048	2.739	303.170	2002-04-12 08:10		France	Aude (11)	Fontgrouse	Observatoire d...	RTN043
CHAM015	Fontgrouse	47.040	6.108	471.820	2013-09-05 08:10		France	Creuse (23)	Fontgrouse	Observatoire d...	RTN043
CHAM016	Fontgrouse	44.857	5.477	1,071.200	2014-07-18 08:10		France	Isère	Fontgrouse	Observatoire d...	RTN043

- Overview of the web client
- Discovering and downloading metadata
- Discovering and downloading data

<http://gnssdata-epos.oca.eu>

See the video of the demo

<http://gnssdata-epos.oca.eu> or <https://gnss-epos.eu/webinar-2021/>

How to use the EPOS GNSS command line client

- Overview of the command line client
- Discovering and downloading metadata
- Discovering and downloading data

Tool accessible via
<http://gnssdata-epos.oca.eu>

See the video of the demo

<http://gnssdata-epos.oca.eu> or <https://gnss-epos.eu/webinar-2021/>

Command Line Client

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                  CIRCLE_SELECT ...] [-ps POLYGON_SELECT
                  POLYGON_SELECT ...] [-lmin MIN_LAT] [-lmax MAX_LAT]
                  [-lmin MIN_LON] [-lmax MAX_LON] [-hmin MIN_ALT]
                  [-hmax MAX_ALT] [-idmin INSTALLED_DATE_FROM]
                  [-idmax INSTALLED_DATE_TO] [-rdmin REMOVED_DATE_FROM]
                  [-rdmax REMOVED_DATE_TO] [-nw NETWORKS [NETWORKS ...]]
                  [-inv INVERSE_NETWORKS [INVERSE_NETWORKS ...]]
                  [-ag AGENCY [AGENCY ...]] [-ss SATELLITE [SATELLITE ...]]
                  [-r RECEIVER_TYPE [RECEIVER_TYPE ...]]
                  [-at ANTENNA_TYPE [ANTENNA_TYPE ...]]
                  [-rad RADOME_TYPE [RADOME_TYPE ...]]
                  [-co COUNTRY [COUNTRY ...]] [-pv PROVINCE [PROVINCE ...]]
                  [-ct CITY [CITY ...]] [--all] [--debug] [--print-url]
                  [-dds DATA_DATE_START] [-dde DATA_DATE_END]
                  [-da DATA_AVAILABILITY] [-sw SAMPLING_WINDOW]
                  [-sf SAMPLING_FREQUENCY] [-fs FILE_TYPE]
                  [-dta DATA_AVAILABILITY] [-mod MINIMUM_OBSERVATION_DAYS]
                  [-moy MINIMUM_OBSERVATION_YEARS] [-fs STATUS_FILES]
                  [-o OUTPUT] [--download-dir DOWNLOAD_DIR] [--version]
                  [-statfiles]
                  target

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  target                stations or files. Choose between the station metadata
                        or the file metadata.

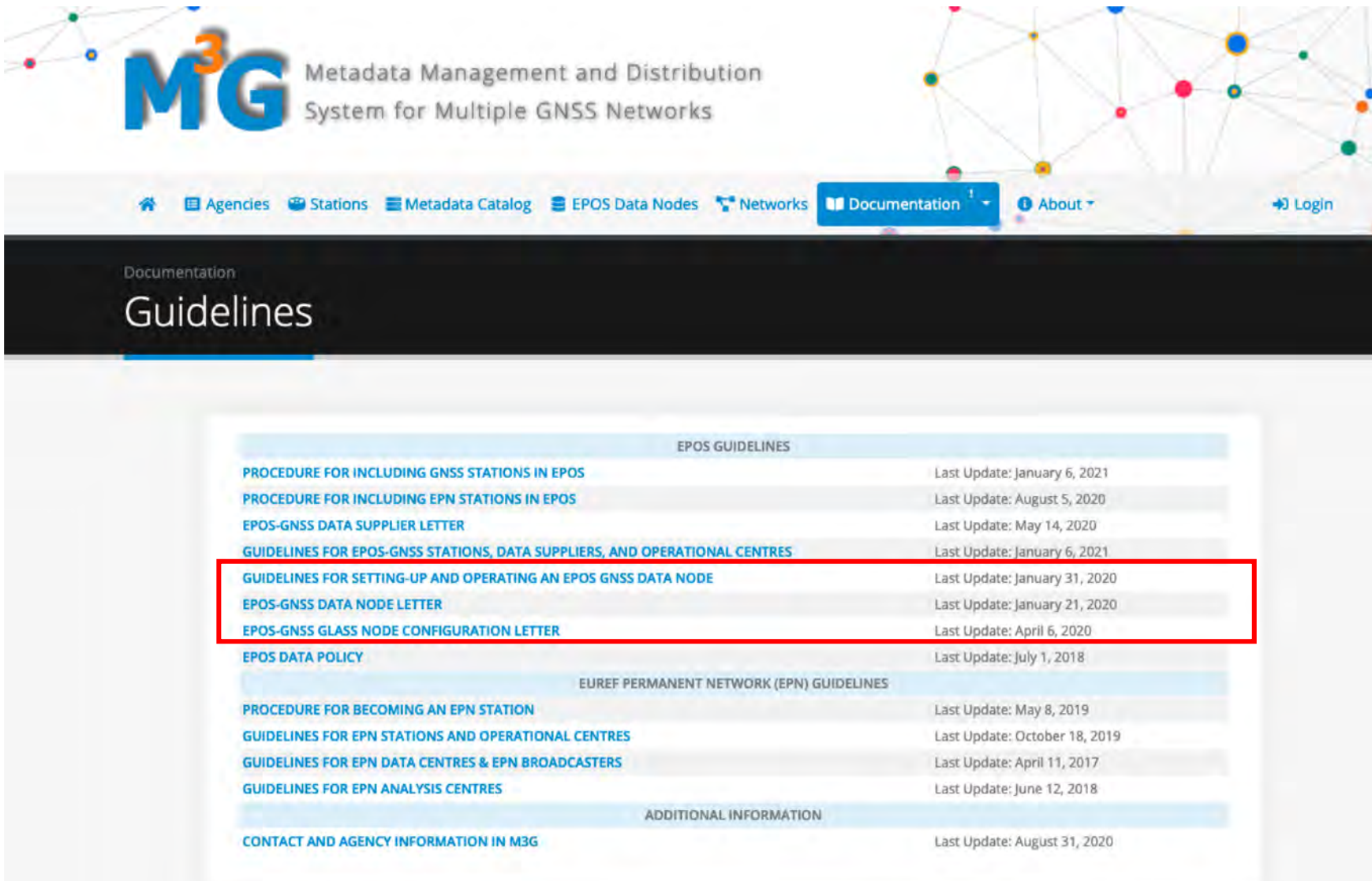
optional arguments:
  -h, --help            show this help message and exit
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  -cf [CONFIG_FILE]     Use a configuration file. Default path Path to
                        configuration file
  -m MARKERS [MARKERS ...]
                        4 characters code of the station. the option can take
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```

Portals and useful links for EPOS GNSS data

- **M³G:** <https://gnss-metadata.eu/>
- **Data Gateway:** <http://gnssdata-epos.oca.eu/>
- **Product Portal:** <https://gnssproducts.epos.ubi.pt/>
- **ICS:** <https://www.ics-c.epos-eu.org/>

To contact the Data Gateway: gnss-dgw@oca.eu

How to become a GLASS node?



M3G Metadata Management and Distribution System for Multiple GNSS Networks

Agencies Stations Metadata Catalog EPOS Data Nodes Networks Documentation About Login

Documentation

Guidelines

EPOS GUIDELINES	
PROCEDURE FOR INCLUDING GNSS STATIONS IN EPOS	Last Update: January 6, 2021
PROCEDURE FOR INCLUDING EPN STATIONS IN EPOS	Last Update: August 5, 2020
EPOS-GNSS DATA SUPPLIER LETTER	Last Update: May 14, 2020
GUIDELINES FOR EPOS-GNSS STATIONS, DATA SUPPLIERS, AND OPERATIONAL CENTRES	Last Update: January 6, 2021
GUIDELINES FOR SETTING-UP AND OPERATING AN EPOS GNSS DATA NODE	Last Update: January 31, 2020
EPOS-GNSS DATA NODE LETTER	Last Update: January 21, 2020
EPOS-GNSS GLASS NODE CONFIGURATION LETTER	Last Update: April 6, 2020
EPOS DATA POLICY	Last Update: July 1, 2018
EUREF PERMANENT NETWORK (EPN) GUIDELINES	
PROCEDURE FOR BECOMING AN EPN STATION	Last Update: May 8, 2019
GUIDELINES FOR EPN STATIONS AND OPERATIONAL CENTRES	Last Update: October 18, 2019
GUIDELINES FOR EPN DATA CENTRES & EPN BROADCASTERS	Last Update: April 11, 2017
GUIDELINES FOR EPN ANALYSIS CENTRES	Last Update: June 12, 2018
ADDITIONAL INFORMATION	
CONTACT AND AGENCY INFORMATION IN M3G	Last Update: August 31, 2020

Documentation currently available from the M3G Documentation Page

Do not hesitate to contact (inside documentation):

m3g@oma.be (M3G)

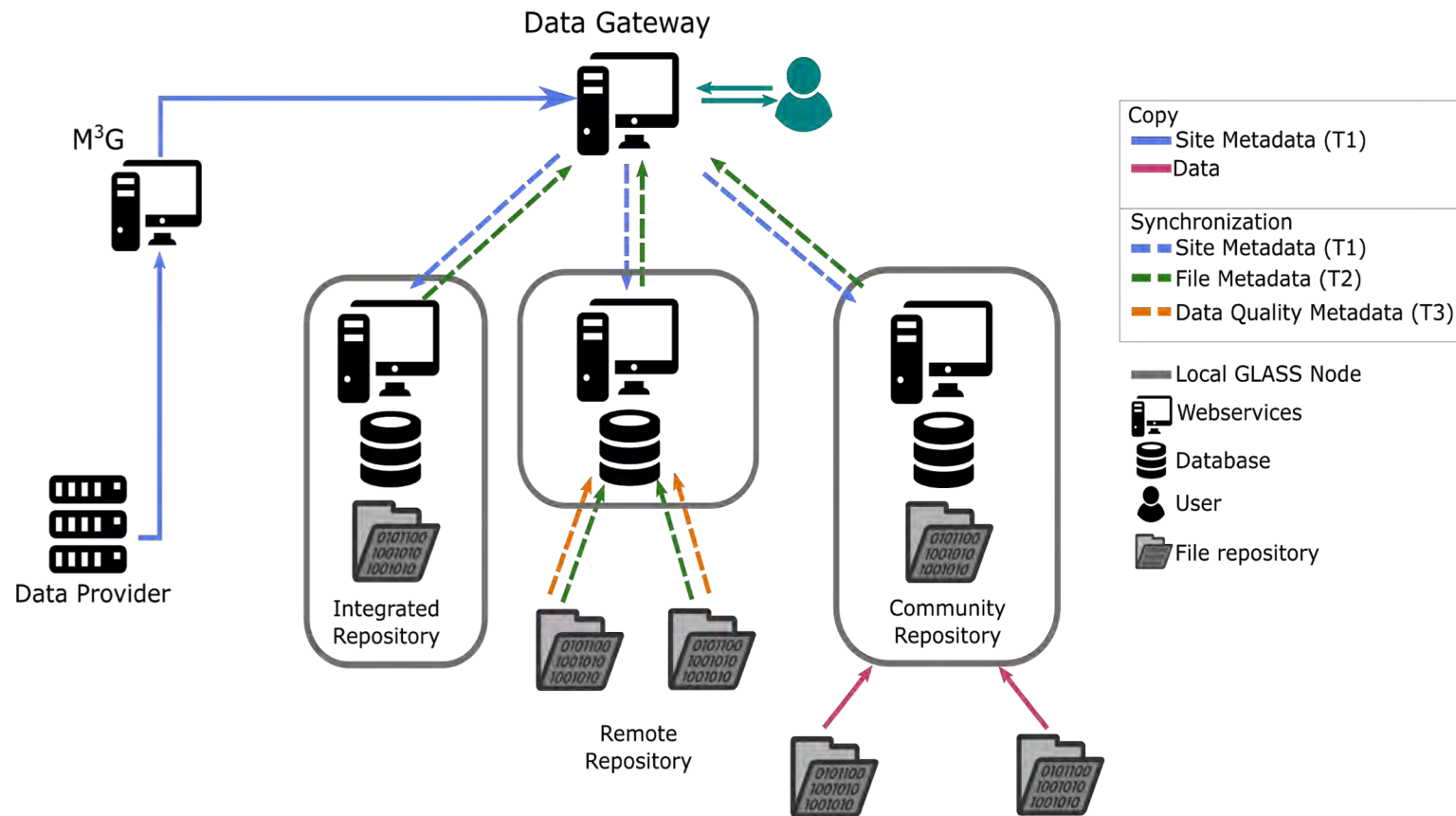
and

gnss-dgw@oca.eu (EPOS GNSS Data Gateway – node coordinator)

and

software@gnss-epos.eu (software coordinator)

Three solutions (data flow schemes) to make EPOS data discoverable through a GLASS node



Option 1 : Integrated Repository

GLASS node and **Data Repository(ies)** hosted at the same location and managed by a single agency.

→ Activity centralized at the node (generation of file and QC metadata)

Option 2 : Remote Repository

GLASS node and **Data Repository(ies)** physically independent and managed by different agencies.

→ An agreement between the repository owner and node manager to decide who is doing what

Option 3 : Community Repository

Data owner transfers the (rinex) files to this repository.