Pilot Project
GNSS SCIENCE SERVICE CENTRE

ESA Contract No. 4000124944/18/ES/JD with GMV

Vicente Navarro (ESAC)

Jesús Cegarra, Laura García, Juan Lera (GMV)

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ACTIVITY BACKGROUND

- GNSS is gaining more and more attention in numerous scientific fields; <u>Fundamental Physics, Metrology, Earth and Space Sciences</u>, among others.

- The IGS contributes to provide on an <u>openly available basis, the GNSS data, products and services</u> to the GNSS Community, thanks <u>to over 200 self-funding agencies</u>, universities, and research institutions in more than <u>100 countries</u>.

- ESA contributes to the IGS via the ESOC Navigation Support Office. ESA/ESOC is today an important Analysis Center within the IGS and it is providing precise orbit, clock, among other GNSS products as well as observation data from ESA's GNSS Observation Network (EGON).

- The access and exploitation of GNSS data and products is implemented by different vertical systems, namely ftp access. Context information has not yet been exploited.

- Many GNSS Tools need to be natively installed. Could they be accessed online?
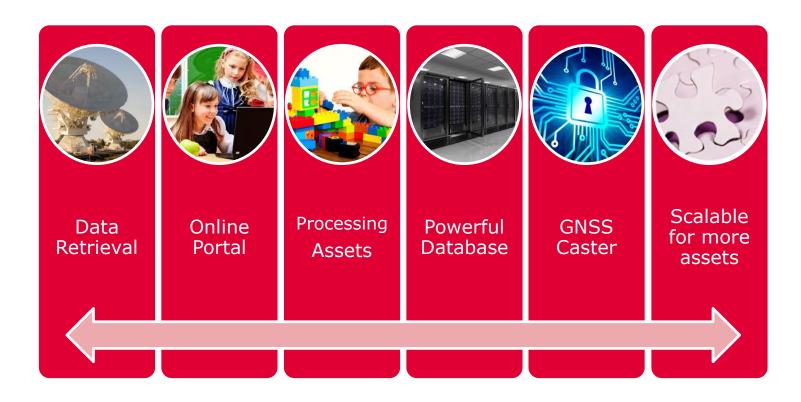
PROJECT SCOPE AND GOAL

- Setup the Pilot GNSS Science Service Center at **ESAC** as a first step towards the consolidation of a worldwide reference GNSS Scientific Archive, through the provision of GNSS products and services in an environment that fosters GNSS Science research in Europe, and notably the use of Galileo (and EGNOS) by the scientific community.

- The GNSS Science Service Center aims at integrating information and processing assets from all different GNSS domains into a single Science Exploitation Platform

HOW TO ACCOMPLISH THIS GOAL?

Data Retrieval

Online Portal

Processing Assets

Powerful Database

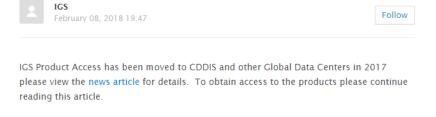GNSS Caster

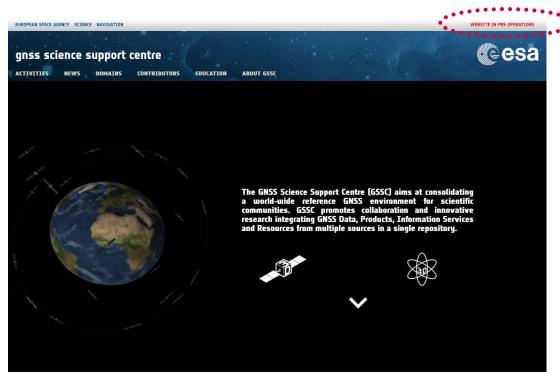Scalable for more assets

IS THERE ANYTHING ALREADY IN PLACE?

- GSSC IGS' mirror already available for data and products download!!

- https://gssc.esa.int

  - https://gssc.esa.int/navipedia/

- ftp://gssc.esa.int

IGS
February 08, 2018 19:47

[Follow]

IGS Product Access has been moved to CDDIS and other Global Data Centers in 2017 please view the news article for details. To obtain access to the products please continue reading this article.

GPS Satellite Ephemerides (Orbits) / Satellite & Station Clocks

Orbit and Station and satellite clock products are found in the standard product directories, the orbits in files that end in *.sp3.Z and the clocks in files that end in *.clk.Z ;.

- ftp://cddis.gsfc.nasa.gov/gnss/products/
- ftp://igs.ensg.ign.fr/pub/igs/products/
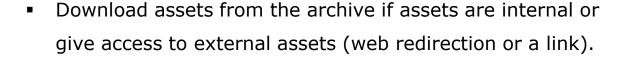- ftp://gssc.esa.int/gnss/products/
- ftp://lox.ucsd.edu/pub/products/

EUROPEAN SPACE AGENCY   SCIENCE   NAVIGATION

WEBSITE IN PRE-OPERATIONS

gnss science support centre

esa

ACTIVITIES   NEWS   DOMAINS   CONTRIBUTORS   EDUCATION   ABOUT GSSC

The GNSS Science Support Centre (GSSC) aims at consolidating a world-wide reference GNSS environment for scientific communities. GSSC promotes collaboration and innovative research integrating GNSS Data, Products, Information Services and Resources from multiple sources in a single repository.

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ONLINE PORTAL

- Role Based Access Control. The user will be granted with access to specific GSSC assets and web portal functionalities.

- Access to an index/inventory of all Assets.

- Filter and visualization of assets according their associated meta-information (name, date, type, service domain, owner, quality checks, location…).

- Download assets from the archive if assets are internal or give access to external assets (web redirection or a link).

- Upload assets (to a user account, offering the possibility of making them public).

- Access to tools (configure, provide inputs, launch them, etc)

Access to archived data and products

User Access for uploading their own data

Access to online tools

Jupyter notebook for prototyping

GNSS DATA AND PRODUCTS

- <u>Native assets</u>: the asset belongs to GSSC from ingestion to delivery.

- <u>Federated assets</u>: the asset does not fully belong to GSSC, which controls some part from ingestion to de-livery but not all of it.

- <u>External assets</u>: the asset belongs to an external system and GSSC just references it.
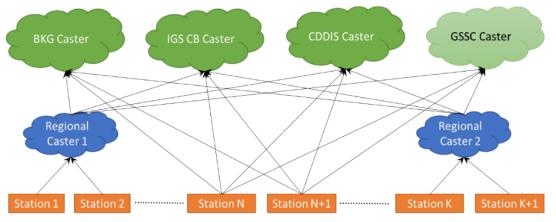
- **What GNSS data and products do you need?**

GSSC CASTER

- Three main institutions provide access to IGS data through three different Casters to the GNSS Community: **IGS Central Bureau, BKG and CDDIS.**

- The main issue currently being faced by the IGS for the provision of RT data and product access to the rapidly growing GNSS Community is related with <u>bandwidth capabilities</u>.

- The addition of the GSSC Caster will ease the connection load.
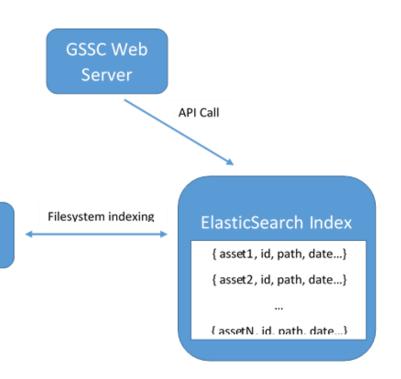
USER DATA RETRIEVAL

- Powerful Database with <u>context information</u>

- Filtering of assets according to the **meta-information** stored for each asset at the inventory (service domain, project, status, station, generation/storage date or date range, type, retrieval rate, hierarchy, owner

- Station quality and tracking

- GNSS spacecraft coverage visualisation

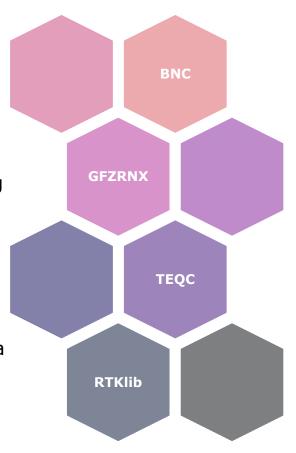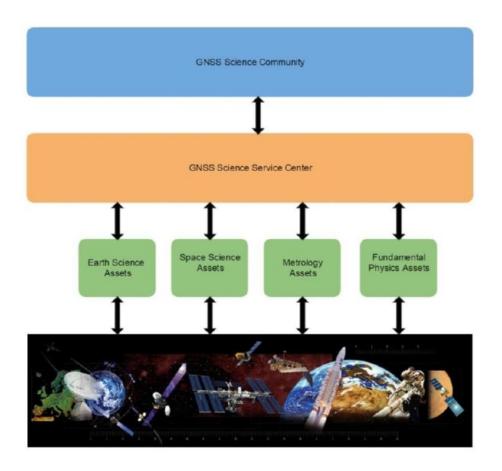- **How would you like to access the data?**

PROCESSING TOOLS

- Each tool will have a set of configuration parameters. Some of them will be configurable by the user and those are the parameters that will be shown at the website and that will be modifiable by the user.

- Provision of inputs to the tool. Each tool will define a set of inputs. Among those, some of them will be given by the user and those are the inputs that the user will be able to introduce at the website.

- Start/stop the execution of the tool

- Retrieval of outputs from the execution. Each tool will give its outputs in a well-known format. The website will allow to store those raw outputs at the archive and index them at the GSSC database.

- **How would you like to process the data? Which tools do you need?**

BNC

GFZRNX

TEQC

RTKlib

SUMMARY

- The GNSS Science Service Center aims at integrating information and processing assets from all different GNSS domains into a single <u>Science Exploitation Platform</u>, to deliver advanced information and analysis services.

- In order to achieve that, a <u>high level of cooperation between ESA and IGS</u> will be pursued with an assessment of additional activities that could be performed by the GSSC in the context of IGS

CONTACT POINTS

▪ Project is under specification phase.

▪ The process of identifying GNSS Assets is ongoing!!!

ESA

• Vicente Navarro

Vicente.Navarro@esa.int

GMV

• Juan J. Lera

jjlera@gmv.com

THANK YOU

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