D5.5 Report on EC-US cooperation

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Introduction

This deliverable is reporting the meetings organized in the framework of Task 5.3 of WP5 dealing with developing best practices for integrating the European GPS station infrastructure within the Global Navigation Satellite Systems (GNSS). This deliverable is reporting the EU and US collaborations. During the last COOPEUS reporting period an important meeting has been scheduled in Task 3 of WP5 to coordinate and implement the collaborations between the EPOS team and UNAVCO on GNSS data integration and standardization. The outcomes of the meeting are reported in this document.

THE EPOS-UNAVCO GSAC MEETING

1 Goal of Conference

The GSAC – WG4-EPOS meeting was held at University of Beira Interior, Covilhã, Portugal on March 31st and April 1st, 2014. It was a joint organization between EPOS and the COOPEUS project with the major goal of discussing GSAC (Geodetic Seamless Archives) web-services towards the integration at European level of geodetic data, namely GNSS (Global Navigation Satellite Systems) observations. With the support of the COOPEUS project, representatives of UNAVCO (USA), who developed the current GSAC version, were also present and able to provide their view how such services can be improved in cooperation with the European partners represented in this meeting.

Currently, the geodetic data are dispersed among a large number of data centers, built at national and European level, that do not communicate between them. A user interested to access data in a particular region for a given data span needs to access several data centers using different protocols. Furthermore, there are no guarantees that many of these data, acquired for other purposes (e.g., surveying applications), are properly stored and accessible for future use. Despite the efforts from EUREF (European Reference Frame) to implement existing global guidelines for GNSS data management, it is essential to implement a coordinated network that can provide seamless access to the European geodetic data to all interested users.

In the second day, it was also organized a WG4 meeting. The major goal of this meeting was to finalize the discussion about the WG4 TCS (Thematic and Core Services). Such goal was achieved with a complete clarification of the TCS structure.

2 Stakeholders Targeted and In Attendance

The GSAC – WG4-EPOS meeting was open to any participant. The number of participants was 32 from 11 European countries, 2 African countries (Mozambique and Nigeria), and United States. It is important to stress that the participants were almost equally divided between geodesists and computer sciences experts, which was one of the main goals of this meeting: bring these two communities to discuss the future developments of GSAC together. In fact, the cooperation between the experts of these areas is essential to optimize the GSAC web services both in the technical and end-user point of view.

Currently, there are already six countries participating in EPOS where GSAC are being implemented: Italy (2), Greece (2), Iceland, France, Belgium, and Portugal. COOPEUS, through KNMI, sponsored the participation of an element of each institution/country (with the exception of Portugal) that already installed GSAC in order that they could share their experience and discuss major issues and ideas to improve the application. COOPEUS also sponsored two members of UNAVCO, including the GSAC developer, Stuar Weir, who was able to strongly interact with all participants.

3 Outcome of the Meeting

- **General**

  Details of the conclusions of the meeting are presented as annex "GSAC Minutes". The most important decisions are:

  - To continue investing in the GSAC web-services as a future standard for geodetic data dissemination, in particular for GNSS data. Such standards should also be extended to the associated meta-data, which clearly is so important as the data themselves.
  - Such investment should also be done by the European partners, namely in the framework of the EPOS project. UNAVCO will continue to support the development of GSAC but the necessary funds are not presently guaranteed in the long run.
  - In order to correct some issues rose during the meeting, a Technical Commission was nominated to prepare a new database structure for GSAC. This commission is composed by: Benedikt Ófeigsson, Jean-Luc Menut, Quentin Baire, David Zuliani and Erwin Weisensarter, plus Stuart Wier. By September, they will have a database structure tailored for GNSS with all the required fields.

- **Specific to stakeholders**

  The webpage of the GSAC services will continue to be maintained by UNAVCO (https://facility.unavco.org/data/gsacws/gsacws.html). In addition, a mailing list will be created in order to share all information among the stakeholders. This new mailing is available at http://postal.unavco.org/mailman/subscribe/gsac. UBI will

also keep the webpage of the meeting (http://segal.ubi.pt/2014GSAC/) where information about GSAC will continue to be available.

The following Annexes will list the Agenda, the participant Lists and the draft minutes reporting the discussions.

GSAC-EPOS
Covilhã 2014

Schedule

March 30th - Sunday

Afternoon	Organized bus from Lisbon to Covilhã

March 31st - Monday

9:00 - 9:15	Registration
9:15 - 9:30	Welcome and Practicalities
9:30 - 10:00	EPOS status and General COOPEUS EU-US Cooperation
10:00 - 10:15	Coffee Break
10:15 - 10:30	UNAVCO, Origins and Future of GSAC (Fran Boler; UNAVCO)
10:30 - 12:30	GSAC Presentation (Stuart Wier; UNAVCO)
12:30 - 13:30	Lunch Break
13:30 - 13:45	European Implementations (INGV - Italy)
13:45 - 14:00	European Implementations (ROB - Belgium)
14:00 - 14:15	European Implementations (NOA - Greece)
14:15 - 14:30	European Implementations (RENAG - France)
14:30 - 14:45	European Implementations (IMO- Iceland)
14:45 - 15:00	European Implementations (SEGAL - Portugal)
15:00 - 15:15	European Implementations (OGS - Italy)
15:15 - 15:30	European Implementations (NTUA - Greece)
15:30 - 15:45	Coffee Break
15:45 - 18:00	Open Discussion
18:30 - 22:00	Social Dinner(Departure from UBI) - Quinta da Eira Peroviseu

April 1st - Tuesday

9:00 - 12:30	GSAC Federation, Use and Implementation Working Session*
12:30 - 14:00	Lunch Break
14:00 - 17:00	WG4 Meeting/GSAC Federation Use and Implementation Working Session

April 2nd - Wednesday

Moorning	Organized bus from Covilhã to Lisbon

*All participants will have the opportunity to install GSAC on their laptops. The intent is to demonstrate what is needed to install GSAC (but not to make a public server online). Demo database will be provided.

NAME	Country	Institution	BUS: Lisbon - Covilhã	BUS: Covilhã - Lisbon
Guenter Stangl	Austria	Austrian Academy of Sciences	yes	yes
Carine Bruyninx	Belgium	Royal Observatory of Belgium	yes	yes
Quentin Baire	Belgium	Royal Observatory of Belgium	yes	yes
Jan Dousa	Czech Republic	Research Institute of Geodesy, Topography and Cartography	no	yes
Kirill Palamartchouk	England	Newcastle University	no	no
Andrea Walpersdorf	France	ISTerre Grenoble	yes	yes
Menut Jean-Luc	France	Observatoire de la Côte d'Azur	yes	
Erwin Wiesensarter	Germany	BKG	yes	
Markus Ramatschi	Germany	GeoForschungsZentrum Potsdam	yes	yes
Wolfgang Soehne	Germany	BKG	yes	
Thomas Hoffmann	Germany	EPOS	yes	yes
Argyrakis Panagiotis	Greece	National Observatory of Athens	yes	yes
Demitris Anastasiou	Greece	National Technical University of Athens	yes	yes
Xanthos Papanikolaou	Greece	National Technical University of Athens	yes	yes
Benedikt Ófeigsson	Iceland	Icelandic Metereological Office	no	no
Daniele Bailo	Italy	EPOS-INGV-ITALY	yes	yes
David Zuliani	Italy	Istituto Nazionale di Oceangrafia e di Geofisica Sperimentale	yes	yes
Gianpaolo Cecere	Italy	Istituto Nazionale di Geofisica e Vulcanologia	yes	
Giuseppe Colucci	Italy	e-Geos/CGS Matera	yes	yes
Giuseppe Puglisi	Italy	Istituto Nazionale di Geofisica e Vulcanologia - Catania	yes	no
Luigi Falco	Italy	Istituto Nazionale di Geofisica e Vulcanologia	yes	
Massimo Rossi	Italy	Istituto Nazionale di Geofisica e Vulcanologia - Catania	yes	no
Nicola D'Agostino	Italy	Istituto Nazionale di Geofisica e Vulcanologia	yes	
Andrzej Araszkiewicz	Poland	Military University of Technology	yes	
Piotr Szymanski	Poland	Military University of Technology	yes	
João Fonseca	Portugal	Instituto Superior Técnico	no	no
Luísa Bastos	Portugal	Astronomical Observatory	no	no
David García	Spain	ITACyL	no	no
Marcelino Valdés	Spain	Instituto Geográfico Nacional	no	no
Modesto Diaz	Spain	ITACyL	no	no
Fran Boler	USA	UNAVCO	yes	yes
Stuart Wier	USA	UNAVCO	yes	yes

Minutes of open Discussion on GSAC (31 March, Covilhã)

Convened by Rui Fernandes and Stuart Wier.

David Zuliani: I would like start with a discussion on data policy. Is it possible to have user access control with GSAC?
Stuart: First, UNAVCO is open access so this is no issue. Europe needs to figure it out itself. Maybe a special software is needed for user access control. Another option is to put user account on the FTP servers. Nevertheless, management account can in principle be put in GSAC.
Benni: This solution will not usable. It's better to use other well defined software for account management instead of putting it into GSAC.
Stuart: In the federated GSAC, the situation gets complicated if the user has different accounts at different repositories. Example: at UNAVCO super sites 5 people forgot their password. Conclusion: you need full person to help users because it adds overhead. It can be part of GSAC but you need professional help with this.

Remark: split this problem in data management and data policy. In WG4 we already have quite a lot open access of data. There only exist embargo's for some time and registration after which data is freely available. It's better to think on long term strategy to develop/implement some central authentication.

Stuart: who will manage this central authentication? Do the user has to pass any qualification? How do you prevent bogus ID's. Again, you need professional assistance to develop/implement this.

Carine: why do you need authentication?

Answer: statistics of data traffic. Maybe tracking of IP's can serve this purpose as well. To attract funding you need to show who is using your data and show that your data are useful. Also for security reasons. A example is when an annoying user is taking up all bandwidth. You need to know who is doing this. Another reason is to keep track of the users and check if they cite (or not at all) you correctly in their articles.

Rui: when WG4 data policy was written registered access was included. Carine said that she wanted this but maybe did not realise all implications.
Stuart: you need professional help to implement with this. Maybe solutions exist to block annoying users automatically without registration.
Fran: what's the problem? You don't want people to download your data?
Remark: someone was downloading everything from our repository and slowed down the network. It was difficult to track the user.

Stuart: other solutions exist to deal with this problem: limit bandwidth per user.

Rui: Authentication helps funding. Installing GSAC and afterwards collecting money is not the strategy of WG4.
Daniele: You need to know who uses the data. Maybe geodetic community needs to develop a plugin

for registration.
Rui: The idea workshop is to come up with common collaborative work. Maybe data policy access is secondary issue.
Daniele: Perhaps create a board for standardization.

Stuart: GSAC has log-files but are not used much yet. People clicks are logged. Statistics can be parsed for these. Time of request and IP's are also logged. We know that 5 university from Strasbourg are biggest user. They are many ways to solve this issue. Can add field username and password to DB and GSAC can use this to filter access. Now federated access with different accounts will cause problems. I am just showing simple solution but these might have complex consequences. Next, a board of standardization is useful for advice. I propose a working group with practising geodesists to define the database structure that satisfies everybody needs (most of the time). Maybe tailored for GNSS (called DB2). Keep the simple DB for other people and add new BD2 for requirements outlined today.

Rui: Will the new prototype scheme be compatible with the old one? Broad scheme versus very specific.

Stuart: this new DB will be tailored to GNSS. This will be no problem because queries are defined in the local server, not in the GSAC core module. But we need to make priorities what needs to be done. I just want to point out possibilities. Not telling what you should do. Define your objectives, and then write the Java code (3 months of work) and then you are done. You can also hire a programmer. UNAVCO cannot guarantee help.

Rui: maybe we need first find resources then define what we need to implement. We can look at UNAVCO for how to handle meta data because they do the same. SOPAC and GES DISC might have similar structure which we can follow. Another problem: at the moment I get several files for one station which shows inconsistent meta data.

Remark: this is not a GSAC problem. It is a provider problem.

Rui: GSAC should have a plugin for QC. Development can be collaborate project. If this not solved you lose confidence of GSAC users.

Remark: maybe we can have an external tool?
Rui: This needs to be solved to really use GSAC usefully in federate state. QC does not need to included in GSAC.
Remark: do SOPAC use external software?
Fran: It used teqc but providers need to be responsible for inserting correct meta data.
Remark: There's a difference between USA and Europe. In USA small number of networks, Europe has lots. Mix of several networks of private, EUREF and,scientific networks.
Fran: in the USA also a lot of small company contribute to meta base. Also with varying meta data quality or latency.
Stuart: teqc is easy to get and easy to use.

Stuart: Now is a good time to define the database structure tailored for GNSS data (DB2). UNAVCO has not the resources to write the Java script afterwards but can help.

Benni: first we need to define the tables and meta tables.
Fran: Maybe we can tackle duplicate station ID's. Can be solved by adding owner name.
Stuart: This can also be solved by using station full name to 4 character ID. Longitude and latitude.
Remark: 4 character code and Dome number is already accepted method although not always followed.
Stuart: It's easy to come up with new name but comes quickly management headache.
Carine: During the IGS workshop this issue was discussed. I suggest to create one website where all ID's are catalogues. At IGS level there should be space to for this.
Fran: This can be also human problem. People are lazy.
Carine: in Prague it was decided that it is necessary to have meta data to be an EPOS data centre.
Stuart: For tilt data we made a special database. The same can be done for GNSS data.
Carine: put people together to define this DB2. Who?

Benedikt Ófeigsson, Jean-Luc Menut, Quentin Baire, David Zuliani and Erwin Weisensarter were elected to be part of this group. By september they will have a database structure tailored for GNSS with all the required fields.

Stuart: federated GSAC can query other GSAC's without the other knows about it. Do you want a uncontrolled federate growth? This issue can solved.
Next, GSAC is moving to be more open source, with collaborators being invited to work on branches. This is necessary to keep it alive. At the moment only I know the code.

David Zuliani: Is it possible to have real time GNSS services inside GSAC?
Fran: This feature is already present inside the UNAVCO GSAC and shouldn’t be a problem to implement for the EPSOS version.

Remark: what about the campaign data?
Stuart: GSAC can deal with it with no problem. It has a field in DB to indicate this.

Fran: stop thinking about the site-log as container for information. Think directly in terms of DB.
Stuart: site-log is very prone to little type errors. DB enforces already right type.
Benni: that is why I suggest to implement another layer to do some validation of entered data.
Carine: that what we already do at ROB. Internally we already use DB as container for meta data.
Fran: IGS central bureau is busy to develop to software what you at ROB doing already.

Remark: To solve unique ID problem you can use a persistent identifier: add field to DB2. Assigning the PID should be done with the help of effective UID (euid). It will also help interoperatibility.

Stuart: what happens you download from three different GSACS? Maybe only show originator? Can be implemented if every file has a unique ID. This helps when the files are not exactly the same.
Remark: sometimes you don't want the original file.
Rui: in GIPSY oasis incorrect header needs to be corrected.
Carine: that is why we have a 3 months delay to catch all this problems. You cannot guarantee correct meta data.

Torildt: seismologists have exactly the same problems. Congratulations with your friendly discussion during this afternoon.