Challenges and Upgrades of the **EPN Central Bureau Information System**

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WELCOME !		
EUREF PERMANENT NETWORK	QUICK LINK TO SITE INFORMATION	
coordinate system throughout Europe. So reference system forms the backbone for territory both on a national as on an inter-	The ETRS89 is maintained by the EU, this sub-commission EUREF and it is accessed through the EUREF Permanent Network (EPN), a science-driven network of continuously operating GPS reference stations with precisely known coordinates in the ETRS89.	LAST UPDATED/NEW PAGES 2014-03-11 : Relation to EUMETNET added to Projetcs. 2013-12-18 : The Procedure for Becoming an EPN Station has been updated. 2013-11-19 : The guidelines for the EPN local analysis centres have been updated. More
	All contributions to the EPN are voluntary, with more than 100 European agencies/universities involved, and the reliability of the network is based on redundancy and extensive guidelines guaranteeing the quality of the raw GPS data to the resulting station positons. Next to its key role in the maintenance of the ETRS89, the EPN data are also used for a wide range of scientific applications such as the monitoring of ground	NEWS 2013-12-24 : Christmas holidays 2013-12-05 : Antenna Serial Numbers in STA and ATX files at EPN CB 2013-11-26 : epnc_08_FULLSN.atx with full Serial Numbers available More

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EPN CB Information System

Continuous evaluation of functionalities and adaptation of infrastructure, internal database and software according to evolving (external and internal) user needs.

Hardware: Virtual machine on ESX server (redundancy & scalability).

OS: Linux CentOS 6.4 (stability & reliability).

Web site: Completely developed at ROB;

xhtml & css2 compliant (css3 not accepted

Relational MySQL Database (Third Normal Form):



Introduction

The EUREF Permanent Network (EPN) Central Bureau (CB) is responsible for the daily management of the EPN (http://www.epncb.oma.be/):

- Gateway to all EPN observation data, meta-data and products •
- Monitoring and validation of EPN data and meta-data
- On the web since 1996, but permanently evolving ۲





AC Analyzed Network File Format (RNX) Figure 2: Content of EPN CB MySQL database

> Web 2.0 enabled content management of EPN station information (station log and pictures), see Fig. 5.

> Operational Centre (OC) ASCII form sent by email to be approved by EPN CB (list of stations and responsible for station log update).

> For EPN stations (user account for each OC): reads station log from MySQL database, on-line changes, validates and saves in database and exports in station log format. Similar account for submission of station pictures.

> For non EPN stations (guest account): reads station log from local disk, interactive on-line changes, on-line validation and saves station log on local disk.



Reprocessing

Changing GNSS landscape imposes new challenges on EPN CB:

- Growing importance of real-time data distribution
- Multiple GNSS systems, new signals, RINEX v3.02 format •
- European Place Observatory System (EPOS, construction phase starting 2016), • with a GNSS component aiming to provide access to data and meta-data from all possible European GNSS stations

Recent Upgrades

Proactive requests for station pictures: 97% of EPN stations

Checks of availability of *RINEX v3.xx* observation data + meta-data check ; stimulate station managers to submit RINEX v3.02

Comparison of EPN Zenith Tropospheric Delays (ZTD) with ZTD from co-located radiosonde and VLBI

updated residual Daily position time series + Link to ITRF time series (if available)



Plans

Switch to multi-GNSS (Galileo included) data quality check software + RINEX v3.02

EPN densification stations (meta-data and data access information available and maintained)

Real-time monitoring of real-time data availability and consistency of streaming information at 3 EPN broadcasters (broadcaster guidelines under preparation), Fig.9

Enhanced "Quick-View" station status map (Fig. 10)





REAL-TIME PRODUCTS

quality

individual

and

e.g.

ountpoint	ASI (status: 2014-06-18 09:05 UTC)	BKG (status: 2014-06-18 09:05 UTC)	ROB (status: 2014-06-18 09:05 UTC)		
EUREF01	RTCM 3.0 - BKG	RTCM 3.0 - EUREF filter combination	RTCM 3.0 - EUREF filter combination		
EUREF02	RTCM 3.0 - BKG	RTCM 3.0 - EUREF filter combination	RTCM 3.0 - EUREF filter combination		
RTCM3EPH	RTCM 3 - BKG				

EAL-IIME	ALTIME DATA STREAMS				
ountpoint	ASI (status: 2014-06-18 09:05 UTC)	BKG (status: 2014-06-18 09:05 UTC)	ROB (status: 2014-06-18 09:05 UTC)		
ACOR0	RTCM 3.1 - ergnss-ip.ign.es:2101/ACOR0(1)	RTCM 3.1 - ergnss-ip.ign.es:2101/ACOR0(1)	RTCM 3.1 - IGNE, Servicio de Programas Geodesicos		
AJAC0	RTCM 3.1 - rgp-ip.ign.fr:2101/AJAC1(1)	RTCM 3.1 - www.igs-ip.net:2101/AJAC0(2)	RTCM 3.1 - none		
ALAC0	RTCM 2.3 - ergnss-ip.ign.es:2101/ALAC0(1)	RTCM 3.0 - ergnss-ip.ign.es:2101/ALACO(1)	RTCM 3.1 - IGNE, Servicio de Programas Geodesicos		
ALBA0	RTCM 2.1 - ergnss-ip.ign.es:2101/ALBA0(1)	RTCM 3.0 - ergnss-ip.ign.es:2101/ALBA0(1)	RTCM 3.1 - IGNE, Servicio de Programas Geodesicos		
ALME0	RTCM 2.3 - ergnss-ip.ign.es:2101/ALME0(1)	RTCM 2.3 - ergnss-ip.ign.es:2101/ALME0(1)	RTCM 2.3 - IGNE, Servicio de Programas Geodesicos		
AUT10	Never received	Never received	Never received		
BELF0	RTCM 3.1 - www.euref-ip.net:2101/BELF0(1)	RTCM 3.1 - Ordnance Survey of Northern Ireland	RTCM 3.1 - Ordnance Survey of Northern Ireland		
BELLO	RTCM 3.0 - www.euref-ip.net:2101/BELL0(1)	RTCM 3.0 - ICC Catnet	RTCM 3.0 - ICC Catnet		
BOGIO	RTCM 2.1 - www.euref-ip.net:2101/BOGI(1)	RTCM 3.0 - IGiK	RTCM 3.0 - IGiK		
BOR10	RTCM 2.3 - www.euref-ip.net:2101/BOR10(1)	RTCM 2.3 - SRC PAS	RTCM 2.3 - SRC PAS		
BORJ0			RTCM 3.0 - BKG		
BORJ1	RTCM 3.0 - www.euref-ip.net:2101/BORJ1(1)	RTCM 3.0 - BKG	RTCM 3.0 - BKG		
BORR0	RTCM 3.0 - ergnss-ip.ign.es:2101/BORR0(1)	RTCM 3.0 - ergnss-ip.ign.es:2101/BORR0(1)	RTCM 3.0 - Instituto Cartografico Valenciano		
BRST0	RTCM 3.0 - BRSTO rgp-ip.ign.fr:2101/BRST1(1)	RTCM 3.0 - www.igs-ip.net:2101/BRST0(2)	RTCM 3.1 - none		
BRUX0		RTCM 3.0 - www.igs-ip.net:2101/BRUX0(2)	RTCM 3.0 - ROB http://www.gnss.be		
DDIIV1			DAWL DOD bttp://www.apaa.ba		

Figure 9: Draft design of new broadcaster monitoring web page

Figure 10: Draft design of new interactive EPN station status web page (Status is green when: Daily stations \rightarrow data available for the last day; Hourly stations \rightarrow data available for the last hour ; Real-time stations \rightarrow data available now)

Re-organization of Analysis Centres (introduction of new types of Analysis Centres)

Distributed access for content management for all EUREF Working Groups and EPN Product Coordinators

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