EUREF's Contribution to the

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ROYAL OBSERVATORY OF BELGIUM

EUREF Symposium Wroclaw, May 17-19, 2017

What is EPOS (European Plate Observing System)?

European Research Infrastructures (RIs) = facilities, resources and services used by the science community to conduct research and foster innovation.

- Major scientific equipment
- resources such as collections
- archives of scientific data
- e-infrastructures such as data and computing systems
- communication networks

- single-sited (a single resource at a single location)
- distributed (a network of distributed resources)
- virtual (the service is provided electronically)

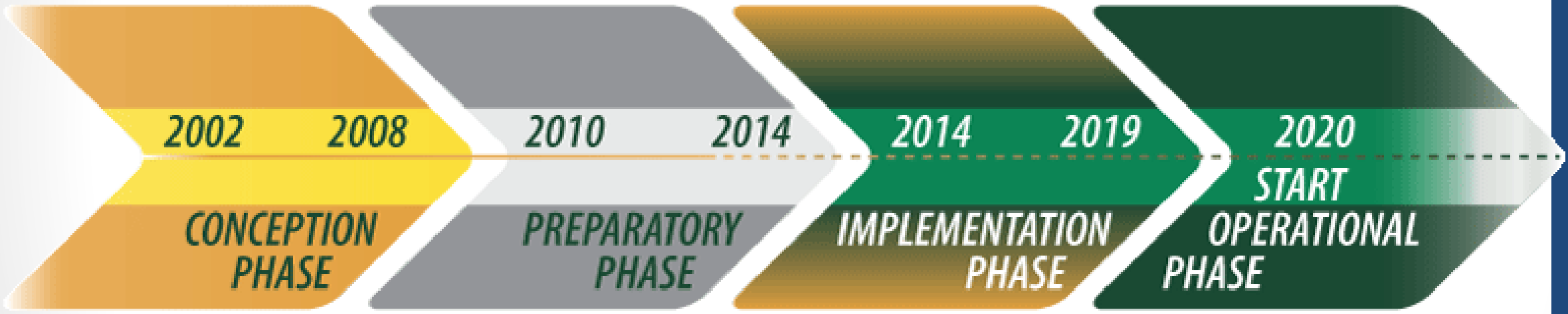
Examples:

CERN : the world's largest particle physics laboratory

MARINET: the Marine Renewables Infrastructure Network

GÉANT: a high-speed network (e-Infrastructure)

EPOS is under construction



H2020 project EPOS-IP

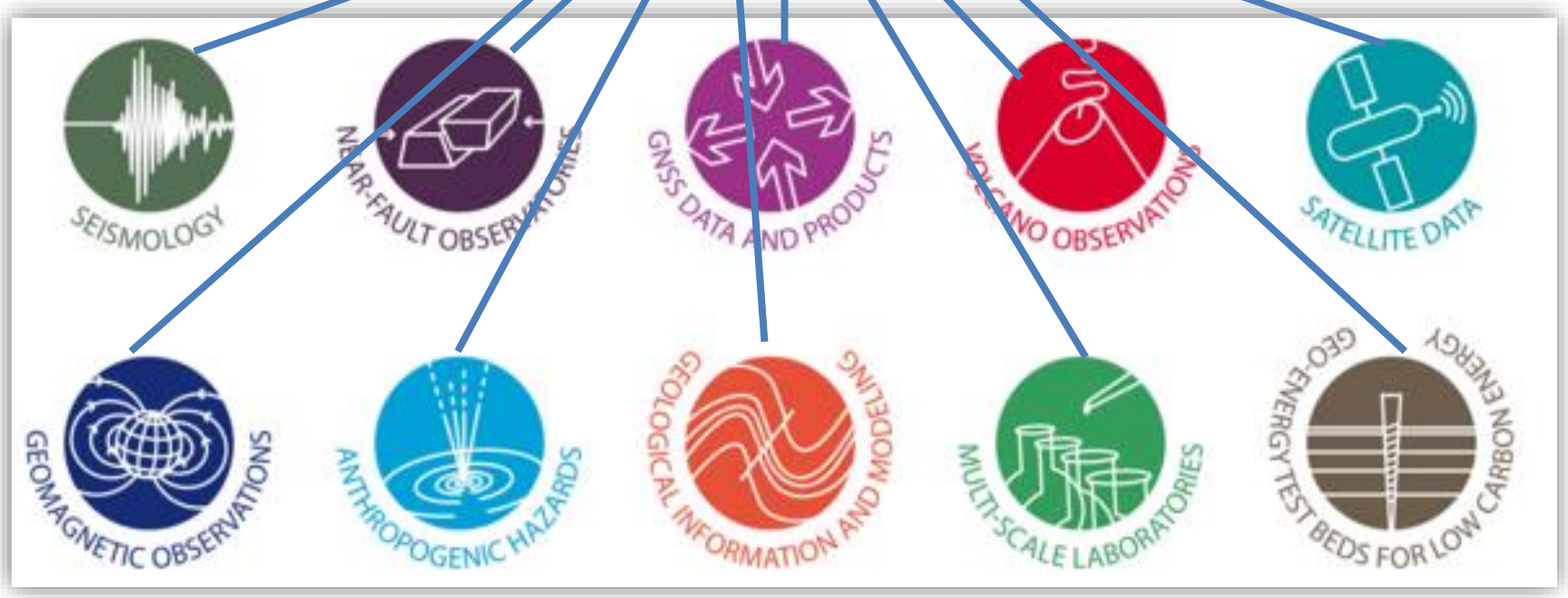
EPOS in Practice

Easy-to-find data and data products **(open access)** as well as tools for visualization, processing and an

Focus on Solid Ear

the interna core to the surface

EPOS Portal



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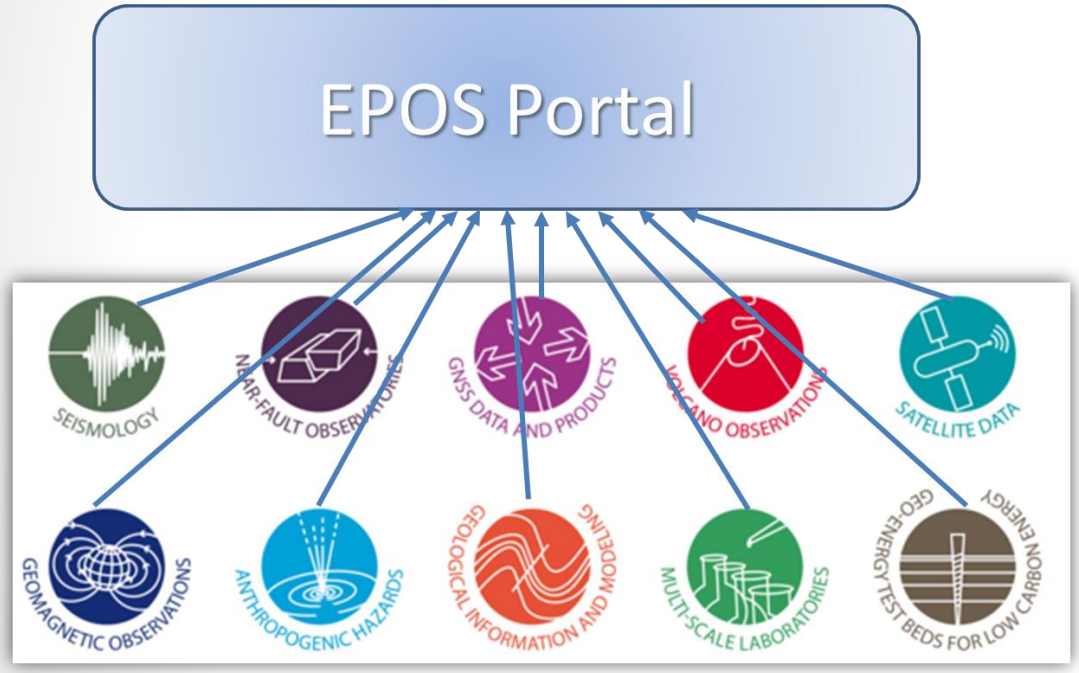
Today: EPOS Implementation Phase

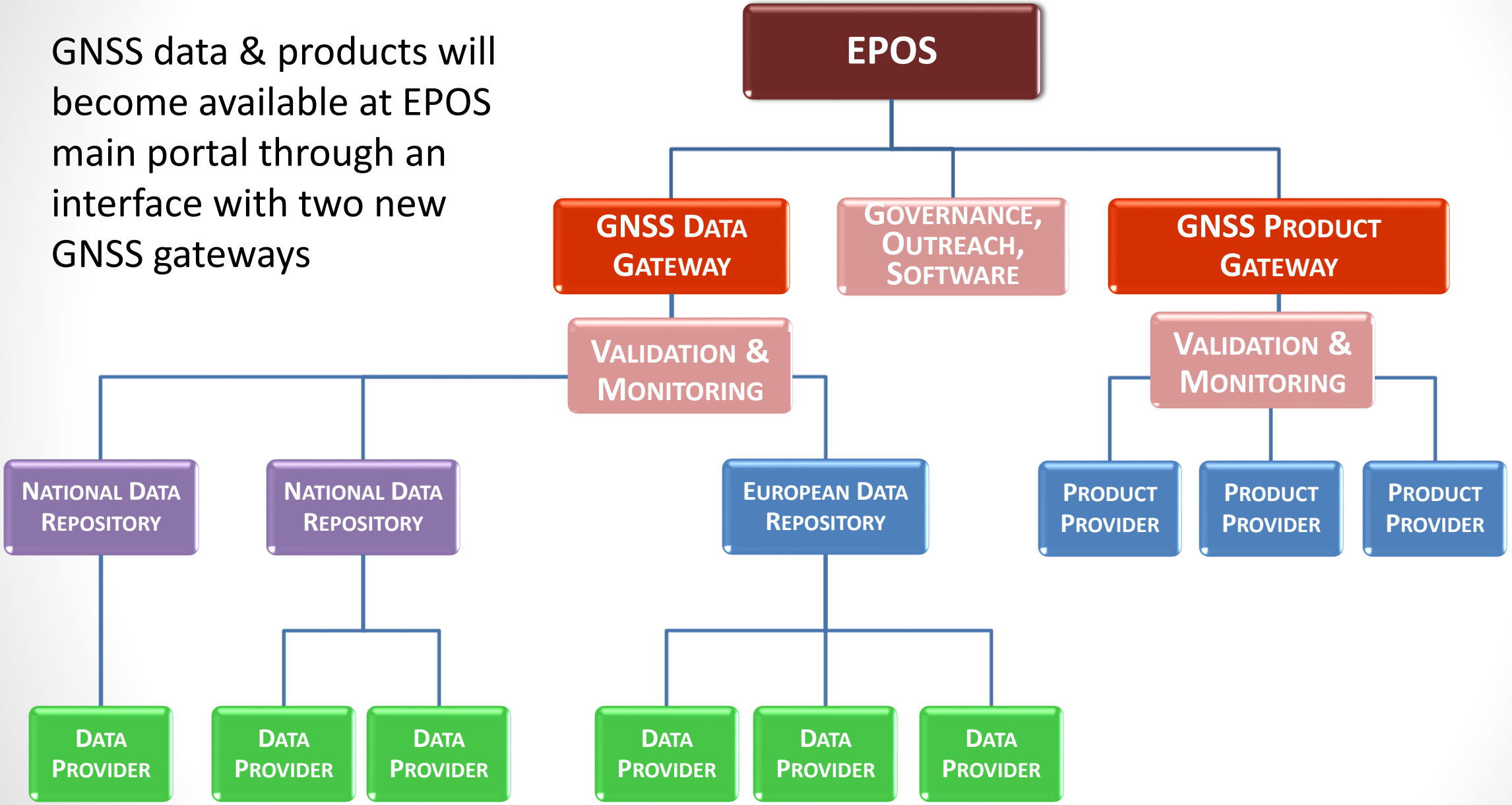


Each of the communities (e.g. GNSS) gets organized:

- Set up their governance (to speak with 'one voice' in EPOS)
- Define the data and data products to provide to the EPOS portal
- Construct the (IT) interfaces between their community and the EPOS portal

GNSS
Contribution based on collaboration between EUREF and geophysical/geodetic community that is not involved in EUREF

GNSS data & products will become available at EPOS main portal through an interface with two new GNSS gateways



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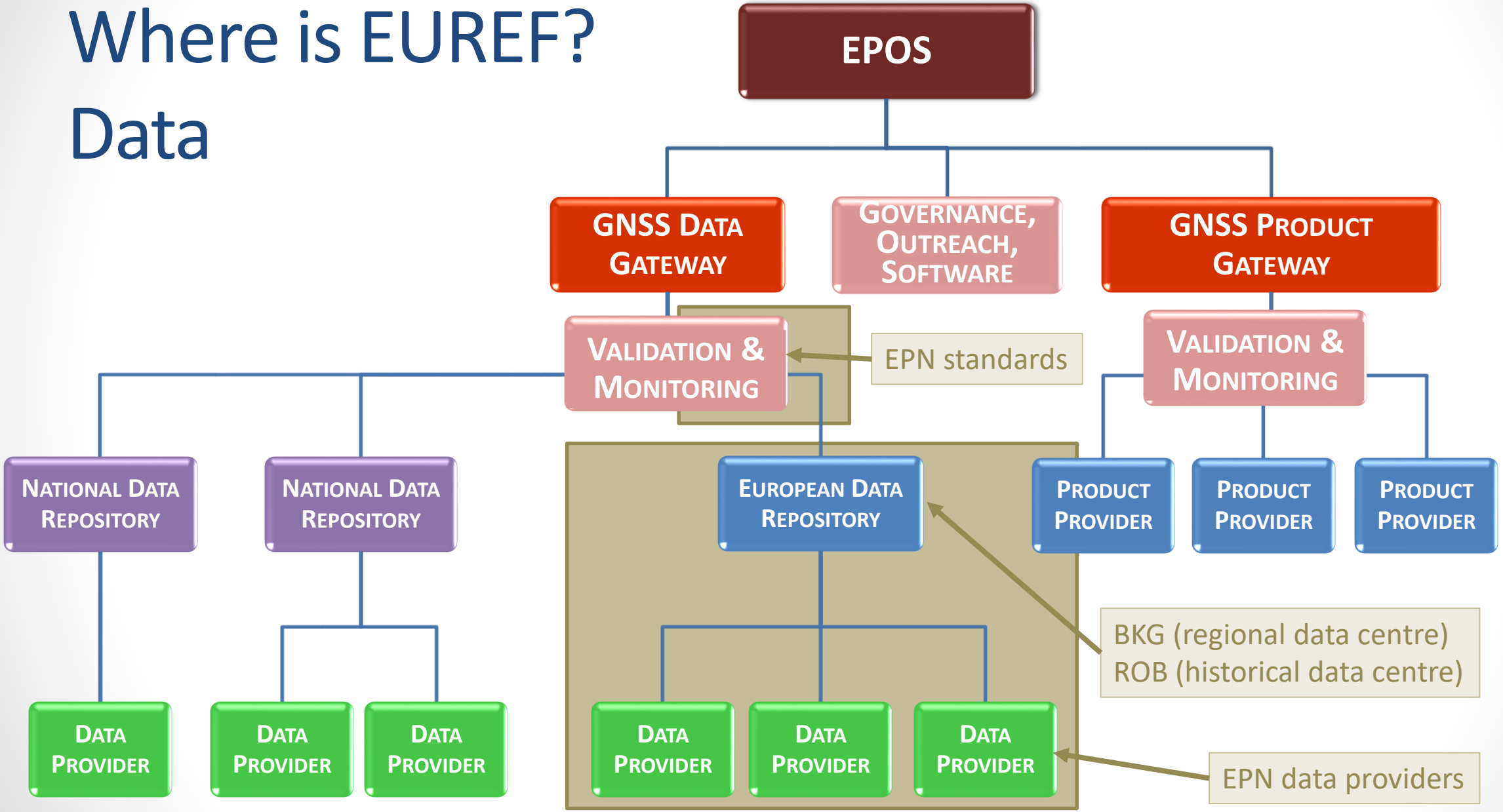
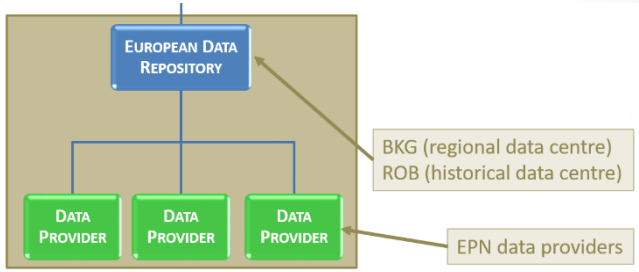
Where is EUREF?
Data



EUREF data provision to EPOS



- EPN stations will not become automatically EPOS stations
  - Their data will not automatically show up at the EPOS GNSS data gateway nor at the main EPOS portal

- For an EPN station to become an EPOS station:
  - Sign an EPOS Data Supplier Letter
  - That's all….

Principles of Data Supplier Letter

The supplier guarantees

- to have full ownership rights of the DDSS and/or it has full rights to distribute the DDSS or to allow their distribution by a third party.
- to have taken reasonable steps to maximize the quality of the DDSS.

The supplier allows

- EPOS to distribute the DDSS
- EPOS to affix the Creative Commons 4.0 CC:BY license on any Data or Data Product provided with no license information.

In return, the Supplier may benefit from EPOS Users authentication system's feedback, in order to be informed about its DDSS usage.

DDSS = Data, Data products, Software, and Services

CC:BY license

- ✓ copy and redistribute the material in any medium or format
- ✓ remix, transform, and build upon the material
- ✓ for any purpose, even commercially.
- ✓ You must give appropriate credit, provide a link to the license, and indicate if changes were made.

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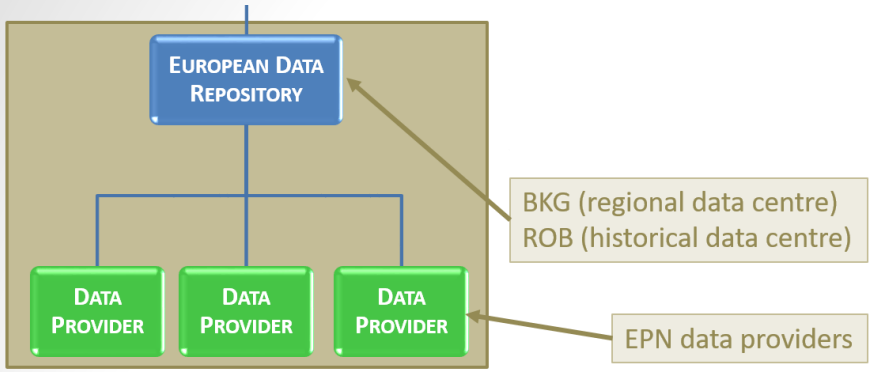


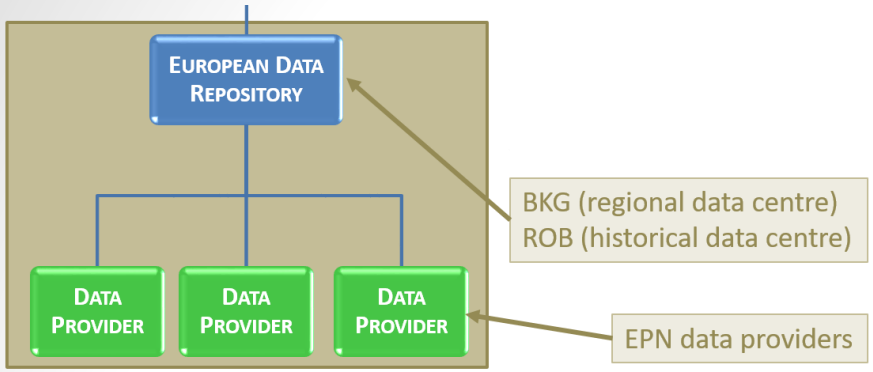
EUREF data provision to EPOS

What happens in the background?

Metadata:

The EPN and EPOS will use one common system for managing site logs and Operational Centre form

- Update of a site log at the EPN CB => update of site log at EPOS
- New system under development at ROB, see presentation *"A new GNSS station metadata management and dissemination system in support of multiple networks"*, by A. Fabian



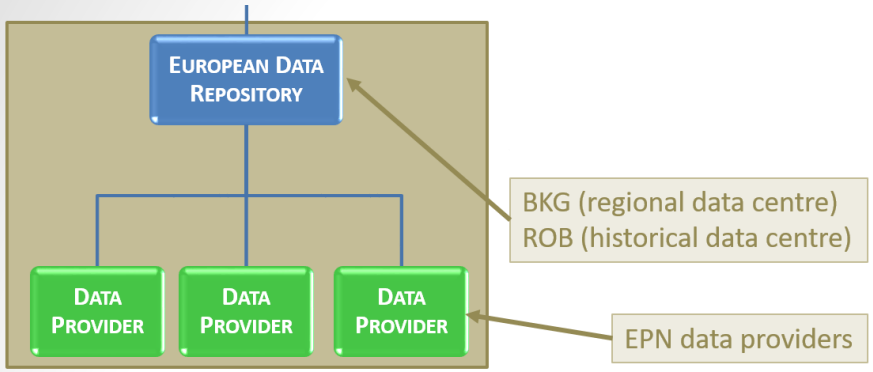
EUREF data provision to EPOS

What happens in the background?

RINEX data:

BKG and ROB will run EPOS software package (GLASS)

- Data will be kept at BKG and ROB, but software will allow EPOS GNSS data gateway and EPOS main portal to link to these data



EUREF data provision to EPOS

Why contribute to EPOS?

- ✓Minimal effort for EPN stations
- ✓More visibility of your station data, more users
- ✓EPOS feedback on data usage
- ✓EPOS puts license + DOI (if not yet existing) on data
- ✓Member of EPOS GNSS data provider board → representation in EPOS GNSS Governance
- ✓Each country that will join EPOS will define its in-kind contribution to EPOS. If your stations are mentioned in this in-kind contribution, then your government could ensure national support for their long-term operation.

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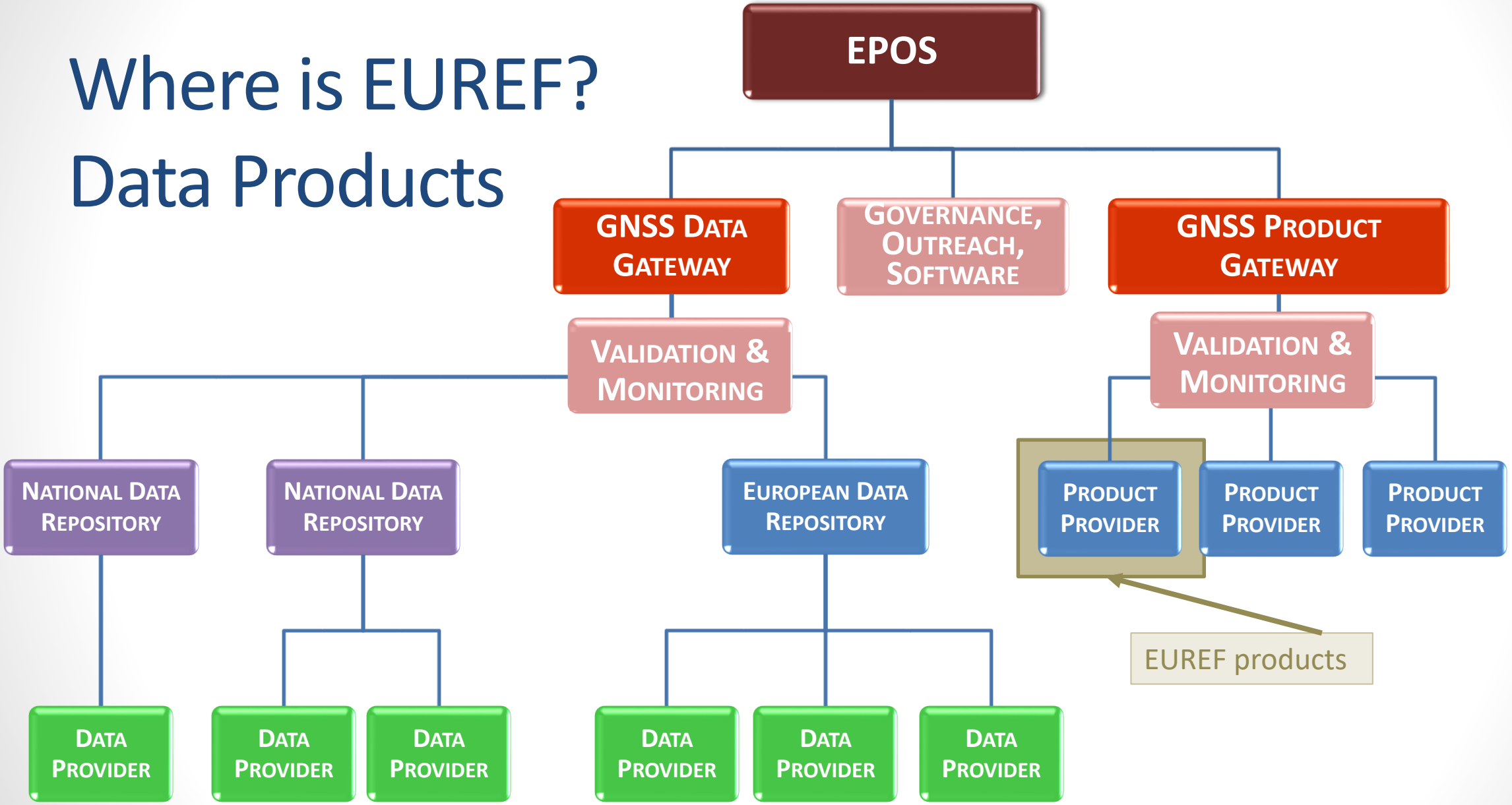
Countries joining EPOS?

- At the moment 2015-2019: EPOS implementation phase
  - Construction of software, contacts with potential data suppliers, generation of first data products

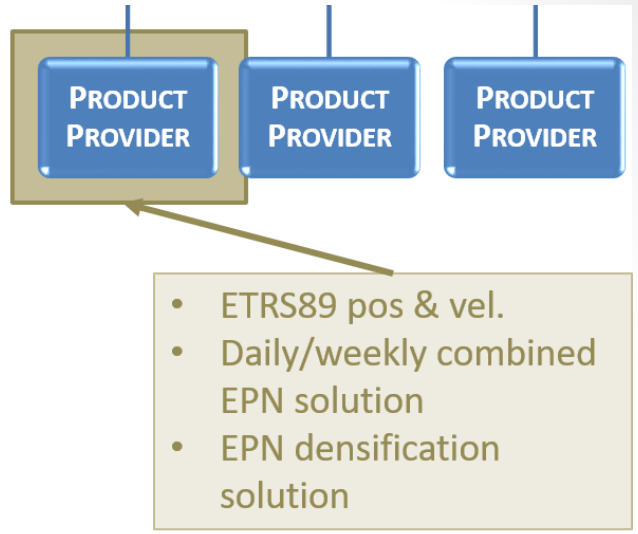
- But goal is to also set up EPOS-ERIC (legal structure)
  - Step 1: Summer 2017
  - Step 2: Beginning of 2018
  - EPOS-ERIC in place end 2018/beginning 2019
    - Only countries can be member of ERIC, which pay yearly fee to support the operation of infrastructure (mainly the high level integrated services)

ERIC: European Research Infrastructure Consortium

Where is EUREF?
Data Products



EUREF data product provision to EPOS



Uploaded towards EPOS GNSS product gateway

1. daily/weekly combined EPN SINEX solution
   Frequency: daily/weekly
2. Official multi-year EPN pos & vel SINEX, time series, outliers, discontinuities
   Frequency: 15 weeks
3. EPN densification solution

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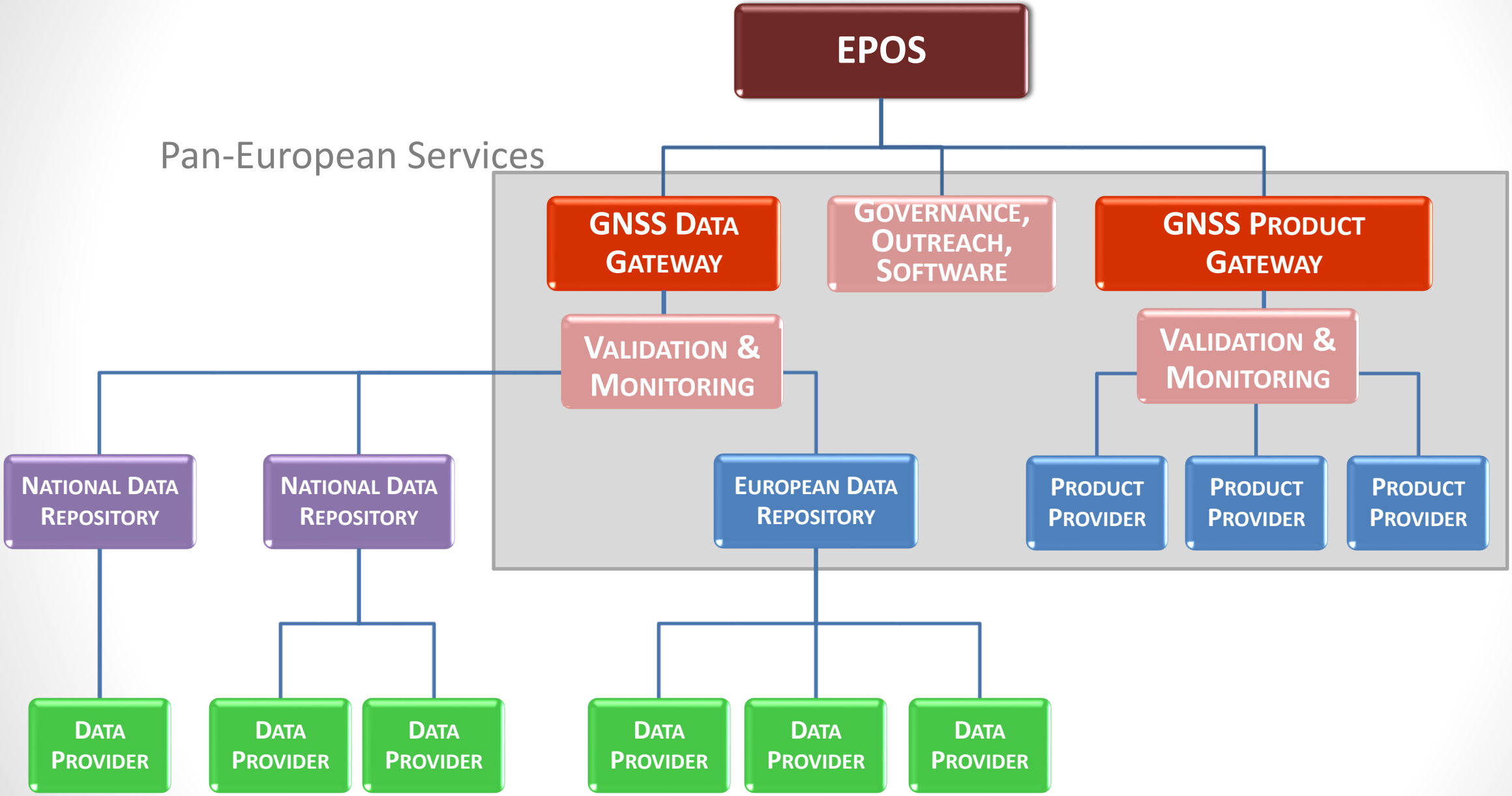
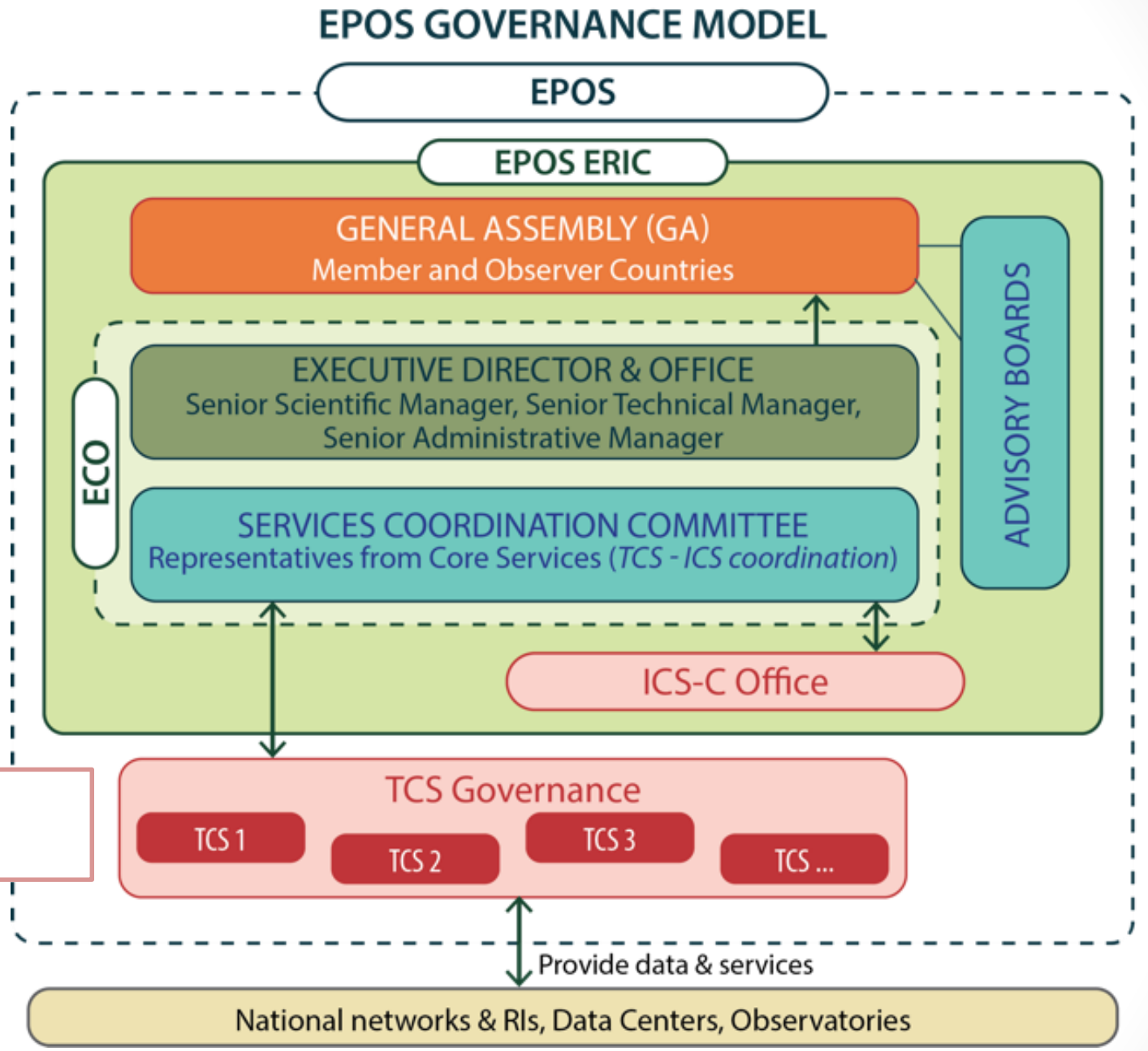
Pan-European Services



Future EPOS Governance

Set up during EPOS Implementation Phase and operational by ~2019



Thematic Core Service (TCS) → GNSS, seismo, geology, …

ICS: Integrated Core Services

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Governance at GNSS level

Consortium Board :

- Service providers of pan-European services
- Representatives of user community
- Representatives of data suppliers

→ Representation in EPOS Service Coordination Committee

Executive Board :

Coordinators of main service pillars (Data, Products, Outreach, Software, …)

Advisory Boards (scientific, users, data)

Frequently Asked Questions (1)

1) Can I contribute with GNSS station data to EPOS if my country does not join EPOS?

Yes, there is no restriction to who can contribute.

2) Do I get paid to provide GNSS data to EPOS?

No, but you could get a long-term commitment from your government for funding to maintain your stations (in-kind contribution to EPOS). EUREF data and product provision is also done free of charge on a best effort basis.

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Frequently Asked Questions (2)

3) If I provide data to EPOS, will my organisation be somewhere visible in the EPOS GNSS data gateway?

Yes, the data provider is visible as well as the station owner through the site log information that you provided.

4) What is my level of responsability towards EPOS if I decide to participate?

You sign a Data supplier Letter with EPOS. In this letter you guarantee that you are allowed to provide the data to EPOS (ownership) and that you do your best to provide good quality data to EPOS.

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Frequently Asked Questions (3)

5) I understand that each GNSS station must be registered as an EPOS station – which is only possible with a station log provided to and accepted by EPOS – before its data can be used.

But what about stations which are part of data products delivered to EPOS?

Here the same requirements are applied, that is, only stations with station logs are accepted. The procedure to handle the other stations is still open:

a) eliminate them from the solution and, consequently, from the EPOS data base?

b) flag them as non-validated solutions?

Frequently Asked Questions (4)

6) I wish to contribute to EPOS with EPN stations, but also with some of the non-EPN stations in my network. Is it enough to sign the Supplier Letter?

- Only for the **EPN stations**, the Supplier Letter enough.
  - Metadata: will flow to EPOS through the EPN CB;
  - Data: will flow to EPOS through BKG & ROB data centers.
- For **non-EPN stations**, you need in addition to the Supplier Letter to make sure that your metadata and data (open access!) become 'discoverable' to EPOS.
  - Metadata: new M3G system as for EPN stations;
  - Data: need to be available by ftp (local or external) and EPOS software (GLASS) needs to run on top of it (no need to adapt directory structure).
    - GLASS scans the data directories, runs quality checks, puts info (access point) in data base and provides the location information to the EPOS-GNSS data gateway. People requesting data at the data gateway will be redirected to your data directory.

Frequently Asked Questions (5)

7) My EPN data are also available at my own RI (e.g. Local Data Centre). Can I distribute them to EPOS also via my own national RI?

Yes. EPOS supports data redundancy. The EPOS GNSS data gateway allows to access the GNSS data through primary and, optionally, secondary or mirror data centers. These data centers can be the EUREF data centers (BKG, ROB) as well as your own national data center (the data supplier can choose the primary data center).

8) I have data of some stations which I cannot immediately provide to the public. Do I have to separate them from the others?

No, the meta data of each EPOS station allows to include embargo information.

Official Involvement at Governmental Level

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EPOS Board of Governmental Representatives

Country	Member
Austria	Wolfang Lenhardt
Belgium	Laurent Ghys
Czech Republic	Petr Ventluka
Denmark	Stine Bovtrup
Finland	Petteri Kauppinen
France	Didier Marquer
Germany	Norbert Overbeck
Greece	Maria Koutrokoi
Iceland	Stefan Einarsson
Ireland	Koen Verbruggen
Italy	Salvatore La Rosa
Netherland	Marc de Jonge
Norway	Odd Ivar Eriksen
Poland	Michał Rybiński
Portugal	Daniel Carapau
Romania	Oana Firu
Slovak Republic	Lukáš Zendulka
Slovenia	Albin Kralj
Spain	Inmaculada Figueroa
Sweden	Magnus Friberg
Switzerland	Gunter Siddiqi
Turkey	Emre Ilyas
United Kingdom	John Ludden

EPOS Board of National Scientific Representatives

Country	Member
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Belgium	Carine Bruyninx
Czech Republic	Pavel Hejda
Denmark	Thomas Funck
Finland	Annakaisa Korja
France	Helle Pedersen
Greece	Akis Tselentis
Hungary	Viktor Wesztergom
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Ireland	Brian McConnell
Italy	Lilli Freda
Netherland	Wim Spakman
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Romania	Mircea Radulian
Slovenia	Stanka Sebela
Spain	Ramon Carbonell
Sweden	Christopher Juhlin
Switzerland	Florian Haslinger
Turkey	Haluk Özener
United Kingdom	Andreas Rietbrock

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