Service Quality Monitoring
Working group status

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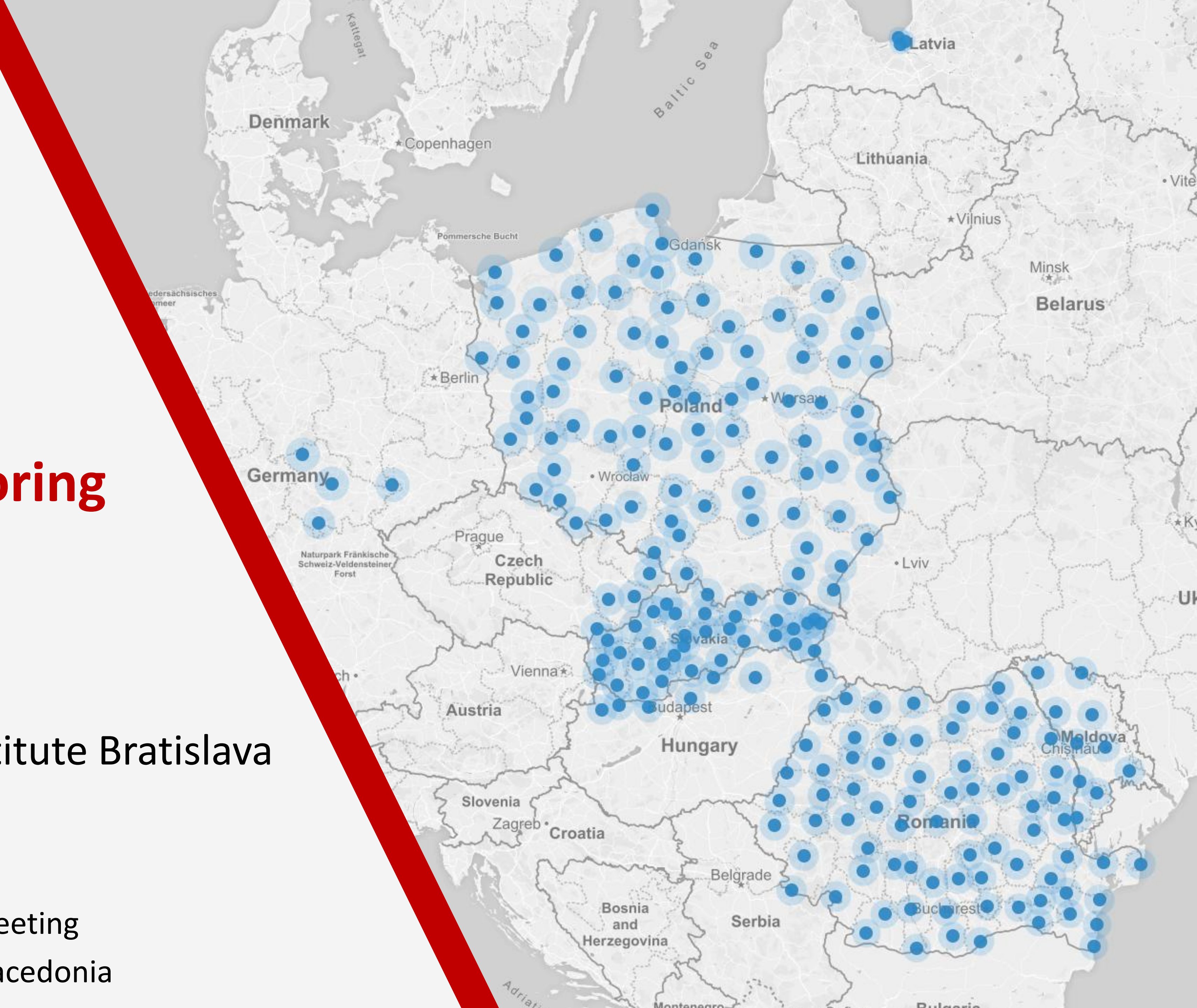
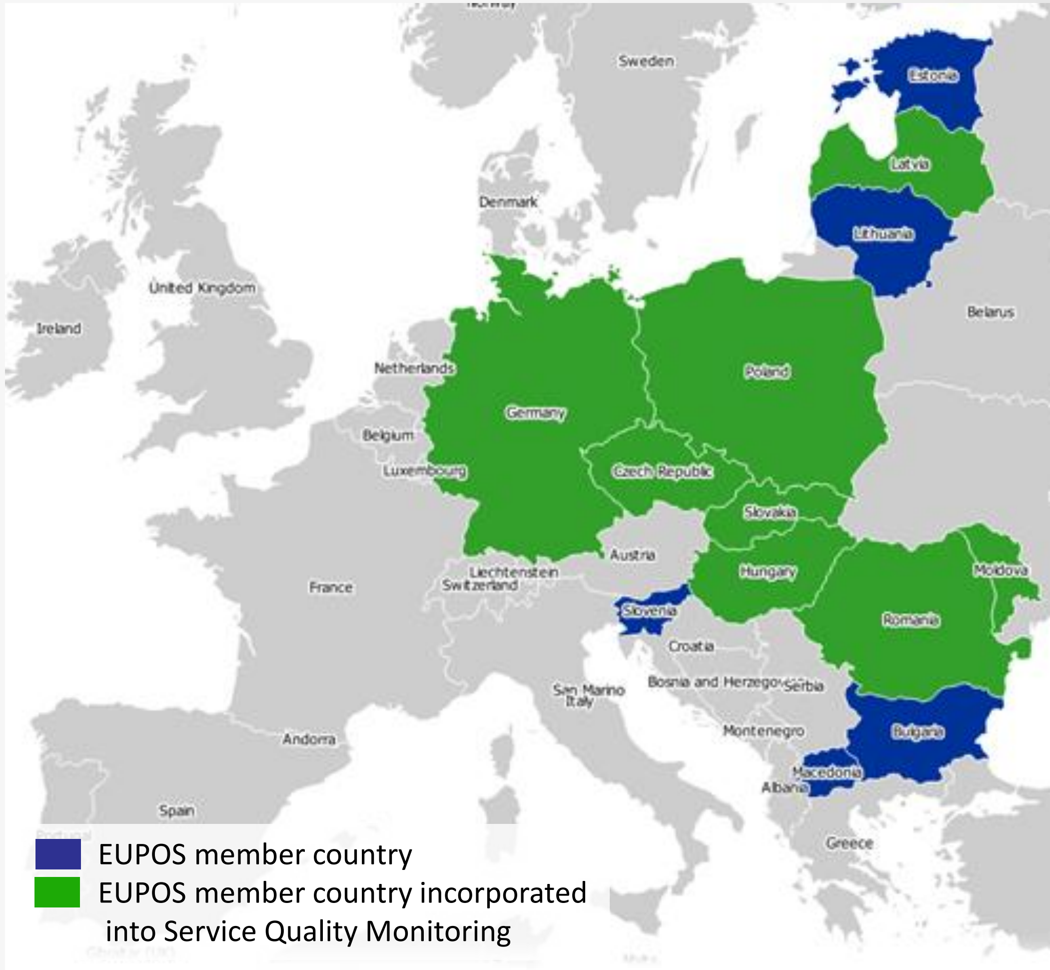
10th EUPOS Council and Technical Meeting

October 24-25, 2024, Skopje, North Macedonia

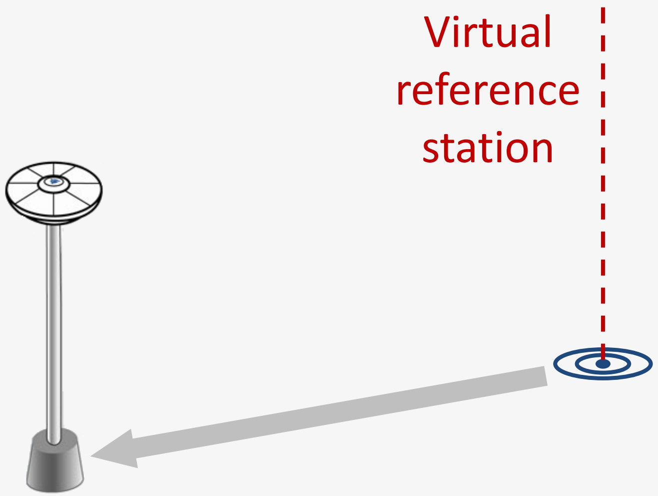


EUPOS WG on Service Quality Monitoring

- Established in 2014
- Inspired by Czech and Slovakian solution
- Aims:
  - creation of the uniform common network RTK quality monitoring tool based on virtual monitoring stations for all EUPOS member countries
- Working group members
  - Karol Smolík (Slovakia) - chair
  - Branislav Droščák (Slovakia)
- WG cooperators
  - Szymon Wajda (Poland) – ASG-EUPOS
  - István Galambos (Hungary) – gnssnet.hu
  - Vlad Sorta, Miluta Flueras, Victor Crasnopolschi (Romania) – ROMPOS
  - Christian Trautvetter (Germany) – SAPOS
  - Rolands Pinta (Latvia) – EUPOS-RIGA
  - Alexandr Mihailov (Moldova) – MOLDPOS
  - Jan Řezníček (Czech Republic) – CZEPOS



How can we monitor Network RTK quality?



Monitoring by physical monitoring stations

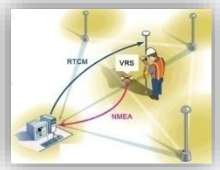
- 👍 real values of deviations
- 👎 higher costs
- 👎 the inability to monitor the entire network

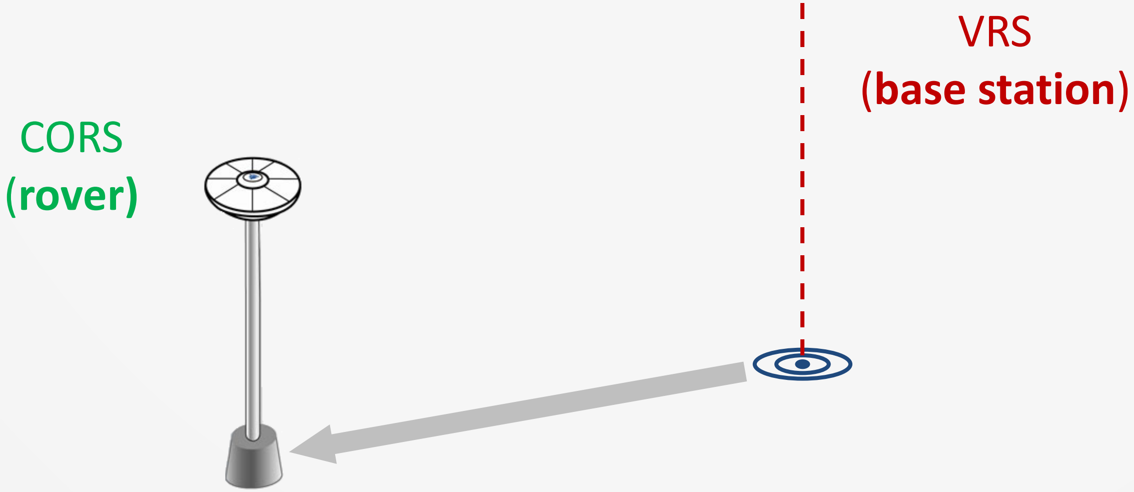
Monitoring by Virtual stations ✓

- 👍 no physical monitoring stations
- 👍 lower costs
- 👍 monitoring of the entire network
- 👎 virtual principle ≠ real deviation

EUPOS service quality monitoring
Principle

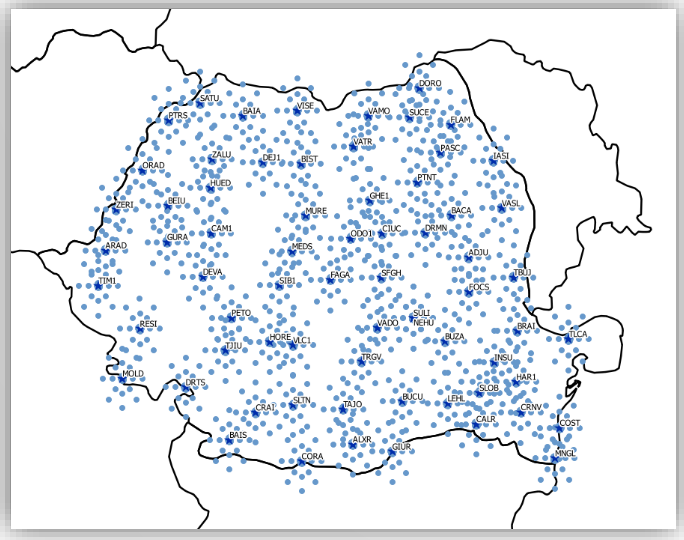
- Concept copies the design of SKPOS® network solution quality monitoring application
- Monitoring independent from the GNSS service provider control software
- Fully automatic solution
- Virtual solution (no real monitor stations)

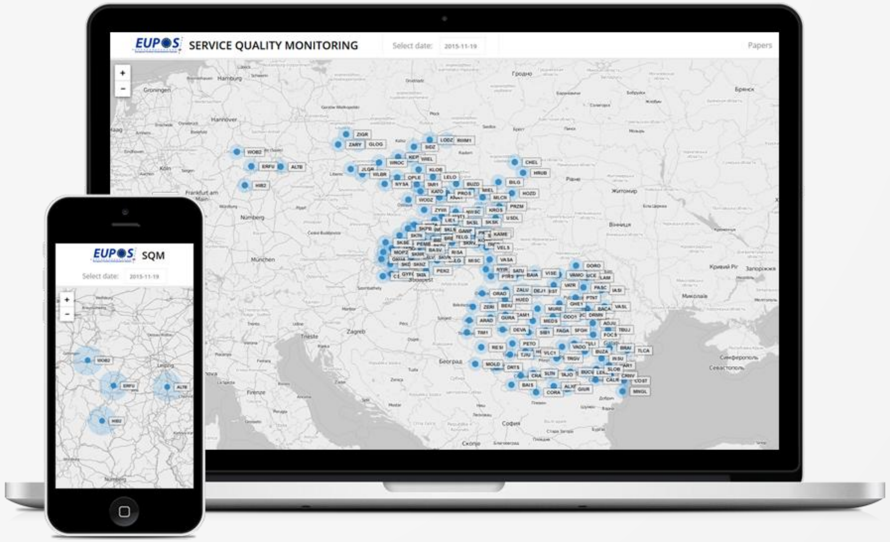




EUPOS service quality monitoring
Principle

- Monitoring of the whole territory of countries
- Random generation of (virtual) test points
- Baseline processing by open source RTKNAVI software RTKNAVI www.rtklib.com
- Results available via web/mobile application





EUPOS service quality monitoring
Status (October 2024)

SKPOS	35 stations
ASG eupos	87 stations
GNSSnet.hu GNSS SZOLGÁLTATÓ KÖZPONT	7 stations
ROMPOS Romanian Position Determination System	86 stations
SAPOS	4 stations
RIGA EUPOS	3 stations
MOLDPOS	10 stations
CZEPOS	4 stations
	236 stations

GNSS receiver manufacturers

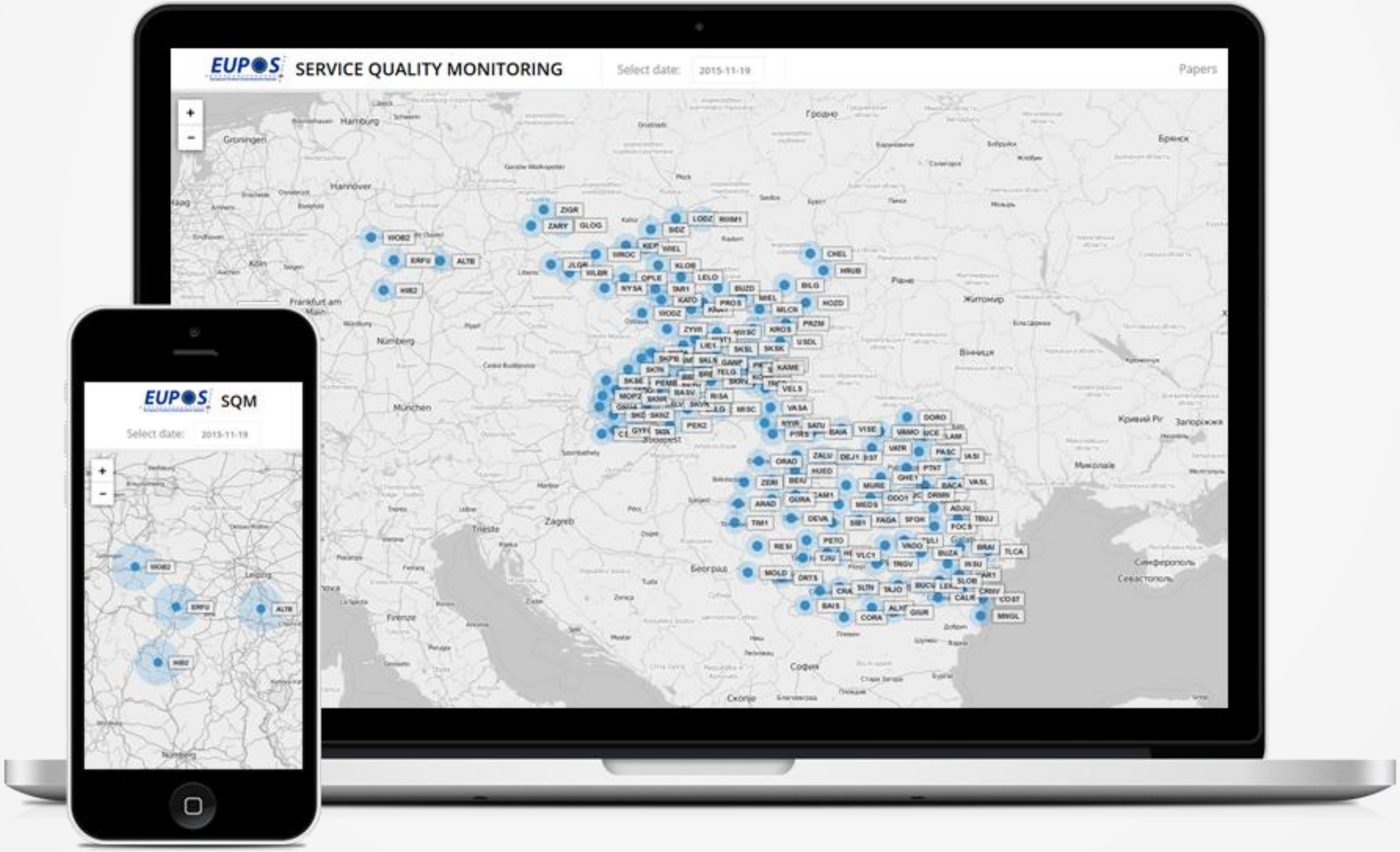
- Trimble
- Leica
- Topcon
- Javad
- Astech

Network softwares:

- Trimble Pivot Platform
- Geo++ GNSMART
- Leica Spider

EUPOS service quality monitoring
User interface

http://monitoringEUPOS.gku.sk



EUPOS networks deviations comparison

Statistics

RTK network		SKPOS	ASG eupos	SAPOS	ROMPOS	MOLDPOS	CZEPOS	GNSSnet.hu	RIGA EUPOS	EUPOS
Control Software		Trimble Pivot Platform			Leica Spider			Geo++ GNSMART		Σ
Time period		11 years	10 years	9 years	10 years	7 years	6 year	10 years	9 years	
Number of monitored stations		35	87	4	86	10	4	7	3	**236**
Maximal	ne	49.9 cm	46.8 cm	51.9 cm	49.8 cm	42.1 cm	41.1 cm	49.1 cm	49.8 cm	
	u	49.8 cm	49.5 cm	48.9 cm	49.9 cm	44.5 cm	47.9 cm	69.9 cm	59.9 cm	
Average	ne	1.0 cm	1.0 cm	0.9 cm	1.2 cm	1.1 cm	0.8 cm	1.0 cm	1.1 cm	**1.0 cm**
	u	2.4 cm	1.2 cm	1.9 cm	2.4 cm	1.5 cm	2.8 cm	1.3 cm	2.1 cm	**2.0 cm**
No fix		13%	8%	8%	15%	27%	10%	12%	20%	**14%**

Plans to next year

- Comparison of the virtual principle with the new physical station in Slovakia

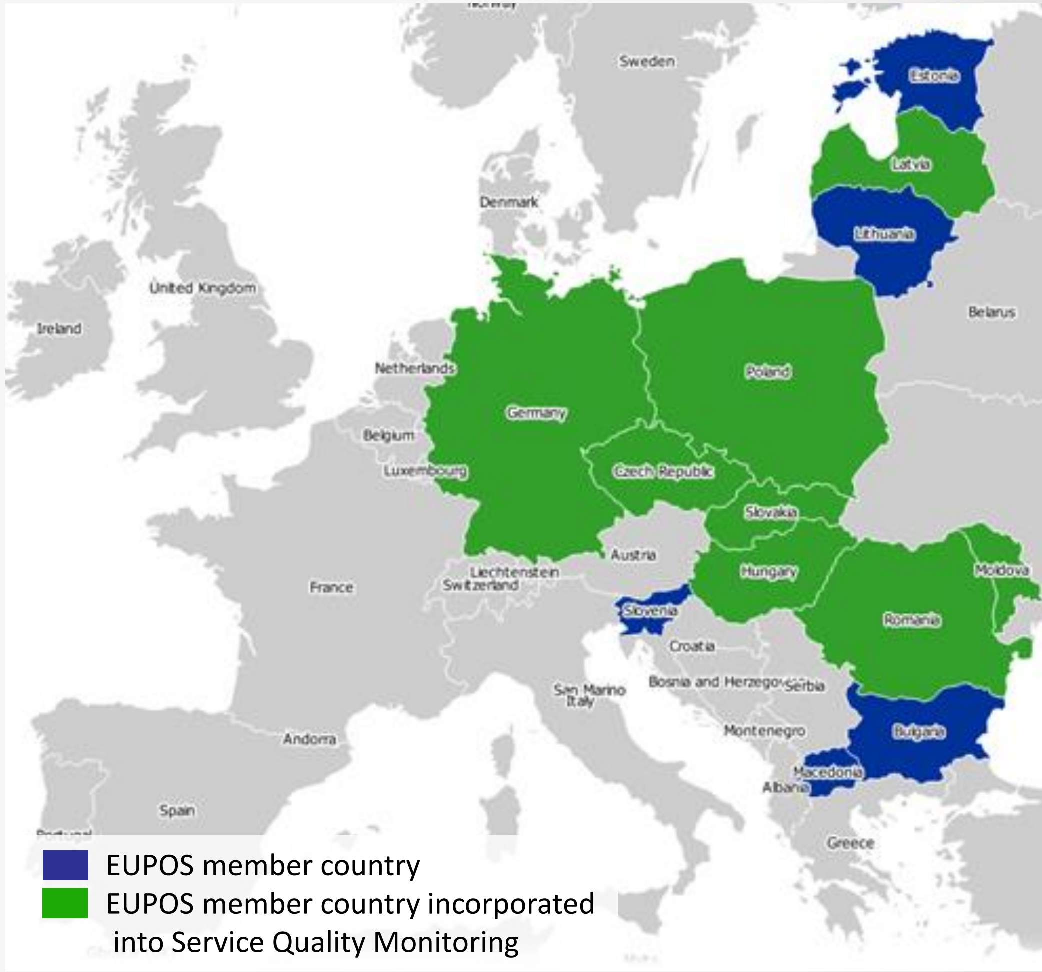
- Migration to a new server
- New version of
  - Windows Server
  - Apache web server
  - PHP
  - MariaDB

Join us - join EUPOS SQM!

- What you will get?
  - feedback about quality of your service
  - comparison of your service with other countries

- E-mail contact:
  - karol.smolik@skgeodesy.sk

- What we need for joining:
  - login and password which allows us to get
    - access to the network RTK solution (VRS concept)
    - access to permanent stations via NTRIP Caster
  - corrections provided in RTCM 3.x format
  - CORS coordinates



Thank you for your attention

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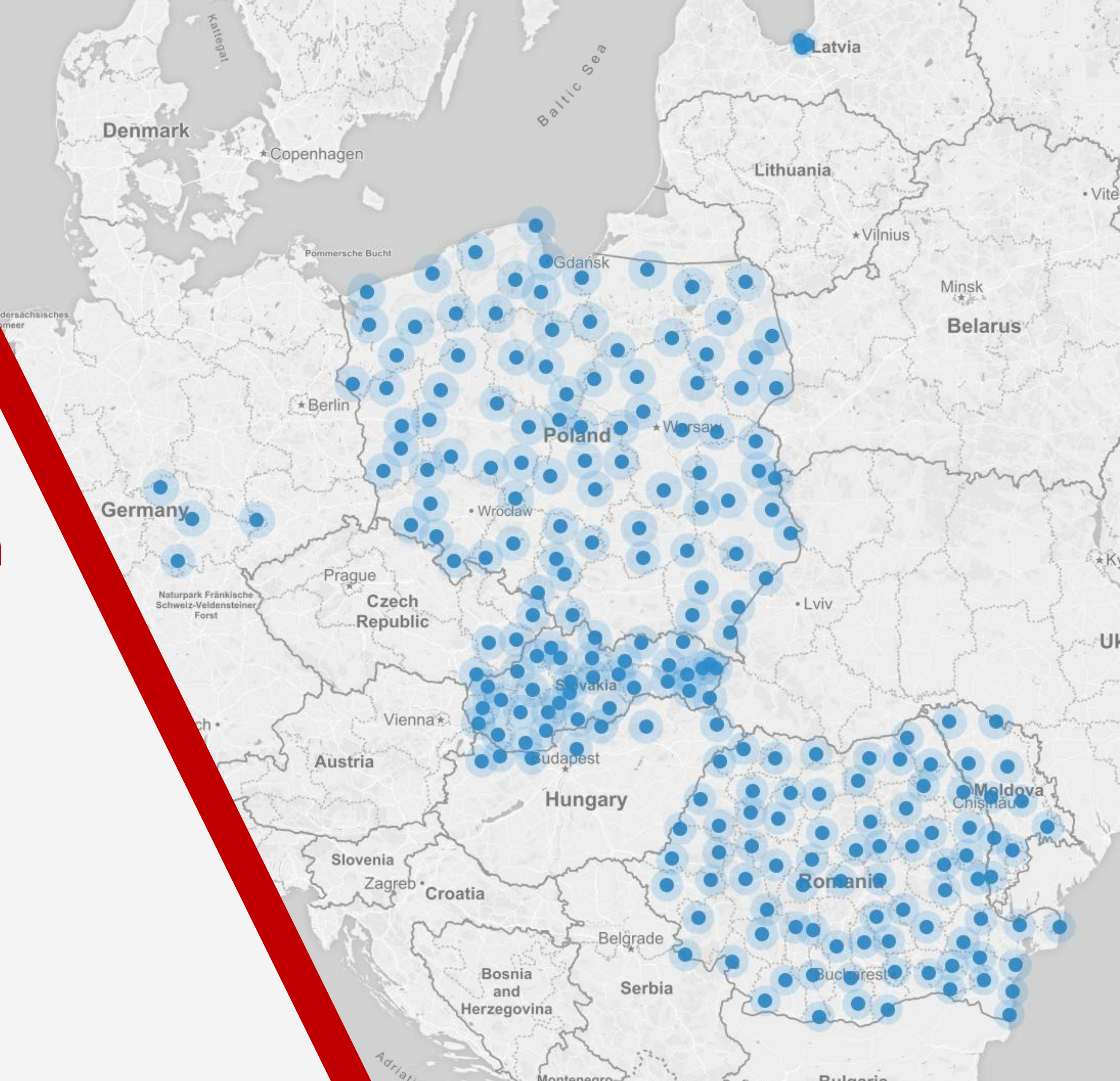

EUPOS

European Position Determination System

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