EUREF-IP Pilot Project – Status Report

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Contents

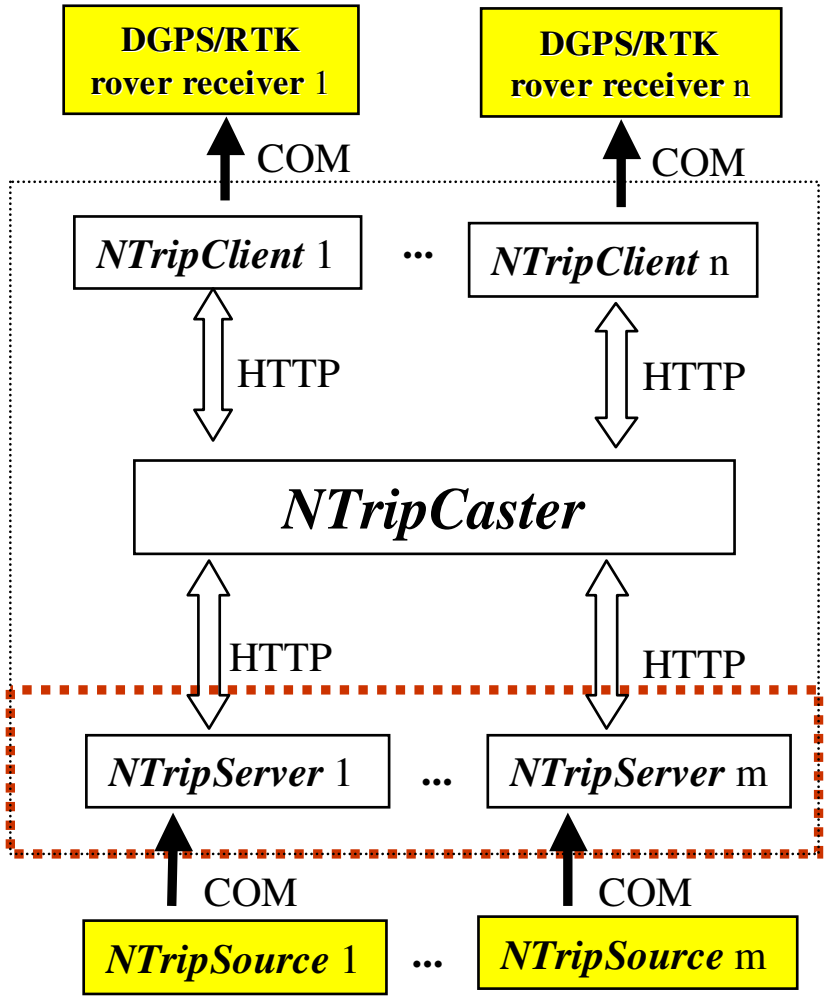
- Ntrip concept and components
- Curren status concerning real-time
  - broadcaster
  - data streams
- Ntrip usage, examples
  - Networked DGPS/RTK
  - Navigation

Networked Transport of RTCM via Internet Protocol (Ntrip)

- Method: IP Streaming, allows use of packet switched communication (GPRS, UMTS)
- Derived from Internet Radio Technology
- Standardized within RTCM
- Based on HTTP

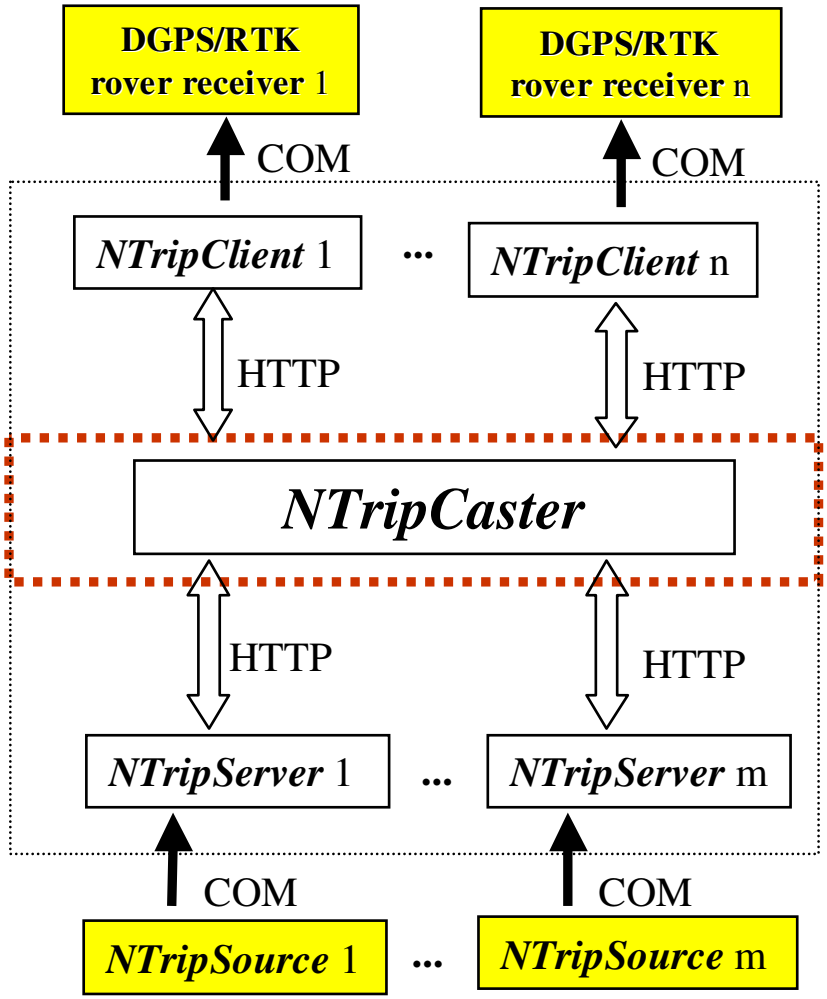
Ntrip Server

- **NtripServer receives data of NtripSource and forwards it to NtripCaster**
- **Mountpoint and password are defined by administrator of NtripCaster for purpose of authentication**
- **NtripServer is a PC program sending data to NtripCaster after receiving them *e.g.* via the serial port**



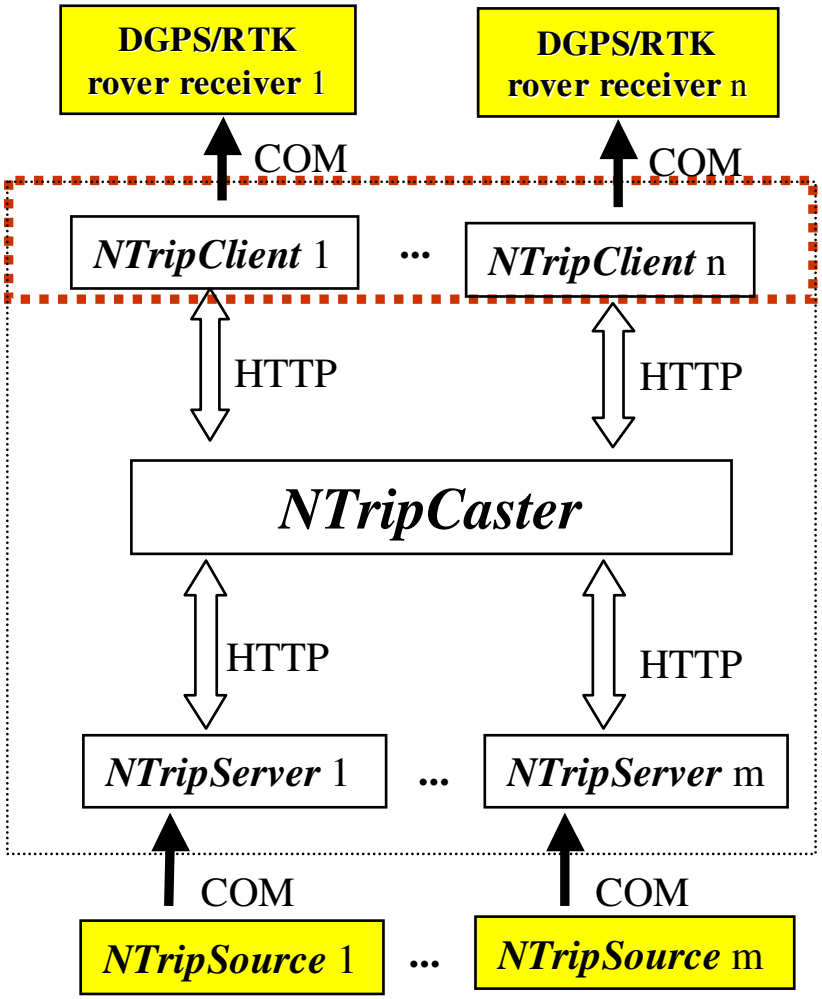
Ntrip Caster

- **Is the component for stream splitting and broadcasting**
- **Acts as ”switch board” for connecting NtripClients to required streams**
- **Is an HTTP server supporting a subset of HTTP messages, NtripClient and NtripServer act as HTTP clients**

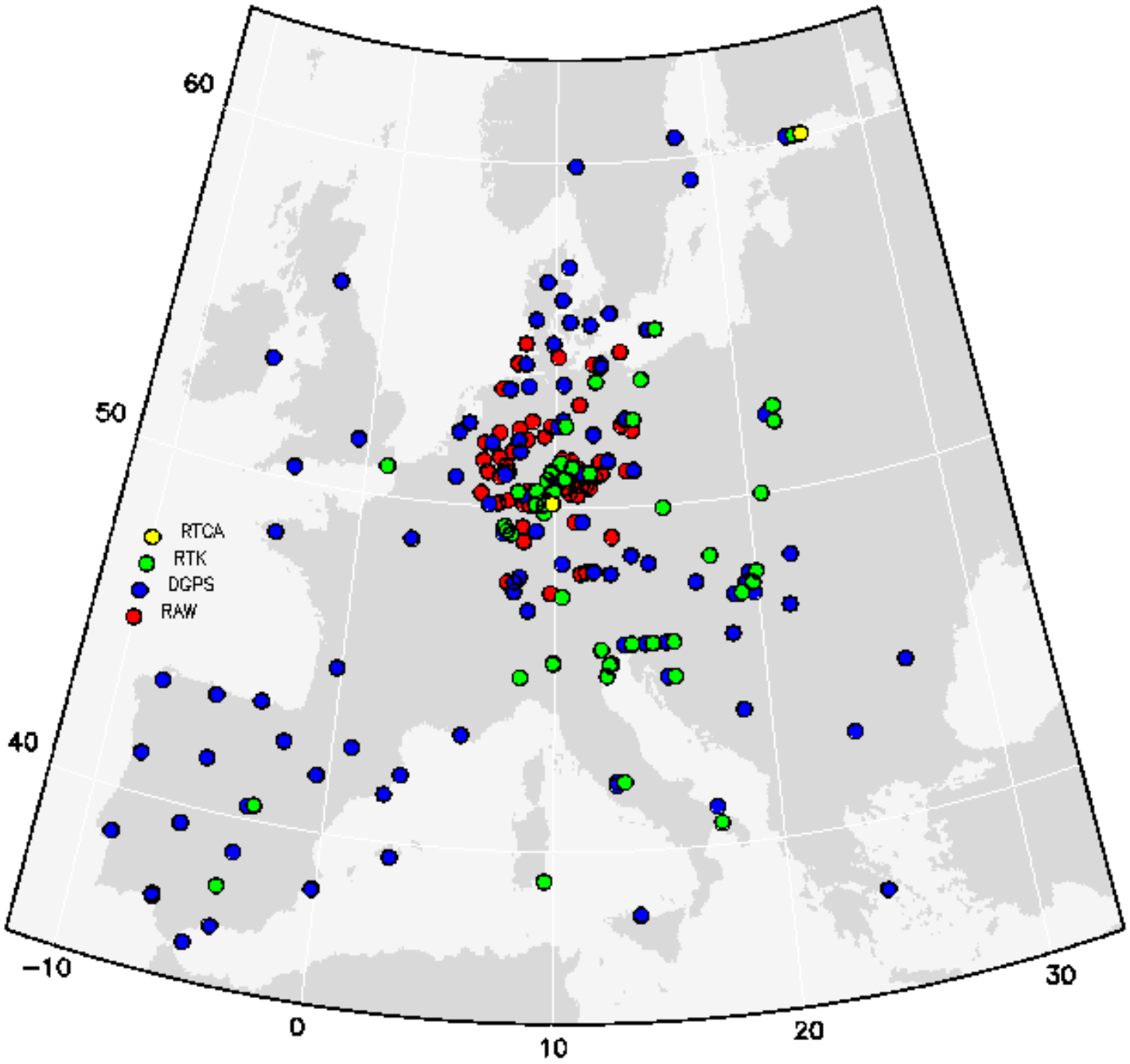


Ntrip Client

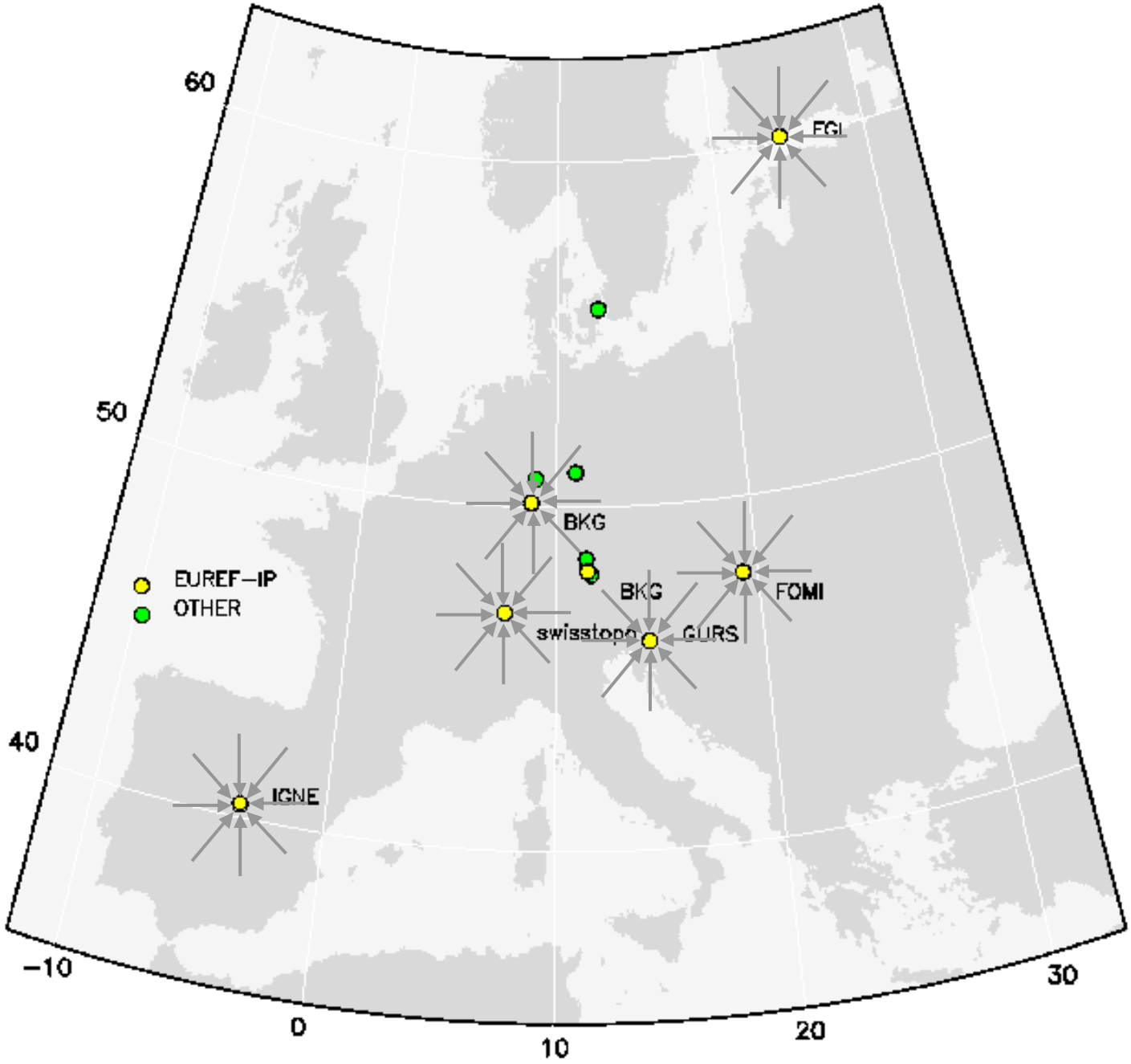
- **Sends and receives data to and from NtripCaster, may retrieve list of available NtripSources**
- **Forwards data either to rover RTK GPS receiver or to processing software in an application terminal for calculating position**

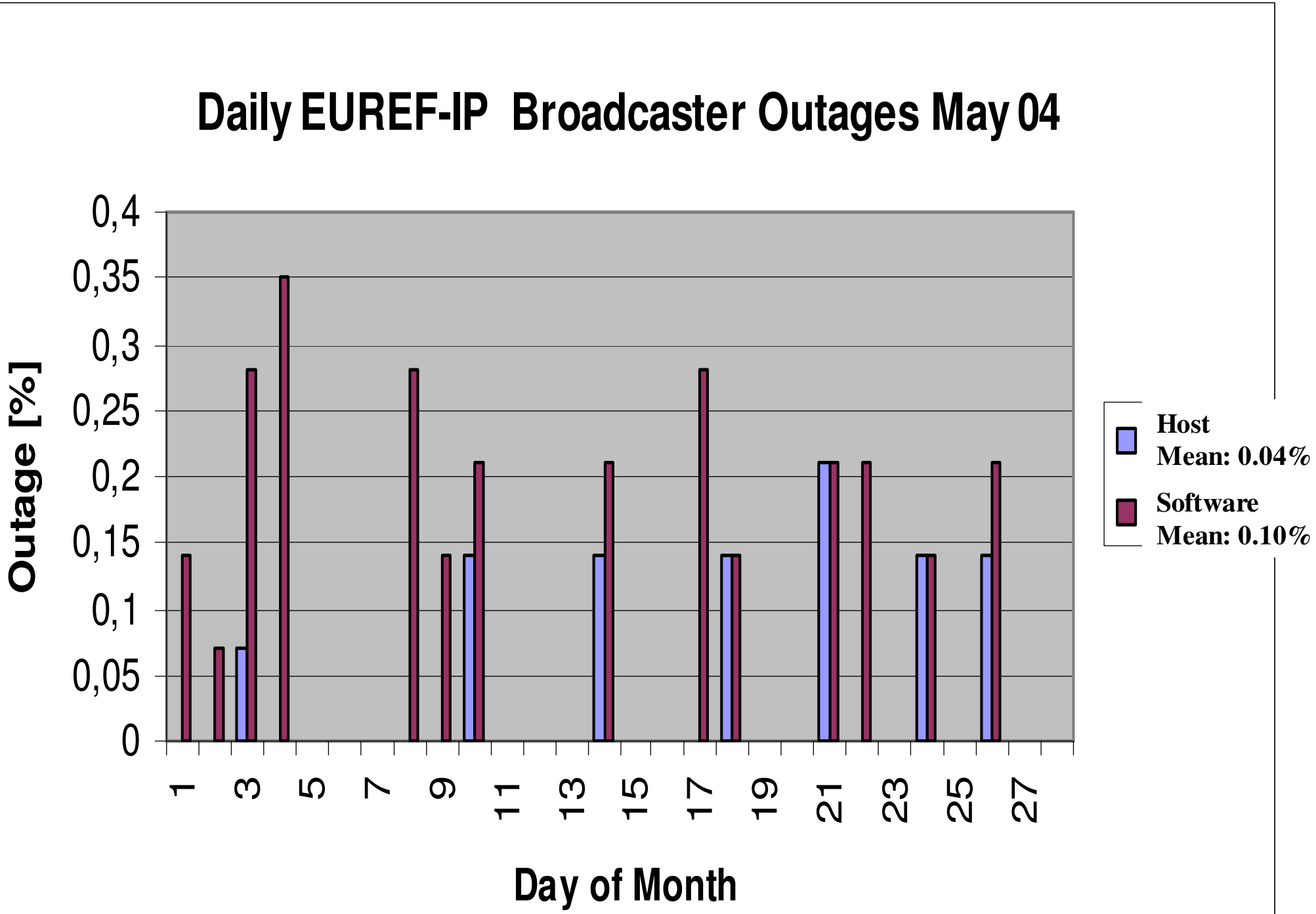


What‘s available today in Europe via EUREF`s Ntrip?

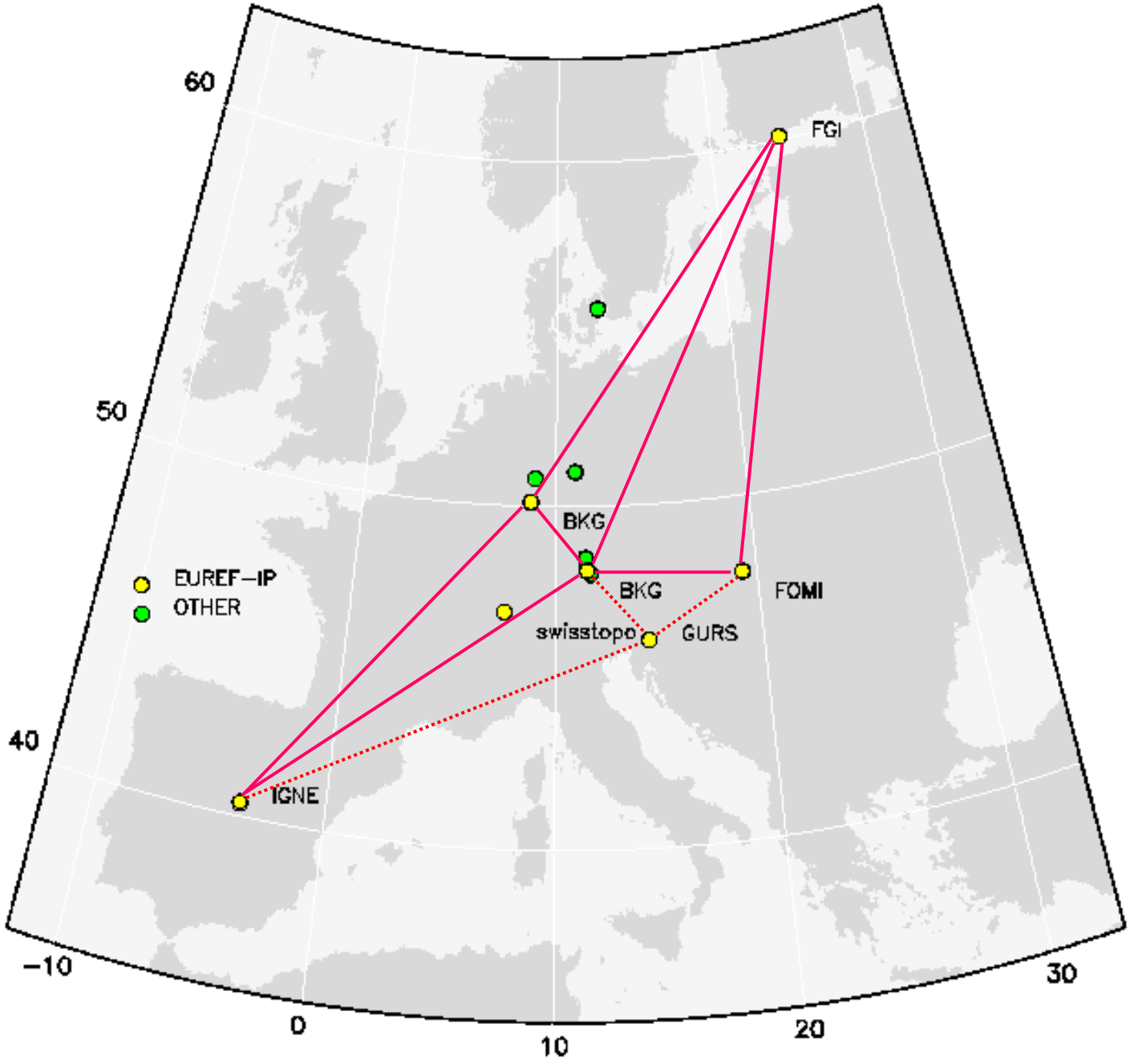


Today´s EUREF-IP Ntrip Broadcaster Implementations

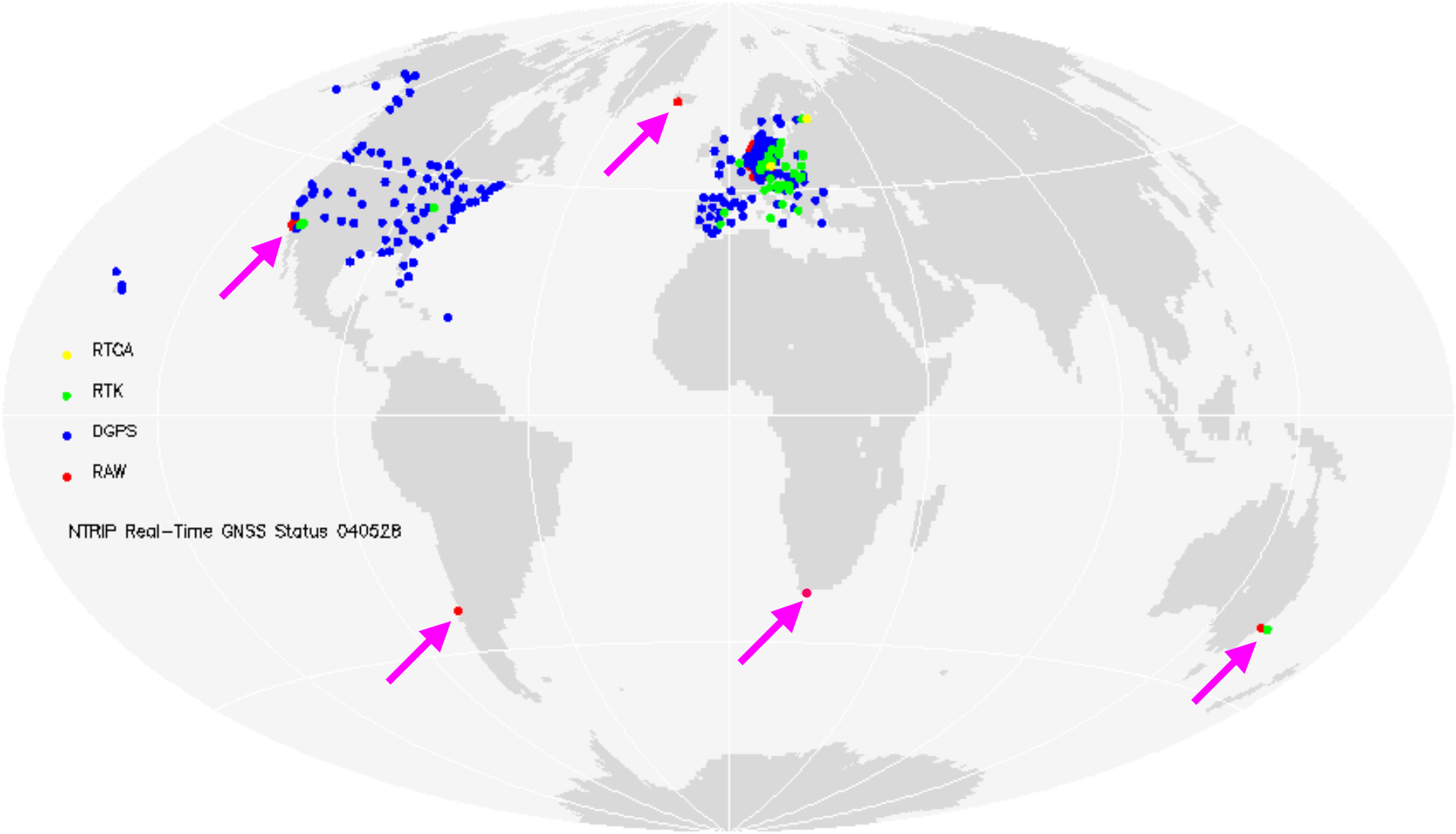



Daily EUREF-IP Broadcaster Outages May 04
Outage [%]
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
1
3
5
7
9
11
13
15
17
19
21
23
25
27
Day of Month
Host
Mean: 0.04%
Software
Mean: 0.10%

Broadcaster Monitoring&Fallback Concept

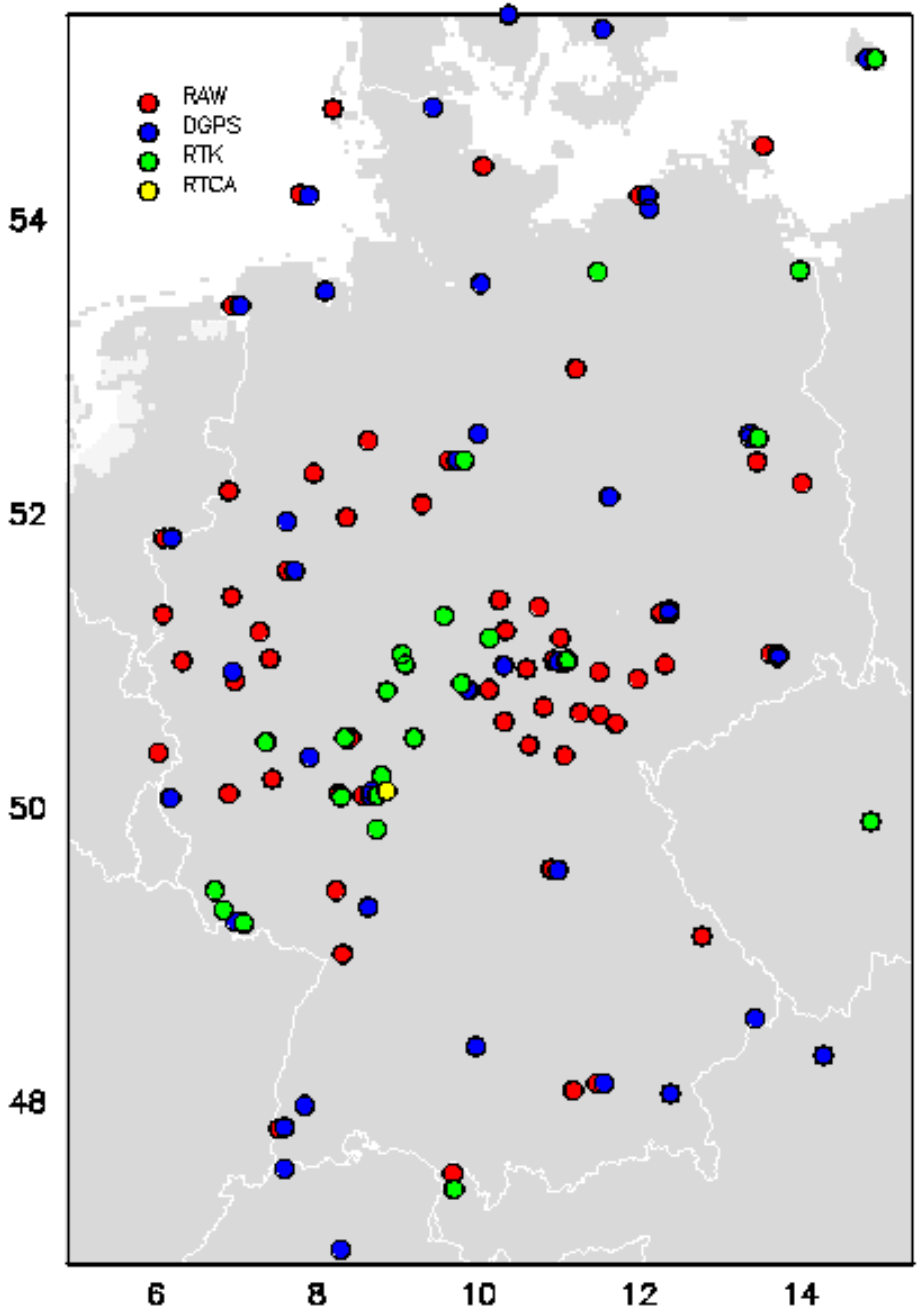


Global Ntrip Real-Time Network

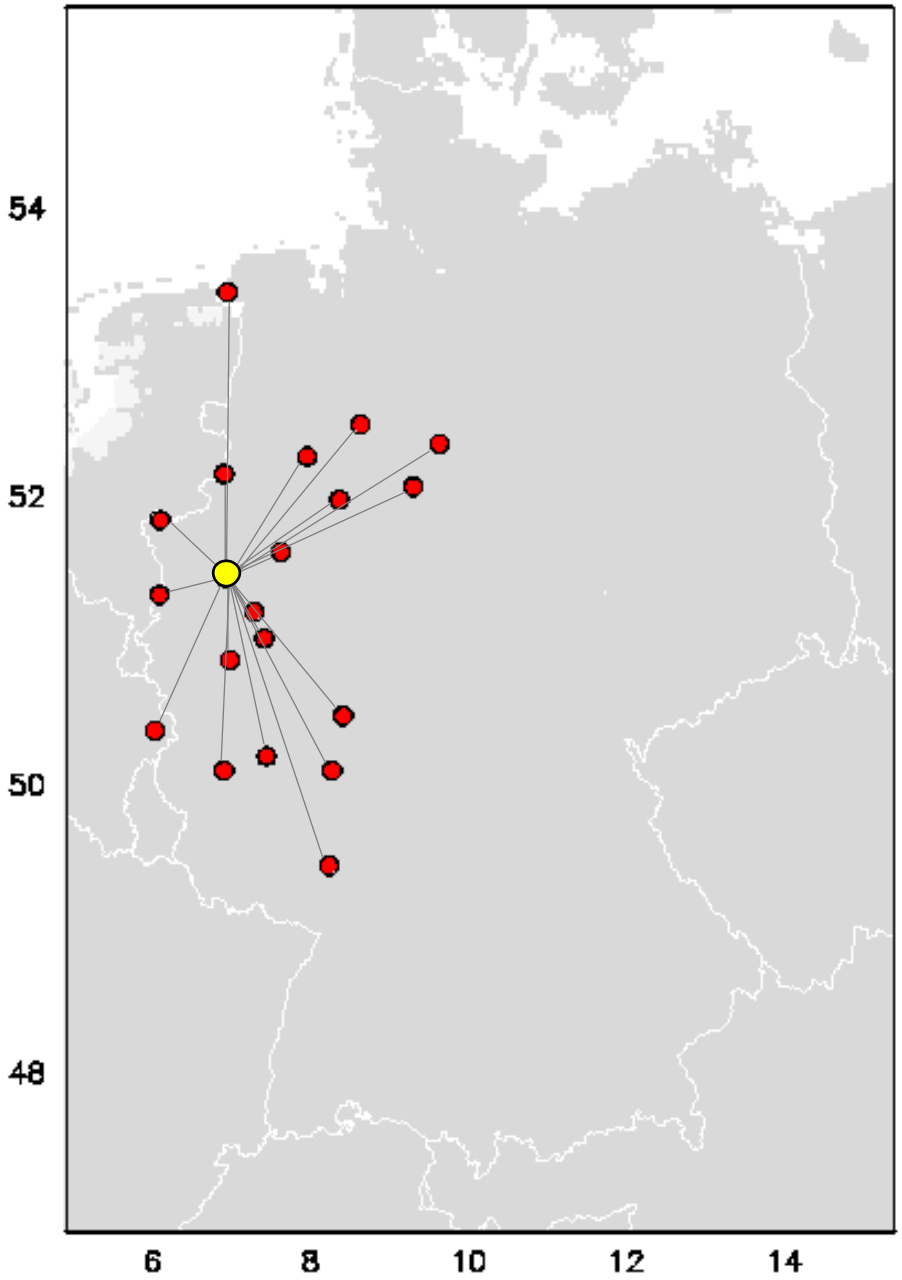


Purpose: Tracking below horizon

What‘s available via EUREF´s Ntrip Protocol in Germany?



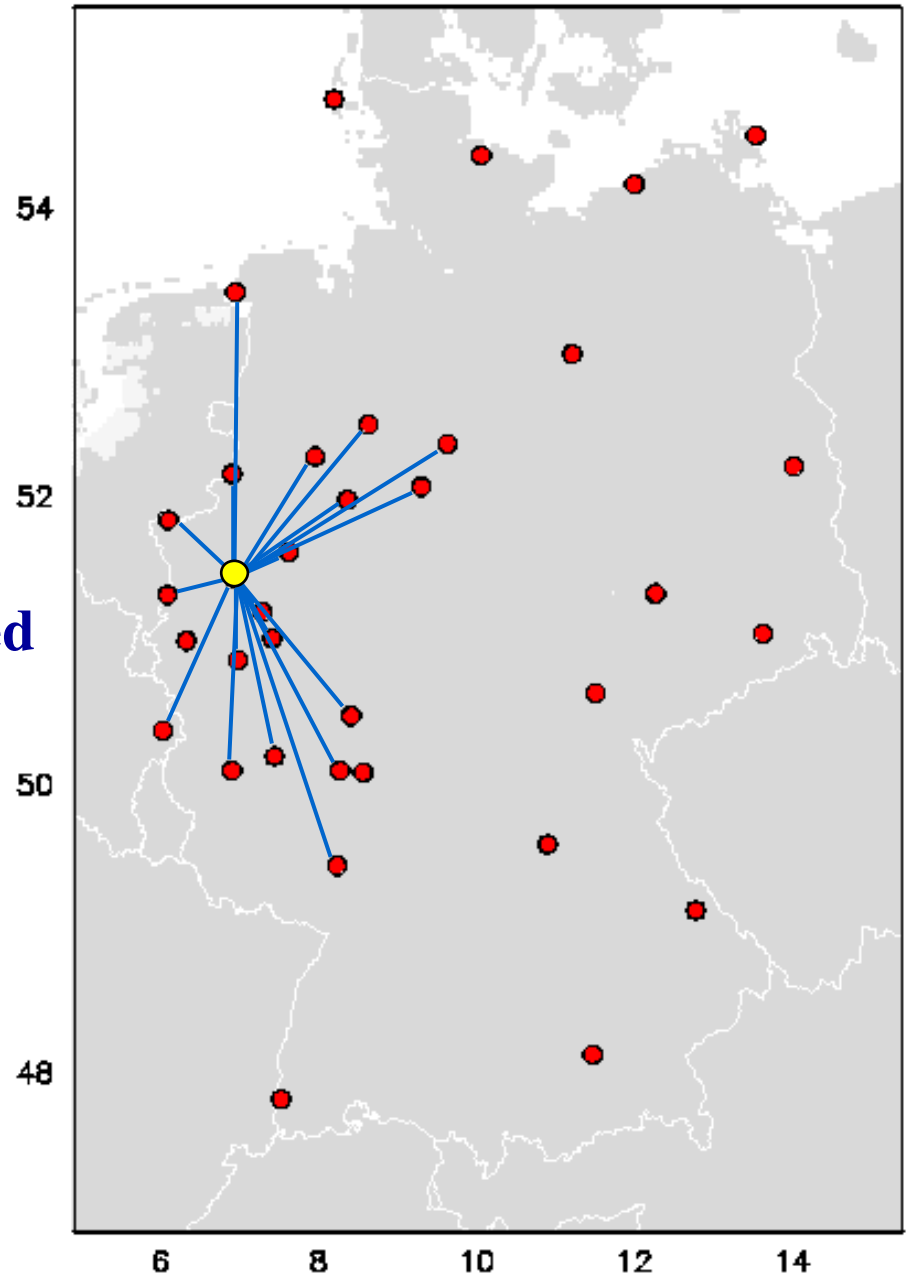
Commercial DGPS/RTK Network ASCOS, Germany



Commercial DGPS/RTK Network ASCOS, Germany

Real-Time Integration of EUREF/IGS Streams

Makes sure that coordinates continuously related to ETRS89



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Real-Time Integration of EUREF/IGS Streams

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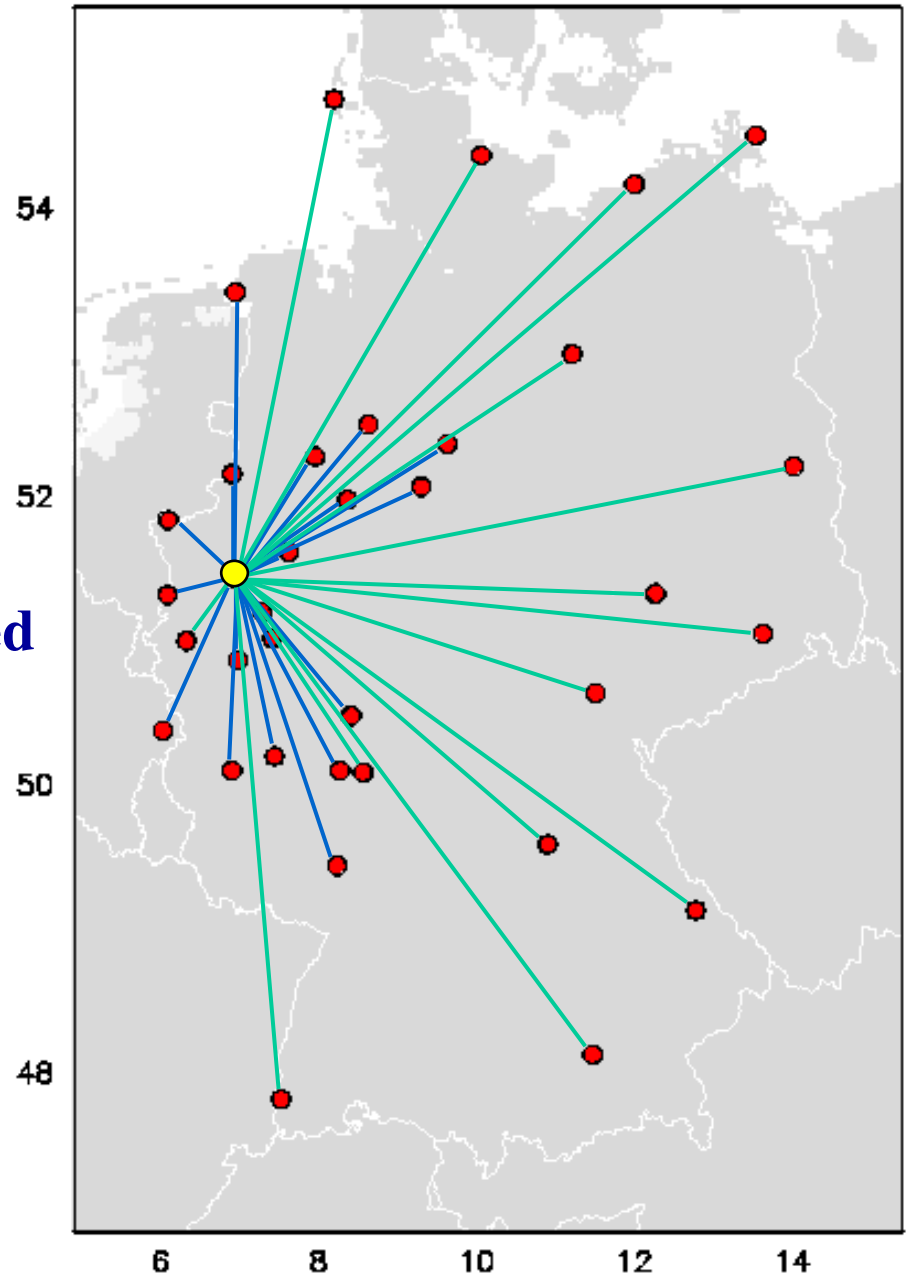
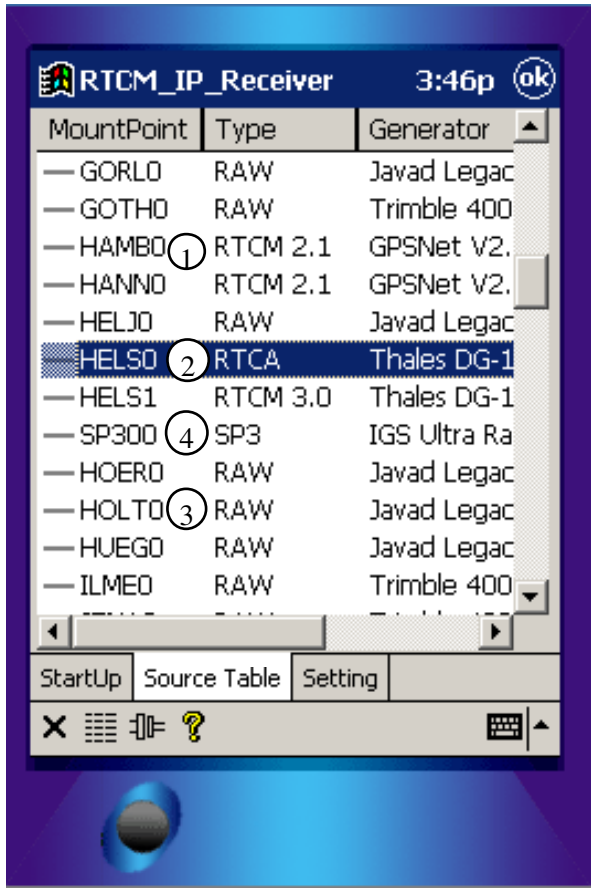
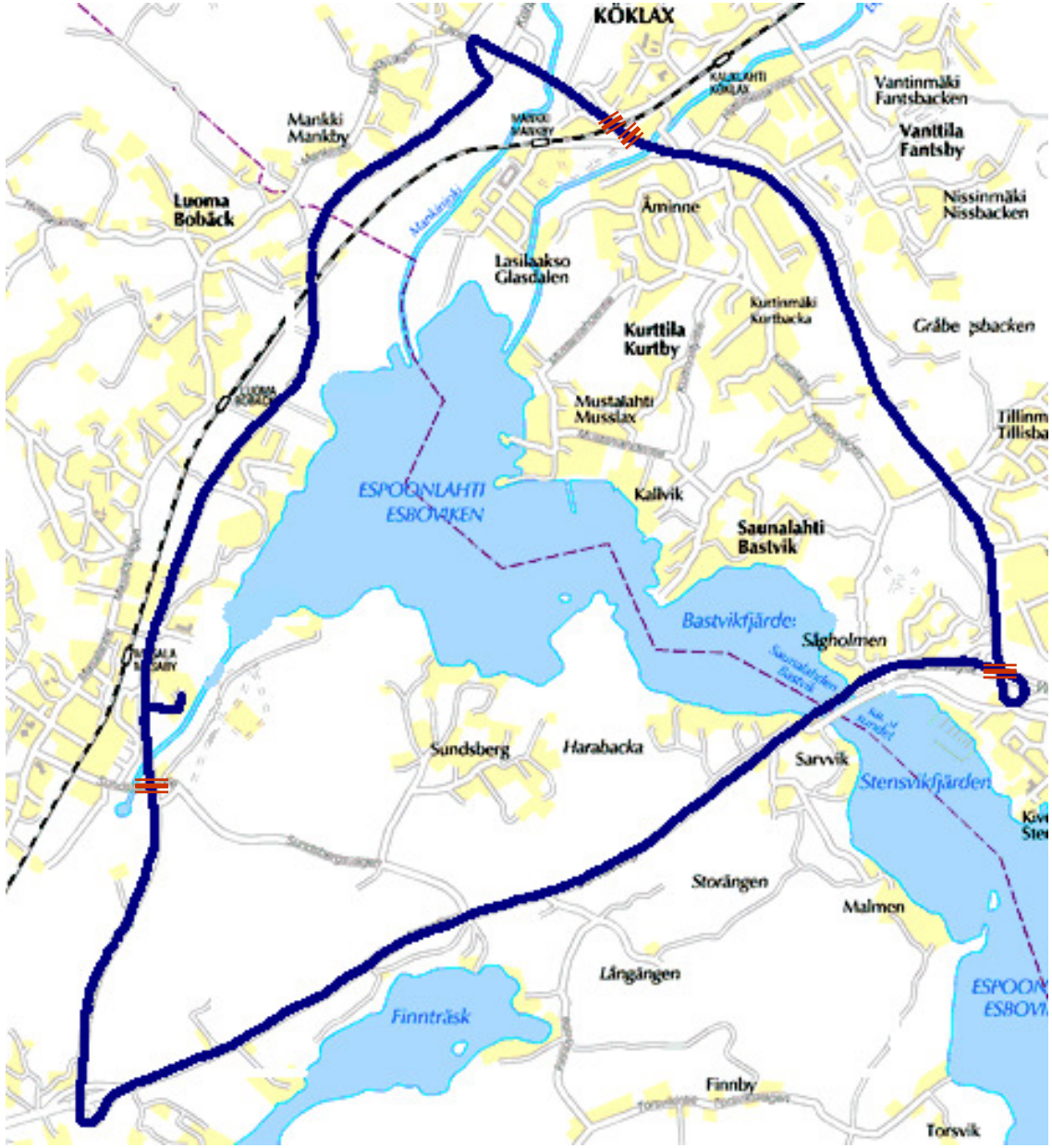


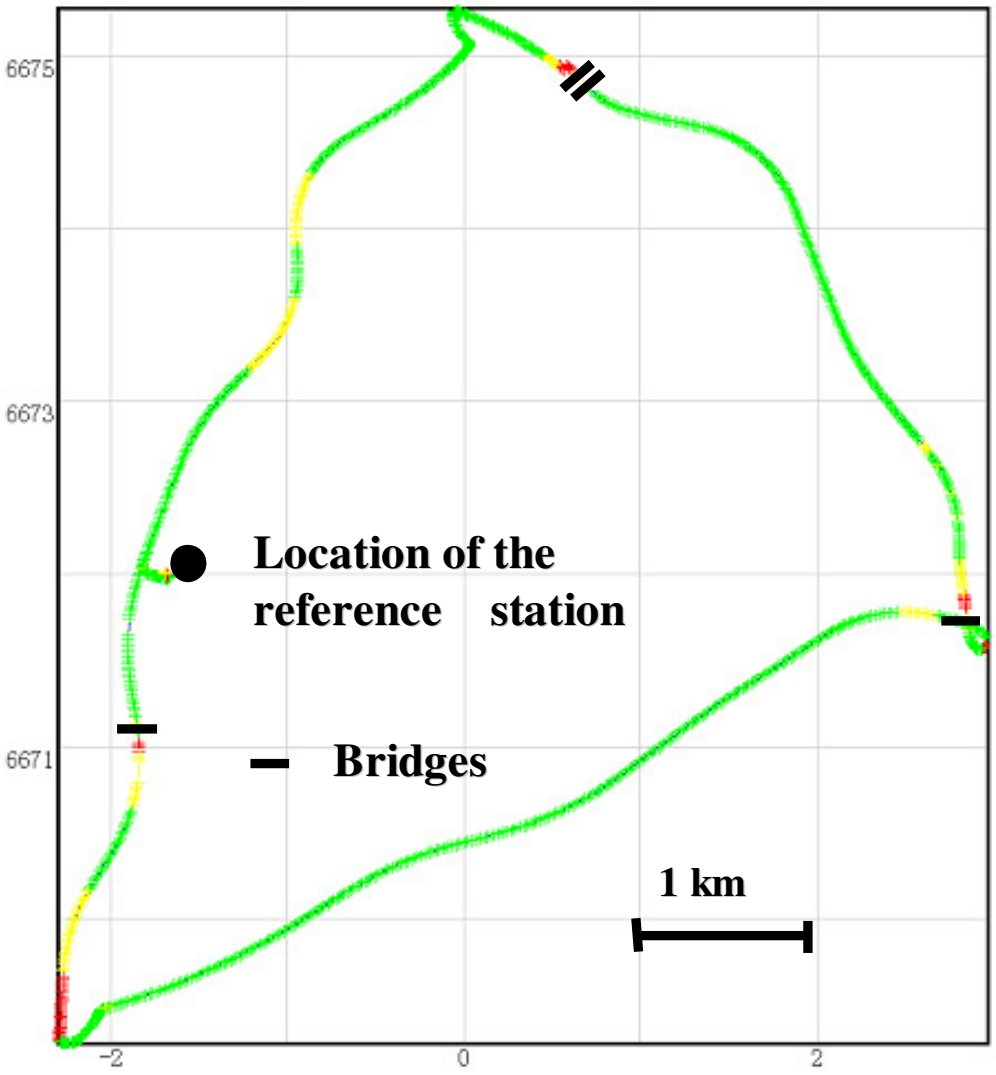
Ntrip Client Developed by FGI



Route of EUREF-IP Ntrip Driving Test



Results of the GSM Test Scenarios



Driving speed: upto 80 km per hour.

Driving route: 18 km (GL-Kivenlahti-Kauklahti-GL)

The vehicle passed under 4 bridges.

Green: Fixed RTK solution 79%

Yellow: Floating RTK solution 12%

Red: GPS navigation solution 5%.

GPS outage: 4%

Who has implemented EUREF‘s Ntrip Protokol in commercial products following RTCM´s standardization?

- ArcNtrip ArcPad GIS Data Collection Software, NtripClient
- GART-2000 Rover Control & GIS Data Collection Software, NtripClient
- GNSMART DGPS & RTK Networking Software, NtripClient
- GPSBase Reference Station Software, NtripServer
- GPSNet DGPS & RTK Networking Software, NtripCaster
- MultiNET DGPS Networking Software, NtripServer
- MultiNAV Reference Station Software, NtripClient
- Rtca2Rtcm EGNOS/WAAS Format Conversion Software, NtripClient&Server
- SurveyController Rover Control Software, NtripClient
- TerraSync GIS Data Collection and Data Maintenance Software, NtripClient

EUREF-IP, Current Real-Time Activities

- Include more EPN stations in Europe
- Get additional Broadcasters up and running
- Maintain and distribute software & standard
- Include globally distributed stations
- Work on RTCM´s Ntrip Version 2.0 (UDP)
- Work on coordination with IGS RTWG
- Galileo 6FP