

# Post-Processing versus Real-Time GNSS

## Challenging Perspectives for EUREF in view of a rising Confrontation and Competition

Georg Weber

EUREF Symposium, Vienna, June 1-3, 2005

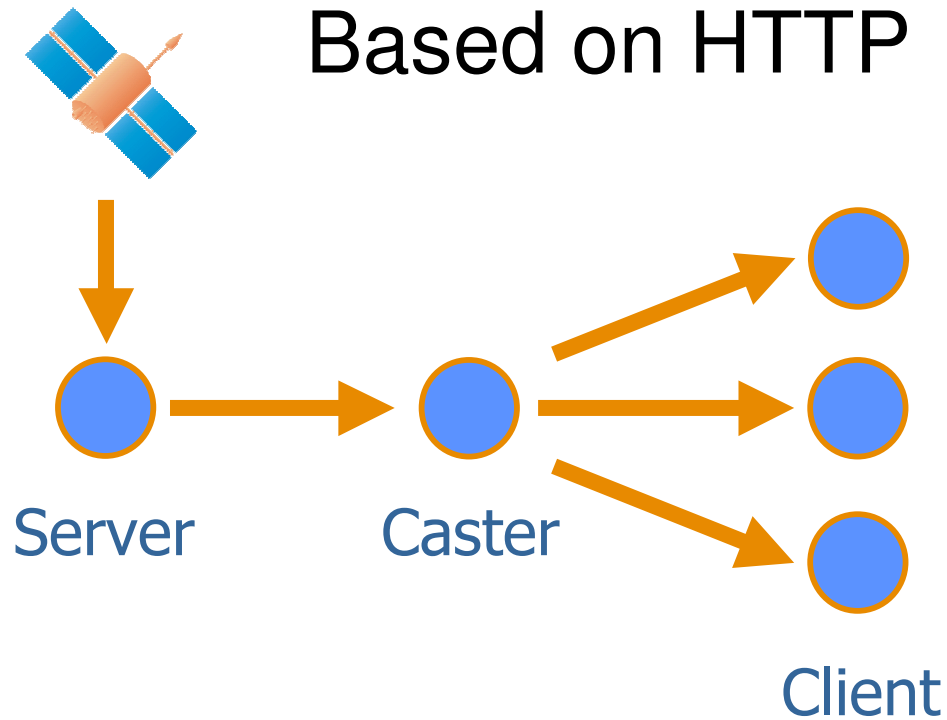
# Post-Processing versus Real-Time

## The Challenge:

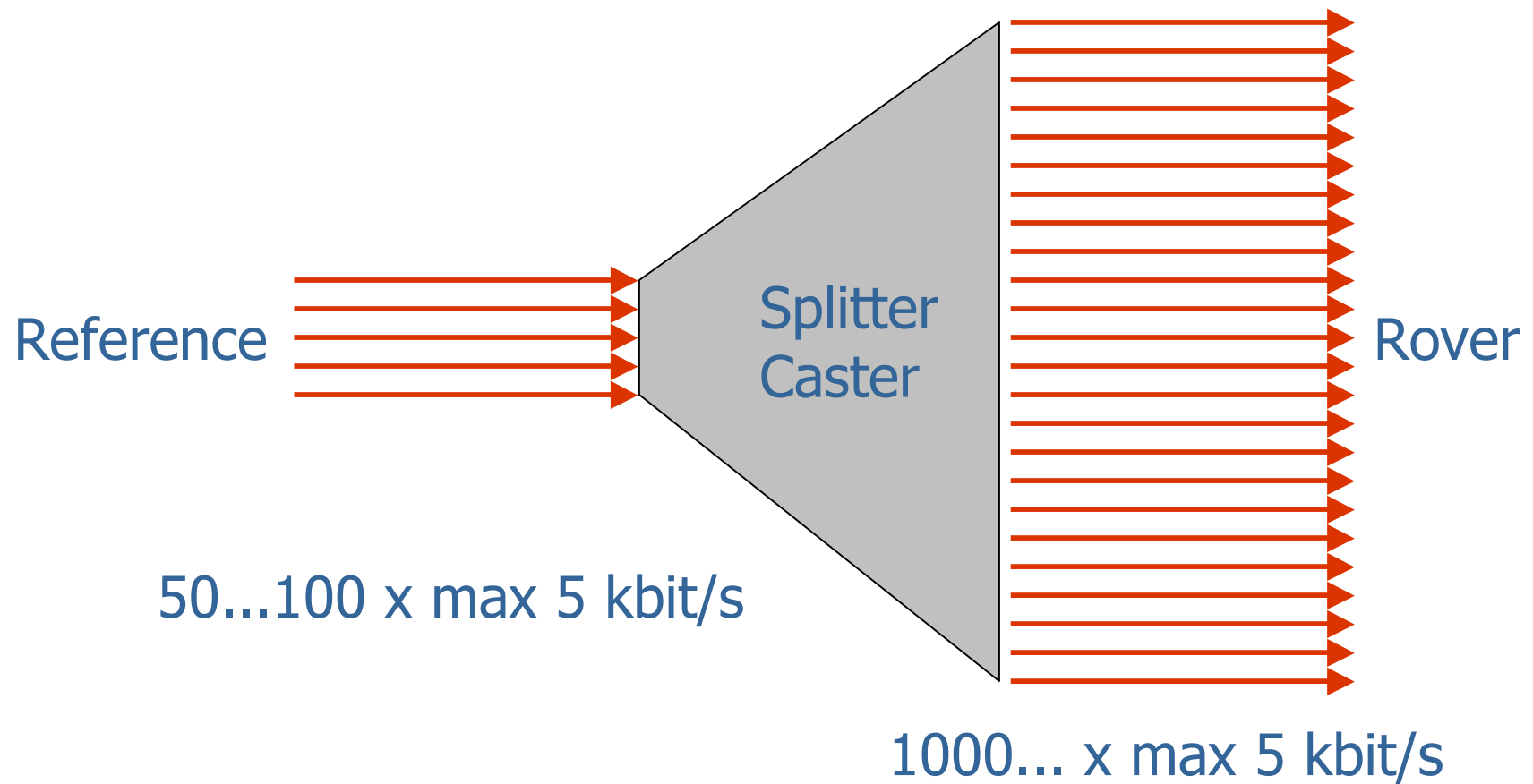
- Is EUREF running out of business?
- So far mainly post-processing oriented, EUREF is confronted with the need to extend its services towards real-time.
- How shall EUREF cope with the new situation? Should it add new products to its portfolio and what could they be?
- What could be an appropriate policy to align to?

# Networked Transport of RTCM via Internet Protocol (Ntrip)

GPRS/UMTS Mobile Internet  
Based on HTTP



# Internet Radio Technologie



# September 2004

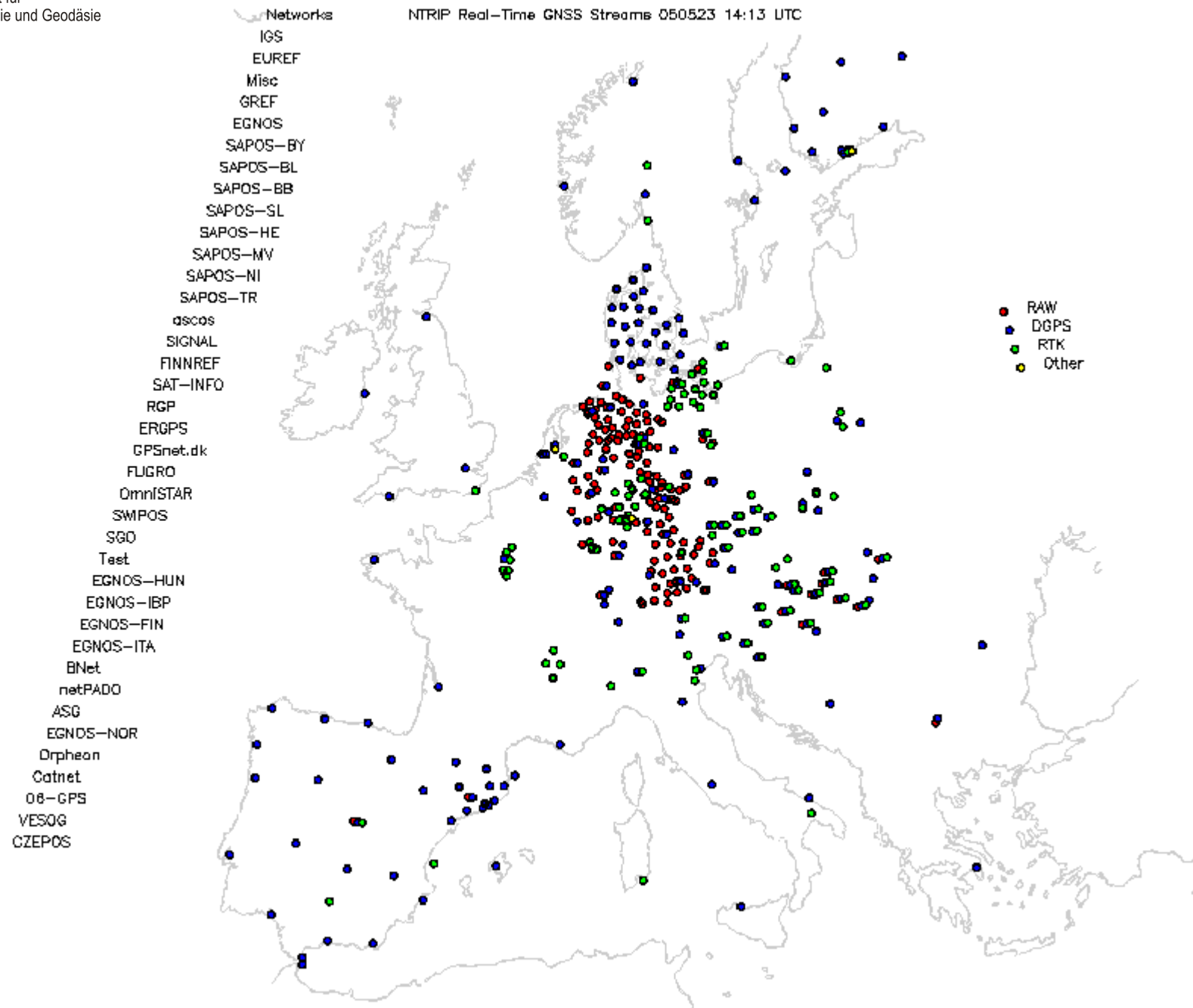
## Ntrip becomes RTCM Standard



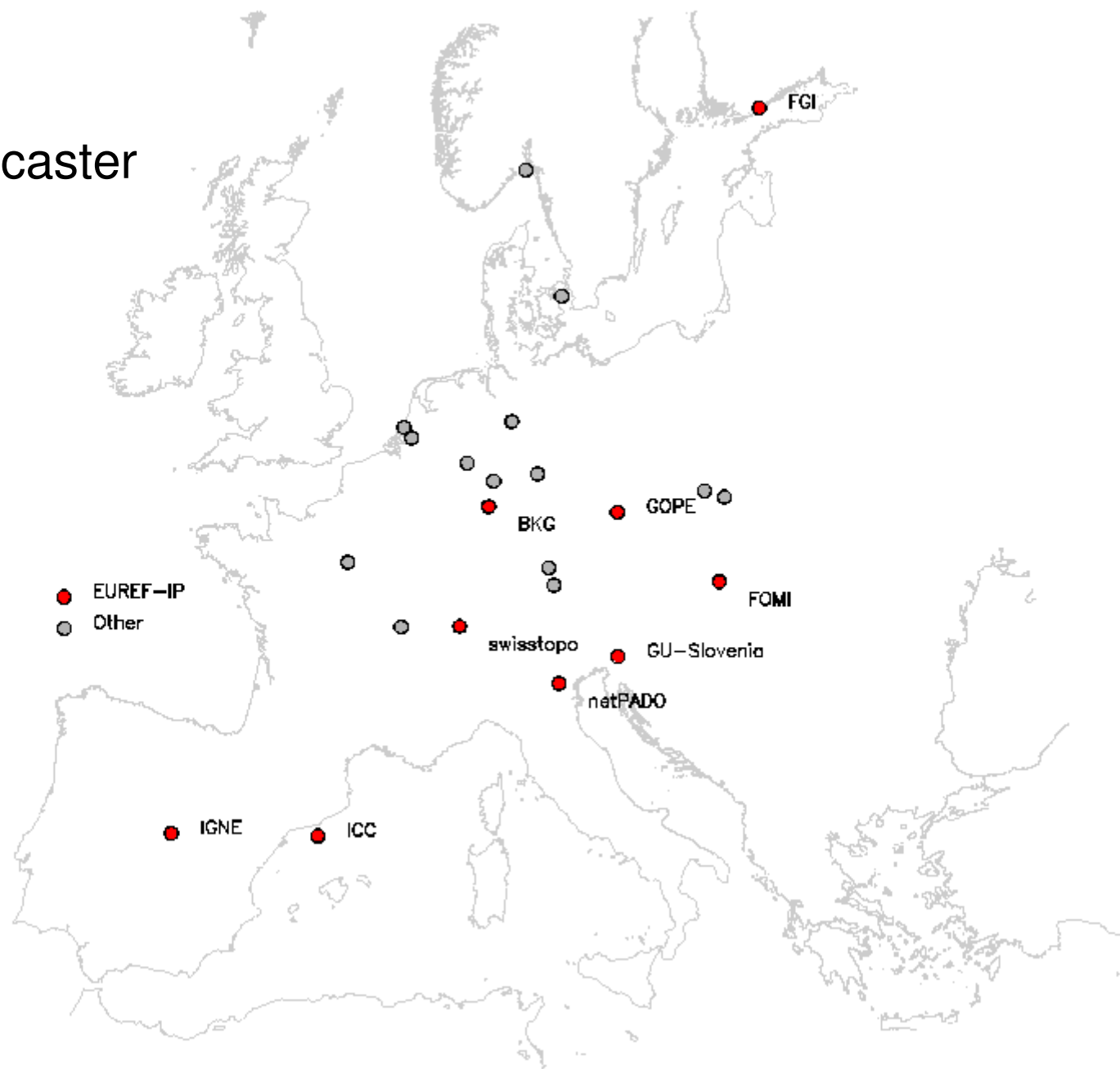
# Status Ntrip Real-Time GNSS Reference Networks

Who participates?





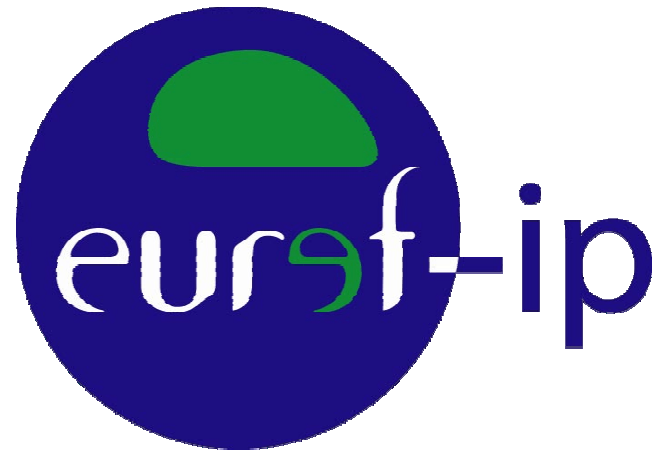
## Ntrip Broadcaster Europa





# Real-Time GNSS Reference Networks

**Why?**  
**What for?**



# **Hourly / Daily RINEX Upload**

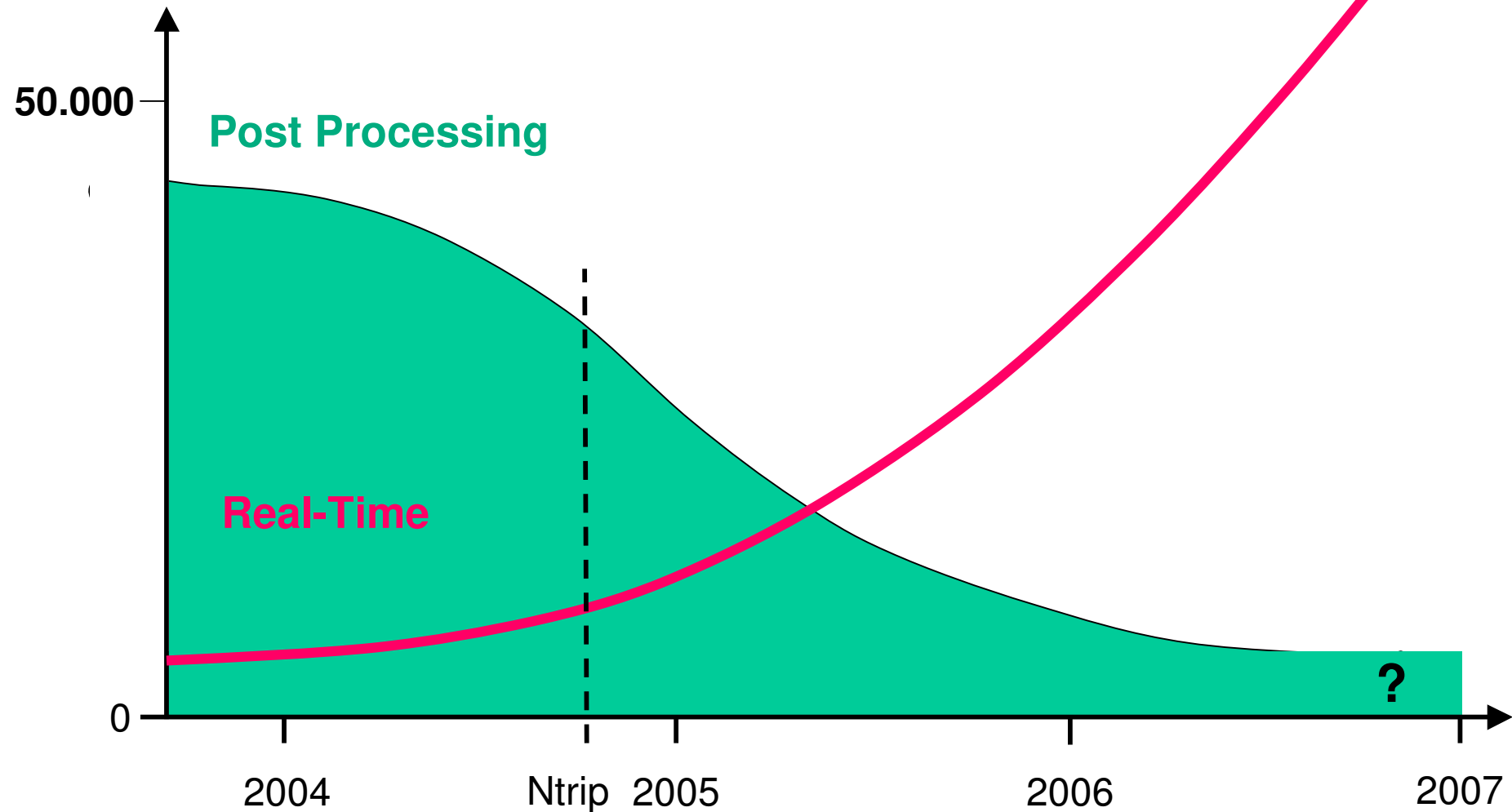
**Would you accept to receive your  
Daily Newspaper Monthly?**

# Confrontation/Competition

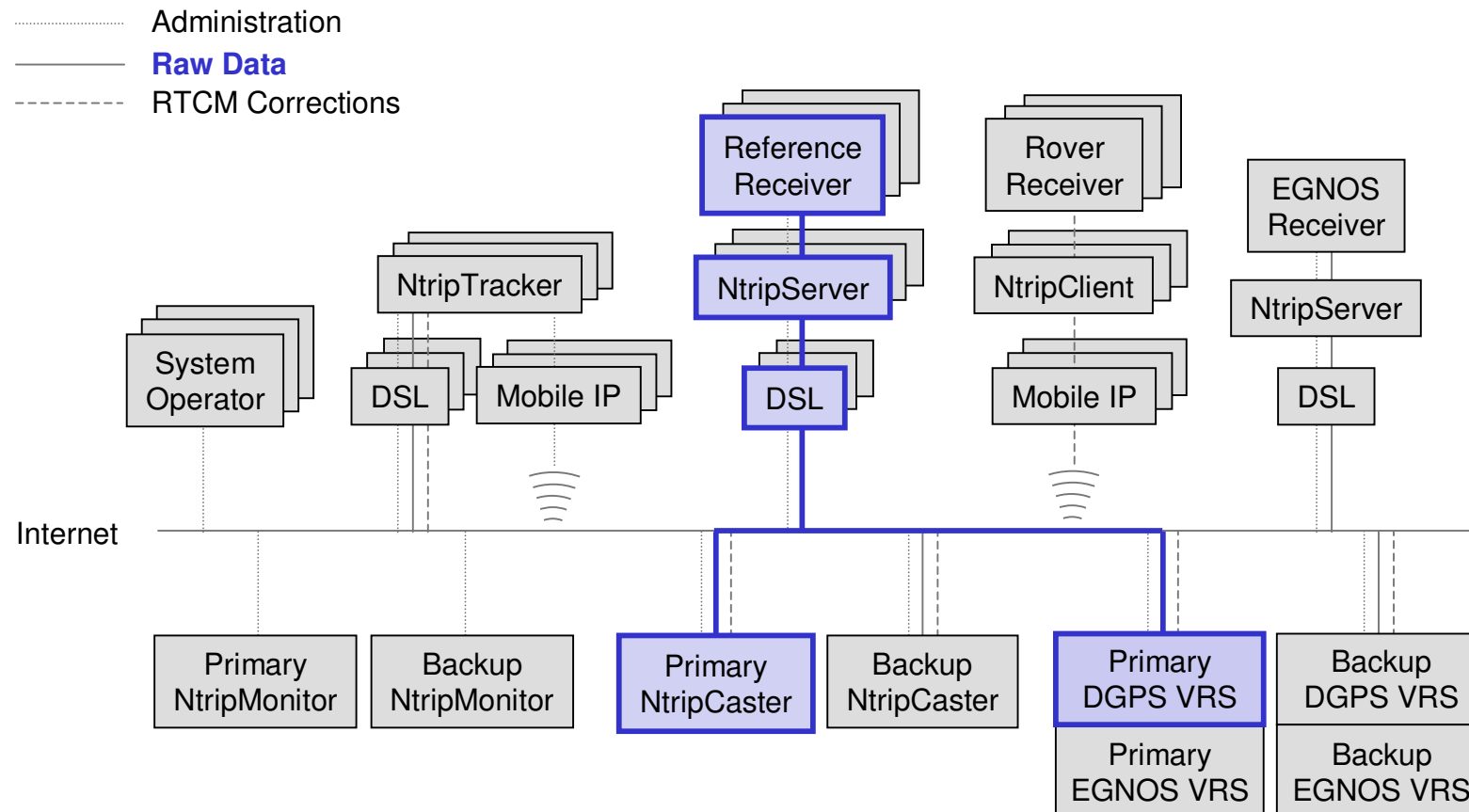
- The number of post-processing GNSS users decreases rapidly.
- At the same time, the community of real-time users grows dramatically.
- With the exception of high precision reference system maintenance, very soon there will remain only a few positioning applications carried out in a post-processing mode.

# Post-Processing vers. Real-Time

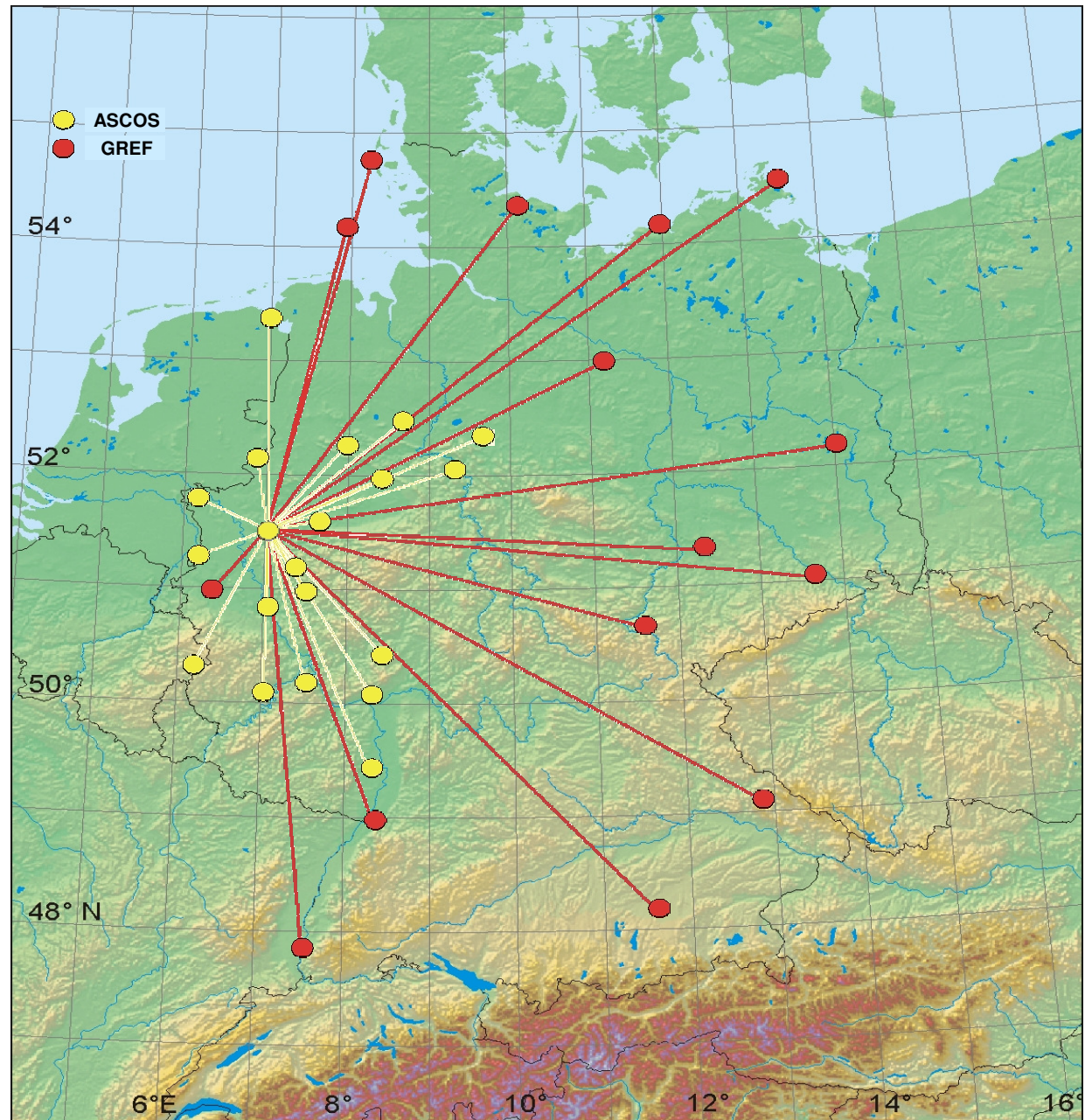
L1/L2 GPS Receivers



# Principle of Ntrip Real-Time GNSS Services

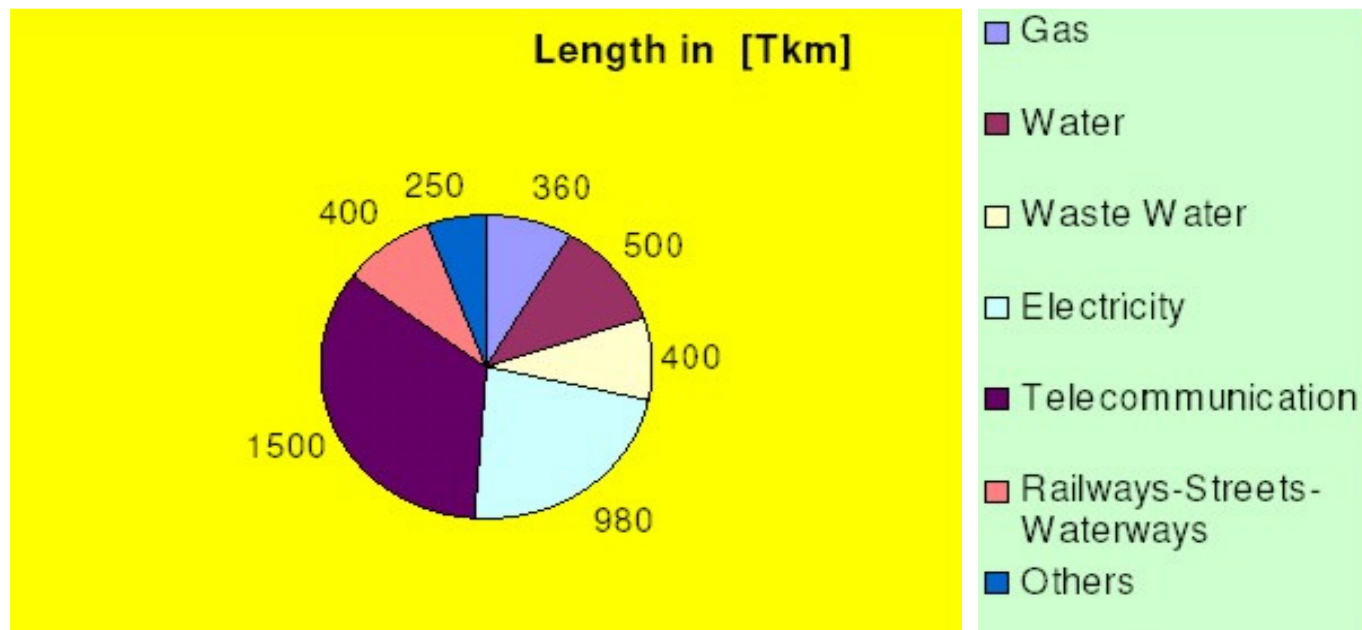


# Post-Processing versus Real-Time



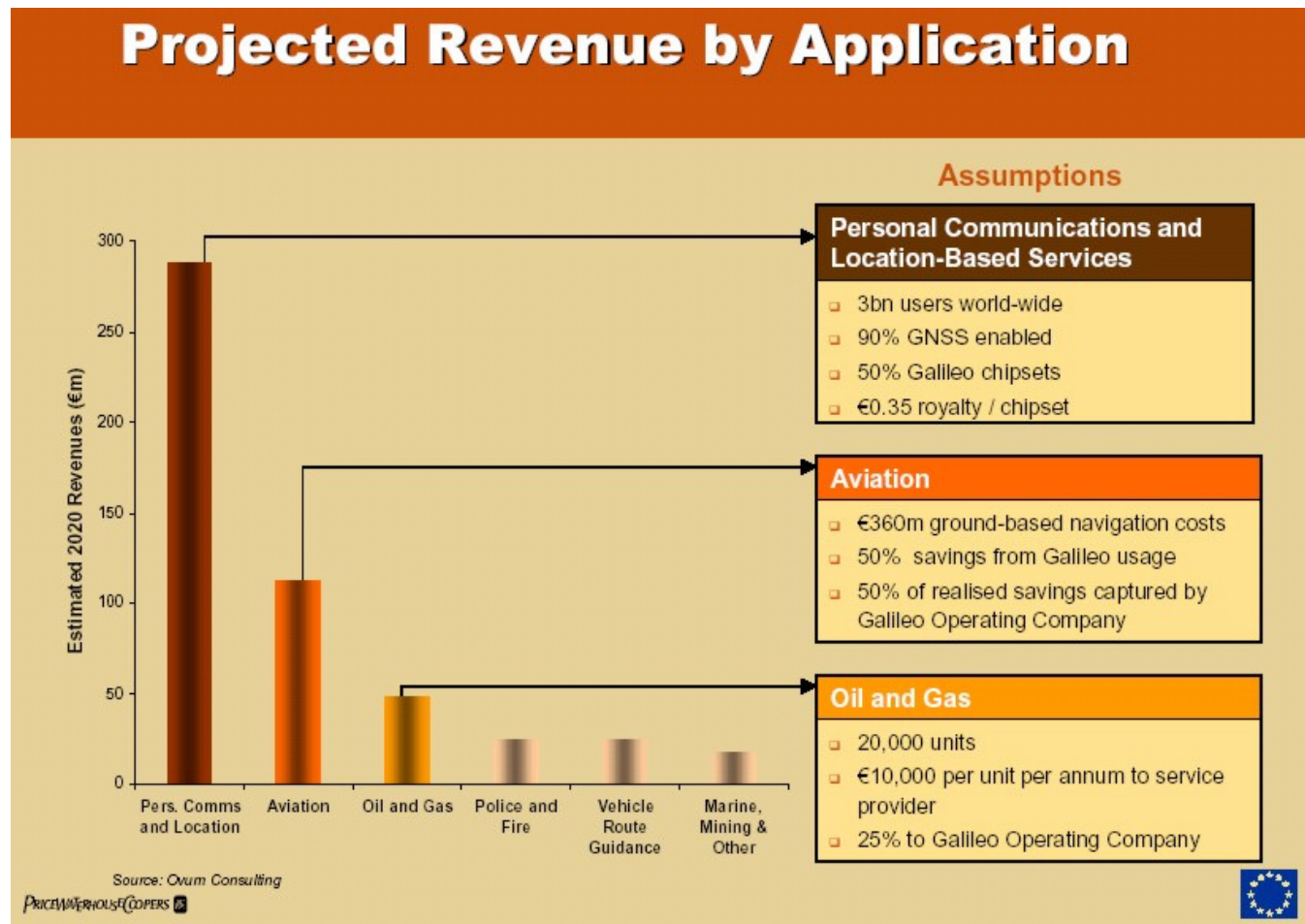
# Real-Time GNSS Positioning

## Cables/Pipelines in Europe





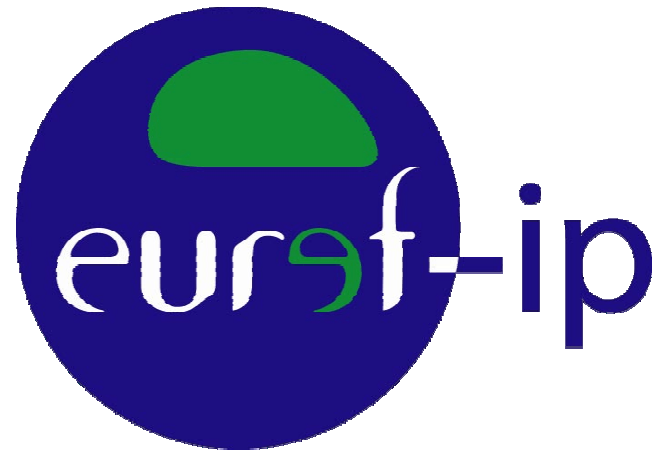
# GALILEO



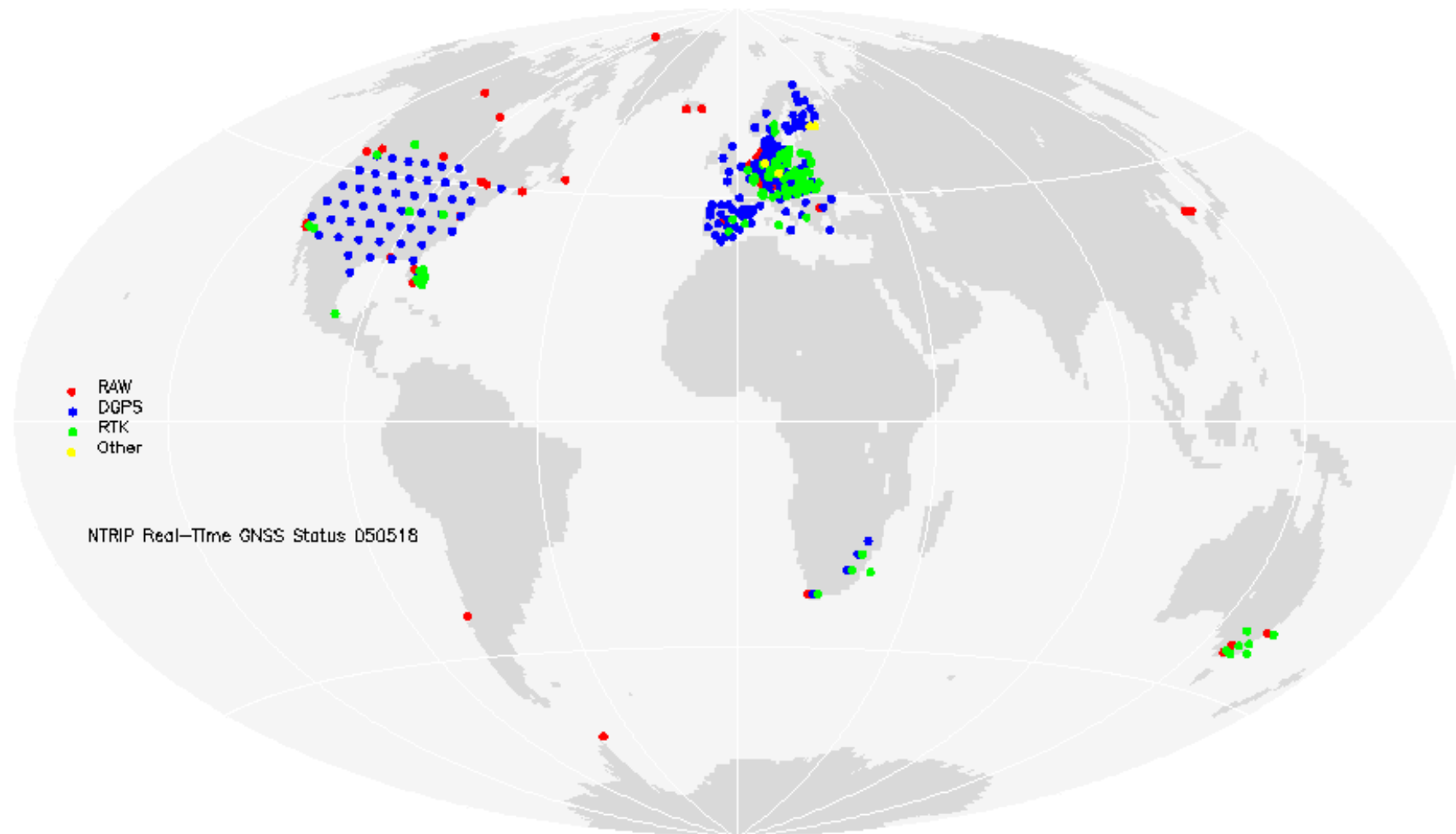


# EUREF Real-Time GNSS Policy

**Join the club?**



## Ntrip, Global View



# **NMA's in Need for a Real-Time GNSS Engine?**

Products:      Satellite Orbits, Clocks  
                    Ephemerides (A-GPS)  
                    Troposphere  
                    Ionosphere  
                    Space-Weather  
                    Health Monitoring  
                    Interference  
                    Tsunami  
                    DGPS/RTK  
                    Galileo .....

**What are the options?   Who wants to participate?**

# Recommendation

- A major step forward could be the common adaptation or even development of a real-time GNSS software package within the framework of EUREF. Its long-term usage and maintenance may follow the “open-source” model adopted for handling of the Bernese post-processing software.