EUREF-IP Pilot Project – Status Report

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Contents

- Ntrip concept and components
- Current 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 [%]

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
Real-Time Integration of EUREF/IGS Streams

Makes sure that coordinates are continuously related to ETRS89

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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