

Time Transfer Using Fiber Links

Werner Mache, BEV

Vladimír Smotlacha, CESNET

Alexander Kuna, IPE

BEV - Bundesamt für Eich- und Vermessungswesen

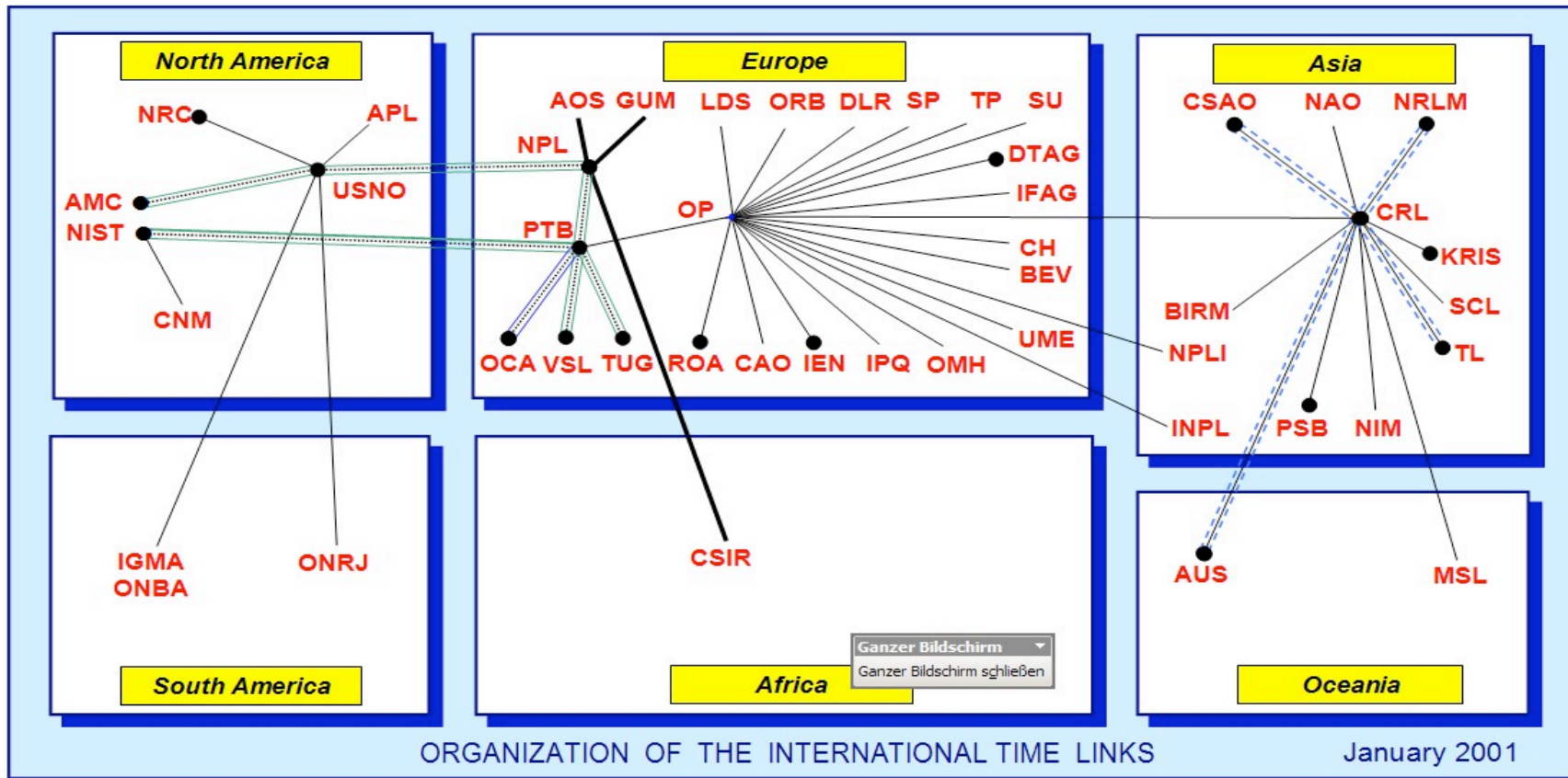


Background

- BEV – National Metrology Institute of Austria
 - Time and Frequency Lab
 - 4 Atomic Clocks

- International Comparison of Atomic clocks
 - current techniques via Satellites
 - Accuracy 1 Nanosecond

Current Time Transfer Network



Legend:

- TWSTFT
- - - TWSTFT link in preparation for introduction into TAI
- OCA/PTB link not used for computation of TAI
- Laboratory equipped with TWSTFT
- GPS CV single-channel
- GPS CV single-channel back-up link
- GPS CV multi-channel

TUG operational until June 2000

Topic of the research Project

- Accurate Time Transfer via all-optical network
- Joint research project of BEV and CESNET/IPE
- Uses ACOnet Infrastructure

Goal

- Design a method for accurate time transfer – alternative to satellite based methods
- Comparable or better accuracy and stability on range ~1000 km
- Use existing DWDM all-optical networks

First Experiments

- Mr. V. Smotlacha developed adapters utilizing channels in DWDM all-optical network
- Tests performed in a all-optical loop at CESNET
- All-optical link from Prague to ACOnet Server room available
- International measurement of BEV from ACOnet to CESNET with very good results

Future work

- Complete all-optical path between BEV and IPE (Austrian and Czech time and frequency laboratory)
- Develop and study the measurement possibilities in real optical link
- Convert experimental method to service – timescale comparison

Thank you