GÉANT Infoshare: European Time and Frequency Services - Principles, Challenges and Use Cases

T&F Research and Innovation projects

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Agenda

T&F Research and Innovation projects

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Introduction

NEAT-FT

OFTEN

TiFOON

CLONETS

CLONETS-DS

Group of users

- Time keeping (NMI)
- Telecoms
- Radio astronomy (VLBI, LOFAR)
- Geodesy
- Navigation
- Geophysics
- Fundamental Research
- Optical clocks
This **project will advance fibre-based frequency transfer capabilities** in Europe towards a universal tool for time and frequency metrology by developing **combined time and frequency techniques with enhanced performance**, while ensuring compatibility with optical telecommunication networks. In addition the project will promote fibre-optic time and frequency dissemination for applications beyond metrology, for example in geodesy.

Project - TiFOON (http://empir.npl.co.uk/tifoon/project/)
Direction of work

- Techniques for combined optical time and frequency transfer over fiber networks
- Towards human intervention-free optical time and frequency transfer
- Time and frequency transfer together with data common channels
- Dissemination of time and frequency beyond NMI
TiFOON project – 15 participants

NMI
- NPL
- PTB
- INRiM
- VSL
- Dutch Metrology Institute
- Observatoire de Paris
- SYRTE
- METAS

Academic & Research
- RISE
- Politecnico di Torino
- AGH
- CNRS
- ISI
- CAS
- TUM

NREN
- cesnet
- PSNC

Industry
- uQuans
- Quromion Quantum Sensors
The CLONETS project aimed to prepare the transfer of T&F dissemination new generation of technology to industry and to strengthen the coordination between research infrastructures and the research and education telecommunication networks, in order to prepare the deployment of this technology to create a sustainable, pan-European network, providing high-performance "clock" services to European research infrastructures. Further this core network should be designed to be compatible with a global European vision of time and frequency distribution over telecommunication networks, enabling it to provide support to a multitude of lower-performance time services, responding to the rapidly growing needs created by developments such as cloud computing, Internet of Things and Industry 4.0.

Project - CLONETS (https://www.clonets.eu/)
Direction of work

- Definition of key technologies and trends
- Definition of technology development roadmaps and strategic agenda
- Identification of additional applications and markets
- Impact, training and communication

The proposed project aims to establish a pan-European time and frequency reference system as a European Research Infrastructure to serve the European science community. It is based on transmitting ultra precise time and frequency information via optical fiber. The proposed project builds on several joint European projects and its direct precursor project CLONETS. We now go far beyond previous efforts by designing a sustainable, pan-European, ultra-precise time-and-frequency reference-system available to the European research community. This Research Infrastructure considers user needs, designs the required architecture, engineering models and roadmaps, and develops a sustainability model for the future service, thus strengthening the European research area.

Project - CLONETS-DS (https://clonets-ds.eu/)
Direction of work

- Scientific cases
- Technical design
- Governance and sustainability
- Impact and dissemination
CLONETS-DS project – 18 participants

NREN

Academic & Research

Industry

GN4-3 / GN4-3N Symposium 2020

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T&F project details and homepages

- NEAT-FT [Project Details – EURAMET](#)
- OFTEN [Project Details – EURAMET](#)
- TiFOON [Project Details – EURAMET](#)
- CLONETS [CLONETS Homepage](#)
- CLONETS-DS [CLONETS-DS Homepage](#)
Thank you

Any questions?

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