

# **Project Information**



## SENDATE-PLANETS

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#### Partners:

2NS - Second Nature Security Oy, Finland Airbus DS Oy, Finland Airbus Group Innovations, Germany BISDN, Germany Comiq Oy, Finland Elisa Appelsiini Oy, Finland F-Secure Corporation, Finland Fraunhofer AISEC, Germany genua GmbH, Germany Infineon Technologies AG, Germany Infosim GmbH & Co. KG, Germany Infosim GmbH & Co. KG, Germany Insta DefSec Oy, Finland Karlsruhe Institute of Technology, Germany MPY, Finland Nokia, Germany Ruhr Universität Bochum, Germany Softera, Finland SSH Communications Security, Finland Technical University Braunschweig, Germany Technische Universität Darmstadt, Germany Technische Universität München - i8, Germany Technische Universität München - i8, Germany Universität der Bundeswehr München IT-Systeme, Germany Universität Würzburg, Germany VTT Technical Research Centre of Finland Ltd., Finland

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#### **Project Websites**

www.celticplus.eu/project-sendateplanets www.sendate.eu

# SEcure Networking for a DATa center cloud in Europe

SENDATE-PLANETS addresses the challenges of a secure distributed cloud architecture, which should be able to handle new application scenarios of our digital society, e.g., Industrial Internet and mobile connected objects. Innovative approaches such as Network Functions Virtualization (NFV) in combination with Software Defined Networking (SDN) are the basis for a secure, flexible, low latency, and locationaware distributed data center approach.

## Main focus

The introduction of NFV/SDN together with the integration of telco and IT technologies comes with several challenges, which are in the focus of SENDATE-PLANETS.

**Security:** One focus is on public application specific security methods implemented in a virtual SDN architecture. Furthermore, a real-time, risk-based measurement and evaluation of the system security level has to be developed to provide a distributed cloud security management and orchestration. It will ensure specific security levels for virtual network functions.

**Data centers:** The location of data in a distributed cloud architecture plays an important role to ensure different privacy and security levels and to guarantee certain QoS requirements. Therefore, the SENDATE-PLANETS architecture will

allow flexible placements of network functions / microservices.

**Networking:** An optimal placement of network functions requires a flexible monitoring concept consisting of centralized/de -centralized monitoring functions. This allows for an availability analysis of control - and management-functions to guarantee certain QoS levels.

#### Approach

SENDATE-PLANETS researches new technologies to configure and adjust distributed data center setups and function placement according to the current requirements. Functions of network elements such as firewalls and mobility management entities are set up on demand in distributed data centers. To allow an efficient cooperation of these different virtual network functions, the network between the different data centers has to be set up dynamically taking into account the function chain requirements and the available resources. Therefore, the researchers develop and evaluate different architectures and placement algorithms for network functions, considering the available resources, security requirements as well as the geographic locations. These algorithms will be implemented, validated, optimized, and presented in a distributed SENDATE-PLANETS cloud infrastructure.

Another approach researched in SEN-



DATE-PLANETS is to quantify the increased vulnerability to cyberattacks due to the softwarization. Therefore, new automatic security the next generation mobile Internet (5G), where distributed data center environments will play an important role. The results will help

tive technologies like Network Functions Virtualization, the unification of IT and telecommunication and applying new security



mechanisms are developed, which ensure aligned security mechanisms of IT and network hardware with software. In addition, mechanisms for real-time measurements of security levels will be developed for enabling a distributed cloud security management and – orchestration.

#### Main results

The project results will be the basis for concepts and products for

## About Celtic-Plus

Celtic-Plus is an industry-driven European research initiative to define, perform and finance through public and private funding common research projects in the area of telecommunications, new media, future Internet, and applications & services focusing on a new "Smart Connected World" paradigm. Celtic-Plus is a EUREKA ICT cluster and belongs to the intergovernmental **EUREKA** network. Celtic-Plus is open to any type of company covering the Celtic-Plus research areas, large industry as well as small companies

to flexibly distribute network functions between micro PoPs, edge-, and core-clouds depending not only on the load, but also on service demands and security aspects.

### Impact

As we are currently facing major changes in the telecommunication industry, the results of SENDATE-PLANETS will pave the way to tomorrow's telco clouds. Innova-

or universities and research organisations. Even companies outside the EUREKA countries may get some possibilities to join a Celtic-Plus project under certain conditions.

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concepts to future networks can also bring opportunities for the European society and industry including SMEs. The investigation and realization of new concepts that result in flexible, highly efficient, and secure networks will lead to a significant advantage for Europe and will boost the development of all competing industries. This is not restricted to the telecommunication and IT sectors, but covers also for "verticals", such as Industrial Internet, machinery construction, and the automotive sector.