Celtic-Plus
Smart Connected World

Project Information

FLEXNET

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Blue Technologies, Poland

Citymesh, Belgium

Civimetrix, Canada

Data Alliance, Korea

Gradiant, Spain

IMEC, Belgium

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Project Websites

www.celticplus.eu/project-flexnet

Www.project-flexnet.com

Flexible IoT Networks for Value Creators

The main objective of the project is to build a new paradigm of flexible communication networks to boost the creation of Internet-of-Things value. FLEXNET provides IoT (Internet of Things) value creators the availability of consuming network communications on demand, in real time, automatically and according to their specific needs.

Main focus

The FLEXNET project is perfectly aligned with the definition and development work of the 5G technology (Fifth Generation of mobile communications) where the main objective is to provide high quality connectivity (high throughput, high availability, low latency, high density of connections), adjustable to the needs of each application and with a significant improvement in the user experience with respect to current technologies. Software Defined Networking (SDN) technology and its ability to adapt in real time is the centre of the FLEXNET project.

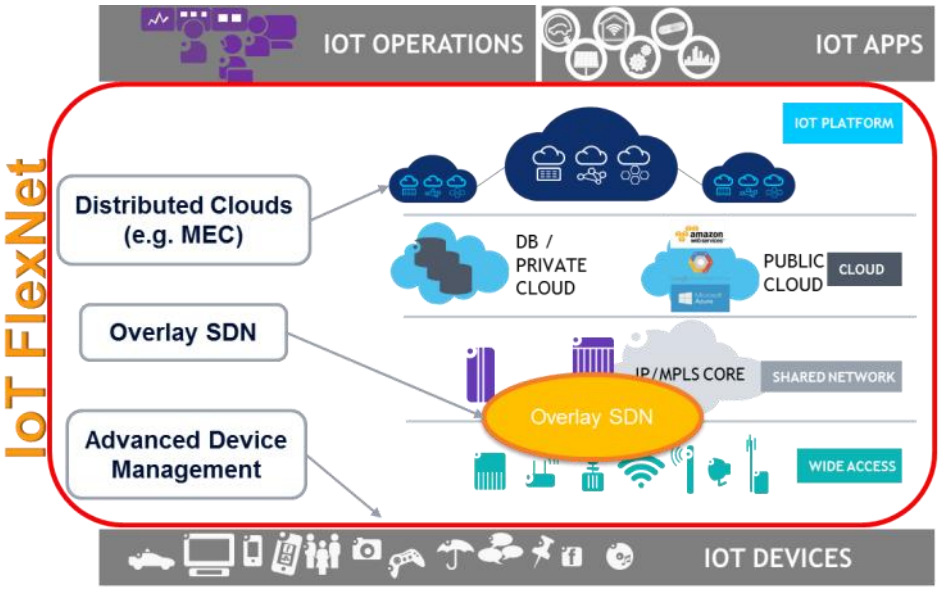
The concept of SDN networks is based on separating and centralizing the control of the data (control plane) of the data that goes through the network (user plane). In order to do so, specific, complex and sometimes proprietary hardware of a given manufacturer is replaced by simple, highly reliable and totally standard equipment. This network architecture allows combining high flexibility with high reliability and availability.

Approach

To achieve the objectives, the project relies on the development and adaptation of key technologies fully aligned with 5G design principles:

Create an Overlay Software Defined Network (SDN), based on VxLAN tunnelling. To support ultra-flexible environments, it is necessary to consider new solutions, such as the separation of user and control planes, as well as the redefinition of the support of network programmability.

Advanced device management and data collection technologies. The different endpoints involved for each IoT use



case is properly interconnected and automatically adapted and reconfigured according to the needs requested in each moment, applying the communications policies suitable in each moment. For this purpose, the project uses as baseline the open standards from the Open Mobile alliance (OMA).

Use of distributed clouds to provide the appropriate flexibility to create, delete or move virtual machines of the IoT applications. This is essential to support highly efficient transmission and data processing, necessary to properly balance the network resources and allow low latency solutions. The main concept behind is to place functions closer at the edge of the access network and device, so compute, storage and networking is rationalized and adapted. The framework of Mobile Edge Computing (MEC) will also play an important role for meeting many crucial requirements.

This combination of SDN + OMA Device Management + Edge Computing for IoT solutions is the key characteristic of FLEXNET .

Existing IoT platforms and services are very different each other. However, they are usually monolithic solutions with strong limitations determined in the design phase: dimensioning of the solutions, type of devices, etc. Thanks to FLEXNET, IoT platforms will be able to dynamically adapt to the number of users, devices, location of servers, etc.

This flexibility will be determinant for fast TTM in new IoT services, as initial deployments will not limit future evolutions, avoiding the need of dimensioning the whole network during design phase.

Main results

The main outcome of this project is a **new paradigm of flexible network** providing the IoT value creators the availability to consume the network communication resources on demand according to their specific needs.

To ensure a specific quality of service parameters, the idea of **reconfiguring the network according to events detection**, so that activating different concurrent routes from one source to multiple destinations, plays a capital role in FLEXNET project.

The FLEXNET project aims **to provide relevant inputs for the future 5G** evolution towards a full programmable and flexible network specifically for the IoT domain, with the final target to help in designing the best environment for IoT value creation.

Impact

The impact of the FLEXNET project can be summarized in two main ideas, fully aligned with the 5G technology development:

Reducing the average service creation time cycle. The response time is crucial in all safety and emergency management applications. In this sense, the project will contribute to validate that the reduced response times, which are achieved thanks to the flexible network paradigm, significantly improve emergency management.

Increasing number of SDN controllable resources. The project develops a real and intense use of this technology, contributing positively to its implantation in present and future mobile communication networks. In this sense, the objective is to contribute to the SDN technology becoming the base of the networks of the future and that is seen as an integral and inseparable part of them.

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 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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