SELFNET - Framework for Self-Organized Network Management in Virtualised and Software Defined Networks

SELFNET Project

Jose M. Alcaraz Calero & Qi Wang, University of the West of Scotland – Technical Coordinators

Maria Joao Barros, Eurescom - Project Coordinator
SELFNET Consortium members:

- **Industrial Partners**
  - Eurescom - Germany (Project Coordinator)
  - Portugal Telecom Research & Inovacao – Portugal
  - Proef – Portugal
  - Alvarion - Israel
- **University Partners**
  - University of the West of Scotland - UK (Technical Coordinator)
  - Universidad de Murcia – Spain
  - Universidad Complutense de Madrid - Spain
- **Research Institutes**
  - DFKI – Germany
- **SMEs**
  - Nextworks - Italy
  - InnoRoute - Germany
  - Ubiwhere - Portugal
  - Creative Systems Engineering - Greece
Main Objectives

• To deliver an innovative framework for the automated management and rapid deployment of self-organized next-generation networks and services
• For automated network monitoring and maintenance management tasks
• Extending the state-of-the-art network management within the Software-Defined Networking and Network Function Virtualization (SDN/NFV) arena
• Removing the reliance on costly, vendor-specific hardware with an advanced software-based approach
• Automatically detecting and mitigating a range of common network problems that are currently still being manually addressed by network operators (use case driven)
• Reducing operational costs and improving user experience
Main Technical Goals

• **1. Automated network monitoring**
  – Automatic deployment of NFV apps. → Distributed monitoring of network infrastructure.
  – High-level Health of Network (HoN) metrics → Multidimensional view of potential network failures, bottlenecks, security threats, intrusions, etc.

• **2. Autonomic network maintenance**
  – High-level tactical corrective and preventive measures to enable autonomic reactive and proactive network maintenance.

• **3. Automated deployment of network management tools:**
  – Automatic reactive and proactive actions → Against existing/potential network problems
  – Automatic deployment of distributed services in the network
    • Intrusion protection tools,
    • Load-balancing tools,
    • High-availability routing tools,
    • Transparent cache tools
    • Other network management tools

• **4. Automated network service provisioning**
  – Manage and optimize the usage and deployment of NFV and SDN applications
Areas to be addressed

- **Automated Network Management**
- **5G-PPP Topic completely applicable:**
  - P11: Cognitive Network Management
- **5G-PPP topics partially addressing the topic**
  - P12: SLM & metrics for QoS
  - P13: Network Security and integrity
  - P14: Virtual Network Platforms
  - P15: Service Programming and Orchestration
Main impact

- **At the macro level:**
  - Enlarged market share for European network operators: providing network infrastructures with new intelligence to automatically perform self-configuring, self-healing, self-protecting and self-optimizing functionalities
  - Enlarged market share for European equipment vendors: Including in future network equipment capabilities for self-organization and self-improvement of the network
  - Strengthen the competitiveness of European service providers: with optimized service and application performances to increase the QoE of users, thus attracting more subscribers

- **At the societal level:**
  - Enhanced QoE of the end users, bandwidth usage and support for video applications
  - More secured and resilient network and services
  - Reduced energy consumption, by reducing the amount of physical devices and increasing the utilization of existing ones

- **At the operational level:**
  - Improved scalability from the distributed intelligence, hierarchical network function/element deployment, scalable service creation, and cloud computing
  - Improved extensibility through a combination of layering, modular design and open APIs
  - Reduced OPEX by automation and CAPEX by utilizing cloud resources
  - Reduced service creation and deployment time
Questions