



## CONVERGENCE of FIXED and MOBILE BROADBAND ACCESS/AGGREGATION NETWORKS

### At A Glance: COMBO

**CONvergence of fixed and Mobile  
BRoadband access/aggregation  
networks**



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*Today, standardization work and bodies dealing with fixed and mobile networks are still separated, and Fixed-Mobile Convergence (FMC) is mainly implemented at service level, allowing a converged service control layer. In contrast, COMBO will allow the convergence of fixed and mobile networks themselves, combining both an optimal and seamless quality of experience for the end user together with an optimised network infrastructure ensuring increased performance, reduced cost and reduced energy.*

### Main Objectives

To achieve this target, COMBO will propose and investigate new integrated approaches for Fixed-Mobile Converged broadband access / aggregation networks for different scenarios. COMBO architectures will be based on joint optimization of fixed and mobile access / aggregation networks around the innovative concept of Next Generation Point of Presence (NG-POP). This will lead to a better distribution of all essential functions, equipment and infrastructures of convergent networks.

The key objectives of COMBO will be to:

- Define optimised FMC network architectures, which will be quantitatively assessed and compared with respect to Key Performance Indicators such as cost, energy consumption, bitrate, delay, QoS;
- Assess multi-operator FMC scenarios to ensure openness and flexibility for network operators and service providers;
- Demonstrate experimentally FMC network features in lab and field tests to show the feasibility of proposed architectures;
- Drive standardization bodies with respect to FMC architectures to boost COMBO concepts in coming standards and to foster large scale implementation of FMC networks.

***COMBO, a unified  
access and  
aggregation  
architecture  
leading to Fixed-  
Mobile  
Convergence!***

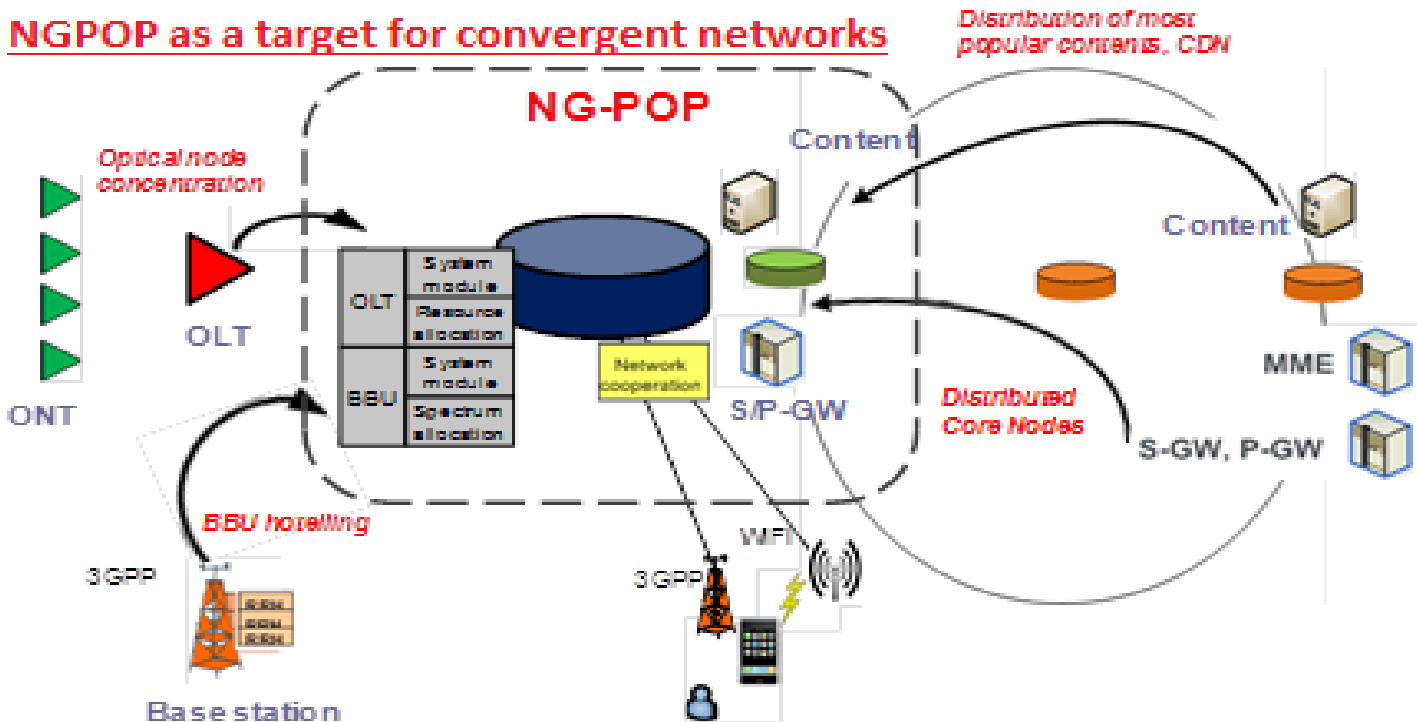
## Technical Approach

Besides management, the project is divided into the following workpackages:

**WP2 Framework definition, Architecture and Evolution:** provides the general framework and use cases for fixed and mobile networks and assess current evolution trends and traffic demands. Identifies the requirements and Key Performance Indicators (KPI) that will have to be considered during the FMC network architectures design.

- Deal with rapidly increasing traffic and changing applications
- Adapt Network structure according to the different requirements of fixed and mobile networks
- Identify where to place Intelligence in the network
- Enable multi-operator/multi-vendor environment
- Seamless performance monitoring and

## NGPOP as a target for convergent networks



**WP3 Fixed Mobile Convergent architectures:** proposes, defines and assesses candidate architectures for future FMC networks. It compares in detail the candidate FMC architectures

**WP4 Traffic and performance management** defines the measurable QoS parameters that reflect the FMC network optimization criteria. It also develops a system for optimised network management based on performance monitoring and performance management tools.

**WP5 Techno-economic Assessment** quantitatively assesses proposed FMC network architectures based on cost and energy consumption calculations. It also assesses the impact of network convergence on business ecosystems.

**WP6 Functional Development & Experimental Research Activities** demonstrates experimentally varying levels of network convergence identified within the project.

**WP7 Dissemination and Standardization** coordinates and performs project results dissemination and exploitation, with a particular focus on standardization and discussion fora.

### Key Issues

- Save costs including CAPEX and OPEX

management in shared networks

- Reduce Energy consumption

### Expected Impact

- Strengthened positioning of European industry in the different fields of fixed mobile convergence: the COMBO consortium gathers major vendors, operators and SMEs in the field which all have the ambition to develop products and issue standards based on COMBO achievements.

- Increased economic and energy efficiency of access/transport infrastructures: this key impact will be reached as COMBO takes into account technical, economical and energy consumption analysis to optimise both capacity and consumption of FMC architectures.

- Contributions to standards and regulation as well as the related IPRs: COMBO partners are already active and will exploit the generated IPR by contributing to FSAN, ITU, IEEE 802.3, 3GPP, ETSI.

- Industry adoption of spectral-efficient broadband wireless systems, novel Internet architectures and technologies: COMBO will redefine fixed and mobile architectures and provide the industry with networking solutions to deploy spectral-efficient broadband wireless systems.