Fibre Optic Networks for Distributed, Extendible Heterogeneous Radio Architectures and Service Provisioning

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Futon

Creating a new hybrid radio-fibre paradigm

Flexible architecture supported by a transparent fibre infrastructure for **heterogeneous wireless systems**, based on the **joint processing** of the radio signals from distinct remote antenna units.

Intra-system optimization, cross layer optimization and efficient management of heterogeneous wireless systems are enabled.

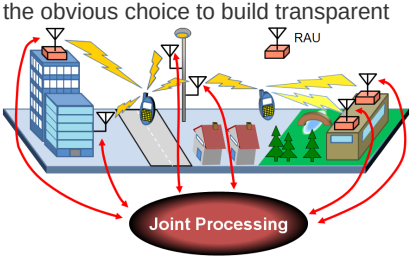
What are the main goals?

Specify and design a **hybrid optical-radio system** enabling the **high bit rates** envisioned for 4G.

Exploit the potentialities offered by the infrastructure to develop mechanisms for **inter-system coordination** and optimum usage of the radio resources.

Motivation and drivers

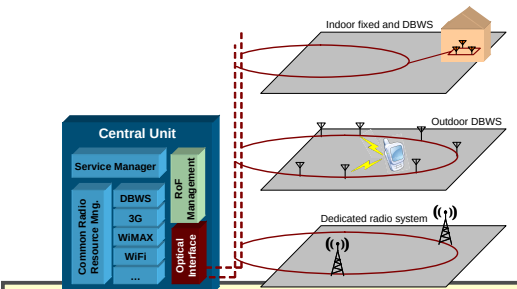
- High bit rates (~1 Gbit/s) require the exploitation of wireless scattering properties
- Mobiles communicating with several antennas with perfect cooperation between them
- **Optical fibre** is the obvious choice to build transparent links due to its low attenuation and large bandwidth



Joint processing of spatially separated radio signals solves both **wireless system capacity** and **point to point capacity** problems

Innovative concept and architecture

- FUTON architecture comprises **serving areas**, where remote access units (RAUs) are located
- RAUs are linked to a central unit (CU), using **a transparent RoF** system and send/receive signals from different wireless systems
- All processing tasks are performed at the CU, and the joint processing of radio signals to/from different RAUs enable the development of **virtual MIMO** links



Heterogeneous wireless systems connected together through a **transparent fibre optic** infrastructure

The FUTON concept will bring new business models, fostering competition and the entrance of new players on the telecommunications market, thus addressing the goal of an open and competitive digital economy

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