Distributed computing, storage and radio resource allocation over cooperative femtocells

Concertation meeting
Overall objectives of TROPIC

To exploit the convergence of pervasive femto-network infrastructure and cloud computing paradigms for virtualisation/distribution of applications and services by...

... investigating and developing appropriate technologies for self-organising small cell deployments

... evaluating the advantages in terms of spectral/energy efficiency and service effectiveness
Why do we need the project?

- A massive deployment of small cells is expected based on IMT-Adv technologies
  - Self-organised management for advanced transmission schemes are needed, encompassing macro/femto interference management; QoS; backhaul usage; business model; operation & maintenance...
  - New energy efficiency tradeoffs.

The use of HeNB in a two-tier computation/communication scenario can result in profitable business case study to users, operators and manufacturers.
- Cloud applications could be burst out to the network of HeNB if these had enough computational/storage resources.

- Coordinated and uncoordinated management of radio/computation/storage resources in presence of MBS is needed.
TROPIC approach

Devise joint resource allocation and virtualisation techniques for a heterogeneous network with elements featuring enhanced computational resources

1. Proof of system enhancement with theoretic and simulated results (all WP)
2. Proof of concept on a new platform (WP6)
3. Generation of business model (WP7)
4. Contributions to 3GPP and ITU (WP7)
5. Generating IPR on key techniques (WP7)
6. Dissemination: conferences, journals and workshop organization (WP7)

1. Radio communication design
2. Computing resources management
3. System integration
4. Demonstration platform

Technical approach

WP3
Channel-aware cooperative comm.
HeNB network coordination

WP4
Virtualization of HeNB
HeNB cluster management

WP5
System level aspects
Management of cloud services

WP6
Full system emulator
Proof of concept

Assessment of project success
Exploitation of results

- Transfer of 'know-how' and IPR generation
- Add-on feature in systems and prototyping
- Business model
- Standardisation and forum participation
Expected benefits of the TROPIC results are...

- Better user quality of service in cloud applications
- Improve energy efficiency in mobile terminals
- Enhanced wireless network capacity
- More profitable business case for operators (based on new cloud-based services, reduced churn rate, reduced deployment costs,...)