EU FP7 STREP SOCRATES

Self-Optimisation and self-ConfiguRATion in WirelEss networkS

Cell Outage Compensation

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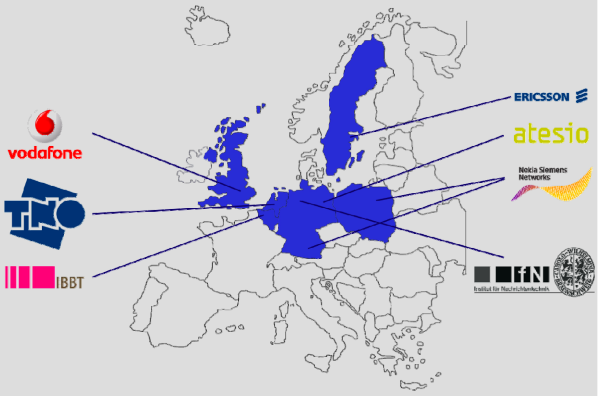


Goals and Approach

Goal: Automatically reduce coverage hole originated from cell outage by temporarily allowing lower service quality as controlled by the operator policy

Approach: Increase coverage of neighbouring cells to the extend possible given by the quality constraint expressed in the operator policy. Main achievements:

- Operator policy which specifies the tradeoff between coverage and user throughput
- Identification of parameters controlling the cell coverage
- Algorithms that automatically tune control parameters according to operator policy

Simulator / Demonstrator Setup

- Static snapshot simulator
- Propagation: Okumura-Hata (urban), 8 dB standard deviation shadowing map
- 3D antenna pattern (3GPP)
- Data traffic characterized by requested data rate in downlink and uplink
- Dimensioning targets based on coverage, downlink and uplink 10th percentile user throughput
- Network layout: capacity driven layout (500 m inter-site distance), coverage driven layout (2200 m inter-site distance)
- High load (47 UE/cell), medium load (23 UE/cell), low load (1 UE/cell)

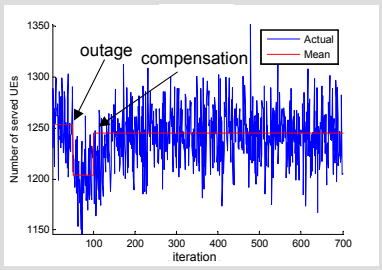
Results

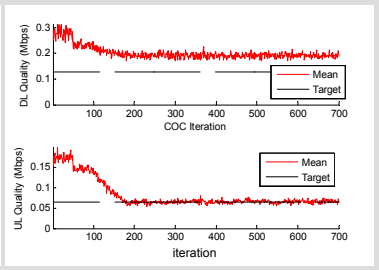
Controllability study:

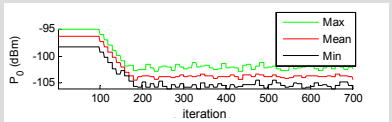
- Uplink is typically the bottleneck
- Parameters related to uplink coverage have most impact on compensation, e.g., uplink target received power P_0 and antenna tilt

Compensation algorithms:

- Increase number of served users
- Ensures that user throughput satisfies operator requirements (policy)







Demonstrator – What is shown