

Cell Outage Management in LTE Networks

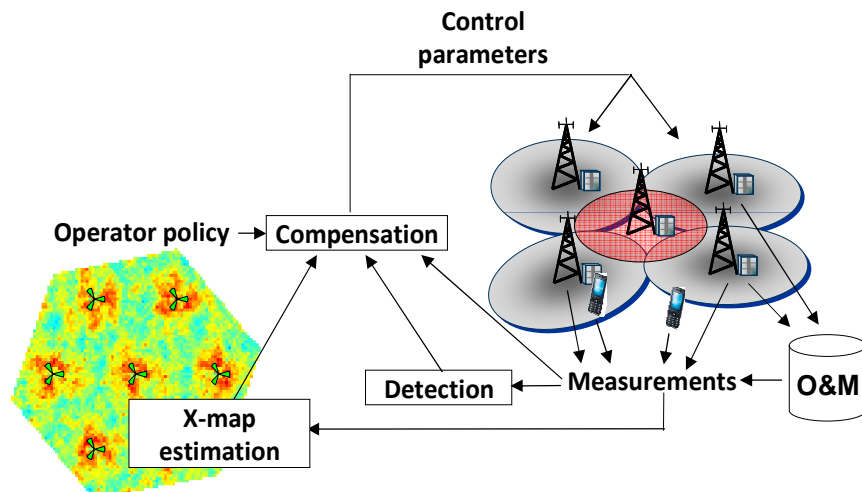
M. Amirijoo¹, L. Jorguseski², T. Kürner³, R. Litjens², M. Neuland³, L. C. Schmelz⁴, U. Türke⁵

¹ Ericsson, Linköping, Sweden, ² TNO ICT, Delft, The Netherlands, ³ TU Braunschweig, Braunschweig, Germany,

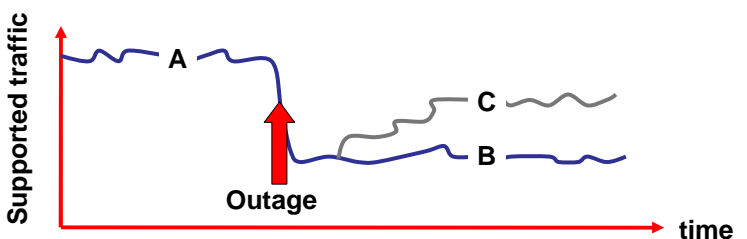
⁴ Nokia Siemens Networks, Munich, Germany, ⁵ Atesio, Berlin, Germany

mehdi.amirijoo@ericsson.com, ljupco.jorguseski@tno.nl, t.kuerner@tu-bs.de, remco.litjens@tno.nl, m.neuland@tu-bs.de, lars.schmelz@nsn.com, tuerke@atesio.d

A promising approach for reducing *manual* network management is to introduce self-organisation functionalities. The goal of cell outage management is to *automatically* minimise the network performance degradation when a cell is in outage through quick detection and compensation measures.



Compensation algorithms alter control parameters, e.g. cell transmit power. The tradeoff between capacity and coverage offered to the outage area and degradation experienced in the surrounding cells is specified by the operator policy.



Three system states are defined in the envisaged evaluation methodology. State A, denotes the pre-outage situation, state B and C are the post-outage situation without and with compensation, respectively. Solutions are evaluated with, e.g., varying base station density, traffic load, service types, and outage location.

Various measurements from the UEs, base stations, and operation and maintenance (O&M) are used to detect an outage. Measurements may include, e.g., cell load, radio link failure rate, and reference signal received power (RSRP).

X-map estimation is used to observe the impact of the compensation actions. An x-map is a geographic map with overlay performance information, e.g., path loss, which is achieved by using UE reports together with localisation information.

Steps involved in development:

- Controllability and observability
- Design of compensation algorithms
- Deployment assessment

Currently step 1 is being finalized.

The presented work was carried out within the FP7 SOCRATES project.

