Self Organising Network (SON) in Telecommunication Networks

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Have you ever tried to manage 30,000 elements with hundreds of parameters each by hand?
... an impossible task!
... so what is the alternative?
Self Organising
Overview: Next Generation chance: Self Organising Networks?

- Our vision
- The drivers for SON
- What SON is all about
- Examples for SON features
- SON from an Operator Point of View
- The SON Roadmap
- Summary
Analysing cost drivers in site life cycle ...

High cost & effort for
- Installation & commissioning
  - Highly manual work
- Operations
  - Repetitive
  - Highly manual work
- Planning
  - Partially automated
- Optimisation
  - Partially automated
Analysing cost drivers in site life cycle ...

Self Organising

Potential savings

I&C

Operations
The holistic approach of SON

Deployment

Planning

Operations

Optimisation

Self Organising Networks
## The Top 10 SON use cases

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>Plug &amp; Play Installation</strong></td>
<td><strong>Focal point</strong></td>
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<tr>
<td><strong>2</strong></td>
<td><strong>ANR (Automatic Neighbour Relationship Configuration)</strong></td>
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<td><strong>3</strong></td>
<td><strong>OSS Integration</strong> <em>(Full standardised northbound Configuration-, Alarm- and Performance-Management)</em></td>
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<td><strong>QoS optimisation</strong></td>
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SON concepts & standardisation available

- SON is an important topic in standardisation activities
- 32 SON use cases defined in NGMN
- 21 operators and vendors pushing SON forward (over 100 engineers)
- 9 working groups established dealing with SON related topics
- Resulting concepts and standardisation in
  TOP Operational Efficiency Recommendations
  published on NGMN webpage:
  http://www.ngmn.org/nc/downloads/techdownloads.html
- SON in EU funded projects E³ and SOCRATES
Example for SON features coming soon:

The fully automated Plug&Play Installation Process

<table>
<thead>
<tr>
<th>Conventional installation Process</th>
<th>fully automated Plug&amp;Play Installation</th>
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<tbody>
<tr>
<td>▪ 2-3 qualified technician on site</td>
<td>▪ 1 person on site</td>
</tr>
<tr>
<td>▪ Hook up to NodeB via Laptop</td>
<td>▪ NodeB is self-configured &amp; self tested</td>
</tr>
<tr>
<td>▪ Implement configuration files</td>
<td>▪ Green light indicates node is on air</td>
</tr>
<tr>
<td>▪ Communication between Installer and Operator at OMC Parameter adjustments, testing</td>
<td>▪ Total duration ca. 20 min</td>
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<tr>
<td>▪ Total duration ca. 2 h</td>
<td></td>
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Vision: As simple as installing a WLAN Router
Plug’n Play Proof of Concept is given

Prepare

Connect

Configure

Activate

Parameters: X1 X2 ...

Create Configuration File & transfer it into OMC

Get in contact with OMC

Get software & configuration

eNB is in operational mode & under control via OMC

OMC*

Planning Tool

Automatic

Secure Transport Net

Automatic IP allocation & Certificate handling

Automatic

SW Check & Download

Self Test

*OMC: Operation & Maintenance Center

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Example for SON features coming soon:

Automatic Neighbourhood Relations (ANR)

- No planning of neighbourhood relations at all
- All this in real time

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eNB1 to eNB2 via X2 interface

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ANR successfully tested in trial networks

HO performance without NR pre-planning

without ANR
- NR configured manually
- typical number of HO
- typical number of call drops
- manually optimised network

with ANR
- Results in two trials with two different infrastructures
  - No change of typical HO number
  - Quality on same level as with planned configuration
  - ANR works on the fly: neighbour is identified, configured and HO can takes place in nearly real time
  - ANR is reactive on network changes

With ANR: high quality can be achieved without spending effort for planning & optimization
SON realization needs balance

Operator To Do’s:
- push creation of SON concepts and its standardization
- agree in contracts with vendors on SON realization
- balance out implementation and operator’s specifics in “Proof of Concept” (PoC)
- earn the benefits and savings in production
SON is coming

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(Status in October 2010)
SON is real!

• SON is crucial for the whole mobile industry (operators & vendors)
✓ SON is real!! First features of SON expected soon:
  ▪ proof of concept done in field and lab tests
  ▪ availability in live networks in 2010
  ▪ improvements and further SON features to follow soon

• We have to live the SON idea to make it happen
• We are at the beginning of the road – keep on pushing
Thank you for your attention.