Self-Organizing Networks

02.04.2014

Ole Grøndalen, Telenor Research, Next Generation Network Technology

IoT Conference

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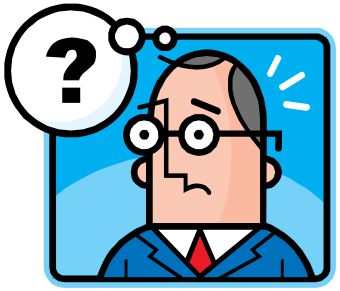
Presentation outline



Why do we need Self-Organizing Networks (SON)?

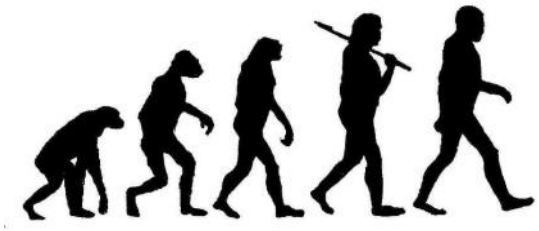
What is SON?

SON is a collection of automatization functions for realizing Self-X goals:

- Self-Configuration
- Self-Optimization
- Self-Diagnostization and Self-Healing
- Self-Planning
- Self-Coordination
- Self- ...

What are the benefits?

Some challenges for SON



How will SON develop?

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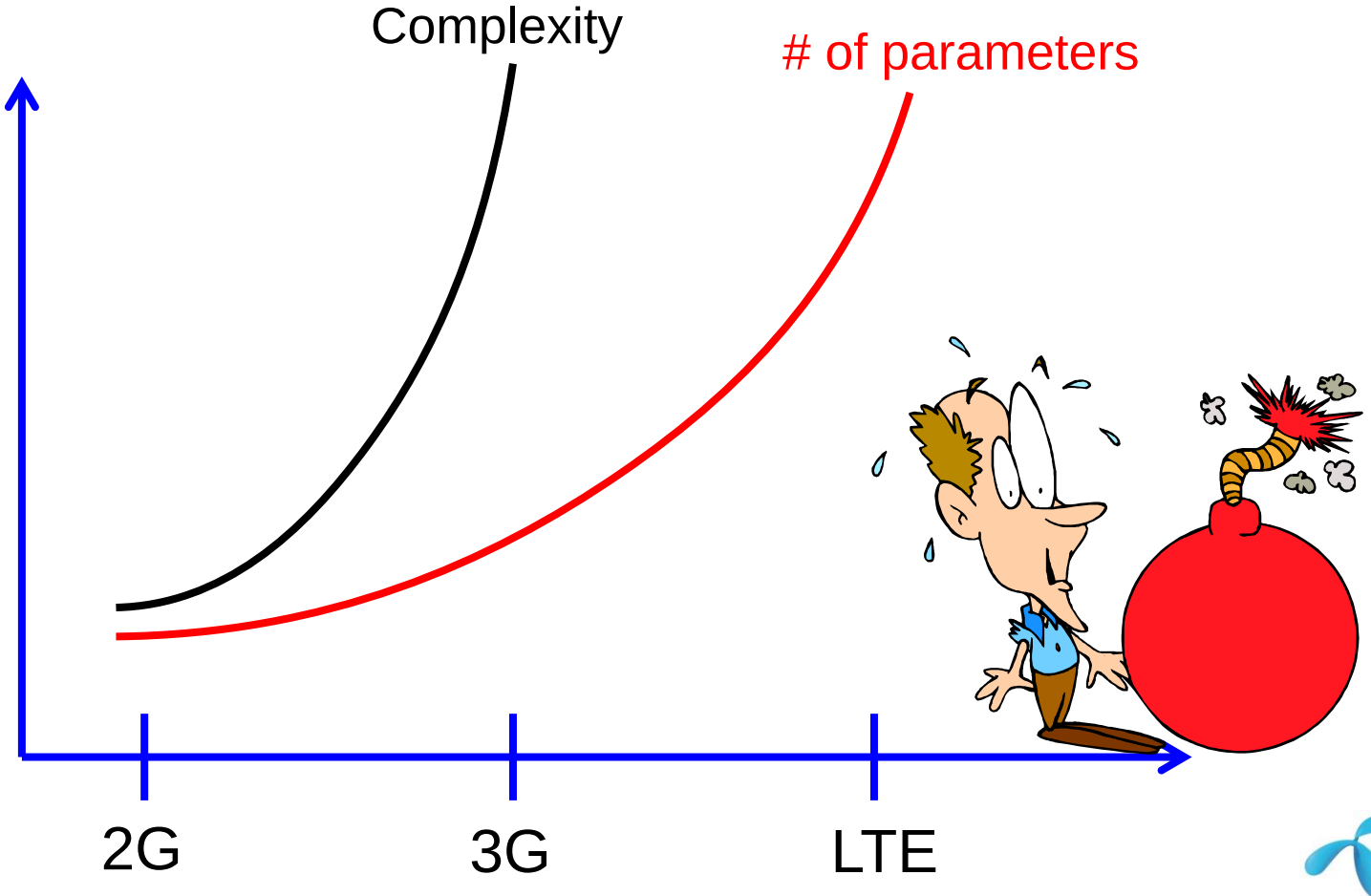
The number of parameters increases



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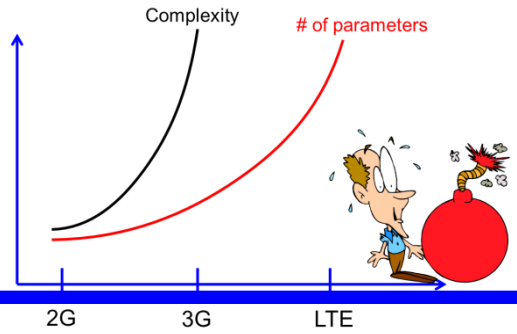
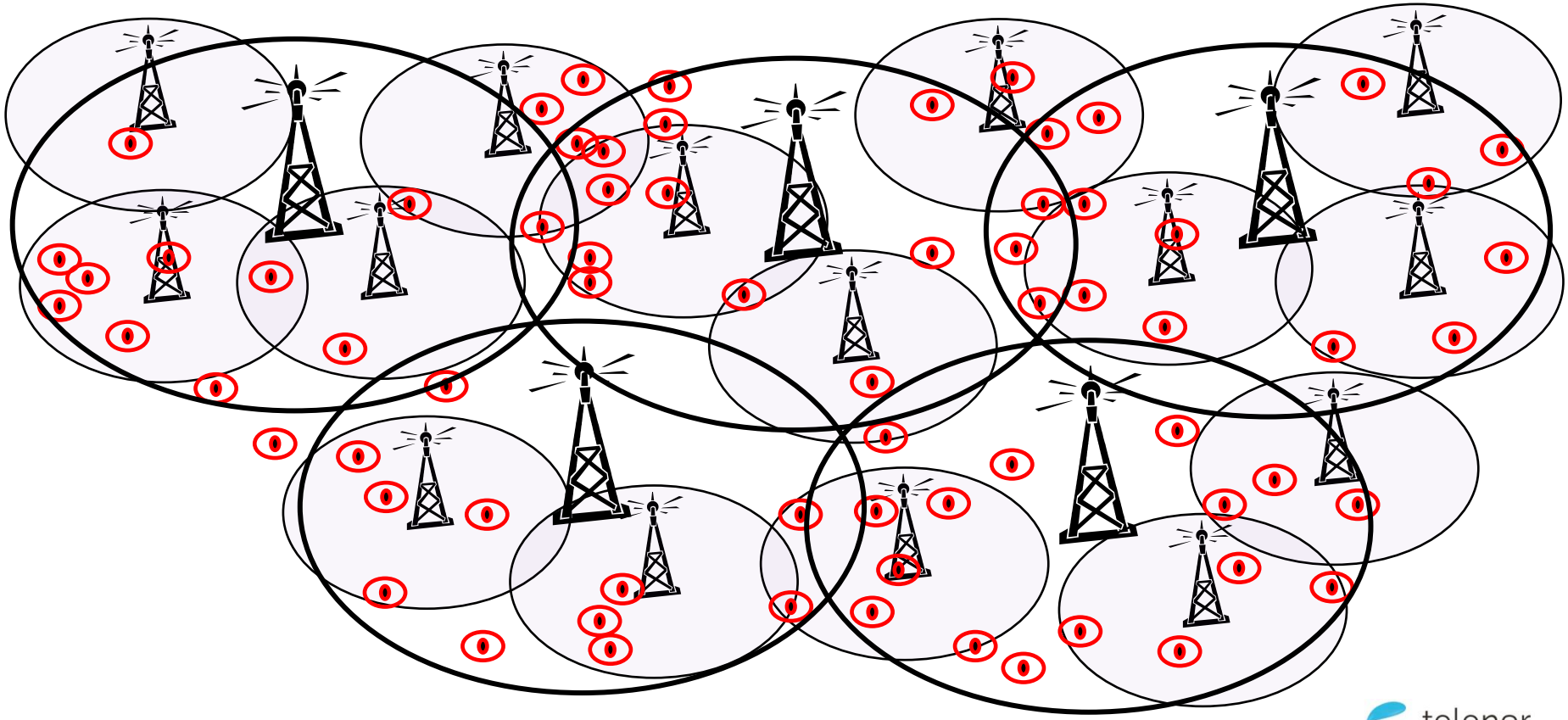


Future: Large number of femtocells



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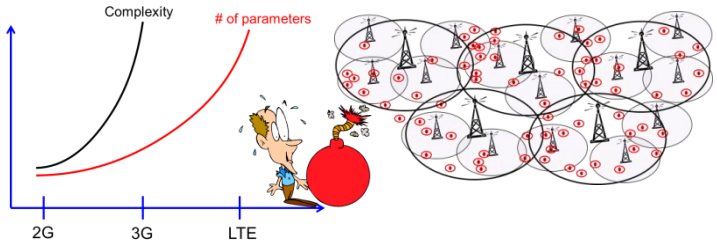
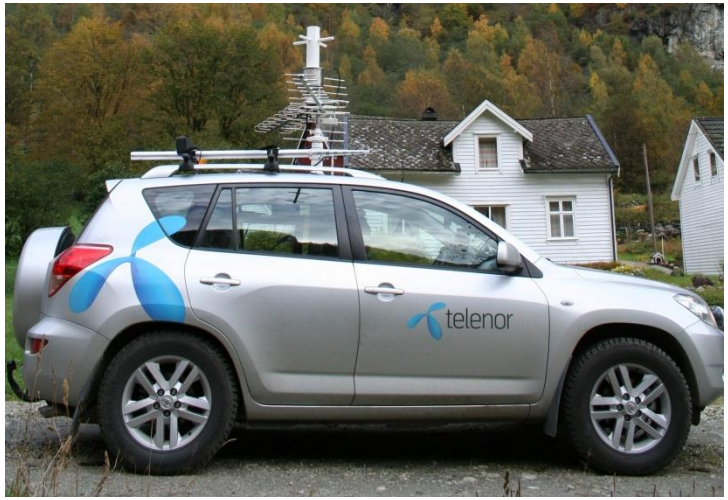


Network optimization today



Time consuming measurements

Manual setting of parameter values

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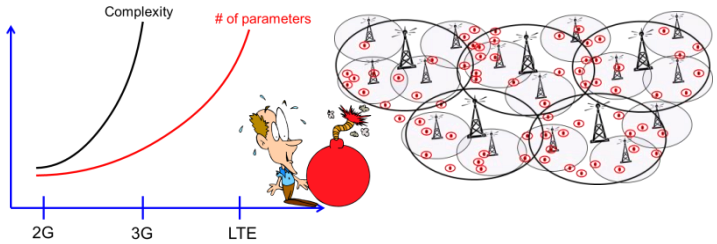

Failure discovery and repair today

Networks problems are often discovered by the customers

Network performance is low until the problem is fixed

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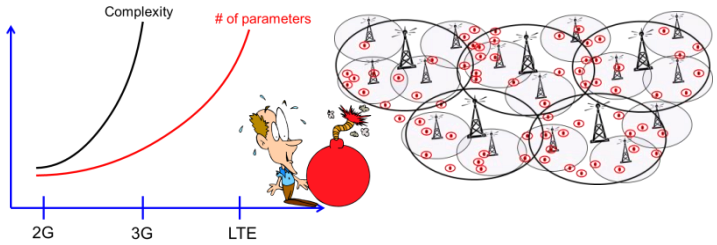

SON is a collection of automatization functions for realizing Self-X goals:

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- Self-Planning
- Self-Coordination

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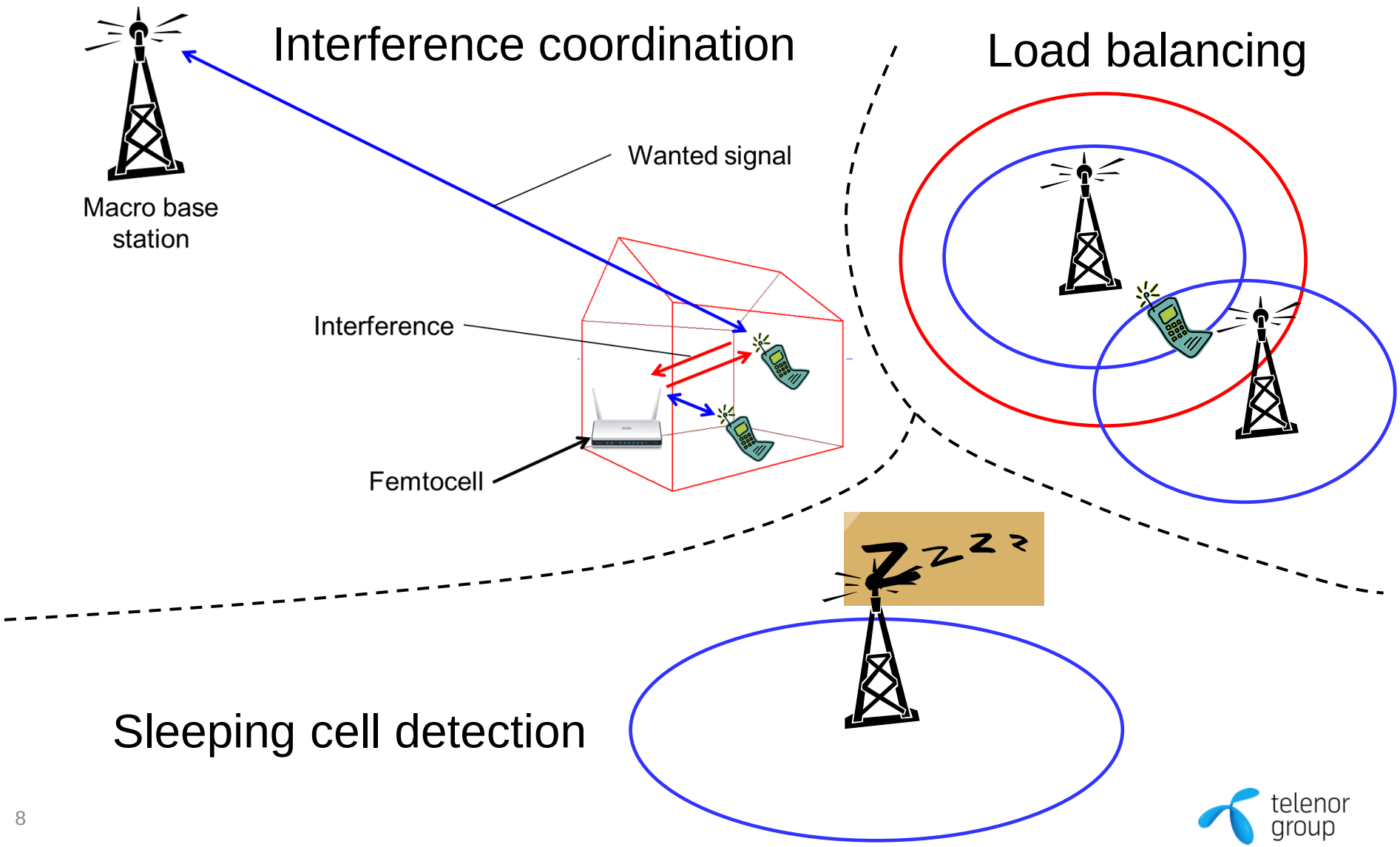
Examples of SON functions



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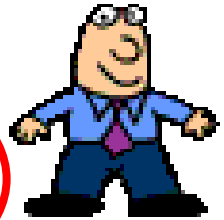
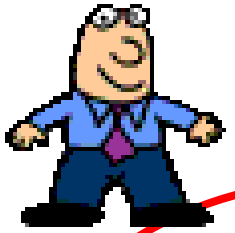
Benefits

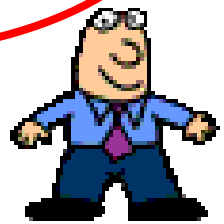


For the users:
Improved user experience

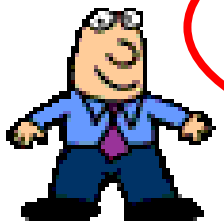


For operators:
Easy installation
Reduced OPEX
Reduced CAPEX
Better performance

For vendors:
Differentiates vendors
Enables small cells



For the society:
Saves energy
Better use of the frequency resources



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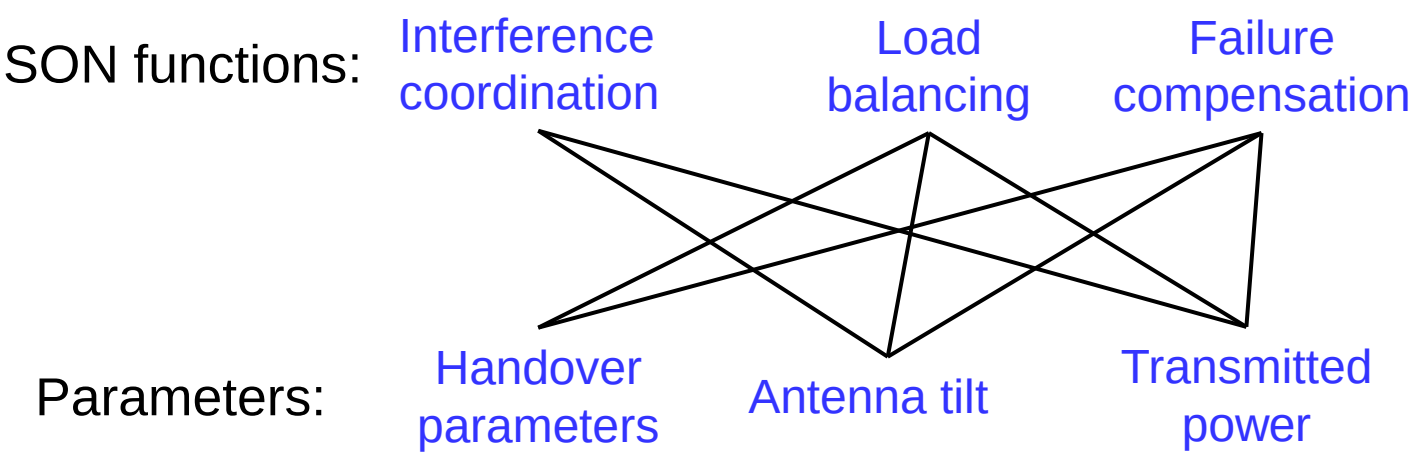
Challenges for SON (1)

- Different SON functions try to adjust the same parameters, possibly with partly conflicting goals
  - May lead to network instabilities
  - Challenging to set criterions for individual SON functions so that global network optimization is achieved
  - The problem can increase with time as more SON functions are added



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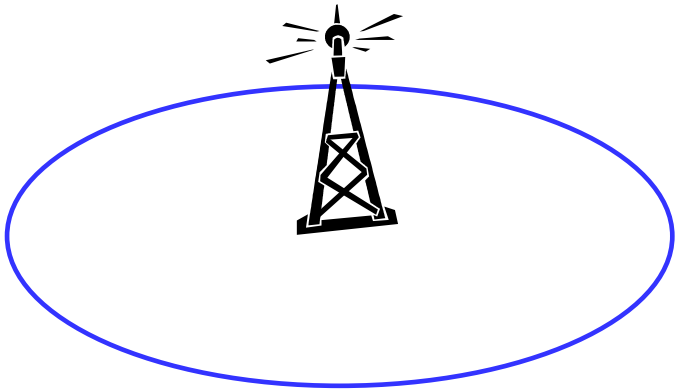
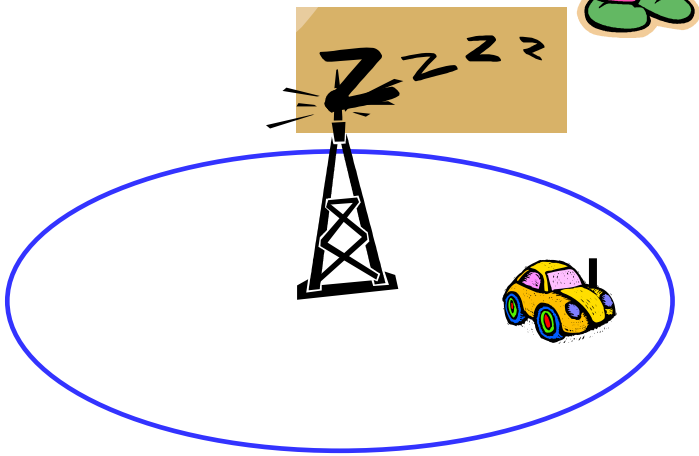
Challenges for SON (2)

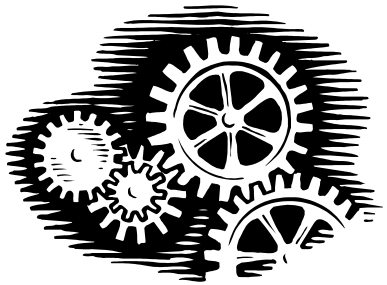
- Ambiguities in interpretation of observations may lead to actions that cause reduced network performance or even network instabilities (wrong diagnosis => wrong cure)





Sleeping cell or no users?

- The complexity associated with understanding how the different SON functions interact and how the different policies should be set, can become challenging.
  - Somewhat contrary to the goal of minimizing and simplifying manual intervention



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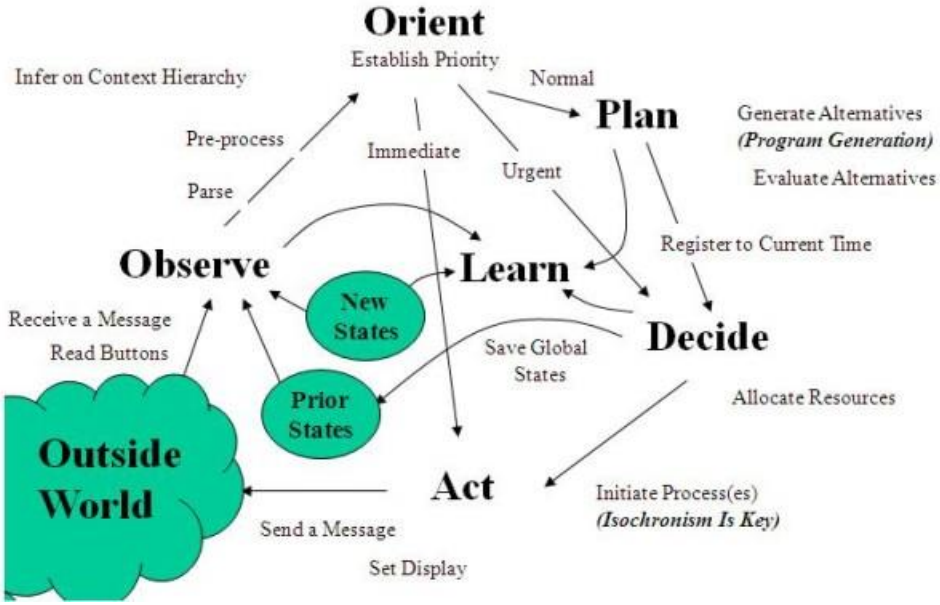
SON has an exciting future



With SON, the network and network elements will be:

- Self-aware
- Gather accurate information about the environment
- Learn from experience
- Be able to adapt the behavior accordingly

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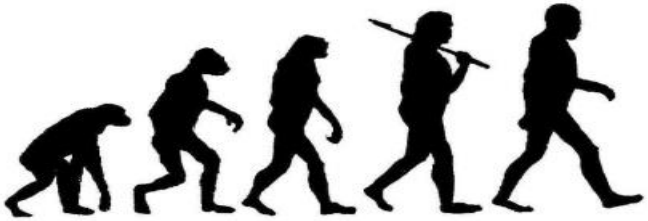
Some predictions on future SON



- SON will be used in all parts of the network, not just in the access
- Terminals will play a more central and more autonomous role
- Terminals will be handled on a more individual basis, taking into account parameters like:
  - State of movement (speed, direction, etc.)
  - Services running
  - User preferences and subscription type
- SON functions will be more distributed and local
  - For better responsiveness, scalability and robustness
  - Better match to tomorrow's heterogeneous networks

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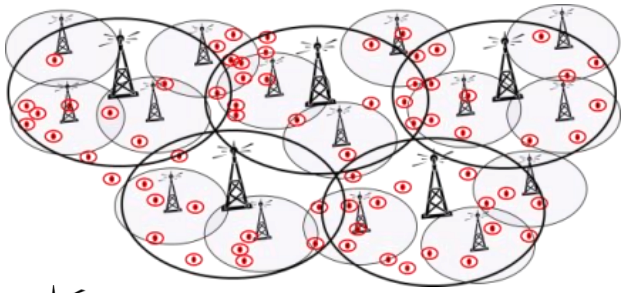
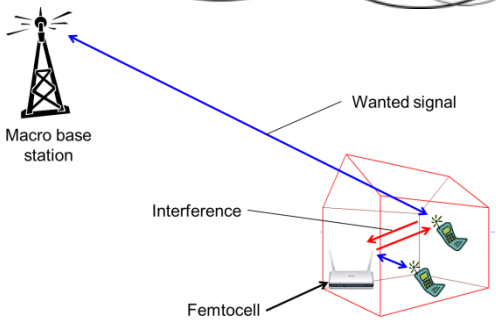
SON is needed for cost control and handling increased complexity

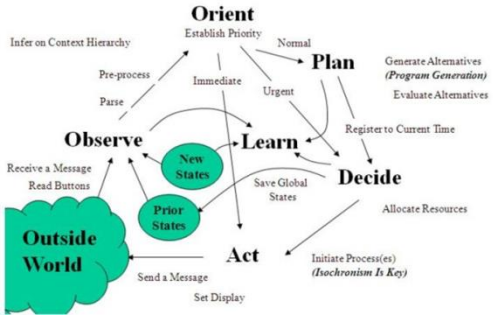
The complexity of future networks will increase



SON is already used for handling complexity



SON has an exiting future



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Thank you for your attention!

Ole Grøndalen (ole.grondalen@telenor.com)

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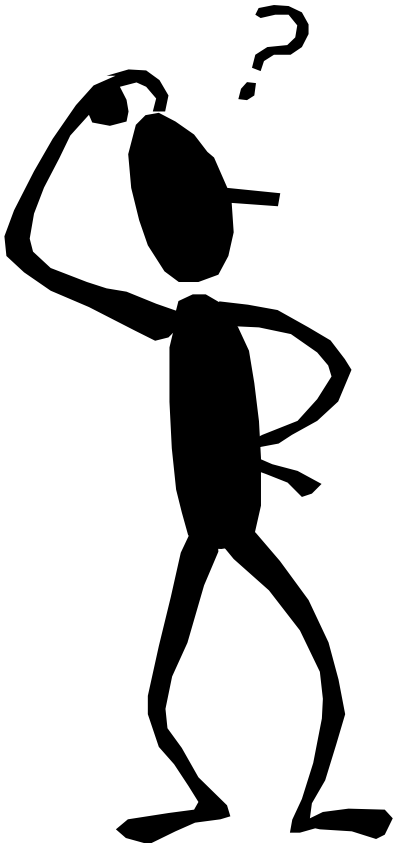
Questions



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