



ERICSSON

SCOPE FOR NB-IOT IN REL-16



OUTLOOK

- › NB-IoT was during Release 13/14 designed as a lean and ultra-low complexity mMTC access technology.
- › Release 15 introduces support e.g. for TDD operation, early data transmission and a wake-up signal.
- › The number of connected devices is expected to grow rapidly in the coming years.
- › Our vision
 - Make NB-IoT network more efficient, further improve UE performance, support new use cases, ...
 - Continue to follow NB-IoT design principles while improving areas where improvements are needed.



OVERVIEW



- › Enhanced network management tools
- › Further improved spectral efficiency
- › Improved UE performance in coverage extension
- › Mobility enhancement
- › Support of new use cases

ENHANCED NETWORK MANAGEMENT TOOLS



- › Congestion/overload control in RRC connected mode [RAN2 lead]
 - Network control of UE behavior in RRC connected mode extended to include prevention of mobile originating signaling and/or data traffic
- › Proactive load distribution over time [RAN2 lead]
 - Introduce tool(s) for implicit load distribution over time to manage traffic spikes
 - › No additional/explicit signalling should be required
 - Introduce a mechanism for preventing CE level ramping due to access overload
- › SON/ANR functionality to improve network robustness [RAN2 lead, RAN3]
 - Specify the following SON enablers based on existing LTE features:
 - › Reporting of Cell Global Identity and strongest cell(s)
 - Enabler for Automatic Neighbor Relations (ANR) and important for avoiding and resolving PCI conflicts
 - › Random access performance and radio link failure (RLF) reporting
 - Improves observability and control of random access performance and coverage

FURTHER IMPROVED SPECTRAL EFFICIENCY



- › Introduce mechanism to allow DL channel quality feedback from UEs [RAN1 lead, RAN2, RAN4]
 - Early, periodic and event based DL channel quality feedback supports improved link adaptation for various traffic scenarios

- › Improved UL power control [RAN1 lead, RAN2, RAN4]
 - Introduce periodic and event based PHR report in connected mode
 - Introduce closed loop UL power control in connected mode

- › Improved cross-carrier scheduling [RAN1 lead, RAN2]
 - Specify DCI support for cross-carrier scheduling

IMPROVED UE PERFORMANCE IN COVERAGE EXTENSION



- › Specify support for four NRS antenna ports [RAN1 lead, RAN2, RAN4]
 - Define 4 NRS ports with 4-Tx antenna diversity

MOBILITY ENHANCEMENT



› Idle-mode inter-RAT mobility [RAN2 lead]

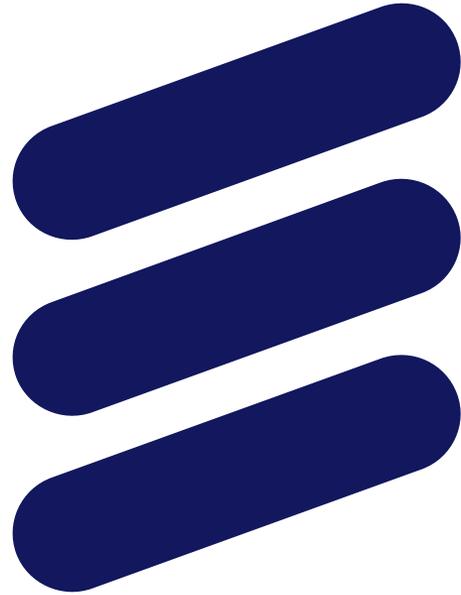
- Many devices support multiple RATs
- Specify the most basic level of support for idle-mode inter-RAT mobility

SUPPORT OF NEW USE CASES



› Public warning system [RAN2 lead]

- Specify Earthquake and Tsunami Warning System (ETWS) features
- Specify Commercial Mobile Alert System (CMAS) features



ERICSSON