

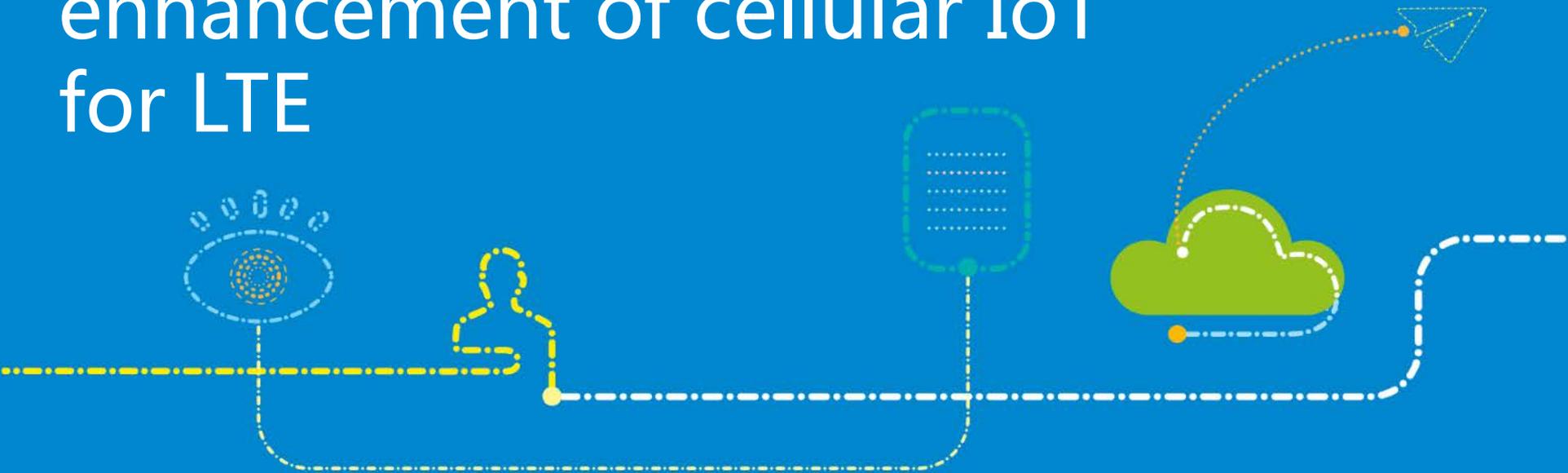
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Agenda item: 10.1.1
Document for: Discussion

Motivation for further enhancement of cellular IoT for LTE



Justification

- In Rel-13, two work items, i.e. eMTC and NB-IoT, were the first industry efforts to address the requirements of cellular internet of things.
- As the number of devices increase drastically, it is important to ensure that large amounts of IoT devices and IoT traffic can be handled efficiently in the networks and that new service requirements can be satisfied:
 - Requirements for device location
 - Requirements for efficient firmware upgrades
 - Requirements to accommodate massive number of IoT devices while maintaining adequate system efficiency



Objectives

- Positioning support
- Multi-cast enhancements
- Multi-carrier enhancements
- Efficiency & Mobility enhancements



Positioning

- Study and specify new reference signal to support positioning for in-band, guard band, and standalone deployment scenarios and for coverage enhancement scenario. [RAN1, RAN4]
- Study and specify enhancements on control plane overhead reduction and UE power consumption reduction. Note UEs in both RRC-connected/idle mode should be considered [RAN2]



Multi-cast enhancements

- Study and specify means to enable both MBSFN and SC-PTM reception in both normal and enhanced coverage [RAN1, RAN2]:
 - Reuse the Rel-13 coverage enhancement techniques as much as possible.
 - Specify new efficient transmission scheme for MBSFN and SC-PTM, if needed.
- Specify means to optimize UE power consumption for both MBSFN and SC-PTM [RAN2]
 - Enhanced MBMS service data scheduling
 - Optimize UE power consumption in monitoring MCCH
- Specify means for reliable support of multicast traffic types, e.g. for software update [RAN1, RAN2]



Multi-carrier enhancements

- Specify enhancements for multiple carriers in a single cell [RAN1, RAN2] :
 - Multiple configured NB-IoT carriers for NPRACH transmission
 - Paging transmissions on non-anchor carrier(s) for load balancing
 - Cross carrier dynamic scheduling for unicast transmissions
- Specify enhancements for multiple cells configured with multiple carriers [RAN1, RAN2] :
 - Optimization of load balancing solutions for NB-IoT devices in RRC-IDLE/connected



Efficiency & Mobility enhancements

- Specify enhancement for RACH process to improve the efficiency of small packet transmission [RAN1, RAN2]
- Evaluate the synchronization performance of mobility scenarios, e.g. the accuracy of TA. Based on the evaluation results, specify necessary enhancement [RAN1]
- Specify means to achieve data transmission continuity for the low/medium speed NB-IOT devices [RAN2].



Thank you



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