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Document for: Discussion

Views on ambient IoT for Rel-19

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Background

Rel-18 RAN SID: Study on Ambient IoT in RAN

- SID (RP-222685) was approved at the RAN#97-e meeting.
- As outcome of the SI, in TR 38.848,
  - » Representative use cases are defined including Indoor/outdoor inventory/sensors/positioning/command.
  - » Connectivity topologies are defined including bidirectional direct communication between A-IoT and BS, communication between A-IoT and BS with intermediate/assisting node, bidirectional direct communication between A-IoT and UE.
  - » Device types are defined according to energy storage capacity and capability of generating RF signals for transmission.
  - » RAN design targets are defined regarding power consumption, complexity, coverage, data rate, etc.

Proposals for target scenario

- **SI-only or SI+WI**
  - SI only for Ambient IoT in Rel-19, if included in Rel-19 package.
    - » Huge workload is expected to study new Tx/Rx architecture/procedure, similar to Rel-18 study on LP-WUS/WUR
  - A-IoT is not urgent compared to other urgent WIs.
- **Target deployment scenario and device type**
  - All of Device type A, B and C should be studied.
    - » Especially for Device A and B, topology 2 and/or 3 should be considered from coverage perspective.
  - **Proposal**: SI-only for Device C with topology 1 and Device A/B with topology 2/3
- **FR1 FDD/TDD**
  - TDD may requires additional impacts.
  - **Proposal**: Study FDD-only.
- **In-band, in guard band or SA**
  - **Proposal**:
    - » At least in-band operation should be included.
    - » Open to study all applicable scenarios, e.g., in-band for topology 2/3.

Proposals for objectives

- **From the potential objectives captured in RP-232745, at least the following should be the scope of SI in Rel-19.**

- Evaluations and remaining feasibility assessments
  - Device architecture and characteristics
  - Evaluation methodology and assumptions
  - Design target evaluations
  - Coexistence evaluations
- Physical layer study on:
  - Waveform and multiple access
  - Frame structure and numerology
  - Modulation and channel coding
  - Physical layer signals/channels
  - Physical layer procedures
- Higher layers study on:
  - Simplification of protocol stack and signaling procedure for each of Device Types
    - Control plane functionalities, including CN connectivity and mobility
    - User plane functionalities
    - Security aspects (*Note: This does not necessarily mean security has RAN impact)
- RAN3 aspects for study:
  - Enabling necessary CN-RAN signalling
  - RAN architecture aspects, if any
- RAN4 aspects for study:
  - Feasibility study of BS/UE/device architectures
  - Link budget study
  - Coexistence analysis
  - RRM
  - RF

- Note: SID revision can be done for more detailed scope in later timing depending on the discussion progress.

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