3GPP TSG RAN Meeting #101
Bangalore, India, September 11-15, 2023

RP-232118

Views on Ambient-IoT

Agenda Item: 9.2.2
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Overview

- Our views on the following topics are provided
  - Potential prioritization in the follow-up SI/WI
    - Topologies
    - Device types
    - Spectrum

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Potential (de)prioritization in the follow-up SI/WI

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- So many use cases, topologies, device types etc still remain after the RAN level study
- This situation leads to market fragmentation, which is not good for 3GPP ecosystem

→ For the smooth discussion in the follow-up SI/WI scoping, we provide our priorities for Amb-IoT use cases, scenarios, topologies and device types

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Areas for (de)prioritization - Topologies

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Agreement in RAN#99:

- Topology (1): BS <-> Ambient IoT device
  - NOTE 1: Includes the possibility of BS Rx and BS Tx in different BSs
- Topology (2): BS <-> intermediate node <-> Ambient IoT device
  - NOTE 1: Intermediate node can be relay, IAB, UE, repeater, etc. which is capable of ambient IoT
- Topology (3): BS <-> assisting node <-> Ambient IoT device <-> BS
  - NOTE 1: Assisting node can be relay, IAB, UE, repeater, etc. which is capable of ambient IoT
  - FFS: If the two BS can be different
- Topology (4): UE <-> Ambient IoT device

- The benefit of 3GPP-based Amb-IoT is **<u>the use of existing coverage</u>**, i.e, wider coverage than existing non-3GPP technology
  - Topologies (1) and (2) are aligned with this direction
- On the other hand, the benefit of topologies (3) and (4) is unclear
  - Topology (3) requires additional deployment of assistant node for Ambient-IoT devices
  - The benefit of topology (4) over non-3GPP technology needs to be clarified

<u>Observation 1:</u>
Topologies (3) and (4) can be deprioritized or excluded in the follow-up SI. Thereby, UE based reader scenario (Deployment scenario 3 and 5) can be deprioritized or excluded in the follow-up SI

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Areas for (de)prioritization – Device Type

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Metric	Target for Device A	Target for Device B	Target for Device C
Power consumption	[Device A ≤ 10 μW] or [Device A ≤ 1 μW]	Device A « Device B < Device C or Device A ≤ Device B < Device C	Device C ≤ 1 mW to ≤ 10 mW
Complexity	Device A: Comparable to UHF RFID ISO18000-6C (EPC C1G2)	Device A < Device B < Device C	Device C: Orders-of-magnitude lower than NB-IoT

- Device A and B are useful for the scenario where assistance node (topology (3))or UE based reader (topology (4))is available
- Since neither topology (3) nor (4) has high priority as discussed in the previous slide, there would be no reason to prioritize device A and B
- Supporting all device types can lead to market fragmentation, which is undesirable.

Observation 2:

Device A and B can be deprioritized or excluded in the follow-up SI

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Areas for (de)prioritization - Spectrum

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- What is the benefit and drawback of Ambient-IoT with unlicensed spectrum?
  - Benefit
    - No license fee
    - Nomadic deployment of gNB/intermediate node
    - Global harmonization of spectrum (e.g, 2.4GHz ISM band)
  - Drawback
    - Interference
    - Limitation of UL Tx power (depending on regulation)
    - Potential introduction of coexistence functionalities, e.g, carrier sense (depending on spectrum)
- What is the benefit of 3GPP Ambient-IoT (compared with non-3GPP technology with unlicensed spectrum)?
  - Wide coverage as an operator service
  - Stable service quality by operator's deployment

→It is questioned if 3GPP Ambient-IoT with unlicensed spectrum can still be competitive?

<u>Observation 3:</u>
Unlicensed spectrum can be deprioritized in the follow-up SI/WI

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Our views for follow-up SI/WI

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- Based on the observations so far, we believe clear focus/down-selection can be done, and the following proposal can be made:

Proposal1:
The conclusion of the TR should include the necessity of prioritization of the scenarios, topologies and/or device types and deployment scenario characteristics for the focused discussion in the follow-up SI/WI (if agreed)

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Proposal

- **The conclusion of the TR should include the necessity of prioritization of the scenarios, topologies and/or device types and deployment scenario characteristics for the focused discussion in the follow-up SI/WI (if agreed)**
  - **Topologies (3) and (4) can be deprioritized or excluded in the follow-up SI/WI. Thereby, UE based reader scenario (Deployment scenario 3 and 5) can be deprioritized or excluded in the follow-up SI/WI**
  - **Device A and B can be deprioritized or excluded in the follow-up SI**
  - **Unlicensed spectrum can be deprioritized in the follow-up SI/WI**

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Thank you

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