

3GPP TSG RAN Rel-19 Workshop
Taipei, Jun 15 – 16, 2023



Motivations for Ambient IoT in Rel19

Business Case for Ambient IoT

- Food Traceability Rule, will go into effect in January 2026 ⁽¹⁾ time frame - which will benefit from Ambient IoT defined within 3GPP.
- 2021 Global food market is 11T\$ ⁽²⁾, and the cold supply chain is 242B\$⁽³⁾ - This is a big market.
 - In the United States alone, food waste is estimated at between 30-40 percent of the food supply⁽⁴⁾.
 - This is a significant contribution to global carbon footprint
- Many other use cases from industry, agriculture, health and end-users which were presented (22.840), also wait for the proposed low overall cost and high value of ambient IoT devices.

(1) <https://www.fda.gov/food/food-safety-modernization-act-fsma/fsma-final-rule-requirements-additional-traceability-records-certain-foods>

(2) <https://www.grandviewresearch.com/industry-analysis/food-grocery-retail-market>

(3) <https://www.grandviewresearch.com/industry-analysis/cold-chain-market>

(4) <https://www.usda.gov/foodwaste/faqs>

Technology Advantages for Ambient IoT in 3GPP

- From report 38.848, the ambient IoT devices are expected to transmit with very low power.
- By service definitions (22.840), the ambient IoT devices are expected to be maintenance free.
- Thus potential Ambient IoT devices when using the licensed spectrum will significantly benefit from:
 - Lower and controlled interference in the licensed band
 - Higher transmit power for activating ambient IoT devices
 - Higher security levels
 - Extensive deployments
 - The existing billing infrastructure

Priority of Feature Set

- Scope of the 38.848 report is rather wide, with many features and deployment options
- Focus of the workgroups work is needed in order to achieve reasonable time to market of specification and devices

Topology

- We propose to focus on Topology 4 (UE <-> Ambient IoT device) as a good candidate for first stage devices.
 - It requires the bare minimal deployment and infrastructure changes while maintaining many of the benefits.
 - Many of the use cases can be enabled using this topology.
- The next stage should be Topology 1 (BS <-> Ambient IoT device) enablement.
 - This will require more infrastructure and deployment changes which may be suitable for later releases.

Priority of Feature Set [cont.]

Spectrum

- We propose to focus on the licensed FDD spectrum.
 - Due to the low energy and power consumption and data-rate limitations of ambient IoT devices, the lower bands are more suitable.
 - Licensed band is required to handle interference and also better handle the low power access.

Devices

- We propose to focus on Device type C (active transmitter)
 - Active transmitters require minimal changes to existing deployments and provide best coverage
 - We believe the added costs of type C devices compared to Type A or B (backscatter) are alleviated by the lower infrastructure cost.

Scope within Rel19

- We believe Ambient IoT can not be concluded within a single release
- We support defining SI for RAN1/2/3/4 about Ambient IoT in order to enable this feature
- We support Rel19 including also WI for ambient IoT, on a focused feature set.