

3GPP Rel19

Orange views on Ambient IoT

3GPP Rel19 – Ambient IoT - opportunities for Orange

Current Limitations

Opportunities for operators

RFID-like

- **RFID link budget** is limited
- Requires dedicated **gateways**

- **Complementary to RFID**, e.g. for inventory & trackers (new market for operators)
- **Re-use of existing network** infrastructure (macro & indoor)

Geo-location

- Current **indoor geolocation systems** (e.g. Bluetooth Low Energy) remain costly to deploy

- Lower complexity & **lower cost** indoor geolocation systems (e.g. shopping malls, airports, offices,...)

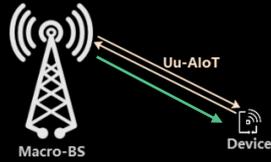
Sensors

- Cost, complexity & energy consumption of **current cellular IoT UEs** may be further reduced for ultra low bit rate services

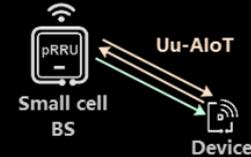
- **Lower cost** IoT devices for outdoor sensors (e.g. temperature sensors)

3GPP Rel19 – Ambient IoT – main target topologies

BS <-> Tag

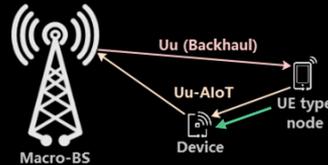


- Macro BS to Tag direct connectivity (**both outdoors**)
- Targeting **sensors** with semi-passive / active devices

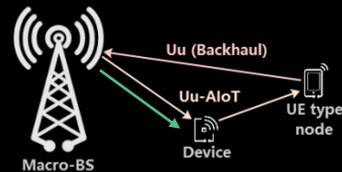


- Small Cell to Tag direct connectivity (**both indoors**)
- Targeting **RFID-like devices (inventory, indoor trackers & sensors)**

Bistatic BS – Tag - UE



- UE -> Tag -> BS or BS -> Tag -> UE connectivity
- **UE as relay** seen as useful to overcome the **limited service coverage** with BS-only



- Targeting **trackers / UE geolocation**



3GPP Rel19 – Ambient IoT – specific operator requirements

Network Authentication

- Authentication **by the network** is critical both for service **authorization** and **monetization**
- **For the tag**, e.g. need for an encrypted authentication code (only known to the operator of the service)
- **For the UE** used as a reader or a relay, to manage rights to use the service

Multi-operator Coexistence

- **Bandwidth of Influence** of backscattering devices may not be contained to a single operator bandwidth
- **Coexistence** between adjacent operators requires further studies, inc. interferences and impact on network capacity

System Capacity

- System capacity may be limited with a high density of Ambient IoT devices
- Mechanisms to **avoid collisions** and **spread the load** in the time domain (e.g. duty cycles, tuneable transmission periodicities, group paging...) should be further studied