**3GPP SA WG2 Meeting #161 S2-240**

**Athens, February 26 – March 1, 2024 (rev of S2-2402260+02566)**

**Source: Ericsson, ZTE?**

**Title: Architecture Assumptions and Requirements: Update to support DO-A**

**Document for: Approval**

**Agenda Item: 19.14**

**Work Item / Release: FS\_AmbientIoT / Rel-19**

*Abstract of the contribution: The contribution discusses and proposes to support DO-A in Architecture Assumptions and Requirements.*

**1. Introduction**

In SA2#160AHE, there were some discussions about the traffic types to be studied. In RAN SID, DT and DO-DTT are high prioritized. In the architecture assumption discussion, DT and DO-DTT are high prioritized as well as listed in clause 4.1 of TR 23.700-13:

*- The following traffic types for Ambient IoT Device are to be studied:*

*- DT: Device-terminated; and*

*- DO-DTT: Device-originated - device-terminated triggered.*

*NOTE 1: The final decision for including DO-A (Device-originated - autonomous) in the study depends on RAN decision.*

However, depending on the use cases, RAN and CN may get different conclusions regarding DO-A and DO-DTT. Taking the inventory command as an example:

* When AF requests CN to perform inventory, CN sends the request to RAN (reader), the RAN reads the device ID and send it back to CN. CN forwards it to AF. It is a typical DO-DTT, regardless from RAN’s perspective or from CN’s perspective.
* When BSS/OSS configures RAN to perform inventory, the RAN reads the device ID and send it to CN. CN forwards it to AF. From RAN’s perspective, it is a DO-DTT. But from CN’s perspective, it is a DO-A.

**[Proposal-1]** For the use case that BSS/OSS configures RAN for inventory, which would be seen as DO-A from CN’s perspective, should be taken into account by SA2.

From architecture design perspective, if DO-A cannot be considered from the beginning, it’s hard to ensure the architecture to be future proof to support DO-A in future releases.

**[Proposal-2]** For good architecture design, DO-A need to be taken into consideration.

**[Proposal-3]** Based on **[Proposal-1]** and **[Proposal-2]**, it is proposd to include DO-A into the scope of the study.

**2. Proposal**

It is proposed to agree the following changes to 3GPP TR 23.700-13 v0.1.0:

\* \* \* Start of Change \* \* \* \*

## 3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**Ambient IoT Device:** An Ambient IoT device is an IoT device powered by energy harvesting, with limited energy storage capability. The other characteristics of the Ambient IoT device are defined in TR 38.xyz [8].

NOTE 1: The final decision on the term name is to be determined in TR conclusion or normative phase.

**Ambient IoT Services:** The functionalities and procedures to support Ambient IoT use cases.

NOTE 2: the functionalities and procedures for Ambient IoT Services are left to outcome of the study.

**Device-originated - autonomous (DO-A):** The traffic is originated from the device autonomously without outside triggering.

**Device-originated - device-terminated triggered (DO-DTT):** The device originated traffic is triggered by the device terminated traffic or signalling.

**Device-terminated (DT):** The traffic is terminated at the AIoT device.

\* \* \* Next of Change \* \* \* \*

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

AIoT Ambient IoT

DO-A Device-originated - autonomous

DO-DTT Device-originated - device-terminated triggered

DT Device-terminated

\* \* \* Next of Change \* \* \* \*

## 4.1 Architectural Assumptions

- The following traffic types for Ambient IoT Device are to be studied:

- DT: Device-terminated;

- DO-A: Device-originated autonomous; and

- DO-DTT: Device-originated - device-terminated triggered.

NOTE X: For DO-DTT, the CN can receive UL traffic from AIoT Devices, which is triggered by RAN, without DL traffic from the CN.

NOTE 1: The final decision for including DO-A (Device-originated - autonomous) in the study depends on RAN decision.

- The following two connectivity topologies as defined in TR 38.848 [7] are to be studied:

- Topology 1: BS <--> Ambient IoT Device;

- Topology 2: BS <--> intermediate node <--> Ambient IoT Device: Only a UE can act as an intermediate node which is under the network control.

- The communication spectrum is assumed to be licensed.

- Handover is not supported.

- RRC states are not supported by AIoT Devices (see RP-234058 [3])

- No mobility (i.e. at least no cell selection/re-selection-like function) supported by AIoT Devices (see RP-234058 [3])

Editor's note: The RAN SID reference is to be updated to RAN TR when available, and the meaning of no mobility is to be clarified by RAN.

NOTE 2: Coordination with RAN is required to determine the Ambient IoT Device capabilities in relation to system level of functionality (considering e.g. traffic scenarios, connectivity topologies etc.).

NOTE 3: The security aspects for Ambient IoT requires coordination with SA WG3.

NOTE 4: The charging aspects for Ambient IoT will be studied by SA WG5.

NOTE 5: The NAS based Congestion control is not in the scope of this study.

\* \* \* End of Change \* \* \* \*