**3GPP TSG-WG SA2 Meeting #169 *S2-250xxxx***

**Fukuoka City, Fukuoka, JP, 19th May – 23rd May, 2025 (revision of S2-250xxxx)**

**Source: Huawei, HiSilicon**

**Title: pCR for TS 23.369: NF Selection Update**

**Document for: Approval**

**Agenda Item: 19.14.2**

**Work Item / Release: AmbientIoT-ARC / Rel-19**

*Abstract: address ENs about NF Selection*

# 1. Introduction/Discussion

Editor’s note: It is FFS whether and how the procedure is performed between AMF and AIOTF in order to provide the NG-RAN ID of NG-RAN from the AMF to the AIOTF.

The AMF capable of Ambient IoT can register its support of AIoT service as part of its NF profile in the NRF. The AIOTF can discover the AIoT capable AMF via NRF. The AIOTF selects the AMF to route the AIoT messages if the selected RAN node/reader is within the coverage of the AMF.

During NGAP setup procedure in case of indirect connectivity, the NG-RAN initiates the setup procedure towards the configured AMF. The same configuration can also apply to the AIOTF, thus the AIOTF can determine the correct AMF that is configured to connect to the selected node/reader.

- Even if the NGAP connection fails to setup between the AMF and target NG-RAN, the AMF can reject the delivery request from AIOTF with appropriate code.

- In the case that NG-RAN nodes or AMF instances are newly added or released, the configuration shall be updated according, both at the NG-RAN and the AIOTF.

**Proposal 1**: The AIOTF knows the relationship between the NG-RAN and the AMF by means of the configuration, same as the configuration used by NG-RAN to setup NGAP association towards the AMF.

Editor’s note: NG-RAN and RAN reader information needs to coordinate with the RAN WG(s). Details are pending RAN WG feedback.

Editor’s note: The AIOTF or AMF configuration of NG-RAN and RAN reader information over NGAP needs to coordinate with RAN WG(s).

Editor’s note: It is FFS how NG-RAN transfers and updates its information to the AIOTF in indirect connectivity.

LS from RAN3 (R3-250905) and RAN3 (R3-252481) state that the A-IoT RAN information (supported Area, served reader ID list) is aware by AIOTF via OAM configuration. And RAN3 agreed to define a new “A-IoT Area”. The AIOTF may indicate the Requested Service Area as a list of “A-IoT Areas” and/or a list of readers in the Inventory Request message.

**Proposal 2**: Remove the ENs.

Editor's note: The further investigation of factors for the ADM selection will be needed and other factors are FFS.

Domain information of AIoT device permanent ID contains the PLMN ID, NID or A third party identifier used. Normally, the domain information together with NRF is used to locate the entity storing the AIoT device profile data of an Ambient IoT Device. Other parts (e.g., ID type or ID identification) are not clear how to use NRF to select or discover the ADM.

**Proposal 3**: Clarify AIoT device permanent ID is used for ADM selection in case of local configuration.

# 2. Text Proposal

It is proposed to capture the following changes vs. TS 23.369.

\* \* \* \* First change \* \* \* \*

## 5.3 Discovery and Selection of AIoT node(s)

### 5.3.1 AIOTF Discovery and Selection

The AIOTF discovery and selection functionality is supported by the NEF and AF to determine an AIOTF to handle AIoT Services.

When the NEF or AF performs AIOTF discovery and selection for an AIoT service operation request, the following applies:

- The NEF or AF shall utilize the NRF to discover AIOTF instance(s) unless AIOTF information is available by other means, e.g. locally configured in the NEF or AF. The NEF or AF provides to the NRF the Target Area information, when trying to discover AIOTF instance(s). The NRF provides AIOTF instance(s) to the NEF or AF.

NOTE: The local configuration in the NEF can be used for example to select a specific AIOTF instance for the request from a given AF.

- The NEF or the AF selects the AIOTF instance(s) based on the available AIOTF instance(s) (obtained from the NRF or locally configured)

When AIoT Device ID information indicates individual AIoT device(s), the NEF may select AIOTF(s) by taking into account the last known AIOTF instance(s) (e.g., AIOTF address/ID) for those device(s) from ADM.

### 5.3.2 ADM Discovery and Selection

The ADM discovery and selection function is supported by the AIOTF to select an ADM instance to retrieve the device profile data or update the last known AIOTF for the AIoT device. The AIOTF may also discover and select an ADM to retrieve AF authorization data. Similarly, the NEF uses the ADM discovery and selection function to select an ADM to obtain the last known AIOTF for the AIoT device.

When the ADM discovery is performed, the AIOTF or the NEF utilizes the NRF to discover the ADM instance(s) unless the ADM information is available by other means, e.g., locally configured. The AIOTF or the NEF selects an ADM instance based on the available ADM instances (obtained from the NRF or locally configured).

One or more of the following factors may be considered for the ADM discovery and selection:

- The AIoT device permanent ID or domain information of AIoT Device Permanent ID.

- The AF ID.

NOTE: The AIoT Device Permanent ID is only used in the case that local configuration is used for the ADM discovery and selection.

### 5.3.3 NG-RAN Node and RAN Reader Selection

The AIOTF selects NG-RAN node(s) and optionally RAN readers.

The AIOTF obtains the NG-RAN information (supported AIoT Area(s), and/or RAN reader ID list, and, optionally, the location of each served RAN reader) via OAM. The AIOTF receives an AIoT service request including the Target Area information from the NEF or trusted AF. Based on the received Target Area information and the NG-RAN information configured by OAM, the AIOTF selects the NG-RAN node(s) and optionally RAN reader(s).

NOTE 1: The Target Area information can span the supported Area of multiple NG-RAN node(s) or can be a subset of the supported Area of a NG-RAN node.

The AIOTF sends the AIoT service request to the selected NG-RAN node(s), optionally including the RAN Area information derived from mapping the Target Area information to the supported AIoT Area(s) and/or RAN reader ID list, if selected, to assist RAN reader selection by NG-RAN node, either directly or through the selected AMF. If multiple NG-RAN nodes are selected, the AIOTF sends the AIoT service request to each selected NG-RAN node along with its corresponding RAN Area information and/or the RAN reader ID list, if selected

If the AIOTF does not provide the RAN Area information or the RAN reader ID list in the AIoT service request to the NG-RAN node, then the NG-RAN node may use all available RAN readers.

NOTE 2: RAN reader ID is not exposed to the AF.

If an AIoT service request includes AIoT device Identifier(s), the AIOTF may consider the last known serving RAN reader(s) from the AIoT device context to determine targeted RAN reader(s) directly.

NOTE 3: From the selected NG-RAN node, the AIOTF receives the Inventory Report including the RAN reader ID that represents the AIoT device’s location at reader ID granularity. The AIOTF uses the RAN reader ID to update the last known serving RAN reader information in the local AIoT device context.

### 5.3.4 AMF Discovery and Selection

For indirect Connectivity via AMF (see clause 4.2), AMF discovery and selection functionality is implemented in AIOTF.

The AIOTF performs AMF discovery and selection in order to forward AIoT service operation messages to the target NG-RAN node via selected AMF. When the AIOTF selects a NG-RAN node during the NG-RAN Node and RAN Reader selection procedure as defined in clause 5.3.3, the AIOTF selects the AMF that has association with the selected NG-RAN node based on local configuration.

\* \* \* \* End of changes \* \* \* \*