**3GPP TSG-WG SA2 Meeting #170S2-250xxxx**

**Goteborg, SE, 25th Aug – 29th Aug, 2025 (revision of S2-2505342)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.369** | **CR** | **XXXX** | **rev** | **-** | **Current version:** | **19.0.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Update of Procedures between AIOTF and NG-RAN for Indirect Connectivity | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | AmbientIoT-ARC | | | | |  | ***Date:*** | | | 2025-08-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Clause 6.2.4 describes the Procedures between AIOTF and NG-RAN for Indirect Connectivity.  **Issue 1:**  When AMF receives step 1, it shall reply to AIOTF an immediate response. The figure and the step description need to be updated.  **Issue 2:**  Step 2 and step 3 cover multiple AIoT operations (Inventory Response Transfer, Inventory Report Transfer, Inventory Failure Transfer, Command Response Transfer or Command Failure Transfer). Among the operations, Inventory Response Transfer, Inventory Failure Transfer and Command Failure Transfer are responses to require not interact with AIoT Device on the air interface, while Inventory Report Transfer and Command Response Transfer need interactions with AIoT Device on the air interface and are sent by NG-RAN later.  **Issue 3:**  As a result of issue 2, the AMF needs to maintain information to enable the routing of later notifications and events to an AIOTF and how this is done needs to clarified.  Considering the immediate responses and notifications of later events, it is clearer to describe the handling in 2 parts, towards NG-RAN and from NG-RAN, as the from NG-RAN procedure can be used multiple times during an AIoT procedure, e.g., inventory.  Separation of the figure and updating the step description needs to be done. | | | | | | | | |
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| ***Summary of change:*** | | 1. Introduce clauses for an overview, towards NG-RAN and from NG-RAN handling.  2. Align message names and terminology  3. Introduce context handing in the AMF to enable event routing.  Device on the air interface. | | | | | | | | |
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| ***Consequences if not approved:*** | | The procedure lacks the steps and step descriptions are not clear. | | | | | | | | |
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| ***Clauses affected:*** | | 6.2.4, 6.2.4.1 (new), 6.2.4.2 (new), 6.2.4.3 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

### 6.2.4 Procedures between AIOTF and NG-RAN for Indirect Connectivity

#### 6.2.4.1 Overview

An AIOTF and NG-RAN can use an indirect interface via an AMF as described in clause 4.2.2.4. The AIOTF can send messages which are to be sent to NG-RAN and NG-RAN can send messages which are to be sent to an AIOTF. The procedure for NGAP message delivery to NG-RAN is defined in clause 6.2.4.2 and the procedure for message delivery from NG-RAN is defined in clause 6.2.4.3.

#### 6.2.4.2 Message delivery to NG-RAN

When the AIOTF sends commands the AMF receives an NAMF\_AIoT\_MessageDelivery request and sends the corresponding NGAP command to NG-RAN. The additional steps used for indirect interface between AIOTF and NG-RAN are shown in Figure 6.2.4.2-1.



Figure 6.2.4-1: Procedure for NGAP message delivery to NG-RAN using indirect connectivity via an AMF

1. The AIOTF sends Namf\_AIoT\_MessageDelivery Request message (NGAP AIoT information, NG-RAN ID, AIOTF ID, Correlation ID, AIoT NGAP Message Type, Notification endpoint or Transaction Reference ID) to the AMF.

The AIoT NGAP Message Type identifies the NGAP message to send to NG-RAN and NGAP AIoT information is provided to NG-RAN in the NGAP message.

If the AMF receives a Notification endpoint, the AMF creates a transaction context, assigns a Transaction Reference ID to it and stores the NG-RAN ID, AIOTF ID, Correlation ID and Notification endpoint within the transaction context. The AIOTF is implicity subscribed to Namf\_AIoT\_Notify events.

The Transaction Reference ID is included instead of Notification endpoint when the Message Type is set to a value other than "Inventory Request".

2. The AMF responds to the AIOTF with a result indicating whether the AMF will handle the request, and the Transaction Reference ID. If a failure is indicated by the result indication, then the procedure stops and the remaining steps are skipped.

3. The AMF sends an NGAP message (AIOTF ID, Correlation ID, NGAP AIoT information) to the target NG-RAN.

4. The procedure for handling NGAP messages from NG-RAN is used for route NGAP messages from NG-RAN to the AIOTF.

#### 6.2.4.3 Message delivery to AIOTF

When the AMF receives an NGAP message from NG-RAN, for example, responses to a procedure or events like Inventory Reports, the AMF determines which AIOTF to send a Namf\_AIoT\_Notify to and sends the information from NG-RAN to that AIOTF. The additional steps used for indirect interface from NGAP towards AIOTF is shown in Figure 6.2.4.3-1.



Figure 6.2.4.3-1: Procedure for NG-RAN event handling using indirect connectivity via an AMF

1. Before any NGAP message can be routed from NG-RAN to the AIOTF, the AMF must have created a transaction context, identified by a Transaction Reference ID, to be able to route the the messages from NG-RAN to the AIOTF. The same context can be used route multiple NGAP messages from NG-RAN.

2. NG-RAN sends an NGAP message (AIOTF ID, Correlation ID, NGAP AIoT information) to an AMF. NGAP AIoT information is determine by NG-RAN depending upon the operation the NGAP message relates to.

3. AMF determines the Notification endpoint using the AIOTF ID and Correlation ID received in step 1 from NG-RAN, and then sends the Namf\_AIoT\_Notify message (AIoT NGAP Message Type, NGAP AIoT information, Transaction Reference ID) to the AIOTF.

Step 2 and step 3 are repeated for each NGAP message received from NG-RAN.

If the message received from NG-RAN is an Inventory Failure indicating an error or an AIOT Session Release Complete, then the AMF releases the transaction context associated with the AIOTF ID and Correlation ID, after sending the Namf\_AIoT\_Notify message to the AIOTF.

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