**3GPP TSG-CT WG4 Meeting #110-eC4-223xxx**

**E-Meeting, 12th – 20th May 2022 was C4-223205**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.518** | **CR** | **0747** | **rev** | **1** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Event Reporting in RRC inactive state | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | C4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_eLCS\_ph2 | | | | |  | ***Date:*** | | | 2022-05-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As the agreed S2-2203251, three separate procedures are added in TS 23.273 to support each of UL positioning, DL positioning and UL+DL positioning.  It proposes to update procedure supported by N1N2MessageTransfer and N1MessageNotify | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | It proposes to update procedure supported by N1N2MessageTransfer and N1MessageNotify | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | It is not align with stage 2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.2.3.1, 5.2.2.3.5, 6.1.6.2.16 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.273 CR 0228 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not introduce any changes to the OpenAPI files. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* Begin of Changes \* \* \* \*

#### 5.2.2.3 UE Specific N1N2 Message Operations

##### 5.2.2.3.1 N1N2MessageTransfer

5.2.2.3.1.1 General

The N1N2MessageTransfer service operation is used by a NF Service Consumer to transfer N1 and/or N2 information to the UE and/or 5G-AN through the AMF in the following procedures:

- Network triggered Service Request (see clause 4.2.3.3 of 3GPP TS 23.502 [3])

- PDU Session establishment (see clause 4.3.2 of 3GPP TS 23.502 [3])

- PDU Session modification (see clause 4.3.3 of 3GPP TS 23.502 [3])

- PDU Session release (see clause 4.3.4 of TS 3GPP 23.502 [3])

- Session continuity, service continuity and UP path management (see clause 4.3.5 of 3GPP TS 23.502 [3])

- Inter NG-RAN node N2 based handover (see clause 4.9.1.3 of 3GPP TS 23.502 [3])

- SMS over NAS procedures (see clause 4.13.3 of 3GPP TS 23.502 [3]

- UE assisted and UE based positioning procedure (see clause 6.11.1 of 3GPP TS 23.273 [42])

- Network assisted positioning procedure (see clause 6.11.2 of 3GPP TS 23.273 [42])

- LCS Event Report, Event Reporting in RRC INACTIVE state procedures, LCS Cancel Location and LCS Periodic-Triggered Invoke procedures (see clause 6.3 and clause 6.7 of 3GPP TS 23.273 [42])

- UE configuration update procedure for transparent UE policy delivery (see clause 4.2.4.3 of 3GPP TS 23.502 [3])

- UPF anchored Mobile Terminated Data Transport in Control Plane CIoT 5GS Optimisation (see clause 4.24.2 of 3GPP TS 23.502 [3])

- NEF Anchored Mobile Terminated Data Transport (see clause 4.25.5 of 3GPP TS 23.502 [3])

- System interworking procedures with EPC (see clause 4.3 in 3GPP TS 23.501 [2] and clause 4.11 in 3GPP TS 23.502 [3])

- SMF triggered N3 data transfer establishment procedure (see clause 4.2.10.2 of 3GPP TS 23.502 [3])

- 5G-RG requested PDU Session Establishment via W-5GAN (see clause 7.3.1 of 3GPP TS 23.316 [48])

- 5G-RG or Network requested PDU Session Modification via W-5GAN (see clause 7.3.2 of 3GPP TS 23.316 [48])

- 5G-RG or Network requested PDU Session Release via W-5GAN (see clause 7.3.3 of 3GPP TS 23.316 [48])

- FN-RG related PDU Session Establishment via W-5GAN (see clause 7.3.4 of 3GPP TS 23.316 [48])

- CN-initiated selective deactivation of UP connection of an existing PDU Session associated with W-5GAN Access (see clause 7.3.5 of 3GPP TS 23.316 [48])

- FN-RG or Network Requested PDU Session Modification via W-5GAN (see clause 7.3.6 of 3GPP TS 23.316 [48])

- FN-RG or Network Requested PDU Session Release via W-5GAN (see clause 7.3.7 of 3GPP TS 23.316 [48])

- Non-5G capable device behind 5G-CRG and FN-CRG requested PDU Session Establishment via W-5GAN (see clause 4.10a of 3GPP TS 23.316 [48])

- Non-5G capable device behind 5G-CRG and FN-CRG or Network Requested PDU Session Modification via W-5GAN (see clause 4.10a of 3GPP TS 23.316 [48])

- Non-5G capable device behind 5G-CRG and FN-CRG or Network Requested PDU Session Release via W-5GAN (see clause 4.10a of 3GPP TS 23.316 [48])

- Handover procedures between 3GPP access / 5GC and W-5GAN access (see clause 7.6.3 of 3GPP TS 23.316 [48])

- Handover from 3GPP access / EPS to W-5GAN / 5GC (see clause 7.6.4.1 of 3GPP TS 23.316 [48])

- Transfer UAV specific data via N1 SM (see clause 5.2.4.3 of 3GPP TS 23.256 [56])

NOTE: Though in 3GPP TS 23.502 [3] the procedure is called "UE configuration update procedure for transparent UE policy delivery", as per 3GPP TS 24.501 [11] clause 5.4.5.3.1, the network initiated NAS transport procedure is used.

The NF Service Consumer shall invoke the service operation by using HTTP method POST, to request the AMF to transfer N1 and/or N2 information for a UE and/or 5G-AN, with the URI of "N1 N2 Messages Collection" resource (see clause 6.1.3.5.3.1).

The NF Service Consumer may include the following information in the HTTP Request message body:

- SUPI

- PDU Session ID or LCS Correlation ID depending on the N1/N2 message class to be transferred

- N2 SM Information (PDU Session ID, QoS profile, CN N3 Tunnel Info, S-NSSAI)

- N1 Message Container, including a N1 SM, LPP message, LCS message, SMS, UPDP message

- N2 Information Container, including N2 SM, NRPPa message, PWS or RAN related information

- Mobile Terminated Data (i.e. CIoT user data container)

- Allocation and Retention Priority (ARP)

- Paging Policy Indication

- 5QI

- Notification URL (used for receiving Paging Failure Indication)

- Last Message Indication

- NF Instance Identifier and optionally Service Instance Identifier of the NF Service Consumer (e.g. an LMF or SMF)

- N1 SM Skipping Indication

- Area of Validity for N2 SM Information

- A MA PDU Session Accepted indication, if a MA-PDU session is established;

- Extended Buffering Support Indication, if SMF determines that Extended Buffering applies during Network triggered Service Request Procedure (see clause 4.2.3.3 of 3GPP TS 23.502 [3]), UPF anchored Mobile Terminated Data Transport in Control Plane CIoT 5GS Optimisation procedure (see clause 4.24.2 of 3GPP TS 23.502 [3]) or NEF Anchored Mobile Terminated Data Transport (see clause 4.25.5 of 3GPP TS 23.502 [3]);

- Target Access type towards which the SMF requests to send N2 information and optionally N1 information, for a Multi-Access (MA) PDU session, or through which the LMF requests to transfer an LPP message to the UE.

During an intra-AMF handover between 3GPP and non-3GPP accesses, the SMF shall include the targetAccess IE set to the old access type in the HTTP Request message body, when releasing the N2 PDU session resources in the old access (see step 3 of Figure 4.9.2.1-1 and step 3 of Figure 4.9.2.2-1 of 3GPP TS 23.502 [3]).



Figure 5.2.2.3.1.1-1 N1N2MessageTransfer for UE related signalling

1. The NF Service Consumer shall send a POST request to transfer N1 and N2 information. The NF Service Consumer may include a N1N2MessageTransfer Notification URI to AMF in the request message.

2a. On success, i.e. if the request is accepted and the AMF is able to transfer the N1/N2 message to the UE and/or the AN, the AMF shall respond with a "200 OK" status code. The AMF shall set the cause IE in the N1N2MessageTransferRspData as "N1\_N2\_TRANSFER\_INITIATED" in this case.

The AMF shall respond with a "200 OK" status code and set the cause IE in the N1N2MessageTransferRspData to "N2\_MSG\_NOT\_TRANSFERRED", if the N1N2MessageTransfer request included an area of validity for the N2 SM Information, the UE is in CM-CONNECTED state and outside of the area of validity.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.1.3.5.3.1-3 shall be returned. For a 4xx/5xx response, the message body shall contain a N1N2MessageTransferError structure, including:

- a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.1.3.5.3.1-3;

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

##### 5.2.2.3.5 N1MessageNotify

5.2.2.3.5.1 General

The N1MessageNotify service operation is used by an AMF notifying the N1 message received from the UE to a destination CN NF, and it is used in the following procedures:

- Registration with AMF re-allocation (see clause 4.2.2.2.3 of 3GPP TS 23.502 [3])

- UE assisted and UE based positioning procedure (see clause 6.11.1 of 3GPP TS 23.273 [42])

- LCS Event Report, Event Reporting in RRC INACTIVE state procedures, LCS Cancel Location and LCS Periodic-Triggered Invoke procedures (see clause 6.3 and clause 6.7 of 3GPP TS 23.273 [42])

- UE configuration update procedure for transparent UE policy delivery (See clause 4.2.4.3 in 3GPP TS 23.502 [3])

- UE triggered policy provisioning procedure to request UE policies. (See clause 6.2.4 in 3GPP TS 23.287 [47])

NOTE: Though in 3GPP TS 23.502 [3] the procedure is called "UE configuration update procedure for transparent UE policy delivery", as per 3GPP TS 24.501 [11] clause 5.4.5.2.1, the UE initiated NAS transport procedure is used.

The AMF shall use HTTP POST method to the N1 Notification URI provided by the NF Service Consumer via N1N2MessageSubscribe service operation (See clause 5.2.2.3.3). See also figure 5.2.2.3.5.1-1.



Figure 5.2.2.3.5.1-1 N1 Message Notify

1. The AMF shall send a HTTP POST request to the N1 Notification URI, and the payload body of the POST request shall contain an N1MessageNotificatoin data structure with the subscribed N1 message.

2a. On success, "204 No Content" shall be returned and the payload body of the POST response shall be empty.

2b. On failure or redirection, one of the HTTP status code listed in Table 6.1.5.4.3.1-3 shall be returned. The message body shall contain a ProblemDetails object with "cause" set to one of the corresponding application errors listed in Table 6.1.5.4.3.1-3.

5.2.2.3.5.2 Using N1MessageNotify in the Registration with AMF Re-allocation Procedure

In the Registration with AMF re-allocation procedure, the N1MessageNotify service operation is invoked by a NF Service Producer, i.e. an Initial AMF, towards a NF Service Consumer, e.g. the target AMF, which is selected to serve the UE, by the initial AMF.

The requirements specified in clause 5.2.2.3.5.1 shall apply with the following modifications:

1. The initial AMF discovers the NF Service Consumer (e.g. the target AMF) from the NRF, and fetch N1 Notification URI from the default notification subscription registered with "N1\_MESSAGE" notification type and "5GMM" N1 message class (See Table 6.2.6.2.3-1 and Table 6.2.6.2.4-1 of 3GPP TS 29.510 [29].

NOTE: The alternate AMF is expected to have registered a callback URI with the NRF.

2. Same as step 1 of Figure 5.2.2.3.5.1-1, the request payload shall include the following information in the HTTP POST Request message body:

- RAN NGAP ID and initial AMF name (the information enabling (R)AN to identify the N2 terminating point);

- RAN identity, e.g. RAN Node Id, RAN N2 IPv4/v6 address;

- Information from RAN, e.g. User Location, RRC Establishment Cause and UE Context Request;

- the N1 message, which shall be the complete Registration Request message in clear text if the UE has a valid NAS security context, or as the one contained in the NAS message container IE in the Security Mode Complete message as specified in clause 4.2.2.2.3 of 3GPP TS 23.502 [2];

- the UE's SUPI and MM Context;

- the Allowed NSSAI together with the corresponding NSI IDs (if network slicing is used and the initial AMF has obtained).

5.2.2.3.5.3 Using N1MessageNotify in the UE Assisted and UE Based Positioning Procedure

In the UE assisted and UE based positioning procedure, the N1MessageNotify service operation is invoked by the AMF, towards the LMF, to notify the N1 UE positioning messages received from the UE.

The requirements specified in clause 5.2.2.3.5.1 shall apply with the following modifications:

1. If the corresponding N1 notification URI is not available, the AMF shall retrieve the NF profile of the NF Service Consumer (e.g. the LMF) from the NRF using the NF Instance Identifier received during corresponding N1N2MessageTransfer service operation (see clause 5.2.2.3.1), and further identify the corresponding service instance if Service Instance Identifier was also received, and fetch N1 Notification URI from the default notification subscription registered with "N1\_MESSAGE" notification type and "LPP" N1 message class (See Table 6.2.6.2.3-1 and Table 6.2.6.2.4-1 of 3GPP TS 29.510 [29]).

2. Same as step 1 of Figure 5.2.2.3.5.1-1, the request payload shall include the following information:

- the N1 Uplink Positioning Message;

- LCS correlation identifier.

5.2.2.3.5.4 Using N1MessageNotify in the UE Configuration Update for transparent UE Policy delivery

In the UE Configuration Update for transparent UE Policy delivery procedure, the N1MessageNotify service operation is invoked by the AMF, towards the PCF which subscribed to be notified with UPDP messages received from the UE.

The requirements specified in clause 5.2.2.3.5.1 shall apply with the following modifications:

1. Same as step 1 of Figure 5.2.2.3.5.1-1. The request payload shall include the following information:

- the UPDP message.

5.2.2.3.5.5 Using N1MessageNotify in the LCS Event Report, Event Reporting in RRC INACTIVE state procedures, LCS Cancel Location and LCS Periodic-Triggered Invoke Procedures

In the LCS Event Report, Event Reporting in RRC INACTIVE state procedures, LCS Cancel Location and LCS Periodic-Triggered Invoke procedure, the N1MessageNotify service operation is invoked by the AMF, towards the LMF, to notify the N1 UE LCS messages received from the UE.

The requirements specified in clause 5.2.2.3.5.1 shall apply with the following modifications:

1. If the corresponding N1 notification URI is not available, the AMF shall retrieve the NF profile of the NF Service Consumer (e.g. the LMF) from the NRF using the NF Instance Identifier received during corresponding N1N2MessageTransfer service operation (see clause 5.2.2.3.1), and further identify the corresponding service instance if Service Instance Identifier was also received, and fetch N1 Notification URI from the default notification subscription registered with "N1\_MESSAGE" notification type and "LCS" N1 message class (See Table 6.2.6.2.3-1 and Table 6.2.6.2.4-1 of 3GPP TS 29.510 [29]).

2. Same as step 1 of Figure 5.2.2.3.5.1-1, the request payload shall include the following information:

- the N1 Uplink LCS Message;

- LCS correlation identifier;

- indication of Control Plane CIoT 5GS Optimisation if Control Plane CIoT 5GS Optimisation is being used.

and may include serving cell ID if it is available;

NOTE: For the EventReport message and UE initiated CancelDeferredLocation message, the AMF includes the deferred routing identifier received from UE in N1 UL NAS TRANSPORT message as LCS correlation identifier. The LCS correlation identifier can assist a serving LMF in identifying the periodic or triggered location session if the same LMF had assigned the deferred routing identifier or can indicate to the LMF that it is acting as a default LMF.

5.2.2.3.5.6 Using N1MessageNotify in the UE triggered policy provisioning procedure to request UE policies

In the UE triggered policy provisioning procedure, the N1MessageNotify service operation is invoked by the AMF, towards the PCF which subscribed to be notified with UPDP messages received from the UE.

The requirements specified in clause 5.2.2.3.5.1 shall apply with the following modifications:

1. Same as step 1 of Figure 5.2.2.3.5.1-1. The request payload shall include the following information:

- the UPDP message.

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

##### 6.1.6.2.16 Type: N1MessageNotification

Table 6.1.6.2.16-1: Definition of type N1MessageNotification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| n1NotifySubscriptionId | string | C | 0..1 | Represents the subscription Id for which the notification is generated. The NF Service Consumer uses this to correlate the notification against a corresponding subscription. If the notification is due to an implicit subscription via NRF, then the value shall be set as "implicit".  This IE shall be present if the notification is based on a subscription to N1MessgeNotification. An exception is for the case when initial AMF forwards NAS message to target AMF during AMF re-allocation procedure. |
| n1MessageContainer | N1MessageContainer | M | 1 | Contains the N1 message class and N1 message content. |
| lcsCorrelationId | CorrelationID | O | 0..1 | If the N1 message notified is for LCS procedures, the NF Service Producer (e.g. AMF) may include an LCS correlation identifier. |
| registrationCtxtContainer | RegistrationContextContainer | C | 0..1 | If the N1 message notified is of type 5GMM (i.e. during Registration with AMF re-allocation procedure), the NF Service Producer (e.g. AMF) shall include this IE, if available. |
| newLmfIdentification | LMFIdentification | O | 0..1 | If a new LMF is selected by AMF, this IE may include the new selected LMF Identification. |
| guami | Guami | C | 0..1 | This IE shall be present during UE Assisted and UE Based Positioning Procedure (see clause 5.2.2.3.5.3) or the LCS Event Report, Event Reporting in RRC INACTIVE state procedures, LCS Cancel Location and LCS Periodic-Triggered Invoke Procedures (see clause 5.2.2.3.5.5) and it may be present otherwise.  When present, it shall contain the GUAMI serving the UE. |
| cIoT5GSOptimisation | boolean | C | 0..1 | This IE shall be present when the N1 message class is "LPP/LCS" and the N1 message is received from the UE with Control Plane CIoT 5GS Optimisation. When present, it shall be set as follows:  - true: Control Plane CIoT 5GS Optimisation was used and no signalling or data is currently pending for the UE at the AMF.  - false (default): Control Plane CIoT 5GS Optimisation was not used or signalling or data is currently pending for the UE at the AMF. |
| ecgi | Ecgi | O | 0..1 | When present, this IE shall indicate the identifier of the E-UTRAN cell serving the UE.  This IE may be present if the N1 message notified is for LCS procedures. |
| ncgi | Ncgi | O | 0..1 | When present, this IE shall indicate the identifier of the NR cell serving the UE.  This IE may be present if the N1 message notified is for LCS procedures. |

\* \* \* End of Changes \* \* \* \*