**3GPP TSG-RAN WG3 #123R3-240687**

**Athens, Greece, 26th February- 1st March, 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **1114** | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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 | **X** | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | NG-RAN indicates to SMF when a GTP-U Error Indication is received | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI18 | | | | |  | ***Date:*** | | | 2024-02-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | *Rel-18* |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | CT4 discussed the following requirements in clause 5.3.3.1 of 3GPP TS 23.527 for the case when the 5G-AN receives a GTP-U Error Indication and agreed that it would be beneficial that the NG-RAN can indicate to the SMF that the release is due to receiving a GTP-U Error Indication from the NG-U tunnel, so the SMF can use this information to determine to re-establish the PFCP session for the affected PDU session. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Clarify that the PDU session notify procedure is used to release the PDU session due to GTP-U Error Indication;  Add a new indicator “User Plane Error” with code point “gTP-U Error Indication Received,”.  Impact assessment towards the previous version of the specification (same release):  This CR has an isolated impact towards the previous version of the specification (same release).  The CR is backwards compatible. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 8.2.4.1, 9.3.1.2, 9.4.5 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | It is not possible for SMF to know that the PDU session is released due to GTP-U Error Indication | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 38.401: "NG-RAN; Architecture description".

[3] 3GPP TS 38.410: "NG-RAN; NG general aspects and principles".

[4] ITU-T Recommendation X.691 (07/2002): "Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".

[5] ITU-T Recommendation X.680 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".

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[50] 3GPP TS 23.203: "Policy and charging control architecture".

[51] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".

[52] 3GPP TS 26.118: "Virtual Reality (VR) profiles for streaming applications".

[53] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[54] 3GPP TS 23.256: "Support of Uncrewed Aerial Systems (UAS) connectivity, identification and tracking; Stage 2".

[55] IEEE Std 1588: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems", Edition 2019.

[56] 3GPP TS 29.585: "5G System (5GS); Session Management Function (SMF) / Centralized User Configuration (CUC) to Access Network Talker Listener (AN-TL) and Core Network Talker Listener (CN-TL) protocol aspects; Stage 3".

[xx] 3GPP TS 23.527: "5G System; Restoration procedures”.

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### 8.2.4 PDU Session Resource Notify

#### 8.2.4.1 General

The purpose of the PDU Session Resource Notify procedure is to notify that the already established QoS flow(s) or PDU session(s) for a given UE are released or not fulfilled anymore or fulfilled again by the NG-RAN node for which notification control is requested. It is further used to notify that the updated QoS parameters during the Path Switch Request procedure are not successfully accepted by the NG-RAN node. It is also used to indicate that the PDU session resource or QoS flows are released due to a GTP-U Error Indication received over a NG-U tunnel. The procedure uses UE-associated signalling.

#### 8.2.4.2 Successful Operation



Figure 8.2.4.2-1: PDU session resource notify

The NG-RAN node initiates the procedure by sending a PDU SESSION RESOURCE NOTIFY message.

The PDU SESSION RESOURCE NOTIFY message shall contain the information of PDU session resources or QoS flows which are released or not fulfilled anymore or fulfilled again by the NG-RAN node.

- For each PDU session for which some QoS flows are released or not fulfilled anymore or fulfilled again by the NG-RAN node, the *PDU Session Resource Notify Transfer* IE shall be included containing:

1. The list of QoS flows which are released by the NG-RAN node, if any, in the *QoS Flow Released List* IE.

2. The list of GBR QoS flows which are not fulfilled anymore or fulfilled again by the NG-RAN node, if any, in the *QoS Flow Notify List* IE together with the *Notification Cause* IE. For a QoS flow indicated as not fulfilled anymore the NG-RAN node may also indicate an alternative QoS parameters set which it can currently fulfil in the *Current QoS Parameters Set Index* IE. For a QoS flow indicated as not fulfilled anymore the NG-RAN node may also indicate the RAN feedback in the *TSC Traffic Characteristics Feedback* IE.

3. The list of QoS flows for which the QoS parameters were updated but could not be successfully accepted by the NG-RAN node during the Path Switch Request procedure, if any, in the *QoS Flow Feedback List* IE which may be associated with a value it could offer.

- For each PDU session resource which is released by the NG-RAN node, the *PDU Session Resource Notify Released Transfer* IE shall be included containing the release cause in the *Cause* IE. If the *User Plane Error* IE is set to "gTP-U Error Indication Received", the SMF shall, if supported, consider that the PDU session is released due a GTP-U Error Indication received over a NG-U tunnel, as specified in 3GPP TS 23.527 [xx].

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE NOTIFY message location information of the UE in the *User Location Information* IE.

Upon reception of the PDU SESSION RESOURCE NOTIFY message, the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Notify Transfer* IE or *PDU Session Resource Notify Released Transfer* IE to the SMF associated with the concerned PDU session. Upon reception of *PDU Session* *Resource Notify Transfer* IE, the SMF normally initiate the appropriate release or modify procedure on the core network side for the PDU session(s) or QoS flow(s) identified as not fulfilled anymore.

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Notify Transfer* IE or the *PDU Session Resource Notify Released Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

If the *User Location Information* IE is included in the PDU SESSION RESOURCE NOTIFY message, the AMF shall handle this information as specified in TS 23.501 [9].

#### 8.2.4.3 Abnormal Conditions

Void.

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#### 9.3.4.13 PDU Session Resource Notify Released Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Cause | M |  | 9.3.1.2 |  | - |  |
| Secondary RAT Usage Information | O |  | 9.3.1.114 |  | YES | ignore |
| User Plane Error | O |  | ENUMERATED(gTP-U Error Indication Received, …) |  | YES | ignore |

### 9.4.5 Information Element Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

NGAP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Skip to Next Change \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

id-SourceTNLAddrInfo,

id-SurvivalTime,

id-Selected-Target-SNPN-Identity,

id-TNLAssociationTransportLayerAddressNGRAN,

id-TAINSAGSupportList,

id-TargetHomeENB-ID,

id-TargetRNC-ID,

id-TimeBasedHandoverInformation,

id-TraceCollectionEntityURI,

id-TSCTrafficCharacteristics,

id-UEHistoryInformationFromTheUE,

id-UERadioCapabilityForPaging,

id-UERadioCapabilityForPagingOfNB-IoT,

id-UL-NGU-UP-TNLInformation,

id-UL-NGU-UP-TNLModifyList,

id-ULForwarding,

id-ULForwardingUP-TNLInformation,

id-UplinkTLContainer,

id-UsedRSNInformation,

id-UserLocationInformationTNGF,

id-UserLocationInformationTWIF,

id-UserLocationInformationW-AGF,

id-UserPlaneError,

id-EarlyMeasurement,

id-BeamMeasurementsReportConfiguration,

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PDUSessionResourceNotifyItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

PDUSessionResourceNotifyReleasedTransfer ::= SEQUENCE {

cause Cause,

iE-Extensions ProtocolExtensionContainer { {PDUSessionResourceNotifyReleasedTransfer-ExtIEs} } OPTIONAL,

...

}

PDUSessionResourceNotifyReleasedTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-SecondaryRATUsageInformation CRITICALITY ignore EXTENSION SecondaryRATUsageInformation PRESENCE optional }|

{ ID id-UserPlaneError CRITICALITY ignore EXTENSION UserPlaneError PRESENCE optional },

...

}

UserPlaneError ::= ENUMERATED {

gTP-U-Error\_Indication\_received,

...

}

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### 9.4.7 Constant Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Constant definitions

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

NGAP-Constants {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- IE parameter types from other modules.

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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id-DLDiscarding ProtocolIE-ID ::= 421

id-PDUsetQoSParameters ProtocolIE-ID ::= 422

id-PDUSetbasedHandlingIndicator ProtocolIE-ID ::= 423

id-N6JitterInformation ProtocolIE-ID ::= 424

id-ECNMarkingorCongestionInformationReportingRequest ProtocolIE-ID ::= 425

id-ECNMarkingorCongestionInformationReportingStatus ProtocolIE-ID ::= 426

id-UserPlaneError ProtocolIE-ID ::= xxx

END

-- ASN1STOP