**3GPP TSG-CT WG3 Meeting #140 *C3-251328***

**Wuhan, CN, 7 - 11 April 2025 *(Revision of C3-251xyz)***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.122** | **CR** | **0934** | **rev** | **-** | **Current version:** | **19.2.0** |  |
|  | | | | | | | | |
| *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:*** | Completion of loss of connectivity event | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NBI19 | | | | |  | ***Date:*** | | | 2025-3-27 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | Per loss of connectivity event by MonitoringEvent API, the Loss\_of\_connectivity\_notification\_5G feature also requires to support the Loss\_of\_connectivity\_notification feature, while the feature dependency is missing in the current specification.  In addition, the value of the "lossOfConnectReason" attribute is introduced in TS 29.522. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Fix the above issues.  Add table note clarify that when the "Loss\_of\_connectivity\_notification\_5G" feature is also supported, the value of the "lossOfConnectReason" attribute shall be set as defined in clause 4.4.2 of 3GPP TS 29.522 [62]. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.2.3.2, 5.3.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not impact on the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Proposed changes:**

\*\*\* 1st Change \*\*\*

##### 5.3.2.3.2 Type: MonitoringEventReport

This data type represents a monitoring event notification which is sent from the SCEF to the SCS/AS.

Table 5.3.2.3.2-1: Definition of type MonitoringEventReport

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attribute name | | Data type | | Cardinality | | Description | | Applicability (NOTE 1) | |
| imeiChange | | AssociationType | | 0..1 | | If "monitoringType" is "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION", this parameter shall be included to identify the event of change of IMSI-IMEI or IMSI-IMEISV association is detected.  See also 3GPP TS 29.336 [11] clause 8.4.22 for pre-5G. | | Change\_of\_IMSI\_IMEI\_association\_notification | |
| externalId | | ExternalId | | 0..1 | | Contains the external identifier.  This attribute may also be present in the monitoring event subscription one-time response message, if the "UEId\_retrieval" feature is supported and the corresponding request message includes the "ueIpAddr" attribute or the "ueMacAddr" attribute.  (NOTE 2) | |  | |
| appId | | string | | 0..1 | | Contains the identifier of the detected application. (NOTE 4) | | AppDetection\_5G | |
| pduSessInfo | | PduSessionInformation | | 0..1 | | Represents the PDU session information related to the detected application.  If "monitoringType" is "APPLICATION\_START" and/or "APPLICATION\_STOP", this attribute shall be present, if available, to indicate the application traffic detection details. | | AppDetection\_5G | |
| idleStatusInfo | | IdleStatusInfo | | 0..1 | | If "idleStatusIndication" in the "MonitoringEventSubscription"sets to "true", this parameter shall be included to indicate the information when the UE transitions into idle mode. | | Ue-reachability\_notification,  Availability\_after\_DDN\_failure\_notification | |
| locationInfo | | LocationInfo | | 0..1 | | If "monitoringType" is "LOCATION\_REPORTING", this parameter shall be included to indicate the user location related information. | | Location\_notification, eLCS | |
| locFailureCause | | LocationFailureCause | | 0..1 | | Indicates the location positioning failure cause. | | eLCS | |
| lossOfConnectReason | | integer | | 0..1 | | If "monitoringType" is "LOSS\_OF\_CONNECTIVITY", this parameter shall be included if available to identify the reason why loss of connectivity is reported.  See also 3GPP TS 29.336 [11] clause 8.4.58 for pre-5G.  (NOTE 5) | | Loss\_of\_connectivity\_notification | |
| unavailPerDur | | DurationSec | | 0..1 | | If "monitoringType" is "LOSS\_OF\_CONNECTIVITY", then this parameter shall be included if available to identify the UE’s Unavailability Period Duration. | | Loss\_of\_connectivity\_notification\_5G | |
| maxUEAvailabilityTime | | DateTime | | 0..1 | | If "monitoringType" is "UE\_REACHABILITY", this parameter may be included to identify the timestamp until which a UE using a power saving mechanism is expected to be reachable for SM delivery.  Refer to Clause 5.3.3.22 of 3GPP TS 29.338 [34]. | | Ue-reachability\_notification | |
| msisdn | | Msisdn | | 0..1 | | Identifies the MS internal PSTN/ISDN number.  (NOTE 2) | |  | |
| monitoringType | | MonitoringType | | 1 | | Identifies the type of monitoring type as defined in clause 5.3.2.4.3. | |  | |
| uePerLocationReport | | UePerLocationReport | | 0..1 | | If "monitoringType" is "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter shall be included to indicate the number of UEs found at the location.  If "subType" indicates "AERIAL\_UE" subscription type, this parameter shall be included to indicate the number of UAV’s found at the location. | | Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G | |
| plmnId | | PlmnId | | 0..1 | | If "monitoringType" is "ROAMING\_STATUS" and "plmnIIndication" in the "MonitoringEventSubscription" sets to "true", this parameter shall be included to indicate the UE's serving PLMN. | | Roaming\_status\_notification | |
| pei | | Pei | | 0..1 | | Contains the PEI.  When the "enNB2" feature is supported and the "monitoringType" attribute is set to "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION", this attribute may be present and shall contain the new PEI.  When the "RVAS\_5G" feature is supported and the "monitoringType" attribute is set to "ROAMING\_STATUS", this attribute may be present and shall contains the PEI. | | enNB2, RVAS\_5G | |
| reachabilityType | | ReachabilityType | | 0..1 | | If "monitoringType" is "UE\_REACHABILITY", this parameter shall be included to identify the reachability of the UE.  See also 3GPP TS 29.336 [11] clause 8.4.20 for pre-5G. | | Ue-reachability\_notification | |
| roamingStatus | | boolean | | 0..1 | | If "monitoringType" is "ROAMING\_STATUS", this parameter shall be set to "true" if the new serving PLMN is different from the HPLMN. Set to false or omitted otherwise. | | Roaming\_status\_notification | |
| failureCause | | FailureCause | | 0..1 | | If "monitoringType" is "COMMUNICATION\_FAILURE", this parameter shall be included to indicate the reason of communication failure. | | Communication\_failure\_notification | |
| eventTime | | DateTime | | 0..1 | | Identifies when the event is detected or received.  Shall be included for each group of UEs. | |  | |
| pdnConnInfoList | | array(PdnConnectionInformation) | | 0..N | | If "monitoringType" is "PDN\_CONNECTIVITY\_STATUS", this parameter shall be included to indicate the PDN connection details. | | Pdn\_connectivity\_status | |
| dddStatus | | DlDataDeliveryStatus | | 0..1 | | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter shall be included to identify the downlink data delivery status detected by the network. | | Downlink\_data\_delivery\_status\_5G | |
| dddTrafDescriptor | | DddTrafficDescriptor | | 0..1 | | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter shall be included to identify the downlink data descriptor impacted by the downlink data delivery status change. | | Downlink\_data\_delivery\_status\_5G | |
| maxWaitTime | | DateTime | | 0..1 | | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter may be included to identify the time before which the data will be buffered. | | Downlink\_data\_delivery\_status\_5G | |
| apiCaps | | array(ApiCapabilityInfo) | | 0..N | | If "monitoringType" is "API\_SUPPORT\_CAPABILITY", this parameter shall be included to indicate the availability of all APIs supported by the serving network or the availability of interested APIs, indicated by the "apiNames" attribute in "MonitoringEventSubscription", supported by the serving network.  If no API is supported by the serving network, an empty apiCaps shall be provided. | | API\_support\_capability\_notification | |
| nSStatusInfo | | SACEventStatus | | 0..1 | | If the "monitoringType" attribute is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS", this parameter shall be included to indicate the current network slice status information for the concerned network slice.  (NOTE 3) | | NSAC | |
| afServiceId | | string | | 0..1 | | Contains the identifier of the service to which the NSAC reporting is related.  It shall be provided only if it is present in the related NSAC subscription request and the "monitoringType" attribute is set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS". | | NSAC | |
| servLevelDevId | | string | | 0..1 | | If "monitoringType" is "AREA\_OF\_INTEREST" or "NUMBER\_OF\_UES\_IN\_AN\_AREA" and "subType" indicate "AERIAL\_UE", this parameter may be included to identify the UAV. | | UAV | |
| uavPresInd | | boolean | | 0..1 | | If "monitoringType" is "AREA\_OF\_INTEREST", this parameter shall be set to true if the specified UAV is in the monitoring area. Set to false or omitted otherwise. | | UAV | |
| groupMembListChanges | | GroupMembListChanges | | 0..1 | | Contains information on the change(s) to the group members list.  This attribute shall be present only if the "monitoringType" attribute is set to "GROUP\_MEMBER\_LIST\_CHANGE". | | GMEC | |
| sessInactiveTime | | DurationSec | | 0..1 | | The value of the session inactivity timer.  This attribute shall be present only if the "monitoringType" attribute is set to "SESSION\_INACTIVITY\_TIME". | | DataTransfer | |
| trafficInfo | | TrafficInformation | | 0..1 | | The value of the UL/DL data rate and/or Traffic volume.  This attribute shall be present only if the "monitoringType" attribute is set to "TRAFFIC\_VOLUME” and/or "UL\_DL\_DATA\_RATE". | | DataTransfer | |
| ueStrAndFwdSatInfos | | array(UeStrAndFwdSatInfo) | | 0..N | | If "monitoringType" attribute is "STR\_FWD\_SAT\_INFO", this parameter shall be included to indicate the UE status in Store and Forward mode. | | SAT\_STRFWD\_OP | |
| energyInfos | | array(EnergyInfo) | | 0..N | | If "monitoringType" attribute is "UE\_ENERGY" and/or "UE\_PDU\_SESSION\_ENERGY", this parameter shall be included to provide the energy consumption information of the UE. | | Energy | |
| NOTE 1: Properties marked with a feature as defined in clause 5.3.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 2: Identifies the user for which the event occurred. When the "RVAS\_5G" feature is not supported and/or the reported event within the "monitoringType" attribute is not the "ROAMING\_STATUS" event, then at least one of these attributes shall be present. When the "RVAS\_5G" feature is supported and the reported event within the "monitoringType" attribute is "ROAMING\_STATUS", then these attributes are mutually exclusive and only one of them may be present.  NOTE 3: If the "eNSAC" feature is supported, the "SACEventStatus" data type shall include an indication to report either the current number of registered UEs or the current number of UEs with at least one PDU session/PDN connection.  NOTE 4: When the "AppDetection\_5G" feature is supported and the "monitoringType" attribute is set to either "APPLICATION\_START" or "APPLICATION\_STOP", the "appId" attribute shall be present only if the "appIds" attribute within the corresponding subscription resource contains more than one array element (i.e., more than one application identifier).  NOTE 5: When the "Loss\_of\_connectivity\_notification\_5G" feature is supported, the value of the "lossOfConnectReason" attribute shall be set as defined in clause 4.4.2 of 3GPP TS 29.522 [62]. | | | | | | | | | |

Editor's note: Monitoring event related to UE QoS Flow for the "Energy" feature is FFS.

\*\*\* 2nd Change \*\*\*

### 5.3.4 Used Features

The table below defines the features applicable to the MonitoringEvent API. Those features are negotiated as described in clause 5.2.7.

Table 5.3.4-1: Features used by MonitoringEvent API

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Feature Number | | Feature | | Description | |
| 1 | | Loss\_of\_connectivity\_notification | | The SCS/AS is notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication | |
| 2 | | Ue-reachability\_notification | | The SCS/AS is notified when the UE becomes reachable for sending either SMS or downlink data to the UE | |
| 3 | | Location\_notification | | The SCS/AS is notified of the current location or the last known location of the UE | |
| 4 | | Change\_of\_IMSI\_IMEI\_association\_notification | | The SCS/AS is notified when the association of an ME (IMEI(SV)) that uses a specific subscription (IMSI) is changed | |
| 5 | | Roaming\_status\_notification | | The SCS/AS is notified when the UE's roaming status changes | |
| 6 | | Communication\_failure\_notification | | The SCS/AS is notified of communication failure events | |
| 7 | | Availability\_after\_DDN\_failure\_notification | | The SCS/AS is notified when the UE has become available after a DDN failure | |
| 8 | | Number\_of\_UEs\_in\_an\_area\_notification | | The SCS/AS is notified the number of UEs present in a given geographic area  The feature supports pre-5G (e.g. 4G) requirement. | |
| 9 | | Notification\_websocket | | The delivery of notifications over Websocket is supported according to clause 5.2.5.4. This feature requires that the Notification\_test\_event featute is also supported. | |
| 10 | | Notification\_test\_event | | The testing of notification connection is supported according to clause 5.2.5.3. | |
| 11 | | Subscription\_modification | | Modifications of an individual subscription resource. | |
| 12 | | Number\_of\_UEs\_in\_an\_area\_notification\_5G | | The AF is notified the number of UEs present in a given geographic area.  The feature supports the 5G requirement. This feature may only be supported in 5G. | |
| 13 | | Pdn\_connectivity\_status | | The SCS/AS requests to be notified when the 3GPP network detects that the UE’s PDN connection is set up or torn down. | |
| 14 | | Downlink\_data\_delivery\_status\_5G | | The AF requests to be notified when the 3GPP network detects that the downlink data delivery status is changed. The feature is not applicable to pre-5G. | |
| 15 | | Availability\_after\_DDN\_failure\_notification\_enhancement | | The AF is notified when the UE has become available after a DDN failure and the traffic matches the packet filter provided by the AF. The feature is not applicable to pre-5G. | |
| 16 | | Enhanced\_param\_config | | This feature supports the co-existence of multiple event configurations for target UE(s) if there are parameters affecting periodic RAU/TAU timer and/or Active Time. Supporting this feature also requires the support of feature number 1 or 2. | |
| 17 | | API\_support\_capability\_notification | | The SCS/AS is notified of the availability of support of service APIs. This feature is only applicable in interworking SCEF+NEF scenario. | |
| 18 | | eLCS | | This feature supports the enhanced location exposure service (e.g. location information preciser than cell level).  The feature is not applicable to pre-5G (e.g. 4G). | |
| 19 | | NSAC | | This feature controls the support of the Network Slice Admission Control (NSAC) functionalities.  The feature is not applicable to pre-5G (e.g. 4G). | |
| 20 | | Partial\_group\_modification | | This feature supports the partial cancellation and/or partial addition to the group member(s) within the grouped event monitoring subscription. | |
| 21 | | UAV | | The SCS/AS requests to be notified of the UAV presence status in a specific geographic area. This feature is only applicable in interworking SCEF+NEF scenario, or standalone 5G scenario.  This feature requires that Number\_of\_UEs\_in\_an\_area\_notification and Number\_of\_UEs\_in\_an\_area\_notification\_5G features are also supported. | |
| 22 | | MULTIQOS | | This feature indicates the support for "Multiple QoS Class" which enables to support more than one Location QoS during LCS procedures.  This feature requires that the eLCS feature is also supported. | |
| 23 | | Session\_Management\_Enhancement | | This feature supports Session Management enhancement with requested DNN and/or S-NSSAI. This feature requires that the Pdn\_connectivity\_status feature or Downlink\_data\_delivery\_status\_5G feature is also supported. | |
| 24 | | enNB | | Indicates the support of enhancements to the northbound interfaces. | |
| 25 | | EDGEAPP | | This feature controls the support of EDGE applications related functionalities (e.g. support the civic address as a possible location granularity).  The feature is not applicable to pre-5G (e.g. 4G). | |
| 26 | | UEId\_retrieval | | This feature supports AF specific UE ID retrieval which is not applicable to pre-5G (e.g. 4G). | |
| 27 | | UserConsentRevocation | | This feature indicates the support of user consent revocation management and enforcement (e.g. stop data processing) for EDGE applications. | |
| 28 | | Subscription\_Patch | | This feature indicates the support of the PATCH method for partial modification of an existing event monitoring subscription. | |
| 29 | | GMEC | | This feature indicates the support of Generic Group Management, Exposure and Communication Enhancements.  The following functionalities are supported:  - Support Group Members List Change event reporting.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 30 | | Loss\_of\_connectivity\_notification\_5G | | The AF is notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication.  This feature requires that the Loss\_of\_connectivity\_notification feature is also supported.  This feature is not applicable to pre-5G (e.g. 4G). | |
| 31 | | enNB1 | | Indicates the support of enhancements to this northbound API in Rel-18. | |
| 32 | | AppDetection\_5G | | This feature indicates the support of Application traffic detection (e.g., start and stop) monitoring event.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 33 | | enNB1\_5G | | Indicates the support of enhancements to this northbound API for 5G in Rel-18.  This feature is not applicable to pre-5G (e.g. 4G). | |
| 34 | | eLCS\_en | | This feature indicates the support of the enhancements to the eLCS feature.  The following functionalities are supported:  - Support the error handling related to the area event reporting for the case where the requested location area is not allowed.  - Support location reporting over user plane between UE and AF.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 35 | | eNSAC | | This feature indicates the support of the enhancements to the NSAC feature.  The following functionalities are supported:  - Support the status notification of the current number of UEs with at least one PDU session/PDN connection.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 36 | | Ranging\_SL | | This feature indicates the support of the ranging and sidelink positioning functionality.  The following functionalities are supported:  - Support the ranging and sidelink input/output parameters.  This feature requires the support of eLCS feature.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 37 | | DataTransfer | | This feature indicates the support of Session inactivity time, Traffic volume and UL/DL data rate events for data transfer and measurement.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 38 | | RVAS\_5G | | This feature indicates the support of the 5G Roaming Value-Added Services (RVAS).  The following functionalities are supported:  - Support the reporting of the equipment and subscription identifers as part of the roaming status report in order to support the RVAS Welcome SMS functionality.  This feature requires the support of the "Roaming\_status\_notification" feature.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 39 | | eLCS\_en2 | | This feature indicates the support of the enhancements to the eLCS feature.  The following functionalities are supported:  - Support the location reporting in terms of local geographical co-ordinates.  This feature requires the support of "eLCS" feature.  This feature is not applicable to pre-5G (e.g., 4G). | |
| 40 | | SAT\_STRFWD\_OP | | This feature indicates the support of 5G satellite services:  The following functionalities are supported:  - Support the SCS/AS requests to be notified about the Store and Forward Satellite Operation. | |
| 41 | | enNB2 | | Indicates the support of the enhancements to this northbound API in Rel-19.  The following functionalities are supported:  - Support to optionally provide the new PEI when reporting the "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION" event.  - Support to provide the IP domain associated with the UE's IPv4 address. | |
| 42 | | Energy | | Indicates the support of the Energy consumption information exposure feature.  The following functionalities are supported:  - Support to provide energy consumption information for the UE at different granularity level.  This feature is not applicable to pre-5G (e.g., 4G). | |

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