**3GPP TSG- Meeting # *s3i250056***

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
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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:*** | SMF enhancement for LI for 5G ProSe Communication via 5G ProSe UE-to-Network Relay - Stage 3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | SA3LI (Ministère Economie et Finances) | | | | | | | | | |
| ***Source to TSG:*** | SA3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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:*** | | Absence of LI for 5G ProSe Communication via 5G ProSe UE-to-Network Relay - Stage 3 | | | | | | | | |
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| ***Summary of change:*** | | SMF enhancement for LI for 5G ProSe Communication via 5G ProSe UE-to-Network Relay - Stage 3 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | LI for 5G ProSe Communication via 5G ProSe UE-to-Network Relay - Stage 3 would still be missing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.3.2.1; 6.2.3.2.3; 6.2.3.2.5; 6.2.3.2.9 (New); 6.2.3.2.10 (New); 6.2.3.7; TS33128Payloads.asn | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Schema changes for this CR can be found on the Forge:  Merge Request: <https://forge.3gpp.org/rep/sa3/li/-/merge_requests/307>  Commit Hash: <https://forge.3gpp.org/rep/sa3/li/-/commit/69ca852385dbce33ae13a732f0d3757b4d271b7a> | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | s3i250019 | | | | | | | | |

START OF FIRST CHANGE

##### 6.2.3.2.1 General

The IRI-POI present in the SMF shall send the xIRIs over LI\_X2 for each of the events listed in TS 33.127 [5] clause 6.2.3.3, the details of which are described in the following clauses. In the case where the SMF is part of a combined SMF+PGW-C, the details of the events are specified in clause 6.3.3.2. The IRI-POI present in the SMF shall also send a SeparatedLocationReporting xIRI (as described in clause 7.3.4.1) when the IRI-POI provisioned in the H-SMF detects that the V-SMF has sent location data via the HsmfUpdateData service operation to the H-SMF that does not otherwise trigger an existing SMF record type.

As specified in TS 23.501 [2] clause 5.6.1, a PDU session may support either a single-access PDU Connectivity Service (referred to as a single-access PDU Session) or a multi-access PDU Connectivity Service (referred to as a Multi-Access PDU (MA PDU) session).

The details of the messages for single-access PDU sessions are provided below in clauses 6.2.3.2.2, 6.2.3.2.3, 6.2.3.2.4, 6.2.3.2.5 and 6.2.3.2.6.

The details of the messages for multi-access PDU sessions are provided below in clauses 6.2.3.2.7 and 6.2.3.2.8.

The details of the messages for target 5G ProSe Remote UE connected to or disconnected from a 5G ProSe layer-3 UE-to-network Relay UE are provided below in clauses 6.2.3.2.9 and 6.2.3.2.10.

END OF FIRST CHANGE

START OF SECOND CHANGE

##### 6.2.3.2.3 PDU session modification

The IRI-POI in the SMF shall generate an xIRI containing an SMFPDUSessionModification record when the IRI-POI present in the SMF detects that a single-access PDU session has been modified for the target UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO), receives the N1 NAS message (via AMF) PDU SESSION MODIFICATION COMPLETE from the UE and the 5GSM state within the SMF is returned to PDU SESSION ACTIVE (see TS 24.501 [13] clauses 6.1.3.3, 6.3.2 and 6.4.2). This applies to the following two cases:

- UE initiated PDU session modification (see TS 23.502 [4] clause 4.3.3.2).

- Network initiated PDU session modification (see TS 23.502 [4] clause 4.3.3.2).

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO), sends the N1 NAS message (via AMF) PDU SESSION ESTABLISHMENT ACCEPT to the UE and the 5GSM state within the SMF remains in the PDU SESSION ACTIVE (see TS 24.501 [13] clause 6.1.3.3 and 6.4.1). This applies to the following case:

- Handover from one access type to another access type happens (e.g. 3GPP to non-3GPP); see TS 23.502 [4] clauses 4.9.2.1 and 4.9.2.2).

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO), sends the Nsmf\_PDUSession\_UpdateSMContext response to the AMF when the PDU session modified or SM context is changed. In this case, the Nsmf\_PDUSession\_UpdateSMContext response may not have an embedded NAS message. This applies to the following case:

- Handover scenarios (5G to 5G, see TS 23.502 [4] clauses 4.9.1.2 and 4.9.1.3).

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) receives the N4: PFCP Session Establishment Response when a PFCP session is established on a new UPF (or V-UPF in a roaming case) within the existing SM Context without a following Nsmf\_PDUSession\_Update\_Context message being sent to the AMF. This applies to the following case:

- Handover scenarios (5G to 5G, see TS 23.502 [4] clauses 4.9.1.2 and 4.9.1.3).

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) receives the N4: PFCP Session Modification Response when a new tunnel Identifier (local or remote) is added to the PDU session or removed from the PDU session without a following Nsmf\_PDUSession\_Update\_Context message being sent to the AMF. This applies to the following case:

- Handover scenarios (5G to 5G, see TS 23.502 [4] clauses 4.9.1.2 and 4.9.1.3).

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) receives the N4: PFCP Session Deletion Response when a PFCP session is deleted from an SM Context that remains active. This applies to the following case:

- Handover scenarios (5G to 5G, see TS 23.502 [4] clauses 4.9.1.2 and 4.9.1.3).

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) receives the N16: Nsmf\_PDU\_Session\_Update Response message with n1SmInfoFromUe IE containing the PDU SESSION MODIFICATION COMPLETE (see TS 29.502 [16] clauses 5.2.1, 5.2.2.8, 5.2.3, and 6.1.6.4). This applies to the following three cases:

- UE initiated PDU session modification (see TS 23.502 [4] clause 4.3.3.3).

- Network (VPLMN) initiated PDU session modification (see TS 23.502 [4] clause 4.3.3.3).

- Network (HPLMN) initiated PDU session modification (see TS 23.502 [4] clause 4.3.3.3).

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) sends the N16: Nsmf\_PDU\_Session\_Create Response message with n1SmInfoToUe IE containing the PDU SESSION ESTABLISHMENT ACCEPT (see TS 29.502 [16] clauses 5.2.1, 5.2.2.8, 5.2.3, and 6.1.6.4) while it had received a N16 Nsmf\_PDU\_Session\_Create Request message with an existing PDU Session Id with access type being changed. This applies to the following case:

- Handover from one access type to another access type happens (e.g. 3GPP to non-3GPP); see TS 23.502 [4] clauses 4.9.2.3 and 4.9.2.4) where the V-SMF is used for the PDU session on the new access type only.

- For a home-routed roaming scenario, the SMF in the HPLMN (i.e. H-SMF) sends the N16: Nsmf\_PDU\_Session\_Update Response message with n1SmInfoToUe IE containing the PDU SESSION ESTABLISHMENT ACCEPT (see TS 29.502 [16]) while it had received a N16 Nsmf\_PDU\_Session\_Update Request message with an existing PDU Session Id with access type being changed. This applies to the following case:

- Handover from one access type to another access type happens (e.g. 3GPP to non-3GPP) where the same V-SMF is used for the PDU session on both access types.

- For a non-roaming scenario, SMF sends a Nsmf\_EventExposure\_Notify request to the NEF or AF for the target UE for the event "UP Path Change" related to a corresponding subscription from AF (see TS 29.508 [90] clause 4.2.2).

- For a non-roaming scenario, SMF sends a Nsmf\_EventExposure\_AppRelocationInfo response to the NEF or AF for the target UE in response to Nsmf\_EventExposure\_AppRelocationInfo request sent by NEF or AF to SMF (see TS 29.508 [90] clause 4.2.5).

- For a non-roaming scenario, SMF receives a Nnef\_PFDManagement\_Fetch response from the NEF for the target UE in response to Nnef\_PFDManagement\_Fetch request sent by SMF to NEF (see TS 29.551 [96] clause 4.2.2).

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO), receives the N1 NAS message (via AMF) Remote UE Report from the target UE behaving as a 5G ProSe layer-3 UE-to-network relay UE. N1 NAS message Remote UE Report informs that one or several 5G Prose Remote UEs connect to or disconnect from a target 5G ProSe layer-3 UE-to-network Relay UE.

If the Npcf\_SMPolicyControlUpdateNotify response sent to the PCF for the target UE in response to an Npcf\_SMPolicyControlUpdateNotify request includes PCC rules in which the traffic control policy data contains either a routeToLocs IE or trafficSteeringPolIdDl IE and/or trafficSteeringPolIdUl IE, then the SMF shall include those PCC rules in the xIRI. These PCC rules correspond to policies that influence the target UE’s traffic flows (see TS 29.513 [88] clause 5.5.3).

Table 6.2.3.2.3-1: Payload for SMFPDUSessionModification record

| Field name | Type | Cardinality | Description | M/C/O |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI was not authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available. | C |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the N3IWF, TNGF or TWIF, if available. IP addresses are given as 4 octets (for IPv4) or 16 octets (for IPv6) with the most significant octet first (network byte order). | C |
| location | Location | 0..1 | Location information provided by the AMF or present in the context at the SMF, if available. | C |
| requestType | FiveGSMRequestType | 0..1 | Type of request as described in TS 24.501 [13] clause 9.11.3.47, if available. | C |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT type associated with the access, if available. Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| pDUSessionID | PDUSessionID | 0..1 | PDU Session ID, see TS 24.501 [13] clause 9.4. Shall be provided. This parameter is conditional only for backwards compatibility. | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections associated with the reported PDU Session. Shall be included when the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter may include the additional IEs in table 6.2.3.2.2-2, if available. | C |
| uEEndpoint | UEEndpointAddress | 0..1 | UE IP address(es) assigned to the PDU Session, if available (see TS 29.244 [15] clause 5.21). | C |
| servingNetwork | SMFServingNetwork | 0..1 | Shall be present if this IE is in the SMContextUpdateData, HsmfUpdateData or message sent to the SMF or the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clauses 6.1.6.2.3, 6.1.6.2.11 and 6.1.6.2.39). | C |
| handoverState | HandoverState | 0..1 | Indicates whether the PDU Session Modification being reported was due to a handover. Shall be present if this IE is in the SMContextUpdatedData or sent by the SMF (see TS 29.502 [16] clause 6.1.6.2.3). | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See table 6.2.3.2.2-3. | M |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence, if available. The payload of a PCC rule for traffic influence is defined in table 6.2.3.2.2-6. | C |
| ePSPDNConnectionModification | EPSPDNConnectionModification | 0..1 | Provides details about PDN Connections when the SMFPDUSessionModification xIRI message is used to report PDN Connection Modification. See table 6.3.3.2.3-1 and clause 6.3.3.2.3. | C |
| uPPathChange | UPPathChange | 0..1 | Notification of the UPPathChange event. This IE is defined in TS 29.508 [90], if available, see table 6.2.3.2.3-2. | C |
| pFDDataForApp | PFDDataForApp | 0..1 | Represents the packet flow descriptions (PFDs) for an application identifier (AppId), if available. This IE is defined in TS 29.551 [96] table 6.2.3.2.3-3. | C |
| satelliteBackhaulCategory | SBIType | 0..1 | Indicates that a satellite backhaul is used towards 5G AN and the corresponding backhaul category, if available. Encoded according to TS 29.571 [17] clause 5.4.3.39. The SBIReference for this parameter shall be populated with 'TS29571\_CommonData.yaml#/components/schemas/SatelliteBackhaulCategory'. | C |
| gEOSatelliteID | GEOSatelliteID | 0..1 | Indicates the satellite ID if satellite backhaul category is GEO, if available. Encoded according to TS 29.571 [17] clause 5.4.2. | C |
| proSeRemoteUEsReport | ProSeRemoteUEsReport | 0..1 | Provides information about the newly connected 5G ProSe Remote UE(s) to the target 5G ProSe layer-3 UE-to-network Relay UE and/or disconnected 5G ProSe remote UE(s) from the target 5G ProSe layer-3 UE-to-network Relay UE, if available. See table 6.2.3.2.3-5. | C |

Table 6.2.3.2.3-2: Payload of UPPathChange

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sourceDNAI | DNAI | 0..1 | Source DNAI, if the DNAI has changed. DNAI represents the location of applications towards which the traffic routing should apply, if available. | C |
| targetDNAI | DNAI | 0..1 | Target DNAI if the DNAI has changed. | C |
| dNAIChangeType | DNAIChangeType | 0..1 | Type of a DNAI change. Possible values are “early”, “late” and “earlyAndLate” notification of UP path reconfiguration, if available. | C |
| sourceUEIPAddress | IPAddress | 0..1 | The IPv4 Address of the served UE for the source DNAI, if available. | C |
| targetUEIPAddress | IPAddress | 0..1 | The IPv4 Address of the served UE for the target DNAI, if available. | C |
| sourceTrafficRouting | RouteToLocation | 0..1 | N6 traffic routing information for the source DNAI, if available. | C |
| targetTrafficRouting | RouteToLocation | 0..1 | N6 traffic routing information for the target DNAI, if available. | C |
| mACAddress | MACAddress | 0..1 | The MAC address of the served UE, if available. | C |

Table 6.2.3.2.3-3: Payload of PFDDataForApp

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| appId | Identifier of an application. | M |
| pFDs | PFDs for an application identifier, if available. PFD is defined in TS 29.551 [96] table 6.2.3.2.3-4. | C |

Table 6.2.3.2.3-4: Payload of PFD

|  |  |  |
| --- | --- | --- |
| Field name | Description | M/C/O |
| pFDId | PFD identifier. | M |
| pFDflowDescription | Represents a set of 3-tuple with protocol, server IP address and server port for UL/DL application traffic, if available. | C |
| uRLs | Represents a set of URL, if available. | C |
| domainNames | Represents a set of FQDN, if available. | C |
| dnProtocol | Indicates the additional protocol and protocol field for domain names to be matched, if available. This IE is defined in 29.122 [63] table 5.14.2.2.4-1. | C |

Table 6.2.3.2.3-5: Payload for ProseRemoteUEsReport

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| remoteUEsContextConnected | RemoteUEContextList | 0..1 | Provides newly connected 5G ProSe Remote UE(s) information. Shall contain the remote UE context list octets if sent in the NAS N1 Remote UE Report message. Defined in TS 24.501 [13] clause 9.11.4.29. | C |
| remoteUEsContextDisconnected | RemoteUEContextList | 0..1 | Provides disconnected target 5G ProSe Remote UE(s) information. Shall contain the target remote UE context list octets if sent in the NAS N1 Remote UE Report message. Defined in TS 24.501 [13] clause 9.11.4.29. | C |

END OF SECOND CHANGE

START OF THIRD CHANGE

##### 6.2.3.2.5 Start of interception with an established PDU session

The IRI-POI in the SMF shall generate an xIRI containing an SMFStartOfInterceptionWithEstablishedPDUSession record when the IRI-POI present in the SMF detects that a single-access PDU session has already been established for the target UE when interception starts.

In a non-roaming scenario, the IRI-POI in the SMF (or in a roaming scenario, the IRI-POI in the V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedPDUSession record when it detects that a new interception for a UE is activated (i.e. provisioned by the LIPF) for the following case:

- The 5GSM state within the SMF for that UE is 5GSM: PDU SESSION ACTIVE or PDU SESSION MODIFICATION PENDING.

NOTE: The above trigger happens when the SMF (V-SMF in VPLMN for HR or SMF in the VPLMN for LBO) had not sent an N1 NAS message PDU SESSION RELEASE COMMAND to the UE for a PDU session and the SMF (V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) had previously sent an N1 NAS message PDU SESSION ESTABLISHMENT ACCEPT to that UE for the same PDU session.

- The target UE behaving as a 5G ProSe layer-3 UE-to-network Relay UE already connects 5G ProSe Remote UE(s) which use the already established PDU session.

In a home-routed roaming scenario, the IRI-POI in the H-SMF shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedPDUSession record when it detects that a new interception for a UE is activated (i.e. provisioned by the LIPF) for the following case:

- The H-SMF had not sent a Nsmf\_PDU\_Session\_Update Request (n1SmInfoToUe: PDU SESSION RELEASE COMMAND) to the V-SMF for a PDU session and H-SMF had previously sent a Nsmf\_PDU\_Session\_Create Response (n1SmInfoToUE: PDU SESSION ESTABLISHMENT ACCEPT) to the V-SMF for that PDU session.

The IRI-POI in the SMF shall generate the xIRI containing the SMFStartOfInterceptionWithEstablishedPDUSession record for each of the PDU sessions (that meets the above criteria) associated with the newly identified target UEs.

Table 6.2.3.2.5-1: Payload for SMFStartOfInterceptionWithEstablishedPDUSession record

| Field name | Type | Cardinality | Description | M/C/O |
| --- | --- | --- | --- | --- |
| sUPI | SUPI | 0..1 | SUPI associated with the PDU session (e.g. as provided by the AMF in the associated Nsmf\_PDU\_Session\_CreateSMContext service operation). Shall be present except for PEI-only unauthenticated emergency sessions. | C |
| sUPIUnauthenticated | SUPIUnauthenticatedIndication | 0..1 | Shall be present if a SUPI is present in the message and set to “true” if the SUPI has not been authenticated, or “false” if it has been authenticated. | C |
| pEI | PEI | 0..1 | PEI associated with the PDU session, if available. | C |
| gPSI | GPSI | 0..1 | GPSI associated with the PDU session, if available. | C |
| pDUSessionID | PDUSessionID | 1 | PDU Session ID as assigned by the AMF, as defined in TS 24.007 [14] clause 11.2.3.1b. | M |
| gTPTunnelID | FTEID | 1 | Contains the F-TEID identifying the UPF endpoint of the GTP tunnel used to encapsulate the traffic derived from the UL NG-U UP TNL Information (see TS 38.413 clause 9.3.4.1), as defined in TS 29.244 [15] clause 8.2.3. Non-GTP encapsulation is for further study. | M |
| pDUSessionType | PDUSessionType | 1 | Identifies selected PDU session type, see TS 24.501 [13] clause 9.11.4.11. | M |
| sNSSAI | SNSSAI | 0..1 | Slice identifier associated with the PDU session, if available. See TS 23.003 [19] clause 28.4.2 and TS 23.501 [2] clause 5.15.2. | C |
| uEEndpoint | SEQUENCE OF UEEndpointAddress | 0..N | UE endpoint address(es) if available. IP addresses are given as 4 octets (for IPv4) or 16 octets (for IPv6) with the most significant octet first (network byte order). MAC addresses are given as 6 octets with the most significant octet first (see TS 29.244 [15] clause 5.21). | C |
| non3GPPAccessEndpoint | UEEndpointAddress | 0..1 | UE's local IP address used to reach the N3IWF, TNGF or TWIF, if available. IP addresses are given as 4 octets (for IPv4) or 16 octets (for IPv6) with the most significant octet first (network byte order). | C |
| location | Location | 0..1 | Location information provided by the AMF at session establishment or present in the context at the SMF, if available. | C |
| dNN | DNN | 1 | Data Network Name associated with the target traffic, as defined in TS 23.003 [19] clause 9A and described in TS 23.502 [4] clause 4.3.2.2. Shall be given in dotted-label presentation format as described in TS 23.003 [19] clause 9.1. | M |
| aMFID | AMFID | 0..1 | Identifier of the AMF associated with the target UE, as defined in TS 23.003 [19] clause 2.10.1, if available. | C |
| hSMFURI | HSMFURI | 0..1 | URI of the Nsmf\_PDUSession service of the selected H-SMF, if available. See TS 29.502 [16] clause 6.1.6.2.2. | C |
| requestType | FiveGSMRequestType | 1 | Type of request as initially set within the PDU SESSION ESTABLISHMENT as described in TS 24.501 [13] clause 9.11.3.47. If the initial value is no longer available the request type shall be set to “existing PDU session”. | M |
| accessType | AccessType | 0..1 | Access type associated with the session (i.e. 3GPP or non-3GPP access) if provided by the AMF (see TS 24.501 [13] clause 9.11.2.1A). | C |
| rATType | RATType | 0..1 | RAT type associated with the access if provided by the AMF as part of session establishment (see TS 23.502 [4] clause 4.3.2). Values given as per TS 29.571 [17] clause 5.4.3.2. | C |
| sMPDUDNRequest | SMPDUDNRequest | 0..1 | Contents of the SM PDU DN request container, if available, as described in TS 24.501 [13] clause 9.11.4.15. | C |
| timeOfSessionEstablishment | Timestamp | 0..1 | Time at which the session establishment occurred, if available. Shall be given qualified with time zone information (i.e. as UTC or offset from UTC, not as local time). | C |
| ePS5GSComboInfo | EPS5GSComboInfo | 0..1 | Provides detailed information about PDN Connections associated with the reported PDU Session. Shall be included when the AMF has selected a SMF+PGW-C to serve the PDU session. This parameter may include the additional IEs in table 6.2.3.2.2-2, if available. | C |
| uEEPSPDNConnection | UEEPSPDNConnection | 0..1 | This IE shall be present, if available, during an EPS to 5GS Idle mode mobility or handover using the N26 interface. If present, it shall contain the EPS bearer context(s) information present in the uEEPSPDNConnection parameter of the intercepted SmContextCreateData message. (see TS 29.502 [16] clause 6.1.6.2.2). | C |
| servingNetwork | SMFServingNetwork | 0..1 | Indicates the serving core network operator PLMN, and for an SNPN, the NID. Shall be present if present in the PDU Session Context or SM Context at the SMF (see TS 29.502 [16] clause 6.1.6.2.39). | C |
| gTPTunnelInfo | GTPTunnelInfo | 1 | Contains the information for the User Plane GTP Tunnels for the PDU Session (see TS 29.502 [16] clauses 6.1.6.2.2, 6.1.6.2.9 and 6.1.6.2.39). See table 6.2.3.2.2-3. | M |
| pCCRules | PCCRuleSet | 0..1 | Set of PCC rules related to traffic influence. Each PCC rule influences the routing of a given traffic flow. If several flows are concerned, then several PCC rules shall be handled by the SMF. Traffic influence policies are originated by an AF. PCF translates these rules into PCC rules for traffic influence. The payload of a PCC rule for traffic influence is defined in table 6.2.3.2.2-6. | C |
| ePSStartOfInterceptionWithEstablishedPDNConnection | EPSStartOfInterceptionWithEstablishedPDNConnection | 0..1 | Provides details about PDN Connections when the SMFStartOfInterceptionWithEstablishedPDUSession xIRI message is used to report the start of interception on a target who already has existing PDN Connections. See table 6.3.3.2.5-1 and clause 6.3.3.2.5. | C |
| pFDDataForApps | PFDDataForApps | 0..1 | Represents a set of associations between application identifier and packet flow descriptions (PFDs), if available. | C |
| satelliteBackhaulCategory | SBIType | 0..1 | Indicates that a satellite backhaul is used towards 5G AN and the corresponding backhaul category, if available. Encoded according to TS 29.571 [17] clause 5.4.3.39. The SBIReference for this parameter shall be populated with 'TS29571\_CommonData.yaml#/components/schemas/SatelliteBackhaulCategory'. | C |
| gEOSatelliteID | GEOSatelliteID | 0..1 | Indicates the satellite ID if satellite backhaul category is GEO, if available. Encoded according to TS 29.571 [17] clause 5.4.2. | C |
| remoteUEsContextConnected | RemoteUEContextList | 0..1 | Provides connected 5G ProSe Remote UE(s) information. Shall contain the remote UE context list if available. Defined in TS 24.501 [13] clause 9.11.4.29. | C |

The IRI-POI present in the SMF generating an xIRI containing a SMFStartOfInterceptionWithEstablishedPDUSession record shall set the Payload Direction field in the PDU header to *not applicable* (Direction Value 5, see ETSI TS 103 221-2 [8] clause 5.2.6).

END OF THIRD CHANGE

START OF FOURTH CHANGE

##### 6.2.3.2.9 ProSe remote UE report

The IRI-POI in the SMF shall generate an xIRI containing an SMFProSeRemoteUEReport record when the IRI-POI present in the SMF detects that a target 5G ProSe Remote UE has connected to a 5G ProSe layer-3 UE-to-network Relay UE or disconnected from a 5G ProSe layer-3 UE-to-network Relay UE. The IRI-POI present in the SMF shall generate the xIRI for the following events:

- For a non-roaming scenario, the SMF (or for a roaming scenario, V-SMF in the VPLMN for HR or SMF in the VPLMN for LBO) returns a Nsmf\_PDUSession\_UpdateSMContext Response in response to a Nsmf\_PDUSession\_UpdateSMContext Request received from the AMF including the n1SmMsg parameter containing the N1 NAS message Remote UE Report related to a target 5G ProSe Remote UE.

Table 6.2.3.2.9-1: Payload for SMFProSeRemoteUEReport record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | Identifies the SUPI of the target 5G ProSe Remote UE connected to or disconnected from a 5G ProSe layer-3 UE-to-network Relay. | M |
| gPSI | GPSI | 0..1 | Identifies the GPSI of the target 5G ProSe Remote UE connected to or disconnected from a 5G ProSe layer-3 UE-to-network Relay. | C |
| pEI | PEI | 0..1 | Identifies the PEI of the target 5G ProSe Remote UE connected to or disconnected from a 5G ProSe layer-3 UE-to-network Relay. | C |
| pDUSessionID | PDUSessionID | 1 | PDU session of the 5G ProSe layer-3 UE-to-network Relay used by the target 5G ProSe Remote UE connected to the 5G ProSe layer-3 UE-to-network Relay UE or disconnected from the 5G ProSe layer-3 UE-to-network Relay UE. | M |
| remoteUEContextConnected | RemoteUEContext | 0..1 | Provides newly connected target 5G ProSe Remote UE information. Shall contain the target remote UE context octets if sent in the Remote UE Report message. Defined in TS 24.501 [13] clause 9.11.4.29.2. | C |
| remoteUEContextDisconnected | RemoteUEContext | 0..1 | Provides disconnected target 5G ProSe Remote UE information. Shall contain the target remote UE context octets if sent in the Remote UE Report message. Defined in TS 24.501 [13] clause 9.11.4.29.2. | C |
| location | Location | 0..1 | Location of the target 5G ProSe Remote UE if available. Shall be encoded using the Location.locationInfo.userLocation parameter. If available, other parameters reportable via Location shall be included. | C |

##### 6.2.3.2.10 Start of interception with connected ProSe remote UE

The IRI-POI in the SMF shall generate an xIRI containing an SMFStartOfInterceptionWithConnectedProSeRemoteUE record when the IRI-POI present in the SMF detects that a target 5G ProSe remote UE has already been connected to a 5G ProSe layer-3 UE-to-network relay UE when interception starts.

Table 6.2.3.2.10-1: Payload for SMFStartOfInterceptionWithConnectedProSeRemoteUE record

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Field name | Type | Cardinality | Description | M/C/O |
| sUPI | SUPI | 1 | Identifies the SUPI of the target 5G ProSe Remote UE connected to a 5G ProSe layer-3 UE-to-network Relay. | M |
| gPSI | GPSI | 0..1 | Identifies the GPSI of the target 5G ProSe Remote UE connected to a 5G ProSe layer-3 UE-to-network Relay. | C |
| pEI | PEI | 0..1 | Identifies the PEI of the target 5G ProSe Remote UE connected to a 5G ProSe layer-3 UE-to-network Relay. | C |
| pDUSessionID | PDUSessionID | 1 | PDU session of the 5G ProSe layer-3 UE-to-network Relay used by the target 5G ProSe Remote UE connected to the 5G ProSe layer-3 UE-to-network Relay UE. | M |
| remoteUEContextConnected | RemoteUEContext | 0..1 | Provides newly connected target 5G ProSe Remote UE information. Shall contain the target remote UE context octets if available. Defined in TS 24.501 [13] clause 9.11.4.29.2. | C |
| location | Location | 0..1 | Location of the target 5G ProSe Remote UE if available. Shall be encoded using the Location.locationInfo.userLocation parameter. If available, other parameters reportable via Location shall be included. | C |

END OF FOURTH CHANGE

START OF FIFTH CHANGE

#### 6.2.3.7 Generation of IRI over LI\_HI2

When an xIRI is received over LI\_X2 from the IRI-POI in the SMF or the IRI-POI in the UPF, the MDF2 shall send the IRI message over LI\_HI2 without undue delay. The IRI message shall contain a copy of the relevant record received from LI\_X2. The record may be enriched by other information available at the MDF (e.g. additional location information).

The ETSI TS 102 232-1 [9] *@LI-PS-PDU.pSHeader.timeStamp* field shall be set to the time at which the SMF event was observed (i.e. the timestamp field of the xIRI).

The *@LI-PS-PDU.payload.iRIPayloadSequence.iRIType* parameter (see ETSI TS 102 232-1 [9] clause 5.2.10) shall be included and coded according to table 6.2.3.7-1.

Table 6.2.3.7-1: IRI type for IRI messages

|  |  |
| --- | --- |
| Record type | IRI Type |
| SMFPDUSessionEstablishment | BEGIN |
| SMFPDUSessionRelease | END |
| SMFPDUSessionModification | CONTINUE |
| SMFStartOfInterceptionWithEstablishedPDUSession | BEGIN |
| SMFUnsuccessfulProcedure | REPORT |
| SMFMAPDUSessionEstablishment | BEGIN |
| SMFMAPDUSessionRelease | END |
| SMFMAPDUSessionModification | CONTINUE |
| SMFStartOfInterceptionWithEstablishedMAPDUSession | BEGIN |
| SMFMAUnsuccessfulProcedure | REPORT |
| SMFPDUtoMAPDUSessionModification | CONTINUE |
| PDHeaderReport | REPORT |
| PDSummaryReport | REPORT |
| SMFProSeRemoteUEReport | REPORT |
| SMFStartOfInterceptionWithConnectedProseRemoteUE | REPORT |

IRI messages associated with the same PDU Session shall be assigned the same CIN (see ETSI TS 102 232-1 [9] clause 5.2.4).

The *@LI-PS-PDU.payload.iRIPayloadSequence.iRIContents.threeGPP33128DefinedIRI* field (see ETSI TS 102 232-7 [10] clause 15) of the LI\_HI2 message shall be populated with the BER-encoded *IRIPayload*.

When an additional warrant is activated on a target UE and the LIPF uses the same XID for the additional warrant, the MDF2 shall be able to generate and deliver the IRI message containing the SMFStartOfInterceptionWithEstablishedPDUSession record and the SMFStartOfInterceptionWithEstablishedMAPDUSession record to the LEMF associated with the additional warrant without receiving a corresponding xIRI. The payload of the SMFStartOfInterceptionWithEstablishedPDUSession record is specified in table 6.2.3.2.5-1, while the payload of the SMFStartOfInterceptionWithEstablishedMAPDUSession record is specified in table 6.2.3.4-1. The MDF2 shall generate and deliver the IRI message containing the SMFStartOfInterceptionWithEstablishedPDUSession record for each of the established PDU sessions to the LEMF associated with the new warrant. The MDF2 shall generate and deliver the IRI message containing the SMFStartOfInterceptionWithEstablishedMAPDUSession record for each of the established MA PDU sessions to the LEMF associated with the new warrant.

If the MDF2 did not receive a previous *SMFStartOfInterceptionWithEstablishedPDUSession.timeOfSessionEstablishment* or *SMFStartOfInterceptionWithEstablishedMAPDUSession*.*timeOfSessionEstablishment* for the same session from the IRI-POI, , the MDF2 shall set the value of the *SMFStartOfInterceptionWithEstablishedPDUSession.timeOfSessionEstablishment* or *SMFStartOfInterceptionWithEstablishedMAPDUSession*.*timeOfSessionEstablishment* to the time provided in the timestamp previously received in the header of the related SMFPDUSessionEstablishment or SMFMAPDUSessionEstablishment xIRI.

When the delivery of packet header information is authorised and approach 2 described in clause 6.2.3.9.1 is used, the MDF2 shall generate the IRI message and send it over LI\_HI2 without undue delay when xCC is received over LI\_MDF from the MDF3. The MDF2 shall generate packet header information reporting as described in clause 6.2.3.5.

END OF FIFTH CHANGE

START OF CHANGE 1

---a/33128/r19/TS33128Payloads.asn  
+++b/33128/r19/TS33128Payloads.asn

@@ -304,7 +304,11 @@ XIRIEvent ::= CHOICE

304 304 iMSHSSSubscriberRecordChange [174] IMSHSSSubscriberRecordChange,

305 305

306 306 -- AMF events, see clause 6.2.2.2.14, continued from tag 147

307 - aMFUEContextUpdate [175] AMFUEContextUpdate

307 + aMFUEContextUpdate [175] AMFUEContextUpdate,

308 +

309 + -- SMF events, see clause 6.2.3.2 continued from tag 61

310 + sMFProSeRemoteUEReport [176] SMFProSeRemoteUEReport,

311 + sMFStartOfInterceptionWithConnectedProSeRemoteUE [177] SMFStartOfInterceptionWithConnectedProSeRemoteUE

308 312 }

309 313

310 314 -- ==============

@@ -592,7 +596,11 @@ IRIEvent ::= CHOICE

592 596 iMSHSSSubscriberRecordChange [174] IMSHSSSubscriberRecordChange,

593 597

594 598 -- AMF events, see clause 6.2.2.3, continued from tag 147

595 - aMFUEContextUpdate [175] AMFUEContextUpdate

599 + aMFUEContextUpdate [175] AMFUEContextUpdate,

600 +

601 + -- SMF events, see clause 6.2.3.7 continued from tag 61

602 + sMFProSeRemoteUEReport [176] SMFProSeRemoteUEReport,

603 + sMFStartOfInterceptionWithConnectedProSeRemoteUE [177] SMFStartOfInterceptionWithConnectedProSeRemoteUE

596 604 }

597 605

598 606 IRITargetIdentifier ::= SEQUENCE

@@ -2375,7 +2383,8 @@ SMFPDUSessionModification ::= SEQUENCE

2375 2383 uPPathChange [19] UPPathChange OPTIONAL,

2376 2384 pFDDataForApp [20] PFDDataForApp OPTIONAL,

2377 2385 satelliteBackhaulCategory [21] SBIType OPTIONAL,

2378 - gEOSatelliteID [22] GEOSatelliteID OPTIONAL

2386 + gEOSatelliteID [22] GEOSatelliteID OPTIONAL,

2387 + proSeRemoteUEsReport [23] ProSeRemoteUEsReport OPTIONAL

2379 2388 }

2380 2389

2381 2390 -- See clause 6.2.3.2.4 for details of this structure

@@ -2428,7 +2437,8 @@ SMFStartOfInterceptionWithEstablishedPDUSession ::= SEQUENCE

2428 2437 ePSStartOfInterceptionWithEstablishedPDNConnection [25] EPSStartOfInterceptionWithEstablishedPDNConnection OPTIONAL,

2429 2438 pFDDataForApps [26] PFDDataForApps OPTIONAL,

2430 2439 satelliteBackhaulCategory [27] SBIType OPTIONAL,

2431 - gEOSatelliteID [28] GEOSatelliteID OPTIONAL

2440 + gEOSatelliteID [28] GEOSatelliteID OPTIONAL,

2441 + remoteUEsContextConnected [29] RemoteUEContextList OPTIONAL

2432 2442 }

2433 2443

2434 2444 -- See clause 6.2.3.2.6 for details of this structure

@@ -2609,6 +2619,26 @@ SMFMAUnsuccessfulProcedure ::= SEQUENCE

2609 2619 sMPDUDNRequest [17] SMPDUDNRequest OPTIONAL

2610 2620 }

2611 2621

2622 + SMFProSeRemoteUEReport ::= SEQUENCE

2623 + {

2624 + sUPI [1] SUPI,

2625 + gPSI [2] GPSI OPTIONAL,

2626 + pEI [3] PEI OPTIONAL,

2627 + pDUSessionID [4] PDUSessionID,

2628 + remoteUEContextConnected [5] RemoteUEContext OPTIONAL,

2629 + remoteUEContextDisconnected [6] RemoteUEContext OPTIONAL,

2630 + location [7] Location OPTIONAL

2631 + }

2632 +

2633 + SMFStartOfInterceptionWithConnectedProSeRemoteUE ::= SEQUENCE

2634 + {

2635 + sUPI [1] SUPI,

2636 + gPSI [2] GPSI OPTIONAL,

2637 + pEI [3] PEI OPTIONAL,

2638 + pDUSessionID [4] PDUSessionID,

2639 + remoteUEContextConnected [5] RemoteUEContextList OPTIONAL,

2640 + location [6] Location OPTIONAL

2641 + }

2612 2642

2613 2643 -- =================

2614 2644 -- 5G SMF parameters

@@ -2918,6 +2948,98 @@ EASServerAddress ::= SEQUENCE

2918 2948 -- See table 5.4.2.1 of TS 29.571 [17]

2919 2949 GEOSatelliteID ::= UTF8String

2920 2950

2951 + ProSeRemoteUEsReport ::= SEQUENCE

2952 + {

2953 + remoteUEsContextConnected [1] RemoteUEContextList OPTIONAL,

2954 + remoteUEsContextDisconnected [2] RemoteUEContextList OPTIONAL

2955 + }

2956 +

2957 + RemoteUEContextList ::= SEQUENCE

2958 + {

2959 + numberOfRemoteUEContexts [1] INTEGER,

2960 + remoteUEContexts [2] SET OF RemoteUEContext

2961 + }

2962 +

2963 + RemoteUEContext ::= SEQUENCE

2964 + {

2965 + remoteUEIDFormat [1] RemoteUEIDFormat,

2966 + remoteUEIDType [2] RemoteUEIDType,

2967 + remoteUEID [3] RemoteUEID,

2968 + uDPPortRangeIndicator [4] BOOLEAN,

2969 + tCPPortRangeIndicator [5] BOOLEAN,

2970 + protocolUsedByRemoteUE [6] ProtocolUsedByRemoteUE,

2971 + addressInformation [7] AddressInformation OPTIONAL,

2972 + hPLMNID [8] PLMNID OPTIONAL

2973 + }

2974 +

2975 + ProtocolUsedByRemoteUE ::= ENUMERATED

2976 + {

2977 + noIPInfo(1),

2978 + iPv4(2),

2979 + iPv6(3),

2980 + unstructured(4),

2981 + ethernet(5)

2982 + }

2983 +

2984 + RemoteUEIDFormat ::= ENUMERATED

2985 + {

2986 + nAI(1),

2987 + sixtyFourBitString(2)

2988 + }

2989 +

2990 + RemoteUEIDType ::= ENUMERATED

2991 + {

2992 + uPPRUKID(1),

2993 + cPPRUKID(2),

2994 + iMEI(3),

2995 + iMEISV(4)

2996 + }

2997 +

2998 + RemoteUEID ::= CHOICE

2999 + {

3000 + uPPRUKIDNAI [1] NAI,

3001 + uPPRUKID64BitString [2] BIT STRING (SIZE(64)),

3002 + cPPRUKIDNAI [3] NAI,

3003 + cPPRUKID64BitString [4] BIT STRING (SIZE(64)),

3004 + iMEI [5] IMEI,

3005 + iMEISV [6] IMEISV

3006 + }

3007 +

3008 + AddressInformation ::= CHOICE

3009 + {

3010 + iPv4Address [1] IPv4Address,

3011 + iPv4AddressUDPPortRange [2] IPv4AddressUDPPortRange,

3012 + iPv4AddressTCPPortRange [3] IPv4AddressTCPPortRange,

3013 + iPv4AddressUDPTCPPortRange [4] IPv4AddressUDPTCPPortRange,

3014 + iPv6Address [5] IPv6Address,

3015 + ethernetAddress [6] MACAddress

3016 + }

3017 +

3018 + IPv4AddressUDPPortRange ::= SEQUENCE

3019 + {

3020 + iPv4Address [1] IPv4Address,

3021 + uDPPortRange [2] PortRange

3022 + }

3023 +

3024 + IPv4AddressTCPPortRange ::= SEQUENCE

3025 + {

3026 + iPv4Address [1] IPv4Address,

3027 + tCPPortRange [2] PortRange

3028 + }

3029 +

3030 + IPv4AddressUDPTCPPortRange ::= SEQUENCE

3031 + {

3032 + iPv4Address [1] IPv4Address,

3033 + uDPPortRange [2] PortRange,

3034 + tCPPortRange [2] PortRange

3035 + }

3036 +

3037 + PortRange ::= SEQUENCE

3038 + {

3039 + portStart [1] INTEGER (0..65535),

3040 + portEnd [2] INTEGER (0..65535)

3041 + }

3042 +

2921 3043 -- ================================

2922 3044 -- PGW-C + SMF PDNConnection Events

2923 3045 -- ================================

END OF CHANGE 1

END OF LAST CHANGE