**3GPP TSG-CT WG4 Meeting #99e**

**E-Meeting, 18th – 28th Aug 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **29.274** | **CR** | **1993** | **rev** | **2** | **Current version:** | **16.4.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Enhancement of network event reporting |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Ericsson |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | TEI16 |  | ***Date:*** | 11-08-2020 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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 canbe 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:*** | TS 23.401 and TS 23.682 require the PGW to return the IP address used for Non-IP tunnelling (i.e. “SGi PtP tunnelling based on UDP/IP”) on the SGi interface, to the MME for use when reporting the PDN Connectivity Status event. See TS 23.401 CR 3454 ([S2-188375](file:///C%3A%5CUsers%5Clandais2%5CAppData%5CRoaming%5CMicrosoft%5CWord%5CDocs%5CS2-188375.zip)), TS 23.682 CR 0404 ([S2-188890](file:///C%3A%5CUsers%5Clandais2%5CAppData%5CRoaming%5CMicrosoft%5CWord%5CDocs%5CS2-188890.zip)). Excerpt from TS 23.401:4.3.17.8.3.3.2 SGi PtP tunnelling based on UDP/IP…The P-GW performs the IP related operations (e.g. allocates IP address for the PDN connection), but the IP address or IP prefix is not provided to the UE (i.e. SLAAC / Router Advertisements are not performed. DHCP or DHCPv6 are not used). In the case of IPv6 the P-GW assigns an Interface Identifier for the PDN connection. The allocated IP address or IPv6 prefix identifies the PDN connection of the UE. The P-GW shall inform the MME of the assigned IPv4 address or IPv6 prefix and Interface Identifier for a PDN Connection of a given UE. However, the UE is not informed about the assigned IPv6 prefix and Interface Identifier.Corresponding changes to GTPv2 have been missed. |
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| ***Summary of change:*** | A new optional IE is introduced to carry the IPv4 address or IPv6 prefix and interface identifier allocated for the SGi PtP tunnel based on UDP/IP. |
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| ***Consequences if not approved:*** | Stage 2 requirements cannot be implemented. For PDN Type Non-IP, MME cannot provide IP address allocated for SGi PtP tunnelling based on UDP/IP, in PDN Connecitivity status event reporting |
|  |  |
| ***Clauses affected:*** | 7.2.2, 8.1, 8.x |
|  |  |
|  | **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:*** | Rev. 1: A new IE is defined in Create Session Response to return the addressing information used for SGi Ptp tunnelling. |

\* \* \* First Change \* \* \* \*

### 7.2.2 Create Session Response

The Create Session Response message shall be sent on the S11/S4 interfaces by the SGW to the MME/S4-SGSN, on the S5/S8 interfaces by the PGW to the SGW, on the S2b interface by the PGW to the ePDG, and on the S2a interface by the PGW to the TWAN as part of the procedures listed for the Create Session Request (see clause 7.2.1).

A PGW may receive the Create Session Response message sent from another PGW (see clause 7.2.1), the PGW shall forward the Create Session response message to the SGW as received from another PGW but with the following modifications:

- the destination IP address and UDP port of the message shall be set to the source IP address and UDP port of the Create Session Request message received from the SGW;

- the source IP address and UDP port of the message shall be set to the IP address and port of the forwarding PGW.

If handling of default bearer fails, then cause at the message level shall be a failure cause.

Possible Cause values are specified in Table 8.4-1. Message specific cause values are:

- "Request accepted".

- "Request accepted partially".

- "New PDN type due to network preference".

- "New PDN type due to single address bearer only".

- "Missing or unknown APN".

- "GRE key not found".

- "Preferred PDN type not supported".

- "All dynamic addresses are occupied".

- "Remote peer not responding".

- "Semantic error in the TFT operation".

- "Syntactic error in the TFT operation".

- "Semantic errors in packet filter(s)".

- "Syntactic errors in packet filter(s)".

- "User authentication failed".

- "APN access denied – no subscription".

- "APN Restriction type incompatibility with currently active PDN Connection".

- "Version not supported by next peer".

- "Denied in RAT".

- "Protocol type not supported".

- "APN congestion".

- "Multiple PDN connections for a given APN not allowed".

- "Multiple accesses to a PDN connection not allowed".

- "Context not found".

- "UE not authorised by OCS or external AAA Server".

Table 7.2.2-1: Information Elements in a Create Session Response

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| Cause | M | See NOTE 2 and NOTE 4. | Cause | 0 |
| Change Reporting Action  | C | This IE shall be included on the S5/S8 and S4/S11 interfaces with the appropriate Action field if the location Change Reporting mechanism is to be started or stopped for this subscriber in the SGSN/MME. | Change Reporting Action | 0 |
| CSG Information Reporting Action | CO | This IE shall be included on the S5/S8 and S4/S11 interfaces with the appropriate Action field if the CSG Info reporting mechanism is to be started or stopped for this subscriber in the SGSN/MME. | CSG Information Reporting Action | 0 |
| H(e)NB Information Reporting | CO | This IE shall be included on the S5/S8 and S4/S11 interfaces with the appropriate Action field if H(e)NB information reporting is to be started or stopped (during a TAU/RAU with SGW change if started earlier) for the PDN connection in the SGSN/MME. | H(e)NB Information Reporting | 0 |
| Sender F-TEID for Control Plane | C | This IE shall be sent on the S11/S4 interfaces. For the S5/S8/ S2a/S2b interfaces it is not needed because its content would be identical to the IE PGW S5/S8/ S2a/S2b F-TEID for PMIP based interface or for GTP based Control Plane interface. | F-TEID | 0 |
| PGW S5/S8/ S2a/S2b F-TEID for PMIP based interface or for GTP based Control Plane interface | C | The PGW shall include this IE on the S5/S8 interfaces during the Initial Attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, UE requested PDN connectivity, PDP Context Activation and a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN procedures.If the SGW receives this IE it shall forward the IE to MME/S4-SGSN on the S11/S4 interface.This IE shall include the TEID for GTP based S5/S8 case and the uplink GRE key in the PMIP based S5/S8 case.For PMIP based S5/S8, this IE shall be included on the S11/S4 interface and shall contain the PGW S5/S8 IP address for control plane; the same IP address shall be used for both control plane and the user plane communication if the Bearer Context IE does not contain a S5/S8-U PGW F-TEID IE. See NOTE 7.The PGW shall include this IE on the S2b interface during the Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, Handover to Untrusted Non-3GPP IP Access with GTP on S2b procedures and Initial Attach for emergency session (GTP on S2b).The PGW shall include this IE on the S2a interface during the Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, UE initiated Connectivity to Additional PDN with GTP on S2a and Handover to TWAN with GTP on S2a proceduresSee NOTE 6. | F-TEID | 1 |
| PDN Address Allocation (PAA) | C | This IE shall be included on the S5/S8, S4/S11 and S2a/S2b interfaces for the E-UTRAN initial attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN, UE requested PDN connectivity, Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, Handover to Untrusted Non-3GPP IP Access with GTP on S2b, Initial Attach for emergency session (GTP on S2b), Initial Attach in WLAN on GTP S2a, Initial Attach in WLAN for Emergency Service on GTP S2a, UE initiated Connectivity to Additional PDN with GTP on S2a and Handover to TWAN with GTP on S2a.The PDN type field in the PAA shall be set to IPv4, or IPv6 or IPv4v6, Non-IP or Ethernet by the PGW. See NOTE4. For the S4/S11 and S5/S8 interfaces, if the PGW uses DHCPv4 for IPv4 address allocation, the IPv4 address field shall be set to 0.0.0.0; otherwise, the IPv4 address field shall be set to non-zero value as specified in 3GPP TS 23.401 [3] and 3GPP TS 23.402 [45]. When assigning an IPv6 address the PGW shall send a non-zero Interface Identifier. See NOTE 8.For Non-IP or Ethernet PDN connections, the PDN Address and Prefix field shall not be present. | PAA | 0 |
| APN Restriction | C | This IE shall be included on the S5/S8 and S4/S11 interfaces in the E-UTRAN initial attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN and UE Requested PDN connectivity procedures.This IE shall also be included on S4/S11 during the Gn/Gp SGSN to S4 SGSN/MME RAU/TAU procedures.This IE denotes the restriction on the combination of types of APN for the APN associated with this EPS bearer Context. | APN Restriction | 0 |
| Aggregate Maximum Bit Rate (APN-AMBR) | C | This IE represents the APN-AMBR. It shall be included on the S5/S8, S4/S11 and S2a/S2b interfaces if the received APN-AMBR has been modified by the PCRF. | AMBR | 0 |
| Linked EPS Bearer ID | C | This IE shall be sent on the S4/S11 interfaces during Gn/Gp SGSN to S4-SGSN/MME RAU/TAU procedure to identify the default bearer the PGW selects for the PDN Connection. | EBI | 0 |
| Protocol Configuration Options (PCO) | C | If ePCO is not supported by the UE or the network, and if the PGW decides to return PCO to the UE during the Attach, PDN connectivity or Handover to 3GPP access procedures, PGW shall send PCO to SGW. If SGW receives the PCO IE, SGW shall forward it to MME/SGSN. | PCO | 0 |
| CO | For trusted WLAN access, if single-connection mode or multiple-connection mode is used, the PGW may include this IE over the S2a interface to send PCO to the UE. |
| Bearer Contexts created | M | EPS bearers corresponding to Bearer Contexts sent in request message. Several IEs with the same type and instance value may be included on the S5/S8 and S4/S11 as necessary to represent a list of Bearers. One single IE shall be included on the S2a/S2b interface.One bearer shall be included for E-UTRAN Initial Attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN, UE Requested PDN Connectivity , Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, Handover to Untrusted Non-3GPP IP Access with GTP on S2b, Initial Attach for emergency session (GTP on S2b), Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, UE initiated Connectivity to Additional PDN with GTP on S2a and Handover to TWAN with GTP on S2a.One or more created bearers shall be included for a Handover/TAU/RAU with an SGW change. See NOTE 2. | Bearer Context | 0 |
| Bearer Contexts marked for removal | C | EPS bearers corresponding to Bearer Contexts to be removed that were sent in the Create Session Request message.For each of those bearers an IE with the same type and instance value shall be included on the S4/S11 interfaces. | Bearer Context | 1 |
| Recovery | C | This IE shall be included on the S4/S11, S5/S8 and S2a/S2b interfaces if contacting the peer for the first time  | Recovery | 0 |
| Charging Gateway Name | C | When Charging Gateway Function (CGF) Address is configured, the PGW shall include this IE on the S5 interface. See NOTE 1. | FQDN | 0 |
| Charging Gateway Address | C | When Charging Gateway Function (CGF) Address is configured, the PGW shall include this IE on the S5 interface. See NOTE 1. | IP Address | 0 |
| PGW-FQ-CSID | C | This IE shall be included by the PGW on the S5/S8 and S2a/S2b interfaces and, when received from S5/S8 be forwarded by the SGW on the S11 interface according to the requirements in 3GPP TS 23.007 [17]. | FQ-CSID | 0 |
| SGW-FQ-CSID | C | This IE shall be included by the SGW on the S11 interface according to the requirements in 3GPP TS 23.007 [17]. | FQ-CSID | 1 |
| SGW LDN | O | This IE is optionally sent by the SGW to the MME/SGSN on the S11/S4 interfaces (see 3GPP TS 32.423 [44]), when communicating the LDN to the peer node for the first time. | Local Distinguished Name (LDN) | 0 |
| PGW LDN | O | This IE is optionally included by the PGW on the S5/S8 and S2a/S2b interfaces (see 3GPP TS 32.423 [44]), when communicating the LDN to the peer node for the first time. | Local Distinguished Name (LDN) | 1 |
| PGW Back-Off Time | O | This IE may be included on the S5/S8 and S4/S11 interfaces when the PDN GW rejects the Create Session Request with the cause "APN congestion". It indicates the time during which the MME or S4-SGSN should refrain from sending subsequent PDN connection establishment requests to the PGW for the congested APN for services other than Service Users/emergency services.See NOTE 3. | EPC Timer | 0 |
| Additional Protocol Configuration Options (APCO) | CO | If multiple authentications are supported by the PGW and if PGW received the Additional Protocol Configuration Options IE in the Create Session Request, the PGW shall include this IE on the S2b interface and perform the corresponding procedures as specified for PAP and CHAP authentication of the UE with external networks in 3GPP TS 33.402 [50]. | Additional Protocol Configuration Options (APCO) | 0 |
| O | If the PGW supports the Additional Protocol Configuration Options IE and if the PGW has received the Additional Protocol Configuration Options IE with the "DNS IPv4/IPv6 Server Address Request" parameter in the Create Session Request over S2b interface, the PGW may include this IE over the S2b interface with the "DNS IPv4/IPv6 Server Address" parameter as specified in 3GPP TS 24.008 [5].If the PGW supports the Additional Protocol Configuration Options IE and if the PGW has received the Additional Protocol Configuration Options IE with the P-CSCF IPv4 Address Request, or P-CSCF IPv6 Address Request or both parameters in the Create Session Request over the S2b interface, the PGW may include this IE over the S2b interface with the P-CSCF IPv4 Address, or P-CSCF IPv6 Address, or both parameters respectively as specified in 3GPP TS 24.008 [5]. If the PGW supports the Additional Protocol Configuration Options IE and if the PGW has received the Additional Protocol Configuration Options IE with a PDU session ID in the Create Session Request over the S2b interface, the PGW may include this IE over the S2b interface with the S-NSSAI as specified in 3GPP TS 24.302 [63] and 3GPP TS 24.008 [5]. |
| O | The PGW may include this IE on the S2a interface to provide the TWAN with additional IP configuration parameters (e.g. DNS server), if a corresponding request was received in the Create Session Request message. |
| Trusted WLAN IPv4 Parameters  | CO | The PGW shall include this IE on the S2a interface to a Trusted WLAN Access if PDN Type in the PAA is set to IPv4 or IPv4v6 and the transparent single-connection mode is used as specified in 3GPP TS 23.402 [45].This IE shall include:* The Subnet Prefix Length of the subnet from which the PGW allocates the UE's IPv4 address.
* The IPv4 Default Router Address which belongs to the same subnet as the IPv4 address allocated to the UE.
 | IPv4 Configuration Parameters (IP4CP) | 0 |
| Indication Flags | CO | This IE shall be included if any one of the applicable flags is set to 1.Applicable flags are:* PDN Pause Support Indication: this flag shall be set to 1 on the S5/S8 interface if the PGW supports the PGW Pause of Charging procedure.
* PDN Pause Enable Indication: this flag shall be set to 1 on the S5/S8 interface if the PGW enables the SGW to use the PGW Pause of Charging procedure for this PDN connection.
* Associate OCI with PGW node's identity: The PGW shall set this flag to 1 on the S5/S8 interface or S2a/S2b interface if it has included the "PGW's Overload Control Information" and if this information is to be associated with the node identity (i.e. FQDN or the IP address received from the HSS or DNS during the PGW selection) of the serving PGW. This flag shall be set to 1 by the PGW if the "PGW's Overload Control Information" is included and the Cause IE is set to a rejection cause code. The SGW shall set this flag on the S11/S4 interface if it supports the overload control feature and if the flag is set on the S5/S8 interface.
* Associate OCI with SGW node's identity: The SGW shall set this flag to 1 on the S11/S4 interface if it has included the "SGW's Overload Control Information" and if this information is to be associated with the node identity (i.e. FQDN or the IP address received from the DNS during the SGW selection) of the serving SGW. This flag shall be set to 1 by the SGW if the "SGW's Overload Control Information" is included and the Cause IE is set to a rejection cause code.
* Delay Tolerant Connection Indication: the flag shall be set to 1 on the S5/S8 and S11/S4 interface if the PDN connection is "Delay Tolerant" (see clause 8.12).
* Triggering SGSN initiated PDP Context Creation/Modification Indication: this flag shall be set to 1 on the S5/S8 interfaces if the network-initiated NBIFOM mode is used for this PDN connection. The SGW shall set this flag on the S4 interface if it supports the NBIFOM feature and the flag is set on the S5/S8 interface.
 | Indication | 0 |
| Presence Reporting Area Action | CO | This IE shall be included on the S5/S8 and S11/S4 interfaces with the appropriate Action field if reporting changes of UE presence in a Presence Routing Area is to be started, stopped or modified for this subscriber in the MME/SGSN.Several IEs with the same type and instance value may be included as necessary to represent a list of Presence Reporting Area Actions. One IE shall be included per PRA to be started, stopped or modified. | Presence Reporting Area Action | 0 |
| PGW's node level Load Control Information | O | The PGW may include this IE on the S5/S8 or S2a/S2b interface, providing its node level load information, if the load control feature is supported by the PGW and is activated for the PLMN to which the access network node, i.e. MME/S4-SGSN for 3GPP access network, ePDG/TWAN for non-3GPP access network, belongs (see clause 12.2.6). | Load Control Information | 0 |
| CO | If the SGW receives this IE and if it supports the load control feature, it shall forward it to the MME/S4-SGSN on the S11/S4 interface. |
| PGW's APN level Load Control Information | O | The PGW may include this IE on the S5/S8 or S2a/S2b interface, providing APN level load information, if the APN level load control feature is supported by the PGW and is activated for the PLMN to which the access network node, i.e. MME/S4-SGSN for 3GPP access network, ePDG/TWAN for non-3GPP access based network, belongs (see clause 12.2.6).When present, the PGW shall provide one or more instances of this IE, up to maximum of 10, with the same type and instance value, each representing the load information for a list of APN(s).See NOTE 9, NOTE 11. | Load Control Information | 1 |
| CO | If the SGW receives this IE and if it supports APN level load control feature, it shall forward it to the MME/S4-SGSN on the S11/S4 interface. |
| SGW's node level Load Control Information | O | The SGW may include this IE, over the S11/S4 interface if the load control feature is supported by the SGW and is activated in the network (see clause 12.2.6).When present, the SGW shall provide only one instance of this IE, representing its node level load information. | Load Control Information | 2 |
| PGW's Overload Control Information | O | During an overload condition, the PGW may include this IE on the S5/S8 or S2a/S2b interface, if the overload control feature is supported by the PGW and is activated for the PLMN to which the access network node, i.e. MME/S4-SGSN for 3GPP access based network, ePDG/TWAN for non-3GPP access based network, belongs (see clause 12.3.11).When present, the PGW shall provide:* node level overload control, in one instance of this IE; and/or
* APN level overload control , in one or more instances of this IE, up to maximum of 10, with the same type and instance value, each representing the overload information for a list of APN(s).

See NOTE 10, NOTE 12. | Overload Control Information | 0 |
| CO | If the SGW receives this IE and if it supports the overload control feature, it shall forward it to the MME/S4-SGSN on the S11/S4 interface. |
| SGW's Overload Control Information | O | During an overload condition, the SGW may include this IE over the S11/S4 interface if the overload control feature is supported by the SGW and is activated in the network (see clause 12.3.11).When present, the SGW shall provide only one instance of this IE, representing its overload information. | Overload Control Information | 1 |
| NBIFOM Container | CO | This IE shall be included on the S5/S8 or S2a/S2b interfaces if the PGW needs to send NBIFOM informationas specified in 3GPP TS 23.161 [71].The Container Type shall be set to 4. | F-Container | 0 |
| CO | If the SGW receives an NBIFOM Container from the PGW, the SGW shall forward this IE to the MME/S4-SGSN on the S11/S4 interface. |
| PDN Connection Charging ID | CO | The PGW shall include this IE on the S5/S8 or S2a/S2b interfaces, during an Initial Attach, Initial PDN connection establishment, or Addition of an access procedures, when using NBIFOM, as specified in 3GPP TS 23.161 [71]. | Charging ID | 0 |
| Extended Protocol Configuration Options (ePCO) | CO | If the PGW decides to return ePCO to the UE during an Initial Attach, UE requested PDN Connectivity procedure, and if the PGW supports the ePCO and the EPCOSI flag is set to 1 in the Create Session Request message, the PGW shall send ePCO to the SGW. If the SGW receives the ePCO IE, the SGW shall forward it to the MME.See NOTE 13. | ePCO | 0 |
| PGW node name | CO | This IE shall be included over S5/S8 interfaces by the PGW when it receives the corresponding Create Session Request message with the CSRMFI flag set to "1", and the creation of the PDN connection has been accepted.If the SGW receives this IE, the SGW shall forward it to the MME over S11 interface. (See NOTE 14) | FQDN | 0 |
| SGi PtP Tunnel Address | CO | This IE shall be included on the S5/S8 and S4/S11 interfaces, if the PDN Type is “Non-IP” and SGi PtP tunnelling based on UDP/IP is used (see clause 4.3.17.8.3.3.2 of 3GPP TS 23.401 [3]).When present, the IE shall contain the IPv4 or IPv6 address, and optionally the UDP port, that is allocated for the SGi PtP tunnel based on UDP/IP. | SGi PtP Tunnel Address | 0 |
| Private Extension | O | This IE may be sent on the S5/S8, S4/S11 and S2a/S2b interfaces. | Private Extension | VS |
| NOTE1: Both Charging Gateway Name and Charging Gateway Address shall not be included at the same time. When both are available, the operator configures a preferred value.NOTE2: If the SGW cannot accept any of the "Bearer Context Created" IEs within Create Session Request message, the SGW shall send the Create Session Response with appropriate reject Cause value. NOTE 3: The last received value of the PGW Back-Off Time IE shall supersede any previous values received from that PGW and for this APN in the MME/SGSN.NOTE4: 3GPP TS 23.401 [3] (see clause 5.3.1.1) and 3GPP TS 23.060 [35] (see clause 9.2.1) specify the handling of the cases when UE has requested IPv4v6 PDN Type, but PGW restricts the usage of IPv4v6 PDN Type. NOTE 5: The conditions of presence of the IEs in the Create Session Response for the MME and S4-SGSN triggered Serving GW relocation (see clause 5.10.4 of 3GPP TS 23.401 [3] and clause 9.2.2.4 of 3GPP TS 23.060 [35]) are identical to those specified respectively for X2 handover with SGW relocation and for Enhanced Serving RNS Relocation with SGW relocation. NOTE 6: The IP address and TEID/GRE key in "PGW S5/S8/ S2a/S2b F-TEID for PMIP based interface or for GTP based Control Plane interface" IE are only provided for the subsequent GTP-C initial messages related to this PDN connection and shall NOT be used for other PDN connections. NOTE 7: For PMIP based S5/S8, the 'S5/S8-U PGW F-TEID' IE and the 'PGW S5/S8/ S2a/S2b F-TEID for PMIP based interface or for GTP based Control Plane interface' IE shall contain the same uplink GRE key; the Interface Type in these IEs shall be set to the value 9 (S5/S8 PGW PMIPv6 interface).NOTE 8: The Interface Identifier value of zero is a reserved value (see IETF RFC 5453 [58]). Clause 5.3.1.2.2 of 3GPP TS 23.401 [3] specifies the mechanism for preventing UE's link-local address collision with the PGW's link-local address.NOTE 9: The receiver, not supporting the APN level load control feature, shall ignore all the occurrence(s) of this IE, i.e. "Load Control Information" IE with instance number "1". The receiver, supporting the APN level load control feature and supporting the APN level load information for the maximum of 10 APNs, shall handle the APN level load information for the first 10 APNs and ignore any more APN level load information.NOTE 10: The receiver, supporting the APN level overload information for the maximum of 10 APNs, shall handle the APN level overload information for the first 10 APNs and ignore any more APN level overload information.NOTE 11: The APN level load information, provided within and across different instances of the "PGW's APN level Load Control Information" IE(s) shall be limited to 10 different APNs.NOTE 12: The APN level overload information, provided within and across different instances of the "PGW's Overload Control Information" IE(s) shall be limited to 10 different APNs.NOTE 13: The MME shall consider the presence of the ePCO IE in the Create Session Response message as an indication that the PGW and the SGW support the ePCO. The UE considers that the PGW supports ePCO when it receives an ePCO from the PGW.NOTE 14: The MME shall update the PGW FQDN associated with this PDN connection using this IE. |

Table 7.2.2-2: Bearer Context Created within Create Session Response

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Octets 1 |  | Bearer Context IE Type = 93 (decimal) |  |  |
| Octets 2 and 3 |  | Length = n |  |  |
| Octets 4 |  | Spare and Instance fields |  |  |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| EPS Bearer ID | M |  | EBI | 0 |
| Cause | M | This IE shall indicate if the bearer handling was successful, and if not, it gives information on the reason. (NOTE 1, NOTE 2, NOTE 3) | Cause | 0 |
| S1-U SGW F-TEID | C | This IE shall be included on the S11 interface if the S1-U interface is used, i.e. if the S11-U Tunnel flag was not set in the Create Session Request. . See NOTE 6. | F-TEID | 0 |
| S4-U SGW F-TEID | C | This IE shall be included on the S4 interface if the S4-U interface is used. | F-TEID | 1 |
| S5/S8-U PGW F-TEID | C | For GTP-based S5/S8, this User Plane IE shall be included on S4/S11 and S5/S8 interfaces during the "E-UTRAN Initial Attach", a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, a "PDP Context Activation", a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN or a "UE Requested PDN Connectivity". | F-TEID | 2 |
|  | For PMIP-based S5/S8, this IE shall be included on the S4/S11 interface during the "E-UTRAN Initial Attach", a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, a "PDP Context Activation", a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN or a "UE Requested PDN Connectivity" if the PGW provided an alternate address for user plane, i.e. an IP address for user plane which is different from the IP address for control plane. When present, this IE shall contain the alternate IP address for user plane and the uplink GRE key.See NOTE 4 and NOTE 5. |
| S12 SGW F-TEID | C | This IE shall be included on the S4 interface if the S12 interface is used. | F-TEID | 3 |
| S2b-U PGW F-TEID | C | This IE (for user plane) shall be included on the S2b interface during the Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, Handover to Untrusted Non-3GPP IP Access with GTP on S2b, and Initial Attach for emergency session (GTP on S2b). | F-TEID | 4 |
| S2a-U PGW F-TEID | C | This IE (for user plane) shall be included on the S2a interface during the Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, UE initiated Connectivity to Additional PDN with GTP on S2a, and Handover to TWAN with GTP on S2a. | F-TEID | 5 |
| Bearer Level QoS | C | This IE shall be included on the S5/S8, S4/S11 and S2a/S2b interfaces if the received QoS parameters have been modified. | Bearer QoS | 0 |
| Charging Id | C | This IE shall be included on the S5/S8 interface for an E-UTRAN initial attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, a PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN and a UE requested PDN connectivity. | Charging Id | 0 |
| O | If the S5/S8 interface is GTP, this IE may be included on the S4 interface, in order to support CAMEL charging at the SGSN, for a PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN, inter S4-SGSN RAU with SGW change and Gn/Gp to S4-SGSN RAU. |
| CO | This IE shall be included on the S2a/S2b interface for an Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, Handover to Untrusted Non-3GPP IP Access with GTP on S2b, Initial Attach for emergency session (GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2a, and Handover to TWAN with GTP on S2a. |
| Bearer Flags | O | Applicable flags are:* PPC (Prohibit Payload Compression) : this flag may be set on the S5/S8 and S4 interfaces.
 | Bearer Flags | 0 |
| S11-U SGW F-TEID | C | This IE shall be included on the S11 interface if the S11-U interface is used, i.e. if the S11-U Tunnel flag was set in the Create Session Request.If the SGW supports both IP address types, the SGW shall send both IP addresses within the F-TEID IE. If only one IP address is included, then the MME shall assume that the SGW does not support the other IP address type. | F-TEID | 6 |
| NOTE 1: According to 3GPP TS 23.401 [3] e.g. clause 5.5.1.2.2 "S1-based handover, normal" and 3GPP TS 23.060 [35], during the handover procedure with an SGW change, except in the case of X2-handover (NOTE2 addresses X2 based HO with SGW change case), the target MME/S4-SGSN initiates the Create Session Request/Response and Modify Bearer Request/Response procedures one after the other. After receiving the "Bearer Context to be Created" IEs within Create Session Request message, the SGW may not accept some of these bearers. The SGW however shall return all bearers with the "Bearer Context Created" IEs within Create Session Response message (this table), but with different Cause values. Bearers that were not accepted by the SGW shall have an appropriate rejection value in the Cause IE. The target MME/S4-SGSN shall send these non-accepted bearers to the target SGW within the "Bearer Context to be removed" IE in a subsequent Modify Bearer Request message. Therefore, the SGW shall allocate the DL S5/S8 SGW F-TEIDs also for the non-accepted bearers. MME/S4-SGSN should remove all of the non-accepted bearers by separate procedures (e.g. an MME/S4-SGSN initiated Dedicated Bearer Deactivation procedure).NOTE 2: According to 3GPP TS 23.401 [3] clause 5.5.1.1.3, "X2-based handover with Serving GW relocation", and 3GPP TS 23.060 [35] clause 6.9.2.2.5A "Enhanced Serving RNS Relocation Procedure using S4", during the X2-handover procedure with an SGW change and Enhanced Serving RNS Relocation Procedure with an SGW change, the target MME/S4-SGSN shall initiate only the Create Session Request/Response procedure. The SGW shall return all bearers (including those not accepted by the SGW) with a "Bearer Context Created" IE within Create Session Response message (this table), but with different Cause values. Bearers that were not accepted by the SGW shall have an appropriate rejection value in the Cause IE, The MME/S4-SGSN should remove these non-accepted bearers by separate procedures as well. NOTE 3: According to 3GPP TS 23.401 [3] e.g. clause 5.3.3.1 "Tracking Area Update procedure with Serving GW change" and 3GPP TS 23.060 [35], during the RAU/TAU procedure with an SGW change, the target MME/S4-SGSN shall initiate only the Create Session Request/Response procedure. The SGW shall return all bearers (including those not accepted by the SGW) with a "Bearer Context Created" IE within Create Session Response message (this table), but with different Cause values. Bearers that were not accepted by the SGW shall have an appropriate rejection value in the Cause IE. When Active Flag or Follow-on request is set during TAU/RAU procedure, MME/S4-SGSN should not establish user plane tunnel over S1 or Iu for those bearer contexts which were not accepted by the target SGW, while in the corresponding Modify Bearer Request message, the MME/S4-SGSN shall include all accepted bearer contexts in the "Bearer Context to be modified" IE and include all non-accepted bearer contexts in the "Bearer Context to be removed" IE. The MME/S4-SGSN should remove the bearers non-accepted by either SGW or eNB/RNC by separate procedures as well.NOTE 4: The capability to receive from the LMA an alternate LMA address for user plane shall be supported homogeneously across all the SGWs, when supported over PMIP-based S5/S8.NOTE 5: For PMIP based S5/S8, the 'S5/S8-U PGW F-TEID' IE and the 'PGW S5/S8/ S2a/S2b F-TEID for PMIP based interface or for GTP based Control Plane interface' IE shall contain the same uplink GRE key; the Interface Type in these IEs shall be set to the value 9 (S5/S8 PGW PMIPv6 interface).NOTE 6: When Control Plane CIoT EPS Optimization is supported, the IP address spaces for S1-U and S11-U may be different, based on operator's deployment. If so, the following requirements shall apply: 1) if the CPOPCI (Control Plane Only PDN Connection Indication) flag is not set in the Create Session Request message, the SGW shall include both the S11-U SGW F-TEID and S1-U SGW F-TEID in the Create Session Response message, regardless of whether the S11-U Tunnel flag is set in the Create Request Request. 2) all the MMEs in the PLMN shall support receiving both the S11-U SGW F-TEID and S1-U SGW F-TEID in the Create Session Response response; the MME shall use them according to whether the CIoT Control Plane Optimization is used. |

Table 7.2.2-3: Bearer Context marked for removal within a Create Session Response

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Octet 1 |  | Bearer Context IE Type = 93 (decimal) |  |  |
| Octets 2 and 3 |  | Length = n |  |  |
| Octet 4 |  | Spare and Instance fields |  |  |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| EPS Bearer ID | M |  | EBI | 0 |
| Cause | M | This IE shall indicate if the bearer handling was successful, and if not, gives the information on the reason. | Cause | 0 |

Table 7.2.2-4: Load Control Information within Create Session Response

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Octet 1 |  | Load Control Information IE Type = 181 (decimal) |  |  |
| Octets 2 and 3 |  | Length = n  |  |  |
| Octet 4 |  | Spare and Instance fields |  |  |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| Load Control Sequence Number | M | See clause 12.2.5.1.2.1 for the description and use of this parameter. | Sequence Number | 0 |
| Load Metric | M | See clauses 12.2.5.1.2.2 and 12.2.5.1.2.3 for the description and use of this parameter. | Metric | 0 |
| List of APN and Relative Capacity | CO | The IE shall (only) be present in the "PGW's APN level Load Control Information" IE.For indicating the APN level load, the PGW shall include one or more instances of this IE, up to maximum of 10, with the same type and instance value, representing a list of APN(s) & its respective "Relative Capacity" (sharing the same "Load Metric").See clause 12.2.5.1.2.3 for the description and use of this parameter.See NOTE 1. | APN and Relative Capacity | 0 |
| NOTE 1: If more than 10 occurrences of "APN and Relative Capacity" IE are received within one instance of the Load Control Information IE, the receiver shall treat it as a protocol error and ignore the entire Load Control Information IE instance. |

Table 7.2.2-5: Overload Control Information within Create Session Response

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Octet 1 |  | Overload Control Information IE Type = 180 (decimal) |  |  |
| Octets 2 and 3 |  | Length = n  |  |  |
| Octet 4 |  | Spare and Instance fields |  |  |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| Overload Control Sequence Number | M | See clause 12.3.5.1.2.1 for the description and use of this parameter. | Sequence Number | 0 |
| Overload Reduction Metric | M | See clauses 12.3.5.1.2.3 and 12.3.5.1.2.4 for the description and use of this parameter. | Metric | 0 |
| Period of Validity | M | See clause 12.3.5.1.2.2 for the description and use of this parameter.This IE should be set to "0" if the "Overload Reduction Metric" is null. This IE shall be ignored by the receiver if the "Overload Reduction Metric" is null. | EPC Timer | 0 |
| List of Access Point Name (APN) | CO | The IE may (only) be present in the "PGW's Overload Control Information" IE.For indicating the APN level overload, the PGW shall include one or more instances of this IE, up to maximum of 10, with the same type and instance value, representing a list of APN(s) (sharing the same "Overload Reduction Metric" and "Period of Validity"). See NOTE 1. | APN | 0 |
| NOTE 1: If more than 10 occurrences of APNs are received within one instance of the Overload Control Information IE, the receiver shall treat it as a protocol error and ignore the entire Overload Control Information IE instance. |

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

## 8.1 Information Element Types

A GTP control plane (signalling) message may contain several information elements. In order to have forward compatible type definitions for the GTPv2 information elements, all of them shall be TLIV (Type, Length, Instance, Value) coded. GTPv2 information element type values are specified in the Table 8.1-1. The last column of this table indicates whether the information element is:

- Fixed Length: the IE has a fixed set of fields, and a fixed number of octets.

- Variable Length: the IE has a fixed set of fields, and has a variable number of octets.
For example, the last octets may be numbered similar to "5 to (n+4)". In this example, if the value of the length field, n, is 0, then the last field is not present.

- Extendable: the IE has a variable number of fields, and has a variable number of octets.
The last fields are typically specified with the statement: "These octet(s) is/are present only if explicitly specified". The legacy receiving entity shall ignore the unknown octets.

In order to improve the efficiency of troubleshooting, it is recommended that the information elements should be arranged in the signalling messages as well as in the grouped IEs, according to the order the information elements are listed in the message definition table or grouped IE definition table in clause 7. However the receiving entity shall be prepared to handle the messages with information elements in any order.

Within information elements, certain fields may be described as spare. These bits shall be transmitted with the value set to 0. To allow for future features, the receiver shall not evaluate these bits. GTPv2-C information elements that have similar semantics in GTPv1-C shall be converted into GTPv1-C format, as specified in TS 29.060 [4], before sending them to a pre-R8 GSN.

Table 8.1-1: Information Element types for GTPv2

| IE Type value(Decimal) | Information elements | Comment / Reference | Number of Fixed Octets |
| --- | --- | --- | --- |
| 0 | Reserved |  |  |
| 1 | International Mobile Subscriber Identity (IMSI) | Variable Length / 8.3 | Not Applicable |
| 2 | Cause | Variable Length / 8.4 | Not Applicable |
| 3 | Recovery (Restart Counter) | Variable Length / 8.5 | Not Applicable |
| 4 to 34 | Reserved for S101 interface | See 3GPP TS 29.276 [14] | See 3GPP TS 29.276 [14] |
| 35 to 50 | Reserved for S121 interface | See 3GPP TS 29.276 [14] | See 3GPP TS 29.276 [14] |
| 51 | STN-SR | See 3GPP TS 29.280 [15] | See 3GPP TS 29.280 [15] |
| 52 to 70 | Reserved for Sv interface | See 3GPP TS 29.280 [15] | See 3GPP TS 29.280 [15] |
| 71 | Access Point Name (APN) | Variable Length / 8.6 | Not Applicable |
| 72 | Aggregate Maximum Bit Rate (AMBR) | Fixed Length / 8.7 | 8 |
| 73 | EPS Bearer ID (EBI) | Extendable / 8.8 | 1 |
| 74 | IP Address | Variable Length / 8.9 | Not Applicable |
| 75 | Mobile Equipment Identity (MEI) | Variable Length / 8.10 | Not Applicable |
| 76 | MSISDN | Variable Length / 8.11 | Not Applicable |
| 77 | Indication | Extendable / 8.12 | 2 |
| 78 | Protocol Configuration Options (PCO) | Variable Length / 8.13 | Not Applicable |
| 79 | PDN Address Allocation (PAA) | Variable Length / 8.14 | Not Applicable |
| 80 | Bearer Level Quality of Service (Bearer QoS) | Extendable / 8.15 | 22 |
| 81 | Flow Quality of Service (Flow QoS) | Extendable / 8.16 | 21 |
| 82 | RAT Type | Extendable / 8.17 | 1 |
| 83 | Serving Network | Extendable / 8.18 | 3 |
| 84 | EPS Bearer Level Traffic Flow Template (Bearer TFT) | Variable Length / 8.19 | Not Applicable |
| 85 | Traffic Aggregation Description (TAD) | Variable Length / 8.20 | Not Applicable |
| 86 | User Location Information (ULI) | Extendable / 8.21 | "f+4-4" (See Figure 8.21-1) |
| 87 | Fully Qualified Tunnel Endpoint Identifier (F-TEID) | Extendable / 8.22 | 9/21/25 |
| 88 | TMSI | Variable Length / 8.23 | Not Applicable |
| 89 | Global CN-Id | Variable Length / 8.24 | Not Applicable |
| 90 | S103 PDN Data Forwarding Info (S103PDF) | Variable Length / 8.25 | Not Applicable |
| 91 | S1-U Data Forwarding Info (S1UDF) | Variable Length/ 8.26 | Not Applicable |
| 92 | Delay Value | Extendable / 8.27 | 1 |
| 93 | Bearer Context  | Extendable / 8.28 | Not Applicable |
| 94 | Charging ID | Extendable / 8.29 | 4 |
| 95 | Charging Characteristics | Extendable / 8.30 | 2 |
| 96 | Trace Information | Variable Length / 8.31 | Not Applicable |
| 97 | Bearer Flags | Extendable / 8.32 | 1 |
| 98 | Reserved |  |  |
| 99 | PDN Type | Extendable / 8.34 | 1 |
| 100 | Procedure Transaction ID | Extendable / 8.35 | 1 |
| 101 | Reserved |  |  |
| 102 | Reserved |  |  |
| 103 | MM Context (GSM Key and Triplets) | Extendable / 8.38 | "r+1-4" (See Figure 8.38-1) |
| 104 | MM Context (UMTS Key, Used Cipher and Quintuplets) | Extendable / 8.38 | "r+1-4" (See Figure 8.38-2) |
| 105 | MM Context (GSM Key, Used Cipher and Quintuplets) | Extendable / 8.38 | "r+1-4" (See Figure 8.38-3) |
| 106 | MM Context (UMTS Key and Quintuplets) | Extendable / 8.38 | "r+1-4" (See Figure 8.38-4) |
| 107 | MM Context (EPS Security Context, Quadruplets and Quintuplets) | Extendable / 8.38 | "s+64-4" (See Figure 8.38-5) |
| 108 | MM Context (UMTS Key, Quadruplets and Quintuplets) | Extendable / 8.38 | "r+1-4" (See Figure 8.38-6) |
| 109 | PDN Connection | Extendable / 8.39 | Not Applicable |
| 110 | PDU Numbers | Extendable / 8.40 | 9 |
| 111 | P-TMSI | Variable Length / 8.41 | Not Applicable |
| 112 | P-TMSI Signature | Variable Length / 8.42 | Not Applicable |
| 113 | Hop Counter | Extendable / 8.43 | 1 |
| 114 | UE Time Zone | Extendable / 8.44 | 2 |
| 115 | Trace Reference | Fixed Length / 8.45 | 6 |
| 116 | Complete Request Message | Variable Length / 8.46 | Not Applicable |
| 117 | GUTI | Variable Length / 8.47 | Not Applicable |
| 118 | F-Container | Variable Length / 8.48 | Not Applicable |
| 119 | F-Cause | Variable Length / 8.49 | Not Applicable |
| 120 | PLMN ID | Variable Length / 8.50 | Not Applicable |
| 121 | Target Identification | Variable Length / 8.51 | Not Applicable |
| 122 | Reserved  |  |  |
| 123 | Packet Flow ID  | Variable Length / 8.53 | Not Applicable |
| 124 | RAB Context  | Fixed Length / 8.54 | 9 |
| 125 | Source RNC PDCP Context Info | Variable Length / 8.55 | Not Applicable |
| 126 | Port Number | Extendable / 8.56 | 2 |
| 127 | APN Restriction | Extendable / 8.57 | 1 |
| 128 | Selection Mode | Extendable / 8.58 | 1 |
| 129 | Source Identification | Variable Length / 8.59 | Not Applicable |
| 130 | Reserved |  |  |
| 131 | Change Reporting Action | Variable Length / 8.61 | Not Applicable |
| 132 | Fully Qualified PDN Connection Set Identifier (FQ-CSID) | Extendable / 8.62 | "q+1-4" (See Figure 8.62-1) |
| 133 | Channel needed | Variable Length / 8.63 | Not Applicable |
| 134 | eMLPP Priority | Variable Length / 8.64 | Not Applicable |
| 135 | Node Type | Extendable / 8.65 | 1 |
| 136 | Fully Qualified Domain Name (FQDN) | Variable Length / 8.66 | Not Applicable |
| 137 | Transaction Identifier (TI) | Variable Length / 8.68 | Not Applicable |
| 138 | MBMS Session Duration | Extendable / 8.69 | 3 |
| 139 | MBMS Service Area | Variable Length / 8.70 | Not Applicable |
| 140 | MBMS Session Identifier | Extendable / 8.71 | 1 |
| 141 | MBMS Flow Identifier | Extendable / 8.72 | 2 |
| 142 | MBMS IP Multicast Distribution | Extendable / 8.73 | "m+1-4" (See Figure 8.73-1) |
| 143 | MBMS Distribution Acknowledge | Extendable / 8.74 | 1 |
| 144 | RFSP Index | Fixed Length / 8.77 | 2 |
| 145 | User CSG Information (UCI) | Extendable / 8.75 | 8 |
| 146 | CSG Information Reporting Action | Extendable / 8.76 | 1 |
| 147 | CSG ID | Extendable / 8.78 | 4 |
| 148 | CSG Membership Indication (CMI) | Extendable / 8.79 | 1 |
| 149 | Service indicator | Fixed Length / 8.80 | 1 |
| 150 | Detach Type | Fixed Length / 8.81 | 1 |
| 151 | Local Distiguished Name (LDN) | Variable Length / 8.82 | Not Applicable |
| 152 | Node Features | Extendable / 8.83 | 1 |
| 153 | MBMS Time to Data Transfer | Extendable / 8.84 | 1 |
| 154 | Throttling | Extendable / 8.85 | 2 |
| 155 | Allocation/Retention Priority (ARP) | Extendable / 8.86 | 1 |
| 156 | EPC Timer | Extendable / 8.87 | 1 |
| 157 | Signalling Priority Indication | Extendable / 8.88 | 1 |
| 158 | Temporary Mobile Group Identity (TMGI) | Extendable / 8.89 | 6 |
| 159 | Additional MM context for SRVCC | Extendable / 8.90 | "e-4" (See Figure 8.90-1) |
| 160 | Additional flags for SRVCC | Extendable / 8.91 | 1 |
| 161 | Reserved |  |  |
| 162 | MDT Configuration | Extendable / 8.93 | "q-4" (See Figure 8.93-1) |
| 163 | Additional Protocol Configuration Options (APCO) | Extendable / 8.94 | "m-4" (See Figure 8.94-1) |
| 164 | Absolute Time of MBMS Data Transfer | Extendable / 8.95 | 8 |
| 165 | H(e)NB Information Reporting  | Extendable / 8.96 | 1 |
| 166 | IPv4 Configuration Parameters (IP4CP) | Extendable / 8.97 | 5 |
| 167 | Change to Report Flags  | Extendable / 8.98 | 1 |
| 168 | Action Indication | Extendable / 8.99 | 1 |
| 169 | TWAN Identifier | Extendable / 8.100 | "k+6-4" (See Figure 8.100-1) |
| 170 | ULI Timestamp | Extendable / 8.101 | 4 |
| 171 | MBMS Flags | Extendable / 8.102 | 1 |
| 172 | RAN/NAS Cause | Extendable / 8.103 | "m-4" (See Figure 8.103-1) |
| 173 | CN Operator Selection Entity | Extendable / 8.104 | 1 |
| 174 | Trusted WLAN Mode Indication | Extendable / 8.105 | 1 |
| 175 | Node Number | Extendable / 8.106 | "p-4" (See Figure 8.106-1) |
| 176 | Node Identifier | Extendable / 8.107 | "q-4" (See Figure 8.107-1) |
| 177 | Presence Reporting Area Action | Extendable / 8.108 | "t-4" (See Figure 8.108-1) |
| 178 | Presence Reporting Area Information | Extendable / 8.109 | 4 |
| 179 | TWAN Identifier Timestamp | Extendable / 8.110 | 4 |
| 180 | Overload Control Information | Extendable / 8.111 | Not Applicable |
| 181 | Load Control Information | Extendable / 8.112 | Not Applicable |
| 182 | Metric | Fixed Length / 8.113 | 1 |
| 183 | Sequence Number | Fixed Length / 8.114 | 4 |
| 184 | APN and Relative Capacity | Extendable / 8.115 | "m-4" (See Figure 8.115 |
| 185 | WLAN Offloadability Indication | Extendable / 8.116 | 1 |
| 186 | Paging and Service Information | Extendable / 8.117 | m-4 (See Figure 8.117-1) |
| 187 | Integer Number | Variable / 8.118 | Not Applicable |
| 188 | Millisecond Time Stamp | Extendable / 8.119 | 6 |
| 189 | Monitoring Event Information | Extendable / 8.120 | "k+2-4" (See Figure 8.120-1) |
| 190 | ECGI List | Extendable / 8.121 | "m\*7+2" (See Figure 8.121-1) |
| 191 | Remote UE Context | Extendable / 8.122 | Not Applicable |
| 192 | Remote User ID | Extendable / 8.123 | "c-4" (see Figure 8.123-1) |
| 193 | Remote UE IP information | Variable Length / 8.124 | Not Applicable |
| 194 | CIoT Optimizations Support Indication | Extendable / 8.125 | 1 |
| 195 | SCEF PDN Connection | Extendable / 8.126 | Not Applicable |
| 196 | Header Compression Configuration | Extendable / 8.127 | 4 |
| 197 | Extended Protocol Configuration Options (ePCO) | Variable Length / 8.128 | Not Applicable |
| 198 | Serving PLMN Rate Control | Extendable / 8.129 | 4 |
| 199 | Counter | Extendable / 8.130 | 5 |
| 200 | Mapped UE Usage Type | Extendable / 8.131 | 2 |
| 201 | Secondary RAT Usage Data Report | Extendable / 8.132 | 27 |
| 202 | UP Function Selection Indication Flags | Extendable / 8.133 | 1 |
| 203 | Maximum Packet Loss Rate | Extendable / 8.134 | 1 |
| 204 | APN Rate Control Status | Extendable / 8.135 | 20 |
| 205 | Extended Trace Information | Extendable / 8.136 | "r-4" (see figure 8.136-1) |
| 206 | Monitoring Event Extension Information | Extendable / 8.137 | "k-4" (See Figure 8.137-1) |
| 207 | Additional RRM Policy Index | Fixed Length / 8.138 | 4 |
| 208 | V2X Context | Extendable / 8.139 | Not Applicable |
| 209 | PC5 QoS Parameters | Extendable / 8.140 | Not Applicable |
| 210 | Services Authorized | Extendable / 8.141 | 2 |
| 211 | Bit Rate | Extendable / 8.142 | 4 |
| 212 | PC5 QoS Flow | Extendable / 8.143 | 11 |
| x | SGi PtP Tunnel Address | Extendable / 8.x | 1 |
| y to 253 | Spare. For future use. |  |  |
| 254 | Special IE type for IE Type Extension  | See NOTE 2  | Not Applicable |
| 255 | Private Extension | Variable Length / 8.67 | Not Applicable |
| 256 to 65535 | Spare. For future use. |  |  |
| NOTE 1: The size of the TLI (Type, Length and Instance) fields, i.e "4" octets, has been subtracted from the number of the fixed octets of the "Fixed Length" and "Extendable" IEs. Hence for some of the "Extendable" IEs, for which the length is defined in terms of variable number of octets, "4" is explicitly subtracted while defining the fixed number of octets. E.g. Length of User Location Information is defined as "f+4" and fixed number of octets for the same is defined as "f+4-4".NOTE 2: The IE Type value 254 indicates that the IE Type shall be further identified by an IE Type Extension field; see clause 8.2.1A. A GTP-C entity which does not support any IE Type encoded with an IE Type Extension field shall ignore an IE received with the IE Type value 254. |

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

## 8.x SGi PtP Tunnel Address

SGi PtP Tunnel Address is coded as depicted in Figure 8.x-1.

|  |  |  |
| --- | --- | --- |
|  | Bits |  |
| Octets | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 1 | Type = x (decimal) |  |
| 2 to 3 | Length = n |  |
| 4 | Spare | Instance |  |
| 5 | Spare | Port | V6 | V4 |  |
| m to (m+3) | IPv4 address |  |
| p to (p+15) | IPv6 address  |  |
| q to (q+1) | Port Number  |  |
| k to (n+4) | These octet(s) is/are present only if explicitly specified |  |

Figure 8.x-1: SGi PtP Tunnel Address

The following flags are coded within Octet 5:

- Bit 1 – V4: If this bit is set to "1", then the IPv4 address field shall be present, otherwise it shall be absent. Bit 2 shall be set to "0" when Bit 1 is set to "1".

- Bit 2 – V6: If this bit is set to "1", then the IPv6 address field shall be present, otherwise it shall be absent. Bit 1 shall be set to "0" when Bit 2 is set to "1"

- Bit 3 – Port: If this bit is set to "1", then the Port Number field shall be present, otherwise it shall be absent

When the IPv4 address field is present, octets m to (m+3) shall contains an IPv4 address. Bit 8 of Octet m represents the most significant bit of the IPv4 address and bit 1 of octet (m+3) the least significant bit.

When the IPv6 address field is present, octets p to (p+15) shall contain the IPv6 Prefix and Interface Identifier. Bit 8 of octet p represents the most significant bit of the IPv6 Prefix and Interface Identifier and bit 1 of octet (p+15) the least significant bit.

When the UDP port field is present, octets q to (q+1) shall contain a UDP port number. Bit 8 of Octet q represents the most significant bit of the port number and bit 1 of octet (q+1) the least significant bit.

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