**3GPP TSG-CT WG4 Meeting #110-eC4-22xxxx**

**E-Meeting, 12th – 20th May 2022was C4-223140**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **29.274** | **CR** | **2055** | **rev** | **1** | **Current version:** | **17.5.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** | ZTE |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2022-05-18 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | NOTE 27 in table 7.2.1-1:"*If the PGW-C/SMF receives the PDU session ID from the UE**in the PCO, ePCO or APCO IE, the 5GCNRI flag is set to 1, and the PGW-C/SMF allows to transfer the PDN connection from EPC to 5GC, the PGW-C/SMF shall return the 5GS parameters (e.g.* ***mapped QoS parameters*** *and S-NSSAI) in the PCO, ePCO or APCO respectively in the Create Session Response message, regardless of the 5GSIWKI flag.*""*5GS parameters (e.g.* ***mapped QoS parameters*** *and S-NSSAI) in the PCO, ePCO or APCO respectively*…" may be misleading:Mapped QoS parameters are included in PCO or ePCO to the UE only when using N26. In case of interworking without N26, only S-NSSAI is included in the PCO, ePCO to the UE.APCO IE is used in case of interworking between ePDG connected to EPC and 5GS. In this case, only S-NAASI is included. In other word, currently there is no case for the APCO to include mapped QoS parameters. |
|  |  |
| ***Summary of change:*** | Clarify the cases on provisioning of 5GS parameters in NOTE27: shall provide mapped QoS parameters and S-NSSAI for interworking with N26 in the PCO or ePCO, provide S-NSSAI for interworking without N26 in the PCO or ePCO, or provide S-NSSAI for interworking between ePDG connected to EPC and 5GS in the APCO. |
|  |  |
| ***Consequences if not approved:*** | It may be incorrectly interpreted that mapped QoS parameters are always included in the PCO, ePCO or APCO IE. |
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| ***Clauses affected:*** | 7.2.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**\*\*\*\*\*\*\***

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

### 7.2.1 Create Session Request

The direction of this message shall be from MME/S4-SGSN to SGW and from SGW to PGW, and from ePDG/TWAN to the PGW (see Table 6.1-1).

The Create Session Request message shall be sent on the S11 interface by the MME to the SGW, and on the S5/S8 interface by the SGW to the PGW as part of the procedures:

- E-UTRAN Initial Attach when a PDN connection needs to be established through the SGW and PGW

- Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN with GTP on S5/S8 interface (see clauses 8.2, 8.6 and 16.11 of 3GPP TS 23.402 [45])

- UE requested PDN connectivity when a PDN connection needs to be established through the SGW and PGW

- Addition of a 3GPP access of NBIFOM procedure as specified by 3GPP TS 23.161 [71]

- Restoration of PDN connections after an PGW-C/SMF change as specified in 3GPP TS 23.007 [17]

The message shall also be sent on S4 interface by the SGSN to the SGW, and on the S5/S8 interface by the SGW to the PGW as part of the procedures:

- PDP Context Activation

- Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN with GTP on S5/S8 interface (see clauses 8.2, 8.6 and 16.11 of 3GPP TS 23.402 [45])

- Addition of a 3GPP access of the NBIFOM procedure as specified by 3GPP TS 23.161 [71]

The message shall also be sent on the S11 interface by the MME to the SGW as part of the procedures:

- Tracking Area Update procedure with Serving GW change

- S1/X2-based handover with SGW change

- UTRAN Iu mode to E-UTRAN Inter RAT handover with SGW change

- GERAN A/Gb mode to E-UTRAN Inter RAT handover with SGW change

- 3G Gn/Gp SGSN to MME combined hard handover and SRNS relocation procedure

- Gn/Gp SGSN to MME Tracking Area Update procedure

- Restoration of PDN connections after an SGW failure if the MME and PGW support these procedures as specified in 3GPP TS 23.007 [17]

- MME triggered Serving GW relocation

- Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN with PMIP on S5/S8 interface (see clauses 8.2 and 16.11 of 3GPP TS 23.402 [45])

and on the S4 interface by the SGSN to the SGW as part of the procedures:

- Routing Area Update with MME interaction and with SGW change

- Gn/Gp SGSN to S4 SGSN Routing Area Update

- Inter SGSN Routeing Area Update Procedure and Combined Inter SGSN RA / LA Update using S4 with SGW change

- Iu mode RA Update Procedure using S4 with SGW change

- E-UTRAN to UTRAN Iu mode Inter RAT handover with SGW change

- E-UTRAN to GERAN A/Gb mode Inter RAT handover with SGW change

- Serving RNS relocation using S4 with SGW change

- Combined hard handover and SRNS relocation using S4 with SGW change

- Combined Cell / URA update and SRNS relocation using S4 with SGW change

- Enhanced serving RNS relocation with SGW relocation

- Restoration of PDN connections after an SGW failure if the SGSN and PGW support these procedures as specified in 3GPP TS 23.007 [17]

- S4-SGSN triggered Serving GW relocation

- Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN with PMIP on S5/S8 interface (see clauses 8.2 and 16.11 of 3GPP TS 23.402 [45])

and on the S2b interface by the ePDG to the PGW as part of the procedures:

- Initial 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 (See clause 8.6 of 3GPP TS 23.402 [45])

- Initial Attach for emergency session (GTP on S2b)

- Addition of an access using S2b of NBIFOM procedure as specified by 3GPP TS 23.161 [71]

and on the S2a interface by the TWAN to the PGW as part of the procedure:

- 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

- Handover to TWAN with GTP on S2a (See clause 16.10 of 3GPP TS 23.402 [45])

- Addition of an access using S2a of NBIFOM procedure as specified by 3GPP TS 23.161 [71].

If the new Create Session Request received by the SGW collides with an existing active PDN connection context (the existing PDN connection context is identified with the tuple [IMSI, EPS Bearer ID], where IMSI shall be replaced by TAC and SNR part of ME Identity for emergency or RLOS attached UE without UICC or authenticated IMSI), this Create Session Request shall be treated as a request for a new session. Before creating the new session, the SGW should delete:

- the existing PDN connection context locally, if the Create Session Request is received with the TEID set to zero in the header, or if it is received with a TEID not set to zero in the header and it collides with the default bearer of an existing PDN connection context;

- the existing dedicated bearer context locally, if the Create Session Request collides with an existing dedicated bearer context and the message is received with a TEID not set to zero in the header.

In the former case, if the PGW S5/S8 IP address for control plane received in the new Create Session Request is different from the PGW S5/S8 IP address for control plane of the existing PDN connection, the SGW should also delete the existing PDN connection in the corresponding PGW by sending a Delete Session Request message.

NOTE 1: The SGW can send the Create Session Request and Delete Session Request over S5/S8 asynchronously, e.g. the SGW can send the Delete Session Request and then the Create Session Request without having to wait for the Delete Session Response. It does not matter if the PGW happens to receive the Delete Session Request after the Create Session Request since the PGW assigns a different S5/S8 F-TEID for control plane to the new PDN connection.

In some network deployment, e.g. when 5G Network Slice is deployed and the combined PGW-C/SMFs are connected to the UDM, the PGW may select another PGW supporting the network slice for which the UE has subscription and then forward the Create Session Request to that PGW. When forwarding the Create Session Request message, the PGW shall forward the Create Session Request message as received from the SGW but with the following modifications:

- the destination IP address of the message shall be set to the selected PGW IP address;

- the CSRMFI flag shall be set to "1";

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

NOTE 2: The Create Session Response message is sent back to the forwarding PGW that forwards it to the SGW. It is assumed that GTPv2/UDP/IP connectivity between the source PGW/SMF and the target PGW/SMF which are in different slices is allowed in such network deployment; otherwise, if there is no GTPv2/UDP/IP connectivity between the source PGW/SMF and the target PGW/SMF, or if the source PGW/SMF does not support forwarding the request to the target PGW/SMF, the source PGW/SMF can proceed as specified in clause 7.2.2.

If the new Create Session Request received by the PGW collides with an existing PDN connection context (the existing PDN connection context is identified with the triplet [IMSI, EPS Bearer ID, Interface type], where applicable Interface type here is S2a TWAN GTP-C interface or S2b ePDG GTP-C interface or S5/S8 SGW GTP-C interface, and where IMSI shall be replaced by TAC and SNR part of ME Identity for emergency or RLOS attached UE without UICC or authenticated IMSI), this Create Session Request shall be treated as a request for a new session. Before creating the new session, the PGW should delete:

- the existing PDN connection context, if the Create Session Request collides with the default bearer of an existing PDN connection context;

- the existing dedicated bearer context, if the Create Session Request collides with a dedicated bearer of an existing PDN connection context.

The PGW shall allocate a new PGW S5/S8 F-TEID for control plane to the new PDN connection, i.e. not the same F-TEID value as the one which was assigned to the existing PDN connection.

NOTE 3: With GTP based S2a and S2b, the EPS Bearer IDs assigned for specific UE over S2a between the TWAN and PGW and over S2b between an ePDG and PGW are independent of the EPS Bearer IDs assigned for the same UE over S5/S8 and may overlap in value (see 3GPP TS 23.402 [45] clause 4.6.2).

NOTE 4: Only the TAC and SNR part of the ME Identity is used to identify an emergency or RLOS attached UE without UICC or authenticated IMSI.

Table 7.2.1-1: Information Elements in a Create Session Request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| IMSI | C | The IMSI shall be included in the message on the S4/S11 interface, and on S5/S8 interface if provided by the MME/SGSN, except for the case:- If the UE is emergency or RLOS attached and the UE is UICCless.The IMSI shall be included in the message on the S4/S11 interface, and on S5/S8 interface if provided by the MME/SGSN, but not used as an identifier* if UE is emergency or RLOS attached but IMSI is not authenticated.

The IMSI shall be included in the message on the S2a/S2b interface, except for the case:- if the UE is emergency attached and the UE is UICCless.The IMSI shall be included in the message on the S2a/S2b interface, but not used as an identifier:- if UE is emergency attached but IMSI is not authenticated. | IMSI | 0 |
| MSISDN | C | For an E-UTRAN Initial Attach and a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN the IE shall be included when used on the S11 interface, if provided in the subscription data from the HSS.For a PDP Context Activation procedure and a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN the IE shall be included when used on the S4 interface, if provided in the subscription data from the HSS.The IE shall be included for the case of a UE Requested PDN Connectivity, if the MME has it stored for that UE.It shall be included when used on the S5/S8 interfaces if provided by the MME/SGSN.The ePDG shall include this IE on the S2b interface during an Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b and a Handover to Untrusted Non-3GPP IP Access with GTP on S2b, Initial Attach for emergency session (GTP on S2b), if provided by the HSS/AAA.The TWAN shall include this IE on the S2a interface during an 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 a Handover to TWAN with GTP on S2a, if provided by the HSS/AAA. | MSISDN | 0 |
| ME Identity (MEI) | C | The MME/SGSN shall include the ME Identity (MEI) IE on the S11/S4 interface:- If the UE is emergency attached and the UE is UICCless; or- If the UE is emergency attached and the IMSI is not authenticatedFor all other cases the MME/SGSN shall include the ME Identity (MEI) IE on the S11/S4 interface if it is available. | MEI | 0 |
| CO | The MME shall include the ME Identity (MEI) IE on the S11 interface:- If the UE is RLOS attached and the UE is UICCless; or- If the UE is RLOS attached and the IMSI is not authenticated. |
| CO | If the SGW receives this IE, it shall forward it to the PGW on the S5/S8 interface. |
| CO | The TWAN/ePDG shall include the ME Identity (MEI) IE on the S2a/S2b interface:- If the UE is emergency attached and the UE is UICCless; or- If the UE is emergency attached and the IMSI is not authenticated.For all other cases, the TWAN/ePDG shall include the ME Identity (MEI) IE on the S2a/S2b interface, if it is available. |
| User Location Information (ULI) | C | This IE shall be included on the S11 interface for E-UTRAN Initial Attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN and UE-requested PDN Connectivity procedures. It shall include ECGI and TAI. The MME/SGSN shall also include it on the S11/S4 interface for TAU/RAU/X2-Handover/Enhanced SRNS Relocation procedure if the PGW/PCRF has requested location information change reporting and MME/SGSN support location information change reporting. | ULI(NOTE 10) | 0 |
| CO | This IE shall also be included on the S4 interface for PDP Context Activation procedure. It shall include CGI/SAI, together with RAI. |
| CO | This IE shall also be included on the S4/S11 interface for a TAU/RAU procedure if- the level of support (User Location Change Reporting and/or CSG Information Change Reporting) changes; or- the target MME/S4-SGSN cannot derive the level of support (User Location Change Reporting and/or CSG Information Change Reporting) for the source Gn/Gp SGSN. See NOTE 9.The MME shall include the ECGI and /or TAI in the ULI, the S4-SGSN shall include either the CGI or SAI or RAI, or CGI/SAI together with RAI in the ULI. |
| CO | This IE shall also be included on the S4/S11 interface for:- a TAU procedure with an S4-SGSN interaction, if the MME supports location information change reporting;- a RAU procedure with an MME interaction, if the S4-SGSN supports location information change reporting.The MME shall include the ECGI and TAI in the ULI, the S4-SGSN shall include the CGI/SAI together with RAI in the ULI. |
| CO | The SGW shall include this IE on S5/S8 if it receives the ULI from MME/SGSN. |
| Serving Network | C | This IE shall be included on the S4/S11, S5/S8 and S2b interfaces 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, a UE requested PDN connectivity, an Attach with GTP on S2b, a UE initiated Connectivity to Additional PDN with GTP on S2b, a Handover to Untrusted Non-3GPP IP Access with GTP on S2b and an Initial Attach for emergency session (GTP on S2b).See NOTE 10. | Serving Network | 0 |
| CO | This IE shall be included on S4/S11 for RAU/TAU/Handover with SGW relocation procedures.See NOTE 10. |
| CO | This IE shall be included on the S2a interface for an Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, a UE initiated Connectivity to Additional PDN with GTP on S2a and a Handover to TWAN with GTP on S2a.The TWAN shall set this IE to the PLMN identity of the selected PLMN used for 3GPP-based access authentication. The selected PLMN is the PLMN of the 3GPP AAA Proxy in roaming case and the PLMN of the 3GPP AAA Server in non-roaming case. |  |
| RAT Type | M | This IE shall be set to the 3GPP access type or to the value matching the characteristics of the non-3GPP access the UE is using to attach to the EPS.The MME shall set the RAT Type to LTE-M if it has received the LTE-M indication from the eNodeB, otherwise it shall set it to the RAT type the UE is using.The ePDG may use the access technology type of the untrusted non-3GPP access network if it is able to acquire it; otherwise it shall indicate Virtual as the RAT Type.The TWAN shall set the RAT Type value to "WLAN" on the S2a interface.If the LTE-M RAT type is received from the MME, the SGW shall signal the following RAT type to the PGW:* LTE-M RAT type, if the 'LTE-M RAT type reporting to PGW' flag is received from the MME; or
* WB-E-UTRAN RAT type, otherwise.

If the Satellite related RAT type is received from the MME, the SGW shall signal the following RAT type to the PGW:* The received Satellite related RAT type, if the 'Satellite RAT Type reporting to PGW Indication' flag is received from the MME; or
* The RAT type without Satellite, i.e. LTE-M / EUTRAN-NB-IoT / WB-E-UTRAN, otherwise.

See NOTE 3, NOTE 4, NOTE 22, NOTE 28. | RAT Type | 0 |
| Indication Flags | C | This IE shall be included if any one of the applicable flags is set to 1.Applicable flags are:* S5/S8 Protocol Type: This flag shall be set to 1 on the S11/S4 interfaces if the chosen protocol type for the S5/S8 interface is PMIP.
* Dual Address Bearer Flag: This flag shall be set to 1 on the S2b, S11/S4 and S5/S8 interfaces when the PDN Type, determined based on UE request and subscription record, is set to IPv4v6 and all SGSNs which the UE may be handed over to support dual addressing. This shall be determined based on node pre-configuration by the operator. (see also NOTE 5). The TWAN shall set this flag to 1 on the S2a interface if it supports IPv4 and IPv6 and the PDN Type determined from the UE request if single-connection mode or multi-connection mode is used (see 3GPP TS 23.402 [45]) and the user subscription data is set to IPv4v6.
* Handover Indication: This flag shall be set to 1 on the S11/S4 and S5/S8 interface during a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, or a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN procedures, or an Addition of a 3GPP access of NBIFOM procedure, or during a 5GS to EPS handover without the N26 interface. This flag shall be set to 1 on the S2b interface during a Handover from 3GPP access to Untrusted Non-3GPP IP Access with GTP on S2b and IP address preservation is requested by the UE, or an Addition of an access using S2b of NBIFOM procedure. This flag shall be set to 1 on the S2a interface during a Handover from 3GPP access to TWAN with GTP on S2a and IP address preservation is requested by the UE, or an Addition of an access using S2a of NBIFOM procedure.
* Operation Indication: This flag shall be set to 1 on the S4/S11 interface for a TAU/RAU procedure with SGW relocation, Enhanced SRNS Relocation with SGW relocation, X2-based handovers with SGW relocation and MME triggered Serving GW relocation.
* Direct Tunnel Flag: This flag shall be set to 1 on the S4 interface if Direct Tunnel is used.
* Piggybacking Supported: This flag shall be set to 1 on the S11 interface only if the MME supports the piggybacking feature as described in Annex F of 3GPP TS 23.401 [3]. This flag shall be set to 1 on S5/S8 only if both the MME and the SGW support piggybacking.
* Change Reporting support Indication: This flag shall be set to 1 on S4/S11 and S5/S8 interfaces if the SGSN/MME supports location Info Change Reporting and if the SGSN/MME's operator policy permits reporting of location change to the operator of the PGW with which the session is being established. See NOTE2.
* CSG Change Reporting Support Indication: This flag shall be set to 1 on S4/S11 and S5/S8 interfaces if the SGSN/MME supports CSG Information Change Reporting and if the SGSN/MME's operator policy permits reporting of CSG Information change to the operator of the PGW with which the session is being established. See NOTE 2.
* Unauthenticated IMSI: This flag shall be set to 1 on the S4/S11, S5/S8 and S2a/S2b interfaces if the IMSI present in the message is not authenticated and is for an emergency attached UE. It shall also be set to 1 on the S11 and S5/S8 interfaces if the IMSI is present in the message is not authenticated and is for an RLOS attached UE.
* PDN Pause Support Indication: this flag shall be set to 1 on the S5/S8 interface if the SGW supports the PGW Pause of Charging procedure.
* NBIFOM Support Indication: This flag shall be set to 1 on S11/S4 if the MME/SGSN supports NBIFOM.This flag shall be set to 1 on S5/S8 if both the SGW and the MME/SGSN support NBIFOM. This flag shall be set to 1 on S2a/S2b if the TWAN/ePDG supports NBIFOM.
* WLCP PDN Connection Modification Support Indication: This flag shall be set to 1 on the S2a interface if the TWAN supports the WLCP PDN Connection Modification procedure.
* UE Not Authorised Cause Code Support Indication: This flag shall be set to 1 on S4/S11 and S5/S8 interface if the SGSN/MME supports the "UE not authorised by OCS or external AAA Server" Cause Code.
* UE Available for Signalling Indication: this flag shall be set to 1 on S11/S4 during a TAU/RAU with SGW relocation procedure if there is pending network initiated PDN connection signalling for this PDN connection. The SGW shall include this IE on S5/S8 if it receives the flag from the MME/SGSN.
* S11-U Tunnel Flag: this flag shall be set to 1 on the S11 interface if user data is transported in NAS signalling.
* Extended PCO Support Indication: this flag shall be set to 1 on S11 interface by the MME if the UE and the MME support ePCO; and this flag shall be set to 1 on S5/S8 interface by the SGW if the SGW supports ePCO and MME has set the flag to 1.
* Control Plane Only PDN Connection Indication: this flag shall be set to 1 over S11 and S5/S8 if the PDN Connection is set to Control Plane Only.
* eNB Change Reporting Support Indication: This flag shall be set to 1 on S11 and S5/S8 interfaces if the MME supports location Info Change Reporting and if the MME's operator policy permits reporting of location change to the operator of the PGW with which the session is being established. See NOTE 19.
* LTE-M RAT Type reporting to PGW Indication: this flag shall be set to 1 on S11, based on operator policy or roaming agreements (for Home Routed PDN connections), if the SGW needs to forward the LTE-M RAT type to the PGW.
* 5GS Interworking Indication(5GSIWKI): this flag shall be set to 1 on S11, S5/S8 and S2b interfaces if the UE supports N1 mode and the PDN connection is not restricted from interworking with 5GS by user subscription (see "5GC" bit within Core-Network-Restrictions AVP and Interworking-5GS-Indicator AVP specified in 3GPP TS 29.272 [70] and 3GPP TS 29.273 [68]).
* 5GS Interworking without N26 Indication: this flag shall be set to 1 on S11 and S5/S8 interfaces if the 5GS Interworking Indication (5GSIWKI) is set to 1 and the N26 interface is not supported. See clause 4.11.1.1 in 3GPP TS 23.502 [83]). (NOTE 23)
* 5GCNRI (5GC Not Restricted Indication): this flag shall be set to 1 on S11, S5/S8 and S2b interfaces if access to the 5GC is not restricted for the PDN connection by user subscription (see "5GC" bit within Core-Network-Restrictions AVP and Interworking-5GS-Indicator AVP specified in 3GPP TS 29.272 [70] and 3GPP TS 29.273 [68]). (NOTE 27)
* 5GCNRS (5GC Not Restricted Support): this flag shall be set to 1 on S11, S5/S8 and S2b interfaces if the sending node (i.e. MME or ePDG) supports setting the 5GCNRI flag. An MME or an ePDG compliant with this version of the specification shall support setting the 5GCNRI flag.
* MTEDTA (MT-EDT Applicable): this flag shall be set to 1 on the S11 interface if MT-EDT is applicable for the PDN connection, i.e. if the UE has indicated its support of MT-EDT as part of the UE network capability and if the local policy requires so. (NOTE 26)
* CSRMFI (Create Session Request Message Forwarded Indication): this shall be set to 1 on S5/S8 interfaces by a PGW if the Create Session Request message has been forwarded by that PGW.
* Restoration of PDN connections after an PGW-C/SMF Change Support Indication: this flag shall be set to 1 on the S11/S2b interface if the MME/ePDG supports the Restoration of PDN connections after an PGW-C/SMF Change procedure as specified in clause 31 of 3GPP TS 23.007 [17]. This flag shall be set to 1 on the S5/S8 interface if the SGW and the MME support the Restoration of PDN connections after an PGW-C/SMF Change procedure as specified in clause 31 of 3GPP TS 23.007 [17].
* PGW Change Indication: this flag shall be set to 1 by the MME/ePDG over the S11/S2b interface if the Create Session Request is to move an existing PDN connection to the new PGW-C/SMF as specified in clauses 31.3 and 31.3A of 3GPP TS 23.007 [17]. The SGW shall forward the flag on the S5/S8 interface.
* PGWRNSI (PGW Redirection due to mismatch with Network Slice subscribed by UE Support Indication): this flag shall be set to 1 on the S11 and S5/S8 interfaces, if the MME supports receiving a Create Session rejection response with the cause "PGW redirection due to mismatch with network slice subscribed by the UE".
* UPIPSI (User Plane Integrity Protection Support Indication): this flag shall be set to 1 by the MME on the S11 interface, if the UE, MME and E-UTRAN supports User Plane Integrity Protection with EPS. This flag shall be set to 1 by the SGW on S5/S8 interface if the MME has set the flag to 1 over the S11 interface.
 | Indication | 0 |
| Sender F-TEID for Control Plane | M |  | F-TEID | 0 |
| PGW S5/S8 Address for Control Plane or PMIP | C | This IE shall be sent on the S11 / S4 interfaces. The TEID or GRE Key is set to "0" in the E-UTRAN initial attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, the PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN and the UE requested PDN connectivity procedures. | F-TEID | 1 |
| Access Point Name (APN) | M |  | APN | 0 |
| Selection Mode | C | This IE shall be included on the S4/S11 and S5/S8 interfaces 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.This IE shall be included on the S2b interface for an Initial Attach with GTP on S2b, a Handover to Untrusted Non-3GPP IP Access with GTP on S2b, a UE initiated Connectivity to Additional PDN with GTP on S2b and an Initial Attach for emergency session (GTP on S2b).It shall indicate whether a subscribed APN or a non- subscribed APN chosen by the UE/MME/SGSN/ePDG/TWAN was selected, see NOTE 17.This IE shall be included on the S2a interface for an Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, a Handover to TWAN with GTP on S2a and a UE initiated Connectivity to Additional PDN with GTP on S2a. The value shall be set to "MS or network provided APN, subscription verified". | Selection Mode | 0 |
| CO | When available, this IE shall be sent by the MME/SGSN on the S11/S4 interface during TAU/RAU/HO with SGW relocation. |
| PDN Type | C | This IE shall be included on the S4/S11 and S5/S8 interfaces 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.This IE shall be set to IPv4, IPv6, IPv4v6, Non-IP or Ethernet. This is based on the UE request and the subscription record retrieved from the HSS (for MME see 3GPP TS 23.401 [3], clause 5.3.1.1, and for SGSN see 3GPP TS 23.060 [35], clause 9.2.1). See NOTE 1. See NOTE 14. See NOTE 24 and 25. | PDN Type | 0 |
| PDN Address Allocation (PAA) | C | This IE shall be included the S4/S11, S5/S8 and S2a/S2b interfaces 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, a UE requested PDN connectivity, an Attach with GTP on S2b, a UE initiated Connectivity to Additional PDN with GTP on S2b, a Handover to Untrusted Non-3GPP IP Access with GTP on S2b, an Initial Attach for emergency session (GTP on S2b, an Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, a UE initiated Connectivity to Additional PDN with GTP on S2a and a Handover to TWAN with GTP on S2a. For PMIP-based S5/S8, this IE shall also be included on the S4/S11 interfaces for TAU/RAU/Handover cases involving SGW relocation.The PDN type field in the PAA shall be set to IPv4, or IPv6 or IPv4v6, Non-IP or Ethernet by MME/SGSN, based on the UE request and the subscription record retrieved from the HSS (see clause 8.12 and also NOTE 5. See also NOTE 24).The TWAN shall set the PDN type field in the PAA to IPv4, or IPv6 or IPv4v6 based on the UE request if single-connection mode or multi-connection mode is used (see 3GPP TS 23.402 [45]), the IP versions the TWAN supports and the PDN type received in the user subscription data from the HSS/3GPP AAA Server, or based on the UE request and the TWAN Emergency Configuration Data for an Initial Attach in WLAN for Emergency Service on GTP S2a.The ePDG shall set the PDN type field in the PAA to IPv4, or IPv6 or IPv4v6 based on the UE request and the subscription record retrieved from the HSS/3GPP AAA Server, or based on the UE request and the ePDG Emergency Configuration Data for an Initial Attach for emergency session (GTP on S2b).For static IP address assignment (for MME see 3GPP TS 23.401 [3], clause 5.3.1.1, for SGSN see 3GPP TS 23.060 [35], clause 9.2.1, for ePDG see 3GPP TS 23.402 [45] clause 4.7.3, and for TWAN see 3GPP TS 23.402 [45] clause 16.1.5), the MME/SGSN/ePDG/TWAN shall set the IPv4 address and/or IPv6 prefix length and IPv6 prefix and Interface Identifier based on the subscribed values received from HSS, if available. For PDN Type IPv4v6, either one of the IP versions (i.e. IPv4 address or IPv6 prefix and Interface Identifier) or both the IP versions may be statically provisioned in the HSS. If only one of the IP versions is statically provisioned in the HSS, the MME/SGSN/ePDG/TWAN shall set the other IP version as all zeros. The value of PDN Type field shall be consistent with the value of the PDN Type IE, if present in this message.For a Handover to Untrusted Non-3GPP IP Access with GTP on S2b, the ePDG shall set the IPv4 address and/or IPv6 prefix length and IPv6 prefix and Interface Identifier based on the IP address(es) received from the UE.For IP PDN connections, if static IP address assignment is not used (e.g. static address is not received from the HSS), and for scenarios other than a Handover to Untrusted Non-3GPP IP Access with GTP on S2b, the IPv4 address shall be set to 0.0.0.0, and/or the IPv6 Prefix Length and IPv6 prefix and Interface Identifier shall all be set to zero.For Non-IP or Ethernet PDN connections, the PDN Address and Prefix field shall not be present. See NOTE 14 and 25. | PAA | 0 |
| CO | This IE shall be sent by the MME/SGSN on S11/S4 interface during TAU/RAU/HO with SGW relocation. |
| Maximum APN Restriction | C | This IE shall be included on the S4/S11 and S5/S8 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 denotes the most stringent restriction as required by any already active bearer context. If there are no already active bearer contexts, this value is set to the least restrictive type. | APN Restriction | 0 |
| Aggregate Maximum Bit Rate (APN-AMBR) | C | This IE represents the APN-AMBR. It shall be included on the S4/S11, S5/S8 and S2a/S2b interfaces for an E-UTRAN initial attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, UE requested PDN connectivity, PDP Context Activation procedure using S4, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN, TAU/RAU/Handover from the Gn/Gp SGSN to the S4 SGSN/MME procedures, Attach with GTP on S2b, a Handover to Untrusted Non-3GPP IP Access with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, an 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, a Handover to TWAN with GTP on S2a and UE initiated Connectivity to Additional PDN with GTP on S2a. | AMBR | 0 |
| Linked EPS Bearer ID | C | This IE shall be included on S4/S11 in RAU/TAU/HO except in the Gn/Gp SGSN to MME/S4-SGSN RAU/TAU/HO procedures with SGW change to identify the default bearer of the PDN Connection | EBI | 0 |
| Trusted WLAN Mode Indication | CO | The TWAN shall include this IE on S2a interface (during initial attach, handover to TWAN with GTP on S2a procedure, UE-initiated additional PDN connectivity procedures), if the single-connection mode or multiple-connection mode is used.The TWAN shall not include this IE if transparent single-connection mode is used. The PGW shall assume that transparent single-connection mode is used if it receives this message without this IE from the TWAN. | TWMI | 0 |
| Protocol Configuration Options (PCO) | C | If MME/SGSN receives PCO from the UE during the Attach, PDN connectivity or Handover to 3GPP access procedures, the MME/SGSN shall forward the PCO IE to SGW. The SGW shall also forward it to PGW. | PCO | 0 |
| CO | If the TWAN receives a PCO from the UE during: an initial attach, handover to TWAN or UE-initiated additional PDN connectivity with GTP on S2a procedures (in multi-connection mode or single connection mode), the TWAN shall forward the PCO IE to the PGW, see 3GPP TS 23.402 [45]. |
| Bearer Contexts to be created | M | Several IEs with the same type and instance value shall be included on the S4/S11 and S5/S8 interfaces 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, PDP Context Activation, UE requested PDN Connectivity, Attach with GTP on S2b, UE initiated Connectivity to Additional PDN with GTP on S2b, Handovers between Untrusted Non-3GPP IP Access with GTP on S2b and 3GPP Access, 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, Handovers between TWAN with GTP on S2a and 3GPP Access and UE initiated Connectivity to Additional PDN with GTP on S2a.One or more bearers shall be included for a Handover/TAU/RAU with an SGW change. See NOTE 6 and NOTE 7. | Bearer Context | 0 |
| Bearer Contexts to be removed | C | This IE shall be included on the S4/S11 interfaces for the TAU/RAU/Handover cases where any of the bearers existing before the TAU/RAU/Handover procedure will be deactivated as consequence of the TAU/RAU/Handover procedure.For each of those bearers, an IE with the same type and instance value shall be included.See NOTE 6 and NOTE 7. | Bearer Context | 1 |
| Trace Information | C | This IE shall be included on the S4/S11 interface if an SGW trace is activated, and/or on the S5/S8 and S2a/2b interfaces if a PGW trace is activated. See 3GPP TS 32.422 [18]. | Trace Information | 0 |
| Recovery | C | This IE shall be included on the S4/S11, S5/S8 and S S2a/2b interfaces if contacting the peer node for the first time. | Recovery | 0 |
| MME-FQ-CSID | C | This IE shall be included by the MME on the S11 interface and shall be forwarded by an SGW on the S5/S8 interfaces 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 S5/S8 interfaces according to the requirements in 3GPP TS 23.007 [17]. | FQ-CSID | 1 |
| ePDG-FQ-CSID | C | This IE shall be included by the ePDG on the S2b interface according to the requirements in 3GPP TS 23.007 [17]. | FQ-CSID | 2 |
| TWAN-FQ-CSID | C | This IE shall be included by the TWAN on the S2a interface according to the requirements in 3GPP TS 23.007 [17]. | FQ-CSID | 3 |
| UE Time Zone | CO | This IE shall be included by the MME over S11 during Initial Attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN and UE Requested PDN Connectivity procedure.This IE shall be included by the SGSN over S4 during PDP Context Activation procedure and a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN.This IE shall be included by the MME/SGSN over S11/S4 TAU/RAU/Handover with SGW relocation. | UE Time Zone | 0 |
| C | If SGW receives this IE, SGW shall forward it to PGW across S5/S8 interface. |
| O | This IE shall be included by the TWAN on the S2a interface for Initial Attach in WLAN procedure, UE-initiated Connectivity to Additional PDN with GTP on S2a and handover to TWAN with GTP on S2a procedure as specified in 3GPP TS 23.402 [45]. |
| User CSG Information (UCI) | CO | This IE shall be included on the S4/S11 interface for E-UTRAN 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 using S4 procedures, if the UE is accessed via CSG cell or hybrid cell.The MME/SGSN shall also include it for TAU/RAU/Handover procedures with SGW relocation if the UE is accessed via a CSG cell or hybrid cell or leaves a CSG or hybrid cell and the PGW/PCRF has requested CSG info reporting and MME/SGSN support CSG info reporting. NOTE 11.The SGW shall include this IE on S5/S8 if it receives the User CSG information from MME/SGSN.See NOTE 10. | UCI | 0 |
| Charging Characteristics | C | This IE shall be included on the S4/S11, S5/S8 and S2a/S2b interfaces according to 3GPP TS 32.251 [8] | Charging Characteristics | 0 |
| MME/S4-SGSN LDN | O | This IE is optionally sent by the MME to the SGW on the S11 interface and by the S4-SGSN to the SGW on the S4 interface (see 3GPP TS 32.423 [44]), when communicating the LDN to the peer node for the first time. | Local Distinguished Name (LDN) | 0 |
| SGW LDN | O | This IE is optionally sent by the SGW to the PGW on the S5/S8 interfaces (see 3GPP TS 32.423 [44]), when communicating the LDN to the peer node for the first time. | Local Distinguished Name (LDN) | 1 |
| ePDG LDN | O | This IE is optionally sent by the ePDG to the PGW on the S2b interfaces (see 3GPP TS 32.423 [44]), when contacting the peer node for the first time.  | Local Distinguished Name (LDN) | 2 |
| TWAN LDN | O | This IE may be sent by the TWAN to the PGW on the S2a interfaces (see 3GPP TS 32.423 [44]), when contacting the peer node for the first time.  | Local Distinguished Name (LDN) | 3 |
| Signalling Priority Indication | CO | The SGSN/MME shall include this IE on the S4/S11 interface if the UE indicates low access priority when requesting to establish the PDN connection.The SGW shall forward this IE in the Create Session Request message on the S5/S8 interfaces if received from the MME/SGSN.  | Signalling Priority Indication | 0 |
| UE Local IP Address | CO | The ePDG shall include this IE on the S2b interface during an Initial Attach for emergency session (GTP on S2b). Otherwise the ePDG shall include this IE on the S2b interface based on local policy.  | IP Address | 0 |
| UE UDP Port | CO | The ePDG shall include this IE on the S2b interface if NAT is detected, the UDP encapsulation is used and the UE Local IP Address is present. | Port Number | 0 |
| Additional Protocol Configuration Options (APCO) | CO | If multiple authentications are supported by the ePDG, the ePDG 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 UE requests the DNS IPv4/IPv6 address in the Configuration Payload (CFG\_REQ) during the IPsec tunnel establishment procedure (as specified in 3GPP TS 33.402 [50]), and if the ePDG supports the Additional Protocol Configuration Options IE, the ePDG may include this IE over S2b interface and correspondingly set the "DNS Server IPv4/v6 Address Request" parameter as defined in 3GPP TS 24.008 [5]. |
| CO | If the UE includes the P-CSCF\_IP6\_ADDRESS attribute, or the P-CSCF\_IP4\_ADDRESS attribute or both in the CFG\_REQUEST configuration payload during the IPsec tunnel establishment procedure as specified in 3GPP TS 24.302 [63]), and if the ePDG supports these IKEv2 attributes and the Additional Protocol Configuration Options IE, the ePDG shall include this IE over the S2b interface and correspondingly set the P-CSCF IPv6 Address Request, or P-CSCF IPv4 Address Request, or both parameters as defined in 3GPP TS 24.008 [5]. |
| CO | If the UE includes the P-CSCF\_RESELECTION\_SUPPORT Private Status Type in a Notify payload within the IKE\_AUTH request message during the IPsec tunnel establishment procedure asspecified in 3GPP TS 24.302 [63], and if the ePDG supports the P-CSCF restoration extension procedure for the untrusted WLAN access (see 3GPP TS 23.380 [61]), the ePDG shall include this IE over the S2b interface and correspondingly set the P-CSCF\_RESELECTION\_SUPPORT, as defined in 3GPP TS 24.008 [5]. |
| O | The TWAN may include this IE on the S2a interface to retrieve additional IP configuration parameters from the PGW (e.g. DNS server) if the transparent single-connection mode is used as specified in 3GPP TS 23.402 [45]. |
| CO | The ePDG shall include this IE over the S2b interface and correspondingly set the PDU session ID, as defined in 3GPP TS 24.008 [5] if:* the UE includes the N1\_MODE\_CAPABILITY Notify payload within the IKE\_AUTH request message during the IPsec tunnel establishment procedure as specified in 3GPP TS 24.302 [63];
* the ePDG supports this IKEv2 attribute and the Additional Protocol Configuration Options IE; and
* the PDN connection is not restricted from interworking with 5GS by user subscription (see "5GC" bit within Core-Network-Restrictions AVP and Interworking-5GS-Indicator AVP specified in 3GPP TS 29.273 [68]).
 |  |
| H(e)NB Local IP Address | CO | The MME/SGSN shall include this IE on S11/S4 interface if the MME/SGSN receives this information from H(e)NB in UE associated S1/Iu signalling according (see 3GPP TS 23.139 [51]) during:* E-UTRAN Initial Attach, a Handover from Trusted or Untrusted Non-3GPP IP Access to E-UTRAN, UE-requested PDN Connectivity, PDP Context Activation and a a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN using S4;
* TAU/RAU/X2-based handover/Enhanced Serving RNS Relocation Procedure with SGW change, if the PGW/PCRF has requested H(e)NB information reporting for the PDN connection.

The SGW shall forward this IE on S5/S8 interface if the SGW receives it from the MME/SGSN. | IP Address | 1 |
| H(e)NB UDP Port | CO | The MME/SGSN shall include this IE on S11/S4 interface if the MME/SGSN receives this information from H(e)NB in UE associated S1/Iu signalling according (see 3GPP TS 23.139 [51]) during:* E-UTRAN 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 using S4;
* TAU/RAU/X2-based handover/Enhanced Serving RNS Relocation Procedure with SGW relocation, if the PGW/PCRF has requested H(e)NB information reporting for the PDN connection.

The SGW shall forward this IE on S5/S8 interface if the SGW receives it from the MME/SGSN. | Port Number | 1 |
| MME/S4-SGSN Identifier | CO | If the PGW triggered SGW restoration procedure is supported, the MME/S4-SGSN shall include this IE on S11/S4 interface and the SGW shall forward this IE on S5 interface in the existing signalling as specified in 3GPP TS 23.007 [17].If the overload control feature is supported by the MME/S4-SGSN and is activated for the PLMN to which the PGW belongs (see clause 12.3.11), the MME/S4-SGSN shall include this IE on the S11/S4 interface. In that case, the SGW shall forward this IE on the S5/S8 interface. | IP Address | 2 |
| TWAN Identifier | CO | This IE shall be included on the S2a interface for Initial Attach in WLAN procedure, UE-initiated Connectivity to Additional PDN with GTP on S2a and handover to TWAN with GTP on S2a procedure as specified in 3GPP TS 23.402 [45].  | TWAN Identifier | 0 |
| ePDG IP Address | O | This IE may be included on the S2b interface based on local policy for Fixed Broadband access network interworking, see 3GPP TS 23.139 [51]. If present, it shall contain the ePDG IP address which is used as IKEv2 tunnel endpoint with the UE. | IP Address | 3 |
| CN Operator Selection Entity | CO | In shared networks, the SGSN shall include this IE on the S4 interface for a PDP Context Activation, a Handover from Trusted or Untrusted Non-3GPP IP Access to UTRAN/GERAN and RAU with SGW relocation procedures, if the information is available, to indicate whether the Serving Network has been selected by the UE or by the network. | CN Operator Selection Entity | 0 |
| CO | The SGW shall include this IE on S5/S8 if it receives it from the SGSN. |
| Presence Reporting Area Information | CO | The MME/SGSN shall include this IE in the following procedures, if the PGW/PCRF/OCS requested reporting changes of UE presence in the Presence Reporting Area(s) and the MME/SGSN supports such reporting:- TAU/RAU/X2 Handover/Enhanced SRNS Relocation procedures with SGW relocation and MME/SGSN change. The new MME/SGSN shall then indicate whether the UE is inside or outside the PRA for each of the active Presence Reporting Area(s), or indicate that the Presence Reporting Area (s) is inactive;- TAU/RAU/X2 Handover/Enhanced SRNS Relocation procedures with SGW relocation and without MME/SGSN change, if the UE enters or leaves the Presence Reporting Area(s). In this case, this IE shall only include the active PRA(s) that the UE has newly entered or left.Several IEs with the same type and instance value may be included as necessary to represent a list of Presence Reporting Area Actions. See NOTE 20. | Presence Reporting Area Information | 0 |
| MME/S4-SGSN's Overload Control Information | O | During an overload condition, the MME/S4-SGSN may include this IE on the S11/S4 interface if the overload control feature is supported by the MME/S4-SGSN and is activated for the PLMN to which the PGW belongs (see clause 12.3.11).When present, the MME/S4-SGSN shall provide only one instance of this IE, representing its overload information. | 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 PGW on the S5/S8 interface. |
| SGW's Overload Control Information | O | During an overload condition, the SGW may include this IE over the S5/S8 interface if the overload control feature is supported by the SGW and is activated for the PLMN to which the PGW belongs (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 |
| TWAN/ePDG's Overload Control Information | O | During an overload condition, the TWAN/ePDG may include this IE over the S2a/S2b interface if the overload control feature is supported by the TWAN/ePDG and is activated for the PLMN to which the PGW belongs (see clause 12.3.11).When present, the TWAN/ePDG shall provide only one instance of this IE, representing its overload information. | Overload Control Information | 2 |
| Origination Time Stamp | CO | The MME/SGSN and the TWAN/ePDG shall include this IE on the S11/S4 and S2a/S2b interface respectively, in the conditions specified in clause 13.2.When present, the Origination Time Stamp shall contain the UTC time when the originating entity initiated the request. | Millisecond Time Stamp | 0 |
| CO | The SGW shall include this IE on the S5/S8 interface if it receives the Origination Time Stamp from the MME/SGSN and if it supports the procedure specified in clause 13.2.  |
| Maximum Wait Time | CO | The MME/SGSN and the TWAN/ePDG shall include this IE on the S11/S4 and S2a/S2b interface respectively, in the conditions specified in clause 13.3.When present, the Maximum Wait Time shall contain the duration (number of milliseconds since the Origination Time Stamp) during which the originator of the request waits for a response. | Integer Number | 0 |
| CO | The SGW shall include this IE on the S5/S8 interface if it receives the Maximum Wait Time from the MME/SGSN and if it supports the procedure specified in clause 13.3. |
| WLAN Location Information | CO | This IE shall be included on the S2b interface if the WLAN Location Information is available.  | TWAN Identifier | 1 |
| WLAN Location Timestamp | CO | This IE shall be included on the S2b interface, if the WLAN Location Timestamp is available.  | TWAN Identifier Timestamp | 0 |
| NBIFOM Container | CO | This IE shall be included on the S11/S4 or S2a/S2b interfaces if the MME/S4-SGSN or the TWAN/ePDG receives an NBIFOM Container from the UE as specified in TS 24.161 73]. The Container Type shall be set to 4. | F-Container | 0 |
| CO | If the SGW receives an NBIFOM Container from the MME/S4-SGSN, the SGW shall forward this IE to the PGW on the S5/S8 interface. |
| Remote UE Context Connected | CO | The MME shall include this IE on the S11 interface during a SGW relocation procedure if such information is available.Several IEs with the same type and instance value may be included as necessary to represent a list of remote UEs connected. | Remote UE Context | 0 |
| 3GPP AAA Server Identifier | O | The ePDG/TWAN may include this IE on the S2a/S2b interface to provide the selected 3GPP AAA server identifier to the PGW. See NOTE 13. | Node Identifier | 0 |
| Extended Protocol Configuration Options (ePCO) | CO | If the MME receives ePCO from the UE during the Initial Attach, UE requested PDN Connectivity procedures, the MME shall forward the ePCO IE to the SGW if the MME supports ePCO.The SGW shall also forward it to the PGW if the SGW supports ePCO. See NOTE 15. | ePCO | 0 |
| Serving PLMN Rate Control | CO | The MME shall include this IE on the S11 interface if Serving PLMN Rate control is configured by the MME operator and the PDN Connection is set to Control Plane Only:- during an Initial Attach, or a UE Requested PDN Connectivity procedure.- during an inter MME TAU with SGW relocation procedureSee NOTE 18.The SGW shall include this IE on S5/S8 if it receives this IE from MME.  | Serving PLMN Rate Control | 0 |
| MO Exception Data Counter | CO | The MME shall include the counter if it has received the counter for RRC cause "MO Exception data" in the Context Response message during a TAU with an MME and SGW change. | Counter | 0 |
| UE TCP Port | CO | The ePDG shall include this IE on the S2b interface if NAT is detected, the TCP encapsulation is used and the UE Local IP Address is present. | Port Number | 2 |
| Mapped UE Usage Type | CO | The MME/SGSN shall include this IE on the S11/S4 interface, if available. When present, this IE shall contain the mapped UE usage type applicable to the PDN connection. See NOTE 21.  | Mapped UE Usage Type | 0 |
| CO | The SGW shall include this IE on S5 if it receives it from the MME/SGSN. |
| User Location Information for SGW  | CO | The MME/SGSN shall include this IE on the S11/S4 interface, based on operator policy for the User Location Information to be sent to the SGW, if the user location information to be passed to the SGW is not already reported in the ULI IE in this message.When present, this IE shall include the ECGI, TAI, eNodeB ID, RAI and/or RNC-ID, based on local policy.See NOTE 21. | ULI | 1 |
| SGW-U node name | CO | The SGW-C shall include this IE on the S5 interface, if available. See NOTE 21.  | FQDN | 0 |
| Secondary RAT Usage Data Report | CO | If the PLMN has configured secondary RAT usage reporting and PDN GW Secondary RAT reporting is active, the MME shall include this IE on the S11 interface if it has received Secondary RAT usage data from eNodeB in an X2-based handover with Serving GW relocation. The MME shall also set the IRSGW flag to "0", to indicate that the Secondary RAT usage data is reported for the Source SGW, and sent via the Target SGW to the PGW.Several IEs with the same type and instance value may be included, to represent multiple usage data reports. | Secondary RAT Usage Data Report | 0 |
| UP Function Selection Indication Flags | CO | Based on operator policy, the MME/S4-SGSN shall include this IE on the S4/S11 interface, if any of the applicable flags is set to 1.Applicable flags are:* DCNR: This flag shall be set to 1 if it is desired to select a specific SGW-U and PGW-U for UEs supporting Dual Connectivity with NR and not restricted from using NR by user subscription, e.g. due to requirements of higher bitrates.

See NOTE 21. | UP Function Selection Indication Flags | 0 |
| CO | The SGW shall include this IE on S5/S8 if it receives it from the MME/S4-SGSN. |
| APN RATE Control Status | CO | If APN RATE Control Status is available in MME/S4-SGSN, APN RATE Control Status shall be transfered on the S4/S11 interface.The SGW shall include the APN RATE Control Status IE on the S5/S8 interface, if received from the MME/S4-SGSN. | APN RATE Control Status | 0 |
| APN RATE Control Status | CO | If APN RATE Control Status is available in MME/S4-SGSN, APN RATE Control Status shall be transfered on the S4/S11 interface.The SGW shall include the APN RATE Control Status IE on the S5/S8 interface, if received from the MME/S4-SGSN. | APN RATE Control Status | 0 |
| Private Extension | O | This IE may be sent on the S5/S8, S4/S11 and S2a/S2b interfaces. | Private Extension | VS |
| NOTE 1: The conditional PDN Type IE is redundant on the S4/S11 and S5/S8 interfaces (as the PAA IE contains exactly the same field). The receiver may ignore it. This IE is never sent on the S2a/S2b interface.NOTE 2: 3GPP TS 23.401 [3] (e.g. clause 5.3.2.1) and 3GPP TS 23.060 [35] (e.g. clause 9.2.2.1) defines the MME/SGSN shall send the MS Info Change Reporting Support Indication to the PGW. In such case MME/SGSN shall use the Change Reporting Support Indication and/or CSG Change Reporting Support Indication (whichever is applicable), even if stage 2 refers to MS Info Change Reporting Support Indication.NOTE 3: The methods that the ePDG may use to acquire the RAT type of the untrusted non-3GPP IP access network are not specified in this release.NOTE 4: The PDN-GW can be informed about the type of access network used by the UE over several reference points, see 3GPP TS 29.212 [30] for the mapping between the code values for the different access network types.NOTE 5: 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 MME does not set the Dual Address Bearer Flag due to the MME operator using single addressing per bearer to support interworking with nodes of earlier releases.NOTE 6: The Bearer Context to be created IE and Bearer Context to be removed IE, together, shall contain all the bearers belonging to the given PDN connection with each bearer appearing in only one of these IEs.NOTE 7: During S1 based handover/ Inter RAT handover/TAU/RAU with S4-SGSN/MME and SGW change, and handover/RAU/TAU from Gn/Gp SGSN to S4-SGSN/MME, if the target MME/S4-SGSN cannot accept one or more PDN connection(s) but can accept at least one or more remaining PDN Connection(s) of the UE, the target MME/SGSN shall indicate all the non GBR bearers of the unaccepted PDN Connection in the Bearer Contexts to be created IE. The (target) MME/SGSN shall indicate all the GBR bearers of the unaccepted PDN connection in the Bearer Contexts to be removed IE.NOTE 8: The conditions of presence of the IEs in the Create Session Request 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 9: During the TAU/RAU/Handover from Gn/Gp SGSN, the target MME/S4-SGSN cannot derive the level of support for User Location Change Reporting and/or CSG Information Change Reporting at the source Gn/Gp SGSN.NOTE 10: In shared networks, when the message is sent from the VPLMN to the HPLMN, the PLMN ID that is communicated in this IE shall be that of the selected Core Network Operator for supporting UEs, or that of the allocated Core Network Operator for non-supporting UEs. As an exception, based on inter-operator roaming/sharing agreement, if the information on whether the UE is a supporting or non-supporting UE is available, the PLMN ID that is communicated to the HPLMN for non-supporting UEs shall be the Common PLMN ID. In shared networks, when the MME/S4-SGSN and PGW pertain to the same PLMN, the Primary PLMN ID shall be communicated in the ECGI to the PGW, and the Common PLMN ID shall be communicated in SAI/CGI to the PGW, for both supporting and non-supporting UEs. The Core Network Operator PLMN ID (selected by the UE for supporting UEs or allocated by the network for non-supporting UEs) shall be communicated in the TAI, RAI, UCI and the Serving Network.See clause 4.4 of 3GPP TS 23.251 [55].NOTE 11: If the UE initiates a TAU or RAU procedure back to the old MME/old S4 SGSN before completing the ongoing TAU or RAU procedure and the UE is not accessed via a CSG cell or hybrid cell, the old MME/old S4-SGSN shall treat this case as the UE leaves a CSG or hybrid cell. .NOTE 12: VoidNOTE 13: If supported, the PGW shall contact the 3GPP AAA server (identified by this IE which carries the Origin-Host and Origin-Realm included in the DEA message received by the ePDG/TWAN over SWm or STa interface) for establishing the S6b session.NOTE 14: Before contacting an EPC entity, e.g. to send a Create Session Request message, the MME/SGSN shall ensure, during the selection procedure, that the receiving entities support Non-IP PDN type, as specified in clause 5.9 of 3GPP TS 29.303 [32], e.g. using the Notification of Supported features procedure to learn if the candidate SGW supports the CIOT feature. See also the clause 8.83.NOTE 15: An MME, SGW and PGW which supports NB-IoT and/or Non-IP or Ethernet PDN type and/or inter-system change with 5GS and/or UAS services shall support ePCO. A UE supporting NB-IoT access and/or Non-IP or Ethernet PDN type and/or N1 mode and/or UAS services also support ePCO.NOTE 16: All the UE's SGi PDN Connections shall either have the Control Plane Only PDN Connection Indication set or not set.NOTE 17: If the APN was authorized based on the wildcard APN, the Selection Mode Value shall be set to indicate that the subscription is not verified, see Annex A of 3GPP TS 23.060 [35].NOTE 18: The MME can set the Control Plane Only Indication only during a PDN connection creation procedure, and the Serving PLMN Rate Control is only applicable to the PDN connection with Control Plane Only Indication set. During an inter MME with SGW relocation procedure, when the source MME has not set the Control Plane Only Indication, and the target MME supports only the Control Plane CIoT Optimizations, then the target MME shall not include the Serving PLMN Rate Control IE as the PDN connection cannot be changed to Control Plane Only.During an inter MME with SGW relocation procedure, when the source MME has set the Control Plane Only Indication and included Serving PLMN rate control IE in the Context Response message, and the target MME supports both the Control Plane CIoT Optimisation and the establishment of the User Plane, the target MME cannot stop the Serving PLMN Rate Control, i.e. the PGW will continue to enforce Serving PLMN Rate Control as the Control Plane Only Indication for this PDN connection cannot be changed during this mobility procedure.NOTE 19: An MME which supports eNB Change Reporting shall also support Change reporting and therefore shall set both the Change Report Supporting indication and the eNB Changing Reporting Support Indication.NOTE 20: Upon inter MME/SGSN mobility, the target MME/SGSN shall report Presence Reporting Area Information for all the active and inactive PRAs requested by the PGW. Upon intra MME/SGSN mobility with SGW relocation, the MME/SGSN shall only report active PRAs whose Presence Reporting Area Information is changed, e.g. from inside to outside, or vice versa.NOTE 21: This information is used for the SGW-U, PGW-U or combined SGW-U/PGW-U selection (see Annex B.2 of 3GPP TS 29.244 [80]).NOTE 22: An MME shall send the LTE-M RAT type to the SGW only if the latter is known to support it. The forwarding of the LTE-M RAT type to the PGW is controlled by the LTE-M RAT Type reporting to PGW Indication.NOTE 23: It is assumed that the N26 interface is supported homogeneously across a PLMN.NOTE 24: PDN connections of PDN Type "Ethernet" are not supported in GERAN/UTRAN. For PDN connections of PDN type "Ethernet", mobility to GERAN/UTRAN or Non 3GPP access from E-UTRAN is not supported. See clause 4.3.17.8a of TS 23.401 [3].NOTE 25: Before contacting an EPC entity, e.g. to send a Create Session Request message, the MME shall ensure, during the selection procedure, that the receiving entities support Ethernet PDN type, as specified in clause 5.13 of 3GPP TS 29.303 [32], e.g. using the Notification of Supported features procedure to learn if the candidate SGW supports the ETH feature. See also the clause 8.83.NOTE 26: The MME should select an SGW supporting MT-EDT if MT-EDT is applicable for the PDN connection.NOTE 27: If the PGW-C/SMF receives the PDU session ID from the UE in the PCO, ePCO or APCO IE, the 5GCNRI flag is set to 1, and the PGW-C/SMF allows to transfer the PDN connection from EPC to 5GC, the PGW-C/SMF shall return the 5GS parameters as specified in 3GPP TS 23.501 [82] and 3GPP TS 23.502 [83] (e.g. mapped QoS parameters and S-NSSAI for interworking with N26 in the PCO or ePCO, provide S-NSSAI for interworking without N26 in the PCO or ePCO, or provide S-NSSAI for interworking between ePDG connected to EPC and 5GS in the APCO) in the Create Session Response message, regardless of the 5GSIWKI flag.NOTE 28: If the LTE-M Satellite related RAT type is received from the MME, the SGW shall send the LTE-M RAT type to the PGW if the 'Satellite RAT Type reporting to PGW Indication' is not received and the 'LTE-M RAT Type reporting to PGW Indication' is received, or the SGW shall send the WB-E-UTRAN RAT type to the PGW if both of the indications are absent. |

Table 7.2.1-2: Bearer Context to be created within Create Session Request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 |
| TFT | O | This IE may be included on the S4/S11 interfaces. | Bearer TFT | 0 |
| S1-U eNodeB F-TEID | C | This IE shall be included on the S11 interface for X2-based handover with SGW relocation. | F-TEID | 0 |
| S4-U SGSN 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 SGW F-TEID | 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 or a "UE Requested PDN Connectivity". | F-TEID | 2 |
| S5/S8-U PGW F-TEID | C | This IE shall be included on the S4 and S11 interfaces for the TAU/RAU/Handover cases when the GTP-based S5/S8 is used. | F-TEID | 3 |
| CO | For PMIP-based S5/S8, this IE shall be included on the S11/S4 interface for the TAU/RAU/Handover cases 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 1. |
| S12 RNC F-TEID | CO | This IE shall be included on the S4 interface if the S12 interface is used in the Enhanced serving RNS relocation with SGW relocation procedure. | F-TEID | 4 |
| S2b-U ePDG F-TEID | C | This IE shall be included on the S2b interface for an Attach with GTP on S2b, a UE initiated Connectivity to Additional PDN with GTP on S2b, a Handover to Untrusted Non-3GPP IP Access with GTP on S2b and an Initial Attach for emergency session (GTP on S2b). | F-TEID | 5 |
| S2a-U TWAN F-TEID | C | This IE shall be included on the S2a interface for an Initial Attach in WLAN on GTP S2a, an Initial Attach in WLAN for Emergency Service on GTP S2a, a UE initiated Connectivity to Additional PDN with GTP on S2a and a Handover to TWAN with GTP on S2a. | F-TEID | 6 |
| Bearer Level QoS | M |  | Bearer QoS | 0 |
| S11-U MME F-TEID | CO | This IE shall be sent on the S11 interface, if S11-U is being used, during the E-UTRAN Initial Attach and UE requested PDN connectivity procedures.This IE may also be sent on the S11 interface, if S11-U is being used, during a Tracking Area Update procedure with Serving GW change, if the MME needs to establish the S11-U tunnel.See NOTE 2. | F-TEID | 7 |
| NOTE 1: 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 2: Establishing the S11-U tunnel at once during the Create Session Request/Response procedure avoids the need for a subsequent Modify Bearer Request/Response exchange to transfer DL or UL user data. |

Table 7.2.1-3: Bearer Context to be removed within Create Session Request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 |
| S4-U SGSN F-TEID | C | This IE shall be sent on the S4 interface if the S4-U interface is used. See NOTE 1. | F-TEID | 0 |
| NOTE 1: The conditional S4-U SGSN F-TEID IE is redundant. |

Table 7.2.1-4: Overload Control Information within Create Session Request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 clause 12.3.5.1.2.3 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 |

Table 7.2.1-5: Remote UE Context Connected within Create Session Request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Octets 1 |  | Remote UE Context IE Type = 191 (decimal) |  |  |
| Octets 2 and 3 |  | Length = n  |  |  |
| Octets 4 |  | Spare and Instance fields |  |  |
| Information elements | P | Condition / Comment | IE Type | Ins. |
| Remote User ID | M | See clause 8.123 for the description and use of this parameter | Remote User ID | 0 |
| Remote UE IP Information | M | See clause 8.124 for the description and use of this parameter | Remote UE IP Information | 0 |

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