**3GPP TSG-CT WG4 Meeting #99eC4-20xxxx**

**E-Meeting, 18th – 28th August 2020 was C4-204362**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.244** | **CR** | **0472** | **rev** | **2** | **Current version:** | **16.4.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Correct IE Type of Redundant Transmission Parameters | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_URLLC | | | | |  | ***Date:*** | | | 2020-08-11 |
|  |  | | | |  | |  | | |  |
| ***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 can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The Redundant Transmission Parameters IE in Create PDI IE has the same IE Type as the Redundant Tranmission Parameters IE in Create FAR IE, while different inner IEs are included in such two Redundant Transmission Parameters IEs.  Assigning same IE type value to different grouped IEs with different inner content is not a good idea, as it decreases readablity of specification. It also introduces complexity to the PFCP protocol design and reduces the protocol efficiency.  Hence, it is proposed to allocate diffent IE Type values for these two Redundant Transmission Parameters IEs. | | | | | | | | |
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| ***Summary of change:*** | | Following changes are made:  - Update the principle of allocating IE type value to grouped IEs.  - Rename the existing two IEs having same name “Redundant Transmission Parameters”.  - Allocate new IE Type value for Redundant Transmission Parameters IE in FAR, in table 7.5.2.3-4. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Assigning same IE type value to different grouped IEs with different inner content decreases specification readability and it may increase complexity of PFCP protocol design and reduce the protocol efficiency. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.3.1, 5.24.2.2, 5.24.2.3, 7.2.3.3, 7.5.2.2, 7.5.2.3, 7.5.2.7, 7.5.4.3, 7.5.4.13, 8.1.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | The IE Type for the Redundant Transmission Parameters IE in FAR shall have different value from the IE Type for the Redudant Transmission Parameters IE in PDR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1:  - Update the principle of assigning IE type value for grouped IEs.  - Rename the existing two Redundant Transmission Parameters IEs, and assign new value for one of these IEs.  Rev2:  - More subclauses are impacted due to update the IE names.  - Editorial corrections. | | | | | | | | |

*BEGIN OF CHANGES*

#### 5.2.3.1 General

The CP function shall provision one and only one FAR for each PDR provisioned in a PFCP session. The FAR provides instructions to the UP function on how to process the packets matching the PDR.

By setting the appropriate flag(s) in the Apply Action IE in the FAR (see clause 8.2.26), the CP function may request the UP function to:

- drop the packets, by setting the DROP flag;

- forward the packets, by setting the FORW flag and by provisioning the Forwarding Parameters providing instructions on how to forward the packets;

- buffer downlink packets by setting the BUFF flag and by optionally provisioning buffering parameters providing instructions on how to buffer the packets;

- notify the CP function about the arrival of a first DL packet being buffered, by setting the NOCP flag;

- notify the CP function about the first discarded DL packet for each service data flow identified by a PDR because the DL Buffering Duration or DL Buffering Suggested Packet Count is exceeded, by setting the DDPN flag, if the UP function supports the DDDS feature;

- notify the CP function about first buffered DL packet for each service data flow identified by a PDR, by setting the BDPN flag, if the UP function supports the DDDS feature;

- duplicate the packets, by setting the DUPL flag and by provisioning the Duplicating Parameters providing instructions on how to forward the duplicated packets;

- accept or deny UE requests to join an IP multicast group (see clause 5.25), by setting the IPMA or IPMD flag;

- duplicate the packets for redundant transmission (see clause 5.24.2), by setting the DFRT flag and by provisioning the Redundant Transmission Forwarding Parameters IE providing instructions on how to forward the duplicated packets for redundant transmission;

- eliminate duplicate packets used for redundant transmission (see clause 5.24.2), by setting the EDRT flag and by provisioning the Redundant Transmission Forwarding Parameters IE providing instructions on how to detect the duplicated packets for redundant transmission.

The CP function may request the UP function to duplicate packets that are to be dropped, forwarded or buffered.

The CP function may request the UP function to forward the packets and duplicate the packets for redundant transmission.

The CP function may request the UP function to forward the packets and eliminate duplicate packets used for redundant transmission.

The CP function may provision one or more FAR(s) per PFCP session. Different FARs of a same PFCP session may be provisioned with a different Apply Action flags, e.g. to enable the forwarding of downlink data packets for some PDRs while requesting to buffer downlink data packets for other PDRs.

NOTE 1: This is necessary to establish or release a partial set of radio access bearers in UTRAN.

When instructed to buffer and notify the CP function about the arrival of a DL packet, the UP function shall notify the CP function, when it receives a first downlink packet for a given FAR (in EPC), or when it receives a first downlink packet for each QoS flow for a given FAR (in 5GC), by sending a PFCP Session Report Request including a Downlink Data Report IE identifying the PDR(s) for which downlink packets have been received.

NOTE 2: Receipt of downlink packets on PDRs associated to different FARs can result in sending multiple PFCP Session Report Request messages for the same PFCP session.

NOTE 3: Receipt of downlink packets pertaining to different QoS flows associated to the same FAR can result in sending multiple PFCP Session Report Request messages for the same PFCP session. The CP function identifies the QFI based on the PDR ID (when different PDRs are used for different QoS flows) or based on the Downlink Data Service Information IE.

If the UP function indicated support of Header Enrichment of UL traffic (see clause 8.2.25), the CP function may provide the UP function with header enrichment information for uplink traffic, by including one or more Header Enrichment IE(s) in the FAR. In this case, the UP function should use this information to enrich the header of the uplink traffic (e.g. HTTP header enrichment).

NOTE 4: It is not defined how to support SGi PtP tunnelling mechanisms other than based on UDP/IP encapsulation (such as PMIPv6/GRE, L2TP, GTP-C/U, see clause 4.3.17.8.3.3.3 of 3GPP TS 23.401 [14]) for Non-IP PDN connections.

If the UP function indicated support of PDI optimisation (see clause 8.2.25), the CP function may include in the forwarding parameters of the FAR the Linked Traffic Endpoint ID, if it is available, identifying the traffic Endpoint allocated for this PFCP session to receive the traffic in the reverse direction.

NOTE 5: This information can enable an SGW-U or PGW-U to correlate the UL and DL traffic (i.e. PDRs) sent over a same bearer.

Assuming for instance a PFCP session provisioned in a PGW-U with:

- an UL PDR 1 (for an S5/S8 bearer 1) with Source Interface "Access" associated to an UL Traffic Endpoint ID "1" (comprising the IP address, a local TEID and optionally a network instance),

- a DL PDR 1 with Source Interface "Core", UE IP address and SDF 1,

the CP function sets the Linked Traffic Endpoint in the DL FAR 1 (associated to DL PDR 1) to the UL Traffic Endpoint "1", which allows the PGW-U to correlate the uplink and downlink PDRs for the same bearer (i.e. that UL PDR 1 associated to UL Traffic Endpoint "1", and DL PDR1 associated to DL FAR 1 with Linked Traffic Endpoint set to UL Traffic Endpoint "1", use the same S5/S8 bearer).

NOTE 6: The Linked Traffic Endpoint can possibly refer to a Traffic Endpoint in the reverse direction requested to be created in the same PFCP request.

*NEXT CHANGE*

#### 5.24.2.2 GTP-U tunnel setup for redundant transmission

The SMF shall request the UPF (PSA) to establish two N3 or N9 tunnels for a PDU session with one or more Service Data Flows associated with QoS flow(s) requiring redundant transmission as follows:

- when provisioning an UL PDR in the UPF (PSA), the SMF shall request the UPF to assign two Local F-TEIDs for the PDR, by provisioning the PDI or the Traffic Endpoint with the Redundant Transmission Detection Parameters IE. The SMF may provide two different Network Instances for these two F-TEIDs to achieve disjoint transport layer paths;

- alternatively, the SMF may request the UPF to assign one Local F-TEID for the related Network Instance when creating the UL PDR, and later request the UPF to assign another Local F-TEID with the same or a different Network Instance when updating the PDR, if the redundant transmission tunnels are not established during the PDU session establishment;

- when provisioning DL FAR in the UPF (PSA) corresponding to QoS flows requiring redundant transmission, the SMF shall request the UPF to duplicate the downlink packets for redundant transmission and the SMF shall provide two F-TEIDs of remote GTP-U tunnel endpoints in the FAR, as described in clause 5.24.2.3;

- alternatively, the SMF may provide one remote endpoint F-TEID when creating the FAR and later provide another remote endpoint F-TEID when updating the FAR, if the redundant transmission tunnels are not established during the PDU session establishment.

NOTE : To forward downlink packets pertaining to service data flows not requiring redundant transmission, the SMF can create a separate FAR not requiring to duplicate the packets.

The PSA UPF shall assign the local F-TEID(s) for establishing the redundant tunnel and include the Local F-TEID(s) for Redundant Transmission IE in the PFCP Session Establishment Response or the PFCP Session Modification Response to the SMF if the Redundant Transmission Detection Parameters IE was received in the corresponding request message.

The SMF shall request the UPF (PSA) to remove one N3 or N9 tunnel used for redundant transmission if redundant transmission is no longer needed as follows:

- request the UPF to remove the local F-TEID for redundant transmission by updating the PDI or the Traffic Endpoint in UL PDR with a null length Redundant Transmission Detection Parameters IE;

- request the UPF to remove the F-TEID of remote GTP-U tunnel endpoint for redundant transmission by updating the FAR in DL PDR with a null length Redundant Transmission Detection Parameters IE;

- set the DFRT and EDRT flags to 0 in the FAR associated to the corresponding UL and DL PDRs, to stop duplicating packets and eliminating duplicate packets.

When so instructed, the PSA UPF shall remove the local F-TEID for redundant transmission and the F-TEID of remote GTP-U tunnel endpoint for redundant transmission, stop duplicating packets and stop detecting/eliminating duplicate packets accordingly.

*NEXT CHANGE*

#### 5.24.2.3 Duplicating downlink packets for redundant transmission

If redundant transmission is required for a QoS flow, the SMF shall instruct the PSA UPF to replicate each downlink packet of the QoS Flow and to assign a sequence number to them by provisioning a FAR with the following information in a PFCP Session Establishment Request or PFCP Session Modification Request:

- the Redundant Transmission Forwarding Parameters IE including an Outer Header Creation IE set to the remote F-TEID of the redundant GTP-U tunnel, and if the GTP-U tunnel for redundant transmission uses a different network instance than the primary GTP-U tunnel, the Network Instance to be used for redundant transmission;

- the Apply Action IE with both the FORW and the DFRT flags set to "1".

When so instructed, the PSA UPF shall replicate downlink packets associated to such a FAR and construct the duplicated downlink packets using the information included in the Redundant Transmission Forwarding Parameters IE and other information included in the Forwarding Parameters IE for information that is not part of the Redundant Transmission Forwarding Parameters IE.The PSA UPF shall add the same sequence number in the PDU Session Container extension header of the downlink packet and the related duplicated downlink packets as specified in 3GPP TS 38.415 [34].

*NEXT CHANGE*

#### 7.2.3.3 Grouped Information Elements

A Grouped IE is an IE which may contain other IEs.

Grouped IEs have a length value in the TLV encoding, which includes the added length of all the embedded IEs. Overall coding of a grouped IE with 4 octets long IE header is defined in clause 8.2. Each IE within a grouped IE also shall also contain 4 octets long IE header.

Grouped IEs are not marked by any flag or limited to a specific range of IE type values. The clause describing an IE in this specification shall explicitly state if it is a Grouped IE.

NOTE: Each entry into each Grouped IE creates a new scope level. Exit from the grouped IE closes the scope level. The PFCP message level is the top most scope.

If more than one grouped IEs of the same type, but for a different purpose are sent within the same message level, these IEs shall have different IE types.

If more than one grouped IEs of the same type and for the same purpose are sent within the same message level, these IEs shall have exactly the same IE type to represent a list.

Assigning the same IE type to grouped IEs which don’t have the same content is not recommended, even if these grouped IEs are in different message levels.

*NEXT CHANGE*

#### 7.5.2.2 Create PDR IE within PFCP Session Establishment Request

The Create PDR grouped IE shall be encoded as shown in Figure 7.5.2.2-1.

Table 7.5.2.2-1: Create PDR IE within PFCP Session Establishment Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Create PDR IE Type = 1(decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| PDR ID | M | This IE shall uniquely identify the PDR among all the PDRs configured for that PFCP session. | X | X | X | X | PDR ID |
| Precedence | M | This IE shall indicate the PDR's precedence to be applied by the UP function among all PDRs of the PFCP session, when looking for a PDR matching an incoming packet. | - | X | X | X | Precedence |
| PDI | M | This IE shall contain the PDI against which incoming packets will be matched.  See Table 7.5.2.2-2. | X | X | X | X | PDI |
| Outer Header Removal | C | This IE shall be present if the UP function is required to remove one or more outer header(s) from the packets matching this PDR. | X | X | - | X | Outer Header Removal |
| FAR ID | C | This IE shall be present if the Activate Predefined Rules IE is not included or if it is included but it does not result in activating a predefined FAR, and if the MAR ID is not included. This IE may be present if the CP function activated a predefined rule name with a predefined FAR but the CP function wishes to overwrite the predefined FAR by another FAR. (NOTE 2)  When present this IE shall contain the FAR ID to be associated to the PDR. | X | X | X | X | FAR ID |
| URR ID | C | This IE shall be present if a measurement action shall be applied to packets matching this PDR.  When present, this IE shall contain the URR IDs to be associated to the PDR.  Several IEs within the same IE type may be present to represent a list of URRs to be associated to the PDR. | X | X | X | X | URR ID |
| QER ID | C | This IE shall be present if a QoS enforcement or QoS marking action shall be applied to packets matching this PDR.  When present, this IE shall contain the QER IDs to be associated to the PDR. Several IEs within the same IE type may be present to represent a list of QERs to be associated to the PDR. | - | X | X | X | QER ID |
| Activate Predefined Rules | C | This IE shall be present if Predefined Rule(s) shall be activated for this PDR. When present this IE shall contain one Predefined Rules name.  Several IEs with the same IE type may be present to represent multiple "Activate Predefined Rules" names. | - | X | X | X | Activate Predefined Rules |
| Activation Time | O | This IE may be present if the PDR activation shall be deferred. (NOTE 1) | - | X | X | X | Activation Time |
| Deactivation Time | O | This IE may be present if the PDR deactivation shall be deferred. (NOTE 1) | - | X | X | X | Deactivation Time |
| MAR ID | C | This IE shall be present if the PDR is provisioned to match the downlink traffic of non-GBR QoS flows towards the UE for a PFCP session established for a MA PDU session. | - | - | - | X | MAR ID |
| Packet Replication and Detection Carry-On Information | C | This IE shall be present if the PDR is provisioned to match a broadcast packet. When present, it contains the information to instruct the UPF to replicate the packet and to carry-on the look-up of other PDRs of other PFCP sessions matching the packet (see clause 5.2.1). | - | - | - | X | Packet Replication and Detection Carry-On Information |
| IP Multicast Addressing Info | O | This IE may be present in an UL PDR controlling UL IGMP/MLD traffic (see 5.25).  When present, it shall contain a (range of) IP multicast address(es), and optionally source specific address(es), identifying a set of IP multicast flows. See Table 7.5.2.2-4.  Several IEs with the same IE type may be present to represent multiple IP multicast flows. | - | - | - | X | IP Multicast Addressing Info |
| UE IP address Pool Identity | O | This IE may be present if UE IP Addresses Pools are configured in the UPF.  When present, this IE shall contain the identity of a UE IP address Pool configured in the UPF.  Two IEs with the same IE type shall be present to represent UE IPv4 Address Pool Identity and UE IPv6 Address Pool Identity if different pool identities are used for UE IPv4 address and UE IPv6 address and both an UE IPv4 and an UE IPv6 address are requested to be assigned for the PFCP session. In this case, the UE IPv4 Address Pool Identity shall be encoded before the UE IPv6 Address Pool Identity. | - | X | - | X | UE IP address Pool Identity |
| MPTCP Applicable Indication | C | This IE shall be present if the PDR is used to detect UL user plane traffic for which MPTCP is applicable. | - | - | - | X | MPTCP Applicable Indication |
| NOTE 1: When the Activation Time and Deactivation Time are not present, the PDR shall be activated immediately at receiving the message.  NOTE 2: If a predefined FAR is or has been activated using a predefined rule name, it is UP function implementation specific whether this predefined FAR can be overwritten by a FAR ID pointing to another predefined FAR (i.e. with the most significant bit set to 1). If not, the UP function shall reject such a request if received from the CP function. | | | | | | | |

Table 7.5.2.2-2: PDI IE within PFCP Session Establishment Request

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 | |  | | PDI IE Type = 2 (decimal) | | | | | | | | | | | |
| Octets 3 and 4 | |  | | Length = n | | | | | | | | | | | |
| Information elements | | P | | Condition / Comment | | Appl. | | | | | | | | IE Type | |
| Sxa | | Sxb | | Sxc | | N4 | |
| Source Interface | | M | | This IE shall identify the source interface of the incoming packet. | | X | | X | | X | | X | | Source Interface | |
| Local F-TEID | | O | | This IE shall not be present if Traffic Endpoint ID is present.  If present, this IE shall identify the local F-TEID to match for an incoming packet.  The CP function shall set the CHOOSE (CH) bit to 1 if the CP function requests the UP function to assign a local F-TEID to the PDR. | | X | | X | | - | | X | | F-TEID | |
| Network Instance | | O | | This IE shall not be present if Traffic Endpoint ID is present. It shall be present if the CP function requests the UP function to allocate a UE IP address/prefix and the Traffic Endpoint ID is not present.  If present, this IE shall identify the Network instance to match for the incoming packet. See NOTE 1, NOTE2. | | X | | X | | X | | X | | Network Instance | |
| Redundant Transmission Detection Parameters | | O | | If present, this IE shall contain the information used for the reception of redundant uplink packets on N3/N9 interfaces. | | - | | - | | - | | X | | Redundant Transmission Detection Parameters | |
| UE IP address | | O | | This IE shall not be present if Traffic Endpoint ID is present.  If present, this IE shall identify the source or destination IP address to match for the incoming packet. (NOTE 5).  The CP function shall set the CHOOSE IPV4 (CHV4) and/or the CHOOSE IPV6 (CHV6) bits to 1 if the UP function supports the allocation of UE IP address/ prefix and the CP function requests the UP function to assign a UE IP address/prefix to the PDR.  In the 5GC, several IEs with the same IE type may be present to represent multiple UE IP addresses, if the UPF indicated support of the IP6PL feature (see clause 5.21). | | - | | X | | X | | X | | UE IP address | |
| Traffic Endpoint ID | | C | | This IE may be present if the UP function has indicated the support of PDI optimization.  If present, this IE shall uniquely identify the Traffic Endpoint for that PFCP session.  Several IEs with the same IE type may be present to provision several Traffic Endpoints with different Traffic Endpoint IDs, from which the UPF may receive packets pertaining to the same service data flow, which is subject for the same FAR, QER and URR, if the UPF has indicated it supports MTE feature as specified in clause 8.2.25. See NOTE 6. | | X | | X | | X | | X | | Traffic Endpoint ID | |
| SDF Filter | | O | | If present, this IE shall identify the SDF filter to match for the incoming packet. Several IEs with the same IE type may be present to provision a list of SDF Filters. The full set of applicable SDF filters, if any, shall be provided during the creation or the modification of the PDI.  See NOTE 3. | | - | | X | | X | | X | | SDF Filter | |
| Application ID | | O | | If present, this IE shall identify the Application ID to match for the incoming packet. | | - | | X | | X | | X | | Application ID | |
| Ethernet PDU Session Information | | O | | This IE may be present to identify all the (DL) Ethernet packets matching an Ethernet PDU session (see clause 5.13.1). | | - | | - | | - | | X | | Ethernet PDU Session Information | |
| Ethernet Packet Filter | | O | | If present, this IE shall identify the Ethernet PDU to match for the incoming packet.  Several IEs with the same IE type may be present to represent a list of Ethernet Packet Filters.  The full set of applicable Ethernet Packet filters, if any, shall be provided during the creation or the modification of the PDI. | | - | | - | | - | | X | | Ethernet Packet Filter | |
| QFI | | O | | This IE shall not be present if Traffic Endpoint ID is present and the QFI(s) are included in the Traffic Endpoint.  If present, this IE shall identify the QoS Flow Identifier to match for the incoming packet.  Several IEs with the same IE type may be present to provision a list of QFIs. When present, the full set of applicable QFIs shall be provided during the creation or the modification of the PDI. | | - | | - | | - | | X | | QFI | |
| Framed-Route | | O | | This IE may be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25). If present, this IE shall describe a framed route.  Several IEs with the same IE type may be present to provision a list of framed routes. (NOTE 5) | | - | | X | | - | | X | | Framed-Route | |
| Framed-Routing | | O | | This IE may be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25). If present, this IE shall describe a framed route. | | - | | X | | - | | X | | Framed-Routing | |
| Framed-IPv6-Route | | O | | This IE may be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25). If present, this IE shall describe a framed IPv6 route.  Several IEs with the same IE type may be present to provision a list of framed IPv6 routes. (NOTE 5) | | - | | X | | - | | X | | Framed-IPv6-Route | |
| Source Interface Type | | O | | This IE may be present to indicate the 3GPP interface type of the source interface, if required by functionalities in the UP Function, e.g. for performance measurements. | | X | | X | | - | | X | | 3GPP Interface Type | |
| IP Multicast Addressing Info | | O | | This IE may be present in a DL PDR controlling DL IP multicast traffic (see clause 5.25).  When present, it shall contain a (range of) IP multicast address(es), and optionally source specific address(es), identifying a set of IP multicast flows. See Table 7.5.2.2-4.  Several IEs with the same IE type may be present to represent multiple IP multicast flows. | | - | | - | | - | | X | | IP Multicast Addressing Info | |
| NOTE 1: The Network Instance parameter is needed e.g. in the following cases:  - PGW/TDF UP function supports multiple PDNs with overlapping IP addresses;  - SGW UP function is connected to PGWs in different IP domains (S5/S8);  - PGW UP function is connected to SGWs in different IP domains (S5/S8);  - SGW UP function is connected to eNodeBs in different IP domains;  - UPF is connected to 5G-ANs in different IP domains;  - Separation of multiple 5G VN groups communication in the UPF;  - Indirect data forwarding.  NOTE 2: When a Local F-TEID is provisioned in the PDI, the Network Instance shall relate to the IP address of the F-TEID. Otherwise, the Network Instance shall relate to the UE IP address if provisioned or the destination IP address in the SDF filter if provisioned  NOTE 3: SDF Filter IE(s) shall not be present if Ethernet Packet Filter IE(s) is present.  NOTE 4: When several SDF filter IEs are provisioned, the UP function shall consider that the packets are matched if matching any SDF filter. The same principle shall apply for Ethernet Packet Filters and QFIs.  NOTE 5: If both the UE IP Address and the Framed-Route (or Framed-IPv6-Route) are present, the packets which are considered being matching the PDR shall match at least one of them.  NOTE 6: Maximum two Traffic Endpoint ID containing different Local TEIDs per PDI may be provisioned over the N4 interface for a PFCP session which is established for a PDU session subject for 5G to EPS mobility with N26 supported. Several Traffic Endpoint ID containing different UE IP Addresses may be provisioned over the N4 interface for a PFCP session if the UPF also indicated support of the IP6PL feature (see clause 5.21.1). | | | | | | | | | | | | | | | |

Table 7.5.2.2-3: Ethernet Packet Filter IE within PFCP Session Establishment Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Ethernet Packet Filter IE Type = 132 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Ethernet Filter ID | C | This shall be present if Bidirectional Ethernet filter is required. This IE shall uniquely identify an Ethernet Filter among all the Ethernet Filters provisioned for a given PFCP session. | - | - | - | X | Ethernet Filter ID |
| Ethernet Filter Properties | C | This IE shall be present when provisioning a bidirectional Ethernet Filter the first time (see clause 5.13.4). | - | - | - | X | Ethernet Filter Properties |
| MAC address | O | If present, this IE shall identify the MAC address.  This IE may be present up to 16 times. | - | - | - | X | MAC address |
| Ethertype | O | If present, this IE shall identify the Ethertype. | - | - | - | X | Ethertype |
| C-TAG | O | If present, this IE shall identify the Customer-VLAN tag. | - | - | - | X | C-TAG |
| S-TAG | O | If present, this IE shall identify the Service-VLAN tag. | - | - | - | X | S-TAG |
| SDF Filter | O | If packet filtering is required, for Ethernet frames with Ethertype indicating IPv4 or IPv6 payload, this IE shall describe the IP Packet Filter Set.  Several IEs with the same IE type may be present to represent a list of SDF filters. | - | - | - | X | SDF Filter |

Table 7.5.2.2-4: IP Multicast Addressing Info IE within PFCP Session Establishment Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | IP Multicast Addressing Info IE Type = 188 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| IP Multicast Address | M | This IE shall contain the IP multicast address(es) of the DL multicast flow(s) or indicate "any" IP multicast address. | - | - | - | X | IP Multicast Address |
| Source IP Address | O | When present, this IE shall contain the source specific IP address of the DL multicast flow.  Several IEs with the same IE type may be present to represent multiple source specific addresses.  If this IE is not present, this indicates "any" source IP address. | - | - | - | X | Source IP Address |

Table 7.5.2.2-5: Redundant Transmission Detection Parameters IE in PDI

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Redundant Transmission Detection Parameters IE Type = 255 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Local F-TEID for Redundant Transmission | M | This IE shall identify the local F-TEID to match for an incoming packet for redundant transmission.  The CP function shall set the CHOOSE (CH) bit to 1 if it requests the UP function to assign a local F-TEID to the PDR. | - | - | - | X | F-TEID |
| Network Instance for Redundant Transmission | C | This IE shall be included if the Local F-TEID for Redundant Transmission uses a different network Instance than the Network Instance used for the Local F-TEID for the primary GTP-U tunnel. | - | - | - | X | Network Instance |

*NEXT CHANGE*

#### 7.5.2.3 Create FAR IE within PFCP Session Establishment Request

The Create FAR grouped IE shall be encoded as shown in Figure 7.5.2.3-1.

Table 7.5.2.3-1: Create FAR IE within PFCP Session Establishment Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Create FAR IE Type = 3 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| FAR ID | M | This IE shall uniquely identify the FAR among all the FARs configured for that PFCP session. | X | X | X | X | FAR ID |
| Apply Action | M | This IE shall indicate the action to apply to the packets, See clauses 5.2.1 and 5.2.3. | X | X | X | X | Apply Action |
| Forwarding Parameters | C | This IE shall be present when the Apply Action requests the packets to be forwarded. It may be present otherwise.  When present, this IE shall contain the forwarding instructions to be applied by the UP function when the Apply Action requests the packets to be forwarded.  See table 7.5.2.3-2. | X | X | X | X | Forwarding Parameters |
| Duplicating Parameters | C | This IE shall be present when the Apply Action requests the packets to be duplicated. It may be present otherwise.  When present, this IE shall contain the forwarding instructions to be applied by the UP function for the traffic to be duplicated, when the Apply Action requests the packets to be duplicated.  Several IEs with the same IE type may be present to represent to duplicate the packets to different destinations. See NOTE 1.  See table 7.5.2.3-3. | X | X | - | - | Duplicating Parameters |
| BAR ID | O | When present, this IE shall contain the BAR ID of the BAR defining the buffering instructions to be applied by the UP function when the Apply Action requests the packets to be buffered. | X | - | - | X | BAR ID |
| Redundant Transmission Forwarding Parameters | C | This IE shall be present when the Apply Action requests the packets to be duplicated for redundant transmission and the Forwarding Parameters IE is included. It may be present otherwise.  When present, this IE shall contain the forwarding instructions to be applied by the UP function for the traffic to be duplicated, when the Apply Action requests the packets to be duplicated for redundant transmission. Except for the parameters included in the Redundant Transmission Parameters IE, the duplicated packets shall apply the same parameters as those indicated in the Forwarding Parameters IE.  See table 7.5.2.3-4. |  |  |  |  | Redundant Transmission Forwarding Parameters |
| NOTE 1: The same user plane packets may be required, according to operator's policy and configuration, to be duplicated to different SX3LIFs. | | | | | | | |

Table 7.5.2.3-2: Forwarding Parameters IE in FAR

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Forwarding Parameters IE Type = 4 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Destination Interface | M | This IE shall identify the destination interface of the outgoing packet. | X | X | X | X | Destination Interface |
| Network Instance | O | When present, this IE shall identify the Network instance towards which to send the outgoing packet. See NOTE 1. | X | X | X | X | Network Instance |
| Redirect Information | C | This IE shall be present if the UP function is required to enforce traffic redirection towards a redirect destination provided by the CP function. | - | X | X | X | Redirect Information |
| Outer Header Creation | C | This IE shall be present if the UP function is required to add one or more outer header(s) to the outgoing packet. If present, it shall contain the F-TEID of the remote GTP-U peer when adding a GTP-U/UDP/IP header, or the Destination IP address and/or Port Number when adding a UDP/IP header or an IP header or the C-TAG/S-TAG (for 5GC). See NOTE 2. | X | X | - | X | Outer Header Creation |
| Transport Level Marking | C | This IE shall be present if the UP function is required to mark the IP header with the DSCP marking as defined by IETF RFC 2474 [22]. When present for EPC, it shall contain the value of the DSCP in the TOS/Traffic Class field set based on the QCI, and optionally the ARP priority level, of the associated EPS bearer, as described in clause 5.10 of 3GPP TS 23.214 [2]. When present for 5GC, it shall contain the value of the DSCP in the TOS/Traffic Class field set based on the 5QI, the Priority Level (if explicitly signalled), and optionally the ARP priority level, of the associated QoS flow, as described in clause 5.8.2.7 of 3GPP TS 23.501 [28], | X | X | - | X | Transport Level Marking |
| Forwarding Policy | C | This IE shall be present if a specific forwarding policy is required to be applied to the packets. It shall be present if the Destination Interface IE is set to SGi-LAN / N6-LAN. It may be present if the Destination Interface is set to Core, Access, or CP-Function. See NOTE 2.  When present, it shall contain an Identifier of the Forwarding Policy locally configured in the UP function. | - | X | X | X | Forwarding Policy |
| Header Enrichment | O | This IE may be present if the UP function indicated support of Header Enrichment of UL traffic. When present, it shall contain information for header enrichment. | - | X | X | X | Header Enrichment |
| Linked Traffic Endpoint ID | C | This IE may be present, if it is available and the UP function indicated support of the PDI optimisation feature, (see clause 8.2.25). When present, it shall identify the Traffic Endpoint ID allocated for this PFCP session to receive the traffic in the reverse direction (see clause 5.2.3.1). | X | X | - | X | Traffic Endpoint ID |
| Proxying | C | This IE shall be present if proxying is to be performed by the UP function.  When present, this IE shall contain the information that the UPF shall respond to Address Resolution Protocol and / or IPv6 Neighbour Solicitation based on the local cache information for the Ethernet PDUs. | - | - | - | X | Proxying |
| Destination Interface Type | O | This IE may be present to indicate the 3GPP interface type of the destination interface, if required by functionalities in the UP Function, e.g. for performance measurements. | X | X | - | X | 3GPP Interface Type |
| Data Network Access Identifier | C | This IE shall be present over N16a to link the UL FAR in an UL CL or BP towards a specific local PSA, if more than one local PSA has been inserted by an I-SMF. It may be present over N16a otherwise. This IE shall not be sent over N4.  When present, it shall be set to the DNAI associated to the local PSA towards which the UL traffic shall be forwarded. | - | - | - | - | Data Network Access Identifier |
| NOTE 1: The Network Instance parameter is needed e.g. in the following cases:  - PGW/TDF UP function supports multiple PDNs with overlapping IP addresses;  - SGW UP function is connected to PGWs in different IP domains (S5/S8);  - PGW UP function is connected to SGWs in different IP domains (S5/S8);  - SGW UP function is connected to eNodeBs in different IP domains;  - UPF is connected to 5G-ANs in different IP domains;  - Separation of multiple 5G VN groups communication in the UPF;  - Indirect data forwarding.  NOTE 2: If the Outer Header Creation and Forwarding Policy are present, the UP function shall put the user plane packets in the user plane tunnel by applying Outer Header Creation, after enforcing the required Forwarding Policy. | | | | | | | |

Table 7.5.2.3-3: Duplicating Parameters IE in FAR

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Duplicating Parameters IE Type = 5 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Destination Interface | M | This IE shall identify the destination interface of the outgoing packet. | X | X | - | - | Destination Interface |
| Outer Header Creation | C | This IE shall be present if the UP function is required to add one or more outer header(s) to the outgoing packet. If present, it shall contain the F-TEID of the remote GTP-U peer. See NOTE 1. | X | X | - | - | Outer Header Creation |
| Transport Level marking | C | This IE shall be present if the UP function is required to mark the IP header with the DSCP marking as defined by IETF RFC 2474 [22]. When present, it shall contain the value of the DSCP in the TOS/Traffic Class field. | X | X | - | - | Transport Level Marking |
| Forwarding Policy | C | This IE shall be present if a specific forwarding policy is required to be applied to the packets. When present, it shall contain an Identifier of the Forwarding Policy locally configured in the UP function. | X | X | - | - | Forwarding Policy |
| NOTE 1: If the Outer Header Creation and Forwarding Policy are present, the UP function shall put the user plane packets in the user plane tunnel by applying Outer Header Creation, after enforcing the required Forwarding Policy. | | | | | | | |

Table 7.5.2.3-4: Redundant Transmission Forwarding Parameters IE in FAR

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Redundant Transmission Forwarding Parameters IE Type = 2xx (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Outer Header Creation | M | This IE shall be present if the UP function is required to perform the redundant transmission of the outgoing packet.  If present, it shall contain the F-TEID of the remote GTP-U peer for redundant transmission. | - | - | - | X | Outer Header Creation |
| Network Instance for Redundant Transmission | C | This IE shall be included if the GTP-U tunnel used for redundant transmission uses a different network Instance than the Network Instance used for the primary GTP-U tunnel. | - | - | - | X | Network Instance |

*NEXT CHANGES*

#### 7.5.2.7 Create Traffic Endpoint IE within PFCP Session Establishment Request

The Create Traffic Endpoint grouped IE shall be encoded as shown in Figure 7.5.2.7-1.

Table 7.5.2.7-1: Create Traffic Endpoint IE within PFCP Session Establishment Request

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 | | Create Traffic Endpoint IE Type = 127(decimal) | | | | | | | | | | | | | | |
| Octets 3 and 4 | | Length = n | | | | | | | | | | | | | | |
| Information elements | | P | | Condition / Comment | | Appl. | | | | | | | | IE Type | | |
| Sxa | | Sxb | | Sxc | | N4 | |
| Traffic Endpoint ID | | M | | This IE shall uniquely identify the Traffic Endpoint for that PFCP session. | | X | | X | | X | | X | | Traffic Endpoint ID | | |
| Local F-TEID | | O | | If present, this IE shall identify the local F-TEID to match for an incoming packet.  The CP function shall set the CHOOSE (CH) bit to 1 if the CP function requests the UP function to assign a local F-TEID to the Traffic Endpoint. | | X | | X | | - | | X | | F-TEID | | |
| Network Instance | | O | | This IE shall be present if the CP function requests the UP function to allocate a UE IP address/prefix.  If present, this IE shall identify the Network instance to match for the incoming packet. See NOTE 1, NOTE 2. | | X | | X | | X | | X | | Network Instance | | |
| Redundant Transmission Detection Parameters | | O | | If present, this IE shall contain the information used for the reception of redundant uplink packets on N3/N9 interfaces.  See Table 7.5.2.2-5. | | - | | - | | - | | X | | Redundant Transmission Detection Parameters | | |
| UE IP address | | O | | If present, this IE shall identify the source or destination IP address to match for the incoming packet. (NOTE 3).  The CP function shall set the CHOOSE IPV4 (CHV4) and/or CHOOSE IPV6 (CHV6) bits to 1 if the UP function supports the allocation of UE IP address/ prefix and the CP function requests the UP function to assign a UE IP address/prefix to the Traffic Endpoint.  In the 5GC, several IEs with the same IE type may be present to represent multiple UE IP addresses, if the UPF indicated support of the IP6PL feature (see clause 5.21). | | - | | X | | X | | X | | UE IP address | | |
| Ethernet PDU Session Information | | O | | This IE may be present to identify all the (DL) Ethernet packets matching an Ethernet PDU session (see clause 5.13.1). | | - | | - | | - | | X | | Ethernet PDU Session Information | | |
| Framed-Route | | O | | This IE may be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25). If present, this IE shall describe a framed route.  Several IEs with the same IE type may be present to provision a list of framed routes. (NOTE 3) | | - | | X | | - | | X | | | Framed-Route | | |
| Framed-Routing | | O | | This IE may be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25). If present, this IE shall describe the framed routing associated to a framed route. | | - | | X | | - | | X | | | Framed-Routing | | |
| Framed-IPv6-Route | | O | | This IE may be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25). If present, this IE shall describe a framed IPv6 route.  Several IEs with the same IE type may be present to provision a list of framed IPv6 routes. (NOTE 3) | | - | | X | | - | | X | | Framed-IPv6-Route | | |
| QFI | | O | | This IE may be present if the UPF has indicated it supports MTE feature as specified in clause 8.2.25.  If present, this IE shall identify the QoS Flow Identifier to match for the incoming packet received from the traffic endpoint.  Several IEs with the same IE type may be present to provision a list of QFIs. When present, the full set of applicable QFIs shall be provided. | | - | | - | | - | | X | | QFI | | |
| NOTE 1: The Network Instance parameter is needed e.g. in the following cases:  - PGW/TDF UP function supports multiple PDNs with overlapping IP addresses;  - SGW UP function is connected to PGWs in different IP domains (S5/S8);  - PGW UP function is connected to SGWs in different IP domains (S5/S8);  - SGW UP function is connected to eNodeBs in different IP domains;  - UPF is connected to 5G-ANs in different IP domains;  - Separation of multiple 5G VN groups communication in the UPF.  NOTE 2: When a Local F-TEID is provisioned in the Traffic Endpoint, the Network Instance shall relate to the IP address of the F-TEID. Otherwise, the Network Instance shall relate to the UE IP address.  NOTE 3: If both the UE IP Address and the Framed-Route (or Framed-IPv6-Route) are present, the packets which are considered being matching the PDR shall match at least one of them. | | | | | | | | | | | | | | | | |

*NEXT CHANGE*

#### 7.5.4.3 Update FAR IE within PFCP Session Modification Request

The Update FAR grouped IE shall be encoded as shown in Figure 7.5.4.3-1.

Table 7.5.4.3-1: Update FAR IE within PFCP Session Modification Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Update FAR IE Type = 10 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| FAR ID | M | This IE shall identify the FAR to be updated. | X | X | X | X | FAR ID |
| Apply Action | C | This IE shall be present if it is changed. | X | X | X | X | Apply Action |
| Update Forwarding parameters | C | This IE shall be present if it is changed.See table 7.5.4.3-2. | X | X | X | X | Update Forwarding Parameters |
| Update Duplicating Parameters | C | This IE shall be present if it is changed. See table 7.5.4.3-3.  Several IEs with the same IE type may be present to request to duplicate the packets to different destinations. | X | X | - | - | Update Duplicating Parameters |
| Redundant Transmission Forwarding Parameters | C | This IE shall be present if it is changed. See table 7.5.2.3-4. | - | - | - | X | Redundant Transmission Forwarding Parameters |
| BAR ID | C | This IE shall be present if the BAR ID associated to the FAR needs to be modified. | X | - | - | X | BAR ID |

Table 7.5.4.3-2: Update Forwarding Parameters IE in FAR

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Update Forwarding Parameters IE Type = 11 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Destination Interface | C | This IE shall only be provided if it is changed.  When present, it shall indicate the destination interface of the outgoing packet. | X | X | X | X | Destination Interface |
| Network instance | C | This IE shall only be provided if it is changed. | X | X | X | X | Network Instance |
| Redirect Information | C | This IE shall be present if the instructions regarding the redirection of traffic by the UP function need to be modified. | - | X | X | X | Redirect Information |
| Outer Header Creation | C | This IE shall only be provided if it is changed. See NOTE 1. | X | X | - | X | Outer Header Creation |
| Transport Level Marking | C | This IE shall only be provided if it is changed | X | X | - | X | Transport Level Marking |
| Forwarding Policy | C | This IE shall only be provided if it is changed. See NOTE 1. | - | X | X | X | Forwarding Policy |
| Header Enrichment | C | This IE shall only be provided if it is changed | - | X | X | X | Header Enrichment |
| PFCPSMReq-Flags | C | This IE shall be included if at least one of the flags is set to "1".  - SNDEM (Send End Marker Packets): this IE shall be present if the CP function modifies the F-TEID of the downstream node in the Outer Header Creation IE and the CP function requests the UP function to construct and send GTP-U End Marker messages towards the old F-TEID of the downstream node. | X | X | - | X | PFCPSMReq-Flags |
| Linked Traffic Endpoint ID | C | This IE may be present, if it is changed and the UP function indicated support of the PDI optimization feature, (see clause 8.2.25). When present, it shall identify the Traffic Endpoint ID allocated for this PFCP session to receive the traffic in the reverse direction (see clause 5.2.3.1). | X | X | - | X | Traffic Endpoint ID |
| Destination Interface Type | C | This IE shall be present to indicate the 3GPP interface type of the destination interface, if the value has changed. | X | X | - | X | 3GPP Interface Type |
| Data Network Access Identifier | C | This IE shall be provided over N16a if it is changed. This IE shall not be sent over N4. | - | - | - | - | Data Network Access Identifier |
| NOTE 1: If the Outer Header Creation and Forwarding Policy are present, the UP function shall put the user plane packets in the user plane tunnel by applying Outer Header Creation, after enforcing the required Forwarding Policy. | | | | | | | |

Table 7.5.4.3-3: Update Duplicating Parameters IE in FAR

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 |  | Update Duplicating Parameters IE Type = 105 (decimal) | | | | | |
| Octets 3 and 4 |  | Length = n | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Destination Interface | C | This IE shall only be provided if it is changed.  When present, it shall indicate the destination interface of the outgoing packet. | X | X | - | - | Destination Interface |
| Outer Header Creation | C | This IE shall only be provided if it is changed. See NOTE 1. | X | X | - | - | Outer Header Creation |
| Transport Level Marking | C | This IE shall only be provided if it is changed. | X | X | - | - | Transport Level Marking |
| Forwarding Policy | C | This IE shall only be provided if it is changed. See NOTE 1. | - | X | - | - | Forwarding Policy |
| NOTE 1: If the Outer Header Creation and Forwarding Policy are present, the UP function shall put the user plane packets in the user plane tunnel by applying Outer Header Creation, after enforcing the required Forwarding Policy. | | | | | | | |

*NEXT CHANGE*

#### 7.5.4.13 Update Traffic Endpoint IE within PFCP Session Modification Request

The Update Traffic Endpoint grouped IE shall be encoded as shown in Figure 7.5.4.13-1.

Table 7.5.4.13-1: Update Traffic Endpoint IE within PFCP Session Modification Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octet 1 and 2 | Update Traffic Endpoint Type = 129 (decimal) | | | | | | |
| Octets 3 and 4 | Length = n | | | | | | |
| Information elements | P | Condition / Comment | Appl. | | | | IE Type |
| Sxa | Sxb | Sxc | N4 |
| Traffic Endpoint ID | M | This IE shall uniquely identify the Traffic Endpoint to be modified for that PFCP session. | X | X | X | X | Traffic Endpoint ID |
| Local F-TEID | C | This IE shall be present if it needs to be changed.  The CP function shall set the CHOOSE (CH) bit to 1 if the CP function requests the UP function to assign a local F-TEID to the PDR.  See NOTE. | X | - | - | X | F-TEID |
| Network Instance | O | If present, this IE shall identify the Network instance to match for the incoming packet. See NOTE. | X | X | X | X | Network Instance |
| Redundant Transmission Detection Parameters | C | This IE shall be present if it needs to be changed See Table 7.5.2.2-5.  See NOTE. | - | - | - | X | Redundant Transmission Detection Parameters |
| UE IP address | C | This IE shall be present if it needs to be changed.  In the 5GC, several IEs with the same IE type may be present to represent multiple UE IP addresses, if the UPF indicated support of the IP6PL feature (see clause 5.21). When present, the UE IP address(es) present in this IE shall replace the UE IP address(es) stored in the UP function for this traffic endpoint.  See NOTE. | - | X | X | X | UE IP address |
| Framed-Route | C | This IE shall be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25) and it needs to be changed. If present, this IE shall describe a framed route.  Several IEs with the same IE type may be present to provision a list of framed routes. | - | X | - | X | Framed-Route |
| Framed-Routing | C | This IE shall be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25) and it needs to be changed. If present, this IE shall describe the framed routing associated to a framed route. | - | X | - | X | Framed-Routing |
| Framed-IPv6-Route | C | This IE shall be present for a DL PDR if the UPF indicated support of Framed Routing (see clause 8.2.25) and it needs to be changed. If present, this IE shall describe a framed IPv6 route.  Several IEs with the same IE type may be present to provision a list of framed IPv6 routes. | - | X | - | X | Framed-IPv6-Route |
| QFI | C | This IE shall be present if QFI(s) applicable for the traffic endpoints need to be changed and if the UPF has indicated it supports MTE feature as specified in clause 8.2.25.  If present, this IE shall identify the QoS Flow Identifier to match for the incoming packet.  Several IEs with the same IE type may be present to provision a list of QFIs. When present, the full set of applicable QFIs shall be provided. | - | - | - | X | QFI |
| NOTE: The IEs which do not need to be modified shall not be included in the Update Traffic Endpoint IE. The UP function shall continue to behave according to the values previously received for IEs not present in the Update Traffic Endpoint IE. F-TEID may be changed if the SGW-C has received the "Change F-TEID support Indication" over the S11/S4 interface (for an IDLE state UE initiated TAU/RAU procedure to allow the SGW changing the GTP-U F-TEID). | | | | | | | |

*NEXT CHANGE*

### 8.1.2 Information Element Types

A PFCP message may contain several IEs. In order to have forward compatible type definitions for the PFCP IEs, all of them shall be TLV (Type, Length, Value) coded. PFCP IE type values are specified in the Table 8.1.2-1.

The 3rd column of this table specifies if the IE is either Extendable or has a variable length or a fixed length and a reference to the clause where the IE is specified:

- 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.

The 4th column of this table indicates the number of fixed Octets the IE contained when the IE was first defined in the specification, which shall be an integer value reflecting the minimum length of fixed octets defined for the IE.

An IE of any of the above types may have a null length as specified in clause 5.6.3. This shall not be considered as an error by the receiving PFCP entity.

In order to improve the efficiency of troubleshooting, it is recommended that the IEs should be arranged in the signalling messages as well as in the grouped IEs, according to the order the IEs 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 IEs in any order.

Within IEs, 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.

Table 8.1.2-1: Information Element Types

| IE Type value  (Decimal) | Information elements | Comment / Reference | Number of Fixed Octets |
| --- | --- | --- | --- |
| 0 | Reserved |  |  |
| 1 | Create PDR | Extendable / Table 7.5.2.2-1 | Not Applicable |
| 2 | PDI | Extendable / Table 7.5.2.2-2 | Not Applicable |
| 3 | Create FAR | Extendable / Table 7.5.2.3-1 | Not Applicable |
| 4 | Forwarding Parameters | Extendable / Table 7.5.2.3-2 | Not Applicable |
| 5 | Duplicating Parameters | Extendable / Table 7.5.2.3-3 | Not Applicable |
| 6 | Create URR | Extendable / Table 7.5.2.4-1 | Not Applicable |
| 7 | Create QER | Extendable / Table 7.5.2.5-1 | Not Applicable |
| 8 | Created PDR | Extendable / Table 7.5.3.2-1 | Not Applicable |
| 9 | Update PDR | Extendable / Table 7.5.4.2-1 | Not Applicable |
| 10 | Update FAR | Extendable / Table 7.5.4.3-1 | Not Applicable |
| 11 | Update Forwarding Parameters | Extendable / Table 7.5.4.3-2 | Not Applicable |
| 12 | Update BAR (PFCP Session Report Response) | Extendable / Table 7.5.9.2-1 | Not Applicable |
| 13 | Update URR | Extendable / Table 7.5.4.4 | Not Applicable |
| 14 | Update QER | Extendable / Table 7.5.4.5 | Not Applicable |
| 15 | Remove PDR | Extendable / Table 7.5.4.6 | Not Applicable |
| 16 | Remove FAR | Extendable / Table 7.5.4.7 | Not Applicable |
| 17 | Remove URR | Extendable / Table 7.5.4.8 | Not Applicable |
| 18 | Remove QER | Extendable / Table 7.5.4.9 | Not Applicable |
| 19 | Cause | Fixed / Clause 8.2.1 | 1 |
| 20 | Source Interface | Extendable / Clause 8.2.2 | 1 |
| 21 | F-TEID | Extendable / Clause 8.2.3 | 1 |
| 22 | Network Instance | Variable Length / Clause 8.2.4 | Not Applicable |
| 23 | SDF Filter | Extendable / Clause 8.2.5 | 2 |
| 24 | Application ID | Variable Length / Clause 8.2.6 | Not Applicable |
| 25 | Gate Status | Extendable / Clause 8.2.7 | 1 |
| 26 | MBR | Extendable / Clause 8.2.8 | 10 |
| 27 | GBR | Extendable / Clause 8.2.9 | 10 |
| 28 | QER Correlation ID | Extendable / Clause 8.2.10 | 4 |
| 29 | Precedence | Extendable / Clause 8.2.11 | 4 |
| 30 | Transport Level Marking | Extendable / Clause 8.2.12 | 2 |
| 31 | Volume Threshold | Extendable /Clause 8.2.13 | 1 |
| 32 | Time Threshold | Extendable /Clause 8.2.14 | 4 |
| 33 | Monitoring Time | Extendable /Clause 8.2.15 | 4 |
| 34 | Subsequent Volume Threshold | Extendable /Clause 8.2.16 | 1 |
| 35 | Subsequent Time Threshold | Extendable /Clause 8.2.17 | 4 |
| 36 | Inactivity Detection Time | Extendable /Clause 8.2.18 | 4 |
| 37 | Reporting Triggers | Extendable /Clause 8.2.19 | 2 |
| 38 | Redirect Information | Extendable /Clause 8.2.20 | 3 |
| 39 | Report Type | Extendable / Clause 8.2.21 | 1 |
| 40 | Offending IE | Fixed / Clause 8.2.22 | 2 |
| 41 | Forwarding Policy | Extendable / Clause 8.2.23 | 1 |
| 42 | Destination Interface | Extendable / Clause 8.2.24 | 1 |
| 43 | UP Function Features | Extendable / Clause 8.2.25 | 1 |
| 44 | Apply Action | Extendable / Clause 8.2.26 | 1 |
| 45 | Downlink Data Service Information | Extendable / Clause 8.2.27 | 1 |
| 46 | Downlink Data Notification Delay | Extendable / Clause 8.2.28 | 1 |
| 47 | DL Buffering Duration | Extendable / Clause 8.2.29 | 1 |
| 48 | DL Buffering Suggested Packet Count | Variable / Clause 8.2.30 | Not Applicable |
| 49 | PFCPSMReq-Flags | Extendable / Clause 8.2.31 | 1 |
| 50 | PFCPSRRsp-Flags | Extendable / Clause 8.2.32 | 1 |
| 51 | Load Control Information | Extendable / Table 7.5.3.3-1 | Not Applicable |
| 52 | Sequence Number | Fixed Length / Clause 8.2.33 | 4 |
| 53 | Metric | Fixed Length / Clause 8.2.34 | 1 |
| 54 | Overload Control Information | Extendable / Table 7.5.3.4-1 | Not Applicable |
| 55 | Timer | Extendable / Clause 8.2 35 | 1 |
| 56 | PDR ID | Extendable / Clause 8.2 36 | 2 |
| 57 | F-SEID | Extendable / Clause 8.2 37 | 9 |
| 58 | Application ID's PFDs | Extendable / Table 7.4.3.1-2 | Not Applicable |
| 59 | PFD context | Extendable / Table 7.4.3.1-3 | Not Applicable |
| 60 | Node ID | Extendable / Clause 8.2.38 | 1 |
| 61 | PFD contents | Extendable / Clause 8.2.39 | 2 |
| 62 | Measurement Method | Extendable / Clause 8.2.40 | 1 |
| 63 | Usage Report Trigger | Extendable / Clause 8.2.41 | 2 |
| 64 | Measurement Period | Extendable / Clause 8.2.42 | 4 |
| 65 | FQ-CSID | Extendable / Clause 8.2.43 | 1 |
| 66 | Volume Measurement | Extendable / Clause 8.2.44 | 1 |
| 67 | Duration Measurement | Extendable / Clause 8.2.45 | 4 |
| 68 | Application Detection Information | Extendable / Table 7.5.8.3-2 | Not Applicable |
| 69 | Time of First Packet | Extendable / Clause 8.2.46 | 4 |
| 70 | Time of Last Packet | Extendable / Clause 8.2.47 | 4 |
| 71 | Quota Holding Time | Extendable / Clause 8.2.48 | 4 |
| 72 | Dropped DL Traffic Threshold | Extendable / Clause 8.2.49 | 1 |
| 73 | Volume Quota | Extendable / Clause 8.2.50 | 1 |
| 74 | Time Quota | Extendable / Clause 8.2.51 | 4 |
| 75 | Start Time | Extendable / Clause 8.2.52 | 4 |
| 76 | End Time | Extendable / Clause 8.2.53 | 4 |
| 77 | Query URR | Extendable / Table 7.5.4.10-1 | Not Applicable |
| 78 | Usage Report (Session Modification Response) | Extendable / Table 7.5.5.2-1 | Not Applicable |
| 79 | Usage Report (Session Deletion Response) | Extendable / Table 7.5.7.2-1 | Not Applicable |
| 80 | Usage Report (Session Report Request) | Extendable / Table 7.5.8.3-1 | Not Applicable |
| 81 | URR ID | Extendable / Clause 8.2.54 | 4 |
| 82 | Linked URR ID | Extendable / Clause 8.2.55 | 4 |
| 83 | Downlink Data Report | Extendable / Table 7.5.8.2-1 | Not Applicable |
| 84 | Outer Header Creation | Extendable / Clause 8.2.56 | 2 |
| 85 | Create BAR | Extendable / Table 7.5.2.6-1 | Not Applicable |
| 86 | Update BAR (Session Modification Request) | Extendable / Table 7.5.4.11-1 | Not Applicable |
| 87 | Remove BAR | Extendable / Table 7.5.4.12-1 | Not Applicable |
| 88 | BAR ID | Extendable / Clause 8.2.57 | 1 |
| 89 | CP Function Features | Extendable / Clause 8.2.58 | 1 |
| 90 | Usage Information | Extendable / Clause 8.2.59 | 1 |
| 91 | Application Instance ID | Variable Length / Clause 8.2.60 | Not Applicable |
| 92 | Flow Information | Extendable / Clause 8.2.61 | 3 |
| 93 | UE IP Address | Extendable / Clause 8.2.62 | 1 |
| 94 | Packet Rate | Extendable / Clause 8.2.63 | 1 |
| 95 | Outer Header Removal | Extendable / Clause 8.2.64 | 1 |
| 96 | Recovery Time Stamp | Extendable / Clause 8.2.65 | 4 |
| 97 | DL Flow Level Marking | Extendable / Clause 8.2.66 | 1 |
| 98 | Header Enrichment | Extendable / Clause 8.2.67 | 1 |
| 99 | Error Indication Report | Extendable / Table 7.5.8.4-1 | Not Applicable |
| 100 | Measurement Information | Extendable / Clause 8.2.68 | 1 |
| 101 | Node Report Type | Extendable / Clause 8.2.69 | 1 |
| 102 | User Plane Path Failure Report | Extendable / Table 7.4.5.1.2-1 | Not Applicable |
| 103 | Remote GTP-U Peer | Extendable / Clause 8.2.70 | 1 |
| 104 | UR-SEQN | Fixed Length / Clause 8.2.71 | 4 |
| 105 | Update Duplicating Parameters | Extendable / Table 7.5.4.3-3 | Not Applicable |
| 106 | Activate Predefined Rules | Variable Length / Clause 8.2.72 | Not Applicable |
| 107 | Deactivate Predefined Rules | Variable Length / Clause 8.2.73 | Not Applicable |
| 108 | FAR ID | Extendable / Clause 8.2.74 | 4 |
| 109 | QER ID | Extendable / Clause 8.2.75 | 4 |
| 110 | OCI Flags | Extendable / Clause 8.2.76 | 1 |
| 111 | PFCP Association Release Request | Extendable / Clause 8.2.77 | 1 |
| 112 | Graceful Release Period | Extendable / Clause 8.2.78 | 1 |
| 113 | PDN Type | Extendable / Clause 8.2.79 | 1 |
| 114 | Failed Rule ID | Extendable / Clause 8.2.80 | 1 |
| 115 | Time Quota Mechanism | Extendable / Clause 8.2.81 | 1 |
| 116 | Reserved |  |  |
| 117 | User Plane Inactivity Timer | Extendable /Clause 8.2.83 | 4 |
| 118 | Aggregated URRs | Extendable / Table 7.5.2.4-2 | Not Applicable |
| 119 | Multiplier | Fixed / Clause 8.2.84 | 12 |
| 120 | Aggregated URR ID | Fixed / Clause 8.2.85 | 4 |
| 121 | Subsequent Volume Quota | Extendable / Clause 8.2.86 | 1 |
| 122 | Subsequent Time Quota | Extendable / Clause 8.2.87 | 4 |
| 123 | RQI | Extendable / Clause 8.2.88 | 1 |
| 124 | QFI | Extendable / Clause 8.2.89 | 1 |
| 125 | Query URR Reference | Extendable / Clause 8.2.90 | 4 |
| 126 | Additional Usage Reports Information | Extendable / Clause 8.2.91 | 2 |
| 127 | Create Traffic Endpoint | Extendable / Table 7.5.2.7 | Not Applicable |
| 128 | Created Traffic Endpoint | Extendable / Table 7.5.3.5 | Not Applicable |
| 129 | Update Traffic Endpoint | Extendable / Table 7.5.4.13 | Not Applicable |
| 130 | Remove Traffic Endpoint | Extendable / Table 7.5.4.14 | Not Applicable |
| 131 | Traffic Endpoint ID | Extendable / Clause 8.2.92 | 1 |
| 132 | Ethernet Packet Filter | Extendable / Table 7.5.2.2-3 | Not Applicable |
| 133 | MAC address | Extendable / Clause 8.2.93 | 1 |
| 134 | C-TAG | Extendable / Clause 8.2.94 | 3 |
| 135 | S-TAG | Extendable / Clause 8.2.95 | 3 |
| 136 | Ethertype | Extendable / Clause 8.2.96 | 2 |
| 137 | Proxying | Extendable / Clause 8.2.97 | 1 |
| 138 | Ethernet Filter ID | Extendable / Clause 8.2.98 | 4 |
| 139 | Ethernet Filter Properties | Extendable / Clause 8.2.99 | 1 |
| 140 | Suggested Buffering Packets Count | Extendable / Clause 8.2.100 | 1 |
| 141 | User ID | Extendable / Clause 8.2.101 | 1 |
| 142 | Ethernet PDU Session Information | Extendable / Clause 8.2.102 | 1 |
| 143 | Ethernet Traffic Information | Extendable / Table 7.5.8.3-3 | Not Applicable |
| 144 | MAC Addresses Detected | Extendable / Clause 8.2.103 | 7 |
| 145 | MAC Addresses Removed | Extendable / Clause 8.2.104 | 7 |
| 146 | Ethernet Inactivity Timer | Extendable / Clause 8.2.105 | 4 |
| 147 | Additional Monitoring Time | Extendable / Table 7.5.2.4-3 | Not Applicable |
| 148 | Event Quota | Extendable / Clause 8.2.112 | 4 |
| 149 | Event Threshold | Extendable / Clause 8.2.113 | 4 |
| 150 | Subsequent Event Quota | Extendable / Clause 8.2.106 | 4 |
| 151 | Subsequent Event Threshold | Extendable / Clause 8.2.107 | 4 |
| 152 | Trace Information | Extendable / Clause 8.2.108 | 7 |
| 153 | Framed-Route | Variable Length / Clause 8.2.109 | Not Applicable |
| 154 | Framed-Routing | Fixed Length / Clause 8.2.110 | 4 |
| 155 | Framed-IPv6-Route | Variable Length / Clause 8.2.111 | Not Applicable |
| 156 | Event Time Stamp | Extendable / Clause 8.2.114 | 4 |
| 157 | Averaging Window | Extendable /Clause 8.2.115 | 4 |
| 158 | Paging Policy Indicator | Extendable / Clause 8.2.116 | 1 |
| 159 | APN/DNN | Variable Length / Clause 8.2.117 | Not Applicable |
| 160 | 3GPP Interface Type | Extendable / Clause 8.2.118 | 1 |
| 161 | PFCPSRReq-Flags | Extendable / Clause 8.2.119 | 1 |
| 162 | PFCPAUReq-Flags | Extendable / Clause 8.2.120 | 1 |
| 163 | Activation Time | Extendable / Clause 8.2.121 | 4 |
| 164 | Deactivation Time | Extendable / Clause 8.2.122 | 4 |
| 165 | Create MAR | Extendable / Table 7.5.2.8-1 | Not Applicable |
| 166 | 3GPP Access Forwarding Action Information | Extendable / Table 7.5.2.8-2 | Not Applicable |
| 167 | Non-3GPP Access Forwarding Action Information | Extendable / Table 7.5.2.8-3 | Not Applicable |
| 168 | Remove MAR | Extendable / Table 7.5.4.15-1 | Not Applicable |
| 169 | Update MAR | Extendable / Table 7.5.4.16-1 | Not Applicable |
| 170 | MAR ID | Extendable / Clause 8.2.123 | 2 |
| 171 | Steering Functionality | Extendable / Clause 8.2.124 | 1 |
| 172 | Steering Mode | Extendable / Clause 8.2.125 | 1 |
| 173 | Weight | Fixed / Clause 8.2.126 | 1 |
| 174 | Priority | Extendable / Clause 8.2.127 | 1 |
| 175 | Update 3GPP Access Forwarding Action Information | Extendable / Table 7.5.4.16-2 | Not Applicable |
| 176 | Update Non 3GPP Access Forwarding Action Information | Extendable / Table 7.5.4.16-3 | Not Applicable |
| 177 | UE IP address Pool Identity | Extendable / Clause 8.2.128 | 2 |
| 178 | Alternative SMF IP Address | Extendable / Clause 8.2.129 | 1 |
| 179 | Packet Replication and Detection Carry-On Information | Extendable / Clause 8.2.130 | 1 |
| 180 | SMF Set ID | Extendable / Clause 8.2.131 | Not applicable |
| 181 | Quota Validity Time | Extendable / Clause 8.2.132 | 4 |
| 182 | Number of Reports | Fixed / Clause 8.2.133 | 2 |
| 183 | PFCP Session Retention Information (within PFCP Association Setup Request) | Extendable / Table 7.4.4.1-2 | 1 |
| 184 | PFCPASRsp-Flags | Extendable / Clause 8.2.134 | 1 |
| 185 | CP PFCP Entity IP Address | Extendable / Clause 8.2.135 | 1 |
| 186 | PFCPSEReq-Flags | Extendable / Clause 8.2.136 | 1 |
| 187 | User Plane Path Recovery Report | Extendable / Table 7.4.5.1.3-1 | Not Applicable |
| 188 | IP Multicast Addressing Info within PFCP Session Establishment Request | Extendable / Clause 7.5.2.2-4 | Not Applicable |
| 189 | Join IP Multicast Information IE within Usage Report | Extendable / Table 7.5.8.3-4 | Not Applicable |
| 190 | Leave IP Multicast Information IE within Usage Report | Extendable / Table 7.5.8.3-5 | Not Applicable |
| 191 | IP Multicast Address | Extendable / Clause 8.2.137 | 1 |
| 192 | Source IP Address | Extendable / Clause 8.2.138 | 1 |
| 193 | Packet Rate Status | Extendable / Clause 8.2.139 | 1 |
| 194 | Create Bridge Info for TSC | Extendable / Clause 8.2.140 | 1 |
| 195 | Created Bridge Info for TSC | Extendable / Table 7.5.3.6-1 | Not Applicable |
| 196 | DS-TT Port Number | Fixed Length / Clause 8.2.141 | 4 |
| 197 | NW-TT Port Number | Fixed Length / Clause 8.2.142 | 4 |
| 198 | TSN Bridge ID | Extendable / Clause 8.2.143 | 1 |
| 199 | TSC Management Information IE within PFCP Session Modification Request | Extendable / Table 7.5.4.18-1 | Not Applicable |
| 200 | TSC Management Information IE within PFCP Session Modification Response | Extendable / Table 7.5.5.3-1 | Not Applicable |
| 201 | TSC Management Information IE within PFCP Session Report Request | Extendable / Table 7.5.8.5-1 | Not Applicable |
| 202 | Port Management Information Container | Variable Length / Clause 8.2.144 | Not Applicable |
| 203 | Clock Drift Control Information | Extendable / Table 7.4.4.1.2-1 | Not Applicable |
| 204 | Requested Clock Drift Information | Extendable / Clause 8.2.145 | 1 |
| 205 | Clock Drift Report | Extendable / Table 7.4.5.1.4-1 | Not Applicable |
| 206 | TSN Time Domain Number | Extendable / Clause 8.2.146 | 1 |
| 207 | Time Offset Threshold | Extendable / Clause 8.2.147 | 8 |
| 208 | Cumulative rateRatio Threshold | Extendable / Clause 8.2.148 | 4 |
| 209 | Time Offset Measurement | Extendable / Clause 8.2.149 | 8 |
| 210 | Cumulative rateRatio Measurement | Extendable / Clause 8.2.150 | 4 |
| 211 | Remove SRR | Extendable/ Table 7.5.4.19-1 | Not applicable |
| 212 | Create SRR | Extendable/ Table 7.5.2.9-1 | Not applicable |
| 213 | Update SRR | Extendable/ Table 7.5.4.21-1 | Not applicable |
| 214 | Session Report | Extendable / Table 7.5.8.7-1 | Not Applicable |
| 215 | SRR ID | Extendable / Clause 8.2.151 | 1 |
| 216 | Access Availability Control Information | Extendable / Table 7.5.2.9-2 | Not applicable |
| 217 | Requested Access Availability Information | Extendable / Clause 8.2.152 | 1 |
| 218 | Access Availability Report | Extendable / Table 7.5.8.6-2 | Not applicable |
| 219 | Access Availability Information | Extendable / Clause 8.2.153 | 1 |
| 220 | Provide ATSSS Control Information | Extendable / Table 7.5.2.10-1 | Not Applicable |
| 221 | ATSSS Control Parameters | Extendable / Table 7.5.3.7-1 | Not Applicable |
| 222 | MPTCP Control Information | Extendable / Clause 8.2.154 | 1 |
| 223 | ATSSS-LL Control Information | Extendable / Clause 8.2.155 | 1 |
| 224 | PMF Control Information | Extendable / Clause 8.2.156 | 1 |
| 225 | MPTCP Parameters | Extendable / Table 7.5.3.7-2 | Not Applicable |
| 226 | ATSSS-LL Parameters | Extendable / Table 7.5.3.7-3 | Not Applicable |
| 227 | PMF Parameters | Extendable / Table 7.5.3.7-4 | Not Applicable |
| 228 | MPTCP Address Information | Extendable / Clause 8.2.157 | 4 |
| 229 | UE Link-Specific IP Address | Extendable / Clause 8.2.158 | 1 |
| 230 | PMF Address Information | Extendable / Clause 8.2.159 | 1 |
| 231 | ATSSS-LL Information | Extendable / Clause 8.2.160 | 1 |
| 232 | Data Network Access Identifier | Variable Length / Clause 8.2.161 | Not applicable |
| 233 | UE IP address Pool Information | Extendable / Table 7.4.4.1-3 | Not Applicable |
| 234 | Average Packet Delay | Extendable / Clause 8.2.162 | 4 |
| 235 | Minimum Packet Delay | Extendable / Clause 8.2.163 | 4 |
| 236 | Maximum Packet Delay | Extendable / Clause 8.2.164 | 4 |
| 237 | QoS Report Trigger | Extendable / Clause 8.2.165 | 1 |
| 238 | GTP-U Path QoS Control Information | Extendable / Table 7.4.4.1.3-1 | Not Applicable |
| 239 | GTP-U Path QoS Report (PFCP Node Report Request) | Extendable / Table 7.4.5.1.5-1 | Not Applicable |
| 240 | QoS Information in GTP-U Path QoS Report | Extendable / Table 7.4.5.1.6-1 | Not Applicable |
| 241 | GTP-U Path Interface Type | Extendable / Clause 8.2.166 | 1 |
| 242 | QoS Monitoring per QoS flow Control Information | Extendable / Table 7.5.2.9-3 | Not applicable |
| 243 | Requested QoS Monitoring | Extendable / Clause 8.2.167 | 1 |
| 244 | Reporting Frequency | Extendable / Clause 8.2.168 | 1 |
| 245 | Packet Delay Thresholds | Extendable / Clause 8.2.169 | 1 |
| 246 | Minimum Wait Time | Extendable / Clause 8.2.170 | 4 |
| 247 | QoS Monitoring Report | Extendable / Table 7.5.8.6-3 | Not applicable |
| 248 | QoS Monitoring Measurement | Extendable / Clause 8.2.171 | 1 |
| 249 | MT-EDT Control Information | Extendable / Clause 8.2.172 | 1 |
| 250 | DL Data Packets Size | Extendable / Clause 8.2.173 | 2 |
| 251 | QER Control Indications | Extendable / Clause 8.2.174 | 1 |
| 252 | Packet Rate Status Report | Extendable / Table 7.5.7.1-2 | Not applicable |
| 253 | NF Instance ID | Fixed / Clause 8.2.175 | 16 |
| 254 | Ethernet Context Information | Extendable / Table 7.5.4.21-1 | Not Applicable |
| 255 | Redundant Transmission Detection Parameters | Extendable / Table 7.5.2.2-5 | Not Applicable |
| 256 | Updated PDR | Extendable / Table 7.5.9.3-1 | Not Applicable |
| 257 | S-NSSAI | Fixed Length / Clause 8.2.176 | 4 |
| 258 | IP version | Extendable / Clause 8.2.177 | 1 |
| 259 | PFCPASReq-Flags | Extendable / Clause 8.2.178 | 1 |
| 260 | Data Status | Extendable / Clause 8.2.179 | 1 |
| 261 | Provide RDS configuration information | Extendable / Table 7.5.2.11-1 | Not Applicable |
| 262 | RDS configuration information | Extendable / Clause 8.2.180 | 1 |
| 263 | Query Packet Rate Status IE within PFCP Session Modification Request | Extendable / Table 7.5.4.22-1 | Not Applicable |
| 264 | Packet Rate Status Report IE within PFCP Session Modification Response | Extendable / Table 7.5.5.4-1 | Not Applicable |
| 265 | MPTCP Applicable Indication | Extendable / Clause 8.2.181 | 1 |
| 266 | Bridge Management Information Container | Variable Length / Clause 8.2.182 | Not Applicable |
| 2xx | Redundant Transmission Forwarding Parameters | Extendable / Table 7.5.2.3-4 | Not Applicable |
| 2yy to 32767 | Spare. For future use. |  |  |
| 32768 to 65535 | Reserved for vendor specific IEs |  |  |

*END OF CHANGES*