**3GPP TSG-CT WG4 Meeting #111-eC4-224230**

**E-Meeting, 18th – 26th August 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **244** | **CR** |  | **rev** |  | **Current version:** |  |  |
|  |
| *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:***  | Unicast transport is used over Nmb9 |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** | -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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18) Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | The approved CR from SA2 (S2-2204743) has clarified that the user plane between MBSTF and MB-UPF is a unicast tunnel as: The user plane between MB-UPF and AF, may use either multicast transport or an unicast tunnel for the MBS session (depending on application and capabilities of control interface). If the transport network does not support multicast transport, the user plane uses an unicast tunnel for the MBS Session. The user plane between MBSTF and AF may use a unicast tunnel, multicast transport or other means (e.g., HTTP download from external CDN). The user plane between MBSTF and MB-UPF uses a unicast tunnel for the MBS session. In case a unicast tunnel is used for the MBS Session between MB-UPF and AF or MBSTF, after receiving the downlink MBS data, the MB-UPF forwards the downlink MBS data without the received outer IP header and tunnel header information.It indicates that over reference point Nmb9, only unicast transport applies. Therefore it should be aligned in the description in CT4 specification. |
|  |  |
| ***Summary of change:*** | Change the description with repect to Nmb9. |
|  |  |
| ***Consequences if not approved:*** | Misalignment between SA4 and CT4 specification. |
|  |  |
| ***Clauses affected:*** | 5.34.2.2, 7.5.2.1, 7.5.2.2, 7.5.2.7 |
|  |  |
|  | **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 \* \* \* \*

#### 5.34.2.2 Instructing the MB-UPF to forward MBS data using multicast and/or unicast transport

When the MB-SMF receives an MBS Session Create Request from a NEF/MBSF to configure an MBS session, the MB-SMF shall select an MB-UPF and request that MB-UPF to allocate relevant user plane resource for the MBS session, or for the MBS session and MBS Service Area for a location dependent MBS service; to do so, the MB-SMF shall send a PFCP Session Establishment Request message to the MB-UPF to setup a PFCP session for the MBS Session, or for the MBS session and MBS Service Area for a location dependent MBS service, including the following information in the PFCP Session Establishment Request message:

- the MBS Session Identifier identifying the MBS session (i.e. TMGI or SSM address);

- the Area Session ID, for a location dependent MBS service;

- a JMBSSM (Join MBS Session SSM) indication in the MBSN4mbReq-Flags IE to request the MB-UPF to join the multicast tree towards the Source Specific Multicast (SSM) address information provided by AF/AS or MBSTF for the MBS Session where the SSM is provided in the IP Multicast Addressing Info IE in the corresponding downlink PDR, if multicast transport applies over N6mb (i.e. if no N6mb ingress tunnel is requested to be allocated);

- a PLLSSM (Provide Low Layer Source Specific Multicast address) indication in the MBSN4mbReq-Flags IE to request the MB-UPF to provide a lower layer SSM address (i.e. multicast destination address and related source IP address) and a GTP-U Common Tunnel EndPoint Identifier (C-TEID), if multicast transport applies over N3mb or N19mb;

- for each MBS QoS flow:

- a Create PDR IE to provision a downlink PDR with PDI or a Create Tunnel Endpoint IE containing either:

- a "Local Ingress Tunnel" IE with the CHOOSE bit set to "1" to request the MB-UPF to allocate an ingress tunnel for Nmb9, or for N6mb if unicast transport is used over N6mb; or

- an IP Multicast Addressing Info IE to request the MB-UPF to retrieve the MBS session data from the IP Multicast Address, when using multicast transport over N6mb.

NOTE: A single ingress tunnel address is assigned for Nmb9, or for N6mb if unicast transport is used over N6mb, regardless of the number of MBS QoS flows.

- a Create QER IE to provision a QER (associated with the PDR including the above PDI or Traffic EndPoint ID) instructing the MB-UPF to insert the QFI of the MBS QoS flow in user plane packets and possibly requesting the MB-UPF to apply specific QoS treatments; the IQFISN (Insert DL MBS QFI Sequence Number) flag in the Create QER IE shall be set to "1" to request the MB-UPF to insert the DL MBS QFI Sequence Number in the PDU session container in user plane packets;

- a Create FAR IE to provision a FAR (associated with the PDR including the above PDI or Traffic EndPoint ID) with the Apply Action set to "FSSM" with an MBS Multicast Parameters IE, when multicast transport is used over N3mb or N19mb, to forward the packets to the low layer SSM address when it is allocated; otherwise, the apply action shall be set to "DROP".

The MBS Session Identifier, Area Session ID (for a location dependent MBS service) and the MBSN4mbReq-Flags are included in the group IE "MBS Session N4mb Control Information" at the PFCP message level.

The MB-UPF shall return the allocated ingress tunnel information in the Created PDR IE or Created Traffic Endpoint IE and provide the Low Layer SSM address if requested.

For an MBS session using unicast transport over N3mb or N19mb, when one or more NG-RAN node(s) and/or PSA UPF(s) provides a downlink GTP-U F-TEID (i.e. IP address and tunnel endpoint identifier) to receive the MBS session data, the MB-SMF shall send a PFCP Session Modification Request message to change the FAR with the Apply-Action set to "MBSU" together with one or more Add MBS Unicast Parameters to instruct the MB-UPF to forward and replicate MBS Session data towards the one or more GTP-U DL tunnels terminating at the NG-RAN(s) and/or PSA UPF(s).

For an MBS session using multicast transport over N3mb or N19mb, if the "FSSM" flag is set in the Apply Action, the MB-UPF shall forward the MBS session data using the Low Layer Source Specific Multicast address (i.e. destination IP multicast address and related source IP address) and C-TEID it allocated to the MBS session.

Both the "FSSM" and "MBSU" flags shall be set in the Apply-Action IE if the MB-UPF is requested to forward MBS data using both multicast and unicast transport over N3mb or N19mb.

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

#### 7.5.2.1 General

The PFCP Session Establishment Request shall be sent over the Sxa, Sxb, Sxc, N4 and N4mb interface by the CP function to establish a new PFCP session context in the UP function.

Table 7.5.2.1-1: Information Elements in a PFCP Session Establishment Request

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| Node ID | M | This IE shall contain the unique identifier of the sending Node. | X | X | X | X | X | Node ID |
| CP F-SEID | M | This IE shall contain the unique identifier allocated by the CP function identifying the session. | X | X | X | X | X | F-SEID |
| Create PDR | M | This IE shall be present for at least one PDR to be associated to the PFCP session.Several IEs with the same IE type may be present to represent multiple PDRs.See Table 7.5.2.2-1. | X | X | X | X | X | Create PDR |
| Create FAR | M | This IE shall be present for at least one FAR to be associated to the PFCP session.Several IEs with the same IE type may be present to represent multiple FARs.See Table 7.5.2.3-1. | X | X | X | X | X | Create FAR |
| Create URR | C | This IE shall be present if a measurement action shall be applied to packets matching one or more PDR(s) of this PFCP session.Several IEs within the same IE type may be present to represent multiple URRs.See Table 7.5.2.4-1. | X | X | X | X | FFS | Create URR |
| Create QER | C | This IE shall be present if a QoS enforcement or QoS marking action shall be applied to packets matching one or more PDR(s) of this PFCP session.Several IEs within the same IE type may be present to represent multiple QERs.See Table 7.5.2.5-1. | - | X | X | X | X | Create QER |
| Create BAR | O | When present, this IE shall contain the buffering instructions to be applied by the UP function to any FAR of this PFCP session set with the Apply Action requesting the packets to be buffered and with a BAR ID IE referring to this BAR. See table 7.5.2.6-1. | X | - | - | X | - | Create BAR |
| Create Traffic Endpoint | C | This IE may be present if the UP function has indicated support of PDI optimization.Several IEs within the same IE type may be present to represent multiple Traffic Endpoints.See Table 7.5.2.7-1. | X | X | X | X | X | Create Traffic Endpoint |
| PDN Type | C | This IE shall be present if the PFCP session is setup for an individual PDN connection or PDU session (see clause 5.2.1).When present, this IE shall indicate whether this is an IP or non-IP PDN connection/PDU session or, for 5GC, an Ethernet PDU session. See NOTE 3. | X | X | - | X | - | PDN Type |
| SGW-C FQ-CSID | C | This IE shall be included according to the requirements in clause 23 of 3GPP TS 23.007 [24]. | X | X | - | - | - | FQ-CSID |
| MME FQ-CSID | C | This IE shall be included when received on the S11 interface or on S5/S8 interface according to the requirements in clause 23 of 3GPP TS 23.007 [24]. | X | X | - | - | - | FQ-CSID |
| PGW-C/SMF FQ-CSID | C | This IE shall be included according to the requirements in clause 23 of 3GPP TS 23.007 [24] and clause 4.6 of 3GPP TS 23.527 [40]. | X | X | - | X | - | FQ-CSID |
| ePDG FQ-CSID | C | This IE shall be included according to the requirements in clause 23 of 3GPP TS 23.007 [24]. | - | X | - | - | - | FQ-CSID |
| TWAN FQ-CSID | C | This IE shall be included according to the requirements in clause 23 of 3GPP TS 23.007 [24]. | - | X | - | - | - | FQ-CSID |
| User Plane Inactivity Timer | O | This IE may be present to request the UP function to send a User Plane Inactivity Report when no user plane packets are received for this PFCP session for a duration exceeding the User Plane Inactivity Timer.When present, it shall contain the duration of the inactivity period after which a User Plane Inactivity Report shall be generated. | - | X | X | X | X | User Plane Inactivity Timer |
| User ID | O | This IE may be present, based on operator policy. It shall only be sent if the UP function is in a trusted environment.See NOTE 1. | X | X | X | X | - | User ID |
| Trace Information | O | When present, this IE shall contain the trace instructions to be applied by the UP function for this PFCP session. | X | X | X | X | - | Trace Information |
| APN/DNN | O | This IE may be present, if related functionalities in the UP function require the APN/DNN information. See NOTE 2. | X | X | - | X | X | APN/DNN |
| Create MAR | C | This IE shall be present for a N4 session established for a MA PDU session.Several IEs with the same IE type may be present to represent multiple MARs.See Table 7.5.2.8-1. | - | - | - | X | - | Create MAR |
| PFCPSEReq-Flags | C | This IE shall be included if at least one of the flags is set to "1".- RESTI (Restoration Indication): this bit shall be set to "1" if the CP function re-establishes an existing PFCP session and the allocation of GTP-U F-TEID and/or UE IP address is performed by the UP function. (NOTE 4)- SUMPC (Stop Usage Measurement to Pause Charging): the CP function, e.g. PGW-C or (H-)SMF, shall set this flag if the usage measurement for the URRs which are applicable for charging (i.e. with the "ASPOC" flag set to "1") shall be stopped in the UP function. | X | X | - | X | - | PFCPSEReq-Flags |
| Create Bridge Info for TSC | C | This IE shall be present for a PFCP session established for TSC to request the UPF to provide Bridge information for TSC.  | - | - | - | X | - | Create Bridge Info for TSC |
| Create SRR | O | This IE may be present to request the UPF to detect and report events not related to specific PDRs.Several IEs within the same IE type may be present to represent multiple SRRs.See Table 7.5.2.9-1. | - | - | - | X | - | Create SRR |
| Provide ATSSS Control Information | C | This IE shall be present for N4 session establishment for a MA PDU session.When present, this IE shall contain the required ATSSS functionalities for this MA PDU session.See Table 7.5.2.10-1. | - | - | - | X | - | Provide ATSSS Control Information |
| Recovery Time Stamp | O | This IE may be included to contain the time stamp when the CP function was started. (See clause 19A of 3GPP TS 23.007 [24].) | X | X | X | X | - | Recovery Time Stamp |
| S-NSSAI | O | This IE may be present, if related functionalities in the UP function require the S-NSSAI information. (NOTE 2, NOTE 5)When present, it shall indicate the S-NSSAI of the PDU session or MBS session. | - | - | - | X | X | S-NSSAI |
| Provide RDS configuration information | O | When present, this IE shall contain the RDS configuration information to be applied by the UP function for this PFCP session. | - | X | - | X | - | Provide RDS configuration information |
| RAT Type | O | This IE may be present to provide the UP Function the current RAT Type for the PDN connection/PDU session to which this PFCP Session is corresponding for statistics purpose if the PFCP session is not established for a MA PDU session.  | X | X | - | X | - | RAT Type |
| L2TP Tunnel Information | C | This IE shall be present if L2TP tunnel information is received from an AAA server, e.g. Radius/Diameter server or if it is configured in the CP function.Several IE with the same IE type may be present to provide L2TP Tunnel Information for alternative LNS. | - | X | - | X | - | L2TP Tunnel Information |
| L2TP Session Information | C | This IE shall be present to include the information to establish a L2TP session, if an L2TP session needs to be established for this PFCP session. | - | X | - | X | - | L2TP Session Information |
| Group Id | O | This IE may be included by the CP function to indicate the group identifier to which the PFCP session pertains (see clause 5.22). | - | X | - | X | - | Group Id |
| MBS Session N4mb Control Information | M | This IE shall identify the MBS session, or the MBS session and Area Session ID for a location dependent MBS service, and it may contain further control information for the MB-UPF. | - | - | - | - | X | MBS Session N4mb Control Information |
| MBS Session N4 Control Information | C | This IE shall be included if the correspond PDU session shall be associated with an MBS session, or with an MBS session and Area Session ID for a location dependent MBS service.Several IEs with the same IE type may be present to provide N4 control information for several MBS sessions, e.g., when the UE requests to join several MBS sessions.  | - | - | - | X | - | MBS Session N4 Control Information |
| DSCP to PPI Control Information | O | This IE may be present if the UPF is required to insert the Paging Policy Indicator (PPI) in the GTP-U PDU Session Container extension header of outgoing GTP-U packets (encapsulating payload packets) based on the DSCP in the TOS/Traffic Class field in the IP header of payload packet and if the UPF supports the EPPPI feature as specified in clause 5.36.2.Several IEs with the same IE type may be present to provide different DSCP to PPI Control Information for different set of QFI(s). | - | - | - | X | - | DSCP to PPI Control Information |
| NOTE 1: This can be used for troubleshooting problems in the UP function affecting a subscriber.NOTE 2: The CP function may provide additional information (e.g. APN/DNN, S-NSSAI) to the UP function, e.g. used by the forwarding rules pre-defined in UP function (some forwarding rules are APN specific), used by the UP function for performance measurement, used by the UP function for resource management, or used by the UPF to include a proper User plane node/Bridge ID in the response message during a PFCP session establishment for a PDU session for TSC.NOTE 3: The SGW-C may set PDN type as Non-IP for an Ethernet PDN to allow interworking with a legacy SGW-U.NOTE 4: The UP function shall accept the CP function allocated GTP-U F-TEID and/or UE IP address in the PFCP Session Establishment Request message with the RESTI flag set to "1", if the requested GTP-U F-TEID and/or UE IP address are available. If the GTP-U F-TEID or UE IP address provided by the CP function is not available at the UP function, the UP function shall reject the PFCP Session Establishment Request with the cause "PFCP session restoration failure due to requested resource not available" (see clause 8.2.1).NOTE 5: A UPF shall support allocating resources using the Network Instance IE and the UPF may additionally support allocating resources using the Network Instance IE and S-NSSAI IE (see clause 5.35). |

Table 7.5.2.1-2: L2TP Tunnel Information IE in the PFCP Session Establishment Request message

|  |  |  |
| --- | --- | --- |
| Octet 1 and 2 |  | L2TP Tunnel Information IE Type = 276 (decimal) |
| Octets 3 and 4 |  | Length = n |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| LNS Address | M | This IE shall be present to include the Tunnel Server Endpoint, i.e. LNS IP address. | - | X | - | X | - | LNS Address |
| Tunnel Password | O | This IE may be present to include the password to be used to authenticate to a remote server. | - | X | - | X | - | Tunnel Password |
| Tunnel Preference | C | This IE shall be present if multiple L2TP Tunnel Information IEs are included in the message.If present this IE indicates the order in which the L2TP Tunnel Information IEs shall be used when trying to establish the L2TP session. | - | X | - | X | - | Tunnel Preference |

Table 7.5.2.1-3: L2TP Session Information IE in the PFCP Session Establishment Request message

|  |  |  |
| --- | --- | --- |
| Octet 1 and 2 |  | L2TP Session Information IE Type = 277 (decimal) |
| Octets 3 and 4 |  | Length = n |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| Calling Number | O | This IE may be present, e.g. to include an MSISDN of the UE. | - | X | - | X | - | Calling Number |
| Called Number | O | This IE may be present, e.g. to include an APN/DNN. | - | X | - | X | - | Called Number |
| Maximum Receive Unit | O | This IE may be present to include Maximum Receive Unit for LCP/PPP which may be set to the value of the MTU received from the UE or may be configured in the CP function. | - | X | - | X | - | Maximum Receive Unit |
| L2TP Session Indications | C | This IE shall be present if the CP function requests the UP function to get a UE IP Address, and/or DNS server information, and/or NBNS server information from the LNS. | - | X | - | X | - | L2TP session Indications |
| L2TP User Authentication  | O | This IE may be present to include the authentication information to be used during L2TP session establishment. | - | X | - | X | - | L2TP User Authentication  |
| NOTE: The Tunnel Password and L2TP User Authentication IE are transferred with plain text, a Network Domain Security/IP based security mechanism may be deployed between the CP function and the UP function if required by the local policies. |

Table 7.5.2.1-4: MBS Session N4mb Control Information IE within PFCP Session Establishment Request

|  |  |  |
| --- | --- | --- |
| Octet 1 and 2 |  | MBS Session N4mb Control Information IE Type = 300 (decimal) |
| Octets 3 and 4 |  | Length = n |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| MBS Session Identifier | M |  | - | - | - | - | X | MBS Session Identifier |
| Area Session ID | C | This IE shall be present for a location dependent MBS service. When present, it shall contain the Area Session ID, which together with the MBS Session Identifier, uniquely identify the service area part of the content data of the MBS service.  | - | - | - | - | X | Area Session ID |
| MBSN4mbReq-Flags | C | This IE shall be included if at least one of the flags is set to "1".- PLLSSM (Provide Lower Layer SSM): the MB-SMF shall set this flag to "1" to request the MB-UPF to allocate a LL SSM (i.e. multicast destination address and related source IP address) and a GTP-U Common Tunnel EndPoint Identifier (C-TEID), if multicast transport is used over N3mb and/or N19mb.- JMBSSM (Join MBS Session SSM): the MB-SMF shall set this flag to "1" to request the MB-UPF to join the multicast tree towards the Source Specific Multicast (SSM) address information provided by AF/AS for the MBS Session, if multicast transport is used over N6mb.- MBS RESTI (MBS Restoration Indication): this bit shall be set to "1" if the MB-SMF re-establishes an existing PFCP session. (NOTE) | - | - | - | - | X | MBSN4mbReq-Flags |
| Multicast Transport Information for N3mb and/or N19mb | C | This IE shall be present during the restoration of a PFCP session of an MBS session after an MB-UPF restart, as defined in clause 8.2.2 of 3GPP TS 23.527 [40]. When present, it shall include the low layer source specific multicast address information (i.e. multicast destination address and related source IP address) and the GTP-U Common Tunnel EndPoint Identifier (C-TEID) that the MB-SMF requests the MB-UPF to allocate for multicast transport over N3mb and/or N19mb, if possible.(NOTE) | - | - | - | - | X | Multicast Transport Information |
| NOTE: The MB-UPF shall accept the MB-SMF allocated N3mb/N19mb and/or the N6mb/Nmb9 address in the PFCP Session Establishment Request message with the MBS RESTI flag set to "1", if the requested addresses are available. If one requested address is not available at the MB-UPF, the MB-UPF shall reject the PFCP Session Establishment Request with the cause "PFCP session restoration failure due to requested resource not available" (see clause 8.2.1).  |

Table 7.5.2.1-5: MBS Session N4 Control Information IE within PFCP Session Establishment Request

|  |  |  |
| --- | --- | --- |
| Octet 1 and 2 |  | MBS Session N4 Control Information IE Type = 310 (decimal) |
| Octets 3 and 4 |  | Length = n |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| MBS Session Identifier | M |  | - | - | - | X | - | MBS Session Identifier |
| Area Session ID | C | This IE shall be present for a location dependent MBS service. When present, it shall contain the Area Session ID, which together with the MBS Session Identifier, uniquely identify the service area part of the content data of the MBS service.  | - | - | - | X | - | Area Session ID |
| Multicast Transport Information | C | This IE shall be present to include a low layer source specific multicast address information (i.e. multicast destination address and related source IP address) and a GTP-U Common Tunnel EndPoint Identifier (C-TEID) which was allocated by the MB-UPF, if IP multicast transport is used over N19mb.  | - | - | - | X | - | Multicast Transport Information |

Table 7.5.2.1-6: DSCP to PPI Control Information IE within PFCP Session Establishment Request

|  |  |  |
| --- | --- | --- |
| Octet 1 and 2 |  | DSCP to PPI Control Information IE Type = 316 (decimal) |
| Octets 3 and 4 |  | Length = n |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| DSCP to PPI Mapping Information | M | This IE shall be present to instruct the UPF to insert the corresponding PPI for the downlink GTP-U packet, where the DSCP of its payload packet is matching one of DSCP codes in the DSCP to PPI Mapping Information.Several IEs with the same IE type may be present to provide different DSCP to PPI mapping information. | - | - | - | X | - | DSCP to PPI Mapping Information |
| QFI | O | This IE may be present to request the UPF to only insert PPI for those packets pertain to the requested QoS flow(s).Several IEs with the same IE type may be present to provide a list of QFIs.(NOTE 1) | - | - | - | X | - | QFI |
| NOTE 1: The absence of QFI(s) indicates that insertion of the corresponding PPI shall be applied for all DL packets (matching the DSCP(s) of the DSCP to PPI Mapping Information IE) pertaining to all QoS flows of the PFCP session. |

\* \* \* 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 | N4mb |
| PDR ID | M | This IE shall uniquely identify the PDR among all the PDRs configured for that PFCP session. | X | 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 | 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 | 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 | 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 | 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 | FFS | 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 | 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 |
| Transport Delay Reporting | C | This IE shall be present to request the UPF to add the delay of the GTP-U path with the preceding uplink GTP-U entity to the "N3/N9 Delay Result received in the GTP-U PDU Session Container extension header (see 3GPP TS 38.415 [34]) of the uplink packet, when monitoring the QoS of a PDU session based on GTP-U path monitoring (see clause 5.24.5.3). See Table 7.5.2.2-6. | - | - | - | X | - | Transport Delay Reporting |
| RAT Type | O | This IE may be present to provide the UP Function the current RAT Type for the UL PDR for statistics purpose if the PFCP session is established for a MA PDU session. | - | - | - | X | - | RAT Type |
| 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. |

Editor's Note: Whether a URR may be associated with a PFCP session for an MBS session is FFS.

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 | N4mb |
| Source Interface | M | This IE shall identify the source interface of the incoming packet. | X | 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 |
| Local Ingress Tunnel | C | This IE shall not be present if Traffic Endpoint ID is present.If present, this IE shall identify the IP address and the UDP port for a UDP/IP tunnel.The CP function shall set the CHOOSE (CH) bit to 1 if the CP function requests the UP function to assign a local ingress tunnel to the PDR. | - | - | - | - | X | Local Ingress Tunnel |
| 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 | 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 UE IP address as 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.This IE may also present to identify the IP address of the CP function as the destination IP address to match for the incoming packet, e.g. Radius, Diameter or DHCP signalling packet. (NOTE 8).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 | 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 | X | SDF Filter |
| Application ID | O | If present, this IE shall identify the Application ID to match for the incoming packet.  | - | X | 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 PDR if the UPF indicated support of Framed Routing (see clauses 8.2.25 and 5.16). 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 clauses 8.2.25 and 5.16). If present, this IE shall describe the routing method for the UP function for the IP route related to Framed-Routes or Framed-IPv6-Routes. (NOTE 7) | - | X | - | X | - | Framed-Routing |
| Framed-IPv6-Route | O | This IE may be present for a PDR if the UPF indicated support of Framed Routing (see clauses 8.2.25 and 5.16). 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 | 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.This IE shall be present over N4mb, if multicast transport is used over N6mb and if Traffic Endpoint ID is not present.Several IEs with the same IE type may be present to represent multiple IP multicast flows. | - | - | - | X | X | IP Multicast Addressing Info |
| DNS Query Filter | O | This IE may be present for an UL PDR if the UPF indicated support of DNS traffic steering based on FQDN in the DNS Query message.If present, this IE shall identify the DNS Query filter to match for the incoming DNS Query packets. Several IEs with the same IE type may be present to provision a list of DNS Query Filters. The full set of applicable DNS Query filters, if any, shall be provided during the creation or the modification of the PDI. | - | - | - | X | - | DNS Query Filter |
| MBS Session Identifier | C | This IE shall be present when the PDR is created to receive MBS session data. (NOTE 9) | - | - | - | X | - | MBS Session Identifier |
| Area Session ID | C | This IE shall be present for a location dependent MBS service. When present, it shall contain the Area Session ID, which together with the MBS Session Identifier, uniquely identify the service area part of the content data of the MBS service. (NOTE 9) | - | - | - | X | - | Area Session ID |
| 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 provisionedNOTE 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).NOTE 7: In this release of specification, the UP function shall announce the IP route(s) for Framed-Route(s) or Framed-IPv6-Route(s) to the PDN regardless of the value of the Framed-Routing.NOTE 8: The IP address of the CP function is needed e.g. perform Router Advertisements and match the destination IP address of the incoming packet if the Radius, Diameter or DHCP signaling packets between the SMF and the external DN is forwarded by the UPF.NOTE 9: The Inclusion of the MBS Session Identifier, or MBS Session Identifier and Area Session ID for a location dependent MBS session, enables the UPF to allocate the same N19mb tunnel for the same MBS Session, or for the same MBS session and Area Session ID for a location dependent MBS session, when receiving multiple PFCP Session Establishment or Modification Request messages for different PFCP sessions being associated with the same MBS session, or with the same MBS session and Area Session ID for a location dependent MBS session, and also helps the UPF to identify the PFCP sessions associated with a MBS Session, or with the same MBS session and Area Session ID for a location dependent MBS session. |

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 | N4mb |
| 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 | N4mb |
| 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.For N4mb, the IP Multicast Address shall be set to the value of IP Multicast Address in the SSM for the MBS Session. | - | - | - | X | 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 |
| M | This IE shall be set to the value of the IP Source Address in the SSM for the MBS Session. | - | - | - | - | X |

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 | N4mb |
| 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 |

Table 7.5.2.2-6: Transport Delay Reporting IE in Create PDR IE

|  |  |  |  |
| --- | --- | --- | --- |
| Octet 1 and 2 |  |  | Transport Delay Reporting IE Type = 271 (decimal) |
| Octets 3 and 4 |  |  | Length = n |
| Information elements | P | Condition / Comment | Appl. | IE Type |
| Sxa | Sxb | Sxc | N4 | N4mb |
| Preceding UL GTP-U Peer | M | This IE shall identify the preceding UL GTP-U peer. | - | - | - | X | - | Remote GTP-U Peer |
| DSCP | O | If present, this IE shall contain the DSCP to use to measure the GTP-U path delay with the preceding UL GTP-U peer. | - | - | - | X | - | Transport Level Marking |

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

#### 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 | N4mb |
| Traffic Endpoint ID | M | This IE shall uniquely identify the Traffic Endpoint for that PFCP session. | X | 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 | 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 UE IP address as 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.This IE may also present to identify the IP address of the CP function as the destination IP address to match for the incoming packet, e.g. Radius, Diameter or DHCP signalling packet. (NOTE 6).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 PDR if the UPF indicated support of Framed Routing (see clauses 8.2.25 and 5.16). 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 clauses 8.2.25 and 5.16). If present, this IE shall describe the routing method for the UP function for the IP route related to Framed-Routes or Framed-IPv6-Routes. (NOTE 5) | - | X | - | X | - | Framed-Routing |
| Framed-IPv6-Route | O | This IE may be present for a PDR if the UPF indicated support of Framed Routing (see clauses 8.2.25 and 5.16). 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 |
| 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.(NOTE 4) | X | X | - | X | X | 3GPP Interface Type |
| Local Ingress Tunnel | C | This IE shall be present over N4mb, for Nmb9, or for N6mb if unicast transport is used over N6mb, if Traffic Endpoint ID is present in the DL PDR.If present, this IE shall identify the IP address and the UDP port for a UDP/IP tunnel.The CP function shall set the CHOOSE (CH) bit to 1 if the CP function requests the UP function to assign a local ingress tunnel to the PDR. | - | - | - | - | X | Local Ingress Tunnel |
| IP Multicast Addressing Info | C | This IE shall be present over N4mb, if multicast transport is used over N6mb, if Traffic Endpoint ID is present in the DL PDR.See Table 7.5.2.2-4. | - | - | - | - | X | IP Multicast Addressing Info |
| MBS Session Identifier | C | This IE shall be present when the PDR is created to receive MBS session data. (NOTE 7) | - | - | - | X | - | MBS Session Identifier |
| Area Session ID | C | This IE shall be present for a location dependent MBS service. When present, it shall contain the Area Session ID, which together with the MBS Session Identifier, uniquely identify the service area part of the content data of the MBS service. (NOTE 7) | - | - | - | X | - | Area Session ID |
| RAT Type | O | This IE may be present to provide the UP Function the current RAT Type for the UL PDR(s) for statistics purpose if the PFCP session is established for a MA PDU session. | - | - | - | X | - | RAT Type |
| 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.NOTE 4: If the Source Interface Type is provisioned at the traffic endpoint, it shall not be provisioned in individual PDRs associated to the traffic endpoint.NOTE 5: In this release of specification, the UP function shall announce the IP route(s) for Framed-Route(s) or Framed-IPv6-Route(s) to the PDN regardless of the value of the Framed-Routing.NOTE 6: The CP IP Address parameter is needed e.g. perform Router Advertisements and match the destination IP address of the incoming packet if the Radius, Diameter or DHCP signaling packets between the SMF and the external DN is forwarded by the UPF.NOTE 7: The Inclusion of the MBS Session Identifier, or MBS Session Identifier and Area Session ID for a location dependent MBS session, enables the UPF to allocate the same N19mb tunnel for the same MBS Session, or for the same MBS Session Identifier and Area Session ID for a location dependent MBS session, when receiving multiple PFCP Session Establishment or Modification Request messages for different PFCP sessions being associated with the same MBS session, or with the same MBS session and Area Session ID for a location dependent MBS session, and also helps the UPF to identify the PFCP sessions associated with a MBS Session, or with the same MBS session and Area Session ID for a location dependent MBS session. |

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