**3GPP TSG-CT WG3 Meeting #118e C3-215131**

**E-Meeting, 11th – 15th October 2021 (Revision of C3-21xxxx)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.508** | **CR** | **0145** | **rev** | **-** | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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:*** | Update input data collection for Slice load level information | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA\_Ph2 | | | | |  | ***Date:*** | | | 2021-09-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TS 23.288 CR 0382 in clause 6.3.2A and 6.3.4 updated with slice load level information supporting, including SMF event exposure supporting updates,  - Individual PDU Session Established or PDU Session Released in a S-NSSAI from SMF:  - Nsmf\_EventExposure\_Subscribe (Target for Event Reporting = “any UE”, Event ID = “PDU Session Establishment and/or PDU Session Release", Event Filter information = S-NSSAI(s), Event reporting mode = reporting to a maximum number or a maximum duration) as defined in TS 23.502 [3] clause 5.2.8.3.1.  hence need to update in this specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update in subscription and notification procedures and data types with EneNA feature supporting network slice based data collection on PDU Session establishment/release for any UE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not fully aligned with TS 23.288 in clause 6.3.2A and 6.3.4 for SMF event exposure supporting slice load level input data collection. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.2.2, 5.6.2.2, 5.6.2.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not impact the OpenAPI files. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

#### 4.2.2.2 Notification about subscribed events

The present "notification about subscribed events" procedure is performed by the SMF when any of the subscribed events occur.

The following applies with respect to the detection of subscribed events:

- If:

- the SMF supports the "downlink data delivery status" feature,

- the event "downlink data delivery status" is subscribed,

- the traffic descriptors of the downlink data source have been provided for that subscription, and

- the SMF is informed that the UE corresponding to that subscription is unreachable,

- if the data is buffered at the UPF, then the SMF shall interact with the UPF to notify that the UPF buffers the downlink packets. The SMF shall include the traffic descriptor of the subscriptions in the PDR with a higher priority if the PCC is not applied to the PDUsession or derive the PDR from the PCC rule received from the PCF as defined in subclause 4.2.4.27 of 3GPP TS 29.512 [14] if the PCC is applied to the PDU session and request the UPF to report when there are corresponding buffered downlink packets or discarded packets in the UPF as defined in subclause 5.28.1 of 3GPP TS 29.244 [23]. When receiving the report from the UPF, the SMF shall determine whether that subscribed event with delivery status "DISCARDED" or "BUFFERED" occurred. The SMF shall determine that subscribed event with delivery status "TRANSMITTED" occurred by the fact that the related PDU session becomes ACTIVE.

- if the data is buffered at the SMF, the SMF shall determine whether that subscribed event occurred by comparing the downlink packets with the traffic descriptors received in the corresponding event subscription. If the SMF decides to buffer the packets, the subscribed event with delivery status "BUFFERED" occurred. If the SMF decides to discard the packets, the subscribed event with delivery status "DISCARDED" occurred. The SMF shall determine that subscribed event with delivery status "TRANSMITTED" occurred by the fact that the related PDU session becomes ACTIVE.

Figure 4.2.2.2-1 illustrates the notification about subscribed events.



Figure 4.2.2.2-1: Notification about subscribed events

If the SMF observes PDU Session related event(s) for which an NF service consumer has subscribed, the SMF shall send an HTTP POST request with "{notifUri}", as previously provided by the NF service consumer within the corresponding subscription, as URI and NsmfEventExposureNotification data structure as request body that shall include:

- Notification correlation ID provided by the NF service consumer during the subscription, or as provided by the PCF for implicit subscription of UP path change as defined in subclause 4.2.6.2.6.2 of 3GPP TS 29.512 [14], or as provided by the PCF for implicit subscription of QoS Monitoring as defined in subclause 4.2.3.25 of 3GPP TS 29.512 [14], as "notifId" attribute; and

- information about the observed event(s) within the "eventNotifs" attribute that shall contain for each observed event an "EventNotification" data structure that shall include:

1. the Event Trigger as "event" attribute;

2. for a UP path change notification:

a) type of notification ("EARLY" or "LATE") as "dnaiChgType" attribute;

b) source DNAI and/or target DNAI as "sourceDnai" attribute and "targetDnai" attribute if DNAI is changed, respectively (NOTE 3); and

c) if the PDU Session type is IP, for the source DNAI IP address/prefix of the UE as "sourceUeIpv4Addr" attribute or "sourceUeIpv6Prefix" attribute; and

d) if the PDU Session type is IP, for the target DNAI IP address/prefix of the UE as "targetUeIpv4Addr" attribute or "targetUeIpv6Prefix" attribute;

e) if available (NOTE 3), for the source DNAI, N6 traffic routing information related to the UE as "sourceTraRouting" attribute;

f) if available (NOTE 3), for the target DNAI, N6 traffic routing information related to the UE as "targetTraRouting" attribute; and

g) if the PDU Session type is Ethernet, the MAC address of the UE in the "ueMac" attribute;

NOTE 1: UP path change notification, i.e. DNAI change notification and/or N6 traffic routing information change notification, can be the result of an implicit subscription of the PCF on behalf of the NEF/AF as part of setting PCC rule(s) via the Npcf\_SMPolicyControl service (see subclause 4.2.6.2.6.2 of 3GPP TS 29.512 [14]).

NOTE 2: If the DNAI is not changed while the N6 traffic routing information change, the source DNAI and target DNAI are not provided.

NOTE 3: The change from the UP path status where no DNAI applies to a status where a DNAI applies indicates the activation of the related AF request and therefore only the target DNAI and N6 traffic routing information is provided in the event notification; the change from the UP path status where a DNAI applies to a status where no DNAI applies indicates the de-activation of the related AF request and therefore only the source DNAI and N6 traffic routing information is provided in the event notification.

3. for a UE IP address change:

a) added new UE IP address or prefix as "adIpv4Addr" attribute or "adIpv6Prefix" attribute, respectively; and/or

b) released UE IP address or prefix as "reIpv4Addr" attribute or "reIpv6Prefix" attribute, respectively;

4. for an access type change:

a) new access type as "accType" attribute;

5. for a PLMN Change:

a) new PLMN as "plmnId" attribute;

6. for a PDU Session Release:

a) ID of the released PDU session as "pduSeId" attribute;

b) DNN of the release PDU session as "dnn" attribute, if the "PduSessionStatus" feature is supported;

c) The type of the release PDU session as "pduSessType" attribute, if the "PduSessionStatus" feature is supported;

d) UE IPv4 address as "ipv4Addr" attribute and/or IPv6 information (IPv6 prefix(es) or IPv6 address(es)) as "ipv6Prefixes" or "ipv6Addrs" attributes, if the released PDU session type is IP and the "PduSessionStatus" feature is supported; and

e) S-NSSAI of the release PDU session as "snssai" attribute, if the "EneNA" feature is supported and "snssai" attribute is present in the subscribed "NsmfEventExposure" data type;

7. the time at which the event was observed encoded as "timeStamp" attribute;

8. the SUPI as the "supi" attribute if the subscription applies to a group of UE(s) or any UE;

9. if available, the GPSI as the "gpsi" attribute if the subscription applies to a group of UE(s) or any UE;

10. for a Downlink Data Delivery Status:

a) the downlink data delivery status as "dddStatus" attribute;

b) the downlink data descriptors impacted by the downlink data delivery status change within the "dddTraDescriptor" attribute; and

c) for downlink data delivery status "BUFFERED". the estimated maximum waiting time as "maxWaitTime" attribute;

11. for a Communication Failure:

a) the detailed communication failure information (e.g. 5G SM cause) as "commFailure" attribute; and

12. for QoS Monitoring:

a) one or two uplink packet delays within the "ulDelays" attribute; or

b) one or two downlink packet delays within the "dlDelays" attribute; or

c) one or two round trip packet delays within the "rtDelays" attribute.

NOTE 4: QoS Monitoring notification can be the result of an implicit subscription of the PCF on behalf of the NEF/AF as part of setting PCC rule(s) via the Npcf\_SMPolicyControl service (see subclause 4.2.3.25 of 3GPP TS 29.512 [14]).

13. for a PDU Session Establishment, if the "PduSessionStatus" feature is supported:

a) ID of the established PDU session as "pduSeId" attribute;

b) DNN of the release PDU session as "dnn" attribute;

c) The type of the release PDU session as "pduSessType" attribute;

d) UE IPv4 address as "ipv4Addr" attribute and/or IPv6 information (IPv6 prefix(es) or IPv6 address(es)) as "ipv6Prefixes" or "ipv6Addrs" attributes if available at PDU session establishment; and

e) S-NSSAI of the established PDU session as "snssai" attribute, if the "EneNA" feature is supported and "snssai" attribute is present in the subscribed "NsmfEventExposure" data type;

14. for a QFI allocation:

a) QFI of the allocated QoS Flow ID for the application as "qfi" attribute;

b) DNN of the allocated PDU session as "dnn" attribute;

c) Slice of the allocated PDU session as "snssai" attribute;

d) The description of the application traffic as "appId", "fDescs" or "ethfDescs" attribute; and

e) ID of the allocated PDU session as "pduSeId" attribute if the subscription was for a UE, a group of UEs, or any UE, and not for a specific PDU Session;

15. for an RAT type change:

a) new RAT type as "ratType" attribute;

- an URI for further AF acknowledgement in the "ackUri" attribute if the SMF determines to wait for the AF acknowledgement before activating the new UP path associated with the new DNAI.

NOTE 5: Based on the indication of AF acknowledgment to be expected in the PCC rules received from the PCF and local configuration, the SMF may determine to wait for the AF acknowledgement before activating the new UP path associated with the new DNAI.

Upon the reception of an HTTP POST request with "{notifUri}" as URI and an NsmfEventExposureNotification data structure as request body, the NF service consumer shall send an HTTP "204 No Content" response for a successful processing.

If errors occur when processing the HTTP POST request, the NF service consumer shall send the HTTP error response as specified in subclause 5.7.

If the feature "ES3XX" is not supported and,

- if the NF service consumer is not able to handle the Notification but another unknown NF service consumer could possibly handle the notification, it shall reply with an HTTP "404 Not found" error response.

NOTE 6: An AMF as NF service consumer can change.

- if the SMF becomes aware that a new NF service consumer is requiring notifications (e.g. via the "404 Not found" response, or via Namf\_Communication service AMFStatusChange Notifications, see 3GPP TS 29.518 [13], or via link level failures or via the Nnrf\_NFDiscovery Service (using the service name and GUAMI obtained during the creation of the subscription) to discover the other AMFs within the AMF set) specified in 3GPP TS 29.510 [12]), and the SMF knows alternate or backup IPv4 Address(es), IPv6 Address(es) or FQDN(s) where to send Notifications (e.g. via "altNotifIpv4Addrs", "altNotifIpv6Addrs" or "altNotifFqdns" attributes received when the subscription was created), the SMF shall exchange the authority part of the Notification URI with one of those addresses and shall use that URI in any subsequent communication. If the SMF received a "404 Not found" response, the SMF should resend the failed notification to that URI.

If the feature "ES3XX" is supported, and the NF service consumer determines the received HTTP POST request needs to be redirected, the NF service consumer shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [4] and,

- if the SMF receives a "307 Temporary Redirect" response, the SMF shall resend the failed event notification request using the received URI in the Location header field as Notification URI. Subsequent event notifications, triggered after the failed one, shall be sent to the Notification URI provided by the NF service consumer during the corresponding subscription creation/update; or

- if the SMF receives a "308 Permanent Redirect" response, the SMF shall resend the failed event notification request and send the subsequent event notification using the received URI in the Location header field as Notification URI.

If the SMF in the VPLMN needs to send an event notification to the NEF in the HPLMN, it may normalize the event based on roaming agreements when required before provisioning the event report to the NEF of the HPLMN.

\*\*\* 2nd Change \*\*\*

#### 5.6.2.2 Type NsmfEventExposure

Table 5.6.2.2-1: Definition of type NsmfEventExposure

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| supi | Supi | C | 0..1 | Subscription Permanent Identifier (NOTE  1) |  |
| gpsi | Gpsi | C | 0..1 | Generic Public Subscription Identifier (NOTE  1) |  |
| anyUeInd | boolean | C | 0..1 | This IE shall be present if the event subscription is applicable to any UE. Default value "false" is used, if not present (NOTE 1) (NOTE m) |  |
| groupId | GroupId | C | 0..1 | Identifies a group of UEs. (NOTE 1) |  |
| pduSeId | PduSessionId | C | 0..1 | PDU session ID (NOTE 1) |  |
| dnn | Dnn | O | 0..1 | Data Network Name. |  |
| snssai | Snssai | O | 0..1 | A single Network Slice Selection Assistance Information. (NOTE m) |  |
| subId | SubId | C | 0..1 | Subscription ID. This parameter shall be supplied by the SMF in HTTP responses that include an object of NsmfEventExposure type. |  |
| notifId | string | M | 1 | Notification Correlation ID provided by the NF service consumer. (NOTE 2) |  |
| notifUri | Uri | M | 1 | Identifies the recipient of Notifications sent by the SMF. |  |
| altNotifIpv4Addrs | array(Ipv4Addr) | O | 1..N | Alternate or backup IPv4 Address(es) where to send Notifications. |  |
| altNotifIpv6Addrs | array(Ipv6Addr) | O | 1..N | Alternate or backup IPv6 Address(es) where to send Notifications. |  |
| altNotifFqdns | array(Fqdn) | O | 1..N | Alternate or backup FQDN(s) where to send Notifications. |  |
| eventSubs | array(EventSubscription) | M | 1..N | Subscribed events. (NOTE m) |  |
| ImmeRep | boolean | O | 0..1 | It is included and set to true if the immediate reporting of the current status of the subscribed event, if available is required. |  |
| notifMethod | NotificationMethod | O | 0..1 | If "notifMethod" is not supplied, the default value "ON\_EVENT\_DETECTION" applies. (NOTE m) |  |
| maxReportNbr | Uinteger | O | 0..1 | If omitted, there is no limit. (NOTE m) |  |
| expiry | DateTime | C | 0..1 | This attribute indicates the expiry time of the subscription, after which the SMF shall not send any event notifications and the subscription becomes invalid. It may be included in an event subscription request and may be included in an event subscription response based on operator policies. If an expiry time was included in the request, then the expiry time returned in the response should be less than or equal to that value. If the expiry time is not included in the response, the NF service consumer shall not associate an expiry time for the subscription. (NOTE m) |  |
| repPeriod | DurationSec | C | 0..1 | Is supplied for notification Method "periodic". |  |
| guami | Guami | C | 0..1 | The Globally Unique AMF Identifier (GUAMI) shall be provided by an AMF as NF service consumer. |  |
| serviceName | ServiceName | O | 0..1 | If the NF service consumer is an AMF, it should provide the name of a service produced by the AMF that makes use of the notification about subscribed events. |  |
| supportedFeatures | SupportedFeatures | C | 0..1 | List of Supported features used as described in subclause 5.8.  This parameter shall be supplied by NF service consumer and SMF in the POST request that request the creation of an SMF Notification Subscriptions resource and the related reply, respectively. |  |
| sampRatio | SamplingRatio | O | 0..1 | Indicates the ratio of the random subset to target UEs, event reports only relates to the subset. |  |
| partitionCriteria | array(PartitioningCriteria) | O | 1..N | Defines criteria for partitioning the UEs in order to apply the sampling ratio for each partition. It may only be included in event subscription requests when the "sampRatio" attribute is also provided. (NOTE 3) | EneNA |
| grpRepTime | DurationSec | O | 0..1 | Indicates the time for which the SMF aggregates the event reports detected by the UEs in a group and report them together to the NF service consumer. |  |
| notifFlag | NotificationFlag | O | 0..1 | Indicates the notification flag, which is used to mute/unmute notifications and to retrieve events stored during a period of muted notifications.  Default: "ACTIVATE" | EneNA |
| NOTE 1: If the event subscription applies for a specific PDU session, the PDU session of a single UE (pduSeId, and gpsi/supi) shall be included; otherwise one and only one of a single UE (gpsi/supi), a group of UEs (groupId), or anyUeInd set to true shall be included.  NOTE 2: If the UDM as NF service consumer subscribes to event (e.g. downlink data delivery status, PDU Session Establishment, PDU Session Release) on behalf of AF/NEF, "notifId" shall be set the same as "referenceId" received from the AF/NEF as defined in subclause 6.4.6.2.4 of 3GPP TS 29.503 [14].  NOTE 3: For a given type of partitioning criteria, the UE shall belong to only one single partition as long as it is served by the NF service producer.  NOTE m: If EneNA feature is supported, when the "snssai" attribute is presented together with "anyUeInd" attribute and the "eventSubs" attribute contains "PDU\_SES\_EST" and "PDU\_SES\_REL", then only the "ON\_EVENT\_DETECTION” value is applicable in the "notifMethod" attribute together with "maxReportNbr" attribute and/or "expiry"attribute presence. | | | | | |

\*\*\* 3rd Change \*\*\*

#### 5.6.2.5 Type EventNotification

Table 5.6.2.5-1: Definition of type EventNotification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | SmfEvent | M | 1 | Event that is notified. |  |
| timeStamp | DateTime | M | 1 | Time at which the event is observed. |  |
| supi | Supi | C | 0..1 | Subscription Permanent Identifier. It is included when the subscription applies to a group of UE(s) or any UE. |  |
| gpsi | Gpsi | C | 0..1 | Identifies a GPSI. It shall contain an MSISDN. It is included when it is available and the subscription applies to a group of UE(s) or any UE. |  |
| sourceDnai | Dnai | C | 0..1 | Source DN Access Identifier. Shall be included for event "UP\_PATH\_CH" if the DNAI changed (NOTE 1, NOTE 2). |  |
| targetDnai | Dnai | C | 0..1 | Target DN Access Identifier. Shall be included for event "UP\_PATH\_CH" if the DNAI changed (NOTE 1, NOTE 2). |  |
| dnaiChgType | DnaiChangeType | C | 0..1 | DNAI Change Type. Shall be included for event "UP\_PATH\_CH". |  |
| sourceUeIpv4Addr | Ipv4Addr | O | 0..1 | The IPv4 Address of the served UE for the source DNAI. May be included for event "UP\_PATH\_CH". |  |
| sourceUeIpv6Prefix | Ipv6Prefix | O | 0..1 | The Ipv6 Address Prefix of the served UE for the source DNAI. May be included for event "UP\_PATH\_CH". |  |
| targetUeIpv4Addr | Ipv4Addr | O | 0..1 | The IPv4 Address of the served UE for the target DNAI. May be included for event "UP\_PATH\_CH". |  |
| targetUeIpv6Prefix | Ipv6Prefix | O | 0..1 | The Ipv6 Address Prefix of the served UE for the target DNAI. May be included for event "UP\_PATH\_CH". |  |
| sourceTraRouting | RouteToLocation | C | 0..1 | N6 traffic routing information for the source DNAI. Shall be included for event "UP\_PATH\_CH" if available (NOTE 2). |  |
| targetTraRouting | RouteToLocation | C | 0..1 | N6 traffic routing information for the target DNAI. Shall be included for event "UP\_PATH\_CH" if available (NOTE 2). |  |
| ueMac | MacAddr48 | O | 0..1 | UE MAC address. May be included for event "UP\_PATH\_CH". |  |
| adIpv4Addr | Ipv4Addr | O | 0..1 | Added IPv4 Address(es). May be included for event "UE\_IP\_CH". |  |
| adIpv6Prefix | Ipv6Prefix | O | 0..1 | Added Ipv6 Address Prefix(es). May be included for event "UE\_IP\_CH". |  |
| reIpv4Addr | Ipv4Addr | O | 0..1 | Removed IPv4 Address(es). May be included for event "UE\_IP\_CH". |  |
| reIpv6Prefix | Ipv6Prefix | O | 0..1 | Removed Ipv6 Address Prefix(es). May be included for event "UE\_IP\_CH". |  |
| plmnId | PlmnId | C | 0..1 | New PLMN ID. Shall be included for event "PLMN\_CH". |  |
| accType | AccessType | C | 0..1 | New Access Type. Shall be included for event "AC\_TY\_CH". |  |
| pduSeId | PduSessionId | C | 0..1 | PDU session ID. Shall be included for event "PDU\_SES\_REL" and "PDU\_SES\_EST". It shall also be included for event "QFI\_ALLOC" if the subscription was for a UE, a group of UEs, or any UE, and not for a specific PDU Session. |  |
| ratType | RatType | C | 0..1 | New RAT Type. Shall be included for event ‘RAT\_TY\_CH’. | EneNA |
| dddStatus | DlDataDeliveryStatus | C | 0..1 | Downlink data delivery status (discarded, transmitted, buffered). Shall be included for event "downlink data delivery status", | DownlinkDataDeliveryStatus |
| maxWaitTime | DateTime | C | 0..1 | The estimated maximum waiting time for downlink data delivery, Shall be included for event "downlink data delivery status" with status "BUFFERED". | DownlinkDataDeliveryStatus |
| dddTraDescriptor | DddTrafficDescriptor | C | 0..1 | The downlink data descriptor impacted by downlink data delivery status ch  ange. Shall be included for event "downlink data delivery status" | DownlinkDataDeliveryStatus |
| commFailure | CommunicationFailure | C | 0..1 | Describes the communication failure cause for the UE. Shall be included for event "COMM\_FAIL". | CommunicationFailure |
| ipv4Addr | Ipv4Addr | O | 0..1 | IPv4 address. May be included for event "PDU\_SES\_REL" or "PDU\_SES\_EST". | PduSessionStatus |
| ipv6Prefixes | array(Ipv6Prefix) | O | 1..N | IPv6 prefixes. May be included for event "PDU\_SES\_REL" or "PDU\_SES\_EST". (NOTE 3) | PduSessionStatus |
| ipv6Addrs | array(Ipv6Addr) | O | 1..N | IPv6 addresses. May be included for event "PDU\_SES\_REL" or "PDU\_SES\_EST". (NOTE 3) | PduSessionStatus |
| pduSessType | PduSessionType | C | 0..1 | PDU session type. Shall be included if the PduSessionStatus feature is supported. | PduSessionStatus |
| qfi | Qfi | C | 0..1 | QoS flow identifier. Shall be included for event "QFI\_ALLOC". | QfiAllocation |
| appId | ApplicationId | O | 0..1 | Contains the application identifier. May be included for event "QFI\_ALLOC". (NOTE 4) | QfiAllocation |
| ethfDescs | array(EthFlowDescription) | O | 1..2 | Contains the flow description for the Uplink and/or Downlink Ethernet flows. May be included for event "QFI\_ALLOC". (NOTE 4) | QfiAllocation |
| fDescs | array(FlowDescription) | O | 1..2 | Contains the flow description for the Uplink and/or Downlink IP flows. May be included for event "QFI\_ALLOC". (NOTE 4) | QfiAllocation |
| dnn | Dnn | C | 0..1 | Data network name, Shall be included for event "QFI\_ALLOC". May be included for event "PDU\_SES\_REL" or "PDU\_SES\_EST". | QfiAllocation, PduSessionStatus |
| snssai | Snssai | C | 0..1 | Identifies the slice information. Shall be included for event "QFI\_ALLOC". | QfiAllocation  EneNA |
| ulDelays | array(Uinteger) | O | 1..N | Uplink packet delay in units of milliseconds. (NOTE 5) | QoSMonitoring |
| dlDelays | array(Uinteger) | O | 1..N | Downlink packet delay in units of milliseconds. (NOTE 5) | QoSMonitoring |
| rtDelays | array(Uinteger) | O | 1..N | Round trip delay in units of milliseconds. (NOTE 5) | QoSMonitoring |
| NOTE 1: If the DNAI is not changed while the N6 traffic routing information is changed, the "sourceDnai" attribute and "targetDnai" attribute shall not be provided.  NOTE 2: The change from the UP path status where no DNAI applies to a status where a DNAI applies indicates the activation of the related AF request and therefore only the target DNAI and N6 traffic routing information is provided in the event notification; the change from the UP path status where a DNAI applies to a status where no DNAI applies indicates the de-activation of the related AF request and therefore only the source DNAI and N6 traffic routing information is provided in the event notification.  NOTE 3: If provided, either ipv6Prefixes or ipv6Addrs shall be present.  NOTE 4: Only one of the appId, ethfDescs or fDescs shall be provided.  NOTE 5: In this release of the specification the maximum number of elements in the array is 2. If more than one value is received at one given point of time for UL packet delay, DL packet delay or round trip packet delay respectively, the SMF reports the minimum and maximum packet delays to the NEF/AF. | | | | | |

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