**3GPP TSG- Meeting #C3-242xxx**

**Changsha, China, – was C3-242337**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **0833** | **rev** | **1** | **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:*** | Various GMEC related corrections | | | | | | | | |
|  |  | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | |
|  |  | | | | | | | | |
| ***Work item code:*** | GMEC | | | | |  | ***Date:*** | | 2024-04-18 |
|  |  | | | |  | |  | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | |  |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | |
| ***Reason for change:*** | | | The following issues have been identified:   * The "GMEC" feature name is different in the MonitoringEvent API ("GMEC") and AsSessionWithQoS API ("GMEC**\_5G**"). It would be better to align the naming to "GMEC". This will also enable to align with the other specifications impacted by the GMEC functionality. * The formulation of NOTE 1 in clause 5.3.2.1.2 may be a bit confusing. * The description of the GMEC related feature defined for the for the MonitoringEvent API should be aligned with the description of the similar feature defined for the AsSessionWithQoS API. | | | | | | |
|  | | |  | | | | | | |
| ***Summary of change:*** | | | This CR proposes to:   * Address the above mentioned issues. | | | | | | |
|  | | |  | | | | | | |
| ***Consequences if not approved:*** | | | * The provisions related to the GMEC functionality are not defined in a consistent way across the specification. | | | | | | |
|  | |  | | | | | | | |
| ***Clauses affected:*** | | 5.3.2.1.1, 5.3.2.1.2, 5.3.2.3.2, 5.3.2.3.13, 5.3.4, 5.14.2.1.1, 5.14.2.1.2, 5.14.2.1.3, 5.14.2.1.5, 5.14.2.1.6, 5.14.2.1.7, 5.14.2.1.8, 5.14.2.1.9, 5.14.2.1.10, 5.14.2.2.3, 5.14.4, 5.14.5.3 | | | | | | | |
|  | |  | | | | | | | |
|  | | **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 descriptions of the APIs defined in this specification. | | | | | | | |
|  | |  | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | |

\* \* \* \* Start of changes \* \* \* \*

##### 5.3.2.1.1 Introduction

This clause defines data structures to be used in resource representations, including subscription resources.

Table 5.3.2.1.1-1 specifies data types re-used by the MonitoringEvent API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the MonitoringEvent API.

Table 5.3.2.1.1-1: MonitoringEvent API re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| 2DRelativeLocation | 3GPP TS 29.572 [42] | Represents 2D local co-ordinates with origin corresponding to another known point. |
| 3DRelativeLocation | 3GPP TS 29.572 [42] | Represents 3D local co-ordinates with origin corresponding to another known point. |
| AccuracyFulfilmentIndicator | 3GPP TS 29.572 [42] | The indication whether the obtained location estimate satisfies the requested QoS or not. |
| AgeOfLocationEstimate | 3GPP TS 29.572 [42] | Age of the location estimate for change of location type or motion type of Location deferred report. |
| Angle | 3GPP TS 29.572 [42] | Indicates value of angle |
| ApplicationlayerId | 3GPP TS 29.571 [45] | Represents the Application Layer ID. |
| CivicAddress | 3GPP TS 29.572 [42] | Civic address. |
| CodeWord | 3GPP TS 29.515 [65] | Code word. |
| DddTrafficDescriptor | 3GPP TS 29.571 [45] | Traffic Descriptor of source of downlink data. |
| DlDataDeliveryStatus | 3GPP TS 29.571 [45] | Traffic Descriptor of source of downlink data notifications. |
| Dnn | 3GPP TS 29.571 [45] | Identifies a DNN. |
| Fqdn | 3GPP TS 29.571 [45] | Identifies a FQDN. |
| GeographicArea | 3GPP TS 29.572 [42] | Identifies the geographical information of the user(s). |
| Gpsi | 3GPP TS 29.571 [45] | Represents a GPSI. |
| IpAddr | 3GPP TS 29.571 [45] | UE IP Address. |
| LdrType | 3GPP TS 29.572 [42] | Location deferred requested event type. |
| LinearDistance | 3GPP TS 29.572 [42] | This IE shall be present and set to true if a location estimate is required for motion event report. |
| LocationQoS | 3GPP TS 29.572 [42] | Requested location QoS. |
| MacAddr48 | 3GPP TS 29.571 [45] | MAC Address. |
| MinorLocationQoS | 3GPP TS 29.572 [42] | Minor Location QoS. |
| NetworkAreaInfo | 3GPP TS 29.554 [50] | Identifies a network area information. |
| VelocityRequested | 3GPP TS 29.572 [42] | Velocity of the target UE requested. |
| PatchItem | 3GPP TS 29.571 [45] | Contains the list of changes to be made to a resource according to the JSON PATCH format specified in IETF RFC 6902 [67]. |
| PduSessionInformation | 3GPP TS 29.523 [70] | Represents PDU session identification information. |
| PositioningMethod | 3GPP TS 29.572 [42] | Identifies the positioning method used to obtain the location estimate of the UE. |
| RangeDirection | 3GPP TS 29.572 [42] | Represents the range and direction between two points. |
| RangingSlResult | 3GPP TS 29.572 [42] | Represents the requested result type for ranging and sidelink positioning |
| RelatedUE | 3GPP TS 29.572 [42] | Represents information on the related UE for ranging and sidelink positioning |
| SACEventStatus | 3GPP TS 29.571 [45] | Contains the network slice status information related to network slice admission control. |
| SACInfo | 3GPP TS 29.571 [45] | Represents network slice admission control information to control the triggering of notifications or convey network slice status information. |
| Snssai | 3GPP TS 29.571 [45] | Contains a S-NSSAI. |
| SupportedFeatures | 3GPP TS 29.571 [45] | Used to negotiate the applicability of the optional features defined in table 5.3.4-1. |
| ServiceIdentiy | 3GPP TS 29.515 [65] | Service identity. |
| SupportedGADShapes | 3GPP TS 29.572 [42] | Supported Geographical Area Description shapes. |
| UcPurpose | 3GPP TS 29.503 [63] | Represents the purpose of a user consent. |
| Uinteger | 3GPP TS 29.571 [45] | Represents an unsigned Integer. |
| Uncertainty | 3GPP TS 29.572 [42] | Indicates value of uncertainty. |
| Uri | 5.2.1.3.2 | Represents a URI. |
| UserLocation | 3GPP TS 29.571 [6] | Represents a user location. |
| VelocityEstimate | 3GPP TS 29.572 [42] | UE velocity, if requested and available. |

Table 5.3.2.1.1-2 specifies the data types defined for the MonitoringEvent API.

Table 5.3.2.1.1-2: MonitoringEvent API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| Accuracy | 5.3.2.4.7 | Represents a desired granularity of accuracy for the requested location information. | Location\_notification,  eLCS, EDGEAPP |
| ApiCapabilityInfo | 5.3.2.3.9 | Represents the availability information of supported API. | API\_support\_capability\_notification |
| AppliedParameterConfiguration | 5.3.2.3.8 | Represents the parameter configuration applied in the network. | Enhanced\_param\_config |
| AssociationType | 5.3.2.4.6 | Represents an IMEI or IMEISV to IMSI association. | Change\_of\_IMSI\_IMEI\_association\_notification |
| ConsentRevocNotif | 5.3.2.3.12 | Represents the user consent revocation information conveyed in a user consent revocation notification. | UserConsentRevocation |
| ConsentRevoked | 5.3.2.3.13 | Represents the information related to revoked user consent(s). | UserConsentRevocation |
| FailureCause | 5.3.2.3.6 | Represents the reason of communication failure. | Communication\_failure\_notification |
| GroupMembListChanges | 5.3.2.3.13 | Represents information on the change(s) to a group members list. | GMEC |
| IdleStatusInfo | 5.3.2.3.3 | Represents the information relevant to when the UE transitions into idle mode. | Ue-reachability\_notification,  Availability\_after\_DDN\_failure\_notification |
| InterfaceIndication | 5.3.2.4.10 | Represents the network entity used for data delivery towards the SCS/AS. | Pdn\_connectivity\_status |
| LocationFailureCause | 5.3.2.4.11 | Represents the cause of location/positioning failure. | eLCS |
| LocationInfo | 5.3.2.3.5 | Represents the user location information. | Location\_notification, eLCS |
| LocationType | 5.3.2.4.5 | Represents a location type. | Location\_notification, Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G,  eLCS |
| MonitoringEventReport | 5.3.2.3.2 | Represents an event monitoring report. |  |
| MonitoringEventReports | 5.3.2.3.10 | Represents one or multiple event monitoring report(s). | enNB |
| MonitoringEventSubscription | 5.3.2.1.2 | Represents a subscription to event(s) monitoring. |  |
| MonitoringNotification | 5.3.2.2.2 | Represents an event monitoring notification. |  |
| MonitoringType | 5.3.2.4.3 | Represents a monitoring event type. |  |
| PdnConnectionInformation | 5.3.2.3.7 | Represents the PDN connection information of the UE. | Pdn\_connectivity\_status |
| PdnConnectionStatus | 5.3.2.4.8 | Represents the PDN connection status. | Pdn\_connectivity\_status |
| PdnType | 5.3.2.4.9 | Represents a PDN connection type. |  |
| ReachabilityType | 5.3.2.4.4 | Represents a reachability type. | Ue-reachability\_notification |
| SACRepFormat | 5.3.2.4.13 | Represents the NSAC reporting format. | NSAC |
| SubType | 5.3.2.4.12 | Represents a subscription type. | UAV |
| UavPolicy | 5.3.2.3.11 | Represents the policy information included in the UAV presence monitoring request. | UAV |
| UePerLocationReport | 5.3.2.3.4 | Represents the number of UEs found at the indicated location. | Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G |
| UpCumEvtRep | 5.3.2.3.18 | Represents the cumulative event report for events reported via user plane. | eLCS\_en |
| UpLocRepAddrAfRm | 5.3.2.3.17 | Represents the user plane addressing information. | eLCS\_en |

\* \* \* \* Next changes \* \* \* \*

##### 5.3.2.1.2 Type: MonitoringEventSubscription

This type represents a subscription to monitoring an event. The same structure is used in the subscription request and subscription response.

Table 5.3.2.1.2-1: Definition of type MonitoringEventSubscription

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability (NOTE 3) |
| self | Link | 0..1 | Link to the resource "Individual Monitoring Event Subscription". This parameter shall be supplied by the SCEF in HTTP responses. |  |
| supportedFeatures | SupportedFeatures | 0..1 | Used to negotiate the supported optional features of the API as described in clause 5.2.7.  This attribute shall be provided in the POST request and in the response of successful resource creation. |  |
| mtcProviderId | string | 0..1 | Identifies the MTC Service Provider and/or MTC Application. (NOTE 7) |  |
| appIds | array(string) | 0..N | Identifies the Application Identifier(s). (NOTE 16) | AppDetection\_5G |
| externalId | ExternalId | 0..1 | Identifies a user as defined in Clause 4.6.2 of 3GPP TS 23.682 [2].  This attribute may also be present in a monitoring event subscription response message, if the "UEId\_retrieval" feature is supported and the corresponding request message includes the "ueIpAddr" attribute or the "ueMacAddr" attribute.  (NOTE 1) (NOTE 5) |  |
| msisdn | Msisdn | 0..1 | Identifies the MS internal PSTN/ISDN number allocated for a UE.  (NOTE 1) (NOTE 5) |  |
| addedExternalIds | array(ExternalId) | 0..N | Indicates addition of the external Identifier(s) within the active group. | Partial\_group\_modification |
| addedMsisdns | array(Msisdn) | 0..N | Indicates addition of the MSISDN(s) within the active group. | Partial\_group\_modification |
| excludedExternalIds | array(ExternalId) | 0..N | Indicates cancellation of the external Identifier(s) within the active group. | Partial\_group\_modification |
| excludedMsisdns | array(Msisdn) | 0..N | Indicates cancellation of the MSISDN(s) within the active group. | Partial\_group\_modification |
| externalGroupId | ExternalGroupId | 0..1 | Identifies a user group as defined in Clause 4.6.2 of 3GPP TS 23.682 [2].  (NOTE 1) (NOTE 6) |  |
| addExtGroupIds | array(ExternalGroupId) | 0..N | Identifies user groups as defined in Clause 4.6.2 of 3GPP TS 23.682 [2].  (NOTE 1) (NOTE 6) | Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G |
| ipv4Addr | Ipv4Addr | 0..1 | Identifies the Ipv4 address.  (NOTE 1) | Location\_notification,  Communication\_failure\_notification |
| ipv6Addr | Ipv6Addr | 0..1 | Identifies the Ipv6 address.  (NOTE 1) | Location\_notification,  Communication\_failure\_notification |
| dnn | Dnn | 0..1 | Identifies a DNN, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only. (NOTE 8) (NOTE 16) | Session\_Management\_Enhancement, UEId\_retrieval, AppDetection\_5G |
| notificationDestination | Link | 1 | An URI of a notification destination that T8 message shall be delivered to. |  |
| requestTestNotification | boolean | 0..1 | Set to "true" by the SCS/AS to request the SCEF to send a test notification as defined in clause 5.2.5.3.  Set to "false" by the SCS/AS indicates not request SCEF to send a test notification  Default "false" if omitted. | Notification\_test\_event |
| websockNotifConfig | WebsockNotifConfig | 0..1 | Configuration parameters to set up notification delivery over Websocket protocol as defined in clause 5.2.5.4. | Notification\_websocket |
| monitoringType | MonitoringType | 1 | Enumeration of monitoring type. Refer to clause 5.3.2.4.3. |  |
| maximumNumberOfReports | integer | 0..1 | Identifies the maximum number of event reports to be generated by the HSS, MME/SGSN as specified in clause 5.6.0 of 3GPP TS 23.682 [2].  (NOTE 2, NOTE 9, NOTE 13)  If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to (or contains) the "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS" values, this attribute may also be provided with a value of 1 to indicate that one-time reporting of the network slice status information is requested by the AF. |  |
| monitorExpireTime | DateTime | 0..1 | Identifies the absolute time at which the related monitoring event request is considered to expire, as specified in clause 5.6.0 of 3GPP TS 23.682 [2].  When the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS", this attribute shall be absent in the response to a one-time reporting monitoring subscription request.  (NOTE 2) |  |
| repPeriod | DurationSec | 0..1 | Identifies the periodic time for the event reports. (NOTE 8, NOTE 9, NOTE 13)  If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS", this attribute may be provided. When provided, it also indicates that periodic reporting of the network slice status information is requested by the AF. |  |
| groupReportGuardTime | DurationSec | 0..1 | Identifies the time for which the SCEF can aggregate the monitoring event reports detected by the UEs in a group and report them together to the SCS/AS, as specified in clause 5.6.0 of 3GPP TS 23.682 [2]. |  |
| maximumDetectionTime | DurationSec | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOSS\_OF\_CONNECTIVITY", this parameter may be included to identify the maximum period of time after which the UE is considered to be unreachable. | Loss\_of\_connectivity\_notification |
| reachabilityType | ReachabilityType | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "UE\_REACHABILITY", this parameter shall be included to identify whether the request is for "Reachability for SMS" or "Reachability for Data". | Ue-reachability\_notification |
| maximumLatency | DurationSec | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "UE\_REACHABILITY", this parameter may be included to identify the maximum delay acceptable for downlink data transfers. | Ue-reachability\_notification |
| maximumResponseTime | DurationSec | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "UE\_REACHABILITY", this parameter may be included to identify the length of time for which the UE stays reachable to allow the SCS/AS to reliably deliver the required downlink data. | Ue-reachability\_notification |
| suggestedNumberOfDlPackets | integer | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "UE\_REACHABILITY", this parameter may be included to identify the number of packets that the serving gateway shall buffer in case that the UE is not reachable. | Ue-reachability-notification |
| idleStatusIndication | boolean | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "UE\_REACHABILITY" or "AVAILABILITY\_AFTER\_DDN\_FAILURE", this parameter may be included to indicate the notification of when a UE, for which PSM is enabled, transitions into idle mode.  - "true": indicate enabling of notification  - "false": indicate no need to notify  Default: "false" if omitted. | Ue-reachability\_notification,  Availability\_after\_DDN\_failure\_notification,  Availability\_after\_DDN\_failure\_notification\_enhancement |
| locationType | LocationType | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING" or "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter shall be included to identify whether the request is for Current Location, Initial Location or Last known Location.  (NOTE 4) | Location\_notification, Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G,  eLCS |
| accuracy | Accuracy | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to identify the desired level of accuracy of the requested location information, as described in clause 4.9.2 of 3GPP TS 23.682 [2]. (NOTE 10, NOTE 11)  For 5G, if the eLCS feature is not supported, the default value is "TA\_RA". | Location\_notification,  eLCS |
| minimumReportInterval | DurationSec | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to identify a minimum time interval between Location Reporting notifications.  If the "ldrType" attribute is present and set to "ENTERING\_INTO\_AREA". "LEAVING\_FROM\_AREA", "BEING\_INSIDE\_AREA" or "MOTION", this attribute shall not be included if the maximumNumberOfReports attribute is present and set to one time event. | Location\_notification,  eLCS |
| maxRptExpireIntvl | DurationSec | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to identify a maximum time interval between Location Reporting notifications.  If the "ldrType" attribute is present and set to "ENTERING\_INTO\_AREA". "LEAVING\_FROM\_AREA", "BEING\_INSIDE\_AREA" or "MOTION", this attribute shall not be included if the maximumNumberOfReports attribute is present and set to one time event. | eLCS |
| samplingInterval | DurationSec | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to identify the maximum time interval between consecutive evaluations by a UE of a trigger event. | eLCS |
| reportingLocEstInd | boolean | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate whether event reporting requires the location information.  Set to "true", indiates the location estimation information shall be included in event reporting.  Set to "false", indicates the location estimation information shall not be included in event reporting.  Default: "false" if omitted. | eLCS |
| linearDistance | LinearDistance | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate the linear(straight line) distance threshold for motion event reporting. | eLCS |
| locQoS | LocationQoS | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate the expected location QoS requirement for an immediate MT-LR or deferred MT-LR.  The "Multiple QoS Class" (i.e. the "lcsQosClass" attribute within the LocationQoS data structure is set to "MULTIPLE\_QOS") shall only be used when the "MUTIQOS" feature is supported.  (NOTE 10) | eLCS, MULTIQOS |
| svcId | ServiceIdentity | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate the service identity of AF. | eLCS |
| ldrType | LdrType | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate the event type for a deferred MT-LR. | eLCS |
| velocityRequested | VelocityRequested | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate if the velocity of the target UE is requested or not. | eLCS |
| maxAgeOfLocEst | AgeOfLocationEstimate | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate acceptable maximum age of location estimate. | eLCS |
| locTimeWindow | TimeWindow | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate the starting time and ending time for a deferred MT-LR. | eLCS |
| supportedGADShapes | array(SupportedGADShapes) | 0..N | Supported Geographical Area Description shapes. | eLCS |
| codeWord | CodeWord | 0..1 | Code word. | eLCS |
| upLocRepIndAf | boolean | 0..1 | If the "LOCATION\_REPORTING" value is set in either the "monitoringType" attribute or the "addnMonTypes" attribute, this attribute may be included to convey the indication of location reporting over user plane.  When present, this attribute shall be set as follows:  "true": the location reporting over user plane is required.  "false": the location reporting over user plane is not required.  Default: "false" if omitted. | eLCS\_en |
| upLocRepAddrAf | UpLocRepAddrAfRm | 0..1 | If the "upLocRepIndAf" attribute is present and set to "true", this attribute may be present to convey the AF's user plane addressing information to be used for location reporting over user plane. | eLCS\_en |
| associationType | AssociationType | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION", this parameter shall be included to identify whether the change of IMSI-IMEI or IMSI-IMEISV association shall be detected. | Change\_of\_IMSI\_IMEI\_association\_notification |
| plmnIndication | boolean | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "ROAMING\_STATUS", this parameter may be included to indicate the notification of UE's Serving PLMN ID.  - "true": The value shall be used to indicate enabling of notification;  - "false": The value shall be used to indicate disabling of notification.  Default: "false" if omitted. | Roaming\_status\_notification |
| locationArea | LocationArea | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter may be included to indicate the area within which the SCS/AS requests the number of UEs.  If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "AREA\_OF\_INTEREST", this parameter shall be included to indicate the area within which the SCS/AS requests the presence status of a specific UAV. | Number\_of\_UEs\_in\_an\_area\_notification, UAV |
| locationArea5G | LocationArea5G | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter may be included to indicate the area within which the AF requests the number of UEs.  If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "LOCATION\_REPORTING", this parameter may be included to indicate the area within which the AF requests the area event of the target UE. (NOTE 12)  If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "AREA\_OF\_INTEREST", this parameter shall be included to indicate the area within which the AF requests the presence status of a specific UAV. | Number\_of\_UEs\_in\_an\_area\_notification\_5G, eLCS, UAV |
| dddTraDescriptors | array(DddTrafficDescriptor) | 0..N | The traffic descriptor(s) of the downlink data source. May be included for event "DOWNLINK\_DATA\_DELIVERY\_STATUS" or "AVAILABILITY\_AFTER\_DDN\_FAILURE". | Downlink\_data\_delivery\_status\_5G,  Availability\_after\_DDN\_failure\_notification\_enhancement |
| dddStati | array(DlDataDeliveryStatus) | 0..N | May be included for event "DOWNLINK\_DATA\_DELIVERY\_STATUS". The subscribed stati (delivered, transmitted, buffered) for the event. If omitted all stati are subscribed. | Downlink\_data\_delivery\_status\_5G |
| monitoringEventReport | MonitoringEventReport | 0..1 | Identifies a monitoring event report which is sent from the SCEF to the SCS/AS.  (NOTE 18) |  |
| apiNames | array(string) | 0..N | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "API\_SUPPORT\_CAPABILITY", this parameter may be included. Each element identifies the name of an API.  It shall set as {apiName} part of the URI structure for each T8 or N33 API as defined in the present specification or 3GPP TS 29.522 [62], respectively.  This allows the SCS/AS to request the capability change for its interested APIs. If it is omitted, the SCS/AS requests to be notified for capability change for all APIs the SCEF+NEF supports. | API\_support\_capability\_notification |
| tgtNsThreshold | SACInfo | 0..1 | Indicates the monitoring threshold value, for the network slice identified by the "snssai" attirbute, upon which event notification(s) are triggered.  This attribute may be provided if the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS". When provided, it also indicates that threshold based reporting of the network slice status information is requested by the AF.  (NOTE 13) | NSAC |
| nsRepFormat | SACRepFormat | 0..1 | Indicates the requested NSAC reporting format, i.e. "PERCENTAGE" or "NUMERICAL".  It shall be provided only if the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS" and periodic reporting is requested (i.e. the "repPeriod" attribute is provided instead of the "tgtNsThreshold" attribute) or one-time reporting is requested (i.e. the "maximumNumberOfReports" attribute is provided with a value of 1). | NSAC |
| afServiceId | string | 0..1 | Contains the identifier of a service on behalf of which the AF is sending the request.  It may be provided by an untrusted AF and only if the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS".  (NOTE 15) | NSAC |
| snssai | Snssai | 0..1 | Indicates the S-NSSAI that the event monitoring subscription is targeting.  This attribute may be provided if the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS".  This attribute may also be provided if the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "PDN\_CONNECTIVITY\_STATUS" or "DOWNLINK\_DATA\_DELIVERY\_STATUS".  (NOTE 8) (NOTE 15) (NOTE 16) | NSAC, Session\_Management\_Enhancement, UEId\_retrieval, AppDetection\_5G |
| immediateRep | boolean | 0..1 | Indicates that immediate reporting is requested or not.  - "true": indicate an immediate reporting is requested.  - "false": indicate an immediate reporting is not requested.  Default value: "false" if omitted.  This attribute may be included if the "monitoringType" attribute (or the "addnMonTypes" attribute) is set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS" when the "NSAC" feature is supported.  (NOTE 13)  This attribute may also be included if the SCS/AS requires immediate reporting of the subscribed event(s) when the "enNB1\_5G" feature is supported.  (NOTE 4) | NSAC,  enNB1\_5G |
| uavPolicy | UavPolicy | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "AREA\_OF\_INTEREST", this parameter may be included to indicate the 3GPP network to take corresponding action. | UAV |
| subType | SubType | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter may be included to indicate the subscription type to be listed in the Event report.  (NOTE 14) | UAV |
| sesEstInd | boolean | 0..1 | If "monitoringType" attribute (or the "addnMonTypes" attribute) is set to "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter may be included.  If set to “true”, it indicates that only UE’s with “PDU session established for DNN(s) subject to aerial service” are to be listed in the Event report.  If set to "false", it indicates that UE’s with "PDU session established for DNN(s) subject to aerial service" are not to be listed in the Event report.  Default: "false" if omitted.  (NOTE 14) | UAV |
| addnMonTypes | array(MonitoringType) | 0..N | Represents additional monitoring types.  (NOTE 17) | enNB |
| addnMonEventReports | array(MonitoringEventReport) | 0..N | Additional monitoring event reports.  May only be provided if the "addnMonTypes" attribute is provided in the corresponding subscription creation/update request.  (NOTE 18) | enNB |
| ueIpAddr | IpAddr | 0..1 | UE IP address. | UEId\_retrieval |
| ueMacAddr | MacAddr48 | 0..1 | UE MAC address. | UEId\_retrieval |
| revocationNotifUri | Uri | 0..1 | Contains the URI via which the AF desires to receive user consent revocation notifications. | UserConsentRevocation |
| reqRangSlRes | array(RangingSlResult) | 0..N | Contains the type of result(s) requested for ranging and sidelink positioning. | Ranging\_SL |
| relatedUEs | map(RelatedUE) | 0..N | Contains a list of the related UE(s) for the ranging and sidelink positioning and the corresponding information.  The key of the map shall be any unique string encoded value. | Ranging\_SL |
| NOTE 1: One of the properties "externalId", "msisdn", "ipv4Addr", "ipv6Addr" or "externalGroupId" shall be included for features "Location\_notification" and "Communication\_failure\_notification";. One of the properties "externalId", "msisdn" or "externalGroupId" shall be included for feature "eLCS". "ipv4Addr" or "ipv6Addr" is required for monitoring via the PCRF for an individual UE. One of the properties "externalId", "msisdn" or "externalGroupId" shall be included for features "Pdn\_connectivity\_status", "Loss\_of\_connectivity\_notification", "Ue-reachability\_notification", "Change\_of\_IMSI\_IMEI\_association\_notification", "Roaming\_status\_notification", "Availability\_after\_DDN\_failure\_notification" and "Availability\_after\_DDN\_failure\_notification\_enhancement".  When the "GMEC" feature is supported, the "externalGroupId" attribute shall be included to subscribe to the group members list change event reporting.  NOTE 2: Inclusion of either "maximumNumberOfReports" (with a value higher than 1) or "monitorExpireTime" makes the Monitoring Request a Continuous Monitoring Request, where the SCEF sends Notifications until either the maximum number of reports or the monitoring duration indicated by the property "monitorExpireTime" is exceeded. The "maximumNumberOfReports" with a value 1 makes the Monitoring Request a One-time Monitoring Request. At least one of "maximumNumberOfReports" or "monitorExpireTime" shall be provided.  NOTE 3: Properties marked with a feature as defined in clause 5.3.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 4: In this release, for features "Number\_of\_UEs\_in\_an\_area\_notification" and "Number\_of\_UEs\_in\_an\_area\_notification\_5G", locationType shall be set to "LAST\_KNOWN\_LOCATION". For 5G, if the "locationType" attribute sets to "LAST\_KNOWN\_LOCATION", the "maximumNumberOfReports" attribute shall set to 1 as a One-time Monitoring Request. For 5G, when the "enNB1\_5G" feature is supported and the "immediateRep" attribute is present set to "true" and outside the scope of the "NSAC" feature, then the "locationType" shall be set to "LAST\_KNOWN\_LOCATION"; when the "immediateRep" is present set to "false" and outside the scope of the "NSAC" feature, then the "locationType" shall be set to "CURRENT\_LOCATION".  NOTE 5: The property does not apply for the features "Number\_of\_UEs\_in\_an\_area\_notification" and "Number\_of\_UEs\_in\_an\_area\_notification\_5G".  NOTE 6: For the features "Number\_of\_UEs\_in\_an\_area\_notification" and "Number\_of\_UEs\_in\_an\_area\_notification\_5G", the property "externalGroupId" may be included for single group and "addExtGroupIds" may be included for multiple groups but not both.  NOTE 7: The SCEF should check received MTC provider identifier and then the SCEF may:  - override it with local configured value and send it to HSS; - send it directly to the HSS; or - reject the monitoring configuration request.  NOTE 8: This property is only applicable for the NEF.  NOTE 9: The value of the "maximumNumberOfReports" attribute sets to 1 and the "repPeriod" attribute are mutually exclusive.  NOTE 10: If the "eLCS" feature is supported, the "accuracy" attribute and "locQoS" attribute are mutually exclusive, and only the "GEO\_AREA" value is applicable for the"accuracy" attribute.  NOTE 11: The value of "TWAN\_ID" is only applicable when the monitoring subscription is via the PCRF as described in clause 4.4.2.2.4.  NOTE 12: If the "eLCS" feature is supported, only the "geographicAreas" attribute within the "locationArea5G" attribute is applicable.  NOTE 13: For the "NSAC" feature, if the "maximumNumberOfReports" attribute is provided with a value of 1, the "repPeriod" attribute and the "tgtNsThreshold" attribute shall not be provided and the "immediateRep" attribute shall be provided and set to true; otherwise, either the "repPeriod" attribute or the "tgtNsThreshold" attribute shall be provided, and if immediate reporting is requested, the "immediateRep" attribute shall be provided and set to true.  NOTE 14: For the feature "UAV", the event "Number of UEs present in a geographical area" is used, where "subType" indication and/or "sesEstInd" may be used as event filters.  NOTE 15: For the "NSAC" feature, the "snssai" and "afServiceId" attributes are mutually exclusive.  NOTE 16: For the "AppDetection\_5G" feature, AF shall provide the "appIds" attribute along with "snssai" and "dnn" attributes for subscription of application traffic detection event notification. the subscription request applies to all the UEs associated with the "snssai" and the "dnn" provided in the request.  NOTE 17: When the "enNB" feature is supported and the "addnMonTypes" attribute is present and contains at least one array element, then this attribute shall not contain an array element set to the same value as the "monitoringType" attribute.  NOTE 18: When the "enNB" feature is supported, the "monitoringEventReport" is present and the "addnMonEventReports" attribute is present and contains at least one array element, then the "addnMonEventReports" attribute shall not contain an array element set to the same value as the "monitoringEventReport" attribute. | | | | |

\* \* \* \* Next changes \* \* \* \*

##### 5.3.2.3.2 Type: MonitoringEventReport

This data type represents a monitoring event notification which is sent from the SCEF to the SCS/AS.

Table 5.3.2.3.2-1: Definition of type MonitoringEventReport

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attribute name | | Data type | | Cardinality | | Description | | Applicability (NOTE 1) | |
| imeiChange | | AssociationType | | 0..1 | | If "monitoringType" is "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION", this parameter shall be included to identify the event of change of IMSI-IMEI or IMSI-IMEISV association is detected.  Refer to 3GPP TS 29.336 [11] Clause 8.4.22. | | Change\_of\_IMSI\_IMEI\_association\_notification | |
| externalId | | ExternalId | | 0..1 | | External identifier.  This attribute may also be present in the monitoring event subscription one-time response message, if the "UEId\_retrieval" feature is supported and the corresponding request message includes the "ueIpAddr" attribute or the "ueMacAddr" attribute.  (NOTE 2) | |  | |
| appId | | string | | 0..1 | | Represents the detected application. (NOTE 4) | | AppDetection\_5G | |
| pduSessInfo | | PduSessionInformation | | 0..1 | | Represents PDU session information related to the observed event.  If "monitoringType" is "APPLICATION\_START" and/or "APPLICATION\_STOP", this parameter shall be included to indicate the Application traffic detection details if available. | | AppDetection\_5G | |
| idleStatusInfo | | IdleStatusInfo | | 0..1 | | If "idleStatusIndication" in the "MonitoringEventSubscription"sets to "true", this parameter shall be included to indicate the information when the UE transitions into idle mode. | | Ue-reachability\_notification,  Availability\_after\_DDN\_failure\_notification | |
| locationInfo | | LocationInfo | | 0..1 | | If "monitoringType" is "LOCATION\_REPORTING", this parameter shall be included to indicate the user location related information. | | Location\_notification, eLCS | |
| locFailureCause | | LocationFailureCause | | 0..1 | | Indicates the location positioning failure cause. | | eLCS | |
| lossOfConnectReason | | integer | | 0..1 | | If "monitoringType" is "LOSS\_OF\_CONNECTIVITY", this parameter shall be included if available to identify the reason why loss of connectivity is reported.  Refer to 3GPP TS 29.336 [11] Clause 8.4.58. | | Loss\_of\_connectivity\_notification | |
| unavailPerDur | | DurationSec | | 0..1 | | If "monitoringType" is "LOSS\_OF\_CONNECTIVITY", then this parameter shall be included if available to identify the UE’s Unavailability Period Duration. | | Loss\_of\_connectivity\_notification\_5G | |
| maxUEAvailabilityTime | | DateTime | | 0..1 | | If "monitoringType" is "UE\_REACHABILITY", this parameter may be included to identify the timestamp until which a UE using a power saving mechanism is expected to be reachable for SM delivery.  Refer to Clause 5.3.3.22 of 3GPP TS 29.338 [34]. | | Ue-reachability\_notification | |
| msisdn | | Msisdn | | 0..1 | | Identifies the MS internal PSTN/ISDN number.  (NOTE 2) | |  | |
| monitoringType | | MonitoringType | | 1 | | Identifies the type of monitoring type as defined in clause 5.3.2.4.3. | |  | |
| uePerLocationReport | | UePerLocationReport | | 0..1 | | If "monitoringType" is "NUMBER\_OF\_UES\_IN\_AN\_AREA", this parameter shall be included to indicate the number of UEs found at the location.  If "subType" indicates "AERIAL\_UE" subscription type, this parameter shall be included to indicate the number of UAV’s found at the location. | | Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G | |
| plmnId | | PlmnId | | 0..1 | | If "monitoringType" is "ROAMING\_STATUS" and "plmnIIndication" in the "MonitoringEventSubscription" sets to "true", this parameter shall be included to indicate the UE's serving PLMN. | | Roaming\_status\_notification | |
| reachabilityType | | ReachabilityType | | 0..1 | | If "monitoringType" is "UE\_REACHABILITY", this parameter shall be included to identify the reachability of the UE.  Refer to 3GPP TS 29.336 [11] Clause 8.4.20. | | Ue-reachability\_notification | |
| roamingStatus | | boolean | | 0..1 | | If "monitoringType" is "ROAMING\_STATUS", this parameter shall be set to "true" if the new serving PLMN is different from the HPLMN. Set to false or omitted otherwise. | | Roaming\_status\_notification | |
| failureCause | | FailureCause | | 0..1 | | If "monitoringType" is "COMMUNICATION\_FAILURE", this parameter shall be included to indicate the reason of communication failure. | | Communication\_failure\_notification | |
| eventTime | | DateTime | | 0..1 | | Identifies when the event is detected or received.  Shall be included for each group of UEs. | |  | |
| pdnConnInfoList | | array(PdnConnectionInformation) | | 0..N | | If "monitoringType" is "PDN\_CONNECTIVITY\_STATUS", this parameter shall be included to indicate the PDN connection details. | | Pdn\_connectivity\_status | |
| dddStatus | | DlDataDeliveryStatus | | 0..1 | | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter shall be included to identify the downlink data delivery status detected by the network. | | Downlink\_data\_delivery\_status\_5G | |
| dddTrafDescriptor | | DddTrafficDescriptor | | 0..1 | | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter shall be included to identify the downlink data descriptor impacted by the downlink data delivery status change. | | Downlink\_data\_delivery\_status\_5G | |
| maxWaitTime | | DateTime | | 0..1 | | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter may be included to identify the time before which the data will be buffered. | | Downlink\_data\_delivery\_status\_5G | |
| apiCaps | | array(ApiCapabilityInfo) | | 0..N | | If "monitoringType" is "API\_SUPPORT\_CAPABILITY", this parameter shall be included to indicate the availability of all APIs supported by the serving network or the availability of interested APIs, indicated by the "apiNames" attribute in "MonitoringEventSubscription", supported by the serving network.  If no API is supported by the serving network, an empty apiCaps shall be provided. | | API\_support\_capability\_notification | |
| nSStatusInfo | | SACEventStatus | | 0..1 | | If the "monitoringType" attribute is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS", this parameter shall be included to indicate the current network slice status information for the concerned network slice.  (NOTE 3) | | NSAC | |
| afServiceId | | string | | 0..1 | | Contains the identifier of the service to which the NSAC reporting is related.  It shall be provided only if it is present in the related NSAC subscription request and the "monitoringType" attribute is set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS". | | NSAC | |
| servLevelDevId | | string | | 0..1 | | If "monitoringType" is "AREA\_OF\_INTEREST" or "NUMBER\_OF\_UES\_IN\_AN\_AREA" and "subType" indicate "AERIAL\_UE", this parameter may be included to identify the UAV. | | UAV | |
| uavPresInd | | boolean | | 0..1 | | If "monitoringType" is "AREA\_OF\_INTEREST", this parameter shall be set to true if the specified UAV is in the monitoring area. Set to false or omitted otherwise. | | UAV | |
| groupMembListChanges | | GroupMembListChanges | | 0..1 | | Contains information on the change(s) to the group members list.  This attribute shall be present only if the "monitoringType" attribute is set to "GROUP\_MEMBER\_LIST\_CHANGE". | | GMEC | |
| NOTE 1: Properties marked with a feature as defined in clause 5.3.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 2: Identifies the user for which the event occurred. At least one of the properties shall be included.  NOTE 3: If the "eNSAC" feature is supported, the "SACEventStatus" data type shall include an indication to report either the current number of registered UEs or the current number of UEs with at least one PDU session/PDN connection.  NOTE 4: When the "AppDetection\_5G" feature is supported and the "monitoringType" is "APPLICATION\_START" or "APPLICATION\_STOP", the "appId" attribute shall be provided if multiple instances were provided in the "appIds" attribute in the subscription request. | | | | | | | | | |

\* \* \* \* Next changes \* \* \* \*

##### 5.3.2.3.13 Type: GroupMembListChanges

Table 5.3.2.3.13-1: Definition of type GroupMembListChanges

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| addedUEs | array(Gpsi) | 0..N | Identifies the UE(s) added to the group. |  |
| removedUEs | array(Gpsi) | 0..N | Identifies the UE(s) removed from the group. |  |
| NOTE: At least one of the "addedUEs" attributes and the "removedUEs" attribute shall be provided. | | | | |

\* \* \* \* Next changes \* \* \* \*

### 5.3.4 Used Features

The table below defines the features applicable to the MonitoringEvent API. Those features are negotiated as described in clause 5.2.7.

Table 5.3.4-1: Features used by MonitoringEvent API

|  |  |  |
| --- | --- | --- |
| Feature Number | Feature | Description |
| 1 | Loss\_of\_connectivity\_notification | The SCS/AS is notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication |
| 2 | Ue-reachability\_notification | The SCS/AS is notified when the UE becomes reachable for sending either SMS or downlink data to the UE |
| 3 | Location\_notification | The SCS/AS is notified of the current location or the last known location of the UE |
| 4 | Change\_of\_IMSI\_IMEI\_association\_notification | The SCS/AS is notified when the association of an ME (IMEI(SV)) that uses a specific subscription (IMSI) is changed |
| 5 | Roaming\_status\_notification | The SCS/AS is notified when the UE's roaming status changes |
| 6 | Communication\_failure\_notification | The SCS/AS is notified of communication failure events |
| 7 | Availability\_after\_DDN\_failure\_notification | The SCS/AS is notified when the UE has become available after a DDN failure |
| 8 | Number\_of\_UEs\_in\_an\_area\_notification | The SCS/AS is notified the number of UEs present in a given geographic area  The feature supports pre-5G (e.g. 4G) requirement. |
| 9 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 5.2.5.4. This feature requires that the Notification\_test\_event featute is also supported. |
| 10 | Notification\_test\_event | The testing of notification connection is supported according to clause 5.2.5.3. |
| 11 | Subscription\_modification | Modifications of an individual subscription resource. |
| 12 | Number\_of\_UEs\_in\_an\_area\_notification\_5G | The AF is notified the number of UEs present in a given geographic area.  The feature supports the 5G requirement. This feature may only be supported in 5G. |
| 13 | Pdn\_connectivity\_status | The SCS/AS requests to be notified when the 3GPP network detects that the UE’s PDN connection is set up or torn down. |
| 14 | Downlink\_data\_delivery\_status\_5G | The AF requests to be notified when the 3GPP network detects that the downlink data delivery status is changed. The feature is not applicable to pre-5G. |
| 15 | Availability\_after\_DDN\_failure\_notification\_enhancement | The AF is notified when the UE has become available after a DDN failure and the traffic matches the packet filter provided by the AF. The feature is not applicable to pre-5G. |
| 16 | Enhanced\_param\_config | This feature supports the co-existence of multiple event configurations for target UE(s) if there are parameters affecting periodic RAU/TAU timer and/or Active Time. Supporting this feature also requires the support of feature number 1 or 2. |
| 17 | API\_support\_capability\_notification | The SCS/AS is notified of the availability of support of service APIs. This feature is only applicable in interworking SCEF+NEF scenario. |
| 18 | eLCS | This feature supports the enhanced location exposure service (e.g. location information preciser than cell level).  The feature is not applicable to pre-5G (e.g. 4G). |
| 19 | NSAC | This feature controls the support of the Network Slice Admission Control (NSAC) functionalities.  The feature is not applicable to pre-5G (e.g. 4G). |
| 20 | Partial\_group\_modification | This feature supports the partial cancellation and/or partial addition to the group member(s) within the grouped event monitoring subscription. |
| 21 | UAV | The SCS/AS requests to be notified of the UAV presence status in a specific geographic area. This feature is only applicable in interworking SCEF+NEF scenario, or standalone 5G scenario.  This feature requires that Number\_of\_UEs\_in\_an\_area\_notification and Number\_of\_UEs\_in\_an\_area\_notification\_5G features are also supported. |
| 22 | MULTIQOS | This feature indicates the support for "Multiple QoS Class" which enables to support more than one Location QoS during LCS procedures.  This feature requires that the eLCS feature is also supported. |
| 23 | Session\_Management\_Enhancement | This feature supports Session Management enhancement with requested DNN and/or S-NSSAI. This feature requires that the Pdn\_connectivity\_status feature or Downlink\_data\_delivery\_status\_5G feature is also supported. |
| 24 | enNB | Indicates the support of enhancements to the northbound interfaces. |
| 25 | EDGEAPP | This feature controls the support of EDGE applications related functionalities (e.g. support the civic address as a possible location granularity).  The feature is not applicable to pre-5G (e.g. 4G). |
| 26 | UEId\_retrieval | This feature supports AF specific UE ID retrieval which is not applicable to pre-5G (e.g. 4G). |
| 27 | UserConsentRevocation | This feature indicates the support of user consent revocation management and enforcement (e.g. stop data processing) for EDGE applications. |
| 28 | Subscription\_Patch | This feature indicates the support of the PATCH method for partial modification of an existing event monitoring subscription. |
| 29 | GMEC | This feature indicates the support of Generic Group Management, Exposure and Communication Enhancements.  The following functionalities are supported:  - Support Group Members List Change event reporting.  This feature is not applicable to pre-5G (e.g., 4G). |
| 30 | Loss\_of\_connectivity\_notification\_5G | The AF is notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication.  This feature is not applicable to pre-5G (e.g. 4G). |
| 31 | enNB1 | Indicates the support of enhancements to this northbound API in Rel-18. |
| 32 | AppDetection\_5G | This feature indicates the support of Application traffic detection (start and stop) monitoring event.  This feature is not applicable to pre-5G (e.g. 4G). |
| 33 | enNB1\_5G | Indicates the support of enhancements to this northbound API for 5G in Rel-18.  This feature is not applicable to pre-5G (e.g. 4G). |
| 34 | eLCS\_en | This feature indicates the support of the enhancements to the eLCS feature.  The following functionalities are supported:  - Support the error handling related to the area event reporting for the case where the requested location area is not allowed.  - Support location reporting over user plane between UE and AF.  This feature is not applicable to pre-5G (e.g. 4G). |
| 35 | eNSAC | This feature indicates the support of the enhancements to the NSAC feature.  The following functionalities are supported:  - Support the status notification of the current number of UEs with at least one PDU session/PDN connection.This feature is not applicable to pre-5G (e.g. 4G). |
| 36 | Ranging\_SL | This feature indicates the support of the ranging and sidelink positioning functionality.  The following functionalities are supported:  - Support the ranging and sidelink input/output parameters.  This feature requires the support of eLCS feature.  This feature is not applicable to pre-5G (e.g. 4G). |
| Feature: A short name that can be used to refer to the bit and to the feature, e.g. "Notification".  Description: A clear textual description of the feature. | | |

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.1 Introduction

This clause defines data structures to be used in resource representations, including subscription resources.

Table 5.14.2.1.1-1 specifies data types re-used by the AsSessionWithQoS API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the AsSessionWithQoS API.

Table 5.14.2.1.1-1: AsSessionWithQoS API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AcceptableServiceInfo | 3GPP TS 29.514 [52] | Acceptable maximum requested bandwidth. |  |
| AlternativeServiceRequirementsData | 3GPP TS 29.514 [52] | Contains alternative QoS related parameters and a reference to them. |  |
| AverWindow | 3GPP TS 29.571 [45] | Averaging Window. | EnQoSMon |
| AverWindowRm | 3GPP TS 29.571 [45] | This data type is defined in the same way as the "AverWindow" data type, but with the OpenAPI "nullable: true" property. | EnQoSMon |
| BatOffsetInfo | 3GPP TS 29.514 [52] | Contains the offset of the BAT and the optionally adjusted periodicity. | EnTSCAC |
| BitRate | 3GPP TS 29.571 [45] | String representing a bit rate that shall be formatted as follows:  Pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$'  Examples:  "125 Mbps", "0.125 Gbps", "125000 Kbps" | EnQoSMon, ListUE\_5G |
| BitRateRm | 3GPP TS 29.571 [45] | This data type is defined in the same way as the "BitRate" data type, but with the OpenAPI "nullable: true" property. |  |
| Dnn | 3GPP TS 29.571 [45] | Identifies a DNN. |  |
| EthFlowDescription | 3GPP TS 29.514 [52] | Defines a packet filter for an Ethernet flow.(NOTE 1) | EthAsSessionQoS\_5G, GMEC |
| EventsSubscReqData | 3GPP TS 29.514 [52] | Identifies the events the application subscribes to. | EnQoSMon |
| EventsSubscReqDataRm | 3GPP TS 29.514 [52] | This data type is defined in the same way as the "EventsSubscReqData" data type, but with the OpenAPI "nullable: true" property | EnQoSMon |
| ExtMaxDataBurstVol | 3GPP TS 29.571 [45] | Unsigned integer indicating Maximum Data Burst Volume (see clauses 5.7.3.7 and 5.7.4 of 3GPP TS 23.501 [8]), expressed in Bytes.  Minimum = 4096. Maximum = 2000000. |  |
| ExtMaxDataBurstVolRm | 3GPP TS 29.571 [45] | This data type is defined in the same way as the "ExtMaxDataBurstVol" data type, but with the OpenAPI "nullable: true" property. |  |
| ExternalGroupId | 5.2.1.3.2 | Represents an external group identifier. | GMEC |
| Gpsi | 3GPP TS 29.571 [45] | Represents a GPSI. | GMEC |
| IpAddr | 3GPP TS 29.571 [45] | UE IP Address. | ListUE\_5G |
| MacAddr48 | 3GPP TS 29.571 [45] | MAC Address. | EthAsSessionQoS\_5G,  enNB |
| MediaType | 3GPP TS 29.514 [52] | Indicates the media type of a single-modal data flow of a multi-modal service. | MultiMedia |
| MultiModalId | 3GPP TS 29.514 [52] | Represents multi-modal service identifier. | MultiMedia |
| PacketDelBudget | 3GPP TS 29.571 [45] | Unsigned integer indicating Packet Delay Budget (see clauses 5.7.3.4 and 5.7.4 of 3GPP TS 23.501 [8])), expressed in milliseconds.  Minimum = 1. | TSC\_5G,  XRM\_5G |
| PacketDelBudgetRm | 3GPP TS 29.571 [45] | This data type is defined in the same way as the "PacketDelBudget" data type, but with the OpenAPI "nullable: true" property. | TSC\_5G,  MultiMedia |
| PacketErrRate | 3GPP TS 29.571 [45] | String representing Packet Error Rate (see clauses 5.7.3.5 and 5.7.4 of 3GPP TS 23.501 [8]), expressed as a "*scalar* x 10-k" where the scalar and the *exponent k are each encoded as one decimal digit*.  Pattern: '^([0-9]E-[0-9])$'  Examples:  Packer Error Rate 4x10-6 shall be encoded as "4E-6".  Packer Error Rate 10-2 shall be encoded as "1E-2". | ExtQoS\_5G |
| PacketErrRateRm | 3GPP TS 29.571 [45] | This data type is defined in the same way as the "PacketErrRate" data type, but with the OpenAPI "nullable: true" property. | ExtQoS\_5G |
| PdvMonitoringReport | 3GPP TS 29.514 [52] | Represents a PDV monitoring report. | EnQoSMon |
| PeriodicityInfo | 3GPP TS 29.514 [52] | Indicates the time period between the start of the two data bursts in Uplink and/or Downlink direction. | PowerSaving |
| PduSetQosPara | 3GPP TS 29.571 [45] | Represents the PDU Set level QoS parameters. | PDUSetHandling |
| PduSetQosParaRm | 3GPP TS 29.571 [45] | Represents the PDU Set level QoS parameters to be modified. | PDUSetHandling |
| PlmnIdNid | 3GPP TS 29.571 [45] | Identifies the network: the PLMN Identifier (the mobile country code and the mobile network code) or the SNPN Identifier (the PLMN Identifier and the NID). | enNB\_5G |
| Port | 5.2.1.3.2 | Unsigned integer with valid values between 0 and 65535 representing a port. | ListUE\_5G |
| ProblemDetails | 5.2.1.2.12 | Problem Details when returning an error response. |  |
| ProtocolDescription | 3GPP TS 29.571 [45] | Represents Protocol description of the media flow | PDUSetHandling PowerSaving |
| RatType | 3GPP TS 29.571 [45] | Identifies the RAT Type. | enNB\_5G |
| ReportingFrequency | 3GPP TS 29.512 [8] | Indicates the frequency for the reporting, such as event triggeredand/or periodic. (NOTE 2) |  |
| RequestedQosMonitoringParameter | 3GPP TS 29.512 [8] | Indicates the QoS information to be measured, e.g.UL packet delay, DL packet delay or round trip packet delay between the UE and the UPF is to be monitored when the QoS Monitoring for packet delay is enabled for the service data flow. (NOTE 2) |  |
| ServAuthInfo | 3GPP TS 29.514 [52] | The authorization result of a request for QoS / QoS monitoring. | EnQoSMon |
| Snssai | 3GPP TS 29.571 [45] | Identifies the S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [45] | Used to negotiate the applicability of the optional features defined in table 5.14.4-1. |  |
| TemporalInValidity | 3GPP TS 29.565 [72] | Represents the temporal invalidity related information. | GMEC |
| TscaiInputContainer | 3GPP TS 29.514 [52] | TSCAI Input information container. | TSC\_5G, MultiMedia, GMEC |
| TscPriorityLevel | 3GPP TS 29.514 [52] | Represents priority of TSC Flows. | TSC\_5G, MultiMedia, GMEC |
| TscPriorityLevelRm | 3GPP TS 29.514 [52] | Represents the same as the TscPriorityLevel data type, but with the OpenAPI "nullable: true" property. | TSC\_5G, MultiMedia, GMEC |
| TsnQosContainer | 3GPP TS 29.514 [52] | Represents individual QoS parameters | MultiMedia |
| TsnQosContainerRm | 3GPP TS 29.514 [52] | Represents the same as the TsnQosContainer data type, but with the OpenAPI "nullable: true" property. | MultiMedia |
| Uinteger | 3GPP TS 29.571 [45] | Unsigned Integer, i.e. only value 0 and integers above 0 are permissible.  Minimum = 0. |  |
| UintegerRm | 3GPP TS 29.571 [45] | This data type is defined in the same way as the "Uinteger" data type, but with the OpenAPI "nullable: true" property. |  |
| UplinkDownlinkSupport | 3GPP TS 29.514 [52] | Provides L4S support information. | L4S, GMEC |
| NOTE 1: In order to support a set of MAC addresses with a specific range in the traffic filter, feature MacAddressRange\_5G as specified in clause 5.14.4 shall be supported.  NOTE 2: In order to support QoS Monitoring, feature QoSMonitoring\_5G as specified in clause 5.14.4 shall be supported. | | |  |

Table 5.14.2.1.1-2 specifies the data types defined for the AsSessionWithQoS API.

Table 5.14.2.1.1-2: AsSessionWithQoS API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AdditionalInfoAsSessionWithQos | 5.14.2.1.10 | Describes additional error information specific for this API. |  |
| AsSessionWithQoSSubscription | 5.14.2.1.2 | Represents an individual AS session with required QoS subscription resource. |  |
| AsSessionWithQoSSubscriptionPatch | 5.14.2.1.3 | Represents parameters to modify an AS session with specific QoS subscription. |  |
| AsSessionMediaComponent | 5.14.2.1.13 | Represents media component data for a multi-modal service. It contains service data flow information for a single modal data flow of a multi-modal service. | MultiMedia |
| AsSessionMediaComponentRm | 5.14.2.1.14 | Represents the same as the AsSessMediaComponent data type but with the "nullable: true" property. | MultiMedia |
| MultiModalFlows | 5.14.2.1.15 | Represents flow information within a single-modal data flow for a multi-modal service. | MultiMedia |
| ProblemDetailsAsSessionWithQos | 5.14.2.1.11 | ProblemDetails as defined in clause 5.2.12.12 extended with specific error information for this API, as described in AdditionalInfoAsSessionWithQos. |  |
| QosMonitoringInformation | 5.14.2.1.6 | Represents QoS monitoring information. | QoSMonitoring\_5G |
| QosMonitoringInformationRm | 5.14.2.1.7 | Represents the same as the QosMonitoringInformation data type but with the "nullable: true" property. | QoSMonitoring\_5G |
| QosMonitoringReport | 5.14.2.1.8 | Represents a QoS monitoring report. | QoSMonitoring\_5G |
| TscQosRequirement | 5.14.2.1.9 | Represents QoS requirements for time sensitive communication. | TSC\_5G, XRM\_5G, GMEC |
| TscQosRequirementRm | 5.14.2.1.10 | Represents the same as the TscQosRequirement data type but with the "nullable: true" property. | TSC\_5G, XRM\_5G, GMEC |
| UserPlaneEvent | 5.14.2.2.3 | Represents the user plane event. | enNB, GMEC |
| UserPlaneEventReport | 5.14.2.1.5 | Represents an event report for user plane. | enNB, GMEC |
| UserPlaneNotificationData | 5.14.2.1.4 | Represents the parameters to be conveyed in a user plane event(s) notification. | enNB, GMEC |
| UeAddInfo | 5.14.2.1.16 | Represents the UE address information. | ListUE\_5G |

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.2 Type: AsSessionWithQoSSubscription

This type represents an AS session request with specific QoS for the service provided by the SCS/AS to the SCEF via T8 interface. The structure is used for subscription request and response.

Table 5.14.2.1.2-1: Definition of type AsSessionWithQoSSubscription

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability (NOTE 1) |
| self | Link | 0..1 | Link to the resource "Individual AS Session with Required QoS Subscription".  This parameter shall be supplied by the SCEF in HTTP responses. |  |
| dnn | Dnn | 0..1 | Identifies a DNN, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only. (NOTE 3) |  |
| snssai | Snssai | 0..1 | Identifies an S-NSSAI. (NOTE 3) |  |
| supportedFeatures | SupportedFeatures | 0..1 | Used to negotiate the supported optional features of the API as described in clause 5.2.7.  This attribute shall be provided in the POST request and in the response of successful resource creation. |  |
| notificationDestination | Link | 1 | Contains the URL to receive the notification bearer level event(s) from the SCEF. |  |
| exterAppId | string | 0..1 | Identifies the external Application Identifier. (NOTE 2) (NOTE 8) (NOTE 9) (NOTE 11) | AppId  ListUE\_5G  GMEC |
| extGroupId | ExternalGroupId | 0..1 | Identifies a group of UE(s).  (NOTE 10) | GMEC |
| gpsi | Gpsi | 0..1 | Identifies a UE using its GPSI.  (NOTE 10) | GMEC |
| flowInfo | array(FlowInfo) | 0..N | Describe the IP data flow which requires QoS.  (NOTE 2) (NOTE 7) (NOTE 8) (NOTE 9) (NOTE 10) (NOTE 11) (NOTE 17) |  |
| ethFlowInfo | array(EthFlowDescription) | 0..N | Identifies Ethernet packet flows.  (NOTE 2) (NOTE 6) (NOTE 8) (NOTE 10) (NOTE 11) | EthAsSessionQoS\_5G  GMEC |
| enEthFlowInfo | array(EthFlowInfo) | 0..N | Identifies the Ethernet flows which require QoS. Each Ethernet flow consists of a flow identifier and the corresponding UL and/or DL flows.  (NOTE 2) (NOTE 6) (NOTE 8) (NOTE 10) (NOTE 11) | EnEthAsSessionQoS\_5G  GMEC |
| qosReference | string | 0..1 | Identifies a pre-defined QoS information. (NOTE 4) (NOTE 5) |  |
| altQoSReferences | array(string) | 0..N | Identifies an ordered list of pre-defined QoS information. The lower the index of the array for a given entry, the higher the priority. (NOTE 4) | AlternativeQoS\_5G  GMEC |
| altQosReqs | array(AlternativeServiceRequirementsData) | 0..N | Identifies an ordered list of alternative service requirements that include individual QoS parameter sets. The lower the index of the array for a given entry, the higher the priority. (NOTE 4) | AltQosWithIndParams\_5G |
| disUeNotif | boolean | 0..1 | Indicates whether to disable QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation. The fulfilled situation is either the QoS profile or an Alternative QoS Profile.  - true: the QoS flow parameters signalling to the UE is disabled;  - false (default): the QoS flow parameters signalling to the UE is not disabled. | DisableUENotification\_5G  GMEC |
| ueIpv4Addr | Ipv4Addr | 0..1 | The Ipv4 address of the UE.  (NOTE 2) |  |
| ipDomain | string | 0..1 | The IPv4 address domain identifier.  The attribute may only be provided if the ueIpv4Addr attribute is present. |  |
| ueIpv6Addr | Ipv6Addr | 0..1 | The Ipv6 address of the UE.  (NOTE 2) |  |
| macAddr | MacAddr48 | 0..1 | Identifies the MAC address.  (NOTE 2) | EthAsSessionQoS\_5G |
| listUeAddrs | array(UeAddInfo) | 0..N | Identifies the list of UE address(es).  (NOTE 9) (NOTE 12) | ListUE\_5G |
| usageThreshold | UsageThreshold | 0..1 | Time period and/or traffic volume in which the QoS is to be applied. |  |
| sponsorInfo | SponsorInformation | 0..1 | Indicates a sponsor information |  |
| qosMonInfo | QosMonitoringInformation | 0..1 | Qos Monitoring information for packet delay measurements. It shall be present when the event "QOS\_MONITORING" is subscribed and packet delay measurements are required.  (NOTE 13) | QoSMonitoring\_5G |
| directNotifInd | boolean | 0..1 | Indicates whether the direct event notification is requested.  - true: the direct event notification is requested;  - false (default): the direct event notification is not requested.  (NOTE 13, NOTE 14) | ExposureToEAS  GMEC |
| tscQosReq | TscQosRequirement | 0..1 | Contains the QoS requirements for time sensitive communication.  This attribute applies also to an AF request QoS for a UE or group of UE(s) not identified by the UE address(es) defined in clause 4.4.9.3 of 3GPP TS 29.522 [62].  (NOTE 5) | TSC\_5G  XRM\_5G  GMEC |
| tempInValidity | TemporalInValidity | 0..1 | Indicates the time interval during which the AF request is not to be applied. | GMEC |
| requestTestNotification | boolean | 0..1 | Set to true by the SCS/AS to request the SCEF to send a test notification as defined in clause 5.2.5.3. Set to false or omitted otherwise. | Notification\_test\_event |
| websockNotifConfig | WebsockNotifConfig | 0..1 | Configuration parameters to set up notification delivery over Websocket protocol as defined in clause 5.2.5.4. | Notification\_websocket |
| events | array(UserPlaneEvent) | 0..N | Corresponds to the list of user plane event(s) to which the SCS/AS requests to subscribe to. | enNB  GMEC |
| multiModalId | MultiModalId | 0..1 | Multi-modal Service Identifier, as defined in 3GPP TS 29.514 [52]. | MultiMedia |
| multiModDatFlows | map(AsSessionMediaComponent) | 0..N | Each element of the map represents Media Component data for a single-modal data flow(s) of a multi-modal service. The key of the map is the attribute "medCompN". (NOTE 8) (NOTE 13) | MultiMedia |
| l4sInd | UplinkDownlinkSupport | 0..1 | Provides L4S support information.  (NOTE 16) | L4S  GMEC |
| pduSetQosDl | PduSetQosPara | 0..1 | Contains the PDU Set QoS Parameter(s) which are used to support PDU Set based QoS handling in the downlink direction. | PDUSetHandling |
| pduSetQosUl | PduSetQosPara | 0..1 | Contains the PDU Set QoS Parameter(s) which are used to support PDU Set based QoS handling in the uplink direction. | PDUSetHandling |
| rTLatencyInd | boolean | 0..1 | Indicates the service data flow needs to meet the Round-Trip (RT) latency requirement of the service, when it is included and set to "true". The default value is "false" if omitted. | RTLatency  GMEC |
| protoDescDl | ProtocolDescription | 0..1 | Downlink Protocol description for PDU Set identification and end of Data burst indication in UPF. | PDUSetHandling  PowerSaving |
| protoDescUl | ProtocolDescription | 0..1 | Uplink Protocol description for PDU Set identification in UE. | PDUSetHandling |
| periodUl | DurationMilliSec | 0..1 | Indicates the time period between the start of the two data bursts in units of milliseconds in Uplink direction. | PowerSaving |
| periodDl | DurationMilliSec | 0..1 | Indicates the time period between the start of the two data bursts in units of milliseconds in Downlink direction. | PowerSaving |
| pdvMon | QosMonitoringInformation | 0..1 | Contains the Packet Delay Variation information for the subscribed report. It shall be present when the event "PACK\_DELAY\_VAR" is subscribed.  (NOTE 13) | EnQoSMon  GMEC |
| qosDuration | DurationSec | 0..1 | Contains the QoS duration to transfer data traffic transmission (e.g., AI/ML transmission). The minimum value of the QoS duration shall be 60 sec. | QoSTiming\_5G |
| qosInactInt | DurationSec | 0..1 | Contains the QoS inactivity interval for the given data traffic transmission (e.g., AI/ML transmission). The minimum value of the QoS inactivity interval shall be 60 sec. | QoSTiming\_5G |
| rttMon | QosMonitoringInformation | 0..1 | Contains the round-trip delay over two QoS flows (i.e. the UL traffic and DL traffic of the service data flow are separated into two QoS flows respectively) information for the subscribed report.  It shall be provided for "RT\_DELAY\_TWO\_QOS\_FLOWS" event.  (NOTE 13) | EnQoSMon  GMEC |
| qosMonDatRate | QosMonitoringInformation | 0..1 | Contains the data rate measurements information for the subscribed report. It shall be present when the event "QOS\_MONITORING" is subscribed and data rate measurements are required.  (NOTE 12) (NOTE 13) | EnQoSMon  ListUE\_5G  GMEC |
| avrgWndw | AverWindow | 0..1 | Averaging window for the calculation of the data rate for the service data flow. It may be present when the "qosMonDatRate" attribute is present.  (NOTE 13) | EnQoSMon |
| servAuthInfo | ServAuthInfo | 0..1 | Indicates the authorization result for the QoS monitoring request.  Supplied by the NEF. | EnQoSMon  GMEC |
| qosMonConReq | QosMonitoringInformation | 0..1 | Contains the requirements of the congestion information (ECN marking percentage) monitoring and reporting. It shall be present when the event "QOS\_MONITORING" is subscribed and congestion information measurements are required.  (NOTE 13) (NOTE 15) (NOTE 16) | EnQoSMon  GMEC |
| listUeConsDtRt | array(IpAddr) | 0..N | Identifies the list of UE addresses subject for Consolidated Data Rate monitoring.  (NOTE 12) | ListUE\_5G |
| NOTE 1: Properties marked with a feature as defined in clause 5.14.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 2: When the "GMEC" feature is not supported, one of "ueIpv4Addr", "ueIpv6Addr" or "macAddr" or "listUeAddrs" shall be included. If ipv4 or ipv6 address is provided, IP flow information shall be provided. If MAC address is provided and the AppId feature is not supported, Ethernet flow information (either "ethFlowInfo", or if the feature EnEthAsSessionQoS\_5G is supported, "enEthFlowInfo") shall be provided. If the AppId feature is supported, one of IP flow information, Ethernet flow information (if EthAsSessionQoS\_5G and/or EnEthAsSessionQoS\_5G is supported) or External Application Identifier shall be provided.  NOTE 3: The property is only applicable for the NEF.  NOTE 4: The attributes "altQoSReferences" and "altQosReqs" are mutually exclusive. The attributes "qosReference" and "altQosReqs" are also mutually exclusive.  NOTE 5: The attributes "reqGbrDl", "reqGbrUl", "reqMbrDl", "reqMbrUl", "maxTscBurstSize", "req5Gsdelay", "reqPer" (if the ExtQoS\_5G and/or "GMEC" feature(s) is/are supported), and "priority" within the "tscQosReq" attribute may be provided only if the "qosReference" attribute is not provided.  NOTE 6: When the Ethernet flow information is provided and, the EthAsSessionQoS\_5G and EnEthAsSessionQoS\_5G features are supported, either the "ethFlowInfo" or the "enEthFlowInfo" shall be provided, but not both simultenously.  NOTE 7: The "tosTC" attribute of the "flowInfo" attribute may only be present if the "ToSTC\_5G" feature is supported.  NOTE 8: The attributes "exterAppId", "flowInfo", "ethFlowInfo", "enEthFlowInfo", "qosReference", "altQoSReferences", "altQosReqs", "tscQosReq", "qosMonInfo" may be provided only if the "multiModDatFlows" attribute is not provided.  NOTE 9: When the "ListUE\_5G" feature is supported, the "listUeAddrs" attribute shall be provided, and either "exterAppId" attribute or "flowInfo" attribute shall be provided.  NOTE 10: When the "GMEC" feature is supported and the target UE(s) are not identified by UE address(es) (i.e., the "ueIpv4Addr", "ueIpv6Addr", "macAddr" or "listUEAddrs" attribute is not applicable to identify the UE(s)), the "extGroupId" attribute and the "gpsi" attributes are mutually exclusive And either one of them shall be provided. If either the "gpsi" attribute or the "extGroupId" attribute are present, then neither the "ueIpv4Addr" attribute, the "ueIpv6Addr" attribute, the "macAddr" attribute nor the "listUEAddrs" attribute shall be included.  NOTE 11: When the "GMEC" feature is supported, either the "exterAppId" attribute, "flowInfo" attribute or Ethernet flow information (either within the "ethFlowInfo" attribute or the "enEthFlowInfo" attribute) shall be provided.  NOTE 12: When the "ListUE\_5G" feature is supported and the "qosMonDatRate" attribute is provided, the "consDataRateThrDl" and "consDataRateThrUl" attributes contained in "qosMonDatRate" attribute indicate the upper bound of the aggregated DL/UL data rate and by default, are applicable to the list of UEs specified by the "listUeAddrs" attribute. If the "listUeConsDtRt" attribute is also provided, then it has to be the subset of "listUeAddrs" attribute.  NOTE 13: When the "MultiMedia" feature is supported, the "qosMonInfo", "directNotifInd", "pdvMon", "rttMon", "qosMonDatRate", "avrgWndw" and "qosMonConReq" attributes may be present only when the "multiModDatFlows" attribute is not present.  NOTE 14: When the "ExposureToEAS" feature is supported, the "directNotifInd" attribute indicates whether direct event notification is requested for the packet delay measurements provided in the "qosMonInfo" attribute. When the "EnQoSMon" feature is supported, the "directNotifInd" attribute indicates whether direct event notification is requested for the QoS measurement(s) provided in the "qosMonInfo", "qosMonDatRate" and/or "qosMonConReq" attribute(s).  NOTE 15: Only the "EVENT\_TRIGGERED" reporting frequency in "repFreqs" attribute contained in QosMonitoringInformation data type is applicable.  NOTE 16: When both, the "L4S" and "EnQoSMon" features are supported, the AF request may include either the indication of L4S support within the "l4sInd" attribute or the request for congestion measurements within the "qosMonConReq" attribute, but shall not include both attributes simultaneously.  NOTE 17: When the "ListUE\_5G" feature is supported and the "flowInfo" attribute is present, the flow description information shall be common for the list of UE(es) with the application server side IP address, port number and protocol. | | | | |

Editor’s Note: It is FFS whether other IEs within the "tscQosReq" attribute than "req5Gsdealy" attribute can apply for multi-modal communication services.

Editor’s Note: Whether the applicable reporting frequency for the Data Rate QoS monitoring can be event triggered and/or periodic is FFS.

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.3 Type: AsSessionWithQoSSubscriptionPatch

This type represents an AS session request with specific QoS for the service provided by the SCS/AS to the SCEF via T8 interface. The structure is used for PATCH request.

Table 5.14.2.1.3-1: Definition of type AsSessionWithQoSSubscriptionPatch

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability (NOTE 1) |
| exterAppId | string | 0..1 | Identifies the external Application Identifier. (NOTE 2) (NOTE 8) | AppId  ListUE\_5G  GMEC |
| flowInfo | array(FlowInfo) | 0..N | Describe the data flow which requires QoS.  (NOTE 2) (NOTE 5) (NOTE 6) (NOTE 8) (NOTE 14) |  |
| ethFlowInfo | array(EthFlowDescription) | 0..N | Describes Ethernet packet flows.  (NOTE 2) (NOTE 6) | EthAsSessionQoS\_5G  GMEC |
| enEthFlowInfo | array(EthFlowInfo) | 0..N | Identifies the Ethernet flows which require QoS. Each Ethernet flow consists of a flow identifier and the corresponding UL and/or DL flows.  (NOTE 2) (NOTE 6) | EnEthAsSessionQoS\_5G  GMEC |
| listUeAddrs | array(UeAddInfo) | 0..N | Identifies the list of UE address(es).  (NOTE 8) (NOTE 9) | ListUE\_5G |
| qosReference | string | 0..1 | Pre-defined QoS reference. (NOTE 3) (NOTE 4) |  |
| altQoSReferences | array(string) | 0..N | Identifiers an ordered list of pre-defined QoS information. The lower the index of the array for a given entry, the higher the priority. (NOTE 3) | AlternativeQoS\_5G  GMEC |
| altQosReqs | array(AlternativeServiceRequirementsData) | 0..N | Identifies an ordered list of alternative service requirements that include individual QoS parameter sets. The lower the index of the array for a given entry, the higher the priority. (NOTE 3) | AltQosWithIndParams\_5G |
| disUeNotif | boolean | 0..1 | Indicates whether to disable QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation. The fulfilled situation is either the QoS profile or an Alternative QoS Profile.  - true: the QoS flow parameters signalling to the UE is disabled;  - false: the QoS flow parameters signalling to the UE is not disabled. | DisableUENotification\_5G  GMEC |
| usageThreshold | UsageThresholdRm | 0..1 | Time period and/or traffic volume in which the QoS is to be applied. |  |
| qosMonInfo | QosMonitoringInformationRm | 0..1 | Qos Monitoring information for packet delay measurements. It may be present when the event "QOS\_MONITORING" is subscribed.  (NOTE 10) | QoSMonitoring\_5G  GMEC |
| directNotifInd | boolean | 0..1 | Indicates whether the direct event notification is requested.  - true: the direct event notification is requested;  - false: the direct event notification is not requested.  (NOTE 10, NOTE 11) | ExposureToEAS  GMEC |
| tscQosReq | TscQosRequirementRm | 0..1 | Contains the QoS requirements for time sensitive communication. (NOTE 4) | TSC\_5G  MultiMedia  GMEC |
| tempInValidity | TemporalInValidity | 0..1 | Indicates the time interval during which the AF request is not to be applied. | GMEC |
| notificationDestination | Link | 0..1 | Contains the URL to receive the notification event(s) from the SCEF. |  |
| events | array(UserPlaneEvent) | 0..N | Corresponds to the list of user plane event(s) to which the SCS/AS requests to subscribe to. | enNB  GMEC |
| multiModDatFlows | map(AsSessionMediaComponentRm) | 0..N | Each element of the map represents Media Component data for a single-modal data flow(s) of a multi-modal service. The key of the map is the attribute "medCompN". (NOTE 6, NOTE 10) | MultiMedia |
| l4sInd | UplinkDownlinkSupport | 0..1 | Provides L4S support information.  (NOTE 13) | L4S  GMEC |
| pduSetQosDl | PduSetQosParaRm | 0..1 | Contains the PDU Set QoS Parameter(s) which are used to support PDU Set based QoS handling in the downlink direction. | PDUSetHandling |
| pduSetQosUl | PduSetQosParaRm | 0..1 | Contains the PDU Set QoS Parameter(s) which are used to support PDU Set based QoS handling in the uplink direction. | PDUSetHandling |
| rTLatencyInd | boolean | 0..1 | Indicates the service data flow needs to meet the Round-Trip (RT) latency requirement of the service, when it is included and set to "true". The default value is "false" if omitted. | RTLatency  GMEC |
| protoDescDl | ProtocolDescription | 0..1 | Downlink Protocol description for PDU Set identification and end of Data burst indication in UPF | PDUSetHandling  PowerSaving |
| protoDescUl | ProtocolDescription | 0..1 | Uplink Protocol description for PDU Set identification in UE | PDUSetHandling |
| periodUl | DurationMilliSecRm | 0..1 | Indicates the time period between the start of the two data bursts in units of milliseconds in Uplink direction. | PowerSaving |
| periodDl | DurationMilliSecRm | 0..1 | Indicates the time period between the start of the two data bursts in units of milliseconds in Downlink direction. | PowerSaving |
| pdvMon | QosMonitoringInformationRm | 0..1 | Packet Delay Variation information for the subscribed report. It may be present when the event "PACK\_DELAY\_VAR" is subscribed.  (NOTE 10) | EnQoSMon  GMEC |
| qosDuration | DurationSecRm | 0..1 | Contains the QoS duration to transfer data transmission (e.g., AI/ML transmission). The minimum value of the QoS duration shall be 60 sec.. | QoSTiming\_5G |
| qosInactInt | DurationSecRm | 0..1 | Contains the QoS inactivity interval for the given data transfer transmission (e.g., AI/ML transmission). The minimum value of the QoS inactivity interval shall be 60 sec. | QoSTiming\_5G |
| rttMon | QosMonitoringInformationRm | 0..1 | Contains the round-trip delay over two QoS flows (i.e. the UL traffic and DL traffic of the service data flow are separated into two QoS flows respectively) information for the subscribed report.  It shall be provided for "RT\_DELAY\_TWO\_QOS\_FLOWS" event. (NOTE 10) | EnQoSMon  GMEC |
| qosMonDatRate | QosMonitoringInformationRm | 0..1 | Contains the data rate measurements information for the subscribed report. It may be present when the event "QOS\_MONITORING" is subscribed and data rate measurements apply.  (NOTE 9, NOTE 10) | EnQoSMon  ListUE\_5G  GMEC |
| avrgWndw | AverWindowRm | 0..1 | Averaging window for the calculation of the data rate for the service data flow.  (NOTE 10) | EnQoSMon |
| qosMonConReq | QosMonitoringInformationRm | 0..1 | Contains the requirements of the congestion information (ECN marking percentage) monitoring and reporting. It may be present when the event "QOS\_MONITORING" is subscribed and congestion information measurements apply.  (NOTE 10) (NOTE 12) (NOTE 13) | EnQoSMon  GMEC |
| listUeConsDtRt | array(IpAddr) | 0..N | Identifies the list of UE addresses subject for Consolidated Data Rate monitoring.  (NOTE 9) | ListUE\_5G |
| NOTE 1: Properties marked with a feature as defined in clause 5.14.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 2: One of "exterAppId", "flowInfo" or either "ethFlowInfo" or "enEthFlowInfo" may be provided.  NOTE 3 The attributes "altQoSReferences" and "altQosReqs" are mutually exclusive. The attributes "qosReference" and "altQosReqs" are also mutually exclusive.  NOTE 4: The attributes "reqGbrDl", "reqGbrUl", "reqMbrDl", "reqMbrUl", "maxTscBurstSize", "req5Gsdelay", "reqPer" (if the ExtQoS\_5G and/or "GMEC" feature(s) is supported), and "priority" within the "tscQosReq" attribute may be provided only if the "qosReference" attribute is not provided.  NOTE 5: The "tosTC" attribute of the "flowInfo" attribute may only be present if the "ToSTC\_5G" feature is supported.  NOTE 6: The attributes "exterAppId", "flowInfo", "ethFlowInfo", "enEthFlowInfo", "qosReference", "altQoSReferences", "altQosReqs", "tscQosReq", "qosMonInfo" may be provided only if the "multiModDatFlows" attribute is not provided.  NOTE 8: When the "ListUE\_5G" feature is supported, the "listUeAddrs" attribute may be provided, and/or either "exterAppId" attribute or "flowInfo" attribute may be provided.  NOTE 9: When the "ListUE\_5G" feature is supported and the "qosMonDatRate" attribute is provided, the "consDataRateThrDl" and "consDataRateThrUl" attributes contained in "qosMonDatRate" attribute indicate the upper bound of the aggregated DL/UL data rate and by default, are applicable to the list of UEs specified by the "listUeAddrs" attribute. If the "listUeConsDtRt" attribute is also provided, then it has to be the subset of "listUeAddrs" attribute.  NOTE 10: When the "MultiMedia" feature is supported, the "qosMonInfo", "directNotifInd", "pdvMon", "rttMon", "qosMonDatRate", "avrgWndw" and "qosMonConReq" attributes may be present only when the "multiModDatFlows" attribute is not present.  NOTE 11: When the "ExposureToEAS" feature is supported, the "directNotifInd" attribute indicates whether direct event notification is requested for the packet delay measurements provided in the "qosMonInfo" attribute. When the "EnQoSMon" feature is supported, the "directNotifInd" attribute indicates whether direct event notification is requested for the QoS measurement(s) indicated in the provided and/or previously provided "qosMonInfo", "qosMonDatRate" and "qosMonConReq" attribute(s).  NOTE 12: Only the "EVENT\_TRIGGERED" reporting frequency in "repFreqs" attribute contained in QosMonitoringInformationRm data type is applicable.  NOTE 13: When both, the "L4S" and "EnQoSMon" features are supported, the AF request may include either the indication of L4S support within the "l4sInd" attribute or the request for congestion measurements within the "qosMonConReq" attribute but shall not include both attributes simultaneously. As result of the PATCH operation, the Individual AS Session with Required QoS Subscription resource shall not contain simultaneously both, the indication of L4S support and the subscription to congestion monitoring.  NOTE 14: When the "ListUE\_5G" feature is supported and the "flowInfo" attribute is present, the flow description information shall be common for the list of UE(es) with the application server side IP address, port number and protocol. | | | | |

Editor’s Note: Whether the applicable reporting frequency for the Data Rate QoS monitoring can be event triggered and/or periodic is FFS.

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.5 Type: UserPlaneEventReport

This type represents an event report for user plane. It shall comply with the provisions defined in table 5.14.2.1.5-1.

Table 5.14.2.1.5-1: Definition of the UserPlaneEventReport data type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability (NOTE 1) |
| event | UserPlaneEvent | 1 | Indicates the event reported by the SCEF. |  |
| accumulatedUsage | AccumulatedUsage | 0..1 | Contains the applicable information corresponding to the event. |  |
| flowIds | array(integer) | 0..N | Identifies the affected flows that were sent during event subscription. It may be omitted when the reported event applies to all the flows sent during the subscription.  (NOTE 2) |  |
| multiModFlows | array(MultiModalFlows) | 0..N | Each element of the array identifies the flow filters for the multi-modal data flows that were sent during event subscription and that are affected by the reported event. It may be omitted when the reported event applies to all the multi-modal data flows sent during the subscription.  (NOTE 2) | MultiMedia |
| appliedQosRef | string | 0..1 | The currently applied QoS reference (or applied individual QoS parameter set, if AltQosWithIndParams\_5G is supported). Applicable for event QOS\_NOT\_GUARANTEED or SUCCESSFUL\_RESOURCES\_ALLOCATION.  When it is omitted and the "event" attribute is QOS\_NOT\_GUARANTEED, the event report indicates that the lowest priority alternative QoS profile could not be fulfilled either. | AlternativeQoS\_5G, AltQosWithIndParams\_5G |
| altQosNotSuppInd | boolean | 0..1 | It may be set to true when the "event" attribute is QOS\_NOT\_GUARANTEED to indicate that alternative service requirements are not supported by the access network. The default value false shall apply if the attribute is not present. | AltQoSProfilesSupportReport, GMEC |
| plmnId | PlmnIdNid | 0..1 | PLMN Identifier or the SNPN Identifier.  It may be present when the reported event is "PLMN\_CHG" and which is allowed to be exposured to the AF based on the local policy or local configuration. | enNB\_5G, GMEC |
| qosMonReports | array(QosMonitoringReport) | 0..N | Contains the QoS Monitoring Reporting information. | QoSMonitoring\_5G, GMEC |
| pdvMonReports | array(PdvMonitoringReport) | 0..N | Contains the PDV Monitoring Reporting information.  (NOTE 3) | EnQoSMon, GMEC |
| ratType | RatType | 0..1 | RAT type may be present if applicable, when the notified event is "ACCESS\_TYPE\_CHANGE" and which is allowed to be exposured to the AF based on the local policy or local configuration. | enNB\_5G, GMEC |
| batOffsetInfo | BatOffsetInfo | 0..1 | The BAT offset and the optionally adjusted periodicity. | EnTSCAC |
| aggrDataRateRpts | array(QosMonitoringReport) | 0..1 | Contains QoS Monitoring for aggregated data rate reporting information. It shall be present when the notified event is "QOS\_MONITORING" and data rate measurements are available. | ListUE\_5G, GMEC |
| rttMonReports | array(QosMonitoringReport) | 0..N | Round-Trip delay for the indicated UL and DL QoS flows. It shall be present when the notified event is "RT\_DELAY\_TWO\_QOS\_FLOWS". | EnQoSMon, GMEC |
| qosMonDatRateReps | array(QosMonitoringReport) | 0..1 | Contains QoS Monitoring for data rate reporting information. It shall be present when the notified event is "QOS\_MONITORING" and data rate measurements are available. | EnQoSMon, GMEC |
| qosMonConInfoReps | array(QosMonitoringReport) | 0..N | Contains QoS Monitoring for congestion information (ECN marking percentage). It shall be present when the notified event is "QOS\_MONITORING" and congestion measurements are available. | EnQoSMon, GMEC |
| NOTE 1: Properties marked with a feature as defined in clause 5.14.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 2: The attributes "flowIds" and "multiModFlows" are mutually exclusive.  NOTE 3: The PdvMonitoringReport data type does not include the "flows" attribute in this API. | | | | |

Editor’s Note: Whether the rttMonReports attribute is needed or the qosMonReports attribute can be used instead to convey both, packet delay and RTT measurements reports requires further discussion.

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.6 Type: QosMonitoringInformation

Table 5.14.2.1.6-1: Definition of type QosMonitoringInformation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| reqQosMonParams | array(RequestedQosMonitoringParameter) | 1..N | Indicates the QoS information to be measured, e.g.UL packet delay, DL packet delay and/or round trip packet delay between the UE and the UPF is to be monitored when the QoS Monitoring for packet delay is enabled for the service data flow.  If the "EnQoSMon" feature is supported, the indication of QoS monitoring for congestion (e.g., the UL and/or the DL congestion indication) or data rate (e.g., the UL and/or the DL data rate indication) may also be provided.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates whether PDV measurement is for the UL, DL and/or round trip packet delay.  If the "EnQoSMon" feature is supported and the "RT\_DELAY\_TWO\_QOS\_FLOWS" event is subscribed, it indicates round trip packet delay. |  |
| repFreqs | array(ReportingFrequency) | 1..N | Indicates the frequency for the reporting, such as event triggeredand/or periodic. |  |
| repThreshDl | Uinteger | 0..1 | Unsigned integer identifying a threshold in units of milliseconds for DL packet delay measurement reports.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates the threshold for DL PDV measurement reports.  It shall be present when the "reqQosMonParams" attribute includes "DOWNLINK". |  |
| repThreshUl | Uinteger | 0..1 | Unsigned integer identifying a threshold in units of milliseconds for UL packet delaymeasurement reports.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates the threshold for UL PDV measurement reports.  It shall be present when the "reqQosMonParams" attribute includes "UPLINK". |  |
| repThreshRp | Uinteger | 0..1 | Unsigned integer identifying a threshold in units of milliseconds for round trip packet delay measurement reports.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates the threshold for round trip PDV measurement reports.  If the "EnQoSMon" feature is supported and the "RT\_DELAY\_TWO\_QOS\_FLOWS" event is subscribed, it indicates the threshold for round trip delay for two QoS flows (i.e. the UL traffic and DL traffic of the service data flow are separated into two QoS flows respectively) measurement reports. |  |
| conThreshDl | Uinteger | 0..1 | Indicates the downlink threshold for congestion reporting, i.e. for the reporting of the received ECN marking percentage for DL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "DOWNLINK\_CONGESTION". | EnQoSMon, GMEC |
| conThreshUl | Uinteger | 0..1 | Indicates the uplink threshold for the congestion reporting, i.e. for the reporting of the received ECN marking percentage for UL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "UPLINK\_CONGESTION". | EnQoSMon, GMEC |
| waitTime | DurationSec | 0..1 | Indicates the minimum waiting time between subsequent reports. It shall be present when the "repFreqs" attribute includes "EVENT\_TRIGGERED". |  |
| repPeriod | DurationSec | 0..1 | Indicates the time interval between successive reporting. It shall be present when the "repFreqs" attribute includes "PERIODIC".  If the feature "PacketDelayFailureReport" is supported, it also indicates the time interval at which a measurement failure needs to be reported if no measurement result is provided. It shall be present when the "repFreqs" attribute includes "PERIODIC" or "EVENT\_TRIGGERED". |  |
| repThreshDatRateDl | BitRate | 0..1 | Indicates the bit rate threshold for the DL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "DOWNLINK\_DATA\_RATE". | EnQoSMon, GMEC |
| repThreshDatRateUl | BitRate | 0..1 | Indicates the bit rate threshold for the UL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "UPLINK\_DATA\_RATE". | EnQoSMon, GMEC |
| consDataRateThrDl | BitRate | 0..1 | Indicates the Downlink Consolidated Data Rate Threshold. | ListUE\_5G |
| consDataRateThrUl | BitRate | 0..1 | Indicates the Uplink Consolidated Data Rate Threshold. | ListUE\_5G |

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.7 Type: QosMonitoringInformationRm

This type represents a QoS Monitoring Information which is defined in clause 5.14.2.1.7 but defined with "nullable: true" property so it can be removed in "JSON Merge Patch", as defined in IETF RFC 7396 [39]. It shall comply with the provisions defined in table 5.14.2.1.7-1.

Duration and volume are also removable in "JSON Merge Patch".

Table 5.14.2.1.7-1: Definition of type QosMonitoringInformationRm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| reqQosMonParams | array(RequestedQosMonitoringParameter) | 0..N | Indicates the QoS information to be measured, e.g.UL packet delay, DL packet delay and/or round trip packet delay between the UE and the UPF is to be monitored when the QoS Monitoring for packet delay is enabled for the service data flow.  If the "EnQoSMon" feature is supported, the indication of QoS monitoring for congestion (e.g., the UL and/or the DL congestion indication) or data rate (e.g., the UL and/or the DL data rate indication) may also be provided.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates whether PDV measurement is for the UL, DL and/or round trip packet delay.  If the "EnQoSMon" feature is supported and the "RT\_DELAY\_TWO\_QOS\_FLOWS" event is subscribed, it indicates round trip packet delay. |  |
| repFreqs | array(ReportingFrequency) | 0..N | Indicates the frequency for the reporting, such as event triggeredand/or periodic. |  |
| repThreshDl | UintegerRm | 0..1 | Unsigned integer identifying a threshold in units of milliseconds for DL packet delay measurement reports.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates the threshold for DL PDV measurement reports.  It shall be present when the "reqQosMonParams" attribute includes "DOWNLINK". |  |
| repThreshUl | UintegerRm | 0..1 | Unsigned integer identifying a threshold in units of milliseconds for UL packet delay measurement reports.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates the threshold for UL PDV measurement reports.  It shall be present when the "reqQosMonParams" attribute includes "UPLINK". |  |
| repThreshRp | UintegerRm | 0..1 | Unsigned integer identifying a threshold in units of milliseconds for round trip packet delay measurement reports.  If the "EnQoSMon" feature is supported and the "PACK\_DELAY\_VAR" event is subscribed, it indicates the threshold for round trip PDV measurement reports.  If the "EnQoSMon" feature is supported and the "RT\_DELAY\_TWO\_QOS\_FLOWS" event is subscribed, it indicates the threshold for round trip delay for two QoS flows (i.e. the UL traffic and DL traffic of the service data flow are separated into two QoS flows respectively) measurement reports. |  |
| conThreshDl | UintegerRm | 0..1 | Indicates the downlink threshold for congestion reporting, i.e. for the reporting of the received ECN marking percentage for DL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "DOWNLINK\_CONGESTION". | EnQoSMon, GMEC |
| conThreshUl | UintegerRm | 0..1 | Indicates the uplink threshold for congestion reporting, i.e. for the reporting of the received ECN marking percentage for UL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "UPLINK\_CONGESTION". | EnQoSMon, GMEC |
| waitTime | DurationSecRm | 0..1 | Indicates the minimum waiting time between subsequent reports. It shall be present when the "repFreqs" attribute includes "EVENT\_TRIGGERED". |  |
| repPeriod | DurationSecRm | 0..1 | Indicates the time interval between successive reporting. It shall be present when the "repFreqs" attribute includes "PERIODIC".  If the feature "PacketDelayFailureReport" is supported, it also indicates the time interval at which a measurement failure needs to be reported if no measurement result is provided. It shall be present when the "repFreqs" attribute includes "PERIODIC" or "EVENT\_TRIGGERED". |  |
| repThreshDatRateDl | BitRateRm | 0..1 | Indicates the bit rate threshold for the DL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "DOWNLINK\_DATA\_RATE". | EnQoSMon, GMEC |
| repThreshDatRateUl | BitRateRm | 0..1 | Indicates the bit rate threshold for the UL. Only applicable when the "repFreqs" attribute includes "EVENT\_TRIGGERED" and the "reqQosMonParams" attribute includes "UPLINK\_DATA\_RATE". | EnQoSMon, GMEC |
| consDataRateThrDl | BitRateRm | 0..1 | Indicates the Downlink Consolidated Data Rate Threshold. | ListUE\_5G |
| consDataRateThrUl | BitRateRm | 0..1 | Indicates the Uplink Consolidated Data Rate Threshold. | ListUE\_5G |

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.8 Type: QosMonitoringReport

Table 5.14.2.1.8-1: Definition of type QosMonitoringReport

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| ulDelays | array(Uinteger) | 0..N | Uplink packet delay in units of milliseconds. (NOTE 1) |  |
| dlDelays | array(Uinteger) | 0..N | Downlink packet delay in units of milliseconds. (NOTE 1) |  |
| rtDelays | array(Uinteger) | 0..N | Round trip delay in units of milliseconds. (NOTE 1) |  |
| pdmf | boolean | 0..1 | Packet delay measurement failure indicator. When set to true, it indicates that a packet delay failure has occurred.  Default value is false if omitted. (NOTE 2) | PacketDelayFailureReport, GMEC |
| ulDataRate | BitRate | 0..1 | UL data rate.  (NOTE 3) | EnQoSMon, GMEC |
| dlDataRate | BitRate | 0..1 | DL data rate.  (NOTE 3) | EnQoSMon, GMEC |
| ulAggrDataRate | BitRate | 0..1 | Indicates the uplink aggregated Data Rate for the applicable list of UEs provided by AF. | ListUE\_5G |
| dlAggrDataRate | BitRate | 0..1 | Indicates the downlink aggregated Data Rate for the applicable list of UEs provided by AF. | ListUE\_5G |
| ulConInfo | Uinteger | 0..1 | Uplink congestion information, i.e., percentage of ECN marked packets for the UL. | EnQoSMon, GMEC |
| dlConInfo | Uinteger | 0..1 | Downlink congestion information, i.e., percentage of ECN marked packets for the DL. | EnQoSMon, GMEC |
| NOTE 1: In this release of the specification one element may be included in the array as difined in clause 4.4.9 in TS 29.522 [62].  NOTE 2: When the "pdmf" attribute is set to true, "ulDelays", "dlDelays" and "rtDelays" and when the feature "EnQoSMon" is supported, "ulDataRate" and "dlDataRate" shall not be present.  NOTE 3: When the "ulDataRate" and/or the "dlDataRate" attribute are included, the parameters related to packet delay and/or congestion information shall not be present. | | | | |

Editor’s Note: The presence conditions of the parameters of QosMonitoringReport are to be consolidated/detailed once all the possible reports are specified.

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.9 Type: TscQosRequirement

Table 5.14.2.1.9-1: Definition of type TscQosRequirement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| reqGbrDl | BitRate | 0..1 | Requested GBR in downlink. |  |
| reqGbrUl | BitRate | 0..1 | Requested GBR in uplink. |  |
| reqMbrDl | BitRate | 0..1 | Requested MBR in downlink. |  |
| reqMbrUl | BitRate | 0..1 | Requested MBR in uplink. |  |
| maxTscBurstSize | ExtMaxDataBurstVol | 0..1 | Maximum burst size of the TSC traffic in units of Bytes. Minimum = 4096, Maximum = 2000000. |  |
| req5Gsdelay | PacketDelBudget | 0..1 | Requested Delay of the TSC traffic. |  |
| reqPer | PacketErrRate | 0..1 | Requested Packet Error Rate of the TSC traffic. | ExtQoS\_5G  GMEC |
| priority | TscPriorityLevel | 0..1 | Unsigned integer indicating the TSC traffic priority in relation to other TSC and non-TSC traffic. |  |
| tscaiTimeDom | Uinteger | 0..1 | Indicates the (g)PTP domain that the (TSN)AF is located in. |  |
| tscaiInputUl | TscaiInputContainer | 0..1 | Transports the input parameters for TSC traffic to construct the TSC Assistance Container in uplink direction.  (NOTE) |  |
| tscaiInputDl | TscaiInputContainer | 0..1 | Transports the input parameters for TSC traffic to construct the TSC Assistance Container in downlink direction.  (NOTE) |  |
| capBatAdaptation | boolean | 0..1 | Indicates the capability for AF to adjust the burst sending time, when it is supported and set to "true".  The default value is "false" if omitted.  (NOTE) | EnTSCAC  GMEC |
| NOTE: The "burstArrivalTimeWnd" attribute, within the "tscaiInputUl" and/or "tscaiInputDl" attributes, and the "capBatAdaptation attribute are mutually exclusive. | | | | |

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.1.10 Type: TscQosRequirementRm

Table 5.14.2.1.10-1: Definition of type TscQosRequirementRm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| reqGbrDl | BitRateRm | 0..1 | Requested GBR in downlink. |  |
| reqGbrUl | BitRateRm | 0..1 | Requested GBR in uplink. |  |
| reqMbrDl | BitRateRm | 0..1 | Requested MBR in downlink. |  |
| reqMbrUl | BitRateRm | 0..1 | Requested MBR in uplink. |  |
| maxTscBurstSize | ExtMaxDataBurstVolRm | 0..1 | Maximum burst size of the TSC traffic in units of Bytes. Minimum = 4096, Maximum = 2000000. |  |
| req5Gsdelay | PacketDelBudgetRm | 0..1 | Requested Delay of the TSC traffic. |  |
| reqPer | PacketErrRateRm | 0..1 | Requested Packet Error Rate of the TSC traffic. | ExtQoS\_5G, GMEC |
| priority | TscPriorityLevelRm | 0..1 | Unsigned integer indicating the TSC traffic priority in relation to other TSC and non-TSC traffic. |  |
| tscaiTimeDom | UintegerRm | 0..1 | Indicates the (g)PTP domain that the (TSN)AF is located in. |  |
| tscaiInputUl | TscaiInputContainer | 0..1 | Transports the input parameters for TSC traffic to construct the TSC Assistance Container in uplink direction.  (NOTE) |  |
| tscaiInputDl | TscaiInputContainer | 0..1 | Transports the input parameters for TSC traffic to construct the TSC Assistance Container in downlink direction.  (NOTE) |  |
| capBatAdaptation | boolean | 0..1 | Indicates the capability for AF to adjust the burst sending time, when it is supported and set to "true".  The default value is "false" if omitted.  (NOTE) | EnTSCAC, GMEC |
| NOTE: The "burstArrivalTimeWnd" attribute, within the "tscaiInputUl" and/or "tscaiInputDl" attributes, and the "capBatAdaptation attribute are mutually exclusive. | | | | |

\* \* \* \* Next changes \* \* \* \*

##### 5.14.2.2.3 Enumeration: UserPlaneEvent

The enumeration UserPlaneEvent represents the user plane event.

Table 5.14.2.2.3-1: Enumeration UserPlaneEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability (NOTE) |
| SESSION\_TERMINATION | Indicates that Rx session is terminated. |  |
| LOSS\_OF\_BEARER | Indicates a loss of a bearer. (NOTE 3) |  |
| RECOVERY\_OF\_BEARER | Indicates a recovery of a bearer. (NOTE 3) |  |
| RELEASE\_OF\_BEARER | Indicates a release of a bearer. (NOTE 3) |  |
| USAGE\_REPORT | Indicates the usage report event. |  |
| FAILED\_RESOURCES\_ALLOCATION | Indicates the resource allocation is failed. |  |
| SUCCESSFUL\_RESOURCES\_ALLOCATION | Indicates the resource allocation is successful. |  |
| QOS\_GUARANTEED | The QoS targets of one or more SDFs are guaranteed again. | AlternativeQoS\_5G, GMEC |
| QOS\_NOT\_GUARANTEED | The QoS targets of one or more SDFs are not being guaranteed. | AlternativeQoS\_5G, GMEC |
| QOS\_MONITORING | Indicates a QoS monitoring event. | QoSMonitoring\_5G, GMEC |
| ACCESS\_TYPE\_CHANGE | Indicates an Access type change. (NOTE 2) | enNB\_5G, GMEC |
| PLMN\_CHG | Indicates a PLMN change. (NOTE 2) | enNB\_5G, GMEC |
| L4S\_NOT\_AVAILABLE | The ECN marking for L4S of one or more SDFs is not available. | L4S, GMEC |
| L4S\_AVAILABLE | The ECN marking for L4S of one or more SDFs is available again. | L4S, GMEC |
| BAT\_OFFSET\_INFO | Indicates the network provided BAT offset and the optionally adjusted periodicity. | EnTSCAC, GMEC |
| RT\_DELAY\_TWO\_QOS\_FLOWS | Indicates round-trip delay on UL and DL flows over two QoS flows. | EnQoSMon, GMEC |
| PACK\_DELAY\_VAR | Indicates Packet Delay Variation is enabled for the SDF. | EnQoSMon, GMEC |
| NOTE 1: Properties marked with a feature as defined in clause 5.14.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.  NOTE 2: The exposure of such network information to the AF needs to be authorized based on the local policy or local configuration.  NOTE 3: The "LOSS\_OF\_BEARER", RECOVERY\_OF\_BEARER, and RELEASE\_OF\_BEARER only apply to 4G. | | |

\* \* \* \* Next changes \* \* \* \*

### 5.14.4 Used Features

The table below defines the features applicable to the AsSessionWithQoS API. Those features are negotiated as described in subclause 5.2.7.

**Table 5.14.4-1: Features used by AsSessionWithQoS API**

|  |  |  |
| --- | --- | --- |
| **Feature Number** | **Feature** | **Description** |
| 1 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 5.2.5.4. This feature requires that the Notification\_test\_event featute is also supported. |
| 2 | Notification\_test\_event | The testing of notifications connections is supported according to clause 5.2.5.3. |
| 3 | EthAsSessionQoS\_5G | Setting up required QoS for Ethernet UE. This feature may only be supported in 5G. |
| 4 | MacAddressRange\_5G | Indicates the support of a set of MAC addresses with a specific range in the traffic filter. This feature may only be supported in 5G. |
| 5 | AlternativeQoS\_5G | Indicates the support of alternative QoS requirements and the QoS notification (i.e. whether the QoS targets for SDF(s) are not guaranteed or guaranteed again). This feature may only be supported in 5G. |
| 6 | QoSMonitoring\_5G | Indicates the support of QoS Monitoring functionality and the report for packet delay monitoring. This feature may only be supported in 5G. |
| 7 | DisableUENotification\_5G | Indicates the support of disabling QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation. This feature may only be supported in 5G. This feature requires that the AlternativeQoS\_5G feature is also supported. |
| 8 | TSC\_5G | Indicates the support of Time Sensitive Communication. This feature may only be supported in 5G. |
| 9 | AppId | Indicates the support of dynamically providing the Application Identifier via the API. |
| 10 | ExposureToEAS | This feature indicates the support of direct notification in 5GC. This feature requires that the QoSMonitoring\_5G feature is also supported. |
| 11 | enNB | Indicates the support of enhancements to the northbound interfaces. |
| 12 | AltQosWithIndParams\_5G | This feature indicates the support of provisioning Alternative Service Requirements with individual QoS parameters. This feature requires that the AlternativeQoS\_5G feature is also supported. |
| 13 | EnEthAsSessionQoS\_5G | Indicates the support of required QoS for Ethernet UE, allowing to indicate separately different UL and/or DL Ethernet flows. This feature may only be supported in 5G. |
| 14 | enNB\_5G | Indicates the support of enhancements to the northbound interfaces and only applicable to 5G. |
| 15 | PacketDelayFailureReport | Indicates the support of packet delay failure report as part of QoS Monitoring procedures. This feature requires that QoSMonitoring\_5G is supported. This feature may only be supported in 5G. |
| 16 | ToSTC\_5G | Indicates the support of Type of Service or Traffic Class. This feature may only be supported in 5G. |
| 17 | EnTSCAC | Indicates the support of extensions to TSCAC and the RAN feedback for BAT offset and adjusted periodicity.  This feature may only be supported in 5G, and requires that the TSC\_5G feature is also supported. |
| 18 | AltQoSProfilesSupportReport | This feature indicates the support of the report of whether Alternative QoS parameters are supported by the access network. This feature requires that AlternativeQoS\_5G and/or AltQosWithIndParams\_5G features are also supported. |
| 19 | ExtQoS\_5G | This feature indicates the support of extended QoS parameters. This feature may only be supported in 5G. |
| 20 | MultiMedia | Indicates the support for multi-modal or multimedia flows for single UE and multiple UE. This feature may only be supported in 5G. This feature may be used in eXtend Reality (XR) use cases. |
| 21 | ExtErrors | Indicates the support of additional application errors related to authorization or PDU Session availability. |
| 22 | QoSTiming\_5G | This feature indicates the support of QoS timing information for the transfer and support of data transmission (e.g., AI/ML transmission). This feature may only be supported in 5G. |
| 23 | ListUE\_5G | Indicates the support for the list of UEs This feature may only be supported in 5G. |
| 24 | GMEC | This feature indicates the support of Generic Group Management Exposure and Communication related enhancements.  The following functionalities are supported:  - Support AF requested QoS for a UE or group of UE(s) not identified by the UE address(es).  This feature may only be supported in 5G.  This feature requires the support of the "QoSMonitoring\_5G" and "AltQosWithIndParams\_5G" features. |
| 25 | PDUSetHandling | This feature indicates the support of PDU Set handling. This feature may be used for eXtended Reality (XR) and interactive media services.  This feature may only be supported in 5G. |
| 26 | RTLatency | This feature indicates the support of Round-Trip latency. This feature may be used for eXtended Reality (XR) and interactive media services.  This feature may only be supported in 5G. |
| 27 | EnQoSMon | This feature indicates the support of enhanced QoS monitoring functionality, i.e. the report of the congestion information, and/or, the RTT delay over two QoS flows, and/or, the data rate information, and/or, the Packet Delay Variation monitoring.  This feature requires that QoSMonitoring\_5G is supported.  This feature may only be supported in 5G |
| 28 | PowerSaving | This feature indicates the support of the Power Saving for different traffic measurement**.**  This feature may only be supported in 5G. |
| 29 | L4S | This feature indicates the support of the AF indication of ECN marking for L4S support.  This feature may only be supported in 5G. |
| Feature: A short name that can be used to refer to the bit and to the feature, e.g. "Notification".  Description: A clear textual description of the feature. | | |

Editor's Note: Whether and/how to indicate the support of end of burst indication, and provision the flow periodicity information within the Power Saving feature is FFS.

\* \* \* \* Next changes \* \* \* \*

#### 5.14.5.3 Application Errors

The application errors defined for AsSessionWithQoS API are listed in table 5.14.5.3-1.

**Table 5.14.5.3-1: Application errors**

|  |  |  |  |
| --- | --- | --- | --- |
| **Application Error** | **HTTP status code** | **Description** | **Applicability** |
| REQUESTED\_SERVICE\_NOT\_AUTHORIZED | 403 Forbidden | The service information provided in the request is rejected. | ExtErrors |
| REQUESTED\_SERVICE\_TEMPORARILY\_NOT\_AUTHORIZED | 403 Forbidden | The service information provided in the request is temporarily rejected. | ExtErrors |
| UNAUTHORIZED\_SPONSORED\_DATA\_CONNECTIVITY | 403 Forbidden | The request for sponsored data connectivity is not authorized. | ExtErrors |
| PDU\_SESSION\_NOT\_AVAILABLE | 500 Internal Server Error | The PDU session is not found for the provided UE address. | ExtErrors |
| INVALID\_SESSION\_UPDATE | 403 Forbidden | Indicates that the session is not allowed to be updated since one or more of the received parameters can not be served in current session. The AF can retry with a new session. | TSC\_5G, GMEC |

\* \* \* \* End of changes \* \* \* \*