**3GPP TSG CT WG3 Meeting #135 *C3-243xxx***

**Hyderabad, IN, 27 - 31 May, 2024 was *C3-243266***

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **0846** | **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:*** | Corrections to the provisions related to the application detection functionality | | | | | | | | |
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| ***Source to WG:*** | Huawei | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | |
|  |  | | | | | | | | |
| ***Work item code:*** | TEI18\_ADEE | | | | |  | ***Date:*** | | 2024-05-20 |
|  |  | | | |  | |  | |  |
| ***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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | |
| ***Reason for change:*** | | | The "APPLICATION**\_**STOP" monitoring type value is incorrectly written as "APPLICATION STOP" in the OpenAPI description.  There are also various provisions related to the application detection functionality that need further clarifications to avoid confusion. | | | | | | |
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| ***Summary of change:*** | | | This CR proposes to:   * Correct the "APPLICATION\_STOP" monitoring type enumeration value in the OpenAPI description. * Apply additional enhancements of the provisions related to the application detection functionality. | | | | | | |
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| ***Consequences if not approved:*** | | | * The "APPLICATION\_STOP" monitoring type enumeration value remains incorrect in the OpenAPI description. * Some of the provisions related to the application detection functionality remain unclear to some extent and may be generate confusion. | | | | | | |
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| ***Clauses affected:*** | | 5.3.2.1.2, 5.3.2.3.2, 5.3.2.4.3, 5.3.4, 5.3.5.3, A.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 introduces backwards compatible corrections to the OpenAPI description of the MonitoringEvent API defined in this specification. | | | | | | | |
|  | |  | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | |

\* \* \* \* Start of 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

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| --- | --- | --- | --- | --- |
| 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 | Contains 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.  This attribute shall be present when the "AppDetection\_5G" feature is supported and the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "APPLICATION\_START" or "APPLICATION\_STOP".  (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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of the "addnMonTypes" attribute) is set to "PDN\_CONNECTIVITY\_STATUS" or "DOWNLINK\_DATA\_DELIVERY\_STATUS".  This attribute shall be present when the "AppDetection\_5G" feature is supported and the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "APPLICATION\_START" or "APPLICATION\_STOP".  (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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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 (and/or an array element of 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".  The property "externalGroupId" shall be included for the "GMEC" feature to subscribe to the group member 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: Void.  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 | | Contains the identifier of the detected application. (NOTE 4) | | AppDetection\_5G | |
| pduSessInfo | | PduSessionInformation | | 0..1 | | Represents the PDU session information related to the detected application.  If "monitoringType" is "APPLICATION\_START" and/or "APPLICATION\_STOP", this attribute shall be present, if available, to indicate the application traffic detection details. | | 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 member 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" attribute is set to either "APPLICATION\_START" or "APPLICATION\_STOP", the "appId" attribute shall be present only if the "appIds" attribute within the corresponding subscription resource contains more than one array element (i.e., more than one application identifier). | | | | | | | | | |

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

##### 5.3.2.4.3 Enumeration: MonitoringType

The enumeration MonitoringType represents a monitoring event type. It shall comply with the provisions defined in table 5.3.2.4.3-1.

Table 5.3.2.4.3-1: Enumeration MonitoringType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability (NOTE 1) |
| LOSS\_OF\_CONNECTIVITY | The SCS/AS requests to be notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication | Loss\_of\_connectivity\_notification |
| UE\_REACHABILITY | The SCS/AS requests to be notified when the UE becomes reachable for sending either SMS or downlink data to the UE | Ue-reachability\_notification |
| LOCATION\_REPORTING | The SCS/AS requests to be notified of the current location or the last known location of the UE | Location\_notification, eLCS |
| CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION | The SCS/AS requests to be notified when the association of an ME (IMEI(SV)) that uses a specific subscription (IMSI) is changed | Change\_of\_IMSI\_IMEI\_association\_notification |
| ROAMING\_STATUS | The SCS/AS queries the UE's current roaming status and requests to get notified when the status changes | Roaming\_status\_notification |
| COMMUNICATION\_FAILURE | The SCS/AS requests to be notified of communication failure events | Communication\_failure\_notification |
| AVAILABILITY\_AFTER\_DDN\_FAILURE | The SCS/AS requests to be notified when the UE has become available after a DDN failure | Availability\_after\_DDN\_failure\_notification, Availability\_after\_DDN\_failure\_notification\_enhancement |
| NUMBER\_OF\_UES\_IN\_AN\_AREA | The SCS/AS requests to be notified the number of UEs in a given geographic area | Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G |
| 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. | Pdn\_connectivity\_status |
| DOWNLINK\_DATA\_DELIVERY\_STATUS | The AF requests to be notified when the 3GPP network detects that the downlink data delivery status is changed. | Downlink\_data\_delivery\_status\_5G |
| API\_SUPPORT\_CAPABILITY | The SCS/AS requests to be notified of the availability of support of service APIs. | API\_support\_capability\_notification |
| NUM\_OF\_REGD\_UES | The AF requests to be notified of the current number of registered UEs for a network slice. | NSAC |
| NUM\_OF\_ESTD\_PDU\_SESSIONS | The AF requests to be notified of the current number of established PDU Sessions for a network slice. | NSAC |
| AREA\_OF\_INTEREST | The SCS/AS requests to be notified when the UAV moves in or out of the geographic area. | UAV |
| GROUP\_MEMBER\_LIST\_CHANGE | The AF requests to be notified of the changes to a group members list. | GMEC |
| APPLICATION\_START | The AF requests to be notified when the start of application traffic has been detected. | AppDetection\_5G |
| APPLICATION\_STOP | The AF requests to be notified when the end of application traffic has been detected. | AppDetection\_5G |
| 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: More monitoring types can be added in the future based on stage 2. | | |

\* \* \* \* 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 (e.g. Ggroup Member 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 (e.g., 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 \* \* \* \*

#### 5.3.5.3 Application Errors

The application errors defined for the MonitoringEvent API are listed in table 5.3.5.3-1.

Table 5.3.5.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
| EVENT\_FEATURE\_MISMATCH | 400 Bad Request | Indicates the resource creation is not allowed since the supported feature corresponding to the monitoring event is not supported by the client. |  |
| DUPLICATE\_REQUEST | 400 Bad Request | Indicates that a duplicate subscription already exists for this client. | enNB |
| PARAMETER\_OUT\_OF\_RANGE | 403 Forbidden | Indicates that the resource is not allowed to be created since one or more of the received parameter are out of range defined by operator policies. |  |
| IDLE\_STATUS\_UNSUPPORTED | 403 Forbidden | Indicates that the resource is not allowed to be created since the Idle Status Indication is received in the request but not supported by the network. |  |
| OPERATION\_PROHIBITED | 403 Forbidden | Indicates the HTTP method is not supported. |  |
| CONSENT\_REVOCATION\_NOT\_SUPPORTED | 403 Forbidden | Indicates that the request is rejected because user consent management and enforcement is not supported by the client. | UserConsentRevocation |
| USER\_CONSENT\_NOT\_GRANTED | 403 Forbidden | Indicates that the request is rejected because user consent is not granted. | UserConsentRevocation |
| RESOURCES\_EXCEEDED | 403 Forbidden | Indicates that no more subscriptions are allowed for this client. | enNB |
| REQUEST\_NOT\_AUTHORIZED | 403 Forbidden | Indicates that the AF specific UE ID retrieval request is not authorized or the AF request to subscribe to application detection is not authorized. | UEId\_retrieval, AppDetection\_5G |
| REQUESTED\_AREA\_NOT\_ALLOWED | 403 Forbidden | Indicates that the location request is rejected because the location area requested by the AF for an area event reporting is not allowed. | eLCS\_en |
| UE\_ID\_NOT\_AVAILABLE | 404 Not Found | Indicates that the AF specific UE ID is not available. | UEId\_retrieval |
| UE\_NOT\_FOUND | 404 Not Found | Indicates that the requested UE address is not found. | UEId\_retrieval |
| EVENT\_UNSUPPORTED | 500 Internal Server Error | Indicates the required monitoring event is not supported by the server. |  |

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

# A.3 MonitoringEvent API

openapi: 3.0.0

info:

title: 3gpp-monitoring-event

version: 1.3.0-alpha.5

description: |

API for Monitoring Event.

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externalDocs:

description: 3GPP TS 29.122 V18.5.0 T8 reference point for Northbound APIs

url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.122/'

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/3gpp-monitoring-event/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122.

paths:

/{scsAsId}/subscriptions:

get:

summary: Read all or queried active subscriptions for the SCS/AS.

operationId: FetchAllMonitoringEventSubscriptions

tags:

- Monitoring Event Subscriptions

parameters:

- name: scsAsId

in: path

description: Identifier of the SCS/AS

required: true

schema:

type: string

- name: ip-addrs

in: query

description: The IP address(es) of the requested UE(s).

required: false

content:

application/json:

schema:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/IpAddr'

minItems: 1

- name: ip-domain

in: query

description: >

The IPv4 address domain identifier. The attribute may only be provided if IPv4 address

is included in the ip-addrs query parameter.

required: false

schema:

type: string

- name: mac-addrs

in: query

description: The MAC address(es) of the requested UE(s).

required: false

schema:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

minItems: 1

responses:

'200':

description: OK (Successful get all or queried active subscriptions for the SCS/AS)

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/MonitoringEventSubscription'

minItems: 0

description: Monitoring event subscriptions

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

post:

summary: Creates a new subscription resource for monitoring event notification.

operationId: CreateMonitoringEventSubscription

tags:

- Monitoring Event Subscriptions

parameters:

- name: scsAsId

in: path

description: Identifier of the SCS/AS

required: true

schema:

type: string

requestBody:

description: Subscription for notification about monitoring event

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringEventSubscription'

callbacks:

notificationDestination:

'{request.body#/notificationDestination}':

post:

requestBody: # contents of the callback message

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringNotification'

responses:

'204':

description: No Content (successful notification)

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

UserConsentRevocationNotif:

'{request.body#/revocationNotifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/ConsentRevocNotif'

responses:

'204':

description: No Content (successful notification).

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

responses:

'201':

description: Created (Successful creation of subscription)

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringEventSubscription'

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

'200':

description: The operation is successful and immediate report is included.

content:

application/json:

schema:

oneOf:

- $ref: '#/components/schemas/MonitoringEventReport'

- $ref: '#/components/schemas/MonitoringEventReports'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/{scsAsId}/subscriptions/{subscriptionId}:

get:

summary: Read an active subscriptions for the SCS/AS and the subscription Id.

operationId: FetchIndMonitoringEventSubscription

tags:

- Individual Monitoring Event Subscription

parameters:

- name: scsAsId

in: path

description: Identifier of the SCS/AS

required: true

schema:

type: string

- name: subscriptionId

in: path

description: Identifier of the subscription resource

required: true

schema:

type: string

responses:

'200':

description: OK (Successful get the active subscription)

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringEventSubscription'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Updates/replaces an existing subscription resource.

operationId: UpdateIndMonitoringEventSubscription

tags:

- Individual Monitoring Event Subscription

parameters:

- name: scsAsId

in: path

description: Identifier of the SCS/AS

required: true

schema:

type: string

- name: subscriptionId

in: path

description: Identifier of the subscription resource

required: true

schema:

type: string

requestBody:

description: Parameters to update/replace the existing subscription

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringEventSubscription'

responses:

'200':

description: OK (Successful update of the subscription)

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringEventSubscription'

'204':

description: No Content (Successful update of the subscription)

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Modifies an existing subscription of monitoring event.

operationId: ModifyIndMonitoringEventSubscription

tags:

- Individual Monitoring Event Subscription

parameters:

- name: scsAsId

in: path

description: Identifier of the SCS/AS.

required: true

schema:

type: string

- name: subscriptionId

in: path

description: Identifier of the subscription resource.

required: true

schema:

type: string

requestBody:

description: >

This is used for PATCH request for partial cancellation and/or partial addition of certain

UE(s) within an active group.

required: true

content:

application/json-patch+json:

schema:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PatchItem'

minItems: 1

responses:

'204':

description: The resource was modified successfully.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Deletes an already existing monitoring event subscription.

operationId: DeleteIndMonitoringEventSubscription

tags:

- Individual Monitoring Event Subscription

parameters:

- name: scsAsId

in: path

description: Identifier of the SCS/AS

required: true

schema:

type: string

- name: subscriptionId

in: path

description: Identifier of the subscription resource

required: true

schema:

type: string

responses:

'204':

description: No Content (Successful deletion of the existing subscription)

'200':

description: OK (Successful deletion of the existing subscription)

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/MonitoringEventReport'

minItems: 1

description: >

The subscription was terminated successfully, the monitoring event report(s)

shall be included if received.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

MonitoringEventSubscription:

description: Represents a subscription to event(s) monitoring.

type: object

properties:

self:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Link'

supportedFeatures:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

mtcProviderId:

type: string

description: Identifies the MTC Service Provider and/or MTC Application.

appIds:

type: array

items:

type: string

description: Identifies the Application Identifier(s)

minItems: 1

externalId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

msisdn:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

addedExternalIds:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

minItems: 1

description: Indicates the added external Identifier(s) within the active group.

addedMsisdns:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

minItems: 1

description: Indicates the added MSISDN(s) within the active group.

excludedExternalIds:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

minItems: 1

description: Indicates cancellation of the external Identifier(s) within the active group.

excludedMsisdns:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

minItems: 1

description: Indicates cancellation of the MSISDN(s) within the active group.

externalGroupId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalGroupId'

addExtGroupId:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalGroupId'

minItems: 2

ipv4Addr:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv4Addr'

ipv6Addr:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv6Addr'

dnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

notificationDestination:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Link'

requestTestNotification:

type: boolean

description: >

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 otherwise.

websockNotifConfig:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/WebsockNotifConfig'

monitoringType:

$ref: '#/components/schemas/MonitoringType'

maximumNumberOfReports:

type: integer

minimum: 1

description: >

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.

monitorExpireTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

repPeriod:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

groupReportGuardTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maximumDetectionTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

reachabilityType:

$ref: '#/components/schemas/ReachabilityType'

maximumLatency:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maximumResponseTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

suggestedNumberOfDlPackets:

type: integer

minimum: 0

description: >

If "monitoringType" is "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.

idleStatusIndication:

type: boolean

description: >

If "monitoringType" 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" indicates enabling of notification;

"false" indicate no need to notify. Default value is "false" if omitted.

locationType:

$ref: '#/components/schemas/LocationType'

accuracy:

$ref: '#/components/schemas/Accuracy'

minimumReportInterval:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maxRptExpireIntvl:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

samplingInterval:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

reportingLocEstInd:

type: boolean

description: >

Indicates whether to request the location estimate for event reporting. If

"monitoringType" is "LOCATION\_REPORTING", this parameter may be included to indicate

whether event reporting requires the location information. If set to true, the location

estimation information shall be included in event reporting. If set to "false",

indicates the location estimation information shall not be included in event reporting.

Default "false" if omitted.

linearDistance:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LinearDistance'

locQoS:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LocationQoS'

svcId:

$ref: 'TS29515\_Ngmlc\_Location.yaml#/components/schemas/ServiceIdentity'

ldrType:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LdrType'

velocityRequested:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/VelocityRequested'

maxAgeOfLocEst:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/AgeOfLocationEstimate'

locTimeWindow:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

supportedGADShapes:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/SupportedGADShapes'

codeWord:

$ref: 'TS29515\_Ngmlc\_Location.yaml#/components/schemas/CodeWord'

upLocRepIndAf:

description: >

Indicates whether location reporting over user plane is requested or not.

"true" indicates the location reporting over user plane is requested.

"false" indicates the location reporting over user plane is not requested.

Default value is "false" if omitted.

type: boolean

default: false

upLocRepAddrAf:

$ref: '#/components/schemas/UpLocRepAddrAfRm'

associationType:

$ref: '#/components/schemas/AssociationType'

plmnIndication:

type: boolean

description: >

If "monitoringType" is "ROAMING\_STATUS", this parameter may be included to indicate the

notification of UE's Serving PLMN ID. Value "true" indicates enabling of notification;

"false" indicates disabling of notification. Default value is "false" if omitted.

locationArea:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea'

locationArea5G:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

dddTraDescriptors:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DddTrafficDescriptor'

minItems: 1

dddStati:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

minItems: 1

apiNames:

type: array

items:

type: string

minItems: 1

monitoringEventReport:

$ref: '#/components/schemas/MonitoringEventReport'

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

tgtNsThreshold:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SACInfo'

nsRepFormat:

$ref: '#/components/schemas/SACRepFormat'

afServiceId:

type: string

immediateRep:

type: boolean

description: >

Indicates whether an 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.

uavPolicy:

$ref: '#/components/schemas/UavPolicy'

sesEstInd:

type: boolean

description: >

Set to true by the SCS/AS so that only UAV's with "PDU session established for DNN(s)

subject to aerial service" are to be listed in the Event report. Set to false or default

false if omitted otherwise.

subType:

$ref: '#/components/schemas/SubType'

addnMonTypes:

type: array

items:

$ref: '#/components/schemas/MonitoringType'

addnMonEventReports:

type: array

items:

$ref: '#/components/schemas/MonitoringEventReport'

ueIpAddr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/IpAddr'

ueMacAddr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

revocationNotifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

reqRangSlRes:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/RangingSlResult'

minItems: 1

relatedUEs:

type: object

additionalProperties:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/RelatedUE'

minProperties: 1

description: >

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 a any unique string set to the value.

required:

- notificationDestination

- monitoringType

anyOf:

- required: [maximumNumberOfReports]

- required: [monitorExpireTime]

MonitoringNotification:

description: Represents an event monitoring notification.

type: object

properties:

subscription:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Link'

configResults:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ConfigResult'

minItems: 1

description: Each element identifies a notification of grouping configuration result.

monitoringEventReports:

type: array

items:

$ref: '#/components/schemas/MonitoringEventReport'

minItems: 1

description: Monitoring event reports.

addedExternalIds:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

minItems: 1

description: >

Identifies the added external Identifier(s) within the active group via

the "externalGroupId" attribute within the MonitoringEventSubscription data type.

addedMsisdns:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

minItems: 1

description: >

Identifies the added MSISDN(s) within the active group via the "externalGroupId"

attribute within the MonitoringEventSubscription data type.

cancelExternalIds:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

minItems: 1

description: >

Identifies the cancelled external Identifier(s) within the active group via

the "externalGroupId" attribute within the MonitoringEventSubscription data type.

cancelMsisdns:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

minItems: 1

description: >

Identifies the cancelled MSISDN(s) within the active group via the "externalGroupId"

attribute within the MonitoringEventSubscription data type.

cancelInd:

type: boolean

description: >

Indicates whether to request to cancel the corresponding monitoring subscription.

Set to false or omitted otherwise.

appliedParam:

$ref: '#/components/schemas/AppliedParameterConfiguration'

required:

- subscription

MonitoringEventReport:

description: Represents an event monitoring report.

type: object

properties:

imeiChange:

$ref: '#/components/schemas/AssociationType'

externalId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

appId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ApplicationId'

pduSessInfo:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/PduSessionInformation'

idleStatusInfo:

$ref: '#/components/schemas/IdleStatusInfo'

locationInfo:

$ref: '#/components/schemas/LocationInfo'

locFailureCause:

$ref: '#/components/schemas/LocationFailureCause'

lossOfConnectReason:

type: integer

description: >

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 clause 8.4.58.

unavailPerDur:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maxUEAvailabilityTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

msisdn:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

monitoringType:

$ref: '#/components/schemas/MonitoringType'

uePerLocationReport:

$ref: '#/components/schemas/UePerLocationReport'

plmnId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/PlmnId'

reachabilityType:

$ref: '#/components/schemas/ReachabilityType'

roamingStatus:

type: boolean

description: >

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.

failureCause:

$ref: '#/components/schemas/FailureCause'

eventTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

pdnConnInfoList:

type: array

items:

$ref: '#/components/schemas/PdnConnectionInformation'

minItems: 1

dddStatus:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DlDataDeliveryStatus'

dddTrafDescriptor:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DddTrafficDescriptor'

maxWaitTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

apiCaps:

type: array

items:

$ref: '#/components/schemas/ApiCapabilityInfo'

minItems: 0

nSStatusInfo:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SACEventStatus'

afServiceId:

type: string

servLevelDevId:

type: string

description: >

If "monitoringType" is "AREA\_OF\_INTEREST", this parameter may be included

to identify the UAV.

uavPresInd:

type: boolean

description: >

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.

groupMembListChanges:

$ref: '#/components/schemas/GroupMembListChanges'

required:

- monitoringType

MonitoringEventReports:

description: Represents a set of event monitoring reports.

type: object

properties:

monitoringEventReports:

type: array

items:

$ref: '#/components/schemas/MonitoringEventReport'

minItems: 1

required:

- monitoringEventReports

IdleStatusInfo:

description: Represents the information relevant to when the UE transitions into idle mode.

type: object

properties:

activeTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

edrxCycleLength:

format: float

type: number

minimum: 0

suggestedNumberOfDlPackets:

type: integer

minimum: 0

description: >

Identifies the number of packets shall be buffered in the serving gateway.

It shall be present if the idle status indication is requested by the SCS/AS

with "idleStatusIndication" in the "monitoringEventSubscription" sets to "true".

idleStatusTimestamp:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

periodicAUTimer:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

UePerLocationReport:

description: Represents the number of UEs found at the indicated location.

type: object

properties:

ueCount:

type: integer

minimum: 0

description: Identifies the number of UEs.

externalIds:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

minItems: 1

description: Each element uniquely identifies a user.

msisdns:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

minItems: 1

description: Each element identifies the MS internal PSTN/ISDN number allocated for a UE.

servLevelDevIds:

type: array

items:

type: string

minItems: 1

description: Each element uniquely identifies a UAV.

required:

- ueCount

LocationInfo:

description: Represents the user location information.

type: object

properties:

ageOfLocationInfo:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationMin'

cellId:

type: string

description: >

Indicates the Cell Global Identification of the user which identifies the cell the UE

is registered.

enodeBId:

type: string

description: Indicates the eNodeB in which the UE is currently located.

routingAreaId:

type: string

description: Identifies the Routing Area Identity of the user where the UE is located.

trackingAreaId:

type: string

description: Identifies the Tracking Area Identity of the user where the UE is located.

plmnId:

type: string

description: Identifies the PLMN Identity of the user where the UE is located.

twanId:

type: string

description: Identifies the TWAN Identity of the user where the UE is located.

userLocation:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/UserLocation'

geographicArea:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

civicAddress:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/CivicAddress'

positionMethod:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/PositioningMethod'

qosFulfilInd:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/AccuracyFulfilmentIndicator'

ueVelocity:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/VelocityEstimate'

ldrType:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/LdrType'

achievedQos:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/MinorLocationQoS'

relAppLayerId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ApplicationlayerId'

rangeDirection:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/RangeDirection'

twoDRelLoc:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/2DRelativeLocation'

threeDRelLoc:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/3DRelativeLocation'

relVelocity:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/VelocityEstimate'

upCumEvtRep:

$ref: '#/components/schemas/UpCumEvtRep'

FailureCause:

description: Represents the reason of communication failure.

type: object

properties:

bssgpCause:

type: integer

description: >

Identifies a non-transparent copy of the BSSGP cause code. Refer to 3GPP TS 29.128.

causeType:

type: integer

description: Identify the type of the S1AP-Cause. Refer to 3GPP TS 29.128.

gmmCause:

type: integer

description: >

Identifies a non-transparent copy of the GMM cause code. Refer to 3GPP TS 29.128.

ranapCause:

type: integer

description: >

Identifies a non-transparent copy of the RANAP cause code. Refer to 3GPP TS 29.128.

ranNasCause:

type: string

description: >

Indicates RAN and/or NAS release cause code information, TWAN release cause code

information or untrusted WLAN release cause code information. Refer to 3GPP TS 29.214.

s1ApCause:

type: integer

description: >

Identifies a non-transparent copy of the S1AP cause code. Refer to 3GPP TS 29.128.

smCause:

type: integer

description: >

Identifies a non-transparent copy of the SM cause code. Refer to 3GPP TS 29.128.

PdnConnectionInformation:

description: Represents the PDN connection information of the UE.

type: object

properties:

status:

$ref: '#/components/schemas/PdnConnectionStatus'

apn:

type: string

description: >

Identify the APN, it is depending on the SCEF local configuration whether or

not this attribute is sent to the SCS/AS.

pdnType:

$ref: '#/components/schemas/PdnType'

interfaceInd:

$ref: '#/components/schemas/InterfaceIndication'

ipv4Addr:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv4Addr'

ipv6Addrs:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv6Addr'

minItems: 1

macAddrs:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

minItems: 1

required:

- status

- pdnType

AppliedParameterConfiguration:

description: Represents the parameter configuration applied in the network.

type: object

properties:

externalIds:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

minItems: 1

description: Each element uniquely identifies a user.

msisdns:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

minItems: 1

description: Each element identifies the MS internal PSTN/ISDN number allocated for a UE.

maximumLatency:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maximumResponseTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maximumDetectionTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

ApiCapabilityInfo:

description: Represents the availability information of supported API.

type: object

properties:

apiName:

type: string

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- apiName

- suppFeat

UavPolicy:

description: >

Represents the policy information included in the UAV presence monitoring request.

type: object

properties:

uavMoveInd:

type: boolean

revokeInd:

type: boolean

required:

- uavMoveInd

- revokeInd

ConsentRevocNotif:

description: >

Represents the user consent revocation information conveyed in a user consent

revocation notification.

type: object

properties:

subscriptionId:

type: string

consentsRevoked:

type: array

items:

$ref: '#/components/schemas/ConsentRevoked'

minItems: 1

required:

- subscriptionId

- consentsRevoked

ConsentRevoked:

description: Represents the information related to a revoked user consent.

type: object

properties:

ucPurpose:

$ref: 'TS29503\_Nudm\_SDM.yaml#/components/schemas/UcPurpose'

externalId:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

msisdn:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

required:

- ucPurpose

oneOf:

- required: [externalId]

- required: [msisdn]

GroupMembListChanges:

description: Represents information on the change(s) to a group's members list.

type: object

properties:

addedUEs:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

minItems: 1

removedUEs:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

minItems: 1

anyOf:

- required: [addedUEs]

- required: [removedUEs]

UpLocRepAddrAfRm:

description: Represents the user plane addressing information.

type: object

properties:

ipv4Addrs:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

minItems: 1

ipv6Addrs:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

minItems: 1

fqdn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Fqdn'

nullable: true

anyOf:

- required: [ipv4Addrs]

- required: [ipv6Addrs]

- required: [fqdn]

UpCumEvtRep:

description: Represents the cumulative event report.

type: object

properties:

upLocRepStat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

#

# ENUMS

#

MonitoringType:

anyOf:

- type: string

enum:

- LOSS\_OF\_CONNECTIVITY

- UE\_REACHABILITY

- LOCATION\_REPORTING

- CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION

- ROAMING\_STATUS

- COMMUNICATION\_FAILURE

- AVAILABILITY\_AFTER\_DDN\_FAILURE

- NUMBER\_OF\_UES\_IN\_AN\_AREA

- PDN\_CONNECTIVITY\_STATUS

- DOWNLINK\_DATA\_DELIVERY\_STATUS

- API\_SUPPORT\_CAPABILITY

- NUM\_OF\_REGD\_UES

- NUM\_OF\_ESTD\_PDU\_SESSIONS

- AREA\_OF\_INTEREST

- GROUP\_MEMBER\_LIST\_CHANGE

- APPLICATION\_START

- APPLICATION\_STOP

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents a monitoring event type.

Possible values are

- LOSS\_OF\_CONNECTIVITY: The SCS/AS requests to be notified when the 3GPP network detects

that the UE is no longer reachable for signalling or user plane communication

- UE\_REACHABILITY: The SCS/AS requests to be notified when the UE becomes reachable for

sending either SMS or downlink data to the UE

- LOCATION\_REPORTING: The SCS/AS requests to be notified of the current location or

the last known location of the UE

- CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION: The SCS/AS requests to be notified when the association

of an ME (IMEI(SV)) that uses a specific subscription (IMSI) is changed

- ROAMING\_STATUS: The SCS/AS queries the UE's current roaming status and requests to get

notified when the status changes

- COMMUNICATION\_FAILURE: The SCS/AS requests to be notified of communication failure events

- AVAILABILITY\_AFTER\_DDN\_FAILURE: The SCS/AS requests to be notified when the UE has become

available after a DDN failure

- NUMBER\_OF\_UES\_IN\_AN\_AREA: The SCS/AS requests to be notified the number of UEs in a given

geographic area

- 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

- DOWNLINK\_DATA\_DELIVERY\_STATUS: The AF requests to be notified when the 3GPP network detects that the downlink data delivery status is changed.

- API\_SUPPORT\_CAPABILITY: The SCS/AS requests to be notified of the availability of support

of service APIs.

- NUM\_OF\_REGD\_UES: The AF requests to be notified of the current number of registered UEs

for a network slice.

- NUM\_OF\_ESTD\_PDU\_SESSIONS: The AF requests to be notified of the current number of

established PDU Sessions for a network slice.

- AREA\_OF\_INTEREST: The SCS/AS requests to be notified when the UAV moves in or

out of the geographic area.

- GROUP\_MEMBER\_LIST\_CHANGE: The AF requests to be notified of the changes to a group members

list.

- APPLICATION\_START: The AF requests to be notified about the start of application traffic

has been detected.

- APPLICATION\_STOP: The AF requests to be notified about the stop of application traffic

has been detected.

ReachabilityType:

anyOf:

- type: string

enum:

- SMS

- DATA

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents a reachability type.

Possible values are

- SMS: The SCS/AS requests to be notified when the UE becomes reachable for sending SMS

to the UE

- DATA: The SCS/AS requests to be notified when the UE becomes reachable for sending

downlink data to the UE.

LocationType:

anyOf:

- type: string

enum:

- CURRENT\_LOCATION

- LAST\_KNOWN\_LOCATION

- CURRENT\_OR\_LAST\_KNOWN\_LOCATION

- INITIAL\_LOCATION

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents a location type.

Possible values are

- CURRENT\_LOCATION: The SCS/AS requests to be notified for current location

- LAST\_KNOWN\_LOCATION: The SCS/AS requests to be notified for last known location

- CURRENT\_OR\_LAST\_KNOWN\_LOCATION: The AF requests the current or last known location

- INITIAL\_LOCATION: The AF requests the initial location

AssociationType:

anyOf:

- type: string

enum:

- IMEI

- IMEISV

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents an IMEI or IMEISV to IMSI association.

Possible values are

- IMEI: The value shall be used when the change of IMSI-IMEI association shall be detected

- IMEISV: The value shall be used when the change of IMSI-IMEISV association shall be

detected

Accuracy:

anyOf:

- type: string

enum:

- CGI\_ECGI

- ENODEB

- TA\_RA

- PLMN

- TWAN\_ID

- GEO\_AREA

- CIVIC\_ADDR

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents a desired granularity of accuracy of the requested location information.

Possible values are

- CGI\_ECGI: The SCS/AS requests to be notified using cell level location accuracy.

- ENODEB: The SCS/AS requests to be notified using eNodeB level location accuracy.

- TA\_RA: The SCS/AS requests to be notified using TA/RA level location accuracy.

- PLMN: The SCS/AS requests to be notified using PLMN level location accuracy.

- TWAN\_ID: The SCS/AS requests to be notified using TWAN identifier level location accuracy.

- GEO\_AREA: The SCS/AS requests to be notified using the geographical area accuracy.

- CIVIC\_ADDR: The SCS/AS requests to be notified using the civic address accuracy.

PdnConnectionStatus:

anyOf:

- type: string

enum:

- CREATED

- RELEASED

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents the PDN connection status.

Possible values are

- CREATED: The PDN connection is created.

- RELEASED: The PDN connection is released.

PdnType:

anyOf:

- type: string

enum:

- IPV4

- IPV6

- IPV4V6

- NON\_IP

- ETHERNET

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents the PDN connection type.

Possible values are

- IPV4: PDN connection of IPv4 type.

- IPV6: PDN connection of IPv6 type.

- IPV4V6: PDN connection of IPv4v6 type.

- NON\_IP: PDN connection of non-IP type.

- ETHERNET: PDN connection of Ethernet type.

InterfaceIndication:

anyOf:

- type: string

enum:

- EXPOSURE\_FUNCTION

- PDN\_GATEWAY

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents the network entity used for data delivery towards the SCS/AS.

Possible values are

- EXPOSURE\_FUNCTION: SCEF is used for the PDN connection towards the SCS/AS.

- PDN\_GATEWAY: PDN gateway is used for the PDN connection towards the SCS/AS.

LocationFailureCause:

anyOf:

- type: string

enum:

- POSITIONING\_DENIED

- UNSUPPORTED\_BY\_UE

- NOT\_REGISTED\_UE

- UNSPECIFIED

- REQUESTED\_AREA\_NOT\_ALLOWED

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration but

is not used to encode content defined in the present version of this API.

description: >

Represents the cause of location positioning failure.

Possible values are:

- POSITIONING\_DENIED: Positioning is denied.

- UNSUPPORTED\_BY\_UE: Positioning is not supported by UE.

- NOT\_REGISTED\_UE: UE is not registered.

- UNSPECIFIED: Unspecified.

- REQUESTED\_AREA\_NOT\_ALLOWED: The location request is rejected because the location area

requested by the AF for area event reporting is not allowed.

SubType:

anyOf:

- type: string

enum:

- AERIAL\_UE

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration but is not used to encode

content defined in the present version of this API.

description: |

Represents a subscription type.

Possible values are

- AERIAL\_UE: The UE has Aerial subscription.

SACRepFormat:

anyOf:

- type: string

enum:

- NUMERICAL

- PERCENTAGE

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration but

is not used to encode content defined in the present version of this API.

description: Indicates the NSAC reporting format.

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