**3GPP TSG CT WG3 Meeting #142 *C3-253689***

**Goteborg, SE, 25th – 29th August, 2025 was C3-253343**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.122** | **CR** | **0961** | **rev** | **1** | **Current version:** | **19.3.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Updates and corrections to Energy Consumption information exposure |
|  |  |
| ***Source to WG:*** | Huawei, ZTE, Ericsson, Nokia |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | EnergySys, NBI19 |  | ***Date:*** | 2025-08-18 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | The following issues have been identified in the definition of the provisions introduced in Rel-19 to support the Energy Consumption information exposure functionality:* Unecessary or redundant conditions for some attributes in the monitoring subscription request.
* Some presence conditions need to be moved completely as table NOTEs to avoid confusion, and the related table NOTEs need to be further refined and completed.
* The case where the "addnMonTypes" attribute is used to enable to convey several monitoring types, i.e., subscribe to more than one event, is not considered at all, including how to convey the related per event reporting thresholds.
* The energy level attribute is not needed with the EnergyInfo data type. In the subscription/notification request, this is conveyed via the "monitoringType" and optionally the "addnMonTypes".
* The support of one-time reporting and immediate reporting is missing.
* The new "Energy" feature description outline needs to be aligned across the two impacted APIs in this specification.
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| ***Summary of change:*** | This CR proposes to:* Address the above-detailed issues and related necessary updates/corrections.
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| ***Consequences if not approved:*** | * The above-detailed necessary updates/corrections are not addressed.
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|  |  |
| ***Clauses affected:*** | 5.3.2.1.1, 5.3.2.1.2, 5.3.2.3.2, 5.3.2.3.20, 5.3.2.4.3, 5.3.4, 5.4.2.1.2, 5.4.2.1.3, 5.4.4, A.3, A.4 |
|  |  |
|  | **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 ... |
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| ***Other comments:*** | This CR introduces backwards compatible new feature and corrections to the OpenAPI descriptions of the following APIs:* TS29122\_MonitoringEvent.yaml
* TS29122\_ResourceManagementOfBdt.yaml
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| ***This CR's revision history:*** |  |

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

##### 5.3.2.1.1 Introduction

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

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

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

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| 2DRelativeLocation | 3GPP TS 29.572 [42] | Represents 2D local co-ordinates with origin corresponding to another known point. | Ranging\_SL |
| 3DRelativeLocation | 3GPP TS 29.572 [42] | Represents 3D local co-ordinates with origin corresponding to another known point. | Ranging\_SL |
| AccuracyFulfilmentIndicator | 3GPP TS 29.572 [42] | The indication whether the obtained location estimate satisfies the requested QoS or not. | eLCS |
| AgeOfLocationEstimate | 3GPP TS 29.572 [42] | Age of the location estimate for change of location type or motion type of Location deferred report. | eLCS |
| ApplicationlayerId | 3GPP TS 29.571 [45] | Represents the Application Layer ID. | Ranging\_SL |
| CivicAddress | 3GPP TS 29.572 [42] | Civic address. | eLCS |
| CodeWord | 3GPP TS 29.515 [65] | Code word. | eLCS |
| DddTrafficDescriptor | 3GPP TS 29.571 [45] | Traffic Descriptor of source of downlink data. | Downlink\_data\_delivery\_status\_5GAvailability\_after\_DDN\_failure\_notification\_enhancement |
| DlDataDelDlDataDeliveryStatus | 3GPP TS 29.571 [45] | Traffic Descriptor of source of downlink data notifications. | Downlink\_data\_delivery\_status\_5G |
| Dnn | 3GPP TS 29.571 [45] | Identifies a DNN. | Session\_Management\_EnhancementUEId\_retrievalAppDetection\_5G |
| FlowDescription | 3GPP TS 29.514 [52] | Represents an IP flow description. | Energy |
| Fqdn | 3GPP TS 29.571 [45] | Identifies a FQDN. |  |
| GeographicArea | 3GPP TS 29.572 [42] | Identifies the geographical information of the user(s). |  |
| Gpsi | 3GPP TS 29.571 [45] | Represents a GPSI. | GMEC |
| IpAddr | 3GPP TS 29.571 [45] | Represents the UE IP Address. | enNBUEId\_retrieval |
| LdrType | 3GPP TS 29.572 [42] | Location deferred requested event type. | eLCS |
| LinearDistance | 3GPP TS 29.572 [42] | This IE shall be present and set to true if a location estimate is required for motion event report. | eLCS |
| LocalArea | 3GPP TS 29.572 [42] | Represents location information in the form of a local area. | eLCS\_en2 |
| LocationQoS | 3GPP TS 29.572 [42] | Requested location QoS. | eLCSMULTIQOS |
| MacAddr48 | 3GPP TS 29.571 [45] | Represents the MAC Address. | enNBUEId\_retrieval |
| MinorLocationQoS | 3GPP TS 29.572 [42] | Minor Location QoS. | MULTIQOS |
| VelocityRequested | 3GPP TS 29.572 [42] | Velocity of the target UE requested. | eLCS |
| PatchItem | 3GPP TS 29.571 [45] | Contains the list of changes to be made to a resource according to the JSON PATCH format specified in IETF RFC 6902 [67]. |  |
| PduSessionInformation | 3GPP TS 29.523 [70] | Represents PDU session identification information. | AppDetection\_5G |
| Pei | 3GPP TS 29.571 [45] | Represents a PEI. | RVAS\_5G, enNB2 |
| PositioningMethod | 3GPP TS 29.572 [42] | Identifies the positioning method used to obtain the location estimate of the UE. | eLCS |
| RangeDirection | 3GPP TS 29.572 [42] | Represents the range and direction between two points. | Ranging\_SL |
| RangingSlResult | 3GPP TS 29.572 [42] | Represents the requested result type for ranging and sidelink positioning | Ranging\_SL |
| RelatedUE | 3GPP TS 29.572 [42] | Represents information on the related UE for ranging and sidelink positioning | Ranging\_SL |
| SACEventStatus | 3GPP TS 29.571 [45] | Contains the network slice status information related to network slice admission control. | NSAC |
| SACInfo | 3GPP TS 29.571 [45] | Represents network slice admission control information to control the triggering of notifications or convey network slice status information. | NSAC |
| Snssai | 3GPP TS 29.571 [45] | Contains a S-NSSAI. | NSACSession\_Management\_EnhancementUEId\_retrievalAppDetection\_5G |
| SupportedFeatures | 3GPP TS 29.571 [45] | Used to negotiate the applicability of the optional features defined in table 5.3.4-1. |  |
| ServiceIdentiy | 3GPP TS 29.515 [65] | Service identity. | eLCS |
| SupportedGADShapes | 3GPP TS 29.572 [42] | Supported Geographical Area Description shapes. | eLCS |
| UcPurpose | 3GPP TS 29.503 [63] | Represents the purpose of a user consent. | DataTransfer |
| Uinteger | 3GPP TS 29.571 [45] | Represents an unsigned Integer. |  |
| Uri | 5.2.1.3.2 | Represents a URI. | UserConsentRevocation |
| UserLocation | 3GPP TS 29.571 [6] | Represents a user location. | enNB1 |
| VelocityEstimate | 3GPP TS 29.572 [42] | UE velocity, if requested and available. | eLCSRanging\_SL |

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

Table 5.3.2.1.1-2: MonitoringEvent API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| Accuracy | 5.3.2.4.7 | Represents a desired granularity of accuracy for the requested location information. | Location\_notification, eLCS, EDGEAPP |
| ApiCapabilityInfo | 5.3.2.3.9 | Represents the availability information of supported API. | API\_support\_capability\_notification |
| AppliedParameterConfiguration | 5.3.2.3.8 | Represents the parameter configuration applied in the network. | Enhanced\_param\_config |
| AssociationType | 5.3.2.4.6 | Represents an IMEI or IMEISV to IMSI association. | Change\_of\_IMSI\_IMEI\_association\_notification |
| ConsentRevocNotif | 5.3.2.3.12 | Represents the user consent revocation information conveyed in a user consent revocation notification. | UserConsentRevocation |
| ConsentRevoked | 5.3.2.3.13 | Represents the information related to revoked user consent(s). | UserConsentRevocation |
| EnergyInfo | 5.3.2.3.20 | Represents the Energy consumption information. | Energy |
| FailureCause | 5.3.2.3.6 | Represents the reason of communication failure. | Communication\_failure\_notification |
| GroupMembListChanges | 5.3.2.3.13 | Represents information on the change(s) to a group members list. | GMEC |
| IdleStatusInfo | 5.3.2.3.3 | Represents the information relevant to when the UE transitions into idle mode. | Ue-reachability\_notification, Availability\_after\_DDN\_failure\_notification |
| InterfaceIndication | 5.3.2.4.10 | Represents the network entity used for data delivery towards the SCS/AS. | Pdn\_connectivity\_status |
| LocationFailureCause | 5.3.2.4.11 | Represents the cause of location/positioning failure. | eLCS |
| LocationInfo | 5.3.2.3.5 | Represents the user location information. | Location\_notification, eLCS |
| LocationType | 5.3.2.4.5 | Represents a location type. | Location\_notification, Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G, eLCS |
| MonitoringEventReport | 5.3.2.3.2 | Represents an event monitoring report. |  |
| MonitoringEventReports | 5.3.2.3.10 | Represents one or multiple event monitoring report(s). | enNB |
| MonitoringEventSubscription | 5.3.2.1.2 | Represents a subscription to event(s) monitoring. |  |
| MonitoringNotification | 5.3.2.2.2 | Represents an event monitoring notification. |  |
| MonitoringType | 5.3.2.4.3 | Represents a monitoring event type. |  |
| PdnConnectionInformation | 5.3.2.3.7 | Represents the PDN connection information of the UE. | Pdn\_connectivity\_status |
| PdnConnectionStatus | 5.3.2.4.8 | Represents the PDN connection status. | Pdn\_connectivity\_status |
| PdnType | 5.3.2.4.9 | Represents a PDN connection type. |  |
| ReachabilityType | 5.3.2.4.4 | Represents a reachability type. | Ue-reachability\_notification |
| SACRepFormat | 5.3.2.4.13 | Represents the NSAC reporting format. | NSAC |
| SubType | 5.3.2.4.12 | Represents a subscription type. | UAV |
| UavPolicy | 5.3.2.3.11 | Represents the policy information included in the UAV presence monitoring request. | UAV |
| UePerLocationReport | 5.3.2.3.4 | Represents the number of UEs found at the indicated location. | Number\_of\_UEs\_in\_an\_area\_notification, Number\_of\_UEs\_in\_an\_area\_notification\_5G |
| UeStrAndFwdSatInfo | 5.3.2.3.19 | Represents the Store and Forward Satellite operation information sent towards SCS/AS. | SAT\_STRFWD\_OP |
| UeStrAndFwdStatus | 5.3.2.4.14 | Represents the Store and Forward mode status of the UE. | SAT\_STRFWD\_OP |
| UpCumEvtRep | 5.3.2.3.18 | Represents the cumulative event report for events reported via user plane. | eLCS\_en |
| UpLocRepAddrAfRm | 5.3.2.3.17 | Represents the user plane addressing information. | eLCS\_en |

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

##### 5.3.2.1.2 Type: MonitoringEventSubscription

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

Table 5.3.2.1.2-1: Definition of type MonitoringEventSubscription

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability (NOTE 3) |
| self | Link | 0..1 | Link to the resource "Individual Monitoring Event Subscription". This parameter shall be supplied by the SCEF in HTTP responses. |  |
| supportedFeatures | SupportedFeatures | 0..1 | Used to negotiate the supported optional features of the API as described in clause 5.2.7.This attribute shall be provided in the POST request and in the response of successful resource creation. |  |
| mtcProviderId | string | 0..1 | Identifies the MTC Service Provider and/or MTC Application. (NOTE 7) |  |
| appIds | array(string) | 0..N | Contains the Application Identifier(s) to which the subscription is related.(NOTE 20) | AppDetection\_5G, Energy |
| 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.If the "Energy" feature is supported and the value of the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "UE\_ENERGY", "PDU\_SESSION\_ENERGY", "SERVICE\_FLOW\_ENERGY" or "UE\_SNSSAI\_ENERGY", this attribute shall be present to identify the UE for which the Energy consumption information is subscribed.(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 |
| ipDomain | string | 0..1 | Contains the IPv4 address domain identifier. This may be public IPv4 address (e.g., when private IP address is included in the "ipv4Addr" attribute).The attribute may only be provided if the "ipv4Addr" attribute is present. | enNB2 |
| 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 19) | Session\_Management\_Enhancement, UEId\_retrieval, AppDetection\_5G, Energy |
| 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 notificationDefault "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)When the "NSAC" feature is supported and the "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.When the "Energy" feature is supported and the value of the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to either "UE\_ENERGY", "PDU\_SESSION\_ENERGY", "SERVICE\_FLOW\_ENERGY" or "UE\_SNSSAI\_ENERGY", this attribute may also be provided with a value of 1 to indicate that one-time reporting of the Energy consumption 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.If the "Energy" feature is supported and the value of the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "UE\_ENERGY", "PDU\_SESSION\_ENERGY", "UE\_SNSSAI\_ENERGY" or "SERVICE\_FLOW\_ENERGY", this attribute may be present to indicate the reporting interval for periodic reporting of the Energy consumption information. |  |
| repTimePeriod | TimeWindow | 0..1 | Contains the reporting time window to indicate the reporting time period for the Energy consumption information. | Energy |
| enrgRepThres | map(EnergyInfo) | 0..1 | Contains the reporting thresholds for the Energy consumption information event(s) reporting.The key of the map shall be set to the value of the energy monitoring type, i.e., either "UE\_ENERGY", "UE\_SNSSAI\_ENERGY", "PDU\_SESSION\_ENERGY" or "SERVICE\_FLOW\_ENERGY", to which the energy reporting thresholds provided within the map value are related.This attribute may contain more than map element only in case several energy monitoring types are subscribed via the "monitoringType" attribute and the "addnMonTypes" attribute. If there is only a single energy monitoring type that is subscribed, then a single map element may be provided with its map key set to the value of the "monitoringType" attribute. | Energy |
| 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 notifyDefault: "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 UE (i.e. 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 UE (i.e. 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 19) (NOTE 21) | NSAC, Session\_Management\_Enhancement, UEId\_retrieval, AppDetection\_5G, Energy |
| immediateRep | boolean | 0..1 | Indicates whether immediate reporting is requested or not.- "true": indicate that immediate reporting is requested.- "false": indicate that immediate reporting is not requested.- The default value is "false" if this attribute is omitted.When the "NSAC" feature is supported, 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 "enNB1\_5G" feature is supported, this attribute may be included if the SCS/AS requires immediate reporting of the subscribed event(s).When the "Energy" feature is supported, this attribute may be present if the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to either "UE\_ENERGY", "PDU\_SESSION\_ENERGY", "SERVICE\_FLOW\_ENERGY" or "UE\_SNSSAI\_ENERGY".(NOTE 4) (NOTE 13) | NSAC, enNB1\_5G; Energy |
| 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 | Contains additional monitoring types.(NOTE 17) | enNB |
| addnMonEventReports | array(MonitoringEventReport) | 0..N | Contains additional monitoring event reports.This attribute may be present only in subscription creation/update responses and only 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 |
| flowDescs | array(FlowDescription) | 0..N | Contains the service data flow information of an application traffic.(NOTE 20) | Energy |
| 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", "Availability\_after\_DDN\_failure\_notification\_enhancement"; One of the properties "externalId" or "msisdn" shall be included for feature "SAT\_STRFWD\_OP".When the "GMEC" feature is supported, the "externalGroupId" attribute shall be included to subscribe to the group members list change event reporting.NOTE 2: Inclusion of either "maximumNumberOfReports" (with a value higher than 1) or "monitorExpireTime" makes the Monitoring Request a Continuous Monitoring Request, where the SCEF sends Notifications until either the maximum number of reports or the monitoring duration indicated by the property "monitorExpireTime" is exceeded. The "maximumNumberOfReports" with a value 1 makes the Monitoring Request a One-time Monitoring Request. At least one of "maximumNumberOfReports" or "monitorExpireTime" shall be provided.NOTE 3: Properties marked with a feature as defined in clause 5.3.4 are applicable as described in clause 5.2.7. If no features are indicated, the related property applies for all the features.NOTE 4: In this release of the specification, for the "Number\_of\_UEs\_in\_an\_area\_notification" and "Number\_of\_UEs\_in\_an\_area\_notification\_5G" features, the "locationType" attribute shall be set to "LAST\_KNOWN\_LOCATION". For 5G, if the "locationType" attribute is set to "LAST\_KNOWN\_LOCATION", the "maximumNumberOfReports" attribute shall be 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" attribute shall be set to "LAST\_KNOWN\_LOCATION". For 5G, when the "enNB1\_5G" feature is supported and the "immediateRep" is either absent or present and set to "false" and outside the scope of the "NSAC" feature, then the "locationType" attribute 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.NOTE 19: When the "Energy" feature is supported and the value of the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "PDU\_SESSION\_ENERGY" or "SERVICE\_FLOW\_ENERGY", then at least one of these attributes shall be present.NOTE 20: When the "Energy" feature is supported and the value of the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "SERVICE\_FLOW\_ENERGY", then these attributes are mutually exclusive and only one of them shall be present.NOTE 21: When the "Energy" feature is supported and the value of the "monitoringType" attribute (and/or an array element of the "addnMonTypes" attribute) is set to "UE\_SNSSAI\_ENERGY", then this attribute shall be present. |

Editor's Note: The encoding of the "repTimePeriod" attribute is FFS.

\* \* \* \* 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.See also 3GPP TS 29.336 [11] clause 8.4.22 for pre-5G. | Change\_of\_IMSI\_IMEI\_association\_notification |
| externalId | ExternalId | 0..1 | Contains the 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" 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.See also 3GPP TS 29.336 [11] clause 8.4.58 for pre-5G.(NOTE 5) | 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 |
| pei | Pei | 0..1 | Contains the PEI.When the "enNB2" feature is supported and the "monitoringType" attribute is set to "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION", this attribute may be present and shall contain the new PEI.When the "RVAS\_5G" feature is supported and the "monitoringType" attribute is set to "ROAMING\_STATUS", this attribute may be present and shall contains the PEI. | enNB2, RVAS\_5G |
| reachabilityType | ReachabilityType | 0..1 | If "monitoringType" is "UE\_REACHABILITY", this parameter shall be included to identify the reachability of the UE.See also 3GPP TS 29.336 [11] clause 8.4.20 for pre-5G. | Ue-reachability\_notification |
| roamingStatus | boolean | 0..1 | If "monitoringType" is "ROAMING\_STATUS", this parameter shall be set to "true" if the new serving PLMN is different from the HPLMN. Set to false or omitted otherwise. | Roaming\_status\_notification |
| failureCause | FailureCause | 0..1 | If "monitoringType" is "COMMUNICATION\_FAILURE", this parameter shall be included to indicate the reason of communication failure. | Communication\_failure\_notification |
| eventTime | DateTime | 0..1 | Identifies when the event is detected or received.Shall be included for each group of UEs. |  |
| pdnConnInfoList | array(PdnConnectionInformation) | 0..N | If "monitoringType" is "PDN\_CONNECTIVITY\_STATUS", this parameter shall be included to indicate the PDN connection details. | Pdn\_connectivity\_status |
| dddStatus | DlDataDeliveryStatus | 0..1 | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter shall be included to identify the downlink data delivery status detected by the network. | Downlink\_data\_delivery\_status\_5G |
| dddTrafDescriptor | DddTrafficDescriptor | 0..1 | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter shall be included to identify the downlink data descriptor impacted by the downlink data delivery status change. | Downlink\_data\_delivery\_status\_5G  |
| maxWaitTime | DateTime | 0..1 | If "monitoringType" is "DOWNLINK\_DATA\_DELIVERY\_STATUS", this parameter may be included to identify the time before which the data will be buffered. | Downlink\_data\_delivery\_status\_5G |
| apiCaps | array(ApiCapabilityInfo) | 0..N | If "monitoringType" is "API\_SUPPORT\_CAPABILITY", this parameter shall be included to indicate the availability of all APIs supported by the serving network or the availability of interested APIs, indicated by the "apiNames" attribute in "MonitoringEventSubscription", supported by the serving network. If no API is supported by the serving network, an empty apiCaps shall be provided. | API\_support\_capability\_notification |
| nSStatusInfo | SACEventStatus | 0..1 | If the "monitoringType" attribute is set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS", this parameter shall be included to indicate the current network slice status information for the concerned network slice. (NOTE 3) | NSAC |
| afServiceId | string | 0..1 | Contains the identifier of the service to which the NSAC reporting is related.It shall be provided only if it is present in the related NSAC subscription request and the "monitoringType" attribute is set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS". | NSAC |
| servLevelDevId | string | 0..1 | If "monitoringType" is "AREA\_OF\_INTEREST" or "NUMBER\_OF\_UES\_IN\_AN\_AREA" and "subType" indicate "AERIAL\_UE", this parameter may be included to identify the UAV. | UAV |
| uavPresInd | boolean | 0..1 | If "monitoringType" is "AREA\_OF\_INTEREST", this parameter shall be set to true if the specified UAV is in the monitoring area. Set to false or omitted otherwise. | UAV |
| groupMembListChanges | GroupMembListChanges | 0..1 | Contains information on the change(s) to the group members list.This attribute shall be present only if the "monitoringType" attribute is set to "GROUP\_MEMBER\_LIST\_CHANGE". | GMEC |
| sessInactiveTime | DurationSec | 0..1 | The value of the session inactivity timer.This attribute shall be present only if the "monitoringType" attribute is set to "SESSION\_INACTIVITY\_TIME". | DataTransfer |
| trafficInfo | TrafficInformation | 0..1 | The value of the UL/DL data rate and/or Traffic volume.This attribute shall be present only if the "monitoringType" attribute is set to "TRAFFIC\_VOLUME” or "UL\_DL\_DATA\_RATE". | DataTransfer |
| ueStrAndFwdSatInfos | array(UeStrAndFwdSatInfo) | 0..N | If "monitoringType" attribute is "STR\_FWD\_SAT\_INFO", this parameter shall be included to indicate the UE status in Store and Forward mode. | SAT\_STRFWD\_OP |
| energyInfoData | EnergyInfo | 0..1 | Contains the Energy consumption information.This attribute shall be present only if the "monitoringType" attribute is set to "UE\_ENERGY", "PDU\_SESSION\_ENERGY", "SERVICE\_FLOW\_ENERGY" or "UE\_SNSSAI\_ENERGY". | Energy |
| 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. When the "RVAS\_5G" feature is not supported and/or the reported event within the "monitoringType" attribute is not the "ROAMING\_STATUS" event, then at least one of these attributes shall be present. When the "RVAS\_5G" feature is supported and the reported event within the "monitoringType" attribute is "ROAMING\_STATUS", then these attributes are mutually exclusive and only one of them may be present.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).NOTE 5: When the "Loss\_of\_connectivity\_notification\_5G" feature is supported, the value of the "lossOfConnectReason" attribute shall be set as defined in clause 4.4.2 of 3GPP TS 29.522 [62]. |

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

##### 5.3.2.3.20 Type: EnergyInfo

Table 5.3.2.3.20-1: Definition of type EnergyInfo

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
|  |  |  |  |  |
| energy | number | 1 | Contains the total energy consumption per data volume, expressed in units of Joules per bit. |  |

\* \* \* \* 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, enNB2 |
| ROAMING\_STATUS | The SCS/AS queries the UE's current roaming status and requests to get notified when the status changes | Roaming\_status\_notification, RVAS\_5G |
| 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 UE (i.e. 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 |
| SESSION\_INACTIVITY\_TIME | The AF requests to be notified of session inactivity time of the measured UE PDU Session. | DataTransfer |
| TRAFFIC\_VOLUME | The AF requests to be notified of traffic volume of the measured UE. | DataTransfer |
| UL\_DL\_DATA\_RATE | The AF requests to be notified of uplink and downlink data rate of the measured UE. | DataTransfer |
| UE\_ENERGY | The AF requests to be notified about the total energy consumed by a UE. | Energy |
| PDU\_SESSION\_ENERGY | The AF requests to be notified about the total energy consumed by a PDU session of a UE. | Energy |
| SERVICE\_FLOW\_ENERGY | The AF requests to be notified about the total energy consumed by an application or service data flow of an application traffic of a UE. | Energy |
| UE\_SNSSAI\_ENERGY | The AF requests to be notified about the total energy consumed by a UE in an S-NSSAI. | Energy |
| STR\_FWD\_SAT\_INFO | The SCS/AS requests to be notified of the support of Store and Forward Satellite Operation. | SAT\_STRFWD\_OP |
| 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 areaThe feature supports pre-5G (e.g. 4G) requirement. |
| 9 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 5.2.5.4. This feature requires that the Notification\_test\_event featute is also supported. |
| 10 | Notification\_test\_event | The testing of notification connection is supported according to clause 5.2.5.3. |
| 11 | Subscription\_modification | Modifications of an individual subscription resource. |
| 12 | Number\_of\_UEs\_in\_an\_area\_notification\_5G | The AF is notified the number of UEs present in a given geographic area.The feature supports the 5G requirement. This feature may only be supported in 5G. |
| 13 | Pdn\_connectivity\_status | The SCS/AS requests to be notified when the 3GPP network detects that the UE’s PDN connection is set up or torn down. |
| 14 | Downlink\_data\_delivery\_status\_5G | The AF requests to be notified when the 3GPP network detects that the downlink data delivery status is changed. The feature is not applicable to pre-5G. |
| 15 | Availability\_after\_DDN\_failure\_notification\_enhancement | The AF is notified when the UE has become available after a DDN failure and the traffic matches the packet filter provided by the AF. The feature is not applicable to pre-5G. |
| 16 | Enhanced\_param\_config | This feature supports the co-existence of multiple event configurations for target UE(s) if there are parameters affecting periodic RAU/TAU timer and/or Active Time. Supporting this feature also requires the support of feature number 1 or 2. |
| 17 | API\_support\_capability\_notification | The SCS/AS is notified of the availability of support of service APIs. This feature is only applicable in interworking SCEF+NEF scenario. |
| 18 | eLCS | This feature supports the enhanced location exposure service (e.g. location information preciser than cell level).The feature is not applicable to pre-5G (e.g. 4G). |
| 19 | NSAC | This feature controls the support of the Network Slice Admission Control (NSAC) functionalities.The feature is not applicable to pre-5G (e.g. 4G). |
| 20 | Partial\_group\_modification | This feature supports the partial cancellation and/or partial addition to the group member(s) within the grouped event monitoring subscription. |
| 21 | UAV | The SCS/AS requests to be notified of the UAV presence status in a specific geographic area. This feature is only applicable in interworking SCEF+NEF scenario, or standalone 5G scenario.This feature requires that Number\_of\_UEs\_in\_an\_area\_notification and Number\_of\_UEs\_in\_an\_area\_notification\_5G features are also supported. |
| 22 | MULTIQOS | This feature indicates the support for "Multiple QoS Class" which enables to support more than one Location QoS during LCS procedures.This feature requires that the eLCS feature is also supported. |
| 23 | Session\_Management\_Enhancement | This feature supports Session Management enhancement with requested DNN and/or S-NSSAI. This feature requires that the Pdn\_connectivity\_status feature or Downlink\_data\_delivery\_status\_5G feature is also supported. |
| 24 | enNB | Indicates the support of enhancements to the northbound interfaces. |
| 25 | EDGEAPP | This feature controls the support of EDGE applications related functionalities (e.g. support the civic address as a possible location granularity).The feature is not applicable to pre-5G (e.g. 4G). |
| 26 | UEId\_retrieval | This feature supports AF specific UE ID retrieval which is not applicable to pre-5G (e.g. 4G). |
| 27 | UserConsentRevocation | This feature indicates the support of user consent revocation management and enforcement (e.g. stop data processing) for EDGE applications. |
| 28 | Subscription\_Patch | This feature indicates the support of the PATCH method for partial modification of an existing event monitoring subscription. |
| 29 | GMEC | This feature indicates the support of Generic Group Management, Exposure and Communication Enhancements.The following functionalities are supported:- Support Group Members List Change event reporting.This feature is not applicable to pre-5G (e.g., 4G). |
| 30 | Loss\_of\_connectivity\_notification\_5G | The AF is notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication.This feature requires that the Loss\_of\_connectivity\_notification feature is also supported.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 requires the support of the "NSAC" feature.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). |
| 37 | DataTransfer | This feature indicates the support of Session inactivity time, Traffic volume and UL/DL data rate events for data transfer and measurement.This feature is not applicable to pre-5G (e.g., 4G). |
| 38 | RVAS\_5G | This feature indicates the support of the 5G Roaming Value-Added Services (RVAS).The following functionalities are supported:- Support the reporting of the equipment and subscription identifers as part of the roaming status report in order to support the RVAS Welcome SMS functionality.This feature requires the support of the "Roaming\_status\_notification" feature.This feature is not applicable to pre-5G (e.g., 4G). |
| 39 | eLCS\_en2 | This feature indicates the support of the enhancements to the eLCS feature.The following functionalities are supported:- Support the location reporting in terms of local geographical co-ordinates.This feature requires the support of "eLCS" feature.This feature is not applicable to pre-5G (e.g., 4G). |
| 40 | SAT\_STRFWD\_OP | This feature indicates the support of 5G satellite services:The following functionalities are supported:- Support the SCS/AS requests to be notified about the Store and Forward Satellite Operation. |
| 41 | enNB2 | Indicates the support of the enhancements to this northbound API in Rel-19.The following functionalities are supported:- Support to optionally provide the new PEI when reporting the "CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION" event.- Support to provide the IP domain associated with the UE's IPv4 address. |
| 42 | Energy | Indicates the support of the Energy consumption information exposure feature.The following functionalities are supported:- Support the exposure and reporting of the energy consumption information for the UE for different granularity levels.This feature is not applicable to pre-5G (e.g., 4G). |

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

##### 5.4.2.1.2 Type: Bdt

This type represents a BDT subscription. The same structure is used in the subscription request and subscription response.

Table 5.4.2.1.2-1: Definition of type Bdt

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability (NOTE 1) |
| self | Link | 0..1 | Link to the resource "Individual BDT 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. |  |
| aspId | string | 0..1 | Identifies an application service provider. | AspId\_5G |
| volumePerUE | UsageThreshold | 1 | Identifies the data volume expected to be transferred per UE. |  |
| numberOfUEs | integer | 1 | Identifies the number of UEs. |  |
| desiredTimeWindow | TimeWindow | 1 | Identifies the time interval. |  |
| locationArea | LocationArea | 0..1 | Identifies the area within which the SCS/AS requests the number of UE. | Bdt |
| locationArea5G | LocationArea5G | 0..1 | Identifies the area within which the AF requests the number of UE. | LocBdt\_5G |
| referenceId | BdtReferenceId | 0..1 | Identifies a selected policy of background data transfer. |  |
| transferPolicies | array(TransferPolicy) | 0..N | Identifies an offered transfer policy. |  |
| selectedPolicy | integer | 0..1 | Identity of the selected background data transfer policy. Shall not be present in initial message exchange, can be provided by NF service consumer in a subsequent message exchange. |  |
| externalGroupId | ExternalGroupId | 0..1 | Identifies a group of users. (NOTE 2) | Group\_Id |
| notificationDestination | Link | 0..1 | Contains the URI to receive the BDT notification from the NEF. | BdtNotification\_5G |
| warnNotifEnabled | boolean | 0..1 | Indicates whether the BDT warning notification is enabled or not.If it is set to true, the BDT warning notification is enabled; if it is set to false or absent, the BDT warning notification is disabled. | BdtNotification\_5G |
| trafficDes | TrafficDescriptor | 0..1 | Contains the traffic descriptor of the background data. (NOTE 2) |  |
| energyInd | boolean | 0..1 | Indicates whether the AF is interested in transferring data in time windows that consume lower energy.- "true" indicates that the AF is interested in transferring data in time windows that consume lower energy.- "false"(default) indicates that the AF is not interested in transferring data in time windows that consume lower energy. | Energy |
| NOTE 1: Properties marked with a feature as defined in clause 5.4.4 are applicable as described in clause 5.2.7. If no feature are indicated, the related property applies for all the features.NOTE 2: The attribute is only applicable to the NEF. |

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

##### 5.4.2.1.3 Type: BdtPatch

This type represents a BDT request for the service provided by the SCS/AS to the SCEF via T8 interface. The structure is used for PATCH request.

Table 5.4.2.1.3-1: Definition of type BdtPatch

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | Description | Applicability |
| selectedPolicy | integer | 1 | Identity of the selected background data transfer policy. |  |
| warnNotifEnabled | boolean | 0..1 | Indicates whether the BDT warning notification is enabled.- true: the BDT warning notification is enabled;- false: the BDT warning notification is not enabled. | BdtNotification\_5G |
| energyInd | boolean | 0..1 | Indicates whether the AF is interested in transferring data in time windows that consume lower energy.- "true" indicates that the AF is interested in transferring data in time windows that consume lower energy.- "false" indicates that the AF is not interested in transferring data in time windows that consume lower energy. | Energy |
| notificationDestination | Link | 0..1 | Contains the URI to receive the BDT notifications from the NEF. | enNB |

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

### 5.4.4 Used Features

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

Table 5.4.4-1: Features used by ResourceManagementOfBdt API

|  |  |  |
| --- | --- | --- |
| Feature Number | Feature | Description |
| 1 | Bdt | The feature supports the pre-5G (e.g. 4G) requirement.  |
| 2 | LocBdt\_5G | The feature supports the 5G requirement. This feature may only be supported in 5G. |
| 3 | Group\_Id | The feature supports forwarding an external group identifier of the user. This feature shall not be supported in pre-5G. |
| 4 | BdtNotification\_5G | The feature supports the sending of BDT notification. This feature includes sending of the BDT warning notification to the AF. This feature may only be supported in 5G. |
| 5 | enNB | The feature supports enhancement of northbound interfaces, e.g. enable the SCS/AS to update notification destination during modification procedure. |
| 6 | AspId\_5G | Indicates the support of application service provider.This feature is not applicable to pre-5G (e.g. 4G). |
| 7 | Energy | Indicates the support of the network energy-based BDT feature.The following functionalities are supported:- Support the provisioning of the Energy Indicator.This feature is not applicable to pre-5G (e.g., 4G). |
|  |

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

# A.3 MonitoringEvent API

openapi: 3.0.0

info:

 title: 3gpp-monitoring-event

 version: 1.4.0-alpha.4

 description: |

 API for Monitoring Event.

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 All rights reserved.

externalDocs:

 description: 3GPP TS 29.122 V19.3.0 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'

 ipDomain:

 type: string

 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'

 repTimePeriod:

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

 enrgRepThres:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 Contains the reporting thresholds of the Energy consumption information.

 The key of the map shall be set to the value of the energy monitoring type, i.e., either

 UE\_ENERGY, UE\_SNSSAI\_ENERGY, PDU\_SESSION\_ENERGY or SERVICE\_FLOW\_ENERGY, to which

 the energy reporting thresholds provided within the map value are related.

 This attribute may contain more than map element only in case several energy monitoring

 types are subscribed via the monitoringType attribute and the addnMonTypes attribute.

 If there is only a single energy monitoring type that is subscribed, then a single map

 element may be provided with its map key set to the value of the monitoringType

 attribute.

 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.

 flowDescs:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/FlowDescription'

 minItems: 1

 description: Describes the application traffic service data flows.

 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.

 See also 3GPP TS 29.336 clause 8.4.58 for pre-5G.

 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.

 pei:

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

 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'

 sessInactiveTime:

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

 trafficInfo:

 $ref: 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/TrafficInformation'

 ueStrAndFwdSatInfos:

 type: array

 items:

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

 minItems: 1

 energyInfoData:

 type: array

 items:

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

 minItems: 1

 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'

 localLocEst:

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

 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'

 UeStrAndFwdSatInfo:

 description: Contains the Store and Forward operation information for satellite access.

 type: object

 properties:

 ueStrAndFwdStatus:

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

 externalId:

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

 msisdn:

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

 estTime:

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

 fLinkAvail:

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

 required:

 - ueStrAndFwdStatus

 oneOf:

 - required: [externalId]

 - required: [msisdn]

 EnergyInfo:

 description: Contains the Energy consumption information for the UE.

 type: object

 properties:

 energy:

 format: float

 type: number

 minimum: 0

 required:

 - energy

#

# 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

 - SESSION\_INACTIVITY\_TIME

 - TRAFFIC\_VOLUME

 - UL\_DL\_DATA\_RATE

 - STR\_FWD\_SAT\_INFO

 - UE\_ENERGY

 - PDU\_SESSION\_ENERGY

 - SERVICE\_FLOW\_ENERGY

 - UE\_SNSSAI\_ENERGY

 - 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 UE(i.e. 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.

 - SESSION\_INACTIVITY\_TIME: The AF requests to be notified of session inactivity time of the

 measured UE PDU Session.

 - TRAFFIC\_VOLUME: The AF requests to be notified of traffic volume of the measured UE.

 - UL\_DL\_DATA\_RATE: The AF requests to be notified of uplink and downlink data rate of the

 measured UE.

 - STR\_FWD\_SAT\_INFO: The SCS/AS requests to be notified of the support of Store and

 Forward Satellite Operation.

 - UE\_ENERGY: The AF requests to be notified about the total energy consumed by the UE.

 - PDU\_SESSION\_ENERGY: The AF requests to be notified about the total energy consumed

 by a PDU session of a UE.

 - SERVICE\_FLOW\_ENERGY: The AF requests to be notified about the total energy consumed

 by an application or service data flow of an application traffic of a UE.

 - UE\_SNSSAI\_ENERGY: The AF requests to be notified about the total energy consumed

 by a UE in an S-NSSAI.

 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

 - INVALID\_USER\_PLANE\_ADDRESS\_INFO

 - 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.

 - INVALID\_USER\_PLANE\_ADDRESS\_INFO: The location request is rejected because the user plane

 address info provided by the AF for location reporting over user plane between the UE

 and AF is invalid.

 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.

 UeStrAndFwdStatus:

 anyOf:

 - type: string

 enum:

 - IN\_SF\_MODE

 - OUT\_OF\_SF\_MODE

 - 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 Store and Forward mode status of the UE.

 Possible values are

 - IN\_SF\_MODE: Indicates that the UE is registered in Store and Forward mode.

 - OUT\_OF\_SF\_MODE: Indicates that the UE is moving from Store and Forward mode to not

 registered in Store and Forward mode.

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

# A.4 ResourceManagementOfBdt API

openapi: 3.0.0

info:

 title: 3gpp-bdt

 version: 1.4.0-alpha.1

 description: |

 API for BDT resouce management.

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externalDocs:

 description: 3GPP TS 29.122 V19.3.0 T8 reference point for Northbound APIs

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

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/3gpp-bdt/v1'

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /{scsAsId}/subscriptions:

 parameters:

 - name: scsAsId

 description: String identifying the SCS/AS.

 in: path

 required: true

 schema:

 type: string

 get:

 summary: Fetch all active background data transfer subscription resources for a given SCS/AS.

 operationId: FetchAllActiveBDTSubscriptions

 tags:

 - BDT Subscription

 responses:

 '200':

 description: all BDT policy subscriptions.

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 description: individual BDT policy 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'

 '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 background data transfer subscription resource.

 operationId: CreateBDTSubscription

 tags:

 - BDT Subscription

 requestBody:

 description: Contains the data to create a BDT subscription.

 required: true

 content:

 application/json:

 schema:

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

 callbacks:

 bDTWarningNotification:

 '{$request.body#/notificationDestination}':

 post:

 requestBody: # contents of the callback message

 required: true

 content:

 application/json:

 schema:

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

 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: Background data transfer policies offered to the SCS/AS.

 content:

 application/json:

 schema:

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

 headers:

 Location:

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

 required: true

 schema:

 type: string

 '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'

 '409':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/409'

 '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}:

 parameters:

 - name: scsAsId

 description: String identifying the SCS/AS.

 in: path

 required: true

 schema:

 type: string

 - name: subscriptionId

 description: String identifying the individual BDT policy resource in the SCEF.

 in: path

 required: true

 schema:

 type: string

 get:

 summary: Read a background data transfer subscription resource.

 operationId: FetchIndBDTSubscription

 tags:

 - Individual BDT Subscription

 responses:

 '200':

 description: Background data transfer policies offered to and selected by the SCEF.

 content:

 application/json:

 schema:

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

 '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: Update a background data transfer subscription resource for negotiation of background data transfer policy.

 operationId: UpdateBDTSubscription

 tags:

 - Individual BDT Subscription

 requestBody:

 description: Parameters to update/replace the existing BDT subscription

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: OK (Successful update of the BDT subscription)

 content:

 application/json:

 schema:

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

 '204':

 description: No Content. The Individual BDT Subscription resource was updated 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'

 patch:

 summary: Modify a background data transfer subscription resource to select one of the transfer policies offered by the SCEF.

 operationId: ModifyBDTSubscription

 tags:

 - Individual BDT Subscription

 requestBody:

 description: Contains information to be performed on the Bdt data structure to select a transfer policy.

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: The Individual BDT Policy resource is modified with a selected policy and a representation of that resource is returned.

 content:

 application/json:

 schema:

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

 '204':

 description: The Individual BDT Policy resource is modified with a selected policy.

 '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: Delete a background data transfer resource.

 operationId: DeleteBDTSubscription

 tags:

 - Individual BDT Subscription

 responses:

 '204':

 description: The Individual BDT Policy resource is deleted.

 '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:

 Bdt:

 description: Represents a Background Data Transfer subscription.

 type: object

 properties:

 self:

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

 supportedFeatures:

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

 aspId:

 type: string

 description: Identifies an application service provider.

 volumePerUE:

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

 numberOfUEs:

 type: integer

 minimum: 1

 description: Identifies the number of UEs.

 desiredTimeWindow:

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

 locationArea:

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

 locationArea5G:

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

 referenceId:

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

 transferPolicies:

 type: array

 items:

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

 minItems: 1

 description: Identifies an offered transfer policy.

 readOnly: true

 selectedPolicy:

 type: integer

 description: >

 Identity of the selected background data transfer policy. Shall not be present in

 initial message exchange, can be provided by NF service consumer in a subsequent message

 exchange.

 externalGroupId:

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

 notificationDestination:

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

 warnNotifEnabled:

 type: boolean

 description: >

 Indicates whether the BDT warning notification is enabled (true) or not (false). Default

 value is false.

 trafficDes:

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

 energyInd:

 type: boolean

 default: false

 description: >

 Indicates whether the AF is interested in transferring data in time windows

 that consume lower energy.

 true indicates that the AF is interested in transferring data in time windows that

 consume lower energy.

 False (default) indicates that the AF is not interested in transferring data in time

 windows that consume lower energy.

 required:

 - volumePerUE

 - numberOfUEs

 - desiredTimeWindow

 BdtPatch:

 description: Represents a Background Data Transfer subscription modification request.

 type: object

 properties:

 selectedPolicy:

 type: integer

 description: Identity of the selected background data transfer policy.

 warnNotifEnabled:

 type: boolean

 description: >

 Indicates whether the BDT warning notification is enabled (true) or not (false).

 notificationDestination:

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

 required:

 - selectedPolicy

 TransferPolicy:

 description: Represents an offered transfer policy sent from the SCEF to the SCS/AS, or a selected transfer policy sent from the SCS/AS to the SCEF.

 type: object

 properties:

 bdtPolicyId:

 type: integer

 description: Identifier for the transfer policy

 maxUplinkBandwidth:

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

 maxDownlinkBandwidth:

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

 ratingGroup:

 type: integer

 minimum: 0

 description: Indicates the rating group during the time window.

 timeWindow:

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

 required:

 - bdtPolicyId

 - ratingGroup

 - timeWindow

 ExNotification:

 description: Represents a Background Data Transfer notification.

 type: object

 properties:

 bdtRefId:

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

 locationArea5G:

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

 timeWindow:

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

 candPolicies:

 type: array

 items:

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

 minItems: 1

 description: This IE indicates a list of the candidate transfer policies from which the AF may select a new transfer policy due to network performance degradation.

 required:

 - bdtRefId

 TrafficDescriptor:

 type: string

 description: Identify a traffic descriptor as defined in Figure 5.2.2 of 3GPP TS 24.526, octets v+5 to w.

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