**3GPP TSG CT WG3 Meeting #138 C3-246152**

**Orlando, US, 18 – 22 November, 2024 (revision of C3-246abc)**

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| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.591** | **CR** | **0221** | **rev** | **-** | **Current version:** | **19.0.0** |  |
|  |
| *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:***  | Support of activation time information collection |
|  |  |
| ***Source to WG:*** | Huawei, Ericsson, Nokia |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | AIML\_CN |  | ***Date:*** | 2024-10-25 |
|  |  |  |  |  |
| ***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:*** | As agreed in S2-2410976, the activation time information may be collected from the AF for signalling storm analytics. This new data collection functionality needs to be supported in stage 3. |
|  |  |
| ***Summary of change:*** | * Define new feature and event to support the activation time information collection.
* Enhance the service descriptions, data types and the OpenAPI file accordingly.
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|  |  |
| ***Consequences if not approved:*** | The stage 2 requirement is not implemented. |
|  |  |
| ***Clauses affected:*** | 4.2.1.1, 4.2.2.2.1, 4.2.2.4.2, 5.1.6.1, 5.1.6.2.4, 5.1.6.2.7, 5.1.6.3.3, 5.1.8, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 23.288 CR 1104  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces a backwards compatible feature to the OpenAPI of Nnef\_EventExposure API. |
|  |  |
| ***This CR's revision history:*** |  |

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

#### 4.2.1.1 Overview

The Nnef\_EventExposure service, as defined in 3GPP TS 23.502 [3], is provided by the Network Exposure Function (NEF). When the UE Application data is collected via the Data Collection AF, the Application Function Exposure Service, as defined in 3GPP TS 26.531 [24], 3GPP TS 26.501 [25] and 3GPP TS 26.512 [26], is provided by the Data Collection AF instantiated in the 5GMS AF for the Event Consumer AF instantiated in the 5GMS ASP.

This service:

- allows NF service consumers to subscribe to, modify and unsubscribe from application events reporting; and

- notifies NF service consumers with a corresponding subscription about observed events at the NEF.

The types of observed events applicable for the NEF include:

AF application events exposed by an AF:

- Service experience;

- UE mobility;

- UE communication;

- Exceptions;

- User Data Congestion;

- Dispersion;

- Performance Data information;

- Collective Behaviour information;

- GNSS Assistance Data information;

- Data volume transfer time information; and

- activation time information of the application(s).

UE application events exposed via the Data Collection AF:

- Media Streaming QoE metrics;

- Media Streaming Consumption reports;

- Media Streaming Network Assistance invocation;

- Media Streaming Dynamic Policy invocation; and

- Media Streaming access activity.

The target of the event reporting may include one or more UE(s), a group of UEs or any UE (i.e. all UEs). When an event to which the NF service consumer has subscribed occurs, the NEF reports the requested information to the NF service consumer based on the event reporting information definition requested by the NF service consumer.

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

##### 4.2.2.2.1 General

This service operation is used by an NF service consumer to subscribe to notifications on specified event(s) or modify an existing subscription.

The following are the types of events for which a subscription to notifications can be created by the NWDAF, the DCCF, or the MFAF as the NF service consumer:

- Service experience;

- UE mobility;

- UE communication;

- Exceptions;

- User Data Congestion;

- Dispersion;

- Performance Data information;

- Collective Behaviour information;

- Data volume transfer time information; and

- activation time information of the application(s).

The following are the types of events for which a subscription can be made by the NWDAF, DCCF, MFAF, or Event Consumer AF as the NF service consumer:

- Media Streaming QoE metrics;

The following are the types of events for which a subscription to notifications can be created by the LMF as the NF service consumer:

- GNSS Assistance Data information.

The following are the types of events for which a subscription can be made by the Event Consumer AF as the NF service consumer:

- Media Streaming Consumption reports;

- Media Streaming Network Assistance invocation;

- Media Streaming Dynamic Policy invocation; and

- Media Streaming access activity.

The following procedures using the Nnef\_EventExposure\_Subscribe service operation are supported:

- creating a new subscription;

- modifying an existing subscription.

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

##### 4.2.2.4.2 Notification about subscribed events

Figure 4.2.2.4.2-1 illustrates the notification about subscribed events.



Figure 4.2.2.4.2-1: Notification about subscribed events

If the NEF observes application related event(s) for which an NF service consumer has subscribed, the NEF shall send an HTTP POST request as shown in step 1 of figure 4.2.2.4.2-1, with the "{notifUri}" as request URI containing the value previously provided by the NF service consumer within the corresponding subscription, and the "NefEventExposureNotif" data structure.

The "NefEventExposureNotif" data structure shall include:

- notification correlation ID provided by the NF service consumer during the subscription as "notifId" attribute; and

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

- the application related event as "event" attribute;

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

- if the "event" attribute is "SVC\_EXPERIENCE", service experience information about the application involved in the reported event in the "svcExprcInfos" attribute;

- if the "event" attribute is "UE\_MOBILITY", UE mobility information assoicated with the application as "ueMobilityInfos" attribute;

- if the "event" attribute is "UE\_COMM", UE communication information assoicated with the application as "ueCommInfos" attribute;

- if the "event" attribute is "EXCEPTIONS", exceptions information associated with a service flow as "excepInfos" attribute;

- if the "event" attribute is "PERF\_DATA", Performance Data Analytics related information as "perfDataInfos" attribute;

- if the "event" attribute is "COLLECTIVE\_BEHAVIOUR", collective behaviour information associated with the UEs and its applications as "collBhvrInfs" attribute;

- if the "event" attribute is "USER\_DATA\_CONGESTION", user data congestion information collected for an AF application as "congestionInfos" attribute;

- if the "event" attribute is "DISPERSION", UE dispersion information collected for an AF as "dispersionInfos" attribute;

- if the "event" attribute is "MS\_QOE\_METRICS",

- Media Streaming QoE metrics information collected for an UE application via the Data Collection AF as "msQoeMetrInfos" attribute; This attribute is deprecated; the attribute "msQoeMetrics" should be used instead;

- if the "MSEventExposure" feature is supported, the Media Streaming QoE metrics information collected for an UE application via the Data Collection AF as "msQoeMetrics" attribute;

- if the "event" attribute is "MS\_CONSUMPTION",

- Media Streaming Consumption reports information collected for an UE application via the Data Collection AF as "msConsumpInfos" attribute; This attribute is deprecated; the attribute "msConsumpReports" should be used instead;

- if the "MSEventExposure" feature is supported, the Media Streaming Consumption reports collected for an UE application via the Data Collection AF as "msConsumpReports" attribute;

- if the "event" attribute is "MS\_NET\_ASSIST\_INVOCATION",

- Media Streaming Network Assistance invocation information collected for an UE application via the Data Collection AF as "msNetAssInvInfos" attribute; This attribute is deprecated; the attribute "msNetAssistInvocation" should be used instead;

- if the "MSEventExposure" feature is supported, the Media Streaming Network Assistance invocation collected for an UE application via the Data Collection AF as "msNetAssistInvocation" attribute;

- if the "event" attribute is "MS\_DYN\_POLICY\_INVOCATION",

- Media Streaming Dynamic Policy invocations information collected for an UE application via the Data Collection AF as "msDynPlyInvInfos" attribute; This attribute is deprecated; the attribute "msDynPlyInvocation" should be used instead;

- if the "MSEventExposure" feature is supported, the Media Streaming Dynamic Policy invocation collected for an UE application via the Data Collection AF as "msDynPlyInvocation" attribute;

- if the "event" attribute is "MS\_ACCESS\_ACTIVITY",

- Media Streaming access activity information collected for an UE application via the Data Collection AF as "msAccActInfos" attribute; This attribute is deprecated; the attribute "msAccess" should be used instead.

- if the "MSEventExposure" feature is supported, the Media Streaming access activity collected for an UE application via the Data Collection AF as "msAccess" attribute;

- if the "event" attribute is "GNSS\_ASSISTANCE\_DATA", GNSS Assistance Data information within the "gnssAssistDataInfo" attribute;

- if the "event" attribute is "DATA\_VOLUME\_TRANSFER\_TIME", data volume transfer time information assoicated with the application as "datVolTransTimeInfos" attribute; and

- if the "event" attribute is "APP\_ACTIVE\_TIME", activation time information of the application(s) as "appActiveTimeInfos" attribute.

If the NF service consumer cannot successfully fulfil the received HTTP POST request due to an internal error or an error in the HTTP POST request, the NF service consumer shall send an HTTP error response as specified in clause 5.1.7.

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

Upon successful reception of an HTTP POST request with "{notifUri}" as request URI and "NefEventExposureNotif" data structure as request body, the NF service consumer shall send an HTTP "204 No Content" response, as shown in step 2 of figure 4.2.2.4.2-1, in case of a successful processing.

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

#### 5.1.6.1 General

This clause specifies the application data model supported by the API.

Table 5.1.6.1-1 specifies the data types defined for the Nnef\_EventExposure service based interface protocol.

Table 5.1.6.1-1: Nnef\_EventExposure specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| GNSSAssistData | 5.1.6.3.2 | Represents GNSS Assistance Data. | GNSSAssistData |
| GNSSAssistDataInfo | 5.1.6.2.13 | Represents GNSS Assistance Data related information. | GNSSAssistData |
| GNSSServArea | 5.1.6.2.14 | Represents the serving area of the GNSS Assistance Data. | GNSSAssistData |
| NefEvent | 5.1.6.3.3 | Represents Network Exposure Events. |  |
| NefEventExposureNotif | 5.1.6.2.3 | Represents notifications on network exposure event(s) that occurred for an Individual Network Exposure Event Subscription resource. |  |
| NefEventExposureSubsc | 5.1.6.2.2 | Represents an Individual Network Exposure Event Subscription resource. |  |
| NefEventFilter | 5.1.6.2.7 | Represents event filter information for an event. |  |
| NefEventNotification | 5.1.6.2.4 | Represents information related to an event to be reported. |  |
| NefEventSubs | 5.1.6.2.5 | Represents an event to be subscribed and the related event filter information |  |
| PerformanceDataInfo | 5.1.6.2.12 | Contains Performance Data Analytics related information collection | PerformanceData |
| ServiceExperienceInfo | 5.1.6.2.9 | Contains service experience information associated with an application. | ServiceExperience |
| TargetUeIdentification | 5.1.6.2.8 | Identifies the UE to which the request applies. |  |
| UeCommunicationInfo | 5.1.6.2.6 | Contains UE communication information associated with an application. | UeCommunication |
| UeMobilityInfo | 5.1.6.2.10 | Contains UE mobility information associated with an application. | UeMobility |
| UeTrajectoryInfo | 5.1.6.2.11 | Contains UE trajectory information. | UeMobility |

Table 5.1.6.1-2 specifies data types re-used by the Nnef\_EventExposure service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nnef\_EventExposure service based interface.

Table 5.1.6.1-2: Nnef\_EventExposure re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AddrFqdn | 3GPP TS 29.517 [18] | IP address and/or FQDN. |  |
| AppActiveTimeInfo | 3GPP TS 29.517 [18] | Contains the activation time information of the application. | AppActiveTime |
| ApplicationId | 3GPP TS 29.571 [16] | Application identifier |  |
| CollectiveBehaviourFilter | 3GPP TS 29.517 [18] | Contains the parameter type and value pair to express the collective behaviour event filters. | CollectiveBehaviour |
| CollectiveBehaviourInfo | 3GPP TS 29.517 [18] | Contains the collective behaviour analytics information. | CollectiveBehaviour |
| CommunicationCollection | 3GPP TS 29.517 [18] | Contains communication information. | UeCommunication |
| ConsumptionReportingUnitsCollection | 3GPP TS 26.512 [30] | Represents the Media Streaming Consumption. | MSEventExposure |
| DateTime | 3GPP TS 29.571 [16] | Contains a date and a time. |  |
| DatVolTransTimeCollection | 3GPP TS 29.517 [18] | Contains data volume transfer time information. | DataVolTransferTime |
| Dnai | 3GPP TS 29.571 [16] |  |  |
| DispersionCollection | 3GPP TS 29.517 [18] | Contains dispersion collection information. | Dispersion |
| DurationSec | 3GPP TS 29.571 [16] | Indicates a period of time in units of seconds. | DataVolTransferTime |
| DynamicPolicyInvocationsCollection | 3GPP TS 26.512 [30] | Represents the Media Streaming Dynamic Policy invocation. | MSEventExposure |
| ExceptionInfo | 3GPP TS 29.517 [18] | Represents exception information for a service flow. | Exceptions |
| GeographicArea | 3GPP TS 29.572 [28] | Represents a geographic area. |  |
| GeographicalCoordinates | 3GPP TS 29.572 [28] | Represents geographical coordinates. |  |
| GroupId | 3GPP TS 29.571 [16] | Contains a Group identifier. |  |
| IpAddr | 3GPP TS 29.571 [16] | Identifies the IP address of a UE. | PerformanceData |
| MediaStreamingAccessesCollection | 3GPP TS 26.512 [30] | Represents the Media Streaming access. | MSEventExposure |
| MSAccessActivityCollection | 3GPP TS 29.517 [18] | Represents the Media Streaming access activity of UE Application collected via Data Collection AF. | MSAccessActivity |
| MsConsumptionCollection | 3GPP TS 29.517 [18] | Represents the Media Streaming Consumption reports of UE Application collected via Data Collection AF. | MSConsumption |
| MsDynPolicyInvocationCollection | 3GPP TS 29.517 [18] | Represents the Media Streaming Dynamic Policy Invocation of UE Application collected via Data Collection AF. | MSDynPolicyInvocation |
| MsQoeMetricsCollection | 3GPP TS 29.517 [18] | Represents the Media Streaming QoE Metrics of UE Application collected via Data Collection AF. | MSQoeMetrics |
| MsNetAssInvocationCollection | 3GPP TS 29.517 [18] | Represents the Media Streaming Network Assistance invocation of UE Application collected via Data Collection AF. | MSNetAssInvocation |
| NetworkAreaInfo | 3GPP TS 29.554 [21] | Represents a network area information. |  |
| NetworkAssistanceInvocationsCollection | 3GPP TS 26.512 [30] | Represents the Media Streaming Network Assistance invocation. | MSEventExposure |
| PacketDelBudget | 3GPP TS 29.571 [16] | Indicates average Packet Delay. | PerformanceData |
| PacketLossRate | 3GPP TS 29.571 [16] | Indicates average Loss Rate. | PerformanceData |
| PerformanceData | 3GPP TS 29.517 [18] | Contains Performance Data | PerformanceData |
| QoEMetricsCollection | 3GPP TS 26.512 [30] | Represents the Media Streaming QoE metrics. | MSEventExposure |
| RedirectResponse | 3GPP TS 29.571 [16] | Contains redirection related information. | ES3XX |
| ReportingInformation | 3GPP TS 29.523 [22] | Represents the type of reporting the subscription requires. |  |
| Supi | 3GPP TS 29.571 [16] | Contains a SUPI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Indicates the features supported. |  |
| ServiceExperienceInfoPerFlow | 3GPP TS 29.517 [18] | Contains service experience information associated with a service flow. | ServiceExperience |
| Tai | 3GPP TS 29.571 [16] | Represents the identifier of a tracking area. |  |
| Uinteger | 3GPP TS 29.571 [16] | Unsigned integer. | ServiceExperienceExt\_eNA |
| UserDataCongestionCollection | 3GPP TS 29.517 [18] | Contains User Data Congestion Analytics related information collection. | UserDataCongestion |
| UserLocation | 3GPP TS 29.571 [16] | Contains user location information. | UeMobility |
| Uri | 3GPP TS 29.571 [16] | Contains a URI. |  |
| Volume | 3GPP TS 29.122 [29] | Unsigned integer identifying a volume in units of bytes. | DataVolTransferTime |

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

##### 5.1.6.2.4 Type: NefEventNotification

Table 5.1.6.2.4-1: Definition of type NefEventNotification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | NefEvent | M | 1 | Represents the reported application related event. |  |
| timeStamp | DateTime | M | 1 | Time at which the event is observed. |  |
| svcExprcInfos | array(ServiceExperienceInfo) | C | 1..N | Contains the service experience information.Shall be present if the "event" attribute sets to "SVC\_EXPERIENCE" | ServiceExperience |
| ueMobilityInfos | array(UeMobilityInfo) | C | 1..N | Contains the UE mobility information.Shall be present if the "event" attribute sets to "UE\_MOBILITY" | UeMobility |
| ueCommInfos | array(UeCommunicationInfo) | C | 1..N | Contains the application communication information.Shall be present if the "event" attribute sets to "UE\_COMM" | UeCommunication |
| excepInfos | array(ExceptionInfo) | C | 1..N | Each element represents the exception information for a service flow. Shall be present if the "event" attribute sets to "EXCEPTIONS". | Exceptions |
| congestionInfos | array(UserDataCongestionCollection) | C | 1..N | Each element represents the user data congestion information for an AF application. Shall be present if the "event" attribute sets to "USER\_DATA\_CONGESTION". | UserDataCongestion |
| perfDataInfos | array(PerformanceDataInfo) | C | 1..N | Each element represents the performance data information collected for an AF application.  | PerformanceData |
| dispersionInfos | array(DispersionCollection) | C | 1..N | Each element represents the UE dispersion information collected for an AF. Shall be present if the "event" attribute sets to "DISPERSION". | Dispersion |
| collBhvrInfs | array(CollectiveBehaviourInfo) | C | 1..N | Each element represents the collective behaviour information related to a set of UEs, applications. Shall be present if the "event" attribute sets to "COLLECTIVE\_BEHAVIOUR".(NOTE) | CollectiveBehaviour |
| msQoeMetrInfos | array(MsQoeMetricsCollection) | C | 1..N | Each element represents the Media Streaming QoE metrics information collected for an UE application via the Data Collection AF. Shall be present if the "event" attribute sets to "MS\_QOE\_METRICS".This attribute is deprecated; the attribute "msQoeMetrics" should be used instead. | MSQoeMetrics |
| msQoeMetrics | array(QoEMetricsCollection) | C | 1..N | Each element represents the Media Streaming QoE metrics event notification.Shall be present if the "event" attribute sets to "MS\_QOE\_METRICS".This attribute deprecates "msQoeMetrInfos" attribute. | MSEventExposure |
| msConsumpInfos | array(MsConsumptionCollection) | C | 1..N | Each element represents the Media Streaming Consumption reports information collected for an UE application via the Data Collection AF. Shall be present if the "event" attribute sets to "MS\_CONSUMPTION".This attribute is deprecated; the attribute "msConsumpReports" should be used instead. | MSConsumption |
| msConsumpReports | array(ConsumptionReportingUnitsCollection) | C | 1..N | Each element represents the Media Streaming Consumption event notification.Shall be present if the "event" attribute sets to "MS\_CONSUMPTION".This attribute deprecates "msConsumpInfos" attribute. | MSEventExposure |
| msNetAssInvInfos | array(MsNetAssInvocationCollection) | C | 1..N | Each element represents the Media Streaming Network Assistance invocation information collected for an UE application via the Data Collection AF. Shall be present if the "event" attribute sets to "MS\_NET\_ASSIST\_INVOCATION".This attribute is deprecated; the attribute "msNetAssistInvocation" should be used instead. | MSNetAssInvocation |
| msNetAssistInvocation | array(NetworkAssistanceInvocationsCollection) | C | 1..N | Each element represents the Media Streaming Network Assistance invocation event notification.Shall be present if the "event" attribute sets to "NET\_ASSIST\_INVOCATION".This attribute deprecates "msNetAssInvInfos" attribute. | MSEventExposure |
| msDynPlyInvInfos | array(MsDynPolicyInvocationCollection) | C | 1..N | Each element represents the Media Streaming Dynamic Policy Invocation information collected for an UE application via the Data Collection AF. Shall be present if the "event" attribute sets to "MS\_DYN\_POLICY\_INVOCATION".This attribute is deprecated; the attribute "msDynPlyInvocation" should be used instead. | MSDynPolicyInvocation |
| msDynPlyInvocation | array(DynamicPolicyInvocationsCollection) | C | 1..N | Each element represents the Media Streaming Dynamic Policy invocation event notification.Shall be present if the "event" attribute sets to "MS\_DYN\_POLICY\_INVOCATION".This attribute deprecates "msDynPlyInvInfos" attribute. | MSEventExposure |
| msAccActInfos | array(MSAccessActivityCollection) | C | 1..N | Each element represents the Media Streaming access activity collected for an UE application via the Data Collection AF. Shall be present if the "event" attribute sets to "MS\_ACCESS\_ACTIVITY".This attribute is deprecated; the attribute "msAccess" should be used instead. | MSAccessActivity |
| msAccess | array(MediaStreamingAccessesCollection) | C | 1..N | Each element represents the Media Streaming access event notification.Shall be present if the "event" attribute sets to "MS\_ACCESS\_ACTIVITY".This attribute deprecates "msAccActInfos" attribute. | MSEventExposure |
| gnssAssistDataInfo | GNSSAssistDataInfo | C | 0..1 | Represents the GNSS Assistance data information.This attribute shall be present only if the "event" attribute is set to "GNSS\_ASSISTANCE\_DATA". | GNSSAssistData |
| datVolTransTimeInfos | array(DatVolTransTimeCollection) | C | 1..N | Each element represents the data volume transfer time information related to an UE. The "gpsi" attribute within the DatVolTransTimeCollection data type is not applicable.This attribute shall be present if the "event" attribute sets to "DATA\_VOLUME\_TRANSFER\_TIME". | DataVolTransferTime |
| appActiveTimeInfos | map(AppActiveTimeInfo) | C | 1..N | Each entry represents activation time information of the application. The key of the map is the "appId" attribute of the AppActiveTimeInfo data type. Shall be present if the "event" attribute sets to "APP\_ACTIVE\_TIME". | AppActiveTime |
| NOTE: The "collBhvrInfs" attribute may include the "collisionDist", "absDirs", "relDirs", "ueTrajectory" and "confidence" attributes only if the "RelativeProximity" feature is supported. |

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

##### 5.1.6.2.7 Type NefEventFilter

Table 5.1.6.2.7-1: Definition of type NefEventFilter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| tgtUe | TargetUeIdentification | M | 1 | Represents the UE information to which the request applies. | (NOTE 1) |
| appIds | array(ApplicationId) | C | 1..N | Each element indicates an application identifier.If absent, the NefEventFilter data applies to any application (i.e. all applications).(NOTE 2) | ServiceExperienceExceptionsUeCommunicationUeMobilityUserDataCongestionPerformanceDataDispersionCollectiveBehaviourMSQoeMetricsMSConsumptionMSNetAssInvocationMSDynPolicyInvocationMSAccessActivityDataVolTransferTimeAppActiveTime |
| locArea | NetworkAreaInfo | O | 0..1 | Represents an area of interest. (NOTE 3) | ServiceExperienceExceptions UeCommunicationUeMobility UserDataCongestionDispersionCollectiveBehaviourMSQoeMetricsMSConsumptionMSNetAssInvocationMSDynPolicyInvocationMSAccessActivityDataVolTransferTime |
| collAttrs | array(CollectiveBehaviourFilter) | O | 1..N | Each element indicates a collective attribute parameter type and value. (NOTE 4) | CollectiveBehaviour |
| NOTE 1: Applicability is further described in the corresponding data type. NOTE 2: For the events "EXCEPTIONS", "UE\_MOBILITY", "UE\_COMM", and "PERF\_DATA", if present, the "appIds" attribute shall include only one element.NOTE 3: For event "SVC\_EXPERIENCE", only the "tais" attribute within the NetworkAreaInfo data is applicable.NOTE 4: The attributes "collBehAttr" and "dataProcType" within this attribute may be used to indicate values of collective behaviour attributes to be matched only if the feature "ExtEventFilters" is supported. |

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

##### 5.1.6.3.3 Enumeration: NefEvent

The enumeration NefEvent represents the subscribed/notified event to be monitored. It shall comply with the provisions defined in table 5.1.6.3.3-1.

Table 5.1.6.3.3-1: Enumeration NefEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| SVC\_EXPERIENCE | Indicates that the subscribed/notified event is service experience information. | ServiceExperience |
| UE\_COMM | Indicates that the subscribed/notified event is UE communication information. | UeCommunication |
| UE\_MOBILITY | Indicates that the subscribed/notified event is UE mobility information. | UeMobility |
| EXCEPTIONS | Indicates that the subscribed/notified event is exceptions information. | Exceptions |
| USER\_DATA\_CONGESTION | Indicates that the subscribed/notified event is user data congestion analytics related information. | UserDataCongestion |
| PERF\_DATA | Indicates that the subscribed/notified event is performance data information. | PerformanceData |
| DISPERSION | Indicates that the event subscribed is dispersion information. | Dispersion |
| COLLECTIVE\_BEHAVIOUR | Indicates that the subscribed/notified event is collective behaviour information.If the "RelativeProximity" feature is supported, this event is also applicable for relative proximity data collection. | CollectiveBehaviourRelativeProximity |
| MS\_QOE\_METRICS | Indicates that the subscribed/notified event is Media Streaming QoE metrics. | MSQoeMetrics |
| MS\_CONSUMPTION | Indicates that the subscribed/notified event is Media Streaming Consumption reports. | MSConsumption |
| MS\_NET\_ASSIST\_INVOCATION | Indicates that the subscribed/notified event is Media Streaming Network Assistance invocation. | MSNetAssInvocation |
| MS\_DYN\_POLICY\_INVOCATION | Indicates that the subscribed/notified event is Media Streaming Dynamic Policy invocation. | MSDynPolicyInvocation |
| MS\_ACCESS\_ACTIVITY | Indicates that the subscribed/notified event is Media Streaming access activity. | MSAccessActivity |
| GNSS\_ASSISTANCE\_DATA | Indicates that the subscribed/notified event is GNSS Assistance Data Collection. | GNSSAssistData |
| DATA\_VOLUME\_TRANSFER\_TIME | Indicates that the event subscribed is data volume transfer time information. | DataVolTransferTime |
| APP\_ACTIVE\_TIME | Indicates that the event subscribed is application activation time information. | AppActiveTime |

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

### 5.1.8 Feature negotiation

The optional features in table 5.1.8-1 are defined for the Nnef\_EventExposure API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 5.1.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | ServiceExperience | This feature indicates support for the "SVC\_EXPERIENCE" event. |
| 2 | UeMobility | This feature indicates support for the "UE\_MOBILITY" event. |
| 3 | UeCommunication | This feature indicates support for the "UE\_COMM" event. |
| 4 | Exceptions | This feature indicates support for the "EXCEPTIONS" event. |
| 5 | ES3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation, according to Stateless NF procedures as specified in clauses 6.5.3.2 and 6.5.3.3 of 3GPP TS 29.500 [4] and according to HTTP redirection principles for indirect communication, as specified in clause 6.10.9 of 3GPP TS 29.500 [4]. |
| 6 | EneNA | This feature indicates support for the enhancements of network data analytics requirements. |
| 7 | UserDataCongestion | This feature indicates support for the event related to User Data Congestion Analytics related information. |
| 8 | PerformanceData | This feature indicates support for the event related to performance data information. |
| 9 | Dispersion | This feature indicates support for the event related to Dispersion Analytics related information. |
| 10 | CollectiveBehaviour | This feature indicates support of collective behaviour information associated with the UEs and its applications. |
| 11 | MSQoeMetrics | This feature indicates support for the event related to Media Streaming QoE metrics for UE Application collected via the Data Collection AF. |
| 12 | MSConsumption | This feature indicates support for the event related to Media Streaming Consumption reports for UE Application collected via the Data Collection AF. |
| 13 | MSNetAssInvocation | This feature indicates support for the event related to Media Streaming Network Assistance invocation for UE Application collected via the Data Collection AF. |
| 14 | MSDynPolicyInvocation | This feature indicates support for the event related to Media Streaming Dynamic Policy invocation for UE Application collected via the Data Collection AF. |
| 15 | MSAccessActivity | This feature indicates support for the event related to Media Streaming access activity for UE Application collected via the Data Collection AF. |
| 16 | DataAccProfileId | This feature indicates support for Data Access Profile Identifier. |
| 17 | GNSSAssistData | This feature indicates the support of the GNSS Assistance Data Collection functionality as part of the enhancements to the 5G LCS functionality.The following functionalities are supported:- GNSS Assistance Data Collection. |
| 18 | UeMobility\_Ext | This feature indicates support for further extensions to the event related to UE mobility supporting AIML including support of list of application service area collection. Supporting this feature also requires the support of feature UeMobility. |
| 19 | PerformanceDataExt\_AIML | This feature indicates the support for the extensions of the analytics related to DN performance supporting AIML, including support of Max/Min UL/DL data collection on packet delay, pack loss and throughput. Supporting this feature also requires the support of feature PerformanceData. |
| 20 | ServiceExperienceExt\_eNA | This feature indicates support for the extensions to service experience supporting eNA, including Service Experience Contribution Weights. Supporting this feature also requires the support of feature ServiceExperience. |
| 21 | EnPerformanceData | This feature indicates support for the enhancements of performance data. It requires the support of the PerformanceData feature. |
| 22 | EnhDataMgmt | Indicates the support of enhanced data management mechanisms. Supporting this feature also requires the support of feature EneNA. |
| 23 | ExtEventFilters | Indicates supported of extended AF event filters. |
| 24 | DataVolTransferTime | This feature indicates support for the event related to data volume transfer time. |
| 25 | MSEventExposure | This feature indicates the support for Media Streaming event exposure.This feature is recommended to be implemented to avoid the usage of the deprecated attributes. |
| 26 | PerEventRepReq | This feature indicates the support of the per-event reporting requirements management functionality.The following functionalities are supported:- Provisioning/updating the reporting requirements on a per subscribed event granularity. |
| 27 | RelativeProximity | This feature indicates the support of providing confidence information of the relative proximity data. Supporting this feature requires the support of the CollectiveBehaviour feature. |
| 28 | AppActiveTime | This feature indicates the support for the application activation time data collection functionality. |

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

# A.2 Nnef\_EventExposure API

openapi: 3.0.0

info:

 title: Nnef\_EventExposure

 version: 1.3.0

 description: |

 NEF Event Exposure Service.

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externalDocs:

 description: >

 3GPP TS 29.591 V18.6.0; 5G System; Network Exposure Function Southbound Services; Stage 3.

 url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.591/

servers:

 - url: '{apiRoot}/nnef-eventexposure/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

 - {}

 - oAuth2ClientCredentials:

 - nnef-eventexposure

paths:

 /subscriptions:

 post:

 summary: subscribe to notifications

 operationId: CreateIndividualSubcription

 tags:

 - Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Success

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: >

 Contains the URI of the newly created resource, according to the structure

 {apiRoot}/nnef-eventexposure/<apiVersion>/subscriptions/{subscriptionId}

 required: true

 schema:

 type: string

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 myNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content, Notification was succesfull

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /subscriptions/{subscriptionId}:

 get:

 summary: retrieve subscription

 operationId: GetIndividualSubcription

 tags:

 - IndividualSubscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: Event Subscription ID

 required: true

 schema:

 type: string

 - name: supp-feat

 in: query

 description: Features supported by the NF service consumer

 required: false

 schema:

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

 responses:

 '200':

 description: OK. Resource representation is returned

 content:

 application/json:

 schema:

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

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 put:

 summary: update subscription

 operationId: ReplaceIndividualSubcription

 tags:

 - IndividualSubscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

 description: Event Subscription ID

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Resource was succesfully modified and representation is returned

 content:

 application/json:

 schema:

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

 '204':

 description: No Content. Resource was succesfully modified

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 delete:

 summary: unsubscribe from notifications

 operationId: DeleteIndividualSubcription

 tags:

 - IndividualSubscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: Event Subscription ID

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. Resource was succesfully deleted

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnef-eventexposure: Access to the Nnef\_EventExposure API

 schemas:

 NefEventExposureSubsc:

 description: Represents an Individual Network Exposure Event Subscription resource.

 type: object

 properties:

 dataAccProfId:

 type: string

 eventsSubs:

 type: array

 items:

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

 minItems: 1

 eventsRepInfo:

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

 notifUri:

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

 notifId:

 type: string

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 suppFeat:

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

 required:

 - eventsSubs

 - notifId

 - notifUri

 NefEventExposureNotif:

 description: >

 Represents notifications on network exposure event(s) that occurred for an Individual Network

 Exposure Event Subscription resource.

 type: object

 properties:

 notifId:

 type: string

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 required:

 - notifId

 - eventNotifs

 NefEventNotification:

 description: Represents information related to an event to be reported.

 type: object

 properties:

 event:

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

 timeStamp:

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

 svcExprcInfos:

 type: array

 items:

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

 minItems: 1

 ueMobilityInfos:

 type: array

 items:

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

 minItems: 1

 ueCommInfos:

 type: array

 items:

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

 minItems: 1

 excepInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/ExceptionInfo'

 minItems: 1

 congestionInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/UserDataCongestionCollection'

 minItems: 1

 perfDataInfos:

 type: array

 items:

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

 minItems: 1

 dispersionInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/DispersionCollection'

 minItems: 1

 collBhvrInfs:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/CollectiveBehaviourInfo'

 minItems: 1

 msQoeMetrInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/MsQoeMetricsCollection'

 minItems: 1

 deprecated: true

 msQoeMetrics:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/QoEMetricsCollection'

 minItems: 1

 description: Represents the Media Streaming QoE metrics event notification.

 msConsumpInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/MsConsumptionCollection'

 minItems: 1

 deprecated: true

 msConsumpReports:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/ConsumptionReportingUnitsCollection'

 minItems: 1

 description: Represents the Media Streaming Consumption event notification.

 msNetAssInvInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/MsNetAssInvocationCollection'

 minItems: 1

 deprecated: true

 msNetAssistInvocation:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/NetworkAssistanceInvocationsCollection'

 minItems: 1

 description: >

 Represents the Media Streaming Network Assistance Invocations event notification.

 msDynPlyInvInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/MsDynPolicyInvocationCollection'

 minItems: 1

 deprecated: true

 msDynPlyInvocation:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/DynamicPolicyInvocationsCollection'

 minItems: 1

 description: Represents the Media Streaming Dynamic Policy Invocations event notification.

 msAccActInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/MSAccessActivityCollection'

 minItems: 1

 deprecated: true

 msAccess:

 type: array

 items:

 $ref: 'TS26512\_EventExposure.yaml#/components/schemas/MediaStreamingAccessesCollection'

 minItems: 1

 description: Represents the Media Streaming access event notification.

 gnssAssistDataInfo:

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

 datVolTransTimeInfos:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/DatVolTransTimeCollection'

 minItems: 1

 appActiveTimeInfos:

 type: object

 additionalProperties:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/AppActiveTimeInfo'

 minProperties: 1

 required:

 - event

 - timeStamp

 NefEventSubs:

 description: Represents an event to be subscribed and the related event filter information.

 type: object

 properties:

 event:

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

 eventFilter:

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

 eventRepInfo:

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

 required:

 - event

 NefEventFilter:

 description: Represents event filter information for an event.

 type: object

 properties:

 tgtUe:

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

 appIds:

 type: array

 items:

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

 minItems: 1

 locArea:

 $ref: 'TS29554\_Npcf\_BDTPolicyControl.yaml#/components/schemas/NetworkAreaInfo'

 collAttrs:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/CollectiveBehaviourFilter'

 minItems: 1

 required:

 - tgtUe

 TargetUeIdentification:

 description: Identifies the UE to which the request applies.

 type: object

 properties:

 supis:

 type: array

 items:

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

 minItems: 1

 interGroupIds:

 type: array

 items:

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

 minItems: 1

 anyUeId:

 type: boolean

 ueIpAddr:

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

 ServiceExperienceInfo:

 description: Contains service experience information associated with an application.

 type: object

 properties:

 appId:

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

 supis:

 type: array

 items:

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

 minItems: 1

 svcExpPerFlows:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/ServiceExperienceInfoPerFlow'

 minItems: 1

 contrWeights:

 type: array

 items:

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

 minItems: 1

 required:

 - svcExpPerFlows

 UeMobilityInfo:

 description: >

 Contains UE mobility information associated with an application. If the "appId" attribute is

 not present, then indicates the collected UE mobility information is applicable to all the

 applications for the UE.

 type: object

 properties:

 supi:

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

 appId:

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

 ueTrajs:

 type: array

 items:

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

 minItems: 1

 areas:

 type: array

 items:

 $ref: 'TS29554\_Npcf\_BDTPolicyControl.yaml#/components/schemas/NetworkAreaInfo'

 minItems: 1

 required:

 - supi

 - ueTrajs

 UeCommunicationInfo:

 description: Contains UE communication information associated with an application.

 type: object

 properties:

 supi:

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

 interGroupId:

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

 appId:

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

 comms:

 type: array

 items:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/CommunicationCollection'

 minItems: 1

 required:

 - comms

 UeTrajectoryInfo:

 description: Contains UE trajectory information.

 type: object

 properties:

 ts:

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

 location:

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

 required:

 - ts

 - location

 PerformanceDataInfo:

 description: Contains Performance Data Analytics related information collection.

 type: object

 properties:

 appId:

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

 ueIpAddr:

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

 ipTrafficFilter:

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

 userLoc:

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

 appLocs:

 type: array

 items:

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

 minItems: 1

 asAddr:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/AddrFqdn'

 perfData:

 $ref: 'TS29517\_Naf\_EventExposure.yaml#/components/schemas/PerformanceData'

 timeStamp:

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

 required:

 - perfData

 - timeStamp

 GNSSAssistDataInfo:

 description: Represents GNSS Assistance Data related information.

 type: object

 properties:

 gnssAssistData:

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

 servArea:

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

 sourceInfo:

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

 required:

 - gnssAssistData

 - servArea

 GNSSServArea:

 description: Represents the serving area of the GNSS Assistance Data.

 type: object

 properties:

 geographicalArea:

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

 taiList:

 type: array

 items:

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

 minItems: 1

 oneOf:

 - required: [geographicalArea]

 - required: [taiList]

# Simple data types and Enumerations

 NefEvent:

 anyOf:

 - type: string

 enum:

 - SVC\_EXPERIENCE

 - UE\_MOBILITY

 - UE\_COMM

 - EXCEPTIONS

 - USER\_DATA\_CONGESTION

 - PERF\_DATA

 - DISPERSION

 - COLLECTIVE\_BEHAVIOUR

 - MS\_QOE\_METRICS

 - MS\_CONSUMPTION

 - MS\_NET\_ASSIST\_INVOCATION

 - MS\_DYN\_POLICY\_INVOCATION

 - MS\_ACCESS\_ACTIVITY

 - GNSS\_ASSISTANCE\_DATA

 - DATA\_VOLUME\_TRANSFER\_TIME

 - APP\_ACTIVE\_TIME - 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 Network Exposure Event.

 Possible values are:

 - SVC\_EXPERIENCE: Indicates that the subscribed/notified event is service experience

 information for an application.

 - UE\_MOBILITY: Indicates that the subscribed/notified event is UE mobility information.

 - UE\_COMM: Indicates that the subscribed/notified event is UE communication information.

 - EXCEPTIONS: Indicates that the subscribed/notified event is exceptions information.

 - USER\_DATA\_CONGESTION: Indicates that the subscribed/notified event is user data congestion

 analytics related information.

 - PERF\_DATA: Indicates that the subscribed/notified event is performance data information.

 - DISPERSION: Indicates that the subscribed/notified event is dispersion information.

 - COLLECTIVE\_BEHAVIOUR: Indicates that the subscribed/notified event is collective behaviour

 information.

 - MS\_QOE\_METRICS: Indicates that the subscribed/notified event is Media Streaming QoE

 metrics.

 - MS\_CONSUMPTION: Indicates that the subscribed/notified event is Media Streaming

 consumption reports.

 - MS\_NET\_ASSIST\_INVOCATION: Indicates that the subscribed/notified event is Media Streaming

 network assistance invocation.

 - MS\_DYN\_POLICY\_INVOCATION: Indicates that the subscribed/notified event is Media Streaming

 dynamic policy invocation.

 - MS\_ACCESS\_ACTIVITY: Indicates that the subscribed/notified event is Media Streaming access

 activity.

 - GNSS\_ASSISTANCE\_DATA: Indicates that the subscribed/notified event is GNSS Assistance Data

 Collection.

 - DATA\_VOLUME\_TRANSFER\_TIME: Indicates that the event subscribed is data volume transfer

 time information.

 - APP\_ACTIVE\_TIME: Indicates that the event subscribed is application activation time

 information.

 GNSSAssistData:

 type: string

 description: >

 Represents GNSS Assistance Data encoded as specified in clause 6.5.2.1 of

 3GPP TS 37.355 [31].

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