**3GPP TSG- Meeting #102 *SP-231229***

**, United Kingdom, 12th–15th December 2023** revision of S4-231663

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **4** | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** |  | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | | 2023-11-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The technical specification does not currently define data types for event exposure and TS 29.517 has referenced some internal data types which are not fit for purpose. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Refactoring of R4 *MediaStreamingAccessRecord* (clauses 17.2 and C.5.1) to enable reuse of common properties for exposure of of events at reference points R5/R6. 2. Definition of abstract *BaseEventCollection* and *BaseEventRecord* (clauses 18.1 and C.6). 3. Definition of event collection and event types for each of five media streaming exposed event types (clauses 18.2–18.6 and C.6). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Event exposure feature of 5G Media Streaming is incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 6.4.2, 6.4.3.10 (new), 6.4.3.11 (new), 6.4.3.12 (new), 6.4.3.13 (new), 17, 17.1, 17.2, 18, 18.1 (new), 18.2 (new), 18.3 (new), 18.4 (new), 18.5 (new), 18.6 (new), 18.7 (new), C.2, C.5.1, C.6 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 26.512 CR0040  TS 26.532 CR0004  TS 29.517 CR0125  TS 29.591 CR0169 | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | CRs dependent on this one are explicitly listed above. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | CR0041r1 [S4-231162]: Resubmitted for WG endorsement.  CR0041r2 [S4-231465]:   * Migrated *MediaStreamingAccess* into common data types to enable reuse for event exposure.   CR0041r3 [S4-231633]:   * Rebaselined clause C.2 against V17.6.0 incorporating changes from CR0037r2 approved at SA#101. * Added explicit reference to NEF southbound exposure in TS 29.591. * Renamed *MediaStreamingSessionId* type to *MediaDeliverySessionId* in preparation for porting to TS 26.510 in next meeting cycle.   CR0041r4 [SP-231229]:   * Changed YAML representation of enumerated types in clasue C.6 (which fixes missing comma error). | | | | | | | | |

First change

# 2 References

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

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[52] IETF draft-bhutton-json-schema-validation: "JSON Schema Validation: A Vocabulary for Structural Validation of JSON", June 2022.

[53] IETF RFC 3339: "Date and Time on the Internet: Timestamps", July 2002.

[54] 3GPP 29.591: "Network Exposure Function Southbound Services; Stage 3".

Next change

### 6.4.2 Simple data types

Table 6.4.2-1 below specifies common simple data types used within the 5GMS APIs, including a short description of each. In cases where types from other specifications are reused, a reference is provided.

Table 6.4.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type name | Type definition | Description | Reference |
| ResourceId | string | String chosen by the 5GMS AF to serve as an identifier in a resource URL. | Clause C.2. |
| Uri | string | Uniform Resource Identifier conforming with the URI Generic Syntax. | TS 29.571 [12] table 5.2.2‑1 |
| Url | string | Uniform Resource Locator, conforming with the URI Generic Syntax. | IETF RFC 3986 [41] |
| Percentage | number | A percentage expressed as a floating point value between 0.0 and 100.0 (inclusive). | Clause C.2. |
| Duration | string | A period of time expressed as a string compliant with the duration format specified in section 7.3.1 of the JSON Schema specification [52]. | Clause C.2.  IETF RFC 3339 [53] appendix A. |
| DurationSec | integer | An unsigned integer identifying a period of time expressed in units of seconds. | TS 29.571 [12] table 5.2.2‑1 |
| DateTime | string | An absolute date and time expressed using the OpenAPI date-time string format. | TS 29.571 [12] table 5.2.2‑1 |
| IPv4Addr | string | IPv4 address formatted in "dotted decimal" notation. | TS 29.571 [12] table 5.2.2‑1. |
| IPv6Addr | string | IPv6 address formatted in colon-separated hexadecimal quartet notation. | TS 29.571 [12] table 5.2.2‑1. |
| Uinteger | integer | Unsigned integer. | TS 29.571 [12] table 5.2.2‑1. |
| Dnn | string | Data Network Name. | TS 29.571 [12] table 5.2.2‑1. |
| BitRate | string | A bit rate expressed as a string-encoded decimal value and unit. | TS 29.571 [12]  table 5.2.2‑1. |
| Media‌Delivery‌Session‌Id | string | A unique identifier for a media delivery session.  This should not contain any user-identifiable data. | Clause C.2. |

Next change

#### 6.4.3.10 MediaStreamingSessionIdentification type

This data type is intended to be used as a building block in other data types.

Table 6.4.3.10‑1: Definition of MediaStreamingSessionIdentification type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| sessionId | Media‌Delivery‌Session‌Id | 1..1 | An identifier for a media streaming session.  This should not contain any user-identifiable data. |

Next change

#### 6.4.3.11 MediaStreamingAccess type

This data type is intended to be used as a building block in other data types.

Table 6.4.3.11‑1: Definition of MediaStreamingAccess type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| mediaStreamHandler‌EndpointAddress | Endpoint‌Address | 1..1 | The endpoint address of the Media Stream Handler accessing the 5GMS AS. (See clause 6.4.3.8.) |
| applicationServer‌EndpointAddress | Endpoint‌Address | 1..1 | The service endpoint on the 5GMS AS to which the Media Stream Handler is connected. (See clause 6.4.3.8.) |
| requestMessage | Object | 1..1 | Details of the HTTP request message submitted to the 5GMS AS by the Media Stream Handler for this media access. |
| method | string | 1..1 | The request method. |
| url | Absolute‌Url | 1..1 | The request URL. (See table 6.4.2‑1.) |
| protocolVersion | string | 1..1 | The HTTP protocol version, e.g., "HTTP/1.1". |
| range | string | 0..1 | The value of the Range request header, if present. |
| size | Uinteger | 1..1 | The total number of bytes in the request message. |
| bodySize | Uinteger | 1..1 | The number of bytes supplied by the Media Stream Handler in the HTTP request message body.  Zero if there is no request body. |
| contentType | string | 0..1 | The MIME content type of the request message, if any. |
| userAgent | string | 0..1 | A string describing the requesting Media Stream Handler, if it supplies a User-Agent request header. |
| userIdentity | String | 0..1 | A string identifying the user that made the access, if supplied. |
| referer | Absolute‌Url | 0..1 | The URL that the Media Player reports being referred from, if the Referer request header is supplied. (See table 6.4.2‑1.) |
| cacheStatus | Cache‌Status | 0..1 | An indication of whether the 5GMS AS is able to serve an object corresponding to requestMessage,url from cache (HIT) or whether there is a stale object cached (EXPIRED) or the requested object is not present in cache (MISS). (See table 6.4.4.4.)  For non-caching implementations of the 5GMS AS, the property shall be omitted. |
| responseMessage | Object | 1..1 | Details of the HTTP response message returned by the 5GMS AS to the Media Stream Handler for this media access. |
| responseCode | Uinteger | 1..1 | The HTTP response code. |
| size | Uinteger | 1..1 | The total number of bytes in the response message. |
| bodySize | Uinteger | 1..1 | The number of bytes in the HTTP response message body. |
| contentType | string | 0..1 | The MIME content type of response message, if any. |
| processingLatency | Float | 1..1 | The time, expressed in milliseconds, taken by the 5GMS AS to respond to the Media Stream Handler request, measured from the first byte of the HTTP request being processed by the 5GMS AS to the last byte of the response being sent. |
| connectionMetrics | Object | 0..1 | Metrics about the performance of the transport connection underlying the HTTP session serving this media access. |
| meanNetwork‌RoundTripTime | Float | 1..1 | A rolling mean average, expressed in milliseconds, of the network round-trip time for the HTTP session. |
| networkRoundTrip‌Time‌Variation | Float | 1..1 | The variation in meanNetwork‌RoundTripTime, expressed in milliseconds, during the averaging period. |
| congestion‌Window‌Size | Uinteger | 1..1 | The current size (in bytes) of the congestion window for the transport connection underlying the HTTP session. |

Next change

#### 6.4.3.12 NetworkAssistanceInvocation type

This data type is intended to be used as a building block in other data types.

Table 6.4.3.11‑1: Definition of NetworkAssistanceInvocation type

| Property name | | Data Type | Cardinality | Description |
| --- | --- | --- | --- | --- |
| policy‌Template‌Id | | ResourceId | 0..1 | Identifying the Policy Template (if any) referenced by the Media Session Handler in the parent Network Assistance Session. |
| service‌Data‌Flow‌Descriptions | | array(‌Service‌Data‌Flow‌Description) | 0..1 | If present, a set of one or more Service Data Flow Descriptions (see clause 6.4.3.1) to which the Network Assistance session has been applied.  Present only for individual data samples and, in exposed events, only when exposure is permitted by the data exposure restrictions in force. |
| requested‌QoS | | Unidirectional‌QoS‌Specification | 0..1 | The network QoS parameters (if any) requested by the Media Session Handler from the 5GMS AF in the parent Network Assistance Session or from the RAN (see clause 6.4.3.13). |
| recommended‌QoS | | object | 0..1 | The network QoS parameters (if any) recommended to the Media Session Handler by the 5GMS AF in the parent Network Assistance Session or by the RAN. |
|  | maximum‌BitRate | BitRate | 1..1 | The maximum recommended bit rate. |
|  | minimum‌BitRate | BitRate | 1..1 | The minimum recommended bit rate. |

Next change

#### 6.4.3.13 UnidirectionalQoSSpecification data type

The UnidirectionalQoSSpecification data type describes a network Quality of Service specification for media streaming in one direction.

Table 6.4.3.13‑1: Definition of UnidirectionalQoSSpecification data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| maximum‌Requested‌BitRate | BitRate | 1..1 | The maximum requested bit rate. |
| minimum‌Desired‌BitRate | BitRate | 0..1 | The minimum desired bit rate. |
| minimum‌Requested‌BitRate | BitRate | 1..1 | The minimum requested bit rate. |
| desired‌Packet‌Latency | integer | 0..1 | The desired packet latency. |
| desired‌Packet‌Loss‌Rate | integer | 0..1 | The desired packet loss rate. |

Next change

# 17 Media Streaming data reporting at R4

## 17.1 General

The following record types shall be used with the Ndcaf\_DataReporting\_Report service operation specified in clause 7.2.3.4.1 of TS 26.532 [47]. In each case, one or more records are included in a DataReport, as specified in clause 7.3.3.2.1 of [47].

The OpenAPI definitions of the record types are found in clause C.5.1 of the present document.

## 17.2 MediaStreamingAccessRecord type

As specified in clause 4.11.3, the MediaStreamingAccessRecord type shall be used by the 5GMS AS to report media streaming access. This data type is defined in clause C.5.1 as the combination of:

- BaseRecord, as defined in clause B.4 of TS 26.532 [49], which provides a record timestamp for the data report.

- MediaStreamingSessionIdentification, as defined in clause 6.4.3.10 of the present document.

If a media streaming session identifier is not explicitly provided by the 5GMS Client at reference point M4, the 5GMS AS may instead synthesise a value for the sessionId property, for example a one-way hash of the transport connection identifier (if available from the underlying transport protocol) or a one-way hash of the 5-tuple formed from the Media Stream Handler and 5GMSd AS endpoint addresses and a transport protocol identifier, combined with a randomly chosen salt to prevent reverse engineering of the original values.

- MediaStreamingAccess, as defined in clause 6.4.3.11 of the present document. These properties shall be populated by the 5GMS AS.



Next change

# 18 Event exposure at R5 and R6

## 18.1 General

The Naf\_EventExposure service specified in TS 29.517 [46] shall be used by event consumers to subscribe to the following types of 5G Media Streaming event notifications, identified by their respective Event IDs, from the Data Collection AF instantiated in the 5GMS AF, and subsequently to receive such notifications in the form of AfEventNotification objects as specified in table 5.6.2.6‑1 of [46] and as further specified in this clause:

1. Media Streaming QoE Event notifications, as specified in clause 18.3, comprising

a) 3GPP-defined QoE metrics information, and

b) non-3GPP-defined QoE metrics information.

2. Media Streaming Consumption Event notifications, as specified in clause 18.4.

3. Media Streaming Network Assistance Invocation Event notifications, as specified in clause 18.5.

4. Media Streaming Dynamic Policy Invocation Event notifications, as specified in clause 18.6.

5. Media Streaming Access Event notifications, as specified in clause 18.7.

OpenAPI data types for these event notifications are found in clause C.6.

In this release, eligible event consumer subscribers to the Naf\_EventExposure service as specified in [46] are the following:

- The NWDAF defined in TS 23.288 [47].

- The Event Consumer AF defined in TS 26.531 [46] when it is deployed in the Trusted DN.

- The NEF defined in TS 23.501 [2] when it is used to expose the Naf\_EventExposure service to functions outside the Trusted DN via the Nnef\_EventExposure service defined in TS 23.502 [45] and specified in TS 29.591 [54].

Implementations of the Data Collection AF instantiated the 5GMS AF shall support negotiation of the optional features relating to 5G Media Streaming specified in table 5.8‑1 of TS 29.517 [46]. Feature negotiation by event consumers is achieved as specified in clause 5.8 of [46].

## 18.2 Common data types for event exposure

### 18.2.1 BaseEventCollection data type

BaseEventCollection is an abstract base data type for describing a collection of media streaming event records. It is combined with other collection data types to form concrete collections. As such, this data type shall not be exposed by the Data Collection AF instantiated in the 5GMS AF.

Table 18.2.1‑1: BaseEventCollection data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| collectionTimestamp | DateTime | 1..1 | The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers. |
| startTimestamp | DateTime | 1..1 | Date–time of earliest data sample included in or summarised by this collection. |
| endTimestamp | DateTime | 1..1 | Date–time of latest data sample included in or summarised by this collection. |
| sampleCount | integer | 1..1 | The number of data samples included in or summarised by this collection. |
| streamingDirection | Provisioning‌Session‌Type | 1..1 | Indicates whether the collection concerns a downlink media streaming session or an uplink media streaming session. |
| summarisations | array(Data‌Aggregation‌Function‌Type) | 1..1 | A set of one or more data aggregation functions (see TS 26.532 [49]) that have been applied to the UE data to produce summary records present in this collection. |
| records | array() | 1..1 | A set of zero or more records, the type of which is specified in subsequent clauses.  Empty when the summarisations property indicates that this collection describes only a count of UE data samples. |

### 18.2.2 BaseEventRecord data type

BaseEventRecord data type is an abstract base data type for describing a single UE data record or summarising a summarising a set of UE data records. It is combined with other collection data types to form concrete collections. As such, this data type shall not be exposed by the Data Collection AF instantiated in the 5GMS AF.

Table 18.2.2‑1: BaseEventRecord data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| recordType | Event‌Record‌Type | 1..1 | The type of this record. See table 18.2.2‑2. |
| recordTimestamp | DateTime | 1..1 | Date–time at which the UE data carried in this record was sampled or summarised. |
| provisioningSessionId | Resource‌Id | 0..1 | The identifier of the Provisioning Session to which this record pertains.  Present only for individual data sample recordType. |
| session‌Id | Media‌Delivery‌SessionId | 0..1 | A value that uniquely identifies the media streaming session to which this record pertains.  Present only for individual data sample recordType. |
| ueIdentification | string | 0..1 | GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force for the event type in question. |
| dataNetworkName | Dnn | 0..1 | Identifying the Data Network of the M4 media streaming session.  Present only for individual data sample recordType. |
| sliceId | Snssai | 0..1 | The S-NSSAI identifying the Network Slice of the M4 media streaming session.  Present only for individual data sample recordType. |
| ueLocations | array(LocationArea5G) | 0..1 | The location(s) of the UE when the data described by this record was sampled.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force for the event in question. |

Table 18.2.2‑2: EventRecordType enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| INDIVIDUAL\_SAMPLE | The event record is an individual UE data sample. |
| SUMMARY\_MEAN | The event record summarises the mean average value over the period indicated by the parent collection. |
| SUMMARY\_MINIMUM | The event record summarises the minimum value over the period indicated by the parent collection. |
| SUMMARY\_MAXIMUM | The event record summarises the maximum value over the period indicated by the parent collection. |
| SUMMARY\_SUM | The event record summarises the sum over the period indicated by the parent collection. |

### 18.2.3 UnidirectionalQoSSpecification data type

The UnidirectionalQoSSpecification data type describes a network Quality of Service specification for media streaming in one direction.

Table 18.1.3‑1: UnidirectionalQoSSpecification data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| maximum‌Requested‌BitRate | BitRate | 1..1 | The maximum requested bit rate. |
| minimum‌Desired‌BitRate | BitRate | 0..1 | The minimum desired bit rate. |
| minimum‌Requested‌BitRate | BitRate | 1..1 | The minimum requested bit rate. |
| desired‌Packet‌Latency | integer | 0..1 | The desired packet latency. |
| desired‌Packet‌Loss‌Rate | integer | 0..1 | The desired packet loss rate. |

## 18.3 QoE metrics event notifications

### 18.3.1 QoEMetricsCollection data type

QoEMetricsCollection is a concrete data type describing a collection of QoE Metrics Event records.

Table 18.3.1‑1: QoEMetricsCollection data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| collectionTimestamp | DateTime | 1..1 | The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers. |
| startTimestamp | DateTime | 1..1 | Date–time of earliest QoE metrics report included in or summarised by this collection. |
| endTimestamp | DateTime | 1..1 | Date–time of latest QoE metrics report included in or summarised by this collection. |
| sampleCount | integer | 1..1 | The number of QoE metrics reports included in or summarised by this collection.  (Where summary records are included in the collection, the number of records in the collection differs from this number.) |
| streamingDirection | Provisioning‌Session‌Type | 1..1 | Collections of QoE metrics records only apply to downlink media streaming. |
| summarisations | array(Data‌Aggregation‌Function‌Type) | 1..1 | One or more of the following data aggregation functions (see clause 6.3.3.2 of TS 26.532 [49]) that have been applied to the UE data to produce summary records present in this collection with the semantics indicated in table 4.7.4.4‑1 of TS 26.501 [2]:  - NULL  - COUNT  - MEAN  - MINIMMUM  - MAXIMUM  - SUM |
| records | array(QoE‌Metrics‌Event) | 1..1 | A set of zero or more QoE Metrics Event records, each one describing a QoE metrics report or summarising a set of QoE metrics reports.  Empty when the summarisations property indicates that this collection describes only a count of UE data samples. |

### 18.3.2 QoEMetricsEvent data type

QoEMetricsEvent is a concrete data type describing a set of, or summaries of, QoE metric samples of the same type.

Table 18.3.2‑1: QoEMetricsEvent data type

| Property name | | | Data Type | Cardinality | Description |
| --- | --- | --- | --- | --- | --- |
| recordType | | | Event‌Record‌Type | 1..1 | One of the following:  - INDIVIDUAL\_SAMPLE  - SUMMARY\_MEAN  - SUMMARY\_MINIMMUM  - SUMMARY\_MAXIMUM  - SUMMARY\_SUM |
| recordTimestamp | | | DateTime | 1..1 | For individual records, the date–time at which the parent QoE metrics report was generated by the Media Session Handler.  Otherwise, the date–time at which the summary record was generated by the Data Collection AF instantiated in the 5GMS AF. |
| provisioningSessionId | | | Resource‌Id | 0..1 | The identifier of the Provisioning Session to which this record pertains.  Present only for individual data sample recordType. |
| session‌Id | | | Media‌Delivery‌SessionId | 0..1 | A value that uniquely identifies the media streaming session to which this record pertains.  Present only for individual data sample recordType. |
| ueIdentification | | | string | 0..1 | GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force. |
| dataNetworkName | | | Dnn | 0..1 | Identifying the Data Network of the M4 media streaming session.  Present only for individual data sample recordType. |
| sliceId | | | Snssai | 0..1 | The S-NSSAI identifying the Network Slice of the M4 media streaming session.  Present only for individual data sample recordType. |
| ueLocations | | | array(Location‌Area5G) | 0..1 | The location(s) of the UE when the data described by this record was sampled.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force. |
| metric‌Type | | | Uri | 1..1 | A fully-qualified term identifier that uniquely identifies the QoE metrics reporting scheme and the type of QoE metric included this record, as specified in clause E.2, up to but excluding the first hierarchical separator. For example, urn:‌3GPP:‌ns:‌PSS:‌DASH:‌QM10#AvgThroughput. |
| samples | | | array(object) | 1..1 | An ordered list of one or more samples of type metricType derived from a single QoE metrics report. |
|  | sampleTimestamp | | DateTime | 0..1 | Where applicable for the metric indicated by metricType, the moment in time at which this QoE metric was sampled. |
|  | sampleDuration | | Duration | 0..1 | Where applicable for the metric indicated by metricType, the time duration over which this QoE metric was sampled. |
|  | mediaTimestamp | | Duration | 0..1 | Where applicable for the metric indicated by metricType, the time point (expressed relative to the start of the media streaming presentation) at which this QoE metric was sampled. |
|  | metrics | | array(object) | 1..1 | A set of key–value pairs for the sampled metrics associated with this QoE metric sample. |
|  |  | key | string | 1..1 | A token that uniquely identifies metric subtype within the scope of the QoE metric type. For example: numbytes.  There shall be at most one instance of this property's value in the parent array. |
|  |  | value | {} | 0..1 | A value (of any type) associated with the metric indicated by key. |

## 18.4 Consumption reporting event notifications

### 18.4.1 ConsumptionReportingUnitsCollection data type

ConsumptionReportingUnitsCollection is a concrete data type describing a collection of consumption reporting event records.

Table 18.4.1‑1: ConsumptionReportingUnitsCollection data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| collectionTimestamp | DateTime | 1..1 | The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers. |
| startTimestamp | DateTime | 1..1 | Date–time of earliest consumption reporting unit included in or summarised by this collection. |
| endTimestamp | DateTime | 1..1 | Date–time of latest consumption reporting unit included in or summarised by this collection. |
| sampleCount | integer | 1..1 | The number of consumption reporting units included in or summarised by this collection.  (Where summary records are included in the collection, the number of records in the collection differs from this number.) |
| streamingDirection | Provisioning‌Session‌Type | 1..1 | Collections of consumption reporting event records only apply to downlink media streaming. |
| summarisations | array(Data‌Aggregation‌Function‌Type) | 1..1 | One or more of the following data aggregation functions (see clause 6.3.3.2 of TS 26.532 [49]) that have been applied to the UE data to produce summary records present in this collection with the semantics indicated in table 4.7.4.5‑1 of TS 26.501 [2]:  - NULL  - COUNT |
| records | array(‌Consumption‌Reporting‌Event) | 1..1 | A set of zero or more consumption reporting event records. |

### 18.4.2 ConsumptionReportingEvent data type

ConsumptionReportingEvent is a concrete data type corresponding to a single consumption reporting unit.

Table 18.4.2‑1: ConsumptionReportingEvent data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| recordType | Event‌Record‌Type | 1..1 | One of the following:  - INDIVIDUAL\_SAMPLE |
| recordTimestamp | DateTime | 1..1 | The date–time at which this consumption reporting unit began. |
| provisioningSessionId | ResourceId | 1..1 | The identifier of the Provisioning Session to which this record pertains. |
| sessionId | Media‌Delivery‌SessionId | 1..1 | A value that uniquely identifies the media streaming session to which this record pertains. |
| ueIdentification | string | 0..1 | GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler.  Present only when exposure is permitted by the data exposure restrictions in force. |
| dataNetworkName | Dnn | 1..1 | Identifying the Data Network of the M4 media streaming session. |
| sliceId | Snssai | 1..1 | The S-NSSAI identifying the Network Slice of the M4 media streaming session. |
| ueLocations | array(Location‌Area5G) | 0..1 | The location(s) of the UE when the data described by this record was sampled.  Present only when exposure is permitted by the data exposure restrictions in force. |
| unitDuration | Duration | 1..1 | The duration of this consumption reporting unit. |
| clientEndpoint‌Address | EndpointAddress | 0..1 | The endpoint address of the UE that consumed media.  Present only if access reporting is enabled in the Consumption Reporting Configuration. |
| serverEndpoint‌Address | EndpointAddress | 0..1 | The endpoint address of the 5GMS AS from which media was consumed.  Present only if access reporting is enabled in the Consumption Reporting Configuration. |
| mediaPlayer‌EntryUrl | AbsoluteUrl | 1..1 | The Media Player Entry URL to which this consumption reporting unit pertains. |
| media‌Component‌Identifier | string | 1..1 | A token (e.g., an MPEG‑DASH representation identifier) identifying the media component of the Media Player Entry that was consumed during this consumption reporting unit. |

## 18.5 Network Assistance invocation event notifications

### 18.5.1 NetworkAssistanceInvocationsCollection data type

NetworkAssistanceInvocationsCollection is a concrete data type describing a collection of Network Assistance Invocation Event records.

Table 18.5.1‑1: NetworkAssistanceInvocationsCollection data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| collectionTimestamp | DateTime | 1..1 | The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers. |
| startTimestamp | DateTime | 1..1 | Date–time of earliest Network Assistance invocation included in or summarised by this collection. |
| endTimestamp | DateTime | 1..1 | Date–time of latest Network Assistance invocation included in or summarised by this collection. |
| sampleCount | integer | 1..1 | The number of Network Assistance invocations included in or summarised by this collection.  (Where summary records are included in the collection, the number of records in the collection differs from this number.) |
| streamingDirection | Provisioning‌Session‌Type | 1..1 | Indicating whether this collection of Network assistance invocation records relates to downlink media streaming sessions or to uplink media streaming sessions. |
| summarisations | array(Data‌Aggregation‌Function‌Type) | 1..1 | One or more of the following data aggregation functions (see clause 6.3.3.2 of TS 26.532 [49]) that have been applied to the UE data to produce summary records present in this collection with the semantics indicated in table 4.7.4.7‑1 of TS 26.501 [2]:  - NULL  - COUNT  - MEAN  - MINIMMUM  - MAXIMUM |
| records | array(‌Network‌Assistance‌Invocation‌Event) | 1..1 | A set of zero or more Network Assistance invocation records. |

### 18.5.2 NetworkAssistanceInvocationEvent data type

NetworkAssistanceInvocationEvent is a concrete data type describing a single invocation of the Network Assistance API (see clause 11.6).

Table 18.5.2‑1: NetworkAssistanceInvocationEvent data type

| Property name | | Data Type | Cardinality | Description |
| --- | --- | --- | --- | --- |
| recordType | | Event‌Record‌Type | 1..1 | One of the following:  - INDIVIDUAL\_SAMPLE  - SUMMARY\_MEAN  - SUMMARY\_MINIMMUM  - SUMMARY\_MAXIMUM |
| recordTimestamp | | DateTime | 1..1 | For individual records, the date–time at which Network Assistance was invoked by the Media Session Handler.  Otherwise, the date–time at which the summary record was generated by the Data Collection AF instantiated in the 5GMS AF. |
| provisioningSessionId | | ResourceId | 0..1 | The identifier of the Provisioning Session to which this record pertains.  Present only for individual data sample recordType. |
| sessionId | | Media‌Delivery‌SessionId | 0..1 | A value that uniquely identifies the media streaming session to which this record pertains.  Present only for individual data sample recordType. |
| ueIdentification | | string | 0..1 | GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force. |
| dataNetworkName | | Dnn | 0..1 | Identifying the Data Network of the M4 media streaming session.  Present only for individual data sample recordType. |
| sliceId | | Snssai | 0..1 | The S-NSSAI identifying the Network Slice of the M4 media streaming session.  Present only for individual data sample recordType. |
| ueLocations | | array(Location‌Area5G) | 0..1 | The location of the UE when Network Assistance was sought. If present, the array shall contain exactly one location for the Network Assistance invocation.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force. |
| network‌Assistance‌Type | | Network‌Assistance‌Type | 1..1 | The type of Network Assistance solicited by the Media Session Handler (see table 18.5.2‑2). |
| policy‌Template‌Id | | ResourceId | 0..1 | Identifying the Policy Template (if any) referenced by the Media Session Handler in the parent Network Assistance Session. |
| service‌Data‌Flow‌Descriptions | | array(‌Service‌Data‌Flow‌Description) | 0..1 | If present, a set of one or more Service Data Flow Descriptions (see clause 6.4.3.1) to which the Network Assistance session has been applied.  Present only for individual data sample recordType and only when exposure is permitted by the data exposure restrictions in force. |
| requested‌QoS | | Unidirectional‌QoS‌Specification | 0..1 | The network QoS parameters (if any) requested by the Media Session Handler from the 5GMS AF in the parent Network Assistance Session or from the RAN (see clause 18.1.3). |
| recommended‌QoS | | object | 0..1 | The network QoS parameters (if any) recommended to the Media Session Handler by the 5GMS AF in the parent Network Assistance Session or by the RAN. |
|  | maximum‌BitRate | BitRate | 1..1 | The maximum recommended bit rate. |
|  | minimum‌BitRate | BitRate | 1..1 | The minimum recommended bit rate. |

Table 18.5.2‑2: NetworkAssistanceType enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| AF\_THROUGHPUT\_ESTIMATION | Throughput estimation (bit rate recommendation) sought from the 5GMS AF. |
| AF\_DELIVERY\_BOOST | Delivery boost sought from the 5GMS AF. |
| ANBR\_THROUGHPUT\_ESTIMATION | Throughput estimation (bit rate recommendation) sought from the RAN. |
| ANBR\_DELIVERY\_BOOST | Delivery boost sought from the RAN. |

## 18.6 Dynamic policy invocation event notifications

### 18.6.1 DynamicPolicyInvocationsCollection data type

DynamicPolicyInvocationsCollection is a concrete data type describing a collection of Dynamic Policy Invocation records.

Table 18.6.1‑1: DynamicPolicyInvocationsCollection data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| collectionTimestamp | DateTime | 1..1 | The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers. |
| startTimestamp | DateTime | 1..1 | Date–time of earliest dynamic policy invocation included in or summarised by this collection. |
| endTimestamp | DateTime | 1..1 | Date–time of latest dynamic policy invocation included in or summarised by this collection. |
| sampleCount | integer | 1..1 | The number of dynamic policy invocations included in or summarised by this collection.  (Where summary records are included in the collection, the number of records in the collection differs from this number.) |
| streamingDirection | Provisioning‌Session‌Type | 1..1 | Indicating whether this collection of dynamic policy invocation records relates to downlink media streaming sessions or to uplink media streaming sessions. |
| summarisations | array(Data‌Aggregation‌Function‌Type) | 1..1 | One or more of the following data aggregation functions (see clause 6.3.3.2 of TS 26.532 [49]) that have been applied to the UE data to produce summary records present in this collection with the semantics indicated in table 4.7.4.6‑1 of TS 26.501 [2]:  - NULL  - COUNT |
| records | array(‌Dynamic‌Policy‌Invocation‌Event) | 1..1 | A set of zero or more dynamic policy invocation event records. |

### 18.6.2 DynamicPolicyInvocationEvent data type

DynamicPolicyInvocationEvent is a concrete data type describing a single invocation of the Dynamic Policies API (see clause 11.5).

Table 18.6.2‑1: DynamicPolicyInvocationEvent data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| recordType | Event‌Record‌Type | 1..1 | One of the following:  - INDIVIDUAL\_SAMPLE |
| recordTimestamp | DateTime | 1..1 | The date–time at which the dynamic policy was invoked by the Media Session Handler. |
| provisioningSessionId | ResourceId | 1..1 | The identifier of the Provisioning Session to which this record pertains. |
| sessionId | Media‌Delivery‌SessionId | 1..1 | A value that uniquely identifies the media streaming session to which this record pertains. |
| ueIdentification | string | 0..1 | GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler.  Present only when exposure is permitted by the data exposure restrictions in force. |
| dataNetworkName | Dnn | 1..1 | Identifying the Data Network of the M4 media streaming session. |
| sliceId | Snssai | 1..1 | The S-NSSAI identifying the Network Slice of the M4 media streaming session. |
| ueLocations | array(Location‌Area5G) | 0..1 | The location of the UE when the dynamic policy was invoked. If present, the array shall contain exactly one location for the dynamic policy invocation.  Present only when exposure is permitted by the data exposure restrictions in force. |
| policy‌Template‌Id | ResourceId | 1..1 | Identifying the Policy Template instantiated by the Media Session Handler. |
| service‌Data‌Flow‌Descriptions | array(‌Service‌Data‌Flow‌Description) | 0..1 | If present, a set of one or more Service Data Flow Descriptions (see clause 6.4.3.1) to which the dynamic policy has been applied.  Present only when exposure is permitted by the data exposure restrictions in force. |
| requested‌QoS | Unidirectional‌QoS‌Specification | 0..1 | The network QoS parameters (if any) requested by the Media Session Handler when instantiating the Policy Template (see clause 18.1.3). |
| enforcement‌Method | string | 1..1 | The policy enforcement method indicated by the 5GMS AF. |
| enforcement‌BitRate | BitRate | 1..1 | The enforcement bit rate indicated by the 5GMS AF. |

## 18.7 Media streaming access event notifications

### 18.7.1 MediaStreamingAccessesCollection data type

MediaStreamingAccessesCollection is a concrete data type describing a collection of Media Streaming Access Event records.

Table 18.7.1‑1: MediaStreamingAccessesCollection data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| collectionTimestamp | DateTime | 1..1 | The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers. |
| startTimestamp | DateTime | 1..1 | Date–time of earliest media streaming access event record included in or summarised by this collection. |
| endTimestamp | DateTime | 1..1 | Date–time of latest media streaming access event record included in or summarised by this collection. |
| sampleCount | integer | 1..1 | The number of media streaming access event records included in or summarised by this collection. |
| streamingDirection | Provisioning‌Session‌Type | 1..1 | Indicating whether this collection of media streaming access event records relates to downlink media streaming sessions or to uplink media streaming sessions. |
| summarisations | array(Data‌Aggregation‌Function‌Type) | 1..1 | One or more of the following data aggregation functions (see clause 6.3.3.2 of TS 26.532 [49]) that have been applied to the UE data to produce summary records present in this collection with the semantics indicated in table 4.7.4.8‑1 of TS 26.501 [2]:  - NULL  - COUNT |
| records | array(‌Media‌Streaming‌Access‌Event) | 1..1 | A set of zero or more media streaming access event records. |

### 18.7.2 MediaStreamingAccessEvent data type

MediaStreamingAccessEvent is a concrete data type describing a single media access by a Media Stream Handler.

Table 18.7.2‑1: MediaStreamingAccessEvent data type

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| recordType | Event‌Record‌Type | 1..1 | One of the following:  - INDIVIDUAL\_SAMPLE |
| recordTimestamp | DateTime | 1..1 | The date–time at which media was accessed by the Media Stream Handler (Media Player or Media Streamer). |
| provisioningSessionId | ResourceId | 1..1 | The identifier of the Provisioning Session to which this record pertains. |
| sessionId | Media‌Delivery‌SessionId | 1..1 | A value that uniquely identifies the media streaming session to which this record pertains. |
| ueIdentification | string | 0..1 | GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler.  Present only when exposure is permitted by the data exposure restrictions in force. |
| dataNetworkName | Dnn | 1..1 | Identifying the Data Network of the M4 media streaming session. |
| sliceId | Snssai | 1..1 | The S-NSSAI identifying the Network Slice of the M4 media streaming session. |
| ueLocations | array(Location‌Area5G) | 0..1 | The location of the UE when the media was accessed. If present, the array shall contain exactly one location for the media streaming access.  Present only when exposure is permitted by the data exposure restrictions in force. |
| mediaStreamHandler‌EndpointAddress | Endpoint‌Address | 1..1 | The endpoint address of the Media Stream Handler accessing the 5GMS AS. (See clause 6.4.3.8.) |
| applicationServer‌EndpointAddress | Endpoint‌Address | 1..1 | The service endpoint on the 5GMS AS to which the Media Stream Handler is connected. (See clause 6.4.3.8.) |
| requestMessage | Object | 1..1 | Details of the HTTP request message submitted to the 5GMS AS by the Media Stream Handler for this media access. |
| method | string | 1..1 | The request method. |
| url | Absolute‌Url | 1..1 | The request URL. (See table 6.4.2‑1.) |
| protocolVersion | string | 1..1 | The HTTP protocol version, e.g., "HTTP/1.1". |
| range | string | 0..1 | The value of the Range request header, if present. |
| size | Uinteger | 1..1 | The total number of bytes in the request message. |
| bodySize | Uinteger | 1..1 | The number of bytes supplied by the Media Stream Handler in the HTTP request message body.  Zero if there is no request body. |
| contentType | string | 0..1 | The MIME content type of the request message, if any. |
| userAgent | string | 0..1 | A string describing the requesting Media Stream Handler, if it supplies a User-Agent request header. |
| userIdentity | String | 0..1 | A string identifying the user that made the access, if supplied. |
| referer | Absolute‌Url | 0..1 | The URL that the Media Player reports being referred from, if the Referer request header is supplied. (See table 6.4.2‑1.) |
| cacheStatus | Cache‌Status | 0..1 | An indication of whether the 5GMS AS is able to serve an object corresponding to requestMessage,url from cache (HIT) or whether there is a stale object cached (EXPIRED) or the requested object is not present in cache (MISS). (See table 6.4.4.4.)  For non-caching implementations of the 5GMS AS, the property shall be omitted. |
| responseMessage | Object | 1..1 | Details of the HTTP response message returned by the 5GMS AS to the Media Stream Handler for this media access. |
| responseCode | Uinteger | 1..1 | The HTTP response code. |
| size | Uinteger | 1..1 | The total number of bytes in the response message. |
| bodySize | Uinteger | 1..1 | The number of bytes in the HTTP response message body. |
| contentType | string | 0..1 | The MIME content type of response message, if any. |
| processingLatency | Float | 1..1 | The time, expressed in milliseconds, taken by the 5GMS AS to respond to the Media Stream Handler request, measured from the first byte of the HTTP request being processed by the 5GMS AS to the last byte of the response being sent. |
| connectionMetrics | Object | 0..1 | Metrics about the performance of the transport connection underlying the HTTP session serving this media access. |
| meanNetwork‌RoundTripTime | Float | 1..1 | A rolling mean average, expressed in milliseconds, of the network round-trip time for the HTTP session. |
| networkRoundTrip‌Time‌Variation | Float | 1..1 | The variation in meanNetwork‌RoundTripTime, expressed in milliseconds, during the averaging period. |
| congestion‌Window‌Size | Uinteger | 1..1 | The current size (in bytes) of the congestion window for the transport connection underlying the HTTP session. |

Next change

# C.2 Data Types applicable to several APIs

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26512\_CommonData.yaml".

|  |
| --- |
| openapi: 3.0.0  info:    title: 5GMS Common Data Types    version: 3.0.0    description: |      5GMS Common Data Types  *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: 5GMS Common Data Types      description: '5G Media Streaming: Common Data Types'  externalDocs:    description: 'TS 26.512 V18.0.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  paths: {}  components:    schemas:      #################################      # Clause 6.4.2: Simple data types      #################################      ResourceId:        type: string        description: String chosen by the 5GMS AF to serve as an identifier in a resource URI.      Percentage:        type: number        minimum: 0.0        maximum: 100.0      #DurationSec is defined in TS29571\_CommonData      Duration:        type: string        format: duration        description: 'String with format "duration" as defined by JSON Schema (referencing IETF RFC 3339, appendix A and, ultimately, ISO 8601).'      #DateTime is defined in TS29571\_CommonData      #Uri is defined in TS29571\_CommonData      Url:        type: string        format: uri-reference        description: 'Uniform Resource Locator, conforming with the "URI-reference" production specified in IETF RFC 3986, section 4.1.'      RelativeUrl:        type: string        format: uri-reference        description: 'Relative Uniform Resource Locator, conforming with the "relative-ref" production specified in IETF RFC 3986, section 4.2. Note that both "query" and "fragment" suffixes are permitted by this production.'      AbsoluteUrl:        type: string        format: uri        description: 'Absolute Uniform Resource Locator, conforming with the "absolute-URI" production specified in IETF RFC 3986, section 4.3 in which the scheme part is "http" or "https". Note that the "query" suffix is permitted by this production, but the "fragment" suffix is not.'      MediaDeliverySessionId:        type: string        description: 'A unique identifier for a media delivery session.'      #####################################      # Clause 6.4.3: Structured data types      #####################################      IpPacketFilterSet:        type: object        required:          - direction        properties:          srcIp:            type: string          dstIp:            type: string          protocol:            type: integer          srcPort:            type: integer          dstPort:            type: integer          toSTc:            type: string          flowLabel:            type: integer          spi:            type: integer          direction:            type: string      ServiceDataFlowDescription:        type: object        properties:          flowDescription:            $ref: '#/components/schemas/IpPacketFilterSet'          domainName:            type: string      M5QoSSpecification:        type: object        required:          - marBwDlBitRate          - marBwUlBitRate          - mirBwDlBitRate          - mirBwUlBitRate        properties:          marBwDlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          marBwUlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          minDesBwDlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          minDesBwUlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          mirBwDlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          mirBwUlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          desLatency:            type: integer            minimum: 0          desLoss:            type: integer            minimum: 0      M1QoSSpecification:        type: object        properties:          qosReference:            type: string          maxBtrUl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          maxBtrDl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          maxAuthBtrUl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          maxAuthBtrDl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          defPacketLossRateDl:            type: integer            minimum: 0          defPacketLossRateUl:            type: integer            minimum: 0      ChargingSpecification:        type: object        properties:          sponId:            type: string          sponStatus:            $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/SponsoringStatus'          gpsi:            type: array            items:              $ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'      TypedLocation:        type: object        required:          - locationIdentifierType          - location        properties:          locationIdentifierType:            $ref: '#/components/schemas/CellIdentifierType'          location:            type: string      OperationSuccessResponse:        type: object        required:        - success        properties:          success:            type: boolean          reason:            type: string      EndpointAddress:        type: object        required:          - portNumber        properties:          hostname:            type: string          ipv4Addr:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'          ipv6Addr:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'          portNumber:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint16'      EdgeProcessingEligibilityCriteria:        type: object        required:          - serviceDataFlowDescriptions          - ueLocations          - timeWindows          - appRequest        properties:          serviceDataFlowDescriptions:            type: array            items:              $ref: '#/components/schemas/ServiceDataFlowDescription'          ueLocations:            type: array            items:              $ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'          timeWindows:            type: array            items:              $ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'          appRequest:            type: boolean      MediaStreamingSessionIdentification:        type: object        required:          - sessionId        properties:          sessionId:            $ref: '#/components/schemas/MediaDeliverySessionId'  MediaStreamingAccess:  type: object  description: Common properties of a single media access by the Media Stream Handler.  required:  - mediaStreamHandlerEndpointAddress  - applicationServerEndpointAddress  - requestMessage  - responseMessage  - processingLatency  properties:  mediaStreamHandlerEndpointAddress:  $ref: '#/components/schemas/EndpointAddress'  applicationServerEndpointAddress:  $ref: '#/components/schemas/EndpointAddress'  requestMessage:  type: object  required:  - method  - url  - protocolVersion  - size  - bodySize  properties:  method:  type: string  url:  $ref: '#/components/schemas/AbsoluteUrl'  protocolVersion:  type: string  range:  type: string  size:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  bodySize:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  contentType:  type: string  userAgent:  type: string  userIdentity:  type: string  referer:  $ref: '#/components/schemas/AbsoluteUrl'  cacheStatus:  $ref: '#/components/schemas/CacheStatus'  responseMessage:  type: object  required:  - responseCode  - size  - bodySize  properties:  responseCode:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  size:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  bodySize:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  contentType:  type: string  processingLatency:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Float'  connectionMetrics:  type: object  required:  - meanNetworkRoundTripTime  - networkRoundTripTimeVariation  - congestionWindowSize  properties:  meanNetworkRoundTripTime:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Float'  networkRoundTripTimeVariation:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Float'  congestionWindowSize:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'  NetworkAssistanceInvocation:  description: Common properties of a single Network Assistance invocation.  type: object  properties:  policyTemplateId:  $ref: '#/components/schemas/ResourceId'  serviceDataFlowDescriptions:  type: array  minItems: 1  items:  $ref: '#/components/schemas/ServiceDataFlowDescription'  requestedQoS:  $ref: '#/components/schemas/UnidirectionalQoSSpecification'  # The network QoS parameters (if any) requested by the Media Session Handler.  recommendedQoS:  type: object  description: The network QoS parameters (if any) recommended to the Media Session Handler.  required:  - maximumBitRate  - minimumBitRate  properties:  maximumBitRate:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'  minimumBitRate:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'  UnidirectionalQoSSpecification:  type: object  description: A specification for network Quality of Service in either the downlink or uplink direction.  required:  - maximumRequestedBitRate  - minimumRequestedBitRate  properties:  maximumRequestedBitRate:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'  minimumDesiredBitRate:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'  minimumRequestedBitRate:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'  desiredPacketLatency:  type: integer  minimum: 0  desiredPacketLossRate:  type: integer  minimum: 0      #####################################      # Clause 6.4.4: Enumerated data types      #####################################      CellIdentifierType:        anyOf:          - type: string            enum: [CGI, ECGI, NCGI]          - 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.      SdfMethod:        anyOf:          - type: string            enum: [5\_TUPLE, 2\_TUPLE, TYPE\_OF\_SERVICE\_MARKING, FLOW\_LABEL, DOMAIN\_NAME]          - 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.      ProvisioningSessionType:        anyOf:          - type: string            enum: [DOWNLINK, UPLINK]          - 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.  CacheStatus:  anyOf:  - type: string  enum: [HIT, MISS, EXPIRED]  - 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.      EASRelocationTolerance:        anyOf:          - type: string            enum: [RELOCATION\_UNAWARE, RELOCATION\_TOLERANT, RELOCATION\_INTOLERANT]          - 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. |

Next change

## C.5.1 R4 data reporting records

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26512\_R4\_DataReporting.yaml".

|  |
| --- |
| openapi: 3.0.0  info:  title: 5GMS R4 Data Reporting data types  version: 2.0.0  description: |  5GMS R4 Data Reporting data types  © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  tags:  - name: 5GMS R4 Data Reporting data types  description: '5G Media Streaming: R4 Data Reporting data types'  externalDocs:  description: 'TS 26.512 V18.0.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  paths: {}  components:  schemas:  MediaStreamingAccessRecord:  description: "An R4 data reporting record describing a single media access by the Media Stream Handler."  allOf:  - $ref: 'TS26532\_Ndcaf\_DataReporting.yaml#/components/schemas/BaseRecord'  - $ref: 'TS26512\_CommonData.yaml#/components/schemas/MediaStreamingSessionIdentification'  - $ref: 'TS26512\_CommonData.yaml#/components/schemas/MediaStreamingAccess' |

Next change

# C.6 OpenAPI representation of event exposure data types

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26512\_EventExposure.yaml".

|  |
| --- |
| openapi: 3.0.0  info:  title: 5GMS Event Exposure  version: 1.0.0  description: |  5GMS Event Exposure syntax  © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  tags:  - name: 5GMS Event Exposure  description: '5G Media Streaming: Event Exposure'  externalDocs:  description: 'TS 26.512 V18.0.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  paths: {}  components:  schemas:  BaseEventCollection:  type: object  description: Abstract base data type describing a collection of event records  required:  - collectionTimestamp  - startTimestamp  - endTimestamp  - sampleCount  - streamingDirection  - summarisations  - records  properties:  collectionTimestamp:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  # The date–time at which this collection was exposed by the Data Collection AF as an event to its subscribed event consumers.  startTimestamp:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  # Date–time of earliest data sample included in or summarised by this collection.  endTimestamp:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  # Date–time of latest data sample included in or summarised by this collection.  sampleCount:  type: integer  minimum: 1  description: The number of data samples included in or summarised by this collection.  streamingDirection:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/ProvisioningSessionType'  summarisations:  type: array  minItems: 1  items:  $ref: 'TS26532\_Ndcaf\_DataReportingProvisioning.yaml#/components/schemas/DataAggregationFunctionType'  description: One or more data aggregation functions that have been applied to the UE data to produce summary records present in this collection.  records:  type: array  minItems: 0  items: {}  description: Type of record is defined by concrete data type.  BaseEventRecord:  type: object  description: Abstract base data type describing a single UE data record or summarising a set of UE data records.  required:  - recordType  - recordTimestamp  properties:  recordType:  $ref: '#/components/schemas/EventRecordType'  recordTimestamp:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  # The date–time at which the UE data carried in this record was sampled or summarised.  provisioningSessionId:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'  # The identifier of the Provisioning Session to which this record pertains. Present only for individual data sample record type.  sessionId:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/MediaDeliverySessionId'  # A value synthesised by the 5GMS System that uniquely identifies the media streaming session to which this record pertains. Present only for individual data sample record type.  ueIdentification:  type: string  description: GPSI of the requesting UE or a stable globally unique string identifying the requesting Media Session Handler. Present only for individual data sample record type and only when exposure is permitted by the data exposure restrictions in force for the event type in question.  dataNetworkName:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'  # Identifying the Data Network of the M4 media streaming session. Present only for individual data sample record type.  sliceId:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'  # The S-NSSAI identifying the Network Slice of the M4 media streaming session. Present only for individual data sample record type.  ueLocations:  type: array  minItems: 0  items:  $ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'  description: The location of the UE when the data described by this record was sampled. Present only for individual data sample record type and only when exposure is permitted by the data exposure restrictions in force for the event in question.  EventRecordType:  description: Enumeration of event record types.  anyOf:  - type: string  enum:  - INDIVIDUAL\_SAMPLE  - SUMMARY\_MEAN  - SUMMARY\_MINIMUM  - SUMMARY\_MAXIMUM  - SUMMARY\_SUM  - 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.  QoEMetricsCollection:  description: A collection of QoE Metrics Event records.  allOf:  - $ref: '#/components/schemas/BaseEventCollection'  - type: object  required:  - records  properties:  records:  type: array  minItems: 0  items:  $ref: '#/components/schemas/QoEMetricsEvent'  description: A set of QoE Metrics Event records, each one describing a QoE metrics report or summarising a set of QoE metrics reports.  QoEMetricsEvent:  description: A QoE Metrics Event record.  allOf:  - $ref: '#/components/schemas/BaseEventRecord'  - type: object  required:  - metricType  properties:  metricType:  $ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'  # A fully-qualified term identifier that uniquely identifies the QoE metrics reporting scheme and the type of QoE metric included in this record, as specified in clause E.2, up to but excluding the first hierarchical separator.  samples:  type: array  minItems: 1  items:  type: object  required:  - metrics  properties:  sampleTimestamp:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'  # The moment in time at which this QoE metric was sampled.  sampleDuration:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/Duration'  # The time duration over which this QoE metric was sampled.  mediaTimestamp:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/Duration'  # The time point in the media at which this QoE metric was sampled.  metrics:  type: array  minItems: 1  description: A set of key–value pairs for the samples metrics associated with this QoE metric sample.  items:  type: object  description: A name and optional value for a QoE metric within a QoE metric sample.  required:  - key  properties:  key:  type: string  description: A token that uniquely identifies the type of metric within the scope of the event type.  value: {}  ConsumptionReportingUnitsCollection:  description: A collection of Consumption Reporting Event records.  allOf:  - $ref: '#/components/schemas/BaseEventCollection'  - type: object  required:  - records  properties:  records:  type: array  minItems: 0  items:  $ref: '#/components/schemas/ConsumptionReportingEvent'  description: A set of records, each one describing a Consumption Reporting Unit.  ConsumptionReportingEvent:  description: A Consumption Reporting Event record, corresponding to a Consumption Reporting Unit.  allOf:  - $ref: '#/components/schemas/BaseEventRecord'  - type: object  required:  - unitDuration  - mediaPlayerEntryUrl  - mediaComponentIdentifier  properties:  unitDuration:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/Duration'  # The duration of this consumption reporting unit.  clientEndpointAddress:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/EndpointAddress'  # The endpoint address of the UE that consumed media.  serverEndpointAddress:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/EndpointAddress'  # The endpoint address of the 5GMS AS from which media was consumed.  mediaPlayerEntryUrl:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'  # The Media Player Entry URL to which this consumption reporting unit pertains.  mediaComponentIdentifier:  type: string  description: A token (e.g., an MPEG DASH representation identifier) identifying the media component of the Media Player Entry that was consumed during this consumption reporting unit.  NetworkAssistanceInvocationsCollection:  description: A collection of Network Assistance Invocation Event records.  allOf:  - $ref: '#/components/schemas/BaseEventCollection'  - type: object  required:  - records  properties:  records:  type: array  minItems: 0  items:  $ref: '#/components/schemas/NetworkAssistanceInvocationEvent'  description: A set of records, each one describing a Network Assistance invocation or summarising a set of Network Assistance invocations.  NetworkAssistanceInvocationEvent:  description: A Network Assistance Invocation Event record.  allOf:  - $ref: '#/components/schemas/BaseEventRecord'  - type: object  required:  - networkAssistanceType  properties:  networkAssistanceType:  $ref: '#/components/schemas/NetworkAssistanceType'  # The type of Network Assistance solicited by the Media Session Handler.  - $ref: 'TS26512\_CommonData.yaml#/components/schemas/NetworkAssistanceInvocation'  NetworkAssistanceType:  description: The type of network assistance sought by the Media Session Handler.  anyOf:  - type: string  enum:  - AF\_THROUGHPUT\_ESTIMATION  - AF\_DELIVERY\_BOOST  - ANBR\_THROUGHPUT\_ESTIMATION  - ANBR\_DELIVERY\_BOOST  - 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.  DynamicPolicyInvocationsCollection:  description: A collection of Dynamic Policy Invocation Event records.  allOf:  - $ref: '#/components/schemas/BaseEventCollection'  - type: object  required:  - records  properties:  records:  type: array  minItems: 0  items:  $ref: '#/components/schemas/DynamicPolicyInvocationEvent'  description: A set of records, each one describing a dynamic policy invocation.  DynamicPolicyInvocationEvent:  description: A Dynamic Policy Invocation Event record.  allOf:  - $ref: '#/components/schemas/BaseEventRecord'  - type: object  required:  - policyTemplateId  properties:  policyTemplateId:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'  serviceDataFlowDescriptions:  type: array  minItems: 1  items:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/ServiceDataFlowDescription'  description: The set of Service Data Flows to which the Media Session Handler requested that the Policy Template be applied. At least a domain name or one packet filter shall be present.  requestedQoS:  $ref: 'TS26512\_CommonData.yaml#/components/schemas/UnidirectionalQoSSpecification'  # The network QoS parameters (if any) requested by the Media Session Handler.  enforcementMethod:  type: string  description: The policy enforcement method chosen by the 5GMS AF.  enforcementBitRate:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'  # The enforcement bit rate (if any) selected by the 5GMS AF.  MediaStreamingAccessesCollection:  description: A collection of Media Streaming Access Event records.  allOf:  - $ref: '#/components/schemas/BaseEventCollection'  - type: object  required:  - records  properties:  records:  type: array  minItems: 0  items:  $ref: '#/components/schemas/MediaStreamingAccessEvent'  description: A set of records, each one describing one media streaming access.  MediaStreamingAccessEvent:  description: A Media Streaming Access Event record.  allOf:  - $ref: '#/components/schemas/BaseEventRecord'  - $ref: 'TS26512\_CommonData.yaml#/components/schemas/MediaStreamingAccess' |

END OF CHANGES