**3GPP TSG CT WG3 Meeting #138 *C3-246435***

**Orlando, US, 18 - 22 November, 2024**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **0033** | **rev** | **1** | **Current version:** |  |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| --- |
|  |
| ***Title:***  | Support of QoS measurement for Multi-Modal traffic in SEALDD service |
|  |  |
| ***Source to WG:*** | Ericsson, Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | XRM\_Ph2\_App |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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 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:*** | CR #0075 of 23.433 introduces the support of QoS measurement for Multi-Modal traffic in SEALDD service. Thus, the related updates are needed in 29.548 |
|  |  |
| ***Summary of change:*** | This CR introduces the support of QoS measurement for Multi-Modal traffic in SEALDD service. |
|  |  |
| ***Consequences if not approved:*** | Stage 2 requirement is not implemented in stage 3. |
|  |  |
| ***Clauses affected:*** | 6.4.6.1, 6.4.6.2.2, 6.4.6.2.6, 6.4.6.2.7, 6.4.6.2.8, 6.4.6.2.11 (new), 6.4.6.2.12 (new) 6.4.6.3.3, 6.4.6.3.5 (new), 6.4.8, A.5 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | * This CR provides BC feature for the SDD\_TransmissionQualityMeasurement API
 |
| ***()*** |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

\* \* \* First Change \* \* \* \*

#### 6.4.6.1 General

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

Table 6.4.6.1-1 specifies the data types defined for the SDD\_TransmissionQualityMeasurement API.

Table 6.4.6.1-1: SDD\_TransmissionQualityMeasurement API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| Crossflow | 6.4.6.2.11 | Represents a crossflow. | XRMApp |
| CrossflowInfo | 6.4.6.2.12 | Represents the crossflow information. | XRMApp |
| FlowDirection | 6.4.6.3.5 | Represents the flow direction. | XRMApp |
| HistTransQualMeasReports | 6.4.6.2.9 | Represents the Historical Transmission Quality Measurement Report(s). |  |
| MeasurementId | 6.4.6.3.3 | Represents the transmission quality measurement type. |  |
| RepGranularity | 6.4.6.3.4 | Represents the reporting granularity. |  |
| TransQualMeasCriteria | 6.4.6.2.7 | Represents the transmission quality measurement reporting criteria. |  |
| TransQualMeasCriteriaSet | 6.4.6.2.10 | Represents a set of transmission quality measurement reporting criteria. |  |
| TransQualMeasData | 6.4.6.2.8 | Represents the transmission quality measurement data. |  |
| TransQualMeasNotif | 6.4.6.2.5 | Represents a Transmission Quality Measurement Notification. |  |
| TransQualMeasReport | 6.4.6.2.6 | Represents a Transmission Quality Measurement report. |  |
| TransQualMeasReq | 6.4.6.2.3 | Represents the Transmission Quality Measurement reporting requirements. |  |
| TransQualMeasSubsc | 6.4.6.2.2 | Represents a Transmission Quality Measurement Subscription. |  |
| TransQualMeasSubscPatch | 6.4.6.2.4 | Represents the requested modifications to a Transmission Quality Measurement Subscription. |  |

Table 6.4.6.1-2 specifies data types re-used by the SDD\_TransmissionQualityMeasurement API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the SDD\_TransmissionQualityMeasurement API.

Table 6.4.6.1-2: SDD\_TransmissionQualityMeasurement API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| BitRate | 3GPP TS 29.571 [18] | Represents a bit rate. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| DateTimeRo | 3GPP TS 29.122 [2] | Represents a date and a time with the read-only property. |  |
| DurationSec | 3GPP TS 29.122 [2] | Represents a time duration in seconds. |  |
| MatchingDirection | 3GPP TS 29.520 [20] | Represents the threshold matching direction. |  |
| NotificationMethod | 3GPP TS 29.508 [16] | Represents the reporting type. |  |
| PacketLossRate | 3GPP TS 29.571 [18] | Represents the packet loss rate. |  |
| ProblemDetails | 3GPP TS 29.122 [2] | Represents error related information. |  |
| SupportedFeatures | 3GPP TS 29.571 [18] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window. |  |
| Uint32 | 3GPP TS 29.571 [18] | Represents an unsigned 32-bit integer. |  |
| Uinteger | 3GPP TS 29.571 [18] | Represents an unsigned integer. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |
| ValidityConditions | 3GPP TS 29.549 [15] | Represents temporal and/or spatial validity conditions. |  |

\* \* \* Next change \* \* \* \*

##### 6.4.6.2.2 Type: TransQualMeasSubsc

Table 6.4.6.2.2-1: Definition of type TransQualMeasSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| appTrafficIds | array(string) | M | 1..N | Contains the identifier(s) of the targeted application traffic (e.g., VAL Service ID, VAL Server ID). |  |
| notifUri | Uri | M | 1 | Contains the URI via which Transmission Quality Measurement notifications shall be delivered. |  |
| valGroupId | string | C | 0..1 | Contains the identity of the VAL group to which the subscription is related.(NOTE) |  |
| valUeIdsList | array(string) | C | 1..N | Contains the list of the identifier(s) of the VAL UE(s) to which the subscription is related.(NOTE) |  |
| valUserIdsList | array(string) | C | 1..N | Contains the list of the identifier(s) of the VAL user(s) to which the subscription is related.(NOTE) |  |
| allValUesInd | boolean | C | 0..1 | Indicates that the subscription is related to all VAL UE/user(s) of the application traffic identified by the application traffic identifier(s) provided within the "appTrafficIds" attribute.- "true" indicates that the subscription is related to all VAL UE/user(s).- "false" indicates that the subscription is not related to all VAL UE/user(s).- The default value when this attribute is omitted is "false".(NOTE) |  |
| flows | array(ConnInfo) | C | 1..N | Contains the descriptor(s) of the SEALDD flow(s) to which the subscription is related.(NOTE) | XRMApp |
| crossflows | array(Crossflow) | C | 1..N | Contains the descriptor(s) of the SEALDD crossflow(s) to which the subscription is related.(NOTE) | XRMApp |
| measConds | array(ValidityConditions) | O | 1..N | Contains the set of temporal and/or spatial measurement condition(s) of the subscription. |  |
| reqs | map(TransQualMeasReq) | M | 1..N | Contains the transmission quality measurement reporting requirements of the subscription.The key of the map shall be any unique string encoded value. |  |
| subsExpTime | DateTimeRo | O | 0..1 | Indicates the time at which the subscription shall expire.This attribute may be present only in Transmission Quality Measurement subscription creation/update responses.If this attribute is absent, this means that the subscription shall not expire, until explicitly deleted by the service consumer. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.4.8.This attribute shall be present only when feature negotiation needs to take place. |  |
| NOTE: The "valGroupId" attribute, the "valUeIdsList" attribute, the "flows" attribute, the "crossflows" attribute and/or the "valUserIdsList" attribute, and when set to "true", the "allValUesInd" attribute, are mutually exclusive. Either one of them shall be present. |

\* \* \* Next change \* \* \* \*

##### 6.4.6.2.6 Type: TransQualMeasReport

Table 6.4.6.2.6-1: Definition of type TransQualMeasReport

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| measId | array(MeasurementId) | M | 1..N | Contains the reported transmission quality measurement(s). |  |
| valUeIds | array(string) | C | 1..N | Contains the list of the identifier(s) of the VAL UE(s) to which the transmission quality measurement(s) report is related.(NOTE) |  |
| valUserIds | array(string) | C | 1..N | Contains the list of the identifier(s) of the VAL user(s) to which the transmission quality measurement(s) report is related.(NOTE) |  |
| flows | array(ConnInfo) | C | 1..N | Contains the descriptor(s) of the SEALDD flow(s) to which the transmission quality measurement(s) report is related.(NOTE) | XRMApp |
| crossflows | array(Crossflow) | C | 1..N | Contains the descriptor(s) of the SEALDD crossflow(s) information to which the transmission quality measurement(s) report is related.(NOTE) | XRMApp |
| measData | TransQualMeasData | O | 0..1 | Contains the reported transmission quality measurement(s) data. |  |
| timestamp | DateTime | O | 0..1 | Contains the timestamp of this transmission quality measurement(s) report. |  |
| NOTE: These attributes are mutually exclusive. Either one of them shall be present, unless the corresponding request targets a single VAL UE/user, in which case these attributes may not be present. |

\* \* \* Next change \* \* \* \*

##### 6.4.6.2.7 Type: TransQualMeasCriteria

Table 6.4.6.2.7-1: Definition of type TransQualMeasCriteria

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| minLatency | Uinteger | C | 0..1 | Contains the requested minimum E2E latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) |  |
| avgLatency | Uinteger | C | 0..1 | Contains the requested average E2E latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) |  |
| maxLatency | Uinteger | C | 0..1 | Contains the requested maximum E2E latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) |  |
| minLatencyDl | Uinteger | C | 0..1 | Contains the requested minimum DL latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgLatencyDl | Uinteger | C | 0..1 | Contains the requested average DL latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxLatencyDl | Uinteger | C | 0..1 | Contains the requested maximum DL latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| minLatencyUl | Uinteger | C | 0..1 | Contains the requested minimum UL latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgLatencyUl | Uinteger | C | 0..1 | Contains the requested average UL latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxLatencyUl | Uinteger | C | 0..1 | Contains the requested maximum UL latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| minLatencyCrossflow | Uinteger | C | 0..1 | Contains the requested minimum crossflow latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgLatencyCrossflow | Uinteger | C | 0..1 | Contains the requested average crossflow latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxLatencyCrossflow | Uinteger | C | 0..1 | Contains the requested maximum crossflow latency (expressed in milliseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| minBitRate | BitRate | C | 0..1 | Contains the requested minimum E2E bit rate for transmission quality measurement reporting.(NOTE) |  |
| avgBitRate | BitRate | C | 0..1 | Contains the requested average E2E bit rate for transmission quality measurement reporting.(NOTE) |  |
| maxBitRate | BitRate | C | 0..1 | Contains the requested maximum E2E bit rate for transmission quality measurement reporting.(NOTE) |  |
| minBitRateDl | BitRate | C | 0..1 | Contains the requested minimum DL bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgBitRateDl | BitRate | C | 0..1 | Contains the requested average DL bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxBitRateDl | BitRate | C | 0..1 | Contains the requested maximum DL bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| minBitRateUl | BitRate | C | 0..1 | Contains the requested minimum UL bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgBitRateUl | BitRate | C | 0..1 | Contains the requested average UL bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxBitRateUl | BitRate | C | 0..1 | Contains the requested maximum UL bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| minBitRateCrossflow | BitRate | C | 0..1 | Contains the requested minimum crossflow bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgBitRateCrossflow | BitRate | C | 0..1 | Contains the requested average crossflow bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxBitRateCrossflow | BitRate | C | 0..1 | Contains the requested maximum crossflow bit rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| minPackLossRate | PacketLossRate | C | 0..1 | Contains the requested minimum E2E packet loss rate for transmission quality measurement reporting.(NOTE) |  |
| avgPackLossRate | PacketLossRate | C | 0..1 | Contains the requested average E2E packet loss rate for transmission quality measurement reporting.(NOTE) |  |
| maxPackLossRate | PacketLossRate | C | 0..1 | Contains the requested maximum E2E packet loss rate for transmission quality measurement reporting.(NOTE) |  |
| minPackLossRateDl | PacketLossRate | C | 0..1 | Contains the requested minimum DL packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgPackLossRateDl | PacketLossRate | C | 0..1 | Contains the requested average DL packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxPackLossRateDl | PacketLossRate | C | 0..1 | Contains the requested maximum DL packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| minPackLossRateUl | PacketLossRate | C | 0..1 | Contains the requested minimum UL packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgPackLossRateUl | PacketLossRate | C | 0..1 | Contains the requested average UL packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxPackLossRateUl | PacketLossRate | C | 0..1 | Contains the requested maximum UL packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| minPackLossRateCrossflow | PacketLossRate | C | 0..1 | Contains the requested minimum crossflow packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgPackLossRateCrossflow | PacketLossRate | C | 0..1 | Contains the requested average crossflow packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxPackLossRateCrossflow | PacketLossRate | C | 0..1 | Contains the requested maximum crosslow packet loss rate for transmission quality measurement reporting.(NOTE) | XRMApp |
| minJitter | Uint32 | C | 0..1 | Contains the requested minimum E2E jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) |  |
| avgJitter | Uint32 | C | 0..1 | Contains the requested average E2E jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) |  |
| maxJitter | Uint32 | C | 0..1 | Contains the requested maximum E2E jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) |  |
| minJitterUl | Uint32 | C | 0..1 | Contains the requested minimum UL jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgJitterUl | Uint32 | C | 0..1 | Contains the requested average UL jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxJitterUl | Uint32 | C | 0..1 | Contains the requested maximum UL jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| minJitterDl | Uint32 | C | 0..1 | Contains the requested minimum DL jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgJitterDl | Uint32 | C | 0..1 | Contains the requested average DL jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxJitterDl | Uint32 | C | 0..1 | Contains the requested maximum DL jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| minJitterCrossflow | Uint32 | C | 0..1 | Contains the requested minimum crossflow jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| avgJitterCrossflow | Uint32 | C | 0..1 | Contains the requested average crossflow jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| maxJitterCrossflow | Uint32 | C | 0..1 | Contains the requested maximum crossflow jitter (expressed in nanoseconds) for transmission quality measurement reporting.(NOTE) | XRMApp |
| NOTE: These attributes are mutually exclusive. Either one of them shall be present. |

\* \* \* Next change \* \* \* \*

##### 6.4.6.2.8 Type: TransQualMeasData

Table 6.4.6.2.8-1: Definition of type TransQualMeasData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| minLatency | Uinteger | O | 0..1 | Contains the measured minimum E2E latency (expressed in milliseconds).(NOTE) |  |
| maxLatency | Uinteger | O | 0..1 | Contains the measured maximum E2E latency (expressed in milliseconds).(NOTE) |  |
| avgLatency | Uinteger | O | 0..1 | Contains the measured average E2E latency (expressed in milliseconds).(NOTE) |  |
| stdDevLatency | Uinteger | O | 0..1 | Contains the standard deviation (expressed in milliseconds) for the measured E2E latency.This attribute may be present only if the "minLatency", "maxLatency" and/or "avgLatency" attribute(s) is/are present. |  |
| kPercLatency | Uinteger | O | 0..1 | Contains the kPercentile (expressed in milliseconds) for the measured E2E latency.This attribute may be present only if the "minLatency", "maxLatency" and/or "avgLatency" attribute(s) is/are present. |  |
| kValLatency | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercLatency" attribute.This attribute shall be present only if the "kPercLatency" attribute is present. |  |
| minLatencyUl | Uinteger | O | 0..1 | Contains the measured minimum UL latency (expressed in milliseconds).(NOTE) | XRMApp |
| maxLatencyUl | Uinteger | O | 0..1 | Contains the measured maximum UL latency (expressed in milliseconds).(NOTE) | XRMApp |
| avgLatencyUl | Uinteger | O | 0..1 | Contains the measured average UL latency (expressed in milliseconds).(NOTE) | XRMApp |
| stdDevLatencyUl | Uinteger | O | 0..1 | Contains the standard deviation (expressed in milliseconds) for the measured UL latency.This attribute may be present only if the "minLatencyUl", "maxLatencyUl" and/or "avgLatencyUl" attribute(s) is/are present. | XRMApp |
| kPercLatencyUl | Uinteger | O | 0..1 | Contains the kPercentile (expressed in milliseconds) for the measured UL latency.This attribute may be present only if the "minLatencyUl", "maxLatencyUl" and/or "avgLatencyUl" attribute(s) is/are present. | XRMApp |
| kValLatencyUl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercLatencyUl" attribute.This attribute shall be present only if the "kPercLatencyUl" attribute is present. | XRMApp |
| minLatencyDl | Uinteger | O | 0..1 | Contains the measured minimum DL latency (expressed in milliseconds).(NOTE) | XRMApp |
| maxLatencyDl | Uinteger | O | 0..1 | Contains the measured maximum DL latency (expressed in milliseconds).(NOTE) | XRMApp |
| avgLatencyDl | Uinteger | O | 0..1 | Contains the measured average DL latency (expressed in milliseconds).(NOTE) | XRMApp |
| stdDevLatencyDl | Uinteger | O | 0..1 | Contains the standard deviation (expressed in milliseconds) for the measured DL latency.This attribute may be present only if the "minLatencyDl", "maxLatencyDl" and/or "avgLatencyDl" attribute(s) is/are present. | XRMApp |
| kPercLatencyDl | Uinteger | O | 0..1 | Contains the kPercentile (expressed in milliseconds) for the measured DL latency.This attribute may be present only if the "minLatencyDl", "maxLatencyDl" and/or "avgLatencyDl" attribute(s) is/are present. | XRMApp |
| kValLatencyDl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercLatencyDl" attribute.This attribute shall be present only if the "kPercLatencyDl" attribute is present. | XRMApp |
| minLatencyCrossflow | Uinteger | O | 0..1 | Contains the measured minimum crosslow latency (expressed in milliseconds).(NOTE) | XRMApp |
| maxLatencyCrossflow | Uinteger | O | 0..1 | Contains the measured maximum crosslow latency (expressed in milliseconds).(NOTE) | XRMApp |
| avgLatencyCrossflow | Uinteger | O | 0..1 | Contains the measured average crosslow latency (expressed in milliseconds).(NOTE) | XRMApp |
| stdDevLatencyCrossflow | Uinteger | O | 0..1 | Contains the standard deviation (expressed in milliseconds) for the measured crosslow latency.This attribute may be present only if the "minLatencyCrosslow", "maxLatencyCrosslow" and/or "avgLatencyCrosslow" attribute(s) is/are present. | XRMApp |
| kPercLatencyCrossflow | Uinteger | O | 0..1 | Contains the kPercentile (expressed in milliseconds) for the measured crossflow latency.This attribute may be present only if the "minLatencyCrosslow", "maxLatencyCrosslow" and/or "avgLatencyCrosslow" attribute(s) is/are present. | XRMApp |
| kValLatencyCrossflow | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercLatencyCrosslow" attribute.This attribute shall be present only if the "kPercLatencyCrosslow" attribute is present. | XRMApp |
| minBitRate | BitRate | O | 0..1 | Contains the measured minimum E2E bit rate.(NOTE) |  |
| maxBitRate | BitRate | O | 0..1 | Contains the measured maximum E2E bit rate.(NOTE) |  |
| avgBitRate | BitRate | O | 0..1 | Contains the measured average E2E bit rate.(NOTE) |  |
| stdDevBitRate | BitRate | O | 0..1 | Contains the standard deviation E2E for the measured bit rate.This attribute may be present only if the "minBitRate", "maxBitRate" and/or "avgBitRate" attribute(s) is/are present. |  |
| kPercBitRate | BitRate | O | 0..1 | Contains the kPercentile for the measured E2E bit rate.This attribute may be present only if the "minBitRate", "maxBitRate" and/or "avgBitRate" attribute(s) is/are present. |  |
| kValBitRate | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercBitRate" attribute.This attribute shall be present only if the "kPercBitRate" attribute is present. |  |
| minBitRateUl | BitRate | O | 0..1 | Contains the measured minimum UL bit rate.(NOTE) | XRMApp |
| maxBitRateUl | BitRate | O | 0..1 | Contains the measured maximum UL bit rate.(NOTE) | XRMApp |
| avgBitRateUl | BitRate | O | 0..1 | Contains the measured average UL bit rate.(NOTE) | XRMApp |
| stdDevBitRateUl | BitRate | O | 0..1 | Contains the standard deviation for the measured UL bit rate.This attribute may be present only if the "minBitRateUl", "maxBitRateUl" and/or "avgBitRateUl" attribute(s) is/are present. | XRMApp |
| kPercBitRateUl | BitRate | O | 0..1 | Contains the kPercentile for the measured UL bit rate.This attribute may be present only if the "minBitRateUl", "maxBitRateUl" and/or "avgBitRateUl" attribute(s) is/are present. | XRMApp |
| kValBitRateUl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercBitRateUl" attribute.This attribute shall be present only if the "kPercBitRateUl" attribute is present. | XRMApp |
| minBitRateDl | BitRate | O | 0..1 | Contains the measured minimum DL bit rate.(NOTE) | XRMApp |
| maxBitRateDl | BitRate | O | 0..1 | Contains the measured maximum DL bit rate.(NOTE) | XRMApp |
| avgBitRateDl | BitRate | O | 0..1 | Contains the measured average DL bit rate.(NOTE) | XRMApp |
| stdDevBitRateDl | BitRate | O | 0..1 | Contains the standard deviation DL for the measured bit rate.This attribute may be present only if the "minBitRateDl", "maxBitRateDl" and/or "avgBitRateDl" attribute(s) is/are present. | XRMApp |
| kPercBitRateDl | BitRate | O | 0..1 | Contains the kPercentile for the measured DL bit rate.This attribute may be present only if the "minBitRateDl", "maxBitRateDl" and/or "avgBitRateDl" attribute(s) is/are present. | XRMApp |
| kValBitRateDl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercBitRateDl" attribute.This attribute shall be present only if the "kPercBitRateDl" attribute is present. | XRMApp |
| minBitRateCrossflow | BitRate | O | 0..1 | Contains the measured minimum crossflow bit rate.(NOTE) | XRMApp |
| maxBitRateCrossflow | BitRate | O | 0..1 | Contains the measured maximum crossflow bit rate.(NOTE) | XRMApp |
| avgBitRateCrossflow | BitRate | O | 0..1 | Contains the measured average crossflow bit rate.(NOTE) | XRMApp |
| stdDevBitRateCrossflow | BitRate | O | 0..1 | Contains the standard deviation crossflow for the measured bit rate.This attribute may be present only if the "minBitRateCrossflow", "maxBitRateCrossflow" and/or "avgBitRateCrossflow" attribute(s) is/are present. | XRMApp |
| kPercBitRateCrossflow | BitRate | O | 0..1 | Contains the kPercentile for the measured crossflow bit rate.This attribute may be present only if the "minBitRateCrossflow", "maxBitRateCrossflow" and/or "avgBitRateCrossflow" attribute(s) is/are present. | XRMApp |
| kValBitRateCrossflow | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercBitRateCrossflow" attribute.This attribute shall be present only if the "kPercBitRateCrossflow" attribute is present. | XRMApp |
| minPackLossRate | PacketLossRate | O | 0..1 | Contains the measured minimum E2E packet loss rate.(NOTE) |  |
| maxPackLossRate | PacketLossRate | O | 0..1 | Contains the measured maximum E2E packet loss rate.(NOTE) |  |
| avgPackLossRate | PacketLossRate | O | 0..1 | Contains the measured average E2E packet loss rate.(NOTE) |  |
| stdDevPackLossRate | PacketLossRate | O | 0..1 | Contains the standard deviation for the measured E2E packet loss rate.This attribute may be present only if the "minPackLossRate", "maxPackLossRate" and/or "avgPackLossRate" attribute(s) is/are present. |  |
| kPercPackLossRate | PacketLossRate | O | 0..1 | Contains the kPercentile for the measured E2E packet loss rate.This attribute may be present only if the "minPackLossRate", "maxPackLossRate" and/or "avgPackLossRate" attribute(s) is/are present. |  |
| kValPackLossRate | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercPackLossRate" attribute.This attribute shall be present only if the "kPercPackLossRate" attribute is present. |  |
| minPackLossRateUl | PacketLossRate | O | 0..1 | Contains the measured minimum UL packet loss rate.(NOTE) | XRMApp |
| maxPackLossRateUl | PacketLossRate | O | 0..1 | Contains the measured maximum UL packet loss rate.(NOTE) | XRMApp |
| avgPackLossRateUl | PacketLossRate | O | 0..1 | Contains the measured average UL packet loss rate.(NOTE) | XRMApp |
| stdDevPackLossRateUl | PacketLossRate | O | 0..1 | Contains the standard deviation for the measured UL packet loss rate.This attribute may be present only if the "minPackLossRateUl", "maxPackLossRateUl" and/or "avgPackLossRateUl" attribute(s) is/are present. | XRMApp |
| kPercPackLossRateUl | PacketLossRate | O | 0..1 | Contains the kPercentile for the measured UL packet loss rate.This attribute may be present only if the "minPackLossRateUl", "maxPackLossRateUl" and/or "avgPackLossRateUl" attribute(s) is/are present. | XRMApp |
| kValPackLossRateUl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercPackLossRateUl" attribute.This attribute shall be present only if the "kPercPackLossRateUl" attribute is present. | XRMApp |
| minPackLossRateDl | PacketLossRate | O | 0..1 | Contains the measured minimum DL packet loss rate.(NOTE) | XRMApp |
| maxPackLossRateDl | PacketLossRate | O | 0..1 | Contains the measured maximum DL packet loss rate.(NOTE) | XRMApp |
| avgPackLossRateDl | PacketLossRate | O | 0..1 | Contains the measured average DL packet loss rate.(NOTE) | XRMApp |
| stdDevPackLossRateDl | PacketLossRate | O | 0..1 | Contains the standard deviation for the measured DL packet loss rate.This attribute may be present only if the "minPackLossRateDl", "maxPackLossRateDl" and/or "avgPackLossRateDl" attribute(s) is/are present. | XRMApp |
| kPercPackLossRateDl | PacketLossRate | O | 0..1 | Contains the kPercentile for the measured DL packet loss rate.This attribute may be present only if the "minPackLossRateDl", "maxPackLossRateDl" and/or "avgPackLossRateDl" attribute(s) is/are present. | XRMApp |
| kValPackLossRateDl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercPackLossRateDl" attribute.This attribute shall be present only if the "kPercPackLossRateDl" attribute is present. | XRMApp |
| minPackLossRateCrossflow | PacketLossRate | O | 0..1 | Contains the measured minimum crossflow packet loss rate.(NOTE) | XRMApp |
| maxPackLossRateCrossflow | PacketLossRate | O | 0..1 | Contains the measured maximum crossflow packet loss rate.(NOTE) | XRMApp |
| avgPackLossRateCrossflow | PacketLossRate | O | 0..1 | Contains the measured average crossflow packet loss rate.(NOTE) | XRMApp |
| stdDevPackLossRateCrossflow | PacketLossRate | O | 0..1 | Contains the standard deviation for the measured crossflow packet loss rate.This attribute may be present only if the "minPackLossRateCrossflow", "maxPackLossRateCrossflow" and/or "avgPackLossRateCrossflow" attribute(s) is/are present. | XRMApp |
| kPercPackLossRateCrossflow | PacketLossRate | O | 0..1 | Contains the kPercentile for the measured crossflow packet loss rate.This attribute may be present only if the "minPackLossRateCrossflow", "maxPackLossRateCrossflow" and/or "avgPackLossRateCrossflow" attribute(s) is/are present. | XRMApp |
| kValPackLossRateCrossflow | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercPackLossRateCrossflow" attribute.This attribute shall be present only if the "kPercPackLossRateCrossflow" attribute is present. | XRMApp |
| minJitter | Uint32 | O | 0..1 | Contains the measured minimum E2E jitter (expressed in nanoseconds).(NOTE) |  |
| maxJitter | Uint32 | O | 0..1 | Contains the measured maximum E2E jitter (expressed in nanoseconds).(NOTE) |  |
| avgJitter | Uint32 | O | 0..1 | Contains the measured average E2E jitter (expressed in nanoseconds).(NOTE) |  |
| stdDevJitter | Uint32 | O | 0..1 | Contains the standard deviation (expressed in nanoseconds) for the measured E2E Jitter.This attribute may be present only if the "minJitter", "maxJitter" and/or "avgJitter" attribute(s) is/are present. |  |
| kPercJitter | Uint32 | O | 0..1 | Contains the kPercentile (expressed in nanoseconds) for the measured Jitter.This attribute may be present only if the "minJitter", "maxJitter" and/or "avgJitter" attribute(s) is/are present. |  |
| kValJitter | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercJitter" attribute.This attribute shall be present only if the "kPercJitter" attribute is present. |  |
| minJitterUl | Uint32 | O | 0..1 | Contains the measured minimum UL jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| maxJitterUl | Uint32 | O | 0..1 | Contains the measured maximum UL jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| avgJitterUl | Uint32 | O | 0..1 | Contains the measured average UL jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| stdDevJitterUl | Uint32 | O | 0..1 | Contains the standard deviation (expressed in nanoseconds) for the measured UL Jitter.This attribute may be present only if the "minJitterUl", "maxJitterUl" and/or "avgJitterUl" attribute(s) is/are present. | XRMApp |
| kPercJitterUl | Uint32 | O | 0..1 | Contains the kPercentile (expressed in nanoseconds) for the measured UL Jitter.This attribute may be present only if the "minJitterUl", "maxJitterUl" and/or "avgJitterUl" attribute(s) is/are present. | XRMApp |
| kValJitterUl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercJitterUl" attribute.This attribute shall be present only if the "kPercJitterUl" attribute is present. | XRMApp |
| minJitterDl | Uint32 | O | 0..1 | Contains the measured minimum DL jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| maxJitterDl | Uint32 | O | 0..1 | Contains the measured maximum DL jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| avgJitterDl | Uint32 | O | 0..1 | Contains the measured average DL jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| stdDevJitterDl | Uint32 | O | 0..1 | Contains the standard deviation (expressed in nanoseconds) for the measured DL Jitter.This attribute may be present only if the "minJitterDl", "maxJitterDl" and/or "avgJitterDl" attribute(s) is/are present. | XRMApp |
| kPercJitterDl | Uint32 | O | 0..1 | Contains the kPercentile (expressed in nanoseconds) for the measured Dl Jitter.This attribute may be present only if the "minJitterDl", "maxJitterDl" and/or "avgJitterDl" attribute(s) is/are present. | XRMApp |
| kValJitterDl | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercJitterDl" attribute.This attribute shall be present only if the "kPercJitterDl" attribute is present. | XRMApp |
| minJitterCrossflow | Uint32 | O | 0..1 | Contains the measured minimum crossflow jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| maxJitterCrossflow | Uint32 | O | 0..1 | Contains the measured maximum crossflow jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| avgJitterCrossflow | Uint32 | O | 0..1 | Contains the measured average crossflow jitter (expressed in nanoseconds).(NOTE) | XRMApp |
| stdDevJitterCrossflow | Uint32 | O | 0..1 | Contains the standard deviation (expressed in nanoseconds) for the measured crossflow Jitter.This attribute may be present only if the "minJitterCrossflow", "maxJitterCrossflow" and/or "avgJitterCrossflow" attribute(s) is/are present. | XRMApp |
| kPercJitterCrossflow | Uint32 | O | 0..1 | Contains the kPercentile (expressed in nanoseconds) for the measured crossflow Jitter.This attribute may be present only if the "minJitterCrossflow", "maxJitterCrossflow" and/or "avgJitterCrossflow" attribute(s) is/are present. | XRMApp |
| kValJitterCrossflow | Uinteger | C | 0..1 | Contains the value of the reported percentile ("k" parameter value) within the "kPercJitterCrossflow" attribute.This attribute shall be present only if the "kPercJitterCrossflow" attribute is present. | XRMApp |
| measPeriod | DurationSec | O | 0..1 | Contains the measurement period of the reported measurements. |  |
| timestamp | DateTime | O | 0..1 | Contains the timestamp of the reported measurements. |  |
| NOTE: At least one of these attributes shall be present. |

\* \* \* Next change \* \* \* \*

##### 6.4.6.2.11 Type: Crossflow

Table 6.4.6.2.11-1: Definition of type Crossflow

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| crossflow | array(CrossflowInfo) | M | 2..2 | Contains the crossflow information. |  |

Editor’s note: The cardinality of the "crossflow" attribute is FFS.

\* \* \* Next change \* \* \* \*

##### 6.4.6.2.12 Type: CrossflowInfo

Table 6.4.6.2.12-1: Definition of type CrossflowInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| flowDesc | ConnInfo | M | 1 | Contains the descriptor of the SEALDD crossflow. |  |
| direction | FlowDirection | M | 1 | Contains the SEALDD crossflow direction. |  |

\* \* \* Next change \* \* \* \*

##### 6.4.6.3.3 Enumeration: MeasurementId

The enumeration MeasurementId represents the transmission quality measurement type. It shall comply with the provisions defined in table 6.4.6.3.3-1.

Table 6.4.6.3.3-1: Enumeration MeasurementId

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| LATENCY | Indicates that the requested/reported measurement is the E2E latency. |  |
| UL\_LATENCY | Indicates that the requested/reported measurement is the UL latency. | XRMApp |
| DL\_LATENCY | Indicates that the requested/reported measurement is the DL latency. | XRMApp |
| CROSSFLOW\_LATENCY | Indicates that the requested/reported measurement is the crossflow latency. | XRMApp |
| BITRATE | Indicates that the requested/reported measurement is the E2E bit rate. |  |
| UL\_BITRATE | Indicates that the requested/reported measurement is the UL bit rate. | XRMApp |
| DL\_BITRATE | Indicates that the requested/reported measurement is the DL bit rate. | XRMApp |
| CROSSFLOW\_BITRATE | Indicates that the requested/reported measurement is the crossflow bit rate. | XRMApp |
| PACKET\_LOSS\_RATE | Indicates that the requested/reported measurement is the E2E packet loss rate. |  |
| UL\_PACKET\_LOSS\_RATE | Indicates that the requested/reported measurement is the UL packet loss rate. | XRMApp |
| DL\_PACKET\_LOSS\_RATE | Indicates that the requested/reported measurement is the DL packet loss rate. | XRMApp |
| CROSSFLOW\_PACKET\_LOSS\_RATE | Indicates that the requested/reported measurement is the crossflow packet loss rate. | XRMApp |
| JITTER | Indicates that the requested/reported measurement is the E2E jitter. |  |
| UL\_JITTER | Indicates that the requested/reported measurement is the UL jitter. | XRMApp |
| DL\_JITTER | Indicates that the requested/reported measurement is the DL jitter. | XRMApp |
| CROSSFLOW\_JITTER | Indicates that the requested/reported measurement is the crossflow jitter. | XRMApp |

\* \* \* Next change \* \* \* \*

##### 6.4.6.3.5 Enumeration: FlowDirection

The enumeration FlowDirection represents the flow direction. It shall comply with the provisions defined in table 6.4.6.3.5-1.

Table 6.4.6.3.5-1: Enumeration FlowDirection

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| UL | Indicates that the flow direction is uplink. |  |
| DL | Indicates that the flow direction is downlink. |  |

\* \* \* Next change \* \* \* \*

### 6.4.8 Feature negotiation

The optional features listed in table 6.4.8-1 are defined for the SDD\_TransmissionQualityMeasurement API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.4.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | XRMApp | This feature indicates the support of the enhancements to the SEAL Data Delivery Enabler Layer to support XRM applications.Within this feature, the following enhancements are covered:- Support granular QoS monitoring for XR services. |

\* \* \* Next change \* \* \* \*

# A.5 SDD\_TransmissionQualityMeasurement API

openapi: 3.0.0

info:

 title: SEALDD Server Data Transmission Quality Measurement Service

 version: 1.0.0

 description: |

 SEALDD Server Data Transmission Quality Measurement Service.

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externalDocs:

 description: >

 3GPP TS 29.548 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

 SEAL Data Delivery (SEALDD) Server Services; Stage 3.

 url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.548/

servers:

 - url: '{apiRoot}/sdd-tqm/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

 - {}

 - oAuth2ClientCredentials: []

paths:

 /subscriptions:

 post:

 summary: Request the creation of a Transmission Quality Measurement Subscription.

 operationId: CreateTransQualMeasSubsc

 tags:

 - Transmission Quality Measurement Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: >

 Created. The Transmission Quality Measurement Subscription is successfully created

 and a representation of the created Individual Transmission Quality Measurement

 Subscription resource shall be returned.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: >

 Contains the URI of the created Individual Transmission Quality Measurement

 Subscription resource.

 required: true

 schema:

 type: string

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 callbacks:

 TransQualMeasNotif:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: >

 No Content. The Transmission Quality Measurement notification is successfully

 received and acknowledged.

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}:

 parameters:

 - name: subscriptionId

 in: path

 description: >

 Represents the identifier of the Individual Transmission Quality Measurement Subscription

 resource.

 required: true

 schema:

 type: string

 get:

 summary: Retrieve an existing Individual Transmission Quality Measurement Subscription resource.

 operationId: GetIndTransQualMeasSubsc

 tags:

 - Individual Transmission Quality Measurement Subscription (Document)

 responses:

 '200':

 description: >

 OK. The requested Individual Transmission Quality Measurement Subscription resource

 shall be returned.

 content:

 application/json:

 schema:

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '406':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 put:

 summary: Request the update of an existing Individual Transmission Quality Measurement Subscription resource.

 operationId: UpdateIndTransQualMeasSubsc

 tags:

 - Individual Transmission Quality Measurement Subscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: >

 OK. The Individual Transmission Quality Measurement Subscription resource is

 successfully updated and a representation of the updated resource shall be returned in

 the response body.

 content:

 application/json:

 schema:

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

 '204':

 description: >

 No Content. The Individual Transmission Quality Measurement Subscription resource is

 successfully updated and no content is returned in the response body.

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 patch:

 summary: Request the modification of an existing Individual Transmission Quality Measurement Subscription resource.

 operationId: ModifyIndTransQualMeasSubsc

 tags:

 - Individual Transmission Quality Measurement Subscription (Document)

 requestBody:

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: >

 OK. The Individual Transmission Quality Measurement Subscription resource is

 successfully modified and a representation of the updated resource shall be returned in

 the response body.

 content:

 application/json:

 schema:

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

 '204':

 description: >

 No Content. The Individual Transmission Quality Measurement Subscription resource is

 successfully modified and no content is returned in the response body.

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 delete:

 summary: Request the deletion of an existing Individual Transmission Quality Measurement Subscription resource.

 operationId: DeleteIndTransQualMeasSubsc

 tags:

 - Individual Transmission Quality Measurement Subscription (Document)

 responses:

 '204':

 description: >

 No Content. The Individual Transmission Quality Measurement Subscription resource is

 successfully deleted.

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /reports:

 get:

 summary: Retrieve Historical Transmission Quality Measurement Report(s).

 operationId: GetHistTransQualMeasReports

 tags:

 - Historical Transmission Quality Measurement Reports (Collection)

 parameters:

 - name: app-traffic-ids

 in: query

 required: true

 schema:

 type: array

 items:

 type: string

 minItems: 1

 - name: val-group-id

 in: query

 required: false

 schema:

 type: string

 - name: val-ue-ids-list

 in: query

 required: false

 schema:

 type: array

 items:

 type: string

 minItems: 1

 - name: val-user-ids-list

 in: query

 required: false

 schema:

 type: array

 items:

 type: string

 minItems: 1

 - name: all-val-ues

 in: query

 required: false

 schema:

 type: boolean

 default: false

 description: >

 Indicates that the request is related to all VAL UE(s) of the application traffic

 identified by the application traffic identifier(s) provided within the

 appTrafficIds attribute.

 true indicates that the request is related to all VAL UE(s).

 false" indicates that the request is not related to all VAL UE(s).

 The default value when this query parameter is omitted is false.

 - name: supp-feat

 in: query

 required: false

 schema:

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

 responses:

 '200':

 description: >

 OK. The requested Historical Transmission Quality Measurement Report(s) , if any, shall

 be returned.

 content:

 application/json:

 schema:

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '406':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{tokenUrl}'

 scopes: {}

 schemas:

#

# STRUCTURED DATA TYPES

#

 TransQualMeasSubsc:

 description: >

 Represents a Transmission Quality Measurement Subscription.

 type: object

 properties:

 appTrafficIds:

 type: array

 items:

 type: string

 minItems: 1

 valGroupId:

 type: string

 valUeIdsList:

 type: array

 items:

 type: string

 minItems: 1

 valUserIdsList:

 type: array

 items:

 type: string

 minItems: 1

 allValUesInd:

 type: boolean

 default: false

 flows:

 type: array

 items:

 $ref: 'TS29548\_SDD\_Transmission.yaml#/components/schemas/ConnInfo'

 minItems: 1

 crossflows:

 type: array

 items:

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

 minItems: 1

 measConds:

 type: array

 items:

 $ref: 'TS29549\_SS\_Events.yaml#/components/schemas/ValidityConditions'

 minItems: 1

 reqs:

 type: object

 additionalProperties:

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

 minProperties: 1

 nullable: true

 description: >

 Represents the transmission quality measurement reporting requirements of the

 subscription.

 The key of the map shall be any unique string encoded value.

 subsExpTime:

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

 notifUri:

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

 suppFeat:

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

 required:

 - appTrafficIds

 - reqs

 - notifUri

 oneOf:

 - required: [valGroupId]

 - required: [valUeIdsList]

 - required: [valUserIdsList]

 - required: [allValUesInd]

 TransQualMeasReq:

 description: >

 Represents Transmission Quality Measurement requirements.

 type: object

 properties:

 measId:

 type: array

 items:

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

 minItems: 1

 repType:

 $ref: 'TS29508\_Nsmf\_EventExposure.yaml#/components/schemas/NotificationMethod'

 repPeriodicity:

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

 repGranularity:

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

 measWindow:

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

 measExpTime:

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

 repCriteriaSets:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 Contains one or several set(s) of transmission quality measurement reporting

 criteria.

 The key of the map shall be any unique string encoded value.

 Only the criteria related to the subscribed measurement(s) within the measId attribute

 shall be present within this attribute.

 required:

 - measId

 TransQualMeasSubscPatch:

 description: >

 Represents the requested modifications to a Transmission Quality Measurement Subscription.

 type: object

 properties:

 measConds:

 type: array

 items:

 $ref: 'TS29549\_SS\_Events.yaml#/components/schemas/ValidityConditions'

 minItems: 1

 reqs:

 type: object

 additionalProperties:

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

 minProperties: 1

 nullable: true

 description: >

 Represents the transmission quality measurement reporting requirements of the

 subscription.

 The key of the map shall be any unique string encoded value and shall be set to the same

 value as the one provided during the creation of the transmission quality measurement

 subscription.

 notifUri:

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

 TransQualMeasNotif:

 description: >

 Represents a Transmission Quality Measurement Notification.

 type: object

 properties:

 subscriptionId:

 type: string

 reports:

 type: array

 items:

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

 minItems: 1

 required:

 - subscriptionId

 - reports

 TransQualMeasReport:

 description: >

 Represents a Transmission Quality Measurement report.

 type: object

 properties:

 measId:

 type: array

 items:

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

 minItems: 1

 valUeIds:

 type: array

 items:

 type: string

 minItems: 1

 valUserIds:

 type: array

 items:

 type: string

 minItems: 1

 flows:

 type: array

 items:

 $ref: 'TS29548\_SDD\_Transmission.yaml#/components/schemas/ConnInfo'

 minItems: 1

 crossflows:

 type: array

 items:

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

 minItems: 1

 measData:

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

 timestamp:

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

 required:

 - measId

 not:

 required: [valUeIds, valUserIds]

 TransQualMeasCriteria:

 description: >

 Represents the Transmission Quality Measurement reporting criteria.

 type: object

 properties:

 minLatency:

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

 avgLatency:

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

 maxLatency:

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

 minLatencyDl:

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

 avgLatencyDl:

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

 maxLatencyDl:

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

 minLatencyUl:

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

 avgLatencyUl:

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

 maxLatencyUl:

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

 minLatencyCrossflow:

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

 avgLatencyCrossflow:

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

 maxLatencyCrossflow:

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

 minBitRate:

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

 avgBitRate:

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

 maxBitRate:

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

 minBitRateDl:

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

 avgBitRateDl:

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

 maxBitRateDl:

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

 minBitRateUl:

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

 avgBitRateUl:

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

 maxBitRateUl:

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

 minBitRateCrossflow:

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

 avgBitRateCrossflow:

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

 maxBitRateCrossflow:

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

 minPackLossRate:

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

 avgPackLossRate:

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

 maxPackLossRate:

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

 minPackLossRateDl:

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

 avgPackLossRateDl:

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

 maxPackLossRateDl:

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

 minPackLossRateUl:

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

 avgPackLossRateUl:

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

 maxPackLossRateUl:

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

 minPackLossRateCrossflow:

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

 avgPackLossRateCrossflow:

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

 maxPackLossRateCrossflow:

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

 minJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 minJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 minJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 minJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 oneOf:

 - required: [minLatency]

 - required: [avgLatency]

 - required: [maxLatency]

 - required: [minLatencyDl]

 - required: [avgLatencyDl]

 - required: [maxLatencyDl]

 - required: [minLatencyUl]

 - required: [avgLatencyUl]

 - required: [maxLatencyUl]

 - required: [minLatencyCrossflow]

 - required: [avgLatencyCrossflow]

 - required: [maxLatencyCrossflow]

 - required: [minBitRate]

 - required: [avgBitRate]

 - required: [maxBitRate]

 - required: [minBitRateDl]

 - required: [avgBitRateDl]

 - required: [maxBitRateDl]

 - required: [minBitRateUl]

 - required: [avgBitRateUl]

 - required: [maxBitRateUl]

 - required: [minBitRateCrossflow]

 - required: [avgBitRateCrossflow]

 - required: [maxBitRateCrossflow]

 - required: [minPackLossRate]

 - required: [avgPackLossRate]

 - required: [maxPackLossRate]

 - required: [minPackLossRateDl]

 - required: [avgPackLossRateDl]

 - required: [maxPackLossRateDl]

 - required: [minPackLossRateUl]

 - required: [avgPackLossRateUl]

 - required: [maxPackLossRateUl]

 - required: [minPackLossRateCrossflow]

 - required: [avgPackLossRateCrossflow]

 - required: [maxPackLossRateCrossflow]

 - required: [minJitter]

 - required: [avgJitter]

 - required: [maxJitter]

 - required: [minJitterDl]

 - required: [avgJitterDl]

 - required: [maxJitterDl]

 - required: [minJitterUl]

 - required: [avgJitterUl]

 - required: [maxJitterUl]

 - required: [minJitterCrossflow]

 - required: [avgJitterCrossflow]

 - required: [maxJitterCrossflow]

 TransQualMeasData:

 description: >

 Represents the Transmission Quality Measurement data.

 type: object

 properties:

 minLatency:

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

 maxLatency:

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

 avgLatency:

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

 stdDevLatency:

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

 kPercLatency:

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

 kValLatency:

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

 minLatencyUl:

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

 maxLatencyUl:

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

 avgLatencyUl:

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

 stdDevLatencyUl:

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

 kPercLatencyUl:

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

 kValLatencyUl:

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

 minLatencyDl:

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

 maxLatencyDl:

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

 avgLatencyDl:

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

 stdDevLatencyDl:

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

 kPercLatencyDl:

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

 kValLatencyDl:

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

 minLatencyCrossflow:

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

 maxLatencyCrossflow:

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

 avgLatencyCrossflow:

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

 stdDevLatencyCrossflow:

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

 kPercLatencyCrossflow:

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

 kValLatencyCrossflow:

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

 minBitRate:

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

 maxBitRate:

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

 avgBitRate:

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

 stdDevBitRate:

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

 kPercBitRate:

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

 kValBitRate:

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

 minBitRateUl:

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

 maxBitRateUl:

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

 avgBitRateUl:

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

 stdDevBitRateUl:

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

 kPercBitRateUl:

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

 kValBitRateUl:

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

 minBitRateDl:

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

 maxBitRateDl:

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

 avgBitRateDl:

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

 stdDevBitRateDl:

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

 kPercBitRateDl:

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

 kValBitRateDl:

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

 minBitRateCrossflow:

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

 maxBitRateCrossflow:

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

 avgBitRateCrossflow:

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

 stdDevBitRateCrossflow:

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

 kPercBitRateCrossflow:

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

 kValBitRateCrossflow:

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

 minPackLossRate:

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

 maxPackLossRate:

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

 avgPackLossRate:

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

 stdDevPackLossRate:

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

 kPercPackLossRate:

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

 kValPackLossRate:

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

 minPackLossRateUl:

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

 maxPackLossRateUl:

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

 avgPackLossRateUl:

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

 stdDevPackLossRateUl:

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

 kPercPackLossRateUl:

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

 kValPackLossRateUl:

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

 minPackLossRateDl:

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

 maxPackLossRateDl:

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

 avgPackLossRateDl:

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

 stdDevPackLossRateDl:

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

 kPercPackLossRateDl:

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

 kValPackLossRateDl:

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

 minPackLossRateCrossflow:

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

 maxPackLossRateCrossflow:

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

 avgPackLossRateCrossflow:

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

 stdDevPackLossRateCrossflow:

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

 kPercPackLossRateCrossflow:

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

 kValPackLossRateCrossflow:

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

 minJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 stdDevJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kPercJitter:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kValJitter:

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

 minJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 stdDevJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kPercJitterUl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kValJitterUl:

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

 minJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 stdDevJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kPercJitterDl:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kValJitterDl:

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

 minJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 maxJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 avgJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 stdDevJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kPercJitterCrossflow:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

 kValJitterCrossflow:

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

 measPeriod:

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

 timestamp:

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

 anyOf:

 - required: [minLatency]

 - required: [avgLatency]

 - required: [maxLatency]

 - required: [minLatencyDl]

 - required: [avgLatencyDl]

 - required: [maxLatencyDl]

 - required: [minLatencyUl]

 - required: [avgLatencyUl]

 - required: [maxLatencyUl]

 - required: [minLatencyCrossflow]

 - required: [avgLatencyCrossflow]

 - required: [maxLatencyCrossflow]

 - required: [minBitRate]

 - required: [avgBitRate]

 - required: [maxBitRate]

 - required: [minBitRateDl]

 - required: [avgBitRateDl]

 - required: [maxBitRateDl]

 - required: [minBitRateUl]

 - required: [avgBitRateUl]

 - required: [maxBitRateUl]

 - required: [minBitRateCrossflow]

 - required: [avgBitRateCrossflow]

 - required: [maxBitRateCrossflow]

 - required: [minPackLossRate]

 - required: [avgPackLossRate]

 - required: [maxPackLossRate]

 - required: [minPackLossRateDl]

 - required: [avgPackLossRateDl]

 - required: [maxPackLossRateDl]

 - required: [minPackLossRateUl]

 - required: [avgPackLossRateUl]

 - required: [maxPackLossRateUl]

 - required: [minPackLossRateCrossflow]

 - required: [avgPackLossRateCrossflow]

 - required: [maxPackLossRateCrossflow]

 - required: [minJitter]

 - required: [avgJitter]

 - required: [maxJitter]

 - required: [minJitterDl]

 - required: [avgJitterDl]

 - required: [maxJitterDl]

 - required: [minJitterUl]

 - required: [avgJitterUl]

 - required: [maxJitterUl]

 - required: [minJitterCrossflow]

 - required: [avgJitterCrossflow]

 - required: [maxJitterCrossflow]

 HistTransQualMeasReports:

 description: >

 Represents Historical Transmission Quality Measurement Report(s).

 type: object

 properties:

 reports:

 type: array

 items:

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

 minItems: 0

 description: >

 Contains the Historical Transmission Quality Measurement Report(s).

 If there are no Historical Transmission Quality Measurement Report(s) fulfilling the

 request, this attribute shall contain an empty array.

 suppFeat:

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

 required:

 - reports

 TransQualMeasCriteriaSet:

 description: >

 Represents a set of transmission quality measurement reporting criteria.

 type: object

 properties:

 criteria:

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

 direction:

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

 required:

 - criteria

 - direction

 Crossflow:

 description: >

 Represents a crossflow.

 type: object

 properties:

 crossflow:

 type: array

 items:

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

 minItems: 2

 maxItems: 2

 required:

 - crossflow

 CrossflowInfo:

 description: >

 Represents the crossflow information.

 type: object

 properties:

 flowDesc:

 $ref: 'TS29548\_SDD\_Transmission.yaml#/components/schemas/ConnInfo'

 direction:

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

 required:

 - flowDesc

 - direction

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

 MeasurementId:

 anyOf:

 - type: string

 enum:

 - LATENCY

 - UL\_LATENCY

 - DL\_LATENCY

 - CROSSFLOW\_LATENCY

 - BITRATE

 - UL\_BITRATE

 - DL\_BITRATE

 - CROSSFLOW\_BITRATE

 - PACKET\_LOSS\_RATE

 - UL\_PACKET\_LOSS\_RATE

 - DL\_PACKET\_LOSS\_RATE

 - CROSSFLOW\_PACKET\_LOSS\_RATE

 - JITTER

 - UL\_JITTER

 - DL\_JITTER

 - CROSSFLOW\_JITTER

 - type: string

 description: >

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

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

 description: |

 Represents the transmission quality measurement type.

 Possible values are:

 - LATENCY: Indicates that the requested/reported measurement is the E2E latency.

 - UL\_LATENCY: Indicates that the requested/reported measurement is the UL latency.

 - DL\_LATENCY: Indicates that the requested/reported measurement is the DL latency.

 - CROSSFLOW\_LATENCY: Indicates that the requested/reported measurement is

 the crossflow latency.

 - BITRATE: Indicates that the requested/reported measurement is the E2E bit rate.

 - UL\_BITRATE: Indicates that the requested/reported measurement is the UL bit rate.

 - DL\_BITRATE: Indicates that the requested/reported measurement is the DL bit rate.

 - CROSSFLOW\_BITRATE: Indicates that the requested/reported measurement is the crossflow

 bit rate.

 - PACKET\_LOSS\_RATE: Indicates that the requested/reported measurement is the E2E packet loss

 rate.

 - UL\_PACKET\_LOSS\_RATE: Indicates that the requested/reported measurement is the UL

 packet loss rate.

 - DL\_PACKET\_LOSS\_RATE: Indicates that the requested/reported measurement is the DL

 packet loss rate.

 - CROSSFLOW\_PACKET\_LOSS\_RATE: Indicates that the requested/reported measurement is

 the crossflow packet loss

 rate.

 - JITTER: Indicates that the requested/reported measurement is the E2E jitter.

 - UL\_JITTER: Indicates that the requested/reported measurement is the UL jitter.

 - DL\_JITTER: Indicates that the requested/reported measurement is the Dl jitter.

 - CROSSFLOW\_JITTER: Indicates that the requested/reported measurement is

 the crossflow jitter.

 RepGranularity:

 anyOf:

 - type: string

 enum:

 - INDIVIDUAL\_VAL\_UE

 - VAL\_GROUP

 - ALL\_VAL\_UES

 - type: string

 description: >

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

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

 description: |

 Represents the reporting granularity.

 Possible values are:

 - INDIVIDUAL\_VAL\_UE: Indicates that the granularity is individual VAL UE/user.

 - VAL\_GROUP: Indicates that the granularity is VAL Group.

 - ALL\_VAL\_UES: Indicates that the granularity is all VAL UE/user(s).

 FlowDirection:

 anyOf:

 - type: string

 enum:

 - UL

 - DL

 - type: string

 description: >

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

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

 description: |

 Represents the flow direction.

 Possible values are:

 - UL: Indicates that the flow direction is uplink.

 - DL: Indicates that the flow direction is downlink.

# Data types describing alternative data types or combinations of data types:

#

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