**3GPP TSG-WG SA4 Meeting #117E  *S4-220121***

**E-meeting, Feb 14th – 23rd, 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.501** | **CR** | **0031** | **rev** | **-** | **Current version:** | **17.0.1** |  |
|  | | | | | | | | |
| *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:*** | Support of per-slice based metrics reporting | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | SA4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GMSA | | | | |  | ***Date:*** | | | 2022-02-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In the previous LS S4-211225 exchanges between SA4, SA2 and RAN3, the per-slice based metrics reporting is to be supported by SA4.  In current RAN3 agreements, the slice scope shall be outside of the transparent QoE configuraiton container and RAN can based on the slice scope to send the QoE configuration to the UEs. During the PDU Session Establishment procedure, the slice Id related to the established PDU Session will be sent to RAN by SMF. So RAN can decide to send QoE configuration to the UEs where there are PDU Sessions using the target network slices. However, RAN cannot figure out whether the media streaming service is using the target network slice or not. Therefore, the slice scope/fiter is also needed in the QoE configuration. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add support of slice based metrics reporting | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Slice based metrics reporting cannot be supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.3, 5.5.2, 5.5.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* First change \* \* \* \*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

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

[2] 3GPP TS 23.501: "System architecture for the 5G System (5GS)".

[3] 3GPP TS 23.502: "Procedures for the 5G System (5GS)".

[4] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[5] 3GPP TS 26.238: "Uplink streaming".

[6] 3GPP TS 26.307: "Presentation layer for 3GPP services".

[7] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[8] 3GPP TS 26.234: "Transparent end-to-end Packet-switched Streaming Service (PSS); Protocols and codecs".

[9] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[10] 3GPP TS 28.530: "Management and orchestration; Concepts, use cases and requirements".

[11] 3GPP TS 28.531: "Management and orchestration; Provisioning".

[12] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[13] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs".

[14] IETF RFC 1034: "Domain names – concepts and facilities".

[X] 3GPP TS 27.007: "AT command set for User Equipment (UE)".

\* \* \* \* Second change \* \* \* \*

### 4.2.3 Service Access Information for Downlink Media Streaming

The Service Access Information is the set of parameters and addresses which are needed by the 5GMSd Client to activate and control the reception of a downlink streaming session, and to report service/content consumption and/or QoE metrics.

The Service Access Information may be provided together with other service announcement information using M8d. Alternatively, the 5GMSd Client fetches the Service Access Information from the 5GMSd AF. Regardless of how it is provided, the Service Access Information contains different information, depending on the collaboration model between the 5GMS System and the 5GMSd Application Provider, and also depending on offered features. Baseline parameters are listed in Table 4.2.3‑1 below:

Table 4.2.3-1: Parameters of baseline service access information

|  |  |
| --- | --- |
| Parameters | Description |
| Provisioning Session identifier | Unique identification of the M1d Provisioning Session. |

When the content hosting feature is activated for a downlink streaming session, the parameters from Table 4.2.3-1a below can additionally be present.

Table 4.2.3-1a: Streaming Access parameters

|  |  |
| --- | --- |
| Parameters | Description |
| Media Player Entry | A document or a pointer to a document that defines a media presentation e.g. MPD for DASH content or URL to a video clip file. |

When the consumption reporting feature is activated for a downlink streaming session, the parameters from Table 4.2.3‑2 below are additionally present.

Table 4.2.3-2: Parameters for consumption reporting configuration

|  |  |
| --- | --- |
| Parameters | Description |
| Reporting interval | Identifies the interval between consumption reports being sent by the Media Session Handler. |
| Server address | A list of 5GMSd AF addresses where the consumption reports are sent by the Media Session Handler. |
| Sample percentage | The proportion of clients that shall report media consumption.  If not specified, all clients shall send reports. |
| Location reporting | Identify whether the Media Session Handler provides location data to the 5GMSd AF (in case of MNO or trusted third parties) |

When the dynamic policy invocation feature is activated for a downlink streaming session the parameters from Table 4.2.3‑3 below are additionally present.

Table 4.2.3-3: Parameters for dynamic policy invocation configuration

|  |  |
| --- | --- |
| Parameters | Description |
| Server address | A list of 5GMSd AF addresses (in the form of opaque URLs) which offer the APIs for dynamic policy invocation sent by the 5GMS Media Session Handler. |
| Valid Policy Template Ids | A list of Policy Template identifiers which the 5GMSd Client is authorized to use. |
| Service Data Flow Methods | A list of recommended Service Data Flow description methods (descriptors), e.g. 5-Tuple, ToS, 2-Tuple, etc, which should be used by the Media Session Handler to describe the Service Data Flows for the traffic to be policed. |
| External reference | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that can be cross-referenced with external metadata about the streaming session. |

When the metrics collection and reporting feature is activated for a downlink streaming session, one or more parameter sets for metrics configuration, according to Table 4.2.3‑4, are additionally present. Each metrics configuration set contains specific settings valid for that configuration, which is typically metric scheme dependent, and collection and reporting shall be done separately for each set.

Table 4.2.3-4: Parameters for each metrics configuration set

|  |  |
| --- | --- |
| Parameters | Description |
| Scheme | The scheme associated with this metrics configuration set. A scheme may be associated with 3GPP or with a non-3GPP entity. If not specified, a default 3GPP metrics scheme shall apply.  Metrics schemes shall be uniquely identified by URIs. |
| Server address | A list of 5GMSd AF addresses to which metric reports shall be sent for this metrics configuration set. |
| DNN | The Data Network Name (DNN) which shall be used when sending metrics report for this metrics configuration set.  If not specified, the default DNN shall be used. |
| Slice filter | (RAN-based reporting procedure only)The network slice(s) for which metrics collection and reporting shall be done for this metrics configuration set.  If not specified, the metrics collection and reporting shall be done for all network slices. |
| Reporting interval | The sending interval between metrics reports for this metrics configuration set.  If not specified, a single final report shall be sent after the streaming session has ended. |
| Sample percentage | The proportion of streaming sessions that shall report metrics for this metrics configuration set.  If not specified, reports shall be sent for all sessions. |
| Streaming source filter | A list of content URL patterns for which metrics reporting shall be done for this metrics configuration set.  If not specified, reporting shall be done for all URLs. |
| Metrics | A list of metrics which shall be collected and reported for this metrics configuration set.  For progressive download and DASH streaming services, the listed metrics are associated with the 3GPP metrics scheme and shall correspond to one or more of the metrics as specified in clauses 10.3 and 10.4, respectively, of TS 26.247 [7].  In addition, for the 3GPP metrics scheme as applied to DASH streaming, the quality reporting scheme and quality reporting protocol as defined in clauses 10.5 and 10.6, respectively, of [7] shall be used.  If not specified, a complete (or default if applicable) set of metrics will be collected and reported. |

When 5GMSd AF-based Network Assistance is activated for a downlink streaming session the parameters from Table 4.2.3‑5 below shall be additionally present.

Table 4.2.3-5: Parameters for 5GMSd AF-based Network Assistance configuration

|  |  |
| --- | --- |
| Parameters | Description |
| Server address | 5GMSd AF address that offers the APIs for 5GMSd AF-based Network Assistance, accessed by the 5GMSd Media Session Handler. The server address shall be an opaque URL, following the 5GMS URL format. |

\* \* \* \* Third change \* \* \* \*

### 5.5.2 RAN-based reporting procedure

In the first use-case, shown in Figure 5.5.2-1 below, the 5GMS System operator controls the metrics collection and reporting using the RAN-based configuration method. In this case the metrics are configured via the RAN and the control plane, independent of 5GMS functional support.



Figure 5.5.2-1: Metrics collection and reporting via RAN-based configuration

The different steps are explained below:

1: Overall metrics configuration is done on the network level, for instance defining which geographical areas that shall have metrics collection active, which metrics to collect, and how metrics shall be reported. If per-slice metrics collection and reporting is supported, a slice filter may be present in the metrics configuration, indicating the specific slice instance(s) for metrics collection and reporting.

2: The metrics configuration(s) is/are sent from the OAM to the RAN, which does not forward that information to the UE at this stage.

3: Time passes, and it is assumed that the UE moves around during that period.

4: The UE enters an area (cell, location area, etc.,) which is inside the geographical constraint. This is discovered by the RAN, and it now needs to activate metrics collection and reporting for the UE.

5: The actual metrics configuration is sent from the RAN to the Media Session Handler, via the control plane.

6: Additional time passes, and the UE has a metrics configuration, but no streaming session has started.

7: A streaming session is started.

8: The session setup is done in conjunction with signalling transactions (not shown here).

8a: If a slice filter is included in the metrics configuration set, the Media Session Handler shall check the running slice which is carrying the current media streaming (e.g. via the AT Command +CGDCONT [X]) and the specific traffic mapping with URSP [4]. If the running slice is within the slice filter, the metrics collection and reporting shall be done. Additionally, the running slice shall also be included into the metrics reports.

9: A new metrics collection job is created in the Media Player.

10: A reference to the new metrics collection job is returned.

11: The configuration for the metrics collection job is sent to the Media Player (i.e. which metrics should be measured) along with the measurement resolution interval). The metrics reporting interval timer is activated in the Media Session Handler.

12: Media is delivered and rendered, and...

13: ...more media is delivered...

14: The configured metrics reporting interval has elapsed, and the Media Session Handler now requests the collected metrics from the Media Player.

15: The Media Player returns the collected metrics.

16: The metrics are reported via the control plane.

17: The session continues...

18: more media is delivered, and then the session is finished.

19: The Media Session Handler requests the final metrics collected.

20: The Media Player returns the final collected metrics.

21: The metrics are reported to the OAM via the control plane.

21a: The OAM may determine the per-slice QoE metrics based on the metrics reports and the slice filter.

22: The metrics collection job is deleted.

23: Time passes, the UE moves around.

24: The UE leaves the geographical area specified by the metrics configuration.

25: The RAN sends metrics (de)configuration to the UE, to stop future metrics collection.

\* \* \* \* Forth change \* \* \* \*

### 5.5.4 Metrics reporting configuration parameters

Table 4.2.3-4 in clause 4.2.3 describes the metrics reporting configuration parameters used in step 5 of Figure 5.5.2-1 and step 3a of Figure 5.5.3-1. Note that some of the parameters are only relevant for a specific reporting option, as shown in Table 5.5.4-1 below.

Table 5.5.4-1: Metrics reporting configuration parameters and options

|  |  |  |
| --- | --- | --- |
| **Parameters** | **Relevance in RAN-based reporting?** | **Relevance in 5GMSd AF-based reporting?** |
| Server address | No | Yes |
| Scheme | No (default 3GPP) | Yes |
| DNN | No | Yes |
| Reporting interval | Yes | Yes |
| Sample percentage | Yes | Yes |
| Streaming source filter | Yes | Yes |
| Slice filter | Yes | No |
| Metrics | Yes (3GPP-defined) | Yes (3GPP-defined or non-3GPP defined) |

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