**3GPP TSG-SA4 Meeting #118-e *S4-220533***

**Online, 6th – 14th April 2022**

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| *CR-Form-v12.2* |
| **draft CHANGE REQUEST** |
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|  | **26.501** | **CR** | **<CR#>** | **rev** |  | **Current version:** | **17.1.0** |  |
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| *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 |  |

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|  |
| ***Title:***  | draft CR on use cases for newly defined 5GMS event  |
|  |  |
| ***Source to WG:*** | S4 |
| ***Source to TSG:*** | Huawei, HiSilicon |
|  |  |
| ***Work item code:*** | EVEX |  | ***Date:*** | 8 April 2022 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | 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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | In the EVEX, new 5GMS event types are introduced. However there are no use cases to clarify how the consumer makes use of the exposed 5GMS event types.  |
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| ***Summary of change:*** | Adding new use cases for the newly defined 5GMS event types. |
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| ***Consequences if not approved:*** | Use cases for new 5GMS event types are missing. |
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| ***Clauses affected:*** | Annex X |
|  |  |
|  | **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".

[15] 3GPP TS 23.548: "5G System Enhancements for Edge Computing; Stage 2".

[16] 3GPP TS 23.558: "Architecture for enabling Edge Applications".

[17] 3GPP TS 28.538: "Management and orchestration; Edge Computing Management".

[18] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[19] 3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[20] 3GPP TS 26.347: "Multimedia Broadcast/Multicast Service (MBMS); Application Programming Interface and URL".

[21] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

[X] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

\* \* \* \* Second change (all new text) \* \* \* \*

Annex X (informative)
Use Cases for 5GMS event exposure

# X.1 Introduction

This annex describes Use Cases related to the exposure of events relating to 5G Media Streaming by the Data Collection AF instantiated in the 5GMS AF.

# X.2 QoE metrics for downlink media streaming

The Use Case for exposing QoE metrics for downlink media streaming as an event is in clause 6.4 of TS 23.288 [X].

# X.3 Consumption of downlink media streaming

The 5GMSd Client collates feedback reports on currently consumed downlink media streaming content according to a provisioned Consumption Reporting Configuration it obtains from the Service Access Information for its Provisioning Session. The consumption reports include the media player entry point URL, the start time, duration and UE locations. The Media Session Handler sends the consumption reports to 5GMSd AF for subsequent event exposure to subscibed Event consumers.

The 5GMSd Application Provider subscribes to downlink media streaming consumption events from the Data Collection AF. With the exposed event, the 5GMS Applcation Provider performs data analytics to determine, for example, which media content is most popular in the 5GMS System, which media content is most popular at a specific location, or which portions of the media content are consumed. This helps the 5GMSd Application Provider to optimise distribution of the most popular media content in the 5GMS System.

Alternatively, the NWDAF subscribes to this event for data analytics, exposing the results to the 5GMSd Application Provider.

# X.4 Invocation of dynamic policies

The Media Session Handler invokes the Dynamic Policy API on the 5GMSd AF via M5d to request a specific policy and charging treatment to be applied to a particular downlink media streaming application data flow. As a result, the 5GMSd AF invokes appropriate service operations on Network Functions in the 5G Core, e.g. Npcf\_Policy‌AuthorizationorNnef\_AFSession‌With‌QoS, to affect the requested network QoS policy change. The 5GMSd AF obtains status information (policy accepted, rejected, etc) about these service operation invocations, and policy enforcement information , such as the enforcement method selected and the enforcement bit rate. After recording the invocation of the dynamic policies, the 5GMSd AF reports these records to its subordinate Data Collection for exposure to subscribed Event consumers.

The event for invocation of dynamic polices may include the timestmap when the Media Session Handler invokes the dynamic function in 5GMSd AF, the requested policy template identifier, the status information, etc.

The Event Consumer AF within the 5GMSd Application Provider or the NWDAF subscribes to events of this type from the Data Collection AF. Using the details about the invocations for dynamic policies, the 5GMSd Application Provider or the NWDAF analyse the network quality provided by the MNO and the dynamic network requirements for this media streaming service.

Alternatively, the NWDAF exposes analytics results to the 5GMSd Application Provider enabling the 5GMSd Application Provider to optimise the media streaming serivce, e.g. provisioning more appropriate policy templates or negotiating more suitable Service Level Agreement (SLA) with the Mobile Network Operator (MNO).

# X.5 Invocation of AF-based Network Assistance

The Network Assistance feature enables a UE to receive a bit rate recommendation from a 5GMS AF providing the Network Assistance server function.

The 5GMS AF uses the Npcf\_PolicyAuthorization notification or Nnef\_MonitoringEvent procedure to receive notifications of network QoS changes, e.g. estimation of throughput, recommendation of a bit rate. The 5GMS AF receives these policy change notifications asynchronously.

The 5GMS AF reports the invocation of AF-based network assistance to its subordinate Data Collection AF, including information about requested QoS and recommended QoS. The Data Collection AF subsquently exposes this UE data to the Event Consumer AF within the 5GMS Application Provider. Using this information, the 5GMS Application Provider is able to optimise the use of the 5GMS System, e.g. by performing dynamic congestion window adjustment.

The NWDAF subscribes to events of this type at the Data Collection AF. Based on the requested QoS and recommended QoS in the exposed events, the NWDAF analyses whether the current network deployment or status can support the currently provisioned media streaming services, and exposes these results to the OAM for better network optimization.

# X.6 Media streaming access activity

## X.6.1 Downlink media streaming access activity

In downlink 5G Media Streaming, the 5GMS AS acts as a CDN (e.g., edge server) in the hosting and delivery of streaming media content that it has ingested. The corresponding media streaming access activity (i.e., CDN access logs) available at the 5GMSd AS are reported to the Data Collection AF instantiated in the 5GMSd AF for subsequent event exposure to the Event Consumer AF in the 5GMSd Application Provider.

The 5GMS Application Provider uses information in the exposed events (e.g. the number of unique users and the access history for different media content items) to improve its CDN content distribution.

Alternatively, the NWDAF subscribes to events of this type and analyses the total volume of data delivered by the 5GMSd AS or the average response time to downlink media requests in order to optimise the 5GMS System deployment or to demonstrate to the 5GMSd Application Provider that the SLA for downlink media streaming has been satisfied.

# X.7 Controlling Event exposure

The 5GMS Application Provider controls the access to UE data exposed by the Data Collection AF by provisioning a set of Data Access Profiles for each Event data in the Data Collection AF. Each of these profiles defines a set of data processing operations to be performed by the Data Collection AF on the event data subscribable by the corresponding Event consumer entity. The Data Access Profile specifies restrictions by the dimensions of time, user and location:

* Time-based restriction determines the granularity of access to UE data related events along the time axis, ranging from the finest granularity which permits Event consumer access to individual events as they occur, to the coarsest granularity which combines all event data into a single aggregated value.
* User-based restriction cotrols access to UE data related events based on end-user grouping. Such restriction ranges from the fine granularity which permits Event consumer access to individual events related to single end user, to medium granularity which aggregates collected event data at the level of user groups, to coarse granularity which bundles the data across all users.
* Location-based restriction defines access to UE data related events based on the geographical location of the data collection client at which the event occurs. Fine-grained control allows the Event consumer to access individual events, irrespective of the location. Medium-grained control aggregates collected event data for a defined geographical area. Coarse-grained control aggregates all event data to produce a single aggregated value for all locations.

For all three of the above dimensions, the 5GMS Application Provider decides that its Event Consumer AF is granted the finest-grained access to event data by all three of the above dimensions. On the other hand, according to the “silver” business agreement it has established with the mobile network operator, the NWDAF is granted medium-grained access to event data, while based on the “bronze” business agreements it has established with another application service providers, its Event Consumer AF is granted coarse-grained access to event data,