**3GPP TSG-S4 Meeting # 127-bis-e S4-240670**

**Online, April 8th - 12th, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **26.510** | **CR** |  | **rev** |  | **Current version:** | **1.1.4** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | pCR on Defining the Notification Channel to the MSH |
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| ***Source to WG:*** | Qualcomm Inc. |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5GMS\_Pro\_Ph2 |  | ***Date:*** | 2nd April 2024 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-18 |
|  | *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:*** | The procedure for notifications between the MSH and the 5GMS AF is underspecified and may not be implemented in an interoperable manner. |
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| ***Summary of change:*** | Add reference to the MQTT specification. Generalize the notification procedure to carry different types of notifications and to clearly identify the related session. |
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| ***Consequences if not approved:*** | The usage of the notification procedure will remain ambiguous and interoperability cannot be guaranteed. |
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| ***Clauses affected:*** | 2, 5.3.3.1, 5.3.4.1, 10.7 |
|  |  |
|  | **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:*** |  |

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| **First Change** |

# 2 References

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

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[MQTT] OASIS: "MQTT Version 5.0",
<https://docs.oasis-open.org/mqtt/mqtt/v5.0/mqtt-v5.0.html>

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| **2nd Change** |

#### 5.3.3.1 Procedures

To take advantage of the Dynamic Policy feature of the Media Delivery System, a Media Session Handler instantiates a Policy Template that was previously provisioned within the scope of a Provisioning Session using the operations specified in clause 5.2.7. The parameters in the Policy Template are used by the Media AF in combination with a dynamic QoS specification supplied by the Media Session Handler to request specific QoS and/or charging policies from the PCF (either directly or via the NEF, as specified in clause 5.5.2) for that media delivery session.

The following procedures are followed by a Media Session Handler to manage Dynamic Policy Instance resources in the Media AF via reference point M5. Instantiating a Policy Template as a dynamic policy requires a Policy Template identifier (provided in Service Access Information that is either retrieved from the Media AF using the operation specified in clause 5.3.2.3 or else supplied via reference point M6), a set of Service Data Flow description(s), an optional dynamic QoS specification and potentially other parameters defined in clause 5.7 of TS 26.501 [26501].

- The Policy Template identifier identifies the desired Policy Template (as previously provisioned per clause 5.2.7.3) to be applied to the specified application flow(s). A Policy Template includes properties such as specific QoS (e.g. background data) or different charging treatments.

- The Media AF combines the information from the Policy Template with dynamic QoS specification supplied by the Media Session Handler and uses this complete set of parameters to invoke the PCF according to clause 5.5.2.

- The set of Service Data Flow description(s) allow the identification and classification by the 5G System of the application traffic involved in a media delivery session. These take the form of an IP packet filter set (as defined in clause 5.7.6 of [23501]) or the Fully-Qualified Domain Name (FQDN) of a Media AS at reference point M4.

NOTE: It is not defined in this release how a Media AF in an external Data Network selects a specific DNN or S‑NSSAI.

Application Identifiers, referring to one or more Packet Flow Descriptions (PFDs), may be used as alternative traffic filtering parameters for dynamic policy invocation. The Media AF shall first provision a PFD in the NEF's PFD Function (PFDF) for one or more (external) Application IDs by sending an HTTP POST message to the NEF as specified in clause 4.4.10 of TS 29.122 [29122]. The mapping between the (external) Application Identifiers and PFDs stored in the PFDF will then be pushed to or pulled from the SMF and installed in the UPF for future traffic identification.

The Dynamic Policy Instance resource created as a result of instantiating a Policy Template shall include an MQTT [MQTT] endpoint address that allows the Media Session Handler to subscribe to receive asynchronous notifications from the Media AF concerning Background Data Transfer opportunities available in relation to that Dynamic Policy Instance. The usage and message formats for MQTT are described in clause 10.7.

HTTP responses for successful and operation-specific failure cases are specified in the following clauses. For all other failure cases, an HTTP response indicating a response code in accordance with clause 7.1.6 shall be returned to the API client. In all failure cases a message body in accordance with clause 7.1.7 shall be included in the response message.

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| **3rd Change** |

#### 5.3.4.1 Procedures

The following procedures are followed by the Media Session Handler to request Network Assistance from one of the Media AF instances listed in the serverAddresses property of the Network Assistance Configuration which is part of the Service Access Information that is either retrieved from the Media AF using the operation specified in clause 5.3.2.3 or else supplied via reference point M6.

1. The Media Client first creates a Network Assistance Session with its chosen Media AF instance. It provides information that will later be used by the Media AF to request a particular network QoS to be applied by the PCF to one or more application data flows, and to recommend a bit rate to the Media Client. The Media AF assigns a resource identifier to the Network Assistance Session at the point of creation. This procedure is further specified in clause 5.3.4.2.

 When a Network Assistance Session is created, the responding Media AF instance may nominate an MQTT [MQTT] endpoint URL in the notificationURL property in the Network Assistance Session resource representation it returns to the Media Session Handler. If this property is present, the Media Session Handler shall subscribe to the MQTT channel provided at the indicated endpoint and shall expect to receive notifications from the Media AF of type M5QoSSpecification with an up-to-date bit rate recommendation whenever this changes. The usage and message formats for MQTT are described in clause 10.7.

2. The Network Assistance Session resource may be retrieved by the Media Session Handler using the procedure specified in clause 5.3.4.3.

3. At any time after the Network Assistance Session resource is created, the Media Client may use the Network Assistance Session resource identifier to explicitly request a bit rate recommendation by invoking a remote procedure call provided for this purpose by the Media AF. This procedure is further specified in clause 5.3.4.4.

4. Using the Network Assistance Session resource identifier, the Media Client may also request a delivery boost to be provided by the 5G System at any time by invoking a remote procedure call provided for this purpose by the Media AF. This procedure is further specified in clause 5.3.4.5.

5. The information provided when first creating a Network Assistance Session may be modified subsequently by the Media Session Handler using the session modification operation specified in clause 5.3.4.6.

6. In order to terminate a Network Assistance Session, the Media Client destroys the Network Assistance Session resource using the procedure specified in clause 5.3.4.7.

Details of the APIs supporting these procedures at reference point M5 are specified in clause 9.4.

HTTP responses for successful and operation-specific failure cases are specified in the following clauses. For all other failure cases, an HTTP response indicating a response code in accordance with clause 7.1.6 shall be returned to the API client. In all failure cases a message body in accordance with clause 7.1.7 shall be included in the response message.

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| **3rd Change** |

## 10.7 Notification Channel

### 10.7.1 General

The Media Session Handler and the 5GMS AF shall support the usage of an MQTT notification channel that is used by the 5GMS AF to notify the Medua Session Handler about updates to the media session or any related configuration information.

For each ongoing media delivery session that uses any of the 5GMS procedure, the Media Session Handler shall subscribe to the associated MQTT notification channel.

For each ongoing media delivery session that the 5GMS AF is managing, it shall offer a notification channel for the Media Session Handler to subscribe to.

In addition, the 5GMS AF shall offer a generic notification channel that is dedicated to all sessions of a specific Application Service Provider with an active Provisioning Session at the 5GMS AF. This channel may be used to share notifications about updates to Service Access Information, Background Data Transfer, or any other relevant media session handling information.

The 5GMS AF shall use a trusted MQTT broker for the exchange of these notifications. The MQTT broker shall use appropriate client authentication mechanisms, such as a token-based authentication mechanism (JWT) to secure access to the notification channel.

The MQTT Topics shall be structured as defined in clause 10.7.2.

The MQTT Messages shall be formated according to clause 10.7.3.

### 10.7.2 Usage of MQTT Topics

The Topic shall be formatted according to the following ABNF syntax:

Topic= provisioningSessionId "/" media\_delivery\_session\_id

Where:

* provisioningSessionId is the Provisioning Session identifier associated with the notifications over this notification channel.
* media\_session\_id is a unique identifier, assigned by the 5GMS AF to a media streaming session. This identifier also includes a unique identifier of the managing Media Session Handler.

The Media Session Handler shall at least subscribe to the {provisioningSessionId}/# topic, enabling the reception of all notification messages that are associated with a particular Provisioning Session.

### 10.7.3 Notification message format

The 5GMS AF shall format each notification it publishes to the Media Session Handler as an MQTT Application Message conveyed as the payload of an MQTT PUBLISH message.

- The *Topic* property of the Variable Header shall be as specified in clause 10.7.2.

- The *Payload Format Indicator* property of the Variable Header shall indicate UTF-8 encoding of the *Payload* field.

The notification message shall be conveyed in the *Payload* field which shall be a formatted as a NotificationMessage JSON [JSON] object using the UTF‑8 character encoding as specified in table 10.7.3-1.

Table 10.7.3‑1: NotificationMessage data type

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| --- | --- | --- | --- |
| Property name | Type | Cardinality | Description |
| type | NotificationMessageType | 1..1 | The type of notification message (see table 10.7.3‑2). |
| serviceAccessInformation | ServiceAccessInformation | 1..1 | Present if type is NOTIFICATION\_‌SERVICE\_‌ACCESS\_‌INFORMATION (see NOTE). |
| dynamicPolicy | DynamicPolicy | 1..1 | Present if type is NOTIFICATION\_‌DYNAMIC\_‌POLICY (see NOTE). |
| networkAssistanceSession | NetworkAssistanceSession | 1..1 | Present if type is NOTIFICATION\_‌NETWORK\_‌ASSISTANCE\_‌SESSION (see NOTE). |
| NOTE: Exactly one of these properties shall be present. |

Table 10.7.3‑2: NotificationMessageType enumeration

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| --- | --- |
| Enumeration value | Description |
| NOTIFICATION\_‌SERVICE\_‌ACCESS\_‌INFORMATION | Notification of a change to a Service Access Information resource. |
| NOTIFICATION\_‌DYNAMIC\_POLICY | Notification of a change to a Dynamic Policy resource. |
| NOTIFICATION\_‌NETWORK\_‌ASSISTANCE\_‌SESSION | Notification of a change to a Network Assistance Session resource. |