**3GPP TSG SA WG4 #112e *S4-21xxxx***

**E-meeting, 1st – 10th February 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **Pseudo CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.804** | **CR** | **<CR#>** | **rev** | **-** | **Current version:** | **0.0.0** |  |
|  | | | | | | | | |
| *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:*** | [FS\_5GMS-EXT] Key Topic Support for encrypted and high-value content | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | SA4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_5GMS-EXT | | | | |  | ***Date:*** | | | 2021-01-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The study item description identifes the key topic “Support for encrypted and high-value content”. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adds the structure and description for this key topic | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Key topic not addressed | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
| ***56*** | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**===== 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 26.501: " 5G Media Streaming (5GMS); General description and architecture".

[3] 3GPP TS 26.511: "5G Media Streaming (5GMS); Profiles, codecs and formats".

[4] 3GPP TS 26.512: "5G Media Streaming (5GMS); Protocols".

**===== CHANGE =====**

# 4 Introduction to 5G Media Streaming

## 4.1 Introduction

## 4.2 Collaboration Scenarios

## 4.3 Architectures

## 4.4 Summary of Stage-3 enablers

**===== CHANGE =====**

# 5 Key Topics

## 5.1 Introduction

## 5.10 Support for encrypted and high-value content

### 5.10.1 Description

Content is increasingly encrypted for distribution for different reasons, e.g. Content Protection, Conditional Access, or integrity of playback. The management of keys for different use cases is a prime concern. Examples include scalable access to keys, secure storage of keys, key availabilities. It is envisioned that an MNO can provide key management and/or key distribution services for content providers. In particular, providing scalable and secure key management within 5GMS for multiple different devices needs further study.

Examples for secure media specification are for example provided by the MovieLabs ECP requirements and other content providers requirements.

In a specific example, a live sports service provider wants to offer a live stream. Examples include where the content needs to be delivered with low latency (typically encoder to glass in 3 – 10 seconds) in order to be on par with regular TV distribution means. Other services may also be considered.

The service may require different tools and functionalities levels of security

1. Conditional access supported by DRM management. As an example, users need to get a master key for decrypting the secondary level keys.
2. Key rotation in order to support live streaming. As an example, these keys are changed periodically but protected by the master key.
3. DRM and key management to ensure playback rules, for example to avoid that clients attempting early playback of the content too early and have advantages in betting/wagering, skipping content, etc.
4. Watermarking: The content is distributed and a unique signature is added at the latest possible time (in the device, at the Edge). An example of such approach can be found here <https://learn.akamai.com/en-us/webhelp/adaptive-media-delivery/adaptive-media-delivery-implementation-guide/GUID-3F89E64C-415D-452D-9541-BB650CD783B9.html>.
5. Content encryption
6. A secure implementation (use of TEE, Secure Media Path)

### 5.10.2 Collaboration Scenarios

It is assumed that the content provider provides DRM protections for the content. However, beyond this different collaboration models between the content provider and 5G System operator/MNO exist

As examples, the MNO provides infrastructure to the content service provider in order to support security related functions

* The service provider may want to provide scalable access to the content and in particular the key distribution. Hence it uses 5G Media streaming servers to support secure key distribution.
* The streaming service provider wants to rule playback, for example to avoid that the situation whereby users can see the streamed content too early while at the same time, the streaming service provider does not want to delay the distribution artificially either and want to give the clients the ability to download the main content (without buffer underruns).
* The service provider asks for fairness in the client, but the client cannot be trusted to act fairly. Hacked clients are possible. Clients may have DRM systems that the service providers will use.
* The service provider asks for a watermarking solution from the MNO.

Encryption (as already defined in TS 26.511 [3]) and secure keys may be used for other purposes, for example for conditional access or DRM systems. In some cases, keys are also provided in hierarchically, depending on business rules, security levels and deployment scenarios.

In an extension of the above use case, the content is distributed via multiple operators network. In this case, the encryption may be done by the service provider and the service provider provides the keys to the MNO. In another case, the service is offered by the MNO and the MNO does encryption and key management.

Editor’s Note: Study collaboration scenarios between the 5G System and Application Provider for each of the key topics.

### 5.10.3 Deployment Architectures

Editor’s Note: Based on the 5GMS Architecture, develop one or more deployment architectures that address the key topics and the collaboration models.

### 5.10.4 Mapping to 5G Media Streaming and High-Level Call Flows

Editor’s Note: Map the key topics to basic functions and develop high-level call flows.

### 5.10.5 Potential open issues

Editor’s Note: Identify the issues that need to be solved.

### 5.10.6 Candidate Solutions

Editor’s Note: Provide candidate solutions (including call flows) for each of the identified issues.