**3GPP TSG- Meeting #**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **22.856** | **CR** |  | **rev** |  | **Current version:** | **19.0.0** |  |
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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:*** | Addition of consolidated requirements | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
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| ***Category:*** | F |  | | | | | ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. At SA1 102, some potential requirements were agreed that had previously been subject to FFS statements in Editor's Notes. These include:  [PR 5.12.6-2]  [PR 5.24.6-4]  [PR 5.24.6-5]  [PR 5.27.6-5]  [PR 5.8.6-1]  [PR 5.28.6-1]  [PR 5.28.6-2]  2. Additionally, there were CPRs that were formulated but not agreed for inclusion in TR 22.856 by the end of SA1 102.  3. There were potential requiermnets that were agreed in the TR but not yet consolidated, including:  [PR 5.3.6.2-3]  This requirement is already supported.  [PR 5.4.6.3]  This requirement should be added to the CPRs.  [PR 5.6.6.1]  [PR 5.6.6.3  [PR 5.7.6-3]  These requirements will be addressed in another CR.  [PR 5.9.6-3]  This requirement is not clear.  These should be added to TR 22.856 consolidation.  4. Some 'consolidated requirements' could not be agreed by the end of SA1 102 and are revisited here.  **A.** [PR 5.12.6-1] The 5G system shall provide a mechanism to support coordination and synchronization of multiple data flows transmitted via one UE or different UEs, subject to synchronization thresholds provided by third party (i.e. a quantitative bound to the extent different data flows can diverge in synchronization.)  **B.** [PR 5.19.6-1] Subject to national/regional regulations, and user consent, the 5G System shall be able to process and expose information from UEs related to user’s location, user’s body, and user’s environment, e.g., user’s home, user’s immediate vicinity.  NOTE: This requirement does not affect the ability of regulatory services, e.g., legal intercept service, to access such information without consent of the user.  **C.** [PR 5.18.6-1][PR 5.24.6-1][PR 5.17.6-2] The 5G system shall support mechanisms to identify an avatar and associate the avatar with a subscriber (i.e. the owner of the avatar).  **D.** [PR 5.18.6-2]Subject to operator policy and national or regional regulation, the 5G system shall support different communication security mechanisms according to the security requirements of different services.  **E.** [PR 5.17.6-1] Subject to regulatory requirements and operator policy and subscriber consent, the 5G system shall provide a means for a third party to access 3GPP services on behalf of the subscriber.  **F.** [PR 5.14.6-2] The 5G system shall support mechanisms to adapt stored digital assets associated with the user by an authorized immersive XR media service. | | | | | | | | |
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| ***Summary of change:*** | | In this CR  - PR 5.3.6.2-3 is moved to 5.3.5 (already supported)  - PR 5.9.6-3 is removed.  - 5.4.6-3 is consolidated with 7.1.1  - 5.8.6-1 is consolidated with 7.1.3  - 5.12.6-2 is consolidated with 7.1.4  - 5.24.6-4 is consolidated with 7.1.4  - 5.24.6-5 is consolidated with 7.1.2  - 5.27.6-6 is consolidated with 7.1.3  - 5.28.6-1 is not treated - this will be considered in a seperate CR.  - 5.28.6-2 is not treated - this will be considered in a seperate CR.  - A [PR 5.12.6-1] is consolidated with 7.1.3  - B [PR 5.19.6-1] is consolidated with 7.1.1  - C [PR 5.18.6-1][PR 5.24.6-1][PR 5.17.6-2] is consolidated with 7.1.2  - D [PR 5.18.6-2] is **not** consolidated - it is not clear what this text means.  - E [PR 5.17.6-1] is consolidated with 7.1.4  - F [PR 5.14.6-2] is consolidated with 7.1.5 | | | | | | | | |
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| ***Consequences if not approved:*** | | Agreed potential requirements and other agreements in SA1 102 will not be taken into account in TR 22.865, nor properly added to TS 22.156. | | | | | | | | |
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| ***Clauses affected:*** | | 5.3.5, 5.3.6.2, 5.9.6, 7.1.1, 7.1.2, 7.1.3, 7.1.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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

### 5.3.5 Existing features partly or fully covering the use case functionality

The service requirements on the support of multimedia communication among multiple users have been captured in TS 22.228 [2] with the following key definitions:

***Conference:*** *An IP multimedia session with two or more participants. Each conference has a "conference focus". A conference can be uniquely identified by a user. Examples for a conference could be a Telepresence or a multimedia game, in which the conference focus is located in a game server.*

***Telepresence:*** *A conference with interactive audio-visual communications experience between remote locations, where the users enjoy a strong sense of realism and presence between all participants by optimizing a variety of attributes such as audio and video quality, eye contact, body language, spatial audio, coordinated environments and natural image size.*

***Telepresence System:*** *A set of functions, devices and network elements which are able to capture, deliver, manage and render multiple high quality interactive audio and video signals in a Telepresence conference. An appropriate number of devices (e.g. cameras, screens, loudspeakers, microphones, codecs) and environmental characteristics are used to establish Telepresence.*

***Conference Focus:*** *The conference focus is an entity which has abilities to host conferences including their creation, maintenance, and manipulation of the media. A conference focus implements the conference policy (e.g. rules for talk burst control, assign priorities and participant’s rights).*

Support of Multi-device and Multi-Identity in IMS MMTEL service is captured in TS 22.173 clause 4.6 [3]:

*The support of multiple devices is inherent in IMS. In addition, a service provider may allow a user to use any public user identities for its outgoing and incoming calls. The added identities can but do not have to belong to the served user. Identities may be part of different subscriptions and different operators.*

In addition, TS 22.101 [4] has specified in clause 26a a set of service requirements on User Identity:

*Identifying distinguished user identities of the user (provided by some external party or by the operator) in the operator network enables an operator to provide an enhanced user experience and optimized performance as well as to offer services to devices that are not part of a 3GPP network. The user to be identified could be an individual human user, using a UE with a certain subscription, or an application running on or connecting via a UE, or a device (“thing”) behind a gateway UE.*

*Network settings can be adapted and services offered to users according to their needs, independent of the subscription that is used to establish the connection. By acting as an identity provider, the operator can take additional information from the network into account to provide a higher level of security for the authentication of a user.*

*The 3GPP System shall support to authenticate a User Identity to a service with a User Identifier.*

The functional requirement and performance KPIs in support of XR applications are mainly captured in TS 22.261:

- clause 7.6.1 AR/VR;

- clause 6.43 Tactile and multi-modal communication service

- clause 7.11 KPIs for tactile and multi-modal communication service

Clause 8 of TS 22.261 specifies the security related requirements covering aspects such as authentication and authorization, identity management, and data security and privacy.

Additional consideration need to be given to allow multiple users from different geographical locations to interact using XR techniques.

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SECOND CHANGE

#### 5.3.6.2 Service requirements for collaborative and concurrent engineering in product design

[PR 5.3.6.2-1] The 5G system shall enhance the interaction between IMS CN and 5G CN to allow 5G CN to provide the IMS CN with real-time feedback in support of XR communication among multiple users simultaneously.

NOTE: The feedback can include information such as network condition, achieved QoS. Such information can be used by the IMS CN, for example, to trigger the codec negotiation.

[PR 5.3.6.2-2] Subject to regulatory requirements, operator policies and user consent, the 5G system shall be able to support mechanisms to expose to a trusted third party (e.g. the conference focus) the result of authenticating a user identity to a UE.

NOTE: Authenticating a user identity to a UE at the terminal side is out of 3GPP scope.

[PR 5.3.6.2-3] The 5G system shall provide a means to synchronize multiple data flows from multiple UEs associated with one user.

THIRD CHANGE

### 5.9.6 Potential New Requirements needed to support the use case

[PR 5.9.6.1] the 5G system shall provide a means to synchronize the incoming data streams of multiple (sensor and rendering) devices associated to different users at different locations.

[PR 5.9.6.2] the 5G system shall provide a means to expose predicted network conditions, in particular, latency, between remote users.

FOURTH CHANGE

### 7.1.1 Localized Mobile Metaverse Service Functionality

Table 7.1.1-1 – Localized Mobile Metaverse Service Functionality Consolidated Requirements

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| --- | --- | --- | --- |
| CPR # | Consolidated Potential Requirement | Original PR # | Comment |
| [CPR 1.1] | Subject to operator policy, the 5G system shall provide a means to define and expose to a third party a spatial anchor, i.e. an association between a physical location (a point or volume in three dimensional space) and service information.  NOTE: Service information can include information to enable users to discover and access services, e.g. type of service, URLs, configuration data, the distance between the user and the spatial anchor, etc. | [PR 5.1.6-1]  [PR 5.1.6.2]  [PR 5.1.6.3]  [PR 5.4.6-2] |  |
| [CPR 1.2] | Subject to operator policy, the 5G system shall enable an authorized third party to request the information associated with a specific spatial anchor.  NOTE: How the service and location information is used by the third party to access a mobile metaverse server and the AR media itself is out of scope of this requirement. | [PR 5.4.6-4] |  |
| [CPR 1.3] | Subject to operator policy, the 5G system shall provide an authorized third party a means to define authorization to access spatial anchor information and to manage the spatial anchor(s), e.g. add, remove or modify spatial anchors. | [PR 5.4.6-5] |  |
| [CPR 1.4] | Subject to operator policy, user consent and regulatory requirements, the 5GS shall provide a means for a UE to provide sensor data, (e.g. from UE sensors, cameras, etc.) to the UE's serving network in order to derive localization information, e.g. to produce or modify a spatial map or discover or find localized mobile metaverse services. | [PR 5.5.6.1-1]  [PR 5.5.6.1-2]  [PR 5.5.6.2-2]  [PR 5.5.6.2-3] |  |
| [CPR 1.5] | Subject to operator policy and regulatory requirements, the 5GS shall support mechanisms to expose a spatial map or derived localization information to authorized third parties. | [PR 5.5.6.1-3] |  |
| [CPR 1.6] | Subject to operator policy, the 5G system shall enable an authorized third party to obtain all of the spatial anchors located in a given three dimensional area.  NOTE: How the authorized third party identifies which three dimensional area to request spatial anchors in is not in scope of the 3GPP standard. Spatial localization and mapping information could be used to identify areas of interest. | [PR 5.4.6-3] | This PR was missed during consolidation, it was already agreed prior to SA1 102. |
| [CPR 1.7] | Subject to national/regional regulations, and user consent, the 5G System shall be able to process and expose information from UEs related to user’s location, user’s pose, and user’s environment, e.g., the user’s immediate vicinity.  NOTE: This requirement does not affect the ability of regulatory services, e.g., legal intercept service, to access required information without consent of the user. | [PR 5.19.6-1] | This PR was agreed before SA1 102, but could not be consolidated at that meeting. |

FIFTH CHANGE

### 7.1.2 Digital representation of users and avatar functionality

Table 7.1.2-1 – Digital representation of users and avatar functionality Consolidated Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| CPR # | Consolidated Potential Requirement | Original PR # | Comment |
| [CPR 2.1] | The 5G system shall support 5G CN to provide real-time feedback in support of conversational XR communication among multiple users simultaneously.  NOTE: The feedback can include information such as network condition, achieved QoS. Such information can be used by the IMS, for example, to trigger the codec negotiation. | [PR 5.3.6.2-1] |  |
| [CPR 2.2] | Subject to user consent, the 5G system (including IMS) shall support multimedia conversational communications between two or more users including transfer of real time avatar media and audio media.  NOTE 1: Avatar media can be transmitted on both uplink and downlink.  NOTE 2: Confidentiality of the data used to produce the avatar (e.g. from the UE cameras, etc.) is assumed. | [PR 5.11.6-1]  [PR 5.22.6-1]  [PR 5.11.6-2]  [PR 5.11.6-3] |  |
| [CPR 2.3] | Subject to user consent, the 5G system (including IMS) shall support change of media types between video and avatar media for parties of a multimedia conversational communication. | [PR 5.11.6-4] |  |
| [CPR 2.4] | The 5G system (including IMS) shall support transcoding between media such as text, GTT, video and avatar media in multimedia conversational communications.  NOTE 1: Text, video or other media could allow a party to control the appearance of its avatar, e.g. to express behaviour, movement, affect, emotions, etc.  NOTE 2: The transcoding of media enables avatar communication, e.g. in scenarios in which UE participating in an IMS call or other service does not support e.g. FACS, encoding avatar media, generating avatar media, etc. | [PR 5.11.6-5]  [PR 5.26.6-2]  [PR 5.26.6-3]  [PR 5.26.6-4] |  |
| [CPR 2.5] | Subject to regulatory requirements, user consent and operator policy, the 5G system (including IMS) shall support the capabilities of rendering the avatar based on the body movement information (e.g. body motion or facial expression) of a human user. | [PR 5.16.6.2-6] |  |
| [CPR 2.6] | The 5G system (including IMS) shall support the encoding of sensor data capturing the facial expression and movement and gestures of a person, in a standard form.  NOTE: The actual transmission and rendering of facial expression and movement and gestures of a person within a multimedia conversational communication is subject to that person’s consent. | [PR 5.26.6-1]  [PR 5.16.6.2-5]  [PR 5.16.6.2-6] |  |
| [CPR 2.7] | The 5G system shall support mechanisms to associate the avatar with a subscriber (i.e. the owner of the avatar) and to expose this association to authorized third parties.  NOTE: A third party could use this information to determine who the other party is when avatar media is used for communication. | [PR 5.18.6-1]  [PR 5.24.6-1]  [PR 5.17.6-2] | This PR was agreed before SA1 102, but could not be consolidated at that meeting. |

SIXTH CHANGE

### 7.1.3 Operational efficiency, exposure, and coordination of mobile metaverse services

Table 7.1.3-1 – Operational efficiency, exposure, and coordination of mobile metaverse services Consolidated Requirements

| CPR # | Consolidated Potential Requirement | Original PR # | Comment |
| --- | --- | --- | --- |
| [CPR 3.1] | Subject to operator policy, the 5G system shall support a mechanism that enables flexible adjustment of communication services based on e.g. the type of devices (e.g., wearables), or communication duration (e.g. more than one hour), such that the services can be operated with reduced energy utilization.  NOTE: Metaverse service experience over an extended period of time (e.g. 2h) requires significant power consumption by the UE. In some cases, a device with no external power supply cannot sustain downloading and rendering of media over a long interval, e.g. for the duration of an entire feature film or athletic event. | [PR 5.7.6-1]  [PR 5.7.6-2] |  |
| [CPR 3.2] | The 5G system shall be able to provide a means to associate and coordinate data flows related to one or multiple UEs e.g. associated with the same object in digital twin applications provided by the mobile metaverse service. | [PR 5.20.6-1]  [PR 5.20.6-2]  [PR 5.20.6-3] |  |
| [CPR 3.3] | Subject to operator policy, regulatory requirements and user consent, the 5G system shall be able to expose network performance information (e.g., observed or predicted bitrate, latency or packet loss) related to one or more users to an authorized third party metaverse application.  NOTE: The network performance information can be per UE and take into account all available access network types, i.e. 3GPP and non-3GPP. | [PR 5.25.6-1]  [PR 5.9.6.2] |  |
| [CPR 3.4] | Subject to operator policy, the 5G system shall support a mechanism to enable one or more authorized third party(ies) to coordinate multiple service data flows delivered to/from one or more UE(s). Multiple UEs may be associated with one user/location or different users at different locations potentially using different access networks, i.e. 3GPP and non-3GPP.  NOTE 1: Coordination refers to the ability to provide an acceptable level of user experience for a given service, e.g. based on latency and synchronization constraints (due to multiple sources or long distance between UEs/users).  NOTE 2: It is not assumed that it is always possible to coordinate and provide the same capabilities regardless of whether 3GPP or non-3GPP access is used. | [PR 5.27.6-3]  [PR 5.9.6.1]  [PR 5.3.6.2-3]  [PR 5.25.6-2]  [PR 5.10.6-2] |  |
| [CPR 3.5] | The 5G system shall enable the coordination of diverse media, transmitted to a UE from one or more mobile metaverse services associated with a physical location, to be combined to form a localized service experience. | [PR 5.1.6-4]  [PR 5.4.6-1] |  |
| [CPR 3.6] | Subject to operator policy, the 5G system shall support exposure mechanisms enabling an authorized third party to determine one or more subscribers to whom mobile metaverse media can be distributed in a resource efficient manner. | [PR 5.27.6-1] |  |
| [CPR 3.7] | Subject to operator policy, subject to user consent, the 5G system shall support a means to provide resource efficient communication of third party mobile metaverse media to one or more subscribers. | [PR 5.27.6-2] |  |
| [CPR 3.8] | Subject to operator policy, the 5G system shall support a means to define a maximum end to end round trip latency for service data flows. | [PR 5.12.6-2] | This PR was agreed at SA1 102 but not yet consolidated. |
| [CPR 3.9] | The 5G system shall provide the capability of reducing the differences between different mobile metaverse services communication performance for a given UE to prevent inconsistency of experience due to XR media with divergent or conflicting characteristics, e.g., resolution, latency or packet loss.  NOTE: The UE can provide communication services for more than one terminal equipment. | [PR 5.27.6-5] | This PR was agreed at SA1 102 but not yet consolidated. |
| [CPR 3.10] | The 5G system shall provide a mechanism to support coordination and synchronization of multiple data flows transmitted via one UE or different UEs, subject to synchronization thresholds provided by third party (i.e. a quantitative bound to the extent different data flows can diverge in time of delivery.) | [PR 5.12.6-1] | This PR was agreed before SA1 102, but could not be consolidated at that meeting. |

SEVENTH CHANGE

### 7.1.4 Security and Privacy aspects of mobile metaverse services

Table 7.1.4-1 – Security and Privacy aspects of mobile metaverse services Consolidated Requirements

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| --- | --- | --- | --- |
| CPR # | Consolidated Potential Requirement | Original PR # | Comment |
| [CPR 4.1] | Subject to regulatory requirements, operator policies and user consent, the 5G system shall be able to support mechanisms to expose to a trusted third party (e.g. the conference focus) the result of the UE authenticating the user.  NOTE: How a UE authenticates the user's identity at the terminal equipment, e.g. using biometrics, is out of 3GPP scope. | [PR 5.3.6.2-2] |  |
| [CPR 4.2] | Subject to operator policy, user consent and regulatory requirements, the 5GS shall support mechanisms to authorize Spatial Localization Service. | [PR 5.5.6.2-1] |  |
| [CPR 4.3] | Subject to regulatory requirements, user consent and operator policy, the 5G system shall be able to authorize the avatar to be used in mobile metaverse services. | [PR 5.24.6-2] |  |
| [CPR 4.4] | Subject to regulatory requirements, user consent and operator policy, the 5G system shall provide mechanisms to manage mechanisms to manage time-bound authorization for specified usersfor an avatar to be used in mobile metaverse services. | [PR 5.24.6-3]  [PR 5.24.6-4] | This PR was agreed at SA1 102 but not yet consolidated. |
| [CPR 4.5] | Subject to regulatory requirements, user consent and operator’s policy, the 5G system shall be able to identify the subscriber who has the right to use an avatar in mobile metaverse services. | [PR 5.24.6-5] | This PR was agreed at SA1 102 but not yet consolidated. |
| [CPR 4.6] | Subject to regulatory requirements and operator policy and subscriber consent, the 5G system shall provide a means for a third party to access 3GPP services asthe subscriber by means of exposed interfaces.  NOTE: The third party uses services the subscriber could, though the services are not being accessed by means of a UE. For example, the third party could originate or terminate an IMS voice call. | [PR 5.17.6-1] | This PR was agreed before SA1 102, but could not be consolidated at that meeting. |

EIGHTH CHANGE

### 7.1.5 Digital Asset Management

Table 7.1.5-1 – Digital Asset Management Consolidated Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| CPR # | Consolidated Potential Requirement | Original PR # | Comment |
| [CPR 5.1] | Subject to user consent, operator policy, and regulatory requirements, the 5G system shall be able to provide functionality to store digital assets associated with a user, and to remove such digital assets associated with a user. | [PR 5.13.6-1]  [PR 5.15.6-1]  [PR 5.16.6.2-1]  [PR 5.14.6-2] |  |
| [CPR 5.2] | Subject to user consent, operator policy, and regulatory requirements, the 5G system shall provide a means to allow a user to securely access and update their digital assets. | [PR 5.13.6-1]  [PR 5.15.6-1]  [PR 5.16.6.2-1] |  |
| [CPR 5.3] | Subject to user consent, the 5G system shall be able to allow a trusted third party to retrieve the digital asset(s) associated with a user, e.g. when the user accesses a specific application.  NOTE: When a user accesses an immersive mobile metaverse service, the authorized third party (service provider) could obtain relevant digital assets of a user associated with that service. | [PR 5.13.6-2]  [PR 5.15.6-3]  [PR 5.14.6-1]  [PR 5.15.6-2] |  |
| [CPR 5.4] | Subject to regulatory requirements and operator policy, the 5G system shall provide secure means to authorize the use of digital assets associated with a user (e.g. digital assets belonging to a third party customer). | [PR 5.16.6.2-2]  [PR 5.13.6.5] |  |
| [CPR 5.5] | The 5G system shall provide mechanisms to certify the authenticity of the digital assets associated with a user. | [PR 5.13.6-4] |  |
| [CPR 5.6] | The 5G system shall support mechanisms to access stored digital assets associated with the user and perform specific adaptations of that asset as requested by an authorized immersive XR media service.  NOTE: The main use case considered during development of this requirement was that stored digital assets such as configuration and other data associated with avatar media can be used to generate or transcode media by the 5G system on behalf of an authorized third party. | [PR 5.14.6-2] |  |

END OF CHANGES