**3GPP TSG-SA WG1 Meeting #104S1-233zzz**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **22.261** | **CR** | **tbd** | **rev** | **-** | **Current version:** | **19.4.0** |  |
|  |
| *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 | **x** | Core Network | **x** |

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|  |
| ***Title:***  | Introduction of Mobile Metaverse Services |
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| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | Metaverse |  | ***Date:*** | 2023-11-03 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-19 |
|  | *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:*** | Mobile Metaverse Services requirements have been added in TS 22.156. There is no reference to this from the 5G system requirements specification, which integrates together all requirements and features added to 5G. |
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| ***Summary of change:*** | Adds an introduction to Mobile Metaverse Services, reference to TS 22.156 and some references internally to TS 22.261 to avoid ambiguity concerning related topics. |
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| ***Consequences if not approved:*** | The relationship between Mobile Metaverse Services and other 5G services will not be clear. The specifications will not be aligned. |
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| ***Clauses affected:*** | 2, 6.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:*** | The impacts listed in the 'change affects' tick boxes above arise due to the normative reference added to TS 22.156. |
|  |  |
| ***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] NGMN 5G White Paper v1.0, February 2015.

[3] 3GPP TS 22.011: "Service accessibility".

[4] Void

[5] 3GPP TS 22.278: "Service requirements for the Evolved Packet System (EPS)".

[6] 3GPP TS 22.101: "Service aspects; Service principles".

[7] 3GPP TS 22.146: "Multimedia Broadcast/Multicast Service (MBMS)".

[8] 3GPP TS 22.246: "Multimedia Broadcast/Multicast Service (MBMS) user services".

[9] 3GPP TS 22.186: "Enhancement of 3GPP support for V2X scenarios".

[10] NGMN, "Recommendations for NGMN KPIs and Requirements for 5G", June 2016

[11] 3GPP TS 22.115: "Service aspects; Charging and billing".

[12] Void

[13] Soriano, R., Alberto, M., Collazo, J., Gonzales, I., Kupzo, F., Moreno, L., & Lorenzo, J. OpenNode. Open Architecture for Secondary Nodes of the Electricity Smartgrid. In Proceedings CIRED 2011 21st International Conference on Electricity Distribution, CD1. June 2011.

[14] North American Electric Reliability Council. Frequently Asked Questions (FAQs) Cyber Security Standards CIP–002–1 through CIP–009–1. Available: http://www.nerc.com/docs/standards/sar/Revised\_CIP-002-009\_FAQs\_06Mar06.pdf. 2006.

[15] McTaggart, Craig, et al. "Improvements in power system integrity protection schemes". Developments in Power System Protection (DPSP 2010). Managing the Change, 10th IET International Conference on. IET, 2010.

[16] IEEE Power Engineering Society – Power System Relaying Committee – System Protection Subcommittee Working Group C-6. Wide Area Protection and Emergency Control.

[17] Begovic, Miroslav, et al. "Wide-area protection and emergency control". Proceedings of the IEEE 93.5, pp. 876-891, 2005.

[18] ITU-T Recommendation G.1000 "Communications quality of service: A framework and definitions".

[19] IEC 61907, "Communication network dependability engineering".

[20] NIST, "Framework for Cyber-Physical Systems", 2016.

[21] 3GPP TS 22.104: "Service requirements for cyber-physical control applications in vertical domains".

[22] 3GPP TS 22.262: "Message Service within the 5G System".

[23] 3GPP TS 22.289: "Mobile Communication System for Railways".

[24] 3GPP TS 22.071: "Location Services".

[25] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode".

[26] 3GPP TS 22.125: "Unmanned Aerial System (UAS) support in 3GPP".

[27] Void

[28] 3GPP TS 22.263: "Service requirements for Video, Imaging and Audio for Professional Applications (VIAPA)".

[29] Void

[30] 3GPP TS 22.179: "Mission Critical Push to Talk (MCPTT)".

[31] IEEE 1588-2019, IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems.

[32] IEC 61850-9-3-2016 - IEC/IEEE International Standard - Communication networks and systems for power utility automation – Part 9-3: Precision time protocol profile for power utility automation.

[33] 3GPP TS 38.305: "NG Radio Access Network (NG-RAN); Stage 2 functional specification of User Equipment (UE) positioning in NG-RAN"

[34] ATIS-0900005: "Technical Report on GPS Vulnerability", https://access.atis.org/apps/group\_public/download.php/36304/ATIS-0900005.pdf

[35] European Commission, Regulatory Technical Standard 25. Level of accuracy of business clocks
<https://ec.europa.eu/finance/securities/docs/isd/mifid/rts/160607-rts-25_en.pdf> (annex <https://ec.europa.eu/finance/securities/docs/isd/mifid/rts/160607-rts-25-annex_en.pdf>)

[36] 5G-ACIA, "Exposure of 5G capabilities for Connected Industries and Automation Applications", 5G-ACIA white pater, February 2021, https://5g-acia.org/wp-content/uploads/2021/04/5G-ACIA\_ExposureOf5GCapabilitiesForConnectedIndustriesAndAutomationApplications.pdf

[37] 3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services".

[38] ITU-T, "Technology Watch Report: The Tactile Internet", August 2014.

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[43] Altinsoy, M.E. (2012). "The Quality of Auditory-Tactile Virtual Environments," Journal of the Audio Engineering Society, Vol. 60, No. 1/2, pp. 38-46, Jan.-Feb. 2012.

[44] M. Di Luca and A. Mahnan, "Perceptual Limits of Visual-Haptic Simultaneity in Virtual Reality Interactions," 2019 IEEE World Haptics Conference (WHC), 2019, pp. 67-72, doi: 10.1109/WHC.2019.8816173.

[45] K. Antonakoglou et al., “Toward Haptic Communications Over the 5G Tactile Internet”, IEEE Communications Surveys & Tutorials, 20 (4), 2018.

[46] ETSI GS OEU 020 (v1.1.1): "Operational energy Efficiency for Users (OEU); Carbon equivalent Intensity measurement; Operational infrastructures; Global KPIs; Global KPIs for ICT Sites".

[47] 3GPP TS 28.310: "Management and orchestration; Energy efficiency of 5G".

[48] ETSI EN 303 472: "Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for RAN equipment".

[49] 3GPP TS 32.299: " Telecommunication management; Charging management; Diameter charging applications".

[50] N. Nonaka et al., "Experimental Trial aboard Shinkansen Test Train Running at 360 km/h for 5G Evolution," 2022 IEEE 95th Vehicular Technology Conference: (VTC2022-Spring), Helsinki, Finland, 2022.

[x] 3GPP TS 22.156, "Mobile Metaverse Services".

SECOND CHANGE

## 6.X Mobile Metaverse Services

### 6.X.1 Description

The term metaverse has been used in various ways to refer to the broader implications of AR and VR. Mobile metaverse services refer to a shared, perceived set of interactive perceived spaces that can be persistent. Metaverse in diverse sectors evokes a number of possible user experiences, products and services can emerge once virtual reality and augmented reality become commonly available and find application in our work, leisure and other activities. Functional enhancments and capabilities included in standards specifications make these services function well, consistently and with diverse support mechanisms over mobile telecommunications networks.

In addition to services that offer virtual or location-independent user experiences, mobile metaverse services also supports content and services that are associated or applicable only in a particular location. These metaverse services are mobile in the sense that mobile users are able to interact with services anywhere and in particular when in the locations where specific services are offered. Requirements for diverse service enablers are introduced to the 5G system to support these services, including avatar call functionality, coordination of services, digital asset management and support for virtual entities.

### 6.X.2 Requirements

The 5G system supports services and service enablers for Mobile Metaverse Services. The associated functional and performance requirements are documented in TS 22.156 [x].

Related requirements concerning media exist in the present document, including in clauses 6.27 related to positioning, 6.43 related to multi-modal communication, and performance requirements in clause 7, especially 7.3 for high-accuracy positioning, and 7.11for multi-modal communication service.

END OF CHANGES