**3GPP TSG-SA1 Meeting #96e *S1-214012***

**Electronic Meeting, 8 – 18 November 2021** *(revision of S1-21xxxx)*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **22.847** | **CR** | **0001** | **rev** | **-** | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Verification of KPIs for the use case in clause 5.5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | InterDigital | | | | | | | | | |
| ***Source to TSG:*** | SA WG1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_TACMM | | | | |  | ***Date:*** | | | 2021-10-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The Editor’s Note:  KPIs for personal exclusion zone in dangerous remote environments may need further discussion and verification.  is removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The Editor’s Note on the KPIs fo reliability and synchronisation thresholds is removed. The Service Area is included. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Editor’s Note remain. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.5.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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] ITU-T, "Technology Watch Report: The Tactile Internet", August 2014.

[3] O. Holland et al., "The IEEE 1918.1 "Tactile Internet" Standards Working Group and its Standards, " Proceedings of the IEEE, vol. 107, no. 2, Feb. 2019.

[4] 3GPP TS 22.263: "Service requirements for Video, Imaging and Audio for Professional Applications".

[5] S. K. Sharma, I. Woungang, A. Anpalagan and S. Chatzinotas, "Toward Tactile Internet in Beyond 5G Era: Recent Advances, Current Issues, and Future Directions," in IEEE Access, vol. 8, pp. 56948-56991, 2020

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[8] SAE Manoeuver Sharing and Coordinating Service Task Force, https://www.sae.org/servlets/works/committeeHome.do?comtID=TEVCSC3A.

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[19] M. Back et al., "The virtual factory: Exploring 3D worlds as industrial collaboration and control environments," 2010 IEEE Virtual Reality Conference (VR), 2010, pp. 257-258

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**========= Next Change ==========**

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

[PR. 5.5.6-1] The 5G network shall support a mechanism to allow an authorized 3rd party to provide QoS policy for flows of multiple UEs associated with an application. The policy may contain e.g. the expected 5GS handling and the associated triggering event.

[PR. 5.5.6-2] The 5G system shall support a mechanism to apply QoS policy for flows of multiple UEs associated with an application received from an authorized 3rd party.

[PR 5.5.6-3] The 5G system shall provide a network connection to address the KPIs for immersive multi-modal navigation applications, see Table 5.5.6-1.

Table 5.5.6-1: Potential Key performance requirements for a personal exclusion zone in dangerous remote environments.

| **Use Cases** | **Characteristic parameter (KPI)** | | | **Influence quantity** | | | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Max allowed end-to-end latency** | **Service bit rate: user-experienced data rate** | **Reliability** | **Message size (byte)** | **# of UEs**  NOTE 1 | **UE Speed** | **Service Area** |
| Immersive multi-modal navigation applications  Remote Site 🡪 Local Site (DL) | 50 ms [11] | 16 kbit/s -2 Mbit/s (without haptic compression encoding)  0.8 - 200 kbit/s (with haptic compression encoding) | [99.999 %] | 1 DoF: 2 to 8  10 DoF: 20 to 80  100 DoF: 200 to 800 | - | Stationary or Pedestrian | ≤ 100 km2  NOTE 2 | Haptic feedback |
| < 400 ms [11] | 1-100 Mbit/s | [99.999 %] | 1500 | - | Workers: Stationary/ or Pedestrian, | ≤ 100 km2  NOTE 2 | Video |
| < 150 ms [11] | 5-512 kbit/s | [99.9 %] | 50 | - | Stationary or Pedestrian | ≤ 100 km2  NOTE 2 | Audio |
| < 300 ms | 600 Mbit/s | [99.9 %] | MTU | - | Stationary or Pedestrian | ≤ 100 km2  NOTE 2 | VR |
| Local Site 🡪 Remote Site (UL) | < 300 ms | 12 kbit/s [26] | [99.999 %] | 1 500 | - | Stationary or Pedestrian | ≤ 100 km2  NOTE 2 | Biometric / Affective |
| < 400 ms [11] | 1-100 Mbit/s | [99.999 %] | 1 500 | - | Workers: Stationary/ or Pedestrian, UAV: [30-300mph] | ≤ 100 km2  NOTE 2 | Video |
| < 150 ms [11] | 5-512 kbit/s | [99.9 %] | 50 | - | Stationary or Pedestrian | ≤ 100 km2  NOTE 2 | Audio |
| < 300 ms | 600 Mbit/s | [99.9 %] | MTU | - | Stationary or Pedestrian | ≤ 100 km2 NOTE 2 | VR |
| NOTE 1: The number of UEs is not indicated in the table, as the number depends on the application, the actual deployment, the service area and the distributed UEs chosen to improve / address required user experience.  NOTE 2: The service area depends on the actual deployment and is the same for uplink and downlink traffic. A local approach can be used in order to satisfy requirements of low latency and high reliability (i.e. the application server will be hosted at the network edge). | | | | | | | | |

[PR 5.5.6-4], The 5G system shall support the following synchronization thresholds to support immersive multi-modal navigation applications, see Table 5.5.6-2.

Table 5.5.6-2: Potential Key performance requirements for synchronization thresholds for a personal exclusion zone in dangerous remote environments.

|  |  |  |
| --- | --- | --- |
| **synchronisation threshold** | | |
| **audio-tactile** | audio delay:  [50 ms] | tactile delay:  [25 ms] |
| **visual-tactile** | visual delay:  [15 ms] | tactile delay:  [50 ms] |

**========= End of Changes ==========**