**3GPP TSG-SA1 Meeting #96e *S1-21xxxx***

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

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **22.847** | **CR** | **<CR#>** | **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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Update of the KPI table in clause 5.4 | | | | | | | | | |
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| ***Source to WG:*** | LG Electronics | | | | | | | | | |
| ***Source to TSG:*** | SA1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_TACMM | | | | |  | ***Date:*** | | | 2021-10-14 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | 1. The attribute of “reliability” was discussed at the last meeting and it was tentatively agreed to keep those values (numbers) with a square bracket, meaning that they are to be confirmed. Different from other attribute in characterizing the necessary performance requirements for Tactile Internet-based interactions, the attribute of “latency” is tightly couple with each specific use case instead of being a requirement per se. Therefore, it is proposed to remove the square bracket from the attribute of “latency” (in the first next column from the column of use case name) 2. At the last meeting, it was discussed but not concluded how to describe the required quantity regarding the attribute of “service range”. Noting that it is one of the key characteristics that TACMM-enabled applications/services should meet ultra-responsive and low-latency, the service range is more relevant if described in 1-D measures; however, it is also worthy of considering the way SA1 used to describe, e.g., in 22.261 and 22.104 (e.g., TSN-related topics), which is described in 2-D. If there exist some use case that requires more refined description in the service range, it can still be described in 1-D; otherwise, it can be described in 2-D. | | | | | | | | |
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| ***Summary of change:*** | | Removal of square brackets in the attribute of “latency”.  Addition of quantitative amount to the attribute of “service range”. | | | | | | | | |
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| ***Consequences if not approved:*** | | TACMM use cases are not clearly described with respect to some attributes. | | | | | | | | |
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| ***Clauses affected:*** | | 5.4.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

**--------- The 1st change ---------**

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

[PR 5.4.6-1] 5G system shall be able to support real-time multimodality communication for interactive haptic control and feedback with KPIs as summarized in Table 5.4.6-1.

**Table 5.4.6-1: Multi-modality communication service performance requirements.**

| **Use Cases** | **Characteristic parameter (KPI)** | | | **Influence quantity** | | | | **Remarks**  **(**NOTE 1**)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Max allowed end-to-end latency**  **(**NOTE 2**)** | **Service bit rate: user-experienced data rate** | **Reliability** | **Message size (byte)** | **# of UEs** | **UE Speed** | **Service Area** |
| Skillset sharing low- dynamic robotics  (including teleoperation) Controller to controlee | 5-10ms | 0.8 - 200 kbit/s (with compression) | [99,999%] | n DoFs: (2n)-(8n)  (n=1,3,6) | **-** | Stationary or Pedestrian | 100 km2 | Haptic  (position, velocity) |
| Skillset sharing low- dynamic robotics  (including teleoperation)  Controlee to controller | 5-10ms | 0.8 - 200 kbit/s (with compression) | [99,999%] | n DoFs: (2n)-(8n)  (n=1,10,100) | **-** | Stationary or Pedestrian | 100 km2 | Haptic feedback |
| 10ms | 1-100 Mbit/s | [99,999%] | 1500 | **-** | Stationary or Pedestrian | 100 km2 | Video |
| 10ms | 5-512 kbit/s | [99,9%] | 50 | **-** | Stationary or Pedestrian | 100 km2 | Audio |
| Highly dynamic/ mobile robotics  Controller to controlee | 1-5ms | 16 kbit/s -2 Mbit/s  (without haptic compression encoding);  0.8 - 200 kbit/s  (with haptic compression encoding) | [99,999%] (with compression)  [99,9%] (w/o compression) | n DoFs: (2n)-(8n)  (n=1,3,6) | **-** | high-dynamic | 4 km2 | Haptic  (position, velocity) |
| Highly dynamic/ mobile robotics  Controlee to controller | 1-5ms | 0.8 - 200 kbit/s | [99,999%] (with compression)  [99,9%] (w/o compression) | n DoFs: (2n)-(8n)  (n=1,10,100) | **-** | high-dynamic | 4 km2 | Haptic feedback |
| 1-10ms | 1-10 Mbit/s | [99,999%] | [2-4] | **-** | high-dynamic | 4 km2 | Video |
| 1-10ms | 100-500 kbit/s | [99,9%] | 100 | **-** | high-dynamic | 4 km2 | Audio |
| NOTE 1: Haptic feedback is typically haptic signal, such as force level, torque level, vibration and texture.  NOTE 2: The latency requirements are expected to be satisfied even when multimodal communication for skillset sharing is via indirect network connection (i.e., relayed by one UE to network relay). | | | | | | | | |