**3GPP TSG SA WG4#109-e meeting *S4-200769***

**20th May – 3rd June 2020 revision of AHVIC-251**

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| *CR-Form-v12.0* | | | | | | | | |
| **draft CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.925** | **CR** | **<CR#>** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *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 | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | XR Traffic Characteristics | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | SA4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_XRTraffic | | | | |  | ***Date:*** | | | 2020-05-18 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | On XR and Cloud Gaming traffic with high throughput, low latency and high reliability requirements, it is important to consider the capacity of these services over Rel-15 and Rel-16 based 5G networks. One way to represent the capacity of the XR and Cloud Gaming services is via the number of users who can simultaneously consume the service under given traffic requirements and for a given deployment scenario (e.g., Urban Macro, Indoor Hotspot) with some density of 5G cells. If the traffic requirements of the XR and Cloud Gaming service are flexible (e.g., the underlying architecture allows adaptation of content), then the capacity of the service can be studied by assessing the delay, throughput and reliability variations with increasing number of users in the system. In order to properly study this, detailed traffic characteristics are necessary. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adds XR Traffic characteristics.   * documents traffic characteristics including for different services, but not limited to   + Downlink data rate ranges   + Uplink data rate ranges   + Maximum packet delay budget in uplink and downlink   + Maximum Packet Error Rate,   + Maximum Round Trip Time   + Traffic Characteristics on IP level in uplink and downlink in terms of packet sizes, and temporal characteristics. XR Services and Cloud Gaming based on the initial information documented in TR26.928 including. * Adds information for the following services   + Viewport independent 6DoF Streaming   + Viewport dependent 6DoF Streaming   + Simple Single Buffer split rendering for online cloud gaming   + Cloud gaming   + MTSI-based XR conversational services | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | XR Traffic Characteristics are not sufficiently documented. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Annex B (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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# 1 Scope

The present document includes following information:

- Media centric Third-Party and Operator services currently deployed or expected to be deployed until 2025 on 3GPP defined 4G and 5G networks.

- Typical deployment characteristics today, such as bandwidth requirements, client buffered and rate adaptation reception characteristics, codecs, protocols in use and latency requirements.

- An overview on technological developments for existing and emerging services and their impact on typical traffic characteristics of media services, e.g. evolution of compression technologies, new demands for high quality, new experiences, etc.

- A summary on typical characteristics and requirements for different media services on 3GPP networks.

- An identification of the applicability of existing 5QIs for such services and potentially identify requirements for new 5QIs or QoS related parameters.

- A detailed modelling of eXtended Reality (XR) Traffic characteristics

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# 2 References

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## 5.6 XR Traffic Characteristics

### 5.6.1 Introduction

Initial typical bitrates and traffic characteristics for XR services are collected in TR 26.928 [30], clause 6.

More details are provided in the following subclauses for different XR services as defined in in TR 26.928 [30], clause 6.

Table X. Association of traffic characteristics and XR architcture defined in TR 26.928

|  |  |
| --- | --- |
| XR traffic characteristics | XR architecture in TR 26.928 [30] |
| Viewport independent 6DOF streaming | Subclause 6.2.2 |
| Viewport dependent 6DOF straming | Subclause 6.2.3 |
| Raster-based split rendering for online cloud gaming | Subclause 6.2.5 |
| Cloud gaming | ? |
| MTSI-based XR conversational service | Subclause 6.2.8 |

Detailed Traffic Characteristics are documented in clause 9.

### Detailed background and XR Traffic modelling are defined Annex B.5.6.2 Viewport independent 6DoF Streaming

Typical downlink bitrates for Viewport independent 6DoF Streaming are FFS.

Typical uplink bitrates for Viewport independent 6DoF Streaming are FFS.

For more details, see clause 9.2.2.

### 5.6.3 Viewport dependent 6DoF Streaming

Typical downlink bitrates for Viewport dependent 6DoF Streaming are FFS.

Typical uplink bitrates for Viewport dependent 6DoF Streaming are FFS.

For more details, see clause 9.2.3.

### 5.6.4 Raster-based split rendering for online cloud gaming

Typical downlink bitrates for raster-based split rendering for online cloud gaming are FFS.

Typical downlink bitrates for raster-based split rendering for online cloud gaming are FFS.

For more details, see clause 9.2.4.

### 5.6.5 Cloud gaming

Typical downlink bitrates for cloud gaming are FFS.

Typical uplink bitrates for cloud gaming are FFS.

For more details, see clause 9.2.5.

### 5.6.6 MTSI-based XR conversational services

Typical downlink bitrates for MTSI-based XR conversational services are FFS.

Typical uplink bitrates for MTSI-based XR conversational services are FFS.

For more details, see clause 9.2.6.

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# 9 Detailed Traffic Characteristics

## 9.1 Introduction and Definitions

Editor's Note: Define based on TS23.501 and clause 8.

* Downlink data rate ranges
* Uplink data rate ranges
* Maximum packet delay budget in uplink and downlink
* Maximum Packet Error Rate,
* Maximum Round Trip Time
* Traffic Characteristics on IP level in uplink and downlink in terms of packet sizes, and temporal characteristics.

## 9.2 XR Traffic Characteristics

### 9.2.1 Introduction

XR Services are defined in TR 26.928 [30], clause 6.

### 9.2.2 Viewport independent 6DoF Streaming

FFS

### 9.2.3 Viewport dependent 6DoF Streaming

FFS

### 9.2.4 Raster-based split rendering for online cloud gaming

FFS

### 9.2.5 Cloud gaming

FFS

### 9.2.6 MTSI-based XR conversational services

FFS

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Annex B:  
XR Traffic Modelling

## B.1 Split Rendering

FFS