

3GPP TSG RAN Rel-18 workshop
Electronic Meeting, June 28 - July 2, 2021

RWS-210061

Agenda Item: 4.2
Source: Spreadtrum Communications
Title: R18 Tactile and multi-modality considerations
Document for: Discussion and decision



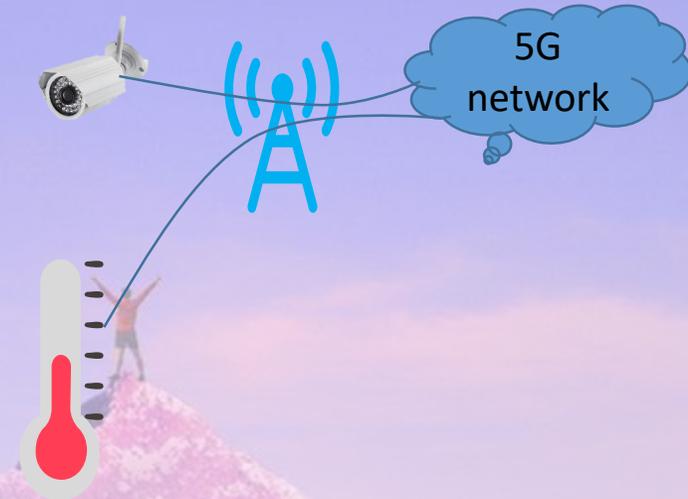
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Justification

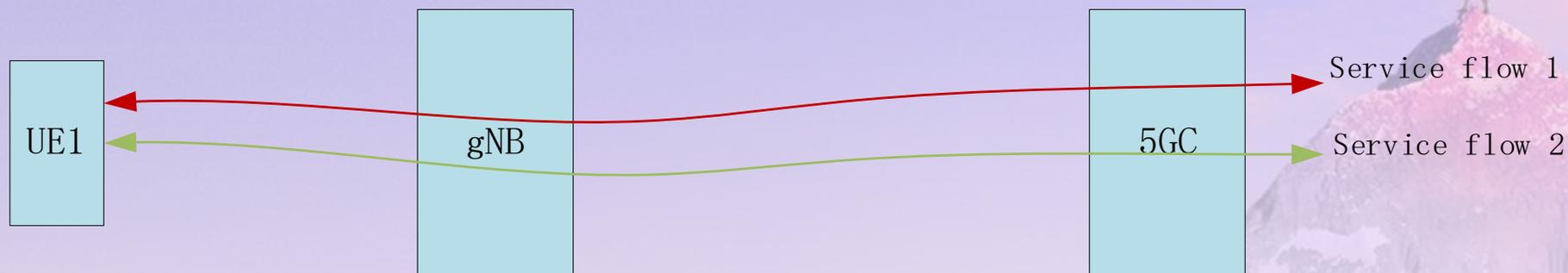
- Multi-modality communication service data includes the input data from different kinds of devices/sensors or the output data to different kinds of destinations required for the same task [1].
- One Tactile and multi-modality communication service is consist of different type service flows: e.g. Video/Audio media; Information perceived by sensors about the environment; Haptic data: can be feelings when touching a surface or kinaesthetic senses. With the parallel transmission of the multi-modality service data, the interpretation in communication services will be more accurate and faster, response can also be quicker.
- The multi-modality communication service can be applied in multiple fields, including: Virtual Reality, Remote human interaction, Remote control, social network of robots, industry and commercial IoT services. The multi-modality service should be supported in 5G network to satisfy the requirements from vertical market.



Scenarios

The different service data of one multi-modality service collected from different kinds of devices/sensors can be transmitted to network via one UE or multiple UEs. And the different service flows of one multi-modality service from application servers can be transmitted to one or many destinations via one or multiple UEs.

- Scenario1: Service flows of one Multi-modality service locate in one UE



- Scenario2: Service flows of one Multi-modality service locate in multiple UEs



Main topics

- Synchronous transmission
- For one multiple modality service, if the service flows within are mapped to one QoS flow, the synchronous transmission can be guaranteed by existing feature or the upper layer. Otherwise, the synchronous transmission of different QoS flows in one UE or multiple UEs should be studied in 5G network.
- Firstly, in order to accomplish the synchronous transmission, RAN needs to identify the QoS flows required synchronous transmission in one UE or multiple UEs.
- Secondly, the data rate of different QoS flows may be different, e.g. the sampling rate of the haptic device for teleoperation systems may reach 1000 times per second and while the video is 60/90 frames per second. The synchronous transmission can be done on block level, and one block consists of the packets produced in each service flow during one duration, e.g. 1ms. The packets in one block from different QoS flows should be transmitted synchronously to satisfy the requirements. RAN needs to identify the packets in the same block.
- Thirdly, synchronous transmission mechanism should be specified.

Main topics

- Differential handling

The multiple service flows of one multi-modality communication service may have different QoS requirement, e.g., latency or reliability.

Furthermore, the importance of the different service flows may be different, e.g., the control signaling is more important than the video in industry control scenarios. The differential handling will be applied according to its importance when the network resource is limited. And the important packets or QoS flow should be identified by RAN.

- Mobility enhancement

In the mobility scenario, the multi-modality communication service can be handover to target cell for the service continuity. In order to guarantee the synchronous transmission easily, the multiple QoS flows of one multi-modality communication service should be switched to the target cell together. Then some enhancements for mobility is needed.

Objective

The study item aims at:

- Study synchronous transmission mechanism [RAN2,RAN3]
 - Identify QoS flows belong to one multi-modality service.
 - Identify synchronous packets of same block in multi-modality service.
 - Specify synchronous transmission mechanism for multi-modality service.
- Differential handling for service flows in multi-modality service, e.g. in limit resource scenario [RAN2,RAN3]
 - Identify important packets/QoS flows.
 - Differential handling for QoS flows/packets with different importance levels.
- Study mobility enhancement for multi-modality service [RAN2,RAN3]
 - Specify multi-modality communication service level mobility where the QoS flows of one multi-modality service are switched to target cell together.

Thank you

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