

Encoding 3GPP Slices for Interactive Media Services

(draft-jiang-tsvwg-slice-media-service-01)

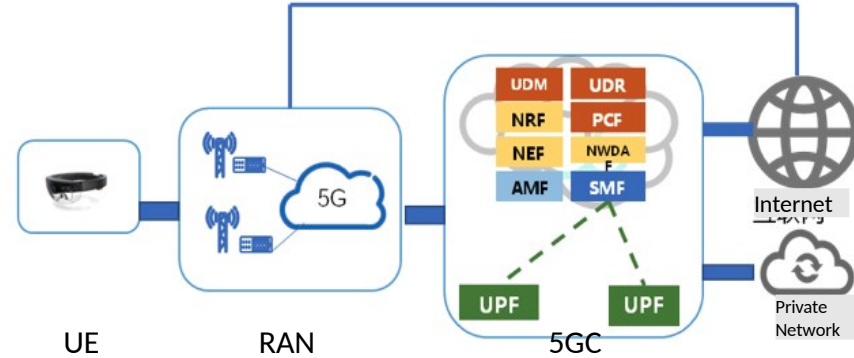
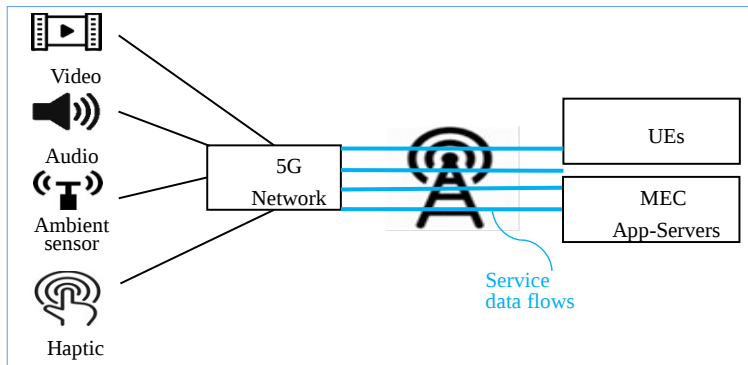
Tianji Jiang, Dan Wang

China Mobile

Motivation - 3GPP SA2 XRM (Extended Reality & Multi-modality Services) (Rel-18 & Rel-19)

XRM: 5G-A service; multi-modalities, e.g. *video, audio, ambient-sensor and haptic data*;

- Service characterized by: **high data rate and low latency** (a new 3GPP-defined standardized SST);
- Various networking related issues to address + **IETF** technologies applied: Network information exposure & congestion control of media streams: L4S with ECN/AQM (3 RFCs in 5G Spec. already), etc.; QoS handling: (PDU/PDU-Set, RTP w/ extension, delay, error-rate, GBR/Non-GBR, etc.); Jitter (UL/DL); provisioning, measurement, guarantee, etc.



Types	Value	Characteristics
eMBB	1	Slice for 5G enhanced mobile broadband
URLLC	2	Slice for ultra-reliable low-latency comm.
MIoT	3	Slice for Massive IoT
V2X	4	Slice for V2X Services
HMTc	5	Slice for High-performance Machine-type comm.
HDLLC	6	Slice for High data-rate & low-latency comm.

Challenges for XRM-based encrypted video/RTP streams

- the later-added UDP header would not be able to expose the 'metadata' (of XRM streams) to the routing entities in the underlay transport networks until the same packet reaches the UDP destinations (UEs).

Sol#1: 6-bit DS field:

- **Pros:** Not normally subject to the encryption hurdle.
- **Cons:** Limited combinations (less granular) & lack of hierarchy.

Solution#2: UDP-option

- **Pros:** more-granular, extensible, encryption-handling: E.g., a single code [*UDP-option-draft*] to identify the main type being '3GPP network slice'; then further define the sub-structure for more concrete SSTs.
- **Cons:** UDP end-to-end processing, i.e., **transport-layer exposed to network-layer processing** (e.g., at 5G UPF)
 - [**Our I.D. argument**] Uniqueness of 5G-A XRM: **5GS a 'composite' UDP receiver** to the IP domain (of a 5GS); then a 5GS UPF may naturally break the IP-UDP demarcation by peeking at the HDLLC/XRM 'metadata' in the UDP option field – Not violate the UDP-option end-to-end rule in broad sense.
 - Some I.D. proposal for explicitly distributing **encrypted** metadata to an intermediary node
 - One tenet of [*UDP-option*] draft: UDP options are just a **framework**.