

Application-aware Networking (APN) for Performance Enhancement of Media Service

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Motivation

The share of media services in the network continues to rise, especially in the new era. In addition to traditional live and on-demand media, new highly demanding media applications are also in the corner:

- Cloud Extended reality (XR)
- Cloud Gaming
- Metaverse

Challenges on Media Delivery

The media traffic, e.g. cloud XR and cloud gaming, has the characteristics of :

- > **high throughput**: cloud XR usually needs a high bandwidth, e.g. 100Mbps;
- > **low latency**: due to the downlink video/haptic feedback data, and a low end-to-end latency less than 20ms;
- > **high reliability**

Especially with introducing the cloud server, in cloud XR scenario, the transmission distance and downlink traffic load are extended compared with the traditional XR mode.

Currently, **it can only support limited XR capacity in network**, especially in 5G base or campus wifi:

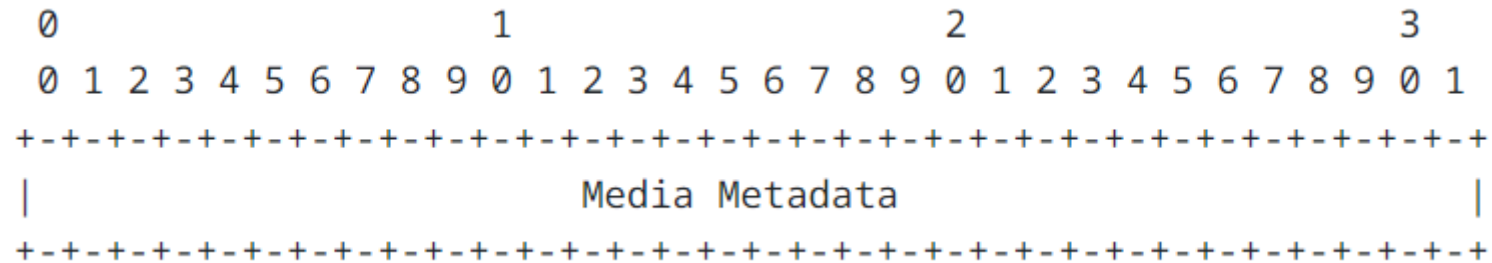
- > For example, one cell typically could just support 5 XR users. It is a big challenge how to improve the system capacity to support more XR users.

APN for Media Delivery

- All media traffic, in spite of which codec was used, have some common characteristics. These characteristics can be very useful for better transmission control and efficiency. However, currently common QoS mechanisms to handle media services together with other data services without taking full advantage of these information.
- We have identified the following requirements for enhancing the quality of media services and APN could be used to satisfy these requirements:
 - > Use Case 1: APN Attribute can carry the **packet dependency information** for the media service
 - > Use Case 2 □ APN can be extended to carry information about **frame types and positions in the GoP**.
 - > Use Case 3: APN can be extended to carry information about **XR/media traffic pattern**.

Media Metadata

This Media Metadata parameter indicates the media application-aware information requested by the APN traffic to satisfy the potential requirements raised above, e.g. packet dependency, frame types, and so on. A format example of this parameter is shown in the following diagram:



Thanks