Mobile Edge Computing for Improvements in OTT Video Delivery

Today's empowered customers demand premium and personalized content that is available ubiquitously and delivered seamlessly. With the advent of OTT Video delivery, consumption on mobile devices has increased significantly and it is predicted to grow at a much high rate over the coming years. Ericsson mobility reports[1] predict 48% CAGR through 2023 with Video volume traffic taking over 75% of data traffic. Therefore, there is mounting pressure on mobile networks to deliver more video.

As more users adapt to OTT Video streaming services, it is putting a strain on mobile networks and forcing Telcos to upgrade their infrastructure. Augmenting network resources is a slow process; meeting the demand for increase in video traffic is becoming a challenge. This is leading to user-experience getting impacted by video stalling and buffering. Availability of 4K, 8K and VR content is further adding to the overall congestion.

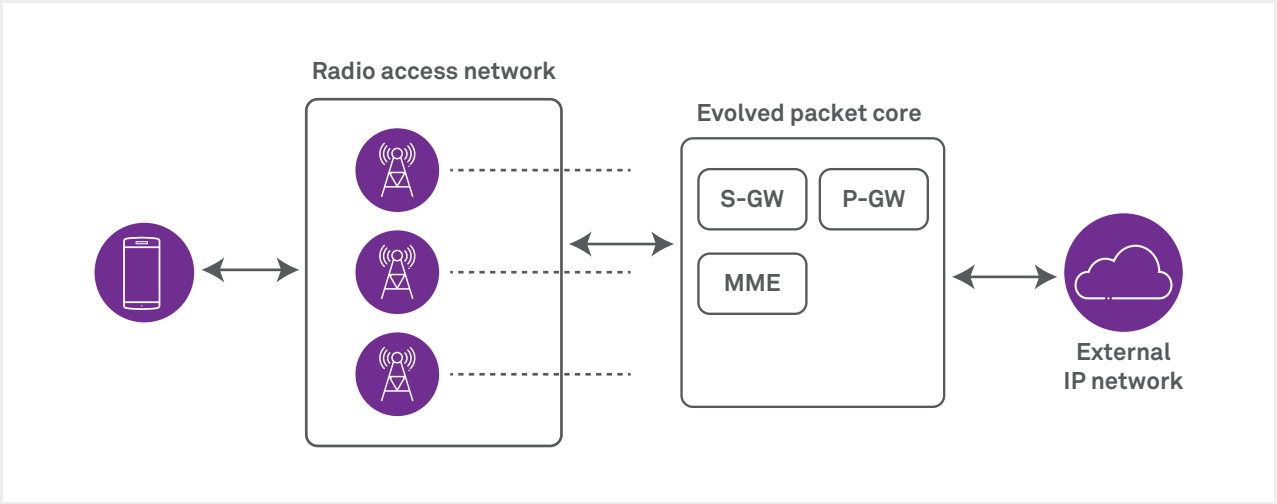
Per MUX.com[2] reports, one buffering event decreases the amount of video watched by 39%, i.e., 4 people out of 10 leave the service, thereby impacting the MVPD. Also, an increase in bandwidth due to 5G may not suffice. The following narrative describes the network factors affecting user experience and the mechanisms to minimize them.

Impact on Network for OTT Video Delivery:

As the number of users increases, the bandwidth per user decreases, which results in video buffering and stalls. The network parameters causing video buffering and Video stalls primarily are latency, Packet loss, and buffer bloats.

As video streaming uses TCP, latency, packet loss causes retransmissions, which reduce the effective bandwidth. With many of the network nodes using big transmission, buffers further aggravate when congestions happen. Packet loss and retransmissions are a direct result. For mobile networks, the sources of latency are at the Mobile edge (RAN), packet core and the external IP Cloud.

MEC brings together an environment to reduce the impact on the network by optimizing deployments of network infrastructure and also enable new video apps to improve overall video QoS.

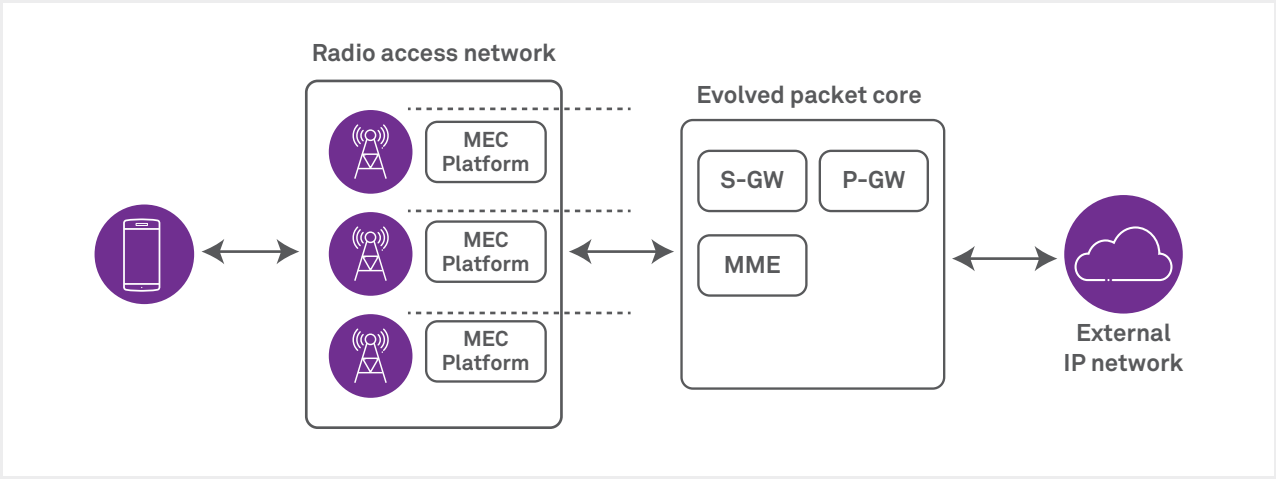


Experimental studies[3] have shown that increasing the bandwidth at the mobile edge is not leading to a proportionate decrease in Peak Load time after a point. However, reducing the latency is leading to better user experience and is improving the effective bandwidth because of lesser number of TCP retransmissions.

Improvements in Network:

There have been efforts aimed at bringing some of the backend functionality closer to the user. We understand that edge services running closer to devices considerably reduces latency, responds faster & improves user experience. It also helps in minimizing congestion across the network, leading to low packet loss and improved effective bandwidth utilization.

Mobile Edge Computing (MEC) is a cloud-based IT service environment offering Compute, Storage and Networking resources/services at the mobile edge. MEC is deployed at RAN and offers services to support applications that interact with mobile devices. By leveraging this MEC infrastructure, we can deploy a host of applications and services aimed at optimizing video delivery workflows.



For example: Hosting video content at the mobile edge can minimize latency as the delays of packet core and external IP cloud will no longer contribute to the overall latency. Users watching Video content from the edge will have a high quality of experience (QoE).

Some key video use-cases that can be implemented to enhance user experience are:

- Video-on-Demand content processing and caching at MEC
- Video Recording (cDVR) of users stored in MEC for about 48 to 72 hours as the chances of playback are high during this time window
- Local channel processing and broadcasting/multicasting using LTE broadcast (eMBMS)
- In-Venue streaming specifically useful for replay of actions
- VR content processing and streaming
- Targeted local advertising to users pertaining to a cell region
- Differentiated Video services to premium customers

Imperative for MVPDs:

It is imperative that MVPDs actively plan to deploy their services over MEC platforms to be able to cater to the growing demands of Video consumption; optimize deployment of additional network infrastructure; and enable new applications that can be monetized.

References:

[1]https://www.ericsson.com/en/mobility-report

[2]https://mux.com/data/

[3]https://www.saguna.net/blog/improving-video-streaming-customer-experience-with-multi-access-edge-computing-research-results-from-vodafone-and-saguna/

About the authors

Jagan Mohan Gorti

Lead Consultant,
Wipro Limited.

Jagan is a Networking consultant working with Multi-programming Video Distributors and Networking Equipment Vendors globally for the past 20+ years. In his current role, he consults on System Architecture and Engineering development for next-generation Media and SDN Platforms.

Manish Verma

Distinguished Member of
Technical Staff,
Wipro Limited.

Manish is a Media Consultant working closely with Multi-programming video distributors globally for the past 18+ years. In his current role, he incubates media solutions and consults in System Architecture and Engineering development for NextGen OTT Video Platforms.

Wipro Limited
Doddakannelli, Sarjapur Road,
Bangalore-560 035,
India

Tel: +91 (80) 2844 0011
Fax: +91 (80) 2844 0256
wipro.com

Wipro Limited (NYSE: WIT, BSE: 507685, NSE: WIPRO) is a leading global information technology, consulting and business process services company. We harness the power of cognitive computing, hyper-automation, robotics, cloud, analytics and emerging technologies to help our clients adapt to the digital world and make them successful. A company recognized globally for its comprehensive portfolio of services, strong commitment to sustainability and good corporate citizenship, we have over 175,000 dedicated employees serving clients across six continents. Together, we discover ideas and connect the dots to build a better and a bold new future.

For more information, please write to us at **info@wipro.com**

IND/B&T/JUN-NOV2019