Real-Time QoE Estimation for DASH Video Using Active Network Probing

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Abstract—**Video on Demand (VoD) accounts for a significant amount of traffic on IP networks. To meet users' expectations, network operators need means to monitor and to identify when service quality is degraded in order to take actions to avoid customer churn. Most solutions cannot monitor end-to-end conditions without modification on video player applications or require deep packet inspection techniques, which may raise privacy issues. In this demonstration, we use active network probing to measure end-to-end network Quality of Service (QoS) conditions and use a Machine Learning model to infer users' Quality of Experience (QoE) in real-time. The results show that the method allows us to identify whether the network conditions allow video sessions with high QoE, or situations in which the user's QoE is degraded.**

II. QoE Inference Using ICMP Probing

Our method uses ICMP probing to perform end-to-end network QoS measurements. Figure 1 gives an overview of the method in co-located and distributed deployments. The co-location considers a context of small-scale Content Delivery Networks (CDNs) deployed within the domain of an Internet Service Provider (ISP). The server provides VoD based on Dynamic Adaptive Streaming over HTTP (DASH). The ISP has no access to server logs but can deploy a Probing Module (PM) to monitor the network between server and client. The ISP can also configure routes so the probing and video flows