Passive QoS Measurement

In short, passive QoS measurement is about measuring QoS statistics for real existing application traffic in the network. This is a significant difference to most other network performance measurement solutions available. Passive QoS measurement is the optimal way to measure and monitor network performance after commissioning.

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1. Where Do We Need Passive QoS Measurement?

There are plenty of solutions and tools available for measuring and monitoring network performance and quality. However, most of them are active ones that don't work well when the network is in operational usage. *Active tools* determine QoS and/or QoE only for the artificial test traffic they generate in one end and measure at the other end of the network path of interest. The generated traffic can mimic some real application, or they are used to obtain the maximum throughput performance. These tools are very useful in verifying newly deployed networks that they work as designed or benchmarking network throughputs with no mission-critical applications employed over them.

With *active measurement solutions*, however, you don't have visibility on how real existing applications experience the network performance. This is the case, although you try to simulate their traffic characteristics. By burdening operational networks with artificial test traffic, this can result in real applications experiencing degraded quality. It is especially important to know how real applications and users experience the network quality when you have connected applications and services with QoS demands, like latency constraints. This is where *passive network measurement solutions* comes into the play, namely to know how network connections serve real applications and respond to their QoS demands.

It is good to realize that active and passive measurement technologies are not competitors of each other. Instead, they are meant for different use cases, completing each other.

2. Passive Measurement in Practice

Let's take an example where there is live video stream application traffic in the network. If an active measurement tool is used to measure the performance, you get results for that artificially generated traffic stream only. However, the actual video stream you are interested in can perform differently. Besides, the active test traffic stream changes the measured system as it adds traffic to the measured network path. In the worst case, it congests the network path of interest. This means that you get incorrect results while interfering with the live video stream user. Passive measurement, on the contrary, evaluates the actual video stream and measures how well the network serves it from the QoS perspective. As a result, you get, for example, *delay*, *jitter*, *packet loss*, and *connection breaks* just for the desired real video stream over the measurement path of interest. Passive QoS measurement also enables you to estimate QoE with application-specific models to get an indication of how satisfied the end-user is for the video quality. When passive QoS measurement is carried out in real-time, some control information needs to be exchanged between the measurement points. The amount of this overhead, however, is often meaningless.