

## Why Maya is & Bandwidth is Not the Performance Answer

What causes performance problems for broadband connections at home or the small office?

There are three sources of problem:

1. Bufferbloat
2. Prioritization
3. Dynamic Bandwidth

The problems explained:

**Bufferbloat.** Bufferbloat is caused by excessive buffering in the routers along the path from the customer site to the destination. Each router along the way is subject to bursts of activity, and when the incoming traffic bursts, the router saves the packets in buffers, and send them later when the burst has subsided.

The delayed packets cause interactive applications to be slow, especially as the dropped TCP packets must be re-transmitted, and the UDP packets are simply discarded, reducing the quality of videoconferences or voice

**Prioritization.** There are no priorities on broadband, and sensitive packets like videoconferences, voice, and Microsoft 365 are delayed while lower priority applications – backups or large file transfers are being transmitted. The symptoms are similar to Bufferbloat, sluggish applications and poor video and voice quality.

**Dynamic Bandwidth.** Broadband bandwidth varies constantly as many customers are sharing the same physical network. As some users' traffic increases, other users' bandwidth must be decreased to make room the higher traffic elsewhere. The users with decreased bandwidth will suffer both Bufferbloat and Prioritization delays, negatively impacting quality.

## Why Bandwidth is Not the Cure

**Bufferbloat.** Increasing bandwidth has limited effect on Bufferbloat. It will reduce it in the router equipment at the customer's site but has no effect on the many routers encountered on the way to the end point.

**Prioritization.** Increasing bandwidth has limited effect on prioritization. All of the TCP applications compete for the available bandwidth, and each take as much as they can get – and the applications generate traffic much faster than the customer's ISP connection. Increasing the bandwidth does allow the applications to get a bit more bandwidth, but the chokepoint at the customer site becomes clogged as quickly as before as the applications eat up the additional bandwidth in a blink.

**Dynamic Bandwidth.** Increasing bandwidth helps when the customer's Internet connection is running at full speed. However, during times of overall network congestion, the bandwidth cuts for the customer can be dramatic – dropping to levels as low as before.

## How Maya Solves the Problems

All three problems are tackled and solved by Maya, providing and maintaining a quality user experience:

**Bufferbloat.** Maya eliminates Bufferbloat by measuring changes in network latency. When latency increases, it indicates that the network is becoming congested, and Maya responds by slightly decreasing the bandwidth consumed by lower priority application sessions – eliminating Bufferbloat. Maya’s technology eliminates Bufferbloat from the entire Internet connection end-to-end, maintaining quality. No other product has this capability.

**Prioritization.** Maya prioritizes each application session by its traffic type – interactive, bulk, large stream or small, then adjusts the packet queues to keep latency at a minimum, and quality high.

**Dynamic Bandwidth.** Maya has Dynamic Bandwidth Control – patented and proprietary mechanisms – to measure network capacity dynamically at the millisecond level. Dynamic Bandwidth Control adjust the available network capacity which is used by Maya’s Bufferbloat Control, and Prioritization Control. The Controls check the current network capacity as packets are processed, and then either sent immediately, speeding up throughput, or delayed or dropped in order to reduce throughput.