In the paper Bufferbloat: Dark Buffers in the Internet, the author briefly introduce the history of internet buffer and the reason of the buffer Bloat (large buffer’s side effect). Without buffer, there won’t be an internet. “Adding buffers to networks and packetizing data into variable-size packets was part of the fundamental advance in communications that led to the Internet. The history of Internet congestion and its solution is the story of trying to find the optimal way to deploy and use buffers in a network.” The quota from the paper tells us how important buffer is and why congestion matters. Conclude from the paper, we get the result that tail drop at buffer lead to packet loss and larger buffer can result a huge TCP windows size. The over buffering has a quadratic impact on latency. Part of the reason is the congestion control is loss based. The author post some solutions to this issue like AMQ and DOCSIS and SPDY.

From the Controlling Queue Delay, the author first demonstrates how queue works in the network and the relation between TCP windows size and queue. Queue is used to absorb the shock —the burst of TCP traffic. The burst mainly due to the traffic from high-speed way to low speed way and the large window size. As a result the author gives the definition of good queue and bad queue. Good queue means permitting bursts of traffic and bad queue means creating excess delay. This is shown in the paper’s figure 3. Codel as an AMQ aims to reduce the latency of queuing delay. The algorithm for Codel is that when the packet dequeue, it will check how long the packet has been in the queue, if he packet has been in the queue too long(larger than target queue delay eg 10ms) , router will drop the packet. The router will do this check every 100ms -200ms (give digits for easy understanding). If 100ms -200ms check won’t fix the queue delay, we will do more frequently check like 80 ms until we fix the queue delay. The reason why this works is mainly due to most CC is loss based and has a timeout for previous unreceived packet if the successor packet has been received.

I think the Codel is a very simple and effective AMQ and it really solve the problem in an elegant way.