Video Tutorial – The Purpose of QoS (3 min)

QoS, what is it and why is it needed? QoS, or Quality of Service, allows us to prioritize certain types of traffic over others. Different types of traffic place different demands on the network. Video traffic and voice traffic require greater resources from the network. They require more bandwidth to achieve the type of quality that is needed in a phone call or streaming video. Financial transactions are time sensitive and they have greater needs than, let's say, a web page or regular data traffic like sending an email. In this diagram, we're given a general concept of how it works. Packets are buffered at the router and three priority queues have been established: a High Priority Queue, a Medium Priority Queue, and a Low Priority Queue.

Voice over IP traffic in the High Priority Queue is given a higher priority so more of those packets are allowed to be forwarded across the network. Financial transactions, which are time sensitive also, are also given a greater priority so more of those are allowed as well. Then lastly, any leftover bandwidth is used for the static web page in the Low Priority Queue. When do we need QoS? We need QoS at points in the network where congestion is experienced. This could be points where you have an aggregation of many lengths, let's say many computers or many users, all having to go up a single uplink or across a single wire. Also, you can situations where there's a speed mismatch, you're going from a faster link to a slower link and also as you cross from a LAN to a WAN or from the WAN to the LAN going from network to network across a gateway router.

Without QoS, packets are processed as they come in. When we have network congestion or variations in delay, which cause jitter, we experience packet loss. Now, if you're trying to stream a voice call or audio stream and you're experiencing excessive jitter or variations, the playout delay buffer can't tolerate it and packets are dropped due to that excessive jitter. Now, too many packets being dropped results in your call dropping out. Now, with QoS, more voice packets are processed or forwarded because they're in the High Priority Queue and it's been configured for zero packet loss. You still have, let's say, variations in delay and you can have jitter but an audio stream is able to make up for that and a playout delay buffer can send out a constant stream of audio information resulting in a call that is experiences zero drop off.