

Optical Ethernet with Quality of Service

Quality of Service (QoS) is a mechanism for prioritizing traffic throughout your network – it allows critical data flows to be served before lower priority flows in times of network congestion. For example, QoS can be used to prioritize traffic for time-sensitive applications like VoIP or video and can control the impact of non time-sensitive traffic such as bulk data transfers or nightly back-ups. If you run multiple real-time applications across your LAN or WAN, QoS provides an added level of assurance that priority applications will have the bandwidth they need for optimal performance.

With increasing demands being placed on your network, you need reliable, predictable traffic delivery from your service provider. QoS can increase the performance of your applications, maximize your bandwidth and network resources, control latency and loss characteristics, and can ensure the highest level of business connectivity.

Why QoS?

QoS is a recent addition to the ENMAX Envision's Optical Ethernet product portfolio. The development was prompted by growing customer demand, but also by the recognition of some emerging trends in wide area enterprise networking:

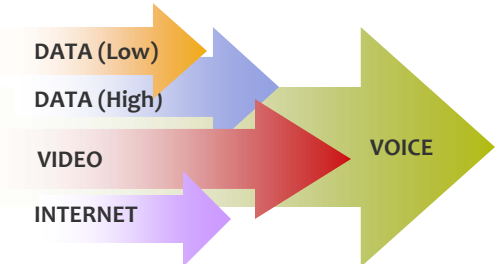
- Increased adoption of VoIP services
- Convergence of media-rich applications running on a single network
- Increased demand on WAN bandwidth
- Real-time applications requiring high availability of the network

Businesses are migrating towards networks that can be multi purpose - where voice, data, and video all traverse the same network infrastructure. Since different applications may be using the same network, there is a need to control how network resources are shared to fulfill the requirements of each service. As a result, there is growing demand for carrier-grade data services that can provide high throughput and reliability as well as the ability to prioritize traffic flows across the network.

Make the Most of Your Bandwidth

A common solution for achieving Quality of Service is to buy more bandwidth than what is actually required to run all the applications. While over-provisioning network bandwidth offers additional throughput, it is often a temporary (and often more expensive) solution in achieving predictable traffic delivery. More bandwidth does not necessarily address some of the common network loss characteristics such as packet loss, jitter, and latency.

ENMAX Envision's QoS is designed to be an affordable solution for maximizing your current bandwidth. Quality of Service is intended to handle what sheer bandwidth cannot – prioritized, timely delivery of specific application data to a particular destination. So, instead of 'buying a bigger pipe', you can begin to better manage and control the traffic that is flowing through that pipe.



Prioritize Your Network Traffic

Voice, video, data or Internet can all be assigned different priority levels. You tell us what's important, and we'll ensure it's delivered.

- Traffic prioritization for applications and users
- Co-existence of mission-critical applications
- Control over network congestion
- Dedicated bandwidth allocation and traffic shaping
- Loss characteristics improvement (jitter, latency, packet-loss)
- Cost-effective; manage traffic vs buying more bandwidth

Packet Loss

Packets transmitted at the source, but not received at the destination. Typically caused by signal degradation, saturated links, corrupt packets or other types of system failures

Jitter

The variation in arrival rates between individual packets. Packets can take multiple paths through a network thus allowing for variation in arrival times at the destination. Jitter can seriously affect the quality of applications like voice and video

Latency

The round trip time for a packet to connect from a source to a destination and back. Latency can be caused by device types, data inspection levels, application, encryption, serialization & distance over a network.

Optical Ethernet Service Portfolio

ENMAX Envision's Optical Ethernet services are designed to maximize your network links by providing data flow priority, dedicated bandwidth, and controlled jitter, latency and packet delivery.

Optical Ethernet services come with a variety of QoS configurations to meet your specific business needs as well as a Network Performance Portal that gives you visibility into your network behaviour. Decide what applications are your highest priorities, and we will customize your traffic flow with up to four levels of classification – Bronze, Silver, Gold and Platinum.

Optical Ethernet Basic	ENMAX Envision's standard Optical Ethernet service. Strictly bronze or 'best effort' service with no prioritized traffic (QoS).
Optical Ethernet Converged	Converged offers two traffic priority levels: bronze for secondary traffic and platinum for mission critical traffic. Ideal if you run voice and data on the same network.
Optical Ethernet Enterprise	A comprehensive Class of Service product with four traffic priority levels available.
Optical Ethernet Private Line	Full, end-to-end line rate throughput on a point to point network. All traffic ingress will be prioritized to either the silver or platinum queue immediately. The setting will be honored across the backbone MPLS network end to end.

Traffic Priority Levels

Differentiated Service (Diffserv/DSCP) or IEEE 802.1p

Bronze

A best effort traffic class that is typically used for services such as e-mail, non-critical OAM and Internet traffic. Best effort traffic has no latency, jitter or delivery guarantees or objectives. Bronze traffic in client networks has the standard 802.1p bit setting of 0 or a DSCP marking of 0 (BE).

Silver

Assured Forwarding low, often used for medium priority traffic such as ERP & CRM software, video/audio and client server transactions. Excess traffic beyond the contracted data rate will be classified into the bronze traffic class. Silver traffic is prioritized in client networks using 802.1p bit setting 2 or a DSCP marking of 26 (AF2).

Assured forwarding high, used for high priority data traffic such as VoIP, video or audio streaming and interactive applications. Excess traffic beyond the contracted data rate will be classified into the bronze traffic class. Gold traffic is prioritized in client networks using 802.1p bit setting 4 or a DSCP marking of 34 (AF3).

Platinum

Expedited forwarding is highly recommended for prioritizing VoIP traffic. ENMAX Envision will police/rate-limit this traffic to the contracted value and will discard any excess traffic. Platinum traffic is prioritized in client networks using 802.1p bit setting 6 or a DSCP marking of 46 (EF).

