When speaking in terms of networking, a “tunnel” is a virtual circuit for an entire flow of packets to traverse (Marsic, 2013). This is in contrast to having the packets travel individually over independent routes. In order to ensure that all packets from a particular flow will be transmitted over the same fixed pathway, a MPLS label is used for Label Switched Routing, or LSR. The MPLS label is a 32 bit value inserted between the link-layer header and the Network-layer header.

When an MPLS label is identified by the entry router, or ingress router, to a MPLS domain, it will forward all packets with that label along the tunnel associated with that label. In this sense, a Forwarding Equivalence Class, or FEC, is created. An FEC is a flow of packets which all have the same MPLS label, and as such traverse the same tunnel (Marsic, 2013). Considering the use of the MPLS label used to direct packet traffic, the tunnel formed for any FEC flow can also be called a Label Switched Path, or LSP.

A Virtual Private Network (VPNs) uses tunnels based on MPLS to create a wide area network dedicated to the traffic of users within that virtual network (Marsic, 2013). In other words, VPNs mimic a dedicated network, by allowing only traffic with the correct labels to traverse it’s tunnels. In this way, specific traffic flow on a particular network is separated from other traffic and therefore can be protected with a differential service from the rest of the traffic.

References

Marsic, I. (2013). Computer Networks: Performance and Quality of Service. Retrieved from http://www.ece.rutgers.edu/~marsic/books/CN/