

Multiprotocol Label Switching (MPLS) is a [protocol](#) for speeding up and [shaping](#) network traffic flows.

MPLS allows most [packets](#) to be forwarded at [Layer 2](#) (the switching level) rather than having to be passed up to [Layer 3](#) (the routing level). Each packet gets labeled on entry into the [service provider's](#) network by the [ingress](#) router. All the subsequent [routing switches](#) perform packet forwarding based only on those labels—they never look as far as the [IP header](#). Finally, the [egress](#) router removes the label(s) and forwards the original IP packet toward its final destination.

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The label determines which pre-determined path the packet will follow. The paths, which are called [label-switched paths](#) (LSPs), allow service providers to decide ahead of time what will be the best way for certain types of traffic to flow within a private or public network.

Service providers can use MPLS to improve [quality of service](#) (QoS) by defining LSPs that can meet specific [service level agreements](#) (SLAs) on traffic [latency](#), [jitter](#), packet loss and [downtime](#). For example, a network might have three service levels -- one level for voice, one level for time-sensitive traffic and one level for “best effort” traffic. MPLS also supports traffic separation and the creation of [virtual private networks](#) (VPNs) [virtual private LAN services](#) (VPLS) and [virtual leased lines](#) (VLLs).

MPLS got its name because it works with the [Internet Protocol](#) (IP), [Asynchronous Transport Mode](#) (ATM) and [frame relay](#) network protocols; any of these protocols can be used to create an LSP. It was created in the late 1990s to avoid having [routers](#) waste time by having to stop and look up [routing tables](#). A common misconception is that MPLS is only used on private networks, but the protocol is used for all service provider networks -- including Internet [backbones](#). Today, [Generalized Multi-Protocol Label Switching](#) (GMPLS) extends

MPLS to manage [time division multiplexing](#) (TDM), [lambda switching](#) and other classes of switching technologies beyond packet switching.

## How an MPLS network works

*This diagram illustrates how a simple MPLS network works.*

