

## Abstract

As Internet traffic continues to increase, companies are demanding greater speeds and better services to disseminate information to their customers, partners and employees. In order to provide reliable services and to support a variety of secure communications among a wide range of locations, Multiprotocol Label Switching Virtual Private Network (MPLS VPN) has been introduced.

MPLS is an emerging technology that aims to address many of the existing issues associated with packet forwarding in today's internetworking environment. Whereas, VPN provides secure private connections through public infrastructure amongst multiple locations. MPLS-based VPN provides isolation, security, simplified routing, easier provisioning as well as scalability. Multiprotocol Internal Border Gateway Protocol (MP-iBGP) has been used to advertise VPN routes across the MPLS VPN backbone due to its capability of handling a large number of routes.

The aim of this project is to study and simulate the MPLS VPN architecture. Several MPLS VPN components are developed to enable the simulation of MPLS VPN architecture. The simulator supports three most widely used MPLS VPN topologies, namely the Intranet topology, the Intranet and Extranet Integration topology and the Central Service topology.

The simulation of MPLS VPN using MP-iBGP has proven that the MPLS VPN architecture is able to provide better scalability, easy provisioning, QoS and security. The simulator will benefit the service providers in configuring a MPLS VPN network environment. Service providers can use the simulator to study and measure the correctness of different types of topologies related to MPLS-VPN.