Designing and Implementation of MPLS Based VPN

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Abstract : MPLS stands for Multi-Protocol Label Switching. It is the technology which replaces ATM (Asynchronous Transfer Mode) and frame relay. In this paper, we have designed a full fledge small scale MPLS based service provider network core network model, which provides communication services (e.g. voice, video and data) to the customer more efficiently using label switching technique. Using MPLS VPN provides security to the customers which are either on LAN or WAN. It protects its single customer sites from being attacked by any intruder from outside world along with the provision of concept of extension of a private network over an internet. In this paper, we tried to implement a service provider network using minimum available resources i.e. five 3800 series CISCO routers comprises of service provider core, provider edge routers and customer edge routers. The customers on the one end of the network (customer side) is capable of sending any kind of data to the customers at the other end using service provider cloud which is MPLS VPN enabled. We have also done simulation and emulation for the model using GNS3 (Graphical Network Simulator-3) and achieved the real time scenarios. We have also deployed a NMS system which monitors our service provider cloud and generates alarm in case of any intrusion or malfunctioning in the network. Moreover, we have also provided a video help desk facility between customers and service provider cloud to resolve the network issues more effectively.
Keywords : MPLS, VPN, NMS, ATM, asynchronous transfer mode
Conference Title : ICSCN 2014 : International Conference on Sensing, Communication, and Networking
Conference Location : Paris, France
Conference Dates : June 26-27, 2014