

To Design a Network That Delivers Reliable Performance 24 Hours a Day 7 Days a Week for Higher Education in Uganda

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Abstract

It aims at existing defects of traditional VPN (Virtual Private Network) in constructing enterprise network, analyses problems which must be considered in designing secure enterprise network, puts forward solution of DMVPN (Dynamic Multipoint VPN) technique to solve the problems that traditional VPN has not solved by now. At the same time, it expatiates on the implementation mechanism of DMVPN, puts forward a concrete case that to adopts the DMVPN technique constructs secure enterprise network of some universities and business chain organization, and network performance indexes are tested. From the results of the test, the DMVPN network entirely satisfies the actual requirements that an enterprise uses a network. It offers a mode that is a convenient and economical investment to an enterprise for building a secure network.

Keywords: Virtual Private Network, designing secure enterprise network, secure enterprise network.

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1. Introduction

The fast-moving of digital communications, companies are tending increasingly to use these new technologies for the storage of their data and archiving their activities with a quick, secure and distributed manner over several sites, with the use of VPN technologies, companies can communicate with each other securely through a public shared infrastructure “Internet” with a low cost compared to traditional solutions such as Frame Relay, ATM, etc. Wireless sensor networks are collections of autonomous devices (sensor nodes) endowed with computational, sensing and wireless communication capabilities. Most universities extend their departments, which constitute a scalability problem, a reconfiguration of all equipment and a reservation of new static public IP address must be done. Dynamic Multipoint Virtual Private Network solution “DMVPN” proposed by Cisco corporation guarantees a full meshed connection between multiple

sites with a dynamic, quick and automatic manner, DMVPN offers scalability, i.e. involves no extra configuration on already configured equipment. DMVPN architecture consists mainly of a Hub and a Spoke routers, Hub router called head office router, play a main role on dynamic creation of tunnels between multiple spokes, the letters are called Branch office routers, from the deployment perspective spokes builds a dynamic permanent tunnel to the HUB but not to other spokes, tunnels between spokes are temporarily created on-demand and deleted when exchanges are finished. DMVPN solution is based on the standard protocols; Multipoint Generic Routing Encapsulation « mGRE », Next-Hop Resolution Protocol « NHRP », Internet Protocol Security « IPsec » and routing protocols, the settings of these protocols vary from one architecture to another, the method “Policy-Based Management of a Secure Dynamic and Multipoint Virtual Private Network” enables centralized management of multiple DMVPN equipments, through a single graphical interface as follow

