

ABSTRACT

Present day a lot of ISP industry uses wireless technology IEEE 802.11 b / g / n with a frequency of 5.8 GHz or 2.4 GHz as the backbone of the ISP's up to the customer due to more efficient economically, and technically the distance and range that can be achieved wider than the use of a physical cable. The use of wireless devices as the backbone also means allowing the device can be accessed from a variety of places and unsecured, the existing wireless authentication system according to the IEEE 802.11i standard the WPA (Wireless Protected Access) or WPA2 still can be penetrated so more research is needed on a more secure encryption method and also more reliable one.

In this final project will be designed and implemented an encryption method on an ISP backbone network that uses wireless devices. As an encryption method it will be used Point to Point method between backbone up to the customer to replace the bridging method commonly used in Router connection. The Protocol that will be used in this Point to Point method is PPPoE (Point to Point Protocol over Ethernet) and to increase the reliability of data transmission, the protocol will be run over MPLS (Multi Protocol Label Switching) in accordance with the reference with the aim that the connection between the customer and the ISP can be protected even if there are other parties that managed to penetrate the security system of the Wi-Fi network and gain access to customers, without sacrificing the performance of the network.

In this final project will be analyzed QoS of the network and the effect of such attacks as ARP Poisoning, Man in the middle, and port scanning on a network that uses PPPoE. Implementation of this thesis carried out at the ISP (Internet Service Provider) company that uses a wireless network as the backbone network to customer. On the scenario that uses packet generator the biggest delay and jitter obtained are 6ms and 2.08ms, while using Video Streaming obtained 171.1ms delay with 19.65ms jitter

Keywords : PPPoE, Wireless, Backbone, MPLS, ARP, VPN