Abstract

Internet Protocol (IP) layer also known as the network layer is responsible for sending and receiving packets in a network. This task is performed by using a uniquely identified fixed length of addresses known as IP addresses. In the IPv4 protocol, the length of addresses is 32 bits and this gives limit of addresses to $2^{32} = 4,294,967,296$. The 32 bit numeric identifier used in the IPv4 was considered enough at the early years of the creation of the internet. Various schemes such as subnetting, Variable Length subnet Mask (VLSM) and the introduction of private IP addresses in combination with Network address Translation (NAT) have been employed to delay the exhaustion of IPv4 as mobile devices increase considerably. With the increase in the world’s population and the emergence of several mobile devices, it is likely that IPv4 addresses can no longer be enough even with all the interventions introduced. The only viable option is the IPV6. Since the launch of the next generation protocol (IPv6) in June 2012, various studies have been undertaken. Many network administrators, IT professional and even customers wonder what has changed and how difficult or otherwise is it to implement network services on IPv6.
Implementation of Network Services on IPv6 Networks

This thesis seeks to bring to the fore the various works on implementation of IPv6, and also implement IPv6 networks and use it to investigate the implementation difficulties in the IPv6 connectivity and routing; transition schemes, Quality of Service (QoS), Security and other services such as Content Delivery Networks (CDN); Dynamic Host Configuration Protocol (DHCP); Transmission Control Protocol (TCP) /User Datagram Protocol (UDP); Simple Mail Transport Protocol (SMTP); Hypertext Transfer Protocol (HTTP) and Domain Name System (DNS) and compare their performances with that of IPv4.

References

1. Fuller V. and Li T. “Classless Inter-Domain Routing (CIDR): The Internet Address Aggregation Plan ” – RFC 4632, August- 2006.

Index Terms

Computer Science
Networks
Keywords

Internet Protocol Version 6 (IPv6), Network Services, Transition Techniques