Map of the Various Configuration Attributes from IPv4 to IPv6 Networks for Dual Stack, 6to4 Tunnelling and NAT: Modelling Designs in OPNET

Authors : Samuel W. Barasa; Samuel M. Mbugua; Simon M. Karume;

Abstract

This paper presents a performance evaluation study of dual stack, 6to4 tunnelling, and Network Address Translation transition schemes on simulative method in IPv4/IPv6 networks. This research aims to find out what IPv4/IPv6 transition scheme performs better in terms of performance parameters packet losses, delays, segment delays, query response times, packet delay variations, packet end-to-end delays, jitters, mean opinion score value, and traffic sent and received for data, voice and video traffic. An equal capacity of network load in terms of probes for the three scenarios is considered and benchmarked to ascertain the impact on the performance parameters on IPv4/IPv6 networks. The scenarios are basically network models configured and simulated using Optimized Network Engineering Tool modeler. The core model designed represents an Internet Service Provider network deployed to form an ideal choice of IP domain corresponded to a realistic network topology running both IPv4 and IPv6 connections. The dual stack, 6to4 tunnelling, and NAT network models are defined which allow the researcher to compare the simulated results. This paper shows that automated 6to4 tunnelling has better performance since it requires only one IPv4 address per tunnel for unlimited number of concurrent sessions though not suitable for voice perhaps because of the encryption overhead.