

ABSTRACT

In the communications network environment, increased traffic and the need for high service availability have driven the development of efficient routing methods. Load balancing is a technique used in computer systems and networks to distribute workload or traffic evenly among multiple resources such as servers, computers, or networks. The goal is to prevent one resource from becoming overburdened while another is idle, thereby increasing overall system efficiency, availability, and performance. One interesting method is Equal-Cost Multipath (ECMP) Routing, in which traffic is divided equally through alternative routes with equal costs. Optimal traffic management in the network becomes a challenge, especially when there is overloading on a single lane or lane failure. In such situations, QoS can be impacted by increased latency, reduced throughput, and service interruptions. ECMP is implemented in network settings to observe how traffic is distributed over alternative routes. The hash function is used to select the path to be used for each packet. The results showed that the use of ECMP results in Throughput with 144p resolution is 190 kbits/s, 240p resolution is 265kbits/s, 360p resolution is 1090 kbits/s, 480p resolution is 3265 kbits/s, 720p resolution is 1111kbits/s, and resolution 1080p is 956 kbits/s, for packet loss with 144p resolution to 1080p get 0%, for delay with 144p resolution is 26,601 ms, 240p resolution is 29,671 ms, 360p resolution is 4,931ms, 480p resolution is 2,646ms, 720p resolution is 4,754 ms, 1080p resolution is 6.172 ms, and jitter for 144p resolution is 26.510 ms, 240p resolution is 29.401ms, 360p resolution is 4.921ms, 480p resolution is 2.677 ms, 720p resolution is 4.747ms, 1080p resolution is 6.157 ms.

Keyword: *ECMP (Equal Cost MultiPath), Latency, QoS, Packet Loss, Throughput*