Network Performance Evaluation on Linux Based Operating Systems

**Introduction and Background**

Information technology continues to rapidly enhance in all aspects of personal, social, and business activities. Times are changing, technology is changing, and so do the demands and the expectations of its users. Undoubtedly, the Internet is playing a vital role by providing a global information superhighway.

**Description**

Internet Protocol (IP) v4 is the standard for the design and interconnection of networks today. However, IPv4 has limitations that hinder growth of the Internet, IPv6 is the solution, and it has two-fold advantage - it addresses inherent problems in the earlier version protocol, and it offers new opportunities that can enhance communication experiences of users beyond current scope. IPv6 has larger data overhead than its counterpart, which hints network performance issues. This project is designed to test the performance of four software routers where IPv4 and IPv6 evaluated in a test bed setup.

**Objectives and Goals**

The goal of this project is to test the performance of 3 latest Linux based Operating Systems distributions – Fedora OS, Ubuntu, and kali. These operating systems need to be configured as software routers before running the tests. Tools such as iPerf or D-ITG is to be employed to generate the test traffics.

**Objectives to be achieved include:**

* Configure the Operating Systems as routers.
* Use TCP and UDP as transmission protocols.
* Test on both IPv4 and IPv6.
* Each test will be on 12 various packet sizes – 128, 256, 384, 512, 640, 768, 896, 1024, 1152, 1280, 1408, 1536 Bytes.
* Performance metrics to test for are – throughputs, delays, jitters, and packet loss. Each test needs to run at least 10 times to ensure accuracy and consistency. Any tests that fall outside 95% confidence interval must be re-run.

**Technical or other Constraints**

**Team members**

* This project is suitable for students with both technical and practical networking background (COMP504, COMP609, etc.).
* A good knowledge of how to configure Windows Server and Linux operating systems will help.
* Must be keen to research and upskill when required.