

## Abstract

The development of protocol lately has been a great help to network communication in general and especially computer network. One of the results of protocol development is known as *TCP-Friendly* protocol. This type of protocol is a product of *TCP* protocol enhancement. This protocol makes us of *grouping* concept when sending the data package. This *grouping* concept is a concept of sending data to multiple recipients/clients in a *multicast* way. This concept is found to be an extremely efficient manner of sending data package through the network.

In its practice, a problem occurring within the multicast data sending with *TCP-Friendly* protocol is identified as *congestion*. *Congestion* is defined as a state where certain network resource is used excessively that causes a long traffic queue within the router in the network. This will give a significant impact to the data package sending in the network being concerned. In order to overcome this problem, *congestion control* is badly needed. Because of that, *congestion control* mekanism on *multicast* transmission is needed to create a good network , this mekanism called *TCP-Friendly Multicast Congestion Control (TFMCC)* .

In this present study, a test of congestion control performance is conducted. This control comprises: *End to end delay*, *End throughput*, and *packet loss rate*. The parameter of the performance will be assessed using *TFMCC* and *TCP*. The performance analysis is then accomplished in a network simulation of *TCP-Friendly Multicast* with *single sender* and *single bottleneck* router using a simulator called *Network Simulator* version 2.34. *TFMCC* and *TCP* during simulation are operated to compare their performances (*end to end delay*, *end throughput*, and *packet loss rate*). From simulation, gained *TFMCC* is better than *TCP*, because *TFMCC* has higher *end to end delay*, lower *end throughput*, and higher *packet loss rate*.

**Keywords:** *TFMCC*, *end to end delay*, *end throughput*, *packet loss rate*, *congestion control*.