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Peak Time Bandwidth Control Algorithms with Fitted Traffic Model on Broadband Network Youtube Video Traffic

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ABSTRACT

This paper presents an analysis of video traffic and fitted to best distribution traffic model to control bandwidth usage in a broadband network. The study scope comprised of collections of inbound YouTube video traffic for 7 days with the time-interval of each day is 3 hours. The broadband network is supported at 10Gbps line speed to Wide Area Network (WAN). The objective of this research is to characterize YouTube video traffic on broadband network, to fit the original traffic to best traffic model and Bandwidth control algorithm is developed based on the real live traffic and using the fitted traffic model. Results presents traffic characterizations are identified based on two (2) parameters Cumulative Distribution Functions (CDF) traffic model. Maximum Likelihood Estimator (MLE) technique is used to fit the best distribution model. Four best traffic model is identified which are Extreme Value, Weibull, Normal and Rician traffic model. Among the four, Weibull shown as the best fitted model that presents value of MLE=-1178.4 with the Scale α=9.49411e+08 and Shape β=2.81324. Bandwidth Control Algorithms is developed based on Peak Time of day and night. Performance shows the bandwidth controlled as bandwidth save, processing time, bucket capacity and cost. Research benefits in the development of design network especially for bandwidth used on Video used in a network.

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INTRODUCTION

1.1 Research Background

Internet played a very important role in this era. The operation of internet started at 1960's when the development of ARPANET, which would become the first network to use Internet Protocol. Nowadays, most of activities in this world need to use internet to complete each of task or to communicate among each other either for a short distance or long distance communication. There are many applications build from the use of internet such as social networking sites, online streaming sites and the latest is cloud computing. The used of the internet in Malaysia being controlled by Malaysian Communications and Multimedia Commission (MCMC) to make sure end user did not use the internet for the bad things and this government agency also protect the data of the organization in Malaysia from being hacked by unwanted people. The demand of internet usage has increase year by year. Most of each type of gadgets in this world is required internet connections to proceed to their applications. Due to this fact, Internet Service Provider (ISP) need to improve their service in providing the better package to make their customer satisfied when use it.

The application of video traffic also being widely used either for individual, organization even in education also being used. This application need a high speed of internet either to stream it online or to download the video to avoid any interrupted which can cause to delayed and buffered. The implementation of fibre optic cable in the service provider side is one of the efforts to give a good service to the customer instead of the implementation of copper wire cable before which has a limited speed