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Fairness Marking Algorithm For Voice over IP Services on Assured Forwarding in Differentiated Services

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Abstract

In this paper, we study the performance of Voice over IP traffic aggregated in Differentiated Services Network which is designed to provide Quality of Services. Although generally Voice over IP traffic of CBR must be forwarded on the EP PHB(Expedited Forwarding Per Hop Behavior) forwarding mechanism due to its sensitivity to delay, AF PHB(Assured Forwarding Per Hop Behavior) forwarding mechanism which asks less cost is used in here according to growing usage of On-Off voice source. This paper applies trTCM(Two-Rate Three-Color Marker) algorithm which has the weight value to determine the drop precedence of packets considering not only congestion but also the bit rate of ITU-T standard voice CODEC algorithm. The simulation result given by NS-2 simulator show that the proposed mechanism makes users share bandwidths fairly proportional to the transmission rate of voice traffics.

I. Introduction

The Premium service is proposed by Jacobson to meet the demand for high quality service[2]. This service essentially creates a virtual line with the bandwidth equal to the desired peak bit-rate being negotiated. The Premium flows are expected to experience a very small queuing delay and delay-jitter inside the network[3]. This service could potentially yield the levels of quality that the Constant Bit Rate (CBR) applications require. The Assured service proposed by Clark et al. provides a better level of service than the ordinary best effort service, during period of network congestion[4]. The level of service assurance is determined by an expected bit-rate that is negotiated with the network. If the level of assurance is not satisfactory, then a higher bit-rate must be (re)negotiated. This service allows more statistical multiplexing of data, at the expense of lower quality, than the Premium service. The Assured service might be useful for transmitting the Variable Bit Rate traffic, such as the interpolated ON-OFF voice[5]. However, the achievable quality of service needs to be investigated. Reference lists the benefits of deploying both Premium and Assured services, and provides a set of common mechanisms in the access, core, and border routers of an internet in order to implement them. The access routers classify the flows, and check their conformity to the contracted profile. Currently, there are two mechanisms favored by the DiffServ community to implement the conformity check at the access routers. The leaky bucket mechanism measures the amount of data that a flow generates over any time interval. If the amount of data exceeds a certain threshold the leaky bucket marks the flow's packets. We chose to