A Study of Fuzzy Logic-Based Controller for Diff-Serv Bandwidth Broking

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Abstract

Quality of Service (QoS) has become an important aspect in networking. This can be justified by the huge cost saving on the infrastructure that has the capability to run both data and voice at the same time. Prioritization and resource allocation has to be provided for different types of traffic especially real-time traffic. One way of implementing this measurable service-oriented scheme is Differential services (Diff-Serv). This mechanism has the simplicity and scalability compared to other mechanisms like Integrated Services. It is required at the same time to take into consideration that Bandwidth Prioritization does not give any delivery time guarantee.

For the LAN/ WAN interface where the issue of bandwidth mismatch appears and leads to congestion on some points, Bandwidth Prioritization will come to minimize this and offers more efficient bandwidth utilization.

QoS over Diff-Serv in this concern is not the only reason that traffic distinction is important. Network administration would also like the capability to share bandwidth in any particular link with respect to different classes via managed priorities. The aim of this MS project is to further investigate the impact of crucial factors on performance of the Bandwidth Fuzzy Logic Controller and propose a method to classify users according to their levels taking into consideration the congestion status on the WAN. These factors can be external or internal and will be manipulated by the Fuzzy Logic Controller which will work as a bandwidth broker and gives each user his optimal Code Point (CP). This CP will consider packet loss rate as an external factor to check the congestion, whereas it will consider the application it uses mixed with his SLA and the available bandwidth as internal factors. This Code Point will be marked in the transmitted packets and the router will check it and treats it as agreed between the user and administrator.