

A Modified Ethernet Protocol for Load Balancing Applications

W. Zhang & J.C. Majithia

Abstract

In this paper, we present a load balancing protocol in the context of a CSMA/CD local area network.

The main objective of this protocol is to achieve efficient load balancing among a group of homogeneous processing sites, interconnected by an Ethernet LAN. Usually when the bus load in such networks approaches bus capacity, the mean packet delay increases rapidly. Thus, some time-critical messages may be severely delayed in such an environment. If the Ethernet is used as the communication system in a load balancing application, then there can be severe performance degradation due to the network operation.

In the proposed network protocol, we introduce two elements viz. message priority and station privilege to achieve load balancing. The use of message priority tends to decrease the queuing delay and also ensure that different classes of messages can satisfy their individual performance requirements. The incorporation of station privilege allows for rapid access to a station with low work load i.e., dynamically attempt load balancing.

The protocol has been simulated using LAN simulation facility. The results show that the desired objective of minimising delay and ensuring a load balance are both achievable. The modifications proposed can also be incorporated in a commercial Ethernet protocol.