

Inter-Office Memorandum

To Bob Metcalf and
Dave Boggs

Date March 5, 1974

From R. Z. Bachrach

Location PARC - Bldg. 31

Subject Comments on
"Draft Ethernet Overview"

Organization GSL - 44

XEROX

I have read with dismay your presentation "Draft Ethernet Overview". As I am sure you are aware, technically or conceptually there is nothing new in your proposal. Perhaps appropriately, you have chosen a coined jargon utilizing discredited scientific conceptual expression in which to frame your ideas. I find your analysis of the proposed interconnection lacking in technical credibility. Quantitative statistical analysis would show that your proposed system would be a failure. You have tried to adopt a scheme inappropriate to the intended engineering application. A random transmission scheme such as you propose, along with the quasi-randomizing hardware you invoke to patch the obvious deficiency, would place in fact an undo hardware, software, and scheduling problem on the individual stations.

You should seriously reconsider your basic premises and formulate fully and logically all the parameters necessary to evaluate the system. Your transmission medium or environment is not quantum noise limited. Simple analysis shows that imposing a poisson (i.e., random) statistics on message transmission drastically reduces the available effective bandwidth. Such a system is effective (reasonable) only in the limit of negligible average bit transmission rates. In fact you will want to maintain as high an effective transmission rate as possible. This requires a synchronized system. The fallacy in your conception is that the stations should be transmitting randomly. One possibility for a synchronized system would be time division multiplexing. You should seriously study how the telephone companies handle this problem. For example the A.T.T. Long Lines T2 buried microwave link multiplexes close to 10^7 - 6 KHz channels.

Most importantly, you should fully define your engineering application before proceeding further. You specify an undefined message packet length, a 1 mile or 1 mile diameter loop and 256 stations working at a 3 Mbs rate. What is the nature of the station? How many bits transmitted does an activity require and what is the expected average rate that the 256 stations will be seeking use of the bus in the contemplated application? What is a tolerable dead time for a given station to acquire a full set of data? The worst case delay for your 1 mile loop is ≈ 2 usec. What effect does this have on far stations getting locked out, etc. . . .?

RZB/fk

cc: W. K. English
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Robert Bachrach