

The Internet

My first 25 years

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Classic (Mis)Quotes?

- The world only needs five computers
 - Thomas J Watson, IBM, 1943
- There is no reason for any individual to have a computer in his home
 - Ken Olsen, DEC, 1977
- 640k ought to be enough for anyone
 - Bill Gates, Microsoft, 1981

Pearls of Wisdom

- The first 90 percent of the code accounts for the first 90 percent of the development time. The remaining 10 percent accounts for the other 90 percent. - Tom Cargill
- Allocate four digits for the year part of a date: a new millenium is coming - David Martin
- (Brooks' Law of Prototypes) Plan to throw one away, you will anyhow - Fred Brooks
- Quotes from Programming Pearls, Jon Bentley, 1985



Paradigm Shifts - the mouse



- First computer mouse held by inventor Douglas Englebart in 1967
- Also an early pioneer of hypertext

Paradigm Shifts - Ethernet

- There's an Internet truism
- Everything over IP - IP over everything
- There seems to be an increasing trend to see the same thing said about Ethernet

XEROX MEMO. OF THE MONTH

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-de-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 Mbps 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. . . . ?

Paradigm Shifts - DNS

- Domain Name System - invented in 1983 by Paul Mockapetris
- Without the DNS the Internet could not have scaled as it has
- Also wrote the first SMTP mail server

Paradigm Shifts - World Wide Web

- Invented by Tim Berners-Lee
- First web site on line in August 1991 at CERN
- <http://www.w3.org/History/19921103-hypertext/hypertext/WWW/TheProject.html>
- Supporter of the idea of Net Neutrality
http://en.wikipedia.org/wiki/Network_neutrality
- First NZ web site at VUW in late 1992



Nearlynet vs Permanet

- <http://www.shirky.com/writings/permanet.html>

Important Milestones



Lessons for the future

- Can we use the past to predict the future?