

LCS Ringnet Documentation

by Jerome H. Saltzer

The LCS version two (10 Mbit/sec.) ring net design is not yet documented in a single technical report, but one can collect a set of published papers and working papers that together describe most of the interesting aspects of the hardware design. These are:

1. Clark, D.D., Pogran, K.T., and Reed, D.P., "An Introduction to Local-Area Networks, Proc. IEEE 66, 11 (November, 1978) pp. 1497-1517.

Sets down the basic principles of the token-access ring and describes the prototype (version one) one-megabit/sec. hardware design.

2. Saltzer, J.H., "Why a Ring?" Proc. Seventh Data Communications Symposium, Mexico City, Mexico, October, 1981, pp. 211-217.

Compares the technology of the ring network with that of the ETHERNET, discussing the problems of each.

3. Saltzer, J.H., and Pogran, K.T., "A Star-shaped ring network with high maintainability," Computer Networks 4, (1980), pp. 239-244.

Proposes laying out the ring with star topology so as to centralize maintenance.

4. Saltzer, J.H., "Version Two Local Net Interface Design Considerations (Revision 1)," M.I.T. Laboratory for Computer Science Network Implementation Note, NIN-(DRAFT), November, 1980.

A complete description of whys and wherefores of the version two (ten Mbit/sec. ring design.

5. Saltzer, J.H., "V2.LNI Transmission Subsystem Requirements," M.I.T. Laboratory for Computer Science Network Implementation Note, NIN 3, February, 1979.

An early specification of requirements that still largely applies to the version two ring design.

---

WORKING PAPER -- Please do not reproduce without the author's permission and do not cite in other publications.

6. Saltzer, J.H., "Communication ring initialization without central control," M.I.T. Laboratory for Computer Science Technical Memorandum, TM-202, December, 1981.

Describes a technique for systematic, decentralized, automatic ring reinitialization.

7. Saltzer, "Clock Regeneration and Jitter Accumulation in a Data Communication Ring," M.I.T. Laboratory for Computer Science Local Network Note, LNN-(DRAFT), November, 1981.

This paper describes a method of clock regeneration and jitter control applicable to high signal-to-noise ratio environments.

8. Saltzer, J.H., editor, "Version II LNI UNIBUS Interface Programming Specifications," M.I.T. Laboratory for Computer Science Network Implementation Note, NIN 23, November, 1980.

Programming manual for the UNIBUS version of the network interface.

9. Ludwig, C., "Version Two LNI NU Bus Interface Programming Specification," M.I.T. Laboratory for Computer Science Network Implementation Note, NIN 32, November, 1980.

Programming manual for the nu-bus version of the network interface.

10. Ludwig, C., "Version 2 LNI S-100 Bus Interface Specifications," M.I.T. Laboratory for Computer Science Network Implementation Note, NIN 28, May, 1980.

Programming manual for the S-100 bus version of the network interface.

11. Saltzer, J.H., Ludwig, C., Arbour, H., and Koss, G., "Local Network Control Module Interface Specifications (revision 1)," M.I.T. Laboratory for Computer Science Network Implementation Note, NIN 30, July, 1980.

Defines the connector-separable interface between the version two ring controller card and the host specific board.

12. Saltzer, J.H., "A Comparison between two Token-Passing Ring Network Design," M.I.T. Laboratory for Computer Science Local Network Note #33, (Revised, March 22, 1983).

Interesting information undocumented as of November, 1981:

- The phase-lock-loop modem design
- The digital modem design
- The packet buffer to DMA interface
- The modem to ring control interface

Note that the above documentation does not describe any of the software or software-implemented protocols used for the ring network. Except for the lowest level drivers, none of these protocols is special to the version two ring; documentation of protocols for the version one ring and TCP/IP applies.