

Chapter 4

31. Yes. The performance degrades as the token rotation time increases, and adding a wire center increases total cable length, hence the token rotation time. For a network whose diameter is only a few km, the effect is small, but for a large MAN it could be noticeable.
37. The 1000 frame/sec bridge would need a faster CPU. Although the other one has a higher throughput, the 1000 frame/sec bridge has more interrupts, more process switches, more frames passed and more of everything that needs the CPU.
40. Nothing special. The new bridge announces itself and the spanning tree algorithm computes a spanning tree for the new configuration. The new topology will put one of the bridges into standby mode, so it will be available as a spare in case one of the others breaks. This type of configuration provides extra reliability at extra cost and is not unusual. It does not cause any problems because no matter how many bridges you connect, you always end up with a spanning tree.
41. With a rotation time of 40 msec and 100 stations, the time for the token to move between stations is $40/100$ msec or 0.4 msec. A station may transmit for 10 msec, followed by a 0.4 msec gap while the token moves to the next station. The best case efficiency is then $10/10.4$ or 96 percent.

Chapter 5

26. With a 2-bit prefix, there would have been 18 bits left over to indicate the network. Consequently, the number of networks would have been 2^{18} or 262,144. However, all 0s and all 1s are special, so only 262,142 are available.
27. The address is 194.47.21.130.
28. For a class B network, the upper 16 bits form the network number and the lower 16 bits are the subnet and host fields. Of the lower 16 bits, the most significant 4 bits are: 1111. This leaves 12 bits for the host number, so 4096 host addresses exist. Addresses 0 and -1 are special, so the maximum number of hosts is 4094.
29. You say, ARP does not provide a service to the network layer, it is part of the network layer and helps provide a service to the transport layer. The issue of IP addressing does not occur in the data link layer. Data link layer protocols are like protocols 1 through 6 in Chap. 3, HDLC, PPP, etc. They move bits from one end of a line to the other