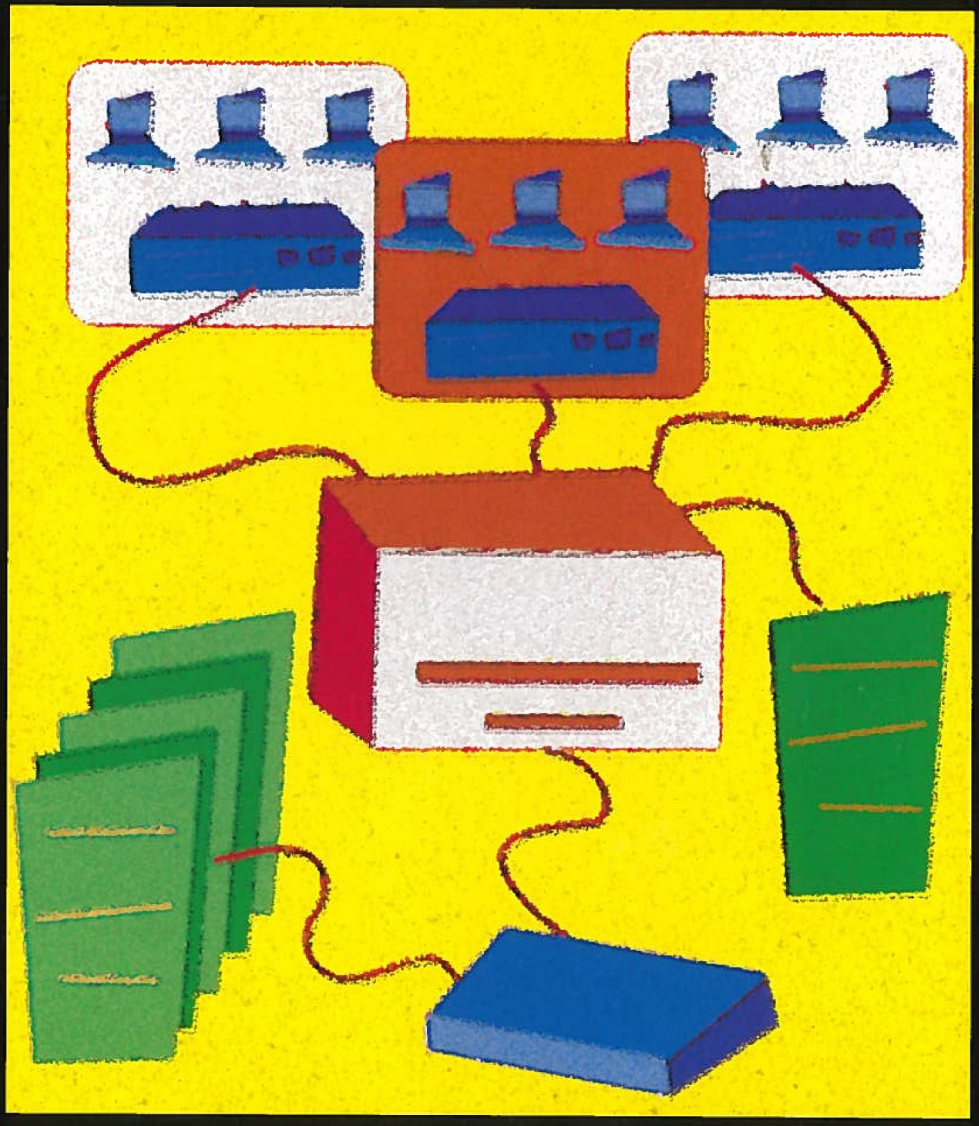
TECHNOLOGY AND APPLICATIONS FOR HIGH-SPEED LANS

GIGABIT ETHERNET



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GIGABIT ETHERNET
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Gigabit Ethernet

Technology and Applications for High-Speed LANs

Rich Seifert

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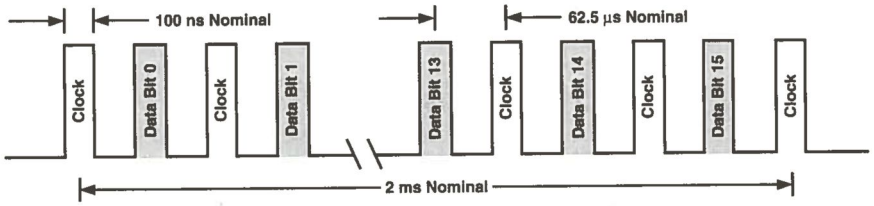

Figure 8–3 Auto-Negotiation signaling.

The entire message is repeated, nominally at 16-ms intervals, until the negotiation is complete.

8.2.4.3 Automatic Configuration without Auto-Negotiation

A device can easily detect whether the signals it is receiving were generated using 10BASE-T, 100BASE-TX, or 100BASE-T4. In the case of 10BASE-T, every device emits characteristic "link pulses" every 16 ms when the link is idle; this constitutes an unmistakable signature.[11] In the case of 100BASE-TX and 100BASE-T4, the signal levels, timing, and encoding used are sufficiently different that determination of the link's nature can be made without the use of Auto-Negotiation. This is often called "parallel detection."

Thus it is possible to automatically configure to any of these three signaling methods without implementing the negotiation protocol. Doing this is fairly common, and it slightly lowers the cost of a product.

However, a great deal of flexibility is lost by not using Auto-Negotiation:

- It is not possible to implement automatic dual-speed capability (for example, 10 Mb/s and 100 Mb/s).
- It is not possible to determine duplex mode.
- It is not possible to determine flow control capability.

The default assumption if Auto-Negotiation is not employed is that the link is operating in half-duplex mode, without explicit flow control. Thus devices not implementing Auto-Negotiation are generally those with only a single mode of operation, for example, a 100BASE-TX (only) repeater hub or a 10BASE-T (half-duplex-only) controller, where there is nothing to be gained by implementing Auto-Negotiation.

11. Also called "link beat," these pulses are used to ensure that the link is physically connected. It is the detection of this pulse that usually enables a "Link LED" on a 10BASE-T controller or hub port.

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