Tech Info Library

Fiber Distributed Data Interface (FDDI): Description (9/94)

Revised: 9/8/94
Security: Everyone

Fiber Distributed Data Interface (FDDI): Description (9/94)

==========

Article Created: 21 June 1990
Article Reviewed/Updated: 8 September 1994

TOPIC ----------

What exactly is FDDI?

DISCUSSION ----------

FDDI stands for Fiber Distributed Data Interface and is an American National Standards Institute (ANSI) standard. Their fiber optic LAN standard is for a token-passing, counter-rotating ring that sends data at 100MB per second.

The ANSI X3T.9 committee took IEEE 802.5's token-ring standard and optimized it for fiber. The services provided on an FDDI network are a superset of the services that 802.5 provides; in general, any software that runs over 802.5 should run over FDDI, only faster. This speed is at least six times greater than the three IEEE 802 LAN standards. Even though 802.3 (Ethernet), 802.4 (token bus and MAP), and 802.5 (token ring) all can be implemented with fiber, they do not take advantage of fiber's capacity.

A FDDI network counter-rotating ring means you have two fiber cables instead of one. Normally only one cable will carry data; the second is used when a cable fault occurs to the first. A station is either single attached (connected to a concentrator which is connected to the ring) or dual attached (connected to both fiber cables directly onto the ring). When two neighboring dual attached stations detect a fault, they bring up the secondary data path. Hence the need for every dual attachment device to have management capabilities built in. Dual attached concentrators are used to interface single attached nodes to the ring. Concentrators will have multiple ports to accommodate multiple single attached devices. Concentrators may also be single attached, but will always be on a link that is eventually connected to a dual attached concentrator attached to the ring. With concentrators, you can build a physical star topology offshoot to the ring network.

The maximum circumference of an FDDI network is 100 kilometers (or 200

kilometers if you count both rings), and supports up to 500 stations (1,000 physical connections to both rings). The maximum distance between two active nodes cannot exceed 2 kilometers, so unless all nodes are active all of the time, the FDDI network will probably be less than the 100-kilometer maximum.

Though the recommended transfer rate is 100MB per second, you could send data on both rings simultaneously for a 200MB transfer rate. Although the data rates on the FDDI ring remain constant when loaded, a station's access time to the network may decrease depending upon the station's priority. Sustained data transfer rates for a 100MB implementation is approximately 80MB per second, due to overhead bits, token passing times, and so on.

FDDI is implemented at the Data Link and Physical layers of the Open Systems Inconnection (OSI) seven-layer model. The basic fiber-optic link consists of an optical transmitter, optical receiver, fiber-optic cable, and optical connection.

The next generation of fiber-based high-speed LANs is already being looked into by the ANSI X3T9.5 committee. One that is upwardly compatible with FDDI, that adds voice and video capability, is FDDI-2. FDDI-2 specifies a time-division multiplex approach to divide the available network bandwidth between voice and data.

Article Change History:
8 Sep 1994 - Reviewed for Accuracy.

Support Information Services

Copyright 1990-94, Apple Computer, Inc.

Tech Info Library Article Number:5825