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.

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Keywords: <None>

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19960215 11:05:19.00

Tech Info Library Article Number: 5825