



CNDS Research 01

Issued: Monday, 14 October 2002
Mode of study: Independent learning
Skills: Research and design skills

Background

In Unit 2 differing network topologies were outlined. With a ring network, it can be seen that there is a much greater scope for sharing on the network, as opposed to a bus network on which nodes contend to get access to the network. The disadvantages of a traditional token ring, however, often overrule their advantages. These disadvantages have now been overcome with networks such as FDDI (Fibre Distributed Data Interchange). This research sheet focuses on the techniques that FDDI has used to overcome the problems in token ring networks.

Research 1

1. Outline the disadvantages of a traditional Token Ring-based networks:


2. Which techniques does FDDI use to overcome the problems of a Token Ring network:

3. How does FDDI use timed-tokens, and how might these be used to allow priority on the ring. Why might this type of network be used in a real-time industrial control network?


4. The EaStMAN network which spans Edinburgh was initially installed with an FDDI network. Outline the **geographical** layout of the network, and the length of the cables used to connect the institutions involved. Which is the longest cable run?



5. For the EaStMAN FDDI network, estimate the amount of time that a light pulse will take to travel completely around the ring. Assume that the light pulse travel at one-third the speed of light (1×10^8 m/s).



6. A data frame on an FDDI network can be between 22 and 4500 bytes long. For a base rate FDDI network, determine the amount of time for the minimum and maximum data frame length.



7. What is a Multiple Access Unit (MAU) on a ring network? What problem does a MAU overcome? Design a network which uses four MAUs to connect between four remote networks. There are six nodes to connect at each site.

