DNADV.WS4 (= DR-Net ADVertisement)

- "DR-Net -- Getting nets to work"
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(Retyped by Emmanuel ROCHE.)

As personal computers enter into widespread use within companies, the requirement for these computers to be able to communicate with each other is increasing rapidly.

Providing shared access to data bases, business operations data, decision support data, and to higher cost peripherals makes sense. Networking is a key element for a company to be able to realise the full potential of its investment in microcomputers.

According to a Future Computing Inc. report (December, 1983), the world-wide personal computer market is projected to grow at about 35% per year through 1988. The same report states that personal computers in Local Area Networks (LANs) are projected to grow at nearly 100% per year, and that this segment is expected to be a $6 Billions world-wide market by 1988.

Personal computer LAN standards are evolving now. The standards are expected to accommodate several types of data link protocol and physical media, affording the user a choice in network design to suit requirements. For example, these requirements may relate to size of network, speed of communication, and cost. The question facing many manufacturers of microcomputers is not whether, but in which direction, to proceed.

Important requirements for microcomputer networks are emerging, including:

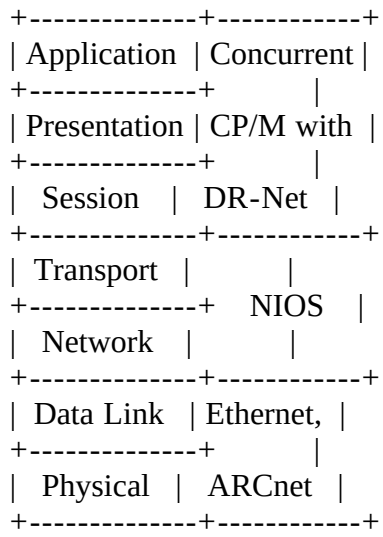
- Hardware independence -- at the microcomputer and network levels
- Flexible multiple server networks
- Resource sharing
- Distributed data processing
- Security
- Applications transparency

A problem faced by many office administrators and DP managers is the interconnection of computers from different vendors, with both 8- and 16-bit processors. In order to make them communicate, they need compatible network software, compatible network hardware, and compatible operating systems. Digital Research offers a solution with a new product called DR-Net, the Digital Research networking software previously referred to as DR-Softnet, has now completed its test phase, and is ready for release.

The purpose of DR-Net is to overcome the problem of connecting different types of computer, including those with different processors, and to do it in a manner which is independent of the physical network being used. The goals guiding this design philosophy are portability, network transparency, applications transparency, and operating system independence. DR-Net is

available today for both 8- and 16-bit Digital Research operating systems, and will migrate to the next generation of Digital Research operating systems on new processors (Motorola M68000, and Zilog Z8000). The 8-bit software is the established CP/NET, and the same basic message format from CP/NET Version 1.2 has been maintained for DR-Net, in order to maintain compatibility. There is also a function call for supporting non-standard messages on the network, to facilitate interfacing to non-Digital Research operating environments.

One way to understand how DR-Net relates to network products like Ethernet or ARCnet is in terms of the International Standards Organisation Open Systems Interconnect reference model (ISO OSI). DR-Net provides the Session and Transport level services, while Ethernet and ARCnet provide the Data Link and Physical levels.



Hardware independence

One of the most significant features of DR-Net is that it can be customised for any of the popular network protocols, just as CP/M can be customised for different microcomputers and processors. The NDOS (or Network Disc Operating System) is analogous to the BDOS of CP/M in that it is the portion of DR-Net that is proprietary and invariant. The NIOS (or Network Input/Output System) is written by the systems implementer for the target network. The systems implementer can then choose the most suitable network protocol, such as Ethernet or ARCnet, or switch to other technologies if they become popular. Additionally, gateways can be developed between different networks. This means that one computer can be a connection between two networks.

Flexible multiple-server networks

DR-Net defines two different types of network node. Requesters are workstations running applications that need to access resources on the network, such as files or printers. All transactions on the network are initiated by Requesters. Servers, on the other hand, are those nodes that respond to requests by reading or writing to files, outputting to printers, or

providing other operating system functions remotely. In order to have a network, there must be at least one Server. However, DR-Net allows multiple Servers on the same network.

Because it is hardware independent, a network can take any shape, depending on the network hardware that is being used. 8- and 16-bit systems can be on the same network, and up to 255 nodes are supported. For 8-bit Servers, under MP/M II, 16 Requesters can be logged in at the same time. For 16-bit Servers, under Concurrent CP/M, up to 64 Requesters processes can be logged in. One Concurrent CP/M station can act as multiple Requesters because of multiple processes being active at the same time. A major benefit to the user is that Concurrent CP/M can act as both a Server and a Requester, and can do so simultaneously due to its multi-tasking capability. This means that the Server operates as a background task, allowing the user to run applications locally or as Requesters on the network, while that same station is performing Server functions. There are two principal advantages to this. First, there is no requirement for a dedicated Server, which saves cost. Second, it is much easier to share information on the network, since all files do not have to be transferred to a central Server before they can be accessed by other Requesters on the network.

Resource sharing

DR-Net therefore provides major benefits in the area of resource sharing, effectively allowing the user to spread the cost of higher priced, high-performance peripherals over many users. The two most common peripherals to be shared are high-capacity disc drives and letter-quality printers.

Comprehensive support for disc drive sharing and file sharing is provided, and DR-Net takes full advantage of the file and record locking features of Concurrent CP/M. File and record locking is essential for data base applications such as accounting or maintenance of personnel records. Without it, data bases could become corrupted as users update files while others are reading them.

Using the print spooler in DR-Net, anyone on the network can send listing output to a printer on the network, and it will automatically be printed as soon as that printer becomes available. A true print spooler/despooler is provided as part of the package. This is different from printing in that, once the file is spooled, the user may continue to use the application and the console. The print job will, in the meantime, be sent to the print server for an available printer.

Distributed data processing

In addition to conventional resource sharing, DR-Net affords network support for inter-node process communication. Queues can be mapped across the network, allowing for inter-process communication and synchronisation. This feature provides the possibility for distributed data processing. For example, an order processing application running at one node could be programmed to

directly input information, using the queues facility, to a shipping and inventory control application running at another node. DR-Net also extends the functionality of CP/M-86 Requesters to allow most Concurrent CP/M applications to run under CP/M-86, if they are to run across the network (i.e., the program is loaded from a remote disc, and data is accessed remotely). This includes supporting file and record locking and queues on CP/M-86 Requesters.

Security

In any network system, security of information is a prime concern for all users. In DR-Net, security is provided at three levels. First, a password must be given when logging onto Servers. This prevents unauthorised users from accessing the network or certain Servers. Second, drives on Servers may be made private. Third, Concurrent CP/M provides for passwords for individual files. This allows sensitive files to be protected, even though other files on the disc may be accessible.

Applications tranparency

Also of concern to network users and managers is the degree of transparency afforded by the system, and the level of compatibility provided for existing applications. The key to applications transparency is that the end-user does not need to interact with the network. This means that applications run in the same way, whether they are on the network or not. This has important benefits for end-users in terms of training time and preservation of their investment in applications software.

There is little doubt that the ease with which an end-user may network personal computers will soon be a major factor in the choice of machine. Digital Research is now able, with DR-Net, to provide the network support that will enable manufacturers of microcomputers to meet the users' needs.

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