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Encyclopaedic Dictionary of Information Technology and Systems

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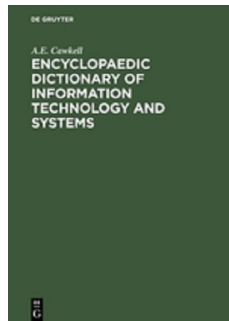
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Pacific and PTAT Atlantic cables, to offer a 64 Kbps ISDN-like service, aimed at multinationals. One stop billing and integration with private networks will be included, and users will appear to be using their own international network.

Many businesses already have extensive private networks. The requirement of a Virtual Private Network (VPN) is to get at least the facilities currently obtained by using leased lines but at a lower cost. A VPN includes dynamic bandwidth allocation purchased on a ''pay as you use'' basis as an alternative to paying for dedicated lines which are only occasionally used at full capacity.

NETWORKS – WIDE AREA (WANs)
A *WAN* is any network covering a wide area – for instance a private leased line network.

In the commonest type of telecommunication network – such as the telephone network – any station is connected to any other by a *switch*. A network does not have to be switched. Large organizations may own a network of leased lines to carry heavy traffic between sites, for instance carrying LAN-originated traffic.

Two examples of WANs are shown on the next two pages. The first shows the British Library Network, reproduced here with their permission, as it is now before consolidation within their new centre. It consists of a number of LANs in London and Yorkshire, each with numerous PCs connected to it, with the LANs interconnected with bridges and 64Kbps private lines.

The second Figure, by courtesy of Spider Systems, illustrates the use of Spider equipment for interconnecting several types of network.

NEURAL NETWORKS
See COMPUTERS – NEURAL NETWORKS.

NLM
National Library of Medicine.

NLQ
Near Letter Quality.

NMOS
n-type Metal Oxide Semiconductor.

NNI
Network Node Interface. See under SONET.

NODE
A computer or switching device situated at connection points on a communication network to monitor, switch, or attach communication channels.

NOISE
Unwanted signal. Interference caused by random electron motion, or by the intrusion of signals from external electrical equipment.

Electrical noise is manifested as a hiss in audio equipment. It produces errors in data transmission where noise signals may be mistaken for data signals. Electrical noise is of four kinds – thermal noise, flicker noise, shot noise and popcorn noise. Thermal noise is generated by the random motion of electrons in resistors; flicker noise is associated with emission from a hot surface such as a heated cathode; shot noise is generated by charges moving within semiconductors, and popcorn noise is a popping noise which is probably due to impurities within semiconductors.

Noise value is usually expressed as the sum of the RMS values of the different noise sources in volts. Much noise is of the ''white noise'' type which means that it is generated over the entire frequency range of the equipment; accordingly the wider the bandwidth the greater the noise level.

''Thermal'', ''Gaussian'', or ''White'' noise is a fundamental property of all electrical circuits. This type of noise manifests itself in audio-frequency circuits as a steady background hiss which may be almost inaudible, but often becomes obvious on long distance circuits. The noise voltages generated are normally small compared with ''signal'' voltages – that is those conveying information – and do not cause trouble.

The telephone network is a complex of cables, switching devices and other equipment some old, some new. Bad contacts at switching points cause noise, so do the impulses caused by dialling which can break through by inductive coupling from one line to another.

Non-telephone electrical equipment and electrical storms can also cause impulsive noise. It is this kind of noise, heard as clicks and crashes which may go on intermittently

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