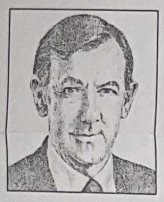
APPLIED INTELLIGENCE

ISDN Boosts Lower Level Net Communications



JAMES MARTIN

This is the fourth of a six-part series on Integrated Services Digital Network, or ISDN, a communication technology that will have great strategic importance in the future.

How ISDN services develop will depend on individual countries and network operators. The main users will be corporations trying to rationalize much of their existing wide-area telecommunications facilities. With ISDN, corporations can make a general, integrated voice and data network available to all users.

It would be wrong to assume that ISDN can fulfill all of a corporation's communications requirements. The highest-capacity ISDN channel, the Primary Rate Access, operates at either 1.544M bps or 2.084M bps, significantly slower than LANs currently in operation. Also, Primary Rate Access is not generally available for communication between individual users. Some potential drawbacks of ISDN are dealt with later in this column.

ISDN Benefits

There are many areas, however, where ISDN services can bring major benefits. The progressive deployment of ISDN across Europe, North America and Asia will encourage the expansion of wide-area, integrated voice and data communications. By providing two 64K-bps (144K) clear information channels and a separate 16K-bps channel for signaling, ISDN makes a wide range of features and services available to the whole community of telephone users.

A major advantage of ISDN to the subscriber, the ability to integrate voice and data over the two 64K-bps channels, is that while a user accesses one of the 64K-bps channels for a telephone conversation, the other 64K-bps channel can be used to either send or receive data. With common-channel signaling, telephone users will have displayed on their handsets the names or numbers of incoming calls.

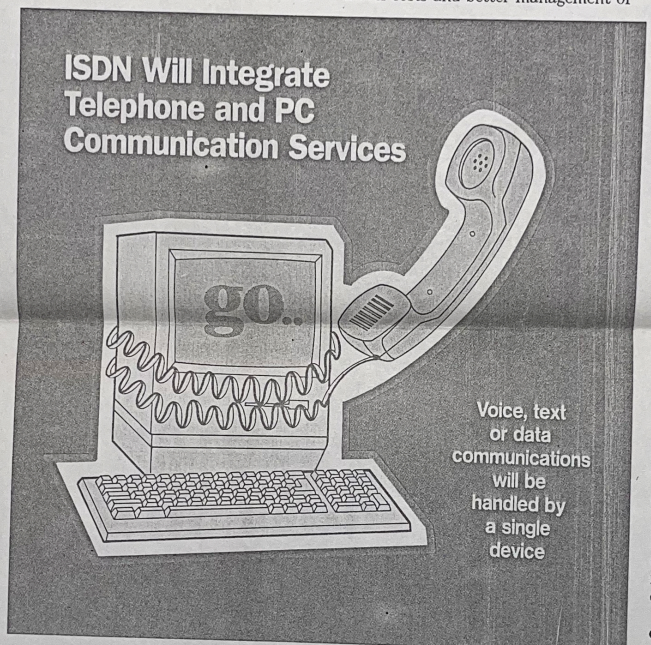
If the line is busy, the called party's telephone will display the name and/or number of the person trying to call, providing the option of taking the incoming call or maintaining the existing one.

The caller will also be able to send a short text message to be displayed on the receiving telephone, an advantage if you're on the telephone and someone else is trying to call you. If you're out and someone wants to leave you a text message, this would be filed in an electronic mailbox that can be accessed when you get back. If the caller would rather leave a spoken message, the ISDN central switching office can store incoming voice messages in digital form and play them back when requested.

One advantage of both digital networks and ISDN is that they allow the functions of the telephone and the PC to be integrated.

The illustration shows an example of an ISDN integrated workstation. The PC can contain a database of telephone numbers that can be dialed from the computer's keyboard. The telephone electronics can be built into the computer so that all the user needs is a simple handset attached to the PC's keyboard. A speaker built into the computer can provide speech functions and hands-free dialing.

For the first time, mixed voice, text or data communications can be handled by a single terminal device. Along with a telephone call, a user can send information on the screen or exchange data with a central computer—all via one line and one communication number.



Maryellen Zawatski

The main ISDN users will be companies trying to rationalize existing wide-area telecommunications facilities. ISDN makes an integrated voice/data network available to all users.

Data-Communications Features

ISDN will provide a number of basic data-communications applications that should be available to all users, including electronic mail and compatibility with other communications devices such as telex and facsimile transfer.

What is clear from these features and the many others is that, to be performed properly, these applications require access to networks of varying bandwidths.

The 64K-bps restriction that current ISDN standards place on user bandwidth is not sufficient for applications such as large file-transfer, graphics, micro-to-mainframe links and so on. For these types of applications, the integrated workstation must have access to a high-speed local area network, either through a direct connection or via the PBX.

However, applications such as electronic mail can be handled adequately at lower bandwidths; that is, at 64K bps or less.

Though costly in terms of circuit and equipment charges, videoconferencing has obvious benefits, such as reduced travel costs and better management of geographically dispersed plants and offices. Better methods of video-signal compression have reduced the bandwidths necessary for full-motion, color videoconferencing to speeds in the region of 384K bps (corresponding to the capacity of the proposed ISDN H0 channel).

Desktop videoconferencing and videophone systems that operate at 64K bps are available. While they don't provide the same quality of image as a system operating at speeds between 384K bps and 1.544M bps, this is a major step in providing video communications to all workstation users.

During the early 1990s, the next generation of PC/integrated workstations will provide video communication as a standard application.

As ISDN networks continue to emerge in both the public and private sectors, the impetus to develop integrated voice and data workstations will increase. As ISDN and Open Systems Interconnection (OSI) standards mature, standard communications applications most probably will be built into all PCs.

Low-cost ISDN chip sets and an increasing emphasis on OSI application standards will mean that integrated voice and data will become the norm for the 1990s.

ISDN Shortcomings

ISDN is not the solution for all computer-to-computer communications. Perhaps the most obvious shortcoming of ISDN is its limited available bandwidth.

For communicating in and around the office, the 144K-bps Basic Rate Access is significantly slower than most existing local area networks (which operate at about 10M bps). For applications such as file transfer, computer-aided design and host-to-host communications, 144K bps isn't fast enough. Very large databases are common in many of today's corporations, and the volume of information being stored electronically is increasing all the time.

Local area networks (LANs) are the dominant data-communications medium in most large corporations. With the introduction of fiber optics into LANs, a standard transmission rate of 100M bps is readily achievable, either for workstation-to-workstation communications or as a high-speed link interconnecting two or more networks.

Given these shortcomings, is ISDN "too little, too late?" For many large corporations with applications that require high-speed local and wide-area data communications, ISDN in its current format is not enough. However, not all users have such requirements.

ISDN should be viewed as a means of enhancing the lower levels of a communications network architecture, providing improved integrated voice and data communications, better access to public digital networks, and new network services.

One of the great strengths of ISDN is the availability of standards. Standard ISDN interfaces can be built into any terminal or PC at low cost, and these interfaces will eventually be compatible throughout the world.

Next week, we'll look at the worldwide development of ISDN, focusing on the different approaches to ISDN that have been implemented in Japan, Europe and North America. ■

The James Martin Productivity Series, an information service updated quarterly, is available through High Productivity Software Inc., of Marblehead, Mass. (800) 242-1240. For information on seminars, please contact (in the United States and Canada) Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402 (213) 394-8305. In Europe, contact Savant, 2 New St., Carnforth, Lancs., LA5 9BX United Kingdom (0524) 734 505.