5 ISDN: Better Access to Better Data

Back in the dark ages of computing – perhaps ten or even twelve years ago – modems and analog telecommunications came into popularity. They were intended primarily for the transmission of words and numbers. Yet in today's increasingly complex world of information, words and numbers are just the beginning.

The typical database of the '90s contains a growing array of still and moving images – from high-resolution photographs and graphics, to full-color video segments, sound samplings and even complete orchestral sequences.

And in the face of this emerging data, modems and analog transmissions have faltered badly. For while it is technically possible to send and receive images, graphics, video, sound and other digitized files at modem speeds, few users have the time or patience to make it practical. Conventional bandwidths and modems not only constrict the amount of information that can be accessed, but limit the range and availability of database information itself.

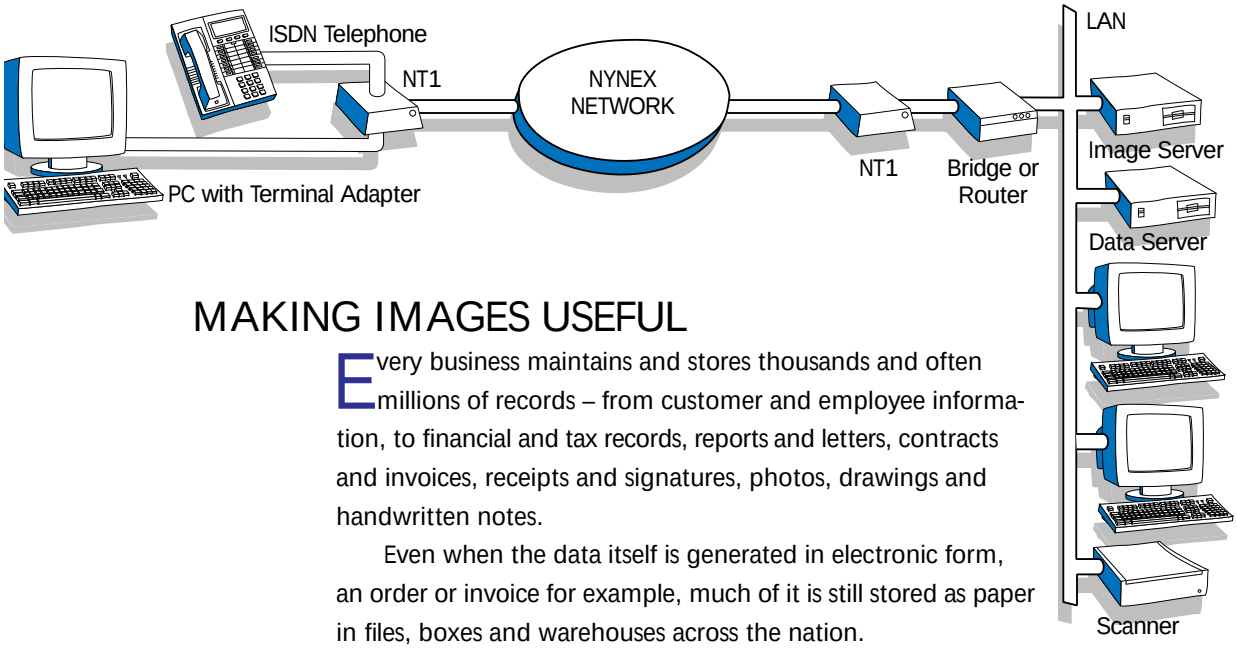
Enter ISDN

With its digital speed and throughput, ISDN has already begun to increase the power and reach of today's databases. Because it is now economical to search through even the largest files of complex, digitally stored images – from diagrams and drawings on a specialized database, to the worldwide warehouse of facts and images on the Internet.

ISDN offers digital access without the need for costly dedicated lines, yet at speeds that outstrip modems by factors of almost *ten-to-one* without compression, and as much as fifty, sixty or *seventy-to-one* with today's still-emerging compression algorithms.

To a student chatting on *Compuserve*, this increase in speed may be all but unnoticeable. After all, one can only type so fast.

Yet to an engineer or physicist searching for specialized images on a remote database, it might mean hours or even days saved – or may, in fact, be the difference in conducting the search at all.



An image retrieval system. *ISDN offers access to images or information at 128Kbps before compression.*

MAKING IMAGES USEFUL

Every business maintains and stores thousands and often millions of records – from customer and employee information, to financial and tax records, reports and letters, contracts and invoices, receipts and signatures, photos, drawings and handwritten notes.

Even when the data itself is generated in electronic form, an order or invoice for example, much of it is still stored as paper in files, boxes and warehouses across the nation.

ISDN offers an alternative. It lets corporations and government agencies store, access and use these mountains of information. It lets them convert images – photos, forms, signatures, fingerprints and more – into digital form, and store, reference and access them just like any other data in a computer.

What's more, the digital speeds of ISDN mean that instead of sending millions of paper copies and faxes from place to place, virtually any office, anywhere, can have fast, efficient access to the *original* – simply by dialing the computer where the information is stored:

- One *manufacturer,* for example, has scanned product documentation from the past 15 years into an image database. Service representatives at headquarters or in the field now have instant access to data and drawings to help with troubleshooting and repair.
- A *magazine publisher* has put scanned advertiser claim forms on-line. With immediate access to the data, customer service agents have reduced settlement times from 70 days to under 30 days.
- A *major bank* now scans forms, reports, signatures and other visual data used every day. Its studies show that imaging not only improves a document's usefulness, but reduces the number of times it is physically handled from 14 to four.
- In Europe, both *Apple*, for computer retailers in France, and *Philips*, for repairers of its CD units, electronically "publish" manuals and other tech-

"The light at the end of the tunnel for analog modem vendors is not *V.fast* but a train wreck," writes Jay Batson of *Forrester Research, Inc.*, a Cambridge, MA, market research firm, "unless their plans include a migration path to ISDN."

"Modem speeds have definitely peaked," adds John Mazalewski of *TeleSystems Marketing Applications*, an ISDN systems integrator. He notes that modem industry projections of 64Kbps and up have proved difficult to achieve in real life. "Basically, modems are forcing increasingly compressed files through what are still 4.5 kilohertz analog lines."

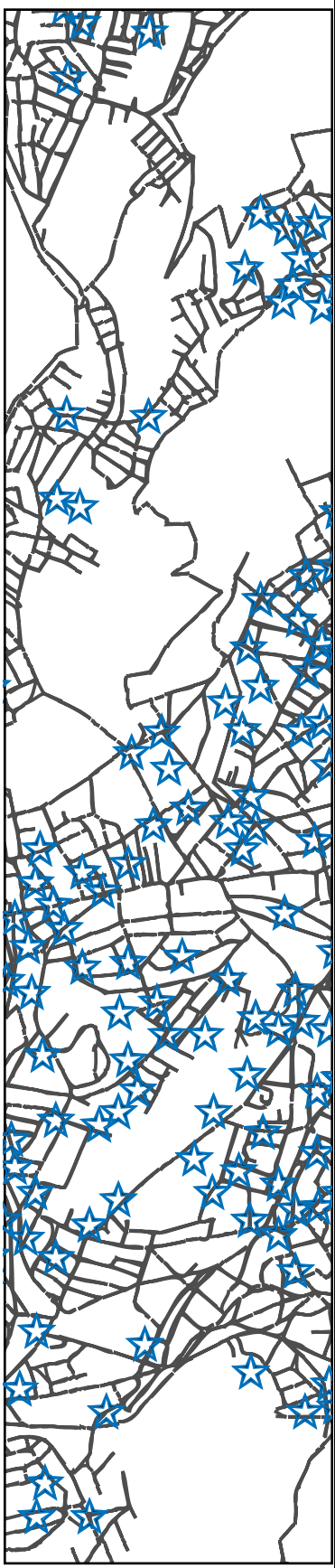
In contrast, he adds, digital compression is just emerging. While 2:1 and 4:1 ratios are common today, many manufacturers are now implementing solid 8:1 algorithms – the equivalent of 1,024Kbps or more than a "meg a second" – through a single bonded BRI.

nical documents. Text, diagrams and illustrations can all be accessed through ISDN-linked desktop systems. Customers use only the most recent updates, while manufacturers significantly reduce the cost of maintaining and upgrading huge volumes of paper.

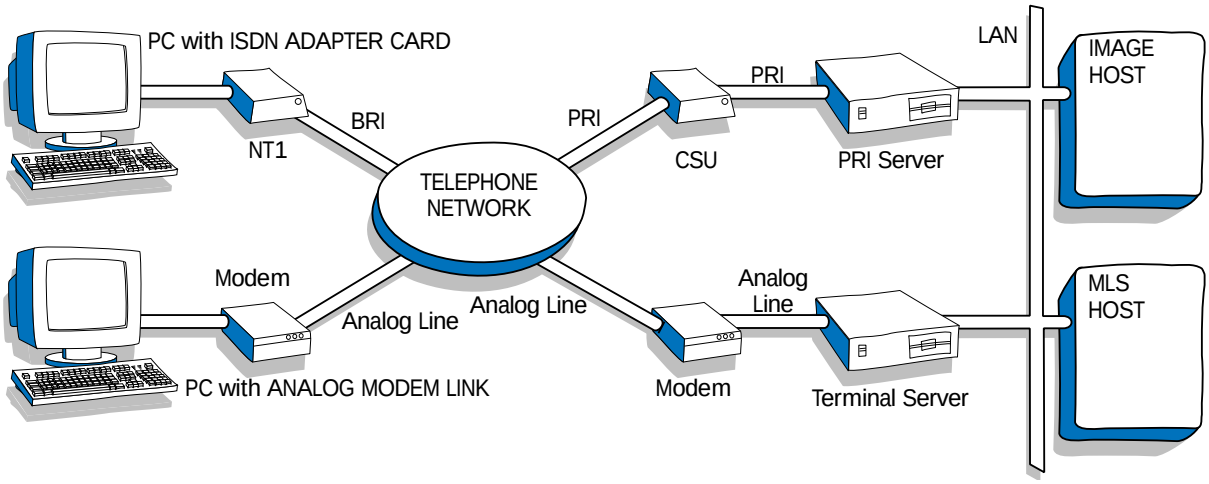
Coping with Government Records

Across the nation, city, county and state governments have begun to scan and electronically store the millions of documents they process each year, including birth certificates, licenses, permits of all types, property records and more. Not only is access dramatically improved, but costs and space requirements are greatly reduced. Some typical examples are:

- *Middlesex County, MA,* where land records including mortgages, deeds, titles, liens, property holders, property maps and more – some dating back to 1620 – have been systematically scanned and put in a modern data/image server. The electronic files are not only less expensive to maintain but dramatically reduce storage and handling requirements. The county processes some 200,000 new transactions a year.
- *Quincy, MA,* where both the tax assessor's office and planning board currently retrieve computerized town maps from the public works department three miles away. "We're just beginning," says Dominic Venturelli, the city's principal programmer. "Our goal is to link all city buildings and LANs with ISDN, and make the wealth of the information at each location available to everyone who needs it."
- An upstate New York *metropolitan police force* is using an ISDN-based imaging system to handle the thousands of motor vehicle accident reports processed each year. With an annual load of some 16,000 multipage documents, department heads note that electronic reports are not only easier to prepare, but easier to find, access and read.
- Other *police departments* throughout the nation have installed data imaging systems to handle everything from fingerprints and mug shots to daily assignment schedules and handwritten records. Images can be accessed from virtually any location, at any time of the day or night.



Making street maps more useful. *In Quincy, MA, typical demographic street maps (at right) are being made available through ISDN for many uses: from land use and road improvement to zoning, crime statistics and more.*



California's RealtyLink

California's RealtyLink. *The first ISDN-based Multiple Listing Service offers high-speed access to full-color photographs, drawings, floor plans, area maps and other images of homes for sale. Analog links also offer data-only access to the MLS.*

RealtyLink is the nation's first multiple listing service (MLS) designed specifically to use the speeds of ISDN. Developed jointly by the *San Fernando Valley Association of Realtors* and *Pacific Bell,* the system stores and makes available color photographs, renderings, floor plans, property maps and other documents that can be used by realtors to interest prospective buyers in an available home.

According to Mary Lou Williams, executive director of the association, full-screen color images are retrieved from the system and drawn on a broker's PC monitor in seconds. Plans include full-color video tours of an area or major property, to be called up at a broker's command.

The system can also access a growing number of mortgage and land records, title and lender guarantees and the like – all designed for use at a property's closing. These documents are scanned as needed throughout California, and made a permanent part of a statewide thrust to virtually eliminate the physical transfer of paper within five years.

SURFING THE INTERNET

ISDN speed makes "surfing the Internet" a fast-moving and exciting adventure. Which means that this graphically intensive worldwide information highway becomes just that – *graphic*. User interfaces such as *Mosaic, Netscape* and others come alive – with full-color visuals, previews and other images replacing unrelenting pages of underlined type.

The Internet, of course, offers an almost unbelievable array of information, from recipes for chocolate cookies and around-the-clock discussions of current soap operas, to worldwide e-mail, international research data, and earnest disputations on the swirled tracks of a top quark.

Yet the Internet is also the most visually intensive system in the world – with photographs of almost every conceivable kind, art from museums and collections around the world, scientific and engineering images from virtually every discipline, global video discussions, and more. They are all on-line, available to the persistent researcher.

It is speed, too, that makes this incredible size and complexity less daunting, more accessible, more useful.

Getting on the Information Highway

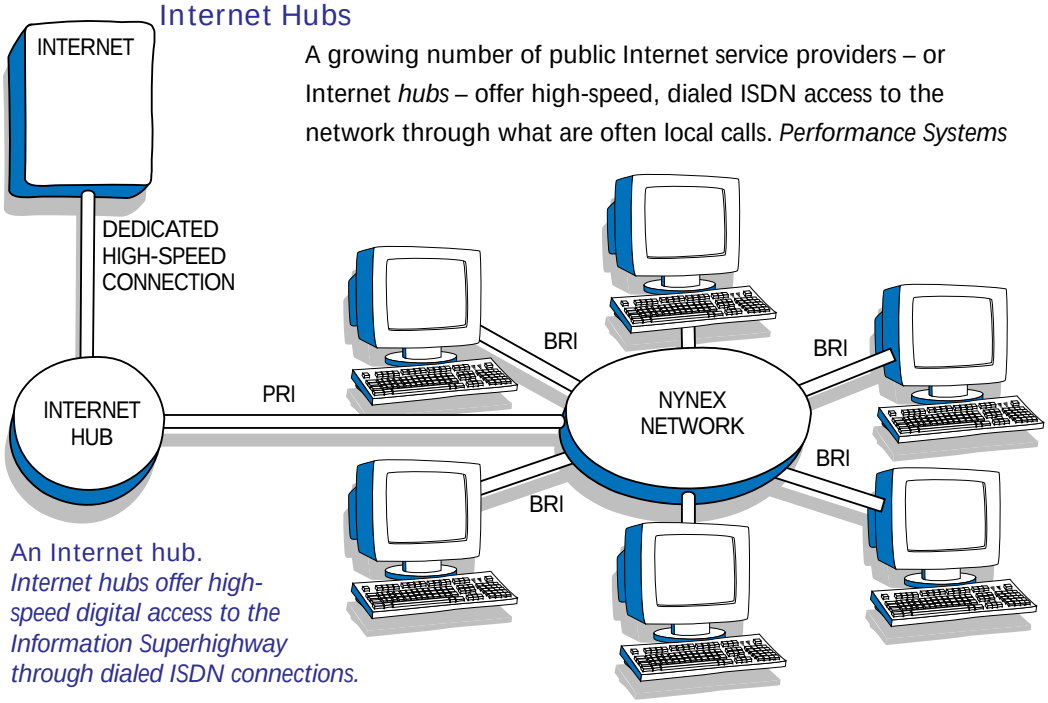
While thousands of business, government, research and educational organizations today reach the Internet through dedicated high-speed lines, many more use standard telephone lines. In fact, as many as twenty to thirty million users currently link their PCs and workstations to the Internet through the limited speeds of analog modems, with dialed connections to the "hubs" of service providers or the "e-mail gateways" of *Compuserve, GEnie, America On-Line, Prodigy* and other information services.

Yet the slow speeds of modems actually undo much of the Internet's graphic power. *Mosaic,* for example, "the most elegant, powerful, intuitive and beautiful knowledge tool ever created" – as well as *Netscape*, *Hot Java* and other key browsers – can often appear not as a fast-paced flow of images from around the world, but as a seemingly endless wait for endlessly evolving screens.

ISDN changes this, and lets this most graphic of databases come to life for millions of potential users.

Internet Hubs

A growing number of public Internet service providers – or Internet *hubs* – offer high-speed, dialed ISDN access to the network through what are often local calls. *Performance Systems*



An Internet hub.
Internet hubs offer high-speed digital access to the Information Superhighway through dialed ISDN connections.

International, for example, offers ISDN-to-Internet nodes throughout the country, including metropolitan areas such as Albany, Boston, Islip, New York City, Portland, Rochester, and White Plains.

Other typical hubs are *Digital Telemedia, Inc.* and the *Internet Channel Corporation*, both in Manhattan. "One major reason to use a hub is cost," says DTI's Karl Kister. "Many companies don't need to camp on the Internet. Rather they just want access when they need something."

"A dedicated line could cost $1,200-1,500 a month," adds Internet Channel president Hal Eisenstein, "while the same high-speeds through ISDN, with reasonable usage, could save as much as a thousand dollars a month." The Internet Channel's Ascend Pipeline equipment offers speeds of up to 512Kbps.

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In the Boston area, both *The Internet Access Company* and *Terranet* offer dialed Internet access through ISDN Intellipath™ switches. Lines to remote users can be "foreign exchanged," and while line costs increase, the Intellipath connections offer unlimited usage at no additional charge.