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Summer 1993

## InfoTech Update, Volume 2, Number 4, Summer 1993

American Institute of Certified Public Accountants. Information Technology Section

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AICPA

# InfoTech

UPDATE

Practical Advice For Implementing Technology

## Day in the Life of a Consultant

*In This Issue:*

*(How Technology Has Affected Our Daily Activities)*

*By Dave Duray*

**Dave Duray is a partner with Price Waterhouse and a member of the AICPA Information Technology Executive Committee. In this article, Duray follows a fictional computer consultant on his daily routine, in order to depict how technology has the potential to affect most of our daily personal and professional activities.**

At home, as I was getting dressed and preparing for my first client appointment of the morning, I thought about how our children have benefited from our home computer. The preschoolers learned their numbers and alphabet using the Reader Rabbit software by the Learning Company and the Early Learning Series by SmartWorks. They also enjoy the graphics from Paintbrush, supplied with Microsoft Windows. The teenagers frequently utilize the word-processing and spreadsheet software that came bundled with our machine. Even though this software is not the type most widely used, I believe that it cannot hurt for them to be exposed to as many different vendor offerings of these commonly used applications as possible.

Before I left the house, I remembered that I needed to check my vari-

ous electronic mailboxes. I have a 9600-baud modem on our home system, and it is much faster than the 2400-baud modem that came with my laptop.

CompuServe was the first place I checked. It is a commercially available network service that, like Prodigy, allows for public access to a myriad of databases, bulletin boards, and network services. Dialing in is very straightforward and in most cities, CompuServe provides a local phone number for access. I checked the Executive News Service to see if any newsworthy event affecting any of my clients had transpired. The clipping service supplies articles based on the topics or company names that are provided. There was nothing of any consequence in the Executive News Service, but I had received mail in response to a question that I had sent to the Computer Consultant Forum. I had asked for information regarding warranty periods for custom software, knowing that the Forum can be a tremendous help in gaining feedback on subscriber experiences relating to a particular technology or subject.

Still signed on, I quickly jumped over to Easy Sabre, the American Airlines reservation system, and assigned my family's seats for our vacation to Disneyworld in two weeks. Using this system, I had earlier tracked down some very attractive airfares. Now that I am familiar with the system, it seems more efficient than calling the airlines directly.

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My next task was to dial my firm's in-house electronic mail to see if my secretary had received the letter that I forwarded and to find out if I had any urgent messages. Our firm has recently implemented Lotus Notes, an extremely comprehensive electronic mail and distributed database system. It is singularly responsible for improving communication and productivity within the organization. Today, I see that I have received a Lotus Note memo from my secretary. She has forwarded a copy of the final draft of a letter that I've asked her to review for spelling and formatting. After saving the letter on my hard drive, I loaded my laser printer with the firm's stationery and printed it. The ability to send a word processing, spreadsheet, ASCII, or executable program file is one of the strongest

*continued on page 2*

features of this system. Lotus has recently launched the Notes Group Pack, a system that is more suitable for smaller firms. It can be installed for as little as 10 users.

Still signed onto the system, I remembered that one of my clients asked that I fax him a copy of an engagement letter. Lotus Notes allows me to send a fax simply by typing the fax phone number in the name field of the memo. The network server will then automatically put on a fax cover sheet and complete the electronic fax. Any reported problems with connecting or transmitting will be immediately reported to my mailbox, or I can request a return receipt. (Prodigy and CompuServe also offer such a service.) I quickly imported the letter from my secretary's directory on our file server into the memo and sent the fax.

Finally, I signed onto a mailbox that one of my clients had established for me on their in-house electronic mail system. These communications keep me informed of the progress of one of their system implementations. I attend their project steering committee meetings—so they copy me on any correspondence, meeting notices, or status reports with respect to the project. This way, I can stay close to their progress without having to frequently visit or call. It is very cost-effective for them and keeps me closer to the project than would otherwise be possible.

I recently learned about a product called Navigator that will automatically dial and retrieve all of my electronic mail from all sources and present the mail—both incoming and outgoing—in a standard format. It would be a real timesaver for me.

I set off to my first appointment,

and, once in my car, dialed my voice mail from my car phone. Calls from a car phone are relatively expensive, but I cleared my voice mail the previous night so this call would be short, while at the same time keeping me up to the minute. Since there were no calls, I left voice mail for my secretary to let her know where I would be for the day and to add a few other instructions. Happily, I now have time to enjoy a quiet ride to collect my thoughts before meeting with my client.

Our consulting practice is focused on systems implementation. Typically, our engagements include assisting clients in the selection of appropriate technology and software, and then managing all aspects of its implementation. The applications are usually accounting oriented. As the lead partner for our firm in this area of practice, my primary role on an engagement is to ensure that we deliver quality work and that the client is satisfied.

Once with the client, I met with the project team and reviewed our progress. The two critical areas of review are 1) how are we doing against the budget? and 2) what are the major unresolved issues? We typically use ABT's Project Workbench to track our projects, even though Microsoft's Project and others are equally functional. These software packages present a very good summary of how well the project is running against budget. Most importantly, they also give us an estimate of how much time it will take to complete the project. The key to these systems and project management is to keep the number of activities at a relatively high level. A good rule of thumb is that a project should not have more than 20 activities associated with it. The project manager

seems on top of everything. Time to meet with the client.

The client meeting went well: All of our recommended issue resolutions were accepted. The client did ask if we could provide any information on the subject of expert systems. When I return to the office, I will use the Computer Select database that our firm subscribes to and inquire on this subject to find any relevant articles and books. This database is comprehensive, easy to use, and is quite affordable. It is distributed on a CD-ROM disk so there is no access or per-use charge. A similar service is also available on CompuServe, but premium on-line charges do apply.

I briefly stopped to check with the project team to remind them to submit their time and expense reports to our accounting department and to make certain that they reconcile their actual time charges to their actual activity in Project Workbench. A lack of integration between time/billing and project management systems is a difficult issue to resolve. Frequently, our client will specify which project management software it would like us to use, but we prefer to allow our consultants the freedom to choose the software with which they are most comfortable. Since most project management software packages include a data export facility, this is one way to achieve integration. The actual data reported is in the project management system—which is detailed at a task level. It can be extracted by consultants, summarized by day and project, reformatted, and submitted to the time/billing system.

I leave this client, satisfied that, so far, this has been a very productive day. **IT**

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The Friedlander Group  
Technical Editor

## Additional Resources

### Groupware:

Lotus Notes 3.0  
Lotus Development Corp.  
55 Cambridge Parkway  
Cambridge, MA 02142  
(800) 828-7086

BeyondMail for Windows 1.1  
Beyond, Inc.  
38 Sidney Street  
Cambridge, MA 02139  
(800) 845-8511

Futurus Team  
Futurus Corp.  
211 Perimeter Center Parkway #910  
Atlanta, GA 30346  
(800) 327-8296

### Remote-Control Software:

Norton pcAnywhere for Windows 1.0  
Symantec Corp.  
10201 Torre Avenue  
Cupertino, CA 95014  
(800) 453-1054

Remote LAN Node  
Digital Communications Associates, Inc.  
1000 Alderman Drive  
Alpharetta, GA 30202  
(800) 348-3221

GatorLink  
Cayman Systems  
26 Landsdowne Street  
Cambridge, MA 02139  
(617) 494-1999

### On-line Services:

CompuServe Information Service  
(800) 848-8990

General Electric Network for Information  
Exchange (GENie)  
(800) 638-9636

Prodigy  
(800) 776-3460

### Databases of Computer-Product Information

Computer Select  
Computer Library  
One Park Avenue  
New York, NY 10016  
(212) 503-4400

Datapro  
Datapro Research Group  
600 Delran Parkway  
P.O. Box 7001  
Delran, NJ 08075  
(800) DATAPRO

### Micro '93

On Monday evening June 14, 1993, the AICPA Information Technology Membership Section held its Second Annual Reception and Technology Demonstration. Many of the current members, as well as those interested in becoming members, attended. Brad Haigis of Trinzic Corporation demonstrated the Executive Information System (EIS) software product Forest & Trees. Forest & Trees enables decisionmakers at all levels to monitor important business activity and make timely, informed decisions based on the most accurate, up-to-date data available. Unfortunately, due to a late cancellation, Comshare's EIS product Commander was not available for demonstration. All attendees at the Exhibition received a complimentary copy of PC Novice—Premium Edition—"Getting Started with Personal Computers." Additional copies of this issue are available by calling Nancy Cohen at (212) 596-6010.

### New CPE Course Available

#### The Computerwise Executive—Selected Readings

Now available, this course is designed to educate executives on the information they need on computer trends and techniques for effective application in their businesses. The course consolidates key issues in easy-to-understand language and enables the reader to make computerwise decisions. It's based on a selection of publications and articles from magazines like *PC Novice*, *PC Today*, the *Journal of Accountancy*, *Management Accounting*, and *The CPA Journal*.

Course highlights include: local area networks, selecting software packages, presentation graphics, systems upgrades, telecommunication systems, multimedia, downsizing, executive information systems, and specialized applications. The course consists of article reprints and publications, and a study guide, including review questions and answers.

#### Subject Category:

Management Information Systems in Industry (Management)

#### Course Level:

Update

#### Recommended CPE Credit:

8 hours

#### Course Format:

Text (730465MT)

To order this self-study course, call toll-free: 1-800-862-4272. Please be prepared to give the product number and your membership number. CPE courses are also available through your state society. If you are a resident of Florida, Missouri, or New York, please order directly through your state society.

# Crowe Chizek: The Ultimate Automated Office

The following article has been reprinted with the permission of *Insight*, the magazine of the Illinois CPA Society. It describes the innovations in place at this high-tech CPA Firm.

Walk into Crowe Chizek's Oak Brook headquarters and it's a shock. Though 120 people work here, the quiet is almost unearthly, with few people in sight. It's the ultimate in office automation.

"We have no secretaries and very few administrative personnel; most of the professionals are out in the field," explains Michael Harnish, partner-in-charge of the firm's technical and operational resources. "We've given them the tools—the computerized systems—to reduce the tedious work, and sent them out to do what they're supposed to do—work with clients."

## Automation = Client Service

"Automation is an effort to reduce administrative and overhead costs, so professionals can concentrate on client activity," says Harnish, a Purdue University graduate in industrial management. "For every dollar the client pays us, we want the greatest percentage to pay for professional time—not clerical time.

"And we generate a very high chargeable percentage," Harnish notes, promptly pulling up chargeability ratios for everyone in the office on his Macintosh. In quick succession, he flips to his phone/address files, checks exposures on one client as of last night at 5 p.m., looks up a staff member's engagements, pulls up an inquiry in a short order—opening one file on top of another to save time.

He can punch up an invoice, check the time and expense detail on

any job, collect data from any or all of Crowe Chizek's offices (by employee, cost on the job, etc.), and can turn data into a graph, flow chart, or pie chart in seconds. He can design graphics for a presentation cover and even make transparencies.

"An automated system is a terrific client service tool," stresses Harnish. "Say a client calls with a question about an invoice. It would help if you had the invoice in front of you to refer to. With the computer, you can bring the invoice up in seconds and the client is still on the line."

"Clients like to think you're sitting there waiting for their call," says Harnish. "With an automated system, you can discuss their concerns the minute they call."

## They Said It Couldn't Be Done

No one thought Crowe Chizek could automate on such a large scale, relates Harnish, who also serves as partner-in-charge of the management services department. But in 1976, Crowe Chizek began to reduce administrative personnel as a firm-wide mission. With 650 employees throughout Crowe Chizek's eight Midwest offices, the firm now maintains a ratio of approximately 12 professionals to one administrative staffer.

The nerve center of the Crowe Chizek computer system is a light, airy room. No people work there, but the room is filled with IBM AS/400, DEC VAX, Unix, HP 3000, Novell and Apple Talk networks—all linked to the firm's seven other offices. The other offices have additional hardware on location.

Crowe Chizek's office automation operates on a backbone of DEC, while the other systems offer a variety of advantages to the firm's consulting

practice. "And everything has CUI (consistent user interface), which simply means you can run all the software the same way, without having to learn several different sets of commands," according to Harnish. "If a huge systems consulting job comes in, this approach lets us parcel the work out to various offices," Harnish notes, "and we also have the capability to scan hard copy and edit it."

To staff the systems consulting practice, Crowe Chizek prefers to hire off college campuses and do the training themselves; they have a large room devoted strictly to training sessions. "When we interview, we look for people with a dual major in business and systems skills," Harnish says, "or a systems person with some business courses. Systems takes priority."

Harnish has a bachelor of science degree in industrial management with a computer science technical option. Besides being a licensed CPA in Michigan, Indiana, and Illinois, he holds a certificate of data processing awarded by the Institute of Certification of Computer Professionals and is accredited by the EDP Auditors Foundation as a Certified Information Systems Auditor. He currently chairs the AICPA's Information Technology Executive Committee and membership section for the United States.

## Automation Starts with a Strategic Plan

For CPA firms thinking about automating, Harnish advises starting with a strategic plan. "Decide where you are going, set monetary guidelines of how much you can spend, then break it down into application features—rate the applications by priority and divide by the money you can spend. Then throw out those applications that exceed your budget," says Harnish, who wrote the AICPA's CPE course "Small Business Computers—Controls and Audits" and articles on artificial intelligence entering the business setting.

"You can compare systems by the

percentage of application features the package can supply, for the money you have to spend. And you'll come up with the degree of fit or functionality. It's a cost-utility rate," he concludes.

### Integrated Client Teams

In addition to automation, Crowe Chizek has taken an integrated-systems approach to its organizational structure, creating industry-specific teams to serve a client. "We still have separate practice groups, but we are approaching clients now on an industry-specific, MIS basis," Harnish says. "Professionals still are attached to tax, audit, or consulting but also to a specific industry such as banking. Now we have a team of tax, audit, and consulting people assigned to a specific industry client—that gives the client a much more useful service."

Crowe Chizek's Chicago consulting practice group also includes technical people, all of whom do systems maintenance and repair on their equipment. In the consulting area, Harnish's management services department has expanded, but kept its niche.

What exactly is that niche? Small to medium-sized firms. "The systems we deal with are generally mid-range on down, such as IBM AS/400, DEC VAX, HP 9000, Unix, Novell, and PCs," says Harnish. "I'm not sure we'd want to compete with firms like TSC and Andersen, although we are working with some larger clients like Henkel, a \$14 billion company in Dusseldorf, Metra in Helsinki, Eli Lilly in Indianapolis, and Motorola. "We are also doing stock conversions in the savings and loan industry."

*Editor's Note:* Is your organization technically innovative? Let us know, so we can tell others what your organization has done—be it in public accounting, industry, education, or government. Contact Nancy Cohen, editor, at (212) 596-6010.

IT

## Using Personal Information Managers to Develop Client Solutions

By Philip H. Friedlander, CPA

**Many of us have used personal information manager (PIM) software to manage our schedules and to-do lists. But the more powerful PIMs can also be used for application solutions. Philip H. Friedlander is an assistant director in the Information Technology Delivery Group of Ernst & Young and a member of the AICPA's Information Technology Executive Committee. In this article, he discusses an application that he developed using PIM software.**

A few years ago, I was approached by a client for advice regarding specialized automation. The client is one of the largest tropical fish producers in the United States. Many years before, I had automated their order processing, inventory, and financial systems on a Data General Mini-computer, and the client viewed this system as a competitive advantage.

The client now wanted a system to manage its pond production. It wanted to track historical data concerning which species responded well to which treatments and which other species. Up until that point in time the historical recordkeeping was done informally and mainly on an anecdotal basis. Unfortunately, the client's requirements were not well defined in that it could not say exactly what information would ultimately be important. It did know that it had to track over two hundred ponds on three different farm properties and wanted to be able to relate species, treatments,

medications, and procedures in some way.

It became apparent to me that initially building this system on the existing mini was not wise. Some vehicle was needed to prototype the system and model the requirements until needs solidified. The Lotus Agenda package proved to be a powerful PIM which could be used initially to model the system. My initial intention was to use Agenda as a prototyping tool. I intended, as soon as the client's requirements firmed up, to build the finalized system on the mini in Cobol, just as the client's other systems had been built.

The Agenda package allows the user to have, in effect, an electronic spreadsheet for text, instead of numbers. Random items of text can be entered and automatically separated into an unlimited number of categories based on the contents of the text. The information base can be looked at using user-defined "views," which are subsets of the entire information base. In addition, macros can be written to re-execute repetitive tasks. Agenda can impute categorization based on the contents of the text. For example, an item entered as "call Bill on Tuesday" can be automatically categorized as a call, can be put on Bill's list, and can be entered for next Tuesday's date.

There were some initial complications. Since the client wanted to store information by species, all species and potential variations had to be defined to Agenda. Synonyms also had to be identified so that they were categorized under the same species as their identical terms. Initially, there were

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many changes in the requirements, as the client used the system and discovered other things that it wanted to do.

Since implementation, the client's requirements have, as expected, substantially stabilized. Neither the client nor I have seen any reason to redevelop the system for the mini, since it is basically doing what the client originally wanted and more. Since implementation, the requirements have expanded further. What was originally intended as a historical record-keeping system has expanded to a pond-management system. Through macros, written by the client, the system now automatically tracks and schedules the steps required to prepare a pond for production. It is used to manage the tasks required for all pond management and identifies each employee's task for each working day. It also forecasts pond availability as well as when stock can be "harvested" for sale.

Today it is used as an integral part of the information management systems of the client. If customers have problems with the product, the entire production life cycle can be traced and production-quality problems identified. The system's platform had to be upgraded to a 486 machine due to the increased size of the system and its information base. Release 2.0 of Agenda has been improved for increased functionality. Today, the client maintains most of the system without intervention. The client adds new views and macros and modifies the categorization criteria.

I highly recommend PIMs and system-development tools. Anytime you have requirements for semi-randomly maintained information, either for a client or within your firm, PIMs should be considered as a potential solution.

Some additional examples of PIM software are

#### **Organizer 1.0**

Lotus Development Corp.  
Cambridge, MA  
(800) 343-5414

#### **Above & Beyond 2.1**

1Soft Corp.  
Middletown, CA  
(800) 326-4391

#### **Polaris PackRat 4.1**

Polaris Software, Inc.  
San Diego, CA  
(800) 922-5728

IT

#### **ITMS Purchasing Program**

The AICPA Information Technology Membership Section is currently discussing a purchasing program with InfoNow Corporation. Distributed as a diskette based/on-line system, the program will allow members to purchase hardware and software at discounted prices. Further information will be mailed to all IT members at the end of August.

## **Network Fax Systems—Look What's Happened to Fax!**

*By Warren Brunson, Tom Clay,  
and Dennis Fredette*

**The following article, which appeared in the Nov/Dec 1992 issue of *NetWare Connection* has been reprinted with the permission of the publisher. In this article, Brunson, Clay, and Fredette offer guidelines for deciding if a network fax system is for you.**

Fax machines were supposed to be the computer's poor relative—people would use fax machines if they weren't smart, rich, or savvy enough to have a "real" computer. By the 1990s, computers were supposed to have tied everyone together worldwide through E-mail services.

But fax machines have turned out to be the VCRs of the 1990s. Just as everyone agrees that VCRs are not ideal for TV reproduction—but everyone seems to own one—so it is with fax machines. Whether it's the ideal way to send information or not, everyone has a fax.

Standalone fax machines eliminate the sticky problems of file transfers and E-mail. You don't need compatible programs or complicated file translation procedures to send files.

You don't have to worry about how to combine text and graphics. In fact, you don't have to compose the material on a computer. You can scribble a note, add a rough drawing or chart, and send it off in seconds.

Although E-mail is excellent for communicating within and between properly equipped computer networks, there are times when fax machines can be even better. That's why, in the face of the more sophisticated E-mail systems, fax machines have not only persisted, but prospered.

There are drawbacks to using a standalone fax machine, however: Users have to walk to the fax machine and possibly spend a lot of time standing in line. Then, when faxes come in, someone has to gather them up and distribute them.

Integrating fax machines within your computer system simplifies the process—at least that's the idea behind network fax systems, which are hardware/software combinations that marry the ease of faxes with the convenience of E-mail. Users can send and receive faxes from their workstations, without having to print documents first.

The hardware part of a network fax system is a board that provides a modem interface to a telephone line,

using fax-standard signals. The software part translates application output into faxable files (creating a picture, or image, of a page), maintains phone directories for individual users and for the overall company, queues and manages fax transmissions, and, in most cases, allows routing of incoming faxes directly to appropriate workstations.

Many software packages also provide an interface with popular E-mail packages so that faxes can be sent or routed by E-mail services, when possible. Most are also compatible with NetWare Message Handling Service (MHS), which is a network and internetwork message routing engine. (See sidebar "Routing Methods on Network Fax Systems.") Many handle multiple phone lines, although some do it far less expensively than others.

Network faxing can be an excellent solution for large organizations and for many smaller offices. But is it for you?

### Do You Need a Network Fax System?

The primary question is, What do you expect a network fax system to do that can't be done with standalone machines? Exploring this question can prevent headaches and unfulfilled expectations later on.

**Regular Fax Machines.** You may find regular fax machines better for your workplace if you find yourself in these circumstances:

You send a lot of documents that aren't generated by your computer system. A regular fax machine can send non-computer generated documents, without having to scan them into the computer first.

You use all your network online storage. Standalone fax machines don't monopolize hard disk resources. Many network fax systems recommend that you start with 30 to 50MB of available hard disk space for incom-

ing and outgoing fax files. A one-page, 7KB WordPerfect document can exceed 50KB in fax format, and a single complex illustration can approach 400KB. Multiply that by the amount of fax traffic you expect on your network.

You shut the network down at night or on weekends. A standalone fax machine can stay on 24 hours a day, even if your network doesn't.

You worry about unwanted intrusion into your network. This might be a concern if your company's entire computer system consists of one network. It should be stressed that we have found no reason to believe that a network could be compromised through a fax system, but a fax system does add another entry point into your network.

Your users' duties involve online transaction processing or complex program usage. In this case, users might find network fax programs intrusive. Most network fax systems have a menu or screen that "pops up" inside your application to alert you of an incoming fax. In DOS mode, the fax systems require you to exit your application and run the fax program to view the fax. (Windows in multitasking mode avoids this drawback.)

You must know immediately that a fax is sent. In some cases, a regular fax might be a little more prompt, even if you have to stand in line at the fax machine. Sometimes faxes get stuck in the network fax queue and aren't immediately routed to the receiver.

Installation cost is the overriding concern. On a phoneline-by-phoneline basis, standalone fax machines are less expensive.

**Network Fax Systems.** On the other hand, there are compelling reasons why network fax systems make excellent economic and business sense:

People in your organization send computer-generated documents. This

is especially critical if the recipients do not have compatible computers.

Several people routinely need concurrent access to information from one incoming fax. Network fax systems make it easier to send copies to everyone who needs them, without leaving your workstation.

Due to the size of your company, faxes are not delivered promptly (a more common problem than you may think).

Employees change offices frequently. With a network fax server, you can immediately receive or send a fax using any workstation on your network.

You have information that is quicker to send by fax than by file transfer. For example, completed blueprint drawings can often be faxed faster than a full-blown Autocad file can be transferred.

**Consider Organization Size and Operation.** All fax systems are not created equal. Current systems offer different levels of sophistication—at different costs, of course. Carefully evaluate the needs of your organization. It isn't necessarily true that a large organization always needs the most sophisticated system. For example, a large organization for which faxing is a nice, but occasional, convenience may need a simple solution. A small sales company whose business life depends upon heavy fax use may need the most sophisticated system it can afford.

Network fax systems boost efficiency and production under the right circumstances. But if you decide to install one, don't throw out all your regular fax machines. No matter how sophisticated a network system you purchase, you might still have a need for the hastily scribbled notes and rough drawings, the preprinted pages, and other items that weren't generated on your network. **IT**



## Routing Methods on Network Fax Systems

So your brand-new, fully automatic network fax system still can't route an inbound fax to your desk without help? You're not alone.

Proper routing of inbound faxes may be the stickiest problem facing network fax system manufacturers. There are so many different sources for incoming faxes—from cheap, semi-reliable fax machines to sophisticated network systems—that finding an area of common technical ground is difficult.

The products we evaluated use several different inbound routing technologies, all of which work—at least part of the time. Yet no existing network product appears to have the ultimate solution.

Here's a quick description of methods:

### **Direct Inward Dialing (DID).**

This may be the easiest for occasional inbound fax senders to deal with—and perhaps the most expensive system to implement.

With DID, the telephone company supplies a series of telephone numbers that all ring on the same line. The fax software assigns a phone number to each fax user, and routes incoming faxes to users by determining which number was dialed.

### **DTMF Automatic Routing.**

DTMF, in the simplest sense, stands for "touch tone." In this system, the fax software assigns a four-digit number to each user. A fax sender dials the fax line, and after the fax system answers, it sends a special autorouting request signal. The sender dials the four digit number for the correct user, and the fax is automatically sent to the user's workstation.

**OCR Automatic Routing.** Implemented by Optus in its fax soft-

ware, this method also assigns a number to each user, up to four digits long. The sender types this number anywhere on the cover sheet of a fax transmission, within double parentheses, and the fax system uses optical scanning technology to read the number and route the fax to the intended recipient.

**Network Name Automatic Routing.** This method works only between Intel fax network systems. The fax network assigns each user a name (usually the user's network login name), and the sender uses this name, preceded by a colon (":JohnB"). The receiving fax system detects this name and routes the fax to the intended recipient.

**Embedded-Code Formatting (ECF).** This method is something of a programming language, in which faxing commands are embedded in a database or other program that automatically generates information, formats it, and faxes it without user intervention.

**MHS.** Is there a common ground among incoming-fax routing systems? Yes—and interestingly enough, it's E-mail.

The high-end systems we tested all provide E-mail routing support, which means your fax can be sent via an E-mail system to your recipient—provided he or she has an E-mail address.

The existing common denominator between fax and E-mail systems for NetWare networks is NetWare MHS, which is software that provides store-and-forward capability. Fax and E-mail systems that support MHS format their message transmissions according to MHS specifications.

MHS reads compatible transmis-

sions, determines the intended recipient and his or her location, and then sends the message to that location, regardless of the type of fax or E-mail system at the different ends.

Although most fax vendors support MHS, most also have their own built-in delivery and routing mechanism (often with several routing options). So, you can choose either to use the built-in routing mechanism or purchase NetWare MHS and use it. Only one of the vendors evaluated in preparing this article requires MHS.

IT

### **Note from the Editor**

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### **Correction**

A misprint appeared in the article entitled "Software Upgrades" in the Spring '93 issue. The paragraph should have read as follows:

Mike's Manufacturing received a payroll *update* in early February. Since he needed to run payroll that day, Mike's controller installed the upgrade immediately. He knew the package would increase that pay period's withholding to reflect the higher payroll tax rates; however, he forgot it would also adjust for what was *under* withheld year-to-date. He also didn't consider how employees who worked for near-minimum wage would react to it.

## Installing Server-Based Network CD-ROM Services

By Donald Hunt, CPA, CISA

**Don Hunt is a consultant, author, and trainer in the areas of data processing and software development with Anderson, Hunt and Company. He is also a member of the AICPA Information Technology Executive Committee. In this second LAN Tutorial column, Hunt expands on a topic discussed in the Winter '93 InfoTech article, "LAN Issues When Using CD-ROMs"—the attachment of the CD-ROM to a server.**

The worlds of tax and accounting research are exploding with new and exciting tools on CD-ROM technology. This technology is coming to the fore at the same time that most CPA firms and accounting departments are getting extremely productive with their LANs. The addition of CD-ROM technology to the network environment provides an efficient way to offer all of these new research tools right to the individual desktop in a cost-effective and easy-to-manage manner. The marriage of CD-ROM and LAN technologies was one conceived in heaven, but the installation process may have come from a much warmer location. Two Small Computer Systems Interface (SCSI) standards with inherent cable connector incompatibilities and no one vendor with all the pieces of the puzzle make the installation somewhat challenging. There are many ways to provide CD-ROM capability to your LAN users. CD-ROMs can be attached to one or more workstations and other users can be "mapped" to those workstations with special software. A dedicated (and of-

ten old) PC can be used as a dedicated CD-ROM server. Another approach is to attach the CD-ROM to the file server and provide centralized CD-ROM support to all users from this one location. The attachment of the CD-ROM to the server is a relatively new approach and the method that will be addressed in this article.

The big picture is fairly simple. The first decision is what CD-ROM drive or multiple drive unit to buy. Much has been written on this, and the decision will rest on how many CD-ROM disks you want to keep on-line at any one time and how much money you want to spend. A high-quality, single disk CD-ROM drive will generally cost between \$500-\$800. Multiple drive devices generally start at about \$2,000 and go up from there. Single-drive units may be chained together using a SCSI adapter. This latter approach provides a sensible way to get started with this technology in a small way and grow as you need additional CD-ROM drive capacity.

If you are going to run the CD-ROM from the server, you will need special software designed to run as a NetWare Loadable Module (NLM). This is because Novell NetWare does not yet support CD-ROM drives as part of the network operating system. This software lets each network user establish a session with the CD-ROM drive attached to the server, and to retrieve research and other material. You will need to check the licensing of your CD-ROMs to be sure that multi-user access is allowed.

The list of things you will need follows. This article will mention specific products which can be used to accomplish CD-ROM on a NetWare 3.11 file server. The prices shown are approximate. There are, of course,

many other products on the market and new ones arrive daily.

### CD-ROM Drive

*NEC CDR-74 Single disk unit (\$725)*

### SCSI Adapter

*Adaptec SCSI II adapter (\$295)*

### SCSI I to SCSI II Conversion cable

*Black Box Corporation (\$80)*

### CD-ROM Software

*Corel SCSI! (\$100)*

The installation process is fairly simple, once you have all the right parts.

1. Set up the CD-ROM drive according to the manufacturer's user guide.
2. Install the SCSI adapter in the server and update the server hardware reference disk or internal configuration, if necessary. (See the manufacturer's installation guide.)
3. Connect the CD-ROM to the SCSI adapter. In some cases, the CD-ROM drive will have a SCSI I plug and the newer SCSI adapters will have a SCSI II plug. The two are not interchangeable. In this case, obtain a conversion cable as noted above.
4. Install the CD-ROM software on the server. This software must be an NLM to execute at the server.
5. Install the workstation software at each station. This software should be provided with the NLM and will be .EXE or .COM files.
6. Load the NLM at the server console.
7. Run the workstation CD-ROM software to attach the workstation to the CD-ROM drive.
8. Install and run the application software (tax, audit, or other CD-ROM product) at the workstation. Be sure to put the CD-ROM disk in the drive at the server.

With a little effort and a little frustration with manufacturers' instructions that are not at all user friendly, you will be rewarded with a new technology that is just starting to be

fully tapped.

#### Manufacturers Referenced:

Adaptec, Inc.  
Milpitas, CA  
(408) 945-8600

Black Box Corporation  
Lawrence, PA  
(412) 746-5500

Corel Systems Corporations  
Ottawa, Ontario, Canada  
(800) 836-7274

NEC Technologies, Inc.  
Boxborough, MA  
(508) 635-4000

Novell Inc.  
Provo, UT  
(800) 453-1267

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### The 7th Canadian Conference on Auditing and Computer Technology

The Canadian Institute of Chartered Accountants and the Institute of Internal Auditors are pleased to announce the 7th Canadian Conference on Auditing and Computer Technology, which will take place October 18-20, 1993, at the Four Seasons Inn on the Park, Toronto, Ontario, Canada.

A sampling of the topics to be presented include: Auditing in a Client Server Environment; Strategic Technologies for Auditors; Auditing LANs, EDI, Auditing Systems Development Project Management; and Business Process Redesign.

Participants will receive a comprehensive conference reference binder—full of checklists, instructions, diagrams, charts, forms, text, methods, specifications, systems, and case studies. They will also be able to visit a vendor fair and exhibition—a gathering of vendors of information system control, quality, audit extraction software, and security products; and exchange ideas, share knowledge, and meet the developers who are supplying the technology that's key to their success.

For further information, telephone Rita Vander Veen at (416) 204-3337 or Colette Mitton at (416) 204-3318.

## INFOTECH Questions & Answers

### Windows

**Q** – What is the difference between a Windows program and a program that runs in Windows?

**A** – Microsoft Windows™ is an operating system that runs in conjunction with DOS. A Windows program requires Windows version 3.0 or later in order to run. It employs a consistent graphical user interface (GUI) to present program information to the user. In addition, Windows allows multitasking of programs, i.e., several programs can be running simultaneously, depending upon available RAM.

A software program that runs in Windows, but is not Windows-based is called a non-Windows application. Non-Windows applications are designed to run with MS-DOS but not specifically with the Microsoft Windows operating system. Most non-Windows applications can run with Windows nonetheless. Windows can be used to access the non-Windows application as a convenience, but the application is designed to run under DOS and does not offer the facilities that Windows provides, such as Dynamic Data Exchange (DDE) or Object Linking and Embedding (OLE).

*Contributed by Amy C. Pierce, CPA, Pierce Chen & Associates, Inc.*

**Q** – How can I use a mouse with a non-Windows application running in a window under Microsoft Windows version 3.1?

**A** – If you are using a Microsoft mouse, you need to set up the MOUSE.SYS driver in your CONFIG.SYS file. This driver is included with Windows 3.1 and should have been copied into your Windows directory when Windows was installed. Add the following statement to CONFIG.SYS:

```
Device=C:\windows\mouse.sys
```

If you are using another brand of mouse, the manufacturer generally supplies a driver file as above, or a program called MOUSE.COM with the mouse. If a .SYS file is provided, copy it to your Windows directory and modify your CONFIG.SYS as indicated above. If a MOUSE.COM program is provided, copy it to your Windows subdirectory and add the following line to your AUTOEXEC.BAT file:

```
C:\windows\mouse
```

In each of the cases above, the mouse driver is loaded before Windows is loaded.

*Contributed by Donald W. Hunt, CPA, Anderson, Hunt & Co.*

### Speed Doubling

**Q** – On 486 machines, what is speed doubling all about? Will all software run at doubled speed?

**A** – The Intel486 DX2 microprocessor doubles the speed at which your primary processor operates. A 486 25 Mhz CPU will operate at 50 Mhz. However, the per-

formance will not be the same as an Intel486 DX-50 that runs at 50 Mhz. Here's why: In systems with the 486-50, the system board and CPU both run at 50 Mhz. In systems using a doubler chip, only the CPU speed doubles. The system board stays at its original speed—25 Mhz, for example. Whenever the system accesses memory, it does so at the speed of the system board. However, because of the 8 kbyte internal cache, it only directly accesses system memory 10–15 percent of the time.

The speed doubler chip installs in a special socket on your system board. Most 486 machines have one built in. If yours doesn't, you may be able to install the chip in the math coprocessor socket. Configure it as a math coprocessor, if you do. Check with your dealer for details.

According to Intel, the DX2 provides about a 70 percent performance increase over the 25 Mhz Intel486, and about a 30 percent increase over the 33 Mhz Intel486. The DX2 should visibly speed up all applications under DOS, Windows, OS/2, and UNIX.

*Contributed by Steven W. Bare, CPA, Clifton, Gunderson & Co.*

### Compressed Formats

**Q** – Some of my programs store information in compressed formats. Should this worry me?

**A** – Not only should you not be worried, you should probably be thankful. As today's software grows more complex to deal with issues like graphical user interfaces (Microsoft Windows, for example), and more sophisticated hardware, the resources required by these applications increases. Programs that eat 10 to 15 megabytes of your available hard disk space are becoming more and more common. If you are like most computer users, you'll find your free disk space diminishing at an astonishing rate.

One of the ways that software developers help us deal with this situation is by storing information in compressed format. Although there are different methods, or algorithms, for achieving this (depending on the type of data being compressed: text, graphics, .EXE files, etc.), compression often works by eliminating duplicate patterns that occur within the data.

Imagine this Q&A as a candidate for compression. Without looking very hard you could find some form of the word compress repeated numerous times. Other likely candidates would be disk, computer, software, the, and so on. By storing only one copy of a repeating pattern, and the location in the file where these patterns occur, programs can significantly reduce the amount of data that it must write to disk. When it is time to subsequently retrieve the compressed data, the program decompresses the data back exactly to the way it was before it was compressed. (Some graphics programs give you the option of using a form of compression that actually removes data from the file ... never to put it back again. They do this on purpose however, using the theory that the benefits of the higher compression ratio achieved is greater than the loss of data — which doesn't significantly reduce the quality of the graphic image anyway.)

The potential down side here is that because your application must spend time compressing data before it stores it to disk, and decompressing it when it retrieves it, the operation may take more time than it would with decompressed data. The key word, however, is may. Actually it is sometimes quicker to write compressed data to disk. Because hard disk operations are so much slower than those performed in memory (where the compression/decompression takes place), the amount of time it takes to compress and write the information may be less than that of writing the larger, decompressed data. It all depends on the amount and type of data being examined, and the algorithm being used.

Generally, all of this squashing and unsquashing is performed transparently by

the application software and requires no user intervention at all. In fact you may not even be aware of all the places that compression is used. The distribution disks of most programs today are in compressed format and subsequently decompressed as you install them onto your hard disk. Sometimes the programs themselves (that is, the actual .EXE files) are packed by software developers prior to shipment. This form of compression places a tiny sub-routine into the .EXE file that tells it how to decompress itself when first loaded into memory from the command prompt. And, if you've ever dealt with communications via modem (like to one of the bulletin board systems), you already know that the files you download are almost always in compressed formats. Because sending data over the telephone lines is so painfully slow (and potentially expensive) it almost always makes sense to compress the files before they are transferred. As a matter of fact, many of the modems on the market today achieve their high transfer rates by automatically compressing data before it is sent or received over the phone lines. DOS version 6.0 has built compression right into the operating system.

So sit back, relax, and let your software worry about squeezing the last ounce of space from your hard disk. Compression is now big business and isn't going to go away until disk space concerns do ... which isn't likely to happen anytime soon.

*Contributed by Todd Denlinger,  
Systems Analyst of Positive Systems,  
Incorporated*

### Rescue Diskette

**Q** – What is a rescue diskette? Why would I need one?

**A** – A rescue diskette contains the files necessary to boot your computer. Given that hard drives are mechanical, eventually they fail. Often, when they do, it is the boot track of the hard disk that fails. I generated my boot disk by creating a bootable system

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disk. Then I copied COMMAND.COM, CONFIG.SYS, and AUTOEXEC.BAT to it. You may also want to include any programs started by CONFIG.SYS or AUTOEXEC.BAT. Some utility programs (Norton Utilities, PC Tools) will create a rescue disk for you when you install them. However, I wouldn't buy them just for that.

Please remember having a rescue disk does not eliminate the need for backing up your hard disk. The rescue disk only assures you will be able to reboot your computer if the hard disk fails. It does nothing to protect the

data stored on your hard disk. Also, pay attention to the statements in your CONFIG.SYS and AUTOEXEC.BAT files. Be sure all command lines refer to your hard disk if appropriate. For example:

Path=C:\;C:\Windows;C:\Dos;. Many people leave the drive reference out of their path command and trip themselves up later.

It only takes a few minutes to create a rescue disk. When your hard disk fails, you'll be glad you did.

*Contributed by Steven W. Bare,  
CPA, Clifton, Gunderson & Co.*

Do you have questions on information technology? Qs&As is designed to provide a forum for IT members to raise questions relating to technology. Send your questions to

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