HOW TO BECOME A PUBLISHING GROUPIE: ESTABLISHING A SUCCESSFUL LOCAL AREA NETWORK FOR YOUR PUBLICATIONS ORGANIZATION (U)

by

G. F. Hayhoe

Westinghouse Savannah River Company
Savannah River Site
Aiken, South Carolina 29808

A paper for presentation at the
Practical Conference on Communication
Oak Ridge, Tennessee
October 24 - 25, 1991

and publication in the proceedings

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

This paper was prepared in connection with work done under Contract No. DE-AC09-89SR18035 with the U.S. Department of Energy. By acceptance of this paper, the publisher and/or recipient acknowledges the U.S. Government's right to retain a nonexclusive, royalty-free license in and to any copyright covering this paper, along with the right to reproduce and to authorize others to reproduce all or part of the copyrighted paper.

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED.
How to Become a Publishing Groupie: Establishing a Successful Local Area Network for Your Publications Organization

George F. Hayhoe
Information Systems Engineering
Westinghouse Savannah River Company
1070 Silver Bluff Road
Aiken, SC 29803
ABSTRACT

Implementing a successful local area network for a publications workgroup isn't as simple as the scarcity of information on the subject would suggest. Making a network work for you requires careful planning, developing or acquiring network expertise, transforming your group's patterns of working together, and carefully managing the human and technological resources. (1)

INTRODUCTION

Despite the repeated predictions of computer industry experts, the "year of the local area network" (LAN) has still not arrived. The delay is understandable, however. For many years, vendors pointed to the LAN's ability to share expensive hardware resources like laser printers and hard disk storage. They understood this application of networks quite well since they made their livings selling hardware. When the costs of these items decreased dramatically, though, network suppliers couldn't point to other benefits because they didn't appreciate the most important reason why LANs are useful:

Desktop computers need to be connected not to share hardware but to share information.

Because information exchange is the most significant activity of most office workers, it makes sense that all aspects of their work—especially their computing environment—should facilitate efficient sharing of information.

While virtually all office workgroups would benefit from a LAN, nowhere could a network have greater impact than in a publications department. Because such groups consist of people performing varied but closely related tasks, and constantly interacting with other workgroup members, they are an ideal target user group for local area networks.

BASIC CONCEPTS OF LOCAL AREA NETWORKING

Although you may not realize it, if you have a printer connected to your personal computer, you are already using a local area network. In its simplest form, a LAN is a combination of at least one processor and any number of storage, input, and output devices (such as hard disks, CD-ROM readers, scanners, printers, typesetters, etc.) connected by cable and operating in a coordinated manner.

In practice, networks are usually more complicated, though not overwhelmingly so. For example, more sophisticated networks utilize one or more servers, processors which offer services to client workstations. A file server allows network users to share files and networkable application programs; a print...
server allows client workstations to share printing resources like laser printers and typesetters; a data server permits clients to access information which is downloaded from and uploaded to a mainframe computer system.

While simple networks like AppleTalk (2) permit low-speed communication among network nodes without special interface cards or operating system enhancements, more sophisticated networks require these add-ons. An ethernet or token ring card, for example, speeds up network communications by a factor of 2 to 10, while a network operating system like Novell NetWare provides password protection and network security to ensure that multiple users working simultaneously do not modify the same files without warning. Typically, the network operating system runs on the server(s), while client workstations are controlled by their usual DOS or Macintosh operating system and a network shell which allows them to use network services.

Because a publishing network typically requires exchanges of large files and possible contention for files and resources by a number of people, use of network interface cards and a network operating system is recommended to avoid significant delays and to provide security so that files will not be corrupted or modified by unauthorized users.

PLANNING—AND PAYING—FOR THE LAN

Before you implement a LAN, you must inventory existing hardware and software; decide what needs to be added or replaced; figure out how much the new hardware, software, and support will cost; determine how to pay for it; and judge whether the proposed investment is wise.

Because a LAN is going to cost a lot of money, the prudent first step is analysis and planning. Unless you’re a specialist yourself, bring in a network expert (an employee of your own company if possible; a consultant if necessary) to help you review the equipment and software you already own, and to suggest workable alternatives.

If all of your group members are using 68030 Macintoshes or 80386 PCs (or a combination of both), you’re fortunate. All you need is a file server, network interface cards, and the necessary cabling, and the hardware side of the network equation is solved. If your group’s hardware includes Macintosh Pluses, you’ll need to buy workstations as well as the server, interface cards, and cabling since Mac Pluses are too slow to support heavy-duty network applications, and they cannot accept a network interface card. If your hardware includes XTs, they may be too slow to support large network applications and definitely need to be replaced if you intend to run Windows applications like PageMaker or Ventura Publisher for Windows.

As a rule of thumb, plan on the following minimum configurations for the server and workstations on your network:

<table>
<thead>
<tr>
<th></th>
<th>File Server</th>
<th>Workstation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Type</td>
<td>68030 or 80386</td>
<td>68020 or 80286</td>
</tr>
<tr>
<td>Processing Speed</td>
<td>20 megahertz</td>
<td>15 megahertz</td>
</tr>
<tr>
<td>Random Access Memory</td>
<td>8 megabytes</td>
<td>1 - 4 megabytes</td>
</tr>
<tr>
<td>Free Hard Disk Space</td>
<td>120 megabytes</td>
<td>40 megabytes</td>
</tr>
<tr>
<td>Free Interface Card Slots</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Network wiring can be less complicated than you might think. If your office building is relatively new or has been recently rewired, the necessary cabling may already be in place. Check with your facility...
telecommunications manager to determine whether additional wiring will be required and how it should be installed. The cost of buying, running, and connecting all the needed cable will vary greatly depending on the number and physical placement of workstations, the type of wiring used (coaxial cable—the more expensive option—or standard telephone wire), and the need to use conduit (required by building codes in many places if the wiring runs through walls).

Finally, you must purchase the network operating system for your file server, the network shell software for each workstation, and network-compatible application software if needed. Be sure that the network operating system and shell software are compatible with the interface cards and wiring medium you have chosen. Also be sure that the application software you choose can either be run from the file server or will support network drives if run from individual workstations.

The cost of all this equipment and software is difficult to generalize since costs will differ depending on your company’s buying arrangements with vendors. The following table provides ballpark estimates:

<table>
<thead>
<tr>
<th>Hardware/Software</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>68030 processor</td>
<td>$3,000</td>
</tr>
<tr>
<td>80386 processor</td>
<td>$2,000</td>
</tr>
<tr>
<td>Network card</td>
<td>$400</td>
</tr>
<tr>
<td>Network operating system (4)</td>
<td>$1,500</td>
</tr>
<tr>
<td>Network-compatible page layout software (per workstation)</td>
<td>$450</td>
</tr>
<tr>
<td>Network compatible wordprocessing software (per workstation)</td>
<td>$350</td>
</tr>
</tbody>
</table>

Only you and your management can determine whether such an investment will be cost-effective. You should remember, however, that whether you install a network or not, you will likely need to upgrade your hardware within the next five years, even if your workgroup’s current PCs are relatively high-end machines. Moreover, you may not be able to afford not to install a network, since your competitors are likely to do so during the next several years. The ultimate question is whether to pay now or later.

In either case, it may be possible to decrease or defer the cost to make it more manageable. For example, your company may have an organization which plans and conducts computer technology pilots. Your workgroup may supply exactly the environment needed to test network hardware and software for eventual installation throughout the entire corporation. If so, you may be required to pay only a portion of the cost of your network—or (if you’re very lucky) none at all.

If a technology pilot project is not feasible, there are other alternatives for reducing or deferring network costs. Most companies depreciate hardware investments over three to five years, so your organization’s budget may be charged only a fraction of the network’s cost each year over the depreciation period. Similarly, you may be able to decrease the network’s cost impact by leasing the equipment you need.

Whatever your choice, confer with your company’s finance and computing organizations for guidance.

HARDWARE/SOFTWARE INSTALLATION AND SUPPORT

Installation of network hardware and software requires considerable technical expertise. Unless you possess the needed knowledge and skills yourself, find an expert to perform these tasks. Your choices are to find the necessary expertise within your company or to hire a consultant. Aside from the planning
and wiring, the network installation should take less than a day, so the task should cost relatively little,
and you will then be assured that the job has been done correctly. Furthermore, if problems arise as a
result of the installation, you can call on the installer to correct them. (Their work is guaranteed; yours,
despite your level of skill, is not.)

You will need a network administrator or supervisor to handle housekeeping details on the network.
The administrator is responsible for such tasks as adding new users to the network and granting access
rights to network drives and print queues. If someone else in your company is available to perform
these duties, take advantage of that service; if not, the job will require at most only an hour or two a
week.

A technical support person is a necessity. This person is responsible for trouble-shooting network hard-
ware and software problems, correcting those that he or she is capable of fixing, and arranging for ser-
vice for more troublesome problems. Unless you have the necessary expertise and the time to take on
another part-time job (in addition to the several full- and part-time jobs you already hold), identify
someone else to provide this service, and make certain that he or she is experienced with your network’s
specific hardware and software configuration.

Regular backups of the file server to ensure data security are also necessary. Backups should ideally be
performed daily and at least weekly, and require between 30 minutes and several hours, depending on
the size and number of files being copied. This task requires a tape backup drive attached to the server
or one of the network workstations, backup software, backup tapes, and a person responsible for per-
forming the backups. The hardware, software, and supplies can all be obtained for less than $1,000.
Most backup software permits you to schedule backup jobs automatically after business hours when
network traffic will be light, but someone must be responsible for changing the tapes, labeling them, and
ensuring that no problems occurred during the backup process.

Finally, end user support is required. If your company has a computer help desk or information center,
that function may be able to provide the necessary support. Otherwise, you must contract for this ser-
vice or provide it yourself. If you assume this role, remember that it will require significant time away
from other work, especially soon after the network is installed and when inevitable problems occur.

**TRAINING**

When you implement the LAN in your workgroup, you will need to train group members in the use of
whatever new software and hardware you’ve installed. You’ll be tempted to overlook training and the
associated cost, rationalizing that the differences aren’t significant and that your workgroup can pick up
the skills they need without formal training.

Although training requires a significant investment of time and money, it’s a wise and necessary
investment. It will help your group members cope with changes in work methods by teaching specific
skills and by answering a variety of questions: *What are the differences between Ventura Publisher menus on
a LAN and menus in the stand-alone version of the software? How do you access the network disk drives? What is
the proper etiquette for modifying or deleting files other users may need?*

To gauge the appropriate type and amount of training for your organization, consider the following
questions:

1. **What is the group’s general level of computer literacy and degree of comfort with changes in their hardware and software?**

   Chances are, there are several answers to this question, since it is rare to find a uniform
degree of comfort with technological change and a uniform level of computer
literacy, even in a small group. Thus, it may be necessary to individualize the training
provided to group members or to allow for additional support for some mem-
bers of your organization once the network is implemented.
If the group or some of its members have never used computers before, you face a special challenge. Such users tend to be suspicious of automated systems and often fear that the machines will cause them to lose their jobs.

2. Aside from the network services themselves, will group members be using hardware and software that is very different from what they are accustomed to when the network is implemented?

The transition from PC to Macintosh (or vice versa) should not be underestimated, despite hardware vendors’ claims. The two platforms’ operating systems are significantly different, and users require training to learn the differences and methods of interacting with the new operating system.

Even if your workgroup will be using the same application programs on the network that they currently use, some differences are inevitable. For example, a “Browse File” option may be available to network users, or printing from the application may require different procedures.

3. How big is your training budget, and how much time away from the job can your workgroup spend?

You’ll probably spend most of your available cash on network hardware and software, so very little will be left for training. And your customers aren’t likely to be impressed when you tell them that a critical job will be delayed so your group can train on the new network.

Perhaps you can minimize the cost of training by utilizing an internal training organization or by providing some or all of the training yourself if you possess the necessary skills and knowledge.

At minimum, most users will require one half day of training on the use of network services, and two or three days on any new page layout program you will implement. Additional training on new word processing and graphics programs require one day or more a piece if the users have some prior experience with similar packages. Users with limited or no prior experience will require more training.

Although the cost may seem steep, a realistic training program will minimize the workgroup’s downtime once the network is installed and will foster more positive attitudes among employees.

**MANAGING THE PEOPLE AND TECHNOLOGY**

Once the network is implemented, the biggest problem you will face is an initial loss of workgroup productivity. Some of this productivity lag will be caused by hardware or software glitches and is entirely beyond their—or your—control; still more will result from the overhead imposed by the learning curve.

The one thing you can depend on is that your schedule will be impacted, so you must schedule this productivity loss.

If you are implementing both a new network and new application software, count on four weeks to elapse before productivity returns to its level before installation. (During the first week, almost no productive work will be accomplished; by the end of week three, your group members will be back to about 50% productivity.) If only a new network is installed, your productivity will likely suffer for about two weeks before returning to its level before installation.

Disk and file management is another inevitable problem. You and your workgroup members will need to establish—and implement—guidelines for managing disks and files. For example, you may set up a folder or subdirectory on the file server and require that users store all files for a particular project there. Users will need to concentrate carefully to implement these guidelines, however, until their use becomes
second nature to them. Application software which includes a utility for identifying all files linked in a publication will help to ensure that the files are stored in the correct location, but you or the network administrator should be prepared to play “disk police” to ensure that guidelines are being observed correctly.

The network can change the way your workgroup does business. Currently available networked word-processing software permits redlining and annotation, so that a writer may draft a document and forward it to one or more other persons in the group for review. When they read the draft, they can edit the manuscript online and also record comments or suggestions. These are all identified separately by reviewer and returned to the writer electronically for incorporation in a revised draft.

Most networkable graphics and page layout products lack a true network identity. They allow multiple users to execute the program but do not employ file and stylesheet locking techniques. (5) Nonetheless, these products do facilitate file sharing and make cooperative work on a publication considerably easier.

Although not currently available, the ideal network wordprocessing and page layout programs should automatically notify the next person in the work flow that a document is ready for review, and place the task in his or her schedule, along with a requested completion date. Within the next several years, integration of network electronic mail and scheduling software with other workgroup applications will make these tasks much less burdensome.

After a few weeks or months, when workgroup members have internalized network use, productivity will increase significantly beyond the level before network installation. Access to network files will enable group members to perform their jobs more efficiently. For example, writers and editors can allow clerks or secretaries to make corrections to text files, attach style sheet tags, and insert illustrations into laid-out pages. Designers and typesetters can more easily contribute their expertise to projects, even the smaller ones that they might not have been involved with previously because of time limitations. And managers can more readily track progress on publications because they can browse work-in-progress at any stage and don’t need to wait for galleys or page proofs.

Productivity gains in excess of 100 percent have been achieved. If you consider the cost of doubling your current staff, the price of hardware, software, and support for a publications LAN becomes truly insignificant.

NOTES

(1) This paper was prepared in connection with work done under Contract No. DE-AC09-84SR18035 with the U. S. Department of Energy.

(2) Specific product names mentioned in this paper are provided for example purposes only; their inclusion is intended neither as an endorsement of those products nor as an implied criticism of competing products.

(3) One megabyte is required unless you plan to run Windows applications; Windows requires 4 megabytes of RAM to run acceptably.

(4) Depending on the network operating system you choose, the cost could be as high as $7,000.

(5) Ventura Publisher is a notable exception to this rule.

BIOSKETCH

George Hayhoe is currently principal technical editor for Westinghouse Savannah River Company, where he leads a software documentation team. He was formerly assistant director of composition and director of the writing lab at Virginia Tech. A senior member of STC, Hayhoe is president of the South Carolina Chapter.
END

DATE FILMED

4 129192