Default Hardware and Software for Small Businesses

ACC 824
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Introduction

The purpose of this paper is to define the default hardware and software choices for small businesses within cost/benefit constraints, which can be modified to accommodate individual differences between businesses and should be flexible enough to allow growth. The most important characteristics of a network for a small business are reliability and easy of management. This solution is based on my clients which includes businesses engaged in engineering, law, veterinary medicine, construction, and non-profit activities. All of these clients are too small to be able to offer a competitive salary to a network administrator. The default solution is divided into a solution for the very small client using one to five workstations and a solution for the slightly larger business using six to 15 workstations.

Typically businesses need word processing, spreadsheets, client contact management, job costing, accounting, anti-virus, e-mail, Internet access, a web presence, and possibly specialized software like Creative Solutions for tax preparation. Resources that need to be shared include high speed printers, modems, and files.

Solution for One to Five Workstations

Application needs include word processing, spreadsheets, and client contact management. It is necessary that applications be standardized across workstations to facilitate office efficiency. Microsoft Office includes word processing, Word, spreadsheets, Excel, and a database, Access. Access enjoys name recognition but the client typically does not know how to use it. Unfortunately, the client either fails to use Access and thereby fails to manage client contacts leading to a significant decrease in business success or gives little thought to the database structure which leads to significant waste when an unusable database is created. Other client contact management software exists which are
easier to use, an example is Goldmine. One solution the client may be willing to accept is to buy the Microsoft Office as a unit and also Goldmine.

Application needs also include job costing and accounting which can easily be handled by either Quicken Deluxe or Peachtree Time & Billing. Quicken Deluxe is superior to Peachtree because it does not require an accounting background to use it intelligently and has extensive flexible reporting capability. Further, Quicken Deluxe interfaces with office applications easily, for example to mail merge all the donors who attended a particularly fund-raiser on a thank you note. Peachtree is a more standard accounting program with the typically less intuitive data entry and less flexible, although still extensive, reporting capability. Peachtree would only be the chosen if the business desired invoicing directly out of the accounting package or had previous experience with the software. Quik Books Pro is vastly inferior to both the above programs because it is significantly less intuitive and less flexible than Quicken Deluxe and has a disastrous inventory module which only permits perpetual moving average inventory.

A widely used anti-virus software is Maccaffe. Office also includes Outlook which can be used as groupware for scheduling and e-mail. Browser software is required for Internet access, and all of them are about equal. An ISP should be contracted to provide a web site with the business's own domain name and e-mail. This reduces security issues. The website should be designed externally because a less than professional website will defeat the site's marketing purpose. Modem sharing applications can be bought separately, for example Lantastic sells one.

Typically the client recognizes the need for new hardware and software but does not realize that these investments will not produce the desired results without significant training of users. However, the client frequently resists user training, either because the employee cannot be freed from ongoing responsibilities or because of the cost, primarily the cost of labor during training. Therefore, every system improvement proposals should include an early emphasis on significant investment in user training. This training includes application training, for example Access. Application training is readily available either at LCC or through the Microsoft excellence exams. I have trained numerous clients on Quicken and am writing a practice set with an emphasis on job costing, budgeting, and
reporting to reduce the amount of time I need to physically be present during this process. LCC’s ACCG 260 course trains users in Peachtree, although it does not cover job costing or budgeting.

In addition to application training, users should be given network training. The default operating system is Windows 95. Windows 95 includes peer to peer capability which is appropriate in a small business using two to five workstations. If the client is not upgrading all of their workstations, Windows 3.x and DOS may be used as clients, although not servers, within the Windows 95 peer to peer environment. Users should be trained to use Explorer and Network Neighborhood. The user should learn to find a file, to view folders by different criteria like date and size, to find a network resource, and to map a drive. Additionally, users should be trained to create a folder, to copy files from folder to folder, to delete a folder, and to restore a folder from the recycle bin. Users should learn to associate application with file types, for example to use Notepad to open .dat files. Most users are unwilling or unable to extract this information from manuals; therefore, they must be trained by a live instructor or with interactive tutorials.

The default workstation should include a Pentium II processor running at 233MHz or more, 32 M of RAM, the largest hard drive which currently comes with the machine at no extra cost, a CD-ROM drive, a 3.5 inch diskette drive, and a surge suppresser. A good monitor, which typically will last longer than the rest of the workstation, is the place to invest a little extra. Almost all monitors will meet the basic requirements of dot pitch .28, 1024 X 764, and non-interlaced at 72Hz, but the determining criteria is the user's visual perception. MAG, Sony, and NEC, among others, produce good looking monitors. A good key board is essential to user comfort and long term productivity. The workstation should be positioned to conserve desk space: the cabinet can be under the desk, the monitor can be raised and the keyboard can be on a sliding shelf. All applications which can be loaded locally, should be loaded locally. Typically problems occur on the network level; therefore, local applications permit users to have partial productivity even when the network is inoperable. Further, performance tends to be faster if the application is local.
The default protocol is Ethernet 10BaseT using Category 5 cable in a star configuration. A star configuration requires additional hardware, a hub; however, a hub is cheap compared with the reliability of Category 5 wire and the isolation of problem connections to the one leg of the star actually having the fault. Future growth may be accommodated by buying a hub with more ports than are presently required, which is less expensive than buying stackable hubs. Further, more positions may be wired than are presently needed for convenience. The NICs need to fit the slot in each computer which may be different due to the age of the computers. 3 COM makes reliable cards. In a two to five workstation business it is not necessary to have dual 10 and 100 cards, because additional speed will probably never be needed.

Additional hardware needs include a modem, a color ink jet printer, and possibly another high speed laser printer. A single modem would probably be sufficient. If additional outgoing speed was required, the line and modem could be upgraded to ISDN. Windows 95 with Microsoft Plus supports RAS; however, only one user at a time. A color printer is essential for marketing and facilitating communication. It is amazing how a colored financial statement can get the attention of users who have been previously uninterested. Printers may be purchased which are able to interface directly to the network; therefore, these printers do not slow down a non-dedicated server workstation.

Security is of only minor concern in this size business unless the nature of the business is particularly sensitive. Data security with periodic back-ups and off site storage are obviously worthwhile. Further, physically locking the software and manuals up with one employee as custodian, usually the secretary who is reliably in the office, is worthwhile because software does tend to be taken home. Password protection of data which is legally confidential, for example birth dates, can be accomplished at the application level. Further users with a high level of access should be password protected. Windows 95 supports password authentication and chap. Messages can be encrypted.
Solution for 6 to 15 Workstations

The primary difference for the six to 15 workstation business is a client/server environment, instead of a peer to peer environment. The client/server environment facilitates management and security. Applications, workstations, OS, cabling, NICs, configuration, Ethernet protocol, user training, and security concepts, although not security implementation, would be the same. An ISP would still provide web access and e-mail. The NOS should be NT because it is more intuitive than Novell. All hardware should be NT certified. NT clients may include Windows 95, Windows 3.x and DOS with Workgroup Connection for MS_DOS. This could benefit a business which was continuing to use older workstations.

The client/server environment implies the existence of a separate server machine. This machine does not have to be a machine marketed as a "server". The server should have a Pentium II processor running at 300 MHz. The additional cost of the higher speed chip is justified by the performance impact on the entire network. The server should also have duplexed mirrored hard drives with SCSI controller cards. Disk mirroring slows down writes but speeds up reads and has the best performance of all RAID levels. Four GB is an adequate hard drive size and bigger is not necessarily better because data has to be backed up using a tape drive. The power supply doesn't need to be redundant because switching a power supply is a relatively quick operation: small businesses generally have longer periods that the network can be down than larger businesses. The server also must have a CD-ROM drive and a UPS. Because a small business is unable to offer a competitive salary to a network administrator, an outside consultant should be retained as a network administrator.
Conclusion

The default software and hardware for small businesses must be reliable, easy to use, and relatively inexpensive. The above solutions achieve these goals by using off the shelf software which is widely used and including only capacity that is realistically needed, rather than basing choices solely on speed or novelty. Typically software which is widely used has higher reliability and is more flexible than specialized packages, for example fund accounting packages, because these characteristics are required to capture market share. All of the above applications interface well. It is through continuing cost/benefit analysis, remaining current on the changes technology is making in a businesses' industry, an appreciation of the limitations imposed by user expertise and interest, and continuing staff training that a small business can maximize the benefit from technology.