

WHITE PAPER

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Prepared By
Windows NT Integration

Compaq Computer
Corporation

CONTENTS

| | |
|--|-----------|
| Executive Summary | 3 |
| Overview | 3 |
| Explanation of Products | 4 |
| Upgrade Options | 5 |
| Before you Begin | 6 |
| System Requirements | 8 |
| Comparison of SBS versus standard Windows NT Installations | 9 |
| Technical Recommendations | 12 |
| Assessing the underlying network | 12 |
| Installation Options | 14 |
| Server Preparation | 14 |
| Installation using SmartStart for SBS | 15 |
| Installation using the Standard Version of Compaq SmartStart | 16 |
| Installation without using SmartStart | 16 |
| Upgrading your system | 17 |
| Working with the To Do List | 18 |
| Component Configuration | 19 |
| Windows NT Server 4.0 - Optimization and Tuning | 19 |
| MS Exchange Server 5.0 | 21 |
| SQL Server 6.5 - Optimization and Tuning | 23 |
| Modem Sharing Server | 25 |
| Uninstalling Small Business Server | 27 |
| Glossary of Terms | 28 |
| Troubleshooting | 28 |
| Known Issues | 28 |
| Error Messages | 29 |
| Basic Troubleshooting Strategy | 30 |
| Basic TCP/IP Troubleshooting | 31 |
| Summary | 31 |

Small Business Server 4.0 Configuration, Optimization, and Installation on Compaq Servers

The purpose of this white paper is to provide users who have minimal network experience, and network administrators, with information about effectively installing, configuring and utilizing the products contained in Microsoft BackOffice Small Business Server on Compaq Servers.

Compaq offers a Small Business Server Solution that is comprised of the ProSignia 200 Small Business Server and the Microsoft BackOffice Small Business Server (SBS) version 4.0 software, however, this white paper will discuss SBS software running on both Compaq ProLiant and ProSignia servers. The information in this document pertains to SBS 4.0, however some 4.0a changes will be mentioned throughout the white paper.

This white paper covers installation, usage, procedures and issues relating to SBS on Compaq server (ProLiant and ProSignia) hardware. It is not tailored specifically to the ProSignia 200 hardware and software bundle.

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Small Business Server Optimization and Installation on Compaq ProLiant Systems

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Note: This white paper will discuss installation, usage, procedures and issues relating to SBS on Compaq ProLiant and ProSignia servers. This white paper is not tailored specifically to the ProSignia 200 hardware and software bundle.

EXECUTIVE SUMMARY

Small businesses are often limited by the financial resources or personnel needed to take advantage of current powerful computer technology. Compaq and Microsoft have created an integrated affordable hardware and software solution that will meet the networking needs of companies who have 25 or fewer concurrent PC users connected to a single server.

The Compaq and Microsoft Small Business solution package consists of a Compaq ProSignia 200 server running Microsoft BackOffice Small Business Server (SBS) software. This solution package includes the SBS software as well as a number of reliability features built into the server such as:

- Error Correcting Memory (Optional)
- SMART, self error detecting Disk Drives
- Server Class SLR SCSI Tape Drive
- Automatic Server Recovery
- Pre-Installation of SBS software
- Easy Installation with built-in Wizards
- Single Console for Administration
- Integrated abilities to share applications, printers, and modems.

Overview

The SBS software will function on other Compaq servers, it is not limited to the ProSignia 200. This white paper will discuss SBS on Compaq ProLiant and ProSignia servers.

The following assumptions have and can be made in conjunction with this white paper:

- A general knowledge of SBS software, DOS and Windows NT terminology has been obtained from reading the Readme.wri and Setup Notes file located on Disc 1 of the Microsoft SBS CD-ROM, and Chapter 2 What is a Computer Network in the Start Here guide.
- The terms Microsoft BackOffice Small Business Server, BackOffice Small Business Server, and SBS reference the same product and shall be used interchangeably.
- CD-ROM drive letters will be referred to as “D:\” or “d:\”. If your CD-ROM drive letter is a letter other *d*: then appropriate substitutions should be made.
- If “Compaq SmartStart” is used it will refer to both the standard version of Compaq SmartStart and Compaq SmartStart for Microsoft SBS.

EXPLANATION OF PRODUCTS

The following components are provided with Microsoft BackOffice Small Business Server (SBS). Table 1 provides a list of software titles and directory structure for Microsoft SBS CD-ROM Disc #1, and a brief explanation of the software.

TABLE 1
DESCRIPTION OF PRODUCTS/COMPONENTS ON DISC 1

| Component | CD-ROM Location* | Explanation |
|--|---------------------------|--|
| Crystal Reports (15 MB) | D:\CRYSTAL | Allows the ability to dynamically create and view reports from the web server log files generated by IIS. |
| Internet Connection Wizard (.6 MB) | D:\ICW | Allows you to connect your business to the Internet |
| Microsoft Active Server Pages (5 MB) | D:\ASPSRV | Provides server side scripting for creating web-based applications for your web site. |
| Microsoft Exchange Client (22 MB) | D:\EXCHCLI | Enables you to send and receive electronic mail. |
| Microsoft Exchange Server (60 MB) | D:\EXCHANGE | Enables your business to send and receive electronic mail, share information, and schedule meetings. |
| Microsoft Fax Services (4 MB) | D:\FAX | Enables users to send and receive faxes from their computers. |
| Microsoft Index Server (3.9 MB) | D:\INDEXSRV | Enables users who access the web site to perform full-text searches and retrieve information from your site. |
| Microsoft Internet Explorer (10 MB) | D:\IE | Web browser. |
| Microsoft Modem Sharing Services (1 MB) | D:\MSHARE | Enables users to use shared modems on SBS. |
| Microsoft Proxy Client (1 MB) | D:\PROXY\CLIENTS | Gateway to the Internet. |
| Microsoft Proxy Server (4 MB) | D:\PROXY | Enables Internet access and helps secure your private network from the Internet. |
| Microsoft Small Business Server (395.8 MB) | ROOT OF DISC 1 AND DISC 2 | Provides management tools for SBS. |
| Microsoft SQL Server (82 MB) | D:\SQL | Enables use of database applications that store, manage, and provide secure access to your business data. |
| Microsoft Web Publishing (1 MB) | D:\WEBPOST | Enables you to post your web site up to an internet service provider (ISP). |
| MS FrontPage | D:\FRONTPG | Helps to create and manage WEB sites. |
| HP JetAdmin v2.4 | D:\JETADMIN | Provides support for the latest HP printers and plotters. |
| Driver Library | D:\DRVLIB | Windows NT drivers for sound cards, network adapters, video cards, printers etc. |

TABLE 1
DESCRIPTION OF PRODUCTS/COMPONENTS ON DISC 1

| Component | CD-ROM Location* | Explanation |
|----------------------------|------------------|---|
| Language Pack | D:\LANGPACK | Provides support for other languages. |
| SBS Administrative Console | D:\REMOTECSL | Provides means of administering SBS remotely. |
| Books Online | D:\SUPPORT | Online Documentation |

* "D:\\" is used to reference the CD-ROM drive letter. Should the drive letter for your CD-ROM differ, the "D" should be substituted accordingly.

Table 2 provides a list of software titles and directory structure for the products and/or components found on the Microsoft BackOffice SBS CD-ROM Disc #2, and a brief explanation of the software.

TABLE 2
DESCRIPTION OF PRODUCTS/COMPONENTS ON DISC 2

| Component | CD-ROM Location* | Explanation |
|-----------------------------|--------------------|--|
| Exchange | D:\MS\EXCHANGE | SBS client files for enabling Exchange. |
| Fax Server Client Component | D:\MS\FAX | Client files that enable fax services on SBS clients. |
| Internet Explorer | D:\MS\IE | Program files for Internet Explorer on client PCs. |
| Modem Sharing | D:\MS\MODEMSHR | Program files for the modem sharing software on client PCs. |
| Windows NT Server SP3 | D:\MS\INTSP3 | Self - extracting files for Windows NT Server SP3 on Intel and Alpha processors. |
| Outlook | D:\MS\OUTLOOK | Program files for Outlook. |
| Proxy Server and Client | D:\MS\PROXY | Program files for MS Proxy Client to be used on SBS clients. |
| Client Information files | D:\RESPONSE\SERVER | Information (.INF) files used by the software to manage and setup clients. |
| Component setup files | D:\SETUP | Files used to customize and install SBS components on client computers. |
| Start Here User's Guide | D:\STARTHRE | Soft copy of the Start Here Instruction manual. |

* "D:\\" is used to reference the CD-ROM drive letter. Should the drive letter for your CD-ROM differ, the "D" should be substituted accordingly.

Upgrade Options

Microsoft and Compaq recommend the following hardware to upgrade your system.

- Additional hard disks for file storage and/or disk mirroring.

Note: Contact your local reseller or access the Compaq Internet Web site at www.compaq.com for information on obtaining additional hardware.

- More than one modem to be used for modem sharing, faxing and dial-up networking.
- Printer for printer resource sharing.
- Additional phone lines dedicated to faxing and Dial-Up Networking.
- An uninterruptible power supply (UPS).
- Additional 28.8 Kbps or greater modem for a dial-up connection to an Internet Service Provider. This is an inexpensive solution that provides satisfactory performance for up to three users.
- Integrated Services Digital Network (ISDN) modem or adapter if you have an ISDN line and are signed up for ISDN service with an ISP. This is more expensive, but provides better performance.
- Additional memory, above and beyond 64Mb, to enhance overall system performance.
- An additional network adapter if your network is to be directly connected to the Internet. This is the best solution to provide a continuous connection to the Internet.

The following software can be added to enhance your system. Contact your local reseller for information on upgrading your software.

- Customers can upgrade the standard 10 client license pack up to a 25 client license limit with the option of upgrading in increments of 5 client license packs per purchase. Customers who outgrow the 25-user limit can upgrade to the standard version of Microsoft BackOffice. If you have purchased a NFR (not for retail) version of SBS you will not be able to upgrade and are limited to 10 client licenses. To check for a NFR version choose *Start* → *Settings* → *Control Panel* → *License* and it will say NFR. NFR versions are available through Microsoft channels. Contact Microsoft or your local reseller for additional information on obtaining a NFR version of SBS software.
- Microsoft BackOffice Small Business Server 4.0 includes Microsoft Proxy Server 1.0. You can upgrade your BackOffice Small Business Server to run the newer version of Microsoft Proxy Server 2.0. Microsoft Proxy Server 2.0 offers a unique combination of web-caching performance, cost-savings and firewall security. This upgrade is recommended if you will be hosting your own Intranet and Internet Web site.
- The Small Business Server ISP Resource Guide, when combined with IIS 4.0, this provides network operators virtually everything they need to get up and running quickly to meet simple Web hosting needs. The kit includes a configuration guide, hardware and software requirements, and a modifiable auto-provisioning script for offering automated signup for access, mail and hosting services.

BEFORE YOU BEGIN

Before beginning the SBS installation process, the appropriate preliminary steps should be taken in preparation of the installation. The following criteria should be met:

- You may install SBS on a Compaq ProLiant or ProSignia server with or without using SmartStart. You will need the following:
 1. Disc 1 and Disc 2 of the Microsoft BackOffice Small Business Server software
 2. Compaq SmartStart for SBS CD-ROM

or

1. Disc 1 and Disc 2 of the Microsoft BackOffice Small Business Server software
2. 3 setup floppy diskettes for the Microsoft BackOffice Small Business Server software

If you are using Compaq SmartStart for SBS the 3 setup floppies are not required for the installation process. Note: If you are not using a Compaq SmartStart CD-ROM and do not have the 3 setup floppy diskettes, you can make the setup diskettes. Use the Winnt32.exe file located in the I386 installation directory on the Microsoft BackOffice Small Business Server CD-ROM to create a set of setup boot floppy disks.

- Review the “System Requirements” topic succeeding this section.
- If you have external devices such as modems and network hubs, make sure they are connected to the server and turned on.
- Install all internal devices to be used on the SBS server.
- Decide what you will use for an Administrator password.
- Have a formatted floppy disk ready to create an Emergency Repair Disk (ERD) during installation.
- Have floppy disks ready to create client installation disks. You will need one disk for every Windows NT Workstation or Windows 95 computer you want to add to the network.

Note: It is recommended that additional RAM and hard disk space be added if more than 10 concurrent users are supported.

System Requirements

Table 3 illustrates the minimum hardware and software requirements for SBS and SBS client computers. If the minimum hardware requirements are not met, SBS will not install.

TABLE 3
MINIMUM SYSTEM REQUIREMENTS

| Hardware/Software Components | SBS Server Requirements | SBS Client Requirements |
|------------------------------|---|--|
| Operating System* | Windows NT Server (PDC) | Windows 95, Windows NT Workstation 4.0, Windows for Workgroups |
| Processor | Pentium 120 (Pentium 200 or above recommended) | 386DX (486DX or above recommended) |
| Memory | 64MB RAM | 8MB for Windows 95, MS-DOS and Window 3.x, 16MB for Windows NT Workstation |
| Hard Disk Space | 2GB free | 60MB free |
| Video | SVGA monitor 800x600 or higher resolution | VGA or higher |
| Drives | CD-ROM drive, Floppy drive (If you are not using Compaq SmartStart for SBS) | 3.5" floppy high-density floppy drive (used to install client software) |
| Additional Peripherals | 1 Modem, 1 Network Interface Adapter | 1 Network Interface Adapter |

* Windows for Workgroups can utilize all the client features of SBS with additional configuration. Windows NT Workstation 3.x, Windows 3.x, MS-DOS, Macintosh, and Unix clients can only use file and print services with additional configuration.

The calculations for minimum hardware requirements are based on a server with 10 concurrent users. If more than 10 concurrent users will access the server additional memory and hard disk space should be used. Worksheet 1 below can be used as a general guideline to help determine the amount of initial memory. As always this worksheet is only a guideline and should not be considered as exact requirements. Additionally, consideration should be taken into account for the types of applications being used, and whether or not the apps are well written.

Note: You cannot have too much memory. This information is only a guideline. The more memory the better.

| WORKSHEET 1 SYSTEM MEMORY CALCULATION | | |
|--|-----|-------|
| System Memory | (A) | 64 MB |
| Average size of data files open per user | (B) | _____ |
| Number of users (above 10) | (C) | _____ |
| Multiply B by C | (D) | _____ |
| Average size of executable (.EXE) files run off the server | (E) | _____ |
| Number of applications being run off the server | (F) | _____ |
| Multiply E by F | (G) | _____ |
| Total System Memory Recommended is the sum of A + D + G | | |

Comparison of SBS versus standard Windows NT Installations

This section illustrates a platform comparison of the standard features and functionality changes associated with the individual operating system packages.

Features

Table 4 lists the general features provided inherently with each operating system platform. If a feature is not listed as being included with a particular platform, it can be added through an upgrade option or separate purchase.

TABLE 4
PLATFORM COMPARISON

| Feature | BackOffice SBS 4.0 | Windows NT Server 4.0 | BackOffice 2.5 |
|---|------------------------------------|---|--|
| Client License | 25 user limit* | No limit | No limit |
| Window NT Server 4.0 with following: IIS 3.0 FrontPage 97 Index Server | yes | yes | yes |
| SQL Server 6.5 | yes | no | yes |
| Exchange Server 5.0 | yes | no | yes |
| Proxy Server 1.0 | yes | no | yes |
| Outlook 97 | yes | no | no |
| Fax Server | yes | no | no |
| Modem Pooling | yes | no | no |
| SMS 1.2 | no | no | yes |
| SNA Server 3.0 | no | no | yes |
| Internet Connection Wizard | yes | no | no |
| Single Console for Mgmt. | yes | no | no |
| Client setup tools | yes | no | no |
| Server installation support | single | multiple | multiple server and multiple sites |
| Miscellaneous | Simplified integrated installation | Uses Administrative wizards for centralized mgmt. | Applications installed on multiple servers |

*If you have purchased a NFR (not for retail) version of SBS you are limited to 10 client licenses.

Installation

Table 5 describes some of the differences between the installation of Microsoft SBS and standard versions of Windows NT.

**TABLE 5
WINDOWS NT INSTALLATION COMPARISON**

| SBS Installation | Standard Windows NT 4.0 Installation |
|---|--|
| If the minimum memory and processor speed requirements are not met, you will not be able to install SBS. | Operating System can be installed, however the performance is extremely slow when minimum requirements are not met. |
| SBS requires NTFS formatting to function correctly. If a file system exists it will automatically be converted to NTFS. However, depending upon the drive configuration you may be given the option to choose either NTFS or FAT. NTFS should be chosen because SBS will not function on FAT. Furthermore, if FAT is chosen it will automatically be converted to NTFS. | You may use NTFS or FAT, the file system that's best for you depends on your business needs. |
| If you are not using the Compaq SmartStart for SBS CD to perform the installation process, the hard drive must be formatted prior to installing the SBS software. | You may format the drive during the installation process. |
| Installs Windows NT 4.0 with Service Pack 3, SQL Server 6.5 with Service Pack 3, and Exchange Server 5.0 with Service Pack 1. | Service Packs are added after the installation process. |
| SBS does not support "trust" relationships. Two or more SBS computers cannot trust each other or other Windows NT server computers. SBS only supports a single domain environment, "trusts" are not necessary. | Trust relationships are supported. |
| Changing the domain name after the installation process is complete is not recommended. Microsoft Exchange Server and Fax Server may not function properly. The only way to recover is to re-install SBS or return to the original domain name. | Changing the domain name after the installation process will not necessarily require you to re-install the operating system. |
| Dial-Up Monitor | Scaled down version when using RAS. |
| Modem Sharing allows you to share one or more modems with users. Fax Server provides a method to manage faxes and allows users to send and receive faxes without a modem. | These applications are only available with SBS, not with Windows NT 4.0. |
| MS DTC (Distributed Transaction Coordinator) | Installed with SQL; not inherent to NT. |
| Winsock Proxy (WSP) Client allows you to enable or disable the Winsock Proxy client software. The WSP client software allows the use of windows sockets applications with MS Proxy Server. | Installed with MS Proxy server or IIS. |
| DHCP and Wins Manager installed by default. SBS is automatically the DHCP and Wins server. | You have a choice of using the Windows NT server as a Wins and/or DHCP server. The DHCP and Wins Server service must be manually selected in the Windows NT TCP/IP Options dialog box. |
| Internet Explorer (IE) 4.0 does not function on SBS 4.0; however, you can run it on SBS 4.0 clients. IE 4.0 will function on SBS version 4.0a and later. | Internet Explorer 4.0 operates properly on Windows NT 4.0 SP3. |

Compaq SmartStart for Microsoft SBS CD-ROM

Table 6 provides a list of software titles and directory structure for the components and utilities found on the Compaq SmartStart for Microsoft BackOffice SBS CD-ROM. A brief explanation of each utility has also been provided. The SBS version of Compaq SmartStart differs from the standard version in that it streamlines the process of installing SBS by eliminating the need for the setup floppies and removes some of the SmartStart functionality that was provided for companies with large networks like Compaq Integration Server.

TABLE 6
DESCRIPTION OF PRODUCTS/COMPONENTS ON COMPAQ SMARTSTART
FOR SBS VERSION 1.01

| Component | CD-ROM Location | Explanation |
|--|--------------------------|--|
| System Configuration Utility v2.37A | \\SYSCFG | Configuration utility used to update Compaq system files. |
| Server Diagnostics v10.15A | \\DIAGS | Diagnostic utility that supports all Compaq server products. |
| Drive Array Advanced Diagnostics v1.40 | \\DAAD | Dos-based tool designed to run on all Compaq products that contain Compaq array controllers. |
| Compaq System ROMPaq #1 | \\CPQSUPSW\\ROMPAQ\\SYS1 | Support software bundled as a flashable ROM image. |
| Compaq System ROMPaq #2 | \\CPQSUPSW\\ROMPAQ\\SYS2 | Support software bundled as a flashable ROM image. |
| Compaq System ROMPaq #3 | \\CPQSUPSW\\ROMPAQ\\SYS3 | Support software bundled as a flashable ROM image. |
| Compaq System ROMPaq #4 | \\CPQSUPSW\\ROMPAQ\\SYS4 | Support software bundled as a flashable ROM image. |
| Compaq Array Configuration v1.10B | \\CPQACU | Setup program for Compaq Array Controllers. It is used to configure physical drives attached to the controller into arrays and logical drives that are used by the operating system. |
| Support Software for Windows NT 4.0 v2.02B | \\NTSSD | Collection of NT drivers, help information and an install utility to run Windows NT on Compaq systems and options. |
| Tandqic Tape Driver v4.00 | \\DRIVERS\\TAPE | Driver for the 4/8GB SLR tape drive that has backward compatibility with other QIC tape drives. |
| 56K Netelligent ISA Modem Driver | \\DRIVERS\\MODEM | Driver for the analog modem. Modem downloads at 56KB/s, uploads at 33.6KB/s and send/receives faxes at 14.4KB/s. Faster downloads are allowed from K56flex compliant digital sources. If a K56flex source is not used downloads will be at up to 33.6Kb/s, and will vary with line conditions. |

Note: The version numbers included in this table are to be used as a point of reference. You may have different version numbers and/or directory structure if you used a later version of the Compaq SmartStart for SBS CD, updated the utilities or if you are using the standard Compaq StartStart CD.

Technical Recommendations

SBS was designed for installation in a new networking environment. SBS will be installed as a primary domain controller. If you wish to use SBS in an existing domain network environment the following steps are recommended:

1. Take the existing primary domain controller (PDC) and its clients offline, disconnect them from the network.
2. Install SBS (can only be installed as a primary domain controller) and its components. You can use the same domain name as used on the original domain controller.
3. Power up the old primary domain controller and clients.
4. Re-install Windows NT as a standalone server or install another operating system on the old (non-SBS) primary domain controller.
5. Connect the computers to the network.
6. Use the Set Up Computer wizard to create client diskettes to allow the existing computers access to the SBS network.
7. Install the SBS client software on the client machines.
8. To completely install SBS server and the first 10 clients, 1 day should be allotted. This does not include preparation time required to familiarize yourself with the software and installation process. This time frame does account for nominal errors that may arise.

Assessing the underlying network

The underlying network affects and constrains your overall network performance and operation. This section will explain and clarify some of those issues to help you choose appropriately.

Network Cabling

There are many network cabling schemes, but small businesses typically choose thin Ethernet, or twisted pair Ethernet. Token ring and thick Ethernet can work well in large organizations because they support many PCs in a relatively large area, but their additional cost and support requirements make them unpopular in small businesses. Thin Ethernet and twisted pair Ethernet do not support as many computers over as large an area, but their lower costs and easier configuration make them attractive to small businesses.

The differences between Thin and twisted pair Ethernet are the number of PCs they can support without additional hardware and in the physical area they cover. Thin Ethernet supports up to 30 PCs per segment, and the segment can reach 185 meters. Twisted pair networks are limited by their hubs, which typically support 4, 8, 12, or 24 computers located within 100 meters of the hub.

Since your SBS network will consist of 25 or fewer computers and as long as they are in a small enough area for either network to reach them all, the main difference is cost. Network cable costs vary considerably, but additional T-connectors and terminators for thin Ethernet are cheaper than twisted pair hubs. However, T-connectors are uncommon in this day in age. If you eventually expand your business and upgrade to Microsoft BackOffice, be sure and take this into consideration when choosing your cabling.

Expansion and maintenance affect cost. Thin Ethernet expansion can be easier. Adding a fifth PC to a thin Ethernet network requires only a new cable and terminator, but adding a fifth PC to a twisted pair Ethernet based on a 4-port hub requires adding a second 4-port hub or moving up to an 8-port model. However, thin Ethernet installation, troubleshooting, and maintenance are often more disruptive and time-consuming (and therefore more expensive). A damaged, defective, or

mis-connected thin Ethernet cable often disrupts the entire network, as does cable replacement, whereas similar problems and repairs on twisted pair Ethernet networks usually affect only one computer.

Dial-Up Networking

Dial-up networking requires communications hardware, typically a modem. Speed is the main factor when choosing a modem (generally, the faster the modem the more it costs). Nearly all new modems support at least 14.4 Kbps, but that is slow by the rising standards of communication and many people want models that support 28.8 Kbps or higher. Consider your users' time and the nature of your business: although a 28.8 Kbps modem is more expensive than a 9600 bps modem, it can transfer a 1 MB file in five minutes whereas the latter takes 15 minutes.

Linking LANs Together

Linking two thin Ethernet networks requires a device called a repeater that forwards (repeats) data between the networks plugged into it. Linking two twisted pair networks requires a cable to connect the two hubs.

If LANs are not close enough to link with a repeater or cable, you need routers that support your network protocols; most routers support TCP/IP and/or IPX (NWLink is compatible with IPX).

Network Adapters

There are hundreds of network adapters on the market, but most resellers stock only a few. Three criteria can help you select an adapter:

- Is a driver available for this adapter and for your operating system?
- Microsoft supplies many drivers; the supported adapters are listed by official make and model name on each operating system's Hardware Compatibility List. Adapter manufacturers may also supply drivers.
- Will the adapter plug into your computer?

There are several standards for adapter slots, and each computer typically supports only one or two of those standards. The network adapter's name usually includes the name of the slot for which it is designed, such as ISA, EISA, PCI, VESA Local Bus (VLB), Microchannel Architecture (abbreviated MC or MCA), PCMCIA, or PC Card.

An adapter's name also includes the type of cabling it supports, if you know what to look for. Ethernet adapters often include *Ether*, *ENET* in the name, if nothing is included it is usually an Ethernet adapter. Thin Ethernet adapters may identify themselves with *BNC*, *Co-ax*, or *Coaxial*. Thick Ethernet adapters may include *AUI* or *DIX*. Twisted pair Ethernet adapters may have *T*, *TP*, *UTP*, *STP*, or *RJ-45* in the names. Token ring adapter names often include *Token*, *TR*, or *16/4*. Adapters for high-speed networks may specify *FDDI*, *FX* or *CDDI*.

Compaq offers a wide-range of network adapters to choose from which meet all of the criteria you should use to select your network adapter. For information on the full range of network options Compaq offers, visit the Internet WEB site at www.compaq.com. Table 7 below illustrates some of the names of Compaq network adapters with a description of each.

TABLE 7
EXAMPLES OF COMPAQ NETWORK CONTROLLERS

| Adapter Name | Description |
|-------------------------------------|--|
| Netelligent 10/100 T/2 PCI UTP/Coax | 10 or 100Mb/s PCI twisted pair and coaxial cable adapter |
| Netflex 3/E | 10Mb/s Ethernet EISA bus mastering adapter. |
| Netflex 3/P | 10Mb/s Ethernet PCI bus mastering adapter |
| Netflex-2 Enet-TR | EISA bus master network adapter supporting both Ethernet and Token Ring. |
| Netflex 3/P 100Base-TX UTP | 100Mb/s Ethernet PCI bus mastering twisted pair adapter |

Beyond these basic compatibility issues, network adapters vary widely in performance and ease of configuration. There are high-performance adapters designed for servers subjected to extreme demands. If your network includes a variety of client makes and models, you should consider how easy the adapter is to configure.

INSTALLATION OPTIONS

The installation process is similar to that of other Microsoft products. You have the choice of either a Complete or Custom installation. The Complete installation installs everything you need to use all the features of SBS and is highly recommended. The Complete installation requires 604 MB of hard disk space. The Custom installation lets you select which components you wish to install on your system. You can install any component by running setup again.

The Complete installation by default requires 604 MB of hard disk space, everything is selected except the Microsoft Index Server Language Resources (1MB) and Online Documentation (0.5MB).

You have the option of installing SBS using SmartStart or without using SmartStart. If you choose to install SBS using SmartStart you may use either Compaq SmartStart for Microsoft Small Business Server CD or the standard version of Compaq SmartStart and Support Software CD. For additional information on what to use for the SBS installation see "Before you Begin" on page 6 and the following sections "Installation using SmartStart" or "Installation without using SmartStart" on page 15 of this white paper.

Server Preparation

Verify that the following tasks have been completed before attempting the installation process:

- Make sure minimum system requirements have been met.
- Make sure you have obtained appropriate installation CD-ROMs and floppy diskettes.
- At a minimum, make sure you have read the following sections of the Start Here Guide: "Chapter 3 Installing BackOffice Small Business Server", "Chapter 4 Getting Started with Small Business Server" and "Appendix B Technical Reference for Small Business Server."
- Make sure you have blank floppy diskettes for the ERD and client set up.

- Make all external devices have been connected and powered up, and that internal devices have been installed.
- Make sure the hard drives have been formatted if you are not using Compaq SmartStart for SBS.

Installation using SmartStart for SBS

SBS can be installed using the Compaq SmartStart for Microsoft BackOffice Small Business Server or the standard version of Compaq SmartStart and Software Support CD. The Compaq SmartStart for Microsoft BackOffice Small Business Server CD has been tailored to meet the needs of SBS customers using the Compaq ProSignia 200. If you are not using this server you can still use the Compaq SmartStart for Microsoft BackOffice Small Business Server CD, however you will receive the following message:

This system is not currently supported with this revision of SmartStart. Please select one of the following options:

[1] Continue with SmartStart

[2] Quit SmartStart

Press 1 to continue with the installation process. The SBS software will be installed successfully.

The Compaq SmartStart for Microsoft BackOffice Small Business Server CD provides the following advantages:

- Eliminates the need to use the MS SBS installation setup floppies.
- Eliminates the need to pre-format the drive because it formats the drive before the installation process has begun.
- Simplifies the SmartStart installation process by bypassing SmartStart options only available for customers with large multiple server networks, such as installing Compaq Integration Server.

To install MS SBS using the Compaq SmartStart for Microsoft BackOffice Small Business Server CD on a drive that has not been previously formatted the following steps are required:

1. Power on the server.
2. Insert the Compaq SmartStart for SBS CD version 1.01 or later. Press *F1* to continue if the system has not been previously formatted or configured.

If you are using Compaq SmartStart for SBS version 1.01 on a Compaq server other than a ProSignia 200 you will receive a message stating that the system is not supported. Press 1 to continue the installation process.

If the system is formatted and already has data on the hard drive, you will be prompted to choose whether to ERASE the system or not. To continue with the install, you must ERASE; however, if you choose to ERASE, all data on the installation hard drive will be destroyed. Make sure adequate backups of the data exist before proceeding.

SmartStart will copy files to the System Partition, format and prepare the main partition for the installation process. Multiple reboots occur during this process. After the preparation stage of the Compaq SmartStart for Microsoft BackOffice Small Business Server setup you will receive the following message:

For some installations using ISA modems, adjustments to System Configuration Information may be necessary.

Please select one of the following options:

[1] *Run the System Configuration Utility*

[2] *Continue*

Additional information on configuring modems can be found in the section entitled “Adding ISA Adapters to Compaq Servers” on page 26 of this document.

If the modem is not configured correctly, later SBS installation steps may not recognize the modem hardware and prevent you from installing and configuring SBS features that rely on the modem. After reviewing the section entitled “Adding ISA Adapters to Compaq Servers” on page 26 of this document, follow the instructions on the screen to complete the installation process. The setup process for Windows NT server will begin.

Installation using the Standard Version of Compaq SmartStart

You can use a standard Compaq SmartStart CD for installing SBS, however you must choose the manual installation path and you will need to use the setup floppy diskettes provided with the SBS software.

1. Power on server.
2. Insert the standard Compaq SmartStart and Support Software CD.
3. Click the button to use English during the SmartStart process option and complete the System Settings information.

Tip: If you do not see the screen that allows you to select your language initially. Select the option to *Run the System Configuration Utility* and continue. After the system has cycled down, the appropriate screen should appear. If the correct option to select your language still does not appear, then choose the option to *Run the Eraser Utility* and continue. **Warning: All data on the hard drive will be erased when you select this option.**

4. Under Installation Path choose *the Manual Configuration* option and select *Begin*.
5. Next, the Compaq SmartStart – Operating System Selection dialog box will appear. Select the Microsoft BackOffice Small Business Server Version 4.0 check box. Choose *Next* and then *Continue*.
6. At the SmartStart for Compaq Servers dialog box choose the option to *Continue with SmartStart* and press *Enter*.
7. At the Reboot dialog box, insert the Microsoft SBS Setup Boot Disk #1, remove the Compaq SmartStart CD, and press *Enter*.
8. The Microsoft SBS setup process will begin. Follow the instructions on the screen to complete the installation process.

Installation without using SmartStart

To install SBS on a computer without using the Compaq SmartStart for SBS CD, the hard disk must be previously formatted. If the hard drive is unformatted you must create a MS-DOS bootable floppy diskette with the FDISK and FORMAT commands to partition and format the hard drive.

If the hard drive has not been formatted you will receive Stop 0x0000001E blue screen error message. If the hard drive is greater than 2GB you should not create a boot partition of greater than 2GB, the remaining free space can be repartitioned using Disk Administrator after the installation process to store data.

Note: If the modem is not correctly configured, later SBS installation steps may not recognize the modem hardware and prevent you from installing and configuring SBS features that rely on the modem.

Note: Information in this section was provided from testing performed using standard Compaq SmartStart version 3.50.

To install SBS without using SmartStart and no operating system is currently installed the following steps are required:

1. If the hard drive has not been formatted, partition and format the hard drive. Power down the computer.
2. Insert the floppy disk labeled "Small Business Server Setup boot Disk 1" into Drive A.
3. Turn the system back on. The Setup program should start. Follow the instructions on the screen. If you need additional installation instructions see Chapter 3 Installing BackOffice Small Business Server in the Start Here Guide.

Upgrading your system

You can upgrade your beta or evaluation copy of SBS. If have already upgraded to the final version of SBS, you need to perform the following steps to complete the upgrade. If you do not complete the following steps, you may receive the following error: "Your evaluation copy of Windows NT server has expired, the server will shut down now."

The following precautions are recommended before running the update program:

- Save all work in programs that are currently running and then close all programs.
- Make sure your users close all files and connections that are open on the server.
- You can send a message to all users on your network to inform them that the server is about to be shut down and that they should save their work and then close any files or connections they have open on the server. To send a message to all Small Business Server users on your network, type the following command at the command prompt and press *Enter*:
net send /DOMAIN Warning! Your server is being restarted for maintenance. Close all your open files on the server.
- You can view all currently connected users from the Manage Connected Users page in the Small Business Server console. To view connected users perform the following steps:
 1. Click the Tasks tab, then click Manage Shared Folders.
 2. Click Manage Connected Users. Click Disconnect All Users. You will be prompted with the following message: "Are you sure you want to close all sessions?" Click Yes.
- Update your Emergency Repair disk with your current settings. To update the Emergency Repair disk perform the following steps:
 1. Insert your Emergency Repair disk into *drive A*: (or blank floppy disk if you do not have an Emergency Repair disk.)
 2. Click the More Tasks tab, then click Manage Disks. Click Create an Emergency Repair Disk. Follow the instructions on the screen.
- Back up your system. Make sure that you have backed up before you start the upgrade. Note you must have a tape backup drive installed in order to perform a backup.

To complete the upgrade process perform the following steps:

1. Insert the Microsoft BackOffice Small Business Server disc number 1.
2. From the Start menu, click Run.
3. Enter *d:\<i386>winnt32.exe /u* where "*d:*" is the drive letter corresponding to your CD-ROM drive.

If you have not upgraded your computer and you are currently running the Windows 95 or Windows NT operating systems, perform the following steps:

Insert the Microsoft SBS Disc 1, into your CD-ROM drive.

On the desktop, double-click the *My Computer* icon, and then double-click the icon for your CD-ROM drive.

The CD-ROM window appears.

Double-click the *Sbssetup.exe* icon. Or, run *sbssetup.exe* from the root of disc 1.

The Small Business Server CD-ROM window appears. Follow the instructions on the screen.

Working with the To Do List

The To Do List is a friendly interface for SBS configuration and maintenance. The Tasks available from the To Do List are necessary to allow employees to use the server. These tasks are *Add a New Printer*, *Add a New User*, *Set Up a Computer*, *Sign Up with an Internet Service provider*, *Add User Licenses* and *Create an Emergency Repair Disk*.

Add New Printer

This task brings up the Add Printer Wizard that is exactly like the standard Add Printer Wizard in Windows NT 4.0. It helps you to install a printer or make printer connections.

Add New User

This task launches the User Account Wizard this wizard steps you through creating user accounts, setting up access rights, and assigning access to shared folders, modems and the Internet. It automatically creates a mailbox for the user and eliminates the need to understand local and global groups. This wizard eliminates the need for the Administrator to use User Manager and has greatly simplified the tasks of creating accounts and assigning permissions. However, all administrative utilities have been included and can be used if you prefer.

Set Up a Computer

This wizard creates a setup floppy disk to be used to allow new or existing clients to use SBS. Use the following steps to set up the client computer:

1. Start the computer you want to set up.
2. Log on to the computer with an account that has administrative rights.
3. Insert the setup disk.
4. Click *Start* → *Run* and type "a:\setup.exe".
5. After setup has completed and the computer has rebooted, log on to the computer.

Sign up with an Internet Service Provider

This wizard opens an Internet tutorial, it will provide you with a temporary sign-up telephone number, provide you with a list of Internet service providers in your area and allow you to complete the online sign up form for the provider that you choose.

Add User Licenses

This wizard allows you to add client license packs up to a maximum of 25 users (with the exception of the NFR version, see page 6 for details). It will display the number of client licenses your company currently has. You can use the *Add New User* wizard to create as many users as you wish. However, only the number of user licenses you have purchased can connect to the server at one time.

Create an Emergency Repair Disk

This task performs the same function as running the “*rdisk*” command. It allows you to create or update the Emergency Repair Disk. It will save your current system settings on a floppy disk that can be used to restore or recover your computer to a bootable system. This utility should not be used as or in place of a backup tool, only system configuration information is saved.

COMPONENT CONFIGURATION

This section contains various tips, and optimization and tuning recommendations for some of the SBS components.

Windows NT Server 4.0 - Optimization and Tuning

SBS has been designed for optimal performance for small business with 25 users, however individual configurations can affect the default settings.

There are a few things that can be done when tuning for "Memory" Performance the list is as follows:

- Schedule memory-intensive applications during off-peak hours. You can use the AT scheduler that ships with Windows NT. For example, it would be better to do a Tape backup during off hours rather than when users are heavily utilizing a system.
- Add more memory. Worksheet 1 on page 8 can be used as a guideline to help determine memory requirements. However, keep in mind that you cannot have too much memory. The more memory the better.
- Spreading paging files across multiple disk drives and controllers generally improves performance. If you have separate controllers or controllers that perform simultaneous read/write of two drives, the system performance improves significantly, especially when a large amount of paging activity occurs. You can have a separate page file for each logical drive. If you have more than one physical hard drives, so that the page files are on separate physical drives, then concurrent swapping can take place, resulting in better response times under heavy paging activity. But, if you have one physical hard drive it is not advantageous to split up your page file so that it resides on separate logical drives.

Use the *Control Panel* → *System* → *Performance* → *Change* and set the page file size. The initial page file size should be set to the recommended value, eliminating the time required by the system to set the page file size to the recommended value.

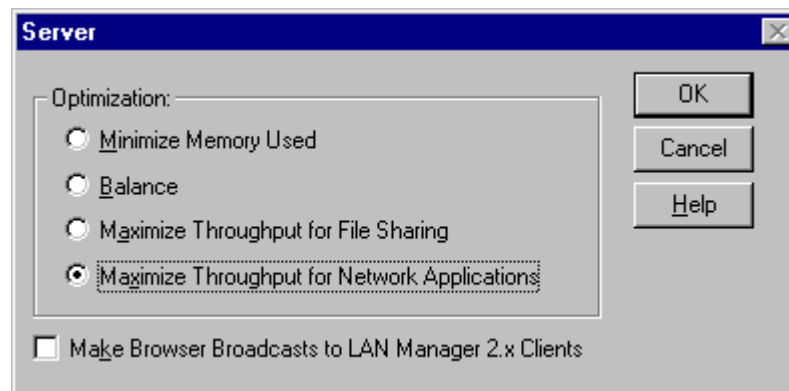
There are a few things that can be done when tuning for "Processor" Performance the list is as follows:

- Schedule CPU-intensive applications during off-peak hours. You can use the AT scheduler that ships with Windows NT.
- If you have control over the application source, you may want to investigate tuning the application to be less CPU intensive. There are a number of tools available with the Windows NT SDK that allow you to do this, such as WAP (Windows API Profiler), CAP (Call Attributed Profiler), FIOSAP (File I/O and Synchronization Win32 API Profiler), and Win32 API Logger.
- Upgrade the processor if possible.
- Add more processors, assuming there is more than 1 thread capable of asynchronous execution. If you have a multiple processor computer, Windows NT will assign separate

threads to different processors (interrupts are also distributed). The thread execution load is then distributed across the multiple processors. For example, if a CPU-intensive thread is executing on processor A, processor B will be free to process other threads.

- Upgrade the secondary cache.
- In a client-server environment, the addition of another CPU will typically give a better performance increase than upgrading to a faster or more advanced processor because of the multithreaded design of all Microsoft BackOffice products.
- Use this dialog box under *Control Panel* → *System* → *Performance*, to change the relative responsiveness of applications that are running at the same time. When more than one application is running in Windows NT, by default in SBS the background application receives more processor time, and so responds better, than applications running in the foreground. This means that the network applications and services will be more responsive (faster). Changing the setting to maximum makes the local applications faster.
- The Windows NT Server service's responsibility is to establish sessions with remote stations and receive SMB (Server Message Block) request messages from those stations. (SMB requests are typically used to request the Server service perform I/O—such as open, read, or write on a device or file located on the Windows NT Server station).

You can configure the Windows NT Server service's resource allocation (and associated nonpaged memory pool usage) by using the *Control Panel* → *Network* application. When you use *Control Panel* → *Network* → *Services* → *Server* → *Properties* to configure the Windows NT Server service software, you are presented with the following Server Optimization Level dialog:



This setting is not valuable to MS-SQL Server because it does its own memory management. This is only valuable to Client/Server applications that do not do their own memory management.

The following recommendations are made:

Minimize Memory Used – Use if you 10 network users or fewer.

Balance – Use if you have the maximum of 25 network users.

Maximize Throughput for Network Applications – Usually used on computers running NT server on a large network. It optimizes server memory for distributed applications that do their own memory caching, such as MS SQL.

MS Exchange Server 5.0

SBS is specifically designed for businesses with 2-25 PC's working from one central location. The Exchange connectors will not work with SBS. Under SBS, MS Exchange defines its own organization and cannot connect with other Exchange Server organizations.

Replication servers are not included with Exchange. They are not needed in a single server environment.

Proactive tools will allow you to detect problems before they occur so that you can fix them before they impact your enterprise communication. Below is a brief discussion of three tools that can be used:

- *Link Monitor* generates alert messages if a link is down or unusually slow.
- *Server Monitor* generates alert messages or consequent actions if a service or a server is down.
- *Performance Monitor* generates alert messages if a set counter value is out of range.

Link Monitor

Link Monitor is a proactive process that checks for problems with message connections or network connections. Link monitors are created and started from the Administrator program. They generate notification in the form of mail messages, network alerts or applications, such as a pager program, when a test message fails to make the round-trip from the monitored object in a pre-determined length of time.

Test messages, also known as ping messages, can be sent to remote system attendants, valid Microsoft Exchange or foreign addresses with an automatic program replying to the ping message, or invalid addresses which will generate a non-delivery report.

By setting up strategic link monitors, the administrator can actively search for possible network and message link glitches and overload to ensure better system performance and reliability.

Server Monitor

Server Monitor is a proactive process that check for problems with all servers and all their services. Server monitors are created and started from the Administrator program. They generate notification in the form of mail messages, network alerts or applications such as a pager program when a monitored service is not running.

The server monitors send RPC requests to each of the monitored servers inquiring about their monitored services. The monitored servers check all services listed in their directories as monitored services and report their condition. When a service is reported as not running, three different actions can be taken independent of the notification: take no action (notification only), restart service, and restart server if possible. Server monitors can also be used to monitor servers' internal clocks and synchronize clocks using the time zone information obtained from the Windows NT operating system.

By setting up strategic server monitors, the administrators can actively search for possible server glitches to ensure better performance and reliability.

Performance Monitor

The Windows NT Performance Monitor can track the real-time operation of all Microsoft Exchange Server components, or it can be used to gather statistical information to determine the normal range of system and network operating conditions. The Performance Monitor can be used to detect bottlenecks, monitor queues, monitor configuration parameters, and tune performance.

Reactive tools allow you to find the causes of problems after they occur. The primary objective is to avoid using reactive tools as much as possible by utilizing all the preventive and proactive tools to set up a working enterprise system. The reactive tools that we will mention are:

- *Windows NT Event Viewer* filters and sorts out logged events, including successful and failed events, logon attempts, and directory and security alerts.
- *Windows NT Server Manager* configures services and server shares on all visible Windows NT-based machines.
- *Pviewer.exe* manages processes on a Windows NT-based machine.

Some of these tools can also be used as proactive tools. The only reason they are classified as reactive tools is because administrators usually use these tools to track down problems after they occur.

Windows NT Event Viewer

Event Viewer is used by all Microsoft Exchange services to store errors and events. This should be the first place to look for evidence of configuration flaws or problems on a Microsoft Exchange server.

There are three type of logs in which events are recorded: system, security (audit) and application. All users can view system and application logs; only administrators can view security logs. All Microsoft Exchange services write to the application log. Services will only write to security log when there is a security breach.

One of the advantages of using the Event Viewer is that you can administer all Windows NT events in one shell. Another advantage is you can filter the information so that tracking an event can be easy.

Each major Microsoft Exchange component also logs events to its own log file for easy access and backup. There are four levels of logging that you can configure through the Microsoft Exchange Administrator program:

- No Logging.
- Low Level Logging--Logging of fatal conditions only.
- Medium Level Logging--Logging of near-fatal conditions only.
- High Level Logging--Logging of all events and conditions.

When the log levels are configured to track all events and conditions, you should back up and remove the log files more often to avoid consuming hard disk space. Also, extensive logging will impact both process and hard drive performance.

Windows NT Server Manager

Windows NT Server Manager is another Windows NT tool leveraged by Microsoft Exchange Server client-server messaging and groupware. The Server Manager allows administrators to access the services and server Control Panel options of any Microsoft Exchange server remotely. It can also be used to promote a server to PDC or synchronize Windows NT information in a domain if there is any problem with the PDC.

This tool allows the administrator to validate whether the RPC and Microsoft Exchange related services are still running in a given server. The administrators can also use this tool to send network alerts to users when stopping any services, stopping any file sharing or restarting the computer.

Pviewer

Pviewer.exe is a utility included in the Windows NT Resource Kit. It allows support professionals to view and stop any process running on the Windows NT-based machine. Pviewer also provides status on memory usage and process usage.

Pviewer is commonly used to stop processes that don't have a user interface and do not appear in the Task List. One such process is the MAPI spooler, MAPISPL32.

There are numerous areas of opportunity in a program such as Microsoft Exchange Server. Just as any enterprise software, Microsoft Exchange troubleshooting does require a certain methodology and knowledge. One suggested methodology is to narrow down the problems and isolate each stage to keep the investigation as simple as possible. Additional information on general troubleshooting can be found in the section entitled "Basic Troubleshooting Strategy" on page 30 of this white paper.

SQL Server 6.5 – Optimization and Tuning

This section will list a some performance boosting techniques you can use when creating your SQL database.

Use *SMALLINT* instead of *CHAR* to save time. Most database administrators and developers will often assign the *CHAR* data type to columns holding only numeric information because the *CHAR* data type can hold anything and is a good catch-all. However, specifying *CHAR* for numeric columns can decrease performance with filters and join conditions and can increase storage requirements.

Tip: When you create columns that contain only numeric information, define the column data type as *SMALLINT* instead of *CHAR*. SQL server saves *SMALLINT* values in 2 bytes of data. This saves you a significant amount of CPU work during join operations or filter conditions, especially if you are processing several rows of data.

Prevent substring searches to increase performance. When search criteria in a SQL statement start at the leftmost position of a column and move right, searching through the indexed character data is easier than when the search criteria begins in the middle of the data, in otherwords, in a substring. For example, suppose you have to locate two types of information in a phone book:

1. All last names starting with a capital "L"
2. All entries with a lower-case "l" as the third letter in the last name.

The first request is easy because the phone book is already indexed (last name, first name). You simply turn to the "L" section of the book and read through the names until you find the first entry with a last name starting with "M".

For both machines and humans, the second request is harder to process and takes more time than the first. With the phone book, you have to read the first three letters of every entry from cover to cover and mark all entries that have "l" as the third letter. The optimizer will have to operate sequentially on what could be an enormous table, which definitely hurts performance.

Tip: If you must sometimes sort on a non-initial substring, divide the column in question into several smaller columns that you can index. This revision help accelerate searching, joining, and sorting.

Don't assign too much memory. The SQL Enterprise manager lets you set the amount of memory dedicated to SQL server. If you allocate too much memory to SQL server, you increase the burden on NT by denying it valuable memory resources necessary to service other tasks.

Tip: The most logical approach to allotting memory to SQL server is to raise the value gradually and monitor performance carefully between changes. If caching rates don't improve after an

increase you've reached the optimal memory value. Also keep track of the swap rate, raising the memory value can inadvertently increase swapping.

Avoid highly duplicate indexes. A highly duplicate index contains a limited number of unique values. For example, if you place an index on a column that contain only two or three values, that index is highly duplicate. Having a highly duplicate index on a column is worse than having no index at all. The database engine must work a lot to process a highly duplicate index during operations such as inserting, updating or deleting data. You can determine whether an index is highly duplicate by running the Database Consistency Checker (DBCC) *SHOW_STATISTICS* command or selecting the Index Distribution Statistics option on the Index Information screen in SQL Enterprise Manager.

Tip: To avoid performance degradation when you must search or sort a highly duplicate value, combine the column in question with a column containing more selective values. This step creates a composite index.

Use the *UPDATE STATISTICS* command. To process indexed database operations as efficiently as possible, SQL server keeps track of index key values. To do so, SQL server runs the *UPDATE STATISTICS* command when you create or re-create an index. If your key values change and you don't refresh the key distribution statistics by running *UPDATE STATISTICS*, the optimizer can make a wrong query-processing decision base on this old information. Although old key distribution statistics will not affect the data the engine return, they can substantially slow system performance.

Tip: If you expect your key values to change over time, periodically rerun the *UPDATE STATISTICS* command.

Prevent long transactions. In addition to protection data, the transaction log has an important effect on database speed. One crucial transaction log performance issue is the length of your transactions.

Tip: Keep your transactions as brief as possible because long open transactions can wreak havoc on database application performance.

Place the transaction log on a separate drive. SQL server lets you choose where to store the transaction log. For most read and write applications, the transaction log is a heavily accessed disk structure because it is at the core of SQL's data integrity architecture.

Tip: To accelerate I/O performance, place the transaction log on a different physical drive from the database. Another reason to put the transaction log on a different device is so that you can periodically perform transaction log dumps without having to back up the data.

Use one large database. Dividing information into several small databases can slow performance. One way SQL server speeds processing is to use its memory buffers (cache) to reduce disk I/O. These memory buffers hold data, indexes and stored procedures. When a SQL application must access one of these resources, the engine first looks in the appropriate memory cache area. On a busy system, many such requests are satisfied from memory rather than from disk. If you divide your data into many small databases, chances are users can't share much of the information stored in memory, which leads to degraded performance.

Tip: although you sometimes need multiple small databases, try to use one large database. To limit data access to appropriate users, you can choose among other methods such as key design and views. Reducing the number of times the engine must make a disk inquiry accelerates the process.

IIS Server 3.0 and MS Proxy Server 1.0

These two components will provide assistance establishing the business on the Internet. Connecting to the Internet means opening an account with an Internet Service Provider (ISP), this can provide a wide range of services to the small business customer, such as Web access and e-mail.

Since most small businesses will not want or need a full-time connection to the Internet, Small Business Server is designed to make it possible for ISPs to give small businesses the same services they give their customers that are connected full-time. ISPs that support Small Business Server are able to host a customer's Web site and receive and store their mail while the customer is offline. Thus, while the customer may be connected to the Internet part-time, they have a full-time business presence. Furthermore, Small Business Server and the ISP work together to provide these services reliably and securely.

Small Business Server simplifies the process of getting connected by providing customers with online referrals to ISPs and automatic sign-up and server configuration. By supplying some basic information through the Internet Connection Wizard, customers can very quickly have e-mail and Web capabilities.

IIS maintains its own cache, separate from the one maintained by the operating system. To increase the performance of IIS make the following adjustment to the following Registry key: HKEY_Local_Machine\System\CurrentControlSet\Services\InetInfo\Parameters

Value name: MemoryCacheSize
Data Type: REG_DWORD
String: 6144000

If this key does not exist you can create it. The default value (string) is 3072000 (3MB) represented in bytes. The range is from 0 to 4096000 (4GB). A value of 0 disables caching and severely affects the performance of IIS. Set this value to 10% of your total server memory, if you have 64MB of RAM set the value to 6144000 (6MB) or 7168000 (7MB).

Modem Sharing Server

Modem Sharing Server allows SBS clients the ability to connect to modem pools. SBS relies heavily on modem usage to provide clients with access to fax services, dial up networking, and the Internet. As such, Microsoft requires that at least one modem be installed in the server when installing the SBS server software. When modems will be used to provide multiple clients with access to fax services, dialup networking and Internet access; Microsoft and Compaq recommend that you install more than one modem.

A modem pool consists of two to four identical modem devices associated with one modem. Pooling modems under SBS allow individual users to select the modem pool they wish to use, and the next available modem in that pool will automatically be chosen to perform the task. Users do not have to specify a certain modem to perform a specific task.

Modems must be identical to be pooled under SBS. Therefore when purchasing additional modems for the SBS server you must purchase the same type of modem currently installed in the server. If you purchase a different modem it will have to be structured in a separate modem pool. In this scenario, if one pool is busy and it is chosen to perform a task, the task will be delayed even though a modem in another pool may be unused at that time.

WARNING: Using the Registry Editor incorrectly can cause serious, system-wide problems that may require you to reinstall SBS to correct them. Use this tool at your own risk.

Adding ISA Adapters to Compaq Servers

A brief description of how to add ISA adapters to Compaq Servers is included. When adding new ISA adapters to Compaq Servers different methods should be used depending on whether the server is an ISA based server (ProSignia 200) or an EISA based server (ProLiant 1600 or 2500).

ISA based servers will support ISA Plug and Play adapters in Plug and Play mode through the use of the Compaq System Configuration Utility (Config Utility). If problems arise, Plug and Play adapters can be installed in Legacy mode. The same procedures used when installing Legacy mode adapters on EISA based machines can be used to install adapters in Legacy mode on ISA based servers.

A standard SmartStart and Support Software CD can be used to create System Configuration Utility floppy diskettes if the Config utility has not been installed on the hard drive (4 floppy diskettes are required.) Follow the steps below:

1. Insert the standard SmartStart and Support Software CD.
2. Choose Create software diskettes from CD only and click Next.
3. Under Select the diskette sets to be created, choose Compaq System Configuration Utility. Choose Next and follow the instructions on the screen.

EISA based servers will not support ISA adapters in Plug and Play mode. Therefore, ISA adapters in an EISA server need to be used in Legacy mode. The method used to add ISA adapters will be different depending on the type of system (EISA based or ISA based).

Installing in ISA based Servers (Plug and Play Mode)

When adding an ISA adapter that supports Plug and Play to any of the ISA based Compaq Servers you can take advantage of the Plug and Play support available through the Config Utility.

Before adding the adapter make sure it is in Plug and Play mode. For instructions refer to the User's Manual that came with the adapter.

1. Install the adapter in the server.
2. Follow the instructions that came with the server.
3. Run the Config Utility.

The Config Utility will automatically set the appropriate resources for the adapter. For each ISA adapter found, the Config Utility will prompt the user to select the physical slot number the adapter is installed in. When Config is complete all necessary resource assignments will be completed, such that there are no resource conflicts.

Note: During testing of the SBS software it was found that some ISA adapters do not have unique Serial ID numbers. While this is allowable with Plug and Play, it will cause problems if two of the same adapters (same vendor, same model) without unique ID numbers are installed in one machine. The Plug and Play segment of the Compaq System Configuration Utility will be unable to identify both adapters when this happens. If the Config Utility does not prompt the user to assign a slot number for all the new adapters added to the system, then most likely all adapters were not identified. When this happens it is recommended that the new adapters be installed in ISA Legacy mode rather than Plug and Play mode. Use the steps identified in the "Installing EISA based Servers (Legacy Mode)" section of this white paper, as a guide.

Installing EISA based Servers (Legacy Mode)

Since EISA based servers do not support ISA adapters in Plug and Play mode they must be changed to Legacy mode to be installed in the server. To use the adapter in Legacy Mode the user must run the Config Utility prior to installing the ISA adapter. This will help prevent possible resource conflict. Using the Config Utility will allow the user to set up the ISA adapter with the required resources. For additional details, and information regarding the settings that should be used refer to both the server and ISA adapter documentation. Use the following process as a guide to install the adapter in Legacy mode:

1. Run the Config Utility on the server. This will allow you to set up and reserve the appropriate resources for the adapter.
2. Make note of the settings selected for the adapter.
3. Install the adapter. Make sure that the resources assigned on the ISA adapter match the resources assigned using the Config Utility.

UNINSTALLING SMALL BUSINESS SERVER

There is no command inherent to the operating system that will allow you to uninstall SBS. The following steps can be followed to uninstall SBS (if you are booting multiple operating systems, do not perform these steps):

1. Obtain a bootable floppy diskette with the following utilities (a DOS 6x or later formatted diskette is recommended):

FDISK
FORMAT

DOS version 6.0x or later must be used to delete an existing NTFS partition.

2. Back up important data. Deleting a partition will erase all data.
3. Turn off the computer.
4. Insert the bootable diskette into the floppy drive.
5. Turn on the computer. (The Command Prompt will be at the "A" drive.)
6. Enter the following at the Command Prompt:

FDISK

(This starts the procedure to delete the primary partition).

7. Select "Delete partition or Logical DOS drive".
8. Select "Delete the Primary Partition" or "Delete Non DOS Partition" if existing partition was NTFS. (A new screen appears listing the primary partition information.)
9. Enter the number of the partition to be deleted at the bottom of the screen.

WARNING: All data will be lost.

- 10) Press *ENTER*.

The steps listed below are optional. They can be used to install DOS as the new or temporary operating system.

CAUTION: This procedure requires the user to delete partitions. When a partition is deleted, all data on that partition is deleted as well.

1. At the Command Prompt, enter the following:
FDISK
2. Select “Create DOS partition or Logical DOS drive”.
3. Select “Create Primary DOS partition”.
4. Select the desired size of the partition. (A new partition will be created.)

GLOSSARY OF TERMS

The following section will provide a description of common terms used in this white paper.

| Term | Definition |
|------------------|--|
| 4/8GB SLR | Fifth generation industry standard QIC tape drive, which ranges from 125MB to 4GB of native format. |
| SLR | Single-channel Linear Recording. The new designation for lower capacity, 5.25-inch half height tape drives. |
| NFR | Not For Retail. Non-upgradable license pack obtained through Microsoft channels that limits the user to a 10 client limit. |
| System Partition | Special area of the fixed disk which can contain Compaq configuration, diagnostic and maintenance utilities. These utilities are more readily available and run faster when installed on the system partition. |
| Legacy adapter | An expansion card that does not have built-in Plug and Play capabilities. Legacy mode specifies a mode of operation without Plug and Play features. Until late 1994 all adapters were legacy adapters. |
| K56flex | A protocol designed to allow faster downloads from K56 flex compliant digital sources. |

TROUBLESHOOTING

The following section discusses some known issues without workarounds at the present time and issues and error messages with workarounds associated with using SBS.

Known Issues

The server network interface card (NIC) must be connected to a HUB to correctly install network services. Services like Exchange will not be correctly configured and started if there is no connection to a HUB during the installation of SBS.

SMS is not supported in this release of SBS. There will be an upgrade path to BackOffice SBS for those needing the functionality of SMS.

Fax Services does not support Macintosh users.

When you Shutdown your system, SBS it appears to hang while displaying the “Shutdown in Progress” dialog box. The shutdown process is extremely slow and will take approximately 5 – 15 minutes to complete the process.

Exchange server limits email attachments to 1MB.

Error Messages

Table 8 lists some SBS error messages and/or known issues incurred with suggested workarounds to resolve the problems.

**TABLE 8
ERROR MESSAGES, ISSUES AND WORKAROUNDS**

| Symptom(s) | Workaround |
|---|---|
| <p>When you try to change the Administrator password when installing SBS, the following error message is displayed:</p> <p>Microsoft Small Business Server Setup Invalid Password.</p> | <p>Follow these steps to reset the password:</p> <ol style="list-style-type: none"> 1. Open User Manager. 2. Select the Administrator account. 3. On the User menu, click Properties and reset the password to a blank password. |
| <p>When you boot from the three setup disks that come with SBS, you do not get the option to run through the repair process.</p> <p>This is usually offered after setup disk number 2 loads and at the first screen, where you press R for repair.</p> | <p>To work around this problem, perform one of the following:</p> <ol style="list-style-type: none"> 1. On the second disk, rename Winnt.sif to Winnt.bak. You can reboot off these disks and it will prompt you to run the Repair process. <p>or</p> <ol style="list-style-type: none"> 2. Re-create a second set of setup disks by using the SBS distribution CD-ROM (not a standard version of Windows NT 4.0 Server or Workstation). <p>To do this, go to any computer running Windows NT. Place the first SBS distribution CD into the CD-ROM drive and type the following at a command prompt:</p> <pre>D:\i386\winnt32 /ox</pre> <p>Alternately, go to an MS-DOS/Windows-based computer and type the following at the command prompt:</p> <pre>D:\i386\winnt /ox</pre> |
| <p>When you use the Computer Setup Wizard in SBS, the following error is displayed:</p> <p>Windows NT Client Setup</p> <p>This setup program must be run on a Windows NT Version 4.x client system.</p> | <p>The Small Business Server should not be set up as a client computer, even for the administrator account. Do not attempt to set up the Small Business Server as a client. Select a workstation computer to configure for the Administrator account.</p> |
| <p>Step 6 in the Release Notes for BackOffice Small Business Server (Readme.wri on CD-ROM #1), incorrectly states the path to the file Winnt.sif. Step 6 reads as follows:</p> <p>"After the third boot floppy disk is created, copy Winnt.sif from <i>d:\i386\support</i> directory (replace d: with the correct drive letter for your CD-ROM) to BOOT DISK #2."</p> | <p>The <i>d:\i386\support</i> directory does not exist. The Winnt.sif file can be found in either the <i>d:\i386</i> or the <i>d:\support</i> directory.</p> |
| <p>When you enter information in the Domain Registration Wizard during the SBS setup, you may receive an error message stating that some of the information is incorrect or incomplete and requesting that you re-enter the information. However, the error does not state which information is in error.</p> | <p>Currently, there is no way to tell which information has been entered in error; you will need to verify all of the information you have entered before continuing.</p> |

TABLE 8
ERROR MESSAGES, ISSUES AND WORKAROUNDS

| Symptom(s) | Workaround |
|---|--|
| When you remove a user from Manage Server Console or delete the user through User Manager, the user's mailbox is removed but the user's shared personal folder is not removed. | SBS 4.0 is not designed to delete the user's shared personal folder. You must remove the %SystemRoot%\Users Shared Folders\%username% folder manually. |
| On a system that has insufficient disk space for the Small Business Server Client setup, the client application installation may cause a blank, blue screen with the symbol "L2" in the top left corner of the screen on Windows 95. | Restart the system, free some hard disk space, and rerun the client setup. |
| If a user is added through the User Resource Wizard and given Administrative permissions, that user may not have Administrative access to all shares immediately. The client will not be able to fax or perform other tasks. The exact error messages may vary but reference permissions or write access problem on the server. | This problem occurs due to the Wizard not parsing and assigning the permissions immediately. Close and restart User Wizard to make sure all permissions have been properly assigned. |

Basic Troubleshooting Strategy

This section lists basic methodology to use when troubleshooting. First you need to gather problem symptoms, to allow you to isolate and resolve the issue. In doing so, the following questions should be asked:

- Is the problem reproducible or random?
- What hardware and/or software is involved?
- Does the problem occur in just one program?
- Does the problem occur with one user or multiple users?
- If applicable does the problem occur on the server or is it just client specific?
- Does order make a difference?
- Has it ever worked?
- What changed on the system in question or the network environment?

After the above questions have been asked you can complete the following steps to resolve the issue:

1. Decide on one cause and solution, at a time. Make appropriate modifications and then test those modifications. Try to minimize the number of things you change between tests.
2. Test each modification to see if it fixed the problem.
3. Write down all symptoms, causes, and solutions. Having a written record makes an excellent reference for future troubleshooting.
4. Return the system to the original state or as close to the original state as possible.

Basic TCP/IP Troubleshooting

Always begin troubleshooting TCP/IP at the network interface layer and work up to the application layer. Make sure the protocols at each layer of the Internet protocol suite can communicate with the layers above and below.

Make sure you can ping successfully. If you can ping successfully, you have verified IP communication between the network interface layer and the internet layer. The *ping* command uses the Address Resolution Protocol (ARP) to resolve the IP address to a hardware address for each echo request and echo reply.

To troubleshoot the network interface and internet layers by using the ping command use the following steps:

1. Ping the loopback address (127.0.0.1) to verify that TCP/IP was installed and loaded correctly.

If this step is unsuccessful, verify that the system was restarted after TCP/IP was installed and configured.

2. Ping the IP address of the server or local system in question to verify that it was configured correctly.

If this step is unsuccessful, view the configuration by using the Network program in Control Panel. Verify that the address was entered correctly, and confirm that the IP address is valid and that it follows addressing guidelines.

3. Ping the IP address of the remote system to verify the LAN connections.

If this step is unsuccessful: make sure the remote system is functional and configured properly and verify the link and/or hub connecting the systems is functional.

4. After you can successful ping the address, ping the name to verify that name resolution is being performed.

SUMMARY

Compaq and Microsoft have combined to provide a solution specifically designed to address the needs of small businesses. This white paper has provided information designed to assist the small business customer. It has been developed to assist with installation, usage, procedures and issues relating to Small Business Server purchased and installed as a package using the Compaq and Microsoft hardware and software option as well as Small Business Server purchased independently and used on other Compaq ProLiant and ProSignia servers.

Note: If you are unable to resolve a problem you may need to use an IP analyzer to view network activity at each layer.
