COMPAQ

Integration Note

Contents

NetWare 5: At Your Command

Abstract: The waiting is over! Novell has successfully launched its powerful, next-generation network operating system, NetWare 5. Providing superior management and control of network applications and resources, NetWare 5 is ideally suited for both Internet and intranet operations.

This Integration Note includes the latest and greatest hot tips, shortcuts, and enhanced commands that help network administrators, developers, and other users to take charge of their systems and truly optimize the many features and benefits of a NetWare 5/Compaq server environment.

And this is just the beginning. As Compaq and Novell engineers and field support teams continue to tune and test NetWare 5 on Compaq robust servers, we'll pass on any juicy tidbits or "tricks" that they discover.

Help us improve our technical communication. Let us know what you think about the technical information in this document. Your feedback is valuable and will help us structure future communications. Please send your comments to: Novell.Feedback@Compaq.com

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NetWare 5: At Your Command
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We Have Lift Off!

Finally! It's here. Novell has successfully launched its high-flying, revolutionary OS, NetWare 5. With NetWare 5, Novell offers some pretty cool extras, like "pure" IP that exemplifies Novell's new strategic direction and commitment to the Internet. NetWare 5 was also designed to be closer, or integrated, with hardware, and most optimally with the equipment it's most familiar with—Compaq equipment, of course. This closeness with hardware results in quicker, more reliable installations and configurations; powerful debugging tools; dynamic programming with NLMs (NetWare Loadable Modules); and a higher performing intranet. It's a network administrator's dream.

Unlike some products that have been hyped beyond their capabilities, NetWare 5 is already attaining its goals and objectives, achieving higher performance records than imagined, and receiving even more kudos than expected. And as Compaq and Novell engineers continue to aggressively test NetWare 5, new short cuts and enhanced command capabilities are surfacing daily. So, we've gathered the best of the lot, arranged them by software and hardware, and now pass them on to our enterprise buddies. It's your turn to be in the controller's seat.

To help you find the exact tip or enhanced command that you want, the Hardware and Software sections have been subdivided into appropriate sub-categories. Since many of the tips fall into more than one topic or category, we have included reference statements to steer you in the right direction. To get the most from this paper, first skim this "high-flying"command manual from front to back, then return to those areas that offer you and your system the greatest benefits. Fact is, every tip and trick included will decrease your learning curve and boost system productivity.

This document, however, in no way attempts to list all the NetWare 5 commands and intricacies; rather consider it a documentation upgrade, or booster-supplement, to other NetWare 5 manuals and documentation. As our engineers and field support teams uncover other pertinent "tricks" and hot tips, this document will be upgraded and available on the Internet. So keep your eyes peeled for updates. Until then, enjoy these tidbits and take command of your operations.

Software Tips and Commands

Compaq and Novell continue their winning partnership with the release of NetWare 5 and all its high-tech, out-of-this-world features—such as, ConsoleOne, Novell Directory Services, and Novell Storage Services. In NetWare 4.11, Novell had introduced the NetWare Peripheral Architecture (NWPA) that revolutionized the driver model and now makes upgrading from a NetWare 4.x environment to a NetWare 5 environment more seamless and less painful. So, if you've been thinking of updating your system, now's the time. That's right! In fact, installing your new NetWare can even be exciting. You just have to pick the right software and hardware, and then make it soar.

If you're reading this, you most likely have already chosen the NetWare 5/Compaq-server platform. Good choice. Now use the tips that follow—especially those focused on Compaq SmartStart and Management CD-ROMs—to fuel your enterprise network.

General NetWare 5 Software Tips

Did you know that a free, DOS-like shell comes with NetWare 5, as well as NetWare 4.11 (intraNetWare)? Sure does. To enable the DOS-like shell for NetWare 5, just enter the NETBASIC command. Then enter SHELL at the command prompt. Now you can immediately

use NetBasic to browse file systems and copy files. The best part is this: you can use NetBasic <u>while</u> the server is still up. For another tip on file management, refer to section "Compaq File Management Utility for NetWare."

Did you know that the 64-bit Novell Storage Services (NSS) won't recognize an older 12-bit FAT system? That's right. Truly a powerful, indexed-storage solution, NSS shatters current file limitations and remount times. So, naturally, it requires a more powerful, later model engine, like (1) Caldera 7.02 or later, (2) MS-DOS 6 or later, or (3) Novell DOS 7 (NDOS7) or later. Simply put: only 16-bit FAT systems can be used with NetWare 5. Maybe that's one of the reasons that Novell has conveniently included Caldera 7.02 (formerly called NDOS7) on its NetWare 5 CD-ROM.

Did you know that…

- the REMOVE DOS command is no longer available?

- the DOWN command replaces EXIT?

- NWCONFIG.NLM replaces INSTALL.NLM?

- to boot the NetWare 5 Server CD-ROM, Compaq servers require either a ROM BIOS dated on or after 7/9/98 or the *CPQBOOT.EXE* SoftPaq?

Well, now you know. In fact, here are more details on the above items.

With server systems growing so quickly, the space occupied by DOS in memory becomes negligible. Most of you have probably never even worried about removing DOS to free up memory. That could be why the REMOVE DOS command is no longer a necessity and no longer available. Think simplicity and one less command to remember.

Novell also simplified other areas. For NetWare 5, Novell combined the former DOWN and EXIT command functions into just one command: DOWN. The DOWN command's job description now includes three functions: (1) disconnecting the server from its clients, (2) unloading NetWare 5, and (3) returning you to the DOS prompt. Slick and fast! And not to worry because any events formerly triggered by the retired EXIT event will still occur when now using just the DOWN command.

But let's not worry about downing the server until we get it up and running. If you can't seem to start (boot) the NetWare 5 Server CD-ROM from your Compaq server, check the ROM BIOS date. If the date is prior to 7/9/98 you need to take a slight detour. You must either update your ROM BIOS or use *CPQBOOT.EXE*. Decisions. Decisions.

> **Choice #1**: Update your system with the latest version of the ROM BIOS, available on the SmartStart CD-ROM mentioned in the next section as well as on the Compaq website.

> **Choice #2**: If your server doesn't have a BIOS update or flashing the BIOS is not convenient, use the file *CPQBOOT.EXE* to create a floppy diskette that will enable you to boot the NetWare 5 Server CD-ROM and begin the installation. *CPQBOOT.EXE* can be found on the NetWare 5 Server CD-ROM (in *INSTALL*) and requires one blank, non-write-protected floppy diskette to create the bootable diskette. There's just a little catch with this second choice: Since *CPQBOOT.EXE* writes an image file to the diskette, any data on the floppy will be overwritten.

Remember to use a blank diskette.

> The choice is yours.

Here are a few more generic NetWare 5 commands and tips that you may not know off the top of your head. They are sure to optimize your new OS and impress your boss.

- If updated drivers and components become available after your NetWare 5 purchase but before installation, you can still use the updated versions rather than the ones that came with NetWare 5. Just place the new versions in C:\NWUPDATE; then run *INSTALL.BAT*, as usual. Running *INSTALL.BAT* will first check this directory for any newer versions of drivers and system components and then automatically replace the older versions.

- To make your NetWare 5 installation a breeze, begin with Compaq SmartStart software. Don't wait until later and wished you had. If you start off on the right foot, components— such as, the hardware agents, server maintenance utilities, and Compaq Support Software for Novell Products (Novell SSD)—will be seamlessly integrated with your NetWare 5 install. For more information on SmartStart, look at section "Compaq Value-Added Software for NetWare 5."

- To switch between applications, just press **Ctrl**+**Esc**. This quick click (easier done than said) brings up the Task Manager that aids in application switching. Whenever you want to return to the system console, just click **Ctrl**+**Esc,** then **Esc** once more. Also refer to the section "Using Java Applications with NetWare 5."

Here comes a great freebie!

- To use the free *Novell LAN Workplace* for DOS, check out the NetWare Client CD-ROM in \PRODUCTS\DOSWin32. *LAN Workplace* is a DOS-based TCP/IP stack used to communicate with the server from a DOS or Windows 3.x-based client.

- Don't like Novell's splash screen, or just tired of seeing it today? Remember, you're in command of your network. Here are your options:

  - To prevent the Novell splash screen from appearing, you can create an empty text file called *SHOWLOGO.NLM* and save it in C:\NWSERVER.

  - If you like simplicity and simple keystrokes, just type SERVER -NL at the DOS prompt when starting the server; the server obeys without any back talk and permanently prevents the splash screen from appearing.

  - Love the Novell splash screen? Well, when it's your turn to start the server, just type SERVER –L, which forces the server to display the splash screen from then on.

- And since we're now discussing the visual aesthetics of your server, we have some good news and some bad news about the "Snakes" screensaver. If you're a former NetWare 3.x or 4.x user, you won't find your wriggily, mobile snakes in NetWare 5's *MONITOR.NLM*. However, to activate those reptiles, you won't have to perform two separate functions: (1) locking the console and (2) activating your screensaver. To do both functions in one command, simply enter SCRSAVER ACTIVATE. *Voila*! Snakes. (Like most screen savers, SCRSAVER can also be configured to activate automatically, locking the console at the same time.)

- To deactivate the screen saver and unlock the console, use your password and log in as the administrator. Then enter UNLOAD SCRSAVER.

Now we'll get back to some configuration tips.

To prevent the NetWare Peripheral Architecture (NWPA) from autoloading drivers, use the NWPA \NALOAD command in the *STARTUP.NCF* file. Without autoload, the system will load only the custom device modules (CDMs) that are manually loaded in the *STARTUP.NCF* file. By

manually loading CDMs, you can be certain that a specific value-added feature provided by the manufacturer is available. If you don't disable autoload, NetWare 5 will merrily chug along and load the default CDMs for all devices detected by NWPA as well as those CDMs that are manually loaded.

Some issues, however, have been found with devices where only the manufacturer provided CDMs should have been used, but other default CDMs had been loaded. Specifically, when using a SCSI tape drive to make a backup, you should use the CDM that is recommended by the backup application manufacturer.

Note: When using NWTAPE.CDM, any applications that use Advanced SCSI programming Interface (ASPI) will not work properly; instead, to make your backup, you should use the SBACKUP program provided with NetWare 5.

To configure the virtual memory usage for NetWare 5, enter the SWAP command at the console. You would think that this command immediately swapped some memory. You might even be a little hesitant to use it. No horror stories with this one. SWAP simply produces a complete list of commands that allow you to take control and configure the virtual memory for your server.

Look before you leap!

A word of caution: any programs that make use of virtual memory will be affected by these settings.

Troubleshooting server issues could take a lot of time. Wouldn't you like to have your system's configuration specifics right at your fingertips? Well, Novell thought you would and, consequently, added two new command options just for this purpose. The DISPLAY ENVIRONMENT command lists all your system's configuration default (straight-from-the-factory) parameters. To see what you've tweaked since the server landed, type DISPLAY MODIFIED ENVIRONMENT. Usually it's a much smaller list.

Here you have it: the scoop on those NLMs.

NetWare Loadable Modules (NLMs) are powerful code packages, or programs, that give you more control of your system. If you really want to make your system fly, learn which ones exist and how to use them. For simplicity, in NetWare 5 Novell even removed the LOAD command so you can save some keystrokes. To launch NLMs without the LOAD command, simply enter the module name. (In a year's time this saves a lot of keystrokes.)

- To check if a specific module has been loaded, enter the MODULES command, followed by the name of the module: [MODULE_NAME]. Wildcards are allowed when searching for a particular module. If you forget the module's name, you can just enter MODULES. You can then view the list of every NLM that has been loaded since the server started.

- Some NLMs are contained inside the *SERVER.EXE* file. These NLMs are called Bound-In and are loaded in a predetermined order when the server is started.

- *JAR.NLM*, *TAR.NLM*, and *ZIP.NLM* are included with NetWare 5 and give you command-line access to compression utilities. There is no need to download the files separately.

For more NLM tips, refer to section "Compaq Value-Added Server Tips."

Let's clarify the CSET and SET commands.

Don't stop yet! Stay-tuned for one of the top tips so far.

Well, this is a great tip for those of us who can't remember more than three items in a row.

To manipulate OS environment parameters on the fly, without having to memorize all their names, use the CSET [CLASS] console command. A list of [CLASS]

parameters will pop onto the screen. CSET will then walk through each variable in the class. No more boring memorization games or scratching parameters on small sheets of paper that always disappear when you need them. Isn't that great? We think so.

After examining the parameters, you can proceed as usual with the SET command. Two tips about SET:

- SET parameters are stored in the *NETWARE CONFIGURATION* file and don't need to be added to the *AUTOEXEC.NCF* or *STARTUP.NCF* files.

- The SET command still works for altering any common parameters that are changed often.

A great way to learn all those NetWare settings.

MONITOR.NLM also has the ability to modify your SET parameters. In the old NetWare 4.x days, you used the *SERVMAN* utility. However, *MONITOR.NLM* is more convenient. Just use these three simple steps:

(1) Start *MONITOR.NLM*.

(2) Select the last choice in the menu listing.

(3) Select the desired parameter from the list.

IMPORTANT: *MONITOR.NLM* must be loaded as the last NLM in the *AUTOEXEC.NCF*. This ensures an accurate read of the configured network server information. If changes are made to the console, unload *MONITOR.NLM* and reload after the change has been made.

We hope you have enjoyed the first section of general NetWare 5 tips and commands. And we hope that installing and maintaining your system will be a little easier. But don't hop out of your controller seat just yet. There are many more commands and tips that follow.

Compaq Value-Add Software Tips

SmartStart and Support Software CD-ROM for Compaq Server Products

Good news! If you can remember the long name of this compact disc, you're halfway to grasping its powerful applications. The other half is even easier. Just sign up for the Compaq SmartStart subscription service (Product No. 195654-001); it's such a vital link to our customers. (Need the web address? Read a little further.)

In order to ensure that Compaq servers are equipped with the latest features and drivers, the SmartStart and Support Software for Compaq Server Products is periodically released, not on a calendar system, but as new products and files become available. Each disc contains BIOS updates; the latest version of value-added drivers; powerful, custom NLMs; and firmware updates. More specifically, SmartStart contains the following programs for NetWare/Compaq systems:

- **Compaq Support Software for Novell Products (Novell SSD)** – NetWare drivers, NLMs, utilities, patches, and information for enhancing NetWare 5 on Compaq systems.

- **Novell Support Pack** – Updates for all services contained in the NetWare box. Features an improved installation, available through *NWCONFIG.NLM*.

- **Compaq System Configuration Utility** – Configurations for the server and its expansion boards. Automatically allocates system resources—such as, interrupts, DMA channels, memory, and I/O ports—among the installed expansion boards.

- **Compaq Array Configuration Utility** – Setup program for Compaq array controllers. Configures physical drives attached to the controller into arrays and logical drives that the OS uses.

- **Compaq Diagnostics Systems ROMPaq** – ROM BIOS updates for Compaq ProSignia and ProLiant servers.

- **Compaq Options ROMPaq** – Upgrades of programmable ROMs on Compaq options, such as, disk controllers and drives.

- **Compaq Array Diagnostic Utility** – Diagnostics for Compaq Drive Arrays.

To obtain your can't-live-without-it subscription to the SmartStart CD-ROM program, visit our website: http://www.compaq.com/smartstart.html. If you already have your CD-ROM and want to immediately reap benefits, just follow the command sequence that follows:

- To install components of the SmartStart CD-ROM, insert the disk and mount the drive. The CD-ROM drive may be mounted either as a DOS drive or a NetWare volume.

IMPORTANT: The method of mounting is important because the path to the CD-ROM is needed to run the installation. If the drive was mounted using the DOS driver, the CD-ROM drive will be accessed as a drive letter, for example, D: However, if the drive was mounted as a volume, then the system will use the volume label assigned to the CD-ROM drive, for example, CPQSMST400:

Understand all that? Good! Because these instructions apply whenever you need to access information or install software from a compact disc. Consequently, to save space and resources, we'll not repeat the details each time. Let's continue.

- Run *NWCONFIG* on the server, and select *Product Options*.

- Since the CD-ROM contains a newer version than the installation is aware of, you should select *Products Not Listed*.

- Press F3 to indicate the path to the CD-ROM. The path will appear as follows, where [VOL_NAME] is either the volume name or drive letter that refers to location of the SmartStart CD-ROM.

    - [VOL_NAME]:\CPQSUPSW*NSSD* installs the latest Compaq device drivers.

    - [VOL_NAME]:\IWSPACK*ENGLISH* installs the intraNetWare Novell Support Pack.

    - [VOL_NAME]:\NW5PACK*ENGLISH* will install the new NetWare 5 Novell Support Pack when available. (Projected availability date: First Quarter 99.)

- Use CPQNSSU.NLM to install Novell SSD v5.01 across the network. By independently changing the source and destination from the installer menu, the Novell SSD can be installed from any server on the network to any other server without requiring the administrator to be at either location. The Novell SSD is also available from the Compaq website.

Compaq Management CD-ROM

Here's another super freebie!

Use the Compaq Management CD-ROM to easily manage your Compaq servers, workstations, desktops, and portables. In other words, this disc explains how to get the most performance from your Compaq hardware.

Contents include

- **Compaq Insight Manager** – Industry-leading application for efficiently managing network desktops and servers.

- **Compaq Insight Management Server Agents** – Data collection and repository tool that provides in-depth subsystem information concerning statuses and faults on Compaq servers, workstations, desktops, and portables.

- **Compaq Survey Utility** – Enhanced serviceability tool that delivers on-line configuration capture and comparison.

- **Systems Management Toolkit** – Integration tool that unifies third-party management products with Compaq Insight Manager.

- **Diskette Builder Management** – Utility that automates the creation of installation diskettes for products on this management disc.

For more information about Compaq Server Management, in particular, Compaq Insight Manager, visit our website: http://www.compaq.com. If you already have your copy of the Management CD-ROM, then let's waste no time.

To install and mount the disc…. Do you remember? For information on mounting the CD-ROM, look back at the **IMPORTANT** tip under the SmartStart install.

- To install the Compaq Insight Management Server Agents and update all Agents in memory and on the hard drive, enter [VOL_NAME]:\AGENTS\NETWARE\ENG\COMPAQ*CPQAGIN.NLM*.

- To install the Compaq Survey Utility, enter [VOL_NAME]:\SURVEY\NETWARE\ENG\ *SINSTALL.NLM*. Do you want the utility to automatically load during server startup and perform its system logging? Use the option SINSTALL –IAUTO_INST. In fact, when you use this option, the utility will automatically perform system logging every Wednesday at noon.

In both cases, [VOL_NAME] is either the volume name or drive letter that refers to the CD-ROM drive.

Compaq File Management Utility for NetWare (*CPQFM.NLM)*

CPQFM.NLM incorporates many common commands in a familiar, graphical, menu-driven interface. Not only a timesaver, it's <u>free</u>**.** That's right. Unlike many commercial products that offer less functionality, *CPQFM.NLM* is available free-of-charge from the *Compaq and Novell Power Resource Paq:* the snazzy Compaq and Novell Partnership CD-ROM with the bolt of lightening on the cover and lots of multi-media information packed inside. By the way, you can order the resource kit from their Partnership website: http://www.compaq.com/partners/novell.

What an offer! Compaq is providing you access to the same homegrown tools that we use in our labs, just in case you need to do some of the fun stuff we do. But remember: these are just lab tools and not production products. They're only intended for use in a lab environment.

If you haven't already done so, you really need to check out the Compaq and Novell Power Resource Paq.

Now, let's get back to the management utility. By using *CPQFM.NLM*, you can save precious time when you (1) search for files, (2) change file attributes, (3) edit files, (4) get file version and date information, and (5) delete files and directories. Want to know more?

- To launch any NLM or to connect to remote servers for file manipulations, this management utility's commands are extended and also apply to the remote file system.

- To view all version and date information for a specific *CDM, DSK, HAM (Host Adapter Module), LAN, NLM, or PSM* (*Platform Support Module*) file, just highlight the file and press **Enter.**

- To delete the highlighted file or directory tree, just press **Del**.

- To view a menu of appropriate file or directory commands and functions, highlight the file or directory and press **Tab** (the majority of *CPQFM.NLM* functions are under the **Tab** menu).

Using Novell Directory Services (NDS) with NetWare 5

A well-integrated family of directory-based services, NDS helps you to centrally manage user access privileges and security across the Internet and your enterprise intranets and extranets. Of prime importance, it provides proxy, firewall, and virtual private network services. And, even if you don't install NetWare 5, you can use this great directory service on most networking systems. But you probably already know all that.

What you might not know is that to install NDS, as well as NetWare 5 itself, you must have a Network Interface Controller (NIC) already installed with the proper driver. Without a functional NIC, your NDS installation is doomed for failure. So plan ahead for this installation.

Using the XWindows GUI with NetWare 5

Do you have any other advice in this area? It looks a little scrawny.

To add items to the XWindows menu, edit SYS:JAVA\NWGFX\ FVWM2*FVW2RC5XX*. This file contains menus and menu items displayed when the Novell button is pushed. The syntax of menu items is a little tricky, but there are many examples in the file itself. With some experimenting you should be able to launch your favorite programs with only a few clicks on the XWindows menu.

Note: Just to be safe, we recommend that you first make a backup of a working *FVW2RC5XX*.

To prevent XWindows from loading at startup, remark, or comment out, the *STARTX.NCF* line from the *AUTOEXEC.NCF* file by adding **REM** or (**#)** or (**;)** to the beginning of the line.

To kill the XWindows GUI and immediately return to the command prompt, press and hold the **Ctrl** and **Alt** keys while simultaneously pressing the **Backspace** key.

Think about this last XWindows GUI tip for a minute. The ability to easily load and unload the GUI while the system keeps churning away is a tremendous boost to your systems' performance.

Using ConsoleOne with NetWare 5

Whew! There's a lot of confusion with ConsoleOne, the ConsoleOne GUI, the Java Console, the Java GUI, the Java X-GUI, and the XWindows GUI. Maybe it's because Java is the buzzword of the Internet, and we all love to drop those buzzwords amongst our Internet buddies. Right? GUI is also a great buzzword. And face facts, GUI just sounds like state-of-the-art computerese. However, we often misuse this terminology until it becomes an imbedded definitions in our personal technology database. So let's clear the air and start speaking the same lingo.

First of all, ConsoleOne is Novell's *management application software*—written in Java—that brings data closer to the user with no loss of control. Java is an Internet–standard *programming*

language. And the only correct GUI in the first paragraph is the XWindows GUI, discussed in the previous section. That's it. Nothing fancy; nothing more.

Now with the tips:

- To launch ConsoleOne, use *C1Start.NCF*. Both ConsoleOne and XWindows will be launched.

- To display specific information about hardware components and specific drivers—such as, slot number and hardware instance number—place your mouse over a driver's name when in NetWare 5's graphical installation. Then click.

Using RCONSOLE with NetWare 5

The DOS-based RCONSOLE command lets you remotely access a server. What you see on your RCONSOLE screen is what you'd see on the remote server's screen if you were actually sitting in front of it. However, due to the nature of the interface, a GUI is unavailable to remote sessions. That means no pictures or mouse movements. RCONSOLE is limited to text. If you try to use (+) or (–) to cycle through remote windows, the GUI will not appear, even if it is active on the server.

For easy console access, just add the following to the end of your *AUTOEXEC.NCF:*

- REMOTE somepassword

- RSPX

Now you'll always have access to the console—without any extra work. Just load *RCONSOLE.EXE* from SYS:PUBLIC (usually on the Z:drive); select SPX; and pick a server.

Need an encrypted password? Easy. Just enter REMOTE. Then type REMOTE ENCRYPT yourpassword. You'll then see the command syntax to use for adding your encrypted password to the *AUTOEXEC* file. At the prompt, type YES, which writes the information to *LDREMOTE.NCF*.

IMPORTANT: Don't use the REMOTE command to change your current password. If you have used INETCFG to set your remote password, you must use the same command to change your password.

Using Java Applications with NetWare 5

NetWare 5 and its compatibility with Java, an Internet-standard, programming language, demonstrates Novell's direction in the Internet world. Here are two tips to help you work better with Java applications.

- To force a Java application to launch in a new window, enter JAVA –NS. Any JAVA programs launched will then appear as separate entries in the Task Manager (**Ctrl+Esc**).

- To kill all Java-based applications, except ConsoleOne, use JAVA –KILLALL at the command prompt. Individual Java applications can also be shut down by using JAVA –SHOW to obtain the process number and then entering JAVA –KILL followed by the ID number of the process you want to kill.

Hardware Tips and Commands

From intelligent fault handling to PCI Hot Plug-compatible components, Compaq servers have been designed in conjunction with Novell's development of network operating systems. This is especially true with NetWare 5. Working together, the Compaq and Novell Partnership has made the ability to hot plug drives, arrays, and controllers into a reality. Consequently, this dynamic team has virtually eliminated system downtime. Additionally, instance loading and unloading of drivers—as well as well-paved migration paths—make troubleshooting, repairing, and upgrading more efficient processes.

General NetWare 5 Hardware Tips

Periodically, spurious or lost hardware interrupts may occur. So how do you chase these down? Well, to see if a device is generating interrupts, enter the DISPLAY INTERRUPTS to see which interrupts are currently active. In the case of a NIC, this usually indicates network activity.

Compaq Value-Added Server Tips

There's nothing like a robust Compaq server! Our sales figures prove that. In fact, on September 14, 1998, Compaq delivered its 2 millionth server. And did you know that over 50% of Compaq servers are running with NetWare? Now that's compatibility and integration. And that's peace of mind. You can be sure that Compaq and Novell have thoroughly joint tested their networking solutions and have provided you with a top-of-the-line networking system.

Everything to get your server up and running is available on the NetWare 5 CD-ROM. Rest-assured that the drivers are the latest versions available when NetWare 5 was released. To get Compaq server management utilities and custom hardware support—such as, the Compaq Server Health Driver and Insight Agents—install the *Support Software for Novell Products* (Novell SSD). The Novell SSD is available on the Compaq website or on the Compaq SmartStart CD-ROM. For more information, you can also refer back to section "Compaq Value-Added Software for NetWare."

If you use the Compaq SmartStart disc to begin the NetWare 5 installation, components—such as, the hardware agents, server maintenance utilities, and Novell SSD—will be included with the NetWare 5 install for seamless integration.

For example, to obtain general information about a server and its configuration, use the Novell-provided software on the NetWare 5 CD-ROM. Just access *TECHWALK.NLM* located in SYS:SYSTEM. Four things happen.

1. *TECHWALK* is a little nosey and asks a few brief questions concerning the administrator.

2. If the answers are acceptable, the program scans the *AUTOEXEC.NCF*, *STARTUP.NCF* and *INETCFG.NCF* files.

3. *TECKWALK* then records all information and settings in an output file for your records.

4. You should read the output file and proceed accordingly.

But, if you require more information about the server than *TECHWALK* has provided, don't panic—the *SURVEY.NLM* utility on the Compaq Management CD-ROM can generate an in-depth hardware and configuration report.

The *SURVEY.NLM* also supplies information about IRQs, array configurations, and other hardware details. The latest version of *SURVEY.NLM* even provides a web server for obtaining

server information remotely. You can install the SURVEY Utility from the Compaq Management CD-ROM. Yup, that's the one you received free.

You can also use the DISPLAY ENVIRONMENT command discussed in the configuration tips in section "General NetWare 5 Software Tips."

Some information on the Integrated Management Log

Server health error messages are stored in the Integrated Management Log (IML), a designated section of NVRAM (non-volatile RAM). Error messages include fan failure detection, caution temperature detection caution, power supply monitoring, ECC memory monitoring, and automatic server recovery. To view and analyze these error messages, you need to load the Integrated Management Log Viewer (CPQIML.NLM). But even before that, you must load the Novell Event Bus (*NEB.NLM)* in the *STARTUP.NCF*, then the Compaq Server Health Driver (CPQHLTH.NLM). Now you can load the IML Viewer and take the proper action.

Some more information on the Novell Event Bus

The Novell Event Bus *(NEB.NLM*) facilitates communication between the software modules, such as, *CPQHLTH.NLM* and *NWPA.NLM;* management agents; and device drivers. That's why you must remember to load *NEB.NLM* before *CPQHLTH.NLM* and before any command to manually load Host Adapter Modules (HAMs) or CDMs, which would force NWPA to be loaded.

Some information on a new Compaq server utility

Have you heard about the new Compaq Power Subsystem Utility (*CPQPOWER.NLM*)? Well, it's one of the new kids on the block and has found a home on the Novel SSD, under the server management section? The new utility displays redundant power subsystem status. It also incorporates the Power Down Manager that allows configuration of the intelligent power switch on ProLiant 6000, 6500, and 7000 systems. Just remember to load CPQHLTH.NLM before *CPQPOWER.NLM*.

Moving on to duplicate installations and other tips

To quickly make duplicate installations of your NetWare 5 servers, use Novell's COPY command and the *RESPONSE.TXT* file that contains all the necessary configuration information stored from the original system. (We assume that you have already installed NetWare 5 and have correctly configured one server.) First, copy the SYS:SYSTEM\INSTALL*RESPONSE.TXT* to a floppy

Compaq SmartStart greatly influenced this feature.

diskette. Then start the installation on a second server with the INSTALL \RF=PATH_TO_FILE*RESPONSE.TXT* command. The installation program will use all the configuration information stored from the original system to setup your next server.

Here are some valuable server operation tips:

- To bring up your server, use either the RESET SERVER or the RESTART SERVER commands. Remember that in NetWare 5, you don't need the DOWN command:

  - RESET SERVER <u>warm boots</u> your system.

  - RESTART SERVER brings the server down and then backup by unloading, then reloading NetWare 5. So, RESTART SERVER doesn't actually reboot your entire system—just the operating system. This is great if you've made any changes to the *AUTOEXEC.NCF* and *STARTUP.NCF* files. Besides, it's faster than RESET SERVER.

- To shut down your server and not reload NetWare 5, use the DOWN command in place of the old DOWN and EXIT combination. And rest easy, events that have been keyed to EXIT

will still function with the DOWN command since DOWN alone now triggers the EXIT events.

- To access infrequently used options and make last-minute changes in your server installation, click the *Customize* button on the Server Summary screen. Now breathe a sigh of relief because here's where you can easily modify any prior incomplete or incorrect options. You can also access options—such as, the SNMP parameters—that aren't necessary in every installation.

- Some NLMs are contained inside the *SERVER.EXE* file. These NLMs are called Bound-In and are loaded in a predetermined order when the server is started. Here are a few specifics about these bound-in characters:

    - Just like ordinary NLMs, a Bound-In NLM can be unloaded by entering UNLOAD *FILENAME.NLM*.

    - To load an internal NLM, you must add an asterisk to the filename to indicate that the file is located in *SERVER.EXE*. For example *FILENAME.NLM*.

    - Should a newer version of an internal NLM ever be released, placing the newer version in the *SERVER.EXE* startup directory will force the server to use the newer version.

- *SERVER.EXE* also has several command-line parameters that may be helpful in debugging driver and server configuration issues.

    - SERVER –NA starts the server without executing the *AUTOEXEC.NCF*.

    - SERVER –NS starts the server without executing *STARTUP.NCF*. Generally, this command also stops the execution of the *AUTOEXEC.NCF* since SYS: is not mounted.

Note: However, if there is an *AUTOEXEC.NCF* in the C:\NWSERVER directory when you use the SERVER –NS command, *AUTOEXEC.NCF* will execute.

    - SERVER –NL prevents the server from showing Novell's splash screen; SERVER –L forces the server to show the splash screen. Also see "General NetWare 5 Software Tips."

    - SERVER –ND will allow the server to boot without loading NDS. Also see "Using Novell Directory Services with NetWare 5."

- Make certain that the latest versions of disk drivers and NLMs are located in both C:\NWSERVER and C:\NWSERVER\DRIVERS. Why? Because NetWare 5 searches C:\NWSERVER and C:\NWSERVER\DRIVERS for drivers when a new hot-pluggable device is detected.

Take heed!   If the server finds a different version of the driver in each location, the file in C:\NWSERVER\DRIVERS will be used for the new device and will replace (overwrite) the one in C:\NWSERVER.

- To view all detected processors and their statuses, enter the command DISPLAY PROCESSORS. In NetWare 5, this command shows how many processors are detected and their current state.

    - The STOP PROCESSORS command will change the state of all SMP processors to offline.

    - The START PROCESSORS command will enable all available processors in the server.

- Both the START and STOP commands can be used to isolate a single CPU by adding the CPU number that is given by the DISPLAY PROCESSORS command, for example, STOP PROCESSOR 3 or START PROCESSOR 4.

Drives and Arrays Tips

If you replace all drives in an array with larger capacity drives, the available space on the current volume remains the same with new, extra capacity available as free space. The additional space may be claimed as a new volume or may be combined with the remaining space on the newer drives as a logical drive. Logical drives can then be assigned a new volume or linked to a volume. If the logical drive is linked to a volume, the users will see additional storage space without ever having lost access to the server

By adding the space to an existing volume, a single volume can continue to grow virtually without limits. When this procedure is combined with PCI Hot Plug Array Controllers, your storage can be upgraded to additional arrays whenever necessary—without interrupting access to any data on the array.

To distribute data to newly added drives, use the Expansion feature of Compaq Online Configuration Utility (*CPQONLIN.NLM*). When new drives are added to an array, the volumes on that array can be expanded to include the new drives. There's only one catch! If physical drives are added to an array and the array is expanded to include the new drives, the new drives cannot be removed later. It makes sense if you think about it. If you distribute data among all available physical drives in an array, the newly added drives would then contain portions of the data that spans all the drives. Remove a drive and poof! Your data disappears.

In any RAID Array, you can substitute any larger drive for any smaller drive. The additional space, however, will not be available until all drives in the array have been upgraded to the larger capacity. In other words, the maximum space available on any array is limited by the capacity of the smallest drive in the array.

IMPORTANT: Do not remove more physical drives than the fault tolerance of the array allows. The volume can fail and any information being written to the array will be lost.

Remember when loading Compaq custom drivers for drives and adapters, you don't have to use the SLOT= parameter. The new drivers automatically load for each instance of the device that is detected by the system.

Some info on partitioning.

To easily create multiple partitions under NetWare 5 on a single drive, read further.

- NetWare 5 accommodates additional drive space more readily than previous versions by allowing up to four NetWare partitions per drive.

- In NetWare 4.x, a partition and volume would have had to be deleted and rebuilt to take advantage of extra free space on a drive. However, in NetWare 5, we can simply create a second, third, or even a fourth partition and assign it a volume without disturbing current disk partitions.

- The ability to create additional partitions is particularly useful when upgrading from a smaller physical drive to a larger one.

- Since we can create more partitions, simply mirror the smaller drive onto the larger drive. Then create a new volume on the remaining space to reclaim it without having to backup and rebuild the original partition.

- Want to access the server's DOS partition remotely? No problem.

- First, make the server's DOS partition available to clients by mounting the DOS partition as an NSS volume using *DOSFAT.NSS*. Remote access to the DOS partition allows for remote access to the server startup files. Loading *DOSFAT.NSS* does not change the file structure of the DOS partition, rather, *DOSFAT.NSS* acts as a translator.

- The server's DOS partition will then magically appear as a new volume.

- You can then set NDS permissions for this new volume.

IMPORTANT: If remote access to the DOS partition is made available, you should carefully note this in NDS. Why? Because if you're not careful, other users will access critical files and then modify or delete them.

Adapters and Drivers Tips

Well, we're almost to the end of our tips and tricks, but don't stop reading yet. Some great jewels are still coming.

- To quickly get a list of currently detected storage adapters and attached devices, enter LIST STORAGE ADAPTERS at the command prompt. LIST STORAGE ADAPTERS is often preferable to the LIST DEVICES command because LIST STORAGE ADAPTERS does not scan the bus for all new devices. Obviously, in systems with numerous adapters and devices, LIST STORAGE ADAPTERS is much faster. The list displays both bound devices and unbound devices and their identification numbers.

Wow! Instant updating!

- To access array controllers, use *CPQARRAY.HAM*. Most of you already know this. But did you know that with a little more than a snap of the fingers you can update *CPQARRAY.HAM* in memory. That's right! Just copy the driver to the server, and type in CPQARRAY.HAM. Done! There's no need to unload and reload drivers while the server is running. And yes, this works *for CPQFC.HAM, CPQSCSI.HAM*, and actually, any *CPQ*.HAM*.

- Compaq valued-added drivers give you the ability to remove or add a single instance of a driver, called instance unloading and loading.

  - To remove a single instance of an adapter driver (.HAM) so that the card can be removed or replaced, enter REMOVE STORAGE ADAPTER=ADAPTER_ID. By doing instances unload of a driver, identical devices that use the same driver are unaffected. This way, you can replace a single failed adapter while allowing the others to maintain server ready.

  - The ADAPTER_ID parameter is user-specified. If you do not know in which slot the card you need resides, or if you don't know the ADAPTER_ID, use the LIST STORAGE ADAPTERS command to view all installed storage controllers, their locations, and their IDs.

- Use only *CPQHLTH.NLM* (Compaq Server Health Driver) versions 4.02 and higher with NetWare 5. Also be sure that *CPQHLTH.NLM* is loaded before loading *CPQRSO.NLM* (Compaq Recovery Server Option) and other server management utilities.

- The Special Compatibility Mode Driver (*SCMD.NLM*) will maintain IPX compatibility in an IP-only network. When installing the NetWare 5 server, selecting the *IP Only* option will not prevent IPX applications from functioning. Support for the IPX applications on the IP network is handled by *SCMD.NLM*.

- *SCMD.NLM* enables NetWare 5 to transmit and receive IP and IPX data across what is essentially a single protocol network.

- If IP Only is selected, *SCMD.NLM* will be loaded automatically by *AUTOEXEC.NCF*.

- By removing the SCMD line from the AUTOEXEC file, all IPX compatibility will be lost on an IP-Only network.

Note: Note that some components of NetWare 5, including ConsoleOne, still use the IPX protocol, therefore it is not recommended to remove SCMD in an IP-Only environment.

Storage Tips

You can mount any free space on any standard volume as an NSS volume. In order to take advantage of the added performance and functionality of NSS, any free space on any standard volume, regardless of the current file system, can be converted into an NSS volume. Only the free space remaining in a volume may be converted; data areas on the drive cannot be converted without destroying the data.

To dismount all volumes with a single command, NetWare 5 added the DISMOUNT ALL command.

Some CD-ROM tips

To load CD-ROM support without loading other NSS support, enter NSS CD9660 at the server console. Once loaded, the CD-ROM acts as a standard NSS volume allowing PC-compatible CD-ROMs to be made available for clients.

To load CD-ROM support but provide access to MacIntosh-formatted CD-ROMs, enter NSS CDHFS. The NSS CD-ROM module also supports automatic mounting/dismounting on compact disc eject and insertion.

If you need to mount/dismount both MacIntosh- and PC-formatted CD-ROMs, load *CDROM.NLM*.

Note: See NSS HELP for more information on other structures that can be mounted as NSS volumes.

Miscellaneous NetWare Command Tips

Our last tip doesn't even have anything to do with NetWare 5, however, it's such a great tip we wanted to include it anyway. We know that some of you still operate both NetWare 3.12 or NetWare 4.11 systems, as well as NetWare 5. And we want to continue supporting those fine systems. So, here it is.

Ordinarily, installing NWPA on NetWare 3.12 or 4.11 would first require installing the older architecture with DDFS, then secondly, upgrading the installed server. It's possible, however, to install NWPA during the initial setup of both NetWare 4.11 and NetWare 3.12. The instructions can be found in the *NSSD.HLP* file on the Novell SSDs.

IMPORTANT: This procedure outlined above is the only way to install NWPA on NetWare 4.11 and NetWare 3.12 without first installing DDFS (.*DSK*) drivers and then converting the system.

Conclusion

We hope you have benefited from these command tips. We've really enjoyed compiling them. A special thanks should be given to all the engineers and technicians who generously contributed the tips. If you have any special hints, tricks, or operating tips to share with your fellow NetWare 5 users, please email them to Novell.Feedback@Compaq.com.