INTRODUCTION TO NETWARE 3.12

NetWare 3.12 is identical to NetWare 3.11 in almost all respects. As the minor ".01" version increment indicates, NetWare 3.12 is the same code, same 32-bit architecture, and same utility base as NetWare 3.11. It is intended as a minor "bug fix" to satisfy 3.x customers until they move to NetWare 4.x or another major version of NetWare 3.x is released.

NetWare 3.12 does, however, offer a few improvements. They are:

✪ NetWare DOS Requester client software - uses ODI and VLMs to control the workstation environment and provide better support for NetWare 4.x.
✪ ElectroText electronic documentation - same Windows-based GUI interface as NetWare 4.x electronic documentation -- comes on CD-ROM.
✪ NCP Packet Signature - better security at the workstation and server.
✪ Alloc Short Term Memory - the MAXIMUM alloc short term memory default has increased from 2,000,000 bytes to 8,000,000 bytes.
✪ Run-time "Saber" menu system - a "run-time" version of the popular Saber menu system is included with most of the bells-and-whistles.
✪ Electronic Mail - Basic MHS and a fundamental E-mail package called "First Mail".
✪ Storage Management Services - same server-based backup engine that is provided in NetWare 4.x.

In the next few pages, I will offer a brief peek into the NEW features offered by NetWare 3.12. Keep in mind, these are "draft" pages from a revision to **Novell's CNA Study Guide**. For more details, see your nearest bookstore.

Have Fun! ☺

THE NETWARE DOS REQUESTER

< Figure 11-3 - Comparison of NETx and NetWare DOS Requester architectures >

The NetWare DOS Requester (VLM) is the connection point between the local operating system (DOS) and network services. See Figure 11-3. The DOS Requester consists of one management file (VLM.EXE) and many supporting Virtual Loadable Modules (*.VLM). NetWare 3.12 supports VLMs for packet signing, printing, communications, and even NETx emulation. These VLMs are advantageous because they can be loaded and unloaded, they reduce workstation overhead, and provide third-party developers with a platform for new ideas. When VLM.EXE is executed, it loads all VLMs found in the current directory (C:\NWCLIENT, by default). You can specify other VLMs or a different directory in the NET.CFG file. VLM.EXE supports the following options:

      VLM /C=path -- loads the DOS Requester using VLMs found in another directory.
      VLM /mc -- loads the DOS Requester in conventional memory.
      VLM /me -- loads the DOS Requester in expanded memory.
      VLM /mx -- loads the DOS Requester in extended memory.

T:
The NetWare DOS Requester can be used with NetWare 3.11 workstations, but remember you must change the CONFIG.SYS file to support LASTDRIVE=Z. This is because the Requester and DOS share drive table information.

T:
If you are moving to the NetWare DOS Requester, your users will find that F: is no longer the first network drive. In many cases it will be changed to D:. To force it back to F:, add the following line to each NET.CFG file:
      FIRST NETWORK DRIVE = F

CONFIGURATION FILES

AUTOEXEC.BAT is a DOS configuration file which is automatically loaded during initial workstation startup. In Chapter 1, we learned that AUTOEXEC.BAT can be used to customize and define workstation specific parameters. These parameters include PATH statements, SET parameters, and the PROMPT command. In addition, the DOS Requester

workstation installation adds the following line to the top of the AUTOEXEC.BAT.

@CALL C:\NWCLIENT\STARTNET.BAT

The STARTNET.BAT file provides support for ODI implementation and VLMs (Virtual Loadable Modules). It looks like this:

STARTNET.BAT
C:
CD\NWCLIENT -- default Requester directory
LSL.COM
NE2000
IPXODI
VLM.EXE -- NetWare DOS Requester files
D: -- first network drive
LOGIN *username*

The CONFIG.SYS workstation boot file is similar to AUTOEXEC.BAT except it loads drivers and defines critical workstation environments. During the NetWare DOS Requester installation, the following line is added to the CONFIG.SYS file:

LASTDRIVE=Z

This command is necessary for the NetWare DOS Requester to operate properly because it shares drive table information with DOS. If C is the last local drive, D becomes the first network drive.

K:
The LASTDRIVE=Z command is required for the NetWare DOS Requester, but it plays havoc with old IPX and NETx workstation files. If this command is used in NetWare 2.2 or 3.11, no network drives will be available.

USING NETWARE 3.12 ELECTROTEXT DOCUMENTATION

NetWare 3.12 is equipped with a powerful new Windows-based documentation tool called "ElectroText". ElectroText is an on-line, electronic version of NetWare 3.12 documentation -- all 20 books! Let's take a closer look.

~1.   Begin Microsoft Windows.

~2.   Enter ElectroText by choosing **File-Run** from Program Manager and executing **ET.EXE** from the SYS:PUBLIC (network) or E:\PUBLIC (CD-ROM) subdirectory.

~3.   This is the main library screen. Enter the **NetWare 3.12 Manuals** bookshelf.

~4.   Notice the many electronic books which appear. Each book represents one of the 20 different NetWare 3.12 manuals. The extra book is a Novell Press catalog. Enter the **Novell Press Catalog** and type **CNA** in the *Search For:* box at the bottom of the screen. Click on **Next**.

How many instances of the word **CNA** appear in the catalog?

~5.   Close the Novell Press Catalog and return to the NetWare 3.12 Manuals. Open the **Concepts** manual and find **NETWIRE** using the outline. Click on the **+** preceeding **NNN**. Find "NetWire" and click on it.

Find **UPS Monitoring** and **MIRRORING**.

~6.   Search for information concerning the **Supervisor**.

How many times does this topic appear in the Concepts manual? How many times does it appear in the entire NetWare 3.12 library? (Hint: to search the entire library, close the Concepts manual and begin the search from the main screen).

~7.   Experiment with the appearance of the outline screen. Open the **Overview** manual. Choose **File-Preferences**. Notice the choices for positioning the outline screen. Highlight **Top** and Choose OK.

~8.   Explore the **NEW Features** of NetWare 3.12. Review **Novell ElectroText**.

What sub-topics appear under Novell ElectroText? Which NetWare 3.12 manual is not available on-line?

~9.   ElectroText includes hyper-text references within and between books. Notice the green-colored topic "**Installing and Using Novell ElectroText**". This refers to a topic in Appendix B of another book -- Installation and Upgrade. Jump to the hyper-text reference by clicking on the green-colored sentence.

~10.   Exit the Installation and Upgrade manual. Let's explore the Printing features of ElectroText. Open the **System Administration** book. Find the reference to **Printing** in the **Using Novell ElectroText** section. Review the **Procedure** for printing from within ElectroText.

What happens when you double click on the green camera icon?

~11.	Follow the printing procedures. First, select **File-Print** from the title bar. Choose "**Sections you choose from outline below**".

Which book appears in the outline?

~12.	Let's print something. Click on the "+" preceeding **How to Use this Manual**. Select **User Comments** and choose OK.

Send a note to Novell Technical Publications telling them what you think of ElectroText.

Finish the exercise by exploring many of the other features of Novell ElectroText. As you can see, this is a superior way of accessing critical NetWare documentation information. It's not the most natural way to read a book, but on-line documentation makes searching for details alot easier.

T:
You can install Novell ElectroText on the network or a local hard disk. In addition, users can access the ElectroText database directly from the NetWare 3.12 system CD-ROM. For more information on installing ElectroText, refer to ElectroText.

ANSWERS

*4.	How many instances of the word CNA appear in the catalog?*
3

*6.	How many times does **Supervisor** appear in the Concepts manual?*
104
How many time does it appear in the entire NetWare 3.12 library?
631

*8.	What subtopics appear under Novell EletroText?*
Viewer Features
Which NetWare 3.12 manual is not available on-line?
Quick Access Guide

10.	*What happens when you double-click on the green camera icon?*
	A figure appears. This figure describes the printing procedure screen.

11.	*Which book appears in the outline?*
	NetWare 3.12 System Administration.

NCP PACKET SIGNATURE

The new NetWare 3.12 NCP Packet Signature feature is designed to protect the LAN from experienced hackers who forge data packets or pose as un-authenticated clients -- NetWare Incognito. The best way to understand NCP Packet Signature is to review the steps that occur between a workstation and a server during normal LAN operations:

~1.	When a workstation client logs into a NetWare 3.12 server, the server and the client establish a shared key referred to as the *session key*. This key is unique for each client logged into the server and for each unique session.

~2.	When the client requests services from the server, the client appends a unique signature to the data packet.

~3.	The server validates the signature as soon as it receives the packet. If it is correct, the

NetWare 3.12 server processes the request and attaches a new signature to the reply. If the client's signature is incorrect, the packet is discarded and an alert message is sent to the server console and error log.

T:
The NCP Packet Signature feature causes a slight decrease in server performance. To alleviate this problem, consider enabling packet bursting or Large Internet Packets (LIP).

K:
NCP Packet Signatures became necessary just recently due to the overzealous activities of a group of students at Lieden University in the Netherlands. The mischievous students are credited with discovering a simple "piggy back" intrusion mechanism for NetWare 2.2 and 3.11 servers. The NCP Packet Signature feature slams the door shut on these would-be hackers.

NCP Packet Signing occurs at both the workstation and the server. NetWare 3.12 contains a default level of packet signing. By default, the client signs only if the server requests it and the server signs if the client is capable. Therefore, signing always occurs. The system manager can customize NCP Packet Signing by using the SET server command and NET.CFG workstation file:

At the SERVER (SET):
SET NCP PACKET SIGNATURE OPTION =

At the WORKSTATION (NET.CFG):
SIGNATURE LEVEL =

NCP Packet Signature can be set at varying levels for clients and server depending on the security needs of the network. Table 9.2 illustrates the available options for NCP Packet Signing:

<< Table 9.2 -- NCP Packet Signature Levels >>

NOVELL'S NEW MENU SYSTEM

Menu Syntax
Novell has revamped their menu system in NetWare 3.12 -- with a little help from Saber, Inc. The new menu structure is a "run-time", partial version of the successful Saber menu system. It follows the same simple Saber syntax, and produces familiar NetWare-looking Blue and Gold menus (GO CAL BEARS!). NetWare 3.12 menu syntax is based on two simple command types: *organizational* and *control*. Organizational commands provide the menu's look-and-feel,

while control commands process internal menu instructions. Let's take a closer look.

T:
If you are still using NetWare 3.11, refer to the NetWare 2.2 menu section of this book. The menu syntax and execution are identical.

Organizational Commands
Organizational menu commands determine what the menu will look like. The two NetWare 3.12 organizational menu commands are:

~b   MENU - identifies the beginning of each menu screen.
~b   ITEM - defines the options which appear on the screen.

K:
The NetWare 3.12 menu system is only a partial version of Saber's own product. Therefore, NetWare menus cannot be fully customized. For example, system managers cannot specify the location of menus on the screen, nor avoid the default color pallette -- BLUE AND GOLD. In addition, NetWare's menu system is limited to 11 cascaded screens -- one main menu and 10 submenus.

The **MENU** command is left-justified and followed by a number. A single NetWare 3.12 menu file can support 254 different menus -- 1 thru 255. The menu number is followed by a comma and the title of the menu. Refer to the sample below for exact syntax. Options are listed under the menu command with the **ITEM** command. Each option is granted a letter (A-Z) and will appear in the exact order in which it is written. If you would like to force a different letter for a particular option, simple preceed the text with a carat (^) and the desired letter -- refer to the menu below. ITEMs can be customized using one of four built-in options: BATCH shells the menu to disk and saves 32 KB of workstation RAM, CHDIR returns the user to their default directory upon completion of the item, PAUSE temporarilty stops menu execution and displays the message "Strike any key to continue", and SHOW displays DOS commands in the upper-left corner -- only if they are executed.

K:
If you use the carat (^) for one option, you must use it for all ITEMs under a given MENU.

Control Commands
Control commands execute menu instructions. They are the workhorses of NetWare 3.12 menu commands. The six control commands are:

~b   EXEC - executes any internal or external program.

~b   SHOW - branches to another menu within this menu file.
~b   LOAD - branches to a different menu file.
~b   GETO - optional user input
~b   GETR - required user input
~b   GETP - assigns user input to a DOS variable

T:
While GET commands add power and flexibility to the NetWare 3.12 menu system, they are difficult to program and extremely finicky. Be careful.

The **EXEC** command causes particular internal and external commands to be executed. The command can be either an .EXE file, a .COM file, a DOS command, or any of the following internal commands: EXEC EXIT to exit the menu and return to the NetWare prompt, EXEC DOS to return to the NetWare prompt temporarily, and EXEC LOGOUT which exits the menu logs users out of the network. The SHOW and LOAD commands provide the same services from a slightly different angle. SHOW branches menu execution to a menu within the current menu file, which LOAD branches menu execution to a completely different menu file. Refer to the sample menu below for an illustration of the SHOW and LOAD syntax.

The final three control commands allow for user input. This feature was previously not available in NetWare menus. **GETO**, **GETR**, and **GETP** are powerful commands, but their syntax is a little tricky. The format for these commands is:

GET*x instruction {prepend} length,prefill,SECURE {append}*

Instruction is replaced by the message you want to display to the user, *prepend* attaches data to the front of the answer string, *length* is the maximum input window size, *prefill* provides a default response, *SECURE* displays asterisks in the user window, and *append* attaches data to the end of the answer string. Some rules to follow for GET*x* commands are: commands must be entered in uppercase, a maximum of 100 GETx commands per ITEM, limit one prompt per line, and you can display 10 prompts per dialog box -- use a carat (^) to force one prompt per box.

K:
When using GETx commands, the ENTER key accepts the input but doesn't execute the command. To activate the corresponding EXEC command, the user must press <F10>.

The **GETO** command receives optional input from the user. The **GETR** command, on the other hand, requires input from the user. If the user does not repsond, the menu will patiently wait until they do. The user can, however, press <Esc> to return to the previous menu. Both the GETO and GETR commands can only handle one piece of information at a time. The **GETP** command can handle many pieces of information at once. In addition, the GETP command stores user input as DOS variables -- %1, %2, %3, %4, and so on. These variables can be used

by other menu commands to further customize user menus.

Refer to the following sample .SRC file for a head-start on NetWare 3.12 menu syntax:

```
MENU 01,TOM'S MAIN MENU
        ITEM ^AApplications
                Show 05
        ITEM ^UUtilities
                Show 10
        ITEM ^JJERRY's Main Menu
                Load U:\USERS\JERRY\JERRY.DAT
        ITEM ^DDOS Prompt
                EXEC DOS
        ITEM ^LLogout
                EXEC LOGOUT

MENU 05,Applications Submenu
        ITEM Word Processing
                EXEC wp
        ITEM Spreadsheet
                EXEC ss
        ITEM Windows
                EXEC win :

MENU 10,Utilities Submenu
        ITEM ^1NetWare Menu Utilities
                SHOW 12
        ITEM ^2NetWare Command Line Utilities
                SHOW 14

MENU 12,NetWare Menu Utilities
        ITEM System Configuration {BATCH}
                EXEC syscon
        ITEM FILER {BATCH}
                EXEC filer
        ITEM Network User Tools {BATCH}
                EXEC session

MENU 14,NetWare Command Line Utilities
        ITEM List Servers {SHOW}
                GETO Enter Server Name and Option: { } 25,, {}
                EXEC SLIST
        ITEM Copy a File {PAUSE}
                GETP Enter Source {} 25,, {}
                GETP Enter Destination {} 25,, {}
                EXEC NCOPY %1 %2
```

ITEM Display a MAP listing {SHOW CHDIR PAUSE}
            EXEC MAP

Menu Execution

NetWare 3.12 menu source files are created using any text editor -- with the .SRC extension. These files are then complied using MENUMAKE.EXE into a .DAT file. The smaller, more flexible DAT file is then executed using NMENU.BAT. In addition, NetWare 3.11 menu files (.MNU) can be converted into 3.12 source files (.SRC) using the MENUCNVT.EXE utility. See Figure 11.4.

<< FIgure 11.4 -- NetWare 3.12 Menu Execution >>

CASE STUDY IV: Building a Menu System for SNOUZER, INC.

USERNAME.SRC
(Note: USERNAME.SRC must be compiled into USERNAME.DAT using MENUMAKE.EXE)

MENU 1,SNOUZER, INC.
  ITEM Applications
     SHOW 2
  ITEM User Utilities
     EXEC Session
  ITEM File Management
     EXEC Filer
  ITEM Logout
     EXEC Logout

MENU 2,Applications
  ITEM ACCT
     SHOW 3
  ITEM DBASE {Batch}
     EXEC DBase
  ITEM WP {Batch}
     EXEC WP
  ITEM 123 {Batch}
     EXEC 123
  ITEM DESIGN
     EXEC Design

MENU 3,ACCT
  ITEM A/P
     EXEC AP
  ITEM G/L
     EXEC GL
  ITEM A/R

EXEC AR

E-MAIL

NetWare 3.12 includes a sophisticated messaging system called **Basic MHS** -- Basic Message Handling Service. Basic MHS provides electronic message delivery on a single server. Another product, Global MHS, provides a more far-reaching E-mail solution. Both Basic and Global MHS are messaging engines -- they aren't E-mail packages. Messages are created in an electronic mail application and delivered by Basic MHS. The E-mail package must comply with the Novell interface standard -- SMF, Standard Message Format.

Novell has included Basic MHS with NetWare 3.12 in an attempt to provide a comprehensive network solution. Messaging has recently become one of the most productive features of local area networking. Along these same lines, Novell has included an entry-level E-mail application called **First Mail**. First Mail is a simple, MHS-compliant application which provides straight-forward E-mail on a single server.

Basic MHS
Basic MHS consists of an NLM at the server and an ADMIN utility at the workstation. To install Basic MHS, follow these simple steps:

~1.   Load INSTALL at the server and choose Product Options.
~2.   Insert Basic MHS to the Currently installed Products screen and enter the path to the Basic MHS files.
~3.   Enter a workgroup name and confirm SYS:MHS as the destination directory.
~4.   Let the system use your current bindery information to build a list of mail users. Also, choose "login names" instead of full names.
~5.   Let the installation program change your system login script and AUTOEXEC.NCF files. It will simply set "MV=" environment variables.

T:
Create all of your users before installing Basic MHS. This way you can let the system create your mail users from the bindery. Otherwise you have to create them manually using ADMIN.EXE.

Once Basic MHS has been installed, you can administer the system through the ADMIN.EXE utility in MHS\EXE. It allows you to create new users, modify and delete existing accounts,

manage distribution lists, register E-mail applications, and modify the Basic MHS system configuration. In order to run ADMIN.EXE at your workstation, you must first load the Btrieve Requester (BREQUEST.EXE).

First Mail

Basic MHS provices the background service of managing user accounts and mail directories, but it doesn't provide a user interface for creating, sending, receiving, or deleting mail. Any E-mail package that uses SMF can use Basic MHS. One such application is First Mail -- which is included with NetWare 3.12. First Mail provides basic messaging capabilities for a single server. It is a comprehensive E-mail application and supports both DOS and Macintosh clients. First Mail is installed automatically when you install Basic MHS, and it resides in the SYS:PUBLIC subdirectory as MAIL.EXE.

STORAGE MANAGEMENT SERVICES

Storage Management Services (SMS) comprises a combination of related services that allow data to be stored and retrieved from a varity of different targets -- Target Service Agents (TSAs). SMS is a backup engine which operates independently from the front-end (application) and back-end (devices). Many manufacturers are currently developing products which support NetWare 3.12's SMS engine. Figure 11.6 shows how five different TSAs can be backed up to three different backup devices. NetWare 3.12 includes a rudamentary SMS application called SBACKUP. SBACKUP is an NLM which operates at the file server. This is efficient because data files travel directly from the server to the attached backup device -- hence, no network traffic. In addition, security and performance are enhanced. Finally, SBACKUP supports multiple protcols, internetworking, and four different name spaces. Let's take a closer look at the features and backup/restore rules of SBACKUP and Storage Management Services.

<< Figure 11.6 -- Storage Management Services >>

```
-----------------------
T:
Novell's NetWare backup strategy has evolved rapidly.  NetWare 2.2 supports only NBACKUP
-- a limited workstation product.  NetWare 3.11 supports both NBACKUP and SBACKUP -- but
not Storage Management Services.  NetWare 3.12 and NetWare 4.0 support only SBACKUP
and the new SMS implementation.
--------------
```

In addition, SBACKUP supports a wider variety of backup devices in the form of independent .DSK device drivers. Hardware manufacturers can provide these drivers for any NetWare compatible backup device. SBACKUP supports three different backup strategies (refer to table 11.1):

FULL -- completing a full backup each time is the most thorough option. It is, however, not very practical. In this case, the "Clear Modify Bit" option is set to Yes and all other default SBACKUP options are chosen.

INCREMENTAL -- the second option backs up only the files which have changed since the last backup. While this choice offers a quick backup, restoring can be a nightmare -- you restore one full and every incremental since then. In this case, the "Clear Modify Bit" option is set to Yes and "Exclude files that have not changed" is set to Yes.

DIFFERENTIAL -- the final, and most effective, strategy employs a combination of the first two. The differential strategy backs up only the files which have changed since the last FULL backup. This makes for quick backups and easy restores -- you restore one full and the latest differential. In this case, the "Exclude files that have changed" option is set to Yes and all other SBACKUP defaults are used -- including "Clear Modify Bit" at No.

<< Table 11.1 -- Comparing three SMS Backup strategies >>