

Alexander SPK[®]

System Protection Kit

~ User Guide ~

Sixth Edition



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INTRODUCTION

With the Alexander SPK in hand you can relax knowing that all of your NetWare® servers will be protected. When misbehaved software threatens to crash any of your servers it will automatically step in and prevent it. In cases where a crash cannot be prevented, it will protect your data by dismounting the volumes. One of the greatest features is that in most cases your users will not know that anything occurred at all. They will continue to work while in the background the SPK buffers them from costly interruptions.

In this new release of the SPK you will find features that protect network up time, simplify resolution, automate reporting, and shorten support times dramatically. A new module even adds monitoring for corruption of compressed files. The SPK will report to any of the industry leading network management consoles. In short; the SPK will manage all aspects of a crash threat or a full crash without any human intervention.

- Keep NetWare running during crash threat
- Unload/reload unstable NLMs without restarting
- Save crash data on-the-fly with NetWare running
- Display industry's most comprehensive crash file
- Windows crash file viewer simplifies diagnostics
- Automated operation does not affect performance
- Protect from multiple sequential crash threats
- Integrate with PageManager and other alerting software
- Sends SNMP trap for all management products
- E-mailable crash file simplifies remote diagnostics

The Alexander SPK contains:

EDNA.NLM

EDNA.NLM (Emergency Diagnostics for the Network Administrator) automatically prevents crashes and runs diagnostics. In cases where a crash is unavoidable, optional switches set Edna to automatically protect your volumes from damage by dismounting them before restarting the server. In either case she creates an .ECF (Edna Crash File) that contains details about the condition of the server at the time of the crash. Edna also reports to PageManager from Atlantis Software, as well as any SNMP management console.

EDNA.EXE

EDNA.EXE is a Windows based crash file viewer that simplifies the viewing and resolution of crash data. Edna will also create an optional email file – which *includes* the Windows® viewer - which you can email to Novell or another support provider for additional analysis.

CONFIG.NLM

Edna automatically manages Novell's CONFIG.NLM for you. Normally when you run Config it creates a static CONFIG.TXT file. Then, when any module is loaded or unloaded the file is out of date. However, with the SPK loaded, when any module is loaded or unloaded, Edna calls upon Config to update the file. That means that when you have a server crash and want to run the config file through ConfigReader it will be up to date! This is very important because the cause of a server crash often has to do with a recent change in the list of loaded modules. A simple switch setting in Edna tells her whether you want Config loaded automatically.

CONFIG READER

ConfigReader by Novell is one of the best and easiest to use diagnostic tools available for NetWare servers. It is simple to have it automatically update its database from the Novell web site making it ready to analyze the output of CONFIG.NLM.

Registering the Alexander SPK

Please register your new copy of the Alexander SPK so that we can notify you when upgrades are available or new products are announced. To register Alexander SPK, either fill out the registration card that came with your product packaging, or use the REGISTER.TXT file (on the Alexander SPK disk) and email it to us at: support@alexander.com

INSTALLATION

SYSTEM REQUIREMENTS

Server

Intel 80386 or higher PC running Native Novell NetWare 3, 4, or 5, with 1 MB disk space for program files on SYS volume, and at least 20 MB on the DOS partition of the server (note: if you want to be able to do full Novell core dumps in your server's DOS partition, allow enough space to account for all of the RAM in your system as well). The entire SPK uses less than 800 KB of RAM on the server and will not affect system performance.

Workstation

PC running Windows 3.11/95/98/NT/2000/XP and 6 MB disk space.

INSTALL

Install The Alexander SPK

From a Windows workstation where you are logged onto the target server as ADMIN/SUPERVISOR or equivalent, and have a drive letter mapped to the root of the SYS volume, insert the disk and run SETUP.EXE. Make sure that you have shut down any other programs while running Set Up.

Registration Information

User Info:

- Enter user name
- Company name
- Serial number

NOTE:

If this is a 30 Day Time-Out version, type in

30day

instead of a regular serial number.

Confirm Registration Information

Confirms that information input on User Information screen is correct.

Select NetWare Version

Next, select the version of NetWare on the target server.

Select Components

Select the different components to install onto your system. By default all components will (and should) be installed.

Choose NLM Directory

Select the directory where the SPK NLMs will be installed. These files must be installed to the SYS volume of the target server. The default directory is:

"SYS:\ALEXSPKS".

Click on BROWSE and then the NETWORK buttons to select your target server.

Choose Windows Directory for Crash File Viewer and Help

Choose Windows EXE Directory: Select the directory where the SPK Windows viewer, help-registration-readme files, and copy of entire manual will be installed. This directory can be either on your workstation or the target server. The default directory is:

"C:\ALEXSPKW"

Select Program Folder

Select the program folder for the SPK icons. The default is "Alexander SPK".

Start Up

Setup will add a single statement to your AUTOEXEC.NCF directing it to check the ALEXSPKS directory for both LOAD and SEARCH ADD statements.

Switch Settings

Configuration switches give you many options on the operation of the SPK. They tell EDNA.NLM how you want her to manage your server. Note that these switches can be set either during installation or at any time directly on the running server. If you are not certain exactly how you want to set the switches, don't worry. Accept the default at installation and remember that you can always modify the switches while the SPK is running. If you want to see a more detailed description of the switches, go to the Edna Server Configuration section of this user guide.

Review Configuration

SETUP allows you to review your installation choices and then begins installing the SPK components. Scroll down so that you are sure to review files set up both on your workstation as well as the server.

Setup Complete

Upon installing the SPK, SETUP will display the current README.TXT file. We strongly recommend that you take a moment to review this information.

REGISTERING THE SPK

Register your copies of the Alexander SPK through email or snailmail

Registering the Alexander SPK

PLEASE take a moment to register your copy of the SPK. If you do, we will keep you posted on new releases, patches and updates to the SPK. You can easily register your copy of the Alexander SPK either by filling out the form found in C:\ALEXSPKW\REGISTER.TXT which was installed on your workstation when running SETUP. Then simply email the registration form to: support@alexander.com

USING SPK

LOADING AND UNLOADING

To load the SPK modules, you must have access to the system console of the file server, either directly or via remote console.

Loading for the First Time? Do a SEARCH ADD:

The installation of the SPK adds a new directory to the root of SYS on your server called ALEXSPKS. If this will be the first time that the SPK is loaded on the server and if it has not been restarted since installing, you will have to tell the server about this new directory through the SEARCH ADD command. Go to the server console and type:*

```
SEARCH ADD SYS:\ALEXSPKS
```

Now you are ready to load the modules for the first time.

* Note that this will not have to be repeated in the future since the SEARCH ADD command has been added to your start up files.

Remember that you can have the SPK configure itself automatically by setting the switches that you desire from the console screen for EDNA.NLM. Edna will then create a configuration (.cfg) file to hold the settings. These can be easily modified at any time from the console. To see additional information on switch settings, see [Edna Server Configuration](#).

PROTECTING YOUR SERVERS

Define Soft and Hard Crashes

A server *crash*, often known as an *abend* (from abnormal end of operation), includes the cessation of normal server operations. Alexander LAN, Inc. has further broken down crash into *hard* and *soft* crashes.

Hard Crash

With the SPK, A hard crash is synonymous with a system crash. Here, the server goes down because the server's OS crashed. In order to regain network services the server will have to be restarted.

Soft Crash

A soft crash is synonymous with an application crash. Here the server can often be protected from crashing through suspension and unloading of the unstable application.

With the SPK, a simple switch setting at the EDNA.NLM console screen automatically changes many hard crashes into soft crashes, thereby preventing interruptions to network services.

How does SPK Prevent Crashes?

When misbehaved NLMs or drivers threaten to cause a server crash, the SPK automatically steps in and prevents it. It does this by first identifying the thread or process that is causing the problem. Then it checks to see who *owns* the thread and suspends the entire NLM. In many cases this enables the server to continue operation

Compare SPK Protection with Novell's

Novell introduced a form of crash prevention in version 4.11 or later of NetWare. When threatened with a crash, the OS suspends the thread causing the threat. Following this you would see a numeral framed by brackets at the server console prompt. If one crash threat was successfully prevented, there would be a <1>. If there had been, say, four, then a <4> would be displayed.

Note that when running NetWare alone, only the thread is suspended and that the owner NLM is still loaded. However, though it is still loaded, it is useless. We call this a "zombie NLM" since it is still loaded and still has resources allocated to it but is otherwise dead. In order to regain its services the server will have to be restarted so that the Zombie NLM can be reloaded. This means the interruption of network services to all of its users. An ABEND.LOG file can be created and saved for later analysis.

Alexander LAN advanced this concept by re-engineering it to further protect the reliability and reduce operation costs. Beginning with version 3.11 of the SPK steps in *suspends the entire NLM* that is threatening the stability of the server. Then it offers the administrator the option of actually unloading the application. If he unloads it, SPK frees up all resources previously held by the NLM. Then the administrator can *reload the nlm and regain its services without restarting the server*. This means that interruptions to office productivity are greatly reduced.

In short, the SPK handles multiple sequential crash threats, suspends each application, and offers the option to unload each as the administrator chooses. As all of this occurs, the users scattered around the enterprise network have no idea that a crash (or crashes) almost brought the system down.

In addition to this protection, the SPK gathers the most comprehensive crash file in the world. While the ABEND.LOG file is an excellent beginning, the .EDNA.ECF file is dramatically more comprehensive and can be viewed by anyone with a simple windows based viewer. A typical crash event recorded in an ABEND.LOG is around 25K in size as compared to an Edna Crash File for NetWare 6 that typically runs from 15 to 25 MB (prior to compression.)

Turning a Crash into an Orderly Shutdown

When a crash cannot be prevented, EDNA.NLM can turn the event into an orderly shutdown. By setting the "Orderly shutdown of server before restart" switch to ON she will work to protect your servers volumes from damage by dismounting them.

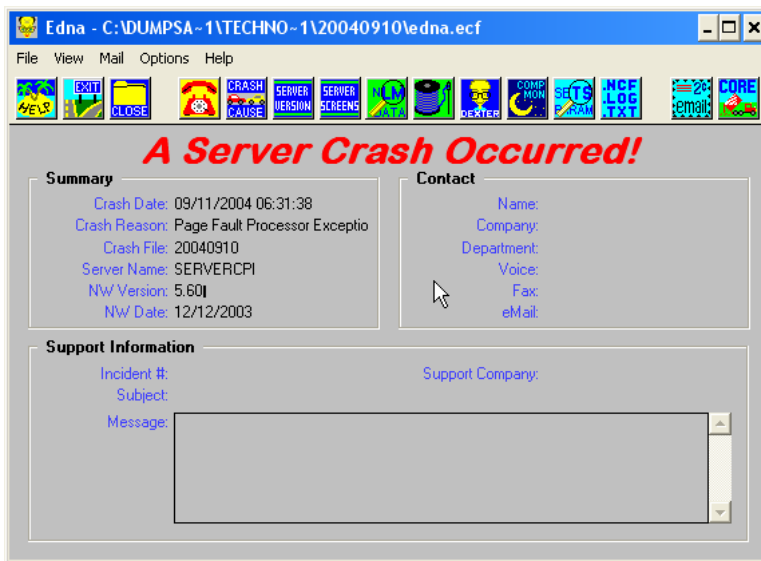
INSTANT CRASH DIAGNOSTICS

A Quick Look at a Crash File

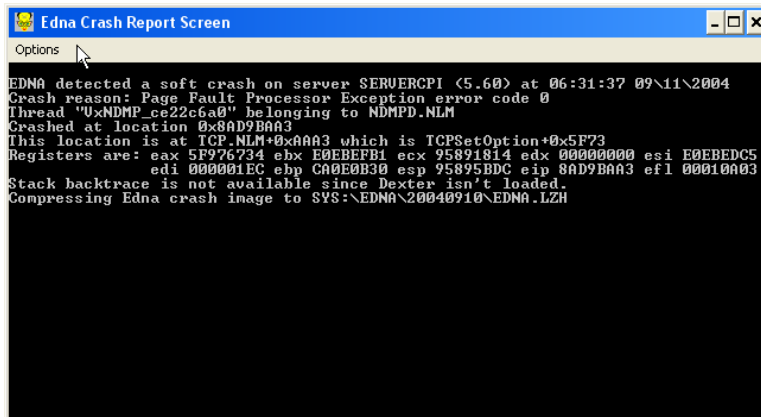
The following steps will walk you through an Edna Crash File, which is generated at the time of a server crash. The following are screen shots of the crash file while being viewed on your windows workstation.

When you want to view a crash file, simply run EDNA.EXE (the win-based crash file viewer) and open any .ECF or .LZH file from any crash that you have had. If you created (or received from someone else) an email crash file, just double click on the file from Windows Explorer (if you downloaded a sample crash file from our web site, it will be an EDNAMAIL.EXE file also). Edna will activate and notify you that the Edna file contains mail and then asks you if you would like to view it. Click on YES. Edna will now activate her viewer, extract her compressed files, and open the Edna Crash File.

The Crash File Open screen will display any edna.ecf (Edna Crash File), edna.lzh file (compressed ECF file), or Edna Mail file (ednamail.exe).



Once your crash file is opened, your main screen will look like this. From this screen, you have access to all of the information captured by the Alexander SPK at the time of the crash. To quickly find the cause of your server crash, click on the "CRASH CAUSE" button.



This screen was created and captured by EDNA.NLM at the time of the server crash.

It gives the administrator or developer a summary of the events which lead up to your sever crash, including identifying the NLM or driver that caused the server to crash. There are several ways to view this report.

1. Server Console

Immediately following the event, Edna displays the crash report on the server console

2. Crash Cause Button

By selecting "Crash Cause" from the toolbar in the crash file

3. Server Screens Button

By selecting the "Server Screens" button you will see a dialogue box from which you will be able to view any of the screens that were running on the server console at the time of the crash including the Crash Report Screen

4. Back-up File in DOS Partition

In rare cases where the SPK is cannot create an ecf file, Edna will save the Crash Report to the DOS partition as a small text file

From this screen we see the crash reason:

Crash reason: Page Fault Processor Exception error code 0

The next line gives us the thread that was running at the time of the crash: "VxNDMP_ce22c6a0" belonging to NDMPD.NLM" and we also have the owner of this thread: "NDMPD.NLM". This tells us that NDMPD.NLM was running thread "VxNDMP_ce22c6a0" at the time of the crash. More than likely, this is the NLM that caused our server to go down. Also note that instructions to the system came from TCP.NLM.

Thread "VxNDMP_ce22c6a0" belonging to NDMPD.NLM
Crashed at location 0x8AD9BAA3
This location is at TCP.NLM+0xAAA3 which is TCPSetOption+0x5F73

Next, check the web site of the developer of NDMPD.NLM. If you do not see any updates or references to a fix to your problem, call and tell them that their NLM tried to crash your server. By providing them with a copy of this Edna crash file it will be easier to repair the offending NLM. Finally, notice that the last line tells you where the complete crash file was saved so that you can view any additional data that you need.

Writing Edna crash image to SYS:\EDNA\20031007.B\EDNA.ECF

So, how do you get this information to the vendor? Edna can create a self extracting EMAIL file which builds her Windows viewer and help files into the crash file. The recipient of the crash file does not have to have the Alexander SPK. To have Edna create a self-extracting EDNAMAIL.EXE file click on the EMAIL button. This opens the

CREATE MAIL dialog box. By default, Edna has already selected all of the files from the "crash directory". Next click on the "create self extracting file" dialog box and (optionally) enter a subject and message. Now click on "CREATE". Edna will create her EDNAMAIL.EXE file which will include all of the crash files that pertained to that specific event AND include a copy of the Windows viewer and help files. When done, you can use your email program to send the file. It's that easy!

Detailed Crash Diagnostics

Walk through an Edna Crash File

View All Details Gathered at the Time of a Crash

To do a detailed diagnosis of a crash you will need to look at all that the crash file offers. Here is a walk through of each of the tool bar buttons and what you will find behind them.

Notice first the main Edna Crash Report screen. From here you can access all of the information contained within the crash file. The background for this screen lists a brief summary of the crash information contained within the file and the contact information for the user who sent it.

The Toolbar and Associated Screens

Edna Crash File Toolbar

The toolbar is divided into two basic groups; the administrative buttons and the crash data buttons. The administrative buttons constitute the first group (four buttons) and are described below.

Help

The HELP button activates the help file for Edna

Exit

The EXIT button closes the current crash file and exits the Windows viewer

Contact Information

The CONTACT INFORMATION button activates a window in which you put your name, address, phone number, email address, etc. Once saved, this contact information will be included with each email crash file that you create for support.

Close File

The CLOSE button closes the current crash file.

The second group of buttons are the crash analysis buttons and are described below.

Server Version

The SERVER VERSION button activates Edna's server information box. The version of NetWare, Revision of CLIB and TTS/SFT levels can be found here. This is useful because it gives you a basic overview of the NetWare platform you will be reviewing.

Server Screens

The SERVER SCREENS button activates Edna's Screens dialog box. From here you can view the snapshot of all the screens which were running at the time of the crash, including the Edna Crash Report Screen.

Threads

The actual thread that was running when the server crashed was called "VxNDMP_ce22c6a0". The THREADS button activates a list of all of the threads which were present at the time of the crash.

View the details for the thread you want information for by clicking on the thread name with the mouse, or change the highlighted thread using the arrow keys. Be sure to look at the thread that reported was running at the time of the crash.

This lets you see detailed information regarding each thread. This information includes whether the thread was running or not, and if not running, what state the thread was in, the registers and flags for thread, and what NLM created the thread

NLM / driver

The NLM or driver that spawned the thread "VxNDMP_ce22c6a0" was "NDMPD". This means that NDMPD.NLM was executing thread "VxNDMP_ce22c6a0" at the time of the crash. More than likely, this is the NLM which caused our server to go down. But to be sure, let us review the rest of the information.

NLM details are crucial when evaluating a server crash

The NLM/DRIVER DATA button activates a list of all the NLMs and drivers which were loaded on the server at the time of the crash. At Alexander LAN, Inc., we have found that fully one half of all server crashes are due to NLMs not being up to date, patches not being loaded, etc.

The NLM Detail screen lets you see information about every NLM and driver that was loaded when the server crashed. Select the NLM you want information for by clicking on the NLM name with the mouse, or change the highlighted NLM using the arrow keys. You'll find information about the NLM including the version, date, description provided by the NLM vendor, and where the NLM's code and data are loaded in memory.

Set the window to sort the NLMs by date in ascending order. Then scroll through and see what the oldest files are. If you suspect that some are out of date, you should run ConfigReader and have it check the CONFIG.TXT file. If you do not have the reader installed, you will find a copy of it on the SPK's CD. Be *sure* to update the reader's database on Novell's web site before having it analyze the CONFIG file. If you are not running CONFIG.NLM, simply change the setting on the EDNA.NLM screen (CONFIG.NLM is included in the SPK installation program).

Dexter/Edna Stack Back Trace

The DEXTER/EDNA STACK BACKTRACE shows the "symbolic" information located in the "LOCATION" column. Symbols are basically task descriptions for code found at certain hex addresses in memory. They are important because they help to identify what the server was trying to accomplish at the time of the crash – as well as the steps that led to the crash. Normally these symbols are hidden from view.

As you look at the stack information note that the most recent event is at the top and you step back in time with each line down. This shows that DIVZERO.NLM was running a process called " VxNDMP_ce22c6a0" at the time of the crash. This was the process which caused the server to crash.

Edna displays stack back-traces, complete with the hidden symbols

To see the stack for any given thread, click on the thread name by using the mouse, or change the highlighted thread using of the arrow keys. The stack shows you what functions the thread was executing at the time of the crash. If there are symbolic names or debug information available, they will be displayed. These function names will often give you valuable clues as to what the thread was trying to do when the server went down.

You have two options for looking at the stack. The first is to see only the function call information. This is the default display. The second is to see all of the information on the stack. In this mode, Edna shows you every item on the stack and tells you what the item is, along with any symbolic or debug information available.

Settable Parameters

The SETS button activates a listing of all of the SET parameters on the server. This is very useful to determine just how the server was setup.

Text Files

The TEXT FILE button activates a dialog box which gives you an option to view any of the text files that Edna copied at the time of the crash. The default list of files to be gathered (which can be edited by the user to include any other files) include: AUTOEXEC.NCF, STARTUP.NCF, SYS\$ERROR.LOG, TT\$ERROR.LOG, NETCHECK.LOG, DEXTER.LOG, EDNA.LOG, CONFIG.TXT, CONLOG.LOG, AUTOEXEC.BAT and CONFIG.SYS.

Email

The EMAIL button activates a dialog box which tells Edna create an EDNAMAIL file. By default, Edna will compress all of her files into one EDNAMAIL.ECM (Edna Crash Mail) file. The user can optionally have Edna create an EDNAMAIL.EXE file, which is a self extracting file containing the Windows viewer and help file. The user can also write a text message to be included in the file. Once the file is created, use your mail program to send the file for technical support via the Internet.

One of the important values of the SPK is that by creating an email crash file and sending it for remote support, that remote engineer can instantly analyze your data, *even if he does not have the SPK!* This is because your crash file *includes* a copy of the EDNA.EXE Windows viewer (which you may give out free of charge). This is very important because it means that all the support engineer needs is a Windows PC.

Reporting to the Vendor of the Offending NLM

Now, we can call the third party developer of NDMPD.NLM and tell them that their NLM created a crash threat to your server. Emailing the crash file to them will make their job of correcting the bug, in most cases, a simple task. It is common that bugs that have eluded programmers and administrators for months can be pinpointed in minutes with an Edna Crash File (ECF).

EDNA

ABOUT EDNA

While the SPK is a kit containing several programs that integrate to protect your server from crashes and simplify resolution, it is Edna that masters the process. She is the actual "crash handler". Edna protects the server from crashing and simplifies diagnostics. In cases where a crash is unavoidable she takes over the server to gather diagnostics, protects the volumes by dismounting them, restores full NetWare services as quickly as possible, and alert the administrator. Her Windows viewer component simplifies diagnostics and remote support by displaying the detailed crash data in simple Windows format and by enabling you to create an Edna Mail attachment so that you can send the crash file for remote support at Novell or another provider. Of course, she would have less to report were it not for the features found in Dexter, CompMon, Config, and NetCheck. But, it takes Edna to put it all together and make it happen -- *automatically*.

In this section of the User Guide you will see the details surrounding Edna's features and operation. Please study it closely so that you will see the many options that Edna offers in the configuration of your own protection scheme for your servers.

USING EDNA

What Happens when Your Server Crashes?

Edna actually creates two screens. The first, which we have just been looking at, is the Edna configuration screen. Edna uses the second screen, the crash report screen, to report information regarding server crashes, rather than reporting the crash to the main server console screen, as NetWare does. This preserves as much of the original console screen at the time of the crash as possible. The crash report screen, with an actual crash reported, is next.

Edna crash report screen

This shows you the type of information that Edna reports immediately when a server crashes. With the help of the Edna user interface, you can do more detailed analysis of the server's condition at the time of the crash (more on this later).

As you can see, Edna reports a great deal about the crash and what caused it. The main areas of the report screen, and what important information can be gleaned from them, will be described in detail.

Edna tells you the name of the server and when the crash occurred, followed by the reason for the crash. In the present case the server has crashed, and Edna identifies the name of the crash. This generally indicates the basic nature of the crash. Many crash descriptions are fairly suggestive of the nature of the problem.

Edna reports the name of the thread that crashed, along with the name of the NLM that owns the thread. This provides a valuable clue as to which NLM may have caused the server to go down.

Edna tells you where the crash occurred in the code, along with whatever symbolic information is available. If the server crashes in the operating system, or in an NLM with

debug symbols, Edna tells you in what function the crash occurred. This, too, may provide a valuable clue as to the nature of the crash.

Edna next reports the CPU registers at the time of the crash. This information is most useful to an engineer familiar with the code at the point of the crash (say, a software developer working for the company that provided the NLM in question, or a Novell support engineer).

Below this, Edna identifies the place to which she is writing the crash image - it is the line on the screen that shows the progress of the saving of the crash information to the DOS partition.

Once output of the crash information is complete, Edna restarts the server (unless you have told her not to). After the server has restarted, and the AUTOEXEC.BAT file has started NetWare back up, Edna is automatically loaded by the AUTOEXEC.NCF file. She detects that a crash has just taken place, and copies the crash file, along with all the files on the user list, to the crash save directory.

Since you might possibly have several crashes take place before you have a chance to look at the first one, Edna actually saves all the crash files in a sub directory of the directory you specify. The name of the sub directory is the date of the crash. If you have more than one crash in a day, Edna adds a letter to the date to keep each sub directory unique. Edna tells you where she copied the files, so that you know exactly where to look.

Edna crash notice screen

After all the files are copied, Edna pops up a notice at the server that a crash has occurred, and tells you where the files were saved. The notice stays up until you acknowledge it by typing a key. Even with the notice posted, Edna is immediately active waiting for the next server crash, so it isn't necessary to quickly acknowledge the crash notice.

RUNNING EDNA ON YOUR SERVER

Setup will automatically add Edna to your AUTOEXEC.NCF file. When Edna is first installed, you will need to start Edna manually. Type EDNA at the server console. This will run EDNA.NCF, and start Edna.

The current window will be outlined in yellow, with a double line for a border. Quick Help for the current window is at the bottom of the screen. Quick Help shows all the available command keystrokes in this window. In this case, ESC tells Edna to exit, TAB sets the next window as the current window, and typing the letter highlighted in yellow toggles the corresponding switch. This window contains the software configuration switches that let you control basic Edna options (these switches are described in detail a little further on).

If a window has a vertical scroll bar (as in the second window, above), then the window has too many lines to display completely. If you highlight that window with TAB, you can move up and down the window with the arrow keys or PageUp/PageDown. You can also zoom the window by typing Z. This will make the window larger, so you can see more at one time. Above is the second window zoomed.

As you can see, in this case the scroll bar has vanished, since the window is now completely displayed.

EDNA SERVER CONFIGURATION

This section describes how you can configure Edna to meet your needs and to customize her actions for your environment.

Software Switches window

First TAB to select the Switches window, then "Z" to zoom the window out so that you can see all switches at one time. The first window lets you control various aspects of Edna's behavior. Each option is toggled by typing the highlighted (yellow) letter. This highlighted letter is usually the first letter of the switch description.

Restart server after capturing hard crash

When a crash cannot be prevented Edna will restart the server for you ensuring maximized up time. However, if for any reason you do not want Edna to restart your servers, just turn off the restart switch by pressing "R". If you have another utility that can also restart a server or, if you are working with the debugger (and Dexter) manually, you may actually not want it brought back up automatically.

Compress crash file and/or core dump

When a server experiences a hard crash, Edna first records the crash file to the DOS partition. Then, when the server is back up, she cleans the crash file out of the DOS partition and places it in a NetWare volume. If you have a server that is low on disk space, DOS partition space in particular, you may want to take advantage of Edna's compression option. Simply press the "C" key to toggle on or off the compression option.

Edna's crash information files, even though they contain a lot of valuable information, are typically not very large when compared with traditional core dump images. So most systems are not likely to run into a problem regarding space. Core dumps, on the other hand, are as large as the RAM on the server. With today's servers, that means a tremendous amount of space. By setting the compression switch, Edna will compress all of the crash information as it is written. Typically, the savings in space runs around 60%. Bear in mind that invoking the compression option may cause Edna to take slightly longer to write the crash images.

When considering whether your server needs crash file compression, consider the following:

Edna Crash File

Depending on your server's configuration, ECF files run from a minimum of 3 MB on smaller NetWare 3.x systems to as much as 25 MB on newer, larger 5.x and 6.x systems.

Novel Core Dump Images

When figuring on allowing for core dump images (which should always be prepared for!), add the amount of RAM on the server (plus a little more) to the

above space considered for the ECF file. While core dumps are typically seldom needed, they are VERY important when the time comes to generate one! The last consideration on space for core dumps is the incredible pace at which RAM usage is growing. If possible, calculate the space needed and *double it*. You'll likely use it in two years due to memory upgrades.

Orderly shutdown of server before restart

When a hard crash cannot be prevented, Edna will work to protect your system from damage by attempting to turn the crash into a "graceful down" or an "orderly shutdown" by dismounting the volumes. Pressing the "O" key will toggle the orderly shutdown on and off.

Soft crash if possible

The "soft crash" switch is, for most administrators, the most interesting and valuable. This is so because invoking it will protect your servers from many crashes automatically. What Edna does is to suspend the NLM or driver that is threatening the server with a crash, allow you to actually unload it, clean up and release all resources that were attributed to that program, gather full crash diagnostics, and, while all this is going on, protecting the users on the workstations from any knowledge that a crash almost occurred. Their work is uninterrupted. Simply pressing the "S" key toggles the soft crash option on and off.

Novell core dump image output

This option instructs Edna to write a full Novell format core dump image. In most cases, this is not needed. However, when trying to diagnose a particularly difficult problem, it can be an excellent resource. To have Edna automatically capture a full core dump, press the "N" key.

Remember that the core dump image file will contain all of the memory on the server at the time of the crash. While this ensures that by completely recording the state of the server, you will have a complete picture of the state of the system for analysis, it also takes a lot of space. It is considerably larger than Edna's crash file. In fact, it will be slightly larger than the amount of RAM on the server. On a production server this can lead to a very large file. If you want to make a Novell crash format file, and you don't have enough room in your DOS partition, we recommend that you use the compress file option. This lets you avoid reformatting your DOS partition or adding auxiliary drives every time you add more memory to your server.

Edna format crash file output

This option, to capture an Edna Crash File (ECF), dramatically simplifies and shortens the diagnostics process following a server hard or soft crash. Unlike a core dump which captures *everything*, even empty cache buffers, the ECF file saves a very comprehensive directory of files that are the most likely resources needed to facilitate resolution. Simply press the "E" key and Edna, working with Dexter, will invoke powerful debugging technology to automatically pinpoint the culprit and save the supporting data. As a rule, this switch should **ALWAYS BE ON**.

This ECF file has other benefits that include:

- Viewable under Windows
- Can create an emailable crash file
- All diagnostic information can be copied and printed
- Much of the information is easy to read and work with by any administrator
- Review of the ECF file usually means that a core dump is not needed
- The most important data in an ECF file can be read in a couple of minutes while the core dump takes several hours

Automatically repair volumes if needed (NetWare 3.x only)

Sometimes when a server crashes, some of the NetWare volumes cannot be mounted. This usually happens if files are being updated on the volume when the server goes down. If the SYS volume cannot be mounted, the server cannot be automatically restarted. Edna can automate restart for you by means of setting the "A" switch.

By setting this switch, Edna will create an AUTOEXEC.NCF file in the directory from which you start etWare. This AUTOEXEC.NCF file will be used only if the SYS volume cannot be mounted. The AUTOEXEC.NCF file will load a program called Ednavfix. Ednavfix will automatically run a volume repair utility, such as vrepair, to repair the SYS volume. Once repair is complete, Ednavfix will restart your server. Now the SYS volume should mount without problems and the server will restart normally. Ednavfix will log what it did to a log file, called EDNAVFIX.LOG, in the DOS partition. As Edna starts up, she will copy any log entries in EDNAVFIX.LOG into the Edna log, and then delete the EDNAVFIX.LOG file (*note that Users of 4.x+ have a similar feature in the OS*).

Load CONFIG.NLM automatically

Setting the "L" switch in Edna will tell her to load Novell's CONFIG.NLM automatically. This is a very helpful feature as it enables Edna and Config to work together to keep track of the server's configuration. Following either a soft or a hard crash, you can run ConfigReader (also by Novell and supplied on the Alexander SPK CD), call up the CONFIG.TXT file saved by Edna during the event, and have the data analyzed with Novell's web based database. ConfigReader will identify any out of date NLMs and other configuration problems. In some cases, users have experienced some performance issues when CONFIG.NLM runs. If this occurs, then set the "L" switch to OFF.

These last three options are command line switches to be used only for troubleshooting:

-NOCRASHFILE

Do not create a crash file

The NOCRASHFILE switch disables the creation of an Edna Crash File (ECF). Therefore, Edna will not gather data when the server crashes.

NOCRASHCHECK

Do not check for previous crash

The NOCRASHCHECK switch tells Edna not to check the operating system (OS) for a previous serve crash. Note that when this switch is activated, Edna will not automatically copy to the SYS volume an ECF that may have been created on the DOS partition.

NOOSHOOKS

Do not install O/S hooks

This switch disengages Edna from the OS and does not allow her to intercept any crash. This switch should be used only on the advice of a technical support engineer.

Directories and Path Names Window

TAB to the center window to see or edit what files will be saved and where. Press the "Z" key to zoom the window. This window lets you configure the directories in which you want Edna to save crash information, and lets you specify a list of files that you want captured along with the crash image itself.

The first path identifies where you want Edna to save the crash image. The default is to the root directory of the DOS drive from which you started NetWare. The second path identifies to which place you want Edna to copy the crash files after the NetWare server is back up. This is usually to a NetWare volume, and the default is to SYS:\EDNA.

The list of files names identifies the files that you want saved along with the Edna crash image. The list shown is the default list. It includes the STARTUP.NCF from the startup directory for the server, and AUTOEXEC.NCF for the server from the SYSTEM directory. Next come the system console and error logs, followed by the logs for the Alexander SPK tools. Last are the Edna activity log and Edna configuration file.

To change any of the files or directories, highlight the line using the arrow keys, and hit ENTER. This will pop up a box with the path name, and will let you change the path. When you hit ENTER it confirms the change and updates the list. Hit ESC to leave without making changes. Add new files by hitting the INSERT key, delete files from the list with the DELETE key.

After Edna has recovered from a crash, she copies the crash image, along with all the files on the list, to the target directory. This is where you go to look at the crash after the server is back up.

Log Window

"Z" zooms the log window to see more information. This window shows you the Edna event log. Edna logs all important events to a file called EDNA.LOG, and to the log window. The log window shows you everything that has happened since Edna was loaded. It typically contains things like when Edna started, when the Edna configuration was changed, and where the files were copied to if a crash was seen.

Use the arrow keys to view parts of the log that aren't visible. The scroll bar to the left indicates where you are in the list.

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