NOVA Line

A newsletter for Novadyne customers who use a variety of hardware and operating system platforms

Issue 3

First Quarter 1994

In this issue

Novadyne and Bull Strategic Alliance

Novadyne Computer Systems, Inc. and Bull HN Information Systems, Inc. have recently entered into a three-year strategic alliance which allows both companies to offer a combined services package to existing and prospective customers.

This alliance enables Novadyne to act as the prime contractor, immediately delivering a full range of LAN and desktop services to its existing customers and prospects. Similarly, Bull can now offer its customers Novadyne hardware and software services on Digital Equipment Corporation (DEC), Sun Microsystems and Tandem products. While these services combine to broaden the services capabilities, they do not overlap.

Bull's relationship with Novadyne brings immediate networking capabilities in the following technological environments: Novell NetWare, Microsoft LAN Manager, Microsoft Windows for WorkGroups, 3COM, Apple Share and Apple Talk, TCP/IP, Proteon and IBM SNA.

Worldwide Information Systems

Bull

"Novadyne has the ability to deliver a complete LAN service to corporate accounts nationwide. We are extremely pleased with our relationship with Bull," said Novadyne chief executive officer, Robert B. Laurence. "This alliance moves Novadyne into the LAN market with one of the leading suppliers in the industry today. We believe this to be a significant development for us and for our customers," he said.

Dick Suech, Bull CSO executive vice president, said, "Novadyne's expertise and commitment were key factors for us in the formation of this partnership. More importantly, we felt we shared the same vision of the service industry; we see the same trends and opportunities. That should allow us to add value to each others' businesses."

"This alliance follows industry trends wherein major corporations offer to their customers additional value through their partner's solution," said Novadyne director of Networking Systems and Services David Carlton. "Bull brings enterprise-wide LAN opportunities, featuring broader multi-vendor business solutions to Novadyne," he said.

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NOVADYNE

RDBMS Corner

by Mike Bingman

Unidata Alerts

As Unidata has now released the latest version of their RDBMS, they have issued the following alerts regarding changes that you may run into in upgrading to this latest release.

UniBasic - Reserved words

Your UniBasic object code from any 2.x release is fully forward compatible with any 3.x release. Unidata has however, introduced a couple of new reserved words. You may find you have a problem recompiling a program on a 3.x release that compiled successfully on a 2.x release. In release 3.1 the added reserved words are:

```
ABSOLUTE
RELATIVE
SYNC
ASYNC
CURRENT
PRIOR
PREVIOUS
```

In release 3.1.5, you can no longer declare ERRMSG as a dimensioned array. In the next release (3.1.5a), the restriction on ERRMSG will be removed. The ERRMSG function (added for UnidataUs UniDesktop product) will get renamed GETERRMSG.

UniBasic - EXECUTE...CAPTURING

The CAPTURING clause in a UniBasic EXECUTE or PERFORM statement is used to capture the output of the executed command in a multi-attributed dynamic array. In release 2.3, the first text appeared in the second attribute of an array. Starting with release 3.x, the first text appears in the first attribute of the array. If your application used text captured in this array, you need to adjust your source code appropriately.

UniBasic - EXECUTE...RETURNING

The RETURNING clause on a UniBasic EXECUTE or PERFORM statement is used to trap Unidata error message number and text generated by the executed command. Some of the error message numbers have changed from release 2.3 to 3.1. If you are explicitly checking for specific numbers in your applications, you should review these numbers to see if any of them have changed. ❑

REALITY Corner

by Gary Moote

Handling Aborts

The REALITY Operating System executes in two modes: *Monitor* or *Virtual*. When executing in Monitor mode, the system is responsible for Input/Output (I/O), memory management, process scheduling, servicing faults, and various interrupts. When a user process gains control, the system is executing in Virtual mode.

The system can abort in either mode. In Monitor mode, aborts are trapped by the Monitor debugger. Monitor aborts only appear on port 0 and cause the whole system to halt. An example of a Monitor abort is:

```
MONITOR ERROR 00
E 0073E 08
>
```

Get assistance from Central Support in troubleshooting these aborts before trying to recover the system.

In Virtual mode, aborts are trapped by the software debugger. The abort is only displayed by the aborted process. An example of a Virtual mode abort is:

```
CROSSING FRAME LIMIT; REG = 11.
ABORT @ 242.07F
!
```

Since Spooler and TIPH processes have no connected terminals, no abort message is displayed. For these processes, when the first entry under the return stack heading is "1.xxx" or "21.xxx" the process has aborted. To determine the abort, do a WHERE for the process in question.

Error Codes and Messages

Monitor aborts display the error codes, whereas a Virtual abort displays the cause. Below is a table showing error code and the associated messages:

Error Code	Error Message
0	Illegal Opcode
1	Return Stack Empty
2	Return Stack Full
3	Referencing Frame Zero
4	Crossing Frame Limit
5	Forward Link Zero
6	Backward Link Zero
7	Privilege Opcode
8	Referencing Illegal Frame
20	I/O Handling Error
23	LAD error

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Digital Corner

by Glen Taylor

OpenVMS SCSI Badblock Replacement

Ever wonder how OpenVMS handles badblock replacement on SCSI disk drives? The following is a brief explanation of how OpenVMS handles uncorrectable reads and writes on SCSI disks.

WRITE

After detecting an uncorrectable write error, OpenVMS will retry three times to successfully write the data to that sector. If at any time the write is successful, the system continues. After three unsuccessful attempts to write the data, another sector is selected and the system continues.

READ

Unlike the SDA disks, SCSI disks have no forced error flag associated with the sector. Therefore, upon detecting a non-correctable read error, OpenVMS retries the read operation three times.

A reassignment of data after three non-correctable read errors could result in corrupt data. Therefore, the system notifies the user with a "SYSTEM-F-PARITY, parity error" message. This indicates that a bad sector has been detected in the file currently being read. A bit is set in the file header to indicate that a possible bad sector exists in the file.

To recover from the above situation, the file must be deleted and restored from a backup saveset. When the file is deleted, the system will detect the badblock bit set in the header and will read each sector of the file until it locates the bad sector. Then, the system will record the bad sector in the BADBLK.SYS file, insuring that this block will not be used again.

Look for more OpenVMS tips and tricks in future issues of *NovaLine*. ❑

The Digital Corner is a new column in *NovaLine* for users of Digital Equipment Corp.'s systems and operating systems. In this issue we hear from Glen Taylor, one of Novadyne's support specialist on DEC.

Tandem Corner

by Tom Bean

Client/Server for Tandem

Finally, it is becoming feasible for Tandem Pathway users to achieve the significant cost savings and improved user service of the Client/Server environment.

Unfortunately, the benefits of this new technology, networking, new cost-efficient workstations, and user friendly Graphical User Interface (GUI) applications, have been offset by the pain and risk of the migration process. Pathway users have found it necessary to abandon a significant portion of their investment in existing applications and undertake a new, expensive, time consuming development project to make this move.

Now multiple packages are available to make the benefits of Client/Server available to Pathway users. They provide automated porting of Pathway applications to the cooperative processing, GUI environment without costly development efforts.

Requester source code, written in Screen COBOL (SCOBOL), is converted to ANSI C and downloaded to a workstation of the type to be used in production. The C source is built to provide a workstation version of the requester. This allows the application requester to execute, without modification, under the workstation's windowing system.

The immediate benefits of moving the requesters to the workstation are the reduction of host resource requirements and improved user response time by eliminating: SCOBOL pseudo-code interpretation, repeated terminal I/Os, field format conversions, downloading of terminal screens, and PCBs consumed by multiple copies of Pathway TCPs.

Additional Benefits

In addition to freeing Tandem resources, this method of implementing Client/Server removes the concern about abandoning the existing investment in terminals. The Pathway version of the requester can still be utilized on the terminals while the workstation based requester is used on the workstations. This allows the user to control the expense of moving to the new workstations by spreading the investment over time.

For more information about the packages that are available, please contact your Novadyne representative. ❑

The Tandem Corner is another new column for *NovaLine* for users of Tandem systems. In this issue we hear from Tom Bean, Novadyne's Tandem Product Manager.

Sun Corner

by Kathryn Rebe

Checking Log Files

UNIX keeps track of certain system events in log files. As time goes on, these files can begin to take up a significant part of your disk space.

The following files should be monitored and purged when the information they contain is no longer needed. To clear a file, issue the command below:

```
$ cat /dev/null > filename
```

/var/adm/utmp (utmpx) records information about who is currently using the system. **init** also uses this file to record what processes have spawned and died. The **who** and **write** commands use this file. This file must exist for the system to boot.

/var/adm/wtmp (wtmpx) records logins, logouts, and system shutdowns or reboots. **init** uses this file to record spawned process information. The **last** command uses this file. This command shows all logins since this file was last created.

/var/adm/lastlog records the history of each user's login.

/var/adm/messages records the system messages. By default, the contents of this file are moved every Saturday to a new name like **messages.1** by **cron**. If the system is shutdown for the weekend, this will not get done.

/var/spool/lp/logs/* records startup and shutdown information about the print services.

/var/adm/sulog records each time the **su** command is used to change the user's privileges to those of another.

/var/mail/userid contains any unread mail messages or messages saved.

/var/adm/pacct records per process accounting information (accounting must be turned on for this file to be used). The command **lastcomm** shows the last commands executed on your system per user in reverse order. Each entry will show the process name, any special flags, username, tty port, amount of CPU time for the process, date and time process exited.

/var/cron/log records a history of processes started by **cron**.

/var/adm/sa/* records system accounting activity. These files are used by the **sar** command.

/var/adm/vold.log records information from the volume manager (**vold**) daemon.

Look for more Sun tips and tricks in the next issue of *NovaLine*. ❑

Industry News...

Apple and IBM Roll Out New Taligent Operating System!

The new Taligent operating system software from Apple Computer Inc. and IBM has made its formal debut before about 500 people at the PC Forum trade show in Phoenix.

Taligent, designed to run on previously incompatible computers, is expected to become generally available next year, according to United Press International, which adds the system "uses a new technology called object orientation, which condenses the amount of machine language needed to give the basic commands to computer."

Also backed by Hewlett-Packard Co., Taligent is expected to begin distributing tools later this year to developers to help them start writing programs based on the system.

Says the wire service, "Taligent is expected to cost the three companies several hundred million dollars on the new system in a major challenge to Microsoft Corp., which is working on an updated version of Windows and an object-oriented program called Cairo." ❑

DOS Corner

by Frank Di Carlo

Using SCANDISK on DOS 6.2

DOS 6.2 has many useful tools that should be part of your daily operations. When you boot your system, you should also check the condition of your disk drives. This can be done with the SCANDISK utility. SCANDISK will check and optionally repair, your File Allocation Table (FAT), your file system structure (lost clusters and crosslinked files), your directory tree structure and your MSDOS boot sector. It will also optionally check the physical surface of the disk. SCANDISK can check and repair hard drives, floppy drives, RAM drives, memory cards and "doublespace" disks.

Since no programs should be running when you run SCANDISK, I recmmend setting up a line in my AUTOEXEC.BAT file before any programs are started as follows:

```
scandisk /all /custom
```

This calls up the SCANDISK utility and has it check all my disk drives (I have two of them). The custom switch tells it to look in the file SCANDISK.INI (which will be in the directory with your MSDOS binaries) for options.

The SCANDISK.INI file is a text file that you can edit and modify to suit your needs. The only "custom" option that I changed is the "surface" parameter. I changed this parameter from "never" to "prompt". This gives me the option to run a surface scan each time SCANDISK runs. The SCANDISK.INI file is heavily commented to help you decide how to set up your particular installation. You can get on-line help from MSDOS for SCANDISK by entering "help scandisk" at the MSDOS prompt.

One last feature is the capability to make an "undo" floppy disk so you can go back to the way it was before SCANDISK fixed the errors. The time spent doing this each time you boot your system is time well spent (I have not lost any data). ❑

Stupid Windows Tricks

Programmers always like to put a bit of personality into their applications and those folks at Microsoft are no exception. Next time you're in Windows, try this:

1. While in the Program Manager, hold down the Ctrl and Shift keys and select **Help**.
2. Under **Help** select **About Program Manager...** (continue to hold Ctrl and Shift keys throughout this entire procedure)
3. In the About Program Manager window double-click on the "flying Windows logo."
4. Click on the **OK** button. (remember, keep holding down Ctrl and Shift)
5. Again, select the **Help** pulldown menu.
6. Under **Help** select **About Program Manager...**. (keep holding Ctrl/Shift)
7. Again, in the About Program Manager window double-click on the "flying Windows logo." The area containing registration and system information should change. (keep holding down those keys, we're not done...)
8. Click on the **OK** button. (oh yeah, keep holding down Ctrl and Shift)
9. Again, select the **Help** pulldown menu.
10. Under **Help** select **About Program Manager...**. (keep holding Ctrl/Shift)
11. Again, in the About Program Manager window double-click on the "flying Windows logo." The center area should change again. (okay, you can let go now) ❑

Industry News...

Software Sales Are Up!

Sales of personal computer applications software reached a record $6.81 billion in North America in 1993, according to figures released today by the Software Publishers Association.

North American software revenues grew 18.5% last year from $5.75 billion in 1992. Total international sales of the primarily U.S. companies grew even faster than did sales in North America and were up 28% for the year. North American unit sales were up 33% for the year, while international units were up 67%.

The industry continued to be fueled by Windows applications with some $3.47 billion in sales in 1993, an 80% increase over 1992's sales of similar programs. Meanwhile, DOS applications continued to decline in North America, falling 25% to $1.93 billion.

Windows applications first outsold DOS applications in North America in the first quarter of 1993.

Sales of Macintosh applications were $1.08 billion in 1993, the first time that annual sales of Macintosh applications were over $1 billion.

The largest application category in 1993 was word processing with sales of $1.02 billion, a 23% increase from $829 million in 1992. This marked the first time any application category's sales exceeded $1 billion. Other hot categories were home education, finance and desktop publishing. ❑

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An *Illegal Opcode* (error 0) is caused by one of two possibilities: a HALT instruction or object code error. A HALT instruction is executed in order to prevent damage from occuring or to aid in system debugging. If any patches have been recently applied to the system, double check their accuracy and also verify the system's ABS (use VERIFY-SYSTEM) for possible object code corruption.

Since each process has a maximum of 11 Return Stack entries, if a process attempts to stack a 12th entry, the process will abort with a *Return Stack Full* (error code 2). A *Return Stack Empty* (error code 1) abort occurs when a process executes an Assembler RETURN when the stack is empty.

Forward Link Zero (error code 5) and *Backward Link Zero* (error code 6) aborts occur when a referenced frame is supposed to link forward or backward to another frame, but does not. If this occurs when referencing a file, it is indicative of a GFE within the referenced data. Also, system functions such as SP-JOBS or WORKSPACE may abort with these types of errors, if a system table is corrupted.

Crossing Frame Limit (error code 4), *Referencing Illegal Frame* (error code 8), or *Referencing Frame Zero* (error code 3) aborts are frequently due to GFEs in the files that are being accessed. Checking the files and correcting the data will fix these problems.

A *Privilege Opcode* abort (error code 7) is due to a Monitor operation being executed in Virtual mode. If this abort occurs, be sure the system verifies and all patches are installed correctly.

I/O Handling errors (error code 20) occur when either a disc, tape, printer, or terminal I/O operation is invalid. These errors usually indicate system table corruption or a hardware problem.

As a final note, whenever an abort occurs, first check to see if the system verifies by doing a VERIFY-SYSTEM from SYSPROG. This is particularly true if several processes abort simultaneously. In the case of a cataloged program, recataloging and rerunning the program may fix the problem.

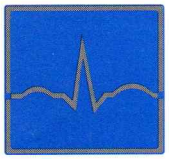
If you encounter an abort that you want investigated, please do not "END" out of the abort before contacting Central Support. By "END"ing out of the abort, you will initialize the process, which clears important process information about the cause of the abort. ❑

Systems Performance Management

Novadyne's Systems Performance Management provides you with optimum performance and availability from your information system resources.

This proactive approach is built around five dynamic and perpetual processes:

Monitoring



This process uses sophisticated hardware and software monitoring tools to track critical performance parameters. With packages such as **NOVA*Watch!*** and **REALITY*Check!*** Novadyne can monitor all aspects of your system.

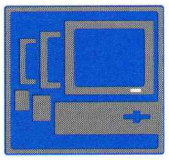
Reporting

The Reporting process provides you with comprehensive reports. Standard reports show data gathered from the monitoring process and from our dispatch database. Custom reports can show performance statistics and other areas of concern.

Advising

Your account manager meets with you to review reports on your system's performance. Specific areas for improvement are identified and a plan is developed to address each area. This process is the basis for our on-going relationship with you.

Refresh



Novadyne works with you to ensure that your system is up to the latest standards. This includes revision levels, as well as technology in general. The Refresh process allows you to get the most from your information system investment.

Restore

This process uses Novadyne's vast experience with hardware and software to restore the performance of your system. With field personnel in over 80 offices nationwide, our approach is "the right part, in the right place, at the right time."

Beyond the traditional "break and fix" approach to computer service, Novadyne's Systems Performance Management brings you peace of mind when it comes to your information systems. We call this Quiet Enjoyment℠.

Our commitment to you is to provide proactive, value-added services designed to deliver a high level of performance from your information processing resources. ❑

Networking Corner

by Kathryn Rebe

A Look At Ethernet...

Ethernet/802.3

Networking allows many different computers from many different vendors to share information transparently. The most popular media for doing this is Ethernet. Ethernet, which is the physical layer for transporting this information, was originally developed by Xerox, Intel and DEC in the late 1970s.

Standards began to emerge in the 1980s. Each Ethernet card is assigned a 48-bit integer known as its Ethernet address, physical address or hardware address. IEEE manages and assigns Ethernet/802.3 addresses.

Standard 10Base5 Thick Ethernet cable

Thick Ethernet is a 0.4 inch RG8 or RG11 50 coaxial ca ble. Each cable segment can be a maximum length of 500m (1,640 ft.). You can have up to four repeaters to connect the segments to make the maximum network length 2400m (8,200 ft.). Transceivers or MAUs are used to attach the workstations to the cable.

Most Ethernet cable has black marks (half-inch block bands) every 2.5 meters which indicate where the transceivers or connectors may be placed. You must attach your workstations where one of the black bands is located, creating a 2.5m minimum distance between transceivers. The maximum length that the transceiver cable (Ethernet to workstation) can be is 50m. The maximum workstations per network is 1,024.

Thinnet 10Base2 cable

Thinnet or "cheapernet" cable is a 0.2 inch RG58-U 50 cable. Each segment can be a maximum distance of 185m (607 ft.). You can have up to four repeaters to connect the segments to make the maximum network length 925m (3,035 ft.). BNC T-connectors are used to attach the workstations to the cable. Minimum distance between T-connectors is 0.5m. The maximum workstations per segment is 30.

Twisted Pair 10BaseT cable

Twisted pair wire is really twisted. Often, low-cost phone wire involves two pair of shielded copper wiring, but the cable itself is not twisted. The purpose of twists in the cable is to minimize signal inductance in the cable. Twisted pair Ethernet is a 24 AWG unshielded cable.

One of the main benefits in using twisted pair Ethernet is installing the Ethernet over existing telephone lines and avoiding the cost of running new cable. Each segment from network device to hub must be < 100m (328 ft.). You can have only one network device attached to each cable. Auxiliary Unit Interfaces (AUIs) are used to attach the workstation to the twisted pair cable via a RJ-45 connector. Twisted pair telephone wire, like thinnet coaxial cable, is cheaper and easier to work with than standard Ethernet cable. ❑

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SunSoft ASP

In late 1993, Novadyne and SunSoft, the system software subsidiary of Sun Microsystems, Inc. broadened their relationship through a partnership that offers comprehensive post-implementation software support and services in the U.S. With over 2000 applications available on Sun's Solaris operating system, Novadyne and its Resellers are focusing on supporting the emerging presence of Solaris in the marketplace.

As a SunSoft Authorized Support Provider (ASP), Novadyne delivers high quality Sun/Solaris support, 24 hours by seven days per week, as well as providing patches and upgrades, and a multitude of other value-added services.

In addition to distributing Sun hardware and software products, Novadyne has been providing Sun software support for over five years and is today, one of only five SunSoft ASPs in the U.S.

Novadyne's SunSoft support offers experienced Solaris analysts who receive ongoing training on SunSoft products and enhancements. A significant feature of our ASP service is on-line around-the-clock access to SunSoft's automated tools. Also, three levels of support are available, including: the customer support analyst, backed up by Novadyne's senior product engineers, with SunSoft providing third-level support.

All Novadyne customers have access to single-call, cost-effective service for Sun hardware, operating system, and layered software products. ❑

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Ron Rando, vice president of multi-vendor, networking and professional services for Bull, said, "As we're involved in integrated service opportunities, the ability to team with Novadyne when customers have requirements for DEC, Tandem and Sun services allows us to provide true single-source, enterprise-wide service solutions."

Bull's Customer Services Organization (CSO) offers comprehensive integrated service solutions for open systems and proprietary environments. In conjunction with other Bull organizations and other business partners, CSO markets, sells and delivers a broad range of service solutions to meet customers' needs. It is a division of Bull HN Information Systems Inc., part of Groupe Bull. With a presence in more than 100 countries and combined revenues of approximately $5.7 billion, Groupe Bull is one of the largest computer companies in the world.

Please call Novadyne Marketing at **(800) 826-4944** for more information on networking services. ❑

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