July 1992

FOCUS

The Magazine of the North American Data General Users Group

INTERCONNECTED

In Focus

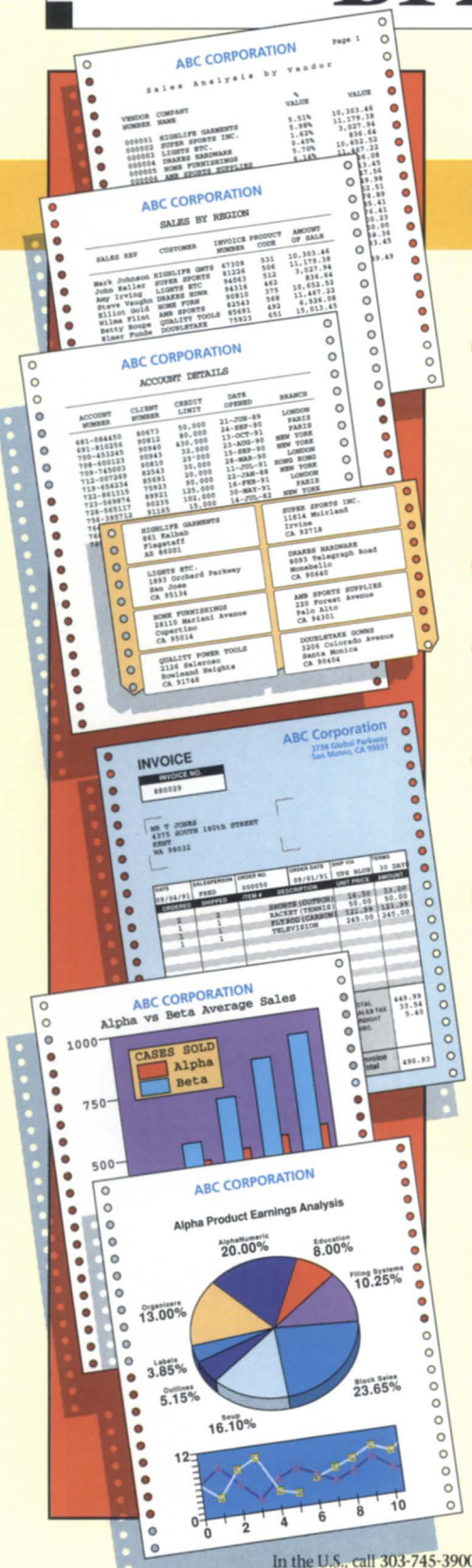
- WANs: Networks of networks
- MV Data Center Manager

Plus

- Misusing your network
- Random thoughts
- Changes in computing
- How *not* to have a wild weekend

Bulk Rate
U.S. Postage
Paid
Permit No. 38
Fulton, MO

VISUAL CYBERQUERY. THE BEST REPORT WRITER BY ANY CRITERIA.



Visual Cyberquery (VCQ), The New Report Writer From Cyberscience, Is Indisputably The Best. Here's Why.

CYBERSCIENCE Corporation, developers of CQCS, the preferred 4GL for DG, announces a revolutionary new concept in report writers. Visual Cyberquery (VCQ) is not one but a family of reporting software products designed to allow any user to create and share query applications and data using an interface appropriate to their needs and experience.

❶ POWERFUL FUNCTIONALITY FOR ALL YOUR USERS.

New and infrequent users start with VCQ Level I. It's menu-driven interface is easy to use and provides instantaneous help all the way. Using VCQ as an intelligent text editor, its report specification language offers increasing power and functionality from Level I, through Level II (Intermediate), to Level III (Advanced) so that experienced users can create the most sophisticated reports. Uniquely, VCQ caters to the entire user spectrum with just one product to license, learn and support.

❷ DESIGN REPORTS IN A FRACTION OF THE TIME.

You can create reports up to 100 times faster using VCQ rather than COBOL.

❸ OUTSTANDING RUN TIME PERFORMANCE.

VCQ can process thousands of database records per second. A report that takes 5 minutes to run in VCQ may take an hour or more to run with other products.

❹ IT'S PART OF CQCS, THE LEADING 4GL.

Using the comprehensive application development environment provided by CQCS, end-users and MIS professionals can work together to create even the most sophisticated applications 10 to 40 times faster than using 3GLs such as COBOL.

❺ DATABASE AND ENVIRONMENT INDEPENDENT.

CQCS is the *only* 4GL that provides simultaneous support for all of DG's most popular databases, including INFOS, ICOBOL, BBASIC and DG/SQL. Naturally, support for DEC's Rdb and RMS, Informix, ORACLE and many more strategic databases is also available. VCQ is 100% compatible across Data General AOS/VS and AViiON, DEC VAX/VMS, strategic UNIX platforms, MS DOS, and PC networks. You can retrofit quickly and easily to existing applications or combine relational and non-relational data in the same reports.

❻ IT'S THE ONLY REPORT WRITER YOU'LL EVER NEED, NOW OR IN THE FUTURE.

No other product *protects* your investment AND *maximizes* your return on investment like VCQ. It extends the life of your computer systems, making it the best investment you've made since the day you bought your computer.

WANT TO SEE THE BEST? CALL US!

1-800-451-1544

Cyberscience CORPORATION

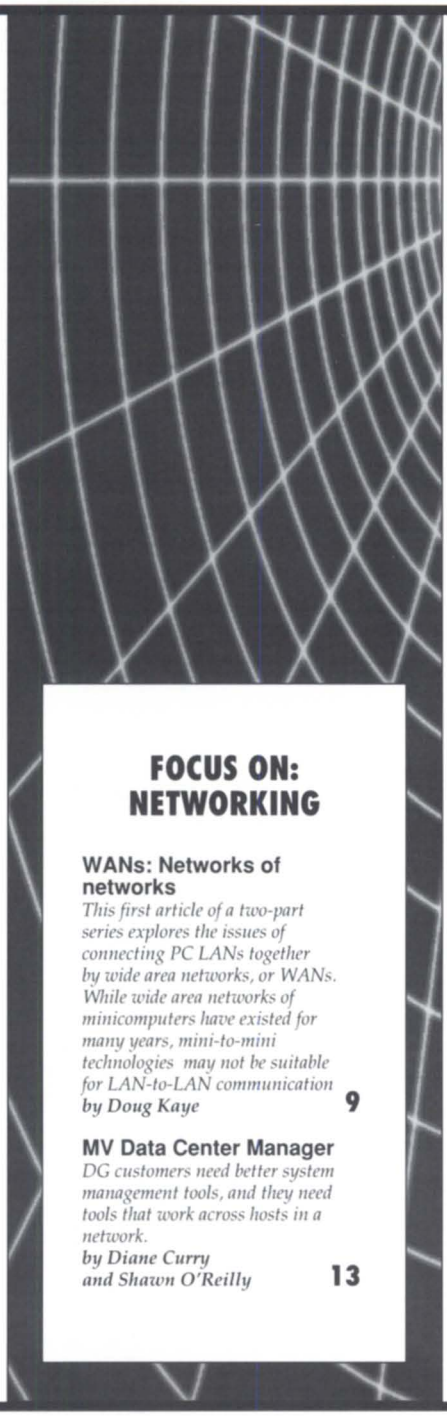
Productivity with Performance

In the U.S., call 303-745-3900. In Australia, call 02-413-4666. In the U.K., call 0992-441111.

Circle 8 on reader service card.

FOCUS

The Magazine of the North American Data General Users Group



Cover: Illustration by Casey Hunter; design by Pat McMurray

FOCUS, the Magazine of the North American Data General Users Group (ISSN 0883-8194) is the official publication of the North American Data General Users Group (NADGUG) in cooperation with Turnkey Publishing. Editorial and business offices are located at Livingston Building, Suite 250, 3420 Executive Center Dr., Austin, TX 78731, phone 512/345-5316. NADGUG headquarters are located at NADGUG, c/o Danieli & O'Keefe Associates, Inc., Chiswick Park, 490 Boston Post Rd., Sudbury, MA 01776, phone 508/443-3330.

Postmaster: Send address changes to Subscription Department, Turnkey Publishing, Livingston Building, Suite 250, 3420 Executive Center Dr., Austin, TX 78731.

FOCUS, the Magazine of the North American Data General Users Group is distributed to members of the North American Data General Users Group. Membership fees are $60 per person. A one-year (12 issues) subscription to *FOCUS, the Magazine of the North American Data General Users Group*, costs $48. For memberships and subscriptions outside the U.S., add $50 to defray the cost of mailing.

The cost of single copies is $4. Requests to replace missing issues free of charge are honored only up to six months after date of issue. Send request to *FOCUS, the Magazine of the North American Data General Users Group*, c/o Turnkey Publishing.

Volume 8, Issue 7.

NORTH AMERICAN DATA GENERAL USERS GROUP

THE ONLY TAPE DRIVE THAT PUTS 25GB ON A SINGLE 8MM TAPE.

Do you wish you could find a backup system with enough capacity, speed, and sophistication to backup unattended?

Could you recreate a document from scratch in the time it takes you to restore it?

FAST BACKUP, FAST RESTORE.

Introducing the CY-8500, the 8mm tape drive that gives you up to 25 GB on a single tape. And with transfer rates of up to 90 MB per minute, backup takes less time, frees resources, and makes frequent backup simple and convenient.

And that's not all. The CY-8500 offers fast file search capability. So you get the advantages of high capacity and fast transfer rates plus the ability to locate and restore your files quickly – about 75 times faster than normal speed.

CONFIGURATION FLEXIBILITY.

The state-of-the-art liquid crystal display gives you complete drive status information. Command under execution, transfer rate, tape remaining, and ECC are presented in a clear easy-to-read format. By offering such features as data compression – for five times the storage capacity per tape – and data encryption – giving you data access control – the CY-8500 adapts to your company's growing needs. We'll adapt to your site requirements too, with rack mounting options and cable lengths of up to 80 feet.

TRUE "PLUG-AND-PLAY" COMPATIBILITY WITH:

Alliant	DEC Unibus	PC 386/ix
Alpha Micro	Gould	PC MS-DOS
Altos	HP	PC
Apollo	IBM AS/400	Xenix/Unix
Arix	IBM Mainframe	Pertec
AT&T	IBM RISC/6000	Plexus
Basic-4	IBM RT	Prime
Concurrent	IBM S/38	Pyramid
Convergent	Macintosh	Sequent
DataGeneral	McDonnell Douglas	Silicon Graphics
DEC 3100	NCR	Sun
DEC BI-Bus	Novell	Unisys
DEC HSC	OS/2	Wang
DEC Q-Bus	PS/2	*and more*
DEC TU/TA81		

PROVEN TECHNOLOGY.

Best of all, the CY-8500 offers peace of mind. 8mm helical scan technology, designed for data recording, gives you demonstrated performance and reliability. Not an adaptation of an audio recording format.

The CY-8500 is part of a complete family of tape backup products that range in capacity from the 150 MB ¼" cartridge streamer to the 2 TB cartridge handling system. All backed up by our in-house technical support group and 12-month warranty. For more information on how you can enjoy the best value in tape backup, call today at 804/873-0900.

CONTEMPORARY CYBERNETICS Group

Rock Landing Corporate Center · 11846 Rock Landing, Newport News, VA 23606 · 804/873-0900 · FAX 804/873-8836

Circle 7 on reader service card.

Serendipity

SYNOPSIS

How many of your problems will attending the Kansas City Conference this year solve? You'll never know if you're not there.

by Tim Boyer
NADGUG Recording Secretary

As you've probably noticed by now, the board is rotating a short column in this space. This puts me at somewhat of a disadvantage. Steve Pounds can give the Treasurer's report. Jan Grossman is still the Conference Chair, so she'll talk about the conference. Dennis Doyle, as president, has lots to talk about—but what does the Recording Secretary do? Regale you with stories of provocative parliamentary procedures?

So, I'm left with an anecdote.

I tend to get some obscure calls from Data General. It's kinda like I'm the user of last resort—if it's obsolete, no longer made, or never worked right in the first place, Tim Boyer probably has it on his system. So about a month before the Denver conference, I got a call from a user in Columbus whose VAR had just gone out of business. He needed support desperately, and Data General told him to give me a call. I asked what language he was running, thinking that DG steered him toward me so that I could put him on the ICobol SIG mailing list.

Extended Basic.

Those of you who have been around awhile will recall that before there was Business Basic, DG was selling a product called Multiple User Extended Basic. It wasn't very popular, and it wasn't around very long (TAC very quickly took over the market with Business Basic), but it did exist, and apparently there are still some people using it. I told this poor soul that I'd see if there was anyone around that still supported EBasic. I posted a note on the RDS bulletin board and got the expected @NULL response.

A couple of weeks later, I went to Denver for the NADGUG conference. When I registered , I pinned a note asking for EBasic help on the "Wanted" bulletin board, and forgot about it.

Six days later, as I was waiting for the shuttle bus to take me back to Cleveland, Lee Jones, our outgoing president (let me rephrase that; Lee was the immediate past president of NADGUG, in addition to being garrulous) spotted me and stopped by to chat. I've known Lee for quite a few years, and he's been an ICobol OEM for over a decade, so this is someone with a bit of Data General experience. Lee said that he'd just taken one last spin by the message board before he left, and lo and behold found a possible new customer. It seems that before there was ICobol, Lee was an Extended Basic OEM. Over the years, these customers tended to drift away from EBasic—and of course, there were no new EBasic customers to pick up—but Lee had been faithfully supporting them ever since. Recently, he lost his last EBasic customer, and it was sort of a sad milestone for him. And here, from out of the blue, was a brand-new customer to support. It was, naturally, the note I had posted.

So a bit of conference serendipity. My EBasic friend gets the kind of software support that most of us wish we had, from someone with more than a decade of DG experience. Lee gets a new customer. And DG keeps a client who, in all likelihood, would have drifted off to a PC-based solution somewhere.

Bulletin boards are fun, but only a fraction of us ever use them, and they're no substitute for the face-to-face encounters that occur at the annual conference. Of course, attending the Kansas City conference won't make all of your problems go away—your boss will still be there when you get back—but I'd be willing to bet that my buddy with the EBasic system would offer to pay for my attendance if I asked.

How many of your problems will it solve? You'll never know if you're not there. See you in Kansas City! Δ

FOCUS
The Magazine of the North American Data General Users Group

NOW THIS IS WHAT WE CALL DOWNSIZING!

Goodbye ol' mainframe computer!
Industry leaders have already decided:
They're going to faster/smaller/less expensive computers based on open systems standards. And Data General is leading the way! Our AViiON® Systems can give you 117 MIPS of mainframe power that fits in a pizza box for a downsized starting price of under $100,000!
Unbelievable, you say? Believe it, we say!
Here's what AViiON can mean to your business:

- Increased savings because AViiON costs millions less than traditional mainframes–plus you save on maintenance, software, power, etc.
- Increased productivity because AViiON allows your different computers to work together as a corporate resource.
- Increased information storage capacity and security thanks to the availability of AViiON's fault tolerant disk array.
- Increased and immediate "mainframe class" performance using the leading databases, business applications and communications software.
- Increased envy from your competitors because you took advantage of open systems for a competitive edge.

Data General AViiON Systems.
That's where the world is going.
And we want to take you with us.
Call **1-800-DATA GEN**

Data General
Where the World is going!

The AViiON System. Mainframe power that fits in a pizza box and saves you millions!

Circle 13 on reader service card.

Data Management Roundtable

SYNOPSIS
The software revision process and NADGUG's conference roundtables need your input.

by Bill Cole
Special to Focus

Current advances and the future for Eclipse Data Management software led off the first annual Data Management Roundtable that was held as part of NADGUG 91. The event attracted more than 40 participants to the hour-long session on the conference's final day.

Doris Knecht and I of Data General's RTP facility presented directions for the software products. Sue Tokay, DG marketing representative, moderated the roundtable and John Pilat, director of Aviion data base engineering, joined the panel for the question-and-answer period. Ms. Knecht and I reviewed recent revisions, plans for upcoming revisions and directions for future revisions of these products: DG/SQL, DG/Ingres, and Infos.

Recent DG/SQL revisions 5.10 and 5.20 provide improved performance for both dynamic SQL and transaction processing environments, support for higher user counts, and the ability to open a larger number of data bases. These revisions also increase the user's ability to tailor the run-time environment with new system configuration attributes that adjust the size and direct the use of system buffers and caches, set checkpointing parameters, and limits on system files.

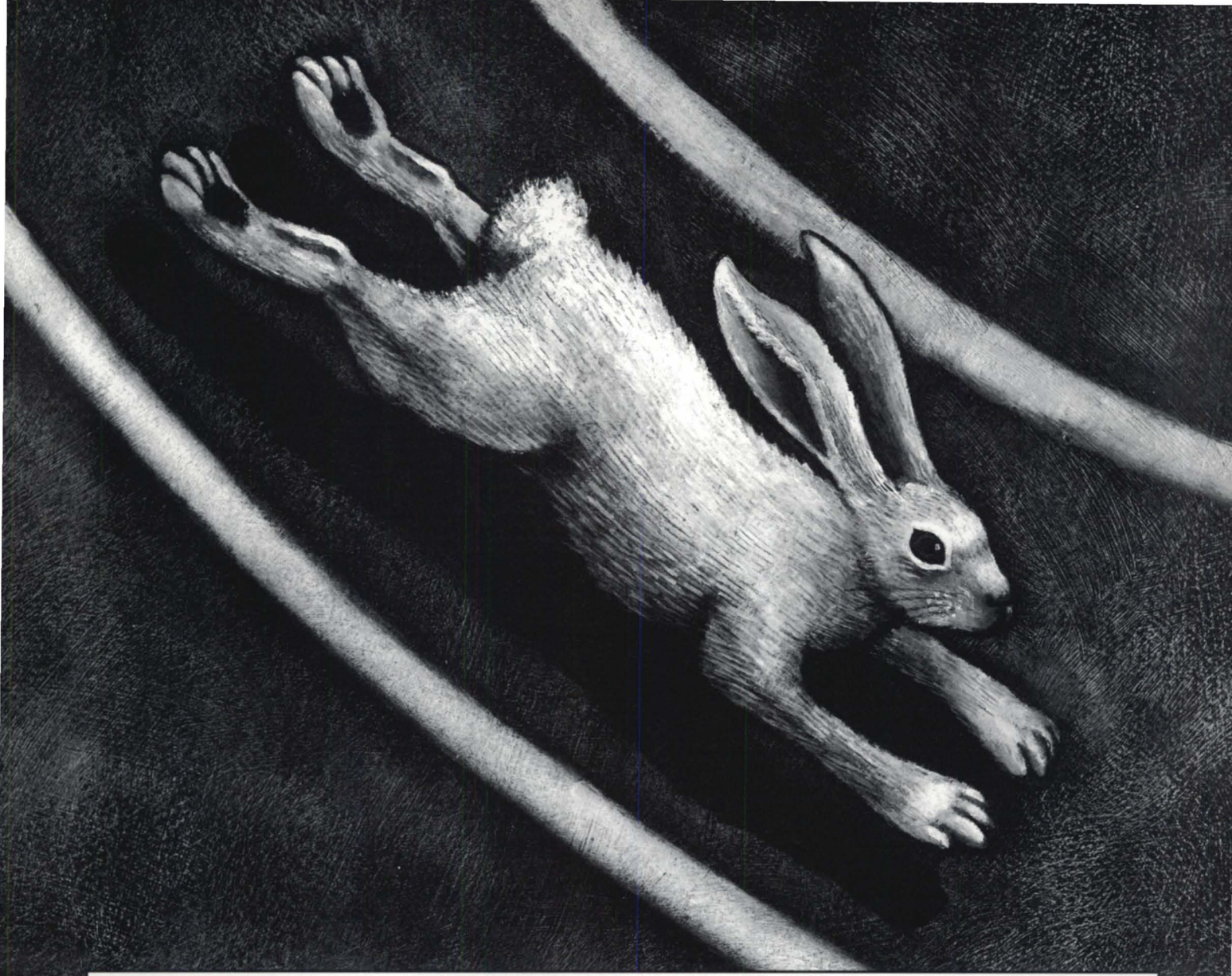
Revision 6.00 of DG/SQL contains enhancements in system configuration, the TIMESTAMP data type, stored procedures, and user-requested improvements. Further ability to tailor the runtime environment is provided through additional system configuration attributes. Significant improvements in the SQL monitor, including reorganization of the screens, display of additional performance data, and on-line help documentation give the user more information to tailor the system.

General DG/SQL performance should be improved, especially for installations using these new capabilities. The TIMESTAMP data type allows the user to capture date and time in a single column, and to manipulate date and time on that column, and format the results. Stored procedures are new in revision 6.00, allowing the user to write, preprocess, store, and call a procedure from an application.

DG/SQL's future is to provide performance scalability and enhancements in response to customer requests. Scalability allows the applications to take advantage of increased CPU power available in future MV hardware platforms. This translates into support for more users as applications move to faster CPUs and/or systems, with more memory or multiprocessor (multi-JP) systems such as the MV/30000, MV/40000, and the new MV/35000 and MV/60000.

DG/Ingres 6.21 and DG/Ingres-Net were released in 1991. This revision supports PC and Unix access for all front-ends, including Windows/4GL. This revision supports DG/SQL 5.00

Continued on page 35



Put Your ICOBOL Applications On The Fast Track.

With Choice!™ and Axis™ from Wild Hare. Only Choice!, Wild Hare's run-time system, lets you run your ICOBOL object programs and data files totally unmodified on any popular computer system. Without recompilation, translation or even reorganization. Any object file works on any platform. In any new market. With virtually unlimited sales potential.

Choice! and Axis currently run on:

MS-DOS	VAX/VMS
OS/2	AOS/VS
PC NETWORKS	MACINTOSH
UNIX	AViiON
XENIX	MCS
AIX	...and others

And Axis, the world's fastest ICOBOL compiler, keeps you ahead of the pack by letting you develop your applications on almost any hardware, and under any popular operating system. Which means if you would rather work under UNIX than AOS/VS, or MS-DOS than VAX/VMS, no problem. Just order the specific Axis for your favorite development environment and you're off.

Put Axis and Choice! on your ICOBOL application team and discover what thousands of others already know: When it comes to turning your application into a runaway success story, place your bets on the Hare.

Call Wild Hare at (303) 442-0324 for more information.

wild hare
COMPUTER SYSTEMS INC.

Wild Hare Computer Systems, Inc. 2820 Wilderness Place Boulder, Colorado 80301 USA Fax: (303) 440-7916 Tel: (303) 442-0324

Circle 41 on reader service card.

Acucobol-85 faster on the Aviion

Dear editor:

Although Tim Boyer's review of Acucobol-85 ("Not a bad trade at all," April 1992) was well-covered and accurately exposed all the salient features of the product, he failed to run a fair benchmark test of Acucobol-85 vs. ICobol.

In the review, Mr. Boyer's benchmark compares ICobol running under the Aviion and Acucobol-85 running on an MV/8. This comparison benchmark does not represent fair, unbiased journalism. Furthermore, this comparison is not a good presentation of the many DG Cobol developers who have migrated from the MV/8 to the Aviion.

Mr. Boyer explains that when using Acucobol-85 you'll sacrifice file speed for other "rich" features. While that may be true running Acucobol-85 under MV/8, it is not true under the Aviion.

I have contacted Mr. Boyer regarding this issue and he explained that he didn't have an Aviion to run Acucobol-85 on. He obligingly sent us the source for his benchmark test so we could run it on our own Aviion 5000. Our suspicions were right; Acucobol-85 ran much faster on the Aviion than on the MV/8.

The following document is a summary of those benchmark tests. Would you please publish these results in—if not the next issue—a future issue of *Focus*? Your readers would probably appreciate a head-to-head comparison where they can make an educated decision based on relevant technology.

Kipp Martell
Manager, Marketing Communications
Acucobol, Inc.

Figure 1: Acucobol-85 benchmark results running on the DG Aviion 5000

Random write	107
Random read	60
Sequential write	17
Sequential read	7
Random read/write	142
Sequential read/write	22
Open-read-close loop	31
Call/recall program	46
Div S9(10) COMP by S9(5) COMP giving S9(5) COMP	62
Mult S9(5) COMP by S9(5) COMP giving S9(10) COMP	6
Add S9(5) COMP to S9(10) COMP	4
Move S9(5) to S9(5) COMP	8
Move X(50) to X(50)	2
Null paragraph	4

(all times in seconds)

Tim Boyer replies:

Yes, the published chart compares Acucobol on the MV/8 to ICobol on the Aviion. However, it also compares Acucobol to ICobol on the MV/8, and ICHOST on a 386.

Acucobol loses out to all three. Mr. Martell's new chart shows that, on random file I-O, Acucobol on an Aviion is still slower than ICobol on any other platform.

True, Acucobol on the Aviion is faster than Acucobol on the MV/8—but that's to be expected. Δ

WANs: Networks of networks

SYNOPSIS

This first article of a two-part series explores the issues of connecting PC LANs together by wide area networks, or WANs. While wide area networks of minicomputers have existed for many years, mini-to-mini technologies may not be suitable for LAN-to-LAN communication.

by Doug Kaye
Special to Focus

Like it or not, your organization's computing power is shifting to your employee's desktops. The centralized mini (and to some extent, the mainframe as well) is being replaced by PCs, Macintoshes, and Unix workstations connected by local area networks (LANs).

If previously you had a network of minicomputers, you will soon be replacing this network with a network of networks: a wide area network, or WAN. Unfortunately, your older networks designed to interconnect minicomputers will perform poorly when used to connect LANs to one another.

Networks of the early 1980s consisted of minicomputers at multiple sites typically tied together by leased data lines. Most of these networks were built using a single vendor's hardware and software, such as IBM's SNA, Digital's Decnet, or Data General's Xodiac. As leased lines were expensive, packet-switching X.25 PDNs were invented as a lower-cost alternative. By using switched virtual circuits and internal network speeds much higher than the access data rates, PDNs share their leased line investments among multiple customers. The X.25 protocol was designed to be optimal for packet switching, and it has served us well for nearly two decades.

In this series, we'll take a look at three WAN technologies: leased lines, packet switching, and (next month) the newcomer, frame relay. In particular, we'll study how well each is suited to the interconnection of LANs, as opposed to minicomputers.

Protocols

The protocols for one communications task are often not appropriate for others. The networks of the 80s used relatively slow and unreliable links, and the principal transport protocol (X.25) was designed to deal with these issues. Because packets could be easily lost, damaged, or received out of sequence, the X.25 software goes to great pains to test for and recover from these error conditions.

LANs are very different. Data link frames are so rarely lost or damaged, and the speed of the LAN is so great,

that LAN protocols treat such events as rare exceptions, rather than common occurrences. When X.25 is used on a LAN, substantial inefficiencies occur because both the transport software (X.25) and the data link hardware (e.g., ethernet) each check every packet for correctness. If a multi-frame message is damaged on an X.25 network, it is best to retransmit only the defective frames. On a faster LAN, it's not worth taking the time to figure out which frames need resending—the whole message is usually retransmitted.

Networks of networks

The real problem occurs when you build an *internet* by connecting a LAN in one city with a LAN in another. Suddenly, the retransmission of a lost message, which was trivial at ethernet's 10 million bits per second, becomes a major event at 56 K bits per second. The protocols that worked on the LAN fail miserably at these lower data rates. When a PC on one LAN communicates with a server on another LAN, the protocols are the same as those used to communicate with a local server.

Now, protocols that have no consideration for low transit delays are piggybacked onto a network with some very severe transit delays. The results are predictably awful, and the PDN vendors rarely compete with leased lines for the internet or WAN business.

The timings

Let's analyze the performance of WANs using leased lines. A DOS *copy* operation via Novell's Netware uses a simple request-response protocol (IPX). The workstation sends a packet of data, the remote site sends an acknowledgement, the workstation sends the next packet, and so on.

An important consideration is the data rate of the connection. That might be 56 K bits per second in the case of many digital leased lines. Does that mean you can transfer 56/8 or 7 K bytes per second of actual data through this connection? No, but let's understand why this is so.

There are two important times for any WAN. First is the *transmission time*, the time it takes to pump the bits onto the wire, one-by-one. Assuming negligible protocol overhead, this is equal to the data rate of the line. For example, at 56 kbps, it takes about 75 milliseconds (ms) to transmit a 512-byte packet.

The second important time is the *propagation delay*, the time it takes the first bit (or any bit) to get from one end of the line to the other. The transit time of a transcontinental terrestrial leased line is on the order of 25 ms. (By the way, if you're wondering whatever happened to satellite lines, consider that a satellite link has a propagation delay of about 250 ms!)

These two times (transmission time and propagation delay) are often confused with one another. Transmission time is usually specified as a data rate. It determines how fast you can put a given quantity of data onto the wire. The propagation delay determines how long it will take for that data to reach

the other end. The two parameters are completely independent of one another.

Let's use these times to see how much actual time we'll spend for each packet in our *copy* command. Study the sequence of events shown below:

t0: First packet transmission begins

t1: After 75 ms, the first packet transmission ends (t0 + 75 ms)

t2: After 25 ms, the end of first packet arrives at remote site; acknowledgement of first packet transmission begins (t0 + 100 ms)

t3: After 15 ms, the acknowledgement of first packet transmission ends (t0 + 115 ms)

t4: After 25 ms, the end of acknowledgement arrives at local site; second packet transmission begins (t0 + 140 ms)

It takes about 140 ms of elapsed time to move the data that could theoretically be moved in 75 ms, if there were no protocol delays. That's not *too* bad—about 55 percent utilization of the available bandwidth.

Packet switches for WANs

Suppose you want to connect more than two sites, and the vendor suggests utilizing its X.25 packet-switched network. You still attach each site to the network using a 56 kbps line, but the network uses 1.544 mbps T1 lines internally. The vendor tells you things should move much more quickly.

The most important consideration is that a PDN is a packet-switched network. That means packets are received by a node in the vendor's network, then forwarded to the next node, and so on. Because the internal lines are T1, you might expect the end-to-end times to be at least as good as our 56 KB link, but they're not, and here's why. At each network node (and you have no control over how many of these there may be, even moment to moment), the vendor's packet-switch hardware must receive each packet in its entirety, make sure it's okay (by examining the CRC and/or checksum), then start transmitting the packet to the next switch on the network. Even an infinitely fast packet switch has a delay of at least one packet time for this store-and-forward operation. If the internal network speed is 1.544 mbps, a packet time may be much less than the packet time of our 56 kbps link. In reality, the switches are not infinitely fast, and there's always a delay while your packet waits along with those of other customers for a turn to get onto the faster line. The delay in a packet switch can be quite significant.

Protocols like X.25 solve this problem by using a technique called "sliding windows," which allows the sender to start many packets on their way before receiving an acknowledgement for the first one. The ack for packet number 1 may come in just as we're sending packet number 7, and the ack for packet

number 2 may arrive as we're sending number 8, and so on.

This works extremely well, and protocols such as X.25 thrive in the packet-switched environment.

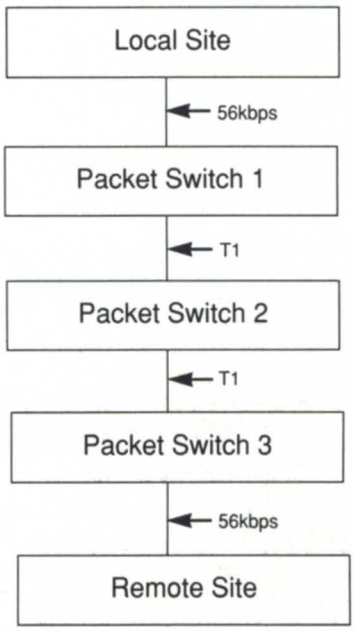
So why doesn't this work for interconnecting LANs? The answer is simple. LAN protocols are designed for networks where there is extraordinarily little transit delay. While it may take 25 ms to move data 2,500 miles, it takes only about 4 *micro*seconds to move data from one end of a large ethernet to another. LANs are so fast that protocol designers often do not use sliding window protocols. The overhead of managing the sliding window may slow the flow of data more than would be gained. Besides which, at these speeds most of the workstations and servers on the LAN couldn't get the data on and off their disks fast enough. The LAN isn't the bottleneck; the computers are. When LAN packets are put into X.25 networks, the sliding window feature of X.25 cannot be used to optimize performance.

Let's see what really happens when our LAN's request-response protocol has to work its way through a packet-switch network. Our sample network (see Figure 1) has three packet-switch nodes interconnected by T1 lines. At T1 rates, the transmission time for a 512-byte frame is only 3 ms. We'll assume a 10 ms propagation delay between each node. We won't trouble you with the step-by-step details this time. Just look at the totals:

Data packet transmission time = 156 ms
  2 x 75 ms (56 kbps) + 2 x 3 ms (T1)
Ack packet transmission time = 36 ms
  2 x 15 ms (56 kbps) + 2 x 3 ms (T1)
Link delays = 80 ms
  8 x 10 ms (56 kb and T1 links)
Total = 272 ms

It takes 272 ms of elapsed time to move the data that could theoretically be moved in 75 ms through the 56 kbps access line. That's disappointing—about 27 percent utilization of the available bandwidth. Consider also that as the number of packet switches in the virtual circuit increases, performance deteriorates rapidly. And if you think a faster access line will help, consider that as access data rates are increased from 56 kbps, the overall throughput goes up only slightly, but the utilization percentage decreases rapidly. For example, if we use T1 lines at both ends of the circuit, as well as between the switches, our theoretical end-to-end time is reduced from 75 ms to 3 ms, but the actual time is only reduced to 1209 ms, for a throughput efficiency of only 2 percent. These aren't just theoretical numbers, by the way. A WAN using a T1 link to a PDN results in about the same performance as a dedicated 56 kbps leased line.

Figure 1: Packet switched network



Enter frame relay

Next month, we'll take a look at frame relay, a solution to these problems for both private and public switched networks. Δ

 Doug Kaye is president of Rational Data Systems, Inc., 1050 Northgate Drive, San Rafael, CA 94903; 800/743-3054 or 415/499-3354. This month's column has been excerpted from the 1992 RDS Report on PC Integration, *available from RDS for $24.95 plus shipping and handling.*

MV Data Center-Manager

by Diane Curry
and Shawn O'Reilly
Special to Focus

SYNOPSIS
The MV Data Center Manager addresses two fundamental problems: DG customers need better system management tools, and they need tools that work across hosts in a network.

Systems have changed dramatically in the past few years. In the past, computers were islands in a sea of information. They were separated from each other, and did little to work together. That has all changed, as networking and terminal servers have bridged the gap between machines. We are now in the era of open systems—users are working across multiple machines in a networked environment to perform their jobs.

Another change taking place for the Data General customer is the introduction of larger and faster machines. These two developments (networked systems and larger machines) make it increasingly difficult to manage installations. The number of resources that need monitoring and controlling has increased. System managers need tools that will allow them to keep an operating environment running smoothly.

Not only does the AOS/VS II group need to rewrite some of the older tools and build some new ones, but existing tools would benefit from a new user interface. The Apple Macintosh and Microsoft Windows 3.0 have raised the expectations of personal computer users, and the computer industry in general, in terms of user interface and ease of use. For an application like EXEC.PR, a point-and-click interface would be more desirable than the current command line interface.

Networked solutions.

System managers need solutions that work across multiple machines in a network. Many customers have more than one Eclipse MV serving their company. These customers will benefit from a suite of tools that allow them to manage resources of all these machines from one central location.

This group of machines is referred to as a Data Center. The definition of a Data Center: a group of MVs connected via a network serving a common purpose. Having all machines working together as a group is important because it implies that there is a common system manager (or group of managers).

The solution to these two problems is the MV Data Center Manager. It will provide solutions in phases, increasing the functional offering with each successive phase. The first phase is the central system console.

The MV Data Center Manager

The MV Data Center Manager is a DG/UX-based, OSF/Motif style tool that allows managing multiple MVs from a central location. Operator consoles for each Eclipse MV are run as an active window. Applications such as DJ or Polish, as well as any macro residing on the MV, may all be run from an Aviion. The MV Data Center Manager logs all window input and output to the local Aviion disk, providing an audit trail for all operator console and system application activity.

The hardware required to run the central system console consists of a TCP/IP local area network (LAN), a TCP/IP Termserver, an AV 210 or AV 310 workstation, A/B switches, cables, and MVs. The Aviion platform was chosen over both a low-end MV and a PC. The low-end MV simply did not offer the graphics capabilities necessary to provide a windowing environment. Although a PC offers Microsoft Windows, the terminal screen size is a severely limiting factor. Additionally, the Aviion's open systems platform offers greater future potential than the other alternatives.

DG/UX and X-Windows were chosen for the easy-to-use graphical user interface (GUI) provided by the X-Win-

Figure 1: Summarized goals of phase 1 of the MV Data Center Manager

- provide point-and-click interface
- centralize management of multiple MVs
- allow users to continue managing machines the way they currently do (with macros, applications, & interaction with the operator console)
- build a platform for future system management tools.

dows system. The MV Data Center Manager employs Motif-style windows, and the keyboard and mouse are supported input devices. The MV Data Center Manager's goal is to provide a clear and obvious menu system for novice Unix and X users, and appropriate mnemonics and accelerators for more experienced users.

TCP/IP and telnet provide the communications medium between the Avion and the MVs. Direct connections to a Termserver can eliminate the need to run TCP/IP, providing an alternative to those users who do not have a LAN and whose MVs have ITCs or LTCs.

The operator console line is fed into an A/B switch. When the switch is in the "local" position, the operator console functions normally. When the switch is in the "network" position, it will go through the Termserver. A system manager can then select a host name from a list of the MVs being managed, start a central op console session, and become the "Pid 2" process for that MV. This is accomplished by using telnet to connect to the internet address of the selected host's op console port.

From the central op console window, all system manager activity can be performed just as it would on a hard-wired op console. This includes booting and shutting down the system, running diagnostics, and OP CLI privileged instructions.

To run applications such as DJ, the MV Data Center manager brings up a window running the DG terminal emulator, "Mterm". When remotely logged into an MV, the Mterm emulator provides the appropriate keyboard translations so that the user can supply input to the running application, just as it would be done when running one on a D216 or D410 DG terminal. Application execution can be as simple as making a menu selection. The MV Data Center manager can configure a username-password pair with an application, eliminating the need to manually log on each time an application is started. While running an application, the process appears as a remotely logged-in TCON to AOS/VS II.

The MV Data Center Manager implements macro execution using the TCP/IP RSH functionality. RSH performs single operations on a remote host without logging on. Access requirements consist of either a matching username or an equivalence file residing on the remote host (MV). This file indicates usernames and hosts of the users allowed to execute RSH commands under a particular username. Because this is an insecure mechanism and MVs are not required to run the RSH daemon, which performs this functionality, macros can also be run in the op console window through an execution of the CLI from the application window.

To complement the MV Data Center Manager, AOS/VS II rev 2.10 will contain a new logfile, the CON0_LOG. The file resides in the root directory and contains all input and output sent to and from device code 10 and 11. Essen-

tially, this file provides a software alternative to the hardcopy op consoles. Additionally, a new viewing utility, BROWSE.PR, will be included in rev 2.10. Browse uses the same function key definitions as the other AOS/VS II menu-based utilities and CEO. Browse is the suggested means of viewing the CON0_LOG because of its ability to search and position within the file, and also because of its ability to indicate when the file has grown in size. Browse can be run from the MV Data Center Manager as an application to view the CON0_LOG.

One potential problem with this new strategy is security. It goes without saying that the Aviion must be kept in a secure location. The implications of having the MV op consoles available through the LAN can be minimized by keeping the connections to the MVs open. This prevents curious intruders from establishing a connection to the op console ports.

Next phase

The first phase of the MV Data Center manager addresses the need to centralize management of multiple MVs on a network. It introduces an OSF/Motif-style interface to a product that manages proprietary hardware. It uses a number of existing products to perform its function.

In the future, the MV Data Center Manager will increase its managing potential to include other resources. Examples of these resources are user profiles, disks (both physical and logical), files, tapes, printers, and applications.

Phase 1's interface will be expanded to be more graphical and icon-driven. A collection of icons will represent the user's configuration and the various resources to be managed. Clicking on icons will allow the user to perform actions on various resources.

An MV Data Center Manager process (server) will run on all machines in the Data Center being managed from the Aviion (client). The client/server communication will be through Sun Microsystems Remote Procedure Call (RPC) over TCP/IP.

When first brought up on the MV, the server must be able to analyze the system and determine as much as possible about the host. Through the AOS/VS II ?LDUINFO system call, for example, it will determine the entire physical and logical disk configuration. It is important to do as much as possible of this setup automatically, to make it more desirable for the user. If the MV Data Center Manager client and a graphical representation of the system are generated automatically, the user is more likely to use it.

Next phase

The first phase of the MV Data Center Manager addresses the need to centralize management of multiple MVs on a network. It introduces an OSF/Motif-style interface to a product that manages proprietary hardware. It uses a number of existing products to perform

its function.

Customers have expressed an interest in an alarm-and-alert mechanism. This alarm/alert mechanism would scan all output sent to the operator console, and alert the operator when one of any number of predetermined situations occur.

The types of messages to be monitored could include hard disk and tape error messsages, any "From system" message, a request from EXEC to mount a tape, etc. The alarm function could include the ability to send mail to a system manager, highlight the affected host operator console window (or icon), or run a user-defined shell script.

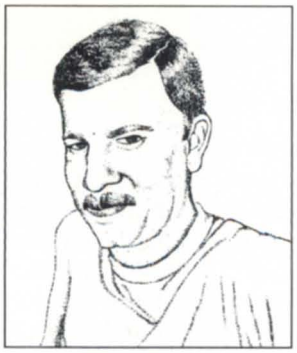
The ability to alarm on user-specified strings is being considered, as well as the ability to specify what actions to take when the particular situation is seen. Customers have also expressed interest in the ability to alarm after many situations have occured.

The MV Data Center Management group is also considering connecting to Aviion operator consoles. This would allow the system manager to monitor and control both Eclipse MVs and Avion servers from a central location, with a consistent interface.

Wrapup

The MV Data Center Manager is an example of what can be accomplished using standards-based products in a proprietary application. Many of Data General's ISVs (independent software vendors) and VARs (value-added resellers) are faced with the dilemma of how to build or enhance proprietary applications that can compete with offerings from other vendors. The challenge is to do it in such a way that these applications can eventually move into the multi-vendor, heterogenous networked environment of the future. The choice of platform for the MV Data Center Manager and the true openness of AOS/VS II gives the product a broad base on which to build. Δ

Diane Curry is a principal software engineer. She has been with Data General for 12 years. Shawn O'Reilly, a principal software eingineer in the AOS/VS II Department, is also the project leader of the MV Data Center Manager.



Tim Boyer

Random thoughts

SYNOPSIS

How do you come up with a set of random numbers, and how do you prove that they're truly random? Well, the answer to that is you don't, but don't let that stop you.

Although Denman's primary business is tire manufacturing, we also fabricate rubber-covered rolls for the steel industry. In addition, we have our own drivers to deliver these rolls. Therefore, on January 1, we were scheduled to go into the drug-testing business.

I won't give you my personal feelings about the effectiveness or constitutionality of random drug testing. Instead, let's talk about that first word—"random."

If I were writing in Basic, there'd be no problems getting a random number from the computer. It's a built-in function—all I have to do is type X=RND(0), and a pseudo-random number between 0 and 1 would be generated. So if I wanted a random number between 1 and 1000, X=INT(RND*1001) would work.

It's not so easy in ICobol. If tenths or hundredths of a second actually worked in ICobol, you could probably do a few arithmetical functions and check the time. But they don't. Anyway, if a driver is fired because of a test, the procedure used would undoubtedly end up in court. In that case, you'd want absolute, irrefutable proof that the procedure was truly random.

Pitfalls abound—I remember one person in college writing a random number generator, who ended the procedure by taking his number and squaring it, not realizing that this would eliminate all answers ending in 2, 3, 7, or 8. So we're really talking about two separate problems here. How do you come up with a set of random numbers, and how do you *prove* that they're truly random?

Well, the answer to the first question is: you don't. End of column.

That is, you don't come up with numbers that are *truly* random. If you can write an algorithm to determine them, they're not random, right? What you want is a pseudo-random number, with each value equally likely to occur. That, we can do.

The best-known method for generating these is the linear congruent method. This method uses the formula

```
A(I)=(A(I-1)*B+1) MOD M
```

to fill an array. In other words, take the previous random number, multiply by a constant B, add 1, and take the remainder when divided by the constant M. The Cobol code for the operation would look like this:

```
COMPUTE-RANDOM-NUMBER.
    MULTIPLY B BY RANDOM-SEED.
    ADD 1 TO RANDOM-SEED.
    DIVIDE M INTO RANDOM-SEED GIVING RANDOM-
DIVIDEND REMAINDER
            RANDOM-REMAINDER.
    MOVE RANDOM-REMAINDER TO RANDOM-SEED.
```

Now, the only problem is to determine your beginning numbers for RAN-

DOM-SEED, B, and M. Piece of cake, right? Any numbers should do. Well, consider RANDOM-SEED = 0, B = 19, and M = 381: the random sequence is 0,1,20,0,1,20. . . —not guaranteed to pass the randomness test.

Don't worry, you don't have to go and test every possibility. The legendary Donald Knuth has come up with some simple, if obscure, rules. First, M should be very large, and conveniently a power of 2 or 10. I use 2^20, or 1,048,576.

Secondly, B shouldn't be too large or small, but should end in x21, with *x* an even number. A good choice is a number one order of magnitude smaller than M. I chose 314,221.

Finally, to come up with the seed, anything will do. I picked a method that was pretty well guaranteed to give me a different random seed every time I ran the program. I took the six-digit TIME field, multiplied by the six-digit DATE field, and divided by 100. I picked these numbers with Cobol in mind. The product of A and B, while large, is always less than the PIC 9(18) maximum that Cobol can accommodate.

What you want is a pseudo-random number, with each value equally likely to occur. That, we can do

But you're left with this humongous number. For instance, on May 1, at noon sharp, the random seed times the constant was 18,925,656,518,400. Even IBM doesn't have that many employees. So, since we have less than 1,000 workers at Denman, I simply took the last three digits by moving the random number to a PIC 9(3) field called RANDOM-EMPLOYEE-NUMBER. I used this number to read the employee file record, and printed out when I got a hit.

Ah, but is it truly random? What if the last three numbers repeat every 200 iterations, and four-fifths of the employees never come up? Of such things are a Human Resource manager's nightmares made. So a randomness test needs to be run. This is the chi-square test, and is simple to implement.

If you run the random number test X times, looking for a number between 0 and Y, you would expect to see each number turn up approximately X/Y times. That is to say, if I was picking a number between 1 and 1,000, and I ran this procedure 20,000 times, I should come up with approximately 20 of each number. The chi-square method subtracts the number of times a value actu-

ally occurs from the expected frequency, squares this, and sums the results. For my 1,000 clock number run, the code looks like this:

```
    DIVIDE NUMBER-OF-PASSES BY 1000 GIVING
EXPECTED-VALUE.
    PERFORM COMPUTE-RANDOM-NUMBER NUMBER-
OF-PASSES TIMES.
    PERFORM COMPUTE-CHI-SQUARE VARYING
TALLY FROM 1 BY 1
        UNTIL TALLY > 1000.
    DIVIDE EXPECTED-VALUE INTO CHI-SQUARE
ROUNDED.

COMPUTE-RANDOM-NUMBER.
    MULTIPLY B BY RANDOM-SEED.
    ADD 1 TO RANDOM-SEED.
    DIVIDE M INTO RANDOM-SEED GIVING RANDOM-
DIVIDEND REMAINDER
        RANDOM-REMAINDER.
    MOVE RANDOM-REMAINDER TO RANDOM-SEED,
RANDOM-EMPLOYEE.
    ADD 1 TO RANDOM-EMPLOYEE.
    ADD 1 TO RANDOM-VALUE (RANDOM-EMPLOYEE).

COMPUTE-CHI-SQUARE.
    SUBTRACT EXPECTED-VALUE FROM RANDOM-
VALUE (TALLY).
    MULTIPLY RANDOM-VALUE (TALLY) BY RANDOM-
VALUE (TALLY).
    ADD RANDOM-VALUE (TALLY) TO CHI-SQUARE.
```

There are some caveats for this test, also. The number of tests run, X, should be larger than 10 times the maximum random value. The results, then, are truly random if the chi-square is within twice the square root of X. Thus, for a number between 1 and 1,000:

```
    DISPLAY CHI-SQUARE-RESULT.
    IF CHI-SQUARE > 1063.25 OR < 936.75
        DISPLAY INVALID-RESULT,
    ELSE DISPLAY VALID-RESULT.
```

I ran the test twice with 20,000 passes each. The results were 1,007.6 and 1,011.5, well within the limits. We had a random test that would stand up in court.

In other news

Data General has begun its new Request for Enhancements process. DG is now funneling RFEs through the user group, and allowing us to set the priorities. This is designed to produce enhancements better suited to our needs. The heads of various special interest groups will be evaluating the enhancement requests, and reporting them back to DG on a monthly basis.

Since NADGUG President Dennis Doyle is the chair of the ICobol SIG, he did what any efficient executive would do—delegate. So I've now got it, and I need help.

Basically, we're to give each RFE a priority from 1 to 5, with 1 being "accomplish if at all possible," and 5 being "accomplish only if it can be reliably determined that hell has frozen over."

Some of them are easy—I don't think the request to allow the compiler to go over 32,768 lines of code has much demand in the user community, so I put that particular request at a 4. I could be wrong—call me and let me know.

Most of them are not. There was a request for more than four alternate keys in ICobol. This has been a perennial request, and now is the time to push for its resolution. But I need some feed-

back from you ICobol users. How many alternates? Are six enough? Eight? Acucobol has 128; is that too many? At what price? Surely, you don't think that Minisam is going to be as fast or compact at 16 alternates as at four. What speed/space degradation is acceptable?

You get the idea. First, send in those enhancement requests—we're now poised to act on them. You can be certain that each and every one will be read and considered. Secondly, please include as many details in the request as possible. Why won't the obvious workaround work for you? What else would this RFE affect? Third, look on the bulletin boards.

Finally, attend the annual conference. This is where the ICobol SIG meeting is held, and where the more controversial issues will be hashed out. There's where you can have a direct, face-to-face impact on the language you use every day.

Odds and ends dept.

As this is being written, I'm at home taking a break from Ultima VII. This is undoubtedly the largest computer game ever written. The minimum requirements are a 386 with 2 MB of memory, 21 MB of free disk space, and a mouse and sound card recommended. I'm playing it on a 386/33, and it's slow—this game truly needs a 486 to play well. Origin isn't even planning a 286 release.

The other day, I came across the invoice for my original DG system, from 1979. It was a CS-40 with 256 KB memory, a 10 MB disk (5 of which was removable), one terminal, and it cost $39,000.

I'm not sure of the point of this, but it must mean something profound. Sooner or later, the game machines are going to be more powerful than the work machines. Δ

Tim Boyer is EDP Manager at Denman Tire Corporation. He may be reached at 400 Diehl South Rd., Leavittsburg, OH 44430, 216/898-2711, faxed at 216/898-5256, on the NADGUG bulletin board at 415/924-3652, or on the CSC bulletin board at 800-DASH-CSC.

Presenting the
ECLIPSE MV/60000 HA™

It's the dawn of a new age of corporate computing!

Welcome to the 6th generation of ECLIPSE®-the generation that reaches new heights in corporate computing while protecting your software investments. The MV/60000 HA gives you:

MORE POWER–100 real MV MIPS supporting over 1000 CEO® or database users with up to 4 CPUs and 1 GB of memory.

GREATER SYSTEM AVAILABILITY–including integrated diagnostics, N+1 power and cooling, AOS/VS II, MRC, and the NEW H.A.D.A./MV disk array.

BREAKTHROUGH TECHNOLOGY–single board 27 MIP CPU, latest Motorola gate arrays, 600 MB/sec asynchronous bus, mid-plane design.

ALL LEADING INDUSTRY STANDARDS–supports SCSI II, TCP/IP, NetBEUI, AppleTalk,® Novell,® OSI, SNA, X.25, and more!

MEETING YOUR NEEDS NOW–whether you require increased processing power, system consolidation, or mission critical confidence, the MV/60000 HA will take you into a new age of corporate computing.

Call **1-800-DATA GEN**

Data General

Circle 14 on reader service card.

Brian Johnson

Misusing your network

SYNOPSIS

Used appropriately, networks are probably the most significant technological leap forward in the last 20 years. But they aren't the slam-dunk answer to all your prayers. And as a bonus this month, BJ reminisces about early DG history.

:TOPIC1:NET:FLASHBACK

The theme of this month's issue is networking, and if you still have last month's issue floating around you should go grab it and re-read it because a lot of what I said about queuing theory applies to networks, too.

The two most common problems I run into associated with the use of networks are misuse of the network and bottlenecks.

So what constitutes misuse of a network? The most common misuse is to use a network as a substitute for peripherals. The classic example occurs when you try to hook up all the PCs in the shop to your MV or Aviion, so that they can all share the nice big disks and nice fast printers on the server rather than have their own disks or printers. That's really handy, except that the overhead in terms of both elapsed time and CPU to access a peripheral on someone else's CPU is significantly more than what would be required to access the same peripheral if it were directly connected.

The second most common misuse of a network is inappropriate use of distributed data bases. Networks were designed for the occasional exchange of data. To run a batch job or a query against a remote data base, with the query running on your CPU, involves incredible overhead compared to the same function run on a local copy of the data base. Logging onto the CPU where the data base resides and running the batch job or query there would be far more efficient. But then you've gained very little by using the network; you've essentially used it as an alternative to dialing directly into the CPU where the data base resides.

To illustrate this dilemma, consider the systems where I work. Four MV/4000s are connected using MCAs (half megabyte per second parallel data buses) running XTS and Xodiac. But most terminals in the place still have an ABCD switchbox next to them. Why? Easy: logging onto another system across the next for the purpose of doing any terminal intensive work is at least 100 times less efficient than doing the same work through a directly connected port. That's especially true when using DG's nifty intelligent multiplexors (IAC, LAC, Termserver, or whatever), which contain their own outboard CPUs and memory.

When your program reads or writes a line of data, all of the grunt work is done in the multiplexor. The host simply passes the request to the multiplexor and does some notifying when the

request completes. Contrast that with being logged on across the network. In this case, PMGR has to do all of the work that would have normally been handled by the multiplexor. And on top of that, two CPUs and multiple processes on each have to be scheduled and run at least twice to handle each request. The number of lines of code, which get executed on both systems when you're logged on across the net and you simply hit the New Line key at a CLI prompt, is staggering.

Is this the fault of DG's incredibly inefficient network software? Hardly. In fact, DG's network software is pretty good (especially XTS II on AOS/VS II). The real problem is simply the number of CPUs and processes that have to get involved, versus the simple case of a directly connected terminal.

If you want to see how costly networks really are, try this experiment: TYPE PARU.32.SR (a big text file) while logged on across the net and monitor total CPU (system and user). Then do it again while logged on directly. On the MV4s it's 24 percent and 38 percent using the network versus 8 percent directly connected. That's a hell of a price to pay just to display text on a screen.

As for the second type of network problem, go back and read the section in last month's column about queuing theory. You'll see that networks pretty much match the assumptions regarding random accesses (data packets) to a non-preemptible shared resource (the physical link, coax or whatever). This means that the results of queuing theory generally apply: as you exceed 25-35 percent busy on the link, the queue length starts to grow exponentially and network response time goes into the toilet. In some respects, networks are even worse than disks because a lot of the traffic consists of incredibly inefficient small packets used for acknowledgements and keystroke echoes. These link acquire/release time and framing overhead on these small packets can wreak havoc on maximum throughput. Many eight-megabit-per-second LANs are lucky if they can achieve maximum throughputs of four megabits per second under ideal conditions. And eight megabits per second isn't that quick to begin with, especially compared to something like the transfer rate of a directly connected disk.

Okay, now that I finished trashing networks, does this mean I don't like them? Hardly. Used appropriately, they are probably the most significant leap forward in technology in the last 20 years. They just aren't the slam-dunk answer to all your prayers that a lot of people would have you believe, especially the guy trying to sell you one.

Moral of the story: The same strategy that works for disks works for networks.

The fastest network access is one that is avoided, and you must overconfigure the bandwidth or limit the traffic in order to avoid massive queuing problems.

:TOPIC2:DG_HISTORY

I've been invited to speak next week at the Chicago Users Group meeting, and they asked for a short history of DG. I'm gonna kill 2.0 birds with 1.0 stones and let you read some of the publishable parts from my voluminous notes. There will be a few anecdotes in the live version that I just can't print without getting DG in hot water with the SEC and the FBI, so you'll just have to find someone who was there if you want the really juicy stuff. I'll also be bringing a bunch of very old DG manuals for ogling. Don't ya wish you lived in Chicago. Not!

There's a lot of DG history I know personally, a lot I've picked up as hearsay, and a lot I missed completely by never working full-time back at HQ. So I'm going to just relate some of the stuff I was actually part of.

Back in 1971, I was working for a DG customer in Chicago writing an operating system and some techno-software on a very early Nova, and later on a Nova 1200. My first machine had 4 K words, a 300 cps paper tape reader and 66 cps paper tape punch; a 10 cps Teletype ASR33, and a 30 cps GE Terminet printer. No, I didn't forget to mention the disk; I didn't have one until later. Most of the software I wrote was written using paper tape for program storage (now you know why the command in Speed to write the buffer out is P; it stands for Punch).

> The most common misuse is to use a network as a substitute for peripherals

When I finally did get a disk, it was an Alpha Data fixed head disk with 128 KB. Yes, you read that right. At the time, I thought it was huge. We eventually ran out of space and upgraded it to a 256 KB. Anyway, DG shipped us its brand-new operating system called DOS along with the disk. I was suspicious of any new software and we had a tight schedule, so I convinced the company I was working for to spring for the source code. If I remember right, it cost about $300 and showed up as about 10 trays of paper tape.

Back in those days when you suspected a bug, you picked up the phone and called Southboro (hereinafter Sobo) because the Chicago office was a rep, not a direct sales office. When you called Sobo, they put you right through to the programming department and you got to talk directly to the author of the product. In my case, I spent quite a bit of time on the phone with a guy

named John Henderson (where are you now John?). Because I had the source code, the call often consisted of just reading John the source code changes needed to fix the problem.

In November of 1971, the company I worked for made the mistake of sending me to the Fall Joint Computer Conference in Las Vegas. My girlfriend at the time had a brother living in San Francisco, so we swung through there on the way. I had never been to the Left Coast, and I was absolutely dumb struck when her brother explained that, no, it never does snow there, and you can ride your motorcycle all year round; and there aren't any bugs to hit you in the face. At the conference, I met the guys from the DG office in Lost Angeles, and they seemed like a reasonable bunch.

Needless to say, when I got back to Chicago it didn't take long for me to give notice, and for me and my girlfriend to pack all of our junk into our cars and caravan out to California. I remember it vividly because it was the week before New Year's Day, and on the way out of Chicago I got a flat tire and I remember kneeling in the slush and a heavy wet snowstorm to change the wheel. Four days later, we crested Altamont pass amid sunshine, blue sky, and about 75-degree weather.

My original plan was to either go back to school and finish a master's degree, or to go to work for DG, but when I called DG's LA office I was told that the only place for a programmer to work was in Sobo, and that the only staff in the outlying offices was Sales or Field Service. I asked them to keep an eye out for a job with a customer, and went back to spending my days exploring San Francisco.

About a month later I got a call from LA, and they said something might be up; it seems some guy named (Dr.) Mike Schneider had been hired in Sobo about six months earlier, and given the charter of putting together a field software support group on the theory that end user business was more lucrative than OEM business; and that DG would need application specialists to help get some of it.

The only catch was that I'd have to move to LA. Yuk. I said, "Not interested."

A week later, I got another call from LA and they asked me to meet a guy in the bar at San Jose airport later that day, to be interviewed for a possible position in the Bay Area. I said okay, dusted off one of the few suits I had, shaved off my beard to look presentable, and drove down to San Jose airport. Within a week, I found myself on a plane to Boston for the First Ever Application Engineer Training Course in Sobo. Me and three other guys. The first thing they did was take us to Building 1 (more like a Shack 1) to meet Captain Ed, then on a tour of recently completed Building 2 (manufacturing), and finally a walk through the almost complete Building 3. The only occupied office in it was Dr. Mike's.

One of the three guys was from Jer-

sey, I think, and he lasted only a couple of months. One of the guys was from Texas (Matt Blanton), and I think he's still around. The last guy was Steve Gaal from LA, who eventually ended up running the organization under Mike Schneider. The way things finally ended up, the Jersey guy had east of the Mississippi and north of the Mason-Dixon line, to the North Pole and Tehran. Matt had south to Tierra Del Fuego, and I had north and west as far as Tehran. I remember that one of my particularly gruesome duties in the early days was to fly to Hawaii once a month to attend a users group meeting in Honolulu and help them sample local beers and po-po's afterwards. Helluva deal.

In case you think I'm joking about the west to Tehran thing, I did have to go to Seoul, Korea, for about a month to install a Nova 800 (yes, I was a hardware guy too) and teach an RDOS internals class. I've even got the manual (in Korean), which one of the students wrote. One of the few things in it in English is my name in the introduction.

All the stories you might have heard, about how the early DG field staff was a bunch of crazies, are true

I spent most of the early days on airplanes. DG was divided into regions, and the West Coast region included Seattle, Denver, Salt Lake City, Phoenix, Albuquerque, LA, the Bay Area, and San Diego. When not on airplanes, I lived in San Francisco but worked out of the Palo Alto office about 35 miles south. The office had one secretary, three sales guys, two FEs, and me. I'll never forget the first day. A sales guy named Don Rector asked me if I wanted to go out to lunch, and I said sure. We ended up at the hofbrau/topless joint called the Brass Rail down near Lockheed in Sunnyvale. I'm not sure we made it back to the office that day. That was a major clue.

The early days at DG were definitely Party Time. All the stories you might have heard, about how the early DG field staff was a bunch of crazies, are true. They were truly amazing at their jobs, and they partied as hard as they worked. I remember some monster bashes, especially the ones at the houses of the sales guys who lived near the beach in the town Manhattan Beach. And every DG office (especially the ones staffed by Mormons) was

absolutely up to date on which topless joints served the best food. For LA , it was the string of places on Aviation Boulevard just east of LAX. And we didn't just go there alone; we took prospects and customers, and they loved it. A lot of deals were closed the morning following major bashes. In fact, I remember one deal that was closed at 2 a.m. in the parking lot of a Seattle massage parlor.

It wasn't just the West Coast field offices, either. On my first trip to Sobo for training, I was given a guided tour of Boston's ill-fated Combat Zone by a guy who obviously knew the place inside out (pun intended).

Later I did my master's thesis research on the biker bars in Revere over on the east side of Boston, but the Zone always remained my Home Away From Home. Even all the foreign offices I visited over the years were populated by wild and crazy guys and girls. So now you know how the NADGUG Sleaze Tours at the NADGUG conferences came about.

:TO_BE_CONTINUED

Anyway, I'm running out of room here and I've barely scratched the surface, so we'll have to continue this another time. Stay tuned. Next time, I'll divulge who got naked in Stan Joseph's pool at the Regional Meeting, and who kept their clothes on and played Peeping Tom.

I'll also relate the goings on at Stan Joseph's upcoming picnic at his house outside Baltimore on June 6th. It's a bash by the Grey Eagles (ex-DG'ers) to honor our newest member, former founder and VP Herb Richman. Δ

David Novy

How *not* to have a wild weekend

SYNOPSIS

How many ways can it be said? Back up your system; make sure your backup procedure works. Or else you could be in for some cruel discoveries, and you may see your problems at work intruding most distressingly into your leisure time.

One dark and stormy Friday night at about 5:30 p.m. I received a telephone call from my brother. He's a software engineer for a computer company that competes with Data General. Anyway, he wondered if I had any contacts in the Exabyte 8 mm tape data-recovery business.

My brother was assisting at a site where a customer had a very serious problem. Because of a misunderstanding between this customer and my brother's employer, the customer had been using only one backup tape for his Unix file server—and in this case, "one" means one and only. Unfortunately, a disk drive had failed during a system backup to this one and only backup tape.

What the customer needed was a way to read the backup data past the point where the drive failure occurred. If this could not be done, there was a possibility that the customer would go bankrupt. The company for which my brother works could normally have recovered the backup data for this customer. However, it was 5:30 p.m. on a Friday, and the tape recovery resources of my brother's employer would not be available until Monday. My brother asked me if I knew of anyone who might be able to help his customer, and get that system back on-line before Monday.

Coincidentally, I had been testing disk backup and recovery software from DMS Systems of Salt Lake City, Utah. It was still only 4:30 p.m. in Salt Lake City. So I told my brother that DMS had written an 8 mm tape backup software package, and there was a good possibility that they could help him. My brother called DMS Systems and reached them just about the time they were heading home for the weekend. DMS Systems personnel said that if someone could get the tape to them,

there was a good chance they could recover the data.

A valiant attempt

Early that Saturday, the customer's system manager was on a plane to Salt Lake City with the one and only backup tape. He did not need to fly out there personally; but then, he probably felt it best to leave town for a while. The system manager delivered the tape, and although DMS Systems made a valiant attempt to recover the data, they discovered that they needed special equipment to read data past the point where the disk crashed.

In the meantime, the DMS Systems people did offer a good suggestion: that the problem at the customer's site was probably *not* with the disk drive, but with the disk controller. DMS Systems called my brother and asked if the "broken" drive could be found. It was located, and determined to be all right. However, another problem had arisen, which prevented recovering the customer's data. The customer's system was a three-drive system. In order to increase performance, the three drives had been configured as one large drive, with data striped across all three drives—a Three Musketeers approach; all for one, and one for all.

Unfortunately for the customer, a field engineer for my brother's company had already reformatted the two remaining drives of the three-drive set.

Once it was determined that the data could not at that point be recovered from the disk drives, and that DMS Systems needed special equipment to recover the data, the DMS Systems people switched to Plan B. The system manager returned home. On Monday, DMS Systems personnel flew to Exabyte headquarters in Colorado Springs, Colorado. The Exabyte people were able to recover the tape's data.

It appeared that all was well, but now came the cruelest discovery of all. The customer had used a buffer size of 512 bytes. This reduced the capacity of the Exabyte tape from its advertised 2.3 GB to only about 1 GB. Only 50 percent of the customer's data had been backed up. The customer had also given himself further problems by having a CD ROM drive on the system, and not excluding it from the backup procedures. This meant that every night, the tape backup included about 400 MB of CD ROM information.

Fortunately, using the information that was recovered from the tape, and data recovered from manual systems, the customer was able to recover from this incident. I do not know if the system manager is still employed at the company, but it is probably safe to assume that the company has acquired a large collection of tape backup media, and that they are no longer backup up information stored on CD ROM.

There are some lessons to be learned from this incident:

1) System backup is critical. There are few companies that can survive major data loss on their central computer systems.

2) If you don't feel comfortable developing a tape backup system by yourself, then hire an expert to do it, and then hire another expert to check the work of the first expert. Remember that even experts can make mistakes.

3) Never assume that your backup procedures are adequate. Review and test the procedures on a regular basis.

4) Do not assume that because a disk drive is down, that the drive itself is bad. Make sure to check the disk cabling *and* the disk controller before replacing a drive. Replacing a disk drive is tedious and potentially hazardous work.

Epilogue

DMS Systems has acquired the necessary equipment to allow it to read past bad areas on 8 mm Exabyte tapes. I have finished my evaluation of the DMS Systems disk backup and recovery (DBR) software. It is a well-written, powerful, and well-supported software package. It is available in the DG world for both Aviion and MV systems. Δ

David Novy is a technical computing specialist at 3M in St. Paul, Minnesota. He is past chairman of the AOS/VS special interest group, and current chairman of NADGUG's SIG/UX. He may be reached at 612/733-3320.

Changes in computing

Editor's note: Following are excerpts from a presentation given by ***Joel Schwartz****, Data General vice president and general manager of the Eclipse Business Unit, during the Business Symposium DG hosted at Harvard Law School on April 8.*

When the Eclipse Business Unit was formed in late 1990, our goal was to implement a focused marketing and development effort that would allow us to better satisfy the needs of our customers. Since then, I hope you'll agree that we have been true to our word.

Managers, developers, and marketers from the EBU have met with hundreds of customers around the world. We have introduced a number of new hardware products that offer unparalleled growth paths, along with dozens of new and enhanced software products.

In 1991, the Eclipse combined hardware and services revenues topped $900 million, and 20 percent of our product sales went to new Data General customers. And today I'm pleased to announce that a new generation of MVs have arrived.

I'd like to take a moment to review our basic mission. Our focus is on delivering a broad, binary-compatible family of computing systems that emphasize:

- Powerful, scalable data processing capabilities
- Office automation
- Commitment to standards and interoperability
- High availability
- Ease of upgrade
- High product quality.

Product strategy

We have put into place an ongoing, five-year hardware strategy to ensure that we will continue to be on target with these goals. Our commitment is to improve our price/performance ratios by 40 percent at least every two years. In addition to providing higher levels of performance, we will continue to focus on your requirements for high availability, scalability, data processing excellence, and ease of upgrades.

Here's a look at our hardware deliverables within the past 12 months. We strengthened Eclipse data storage capabilities with the introduction of the high-speed 4 GB disk subsystem and fast SCSI-2 controller. We introduced new, higher-performance communication options. We announced and delivered, *on time,* three new MV systems in the low and mid-range. Even more importantly, these new CPU products beat our target replacement product goal by nine months. New MV systems have *never* come to market as rapidly as they have in the 1990s.

Figure 1: Eclipse Business Unit; A year in review

Major Software Deliverables:
- AOS/VS II
- MV Data Center Manager
- CEO • CEO Object Office
- Macintosh connectivity

• CEO OO 3.10, 4.00 • (PC*I, Netware, Netbeui, TCP/IP) • Infos Conn Server—Aviion 1.00 • Screen Generator Util (SGU) 2.70 • Remote Infos Agent (RIA) 2.71 • Source Mgmnt Util (SMU) 2.20 • VS/VSii Perf Monitor 5.20, 5.21 • Infos Conn Server (RAX) 1.10 • CEO Integration Toolkit 3.20 • AOS/VS II 2.01, 2.02, 2.03 • AOS/VS TPMS 3.50, 3.51 • AOS/VS II ONC/NFS 1.02 • DUMP_3/LOAD_3 2.50 • CEO Printer Tool kit 1.00 • MS-DOS CEOwrite 3.00 • AOS/VS II TCP/IP 1.10 • DG/Ingres Net 1.00 • Basic 3.30 • XTS II 2.10 • X.400 1.20 • DG/OTS 1.10 • MVNET 2.20 • MV/Ada 2.7.6 • DG/SQL 5.20 • CEO/PXA 3.10 • Netbeui 1.00 • SNA 3270 6.12 • DG/RDOS 2.61 • CEO 3.20, 3.21 • CEO Draw 1.20 • Sort/Merge 3.41 • Keypak for CEO • VS CEOwrite 4.10 • AOS/VS TCP/IP 2.60

In the software arena, our strategy and deliverables are equally as strong. We will continue to focus in areas where we excel—with enhancements to CEO, high availability offerings, AOS/VS II, and information management.

We will address customer requirements with annual revs for all of our major software products. In addition, our software will be enhanced to scale for the more powerful systems, like the ones we are unveiling today. Strategic third-party relationships will continue to be fostered. And focus will be given to connectivity and interoperability solutions that allow MVs to participate in multiplatform environments.

Again, taking a look at our deliverables—in 1991 we shipped 38 new or major revisions to existing software products. And these covered the full gamut of operating systems, CEO and communications.

More specifically, we delivered a full complement of LAN-based comm protocols: TCP/IP, Novell, Appletalk, Netbeui; no other vendor sells and supports such a complete set of industry-standard LAN products. We also signed new agreements with Oracle, Cognos, Wordperfect, and other strategic software partners.

Another area of focus this past year has been on quality, with specific regards to reducing the number of outstanding software trouble reports. I'm pleased to say that in 1991, high-priority STRs were reduced by more than 40 percent, and the total STR count has dropped by more than one-third.

Introducing the sixth generation

But back to the reason for why we're all here today. Gerry Paul's team has been hard at work to deliver, *on time,*

the new sixth-generation systems: the MV/35000 and the MV/60000.

I'm pleased to also introduce to you today the next generation HADA subsystem. This new SCSI-II based subsystem, the HADA/MV, is based on our award-winning HADA design—delivering high performance and high availability disk storage capabilities.

The new MV/35000 doubles Eclipse mid-range performance. It is Data General's first six-way multiprocessor, delivering over 50 real MV MIPS. The MV/35000's CPU consists of a new and improved version of Data General's custom CMOS microprocessor. With a 40-percent single CPU performance improvement over previous generation systems, the MV/35000 CPU exceeds our commitment of 40-percent improvement every two years.

I think a perfect example of this new power comes from Oracle Corporation, who had the opportunity to extensively test the MV/35000 several weeks ago. Joe Vassalo, senior director, mid-range products division, describes the results: "We not only experienced an 80-percent increase in uniprocessor throughput over Data General's previous MV/30000 system, but also the best multiprocessor scaling we have ever seen on Eclipse MV/Family systems."

We also have first-day orders for this new system from Allied Administrators in Kansas City, Standard Microsystems of New York, STNA in France, and Fiserv Corporation of Connecticut.

And I'm delighted to add another to this list—based on preliminary discussions after last evening's dinner, we have also received an order for an MV/35000 mod2 and a HADA from Springfield Technical Community College of Springfield, Massachusetts. I'd also especially like to thank Track Data of New York for their order of seven MV/35000s.

HADA

As a complement to this system—and actually all other Eclipse mid-range and high-end systems, I'm pleased to introduce the new, high-available, high-performance subsystem, HADA/MV.

This low-cost mass storage subsystem delivered improved I/O performance, data protection capabilities, and dual porting support. Based on state-of-the-art RAID technology, HADA/MV packs from 2.5 GB to 30 GB of disk storage into one cabinet.

Figure 2: Eclipse Business Unit; Mission—hardware product strategy

5-year Product Plan
Binary compatible hardware family

- 40-percent price/performance improvement every 2 years
- Ongoing stream of CMOS-based low end and mid-range systems
- Performance-oriented high end systems
- New features focused on: high availability; scalability; data processing excellence; ease of upgrade
- Contemporary, standards-based peripherals

In the event of a disk drive failure, the disk array remains completely operational, with no loss of data or disruption to your applications.

As you can imagine, these features are well recognized by our customers. Barry Morton, executive director of information technology services for the Ministry of Attorney General in Victoria, British Columbia, provides support for almost 3,000 on-line users. Barry's decision to go with the HADA/MV was based on two primary reasons: 1) high availability coupled with inexpensive data redundancy, and 2) high density, which allows a large amount of disk storage in a small footprint.

MV/60000

But perhaps the most exciting product to be introduced today is our new high-end MV/60000 HA. The MV/60000 HA caps the largest single development project ever at Data General. The MV/60000 HA incorporates leading technology to achieve its high level of performance: 16-layer, multiwire printed circuit boards, a mid-plane design; and a gate array cooling technology based on a design from the NASA space program. MV/60000 HA systems can be configured with up to four job processors, each running at nearly 30 Dhrystone MIPS. That means well over 100 MIPS in a fully configured system.

The latest Motorola gate array technology contributes to the high level of power packed within each MV/60 computer. It also allowed us to place the system's processor board on just *one* printed circuit board, which allows for superior system reliability.

To further the goal of high availability, we also embedded several other technologies with the MV/60000 HA. These include dual data busses, and standard redundant cooling and power units for the CPU, memory, and I/O. This high-end MV supports over 1,500 CEO users.

I'm pleased to announce three first-day orders for the MV/60000 HA. BICS is the second-largest bank in France's Banque Populaire Groupe. The applications at BICS include Videotex home banking, signature verification, branch banking, and CEO office automation. Today, BICS has decided to upgrade to an MV/60000 HA2 in order to satisfy growing user requirements in enterprise communications.

RWE-DEA is the largest oil company in Germany, and has ordered an MV/60000 HA1 to be used in their Wesseling refinery. They have 22 MV systems and are using Aviions in Unix projects as well.

Health Data Sciences, a leading international provider of integrated information systems for the health-care industry, has added both the MV/60000 HA and the HADA/MV to their list of products they sell.

I hope you'll agree that the new sixth-generation Eclipse MV/Family systems deliver the leading technology that meets your needs. Δ

The latest products for DG systems

Integrated SNMP/CMIP

Washington, DC—Digital Analysis Corporation (DAC), a Unix system integrator, and Data General Corporation jointly announced OS/Eye*Node, the first integrated network, system, and application management software product designed for use across both TCP/IP and OSI networks. The product was demonstrated at INTEROP 92 Spring, an exhibition spotlighting multivendor interoperability.

Co-developed by DAC and Data General, OS/Eye*Node is currently the only open systems object manager to offer unified control, monitoring, and analysis using SNMP and CMIP/CMIS.

Featuring distributing application control, instrumentation for SNMP and CMIP proxies, and several key management applications, OS/Eye*Node's integrated management approach addresses a broad range of organizations, government agencies, and contractors requiring OSI and TCP/IP support. Similarly, OS/Eye*Node was designed to be scalable and extendable for networks and systems with hundreds to thousands of devices.

OS/Eye*Node features an OSF/Motif graphical user interface to support configuration management, electronic software distribution, system administration, and performance analysis. Vendor-neutral data management technology supports ANSI SQL RDBMS products for storing network configuration, administration, and performance information.

The product will be available during the third quarter of 1992. Pricing information is available upon request.

Digital Analysis Corporation, 1889 Preston White Drive, Reston, VA 22091; 703/476-5900.

Circle 46 on reader service card.

Continued on page 36

AD INDEX

Company	PG#	RS#
Ames Sciences, Inc.	36	1
Asset Remarketing Corporation	33	2
Claflin & Clayton	23	3
Claflin & Clayton	26	4
Compuplan International, Inc.	35	-
Computer Engineering International	39	5
Computer Wholesalers	20	6
Contemporary Cybernetics Group	3	7
Cyberscience Corporation	C2	8
Data Assurance Corporation	8	9
Data Bank Associates, Inc.	10	10
Data Bank Associates, Inc.	11	11
Data Bank Associates, Inc.	16	12
Data General Corporation	5	13
Data General Corporation	21	14
Data General Professional Services	27	15
DataLynx	14	16
Digital Computer Consulting, Inc.	31	17
Digital Computer Consulting, Inc.	12	18
Digital Data Systems	20	19
Digital Dynamics	36	20
Eagle Software, Inc.	C3	21
Eagle Software, Inc.	35	-
Flying Point Software	35	-
Hanson Data Systems	22	22
International Computing Systems	24	23
International Technology Group	33	24
McIntyre's Mini-Computer Sales Group, Inc.	27	25
Minitab Statistical Software	35	-
NADGUG Conference 92	1	26
NADGUG	32	27
Park Place International	12	28
Productivity Systems Development Corporation	18	29
Rational Data Systems	19	30
RAVE Computer Association	25	31
Rhintek, Inc.	15	32
SCIP	29	33
Security Computer Sales	31	34
Sysgen Data Ltd.	16	35
:SYSMGR, a division of B.J. Inc.	36	36
:SYSMGR, a division of B.J. Inc.	37	37
:SYSMGR Bulletin Board	3	-
Systems Management Consultant	35	-
Threshold, Inc.	37	38
TLC, Inc.	C4	39
Universal Data Corporation	32	40
Wild Hare Computer Systems, Inc.	7	41

PRODUCTS AND SERVICES

Company	PG#	RS#
Contemporary Cybernetics Group	37	45
Digital Analysis Corporation	33	46
DMS Systems, Inc.	36	47
PBT Technologies	36	48
SOTAS International, Inc.	37	49
Wild Hare Computer Systems, Inc.	37	50
Zetaco, Inc.	37	51

ON-LINE HELP

***Who to call for answers about* NADGUG *and* FOCUS**

NADGUG address:
c/o Danieli & O'Keefe Associates, Inc.
Chiswick Park, 490 Boston Post Rd.
Sudbury, MA 01776
FAX: 508/443-4715

NADGUG

Membership, RIGs, SIGs
NADGUG staff **800/253-3902**
(Outside the U.S.) **508/443-3330**

Electronic bulletin boards
(300,1200, 2400, or 9600 baud modem)
Rational Data Systems **415/499-7628**
DASH bulletin board (2400 bps modem) **800/DASH-CSC**
Data General Customer Support Center **800/344-3577**

FOCUS Magazine address:
c/o Turnkey Publishing, Inc.
Livingston Building, Suite 250
3420 Executive Center Dr., Austin, TX 78731
FAX: 512/343-7633

FOCUS Magazine

512/345-5316

Editorial comments, article suggestions.....Doug Johnson
(please send product announcements to the address listed above)

Information about advertising.....Michelle Sentenne

FOCUS back issues .....Turnkey Publishing staff

Conference report;
continued from page 6

features and capabilities.

Future DG/Ingres releases will be ported by DG engineers in RTP. The first port, already in progress, is the Ingres 6.4 front-ends (e.g., VIFRED, QBF, ABF, etc.), and the new VISION product.

Also discussed was the market withdrawal of Infos rev 6.00. This was done to ensure no corruption of user data. DG felt it better to withdraw the revision than allow the possibility of corrupted data. Further addressed was the imminent release of rev 5.10, to consolidate 5.01 patches and allow for the new Infos Connection Server for Aviion. The availability of Infos 5.10 was to be December (it was shipped on schedule).

Infos rev 6.00 Infos included user tunability options for tuning Infos resource usage to the operating environment, rather than allowing the resources to be gobbled up without the user's knowledge or agreement. Also included was a new INQUIRE containing many customer-requested features. Perhaps the most important features to many users are improved checkpoint performance and multiple concurrent checkpoints.

Infos rev 6.10 will concentrate on reliability, providing tools for tuning the runtime environment and some new operator commands. Reliability is an obvious first choice given the problems encountered using rev 6.00 at some sites. The software will be more thoroughly tested and reviewed than any previous Infos revision. The rev 6.10 release will contain a monitor that may be used with rev 5.01 or 5.10 to help the user look at the runtime environment, and then set the operating parameters for rev 6.10 to reflect that usage. Also to be included are new operator commands to allow the system operator to know which users have records locked or open.

Data General participants asked thatt further concerns and suggestions be directed to any member of the panel. The address: MV Database marketing, 3400 Computer Drive, Westboro, MA 01581. Δ

Bill Cole is manager of qualification and suport, Proprietary Data Management Products, with Data General.

EQUIPMENT

AVIION
LINE PRINTERS
450/LPM - $5,550.00
800/LPM - $6,350.00
*** NEW * WITH WARRANTY**

Compuplan **1-800-228-8889**
Texas or Nationally
FAX: 214-224-3281

DIAL-UP BULLETIN BOARDS

:SYSMGR BBS specializes in file transfer of RDOS and AOS[/VS] DUMP files - no messaging facilities. XMODEM, YMODEM, and KERMIT supported. 415/391-6531(one line), 2400 baud (Microcom AX9624c), 8 data bits, 1 start /stop bit or 415/550-1454 (voice). System is MV/4000, terminal mode is CHAR/605X.

for **NADGUG**
Membership information contact:
Danieli & O'Keefe Associates, Inc.
1-800-253-3902 (continental U.S. only)
508-443-3330

The North American Data General Users Group is an incredible resource when you need answers

So, don't go it alone– join **NADGUG** *today!*

SERVICES

EAGLE SOFTWARE
Can Help You With
✓ CEO Conversions
✓ INFOS File Reconstruction
✓ Disk Recovery Services
✓ GSA Contract Pricing
CALL TODAY!
1-800-477-5432
EAGLE SOFTWARE, INC
P.O. BOX 16
SALINA, KS • 67402-0016
Phone: (913) 823-7257
FAX: (913) 823-6185

SOFTWARE

Statistical Software
- Powerful
- Fast
- Easy-to-use
- Inexpensive

MINITAB
STATISTICAL SOFTWARE
3081 Enterprise Dr., State College, PA 16801
814-238-3280

Terminal Emulation
@Con/PC & @Con/PC Plus - Complete D210-D411 DG terminal emulation. Plus version includes fast, error-free file transfer (with software for MV), and script language (macros). Network licenses and volume discounts available.
Still only $99 & $149
Flying Point Sales - (516) 725-3622

CONSULTING

DOWNTIME GOT YOU DOWN?
I'll keep your DG ECLIPSE systems running until you catch up with them.
Stephen J. Maroulis,
Systems Management Consultant
P.O. Box 3642, Poughkeepsie, NY 12603
Phone: 914-452-1178, Fax: 914-452-8180

Products and Services; continued from page 33

Unix disk backup

Salt Lake City, UT—DMS Systems, Inc., announced a new version of its disk backup and recovery system for Unix, which supports the DAT autochanger from Advanced Digital Information Corporation (ADIC). This added feature of the DBR is currently available for Aviion DG/UX systems, with support for other operating systems to follow.

When working with the ADIC DAT autochanger, DBR can support unattended backups up to 60 GB, giving users increased capacity and flexibility for system backups.

Selection of tapes from the cartridge is made based on new user options available for both dump and restore operations. During the restore, the DBR on-line index is used to determine which cartridge is needed. The cartridge is mounted without operator intervention.

DMS Systems, Inc., 1111 Brickyard Road, Salt Lake City, UT 84106; 801/484-3333.

Circle 47 on reader service card.

Tape drive emulator archive

Sunnyvale, CA—PBT Technologies offers a plug-and-play archive system for use with Data General Eclipse and Nova computers equipped with conventional 9-track tape drives.

The model MO-650 is based on 650 MB, reusable, magneto-optical disk technology, while the model DT-1300 uses 1.3 GB digital data storage tape cartridge technology. Both systems offer reductions in media cost and storage space requirements, compared to 9-track tape.

The PBT product line offers a proprietary tape drive emulation architecture that allows quick installation on computers using 9-track tape drives, such as the DG 6026. The PBT emulation architecture partitions high-density media into tape "segments," each roughly equivalent in size to a tape reel. The archive is daisy-chained to the computer and existing tape drive. No system modifications are typically required—800, 1600, and 6250 bpi drives are supported.

PBT Technologies, 1180 Miraloma Way, Suite B, Sunnyvale, CA 94086; 408/738-3594.

Circle 48 on reader service card.

Fast-SCSI-2 controller

Minneapolis, MN—Zetaco, Inc., announced the SCZ-6 multifunction controller, a new high-performance controller that implements fast-SCSI-2 technology.

The controller supports data storage devices with the fast-SCSI-2 interface, including magnetic disk drives, helical

scan and half-inch tape drives, and rewriteable optical disks. Up to seven peripherals can be connected to one SCZ-6 controller.

SCZ-6 supports a burst data transfer rate of 10 MB per second, enabling higher performance with large data block transfers, and minimizing bus utilization when the controller is supporting many drives.

Designed for Data General's MV series of minicomputers, the SCZ-6 combines full DPJ (disk) and MTJ (tape) emulation and compatibility with a high-speed asynchronous-synchronous SCSI peripheral interface. The controller emulates DG's latest disk subsystems, 6786/6787, and includes advanced features such as disk mirroring, dual porting, and seek/latency overlap.

Zetaco, Inc., 11400 Rupp Drive, Burnsville, MN 55337; 800/423-3020.

Circle 51 on reader service card.

ICobol compiler

Boulder, CO—Wild Hare Computer Systems introduced Axis/32, an ICobol compiler designed specifically for DOS environments.

Axis/32 runs on any 386 or 486 PC under any DOS or DOS-like system, including any DOS-compatible network, and solves previous DOS memory restrictions. It operates and generates object code identical to Wild Hare's standard Personal Axis product. Its Data General-compatible object code may be run without modification on any machine, from PC to mainframe, under virtually any popular operating system.

Wild Hare Computer Systems, Inc., P.O. Box 3581, Boulder, CO 80307-3581; 303/442-0324.

Circle 50 on reader service card.

Accounting software

Haverhill, MA—SOTAS International, Inc., now offers its family of accounting and human resources software in DG/UX for the Data General Aviion hardware platform.

SOTAS applications feature: a closed-loop system that provides up-to-the-minute reporting; user-controlled applications that allow accounting and personnel departments to control activity; data integrity, preserved through SOTAS security; comprehensive international-multinational features; cash management tools; simple, systemwide ad hoc query-reporting tools.

Unix solutions from SOTAS International include general ledger and financial reporting, purchase order and receiving, accounts payable, accounts receivable, fixed assets management, inventory management, payroll, human resources, applicant tracking, COBRA management, trademark and patents management. Systems and modules are priced (based on the number of users) from $8,000 to $80,000.

SOTAS International, Inc., 508/372-0770. Friedmann & Rose, 418 Commonwealth Avenue, Boston, MA 02215; 617/266-1009.

Circle 49 on reader service card.

QIC tape streamer

Newport News, VA—Contemporary Cybernetics Group added a 1 GB QIC tape streamer to its line of tape and disk storage subsystems. The CY-4000 offers data storage and unattended backup for systems of 500 MB to 1 GB. The CY-4000 follows the 5.25-inch form factor, and can be mounted internally or externally. The exterior tape door keeps contaminants and electrostatic discharges out of the drive. A proprietary media/head loading mechanism protects against tape damage during loading and unloading. Read-after-write recording and parity checking of bus transfers monitor data continuously.

Contemporary Cybernetics Group's QIC streamers are available for a wide range of computer systems, including those made by Data General.

Contemporary Cybernetics Group, 11846 Rock Landing, Newport News, VA 23606; 804/873-9000.

Circle 45 on reader service card.

Bits and bytes

A long, ongoing problem

From: Arlene Blouch

I was hoping that perhaps someone might be able to give me some help on a long, ongoing problem with CEO QMA. I am currently using 3.21, but the problem has been long before. I have 350-plus users, with CEO running on two MV/20000 mod 2's, an MV/9600, and MV/10000. Several times a week, usually around 7 p.m., QMA suddenly appears to hang. Nothing submitted for import/export or printing is processed. Our closing time is set for midnight, and the backups are done around 2 a.m. One host (MV/20) is used by the police department, which is a 24-hour operation. Other users are not bothered since CEO is stopped during backup, and if the problem is happening there, the only notice they have is a flashing error on their printers in the morning.

The only fix seems to be to stop QMA and restart it. I have installed all patches that my local SE can dig up, and I am tired of submitting STRs that only get "unable to reproduce" answers. The sense of humor of the police department is long gone on this one, especially on weekends when an operator must be paged to come in and fix the problem by stopping and starting QMA. Any insight would be greatly appreciated. Am I the only one seeing this?

From: Wally Beddoe

Do you have disk caching turned on, on the disk that contains CEO_QMA's files? Have you applied "3.21_CEO_QMA_PATCH_81"?

From: Bob Butler

Is QMA hanging or are the sons hanging? If QMA has sons that are hanging around, then the problem is likely to be in whatever document is being printed by them. If QMA has no sons, then you've got a unique one. I've got about 250 users, each on two systems here also running 3.21, and have never seen QMA just hang up like you describe. I would check the QMA logs and try to determine who/what was last processed, to see if it can be duplicated.

From: Arlene Blouch

Yes, I do have caching on, the patch is also installed. The patch has made no difference. I have checked the QMA logs and seen no patterns that I have been able to determine. I hadn't thought about checking sons . . . . I'm never here when it hangs, so the amount of information I have gotten from the operations has not been much. I will have them check what sons the process has before they terminate and restart QMA. Thanks. It's been a long frustrating problem.

IAC-8 input buffer length limits

From: Mark Pagano

Does anyone know what the limits are for input buffer length on an IAC-8? We are running AOS/VS II 2.03 on an MV/30000. We are currently using 128 for the input and output buffer length, and need a larger one on input.

From: Wally Beddoe

Support for VSGEN-able ring buffer sizes for all async controller images is available with AOS/VS 2.10. However, the files IAC8RS.<PR,ST> are available from DG that support input ring buffer sizes of 2048 bytes for all lines for AOS/VS 2.00; not sure if they apply to 2.03.

From: Walter Mosscrop

Mark, pages 33-34 in the VS II release notice for 2.00 have the info you need regarding the maximum memory available in an IAC-8. Be careful not to oversubscribe the memory, or it will panic.

Desktop 20 to IBM PC

From: Daniel Bors

Can anyone suggest something that I can run on a Desktop20 to allow it to communicate with an IBM-compatible PC. The operating system is RDOS.

From: Rick Marnell

The only thing I know of is RDOS Kermit, which I believe is on this BBS or :SYSMGR. Of course, you then have the problem of getting onto your DG/20.

From: Tim Boyer

Unfortunately, RDOS Kermit isn't complete, and won't work for you. What do you need to get over? If it's just ASCII stuff, do an XFER. If it's binary data, you've got some problems.

From: John O'Keefe

We've used DG/RDOS Blast (not in a while, however). It works okay for small file transfers, but it bogs down over 2400 baud. The Desktop is just too slow for Blast at higher bauds. You need Blast at both ends, however, since the version under RDOS didn't include other protocols. Good luck.

From: Kevin Danzig

There is a product that at least on RDOS ran pretty clean, called Breakthrough, that was an XMODEM CRC, that you could try. It was able to handle 9600 all day long.

SMI backups

From: DM Frost

While performing a systemwide backup with SMI, I received a "Request refused by operator," error on volume number 11. Since it is not necessary to manually turn operator on/off when performing SMI backups, I cannot determine why I encountered this error.

From: Kevin Danzig

I think that the original macros for SMI backup didn't include labels that high. Check the macro. Δ

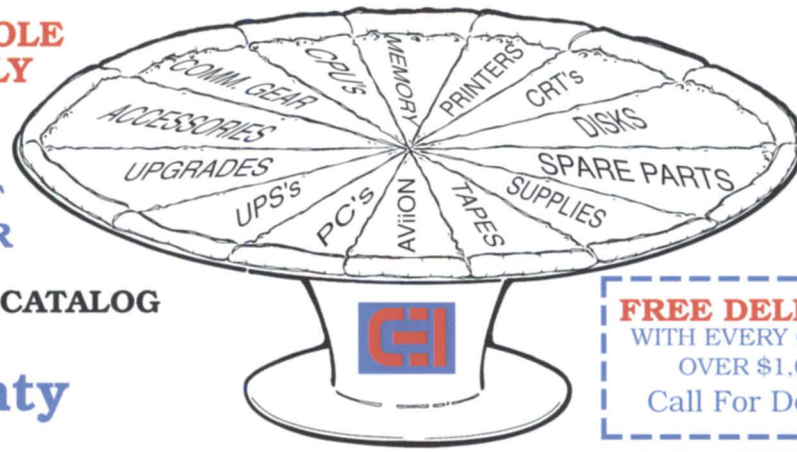
Do you have a question, comment, or answer? Call the NADGUG/RDS electronic bulletin board, available to all NADGUG members, 415/499-7628. No fees other than phone charges.

DATARAM
AUTHORIZED DISTRIBUTOR

Computer Engineering International

2231 Star Court
P.O. Box 81755
Rochester, MI 48308
MI Phone: 313-853 0770
FAX: 313-853-0775

WHY PAY FOR THE WHOLE PIZZA WHEN YOU ONLY NEED A SLICE?



- BUY
- SELL
- TRADE
- DEPOT REPAIR

CALL FOR A FREE PRICE CATALOG

800-462-CEII

60 Day Warranty

FREE DELIVERY
WITH EVERY ORDER
OVER $1,000
Call For Details

PRINTERS

BP-2000 2000 LPM Band Printer	$12,900
4596 600 LPM Quietized (LB615)	4,500
B-600 600 LPM Serial Band Printer	2,500
4327 300 LPM Band Printer S/S	700
M-200 340 CPS Serial Printer	750
6215 Draft Quality Serial Printer	750
6474 12 PPM Laser Printer w/Dual Feeder	1,475
4557 8 PPM Text Laser	650
6194 180 CPS Serial Printer w/keybrd	350
4433 150 CPS Dot Matrix Printer	350
6321 40 CPS Letter Quality Printer	225
005-8096 Data Channel Printer Controller	195

CPUs

MV/20000 Mod 1	$13,950
MV/15000 Mod 20	13,750
MV/15000 Mod 8	5,900
MV/10000 w/4MB	750
MV/9500 w/8MB	25,000
MV/7800XP w/4MB	2,950
MV/4000 w/4MB	450
S280 w/2MB, BMC	1,495
S/140 w/512KB, Floating Pt.	1,495
Nova 4/X w/256KB, 16 slot	595
Nova 3/12 w/64KB, 12 slot	595
S/140 w/512KB	595

CRTs

D217, D413, D463 (New)	Call
6501 D412 w/KB	$295
6500 D216 w/KB	245
6566 D216+ w/KB	295
6308 D470 Color w/KB	450
6394 D461 w/KB	295
6393 D411 w/KB	250
6392 D215 w/KB	185
6391 D214 w/KB	175
6167 D460 w/KB	175
6166 D410 w/KB	160
6169 D211 w/KB	145

MEMORY

80108 MV/9500-9600 32MB Memory	$12,800
7015 AViiON 64MB Memory	Call
8990-E MV/15000-MV/20000 32MB Memory	7,495
8990-D MV/15000-MV/20000 16MB Memory	3,250
8990-C MV/15000-MV/20000 8MB Memory	895
8939 MV/7800XP 4MB Memory	1,500
8901 MV/7800 4MB Memory	750
8765/8708 MV/4, 6, 8, 10 2MB Memory	125
8754 S/140 512KB Memory	195
8387 Nova 4 256KB Memory	175
8545 Nova 3 16KW Core Memory	195
8923-A Desktop 20 1MB Memory	495

COMM. GEAR

4460 Network Bus Adapter w/Box	$895
4623 IAC-24 w/TCB	2,395
4532-A Ethernet LAN Controller	2,700
4586 ITC-128	4,750
4010-A Interlan Ethernet Controller	695
4370 IAC-16 w/TCB-16	685
4369 IAC-8 w/TCB-8	350
4463-ZT USAM-4 for Desktop	100
4207-S Async Interface for Desktop	150
4340 AMI-8	50
4380 ISC-2	250
4817 Termserver 2000	Call

DISKS

6236 354MB Disk S/S	$895
005-17820 HDA for 354MB Disk	400
6239 592MB Disk S/S	2,495
6685 1.0GB SCSI Disk A/O	3,950
6554 662MB SCSI Disk A/O	2,600
6491 322MB SCSI Disk A/O	1,395
6161 147MB Disk S/S	475
6160 73MB Disk S/S	225
6336 71MB Disk/Desktop	595
6581-A 500MB RAMS Disk A/O,	7,495
6621 1.2GB RAMS Disk S/S	13,500
6237 1.062 GB Disk S/S	1,950

MV/DC

MV/2000 w/2MB, CTD, LAC-12	$895
MV/1400 w/4MB, CTD, 160MB	2,350
MV/2500 w/8MB, 130MB CTD, 322MB Disk	7,900
005-30768 MV/2000 Enhanced CPU w/4MB	1,295
6363 160MB Disk	875
6329 120MB Disk	595
6328 70MB Disk	495
6309 737KB Floppy	195
6351 24MB Cartridge Tape	295
4562 LAN Controller	495
4627 LAC-32	2,995
4560 LAC-12	395

TAPES

92185 CDC 6250 BPI Tape Drive	$1,200
6590 2GB Cart. Tape w/CSS Chassis	6,150
6299 1600/6250 BPI Tape S/S	2,795
6300 1600/6250 BPI Tape S/S	2,695
6125 1600 BPI Streaming Tape S/S	150
6123 1600 BPI Streaming Tape/Desktop	495
6026 800/1600 BPI Tape S/S	475
6270-B 15MB Cart. Tape/Desktop	225
6676 525MB Cart.Tape A/O	4,100
005-21691 Tape Controller for 6299/6300	495
005-8584 Tape Controller for 6026	150
BMX-2 Zetaco Tape Controller	575

UPGRADES/PARTS

005-12388 S/140 F.P.U.	$850
005-15633 S/140 ERCC/BMC	1,195
8991 MV/15000-MV/20000 F.P.U.	1,395
8819 MV/10000 IOC-2	595
8997 MV/15000-MV/20000 Expansion Chassis	1,700
8992 MV/15000-MV/20000 Bus Repeater	2,200
8772 S/280 BMC	695
8883 MV/7800 Chassis, 16 Slot	895
8395 Nova 4 Chassis, 16 Slot	425
8749 BBU for MV/10000	795
UPG MV/20000 Mod I to Mod II	8,000
AViiON Processor Boards - Various	Call

Circle 5 on reader service card.

Data Specific

Trade tracking

A high-speed client/server system installed by the **American Stock Exchange** sifts through 1.7 million pages of data each month as part of an overall effort to track illegal insider trading.

The client-server system provides users with access to a central data base from desktop computers. Fifty PCs residing on a DECnet local area network (LAN) are connected to a **Data General** AV 4000 RISC-based server running Security Transaction Archival Systems software.

The Aviion, in turn, is connected to a Panasonic optical disk jukebox containing the exchange's trading information data base.

Developed by New York-based **INSCI,** a Data General value-added reseller, Security Transaction Archival Systems is an indexing and retrieval software solution that allows market surveillance analysts to store large amounts of data (47 GB or 50 optical disk platters containing 940 MB each) for long periods of time. It also provides faster searching, greater retrieval flexibility, and automated tabulation of stock-related statistics.

Joins Zetaco

Zetaco, Inc., of Minneapolis, Minnesota, has named **Russell L. Bengtson** to its top management group as vice president of sales and marketing. Bengtson joins Zetaco after a 20-year career with Unisys, where he held various sales and marketing positions. He graduated from the University of Minnesota with a BS in business administration.

Certified for GOSIP

DG's X.25 for Aviion systems product was recently certified for full conformance with the **U.S. Government OSI Profile** (GOSIP). X.25 for Aviion is formally registered in the **National Institute of Standards and Technology**'s (NIST) register of GOSIP-conformant products.

Robin Cohan, DG's senior OSI product manager, says that X.25's certification for Aviion is the first of several GOSIP-compliant products planned. Other members of the Aviion OSI family will be certified later this year. In addition to X.25 for Aviion, DG's OSI line includes OSI/Platform software, X.400 messaging, and FTAM file transfer capabilities.

The company is the first Unix systems vendor to fully implement the virtual terminal protocol (VTP), which the NIST requires in the latest GOSIP revision 2.

New Aviion prices

New price points for the low end of its Aviion family of multiprocessing Unix servers were announced by Data General, along with the addition of two high-performance multiprocessing configurations to the low end of the Aviion product line.

The entry-level price for a 25 MHz AV 4300 server, configured with 16 MB memory and 332 MB disk, has been reduced from $13,995 to $9,995. A similar system packaged with 1.4 GB of disk has been reduced from $20,895 to $15,995. Other configurations reflect similar reductions. The AV 4300 now replaces the AV 4100 as DG's entry-level server.

Two new high-performance packaged systems include the AV 4320, with 32 MB of memory, two 520 MB hard disk drives, and a 525 MB cartridge tape (price: $21,395); and the AV 4620, with two 33 MHz CPUs, 64 MB of memory, twin 520 MB hard disk drives, and a 525 MB cartridge tape device (price: $36,595).

Disaster recovery

Any computer operation can be by an accident. Anywhere you store or process large volumes of information or data represents vulnerability. One way to remove vulnerability is to have a plan for protecting your MIS operation.

In the United States, Data General has BIRS—Business Interruption Recovery Service. Call the DG Customer Support Center (1-800-DGHELPS) to start the Disaster Recovery process. Once notified, Data General ships a specially designed MV or Aviion configuration within 72 hours.

The system is available up to six weeks at no additional charge. After that, a daily usage charge applies. All Data General support personnel with whom you are used to dealing will be involved in the recovery process, including your account engineer and branch manager.

BIRS offers a complete MV or AV system, delivered and installed at the location of your choice. Customers choose a contingency configuration to match their own: CPU, consoles, video displays, printers, and disk drives. You provide your own operating system, application, third-party software, and data files.

BIRS protection is available for approximately 10 percent of the monthly maintenance charge. The price covers shipping charges, installation, usage, and de-installation.

Call DG Telemarketing for a BIRS evaluation. In addition to BIRS, DG Educational Services offers a two-day disaster/recovery seminar, SM529, for first-time planners.

Data General Customer Support Center, 1-800-DGHELPS; DG Telemarketing 800/343-8842 (press option 2).

Governmental matters

Viewpoint Technologies, a value-added reseller, has recently completed a major Eclipse system upgrade for the City Council of New York City.

The upgrade replaced an MV/15000 Model 10 with an MV/30000 Model 3.

The MV is running Viewpoint's Legislative and Issue Tracking System software.

The system will help city council members track legislative items and critical issues and trends, and evaluate how they relate to various other data. Δ

When it comes to faxing capability, isn't it time you lost some wait?

Now you can.

Consider how much excess "wait," unbilled time, and cost you'd trim from your bottom line if you could fax directly — automatically — from your MV terminals. + *RUSH* reduces faxing from a hefty, hard-to-manage procedure to a lean and simple task: the stroke of a key on your computer gives you direct, automatic fax transmissions. + No more printouts or hard copy needed. No trips to the fax machine. No wasted time waiting for your turn. No more dialing. No more busy signals. No more finger-drumming or ho-humming while waiting to get through. + And *RUSH* not only streamlines your operation and boosts productivity, it also eliminates scanning, which greatly enhances the quality of your faxes.

RUSH™
The Computer Fax System.

It's worth a call: **1-800-477-5432**

EAGLE
SOFTWARE, INC.

Eagle Software, Inc. 123 Indiana P.O. Box 16 Salina, KS 67402-0016
Phone (913)823-7257 FAX (913)823-6185

Circle 21 on reader service card.

Everyone can use a little Tender Loving Care.

With some companies tender loving care is a luxury. But, at TLC it's our way of doing business. Our customers deserve the best and they get it.

HARDWARE SALES, SERVICE AND DEPOT REPAIR

HIGH TRADE IN ALLOWANCES ON EQUIPMENT UPGRADES
180 DAY END-USER WARRANTEE ON ALL PURCHASES
100% SATISFACTION OR YOUR MONEY BACK

All available to you from a staff with over 150 years of Data General experience.

TLC

TECHNICAL & LOGISTICAL CONSULTANTS, INC.

4 Spaceway Lane, Hopedale, MA 01747 508-478-8211, (FAX) 508-473-3109

DataGeneral
VALUE-ADDED RESELLER

Circle 39 on reader service card.