

February 1993

FOCUS

The Magazine of the North American Data General Users Group



In Focus

Can-do service

You get what you pay for

Enterprisewide network service

New Year, new DG structure

Dial up that STR

Plus

Waiting for @Godot

Designing relationally

The heart of the GUI

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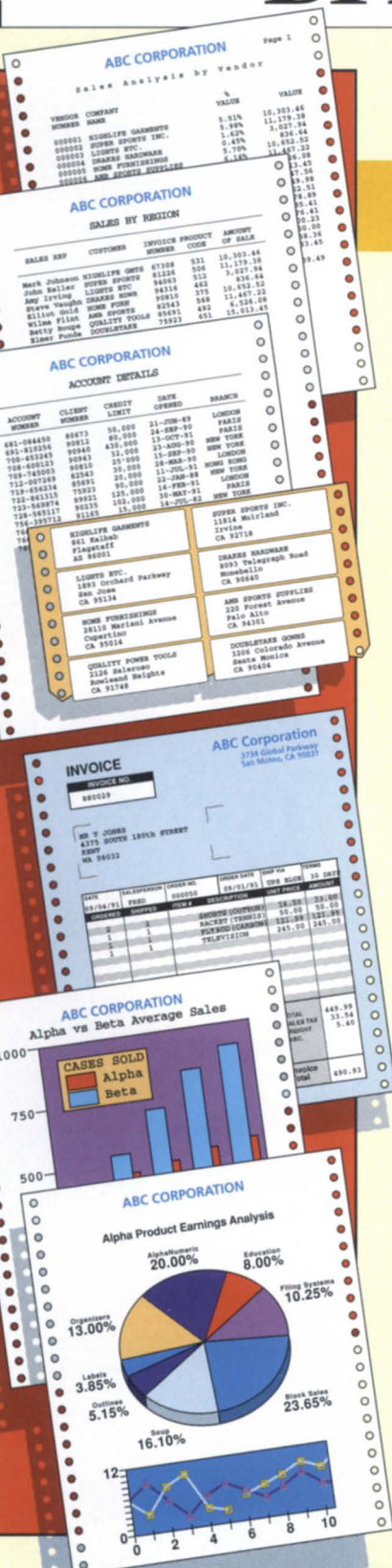
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The Magazine of the North American Data General Users Group



FOCUS ON: SERVICE

You get what you pay for

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Data General



Tim Boyer

NADGUG: as good as you make it

The officers in an organization may be the most visible people, but they're usually backed by a support staff that does much of the work. That's certainly true of NADGUG. In an attempt to remedy this situation, I'd like to introduce you to some of the committees that make up NADGUG.

Here they are

The Audit Committee is chaired by Calvin Durden. As in any corporation, this committee reviews the financial activities of NADGUG for reasonableness, completeness, and accuracy.

Brad Friedlander chairs the Bylaws Committee, which creates and revises NADGUG's governing laws. Brad is the one who tells the board if the rules say we're allowed to do what we want to do, or suggests what we have to change in order to do so.

This year, due to unforeseen circumstances, Calvin Durden is also chairing the Conference Committee. At the risk of offending all of the other committees, this has always been the group that I feel works the hardest. By the time you attended the NADGUG 92 conference in Kansas City last October, the Conference Committee already had literature ready for NADGUG 93. In addition to the chairman, the Conference Committee includes the track chair

leader, Brad Friedlander, and the track chairs, Ron Branom, David Novy, Roger Casey, and Steve Pounds. They have responsibility for scheduling each and every session—and this year, there were more sessions than ever. Once the conference starts, the track chairs are responsible for the smooth operation of their respective sessions.

The Membership Committee is run this year by Frank Perry. Frank's main task involves recruiting and retaining members. He's the one conducting membership surveys, administering membership benefits, and designing the NADGUG membership ads.

Our immediate past president, Dennis Doyle, is chair of the Planning Committee. This committee is responsible for NADGUG's long-range goals and objectives. One major task is preparing each year's operating budget.

Maggie Morris chairs the Publications Committee. She is responsible for all written materials available to the general membership. One of her major charges is *Focus* magazine. In addition, Maggie coordinates the membership directory and the Rational Data Systems bulletin board, and is in charge of the Editorial Advisory Board.

The RIG/SIG Committee is chaired by Al Devitt. Al is responsible for nurturing the regional and special interest

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You get what you pay for

by David Novy
Contributing Editor

I had the issues of service and product quality burned into my brain this past week.

A long-awaited 256 MB memory board arrived on my dock. The box looked as though it had endured a 30-foot fall, even though it was clearly marked "extremely fragile." Inside, four SIMM sockets were broken. The box had been very poorly handled, but even so, the packaging was woefully inadequate for such a fragile piece of equipment. Also, the SIMM sockets themselves were of very poor quality. They reminded me of cheap furniture—the kind you can put together once if you're lucky, but do not try to move it.

Fortunately, the memory vendor offers a lifetime warranty on its product, so a replacement arrived two days later. The SIMM sockets on the new board were of much better quality. But I have to go through the trouble of obtaining an RMA number and returning the damaged board. If the memory board had been packaged better, or if the shipper had taken better care of the package, I would have been spared several hours of wasted time.

The incident with the memory board reminded me once again that fast and reliable service is an absolute necessity for a modern computer center. Had the memory board been a critical replacement part, I could have suffered an additional day of downtime on a major computer system.

Poor quality in computer parts is one issue; lack of investment in people is another. With all the downsizing and cost-cutting occurring in corporate

America today, computers are becoming even more critical for business survival. However, although I see companies willing to make large investments in machines, they appear to be *unwilling* to make the necessary investments in the *people* needed to run the machines.

I know a company that has not had a single requisition for an outside hire for their computer support staff in three years. The attitude seems to be that anyone can run today's computers. Or if necessary, they can hire a contract person to do the work. It is true that modern personal computers are very easy to use. The problem is that while the machines may be easy to use by themselves, they are *not* easy to network together. Nor is it a trivial matter to see that the data they contain are properly backed up.

The problem with using contract people for computer operations support personnel is that there is no loyalty between the corporation and the employee. The company is free to let the contract person go on short notice, and vice versa. The difficulty with this attitude is that the key to a successful computer operation is loyalty and trust. The internal functioning of a computer center is understood by few managers today. They must trust that the computer center will be run properly.

It takes months, if not years, for an individual to learn all the nuances of managing a computer center. These people are vital corporate assets who can put a company out of business faster than even the chairman of the board. So if you wish to be an enlightened manager, be nice to your computer support staff. Take them to lunch

SYNOPSIS

Fast and reliable service is an absolute necessity for a modern computer center. And if you wish to an enlightened manager, be nice to your computer support staff. Take them to lunch once in a while.



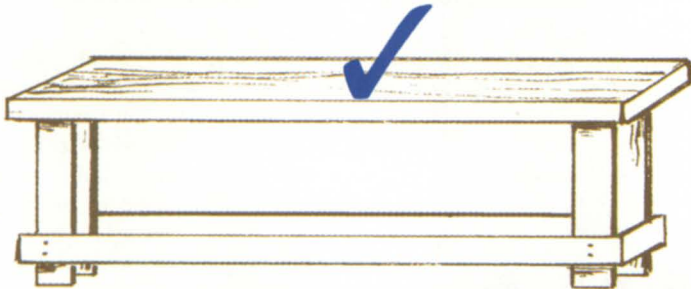
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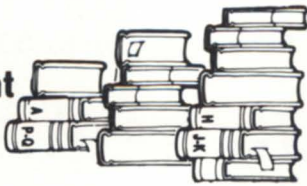
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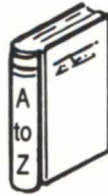
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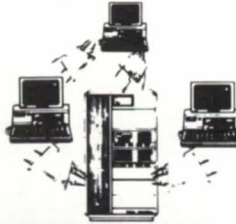
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once in a while. Tell them thanks for a job well done. And be understanding in case of system problems. It will pay great dividends in the years ahead.

A broken disk mirror gives seven hours of bad luck

After a recent system failure, I encountered a great deal of difficulty getting back online because a key disk was mirrored. I had the disks set for automatic resynchronization. This meant that every time I tried to reboot, the mirrored drives tried to resynchronize themselves. Actually, they only appeared to try to resynchronize themselves. Lights flashed furiously, but no resynchronization was taking place.

I tried to use standalone *diskman* to break the mirror, but the software said that there was no mirror to break. What I finally did to overcome the problem was to boot standalone *diskman* and do the steps necessary to create a mirrored disk. I created the mirror and added each piece. As I tried to add each piece, I was told that the piece was busy and could not be used in a new mirror. Although the system told me that the drives were busy, I determined that they were busy because they were resynchronizing.

After the drives had finished resynchronizing, I broke the mirror and shut down one of the disks. At this point, I was able to work on the system without further interference from the mirrored drives. When the repair work was completed, I reestablished the mirror.

What to do if *lpsched* will not start

My local DG software engineer gave me the following "To Do" list when you can't get *lpsched* to restart:

- 1) /usr/sbin/init.d/rc.lpsched stop
- 2) cd /var/spool/lp
- 3) rm SCHEDLOCK, if it exists.
- 4) rm FIFO
- 5) rm listen BSD
- 6) rm ListenS5
- 7) /usr/sbin/init.d/rc.lpsched start

△

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.

Enterprisewide network service

by Paula Jacobs
Special to Focus

SYNOPSIS

In network integration as in other aspects of the computer industry, it's service after the installation that counts.

Designing, integrating, and maintaining an enterprisewide network is complex. It requires a solid understanding of industry standards, communications, and interoperability issues. But often such technical expertise and resources are not available in-house. And while organizations generally rely on their internal staff to manage networks, many business cannot afford to

increase headcount to undertake new networking projects.

So it's not surprising that according to a recent International Data Corporation (IDC) survey of 450 corporate network users, respondents allocate 32 percent of their network services budgets to implementation services. Among tasks cited as critical were developing hardware and software interfaces; establishing a networking standard; specifying data flows, volumes, and traffic; establishing a network support strategy; and

Networking: As comprehensive as you want it

Networks have assumed tremendous strategic business importance as organizations depend on networks for a whole raft of mission-critical applications. Local area networks (LANs) and wide area networks (WANs) are integral parts of workgroup, department, and enterprisewide computing environments.

Multiple networking technologies such as ethernet, token ring, FDDI, and Localtalk must now coexist. Similar-

ly, it's often necessary to support a variety of protocols, such as TCP/IP, X.25, LU 6.2, and Novell IPX. WAN connections may require the use of private T1, dial-up modems, public fractional T1, SMDS, and public relay communications. And networks must also support next-generation applications such as multimedia and imaging.

Data General's Network Integration Services is part of the company's Professional Services Group, which provides customers with a comprehensive portfolio of single-source professional services. DG's Professional Services offerings include: systems integration, software application design and development, software porting and conversion, downsizing assistance, facilities and project management, on-site residencies, help desk support, system implementations, and performance and capacity planning.

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establishing network project management plans.

"Our research indicates that a vendor's business reputation and technical competence in multi-vendor integration are the number-one issues that users cite in selecting a network integrator," said George Newman, director of network integration services at IDC. "Users want a network integrator who can understand their business and help design a network that meets these business needs." Also important is that users want a vendor to manage their network *after* it is installed, and offer the technical ability to integrate new applications.

Focused service

Data General has addressed this complex set of customer requirements with a comprehensive set of solutions, according to Jon Limbird, DG's director of network integration services. "Our objective is to provide customers with the most appropriate networking solu-

tion so they can run their businesses smoothly and efficiently."

Most customers, Limbird said, prefer to work with a single networking supplier as the most efficient way to ensure seamless network performance. As a single-source supplier, Data General's Network Integration Services offers a range of solutions, consulting services, and products. Consulting services include network planning, design, implementation, integration, management, network support, and training.

DG has taken a number of steps to ensure successful, focused service delivery. For example, a team of network consultants located nationwide and backed by a Data General corporate team delivers both LAN and WAN services. The team offers significant technical expertise with a variety of technologies including ethernet, token ring, and FDDI. Using multiple network topologies and industry standard protocols, the consultants will integrate networks that may include Aviiions, Eclipse MV

family systems, PCs, and other assorted equipment. DG's consultants also employ the most up-to-date technologies—frame relay, T1 and fractional T1 links, ATM, and microwave—to integrate the most disparate heterogeneous networks over a single transport environment.

DG Network Integration Services is available to coordinate every network aspect, including complete project management. Data General can assume primary responsibility for the entire network or share responsibility with in-house staff. Services may be as comprehensive as an integrated solution, with total project management encompassing every step—from network design to product integration and network certification.

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requirements, with consideration for operational factors such as network topologies, transmission means and line speeds, access methods, the performance benefits of different networking strategies, and the impact of adding imaging or multimedia applications. The company also provides a cableplant installation service, which includes site preparation, installation of cables and terminations, and certification when testing is complete.

Additionally, DG has developed strategic alliances with leading networking vendors such as Synoptics, Microcom, and 3Com for bridges, routers, intelligent hubs, modems, cables, and other products. Customers can order more than 400 leading third-party industry standard networking products directly from DG.

All products undergo thorough testing and qualification procedures to ensure product compatibility and interoperability with other network components.

As computer networks have become more complex, the level of technical expertise required to deal with this complexity has grown significantly.

Providing better customer connections

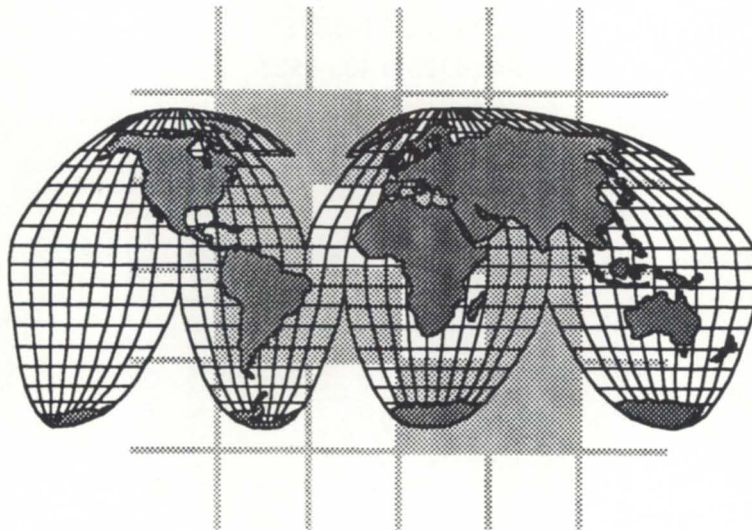
Among Data General's Network Integration Services customers are large and small organizations—hospitals, financial institutions, utility companies, and others. They include installations with multivendor computing platforms and new Unix shops. Some customers have come to Data General to plan and implement an enterprisewide network from scratch. Others simply need to expand or reconfigure an existing installation.

The New York Power Authority required a reliable link to users at three different sites. Some individual workgroups had previously developed independent solutions, but this inconsistent approach did not allow communications among workgroups at the different sites.

"Data General helped us determine the network architecture, traffic patterns, and evaluate the most appropriate network management solution,"

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said Dennis Eccleston, director of applications for MIS.

DG developed a creative design that includes a fiber-optic backbone, based on a star configuration with the data center at the hub of the star and twisted-pair cabling at each location. Avion systems are networked together to link 200 users at corporate headquarters with 250 users at each site connected locally over an ethernet.

The New York Power Authority is now revamping the corporate offices in White Plains, New York, to include wiring closets on every floor, and integrating token ring and ethernet equipment. The organization plans eventually to implement concentrators that support token ring, ethernet, and FDDI.

Data General's Network Integration Services is also helping the organization to evaluate the most efficient network management strategies—simple network management protocol (SNMP), open systems interconnection (OSI), or a combination, and how to implement

While organizations generally rely on their internal staff to manage networks, many business cannot afford to increase headcount to undertake new networking projects.

gateways and routers.

Based on DG's recommendation, the New York Power Authority has decided to implement an SNMP strategy with an evolution to OSI planned for the future. "Network Integration Services has helped us understand the ramifications of network management decisions and develop a new architecture for a wiring scheme," said Eccleston.

Continuous and reliable

Continuous, reliable communications are vital for hospitals and medical institutions, which rely on computers for both patient care and administrative functions. Frequently, it is necessary to connect multiple floors and buildings, including medical offices and satellite facilities.

Mt. Auburn Hospital, a Harvard Medical Center Community teaching hospital in Cambridge, Massachusetts, purchased Avion workstations to integrate the hospital's financial and clinical

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6491 322MB FOR CSS	1,000
6446 234 MB FOR CSS	600
6329 120MB MV/2000	450
6363 160MB MV/2000	750
6100 25MB WINCHESTER W1/28	900
6300/6299 1600/6250 MAG TAPE S/S	1,900
6026 DUAL MAG TAPE S/S BROWN	850
6123 MICRO STREAMER BROWN	400
6270 DESKTOP CARTRIDGE TAPE	450
6125 STREAMER MAG TAPE S/S	400
BMX-3 CONTROLLER	1,100
BMX 2 CONTROLLER	950
005-2169/6299/6300 CONTROLLER	300

MEMORIES

80108 32MB MV/9500/9600	\$9,500
8990-D 16MB MV/20000/15000	1,200
8990-C 8MB MV/20000/15000	400
8939 MV/7800XP 4MB	500
8871 8MB MV/4000/10000	800
8927 4MB MV/2000 NEW STYLE	1,150
8870 4MB MV/4000/10000	450
8765 2MB MV/4000/10000	200
8940 10MB MV/7800XP	2,700
8708 2MB MV/8000	200
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8687 256KB S/140	200
8387 256KB NOVA/4	200
8656 256KB ECLIPSE	200
DESKTOP MEMORY	CALL

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cal system, including a large data base that must be accessible to physicians and clinical staff from any station within the hospital. The hospital also needed to connect with physicians at off-site locations. DG's Network Integration Services designed and installed a network to integrate seven Aviiion workstations on a fiber-optic ethernet network, supporting more than 1,200 users over microwave links. Data General continues to provide the hospital with ongoing support.

"Our users are extremely pleased with the network performance," said Dana Diggins, the hospital's vice president of finance.

Some customers come to Data General Network Integration Services with specific projects. Such was the case with North Adams Regional Hospital, a 140-bed facility serving northwestern Massachusetts and southern Vermont.

According to Mark Kester, computer services coordinator, upon purchasing new terminals and Aviiion systems

the hospital decided to use its existing ethernet backbone system, which predated the 802.3 industry standard. Data General's Network Integration Services installed 90 new cable drops, reterminating existing wiring and ethernet cabling.

"Data General also tested the ethernet backbone and our fiber-optic link to work with the 802.3 standard," said Kester. The facility consists of two multi-story buildings connected over a fiber-optic link with repeaters at both ends.

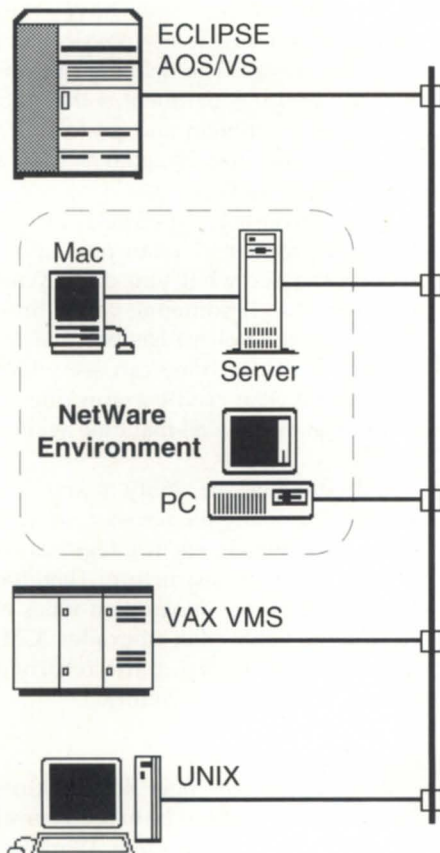
The net-net

As computer networks have become more complex, the level of technical expertise required to deal with this complexity has grown significantly. That's why businesses are increasingly willing to outsource network design and implementation to outside experts. Since networks are critical to business success, IT managers want to ensure that their networks are efficiently

designed and maintained. Market research firm Ledgeway/Dataquest estimates that the worldwide market for network/communications support reached \$16 billion at year-end 1991, and will reach \$39.6 billion in 1996 with a compound annual growth rate of 19.7 percent from 1991 to 1996.

With its Network Integration Services organization, Data General has demonstrated a solid commitment to providing customers with a broad range of networking solutions appropriate to many types of business requirements. Whether you are implementing a major networking project, expanding your current network, or simply needing to order third-party networking products, consider using Data General's Network Integration Services. Δ

Paula Jacobs is a marketing consultant and writer based in Framingham, Massachusetts.



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Can-do service

by Michael E. Marotta
Special to Focus

SYNOPSIS

You might be emotionally dedicated to providing superior customer service. But if you don't have a method, all you have is good intentions.

If you want your business to survive into the next century, you have to follow the lead of companies like World Computer Corporation of Auburn Hills, Michigan. More than 300 credit unions are clients of World Computer Corporation. Some are large, serving more than 100,000 members, and some are very small, with just 1,500 members. All can rely on the fact that service is the engine that drives World Computer Corporation.

World is a Data General VAR that sells MVs and software to 265 credit unions. The company also provides full-service bureau support to 57 other credit unions.

First impression

Your receptionist meets your clients. Typically, this person's job falls under the administration department. But World is not in the business of administering; they sell computers. So the receptionists report to software support.

Receptionists at World log more than 150,000 calls a year. They keep in touch with 51 field engineers nationwide. With the help of World's Macintosh-based call management system (CMS), receptionists are the front line in customer service.

"We will page an FE every 15 minutes until they respond, every 10 minutes if it's a down system," explains Holly Borgstrom. Judy Marrs adds, "We dispatch the FEs and we route all incoming calls." With CMS, if a credit union calls right back you can tell them, "Someone is going to call you in a few minutes."

The receptionists know this for a fact because the interactive CMS screen shows who got the call and when. Pull-down menus and dialog boxes allow point-and-click access to a relational data base of customers and customer-

support personnel. In addition, the Macintoshes also serve as terminals to a network of MVs running CEO and other corporate applications.

Service as a system

You might be emotionally dedicated to providing superior customer service. But if you don't have a method, all you have is good intentions. Service at World Computer is built into the organizational infrastructure: 24-hour support from 7 am Monday to 9 pm Saturday, with beeper support for the slowest 36 hours of the weekend.

"All calls are logged to CMS," says Paul Ward, manager for software system support. World's call management system shows each client's phone and fax numbers, who the FE is, how many disks and printers they have, their modems, and how many physical CPU boards there are. The defining dilemma for any service department is that "you can solve a problem and go to lunch, and the customer calls again as soon as you leave," says Ward.

CMS provides the edge that cuts through problems. "I can pull up the record and see what you did," Ward explains, "so if someone comes in at midnight and a client has been having problems all day, they can see what's been done. The credit union doesn't have to go through all that time again to explain."

CMS provides the ability to know the needs of 265 clients across four time zones. Call management integrates the organizational infrastructure. Therefore World's hardware department relies on it to help clients plan upgrades. CMS shows parts shipped, parts returned, and even third-party vendors.

Their own best client

According to the poet Robert Burns, the greatest gift would be to see yourself as others see you. Therefore, WorldService buys computers and leases software from World Computer Corporation in

order to process transactions for 57 credit unions in Florida, Texas, California, and Washington. In addition, there is a second WorldService data center in Ferndale, Michigan, to meet the needs of 23 local credit unions.

"We do everything a credit union does except take money across the counter," says Don Durance, WorldService director. The company offers telephone audio response 20 hours a day, Monday through Friday, and 24 hours a day on Saturday and Sunday. WorldService also provides ATMs for transfers, loan payments and Friday-night cash withdrawals. In addition, they do all of the government reporting for a credit union, handling critical data such as interest and dividends, printing forms and mailing them to members, and sending magnetic tapes to the IRS.

WorldService provides two kinds of training, live and online. With live training the trainer goes to the credit union or the CU flies its tellers to WorldService.

WorldService also offers online training. "Actually, each customer can access two distinct systems," Durance explains. "One is their data base, their live, real postings." The second one is a training directory. "When they get new people coming in, they can have them posting entries, and then these new tellers can see the effects of those transactions."

To accomplish all this WorldService runs 10 MV/10000s and one MV/20000. In addition to the usual Halon protection and air-conditioning, an electronic monitor watches eight of the CPUs for electrical input, telecommunication input, temperature, and audio system activity. This monitor has autodial reporting of errors and problems. Says Durance, "All software problems can be fixed remotely."

WorldService has 14 operators on three shifts, four software analysts, and a staff programmer. Credit unions communicate with WorldService via four T1 lines, each of which provides 24 slices of 56 kilobaud. Response time is less than two seconds to a local printer at a client site, and three seconds to any ATM. Each customer is online 99.5 percent of the time, meaning that for an 18-hour day the client is down for any reason no more than two minutes on the

average.

"Our customers don't need to have a data-processing center," says Durance. "That's what they pay us to do." WorldService competes against the cost of in-house data processing. "With audio, ATMs, and so on, you are looking at 24-hour operations. That's three shifts, three operators. That will run \$100,000 per year."

Weekends and vacations mean a fourth operator. "And then you need a manager for them. You're looking at \$150,000 per year to do it yourself," Durance says.

Durance points out that this \$150,000 per year doesn't even buy the computer—to say nothing of air-conditioning

The defining dilemma for any service department is that "you can solve a problem and go to lunch, and the customer calls again as soon as you leave"

and fire protection. "The headache of running an operation can tip the balance for even a large credit union."

Credit unions are in business to buy and sell money. "Data processing is not buying and selling money," says Durance. Too often, the important details of data processing are downplayed by those who are not computer professionals. Disaster recovery is a prime example.

WorldService recently verified its disaster recovery plan with a practice held October 4, 1992. The drill demonstrated to NCUA (the National Credit Union Association) that WorldService could recover from a catastrophe within 24 hours.

"We took one system carrying six customers and declared a disaster on Friday afternoon," Durance says. "The system was up in less than 12 hours. We practiced loading data on Saturday afternoon at a data assurance site in

Denver. We put a person on a plane with the tapes, got them to Denver, and had each customer dial in there. We had all six customers up in 24 hours."

This is not some special exception, but an integral part of WorldService's operations. For example, they are also a test site for World Computer software releases. "We beta-test just about every day," Durance explains. "We see every product World offers," says analyst Gloria Randall.

Automating the process

Randall is one of four analysts. "When operators have a question, they will come to an analyst," she says. "If a client wants to change third-party vendors for payroll or electronic funds transfers, we work with the vendor's programmers and work out the parameters for automating the process."

Running WorldService means working with vendors of ATMs, share-drafts, and travelers checks, as well as automated clearing houses. This means knowing the intricacies of a wide range of standards.

For instance, World programs automatic teller machines to communicate with networks. "The ATM industry has grown fantastically," Paul Ward says. He notes that smaller clients that did not offer ATMs are now looking at this industry. There are also batch ATMs for credit unions that can't afford the online time.

And of course, governments have standards and these requirements change. For example, there are now four new transaction codes for federal student loans. Also, WorldService has three clients in Canada. By Canadian law, they can't be down or closed more than two consecutive days.

"It gets real interesting for holidays," says Ward. "We change shifts to schedule and disperse expertise for year-end." Gloria Randall points out that "most people are home celebrating New Year's, and we have people here punching in data." △

Michael E. Marotta is a technical writer with more than a decade of experience on Data General and other equipment. He works in manufacturing and business environments.

New Year, new structure

SYNOPSIS

You may not need a program to know the DG players these days, but a diagram could help.

by Stephen Nikitas
Special to Focus

Data General begins 1993 with a new organizational structure in place. Four business units were established last October to increase the company's product sales and strengthen the company's customer focus. Development and marketing responsibilities are contained within each business unit to ensure that customer's product requirements are met.

The Aviion Business Unit focuses on providing highly competitive products to continue DG's rapid growth in commercial open systems. Aviion product development and marketing programs are led by Vice President Joel Schwartz, who had served as vice presi-

dent of the Eclipse Business Unit since 1990. But Schwartz is no stranger to the Aviion product line. Upon joining DG in 1989 he headed up the effort to recruit software solutions for Aviion. Today more than 3,000 software applications run on Aviion systems and workstations.

Data General's entry into the storage systems business is the responsibility of the Clariion Business Unit. Clariion is DG's family of open mass storage products (formerly named HADA). Besides Aviion and Eclipse computers, Clariion subsystems support Unix-based servers from IBM, Sun Microsystems, Hewlett-Packard, Unisys, and ICL. Tom West, Data General's senior vice president of advanced development, is directing this business unit.

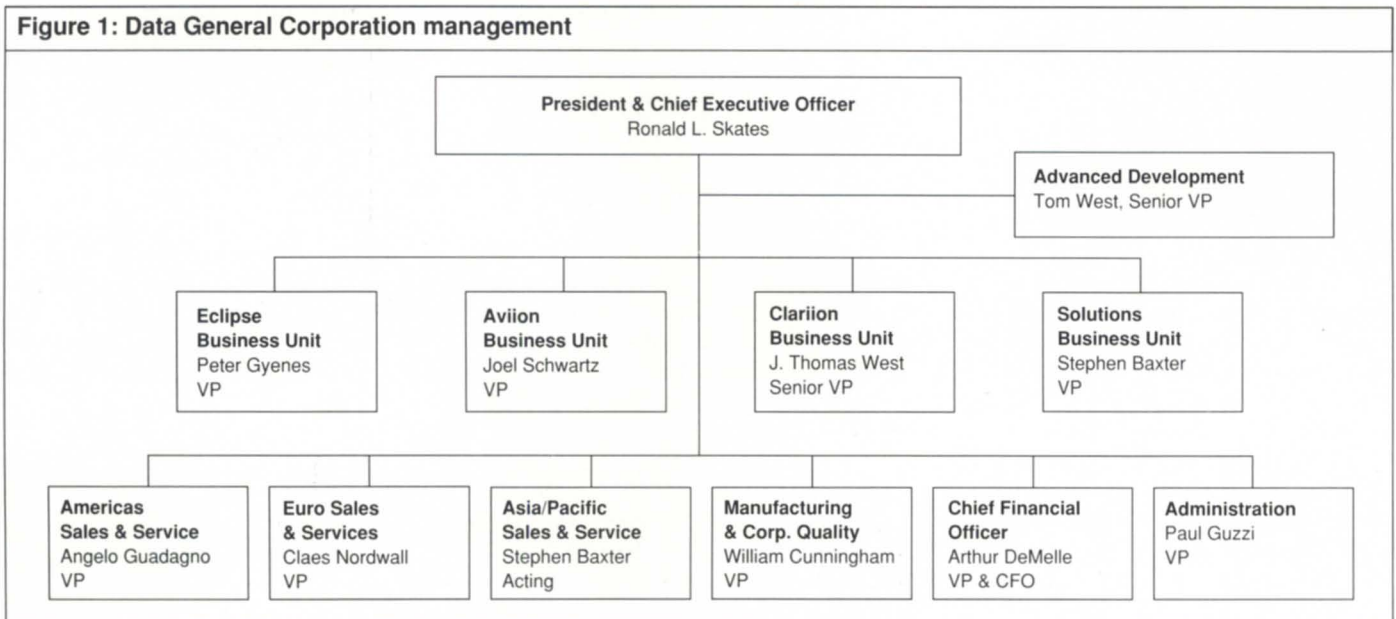
Since it was formed in 1990, the Eclipse Business Unit has concentrated on maximizing worldwide Eclipse computer sales. It is under the leadership of Vice President Peter Gyenes. For the past two years, Gyenes headed DG's international operations, preparing him well to maximize Eclipse business opportunities around the globe.

The Solutions Business Unit combines several key operations to take advantage of ongoing market, product, and channel partnership opportunities. Under Vice President Stephen Baxter, the business unit comprises the Reseller Sales, Industry Marketing, Personal Computers, and Special Systems groups.

Reseller Sales is led by Director Eric Taylor; Industry Marketing is headed by Director Mike Parise; Sales Vice President Robert Mara leads the Personal Computer group; and Vice President Michael Schneider is responsible for Special Systems.

Besides the business units, Data General continues to operate separate manufacturing, sales, service, and administrative functions. Δ

Figure 1: Data General Corporation management



Dial up that STR

SYNOPSIS

Through the Customer Support Center's DASH bulletin board, you can check on the status of particular software trouble reports (STRs).

A new function available on the Data General Customer Support Center's Direct Access to Support Help (DASH) bulletin board allows users to inquire about particular software trouble reports (STRs).

The following information was provided by CSC Software Support Manager Bryan Scoggins:

When you dial into DASH, select the "STR Status" function from the main menu. DASH starts the external utility electronic search program (ESP). To display status information, you must know the specific STR number. If you don't know the number, select the ESP from the DASH main menu to locate the information by searching the file for the products and keywords you specify.

Enter the STR number for which you wish to view information and press Newline (example: NASC-12345).

The program displays information on file for the STR you requested, or lets you know it's "Not a Valid STR." If the STR doesn't exist, press any key to return to the "STR:" prompt.

Some commands are listed below:

Next

"N" returns you to the STR # select.

Forward

Enter "F" to display the next page of information, if additional data exist. The program displays the message, "Last Line Already Displayed" when you have reached the end of the file.

Back

Enter "B" to display the previous page of information. The program displays the message, "First Line Already Displayed," if you are at the beginning of the file.

Stop

Enter "S" to stop your review and return to the "STR#:" selection prompt.

Specify the next STR number you would like to review, or press ESC to return to the main menu screen. Δ

The DASH bulletin board number is 800-DASH-CSC. Call the Customer Support Center at 800/344-3577.



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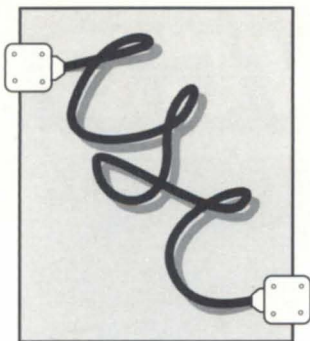
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DASH items

SYNOPSIS

Notices and queries posted on the Direct Access to Support Help bulletin board.

Category: DG/UX

Author: Home Beneficial
Subject: **System access**

I am trying to create a new report to add to the system accounting reports. I would like to show the date, time, and *tty* line that a user signed in on, and the date and time signed off. I would like other information on this report, such as what commands they used, but that would be extra. I would at least like to know when they signed in and out. I know I can add code to the */etc/profile* to capture the information when they sign in, but I don't know how to capture information when they sign out. I know I could write a script for the users to run before they sign out, to capture this information, but I know our users would forget to run this, or they would run it and then decide to stay on. In either case, I don't think it would be accurate. The main reason I want this is to get a better handle on who is accessing my system through our modems.

Reply by: William Krog

If all you need to do is capture the login times of terminal sessions on particular *tty* lines, you should be able to use the 'last' command: check the man pages on 'last' for all the options. You can get the login times and length of terminal sessions on lines 14 and 18; for example, with the command 'last 14 18'. This command reads the */etc/wtmp* file, so you may have to execute the command as root. You may want to write a script that runs periodically to record this information in a permanent log file, since you're probably going to

truncate the */etc/wtmp* file periodically.

Author: Mike Dreiling
Subject: **Tunable parameters listing**

We are operating an Avion 6225 with 64 MB RAM and 20 GB of disk. The primary application is an Oracle data base of some 40 million records occupying about 12 GB. To get better performance from the system, I am trying to perform some system tuning. Since the DG documentation is limited in this area, I am using "System Performance Tunings" by Loukides as a guide. This book refers to several tunable parameters that I cannot find on our system. These include: BUFHWM, NBUF, NAUTOUP, and FSFLUSHR. Can you tell me how to find the current values of these parameters and how to modify them?

Reply by: Wiley N. Johnson

Those parameters are not used in DG/UX. All system parameter defaults are in the file */usr/etc/master.d/dgux & tcpip & nfs*. You will probably find that many parameters listed in a tuning book are not relevant to DG/UX. The kernel is highly modified from what other vendors provide. There is also available from the SEPAC group in Norcross [GA] performance tuning assistance. This includes data collection and analysis, and also a program called RPM/UX that allows you to monitor all the kernel parameters in a near-real-time mode.

Reply by: John Ross

You might also want to take the 5.4 tuning class; it will help you with kernel parameters and file system tuning.

Category: AOS/VS

Author: Dave Williams
Subject: **RJE80/connection establishment**

We use RJE80 to receive/transmit files to many of our customers. Currently our operators establish the connection manually by dialing the number on an exclusion key phone or on the modem itself. Are there any products that will allow us to send the dial string directly to the modem from our MV, so we can eliminate the operator involvement? Also, are there modems that support this in sync mode?

Reply by: Louis McCutchen

We've done it a couple of ways. First, the Black Box modem 208 B/D will let you dial a remote using standard BISYNC protocol. We came up with some CLI macros that send the proper dial string and process the response from the 208. Later, when we needed to use the same modem for SNA-type communications, we installed a Black Box Automatic Calling Unit (ACU-1) to do the dialing. It takes its dial string info from an RS-232 port, and sits between the modem and the ISC/2. These may not be current products, but you can call Black Box at 412/746-5500.

Author: Ellen N. Bourke
Subject: **Maximum memory**

Focus magazine, October 1992, ran an article titled, "Is your CPU cookin'?" MIPS meter tells all." They showed a chart comparing various capacities. They listed the maximum memory for my system (an MV/7800XP) as 128 MB. I had been told by many sources that we already had the maximum 14 MB, and could not contain more. Was this a misprint?

Reply by: Tom Gutnick

I wrote that article, and unfortunately, *Focus* shifted the column headings over by one column. The 128 you saw for max memory was actually the max number of async ports for the MV/7800XP; as Wally notes, the max memory is 28 MB. When the MV/7800XP was originally announced, the max memory was 14 MB (4 MB on the system board, 10 MB add-on daughter board). But a year or two later, we came out with a higher-density board. Because of the design of that system, you would have to replace your existing daughter board with the newer one—but with what it would cost, you

might find it more cost-effective to upgrade the system to an MV/9300. (Upgrade would replace the system board and memory daughter board; all peripherals would stay the same. MV/9x00 supports up to 4 daughter boards of 8 or 32 MB—max is 128 MB. Editor's note: See corrected tables below. Δ

DASH runs on an Aviiion 5200 server located at the Customer Support Center in Norcross, GA. The bulletin board is available 24 hours per day, 7 days per week, free of charge. Call 1-800-DASH-CSC (800/327-4272) for the modem rotary.

Figure 1: MV family processors

LOW-END SYSTEMS

Processor	Announced	MIPS	OA Users	DDP Ratio	dhyrystones	kWhetstones (S/P)	kWhetstones (D/P)	Max Mem (MB)	Async Ports
MV/1000DC	4/89	1.4	24		1,405	966	778	12	32
MV/14000DC	7/87	1.4	24		1,419	966	778	12	12
MV/2000DC	10/85	1.4	28		1,419	966	778	12	64
MV2500DC	7/88	2.6	47		2,567	1,646	1,279	24	64
MV/3200	7/92	3.0	30		3,054	2,316	1,845	24	40
MV/3500DC	8/90	4.6	42		4,640	4,200	2,490	64	56
MV/3600	7/92	6.2	77		6,220	5,815	3,508	64	104
MV/4000DC	2/85	1.1	12		1,130	702	546	8	32
MV/4000	11/82	1.1	12		1,130	702	546	8	64
MV/5500DC	4/90	7.2	100		7,196	4,681	2,839	32	144
MV/5600	7/91	9.6	145		9,578	6,545	4,033	128	208
MV/7800DC	10/86	1.4	31		1,379	1,127	808	14	48
MV/7800DCX	6/87	2.0	42		1,998	1,643	1,175	28	48

MID-RANGE SYSTEMS

MV/7800	6/86	1.4	31		1,379	1,127	808	14	128
MV/7800XP	6/87	2.0	42		1,998	1,643	1,175	28	128
MV/8000 II	6/83	1.8	27		1,800	1,502	1,300	12	128
MV/9300	7/91	4.9	75	52	4,861	4,640	2,372	128	624
MV/9500	4/90	7.2	123	78	7,196	4,681	2,839	128	624
MV/9600	7/91	9.6	159	107	9,578	6,545	4,033	128	624
MV/10000	3/83	3.7	80		3,725	3,212	2,694	32	192
MV/10000SX	1/85	4.2	80		4,237	4,365	3,579	32	192
MV/15000-8	1/87	2.7	59		2,661	3,057	2,634	64	432
MV/15000-10	1/87	4.4	94	73	4,401	4,567	3,964	64	432
MV/15000-20	1/87	7.3	148		7,340	7,133	5,052	64	432
MV/18000-1	10/89	4.4	90	73	4,401	2,482	1,376	64	768
MV/18000SX	10/89	4.4	94		4,401	4,567	3,964	64	768
MV/18000-2	10/89	8.8	163	123	8,802	4,840	2,683	64	768
MV/20000-1	10/85	7.3	148	100	7,340	7,133	5,052	64	1,008
MV/20000-2	10/85	14.7	212	151	14,680	13,909	9,851	64	1,008
MV/30000-1	10/90	7.2	123	70	7,196	4,681	1,453	256	2,472
MV/30000-2	10/90	14.4	220	122	14,392	9,128	2,830	256	2,472
MV/30000-3	10/90	21.6	306	165	21,588	13,575	4,210	256	2,472
MV/30000-4	10/90	28.8	392	199	28,784	18,022	5,590	256	2,472
MV/35000-1	4/92	9.6	196	111	9,578	6,545	4,033	512	2,472
MV/35000-2	4/92	19.2	363	197	19,156	13,090	8,066	512	2,472
MV/35000-3	4/92	28.7	530	277	28,734	19,635	12,099	512	2,472
MV/35000-4	4/92	38.3	706	354	38,312	26,180	16,132	512	2,472
MV/35000-5	4/92	47.9	858	415	47,890	32,725	20,165	512	2,472
MV/35000-6	4/92	57.5	1,019	476	57,468	39,270	24,198	512	2,472

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MV/40000HA-1	10/88	14.4	232	133	14,375	14,558	11,940	256	4,224
MV/40000HA-2	10/88	28.8	418	223	28,750	28,388	23,283	256	4,224
MV/40000HA-3	10/88	43.2	580	297	43,125	42,218	34,626	256	4,224
MV/40000HA-4	10/88	57.5	742	356	57,500	54,048	45,969	256	4,224
MV/60000HA-1	4/92	29.7	489	271	29,732	10,322	5,442	1,024	5,736
MV/60000HA-2	4/92	59.5	892	475	59,464	20,644	10,884	1,024	5,736
MV/60000HA-3	4/92	89.2	1,299	665	89,196	30,966	16,326	1,024	5,736
MV/60000HA-4	4/92	119	1,709	841	118,928	41,288	21,768	1,024	5,736

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Bits and bytes

Virus??



From: Olav Torvund

At one of our sites we recently discovered that some of our ICobol object programs had gotten their .DD portion increased with as much as 100 MB. And other programs again had the .PD portion increased with 400 KB. I do not know if we have a virus or if something is playing tricks on me. I would like to know if anyone else has had this happen. And does anyone know what is happening here? This site has had problems with their UPS for a while; otherwise there have been no other problems. We are running AOS/V5 7.69 with ICobol 1.53.

From: Tim Boyer

Gotta be tricks. No hacker in the world is bored enough to write a virus for AOS/V5. Seriously, I've never heard of anything like that. What did FIXUP tell you? Any file size allocation problems? What's in the files, data or just junk?

From: Olav Torvund

FIXUP left it alone. The SPACE command did not see the additional file size. However, ICobol sees it and gives me the error: "program is too large." X DISPLAY shows me nothing after having scanned the initial part, which in fact is the original program — then the scan just seems to see blank emptiness thereafter. I have now

replaced the programs with new ones, so we have no problems any more. But I do not understand how this came about.

From: Tim Boyer

Me either. I just won't believe an AOS/V5 virus that preys on ICobol object programs. I'd rather believe a hardware error. Better run diagnostics.

Δ

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Brian Johnson

Waiting for @Godot

BJ grapples with tricky system startup macros, and returns to an earlier topic: making use of memory for small to moderate size data bases. Also, a bit of grouching about software support for low-budget types.

SYNOPSIS

:WAIT_FOR_S

A while back I was installing the official release of AOS/VS 7.70 and I ran into a problem starting up the new EXEC. I kept getting a "No such cooperative" message. A little research revealed that it was caused by a CX OPERATOR ON command that I had inserted just after the WAIT_FOR_PORT @EXEC in my EXEC_UP macro. The new EXEC uses a separate process, XMNT1, to service the new MOUNTQ, and apparently it takes a while after @EXEC is created before EXEC gets around to starting up XMNT1. Until XMNT1 is successfully initialized, any attempt to issue a command associated with it just generates an error message.

Normally I would have just added a PAUSE command between the WAIT_FOR_PORT and the CX command, but I've long been annoyed by the situation with respect to how servers are started, including the PERFGS server for my own product, :PERFMGR. The PAUSE command is a tacky solution because you have to pick a worst-case pause time to accommodate slow CPUs, and that just ends up

making faster systems take an unnecessarily long time to boot. So, when I ran into this problem with EXEC, I decided to solve the problem once and for all.

:THE_WAY_WE_WERE

Historically, one of three methods is used to start servers, queues, and streams in the UP macro: start it and press on; start it and delay for some fixed amount of time; or start it and wait for some known file that the server creates to become visible.

DG's software development group has never really addressed the problem in a comprehensive fashion. Two macros to wait for a file to appear or disappear are included in :UTIL on the standard releases of both AOS/VS and AOS/VS II:

```
WAIT_FOR_PORT.CLI
WAIT_FOR_NO_PORT.CLI
```

If you use a DG networking product, then you'll find an additional two macros in the :NET:UTIL directory:

```
WAIT_FOR_NETPORT.CLI
WAIT_FOR_NO_NETPORT.CLI
```

In the old days, these two macros used to be named the same as the ones in :UTIL, but had different contents. Finally, the network group renamed them to avoid confusion. A more recent bit of strangeness is that AOS/VS 7.70 has now adopted the network versions of the macros to replace the original versions in :UTIL, but AOS/VS II 2.20 still ships the old macros. Go figure.

In all cases the macros names are misnomers; the PORT part of the name should be FILE because all the macros actually just wait for a file to be created or deleted.

There are several problems with the WAIT_FOR+ macros as currently supplied. First I'll identify them. Then we'll see if we can't solve them.

The first problem is premature sensing. Unfortunately, simply waiting for an IPC port file to appear is not an accurate indicator of when the owner process is done with its initialization (as I saw with EXEC and XMNT1). Some servers create their IPC port files quite early in their initialization phase; others do it a lot later. EXEC is a good example. It creates the IPC port file @EXEC quite early and it's usually a few more seconds before EXEC sends its "initialized" message. If you try to send commands to EXEC cooperative processes (XMNT1, XBAT1, XLPT1,...) after the IPC port is created but before EXEC has finished initializing, you'll get a "No such cooperative" error message from EXEC.

The second problem is the lack of a timeout facility to allow the UP macros to proceed in the event that the server

doesn't come up for some reason (that's why the NET and INFOS groups created their own macros). I've seen many cases where a system stalled coming up because some server was unable to start.

The last problem is a minor one, but all the macros test for the existence of [!FILENAME path] instead of [!PATH-NAME path]. Usually the path is @something, so there's no real harm, but if the macro is used to sense a file that may be somewhere else due to intervening links, then !FILENAME will fail to find it.

:THE_WAY_THINGS_ARE

A good solution is to wait for a particular process to be created, and then wait for it to become idle. The NO version simply waits for the process name to disappear. Finally, I've occasionally found a use for a utility to wait until a particular file is closed (:UDD:user-name:WP.TXT is a favorite one), so I can then perform some further process-

ing on it. Plus, since this last utility also waits for the file to appear before waiting for it to close, it can be used as a substitute for DG's WAIT_FOR_PORT.CLI.

Luckily, these are all relatively simple utilities to write. The C source code is shown in Figures 1, 2, and 3.

For those of you without C compilers, the source and .PR files are available on the :SYSMGR BBS. Or you can transcribe them into the language of your choice. However, for you C programmers out there please note that these sources were coded as a model for transcribers, so they use "sys_gtmes()" instead of C's built-in "argc/argv[]" variables. Also, the sources assume ANSI C and use BJ Inc.'s ANSI and AOS/VS system call ".h" files. So if you want to compile using vanilla DG C, you'll have to substitute the non-ANSI DG C ".h" files and the much larger DG C system call ".h" files. Finally, please excuse the comment-less coding style; space is at a premium here. The ver-

sions on the BBS are fully commented.

A few implementation details are worth noting, so here they are.

Be sure to link the programs with /PID_SIZE=ANYPID if your system uses the high PID option (PIDs greater than 255).

All the utilities share some operational aspects in common. The default timeout value is 60 seconds and they report what they're waiting for every 5 seconds. They return normally (i.e., XEQ/S will return a NULL string) if things went as expected; otherwise they return the string "**Warning*" and an error code that's as appropriate as possible. If no arguments are supplied, they output a usage hint and return "**Warning*" with the unpublished CLI error code ZEWNA (Wrong Number of Arguments).

In the case of WAIT_FOR_IDLE, the definition of what constitutes "idle" is open to debate. I chose to define it as when the process used less than one percent of the CPU (10 ms.) during the

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Figure 1: WAIT_FOR_IDLE.C

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

#include "sys_ercli.h" /* ZEIDN=01030 & ZEWNA=01032 */
#include "sys_gtmes.h"
#include "sys_runtm.h"
#include "sys_wdelay.h"

const char help[] =
    "Usage: WAIT_FOR_IDLE process-name [timeout]\n";
const char wait[] = "Waiting for %s.\n";
int      argl,argv,cpums,ier,oldms=0,rival=5,toval=60;
char     pname[$$MXPN];
P_GTMES gtmes_pkt_1={$GARG,1,-1,pname};
P_GTMES gtmes_pkt_2={$GARG,2,-1,-1};
P_RUNTM runtm_pkt;

main(void) {
    if (sys_gtmes(&gtmes_pkt_1,&argl,&argv)) {
        fprintf(stderr,help);
        exit(ZEWNA);
    }

    ier = sys_gtmes(&gtmes_pkt_2,&argl,&argv);
    if (ier == 0) {
        if (argv == -1) exit(ZEIDN);
        toval = argv;
    }

    do {
        ier = sys_runtm(pname,-1,&runtm_pkt);
        if (ier == 0) {
            cpums = runtm_pkt.grch - oldms;
            if (cpums < 10) exit(EXIT_SUCCESS);
            oldms = runtm_pkt.grch;
        }
        if (rival == 0) {
            printf(wait,pname);
            rival = 5;
        }
        sys_wdelay(1000);
    } while (--toval);

    exit(ier);
}
```

Figure 3: WAIT_FOR_CLOSED.C

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

#include "sys_ercli.h" /* ZEIDN=01030 & ZEWNA=01032 */
#include "sys_ersys.h"
#include "sys_fstat.h"
#include "sys_gtmes.h"
#include "sys_wdelay.h"

const char help[] =
    "Usage: WAIT_FOR_CLOSE path [seconds]\n";
const char wait[] = "Waiting for %s.\n";
int      argl,argv,ier,opened=0,rival=5,toval=60,twice;
char     path[$$MXPL];
P_FSTAT fstat_pkt;
P_GTMES gtmes_pkt_1={$GARG,1,-1,path};
P_GTMES gtmes_pkt_2={$GARG,2,-1,-1};

main(void) {
    if (sys_gtmes(&gtmes_pkt_1,&argl,&argv)) {
        fprintf(stderr,help);
        exit(ZEWNA);
    }

    ier = sys_gtmes(&gtmes_pkt_2,&argl,&argv);
    if (ier == 0) {
        if (argv == -1) exit(ZEIDN);
        toval = argv;
    }

    do {
        ier = sys_fstat(path,0,&fstat_pkt);
        if (ier == 0) {
            if (fstat_pkt.sopn == 0 && twice++) {
                exit(EXIT_SUCCESS);
            }
        }
        if (rival == 0) {
            printf(wait,path);
            rival = 5;
        }
        sys_wdelay(1000);
    } while (--toval);

    exit(EREO1);
}
```

Figure 2: WAIT_FOR_TERM.C

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

#include "sys_ercli.h" /* ZEIDN=01030 & ZEWNA=01032 */
#include "sys_ersys.h"
#include "sys_gtmes.h"
#include "sys_runtm.h"
#include "sys_wdelay.h"

const char help[] =
    "Usage: WAIT_FOR_TERM process-name [timeout]\n";
const char wait[] = "Waiting for %s to die.\n";
int      argl,argv,ier,rival=5,toval=60;
char     pname[$$MXPL];
P_GTMES gtmes_pkt_1={$GARG,1,-1,pname};
P_GTMES gtmes_pkt_2={$GARG,2,-1,-1};
P_RUNTM runtm_pkt;

main(void) {
    if (sys_gtmes(&gtmes_pkt_1,&argl,&argv)) {
        fprintf(stderr,help);
        exit(ZEWNA);
    }

    ier = sys_gtmes(&gtmes_pkt_2,&argl,&argv);
    if (ier == 0) {
        if (argv == -1) exit(ZEIDN);
        toval = argv;
    }

    do {
        ier = sys_runtm(pname,-1,&runtm_pkt);
        if (ier == ERPRH) exit(EXIT_SUCCESS);
        if (rival == 0) {
            printf(wait,pname);
            rival = 5;
        }
        sys_wdelay(1000);
    } while (--toval);

    exit(ERPNU);
}
```


previous second. It was tempting to make it zero percent because then it would be independent of the processor speed. But I know that there are some DG and third-party servers out there that "tick over" while idle, so I chickened out.

In the case of `WAIT_FOR_CLOSED` I wait for the file to be closed twice in a row in order to protect against the file

being created before being opened. I don't wait to catch it between the create and the open and erroneously deduce that it had already been opened and closed.

`:MY_SYSTEM`

Here's a list of the things I changed in my system startup macros.

I changed the `WAIT_FOR_PORT`

`@EXEC` in `UP_EXEC.CLI` to `WAIT_FOR_IDLE OP:MNT1`. After `EXEC` is done initializing, it immediately starts `XBAT1` and `XMNT1`, in that order. But on older revs you should just wait for `EXEC` itself to become idle.

DG's `INFOS_UP.CLI` checks for `@INFOS` every 5 seconds and aborts after 60 seconds. I don't use DG's macro at all: I created an `INFOS_UP.CLI` that just `PROCS` up `INFOS`, and then does a `WAIT_FOR_IDLE OP:INFOS_II`. In my Wordperfect 4.2 `UPWPEXC.CLI`, I replaced the `PAUSE 3` with `WAIT_FOR_IDLE OP:WPEXC`.

Here's a tricky one. In my print queue startup macros I use `WAIT_FOR_IDLE OP:EXEC`. I don't wait for `OP:XLPT1` because it might have been started already. And it might be busy printing something on the previously started queue, so I wouldn't see it go idle until it was done printing.

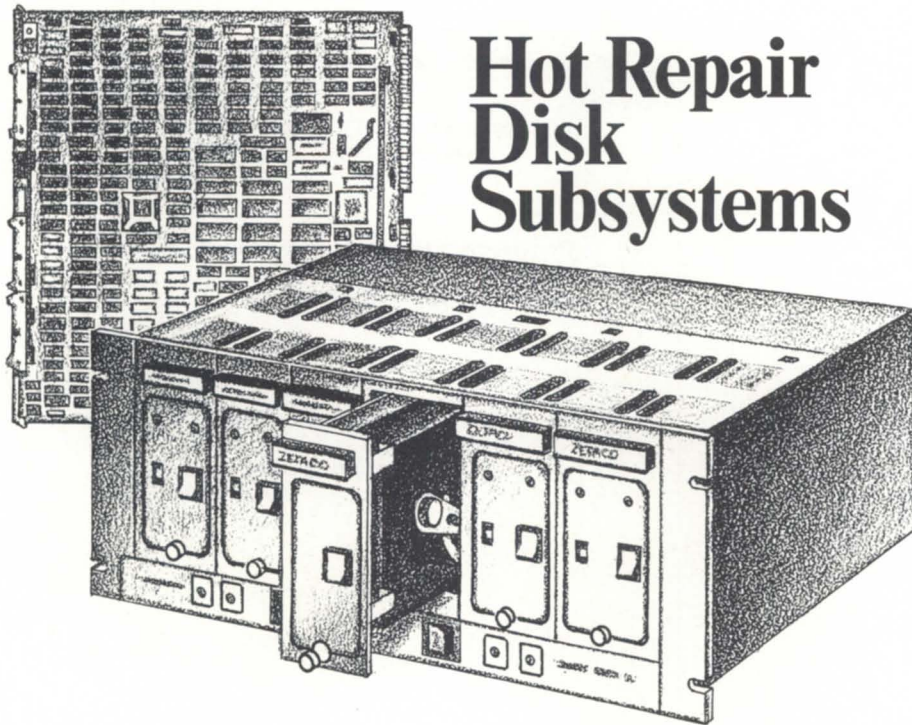
In the case of the network startup macros there are too many combinations to cite here (e.g., `XTS` v.s. `XTS II`), but in general you just want to wait for `OP:NETOP`, `OP:XTS`, `OP:FTP`, or whatever to become idle. The only exception is the `WAIT_FOR_PORT @VCONx`, which should be changed to `WAIT_FOR_CLOSED @VCONx`.

Modifying the `DOWN` macros is much easier; just wait for the respective server processes to disappear using `WAIT_FOR_TERM`.

Okay, you get the idea.

`:P.S.:MEMORY_DATABASES`

A couple of months back I wrote about how it makes more sense in these times of large memory systems to design batch jobs and certain other utilities to make use of memory instead of disk for any small to moderate size data bases. However, I neglected to mention a couple of DG software products that would really gain some speed by taking advantage of this scheme. The most obvious ones are standalone `FIXUP` and the `Disk Polisher` part of `DJ`. Both of these utilities are notoriously slow and incredibly disk intensive, with a high disk re-read/re-write frequency. It would be relatively easy to add an LRU disk block cache, if one is not already present in the current design, and just use all of the available memory for the



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cache. The more memory that's available, the faster the utility would run. In fact, I'm gonna stick my neck out a bit here and challenge DG to give me a copy of the current sources for stand-alone FIXUP (yes, I'll sign whatever), and I'll volunteer to add the new logic just for demonstration purposes.

Even in the stand-among environment there are some potential candidates for mega-memory cache schemes. There are a couple of utilities that are, by nature, often run when the system is relatively idle. Stand-among FIXUP and DJ/Disk Polisher are frequently used on weekends when the timesharing environment is down or minimized. But what about DUMP_II and LOAD_II? Often the system backup/restore takes place at night or on weekends when the system is nearly down. And how about IVERIFY and ISAMVERIFY? They're usually being run prior to bringing the users back up. And while we're at it, how about a version of SORT that's linked for 512 MB instead of the puny 8 MB optional version that's provided now?

One problem with the stand-among programs using all of memory some of the time is how they determine how much memory can safely be used without driving the system into a paging or swapping situation. One way would be to provide a /MEM= switch. But it would also be nice to have a way to ask the operating system how much memory is actually available, so that a sanity check could be performed on the user's /MEM= value. Unfortunately, the only nonprivileged system call that returns information about the total amount of physical memory available to a process is ?GMEM, and the value it gives is nearly useless. ?GMEM returns the amount of memory that would be available if all other swappable processes were swapped out. Thanks a lot. Sure would be nice to have an enhancement to ?GMEM that also returns the current Free and Shared LRU sizes and memory contention state number (hint).

:SOFTWARE_SUPPORT

As long as I mentioned DG C earlier, I'd like to grouse a bit about the software support situation for low-budget types like myself and a lot of my customers.

DG C 4.20 was shipped in an obviously broken state. There couldn't have been any final QA on it; it would compile "hello.c," but wouldn't link it, or any other C program, due to a missing "&" in CCL.CLI. Even after fixing that, I ran into several obvious library bugs within minutes afterward (%p doesn't work and realloc(NULL,n) traps.

At about the same time, I started running into some subtle problems with AOS/VS 7.70, which I had received patches for when I was a beta test site. But apparently neither the fixes nor patches made it onto the official release.

So, being just a lowly SSS customer, what was I to do? Well, it appears I'm stuck. I can't get the patches from good old 1-800-DASH-CSC because I don't have a support contract. I tried the old OIS, but Compuserve says that my ID is no longer valid. Of course I could always submit an STR and hope they saw fit to either send me the patches or replacement modules. But experience has shown that although it takes only a week or two to get an STR acknowledgement, it takes months to get an actual STR response that might include a patch.

I'm sure that the policy of limiting patch and replacement module access to support customers has caused a few people to get support contracts who normally wouldn't, but I gotta wonder how much extra STR processing workload and ill will would be avoided by just making the patches and replacement modules available to all on the BBS? Oh well, I guess I'll just spend the rest of today submitting a pile of STRs and hope for the best.

:HVD

Me a romantic? NOT! Δ

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Designing relationally

SYNOPSIS

This article's purpose is to provide the nonrelational data base designer or programmer with some understanding of the principles used when designing relational data bases, and how to apply these principles to nonrelational data base design.

by Bob Howell
Special to Focus

For those of us who use Infos or ICobol, the terminology and design of relational data bases may often seem confusing. In addition, we can become envious of the many features of relational data bases that ensure data integrity and provide for automatic recovery in the event of system failure. This month we will deal with relational data base principles and general design philosophy. Next time we will get into details of designing a data base at the nuts-and-bolts level, including entity-relationship models, first through fifth normal form, and the benefits of intentional denormalization.

First of all, let me define a relational data base. Keep in mind that this is *my* definition, not Webster's. There are many data base products on the market that claim to be relational, but really are not.

A relational data base system *automatically* relates entities (files or tables) to one another through a predefined system of rules. Most true relational data bases will at the very least relate tables by column- or field-name matching. Note that the word "automatically" is emphasized. This is to distinguish true relational data bases from those

that merely allow the programmer to define relationships at runtime.

There is no magic to a relational data base. All of the elements of a standard keyed data base system, such as Infos, are there. They are merely called different things. Before I proceed further, let's define some terms:

Table. Relational terminology for a file. In Infos or ICobol they are stored on disk as index and data base files. In some relational data bases, tables are stored as separate disk files; in others they are logical entities within a complex file system that has no direct relationship to physical disk files.

Row. Relational terminology for a record within a file. A table consists of one or many rows. In a table of names and addresses, each row would contain one name and address.

Column. A column corresponds to a field within a record. In the above example, one column would contain the person's name, the next column the street address, next the city, state, and zip code.

Index. A data structure that accelerates queries by enabling the system to find records without scanning an entire table. Indices are not required in a relational data base as they are with Infos. In addition, indices are used more to

enable the system to link related tables quickly than they are to identify unique records, as with Infos. As with Infos or ICobol, indices are implemented as B-Tree structures, but they usually are not stored as separate disk files. The data base software may create indices on its own if it determines this to be the fastest way to execute a query. Sometimes it is better to omit an index on small row count tables because the overhead of maintaining an index costs more in performance than simply searching the table sequentially each time you need to locate a row. Indeed, if the data base has a good caching scheme, the entire table might be in memory, and then the search is synonymous to scanning an array. Indices can usually be added or dropped at the administrator's discretion without rebuilding the entire data base, as with Infos or ICobol.

Relationship. How tables or files are logically associated with each other. In the real world, an order has two parts. At the top is customer information such as billing and shipping address and payment terms. On the bottom is the body of the order consisting of a list of items ordered. In data base terminology this would be a one-(the order heading) to-many (the order line items) relationship. Other relationships are one-to-one, many-to-one, and many-to-many. Many-to-one is simply the inverse of the above example. From the line item's point of view, there are many line items to one order. Many-to-many occurs in the case of the inventory items represented on the order. Each inventory item can appear on many orders, and each order can contain many different inventory items.

Referential integrity. This term describes perhaps the most beneficial aspect of a relational data base. Virtually all state-of-the-art true relational data bases support this to some degree. Stated simply, it means that relationships in the data base remain intact. In the earlier example order, it means that if you attempt to delete an inventory item record (or row), and that row is referenced by a line item in an order somewhere in the data base, the system will not allow you to delete that inventory item. You do not have to write a line of program code for this. The data base

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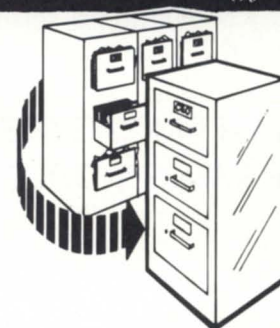


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simply returns an error code to the caller, reporting that referential integrity would be violated by the delete request. The request is aborted.

Think of it: no more "orphaned" line items left on the order file without headers; no more "cleanup" programs that run all night. Sounds great, right? Well maybe, but as you may have guessed, you take a sizeable performance hit for all this behind-the-scenes checking and cross-referencing. But Aviiions can run circles around your old MV anyway, right? Right, and I have a bridge in Brooklyn that's just aching for a buyer like you. There are genuine benefits to be gained by using such a data base. Meanwhile, performance issues have improved and will continue to do so as the technology gets more refined.

SQL. Depending on your point of view, this could mean "Strange, Questionable, and Ludicrous," or "Structured Query Language." I remember a long time ago in a decade far, far away,

No one piece of information exists in a data vacuum. A single piece of information may provide some knowledge, but it really doesn't tell you much by itself.

there was a folk singer named Bob Dylan. People said you either loved him or hated him; there was no middle of the road. The same holds true for SQL. I won't attempt to persuade you,

but I will attempt to define SQL. It is *not* a data base. It is a data base access language.

Specifically, SQL is an ANSI standard for a data base access language. It contains commands for querying, updating, and defining data bases. In its ideal world, you should be able to access any supported data base with it. Indeed, many data bases support it to one degree or another. Some of these are Oracle, DG/SQL, Ingres, Informix, Sybase, SQL Server, DB2, RDB, Dbase IV, R:Base, Foxpro. Also Infos.

NOT! Sorry, Infos does not support SQL. Actually, once mastered, SQL is a powerful data base language. It cannot stand alone, however. It requires another "host language." This can be Cobol, C, or a number of 4GLs. Many SQL-supported data bases also have their own 4GLs, and all of them come with some form of command-line SQL processor.

The goals of relational data bases are really what we are all aiming for in



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data base design, even when using non-relational technology such as Infos. A well-designed data base application should: 1) logically group related information; 2) provide well-defined access paths from one related file to another; and 3) ensure that people cannot logically corrupt the relationships in the data base.

I believe that in reality, *all* data bases are relational. This is because all real-life information is relational. No one piece of information exists in a data vacuum. A single piece of information may provide some knowledge, but it really doesn't tell you much by itself.

Take meteorology for example. One piece of information is precipitation. By itself it is a true-false entity. Either it is precipitating or it isn't. To get a weather forecast, we cannot look only at precipitation, but also at its type (rain, drizzle, snow, sleet, freezing rain, hail). We must also consider its rate (light, moderate, heavy). Other indirectly related factors must be considered: temperature, dewpoint, barometric pressure, wind direction, and speed. This is real-world data, and it's relational.

Infos data base design

Infos gives us the ability to group data logically into records. It also provides the rudimentary elements of providing access paths between related files. Infos does this through a very flexible indexing system. The third aspect of ensuring referential integrity is not provided by Infos. This you the programmer must do by yourself. This is often the most neglected part of data base application design because it requires great discipline on the part of the designer and programmer.

It also involves the end user of the application because it is the user's business rules that usually determine what relates to what, and how tightly referential constraints are applied. If you are still programming in Cobol (VS or I) or another 3GL, then you must code all referential constraints manually in each program. There are some very good 4GL tools and programming languages on the market for AOV/VS that make this easier. I happen to use CQCS by Cyberscience, Inc. With CQCS, I have a relational "view" of my Infos data

bases. It has a data dictionary that defines the relationships between files. (A data dictionary is simply a data base that contains descriptions of other data bases.) Once defined, all I need to do is reference related data in a program, and CQCS "sees" the relationship and knows how to collect data from various files and present them as if they were all in one place.

Whether you use a 3GL or 4GL, after identifying the information to be stored, the most important aspect of data base application design is defining rules. I cannot emphasize this more—*get the end user involved*. As programmers and designers, we sometimes make assumptions about how the user does business that turn out to be completely invalid. It is easier to design an

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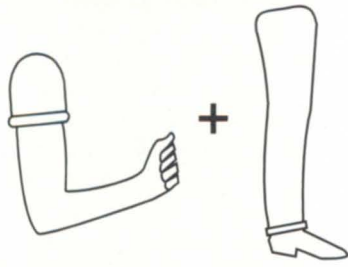
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DATA BASE DESIGN

application correctly from the start than it is to retrofit a poorly or incorrectly designed application.

Let me point out that there is a balance here. I am a strong proponent of the design method called *prototyping*. I start with a limited and simple set of rules that I obtain from the user, and then I build a bare-bones application, while allowing in my design for enhancements later. I give the user a usable application that accomplishes the stated mission. I then add bells and whistles at the user's request.

There seems to be two extremes in data base design philosophy. On the one hand, there are those who "overdesign" projects. They attempt to define every rule, condition, possibility, and remote exception before they allow one line of code to be written. Their reasoning is that they want to write the application once and not rewrite it hundreds of times to accommodate unforeseen rules. However, by the time they finally get some executable code ready, the rules have already changed and they have to redo the programs anyway.

On the other hand, there are those who just start up the editor and code without thinking. Then when they present their masterpiece, the user says, "It's just what I asked for, but not what I want," or worse, "Where do I enter the framis distance to the end of the dustum?"

"What's a dustum?" you ask, realizing with horror that you never asked what the user really wants to use the application for. Now you have to start from scratch because you never allowed for that in the data base. I follow these basic design rules: 1) Define the purpose or mission of the application; 2) Build a usable prototype and let the user try it out; 3) Use the user's input to refine the design; 4) Repeat step 3 until the application stabilizes; this should take no more than three iterations; and 5) Realize that no application is ever really "finished." This is because businesses are constantly changing; therefore your application must be able to change with it if it is to remain in use.

Begin by asking, "What is the minimum that you want this program to do and still be usable?"

"I want to record orders and then print packing lists."

While this seems simple, lots of information can be extrapolated from this statement. Keep in mind that end users are prone to oversimplifying what they do. It is your job to pull the details and exceptions out of them. From this you can assume that if there are orders, there must be customers. Voilá! You need a customer data base. There also must be things to order—an inventory data base. If the customer needs packing lists, he must have something to pack, so it is unlikely that his product is an intangible, such as labor. But you will want to ask, "Is that all your customers order? Do they ever order services?"

This will affect how you design your inventory data base. In addition to "hard" items, you may want provide for time and labor items as well. Does he want to print invoices after the orders have been packed? Now you have to write a billing system as well. This may be too complex to accomplish initially, so you may want to ask, "Can I give you the order entry portion first, and then add the billing portion at a later date?"

So far, we have discussed the properties of a true relational data base. We have also discussed some generic data base design principles that can be applied to any data base design, relational or otherwise. Next time we will tie all of this together by discussing normal forms, a fixed set of rules used to design an ideal data base, and intentional denormalization, the process by which we deliberately break the rules in order to achieve a goal peculiar to our system, such as improved performance. We will also use the design techniques discussed to design a "relational" Infos data base using a simple entity-relationship diagram. Δ

Bob Howell is senior programmer analyst with the Medical Society of the State of New York. He has been involved in data base design and programming on Data General AOS/VS Infos systems for more than eight years. Prior to this he has worked with ICobol and ICOS. His relational data base experience has been with DG/SQL, and R:Base and Foxpro on PCs.

The heart of the GUI

SYNOPSIS

Second of two parts (part 1 appeared in November 1992)—the author continues a demonstration of helpful X-Windows utilities.

by Pete Szaban
Special to Focus

Printing a window

There are two X clients commonly involved in making window image dumps for a printer. The *xwd* client copies the contents of a window to a disk file, and the *xpr* client converts the *xwd* output to a form that can be processed by a supported printer. To make a printout using these clients, you will need access to one of the supported printers listed in Figure 1.

To produce a file suitable for printing, a shell command of the following form can be used: *xwd | xpr -device yy > xxx*

Reading left-to-right, the *xwd* client is invoked to read a window image. The vertical bar (a Unix pipe) tells *xwd* to send its output to the *xpr* program. The *-device* command-line option tells *xpr* to format its output for printer *yy* (where *yy* is one of the printer codes from Figure 1). The greater-than sign tells *xpr* to send its output into the file named *xxx*.

The shell command *xwd | xpr -device ps > /tmp/win.prt* produces a file suitable for printing to a postscript (ps) printer. The name of this file is */tmp/win.prt*. I prefer putting print files in the */tmp* directory so I don't have to worry about cleaning up scratch files left around the system. Try entering the shell command, substituting an available printer device. When the *xwd* client starts, it changes the pointer into a crosshair. Position the crosshair inside the window to be printed, and click mouse button one. To print the entire screen, click the mouse button in the background (root) window. The workstation will beep once when it starts, and then twice after the dump completes. The result will be a binary file ready to go to the printer. Files produced by these clients can become quite large. This implies disk space, printing time, and internal printer memory considerations. Print files generated by *xpr* usually contain binary information. This means the Unix print command *lp* may not be able to handle the file properly. Also, sending one of these files to the printer may leave the printer in an unusual state, causing later print jobs to fail. If you share a printer, you may want to coordinate its use.

The *xcalc* client and command-line options

Most Unix programs accept command-line options that modify their behavior. X client programs are no exception. The *xcalc* client displays a simple calculator. Enter the two following shell window commands:

```
xcalc &  
xcalc -rpn &
```

(Note: try *-analog* on older versions of X instead of *-rpn*)

Figure 1: Supported *xpr* printer devices and their corresponding command-line options

Printer Model	Command Line Option
HP LaserJet	-device ljet
LN03	-device ln03
LA100	-device la100
HP PaintJet	-device pjet
PaintJet XL	-device pjetxl
any Postscript	-device ps

Note: Use *xman* to view the man page or *xpr* for more information.

Two calculator windows will appear. Both windows are produced by the *xcalc* program. The first shell command started a Texas Instruments-style pocket calculator, while the addition of the *-rpn* command-line option resulted in the display of a Hewlett-Packard-style calculator (*-analog* produces a slide rule). Try focusing on each of the *xcalc* windows. Click mouse button 1 over the button widgets. Notice that data can also be entered from the keyboard. The *xcalc* client sometimes is convenient for doing a few quick computations. Use *xman* to find out more about *xcalc*.

The point is to demonstrate the effect of using command-line options, in this case the *-rpn* switch (you may want to try the *-digital* switch with the *xclock* client). Most clients have a private set of command-line options they understand. Fortunately, there is also a set of command-line options that are common to most X clients. Figure 2 lists the unabbreviated versions of several standard command-line options. Terminate the two incarnations of *xcalc* using the *xkill* client, or by clicking mouse button 3 on the "AC" or "ON" key.

The *xterm* client

The *xterm* client demonstrates a few command-line options. The *xterm* client is probably what you have been using to enter shell commands. As its name implies, *xterm* opens an X-terminal window. The *xterm* window emulates a monochrome Tektronix graphics terminal and a Digital Equipment VT102 terminal (see the man page for *xterm*). Those with Avion workstations that also run AOS/VS might be interested to know that newer DG/UX versions come with an X client named *mterm*. It is similar to *xterm*, but can also emulate a Data General terminal. To start an *xterm* client, enter the following shell command: *xterm -title MyShell -e /bin/csh &*

If the window manager and server are capable of displaying window titles, a new window will appear with the title of "MyShell." The new shell window runs the program *csht*. Note that the *-e* command-line option is private to the *xterm* client. Any program name placed after the *-e* is run "captive" (when the program ends, the window goes away).

The wide range of X-supported hardware is partly what makes X so appealing. The X server and window manager do their best to accommodate client program requests, but there is no guarantee things will appear as requested. If a title can't be displayed, for example, its command-line option will be ignored. A prime example of this is a request for color on a monochrome screen. This same factor makes it important to design X clients with care. An X client should not rely on color because it may one day be run on a monochrome display.

Exit *csht* and kill the new *xterm* window by entering a *CONTROL-D* at the keyboard (Hold down the "CTRL" key and type the "D" key). If *CONTROL-D* does not work, you can always remove the *xterm* window with *xkill*.

Geometry specifications: size and position

Geometry specification is performed on the command line with the "-geometry" switch, followed by what X refers to as a "standard geometry string." The standard geometry string specifies the size and position of the client window. It consists of four integers. The first two numbers specify window size,

Figure 2: Unabbreviated list of selected command-line options common to most X clients using the Xt toolkit

Name	Function	Example
-background	set background color	-background blue
-bordercolor	set border color	border yellow
-display	select root window/server	-display blitzon:0.0
-font	set text font	-font *charter*—17*
-foreground	set foreground color	-foreground black
-geometry	set size & location	-geometry 100x100+0+0
-iconic	start as an icon	-iconic
-name	set name of client	-name d2xx
-reverse	swap fore/background color	-reverse
-title	set window title	-title MyShell

separated by an *x*. The last two numbers specify the window position on the screen, and are preceded by plus or minus signs. The command-line option "-geometry 80x24+100+200" specifies a client window 80 units wide (X axis), 24 units tall (Y axis), and with its upper-left corner located 100 pixels to the right and 200 pixels down from the upper-left corner of the display. The plus sign preceding the 100 specifies distance between the left edge of the client window and the left edge of the background (root) window. A minus sign specifies the dis-

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tance between the right edge of the client window and the right edge of the root window. Similarly, a plus sign preceding the 200 specifies the distance between the top edge of the window and the top edge of the root window. If a minus sign, it specifies the distance between the bottom of the client window and the bottom of the root window.

Some clients (like *xterm*) interpret window-size dimensions in characters. Other clients (like *xclock*) interpret window size in units of pixels. Pixels are the smallest addressable dots (picture elements) on the display. Run the *xdpyinfo* client from a shell window to get information from a server about the display. Enter the command as follows: *xdpyinfo*

The "dimensions:" field will show the size of the display in pixels; "resolution:" will show the number of dots per inch in the horizontal, and vertical directions; and the "default number of colormap cells:" field will show the number of colors available.

Font specifications

Note that the command-line option "-geometry 80x24-0-0" will not mean the same thing to different clients. The *xclock* client interprets this as a window 80 pixels wide by 24 pixels tall, with the lower-right corner at the lower-right screen corner, while the *xterm* client would interpret this as a window 80 characters wide by 24 lines tall, with the lower-right corner at the lower-right screen corner.

Figure 3: Components of a font name

fdy	fam-wt-slt-swd—pix-pts-dpx-dpy-sp-avx-cst
fdy	Foundry: bitstream, adobe, dec
fam	The font: family charter, courier, helvetica, new century, school book, symbol, times
wt	Weight: medium, bold
slt	Slant: Italic(i), Oblique(o), Roman(r), Upright(u)
swd	Set Width: condensed, double width, narrow, normal
pix	height in pixels at proper resolution
pts	height in 720th's of an inch at proper resolution
dpx	horizontal resolution in dots per inch
dpy	vertical resolution in dots per inch
sp	Spacing: Monospace(m), Proportionate(p)
avx	average char width in tenths of a pixel
cst	Character Set: fontspecific, iso8859-1

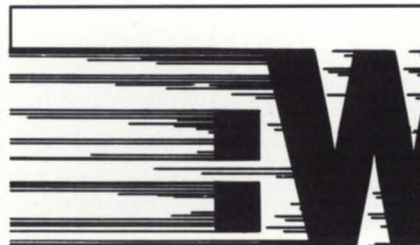
The actual size of the *xterm* window in pixels will depend upon the font. X includes several fonts of various styles and sizes. The X client named *xlsfonts* lists the names of available fonts, and the client *xfd* displays a particular font. Enter the following shell command to generate a list of available fonts:

```
xlsfonts
```

Font specification under X consists of long strings built by joining font description components with hyphens. Fortunately,

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ly, asterisks can serve as wildcard characters, making it unnecessary to type the entire font name. Figure 3 gives an overview of X font name components. View a Helvetica medium 18-pixel font by entering the following *xfd* client shell command:

```
xfd -font '*-helvetica*—18-*
```

Notice that the font name must be enclosed in single quotes when asterisks are present, so that the shell will pass the font name to *xfd*. If more than one font matches the wildcard specification, the X server is at liberty to choose any one of the matching fonts.

Terminate the *xfd* client by moving the pointer inside the *xfd* client window, and pressing the "Q" key. For a demonstration of font specification to a client, type the following shell command to start an *xterm* window using this font:

```
xterm -font '*-helvetica*—18-*' -e /bin/csh &
```

Display specification

The distinct client/server program model gives X one of its most powerful capabilities. As mentioned above, X has client programs that communicate with server programs. There is no rule that the client and server must be on the same workstation. A client program running anywhere in the network can pass requests to a server running anywhere in the network. For example, if a user account named "jdoe" does a

login to a networked workstation named "av10" (the local workstation), the *xload* client could be started on the remote workstation named *av32* located next-door. The *xload* client running on *av32* would be instructed (using the *-display* command-line option) to open its window on *av10*. The result is the *xload* client will display its graph of the system load at *av32* on the monitor of *av10*.

To start *xload* in the example above, the shell command *xload -display av10:0.0 &* was passed to a shell program running on *av32*. The display command-line option instructs the *xload* client running on *av32* to connect to the first screen of the first X server on the networked device named *av10*. In general, the server specification format is *host:server.screen*. The argument to the display option consists of a colon terminated network device name, followed by two integers separated by a period. The first integer identifies which X server to communicate with.

Usually, there is only one server running on each host; the first one is number 0, the second is number 1, etc. The second integer specifies which screen to use (the *xdpinfo* command can be used to list available screens and the characteristics of each). Machines supporting multiple screens primarily use the screen number to identify different video modes, resolutions, or number of colors. The first screen is number 0, the second screen is number 1, etc. Screen 0 is usually a safe bet as

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all X servers support screen 0.

Before a user can start an X client on a remote workstation, several things must be in place. Readers with only one X workstation will not be able to perform the following exercise, as it requires two TCP/IP networked X workstations, and a username/password pair (might not be the same on both machines) to log into each one. The network must be up, the X server must be running on the local workstation, and the network name of the remote machine must be known.

Start *xload* on the remote TCP/IP networked device named REMACH as follows (substitute the actual names of your local and remote workstation in place of LOMACH and REMACH respectively). Assuming the reader has already done a login to LOMACH, and is in the X environment:

- Grant REMACH access to the local X server using the *xhost* client; use the following shell command: *xhost +REMACH*
- Do a remote login to REMACH by entering the following shell command on the local machine (be sure to enter the username/password pair for REMACH in place of *jdoe*); note that a password may not be requested, based upon the network configuration

(Note: If *remsh* does not work, try *rsh* instead. Under DG/UX, the name of this utility is a system configuration option. You can also use *rlogin*, or *telnet* in place of *remsh*.)

```
remsh REMACH -l jdoe
Password:
```

- Enter the following shell command (in the same window *rlogin* was run from) to start *xload* on the local workstation:
/bin/X11/xload -display LOMACH:0.0 &
- In a few seconds, an *xload* client should start. You can now do a logout from REMACH. To do this, you may need to enter a CONTROL-D, or a logout command in the window running *rsh*
- Disallow further access to the X server at LOMACH using the following shell command: *xhost -REMACH*

Several things happened in the preceding exercise. The *xhost* command instructed the server on LOMACH to service X requests from absolutely any client on REMACH (Warning: anyone starting X clients on REMACH also has permission to also make X requests). A network login to REMACH was then done. The *xload* client was then started on the remote machine, and instructed to open its window on LOMACH. After doing a logout from REMACH, The *xhost* client was invoked again to instruct the X server on LOMACH not to service future connect requests from REMACH. For more information, see the manual pages.

This article has covered a broad range of topics without going into much depth. I encourage readers to build on the material presented by experimenting with X, and reading the online man files. Δ

Pete Szaban is a technical programmer at Western New England College in Springfield, Massachusetts. He may be reached at 413/782-1239.

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Westboro—Comprehensive electronic mail has come to Data General's AV Office product suite. DG introduced AV Office Mail, bringing integrated electronic mail and time management to Wordperfect users by using Wordperfect for all messaging document creation.

AV Office Mail can support as many as 500 users on a single Unix system, and provides flexible e-mail and time management functions. The system can be used as a standalone communications tool or integrated within a

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AV Office Mail is fully interoperable with Data General's AV OIS, and runs on Aviiion systems. When using DG's CEO Mail Gateway, AV Office Mail users can also communicate with CEO users on an Eclipse MV family system. Pricing ranges from \$225 for a single user to \$150 per user for more than 50 users.

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**Smarterm 470
for Windows**



Kansas City, MO—At NADGUG 92 Persoft, Inc., announced Smarterm 470 for Windows, a new product in the company's line of terminal emulation software. Smarterm 470 for Windows will allow PCs running Windows to emulate Data General's Dasher series of text and graphics terminals to connect to MV and Aviiion hosts.

Smarterm 470 for Windows will combine advanced network features, precise emulation, and east-of-use features for MS-DOS with the graphical interface of Microsoft Windows.

Smarterm 470 for Windows will emulate DG's D470 color graphics terminal, as well as a wide range of Dasher text terminals. Expansive network support will include NDIS, ODI, and token ring drivers, as well as an implementation of Telnet for connections to Unix hosts.

Like its DOS counterpart, Smarterm 470 for Windows will support virtually all ethernet cards and all popular local area networks (LANs). It will also include features such as graphical keyboard remapping, user-definable button palettes, and a customizable online help system.

Persoft, Inc., 465 Science Drive, P.O. Box 44953, Madison, WI 53744-4953; 608/273-6000.

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**Disk subsystem
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Minneapolis, MN—Zetaco, Inc., announced a new rackmount disk enclosure, designed to hold six 3.5-inch disk drives with the fast-SCSI-2 interface, totaling 6 GB of data storage for an MV minicomputer. The enclosure allows a user to remove a failed drive and install a replacement ("hot swap") without powering off the computer or the enclosure.

Zetaco combines its SCZ-6 controller with the hot repair enclosure to make up a complete subsystem called

the SHR, which are fully hardware and software compatible with Data General's MV family, under DG's DPJ driver.

SHR subsystems are available with either 480 MB or 1 GB drives, both of which employ fast-SCSI-2 technology, and have seek times in the range of 10 to 12 milliseconds.

The enclosure can be configured as

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*Executive Message;
Continued from page 4*

groups. He's assisted by vice-chairs Ed Lindberg and Chuck Goes.

In addition to the members listed above, at conference time we need 40 or 50 more volunteers. The NADGUG booth must be occupied whenever the conference floor is open. Each session needs a speaker host, to introduce the speaker and to see that the session proceeds smoothly. In the past, we've relied on Board of Governors volunteers to fulfill these duties. This year, we may have to go around the board with a sign-up sheet in one hand and a gun in the other.

Your ideas needed

You may have noticed some duplications on the above list. It's not because we don't have anything better to do. We need your support and assistance. Although according to our current bylaws, only RIG and SIG representatives may vote at the Board of Governors meeting, *anyone* may attend and put their two cent's worth in. We encourage you to attend. We need your ideas.

We're always looking for help on committees and subcommittees. If you'd like to volunteer, please contact one of the board members directly or Michelle Dube, our association manager at Danieli & O'Keefe Associates, Inc. Call 800/253-3902 (U.S. and Canada only) or 508/443-3330.

And if you're planning to attend the NADGUG 93 conference in Atlanta next October and you have any interest in helping out in the booth or being a speaker host, please contact one of us.

After all, this is *your* user group. We're proud to serve on the board, and we hope you think we're doing a good job. But any group needs new blood once in a while. Get involved. NADGUG is only as good as you make it. Δ

Tim Boyer is NADGUG Vice President. He writes the "Screen Test" column that appears regularly in Focus. He is EDP manager at Denman Tire Corporation, and may be reached at 400 Diehl South Road, Leavittsburg, OH 44430; phone 216/898-2711, fax 216/898-5256, on the NADGUG bulletin board at 415/924-3652, or on the CSC bulletin board at 800/DASH-CSC.

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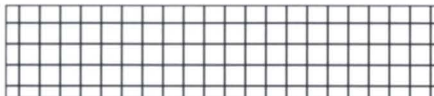
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Open Olympics

Data General, Apple Computer, IBM, Unisys, and Wang Laboratories gathered at the FCC OpenNet Olympics in Washington, DC, last December to provide the first successful demonstration in a public open forum of everyday, practical applications among their various systems.

The showcase was part of the Federal Computer Conference (FCC) OpenNet '92, representing a collaborative effort among 74 vendors and government agencies whose hardware and software provided the basis for a live, enterprisewide demonstration environment.

"Data General's participation in the FCC OpenNet showcase demonstrates our commitment to providing customers with interoperability for real-world applications," said Peter Janke, vice president of DG's federal systems divisions. "Through cooperation with other industry leaders, Data General is pleased to illustrate the benefits of true open systems computing." On the DG team were Aviion and Next workstations.

Vendors were challenged to complete six user-oriented, practical applications involving the transfer of: (1) text mail; (2) formatted text, while preserving formatting; (3) a spreadsheet; (4) a black-and-white photo; (5) a document formatted in SGML (structured general mark-up language); and (6) an X.400 mail message with attached spreadsheet.

Aviion and Next workstations successfully completed five of the six Olympic tasks, and were awarded the OpenNet Achievement Medal.

Candidate Doyle

As of last October's NADGUG 92 conference in Kansas City, former

NADGUG president **Dennis Doyle** was in the final several weeks of a grueling political campaign for state representative in his home state of Oregon. Doyle, a Democrat, challenged a 15-year Republican incumbent for the District 8 seat (west of Portland).

In case you hadn't heard, he lost. "But it was a pretty narrow loss," he says, and he remains undaunted because he built some name recognition and "learned a lot." So will he try again in two years? "You betcha."

Benchmarks

In the Fall '92 "Unix System Price Performance Guide" from **AIM Technology**, Data General came off looking good, ranking among the leaders in virtually all categories. DG's Aviion servers and systems placed first in 8 out of 12 rankings within a variety of categories. Some examples:

In the under-\$50,000 class, best sustained performance went to the Aviion 4625. The \$50,000-\$100,000 class featured the multitasking Aviion 5240, which took first in best price/peak performance, best price/sustained performance, best peak performance, and best sustained performance.

Demonstrating best price/peak performance in the \$100,000-\$500,000 class was the Aviion 6240. Also in that price range, the Aviion 6280 ranked first in peak performance and sustained performance.

DG's Aviion models competed

Call for sessions

If you're interested in conducting a session at NADGUG 93 in Atlanta next October, the deadline is upon you. Application forms are due by Feb. 8 to user group coordinator **Debra Bedrosian** at Data General (3400 Computer Drive, Westboro, MA 01580).

Proposals received after the deadline will be considered on a space-available basis. Presenters will be notified of their acceptance by April 26. For more information, call 508/898-4067.

against comparable systems from such companies as Hewlett-Packard, Sun, Unisys, Motorola, and DEC. The Aviion did not place in any of the over-\$500,000 categories because no AV models are priced that high.

Teaming up

Data General and **Data Assurance Corporation** of Englewood, Colorado, have joined forces to provide DG end-users with an added measure of data insurance: hot-site disaster recovery services.

MV and Aviion users can take advantage of this new service with a single phone call. Through the association with Data Assurance, DG provides subscribers with an alternate electronic data-processing facility in the event of disasters or emergencies such as fires, hurricanes, floods, earthquakes, or power failures.

"This new alliance with Data General gives us the opportunity to enhance our support to Data General users," said **Daniel Kilburn**, Data Assurance president.

Hot-site disaster recovery services are marketed by Data General. Subscription prices depend on system configuration and start at \$400 per month for small systems. DG customers can call 1-800-DATAGEN for more information.

Atria and Informix

Atria Software, Inc., of Natick, Massachusetts and **Informix Software, Inc.**, of Menlo Park, California, announced a multi-year contract through which Informix will use Atria's Clearcase as the core configuration management technology for its worldwide software development environments.

Clearcase is an advanced software configuration management system designed for teams of software engineers working in Unix open systems environments. Informix will implement Clearcase to provide essential building blocks for its software development operations. Δ

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