

INSIDE! Latest News on Web Services and .NET; Hashed Files; OLE Controls and New Federal Regulations for IT

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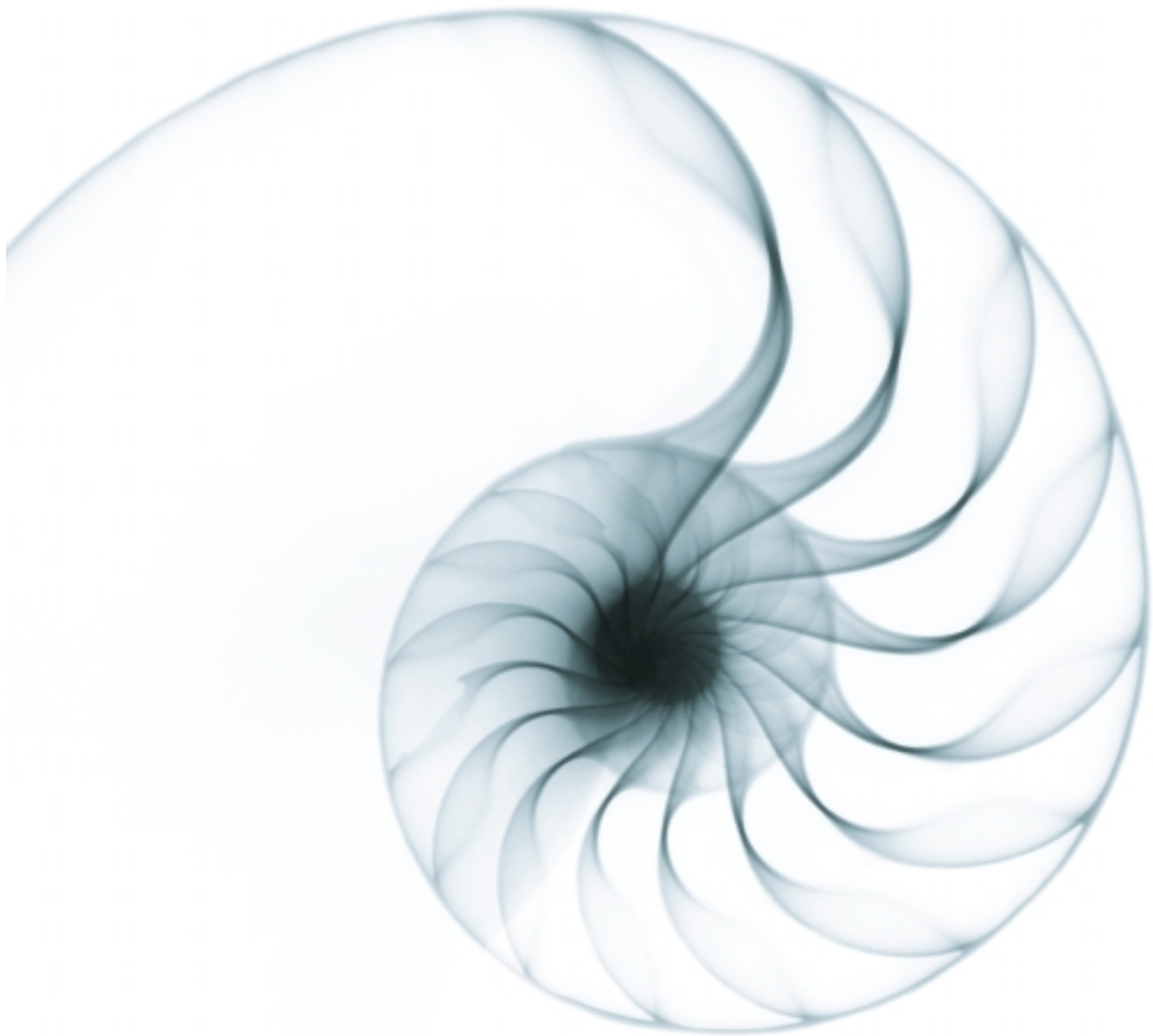
THE BUSINESS COMPUTER MAGAZINE

JULY/AUGUST 2004 • AN IDBMA, INC.



PUBLICATION

The Technology That Drives
**Credit Card
Processing
Software**

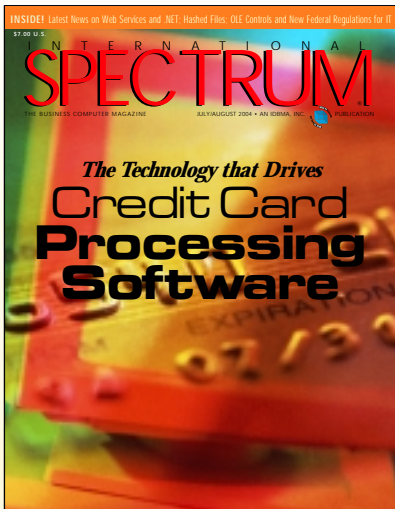


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JULY/AUGUST 2004

Cover Story

THE TECHNOLOGY THAT DRIVES CREDIT CARD PROCESSING SOFTWARE

12 In this month's VAR Spotlight, *Spectrum* magazine interviews the president of Total Computing Solutions, Fred Tuttle. Find out about the growth and trends in credit card processing technology, and how TCS has carved a successful niche in the retail software marketplace.

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6 The International MultiValue Marketplace: Up Close and Personal, Part 2
 Last month we showcased the highlights of Spectrum 2004 held in Las Vegas, Nev., featuring candid comments from major players in the MultiValue market as well as new players on the scene. But there was still more to report because all the exhibitors had products or services deserving of our attention as they each play a special role in the MultiValue industry. In this feature: more on the people and products of Spectrum 2004.

14 SB+ Basics, Part 4
 Because SB+ is a complete applications development environment, it includes all of the necessary tools to develop a complete, comprehensive application. Learn more about these tools in this article, including administration tools, office automation, and user-defined security processes. **BY DANNY PASSIG**

16 History of MultiValue: The 25 Most Influential People in PICK—Where Are They Now?
 In this second installment of the series "Where Are They Now?", we turn back the pages to 1989 and the *Spectrum* magazine cover story, "The 25 Most Influential People in PICK." We've taken this "prestigious" list of people that were highlighted 15 years ago and put our detectives to work. Where are they now? Are they still influential in the marketplace? Are they even in the marketplace? You'd be surprised at what we found ... and didn't find! **BY LEANNE GREEN**

23 Revelation Tech Tips: OpenInsight and OLE Controls
 How easy is cross-application communication? This article conveys the ease of adding and manipulating OLE controls within OpenInsight windows with a step-by-step guide. **BY SEAN FITZSIMONS**

26 Standards, Compliance and Jail, "Oh My!"
 Susan Joslyn follows up with more details on the Sarbanes Oxley Act (and other regulatory agencies) that have come up with new rules for the business game. This time, she focuses on the effects on IT. "Is all of this regulation going to make our lives harder and our jobs more tedious?" she asks. Find out what the COSO framework means to IT in implementing internal controls for financial reporting. **BY SUSAN JOSLYN**

28 Web Services and .NET, Part 4: Examples
 Part 3 of this series, "MultiValue Toolkits," profiled software to help MultiValue developers implement Web Services with existing applications. In this fourth and final installment of this series, you'll find real-world examples of Web Services in the MultiValue world and elsewhere. **BY TONY GRAVAGNO**

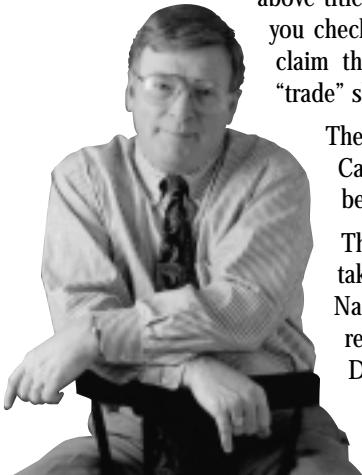
35 UniVerse and UniData Hashed Files, Part 3: Resizing to Maintain Optimum Performance
 In the first two parts of this series, the mechanics and vocabulary of hashed files were explored. Part 3 is devoted to a discussion of "resizing" hashed files. The authors examine the costs and benefits of resizing and then present their thoughts about the best way to approach the process of resizing files. **BY JEFF FITZGERALD AND PEGGY LONG**

40 Just for Fun - Searching Addresses
 The address is a key piece of information in anyone's database, but it can be extremely hard to validate, and due to free form input, even harder to search. **BY NATHAN RECTOR**

[FROM THE INSIDE]

Spectrum Show Claims Title of Longest Surviving Computer Tradeshow in America

O.K., I know we're not in the same league, but with the cancellation of the 2004 Comdex Show, International Spectrum hereby claims the above title on behalf of the MultiValue industry. Oh, I know if you check the Internet, there are a few flea-circus types that claim the title, but I'm talking about honest-to-goodness "trade" shows.



The first Spectrum Show was held in January 1982 at Caesar's Tahoe in Lake Tahoe, Calif., which means we've been at it solidly now for 23 years straight!

There were two events along the way that might have taken us down along with the big guys. Remember the National Computer Conference? At one time, at the request of the PICK vendors, we flew to Washington D.C. to NCC's headquarters to propose that Spectrum be folded into the NCC. They basically turned up their nose at the idea, but said if we wanted to buy some booth space they would be happy to try to fit us in. The NCC "war room" was a foreboding set of walls with huge marked-up floor plans for all of their exhibition space. We went home and forgot about it.

At the next NCC, over 130,000 people attended in Anaheim, Calif. The show was so big that it spilled over into huge tents in the parking lot of the convention center. As only can happen in California, they had one of their rare "Santa Ana" heat waves. The temperature inside the tents topped 130 degrees, and it literally started "raining" inside the tents. This, combined with the bonus of static electricity, toasted the delicate minicomputer systems of the day.

Twelve months later, NCC was gone.

The second incident occurred a few years later when the PICK vendors again asked us (Spectrum) to approach Comdex with the same idea. We met with Comdex's Shelly Adelson with the idea of a "PICK Pavilion" within Comdex. The idea didn't fly this time because Comdex had a strict rule against more than one company residing in a booth.

So nanner-nanner-nanner!

I guess I have to admit that our longevity has nothing to do with us. We are a mirror of you, the people in the MultiValue industry. It's a testament to the intrinsic value of the MultiValue databases, the people in our market, and the applications you have built around it. Congratulations to you too!

See you at the next Spectrum Show in San Diego in February.

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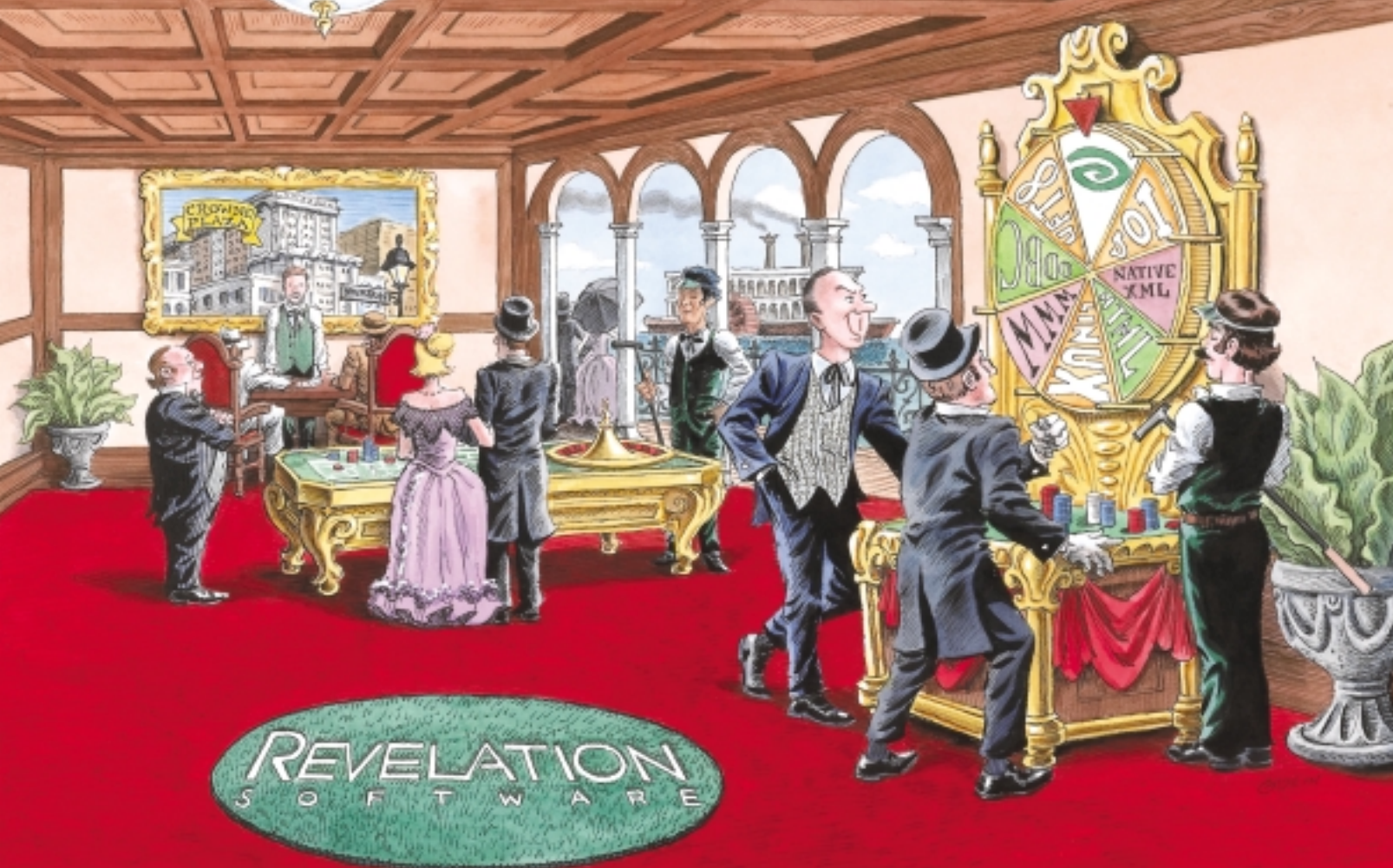
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NEWS RELEASES/UNSOLICITED ARTICLES
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[SPECTRUM 2004]

More From Spectrum 2004



At Spectrum 2004 in Las Vegas, Nev., held March 15 - 19, there was a noticeable buzz in the venue - an excitement about the newest technologies that are now accessible to MultiValue users as well as tried-and-true products whose purpose is to advance the functionality of MultiValue systems. Last issue (*International Spectrum* 2004-Up Close and Personal," May/June 2004) featured candid comments from major players in the MultiValue market as well as new players on the scene. But there was still more to report as all the exhibitors had products or services that are deserving of our attention as they each play a special role in the MultiValue industry. In this feature: more on the people and products of Spectrum 2004.

Zeus Data Integration Eliminates the Headaches of Moving Data

If you've ever had to write a custom application for moving data between systems, then you know the pitfalls. To alleviate that tedious process, Mount Olympus Systems Inc. has developed the Zeus Data Integration product to do all the work for you, as many times as you need.

"Our goal was to take the worst part of programming—the biggest headache—and create a situation where you never have to do it again," said Charles Barouch, chief technology officer of Mount Olympus Systems. "We've created a piece of software that programmers can use to take care of the worst part. The movement and conversion of data is always done as part of a larger project—IT staff is never given the time to do just that part of it right."

Zeus Data Integration software can help overcome the obstacles of data management in a variety of situations. In any of the following instances, according to Mount Olympus Systems, Zeus Data Integration software would be useful:

- Your company gets bought out by an Oracle-only company
- Your company acquires an "everything's on spreadsheets" company
- Your company retains an accounting firm that knows only "Quick Books"

- Your company sells to a company that wants non-standard EDI
- Your company buys from a vendor who discounts electronic transactions.

Using Zeus Data Integration Software in these cases would mean never having to write a custom application for moving data again. All the templates are stored in one location for easy access. Users can quickly prototype conversions.

Robert Coltun of Mount Olympus, who goes way back in the MultiValue industry to the Microdata days, said Zeus Data Integration is the result of putting a "front-end on something I'd been doing for years. People are always doing conversions, having to manipulate data. I asked myself, 'What do people need?' 'What are people always going back to?' I had a template for converting code, but it was in my head. I put that into this product."

Barouch added: "And the price is cheap enough where anyone can buy it. If you can pay \$1,000 to get rid of the worst part of your day, would you pay \$1,000 one time?"

Zeus Data Integration is available for Windows and Linux. AIX and HP-UX support will also be developed. For more information, visit www.Mount-Olympus-Systems.com.

Continues on page 8



Every **CRAFTSMAN** knows
you need the **RIGHT TOOLS**
to do **THE JOB.**

That's why we've dedicated our 2004/2005 conferences to showcasing the newest and best software tools available for you to take your MultiValue application to where you want it to go! **Come see what's new!**

For more information visit www.intl-spectrum.com

London, England

September 22 - 23, 2004
Novotel London West Hotel

Sydney, Australia

October 12 - 13, 2004
Star City Hotel & Casino

Melbourne, Australia

October 18, 2004
La Meridien at Rialto

San Diego, CA, USA

February 22 - 25, 2005
Hyatt Regency Islandia
Hotel & Marina



More From Spectrum 2004...

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DMCons Presents the Toolbox

Clarence Cope, president and CEO of Pennsylvania-based **DMCons Inc.**, celebrated the first sale of **The Toolbox**, a new product designed expressly for the Multi-Value market. The Toolbox is the culmination of 15 years of development on the part of Cope. "When databases are delivered, they essentially have a line editor that was written in 1970 and a search engine—and that was about all the tools you had," Cope explained. "So about 15 years ago I started to work on an integrated utility package that would give me the power as a consultant to do the work I had to do. I designed a series of tools in an integrated package that would allow me to find anything in a short period of time."

The Toolbox provides a multitude of capabilities, among them List Processing. An LPR list is a disk resident list similar to a select list containing both file name and record name, programmatically made to perform like a select list. With this feature, users can do the following:

Easily create permanent lists

- Quick lists to build a list of any file
- Select to build a list
- Create a list from an active select list
- Create lists from various search displays

Segment Lists

- Boolean operations on lists
- Searching
 - Simple searches of multiple strings
 - Complex searches of multiple strings, ability to specify strings to be excluded and user programmable exits
 - Searches with instantaneous edits and compiles
 - Compare records of two lists

- Apply functions to each item in a list
- Transfer lists between users
- Attach a comment to each list

The List Editing feature enables users to:

- Apply functions to single items, multiple items, or ranges of items

- Edit, delete, compile, catalog or uncatalog, comment, copy comment, global edit, search and instantaneous edit, format, edit the comments, delete the comments, search the list for character string and compile, copy, move, export, and import
- Segmenting
- Full Macro capability at all levels
- Ability to attach a comment to each item in a list
- Sort lists by file name or by program name or by comment
- LX allows you to look at an exact match for character string in all items in the list. It brings up a window containing lines matched from all sources. Clicking on any line takes you into that item at the line where it was found. The list can be pared down using remove, sublist and exclude.

Vger is a full-featured full-screen editor, harmonizer and research platform. It enables simultaneous editing and comparison of up to six programs as well as editing in command line mode or full-screen mode. Vger's features are comprehensive and numerous. For a

FusionWare Integration Server Simplifies Web Services Deployment

FusionWare Corp. was formed when it acquired all the products and services of GA eXpress Inc. in December 2003. As well as purchasing the assets, FusionWare also retained the personnel instrumental in the development and support of the products and they are now an integral part of the FusionWare team. FusionWare's mission is to provide intelligent integration solutions for medium-sized businesses. The key word is collaboration—speeding up the integration of your business systems with those of your partners to enable you to work together more efficiently.

FusionWare Integration Server simplifies legacy integration and Web Services development and deployment, streamlining the management of internal business processes and Line of Business (LOB) connectivity using industry standards. There are three components:

1. FusionWare Designer, an easy-to-use forms-based integrated development environment for quickly creating Web

Services to integrate diverse data, applications, etc.;

2. FusionWare Server, a fully multi-threaded server written in Java that can execute XML-based applications generated by the Designer; and
3. FusionWare Administrator Console, a Microsoft Windows application fully integrated into the Microsoft Management Console that connects to the FusionWare Server API and monitor process to:
 - Monitor the operation of the FusionWare Server
 - Control the deployment of applications
 - Initiate a variety of actions in the server including refresh, shutdown and the viewing of logs and transactions.

The purpose of FusionWare Integration Server is to enable medium-sized businesses to undertake integration and Web Services development initiatives affordably. Fusion-

Ware Integration Server meets the needs of IT departments who are required to:

- Connect their legacy systems and data with their business partners' processes in a matter of days, not weeks.
- Intelligently integrate on demand, disparate data from manufacturing, accounting, development, sales and HR to allow management to make well-informed critical business decisions on a day-to-day basis.
- Leverage the investment made in all their backend systems and create new innovative business processes that drive competitive advantage.

With its intuitive GUI interface, powerful code generators, query builders and built-in Line of Business connectors to unite any legacy system and data, the FusionWare Integration Server makes it easy to connect disparate enterprise systems to business partners, e-market exchanges, suppliers and customers over the Internet, the company said.

more detailed listing contact DMCons at (814) 234-4543.

Along with The Toolbox, DMCons offers training and extensive technical support.

PRC Assists Companies in Complying with New Legislation

SJ+ Systems Associates asks, "Is your software ready?" Ready for what? Ready for recently passed legislation, such as the Sarbanes-Oxley Act, that will not only affect public companies but small companies as well. PRC, from SJ+ Systems Associates Inc., can help you meet the demands of Sarbanes-Oxley and other audit and compliance requirements such as ISO and CMM.

Susan Joslyn, president of SJ+ Systems Associates, told Spectrum magazine at the show: "People have to comply with Sarbanes-Oxley, so they have to put a tool like PRC into play. They either have to buy it or build it, and they might as well buy it because I'm here!"

PRC provides the tools to ensure that software is secure and modifications are visible and reproducible. Companies invest a lot in mission-critical software, configuring it to meet its unique needs, SJ+ Associates said. Losing customized modifications in software programs can almost be as big a problem as losing the data itself. Often, the data is irrelevant without those customized changes.

PRC provides software configuration and software development life-cycle management for IBM U2/MultiValue software. It integrates all of the elements of software configuration management. Its capabilities include:

- Problem reporting
- Project management
- Change control
- Test management and version/release control
- Time reporting
- Automated deployment
- Rollback, and
- Robust auditing and backup.

For more information, visit www.jplus.com.

SEEK, RETRIEVE, and GP MATE Headline at GP Solutions Booth

GP Solutions Inc. (GPS) showcased the SEEK, RETRIEVE and GP MATE database products as well as its extensive services ranging from consulting to software development and end user training. GPS was formed in 1990 to develop, sell and support advanced database, information, maintenance management and legal software products.

One of those products, SEEK, is an application development environment that targets information management needs. SEEK includes a data entry system and a powerful retrieval language that can be easily tailored to the application's needs. A major feature of this system is its indexed retrieval ability that allows the rapid ad hoc selection and display of information. SEEK is available on UNIX, Linux, and Windows systems.

SEEK-Legal is a suite of legal applications designed for PC LANs and minicomputers. These integrated applications address areas such as Litigation Support, Conflict of Interest and Corporate Records. SEEK-Legal contains a setup routine that permits the end user to customize applications to better meet the needs of the law firm or a particular case. The SEEK-Legal products contain both abstracted indexing and full text searching as well as imaging capabilities.

RETRIEVE is a software product that can be integrated into existing software systems to greatly increase retrieval capabilities. It's based on the SEEK indexing schemes and can reduce the time of retrieval from hours to several seconds. RETRIEVE is designed for use in Multi-Value database systems including UniVerse, UniData, Information, jBASE, D3 and Revelation, where either performance is an issue or users require flexible rapid ad hoc query and reporting capabilities.

GP MATE, an award-winning Enterprise Asset Management System, has been installed in hundreds of sites in industries ranging from petrochemical and discrete manufacturing to hospitals, schools and municipal water treatment plants. For those looking to automate or upgrade their maintenance and inventory programs, GP MATE is a solution that utilizes state-of-the-art multi-tiered client/server architecture to provide an open and integrated software solution, Sophisticated retrieval capabilities are built into the system to permit the online

storage of multiple years of maintenance history and financial transactions. [is](http://www.gpsonline.com)

You can check out what GP MATE has to offer maintenance professionals by downloading an interactive demonstration system from www.gpsonline.com.

Entrinsik's Informer Pulls Data Directly from U2 Databases

Entrinsik Inc. released Informer 3.0 at the Spectrum show. Informer is a Web-based reporting tool that allows users to intuitively pull selected data directly from UniVerse or UniData databases. Reports can be optionally dropped into PDF, Excel, or e-mailed.

Release 3.0 incorporates the following new features:

- Expanded multi-value handling that now supports: "every" and "any" logic; selections using "with associated" option; and multi-value controlled data exploding.
- Support for the "OR" connections in selection criteria.
- Allows the user's information to be used in the selection process.
- Sorts on fields that are not displayed.
- Creates Save-Lists during scheduled runs.

These are just a few of the product's features; for more information, visit www.entrinsik.com.

Print Wizard Takes Printing to the Next Level

Rasmussen Software, based in Portland, Ore., previewed the beta version of Print Wizard, 3.0, which was scheduled for release in early May. Print Wizard is a body of software from Rasmussen Software Inc. that processes and prints text. Print Wizard takes plain text print files and prints them intelligently, automatically fitting them to the page. It prints existing print files with modifications, including adding form overlays. It can also

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More From Spectrum 2004...

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take text files that contain markup tags similar to HTML, process that input, and create the printout as directed.

Print Wizard can accept files that contain international characters as Unicode data and print them correctly. It can also automatically select fonts that contain the needed characters.

Print Wizard is designed to solve many problems involved with printing, such as:

- Legacy reports, designed for particular printers won't print correctly on other printers
- Print jobs must be distributed over networks, even around the world, even with dynamic IP assignment
- End users may need to customize output formats

- Web browsers do not do a good job of printing, especially wide reports
- Users may need to superimpose form images
- Developers using some programming languages may need to create fancier printout than those languages provide, with font changes, line drawings, pictures, etc.
- Most printers can't handle Chinese, Arabic, etc.
- Print files may use backspaces for underlining or bolding, tabs, and other conventions.
- Any of this output may need to be automatically faxed or emailed
- Users may need to generate PDF files

Web Print Object (also known as We PO) is another Rasmussen product aimed at users who need to print precisely and reliably through a Web browser. Frequently users accessing your Web site need to print, but browsers clip the right edge and don't paginate correctly.

Web Print Object is an ActiveX object that can be embedded in Web pages. It appears as a "Print" button. The user clicks the button and gets the printout as you designed it. When clicked, Web Print Object fetches a specified print file from an FTP, HTTP, or HTTPS server, or from the user's network. Then the Print Wizard engine goes to work on it, rendering it precisely on any Windows-supported printer. Web Print Object works in Windows and Internet Explorer.

With Web Print Object, users can now print form overlays, barcodes, invoices, shipping labels and tax forms.

Rasmussen Software also offers the Anzio family of telnet solutions including Anzio Lite, an inexpensive emulator, and AnzioWin, its full-featured product. Both are reliable and easy-to-use terminal emulation software for communications

Continues on page 47

GA Services: A One-Stop Services Company

If your system is down, or you have obsolete equipment and limited resources, or you're in need of a cabling makeover, then GA Services (GAS) may be your answer. GA Services is a single-source provider that offers a broad spectrum of professional, business and support services on a nationwide basis that cover the gamut from business continuity services (disaster recovery), to on-time, on-budget conversions, to networking, to cabling infrastructure. The company's services go beyond regular maintenance and support.

Sherwood King, senior account manager, told Spectrum: "GA Services services not only the PICK marketplace, but the open systems marketplace. What we've got new this year is business continuity services for people who want to back up their systems in terms of disaster recovery and business continuance."

The business continuity services meet the needs of server-based organizations of 50 to 500 users. The cost of downtime for a business can be staggering, not only in terms of dollars but damage to customer relations. Many users believe that their current backup solution is sufficient because they have yet to face the unpleasant, time-consuming experience of trying to restore from a tape backup system that may have corrupted data, according to the company.

GA Services' data storage technology enables cost-effective, continuous backup and almost instantaneous data recovery. Businesses that have obsolete tape backup systems or no backup solution at all can now install an affordable state-of-the-art business continuity solution. The GA Services offering is a software-based platform, using FalconStor software, installed on the user's network. It allows IT directors to easily manage data storage capacity while assuring quick and easy data recovery in the event of a system disruption.

Project management is another service that GA Services offers, in which GA's professional services team works with your staff to create a detailed project plan that includes critical milestones, resource requirements and budgets.

The successful evolution of an organization's IT infrastructure depends on a thorough understanding of each component's life cycle, the company said. GA meets this need with the TCO Assessment service. Total Cost of Ownership (TCO) Assessment provides an understanding of your company's current investment mix and how it can be enhanced.

GA Services' business services encompass network migration that allows your organization to take advantage of the latest IP network technology while continuing to exploit legacy systems. GAS's security solutions offer secure Virtual Private Networks, firewall protection, intranets and extranets that enable companies to conduct e-commerce, m-commerce and e-business transactions.

Support services include Managed Service Desk, which provides a single point of contact for resolving IT problems with support available 24 hours a day, 365 days a year. Multi-Vendor Support complements GAS's remote management and support services, providing on-site rapid fix support, any time, day or night. Packaged or customized support options are available. GAS is an authorized service provider for Sun Microsystems and Hewlett-Packard platforms, and offers customized software and hardware support options for legacy platforms and applications.

King summed up the bottom line: "We deal with all the major databases and all the major hardware lines. We're a services-based organization that offers products around the IT function; we do cabling, networking, migrations, and conversions nationwide. We do it all." **For more information, visit www.gasllc.com.**

Informer



"Fantastic! Informer is exactly what I've been looking for - intuitive for business users with a technology platform to make IT (that's U2) happy!"

— Dawn Wolthuis, Industry Analyst
President, Tincat Group, Inc.

Retrieves Data Fast
No Need for ODBC

Personalizes
Reports

Publishes
as PDF

Drops into
Excel

Generates
Savedlists

E-mails
Reports

Schedules
Reports

Friendly
Dictionaries

Role-based
Security

Handles
Multivalues

Report: Jokes and Writers

Joke	Writer Full Name	Joke Text	Rating
+ Writer Full Name : Aaron Westendorp (5 items) Total Rating: 0			
+ Writer Full Name : George Burro (4 items) Total Rating: 5			
- Writer Full Name : Hannah Hendriksen (4 items) Total Rating: 13			
MENBAR	Hannah Hendriksen	Two men walk into a bar. The third one ducks.	4
BISOMNIAC	Hannah Hendriksen	My agnostic, dyslexic, insomniac neighbor told me he lies awake at night wondering if there is a dog.	4
EYES	Hannah Hendriksen	What did the right eye say to the left eye? Between you and me, something smells.	3
PIZZA	Hannah Hendriksen	Pizza shop: Do you want your pizza cut into 6 or 8 pieces? Customer: Oh 6 please - I couldn't possibly eat 8.	2
Totals			13
Averages			3.25
			Grand Total Rating: 18

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Includes Data from
Multiple Files with
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VAR Spotlight: Total Computing Solutions

This month, Spectrum sat down with Fred Tuttle, president of Total Computing Solutions—provider of TotalLink, a leading credit card processing system for the MultiValue industry. Tuttle founded the company in 1990 as Integris, providing point of sale systems for college and university bookstores. In 2001 he reorganized the company as Total Computing Solutions. At that same time, TCS began marketing its credit card software on its own and gave it the brand of TotalLink.



We asked Tuttle to share the history of TCS with us, to learn more about the growth and trends within credit card processing technology, and to get his opinions on the MultiValue marketplace as he has seen it grow and mature.

SPECTRUM: Fred, you have been around the MultiValue market for a long time. Tell us how you got started in the industry.

Tuttle: Well, that goes back to the early days of the computer industry itself. In 1975 I was working as the assistant controller of a large construction company and was asked to assist on a project to implement its first real computer system. To my good fortune we chose a PICK system and hired a local company to write the software we needed. It didn't take me long to figure out that there were some things you could do with a MultiValue data structure that you just couldn't do with other systems. I've been sold on its value for meeting customer needs ever since.

SPECTRUM: What are some of the key changes you have seen as the industry has matured?

Tuttle: There have been a lot of changes along the way, some very good and some not so good. I think the MultiValue industry faced severe challenges when it lacked global leadership and became somewhat fragmented. Some of that fragmentation is still around today. The strength of a PICK system is also its weakness—legacy code runs and runs and runs. So some of the newer tools that have been developed to help us meet today's computing paradigm are finally taking hold in our market. I am just amazed every day at the creativity and determination I see. Not only from the VARs and partners we work with on a regular basis, but also from customers and users who have found innovative ways to tackle business issues using MultiValue systems. I also think that IBM's acquisition of UniVerse and UniData, and the strategy they have built around that acquisition, has really given the industry a shot in the arm. It shows the confidence IBM has in the ability of MultiValue systems to solve real customer issues and lends additional credence to the entire MultiValue community. I have also been impressed with the resurrection of Revelation—those guys have done a great job.

SPECTRUM: We've heard a lot of positive things about your credit card processing software, TotalLink. How did you get into the technology of credit card processing?

Tuttle: We have always been very focused on the benefits of MultiValue systems. In 1991, one of our college store customers was dissatisfied with their method of processing credit cards. Like most retail establishments, they had a separate machine to process credit cards. They asked if there was a way to do that directly in the point-of-sale system, because anyone who has been to college knows, during their "rush" periods, the lines in a bookstore can get pretty long. Taking the extra time to key in the information into the register, then again into an authorization machine, and waiting for it to dial-up, was adding a couple of minutes to each transaction they had to do. Plus, the added cost of multiple telephone lines just drove their costs even higher. One of our colleges runs 73 registers during rush! We took a hard look around, and found that there really weren't many good options out there for MultiValue systems. We ended up writing interfaces to about a dozen dial-up processors and several private card companies. The inter-



face we developed at that time allowed our customer to process cards for all of their registers with only one phone line and modem, instead of a separate machine and phone line for each register. Because of the streamlining and efficiency we built into our software, customers didn't need to add a second phone line until they were processing over 7,000 transactions per day.

Then, when we introduced TotaLink as a separate product in 2001, we included our first IP/SSL interface. This new interface was great news for our customers, because it increased the efficiency of processing by reducing transaction time down to less than three seconds per transaction. Since then, word of mouth and a little advertising has brought us more customers and VARs who use TotaLink. Today, our customers process over 10 million credit card transactions annually.

SPECTRUM: Why is credit card processing so difficult to do?

Tuttle: The biggest challenge is that the credit card "clearinghouses" use their own highly secure protocol to capture and process credit card transactions. Being able to interface with one of those protocols, while difficult, can be done in a straightforward way. However, keeping the system secure and reliable, especially under heavy loads like most retailers experience during the holiday season, or during "rush" for college stores, requires an efficiently designed system that can handle the throughput. Knowing that we were dealing with a university that might have four or five different "rush" cycles during the year, we made sure we built it right.

The other challenge is that many of the credit card clearinghouses have designed their systems to handle a huge amount of dial-up transactions using the small keypad devices with a card-swipe. Interfacing with the clearinghouses, using a completely TCP/IP or Internet-based connection, brings in its own set of issues that you have to get right. We have developed our product to function the same way for all Multi-Value platforms. Whether on Windows, Linux or UNIX, it is the same basic code

and we never rely on an external piece of hardware to make it work. We also designed our system so that if your Internet connection goes down, you can easily switch over to a standard dial-up modem. Our modem dial-up time is the fastest in the industry. There are other issues too.

SPECTRUM: What kind of issues do you mean?

Tuttle: Let's take one of our VARs as an example. This company provides management and point-of-sale systems to restaurants. Their customers wanted to move from the dial-up keypad machine to an integrated, online system. But the protocol their clearinghouse uses for Internet transactions required a special API and extensive programming using skills outside of MultiValue. With TotaLink, all our VARs need to know is MultiValue Basic and where in their software they want to plug in a few lines of code. We do the rest. This VAR had a chain of restaurants up and running in no time at all. During their busy times at Christmas, New Years and Mother's Day, they were able to eliminate their usually long lines at the registers. This not only increased customer satisfaction, but they were also able to increase their customer count.

SPECTRUM: You mentioned that VARs integrate your software directly into their systems. How difficult is that to do with existing systems?

Tuttle: That is an area where we take a lot of pride in our solution. Our design is very structured and efficient, and completely integrates all the required components directly into the software module. So for most well-designed applications, it is just a matter of calling our software routines from within the current code and then getting back the authorization codes. As amazing as it sounds, the typical integration process for some of our VARs required only about a dozen lines of code. You can actually do it in as few as seven lines of code-and that's not stacking the lines with multiple commands.

SPECTRUM: You have to be joking. Seven lines of code?

Tuttle: (laughs) Yes, seven lines of additional code in PICK Basic. We have customers who have gone live within 24 hours after installation. Recently, I modified an A/R payment entry program to use TotaLink. Credit card payments were not previously accepted so all of the credit card

logic needed to be implemented. It took a total of 16 lines of code. We also provide the integrator with sample code to speed up the integration time and a special merchant account for testing their code.

SPECTRUM: Do you see this area changing over time?

Tuttle: Yes. Although this part of the industry traditionally is slow to change, it is changing. It is becoming more and more important for providers of retail systems to include an online credit card processing capability, rather than rely on dial-up or Windows applications. Our VARs are getting requests from their customers for that capability because it is simply more efficient. Customers and end users today are very savvy, and what we and our VARs are finding is that customers are coming to us because their current solution can't meet their needs.

SPECTRUM: What does the competitive environment look like for credit card processing?

Tuttle: You know, we have been around a long time, and have seen competitors come and go. From our perspective, we just run an honest business and treat our customers and our VARs right. We really focus on meeting their needs and helping them to be successful in their business. We don't believe in giving the software away and leaving the user in a lurch on how to use it. We like to make things simple. We do have a program where there is no cost to the VAR and no incremental cost to the end-user over what they are currently paying. In fact, we usually save the end-user money. Our VARs get a generous share of our revenue, whether going through our clearinghouse or any one of the thousands that we interface to. There is no magic in this business. Rates are highly competitive between clearinghouses and this is to the merchant's benefit. What you really want to find is a partner you can work with, whose product you can easily integrate and who will be there for you with the support you need. And the bottom line is, nobody can touch us in those areas. is



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f you are new to System Builder Plus, there are a

number of ways in which you can gain the knowledge to be able to use this product to its fullest advantage:

1 The SB+ Manuals

The SB+ Reference Manual and the SB+ Administration Manual, used in conjunction with the on-line help, are great starting points for you to explore and get a basic knowledge of System Builder Plus. The current CD, which ships with SB+, also contains the SB+ Solutions Manual Volume One and Two and provides more in-depth explanations of how to use SB+. IBM is in the process of completely rewriting the SB+ documentation and it will be available in the future.

2 The SB+ Demo Account

The System Builder demonstration account contains a Car Rental System, which was designed using SB+ and demonstrates its many features. This account is not loaded during the normal install of SB+, so you must load it when you install SB+. It is a good idea to review this account to get a better appreciation for the type of applications that can be built with SB+. As an added note, if you encounter a problem with your application and you feel it is a SB+ problem, IBM will ask if you were able to duplicate the problem in the SB demo account.

3 Training and Online Help

IBM provides training courses for SB+ at introductory, intermediate and advanced levels. It is also a good idea to subscribe to the sbsolutions group on Yahoo. This is an excellent source of information for solutions to problems that you may encounter with System Builder.



How Does SB+ Work?

SB+ is a complete applications development environment, which includes all the necessary tools to develop a complete, comprehensive application. Administration tools, office automation, and user-defined security processes are also included. The office automation tools are basic tools and you will probably find that you will not use them much, except for the pop calculator, which is very helpful.

The first option in the top menu in Figure 1 is "tools".

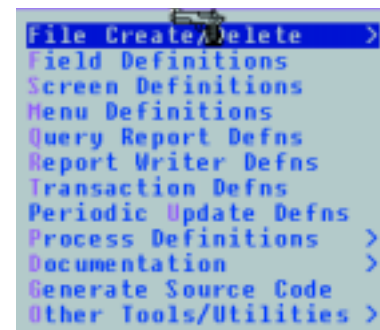


Figure 2

File design is the core to the success of a database application. How data is stored and what data is to be stored is crucial to a well-designed application. System Builder assumes you understand the concept of files, records, fields and keys. If you are not well grounded in these areas, you should seek out a good database text so you can become familiar with these terms.

All SB+ applications are built around the concepts of variable length records, fields and files, multi-values, hashed keys and Btree secondary indexes. This structure is very powerful and flexible.



Figure 1

Create a New File	
File Name	ARTICLE
Description	Article test file
Number Of Fields	5
Number Of Records	100
Ave Length Of Record	100
Use Global Dictionary No	

Figure 3

File Create/Delete is the first tool, and is used to create new files or delete files. SB+ will ask you a series of questions and will use your answers to determine the optimum size for the file (see Figure 3).

Field definition is the most used and most important tool because you will be continually accessing it to add new fields or modify existing ones.

Most applications within System Builder can be dictionary-driven. All information you define in the dictionary is available in all screens, reports and other references to the field.

When designing a new application, SB+ does not force you to have all your fields defined first before you can proceed to the

next step. You have great flexibility in how and when you use the tools that SB+ provides. You may choose to define all your fields first, define the fields as you design the screens, or do a combination of the two.

Even though you have this flexibility, you should give considerable thought to your file design before you actually start building your application. Time spent in thorough analysis and design will pay big dividends when you start the actual building process.

If you wish to prototype the application, you may use the Quick Build section of the screen designer. This will allow you to paint the screen as you would like to see it without a dictionary having been defined first. If you like the prototype,

then SB+ will build the field definitions from the prototype.

My next article will deal with Screen painting, Menus, Reports, Processes and Expressions. is

Danny Passig is a senior software engineer at Natic Systems. He has 33 years experience in the IT field. He has done customer software development and system installations for various businesses. He has worked for IBM as a support engineer for System Builder. Danny holds a Bachelor's degree in Business Administration/Accounting and a MSCIT from Regis University.

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Where Are They Now?

The "25 Most Influential People in PICK"
from *Spectrum Magazine*, 1989

In commemoration of the 20-year anniversary of *Spectrum* magazine, we are continuing the series of "Where Are They Now?"... where we take a light-hearted, enlightening, investigative and somewhat curious peek into the lives of people that have made a difference in the PICK/MultiValue marketplace.

In 1989 *Spectrum* magazine inaugurated the "25 Most Influential People in PICK" feature, described as "the first candid account of 'Who's Who' in the fast-moving, vacillating, and sometimes volatile world of PICK". This was followed by a second list of 25 people in 1990, and has not been done since.

For this story, we've taken the first 25 people that were highlighted 15 years ago and put our detectives to work. Where are they now? Are they still influential in the marketplace? Are they even in the marketplace? You'd be surprised at what we found ... and didn't find!

Of the 25 influential people, only five could not be located. We were unable, however, to interview four others (one is deceased and three were unavailable for an interview).

Only three have officially retired from the business, while six of the "most influential" are no longer in the MultiValue marketplace at all. Of those we found, nine are still involved in this industry, and six still have the same job they did when the article was written 15 years ago!

Don't miss next month's installment of the "Where Are They Now" series, when we share the "funniest memories from my career in PICK" from the original "25 Most Influential" that were interviewed for this article, in addition to their personal opinions, reflections and predictions for the MultiValue market.

1 NEIL BARRY

1989: Manager of Advanced Hardware Development, General Automation

Today: Could not be located

2 JOE BURKE

1989: Director of Prime INFORMATION, Prime Computer, Inc.

Today: VP of Marketing, Exact Software, Inc., Norfolk, MA



Joe Burke entered the PICK market in 1981 as a programming director for Axxess Systems Inc, a PICK VAR in New Jersey. In 1982 he founded *INFOCUS* magazine — a

publication that covered Prime INFORMATION technology and customers. In 1985 he sold his *INFOCUS* interest and became marketing manager for Prime Computer where he stayed until 1991.

In 1991 Burke left Prime (from a position in Munich Germany as director of interna-

tional software marketing) to go to work for VMark, Inc. as senior director of OEM licensing. While in that role, he facilitated the acquisition of Prime INFORMATION by VMark. VMark was his last position in the PICK-related industry.

Where is He Now?

Burke resigned from VMark in 1995 to become an entrepreneur again, founding companies to take them public or to sell/merge them.

Biggest Accomplishment in the PICK Market?

"I was told by an outside party that *INFOCUS* made Prime INFORMATION much more successful than it would have otherwise been, because our publication was distributed internationally and it brought news of Prime INFORMATION to a much wider audience much faster."

3 LYNN CARTER

1989: Director of Systems Engineering, Edgcore Technology

Today: Management of Software Systems Development Faculty, Carnegie Mellon University



Before joining Edge Computer (later, Edgcore Technology), Lynn Carter's background was in software development for test and measurement companies (Tektronix, Motorola, GenRad).

His goal during his short career in PICK was to provide an implementation that allowed both PICK and UNIX applications to run natively on the same machine at the same time and allowed them to communicate with one another.

Where is He Now?

Carter left the industry only months after the 1989 issue of Spectrum named him to the "25 Most Influential" list. (Edgcore sold off its PICK assets and Carter's last task was to "lay-off most of the wonderful people that had worked so hard to make our product successful, and then to lay myself off.")

After leaving Edgcore, Carter joined Carnegie Mellon University's Software Engineering Institute, and spent 12 years supporting large defense-related programs. Three years ago, he was asked to launch a new CMU Campus at Moffett Field California in Silicon Valley and introduce a pair of professional masters degrees to serve software engineering and software engineering management (a technical alternative to an MBA).

Biggest Accomplishment in the PICK Market?

"I still believe that our vision of an inclusive environment that allowed PICK developers a broader palette from which to create fast applications with far less development effort than any traditional system was Edgcore's greatest accomplishment. I was flattered when Spectrum concluded that I should receive any special recognition. It really was the people of the firm that did the real heavy lifting and I was lucky to be in a leadership position."

4 BRIAN CLEGG

1989: Director and Co-Founder, Clegg Driscoll Consultants

Today: Owner, Clegg Web Systems, Australia



Brian Clegg and Austin Driscoll started Clegg Driscoll Consultants (a software company based in Australia) in 1979: "I suggested to Austin that we could have some fun for a year or so and then get a real job. After we passed the two

year mark without going broke, we decided life wasn't all that bad and maybe we could keep going." Clegg Driscoll became a dealer and then the regional distributor for ADDS in Australia. In 1996, U.K.-based Sanderson Electronics bought the company. Clegg stayed on as the managing director of the Australia business and left after two years.

Where is He Now?

Clegg says he is "back at the coal face," working for himself (as Clegg Web Systems) down the path of Internet-based business systems in conjunction with business process modeling. He is currently managing the implementation of Web services-based business applications for the Australian Computer Society.

Most Interesting Job in the PICK Industry?

"The most interesting job we ever picked up was the development of a software and hardware solution for the newly created Federal Airports Corporation which would link 26 airports (previously government controlled) throughout Australia. I think it was 1985. We implemented ADDS boxes throughout the organization and had them networked on a transactional basis once a day — all over dial-up. The corporation was formed by a couple of people from the govern-

ment Civil Aviation Department. There were about 20 people in the organization on December first, and about one month later there were 1,500 who took over all the non-flight airport operations. I remember being very relieved when we produced the first set of financials at the end of January. However, the most memorable aspect was the first check which had a lot more numbers in it than I had ever seen before."

5 NICK DRESHER

1989: Chairman and Managing Director, Universal Computers, Ltd (UCL)

Today: Could not be reached

"I have just downloaded the Spectrum magazine and I see Gus is aging well— isn't it a pity that the properties tab doesn't tell you when a photo was taken. Of course maybe I am just jealous."

- BRIAN CLEGG

6 HENRY EGGERS

1989: Department Manager, Reality OS, McDonnell Douglas Computer Systems Company

Today: Retired in Southern California

Eggers worked for Pick Systems from 1977 to 1984, and then Microdata (McDonnell Douglas) from 1984 to 1994, at which time he "retired and slept for two years." Referring to his career as his passion, Eggers said his work in PICK development for 17 years "wasn't really a job, but was a calling."

Where is He Now?

Although officially retired, Eggers can't constrain his passion for PICK and recently created an extended version of English in Java for his own use. "It takes five times as much code to do something in Java as in Assembler code," he explained.

Most Interesting Job in the PICK Industry?

Writing the multiple printer spooler, and later, serving as the architect and manager of the Reality Operating System. "I was where the buck stopped. It was all my machine. It was the way I wanted it."

7 BILL FREEMAN

1989: President, McDonnell Douglas Computer Systems Company

Today: Could not be located

8 GUS & MONICA GIOBBI

1989: Owners of IDBMA, Inc. (*International Spectrum* magazine and tradeshows)

Today: Different address, same business!



Gus and Monica Giobbi have spent the majority of their professional careers in promoting, expanding and strengthening the MultiValue market. Although the company is only 20 years old, Gus Giobbi began his career selling Reality systems in 1973. He and Monica married their personal lives in 1975 and their business lives in 1984 when they founded International Database Management Association (IDBMA, Inc., now generically called "Spectrum").

Continues on page 18

Where Are They Now?

Twenty years later, Spectrum has published *International Spectrum* magazine, a technical journal (*Spectrum Tech*), PICK programming workbooks, and PICK Market Impact Studies. They helped create and manage the first and only forum of PICK-based manufacturers to unify and grow the industry—originally called Spectrum Manufacturer's Association (SMA) and later, PICK Spectrum. To their credit, they have brought together MultiValue end users, consultants, resellers, developers and manufacturers through 20 years of producing regional, national and international tradeshows and conferences across the U.S, England, Australia and France.

Where Are They Now?

Although their Southern California offices have moved from San Diego to La Jolla and most recently to the Gaslamp Quarter in downtown San Diego, Gus and Monica Giobbi still serve the MultiValue market the only way they know how: with creativity, persistence, and determination. "The market perseveres, and so do we," Gus Giobbi commented.

9 TIM HOLLAND

1989: VP, PICK Development, Sequoia Systems, Inc.

Today: Retired in Ajijic, Mexico



Tim Holland began his noteworthy career with SMI in Chicago in the early 70's, where he created business applications for the Basic4 system. In 1973, SMI became a Microdata VAR with Reality serial number 8 and the rest, as they say, is history.

Holland went to Pick & Associates in 1978 as VP of engineering, member of the Board of Directors and corporate secretary. During this time the porting process to non-firmware machines was developed and PICK was ported to over 35 different systems.

In 1986 Holland left Pick with Rich Lauer to form Concurrent OS Technology. As a PICK licensee, Concurrent implemented three different ports of PICK for various hardware manufacturers, of which one was Sequoia Systems, a large-scale fault tolerant UNIX-based system. This was the first implementation of PICK over another operating system. Sequoia acquired COST in 1988 and Holland became a Sequoia employee.

Where is He Now?

Holland had two other short stints in the MultiValue market: one in 1991 and the latest with Raining Data in 2000. Beyond that, he has spent most of the last 14 years as a senior consultant to the larger PICK sites throughout the world.

While still doing a small amount of consulting, he has recently retired to live in Ajijic Mexico. "It's time for my wife Jamie and me to relax and enjoy life."

Most Interesting Job in the PICK Industry?

"My various times with Pick Systems were never on the dull side (probably the understatement of the century!). However, my most interesting times were in the consulting arena, finding out how real people use the system and helping them do a better job of utilizing and defending their choice of PICK as the most flexible and cost-effective application platform available."

10 JOHN HOWORTH

1989: VP, OEM Sales, McDonnell Douglas Computer Systems Company

Today: Senior Vice President, Metron-Athene, Inc., Laguna Hills, CA

John Howorth was located by Spectrum at his office at Metron-Athene, but unfortunately, was unable to participate in the interview.

11 DEANN JELINEK

1989: Manager of Marketing Support, Datatel Mini Computer Co., Inc.

Today: Director, Software Development Best Practices and Training Services, Datatel, Inc.



DeAnn Jelinek's first job was working as a contract programmer on a Microdata system for Interactive Inc., based in San Diego, Calif. where she worked for Gus Giobbi. It was this background that helped her get a job at Datatel when she moved to Virginia. Jelinek leads the pack of the "25 Most Influential" in the longevity category—she has been with Datatel for over 26 years. She has also provided system and database management support on a variety of the major PICK platforms in her career, including Prime INFORMATION, ADDS Mentor, HP Ultimate, Altos and GA Zebra, to name just a few.

Where is She Today?

As versatile as the systems she has supported, Jelinek has worn many hats at Datatel, including management positions in operations, marketing, and director of sales support, to name a few. For the last eight years, she has specialized in software development methodology, managing software development best practices and training services for 130+ employees in the software development division. In her spare time, Jelinek is completing her doctorate in engineering at George Mason University, expected in 2005 upon the completion of her project, "Mapping an Industry Standard Capability Model to an Organization's Software Development Processes and Practices."

Biggest Accomplishment in the PICK Market?

"I published the article, 'Is PICK Relational?' in the *International Spectrum Tech* journal (Part 1 - February 1989, Part 2 - March 1989), and assisted and edited PICK: The Easy Way, Volume II, Expanded Theory and Operation, by Matthew H. Stern, New York, Comprehensive Information Science Inc., 1986."

12 RICHARD JOWITT

1989: Group Chief Executive, EDP, Plc.

Today: Chief Executive and Managing Director, EDP, Plc.



U.K. businessman Richard Jowitt remembers "flying across the pond in March, 1976 and visiting various sites recommended by Burroughs, to see how online

real-time solutions were being delivered in the USA, using Burroughs mainframe systems. I was not impressed."

Soon after, Jowitt met Ben Appio at ADP's New Jersey headquarters. "Ben explained the ADP business model. A service was provided with VDU's/printers installed at customer premises connected to the ADP equipment via land lines and when the transaction processing billing reached \$2,600 per month, the land lines were ripped out and a Reality system would be delivered to the customer site." Jowitt admits to "stealing an idea" and said this was the business changing moment for EDP in the U.K.

In 1979 EDP took an Ultimate dealership, becoming one of its significant resellers. Following the Spectrum show in late 1980, Jowitt met with Robin White, signed an exclusive distribution contract for the ADDS Mentor, and EDP developed a European Mentor reseller channel, shipping some 5,600 Mentor systems in the following 13 years.

Where is He Now?

Jowitt is still the chief executive and managing director for the U.K.-based EDP, Plc. He stays involved in the U.S. Multi-Value marketplace through EDP's ownership of Objectware, Inc. (for the UniVision database software), Via Systems (ViaDuct) and Amaron (WinLink).

Biggest Accomplishment in the PICK Market?

"The delivery of UniVision, developed by just seven members of the development team, delivered in a brand new, bleeding edge technology in just 120,000 lines of C++ code and in just over three years for the first-out product. Some achievement!"

13 STEVE KRUSE

1989: VP and General Manager, Pick Systems, Inc.

Today: Co-Founder/Partner, Software Nation, Inc., Irvine, CA



Steve Kruse co-founded Cosmos, Inc. in 1982 and originally served as its vice president of sales and marketing, later becoming CEO.

Cosmos produced Revelation and Advanced Revelation, the first PICK-based development systems for the PC. Kruse sold Cosmos in 1987 in a move to become President of the PICK PC Division for Richard Pick and Pick Systems. He later became VP of marketing and sales, and then executive VP.

Where is He Now?

Kruse left Pick Systems and the PICK industry in 1992, "during one of Pick System's infamous layoffs." After that, he returned to his roots in the Microsoft PC/Windows market. Calling himself "a serial software entrepreneur working on my latest startup venture," Kruse is the co-founder and partner of Software Nation, Inc.

Biggest Accomplishment in the PICK Market?

"I think the biggest accomplishment was that most of the customers at Cosmos (Revelation) did not have a clue they were on a PICK-based system. We were the first to branch out of the PICK market and start creating new users, VAR's, etc., when the PC first hit. Instead of competing with other PICK vendors, we went after the databases of the world and did quite well in making a name for ourselves outside the PICK market." *Continues on page 20*

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Where Are They Now?

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14 LEN MACKENZIE

1989: CEO, General Automation, Inc.

Today: Could not be located

From a search on the Internet, we were able to trace Len Mackenzie's steps through the year 2000. In 1991, Mackenzie and his wife, Nanci, who had been a successful entrepreneur in the energy industry since the early 70's, bought out their partners in U.S. Gas Transportation, Inc (USGT). (Mackenzie stayed involved with General Automation until the early 1990's, and then moved full-time to Texas to put his "energies" into the Texas energy business.) In 1998, after exceeding \$500 million in sales, USGT was acquired by Aquila Energy Corporation, a wholly owned subsidiary of UtiliCorp United, and a new company was formed, called Aquila/Dallas. Although both Len and his wife managed Aquila/Dallas until at least the year 2000, *Spectrum* could not find any further information on Mackenzie.

15 EDMOND MARCHEGAY

1989: President and Vice Chairman, IN2 (Intertechnique)

Today: Could not be located

16 RANDY NAYLOR

1989: Founder and President, Northeast Data Systems

Today: Could not be located

17 RICHARD PICK

1989: Founder and President, Pick Systems, Inc.

Today: Deceased

Dick Pick passed away in October of 1994. Pick Systems was renamed to Raining Data in December, 2000, and Mr. Pick's vision lives on throughout the MultiValue market.

18 TED SABARESE

1989: President and Chairman of the Board, The Ultimate Corp.

Today: A partner in five restaurants and an air conditioning company in Ft. Lauderdale, FL

Ted Sabarese was featured in *Spectrum's* "Where Are They Now" series in the May/June 2004 issue featuring the original Microdata dealerships (you can read that article and more about Sabarese at www.intl-spectrum.com).

19 IAN SANDLER

1989: Director of PICK Development, Sanyo/Icon International

Today: Consultant, Florida

Ian Sandler, whose 30-year PICK career included employment at Bantam, Pertec, C. Itoh, Sanyo/Icon and GA, said he essentially had the same job at each company. "I was in charge of taking a vanilla copy of PICK and making it faster, more functional and more reliable."

Where is He Now?

As a consultant, Sandler works for large user sites whose PICK implementation is running too slowly, or for those having problems with interoperability issues.

Biggest Accomplishment in the PICK Market?

"Making the GA R91 release run faster than the comparable ADDS 7000 MOE version, even though the ADDS version was running on a much better hardware platform, and Dave Holle (the competition at ADDS) was really good. We basically proved what the Prime INFORMATION developers (Rod Burns et al) already knew. A well-written interpreter executes meta code faster than a compiled version of the same code. By the time we finished: I had Basic running nearly 10 times as fast on the same hardware platform as an unmodified Basic compiler."

20 JONATHAN SISK

1989: President and Founder, JES & Associates

Today: President and Founder, JES & Associates

Although Jon Sisk did not participate in our interview, we can confirm his whereabouts. In March of 2000, Pick Systems acquired all of the assets of JES. (Pick Systems was renamed to Raining Data in December of 2000). JES training services are now part of the Raining Data Education Center.

21 PAUL THOMPSON

1989: Chairman and Managing Director, Sanderson Electronics Plc.

Today: Involved in a number of companies in the U.K. and Australia

Paul Thompson founded the U.K.-based Sanderson Group with Philip Noden in 1983. He was Chairman of Sanderson Group Plc (which was quoted on the London Stock Exchange) until Sanderson was taken over in January 2000 in a £120 million deal. "The PICK system was a key element within the Sanderson success story," Thompson stated, and Sanderson became one of the largest PICK-based IT companies.

Where is He Now?

Thompson is involved in a number of companies and has a large shareholding in a MultiValue company in Australia.

When Thompson left Sanderson in 2000 he became chairman of West Bromwich Albion, the English League Soccer team. During his three-year period as chairman, he led the club to promotion to the Premier League and oversaw major development of the Club's stadium and its Football Development Centre.

Biggest Accomplishment in the PICK market?

"The development of the Sanderson Group into a £109 million revenue international business employing 1105 people in several countries."

22 JUDD VAN DERVORT

1989: President and Founder, Keystone Information Systems

Today: Still active in Keystone

Judd Van Dervort was featured in *Spectrum's* "Where Are They Now" series in the May / June 2004 issue featuring the original Microdata dealerships (you can read that article and more about Van Dervort at www.intl-spectrum.com).

23 WAYNE WAHLENMEIER

1989: VP and General Manager, Fujitsu Microsystems of America, Inc.

Today: Jupiter Systems, San Leandro, CA

Wayne Wahlenmeier started in the PICK market in 1980 when he bought the hardware assets of Pick & Associates with three partners and formed Evolution Computer Systems Corporation. He sold that company to a spin off of Addressograph-Multi-graph Corporation and joined Pick Systems as VP of sales and marketing. He left Pick Systems to join Fujitsu Microsystems of America as VP and general manager. Fujitsu then became a PICK licensee.

Where is He Now?

Wahlenmeier left the PICK market in 1990 to pursue an equity position in a

software company in San Diego. When that company sold, he joined Jupiter Systems as VP of sales and marketing. Jupiter builds computerized display wall controllers that are used in command and control systems. (Notable installations include NASA, IBM, Osaka Airport, Munich Airport and recently, the primary center for General T. Frank's command center in the Iraqi war.) Wahlenmeier also spends a lot of time in China, where he serves as the Chairman of the Board of Jupiter's Chinese subsidiary, Jupiter Systems China Limited, with manufacturing facilities in Shenzhen, China.

Most Interesting Job in the PICK Industry?

"Working for Dick Pick at Pick Systems!"

24 ROBIN WHITE

1989: VP and General Manager, Systems Division, ADDS/NCR

Today: Retired, living in Florida and New York



Robin White began in the MultiValue industry around 1980 as director of marketing for ADDS (Applied Digital Data Systems), where he developed the

plan to broaden its marketplace from computer video terminals into computer systems.

Banking on the strength of ADDS' current distribution channel of Microdata and Prime INFORMATION dealers, White approached Dick Pick with the idea of implementing the PICK OS on a micro-processor-based computer. ADDS' first product, the Mentor 4000, was introduced in the fall of 1980 at the COMDEX show in Las Vegas and began production deliveries in the spring of 1981. White became the VP and General Manager of the ADDS Systems Division.

In the early 80's, ADDS became a subsidiary of NCR Corporation and successfully incorporated NCR computer platforms as the Mentor 6000 series. In 1991, AT&T acquired NCR after an unfriendly and bloody takeover battle and White left the company at the end of that year.

Continues on page 22

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Where Are They Now?

Continued from page 21

Where is He Now?

In the early 90's White went to work in the turn-around of companies experiencing difficulties and their subsequent resale. In 1998 he returned to the MultiValue marketplace as president of Via Systems in Colorado Springs. While there, Via Systems introduced the UniVision environment, Via Duct and Web Wizard.

White retired from Via Systems in 2001 and now spends his time leisurely in Naples, Florida during the winter months and near the village of Canaan, New York in the Berkshires during the summer. "Not being a golfer, my biggest challenges these days are keeping deer, rabbits and woodchucks away from my flower and vegetable gardens," he said. White also spends time in real estate investment, development and management in both New York City and Florida, as well as philanthropic activities.

Biggest Accomplishment in the PICK Market?

"The opportunity to help develop ADDS Systems into a really successful business was a great and satisfying experience ... and I loved almost every minute of it."

25 BILL WULFF

1989: President and Co-founder, Laguna Software

Today: Owner, Orcas Net Inc., Eastsound, WA



Bill Wulff got his start in the PICK market in 1977 when a friend, John Peterson, introduced him to his brother, Paul, who was building hardware for Pick Systems. At the time, Wulff owned Irvine Fasteners, a fastener distribution company. In response to his desire to computerize that company, Paul Peterson and Wulff, together with PICK programmer Walt Morton, formed SUNMO, a PICK time-share company. Coincidentally, Wulff's fastener company was in the same industrial complex as Pick Computer Works and he got to know Dick Pick and the early developers of the PICK system. Pick would often bring people to Irvine Fasteners to

show a live application of the PICK system in a wholesale distribution environment. "In time I found that I was enjoying the systems part of running Irvine Fasteners more than the business itself," Wulff said.

Wulff sold the company and began consulting under the company name of Wulff & Associates, and in 1981 founded Laguna Software with partner, Steve Lambert. Laguna Software developed PICK-based wholesale distribution and accounting software and became one of the leaders in that environment.

Where is He Now?

Wulff left Southern California in the early 1990's, moving to Orcas Island, Wash., in pursuit of a more rural environment. Eventually, he and Lambert parted ways and Wulff started Orcas Net, Inc. in 1996. Orcas Net has a suite of software that supports financial planners in the security brokerage business associated with credit unions and banks.

Most Interesting Job in the PICK Industry?

"Clearly, the most interesting job is the one I'm doing now. The security industry (stock market, mutual funds, and insurance products) is complex and fast-moving." IS

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OpenInsight and OLE Controls

BY SEAN FITZSIMONS, REVELATION SOFTWARE

Since the release of OpenInsight 4.1 in August of 2002, OpenInsight has had the ability to use OLE controls within an OpenInsight form. This functionality has increased the developer's ability to provide their clients with rapid development application through the use of third party controls. No longer is the application limited to and limited by using only OpenInsight controls. As you may very well know, OLE controls provide the developer with the tools to use reusable components across applications. The need to create specific functionality per application or to copy source code from one application to the next is considerably decreased. Also, OLE provides the ability to use vendor-provided controls within an application. If one can exploit the use of pre-written objects, one should.

At first, OLE was the use of linking and embedding objects from one application within another application. As time passed, the functionality increased and names changed. VBXs (Visual Basic Extensions) were created for use with VB. These evolved into OCXs (OLE Control Extensions), and then evolved into ActiveX controls. All of these technologies were then rolled into one name, COM objects. Regardless of the name, the purpose of these objects has always been for cross-application communication.

With this article, I hope to convey the ease of adding and manipulating OLE controls within OpenInsight windows with a step-by-step guide.

STEP 1: Adding OLE Controls to an OpenInsight Form

The OpenInsight Form Designer is the tool to use when adding OLE controls to an application. The Form Designer can be accessed via the Tools menu in the OpenInsight Application Manager.

In an active form, you can add a control by selecting the OLE Control button on the Control Tool Bar and placing the control on the form.

The control, when initially placed onto the form, is just an empty gray control.

FIGURE 1. OpenInsight Control Tool Bar

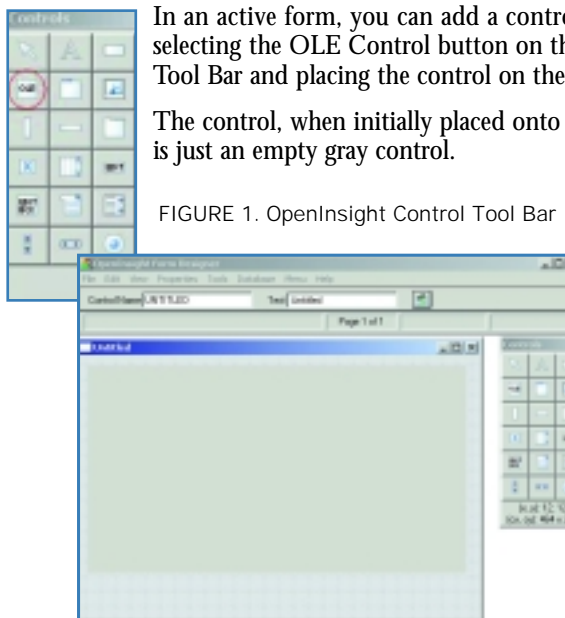


FIGURE 2. OpenInsight OLE Control placed on form.

In order to bind the OpenInsight control to the OLE control, access the control's property dialog via the Properties menu, and enter the OLE Control Class. The OLE Control Class can be either a class name or a URL. The default OLE control in OpenInsight is a browser control; therefore, if the developer enters a valid URL the control will display that URL. The Class name can be determined by accessing the OCX's Registry entry in the Windows OS. This example will be using the Microsoft Calendar control. For this control's class name, the Version Independent ProgID defined in the Registry will be used. The ProgID could be used but, if the calendar version changes in the OS, there may be a need to revisit the design of the application and redeployment may be necessary. If the version-independent ID is used, then revisiting the design is only necessary when the ProgID changes, not the version.

Continues on page 24

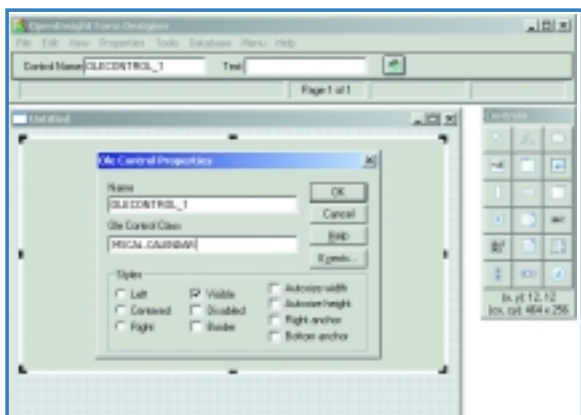


FIGURE 3. OLE Control Properties

The control is now ready for use. The developer can set and get properties, execute methods and capture events.

STEP 2: Getting and Setting Properties

The OpenInsight `Get_Property` and `Set_Property` commands can be used as one would normally use them in OpenInsight.

SYNTAX OF COMMANDS

`Get_Property` Command Value = `Get_Property(CtrlEntID, property)`

`Set_Property` Command lastValue = `Set_Property(CtrlEntID, property, value)`

The `CtrlEntID` or Control Entity Identifier is a variable that contains the fully qualified control name. The fully qualified control name is the window name followed by a period followed by the control name. The `CtrlEntID`, as well as the property, must be in uppercase and quoted. For example, the window name is `MY_OLE_CALENDAR` and the control name is `OLECONTROL_1`, therefore `MY_OLE_CALENDAR.OLECONTROL_1` is the fully qualified control name.

EXAMPLES OF USE

To determine the selected day, issue the following `Get_Property` command:

`SelectedDay = Get_Property('MY_OLE_CALENDAR.OLECONTROL_1','DAY')`



FIGURE 4. Calendar Control

Based on the figure above, the value of `SelectedDay` will be 1.

To set the day to a different day, issue the following `Set_Property` command:

`PriorValue = Set_Property('MY_OLE_CALENDAR.OLECONTROL_1','DAY',7)`

This will change the day to the 7th.



FIGURE 5. Calendar Control Date Change

If any property of the OCX contains the same name as an OpenInsight property, then to access the OCX's property the property must be prefixed with 'OLE.'. For example, all OpenInsight controls have a `BACKCOLOR` property. The `MSCAL.Calendar` control also has a property called `BACKCOLOR`. To distinguish between the Calendar and the OpenInsight property, the Calendar's property would be prefixed upon the call.

`BackColor = Get_Property('MY_OLE_CALENDAR.OLECONTROL_1','OLE.BACKCOLOR')`

STEP 3: Accessing Methods

The OpenInsight `Send_Message` command is used to access an OLE control's methods.

SYNTAX OF COMMAND

Status = `Send_Message(control,method,param1,param2,param3,param4)`

EXAMPLES OF USE

Status = `Send_Message('MY_OLE_CALENDAR.OLECONTROL_1','PreviousMonth')`

Status = `Send_Message('MY_OLE_CALENDAR.OLECONTROL_1','NextMonth')`

These commands could be placed within the `CLICK` event of separate buttons, and then by clicking on the buttons one could navigate through the calendar by month.

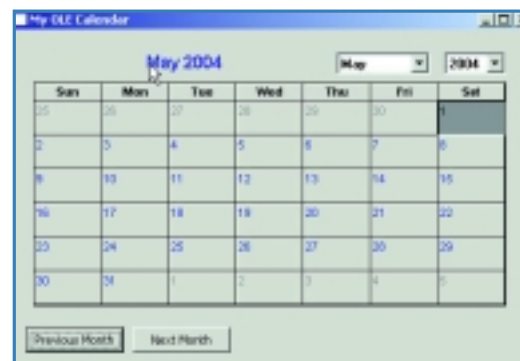


FIGURE 6. Calendar Control Method

STEP 4: Accessing OLE Events

The OLE Control contains two (2) event handlers: OLE and WINMSG. The OLE handler is used to capture the OLE events and the WINMSG handler is used to capture windows messages.

To receive Ole Events, the QUALIFY_EVENT Send_Message message is used.

SYNTAX OF COMMAND

```
Status = Send_Message('MY_OLE_CALENDAR.OLECON-  
TROL_1', 'QUALIFY_EVENT', OleEvent, Qualifier)
```

OleEvent is the name of the OLE event to receive. This may be either a type library name or a DISPID number. A zero length ("") OLEEvent name is treated as the special case of "All Ole Events" and can be used to receive all OLE events.

The Qualifier is a list of seven parameters defining how the event should be qualified.

Param<1>	Set or clear the event. If true, the event is set, if false (or just not passed) the event is cleared. Valid for all event types (not just OLE events).
Param<2>	The fully qualified event handler. This specifies the specific event handler to be called and avoids the overhead of the system determining the proper event handler at runtime. This parameter is optional and is valid for all event types.
Param<3>	The OpenInsight event name. This can be used instead of Param<2> and specifies the event name to handle this event allowing OpenInsight to determine the fully qualified event handler at runtime. This parameter is optional and is valid for all event types.
Param<4>	Execute synchronously. If true, the event is executed immediately when the event occurs. If false, the original behavior of scheduling the event handler to be executed sometime "real soon" is used. This parameter is optional and is valid for all event types.
Param<5>	Suppress the name parameter. If true, the OLE event name is not passed to the event handler. If false, the default behavior of passing the event name as the third parameter of the event is done. Optional and only valid for OLE events.
Param<6>	Pass the event dispid. If true, the OLE event dispid value is passed. If false, the default behavior of not passing the event dispid value is done. Optional and only valid for OLE events.
Param<7>	Single parameter option. If true, all of the OLE event parameters are passed as a single field mark delimited parameter to the event handler. If false, the default behavior of passing each OLE event parameter as a separate event handler parameter is performed. Optional and only valid for OLE events.

EXAMPLES OF USE

For this example, intercept the DblClick event of the Calendar control. In order to qualify the event, the Send_Message command should be placed into the Create event of the form MY_OLE_CALENDAR. Event handlers within OpenInsight can be accessed via the Edit Events option on the Properties menu of the Form Designer.

```
declare function Send_Message
```

```
OleEvent = 'DblClick'
```

```
Qualifier = "
```

```
Qualifier<1> = 1 ; * Set the Event
```

```
Qualifier<4> = '2' ; * synchronous execution
```

```
Qualifier<7> = 1 ; * single parameter
```

```
status = Send_Message('MY_OLE_CALENDAR.OLECON-  
TROL_1', 'QUALIFY_EVENT', OleEvent, Qualifier)
```

When the double click occurs the OLE control's OLE event is then triggered and whatever code is in the OLE event handler is executed.

In the OLE Control's OLE event handler the following code is placed:

```
declare function Dialog_Box
```

```
if eventName = 'DblClick' then
```

```
    selectedDate = Get_Property(CtrlEntId, 'Value')
```

```
    /* CtrlEntId = name of control, Value return dd/mm/yy */
```

```
    status = Dialog_Box("TO_DO_LIST", @window, selectedDate)
```

```
    /*call the To Do List window passing in the selected date */
```

```
end
```

The following sequence occurs:

Double click on June 15th and the To Do List for the 15th is displayed.

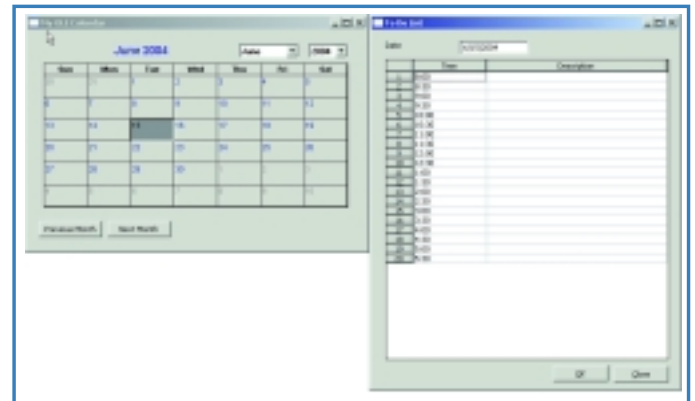


FIGURE 7. OLE Event Handling

The next release of OpenInsight, version 7.1, will contain improvements to OpenInsight's use of OLE controls. Currently, control properties are only accessible in runtime mode. In OpenInsight 7.1, the properties will be supported in development mode and the property sheet will be exposed to the developer in the Form Designer.

OpenInsight uses other common controls within the product, such as Microsoft's RICHTEXT.RichtextCtrl, which is a rich text edit control and ComponentOne's VSPRINTER, which is the backbone of the OpenInsight Printer Interface (OIPI).

The use of OLE controls in OpenInsight provides the developer with the opportunity to extend their application beyond OpenInsight's borders and cut down on development time. We have only scratched the surface of using OLE in OpenInsight but hope your appetite has been whetted for more. [is](#)

Standards, Compliance and Jail, *oh my!*

BY SUSAN JOSLYN

1 Not all bad, you know. The fact that the Sarbanes Oxley Act (and other regulatory agencies) have come up with new rules for the game can actually be good news for the players. All of the players. But let's forget about managers and bean counters for a change and talk about us. IT. Is all of this regulation going to make our lives harder and our jobs more tedious? Not necessarily. If we're running more efficiently and producing better results, a lot of good things will cascade from there. (Happy users, happy bosses, bigger budgets, longer lunch hours.) And now we have a lot of help to get "better".

One of the things that came about as part of the Sarbanes-Oxley Act (SOX) is an almost off-hand endorsement of the COSO framework. COSO isn't new, but all of a sudden its ... well, almost *trendy*. For the past 18 years, COSO (The Committee of Sponsoring Organizations of the Treadway Commission) has been the accepted framework for implementing internal controls for financial reporting.

In 1992 COSO issued a groundbreaking report entitled Internal Control-Integrated Framework, which identified the establishment of internal controls as a means for helping a company achieve numerous objectives. The objectives include achieving its performance and

profitability targets, preventing loss of resources and ensuring reliable financial reporting. The reason this report has become entwined with Sarbanes-Oxley is its assertion that internal controls help ensure that the company complies with laws and regulations, avoiding damage to its reputation and other consequences. Many companies used this report as the basis for their immediate response to Sarbanes-Oxley.

There is a tremendous amount of data that must be monitored to make sure the financial statements are accurate. It is a given that IT will be relied upon to collect, store and compile this data from all areas of the company and transmit it to the appropriate people. IT processes and technology, however, are not addressed by COSO. Enter CobIT—Control Objectives for Information and related Technology. CobIT is a guideline/ framework that was first developed in 1996 by the Information Systems Audit and Control Association (ISACA). It is now developed and published by the IT Governance Institute. It takes the framework concept and the idea of "control objectives" from COSO and applies it to IT processes specifically.

CobIT is relatively small in size and attempts to be both pragmatic and responsive to business needs while being independent of the technical IT platforms adopted in an organization. It takes into account pretty much everything that IT needs to consider. It brings a cohesive and thoroughness to all those ideas and demands that are currently spinning around in our collective IT heads that we're feeling so much pressure to get a better handle on. We can look to cobIT for a guideline, a standard, a mentor. CobIT's "good practices" are a consensus of experts. Good practices will help optimize information investments and will provide a measure to be judged against when things do go wrong.

Like any good checklist, the cobIT framework begins by breaking down the overall task into more manageable chunks. It does this by grouping IT processes into four domains and addressing these by 34 "high-level control objectives". Each of those control objectives is then further broken down by specific goals and requirements.

The "framework" itself is a publication of these control objectives. It is simple and straightforward and practical and clear. Then the very best part of cobIT is the "Management Guideline" published as Appendix I of the Framework itself. These three pages alone are worthy of the IASCA membership dues! These guidelines are generic and action-oriented for the purpose of answering the following types of management question: How far should we go, and is the cost justified by the benefit? What are the indicators of good performance? What are the critical success factors? What are the risks of not achieving our objectives? What do others do? How do we measure and compare?

An IT control objective is a statement of the desired result or purpose to be achieved by implementing control procedures within a particular activity. The 34 high-level control objectives are grouped into four domains: 1) planning and organization, 2) acquisition and implementation, 3) delivery and support, and 4) monitoring.

In addition, corresponding to each of the 34 high-level control objectives is an Audit Guideline to enable the review of IT processes against cobIT's 318 recommended detailed control objectives to provide management assurance and/or advice for improvement.

The framework begins by defining a set of principals that impact quality, fiduciary requirements and security requirements. These principals are effectiveness, efficiency, confidentiality, integrity, availability, compliance and reliability. There is firm definition of each early in the framework along with the definition's "primary" and "secondary" impact. IT Resources are also identified as people, applications, technology, facilities and data.

Now, with that as a foundation, each of the high-level control objectives is presented in terms of its impact on the stated principals (which are primary and secondary in relation to the particular objective) and its applicability to the stated resources—all in a standardized format.

It does take a little study to get the hang of it. But be assured that a few minutes' investment will be rewarded with a dawning recognition of the raw grace of the document. Something that has seemed large and vague and fuzzy and just plain hard has been boiled down to its base elements and defined in a way that is irrefutable in its simple correctness.

Let's pick a control objective and look at it more closely. "DS2" appeals because it's simple and universal. It is in the "Delivery and Support" domain and is titled "Manage third-party services". Its primary impact is on effectiveness and efficiency. The high-level control objective DS2 reads like this:

Control over the IT process of Managing third-party services

That satisfies the business requirement To insure that roles and responsibilities of third parties are clearly defined, adhered to and continue to satisfy requirements.

Is enabled by Control measures aimed at the review and monitoring of existing agreements and procedures for their effectiveness and compliance with organization policy

And takes into consideration

- *third-party service agreements*
- *contract management*
- *non-disclosure agreements*
- *legal and regulatory requirements*
- *service delivery monitoring and reporting*
- *enterprise and IT risk assessments*
- *performance rewards and penalties*
- *internal and external organizational accountability*
- *analysis of cost and service level variances*

The audit guidelines for this control objective are very detailed. An excerpt of this guideline appears in the box at the right.

Admittedly this is getting ... well, controlling. And that is only one page of the audit guideline for DS2 (there are several). Still, it's a simple bulleted list. And each step is plainly stated. It's easy enough to cross off the ones that don't apply to the particular situation. It's a guideline, a checklist, and a reminder that is thorough and simple.

If it's time for your IT organization to improve its practices (and, well ... it is time), cobIT is going to be your new best friend. is

[Much of this information comes directly from the cobIT publications from the IT Governance Institute. Information and membership can be obtained at www.isaca.org]

**AUDIT GUIDELINE,
CONTROL OBJECTIVE DS2**

Both high-level and detailed control objectives are audited by obtaining an understanding by:

Interviewing:

- Chief information officer
- IT senior management
- IT contract/service level administrator
- IT operations management
- Security officer

Obtaining:

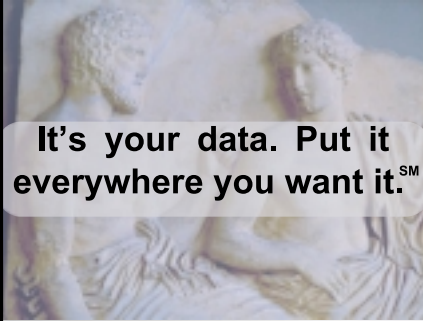
- Organization-wide policies and procedures relating to purchased services and, in particular, third-party vendor relationships
- IT policies and procedures relating to: third-party relationships, vendor selection procedures, contract content of such relationships, physical and logical security, quality maintenance of vendors, contingency planning and outsourcing

- List of all current third-party relationships and actual contracts associated with each
- Service level reporting related to third-party relationships and services
- Minutes of meetings discussing contract review, performance evaluation and relationship management
- Confidentiality agreements for all third-party relationships
- Security access listings with profiles and resources available to vendors

Evaluating the controls by:
Considering whether:

- IT policies and procedures relating to third-party relationships exist and are consistent with organizational general Policies
- Policies exist specifically addressing need for contracts, definition of content of contracts, owner or relationship
- manager responsible for ensuring contracts are created, maintained, monitored and renegotiated as required

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BY TONY GRAVAGNO

WEB SERVICES AND .NET, PART 4, EXAMPLES

Part 3 of this series, "MultiValue Toolkits,"

profiled software to help MultiValue developers

implement Web Services with existing

applications. In this fourth and final

installment of this series, you'll find

real-world examples of Web Services in the

MultiValue world and elsewhere. Once

again, I'll occasionally abbreviate "Web Ser-

vices" as simply "WS", and I have asterisks*

to indicate more material is available at

<http://NebulaRnD.com/Spectrum>.

There are lots of WS implementations in the non-MV world, but alas, I've found very few in our MV world ... so far. This is what sparked my interest in doing this series—to inform and encourage developers to add value to their software using popular technology. I hope these examples get your creativity flowing as you see how Web Services might benefit you. Please feel free to contact me to brainstorm ideas for your environment.

Financial Industry

Patrick Payne works with Sierra Pacific Mortgage (SPM), with over 600 users running on D3 Linux and D3 AIX. SPM exchanges data with trading partners for loans, credit reports, flood certification, property searches, etc. Like many companies, some of its trading partners set up Web pages for SPM employees to input data to their systems, but now they're migrating to .NET-based Web Services solutions. Payne explains how this evolved: "We have an underwriting application that proxies a vendor's Web page into our application. The customer sees the vendor's page in my page, but all submits are to my PICK server which pulls all the variables and re-queries the vendor's Web site using cURL*. The HTML response is then grabbed by PICK, the page is modified slightly and then merged into my Web page. My vendors were at first amazed, and then after some more explanations, realized the potential of what I was doing if the process was simplified. This is why we are now working with them to build an integrated SOAP version." Note that the servers are doing all the communication, and the end-user clients are communicating with their MV server with a browser interface. The end-user has no idea how many servers are involved in their request processing—a fundamental premise of Web Services.

Payne shares some lessons about his deployment experience: "The first thing you quickly learn is that SOAP is just a packet transfer routine and what it transfers is up to you.* The biggest issue I run into with other vendors is that they are using packaged tools that attempt to define the internal structure of the SOAP call for you. The best thing is, I've been able to keep up to pace with some pretty knowledgeable .NET programmers and we have

not run into any incompatibilities. In fact, they tried to do this project with other 'more modern shops' but have had much more luck with me."

"We have seen a huge Return On Investment," Payne continued. "As a PICK company we have been able to implement services much faster than any of our competitors. Many vendors are starting to come to me to build their SOAP plug-in tools."

Medical Applications

Capillary freeware was profiled in my last article. Steve Lake, author of Capillary, explained how that Web Service interface to D3 is being used.

"Kelvin is a Measurement Data Archive system," Lake explained*. "Vital signs from patient monitors are captured by a PC and then sent using WS to the archive. A Web browser can access these measurements using WS to reconstruct the signal. The PC acts as a translator for the semantics of the patient monitor interface and Kelvin holds measurements in an abstract format, with a dictionary used to describe what the measurements represent. This allows it to be configured to accept new patient monitor formats."

Lake continued to say: "AMREX is a clinical information system that holds details of patient episodes concerning the anesthesiologist*. It covers all interactions from Pre-Op Assessment to Post Op follow-up. It has Kelvin embedded to handle the patient monitor side. The interface is totally Web-based and communicates via WS. The main point is that the WS interface to Kelvin allowed us to use it inside AMREX."

(In an e-mail interview, Lake provided some interesting technical and personal insight* into the deployment of Web Services. You can read more about it at <http://NebulaRnD.com/Spectrum>.)

Regional Affiliates

Nebula R&D clients are mostly VARs. They have their own clients who present them with special needs. The VARs come to Nebula to satisfy those needs transparently and behind the scenes.

One such client is Realtime Software Corporation* (RSC), specializing in Multi-Value business and manufacturing control software. (Because some releases could not be obtained, a few alias names are being used for end-user companies.) One of Realtime's clients, XVehicles, manufactures

specialty trucks and service vehicles. They have regional distributors who take orders for custom-configured vehicles, and the orders must then be sent to a corporate office for processing. Nebula R&D wrote a Perl-based WS client, which is invoked from the Realtime application. It logs into the XVehicles server with a user ID and password, sends order data, and gets a receipt in the response.

Paul Ridgway of Realtime Software comments: "In the past, the distributors would have to sign into the corporate website and type in the purchase order, which was a very tedious duplication of effort. Now, in a matter of seconds after the user creates a purchase order in our application, the data is posted directly into the vendor's order system and the dealer has confirmation. If anything is wrong, the user can review the errors and resubmit the order. Development in D3 was extremely simple with the interface Nebula created interface for us."

Transactions are processed by end-users directly from a purchase order entry screen to the remote server, but it was designed so that the user session is not hung if the remote server is down. Transactions that

continues on page 30

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Web Services

Continued from page 29

can't be processed immediately are queued. Perl was chosen for development because it is cross-platform and easy to support. The code was written and tested over Windows even though the Realtime applications at XVehicles all run over Linux. Prior to this experience, Realtime had never dealt with Perl. Today they are able to install the entire interface to new turnkey environments with no assistance from us.

Big Customers Drive Change

Another interface Nebula created for Realtime shares some code with the XVehicles interface. A large and well-known computer company, anonymously referred to here as BigCo, conducts business with a large number of trading partners. One of BigCo's vendors, also anonymously referred to as SupplyCo, uses the Realtime business application package to process hundreds of new transactions per day with BigCo, in addition to its other clients. BigCo needed to know when SupplyCo receives and ships stock, and even when hardware moves through various stages in the vendor's processing plant. Realtime easily tracks inventory, so Nebula was responsible for inbound and outbound communications with the application, totaling several thousand messages per day.

In this mission critical environment, timing is everything. According to Paul Ridgway: "If an order is issued from BigCo to our customer's application as late as 7:45pm, they must ship that order out the same day. Picking tickets are printed less than 10 seconds after the order is released from BigCo. Our customer is shipping several hundred overnight parcels a day to individual addresses with no margin for failure. All of these orders get fed into Realtime from XML purchase orders with no operator intervention."

BigCo has standardized on the WebMethods B2B server for its XML communications. Another provider was contracted for the WebMethods connectivity between BigCo and SupplyCo, and Nebula provided the connectivity from the WebMethods server in SupplyCo to D3 Linux with the Realtime software. Interfacing with this system wasn't a problem after we understood the specific XML to and from WebMethods. FlashCONNECT* is used as the data conduit from WebMethods to D3, and cURL is used for outbound connections from D3 to WebMethods and other intranet processes.

Ridgway comments: "We have been extremely pleased with the FlashCONNECT product which can receive hundreds of XML transactions in a matter of seconds. In over a year of running live, D3 and FlashCONNECT have performed flawlessly."

Tiered Services

In his recent articles on SmartPhones in *Spectrum* magazine, Nathan Rector profiled devices that both compute and communicate. Between the device and the software application you may find one or more Web Services. If you're wondering how to connect PDAs or smartphones to your system, consider Web Services. Try not to think of connectivity as a direct pipe from a device to a server. You can use one WS from the client to your public Web server, one from there to your MV application, and another WS client from your MV application to other applications. With this architecture, you can make any device render data from many sources.

Mainstream Examples

In the non-MV world there are innumerable examples of Web Services, and more coming on-line every day. Here are some examples (see the links <http://NebulaRnD.com/Spectrum>):

The "Big Three" are currently Google, Amazon and eBay. These companies are now seen as more than product and service providers, but as "platforms" supporting a new generation of Internet killer apps.* See the link to an article for comparing and combining the services on my web site.*

The Microsoft MapPoint Web Service* allows developers to incorporate location-based services into applications and business processes. The interface uses SOAP, and of course can integrate directly with .NET, but doesn't necessarily need to.

CRM solutions provider Salesforce.com provides the "sforce" WS development tools to make its data and applications available as components in external applications. This is a great example for MultiValue VARs of a business application being extended for use by other applications such as Intuit QuickBooks and Microsoft Business Solutions Great Plains*.

Other public services are available* and listed at XMLRPC.Com, XMethods.Org, and other sites. Examples include a tourist operator interface for Prince Edward Island; Conversant information management groupware; a utility to distribute per-user customizations among a network of Web servers; and Syndic8 which catalogs over 4500 sources of syndicated news headlines.

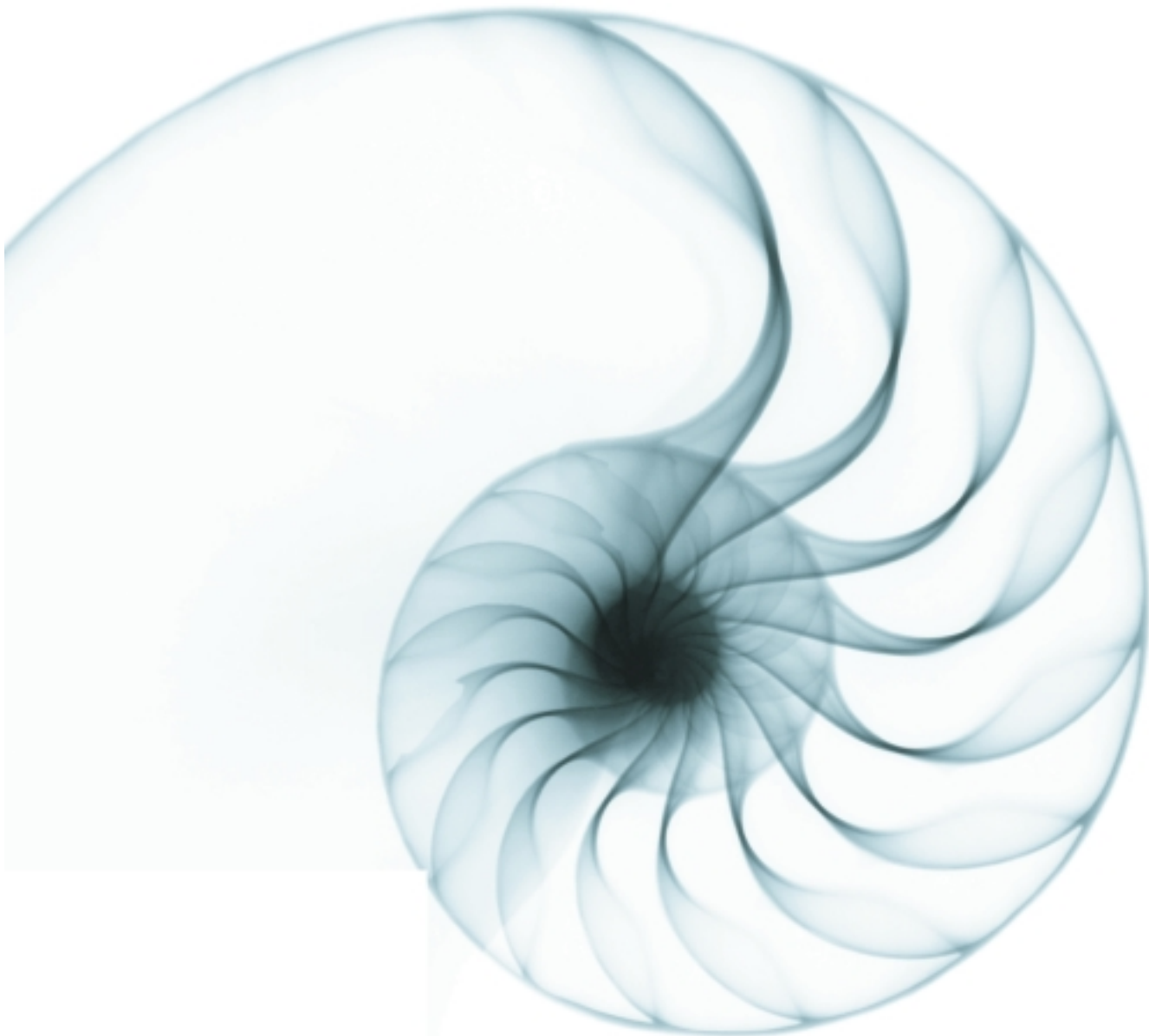
Should You Deploy Web Services?

Most sites can benefit from Web Services if there are multiple applications running over a network, or if there is a need to provide access from one software module to different user and program interfaces. Deploying publicly accessible services requires caution and some expertise to prevent intentional or accidental abuse. A site that is too small, or not prepared to work through security and stability requirements, should probably not deploy.

However, consumers and other paying clients will be asking for Web-based services from providers of all forms of products, services and application software. We are already seeing the demand, and larger companies are positioning to benefit. Even smaller systems have data and functionality that may be useful if extended for new purposes. You are encouraged to analyze your software assets, and check with your users and trading partners to determine if remote application access via Web Services will be of benefit. is

T O N Y G R A V A G N O is founder and chief software architect of Nebula Research and Development, specializing in software and services, including Web Services and .NET integration. Tony has been involved with the PICK market for over 20 years and has held the titles of QA Manager at Pick Systems and DBMS Product Manager at Raining Data. All articles are available on-line with notes at <http://NebulaRnD.com/Spectrum>.

Feel free to contact him with requests for more articles of interest to the MultiValue community.



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Alan Godby - Product Director - Evolve 360 Pty Ltd



MARTIN MEIER
Managing Director, MBS

Meier Business Systems to Provide MITS Support Down Under

Management Information Tools, Inc., (MITI) and Meier Business Systems (MBS) announced an agreement establishing MBS as a premier provider of MITS maintenance, support and upgrades in Australia, New Zealand and South East Asia. Under the agreement, MBS will provide first and second line support to MITS customers and resellers throughout the region.

MITS (Management Information Tool Software) is the leading MultiValue online analytical processing/business intelligence (OLAP/BI) tool that offers advanced dynamic and interactive data reporting. MBS is a leading supplier of MultiValue products including MITS, IBM's UniVerse/UniData (U2) and System Builder (SB) product family in Australasia.

"The MultiValue market in Asia Pacific is very active, and developing customer relationships in this region is an important part of our overall business strategy," said Fred Owen, MITI's General Manager. "MBS is the right partner for MITI, with an experienced, professional team and a stellar reputation for outstanding customer support. They will enable us to broaden our reach, deliver much needed

data reporting solutions and consulting to this market, and ultimately succeed in the Asia Pacific region."

"We are proud to have MITI as our partner, and to add the support of its

Continues on page 33

[Letters]

Dear Editor:

I enjoyed glancing through this issue and came to "The Dirty Dozen" ["Where Are They Now" article in the May/June issue-ed] and noticed that you could not reach Joe Apprendi, who was my partner in Concept Systems Inc. from 1974 to 1989. Joe is currently president of IT Resources in Vorhees, NJ. Joe's company is doing retail industry systems, as CSI had done.

When Joe and I first started CSI in late summer of '74, we set our goals and almost immediately went out to Microdata and looked at the then-forming Reality. The whole technical concept by Dick Pick was appealing, although he and Microdata's management were already at odds. We ordered one through Ted Sabarese's original dealership (if I remember correctly), and received Microdata Reality serial #55. When we got the machine, there was no Basic, just "Batch" to input, calc, and post, and "English" to report. "Proc" was where Batch strings ran from. And there was the Assembler and Edit.

We got a Ken Simms' version of "SBasic" from a tape marked for "the Fish Bowl" (Microdata's demo area), for which there was a photocopy of the computer printed notes on what it was. We wrote our first application package using that, and put it into production in about three months, replacing a batch NCR Century computer with several online terminals and a couple of printers to our Reality, strung via a leased line telecom set-up. It worked, we could write applications fast and easy, and it had the unlimited potential of up to 32 terminals. Well, maybe if they were not all being used at once. Eventually the Tom Ellis version of Basic came to us. The greatest breakthrough in writing Basic on Reality came when you could read an item and break it apart (and write one, too), rather than only being able to read or write a value. Or maybe the big thing was having more than one file open. Or, ...

We eventually became a pretty substantial systems company with our products primarily based on PICK systems (or MultiValue-whatever you prefer to call it) from Microdata, Ultimate, IBM, and others. The death of CSI was several years after it was acquired by UniQuest and UniQuest's quest to create a new generation of applications written in C. The job was bigger than they thought, apparently. Thankfully, I missed that part of the history.

You accurately describe the dealer/reseller scene. We had substantial hardware margins, in the low 40's percent range, and that made the total gross margin of the hardware/software/services deal pretty substantial. We generally sold larger machines, so the hardware "pop" was pretty good. We had good financial years and not-so-good years, but none of the fault was the hardware margin; mainly just our zest to promise more than we could deliver to our customers in a given time. I suspect others suffered that pain as well.

Continues on page 34

new products

FusionWare Introduces Web Services Designed For Legacy Systems

FusionWare Corporation, a leader in open data access and intelligent integration products, announced the launch of the fully scalable FusionWare Integration Server—an affordable Web Services development and deployment environment.

Designed using open standards, the FusionWare Server can run on all major platforms and operating systems. It enables existing IT staff to build business applications in days as opposed to weeks or months, and eliminates the need to outsource development to expensive consulting firms. The result is a significant reduction in total cost of ownership—enabling resource-constrained companies to quickly integrate dissimilar systems, easily collaborate with partners and customers and innovate to improve their business performance.

According to Ron Schmelzer, senior analyst for Zapthink, an IT market intelligence and research firm that provides critical insight into Web Services, “The FusionWare Integration Server offers a compelling proposition for firms searching for a more affordable and easier way to build Web Services and SOA-based applications. With a compelling forms-based IDE including an XPath generator, query builders, XSLT wizard and backend adapters, the FusionWare Integration Server is a good choice for organizations who want to maximize their investment in their legacy systems. Users are able to build innovative business processes easily and quickly to drive their competitive advantage, while creating the foundation for a Service Oriented Architecture for the future.”

“It is repeatedly demonstrated that many companies wildly underestimate the true cost of Web Services adoption. In most Web Services projects, the cost of implementation plus the cost of

change and support far exceed the total cost of software, making Web Services an expensive proposition for many organizations,” said Alan Davis, FusionWare CEO. “With our product, customers are able to build robust Web Services applications rapidly and cost-effectively themselves, without the need for outsourced consulting services. This reduces the expense of implementation and support and decreases considerably, the Total Cost of Ownership.”

The FusionWare Integration Server was designed specifically for companies with small to midsized IT departments, having to manage complex environments containing a mix of different hardware, operating systems, databases and applications. Typically, their business programmers/analysts are highly skilled in legacy business systems, and need to adapt quickly to the latest development technologies that are required to build and deploy Web Services. The FusionWare Integration Server facilitates this process, helping

break down the barrier to Web Services adoption with three components:

- The FusionWare Designer: An intuitive, forms based GUI interface, powerful code generators, wizards, query builders and built-in adapters, packaged in a powerful Windows and XML based development environment.
- The FusionWare Server: A fully multi-threaded and highly portable server written in JAVA that executes Web Services on all major platforms.
- The FusionWare Administrator: Monitors and manages the operation of the server and controls deployment of Web Services.

Pricing and Distribution

The product is being sold in the US, UK and Asia/Pacific markets through both direct and indirect channels. “All in one” pricing is available starting under \$50,000, as well as an affordable quick-start package.

www.fusionware.net

Continued from page 32

world-class OLAP/BI products to our portfolio,” said Martin Meier, Managing Director, MBS. “MITS complements our core product and service offerings and provides our reseller network with an excellent opportunity to also add value to their end-users. We feel confident about this agreement because of MITI’s innovative next-generation technology and strong

commitment to support and service.”

MBS has been selling the MITS product for many years as an IBM distributor. It has now been appointed by MITI to provide maintenance, upgrades, support and troubleshooting services directly to any MITS reseller or user in Australia, New Zealand and South East Asia. In addition to using MBS as their source for MITS products, customers now have the expanded option of using the MBS

support team as their local source for MITS support, maintenance and upgrades.

“MBS has a long-standing record of providing first and second level support and consulting services to the MultiValue community in the Asia Pacific region,” Owen said. “With its existing support infrastructure, experience, and in-house technical skills, this new support partnership is a natural fit for MBS and solidifies its position as the regional MITS expert.”

In 2001, having been a successful IBM hardware and software Business Partner for almost 10 years, MBS was appointed by IBM as a distributor for all U2, MITS, SB, RedBack and associated products. Shortly after that, MBS acquired the Australian SB Tech U2 and SB distribution business. As an integral part of the ongoing delivery of product and support in the region, MBS provides product licenses, support,

Continues on page 34

newsmakers

Continued from page 33

maintenance, education and many other products and services to its vast reseller network and end user community.

MBS has held a number of road shows and events around Australia showcasing MITS. Meier explained: "We hope to encourage the majority of our resellers to integrate MITS as a value-add into their application. This is already in progress with the Masterpack distribution and warehousing application packages – a leading ERP solution developed in UniVerse and SB+."

For more information, contact Fred Owen, MITI, (206) 789-8313, fred@mitsonline.com or Martin Meier, Meier Business Systems, 011-613-9571-3111, martin.meier@mbs.net.au

PRC brings Sarbanes-Oxley Readiness to MultiValue IT Industry

SJ+ Systems Associates has stepped up its security, auditing and reporting capability to provide immediate compliance with Sarbanes-Oxley requirements. PRC, the software tool from SJ+, will now offer more control over what is audited, including data elements and additional reporting capability.

"Most of the compliance requirements of Sarbanes-Oxley are addressed by the

software when PRC is installed," remarked SJ+ President Susan Joslyn. "The first thing auditors want to see is the framework with established processes. With PRC, as soon as you've set up the first few configuration screens, the documentation is in place, along with the procedures—if only roughly—and the rules to support and audit those procedures."

In addition to configuration management, PRC includes problem reporting, project management change control/source control (all levels, including data), deployment (with rollback) auditing, compliance reporting and test management.

Joslyn cautions that this isn't just for large financial enterprises. "With Sarbanes-Oxley and other regulatory challenges, even a small vendor who does business with a large enterprise that's governed by these regulations could be required to provide the same level of reporting."

PRC was designed for high levels of scalability, allowing customers to start small and grow their compliance as they develop their own "best practices" for addressing metadata issues.

For information, contact SJ+ at 954-796-9868, info@sjplus.com, or <http://sjplus.com>.

The dealer gatherings were memorable. You got to meet your industry peers, as well as the vendors' under-the-hood people, in an exotic place, in a gathering designed to be fun for the entrepreneur and their spouse, and maybe a key associate or two. The tax implications were simpler then, the business was pretty good, and the relationship between us all was pretty good.

I could tell you stories about some of the dealers, but they've paid me to keep quiet. Or threatened me. So, contact my friend Joe and get up to date on him. He'll likely have a different take on it all than I do. And he'll have better stories. Who's going to threaten Joe?

Continued best wishes and thanks for keeping the flame lit through all these years.

- Chuck Thomas

Editor's Note: Thanks to Chuck, we were able to contact Joe Apprendi and hear his side of the story as well. We appreciate the continued effort by our readers to inform us about anyone we refer to as "missing in action" through the ongoing "Where Are They Now" series. The response from Joe Apprendi follows:

Dear Editor:

I really enjoyed the article on the old "PICK Gang" and learning where the other original dealers are today. It brought back a lot of memories, most of them good, about the early growth and travails associated with PICK and Microdata.

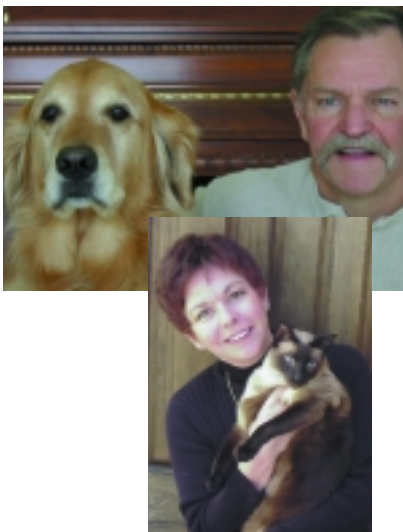
[As Chuck said], we did enjoy terrific hardware margins during the early Microdata era. We used to make great deals on the software to get the hardware/operating systems margins from our customers. Later as hardware became more of a commodity, we were giving the hardware away to sell the software, which is pretty much the business today, so much so that our current business at IT Resources is all software and services.

There was a whole lot of enthusiasm in those early days and most of the dealers were out in their respective markets selling Microdata and PICK with a missionary's zeal. The dealer meetings, in the beginning with Microdata and later with Ultimate, provided the forum we needed to exchange ideas, lobby for better margins and generally raise hell. As far as the camaraderie, craziness and stories associated with those gatherings, I'll invoke Las Vegas' current advertising slogan "what happens here, stays here."

Our current software is not PICK or MultiValue-based, (we quit fighting the tide), and are more mainstream. Having said that, there are a number of old PICK professionals in my current company who lament that the development and database tools we use today, although well-accepted in the marketplace, are far inferior to the sophistication and ease of use/implementation PICK provided.

Again, thanks for the memories.

Regards, Joe Apprendi



UniVerse and UniData Hashed FILES

Part 3

BY JEFF FITZGERALD AND PEGGY LONG

Resizing to Maintain Optimum Performance

In the first two parts of this series we described the mechanics of hashed files and defined the vocabulary used to discuss them. “Modulo,” “type” and “separation” were explained in terms of their effect on file allocation. We devoted the entire second part to “overflow” – the condition that occurs when data added to a group in a file exceeds the storage capacity of the group. Overflow will occur naturally, over time, in any active file. This is simply one of the costs of the hashed file structure used by UniVerse and UniData. Fortunately, there are methods available to minimize overflow and keep files performing well. This part of our series will be devoted to a discussion of “resizing” hashed files. We will first examine the costs and benefits of resizing and will then present our thoughts about the best way to approach the process of resizing files.

The Cost of Overflow

As you will see, resizing is a royal pain! It takes time, resources and planning. Because resizing must be done at a time when no users are on the system, it necessitates downtime that is not always available. And, because resizing can be dangerous, it should be carefully coordinated with the backup schedule. Thus, resizing is expensive. We believe, however, that resizing is not only worth the cost but that it is absolutely critical to maintaining good performance.

Over the last 20 years we have seen literally millions of files and have observed many examples of the difference file sizing can make. Some of them were fairly amazing! For instance, one of our clients was experiencing horrible performance in their AR system. From the time a clerk entered the customer name and pressed return it was taking 15 minutes for the screen to paint with the customer detail. The client was considering dumping the system and starting over with different software. It took us very little time to notice that the main AR file, which was about 300 MB in size, was using a modulo of 1! Each time a data record was accessed, the system was forced to sequentially read the 300 MB group. We resized the file to a more appropriate modulo and the response time went from 15 minutes to about 15 seconds. We certainly felt like heroes that day!

Most often the impact of poorly sized files is less dramatic and more insidious. It is

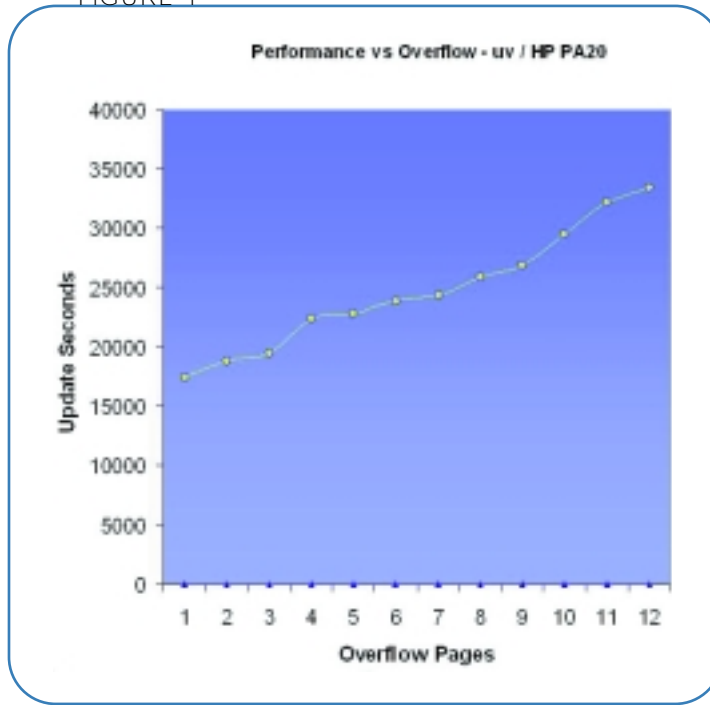
Continues on page 36

UniVerse and UniData Hashed Files *Continued from page 35*

often related to a general feeling of “things are a lot slower than they used to be.” Usually the number of users and the overall workload has increased and it may not be clear that there is a sizing issue without looking closely at the files.

We’ve done a number of experiments over the years to quantify the cost of overflow. We have replicated several of them for this article, using both UniVerse and UniData on two of our HP systems. To model various degrees of overflow we created a series of files that had increasingly smaller modules but contained the same data records. Thus, each file had successively longer chains of overflow associated with each group. We then ran a process that accessed each record of the file, in random order, added a new field and then wrote the record back to disk. We plotted the clock time of the process against the length of the overflow chain. The tests were run on quiescent systems and we tried our best to control other variables. We don’t present the results as a meaningful prediction of performance on other systems but simply as a graphic example of how increasingly long overflow chains affect performance. The results of these tests are shown in figures 1, 2 and 3.

FIGURE 1



records in approximately 17,000 seconds. When we resized the file such that each group had 12 buffers of overflow, the up-date process took approximately 33,000 seconds — almost twice as long.

In Figure 2 (see Page 37), the plot is very similar to the one shown in Figure 1. The test was performed on an older, smaller HP

system with less memory and a slower disk. In order to finish the test in a reasonable amount of time, the number of records was reduced by a factor of 10. Again, note the much longer time required to update the file with 12 pages of overflow per group — over 7,000 seconds versus around 2,000 seconds for the file with only one page of overflow per group.

system with less memory and a slower disk. In order to finish the test in a reasonable amount of time, the number of records was reduced by a factor of 10. Again, note the much longer time required to update the file with 12 pages of overflow per group — over 7,000 seconds versus around 2,000 seconds for the file with only one page of overflow per group.

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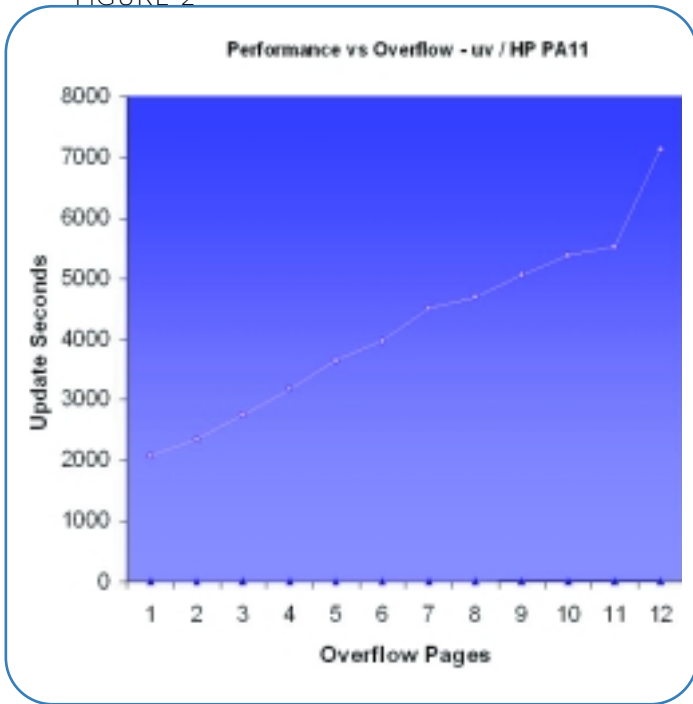
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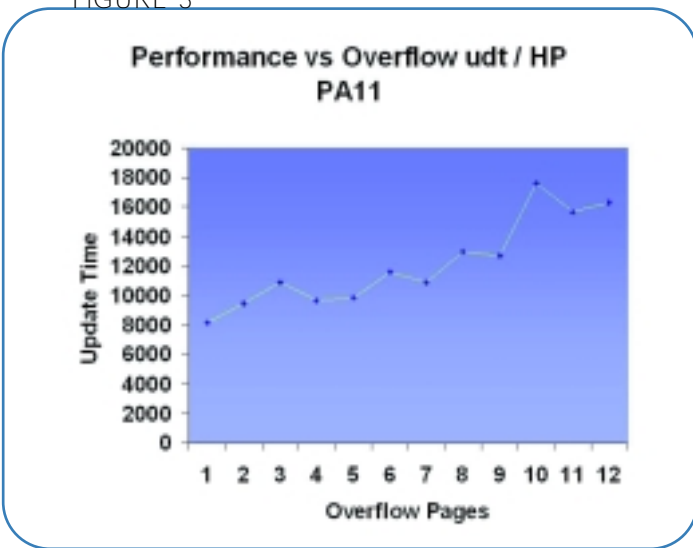
symbol Reseller

FIGURE 2



tests was nearly linear — we had expected the performance to degrade much more quickly as the length of the overflow chains increased. When we have time to run the experiment again we will make the files larger to compensate for the large amounts of memory and disk cache on the test systems.

FIGURE 3



The plot in Figure 3 (above) shows the results of our test on a UniData system. In this test, we reduced the size of our records and made the keys somewhat larger in order to produce a Level 2 overflow in the files. Again, note that the file with 12 pages of overflow per group took slightly over 16,000 seconds to update—more than twice as long as the file with only one overflow page per group.

The gross conclusion that we draw from this sort of test is this: The more overflow in a file, the longer it takes to access the data. This is because more I/O and memory resources are required to read and scan a long chain of buffers in a group. It was somewhat surprising to us that the relationship shown in these

tests was nearly linear — we had expected the performance to degrade much more quickly as the length of the overflow chains increased. When we have time to run the experiment again we will make the files larger to compensate for the large amounts of memory and disk cache on the test systems.

Another cost of overflow is increased vulnerability to file damage. UniVerse and UniData files are remarkably resilient and don't break often. When they do break, it is almost always due to an abnormal system halt or hardware problem. As we described in Part 1 of this series, the records within a group are referenced by a system of pointers and offsets that allow the system to parse the records in the group. If a group is being updated and the system goes down hard, the updated group may not get completely writ-

ten to disk. In this situation it is possible for a pointer to be corrupted, thus damaging the file. Longer groups with many overflow buffers will take longer to be written to disk than shorter groups. Thus, if a problem occurs, a file with lots of overflow has a greater window of exposure than a well-maintained file.

These factors—the performance impact and increased vulnerability—lead us to say that periodic file maintenance is a critical part of system administration.

Let's now examine a procedure for maintaining files.

Continues on page 38

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UniVerse and UniData Hashed Files *Continued from page 37*

A File Resizing "Recipe"

We wouldn't presume to say that our approach to resizing is the "best" or the "only valid" one. If you are following a systematic plan of file maintenance and it is working for you, keep doing it. If you aren't resizing regularly or are not sure that what you are doing is working well, give our method a try.

Our resizing approach can be boiled down to this series of steps:

- 1** Decide on a default separation to use for most files.
- 2** Calculate a modulo for the file based upon the amount of data in the file and the expected rate of growth.
- 3** Examine the hashing distribution of the file; if it is not good, experimentally simulate all the file types and pick the best one.
- 4** Find a time that no users are on the system.
- 5** Make sure you have a backup of the files to be resized in case disaster strikes.
- 6** Perform the resize of the file using the calculated modulo, type and separation.
- 7** Validate the results.
- 8** Open the system back up to users.

The following paragraphs discuss each step of our "recipe" in detail.

(1) Default Separation

Over the years we've heard various recommendations about picking separation or block size. Here are some of them: "Always make the separation 1 — on a multi-user system it doesn't matter anyway. The head will have moved before you read the second block;" "Pick the separation so that each group can hold 10 average size records;" "Match the separation to the physical size of the UNIX file system blocks;" "Make the separation really big to take advantage of the disk cache;" "Keep increasing the separation until the overflow goes away;" "Don't use a small separation — the 'igets' will kill you!"

Of the three tuning parameters available — modulo, type and separation — separation is the least likely to make a big difference. Unreasonable separation choices can certainly hurt, but we don't recall seeing "night and day" differences caused by changing separation within *reasonable* ranges.

Our starting recommendation for separation is this: Try a separation of 4 for a default choice. This produces a block size of 2,048 and is usually a good choice. From this default, feel free to deviate up or down for individual files based upon your knowledge and experience with those files. Before changing from the default separation, have a reason for doing so and try an experiment to see if the new separation will actually benefit the file. For individual files, follow these guidelines for "reasonableness":

- Use a separation that is a power of 2. A separation such as 3 may cause a group to span file system blocks and increase I/O requirements.
- Unless the record sizes are very small (< 100 bytes or so), a separation of 1 in UniVerse may waste some space. This is because a UniVerse record is not allowed to be fragmented over two buffers. Each buffer will have unused space at the end which can only be used by small records.
- Don't base a large separation on a minority of the records in the file. If 50 records in a 1,000 record file are large, don't increase the separation to accommodate the 50 records—accommodate the majority and let the 50 records cause a small amount of overflow.
- Don't use a separation larger than 16 unless you test it. In UniData a block size of 16K is the upper limit, but UniVerse will arbitrarily allow large separations. Our experience is that very large values will hurt performance more often than they will help.

Note: UniData commands set the buffer size using a "Block Size Multiplier" which is in units of 1024, except for 0 which produces a buffer size of 512. A "Block Size Multiplier" of 2 yields a buffer size of 2,048 bytes. When referring to block size for both UniVerse and UniData, we use the term "separation" which is always expressed in units of 512 bytes. This is the traditional jargon used in the original implementation of the "PICK-style" database.

(2) Modulo Calculation

Regardless of everything else, the file has to have enough space to store the data. And since the data will be changing, the modulo will be the parameter most frequently modified. First, you will need to know how much data is in the file. There are a number of ways of determining the amount of data; the FILE.STAT command (TLC) is as easy as any. On both UniVerse and UniData, simply enter "FILE.STAT filename"

at the prompt. The output format varies a bit—many of the numbers are interesting, but for now here are the fields you want:

UniData - Total number of bytes = 16537

UniVerse - Number of data bytes = 29168

If you attempt to reconcile these numbers with the actual number of data bytes in the file, you will likely not be able to because the FILE.STAT numbers include pad space and other bits of overhead that you can't easily count. If you use another figure that doesn't include overhead, you should add a bit of extra space. A reasonable guess for overhead is: for UniData, 10 bytes per record; for UniVerse, 12 bytes per record for 32-bit files and 24 bytes per record for 64-bit files.

Once you know approximately how much data is in the file, you should think about how much the file can be expected to grow between now and the next time you will be resizing it. Resizing is a repetitive task that should be done on a systematic schedule. We resize every two weeks. If your system is up 24x7, you may not be able to have downtime that frequently. If your system is very active, you may need to resize more often.

As a starting point, plan on adding 20% extra to accommodate growth. If your file is growing very quickly or cannot be resized very often, increase that a bit. Try to arrive at a percentage figure that we will call the "fudge factor." Convert the percentage to a decimal—If you choose 20% the "fudge factor" will be ".2". You have already chosen a separation, either as a default or as a specific value for this file. You can calculate a modulo from these figures using this formula:

Modulo = Data Bytes / (Separation * 512 * (1 - fudge factor))

Remember that the modulo means "how many groups" there are in the file. To calculate the modulo we need to know how many bytes of data we want to put in each group. The separation multiplied by 512 will be the maximum size of a group. We decrease that by the percentage chosen as the "fudge factor." For example, if we use a separation of 4 and a "fudge factor" of 20% (.2), we will have $(4 * 512 * (1 - .2))$ or $(2048 * .80)$ or 1,638. So we are planning on an average of 1,638 bytes in each group. Divide the data byte count by this number to determine the modulo. Here's a complete example:

Data Bytes = 56500

Fudge Factor = .2 (20%)

Separation = 4

Continues on page 45

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B Y N A T H A N R E C T O R

**The address is
a key piece of
information in
anyone's database,
but it can be
extremely hard to
validate, and due to
free form input,
even harder to
search.**

Several years ago, I had a client that wanted to use the Address as data for validation when checking for duplicate information. The client works in the building trades and keeps tracks of job sites. Since more than one of their customers could be working at any one job site, they wanted to make sure that duplicate job site records were not made.

Since every bid is keyed both with a customer number and a job site number, they had to keep their users from creating duplicate records or confusion would result. The address was the only common element in all the site records.

The client wanted a way to search for exact and/or like addresses, then display the results to the user for them to choose from if only like addresses were found.

If they were creating a new database, then the easiest way to do this is to require the user to break out the common information like the street name and address number. The problem was that the data-

base already existed. The client wanted to retrofit this database. They also wanted to keep the data entry as normal as possible, so the division of the address number and street name was not a viable solution.

An address can be input in several different formats, but they all follow a common pattern. Look at the following examples:

Wilson Street, #B
100 Wilson Street, #B
100 Wilson, Apt. b
100 Wilson Street

Pattern: {address number}{street name}{type of street}{apartment or suite}

Using this format as the guideline, I wrote a routine that would extract the address information following this pattern.

The first thing that the routine does is check to see if an address number has been input. Once it has found all of the address number, then it checks to see what the street name is.

Street names can be a little confusing. At times people input "Wilson Street" when they really want to have "Wilson Lane".

Other times, only "Wilson" is input as the street name. Due to this, the routine separates the name of the street and the type of the street (road, lane, ave, etc.) from each other. This allows matches on just "Wilson" and then checks to see if the street type matches up to create a more exact match.

For the same reason that "Wilson" and "Street" are separated, the apartment number is also separated from the address.

As displayed in the examples of the "Wilson Street" address, the routine has to be able to know when a part of the address is missing and move onto the next part. Instead of starting with one part of the address and finding that before moving onto the next part, the routine looks for all parts of the address as it spans the address string.

The end result of each example are:

Wilson Street, #B = Wilson;;B;;Street
100 Wilson Street, #B = Wilson;100;B;;Street
100 Wilson, Apt. b = Wilson;100;B;;
100 Wilson Street = Wilson;100;;;Street

Now that the address has been broken into common components, it can now be indexed and searched. It can even be validated to make sure that all the information needed has been input. For example, validating the user for an address number, or the requirement of the street type.

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Win addresses

```
SUBROUTINE FORMAT.ADDR1 (ADDRESS)
EQUATE AM TO CHAR(254), VM TO CHAR(253), SVM TO CHAR(252)
EQUATE BELL TO CHAR(7)
```

```
*
*CREATED BY NATHAN RECTOR, 10/08/96
*   NATEC SYSTEMS
*   nrector@natecsystems.com
*   http://www.natecsystems.com
*
```

DOCUMENTATION

```
* This program is used to create a value used to create a common
* format for an address.
```

```
* The program will isolate the different types of addresses and
* create a value that make the address easies to find.
```

```
* {street name};{address #};{apt#};{lot#};{street type}
```

```
* INPUT 'Y' to continue OR 'N' to return to Menu.
```

```
*****
*OPEN FILES
```

```
*****
*
*STREET.SUFIX =
".STREET.LANE.AVENUE.WAY.COURT.CIRLE.PLACE.ROAD.DRIVE."
```

```
*** This var is used to convert abbreviations into thier long
*** names. This will allow the street names to be more accurate
*** when searching.
```

```
*** format:
*** ABBRV<1,-1> = abbreviation
*** <2,-1> = full name
```

```
*
* ABBRV = ""
```

```
*****
*PROGRAMMING LOGIC
```

```
*****
STREET.NAME = "" ; ADDRESS = TRIM(ADDRESS) 'CU'
*
IF ADDRESS[1,3] = "C/O" THEN ADDRESS = ADDRESS[4,LEN(ADDRESS)]
*
*** takes care of the PO boxes
*
BEGIN CASE
CASE ADDRESS = "" ; GOTO 900
CASE ADDRESS[1,8] 'CU' = "P.O. BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[9,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,6] 'CU' = "PO BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[7,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,9] 'CU' = "P. O. BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[10,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,5] 'CU' = "POBOX" ; ADDRESS.NUM =
TRIM(ADDRESS[6,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,3] 'CU' = "BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[4,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,7] 'CU' = "P.O.BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[8,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,4] 'CU' = "P.O." ; ADDRESS.NUM =
TRIM(ADDRESS[5,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,7] 'CU' = "POSTBOX" ; ADDRESS.NUM =
TRIM(ADDRESS[8,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,8] 'CU' = "P. O BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[9,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,7] 'CU' = "P O BOX" ; ADDRESS.NUM =
TRIM(ADDRESS[8,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,6] 'CU' = "P O BX" ; ADDRESS.NUM =
TRIM(ADDRESS[7,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,3] 'CU' = "P O" ; ADDRESS.NUM =
TRIM(ADDRESS[4,10]) ; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,4] 'CU' = "P. O." ; ADDRESS.NUM = TRIM(ADDRESS[5,10])
; STREET.NAME = "POBOX" ; GOTO 800
CASE ADDRESS[1,4] 'CU' = "P. B." ; ADDRESS.NUM =
TRIM(ADDRESS[5,10]) ; STREET.NAME = "POBOX" ; GOTO 800
END CASE
*
*** takes the Number part of the address out of the address list
*
ADDRESS.NUM = "" ; WORD = FIELD(ADDRESS, " ", 1) ; NEXT.WORD =
FIELD(ADDRESS, " ", 2)
BEGIN CASE
CASE WORD[1,1] = "#"
* taken card of later
CASE NEXT.WORD = "1/2"
ADDRESS.NUM = FIELD(ADDRESS, " ", 1)
HALF = FIELD(ADDRESS, " ", 2)
ADDRESS = ADDRESS[COL2() + 1,LEN(ADDRESS)]
*
ADDRESS.NUM = ADDRESS.NUM : " 1/2"
CASE WORD MATCHES "1NON1X1/2"
ADDRESS.NUM = FIELD(ADDRESS, " ", 1)
ADDRESS = ADDRESS[COL2() + 1,LEN(ADDRESS)]
*

```

continues on page 42

Just for Fun *Continued from page 41*

```
ADDRESS.NUM = ADDRESS.NUM[1,LEN(ADDRESS.NUM) - 3] 'CN' : " 1/2"
CASE WORD MATCHES "OX"-'OX"
ADDRESS.NUM = FIELD(ADDRESS," ",1)
ADDRESS = ADDRESS[COL2() + 1,LEN(ADDRESS)]
*
STREET.NAME<2> = STREET.NAME<2> : " " : FIELD(ADDRESS.NUM,"-",2)
ADDRESS.NUM = FIELD(ADDRESS.NUM,"-",1)
CASE NUM(WORD)
ADDRESS.NUM = FIELD(ADDRESS," ",1)
ADDRESS = ADDRESS[COL2() + 1,LEN(ADDRESS)]
CASE WORD MATCHES "1NOX'TH" OR WORD MATCHES "1NOX'ND" OR WORD
MATCHES "1NOX'ST"
* no address numbers.
CASE WORD MATCHES "1NONOX" OR WORD MATCHES "1A1NONOX"
ADDRESS.NUM = FIELD(ADDRESS," ",1)
ADDRESS = ADDRESS[COL2() + 1,LEN(ADDRESS)]
*
STREET.NAME<2> = STREET.NAME<2> : " " : ADDRESS.NUM 'CA'
ADDRESS.NUM = ADDRESS.NUM 'CN'
END CASE
*
*** breaks the address down word for word, looking for abbreviations
*** or apartment#s
*
ADDRESS.COMPLETE = 0 ; PREV.WORD = "" ; PREV.DELIM = "" ; AFTER.STREET
= 0
LOOP
UNTIL TRIM(ADDRESS = "") OR ADDRESS.COMPLETE DO
GOSUB 5000 ;* gets word
ADDRESS = ADDRESS[FN.POS + 1,LEN(ADDRESS)]
*
*** decides what to do with an 's. Check to see if it is actual
*** 's or 's'
*
IF NOT(WORD = "") AND DELIM = "\\" AND ADDRESS[1,1] = "S" THEN
WORD = WORD : '\S\
ADDRESS = ADDRESS[2,999]
END
*
BEGIN CASE
CASE WORD = ""
CASE WORD = "NO" AND STREET.NAME<1> = ""
* if there is not street name, and 'NO' is found, then it
* is an abbreviation for North
WORD = "NORTH"
CASE INDEX(VM: ABBRV<1> : VM, VM: WORD : VM, 1)
LOCATE(WORD, ABBRV, 1; MV) ELSE MV = ""
IF NOT(MV = "") THEN WORD = ABBRV<2, MV>
END CASE
*
BEGIN CASE
CASE WORD = ""
```

```
*** no value
CASE PREV.WORD = ""
*** no previous word to work with
CASE PREV.WORD = "AND"
*** the next char is part of the address
WORD = PREV.WORD : " " : WORD
PREV.WORD = ""
CASE INDEX(STREET.SUFIX,".": WORD : ".", 1)
*** the previous word is part of a street name
STREET.NAME<1> = STREET.NAME<1> : " " : PREV.WORD
PREV.WORD = ""
CASE STREET.NAME<1> = ""
*** no previous street name. convert the single chars
BEGIN CASE
CASE PREV.WORD = "W"
STREET.NAME<1> = STREET.NAME<1> : "WEST"
CASE PREV.WORD = "E"
STREET.NAME<1> = STREET.NAME<1> : "EAST"
CASE PREV.WORD = "N"
STREET.NAME<1> = STREET.NAME<1> : "NORTH"
CASE PREV.WORD = "S"
STREET.NAME<1> = STREET.NAME<1> : "SOUTH"
CASE 1
STREET.NAME<2> = STREET.NAME<2> : PREV.WORD
END CASE
PREV.WORD = ""
CASE 1
*** assume the pervious word is an apartment#
STREET.NAME<2> = STREET.NAME<2> : " " : PREV.WORD
PREV.WORD = ""
END CASE
*
*** gets word
*
BEGIN CASE
CASE DELIM = "#"
GOSUB 4000
*
STREET.NAME<2> = STREET.NAME<2> : " " : APT.LOT
CASE WORD = ""
CASE INDEX(" .APT.NO.SUITE.UNIT.STE.SPACE.RM.", " ": WORD : ".", 1)
GOSUB 4000
*
STREET.NAME<2> = STREET.NAME<2> : " " : APT.LOT
CASE WORD = "LOT"
GOSUB 4000
*
STREET.NAME<3> = STREET.NAME<3> : " " : APT.LOT
PREV.WORD = ""
CASE AFTER.STREET AND NUM(WORD)
* found a number after the street suffix had been defined
STREET.NAME<2> = STREET.NAME<2> : " " : WORD
CASE LEN(WORD) = 1
* just add to the previous word to make test with the next
```

```

* word
PREVWORD = WORD
CASE WORD = "AND"
PREVWORD = WORD
CASE WORD = "TH" AND NUM(TRIM(STREET.NAME<1>))
* the 'TH' in '12th' had a space in it
STREET.NAME<1> = STREET.NAME<1> : WORD
CASE INDEX(STREET.SUFIX, ".": WORD : ".", 1)
* this a street suffix. Place in different area to keep the street
* name by itself
STREET.NAME<4> = STREET.NAME<4> : "." : WORD
AFTER.STREET = 1
CASE 1
STREET.NAME<1> = STREET.NAME<1> : "." : WORD
END CASE
REPEAT
*
BEGIN CASE
CASE PREV.WORD = ""
CASE STREET.NAME<1> = "" ; STREET.NAME<1> = PREV.WORD
CASE 1 ; STREET.NAME<2> = STREET.NAME<2> : PREV.WORD
END CASE
800*
ADDRESS.NUM = TRIM(ADDRESS.NUM)
STREET.NAME<1> = TRIM(STREET.NAME<1>) ;* Street name
STREET.NAME<2> = TRIM(STREET.NAME<2>) ;* appartment#
STREET.NAME<3> = TRIM(STREET.NAME<3>) ;* Lot Number
STREET.NAME<4> = TRIM(STREET.NAME<4>) ;* Street Type
*
ADDRESS = STREET.NAME<1> : "." : ADDRESS.NUM : "." : STREET.NAME<4> : "." : STREET.NAME<2> : "." :
STREET.NAME<3>
900*
RETURN
*****
*SUBROUTINE
*****
4000*
APT.LOT = "" ; STOP.LOOP = 0
LOOP
GOSUB 5000 ; NEXT.WORD = WORD
ADDRESS = ADDRESS[FN.POS + 1, LEN(ADDRESS)]
*
*** takes out trailing dots
*
IF NEXT.WORD[LEN(NEXT.WORD), 1] = "." THEN NEXT.WORD = NEXT.WORD[1, LEN(NEXT.WORD) - 1]
IF NEXT.WORD[LEN(NEXT.WORD), 1] = "." THEN NEXT.WORD = NEXT.WORD[1, LEN(NEXT.WORD) - 1]
*
BEGIN CASE
CASE NEXT.WORD = ""
CASE NEXT.WORD = "#"
CASE 1
APT.LOT = APT.LOT : NEXT.WORD
*** checks to see if the next word is an 'AND', if so, then
*** get it, and look at the next appartment#
*

```

Continues on page 44

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Just for Fun *Continued from page 44*

```

IF FIELD(ADDRESS," ",1) = "&" THEN
  ADDRESS = ADDRESS[COL2() + 1,LEN(ADDRESS)]
  APT.LOT = APT.LOT:"&"
END ELSE
  STOP.LOOP = 1
END
END CASE
UNTIL ADDRESS = "" OR STOP.LOOP DO
REPEAT
RETURN
5000*
WORD = "" ; SEARCH = ADDRESS ; STOP.DELIM.LOOP = 0
FN.POS = 0
LOOP
DELIM = OCONV(SEARCH,"MC/A":VM:"MC/N")[1,1]
IF DELIM = "" THEN
  POS = LEN(SEARCH) + 1
END ELSE
  POS = INDEX(SEARCH,DELIM,1)
END
*
NEXT.CHAR = SEARCH[POS + 1,1]
*
STOP.DELIM.LOOP = 1 ; CHAR = ""

```

```

IF DELIM = "&" THEN CHAR = "&"
BEGIN CASE
  CASE NOT(DELIM = ".")
  CASE NUM(NEXT.CHAR) AND NOT(NEXT.CHAR = "")
  CASE 1 ; STOP.DELIM.LOOP = 0
END CASE
*
BEGIN CASE
  CASE NOT(DELIM = "-")
  CASE INDEX(" .",NEXT.CHAR,1)
  CASE 1
    CHAR = "-" ; STOP.DELIM.LOOP = 0
  END CASE
*
WORD = WORD : SEARCH[1,POS - 1] ; CHAR
SEARCH = SEARCH[POS + 1,LEN(SEARCH)]
*
FN.POS = FN.POS + POS
UNTIL STOP.DELIM.LOOP DO
REPEAT
RETURN
END

```

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	Description: Ruggedized PicoDc: Polarized Reme Laser				
3		\$0.00		\$0.00	YES

UniVerse and UniData Hashed Files *Continued from page 43*

HASH.AID will be written to a file named HASH.AID.FILE. We recommend using NO.PAGE to avoid having to page through the terminal output. When the process is done you may view the results with this command:

Unfortunately, UniData doesn't have the HASH.AID utility to test file types. However, there are only two file types as opposed to UniVerse's 17 types. An easy way to test the UniData file types is to create a new file using the other file type and copy the data

```
>LIST HASH.AID.FILE
```

```
HASH.AID summary report Page 1
```

Type	Modulo	Separation	Records	File Size	Smallest Group	Largest Group	Average Size	Oversize Groups
2	73	4	1,785	413,696	912	32,824	4,637	57
3	73	4	1,785	411,648	1,272	14,928	4,637	67
4	73	4	1,785	421,888	2,796	56,904	4,637	42
5	73	4	1,785	415,744	1,136	63,336	4,637	32
6	73	4	1,785	487,424	0	331,884	4,637	2
7	73	4	1,785	487,424	0	331,884	4,637	2
8	73	4	1,785	487,424	0	331,884	4,637	2
9	73	4	1,785	487,424	0	332,104	4,637	2
10	73	4	1,785	411,648	1,736	7,892	4,637	72
11	73	4	1,785	417,792	1,540	7,724	4,637	72
12	73	4	1,785	411,648	2,224	9,584	4,637	73
13	73	4	1,785	419,840	1,640	10,272	4,637	72
14	73	4	1,785	423,936	1,904	7,088	4,637	72
15	73	4	1,785	423,936	1,904	7,088	4,637	72
16	73	4	1,785	417,792	2,524	6,936	4,637	73
17	73	4	1,785	425,984	2,732	6,788	4,637	73
18	73	4	1,785	415,744	1,984	6,948	4,637	72

If you run the HASH.AID command multiple times, clear the HASH.AID.FILE between each HASH.AID command; otherwise the results will accumulate and make the report harder to analyze. One piece of information that we wish HASH.AID would report is the number of empty groups, because a large number of empty groups may skew the results.

In analyzing the HASH.AID results we inspect: (1) the size of the Largest Group; (2) the magnitude of the difference between the Largest and Smallest Groups; and (3) the number of Oversize Groups. Remember that a long chain of overflow buffers can cost more than a number of shorter chains. In the example data, notice types 6 through 9: even though these types would produce only two Oversize Groups, they would be poor choices because of the huge size of the Largest Group. Here is a case where the number of empty groups would be good to know. Likely, all of the file's data is in two groups! My type choice for this file would be type 17. This type has the smallest Largest Group and the difference between the Smallest and Largest Groups is less than the other types. Even though some of the other types have fewer Oversize Groups, they likely have more total overflow because of the longer overflow chains.

into it. The two files can then be compared using the GROUP.STAT command.

The second file should have the same modulo and separation (block size) as the first. The only difference should be the hash type: 0 or 1.

(4) / (5) Find a Time to Resize

Resizing files isn't necessarily dangerous, but rearranging your data files can be. This is a sensitive process and if something goes wrong, the result can be a damaged or missing file. As with any other risky venture, it's good to have insurance. For resizing you can "buy insurance" by following two bits of advice: (1) Resize only when no users are on the system, and (2) Have a good backup of the files being resized.

It's worthwhile to analyze your backup strategy. If the backup is done while users are updating files, there can be problems. Depending upon the backup utility, restoring a file that was being updated while being backed-up can result in a corrupt file. In the best case, a backup done on an active system may lead to database integrity problems. It is also a good idea to test your backup tapes periodically. Hopefully, you backup much more frequently than you restore. Prove to yourself that you can actually restore from your backup if needed.

UniVerse offers a "concurrent" option to the RESIZE command so that, in theory at least, one can resize an active file. Our advice is not to even think about using the concurrent option—it is simply too risky and if something does go awry it can be very difficult to recover. So, be warned, if you choose to ignore these two bits of advice (no users; good backup), make sure you have lots of redundancy and a strategy to fix things if Murphy makes an appearance while you are resizing.

How long will the system need to be down for resizing? Predicting the time a resize will take is not easy. Probably the easiest way is to allow extra time the first time you resize and record the actual times. These times will be a good predictor for future resize sessions on the same files. Large files take longer than small files; badly out of shape files (big difference between the current and new modulo and/or very bad distribution) will take longer than not so badly sized files; large modulo changes will take longer than smaller changes. This last, by the way, is also an argument for frequent resizing!

(6) Perform the Resize

Actually performing the RESIZE is fairly straightforward. For large files, do a check to see if you need to worry about the 2GB boundary. Multiply the new modulo by the new separation times 512. For example, suppose the new modulo is 976,352 and the new separation is 4 (a 2048 byte buffer). Our calculation looks like this:

$$976,352 \times 4 \times 512 = 1,999,568,896$$

This is uncomfortably close to 2GB. When the new file is being populated, a bit of overflow will cause the file to grow past 2GB. For 32 bit files, which include all UniData files and all UniVerse files not created or resized with the 64BIT option, this will cause the file to break! If you have a file in this situation you will need to address the 2GB issue. Options include: Purging data (my favorite solution); using the 64BIT option if you have a platform and release of UniVerse which supports it; using dynamic files which will break the file into at least two portions; or using a distributed file which will break the file into logical parts. If you plan to use the 64BIT option in UniVerse, redo your modulo calculation and add another 12 bytes per record to the count of bytes to be stored. This is to accommodate the larger record headers needed for 64-bit addressing.

Assuming that you don't have to worry about the 2GB boundary, the basic resizing commands are:

UniVerse – RESIZE filename new.type
new.modulo new.separation

UniData – RESIZE filename new.modulo,block.size.multiplier TYPE new.type

Note that UniData uses a “block size multiplier” instead of a separation. A “block size multiplier” of 0 produces buffers of 512, a separation of 1; “block size multipliers” of 1 through 16 are multiplied by 1,024 so that a “1” yields buffers of 1,024 (a separation of 2), a “4” yields buffers of 4,096 (a separation of 8), and so on.

UniData offers an alternative command, “memresize,” which attempts to resize the file using memory rather than creating a disk file copy. For files small enough to be handled in memory, this is considerably faster. The “memresize” command has a MEMORY argument that specifies the amount of memory to allocate for the process.

UniVerse has a “USING” argument that allows you to specify a directory for the temp file used during the resize. This allows you to manage disk space and makes it easier to resize large files.

(7) Validate the Results

Make sure to carefully note any error messages that occur during the resize. Since you have a good backup and no users are on the system, you can repair any problems with no danger of losing data by restoring from your backup. However, if you don't realize that a problem occurred until hours or days later, it becomes more difficult to deal with it.

Did your new parameters reduce overflow, improve the distribution and improve file performance? One way to “check your work” is to run the same analysis you used to determine the new parameters. Check the distribution with GROUP.STAT. Calculate the modulo again just to be sure your arithmetic was correct. Of course the real test is how the file performs and this can be very hard to measure (perhaps a topic for another article?).

Our “Seven Steps to Resizing” involve a lot of work. We suggest that you start with a few files that are under 10 MB in size. Make copies of them in a test area. Practice calculating and resizing with these files until you develop a comfort level with the process.

Additionally, we invite you to call or email us if you would like to discuss any of these topics in more detail: peggy@fitzlong.com or jeff@fitzlong.com. We are happy to answer your questions and offer our opinions.

Again, it's a lot of work but good system performance cannot be maintained without good database maintenance techniques. is

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between Windows PCs and host systems running any variety of UNIX or LINUX, the company said. With support for connections over telnet, Secure Shell, direct serial or modems, Rasmussen's software is a complete solution package for all communications needs.

For more information, visit
www.anzio.com.

EasyCo Provides Unique Universal Communications Tool

Easy Computing Company (EasyCo) showed how Coyote, its multidimensional Internet communications server, works and how it's different from other MultiValue database tools. Coyote acts as a Web server, Web browser, mail server, RPC server, and XML server and provides real-time linking and hot backup for MultiValue-based systems.

The Coyote engine lets MultiValue machines flexibly communicate via HTTP and email, which are widely accepted communications standards that almost all computers are designed to communicate with. Coyote, running on phantom processes, delivers these engines to the MultiValue community as a direct interface to existing MultiValue machines. Other products, the company said, provide only an interface layer to engines provided by operating system suppliers.

According to EasyCo, most database interfaces to Web and email require the developer to write in a component layer that is then submitted to a generic Web or other engine. As a result, applications become much more complex due to having multiple layers to maintain, and consequently, maintenance of complex applications is difficult.

Coyote eliminates the middleware, producing 1.1 server-compliant Web pages are far faster than indirectly interfaced systems. Because the Coyote server runs on phantom processes, output of any Coyote-based service requires no additional database ports, which means a significant savings.

For more information, visit
www.easyco.com.

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XLr8 Helps U2 Applications Evolve to Meet Challenges of e-Business

XLr8, from U2logic, an IBM Business Partner, is a Web-forms development tool for UniData and UniVerse databases which offers affordable, easy-to-use utilities and tools for Web-forms, architecture, performance, management, administration and replication. With XLr8, additional investment in human resources and client-side software isn't required. Web-enabled U2 business applications mark a significant milestone for today's business climate, ushering in an age of increased productivity and efficiency, the company said.

XLr8 allows users to create consistent Web page forms for data collection in a fraction of the time it takes with conventional methodology. As Web-based forms continue to evolve, changes are instantly administered, automatically generating the appropriate HTML, Java Script, ASP and ASP.NET code. Version 4.0 now offers extensions to System Builder, allowing SB Plus applications a clear pathway to Web client functionality.

Additional features include asynchronous communications, instantly updating and validating field by field with no loss in performance. XLr8 has simple external tab interfacing, multilingual language support and customizable style sheets. Focus before and after reads are user programmable and XLr8 includes XML support. An optional report writer is available to quickly and easily create report forms

For more information, visit
www.U2logic.com.

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