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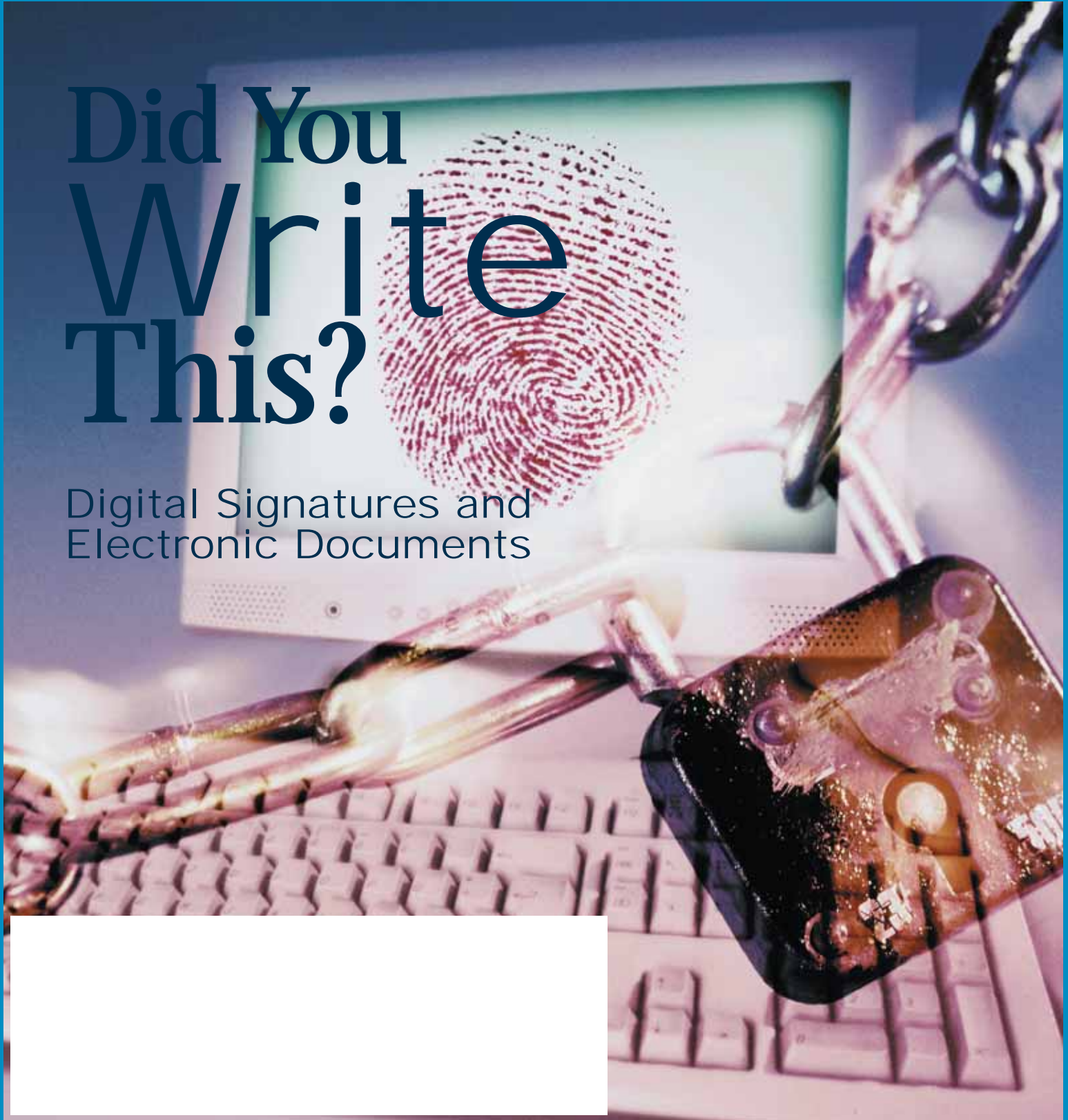
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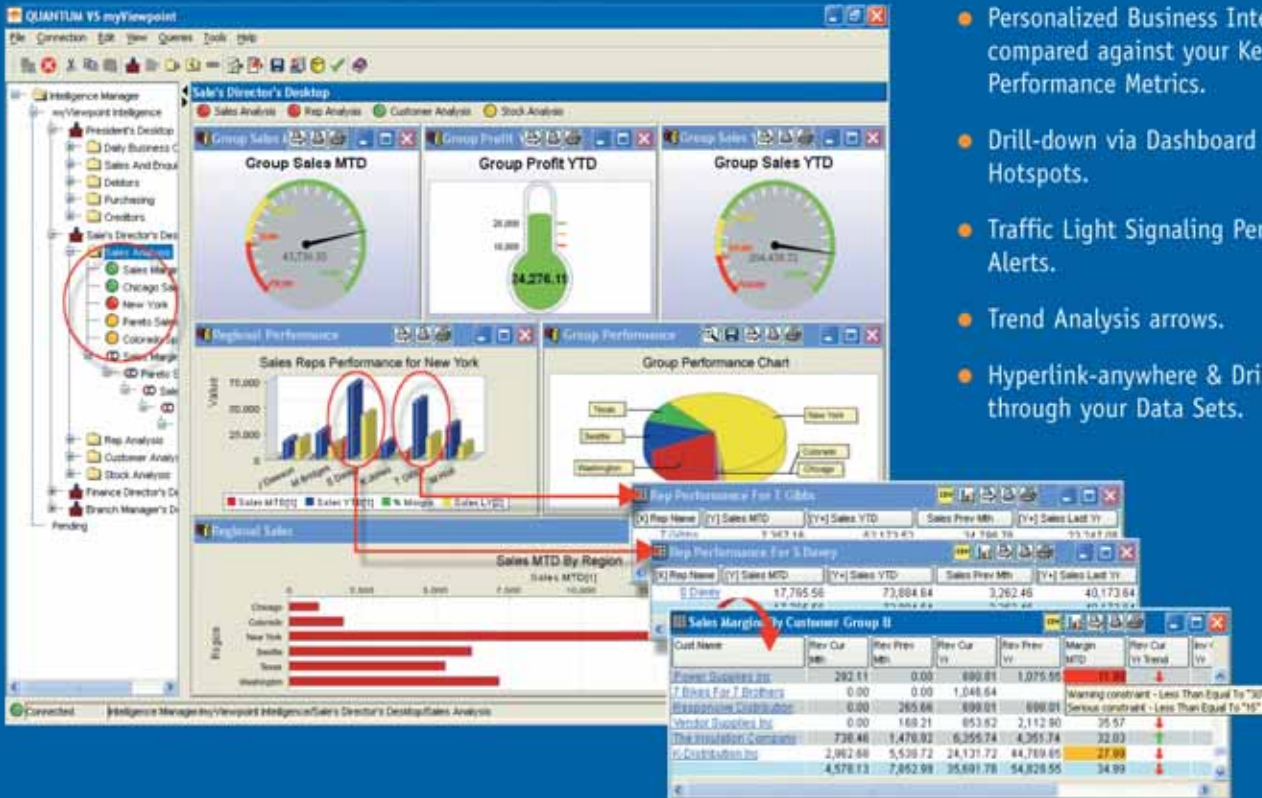
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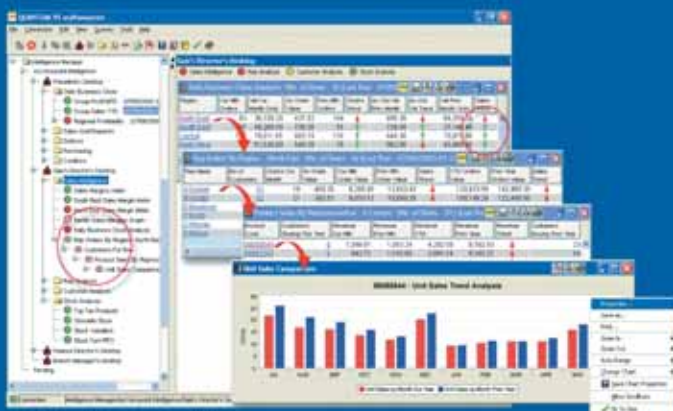


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telling you to take a completely different approach to the project.

How do you know it really came from your boss and that it wasn't altered before you got it?

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It's a new year, and time for your New Year's Resolutions—losing holiday weight, taxes, and taking the next step in your business strategies. If you are like me, you made your New Year's Resolutions and promptly broke them within 2 weeks... which probably means you have not lost any holiday weight either. Now Taxes are something you wish you could get around, and the next step in business strategies is not always well defined.

When I took over Spectrum last year, I set down some goals and strategies for the following years. You saw the changes last year to the magazine and the continuation of the Webinars.

There are a few things that I have planned for this year. Obviously the **2007 Spectrum Conference and Exhibition** on March 6th through the 9th, is a big deal, and I will be continually working towards improving the content and value of this event.



I will also continue to work on the magazine. As you can see from this issue, there has been a change to the cover.

We will also continue to bring more valuable content to you on MultiValue Technologies, and MultiValue Community successes.

You will also start seeing physical copies of the magazine show up in Europe and Australia. The PDF will still be available from the web site, so that those that don't receive a physical copy can still read it online.

We are also encouraging you, the end user and reader, to submit articles to the magazine either as technical solutions or success stories. If you are not comfortable writing or don't know where to start, there will be a session at the International Spectrum Conference on Friday, March 9th, on "Submitting articles and/or becoming a presenter at future conferences" that will help. MultiValue Technology and its Community is all about you, so we would like to hear from you and see the solutions you created to solve your day-to-day problems.

The e-Xtra Newsletter has been very successful, and will continue providing MultiValue Community Events and News. I've had many readers comment on the "Tech Tips" being helpful, and I'm always looking for "Tech Tips" from users to share with others.

You have likely seen the new section for "Positions Available" in the newsletter, as well. If you want to include something in "Positions Available", feel free to contact us anytime.

Something new this year for e-Xtra is the publication of the newsletter in RSS form. This allows those people that have problems receiving the newsletter due to spam filters to keep up on what the MultiValue Community is doing through an RSS Reader.

You will see a new style of **Webinar** being introduced this year under the heading of "Spectrum University". Spectrum University is designed to provide in-depth training on topics that affect you. These Webinars provide hands on examples that you are able to use in your workplace, or to get and understanding of how to do something. Most of these Webinars will be multi-week education classes that are only 1 hour long to keep them from causing too much of an impact in your work place.

As you can see, there are a lot of things going on this year as we continue to provide insight and information to MultiValue Technologies and the Community around the world.

- Nathan Rector, President, International Spectrum -
nathan@intl-spectrum.com

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International Spectrum is published six (6) times per year at the subscription price of \$40.00 U.S. in the U.S.A.; \$45.00 U.S. in Canada and Mexico; \$50.00 U.S. for other countries. Single copy rates are \$7.00 U.S. in the U.S.A. and Canada, and \$9.00 U.S. in all other countries. International Spectrum is published by International Spectrum, Inc., 80 Garden Center, Suite 6, Broomfield, CO 80020; Tel: 720/259-1356; Fax: 603/250-0664 E-Mail: request@intl-spectrum.com. Copyright 2006 International Database Management Association, Inc. All rights reserved. Reproduction in whole or in part, without written permission, is prohibited.

PRINTED IN USA • ART AND DESIGN: CP Design; 619-246-6878; San Diego, CA

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Getting Data Out of MultiValue: *When Enormous, Complex, and Amazing Doesn't Cut It*

In the right hands, MultiValue systems are capable of efficiently running enormous, complex businesses, handling amazing volumes of transactions, and doing this with a skeleton crew compared to what is necessary with other environments. If MultiValue has weak spots, it is in two places: green-screen interfaces and ad hoc reporting. There are solutions to the green-screen problem, and they do a great job leveraging MultiValue strengths, but there really isn't a good solution to large-scale, ad hoc reporting within the MultiValue environment. Data must be moved out of MultiValue to effectively sort, filter, and total it without placing an undue burden on operational systems. This was the conclusion reached at one MultiValue shop handling massive volumes of complex transactions. This article uses their experience as a launch point to define the advantages and tradeoffs of three different techniques for pulling large amounts of data out of MultiValue for reporting: writing programs, using middleware, or using an ETL tool. The article concludes with a look at a fourth option, MITS Report, which bundles ETL with a MultiValue-aware reporting environment.

In 1998, I joined Seattle FilmWorks (SFW), an exciting place for a UniVerse programmer. The MultiValue systems being designed there supported tremendous growth at the end of the last century, and supported tremendous change as we moved into the new digital century. With millions of customers and tens of millions of prospects in distributed files, on a busy day SFW would push more than one-and-a-half million individually numbered 35mm film prints through

an automated photo finishing lab with UniVerse-driven film sorting and splicing robots. Data would pour into half a dozen UniVerse boxes from 75 data entry screens, from 200 barcode readers, and from serial and network ports connected to a dozen \$600K multiscan printers and more than 100 digital scanners, cutters, and packaging stations. Roll volumes had been skyrocketing for years, and our new digital scanning and Internet delivery was very successful — all supported by a

custom UniVerse environment that continued to scale reliably. The one challenge SFW could not effectively meet was large-scale, ad hoc reporting.

Increasing digital camera sales brought major changes to the photo finishing business, including rapidly changing reporting requirements as the company tried to shape and monitor new marketing strategies. A handful of power users had attempted self-serve reporting, but it was impractical against gigabytes of custom data. The marketing department was unhappy with reports that took hours and hours, and IT and production were certainly not pleased with the system resources consumed by power users who invariably spelled SELECT with two initial Ss! SFW needed a solution to protect users from the system and the system from users. They needed to move the granular transaction data out of UniVerse into a reporting platform, or data warehouse. Even today, this remains the number one reason to move data out of MultiValue — to get high impact reporting with low impact on operations.

After committing to a reporting server, SFW had three options for moving data to the server: writing programs to export the data, using middleware like ODBC, or using an Extract-Transform-Load, or ETL, tool. The same three options are available today.

Continues on page 8

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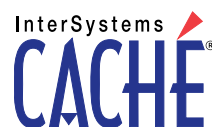


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Visit InterSystems' Booth #202 at the International Spectrum show on March 6-9, 2007 in Long Beach, CA. Download the Caché MultiValue Developers Release Kit, and view an online demonstration at InterSystems.com/Cachemv15WW

Getting Data Out of MultiValue: *When Enormous, Complex, and Amazing Doesn't Cut It*

Continued from page 6

In each case, the goal is to provide a reporting environment separate from the MultiValue operational environment and capable of efficiently sorting, filtering, and totaling large amounts of data and presenting it interactively. This overview begins by outlining a reference target environment, the key challenge of exporting multivalued data, and then looks at the specifics of programmatically exporting data, using middleware, using ETL tools, and how MITS Report uses a hybrid approach building on the others.

Reference Environment

To pull data out of MultiValue to report on it, the data needs to be placed somewhere that produces reports efficiently. While MultiValue databases are rightly renowned for their flexible and efficient handling of transactions, the rigid structures of traditional relational databases have better support for rapid indexing, sorting, and filtering, and have a well-understood interface supported by many specialized reporting client tools. The target database will be referred to generically as SQL, but it could easily be Oracle, IBM DB2, Microsoft SQL Server, MySQL, PostgreSQL, or one of a number of embedded SQL databases. The operating system can impact the choice of solution and will be discussed where applicable. Whether Excel, Crystal Reports, or another solution is used to access exported data, the problem of getting data to the target SQL platform will not change.

The Key Challenge

The first step is constructing a target database. It's not unusual for five or six MultiValue files representing a business process to become 30 or 40 SQL tables, and this is the single biggest

challenge moving data out of MultiValue—getting the right data from the right attribute to the right column in the right table or tables. The solution must create and populate SQL data structures, which differ significantly from MultiValue structures. MultiValue data does not enforce the concepts of type (character or number) and null values (not empty values), and SQL does not have the concept of multivalued fields. At some point, any solution needs to repeat single-valued fields to correspond to multivalued fields in the same records. Whether these issues are dealt with manually or a tool is used, rules and assumptions must be captured and maintained in Basic code, dictionaries, or an application.

Programmatic Solutions

Data can be programmatically “pushed” to the report server, and this is one of the first approaches a programmer will try. The challenge will be deciding whether to tailor the output of the MultiValue Basic programs, or “flatten” the data, to match the SQL reporting environment, or to create an import process in the reporting environment that can consume a file that matches the layout of the MultiValue system. The latter approach is more of a challenge for MultiValue programmers but can be significantly faster, because they are offloading an inefficient process to a system built for these kinds of application. The major drawbacks of any programmatic solution boil down to managing change—changes in data and changes in structure. Synchronizing data between two systems can be a challenge, but when new fields are

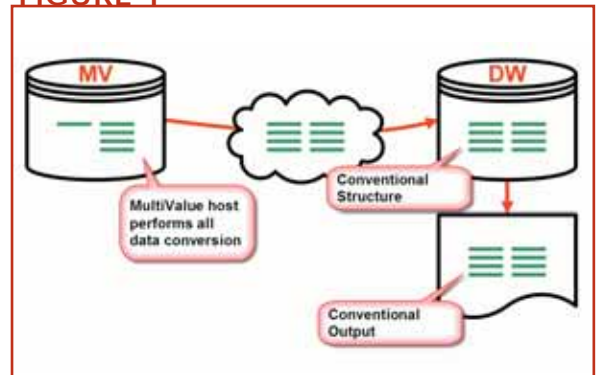
added, the maintenance of programs in two different environments must also be synchronized. Other important considerations include the lack of integrated scheduling, security, and error handling. If the key pieces of this infrastructure are in place, a programming solution can be a reasonable approach.

SFW met with some success with this approach, but intimate knowledge of both the source and target systems was required.

ODBC and Other Middleware

A number of utilities allow a SQL reporting solution to “pull” from MultiValue. With ODBC approaches, the MultiValue system has the burden of creating data structures matching the requirements of the SQL database. MultiValue data does not enforce the concepts of type or null values, and ODBC does not support multivalued fields. Rules to handle this translation must be manually captured in dictionaries, adding a significant layer of complexity. The process of repeating single-valued fields to accompany multivalued fields (Fig. 1)

FIGURE 1



can be very slow, and by the time the data are in the data warehouse or reporting server, data and subsequent reporting lose any sense of having originated from a MultiValue system.

Over the last five years, .NET solutions from Raining Data, FusionWare, and BlueFinity have arisen to take the place of ODBC, using XML in place of the rigid SQL structures imposed by ODBC. The result is greater reliability and better integration, but the heavy lifting of conversion is still usually per-



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formed by the MultiValue host. Kore and Sierra Bravo sell data integration tools that fill the same role. Windows-based shops that have Microsoft SQL Server expertise in-house might consider one of these .NET-based solutions. An existing data warehouse with an ODBC-aware ETL tool can make ODBC worthwhile even with its overhead. SFW had limited success with ODBC because of the lack of drivers for certain Unix environments.

Extract-Transform-Load (ETL)

ETL tools like DataStage represent the upper end of the market for moving data out of any database, not just out of MultiValue. These are stand-alone products that extract data from one source, transform it, and then load it into another database. They have extensive capabilities to convert and cleanse data, and feature sophisticated scheduling and detailed logging and error handling. Two MultiValue-aware ETL tools are on the market today: IBM DataStage (originally Ardent DataStage), a very widely used data warehousing tool that is actually built on an embedded version of UniVerse, and Solonde TransformOnDemand, which includes a UniObjects interface in its enterprise version. In addition, Microsoft Data Transformation Services (DTS) and their newer SQL Server Integration Services (SSIS) can access U2 data using packages generated by Kore's Kourier Integrator. Each of these ETL tools will assist in designing a SQL database layout based on MultiValue data. Other ETL tools are available, but these are not MultiValue-

aware and would need to access data through intermediate text files, or they could offer MultiValue platform support via ODBC.

Because the ETL tools can run on a separate server, they can perform the conversion from MultiValue to SQL structures outside the operational system (Fig. 2).

In addition, because these tools have access to the MultiValue data, they can mimic the layout of MultiValue fields using multiple tables. The final output, however, will not reflect the MultiValue flavor of the data—a customer name will be repeated with each of

FIGURE 2

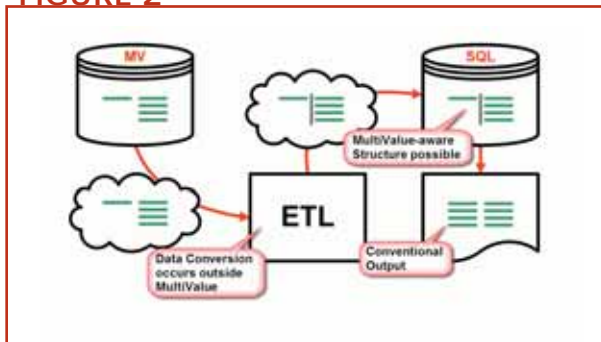
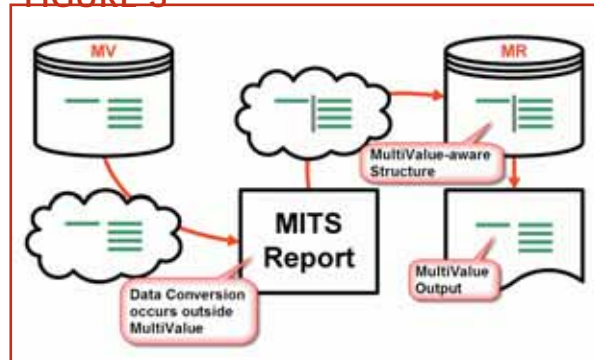


FIGURE 3



their orders. ETL tools are a good choice to bring together a number of MultiValue and relational databases with consolidated reporting requirements. In the end, SFW was the first west coast site to install DataStage.

While MultiValue databases are rightly renowned for their flexible and efficient handling of transactions, the rigid structures of traditional relational databases have better support for rapid indexing, sorting, and filtering, and have a well-understood interface supported by many specialized reporting client tools.

MITS Report

MITS Report bundles the MultiValue export utility, embedded ETL, the report server, and a compelling MultiValue-aware reporting client in an economical offering that provides an end-to-end alternative to the external reporting server. To simplify configuration, the various components share the same metadata drawn from MultiValue dictionaries. Relevant fields are specified only once, and are used for the data export, used to define the MultiValue-aware layout in the data store, and presented in the web-based reporting client (Fig. 3). The MultiValue export and ETL components are inherited from MITS Discover, the Analytical Reporting solution proven at thousands of customer sites. The report server has two components: an embedded database optimized for sorting and filtering with custom data structures

designed to retain the MultiValue flavor of the source data, and a web server based on MITSWeb, the most widely deployed Java server in the MultiValue world.

As an end-to-end solution, MITS Report can include features where it make sense for end users, and not for programmers. One such

feature is its smart sorting of MultiValued data.

When trying to work with multivalued data to create a report server or view the data in conventional reporting tools, the most vexing problem is han-

Continues on page 12

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FIGURE 4

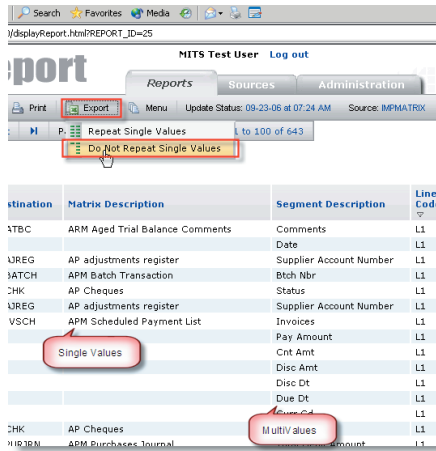


FIGURE 5

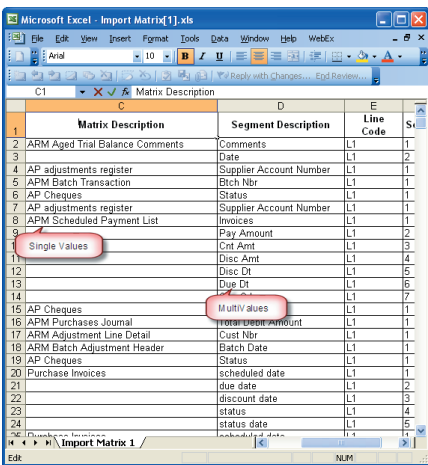
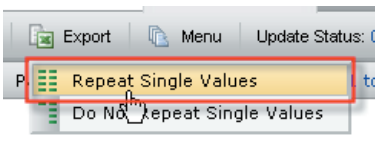
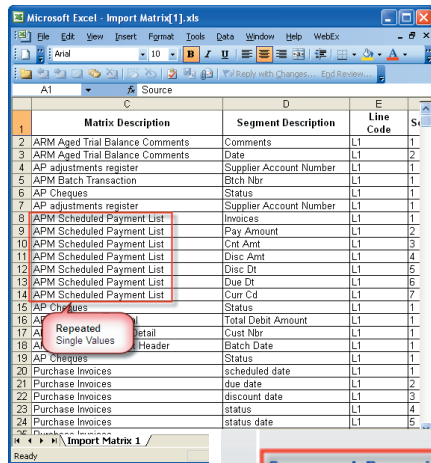


FIGURE 6



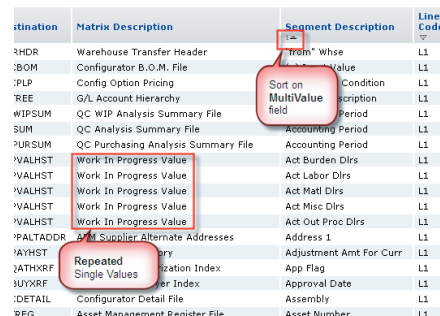
ding a mixture of single-valued and multivalued data. Although MultiValue reports typically show single-valued fields just once, they must be repeated if the data is to be sorted. This is common when exporting to Excel, and MITS Report builds this into the Excel export feature, instead of forcing the decision into the data export, ETL, or storage processes (figs. 4-7).

FIGURE 7



To sort data in Excel, single-valued fields must be repeated. This is the same processing that had to occur in an

FIGURE 9



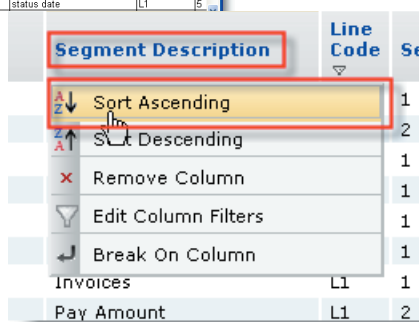
ODBC solution, but here the processing is restricted to the data on one report rather than the entire report server.

There are cases where single-valued data must be repeated in the MultiValue environment—like a sort BY-EXPloding. In MITS Report, this repetition happens automatically each time a sort on a multivalued field is specified (figs. 8 and 9).

Conclusion

Single-point configuration and respect for the MultiValue model from beginning to end set MITS Report apart from less integrated external report server solutions. While MITS Report was developed with a blank slate as a new operational reporting solution for MultiValue, the design decision to move it to a separate server architecture meant MITS had to face all the same problems any MultiValue site faces when creating an external report server. MITS worked hard to solve each issue in ways that were robust and efficient while emphasizing ease of use—leading to features like automatically repeating single values during sorts—and making it a solution to consider when ad hoc reporting overwhelms your operational MultiValue system.

FIGURE 8



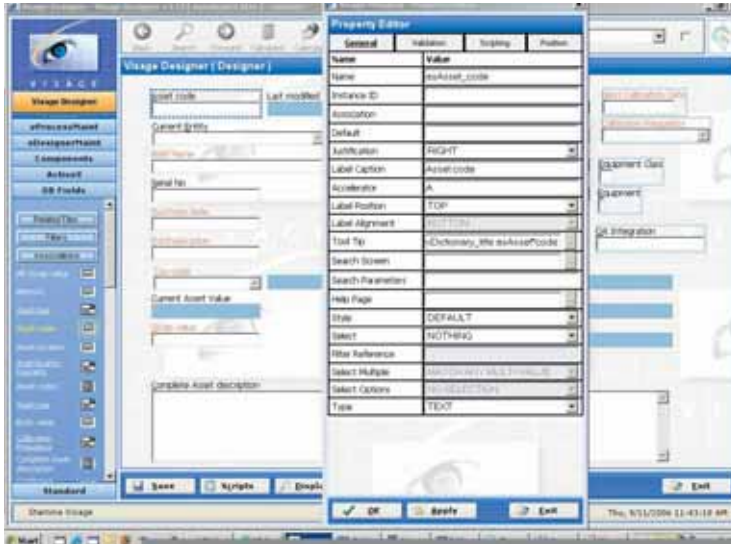
This article briefly visited a range of solutions for getting data out of MultiValue. Each solution has its own place in a number of dimensions like performance, flexibility, compatibility, and price. For MultiValue sites considering offloading

ad hoc reporting, this should be a starting point, and for sites already involved in these projects, it doesn't hurt to understand other options that might be a better fit. If you are involved with a project like this and I missed your solution, drop me a line. **IS**

ROSS MORRESSEY is Channel Solutions Architect for MITS. He can be reached via e-mail at rossm@mits.com.

4GL Briefing— Osmosis

BY CHARLES BAROUCH



SPECTRUM: What's the origin of the product?

David: Origins go back to mid 1980s.

Neil: We originally started in the MultiValue market using R83 and a third party 4GL back in 1983. We developed applications for small to medium businesses. It reached the stage where we had written more than 75% of the application in Data Basic, so we decided to

write our own in-house tools. The first name we used was Configure, and it was only used in-house.

David: This is currently the sixth generation of the product now called Osmosis.

SPECTRUM: Where did the name Osmosis come from?

Neil: It took a long time, but due to our software being so flexible, and the migration facility from other 4GLs, we thought that "Osmosis," being the moving of liquid through a membrane, sounded a reasonable analogy. Other than that, everyone liked the name.

David: A new name is always a challenge.

SPECTRUM: What are the key features that make Osmosis worth working with?

David: Because of origins, we have an extremely solid and full character mode implementation. In the last 2 years a full Windows GUI has been added.

Neil: The CUI part had been available since inception in 1983. My expertise is in MultiValue and MultiValue Basic—not a good insight into the Windows and GUI perspective. So my son Matthew came into the business (straight from college) and developed the GUI. He's a Visual Basic developer and therefore leans towards Windows and not green-screen, which is exactly why we decided on that route. Matthew has been given total control of its development and I have developed the interface routines in MultiValue Basic to supplement it.

Continues on page 14

Neil Charrington,
Chief Architect at
SC Systems, and
David Peters,
Sales Executive
at SC Systems,
gave us a chance
to talk to them
about their 4GL,
Osmosis.

4GL Briefing — Osmosis

Continued from page 13

Our aim was to make Osmosis a complete development and run-time environment. MultiValue has always suffered from the perceived image of being old-hat, character-driven and so on. We have achieved a modern environment for developers by providing a Visual Studio look and feel. Developers can create modern, feature-rich applications that focus on the user's needs and not simply the programmers'. The applications can be both character and GUI.

SPECTRUM: With the same code base?

Neil: Every facet can be switched between green-screen format and graphical, and indeed each user can have their own preference. To do this so flexibly, the underlying code base is the same, and the business rules are the same. The application can be developed using either format.

SPECTRUM: If this was the first 4GL a MultiValue programmer works with, what's the learning curve?

Neil: Assuming they are already familiar with the MultiValue model—data and dictionary structures—a developer would quickly become familiar with Osmosis. With the concept of being a complete environment, it would not take a non-MultiValue developer too long, either. This should be great news for MultiValue as it might encourage the younger developers to come to us. Or at least it might make them available to MultiValue employers.

SPECTRUM: David, when you offer Osmosis to a prospect, what's the lead concept or idea you put in front of them to encourage them to consider Osmosis?

David: Today it's the Osmosis GUI. The ease of use for the developer is a good sell, especially with one of our competitors struggling to get their GUI sorted [out].

The next part of the story is then with the user. The GUI provides strong user tools for inquiry and information sorting.

Neil: Osmosis has taken onboard and integrated a well-known popular Windows data grid. This grid allows us to provide features that seem to be really alien to the MultiValue market, like the ability to populate data into a table and sort it (by clicking on the column header as you would in most mainstream applications). Or filter it against any one or more of the columns, or group it by one or more columns, preview the table or export it to Excel, Word, XML, HTML, or to the printer. All of this is built-in and automatically available when you create reports or inquiry tables.

SPECTRUM: What advice do you have for companies who are all green-screen, traditional code, and want to move to Osmosis? How do they start a conversion in a way that gets them some good initial value?

Neil: If they have already used another 4GL to develop either character or client-server applications, they may be able to migrate to Osmosis already. We have tools to convert some 4GLs. If they have used generic code, and assuming they have the code and understand the methods that were used to create the application, they may be able to write their own conversion tools because we provide a complete schema of Osmosis files within our documentation. Or they ask for our help and we are pleased to oblige.

SPECTRUM: And how did you end up working with jBASE?

David: The jBASE relationship has been long standing as well.

Neil: In 1998 we were looking to move away from being exclusively D3, so we looked around and came up with jBASE.

SPECTRUM: Is Osmosis jBASE only, or can it run on other MultiValue platforms?

David: We're available on jBASE, D3, and UniVerse. Other major vendors are in discussion with us.

Neil: We have end users from Manufacturing, Warehousing, Retail, Education, and Government using Osmosis and/or its predecessors.

SPECTRUM: All UK based?

Neil: We have airports in the USA using Osmosis, businesses in the UK, local government in Europe, and a medical software developer in Australia. We are talking to other developers in South Africa, New Zealand, and Eastern Europe.

SPECTRUM: Do you have a success story you want to mention?

David: The Bowman group in the US is a good story.

Neil: Their applications for airports, specifically their HR systems, were migrated from another well-known 4GL in 2004. Their HR applications are operating in several major airports across the USA. We converted their entire systems 100%, so they did not have any extra work to move any part of the system to Osmosis. We started at about 60% to 70%, but with access to their technical people, we managed to get it to 100%. The first airport application in Osmosis was wheeled out early 2005.

SPECTRUM: So, it took a full year?

Neil: No, we took delivery of their HR suite in October 2004, and by December 2004 we had the first version converted. We then had their techies input and by mid January 2005 we had the final version ready to roll. I believe they installed this version in February 2005. That also included changing database

platforms, which was not a prerequisite for Osmosis, but done at the same time.

One of the special features that they utilize greatly is the Osmosis Print Manager which allows them to manipulate their spooler in a Windows-like graphical form, where their users previously were forced to use the shell commands. They were suddenly able to use their mouse and click to create printers, move print jobs from one printer to another, and so on. They also took advantage of the Osmosis eFax module to write a messaging (e-mail) module to supplement another of their work plan applications that still operates in UniVerse.

David: Osmosis Print Manager neatly integrates with the application development environment, and as Neil says, is a great user tool. It is also sold as a stand-alone product. As Neil pointed out, we work with you: not just a supplier, but building long term relationships.

Neil: Ask Brad Bowman of The Bowman Group. We work very closely with people. We enjoy building relationships, whether with vendors, developers, or end users. When you are developing applications, you need the support from every side. We listen to all of them. That's how Osmosis has grown and become the rich product that it is.

Developers want to develop feature-rich applications, so we included the grid, we integrate with mainstream applications, we provide the tools for them to make their job easier and their end users happier. End users don't want to go to the shell prompt all the time to do simple things like release print jobs, switch jobs, resize files and so on, so we developed Osmosis Print Manager and Configure. Vendors want us to use their features and where we can we will.

David: We use our products to create customer satisfaction. [IS](#)



CREDIT CARD INTEGRATION

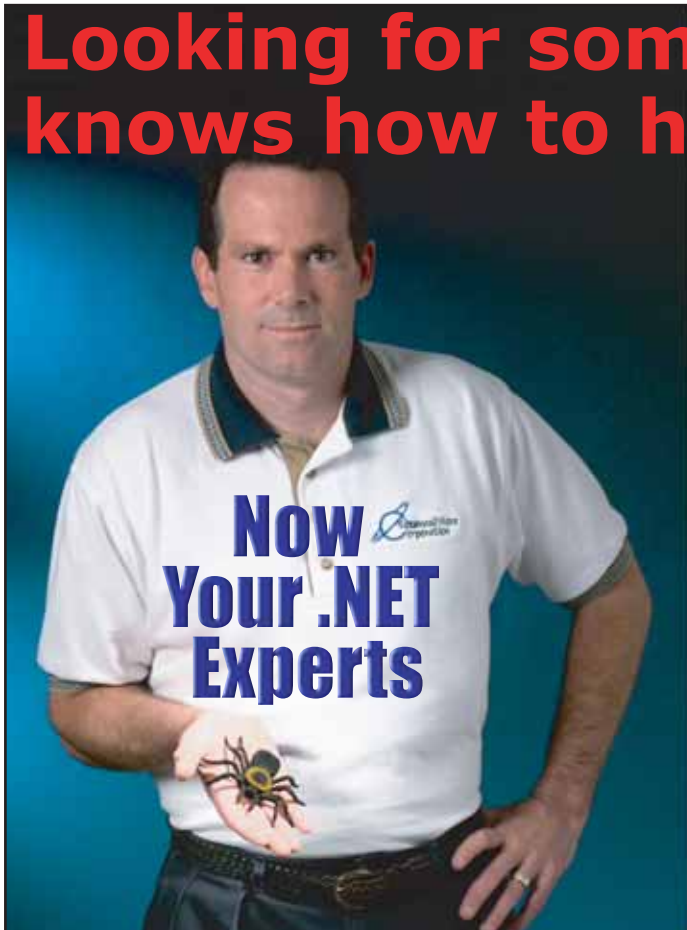
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Order Cycle

for Programmers (Part II)

BY CHARLES BAROUCH

I'm talking to my friend Linda about user training for data entry personnel and she relates the following true story:

"I was training a new employee. We're going from screen to screen and I'm showing her what I expect her to fill in at each point. I get to this one field and I tell her to fill it in with the number two. The woman next to us, whom I trained three months earlier, contradicts me and says 'No, you put an eleven in that field.'"

The field was "MONTH," and the woman Linda had trained in November had been putting an eleven in the month field for three months now. When we see procedural errors in data entry amongst people who do this sort of work for a living, we have to wonder what would happen if we let completely untrained hands touch our databases. With the advent of online ordering, we have created exactly that situation.

Of course, as we mentioned in the last installment, untrained data entry is not the only hurdle in bringing the order process directly into every living room. Let's look at some of the ways we need to rethink order entry once we put it online.

People look at Amazon and ebay as prime examples of people who do the web store the right way. They are not the only ones, and they are not always the best. The fact that there are other stores, thousands and thousands of them, means that either by product mix, presentation, features, or price, other sites are doing something that draws dollars away from the biggest players and into these other stores.

So, a key task in creating an e-commerce site is focusing on giving people a reason to look at the site. A example of a

company that did such a good job of value-add that Amazon felt compelled to buy them is imdb.com. They also happen to be one of the best examples of good usage of database technology to produce effective information.

IMDB is the Internet Movie Database. The central function of the site is not sales. In fact, you can't buy movies directly from them. However, you can search for actors, movies, TV shows, character names, and other key information - all of which happens to link to Amazon "buy now" buttons in the upper right hand corner of each page. You don't go to IMDB looking to buy; you go because movies and TV are interesting to you. This is called self-screening or self-qualifying. It is a process where the appeal of a site reduces the traffic to just people who are interested and likely to buy.

Once there, you can look up, for obvious example, Kevin Bacon. His page on IMDB is hot-linked to every movie he has ever been in and all of his TV appearances. So, you start at Kevin Bacon, move to a movie he did, "Stir of Echoes," which is hot-linked to his co-star, Kathryn Erbe, which leads you to a hot link to her appearance in "D2: Mighty Ducks" which you then "buy now" for your nephew.

Until that very last step, this doesn't sound like order entry. This site has taken the "people who liked x also buy y" sort or up-sell and have turned that one feature into the primary purpose of the site. This does not have any analog in the green-screen order entry world, but on the web, this is a critical selling tool.

So, sites that do well support good order entry, but they depend on good design, original thinking, eye-appeal, and self-screening in order to attract and hold the people who will buy. That means that screen layout, our old 80x24 grid, has been replaced with a whole, full time job category. Getting the store online is not enough. Getting it useful is the key.

Another good example of this sort of outside-the-box approach is a WebWizard project I did with the Camry Group. Our customer didn't really need for people to be able to order online. His e-commerce site has no order entry, is not open to the public, and

When we bring the sales process to the web, we can't just think of it as replicating order entry. We have to think about all the parts of sales.

doesn't handle credit cards. All it does is allow his existing customers to search for and query inventory, so they know what they can get immediately from him when reselling those items to their customers. His order entry is still a phone and e-mail process, but the web drives the sales as surely as it does for Amazon.

When we bring the sales process to the web, we can't just think of it as replicating order entry. We have to think about all the parts of sales. Your web site has to do everything your physical store would, a good chunk of what your marketing would do in a traditional environment, and, by the way, still be a nearly foolproof order entry system which incorporates a best practices customer service component.

Let's go to a store in the 1950s and (in parenthesis) look at the web equivalents of the sales, marketing, and order process.

I send Betty Lou out to neighborhood parking areas to put up flyers (e-mail marking to potential customers). I don't send the flyers out of the neighborhood, because my store is likely to only appeal to locals (targeted marketing, understanding your unique sales proposition and who is self-selects). The flyers have artwork (consistent brand identification through logo, product pictures)

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by Robert Houben, FusionWare

Secure Sockets for MultiValue



Why Do Secure Sockets Matter?

Does your MultiValue system contain sensitive or valuable medical, human resources, financial, or personal information? Are you subject to Sarbanes-Oxley restrictions requiring due diligence to ensure the security and privacy of the data in your systems? This article explains a possible vulnerability that you may be facing and steps you can take to mitigate its associated risks.

Your Systems Are Vulnerable

The Web has forever changed the nature of IT. As I am writing this, there are known exploits for bugs in Microsoft software for which no patch exists. These exploits were released before anyone knew that the exploit existed. The bugs were discovered in the course of trying to identify how the exploit got past the companies' defenses.

Everyone has known someone, or have themselves, at one time or another, discovered that their system was running slowly or doing other "strange" things because of spyware that had infiltrated their computer. It is not my intent to look in depth at all the methods through which a computer can be infected with spyware. Rather, I simply want to point out that if you have any number of users on a network you are likely to wind up with malicious software on that network.

It is important to note that this is not just the domain of unsophisticated users. I think of Mark Russinovich,

founder of Sysinternals, a leading security specialist, who discovered, almost by accident, that putting a Sony CD in his computer drive installed a rootkit on his computer. I wonder how long it would have taken for someone to find this if he hadn't discovered it.

The important thing to note is that if you have a computer that has access to the internet, that computer is at risk of being infected with malicious software. The risk is high enough that you should really assume that this will hap-

pen in the next six months, and that you will take some time to realize it is happening before you will catch it.

MultiValue Systems Traditionally Use Insecure Telnet

Originally, MultiValue systems used serial I/O to communicate between devices such as printers, terminals, modems, and remote networks. Then, as networks became ubiquitous and users discovered that their transport was more reliable, more robust and much faster, the move to network-based communications took place. The Telnet standard quickly took over. Today, the vast bulk of communications with MultiValue systems takes place over socket-based communications, usually Telnet.

Telnet is traditionally a plain ASCII, simple transport. This makes it fast, efficient, and easy to work with, however it also means that anyone can download a packet sniffer and use it to spy on traffic. There are several web sites that make free packet sniffers available for

Figure 1

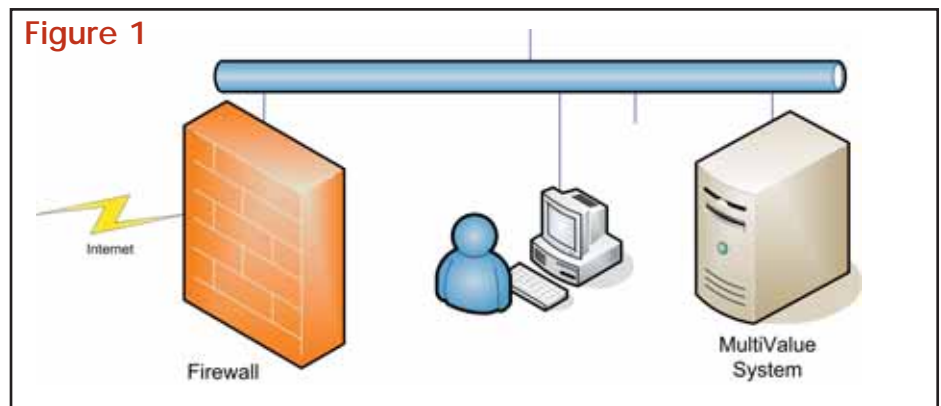
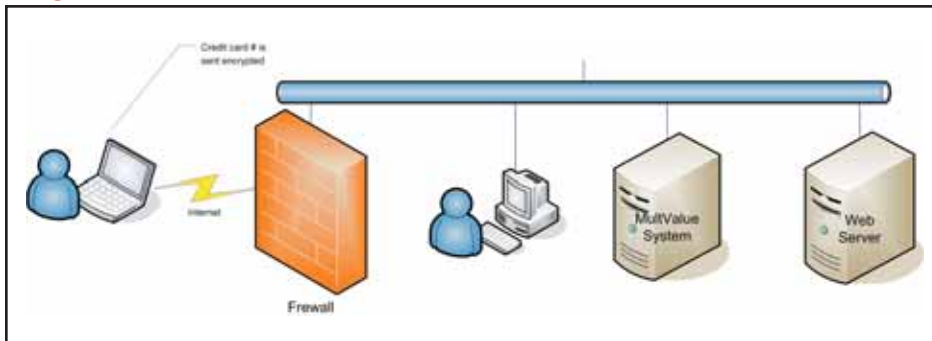


Figure 2



the general public to use. These are easy to install on your computer and to use. They will reassemble the traffic flow (in both directions, if you wish) and allow you to save it to a file, print it, or send it somewhere else using e-mail, FTP, HTTP, or some other mechanism.

Fortress Model

Many users have traditionally subscribed to the Fortress model of security. Figure 1 shows a simplification of a network configuration.

The fortress model takes the approach that you build a fortress and protect it (with a firewall, in this case). You trust everyone inside the fortress, so all that you need to do is ensure that only “friendly” people get inside the fortress.

There are situations where this may actually make sense, but as I will show, for the majority of MultiValue users, this is probably not a valid approach.

There are two general problems with this approach:

First, most intentional exploits that companies experience are done by “trusted” employees or consultants who have access to the systems inside the fortress. This ranges from disgruntled employees taking out their frustrations to people who see a way to “better” themselves at the expense of the enterprise.

Second, spyware can result in insiders inadvertently exposing the company to great risk. Note that for most enterprises, the users represented by the one user icon in the diagram have unlimited rights to browse outside of the corporate firewall to web sites and to send/receive e-mail. They may also have access to a number of other technologies, such as FTP, IM, and others that have built-in data transfer capabilities.

Effectively, the fortress model suffers from the problem that both intentionally and unintentionally, your workstations

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Secure Sockets for MultiValue

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can be used to send sensitive data out of the fortress.

When Is This Not a Problem?

It is important to note that the risks associated with these situations are limited for some customers. If you are not processing sensitive medical, human resources, personal, or financial data for either your internal personnel or customers, then you may not have a concern. If you feel that there is no significant value to a third party to justify the risk to themselves breaking into your network, gathering data and transmitting it outside of the network, then this may not be an issue for you. Otherwise, you should seriously consider the issues raised in this article.

Example Exploit

In order to make this picture crystal clear, I will take a few moments to show how this could be a problem:

In figure 2, you have a remote user communicating with your corporate web server using secure HTTP. This could be any sensitive data, but for our purposes, we'll call it a credit card. The user places an order with the web server using their credit card number to purchase goods from your company. Because they are using secure sockets to communicate with your web server, you would assume that the credit card numbers are safe from prying eyes.

However, the actual communication between the web server and the MultiValue system is done using standard Telnet-based communication, as shown in figure 3.

Now, let's suppose that the user shown inside the firewall browses to a web site that has been compromised, and that this web site has a virus installed on it that exploits a weakness in your browser, that the browser vendor does-

Note that socket 80 is the one used for all web traffic, so your firewall is very unlikely to block it, and intrusion detection software will probably not see anything unusual in this activity.

n't even know exists. In figure 4 you see that we now have a machine inside the firewall (inside the fortress) that has itself been compromised:

The newly installed spyware itself installs a packet sniffer. It also opens up a socket connection over socket 80 to a "Crooked System" computer located anywhere in the world. It then scans all network traffic for anything that looks like a credit card number and sends the entire stream for 10K either side of it to the Crooked System.

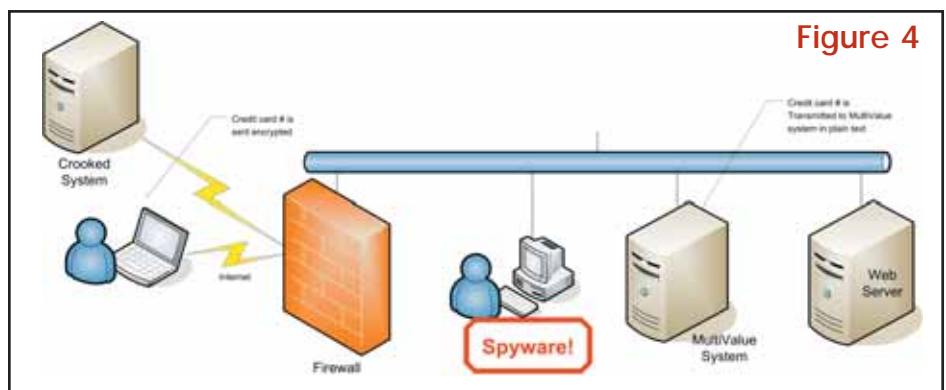
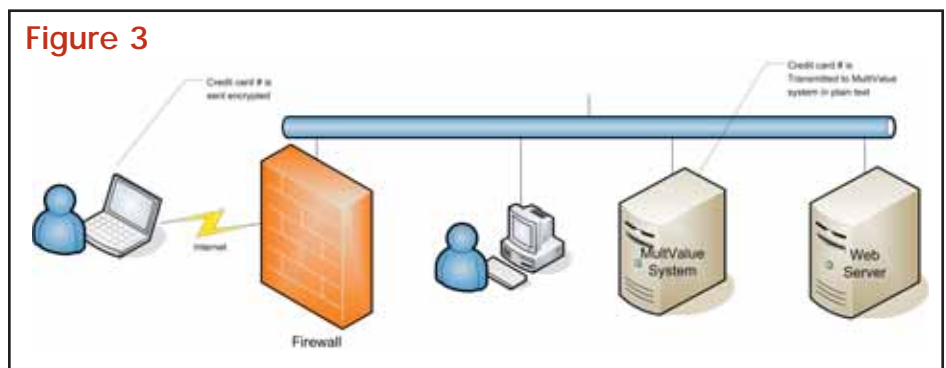
Note that socket 80 is the one used for all web traffic, so your firewall is very unlikely to block it, and intrusion detection software will probably not see anything unusual in this activity.

The initial traffic from your customer to the web server is safe, because it is encrypted. The traffic from the web server to the MultiValue system is unsafe, because it is transmitted in plain text.

Variations on the Theme

In addition to the fact that there are different types of data that are at risk, you may also have other devices. For instance, POS terminals coming in over a WAN link need to transmit sensitive data to the database. There are many

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International Travel Industry Giant Increases Competitive Advantage with ONware and Oracle Offering



Summary: Datalex's Travel Distribution Platform (TDP) is an end-to-end platform for growth, scalability, and extensibility. Functional components of TDP are deployed to maximize revenue, minimize distribution costs, simplify business processes, and deliver self-service across multiple channels. Datalex TDP is based on an Oracle solution. The TDP Fares component of the platform provides an advanced airline fare pricing shopping and management solution and is built on a MultiValue-style DBMS platform, specifically IBM's UniVerse and UniData (U2). ONware, from ONgroup, enabled Datalex to run TDP Fares directly on Oracle, without the time and costs associated with reengineering.

Benefit: TDP Fares can now be deployed on both U2 and Oracle giving Datalex a competitive advantage to increase market share.

Challenge The challenge in bringing these two modules together is not only in the difference in the U2/MultiValue data model, (U2 is 3-dimensional while Oracle is 2-dimensional), but also the ability to execute the Basic

programs and other MultiValue application objects directly on Oracle.

Solution: Reuse TDP Fares U2 application logic directly on Oracle, expanding Datalex's platform offerings.

The de facto standard for database management systems (DBMS) in the international travel industry is Oracle. Acknowledged as a best-of-breed application, Datalex TDP is the most advanced online shopping and reservations engine for airlines and travel suppliers. TDP provides advanced shopping, pricing, and booking capabilities. It also enables flight driven dynamic packaging with air, car, hotel, insurance, and activities. The TDP Fares solution controls the creation, maintenance, distribution, and pricing of fares, so that airlines can focus on maximizing revenue by directly targeting discounts and incentives by customer, corporate client, and agency groups.

The choice of ONware gives Datalex the ability to run the U2 application logic on and store their data in standard Oracle tables without starting over. ONware enhances Oracle with the ability to execute U2 logic. With ONware,

Datalex has a familiar MultiValue engine that can run their Basic programs, utilize the U2 dictionary objects, and run the MultiValue query statements directly on Oracle.

ONware eliminates the expense (in terms of time and dollars) of reengineering a proven and solid component of Datalex's software product offering.

The migration from U2 to Oracle consists of compiling Basic source code, compiling dictionary objects, loading data (equivalent of an account save/restore), and testing. Of key importance was ONware's ability to support UniVerse's GCI interface to customer developed C and C++ routines. Datalex's core competence includes the development of travel distribution solutions that extend from mainframe to desktop. These include a comprehensive suite of internet and connectivity applications, mainframe development, and professional services.

Visit www.ONgroup.com
for more information
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Kittery Trading Post Introduces Online Shopping



Since 1938, The Kittery Trading Post (KTP) has

served New England, and the rest of the world for that matter, providing top quality products and service for camping, fishing, hunting, and skiing needs. In the spring of 1983, management determined that in order to continue to be successful, and to provide the service and additional products that its customers deserved, it was time to join the throngs of organizations that had already found the need to automate their business.

Enter Pick, in the form of first, General Automation Zebra, followed by Data General and Advanced Pick on DGUX. COMPAQ and D3/NT took over in 1998, to be replaced in 2003 by the current HP systems running D3/NT. Pick (Raining Data) allowed us to service the tremendous growth in size that KTP experienced, evolving to the current 90,000+ sq. ft of retail space. POS Sales transactions number in excess of 620,000 per year. Peak-time (July 1 – Dec. 31) transactions are 2,100 per day.

As well, a separate store for Bicycle, Surf, and Paintball needs is about 1,000 ft.

south of KTP; an attached 30,000 sq.ft warehouse, a 37,000 sq.ft facility about four miles north, in York, Me., and most recently, a 65,000 sq. ft warehouse three miles south, in Portsmouth, N.H., comprise the other facets of KTP.

Until now, that is. On Wednesday, Oct. 25, 2006, The Kittery Trading Post proudly debuted its newest sales entity – www.ktp.com. This web page / shopping cart was designed by a firm in Vermont, using MySQL as its database. Again, Pick (RainingData) was there to assist KTP in making this transition to world-wide sales possible.

Through the aid of RD's OPENDB, all of the back-office applications dealing with not only the updating of current stock and pricing to the web, but the extraction of SQL tables from the web site, into our D3/NT database, allow us to build orders, pick inventory, and ship to our customers. The merger to UPS WorldShip software was a simple "SQL-CREATE-TABLE..." statement, and we were on our way. Visual Basic screens, using the D3 API, are used to finalize shipping quantities, print customized packing documents and greeting cards, and to complete billing.

During our first few weeks of doing business on the web, we experienced slow but steady growth, which was exactly what we had hoped for at the outset. The initial volume of sales allowed us to fine-tune the picking, packing, and billing processes. By week seven, with minimal advertising except to our registered email customers, we had processed sales to all 50 states and most Canadian Provinces, while the volume of orders rose to 90 -100 per day.

With the OPENDB connection to the MySQL database, a MultiValue programmer need not learn any additional programming language, which is a major factor in being able to see this project come to fulfillment in a relatively short period of time. Besides updating by way of Pick programs, editing of SQL records is done via the Pick Editor, or Update Processor.

It has been my pleasure to be the Director of MIS since the department's inception, way back in 1983. It has also been a pleasure to have Pick as THE one and only database to serve this company's Information Technology needs. And now, thanks largely to Pick Systems / RainingData's products, and the efforts of

RD support-staff members Rick Davies and Robert Burke, and to Zumasys, providers of hardware and support here at KTP, specifically, Joe Cupp, who directs the support staff at Zumasys, we have entered into a new era.

I invite you to check out our website, and view the short video at the bottom of the screen, which gives a brief picture of who KTP is and what we stand for. I also ask that you spread the word to your friends and associates, asking them also to try our site.

Thanks, and happy shopping at KTP.COM

Jim Cronin,
Sr. Director Management Information Systems

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Nebula R&D Expands European Presence

U.S.A.-based Nebula Research and Development has announced European operations are now being handled through the office referred to as "Nebula-Spain." Joseba Real de Asua will represent Nebula R&D in the sales cycle, provide product support, and contribute to ongoing development projects. This is part of an initiative to provide direct sales and support in local time zones and local languages for a growing client base in Europe, as well as to bring more Pick/MultiValue software to Spanish-speaking users in Spain and Latin America.

Nebula R&D is an authorized reseller for DesignBais International, and provides related training and development services. Joseba is now translating the DesignBais reference manual for developers in Spain and Latin America. The DesignBais software facilitates deployment of MultiValue applications in local languages, including Chinese and other languages that do not use the Latin alphabet. The development environment itself is being extended to use this feature, which Joseba will use to translate the product itself for use by Spanish developers who do not speak English.

Specializing in communications software for MultiValue environments and GUI development, Nebula R&D also sells, supports, and provides training and development services for mv.NET. Joseba is skilled with mv.NET and related technologies and is ideally qualified to represent Nebula R&D and offer mv.NET and advanced development services to MultiValue VARs and end users.

A new localized GUI might help to preserve existing software investments or open new markets for application resellers. End users and software developers with non-English speaking audiences are invited to contact Joseba Real de Asua, or Tony Gravagno, President of Nebula Research and Development, to discuss the possibilities.

For more information, please visit <http://Nebula-RnD.com>. ■

Carson-Newman College Chooses Informer Web Reporting



Situation: Carson-Newman, a four-year college with an enrollment of 2,200 students, needed to deploy a Reporting Solution to support their new back office implementation of Datatel,

an ERP system built on UniData designed to manage campus operational needs.

IT Staff required a Reporting Solution able to satisfy and exceed the needs and expectations of eventual report consumers — one providing fast, secure access to real-time information.

Challenge: Provide real-time data access campus-wide

Greg Bailey and his staff at Carson-Newman College are responsible for, among other things, the day-to-day operation of the campus-wide ERP implementation of Datatel, a software package designed to manage

universities and community colleges, including everything from student enrollment, financial aid, and marketing operations. Essentially the backbone of the University insofar as software is concerned.

Datatel is a relatively new package for Carson-Newman,

Continues next page

News-makers

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Carson-Newman Continued from page 23

having only completed the rollout campus-wide in 2004. Prior to the rollover, Greg and his staff relied on a heavily modified legacy reporting system to retrieve data from their previous system. But with a new state-of-the-art back office installed campus-wide, Carson-Newman quickly realized the need for a strong reporting environment to complement it. They entered the marketplace

seeking a cost-effective solution supporting their MultiValue UniData database.

Solution: Implement Informer Web Reporting

Ultimately, the IT staff at Carson-Newman needed to provide a gateway to operational information for their end users. To be successful, they required a system easy to maintain, intuitive for end users, secure, fast, powerful, and most importantly, cost-effective. After reviewing available options, Greg and

his staff chose Informer Web Reporting.

Results: Intuitive, personalized view into administrative data

Within a week of purchase, Carson-Newman delivered critical reports to end users and trained report consumers to create and modify their own reports. A customer of Entrinsic since only the summer of 2005, Carson-Newman operational staff now bases much of their daily operations on Informer functionality, relying both on stan-

dard features such as report scheduling as well as new-found creative ways of manipulating Informer reports, such as automating call-lists to their Telecommunications counselors.

"Informer has been the best investment we've made since we converted our administrative software to a UniData platform. With its easy, web-based, real-time, point and click interface, Informer delivers a powerful reporting solution that is affordable and would be almost impossible to be without now," said Kevin Houk, Application Systems Analyst, Carson-Newman College. ■

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Digital Signatures

Electronic documents play an ever increasing role in our lives. But this raises a difficult question. Just how far can you trust an electronic document?

Documents can be faked. Signatures can be scanned. E-mail passes across insecure servers, relayed across the world. Every day your in-box attracts spurious requests for financial details amongst the adverts for physical enhancements. We know these things are unsafe: how then can we be sure when a real document arrives?

To establish trust in a document, we need to know three basic things:

- ◆ Whether the document has been changed.
- ◆ When the document was authorised.
- ◆ Who created or authorised the document.

If we do not know the answer to any one of these questions, the truth is that we cannot trust that document. And whilst that raises some difficulties for us as individuals, that lack of trust is a greater issue when applied to business and federal transactions such as e-commerce, business-to-business operations, legal forms, medical data, tax and other government submissions and increasingly to the world of corporate

governance. The Sarbanes-Oxley Act, along with forthcoming E.U. legislation, place requirements on companies to archive documents and communications securely in a tamper-proof fashion. So how is that possible?

Establishing trust in a document is not a new phenomenon. For as long as the written word has existed, we can assume, human nature being what it is, that fakery has existed alongside it. And so throughout history, different ways of countering fakery have also been devised, from a tally stick split across the markings so that the two sides must join up to seal a pact to a wax seal placed across the join of a scrolled

parchment to indicate tampering. Modern documents have sacrificed convenience over security by relying on a personal signature that can be legally binding on mortgage applications and credit card vouchers and yet

so easy to duplicate. Chip and PIN is a belated attempt to reduce the massive levels of credit card fraud.

In the digital world, we deserve something better.

Identifying Marks

Consider a wax seal. For much of Western history, wax seals conferred the authority of the State onto a document. A seal could convey the highest authority standing in place of the King.

Affixing a seal to a document gave it authority; removing the

seal revoked that authority. Of course, the seal did not itself prevent tampering to the document itself—though it probably established the penalty for anyone caught doing so! And the

A digital signature can ensure the authority, date, and currency of a document. In order to answer those three questions, it needs to combine three technologies.

seal would have to be recognized by all parties.

Fortunately for us today, we have an equivalent to the seal that can apply to electronic documents (and is less messy to fix). That counterpart is a digital signature.

A digital signature is not a representation of a physical signature. A digital signature is a structure that can be applied to a document or file to answer those three questions above. A digital signature can ensure the authority, date, and currency of a document. In order to answer those three questions, it needs to combine three technologies.

Message Digest

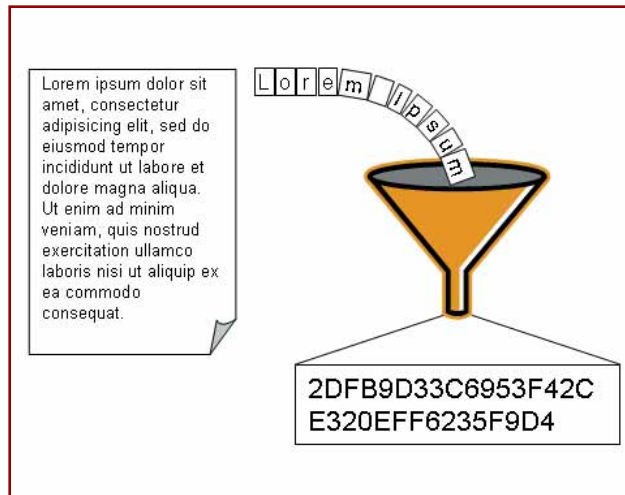
The first technology establishes the validity of the document: that the document has not changed in any way since its authority was granted. Note that I do not say, since it was created, as authority in the form of a digital signature can be applied at any time and by more than one party, similar to a paper form that is countersigned by a manager or witness. The digital signature needs to capture the state of the document as it was at the time the signature was created, so that this state can be checked against the state of the document when the document is read.

A digital signature performs this by generating a Message Digest. A digest is like a digital fingerprint: it distills the document content into a small identifier that can be stored and later verified by running the same operation against the document a second time. If the resulting identifier and the original identifier match identically, you can be sure the document has not been altered.

In practice, a message digest is created by performing an algorithm that examines each byte of the document and combines it into the calculation of a very large number. This number is such that no two non-identical documents will produce the same number, and the

algorithm is structured in such a way that even the smallest change to the document will yield a huge difference in the number produced. There are two standard digest formats in common use: the 16 byte MD5 and the more secure 20 byte SHA-1 digest (fig. 1).

Figure 1



Time Stamp

The second question concerns the time when the document was authorized. In many cases, we may be content to simply use the local time stamp on the server where the digital signature was applied. For more robust validation of time critical documentation, we need to know the time established by a trusted time server.

Digital signatures may include a time stamp requested from a time stamping authority (TSA). There are a number of such services available, both public and commercial. The time stamp returned from the TSA encodes the time from a verifiable source, a unique serial number, an identifier for the authority and details of the security policy under which it was created. The time stamp is signed using a certificate key reserved for that purpose. Those really wishing to know more about TSAs (and who have too much time on their hands) can google for RFC 3161, the document that defines the time stamp protocol and responses.

Signature Authority

Finally, the authority of the signature is established using a public key encryption. The signature is encrypted using a private key and enveloped with an X.509 certificate that serves to establish the identity of the signer—all of which deserves further explanation.

The authority of a document rests with the person or organization responsible for signing the document. Which raises the question: how can we trust the identity of that person?

We need a secure means of establishing the signer's identity or, failing that, a way of trusting someone else who can

identify on our behalf. Since in all probability we don't personally know the signer and haven't received the document directly from their hands, we have to delegate that responsibility to a third party. This is the job of a Certificate Authority.

Certificate Authorities (CAs) fulfill the vital role of "trust brokers." A certificate authority establishes a very precise and specific trust relationship with regard to a particular party and confers that trust through the medium of a digital certificate. By checking the certificate, we can decide whether we trust the CA and therefore, by association, whether we trust the party that they have trusted.

Digital Certificates

Certificates are a complex subject, made more so by the general air of obfuscation and mystery that seems to surround anything in this area. Just what is a Digital Certificate, and how does it pass on a trust relationship? Time for a (slightly simplified) example.

Continues on page 28

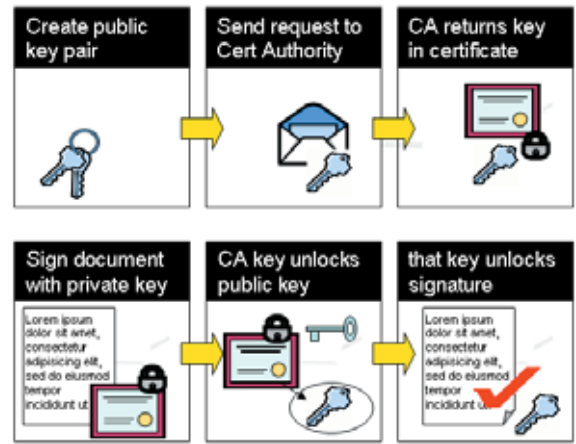
Let's say I receive a document that purports to come from my friend Bill. Now I may know Bill; I may have met him at trade shows and even shared drinks at the bar. I think he's basically trustworthy (he pays his bar tab), but can I also be absolutely certain that the document came directly from him? I could ring him up and ask, but then he's (a) probably busy, (b) in a different time zone, and (c) well known for indulging in long drawn-out conversations. So I need a quicker and more verifiable route. Fortunately Bill's document has included a digital signature and a certificate from a reputable Certificate Authority. This is how it happened (fig. 2):

First Bill created a public and private key pair (see the breakout for details of public key encryption). This pair of keys is unique: no other keys in the world can ever match this pair. How he generated the keys is not relevant:

there are a number of tools he could have used, including the OpenSSL libraries.

Next, Bill contacted a Certificate Authority with a worldwide reputation for honest dealing. He sent a request for a personal certificate to this CA, including his public key with the request. Before issuing a Certificate, the CA performs various background checks to verify that Bill really was who he claimed to be, thereby establishing his identity to the authority and creating a very clear level of trust between the certificate authority and Bill. Only once the CA was sure of his identity, did the CA then send Bill an X.509 certificate. The CA also publishes the nature of the background checks it carries out, so that these could be verified by anyone wanting to know whether

Figure 2



the CA's level of trust is sufficiently reliable for their needs.

The X.509 certificate they issued includes:

- ◆ Bill's public key from his original request.
- ◆ a set of identifying details.
- ◆ the details for the CA who issued the certificate.

Public-Key Cryptography

Public-key cryptography is an esoteric branch of cryptography that resolves one of the traditional problems with data encryption. Regular ciphers, also known as symmetric ciphers, encrypt data using a key or pass-phrase. These can be highly secure but suffer from the drawback that the same key is used for encrypting and decrypting the data.

To see why this is a problem, consider the story of the chocolate.

Alice is a team leader. Her team consists of Sue and Grace. Their work is sensitive, and to prevent electronic eavesdropping, this small team regularly communicates using encrypted messages.

One day three boxes of chocolates arrives from a happy customer—one for each of the team (it's nice when that happens!). Alice sends a message to Sue and Grace to let them know they can each pick up their box. The message is

encrypted using a symmetric cipher, but Sue and Grace have the key. They can both decrypt the message and read it.

Grace likes chocolate—so much she will do bad things to get it. She also gets the message first and calls Sue away from her desk. With Sue out of the way, she forwards a second copy of the message from Alice but alters it to tell Sue to delete her last message as it is a fake containing a virus. To make it seem genuine, she encrypts it using their shared password. Sue opens the message, believes it genuinely came from Alice, and deletes the message about the chocolate. Grace is free to get both boxes of chocolates for herself.

What if they had used public-key cryptography?

Public-key encryption uses two mathematically related but separate keys, one of which is known as the "private key" and one of which is known as the "public key." A message encrypted

using the private key can only be decrypted using the matching public key; likewise a document encrypted using the public key can only be decrypted using the matching private key. The same key cannot be used to both encrypt and decrypt a message.

Using a public-key infrastructure, Alice, Sue, and Grace would each have their own private key that they can use to encrypt messages. They exchange their matching public keys so that they can decrypt each other's messages.

When a message arrives, they can each read it by using the corresponding public key; but the encryption is like a fingerprint, and none of them has access to the others' private keys. This means that the identity of the message sender is always known.

So when Grace gets the message about the chocolates, she can only forward a message encrypted using her own private key, and Sue will know that it hasn't come from Alice.

Sue's share of the chocolates is safe.

- ◆ Finally and most importantly the certificate is signed using the CA's own private key.

Bill then created a digital signature and encrypted it using his private key, and sent me the signed document along with his certificate. You recall that the certificate contains Bill's public key needed to decrypt the signature — except that it is locked by the CA's private key.

When I receive the document, I can ask the CA to validate the certificate. This is essence requests the public key from the CA (actually in the form of a certificate once again), which I use then use to unlock Bill's X.509 certificate, showing that the certificate must have originated with that CA. Having unlocked the certificate, I can then extract Bill's public key. Finally I can use Bill's (now accessible) public key to decrypt the signature and prove that the signature was indeed his.

Digital Signatures in the Real World

As you see from the example, digital signatures can provide a high degree of certainty but at the expense of a significant amount of work.

Digital signatures depend on three things: the trustworthiness of Certificate Authorities, the willingness of people to sign up for certificates with which to authorize documents, and the availability of software for signing and verifying those signatures.

So far, the world seems content to trust the CAs—companies like VeriSign and Thawte establish trusted identities for eCommerce transactions, secure communications over SSL, e-mail, and document signing. The willingness of companies to adopt digital signatures is an economic one. Signed certificates can be expensive depending on the level of background checks performed, but so is the potential cost of fraud, and in any case, legislation may begin to force companies' hands.

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The availability of software, however, is still a potential barrier, particularly when it comes to verifying files. The technology is complex and obscure, and for most file types there is no provision for a standard built-in digital signature. This means that the signature needs to be generated and exchanged separately (for example, in a zipped archive) or enveloped with the document in a standard format that can be

easily distinguished and handled. The lack of easy-to-use and inexpensive software for generating signatures, along with the general difficulty in getting to grips with the technologies, is a major factor in the sparse adoption of these procedures.

Even the certificates themselves are part of that problem. These are designed for secure key exchange, but

Continues on page 30

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wise send the secure message to new locations. The PKCS#7 format is a standard format used for securing e-mail attachments, and so is probably the most commonly verifiable format.

For an even more direct and secure operation, mvPDF allows users both to generate and to sign Adobe PDF documents from within a MultiValue application, using either a Basic API, WYSIWYG document designer, or command line tools and can be used to sign PDF documents created by third parties as well as those it creates itself.

Both products include a certificate manager (fig. 3) to hold certificates in an identifiable and secure manner, avoiding the usual issues with the Windows certificate stores and making it easy for developers to specify certificates to use for signing.

But just why should a signature be more secure as part of an Adobe PDF document than other formats?

Signatures in Adobe PDF

Whilst it is possible to attach signatures to any file type, it would be better to select a file format that includes digital signatures embedded inside the physical document structure, and better still to select one that offers automatic verification when the document is opened.

This is one of the features offered by Adobe's Portable Document Format and one reason why PDF is being adopted by a number of European countries as a medium for government transactions such as tax submissions.

Adobe's Acrobat Reader directly supports a range of digital signature types, and the Reader itself performs all the necessary verification to ensure that the signature is both valid and current: this

includes the digest calculations and all the facilities for communicating with the certificate authorities to perform certificate verification. All of this takes place transparently to the user as the document is opened. PDF documents can even support incremental changes signed by more than one party.

The PDF signature block holds additional information to back up the signature itself. A signature block can include the reason for the signature—for example, authorship, witness, verification or any other text. It can include legal text to explain the nature of the signature authority. And you can add your own signature image to appear on a specified page in the doc-

Figure 3



Continued from page 29

are not designed for software automation. Identifying individual certificates is a difficult affair. Windows certificate stores are notoriously difficult to navigate programmatically, and the secure file formats used to distribute certificates (PFX files) are shielded with a password that must be known to the signer, which presents a problem when using them in an automated environment.

Digital Signatures for MultiValue Users

There are a small number of products that will provide digital signature support to MultiValue applications.

mvDistributor is one product that allows MultiValue developers to generate digital signatures along with SHA1 and MD5 digests and to envelope files using the PKCS#7 format, before then allowing them to e-mail, ftp, or other-

ument so that the recipient can click on the image and view the signature properties.

mvPDF supports these facilities directly from within its BASIC API. For more information on mvPDF and digital signature support please visit my web site at: <http://www.brianleach.co.uk> is

BRIAN LEACH is an independent MultiValue consultant and contractor, and Vice President of the IBM U2 User Group. You can find more tools and free utilities on his website at: <http://www.brianleach.co.uk>

New Products

Entrinsik's Informer v3.2.1 Now Available



The newest version of Entrinsik's U2 Web Reporting System Informer offers new report distribution features as well as easier and closer integration with VAR Software Products.

Enhancing their growing reputation as the best in class reporting solution vendor for the IBM U2 family of database products, Entrinsik president Doug Leupen proudly announced general availability for the newest version of their popular Informer Web Reporting System.

Informer is a J2EE web application designed for intuitive access into UniVerse and UniData database stores. Using only a web browser, users can create and execute personalized reports to be displayed in HTML format or exported to popular desktop applications such as MicroSoft Excel and Adobe PDF. Reports can also be scheduled to execute on a recurring basis and delivered via e-mail or saved to the network.

New features for end users in v3.2.1 include a host of collaboration features, such as the Informer Community, and the ability to import and export report templates. Users with similar database schemas can take advantage of these features to share report and meta definitions, thereby helping to distribute commonly used and known quality report templates.

Entrinsik also markets Informer Web Reporting to VARs and Resellers in need of a complimentary reporting tool for their U2-based products, recent deals including Companion Technologies, F.W. Davison, and others. These VARs and others will benefit from the new VAR Toolkit included in Informer v3.2.1. This new collection of features allows VARs and resellers to offer a customized OEM version of Informer for delivery to their clients, or as an embedded solution in their existing offerings.

The toolkit makes it simple for VARs and Resellers to customize Informer, both visually – such as changing the look and feel of the application and the installer – and programmatically – such as adding custom authentication drivers, embedding default configuration settings, and more. It also includes a build script to automatically bundle customized drivers, settings, and data elements such as default reports, into a new point-and-click type installer that can be distributed to customers.

Andrew Morovati, Informer Project Manager for Entrinsik, explains, "The VAR Toolkit essentially enables Informer to be relicensed in a customized format. Now VARs can offer a completely blended solution straight out of the box."

This represents the third major release of Informer in as many years, and continues Entrinsik's trend of quick response to changing customer needs. Entrinsik President Doug Leupen notes, "We have been listening to our customer's needs as we pursue rapid development and upgrades to this very popular tool.

As this release again demonstrates, we're committed to keeping Informer intuitive and simple to use for end users while providing features for the technical and development staff as well." ■

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BlueFinity's Web Binding Objects with Ajax Features Helps Web Development Shine



BlueFinity International, a member of the Mpower1 group of companies, is pleased to announce the latest enhancements to its Multi-Value to .NET toolset – mv.NET Web Binding Objects with Ajax features. For developers using Visual Studio to create ASP.NET applications, mv.NET Web Binding Objects offers rapid development of sophisticated web applications. The integration of Ajax features into mv.NET gives MultiValue developers access to a wide range of web development techniques for improving the look, feel, and operation of web-based applications.

Based on the highly successful Binding Objects for rich-client, Web Binding Objects allows developers to create functionally rich web applications with a fraction of the coding effort traditionally associated with such tasks. Web Binding Objects combines strong Visual Studio integration with high-performance ASP-based support technology to provide a powerful and flexible infrastructure for developers to use as the basis of their web application development activity.

The data access layer of Web Binding Objects is built around the industry-leading mv.NET data connectivity components, ensuring rapid and reliable data access performance combined with efficient session management.

Web Binding Objects brings a rich-client style of data-bound development to the web application arena, providing a highly complimentary extension to Microsoft's goal of closing the gap on the differences between rich-client and web-client application development processes.

"With Web Binding Objects, the developer is able to focus on delivering the business requirement, without having to spend relatively large amounts of time on the more mundane, non-visible infrastructure areas - this being handled automatically by Binding Objects," explains David Cooper, Lead Developer at BlueFinity. Consequently, issues like connection pooling, state-retention, complex inter-page related navigation and back-tracking, field validation, etc. are all woven into the fabric of the Binding Objects infrastructure – saving the developer time and effort.

"However, the hot developer arena is not so much web application development in general, but rather web application development using Ajax principles - that is, the adoption of semi-standardized ways of producing more responsive, sophisticated, and slicker Web application interfaces," Cooper adds. When Ajax-based techniques started to emerge within the web developer community, BlueFinity developers immediately recognized the potential for dramatically improving Web applications. "We believe that we are in a market first position with our automatic integration of Ajax into a .NET data binding technology."

Ajax, shorthand for Asynchronous JavaScript and XML, is a web development technique for increasing the interactivity of web applications. Ajax gives developers a framework for significantly enhancing the usability and interactivity of web applications. The aim behind Ajax is to make web applications feel more responsive by exchanging small amounts of data with the server – behind the scenes – so that the entire web page does

not have to be reloaded each time the user makes changes or selections.

"It is the concept of Ajax being tightly integrated into the data binding framework that makes our use of Ajax such a compelling feature for Web developers," Cooper remarks. "We take care of all the Ajax implementation and management – the developer simply has to set one property of our data binding manager to 'true' in order to activate a whole layer of automatic Ajax integration."

Web Binding Objects and Ajax integration are available now in Version 3 of mv.NET, with further enhancements planned. "This seamless integration of both a data-bound programming pattern with background Ajax processing is, we believe, unique and one which we will be actively expanding upon over the coming months."

BlueFinity will show demonstrations of its mv.NET technology at the International Spectrum show in Long Beach, CA in March and at its inaugural developer's conference in May in Miami, FL. For more information including free webinars or to download a free evaluation, visit www.bluefinity.com. ■

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New Products

jBASE International Announces Major Enhancements in Release 4.1.5



jBASE International, a leading supplier of database management software and web enabling tools for development, deploying, and maintaining business applications solutions, is pleased to announce the general availability of the latest version of its multidimensional database: jBASE Release 4.1.5.

The release of jBASE 4.1.5 undoubtedly marks a major new software development for jBASE software. This release introduces a number of new concepts and features to the jBASE product model as well as several minor, although no less important, enhancements.

Many of the features have been redesigned from the ground up to improve an already best-of-breed performer. The thread signal handler has been reworked to ensure full thread safety, making jBASE the only thread safe MultiValue database. This functionality is ideal for the customer devel-

oping multi-threaded Java applications.

Enhanced SQL, Java, and XML support position jBASE on a level playing field to the mainstream DBMS. Developers now have the ability to integrate XML into their applications, to use .NET and Java more extensively, and to use the multi-threading features of those languages. A number of XML statements have been added to Basic support construction of XML documents. In addition, it is now possible to validate XML documents against schemas, or DTDs, using a Basic statement.

A new file type has been added, jPlus, which offers the ability to use large files (greater than 2GB) without administrative headaches. This is ideal for the customer with extra large files on a system, or who wishes to use files that are more resilient to data corruption.

This latest release also incorporates modifications to the underlying jBASE library functions and components in order to provide the tools and mechanisms whereby applications can be internationalized and localized for

global communities. The internationalization functionality provides applications with the capability for correct handling of locale dependent collation sequencing, along with processing of unique character properties, code page data import/export, and terminal/printer data input and output. The jBASE library functions, when used in International Mode, process internally using character rather than byte oriented values and properties so that applications can be easily coded or converted by minimum change for the international market.

The addition of an SQL engine means that a Basic programmer can include SQL statements in place of or in addition to jQL in their Basic code or at the command line to access jBASE files. It enables users to perform standard SQL queries against jBASE files including joins directly, field comparisons, and other SQL type features not available with standard jQL reporting language. In particular, with jBASE, SQL allows users to query data where there might be tables within tables

and no primary key/foreign key relationship.

To prevent people seeing jBASE data using non-jBASE tools, encryption has been added to the areas where it is possible to see data. This means that it is now possible to encrypt jBASE hash files, backups, and transaction journals. jBASE Release 4.1.x users can also purchase the optional Data at Rest Encryption Module (DREM), a powerful new cross-platform jEDI that supports 128-bit encryption and decryption of data at the file system level without any changes to the application code.

"This release emphasizes our commitment to our customers and is another demonstration of our stated goal to provide a technological leadership position both in our market and in the mainstream database market," comments Pete Loveless, CEO of jBASE International. "We are thrilled to be able to provide our partners and customers with a truly cutting edge platform and toolset, capable of catapulting legacy as well as mainstream applications to the forefront of tomorrow's computing solutions."

Visit www.jBASE.com for a full list of enhancements, documentation, access to professional services and consulting, or to apply for a free evaluation license. ■

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OpenQM

Object-Oriented Programming

BY MARTIN PHILLIPS, LADYBRIDGE SYSTEMS LTD

Why Do I
Need
Objects? You
don't!
However,
using objects
may make
your life much
easier and
can
significantly
shorten
development
times.

In the first of this two part series, Doug Dumitru gave an overview of how OpenQM extends the familiar MultiValue programming language to add objects, a combination of data and associated program operations. In this article, we explore how objects can be used in a practical situation.

A Quick Review of Terminology

A class module defines a set of persistent data items and one or more operations that can be performed against that data.

An object is a run-time instance of a class, and there may be many instances of the same class, each with its own separate data.

In QMBasic, the object is instantiated (created) using the OBJECT() function, assigning the result to a variable that can then be used to reference the object. References to public

data items or externally callable functions and subroutines within the object use a new operator, -> (pronounced "objref"). This operator takes an object variable to its left and the name of a public data item, function, or subroutine on the right. The name can also be constructed programmatically though we will not explore this further here.

Why Do I Need Objects?

You don't! However, using objects may make your life much easier and can significantly shorten development times.

The example in this article is based on the qmclient.cls class that is part of the standard OpenQM software release and provides access to the QMClient functionality from within QMBasic. Probably the most powerful feature of this class is that it allows applications to execute commands or subroutines on other OpenQM systems, though all the other QMClient features are available too. To implement QMClient from inside QMBasic requires that we open a network connection to a remote server and exchange message pairs in the same way as the Visual Basic QMClient API.

We could implement this using a conventional subroutine-style interface but, because we wish to be able to maintain multiple simultaneous connections each with its own persistent state data, the subroutine becomes messy. Perhaps more importantly, there is no automatic

Continues on page 36

Figure 1

```
CLASS QMCLIENT
  PRIVATE CONTEXT,          ;* Connection state
          SKT                ;* Socket
  PUBLIC ERROR

  ...Functions described below go here...
END
```

Figure 2

```
PUBLIC SUBROUTINE CREATE.OBJECT
  ERROR = ''
  CONTEXT = CX.DISCONNECTED
END
```

Figure 3

```

PUBLIC FUNCTION CONNECT(HOST, PORT, USER, PASSWORD, ACCOUNT)
  SKT = OPEN.SOCKET(HOST, PORT, SKT$BLOCKING)
  IF STATUS() THEN
    ERROR = 'Error ' : STATUS() : ' from OPEN.SOCKET()'
    RETURN @FALSE
  END

  IF NOT(LOGIN(USER, PASSWORD, ACCOUNT)) THEN
    CLOSE.SOCKET SKT
    ERROR = 'Check user name and password'
    RETURN @FALSE
  END

  ERROR = ''
  CONTEXT = CX.CONNECTED
  RETURN @TRUE
END

```

Figure 4

```

CLI = OBJECT("QMCLIENT.CLS")
IF CLI->CONNECT("MYSERVER", -1, "JSMITH", "MYPASS", "QM") THEN
  ...processing...
END

```

represent the connection state and the socket variable. Because these are private, they cannot be viewed or modified from outside the object, which means that the caller cannot interfere with its internal operation. We also need to maintain a publicly visible error text variable. So, to get started, we need the code shown in figure 1.

Just like normal local variables, private and public variables start life unassigned. We would like to initialize some of these variables when the object is instantiated. We can do this using the automatically executed optional CREATE.OBJECT public subroutine (fig. 2).

Next, we need a function that will establish the connection to the remote server. Detail of construction of the network packet has been omitted, allowing us to concentrate on the important bits that relate to object programming (fig. 3).

From the user's perspective, establishing a QMClient connection from within a QMBasic program requires something similar to the code shown in figure 4.

It would have been possible to perform the connection as part of the object instantiation by adding arguments to the CREATE.OBJECT subroutine, but we chose to keep the interface as similar to the Visual Basic use of the QMClient API as possible.

Now we want to call a subroutine on the remote server. We need to add a CALL subroutine to our class module (fig. 5). Again, for clarity, we have omitted the argument error checking and other less interesting components of this subroutine so that we can concentrate on the important bits.

Note the use of the ... syntax to say that this subroutine takes a variable number of unnamed arguments. We then use the ARG.COUNT() function to find out how many were actually given and the

OpenQM *Continued from page 35*

way to clear down connections in the event of program failure. With object programming, the object and its data remain in existence until the object variable is discarded or overwritten, at which point OpenQM will automatically execute an optional user defined "destructor" routine. This removes the need for the developer to keep track of which objects exist and to execute special actions to release resources, etc., when they are no longer required.

Implementation of the 32 operations supported by the qmclient.cls class took about half a day, considerably less than the anticipated development time for a subroutine approach.

Persistent Data

Class modules can use conventional common blocks to maintain data across successive calls but this gives no way to separate the data for different instantiations. We would need to resort to dimensioned matrices for all of our variables and add an indexing argument of some form to all calls. A class module has two styles of persistent data that are automatically distinct for each instance of the object. Private

Figure 5

```

PUBLIC SUBROUTINE CALL(SUBR, ...)
  ARGC = ARG.COUNT()
  FOR I = 2 TO ARGC
    ARG.STRING = ARG(I)
    ...construct outgoing packet...
  NEXT I

  IF MESSAGE.PAIR(SRVR.CALL, PKT) THEN
    ...Update any returned arguments...
  END
END

```

Figure 6

```

PUBLIC SUBROUTINE DISCONNECT
  IF CONTEXT # CX.DISCONNECTED THEN
    CLOSE.SOCKET SKT
    CONTEXT = CX.DISCONNECTED
  END
END

```

data items are visible only from inside the object, whereas public data items can be accessed directly by the calling program. One of the clever bits about public data items is that it is possible for a class to include code that is to be executed when updating the variable but allow the calling program to retrieve the value directly, or vice versa. This can be used, for example, to validate the value being written to a variable.

Our simplified QMClient class needs to maintain two private data items that

ARG() function to access the arguments by position rather than name.

To complete our very much simplified example, we need to add a DISCONNECT subroutine as shown in figure 6.

Finally, to ensure that the socket is disconnected if the calling program terminates without calling the above routine, we add a DESTROY.OBJECT subroutine that will be executed automatically when the last variable referencing the object is discarded or overwritten (fig. 7). This subroutine, if present, will always be executed, even if the calling program aborts. It is impossible for a program to destroy an object variable without the destructor routine being executed.

Note the use of the reserved name ME to reference a public subroutine within the same object.

So, to bring it all together from the calling program's view, we might end up with something like figure 8.

This somewhat simplified view of what goes on inside the qmclient.cls class module shows how objects can be used to maintain persistent data that belongs to a specific instance of the object. There is no reason why the calling program could not establish connections to a large number of remote servers simultaneously.

So, now let's go "under the covers" and explore a little about how objects really work in OpenQM.

Because the MultiValue Basic language hides it so effectively, developers often tend to think of variables as being typeless. In fact, there are many internal variable types (OpenQM has 19). One of these represents an object and is actually little more than a set of pointers linking to the executable code of the class module, the persistent public and private variables, a list of inherited objects, and a name map that lists the public variables, functions, and subroutines.

When a program uses the -> (objref) operator, the QMBasic run machine

scans the name map looking for the referenced item. This scan has to distinguish between use of a name as an lvalue (on the left of an assignment) or as an rvalue (the source of data for an expression). If the name is not found, the search then continues down into inherited objects, effectively treating them as an extension to the original class. If the name is still not found, the process is repeated for the name "UNDEFINED" to allow execution of an undefined name handler as discussed in the previous article.

Assuming that the name is found, the name map specifies whether the object is a public data item that can be referenced directly by the calling program with no additional code execution, or whether it corresponds to a public function or subroutine that must be executed to retrieve or store the value. Where program statements in the class must be executed, QM runs the rele-

Figure 7

```
PUBLIC SUBROUTINE DESTROY.OBJECT
  ME->DISCONNECT
END
```

Figure 8

```
CLI = OBJECT("QMCLIENT.CLS")
IF CLI->CONNECT("MYSERVER", -1, "JSMITH", "MYPASS", "QM") THEN
  CLI->CALL("MYSUB", CLIENT.NO, BALANCE)
  DISPLAY 'Client balance is ' : BALANCE
  CLI->DISCONNECT
END ELSE
  STOP 'Cannot connect' : CLI->ERROR
END
```

vant entry point of the class module in much the same way as if it had been called from the user's program. Because it is "just another program," the class module can do all of the things that a "normal" program may do.

It is not necessary for the calling program to execute any form of termination function when an object is discarded as this happens automatically. The QM kernel tracks the number of variables that reference the object and, when this decays to zero, looks for a destructor routine (DESTROY.OBJECT),

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executing this if it exists. There are some interesting complications involved in protecting against destructor routines that abort but, thankfully, these are totally internal and need not concern developers.

So, returning to the theme of Doug Dumitru's article in which he described objects as "souped up subroutines," that really is all they are. By integrating objects into the standard QMBasic language, there is no massive learning curve before developers can take advantage of this new technology. What objects bring us is the ability to

encapsulate data and associated program operations together in a way that can significantly simplify development. In no way do they make previous techniques obsolete. Rather, they are a powerful new tool for developers to use where appropriate.

For more details, visit www.openqm.com or see us at the Long Beach Spectrum Conference. IS

MARTIN PHILLIPS is Technical Director of Ladybridge Systems Ltd, the originators of the OpenQM product.

* XSL Interesting Example

I was asked recently if XSL can be as useful for writing reports as our MultiValue Basic language. Although the syntax might seem more complex than Basic, it's quite possible to do simple things like FOR-NEXT.

As a reminder, XSL is a language that can generate reports using XML data. The data can come from your MultiValue database using MultiValue database tools, our WebWizard software, or any XML data for that matter. I wrote about XSL and XML last year and gave a some presentations at International Spectrum. You may catch my talks on the subject again this year at Long Beach.

If you take a look at figure 1, you will see an example of a FOR-NEXT loop that does not actually require the need for an XML database loop. It's an interesting use of the template and a parameter variable to behave in a loop fashion. You can see the result of this little style sheet in figure 2.

An interesting use of this might be if you're trying to show some HTML (such as dots or spaces) in a report, to pad out columns and line up numbers correctly.

Basically, the concept is that a variable "var" is tested. Depending on its value, some output is shown. The approach is to use the call-template ability of XSL documents. From within a test against the value of var, you will see the call-template used multiple times.

Figure 1

```
<?xml version="1.0" encoding="US-ASCII" ?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <xsl:output method="html" omit-xml-declaration="no" indent="yes" />

  <xsl:template match="test">
    <xsl:call-template name="loop">
      <xsl:with-param name="var">2</xsl:with-param>
    </xsl:call-template>
  </xsl:template>

  <xsl:template name="loop">
    <xsl:choose>
      <xsl:when test="$var > 0">
        Looping...
        <xsl:call-template name="loop">
          <xsl:with-param name="var">
            <xsl:number value="number($var) - 1" />
          </xsl:with-param>
        </xsl:call-template>
      </xsl:when>
      <xsl:otherwise>
        And I'm Done
      </xsl:otherwise>
    </xsl:choose>
  </xsl:template>

</xsl:stylesheet>
```

Figure 2

Looping... Looping... And I'm Done

* E-mail revisited

Back in the early 80s, when I was first e-mailing while working at USC, I didn't have to worry about privacy. It was all academic, so there were no business or personal issues getting tossed around. But today, of course, people are utterly dependent upon the privacy of their e-mail. In some cases, people seem more adamant about secure e-mail than phone messages, as phone messages are transient and are not easily backed up or forwarded to other people.

If you're looking for ways to secure your e-mail, you might check out some of the new services that handle e-mail more securely.

[Kablooey

At www.kablooeymail.com, you'll see that you can send e-mail that you can cancel and, more importantly, self-destruct after a set time. Think Mission Impossible, but without the cool exploding tape recorder. (Tape recorder, did I just date myself saying tape recorder?) Better yet, you'll know if the messages are read, and the messages are not saved in the recipient's mailbox or mail server. And, even better, no cost. At this time, you can only read the actual e-mail message from their web site, but that is due to change shortly.

[Echoworx

If you use ISPs AT&T, BellSouth, Verizon and others, you can subscribe to a special e-mail security service. Basically, the ISP is involved to perform end-to-end encryption and digital signing of the e-mail. Unlike Kablooey, it is designed to work directly with your e-mail packages, including Outlook.

[Rpost

Wish we had registered mail for the electronic age? Actually, there are vendors that do this.

Rpost confirms that someone received the e-mail, in that they cannot see the message unless they've agreed to receive it. Messages are encrypted and can be charged at US\$0.59/message plus \$40/year. This approach is quite interesting, as the company markets itself as something that can stand in court.

[Microsoft

The giant that is Outlook will be enhanced in 2007 to include the ability to set expiration times and electronic postmarks. Moreover, it will supposedly have the ability to allow you to flag some messages so that they cannot be forwarded or printed. Nifty.

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If you're looking for ways to secure your e-mail, you might check out some of the new services that handle e-mail more securely

Expand Your UniVerse

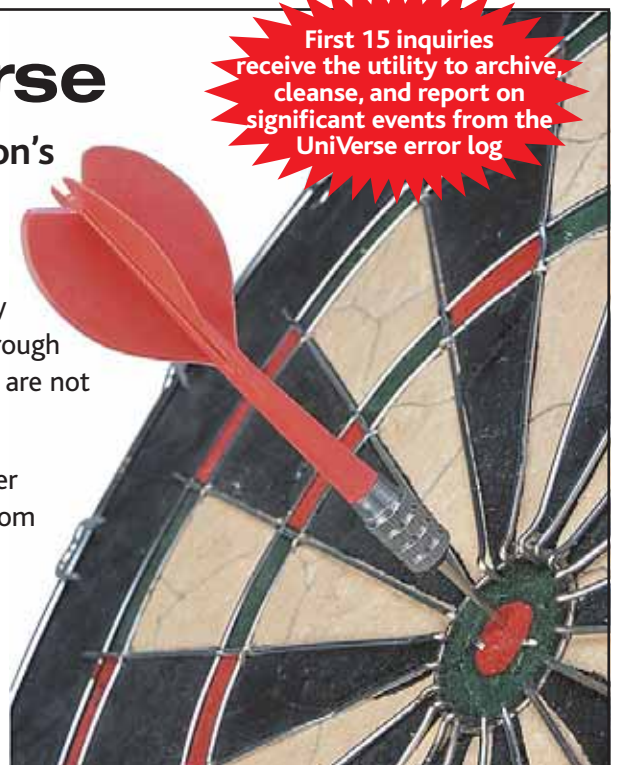
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Q & A

INTERVIEW
with *Susie Siegesmund, IBM*

We caught up with Susie Siegesmund, IBM's Director, WW U2 Data Services, at the 2006 IBM Information On Demand conference and were able to sit down with her for the following chat.

SPECTRUM: We wanted to chat with you about some of the points you made in your keynote. I notice that U2 is no longer under the DB2 branding. What does that mean for the positioning of U2 within IBM? Are all the different databases considered competitors of each other?

SUSIE: When Ambuj Goyal took over a year ago as the general manager of the Information Management division, he took a much more focused business look at the different software we have in Information Management. He realized that we aren't just about data servers, and we're definitely not just about DB2. In taking that look he said, I'm going to reorganize Information Management, and one of the things I'm going to do is say that DB2 is not just our flagship product. It's not all we have to sell. We have a lot of other products that are equally important. Because he's a businessman, he looked and said, wow. We are growing the U2 business, we are growing the Informix Dynamic Server business, and we are growing them even though we have been paying very little attention to them. We could do more if we were to put out the proper messaging.

He divided us into four pillars: content management, business intelligence, master information, and data servers. He put a team on each one to say, what's the proper messaging here? And Bernie Spang, who is charge of marketing for the data servers, looked at it and said okay, IBM has, I'm going to guess, in the neighborhood of fifteen data servers that we still provide to the world because we have customers on them. Customers are the thing that drive our business, so they are our priority. So we decided which ones we were going to continue to support, but more importantly for us, which ones we were going to continue to develop. And we came out with a message about the spectrum of databases that we need, and we took that out publicly to the analysts.

There are basically six data servers that we are continuing to develop and enhancing future technologies in order to make sure that they can participate in our overall messages of information as a service. And those, from small to a large if you think about it in terms of footprint or maybe somewhat in terms variety of functionality, are DB2 Everyplace which goes on the

handheld, Cloudscape which is 100% pure Java, the U2 Products, which our people in IBM think of as one data server—it's really two, UniData and UniVerse, Informix Dynamic Server, IMS (which when people worry that we're getting long in the tooth or old fashioned, think about something that has been around since the 50s), and then DB2, both on the mainframe and on the distributed platform. The reason we kind of push DB2 off over to the right is that with the latest release, we have pure relational and pure XML data store in there. It's a real step forward in data server technology. The idea is that whatever your need, we've got the right data server.

Within IBM, the U2 products and Informix Dynamic Server are sold a lot embedded. We're in the channel sales organization; we're considered OEM products because we usually have a partner who has built a very robust application on that data server, and we go to market through our partners. So we're kind of grouped in the middle. All the data servers can be used for OLTP; it's just a matter of the size of the footprint you can tolerate, the performance features that you need, whatever will dictate which is the right data server for you.

SPECTRUM: Looking at the roadmap of the products in Jackie's session, there seems to be an emphasis on web services. As expected, that links in with IBM's IOD positioning. How do you see SOA affecting U2?

SUSIE: I think SOA is very exciting for all of our customers and partners and for the future use of the data servers by new developers. SOA is one of those things that is leveling the playing field because it's based on standards. We couldn't be doing it if it hadn't been for the standards that have come out for the interchange of information over the Internet. All the standards associated with that are opening up the ability to have this Information On Demand. IBM is taking it to the level of information as a service.

With service-oriented architecture, you take the different business logic pieces you have and you publish them as web services. The beauty is that you can do that from UniBasic; you can do that from UniData and UniVerse applications. You have the web service and some other database somewhere else in the world comes along and wants the information, whether it's to order from you or find some information from you. That other data server doesn't need to know anything about the underlying database. And we don't need to know anything about them. So suddenly, instead of being a little unique because we're MultiValue extended relational, we speak SQL. It's not our native tongue, so to speak, but we're talking a language that's the same language as everyone else is talking. So it's really leveling the playing field. And to the extent that my partners adopt this SOA message and technique and methodology going forward, they can take their legacy applications and all

that wonderful business logic, the fact that they really know their industry, and they can preserve that logic by publishing it as web services.

It's so much easier and so much more efficient than when we go the other direction and work with low-level interfaces. You can talk with any other data server you want to. But there's work involved. Every time it's a different data server, it's a different language, it's different mapping, it's different this and that and the other thing. So you end up having to build all of these different pathways. You have to know where it is going and what it is doing when you execute your commands. That's not true with web services.

Web services are really important to the products. So we're excited that we have our new web services development capabilities in the data servers. We announced them as part of UniVerse 10.2, but we have back-ported them to 10.1. And we are coming out with release 7.1 of UniData.

SPECTRUM: It sounds like you're saying that web services for U2 puts us on a par with everybody else. We know our data structure. We love our MultiValue, but we now no longer have to defend it?

SUSIE: That's right! We're on equal footing with every other data server out there.

SPECTRUM: Some of the slides that are shown at the U2 booth in the exhibit hall report that satisfaction with support is at 95 percent, and that 33 percent of support issues are now submitted via the Web.

How has U2 support changed over the last year?

SUSIE: It's interesting. Of course, we are higher than last year, but we had 90 percent customer satisfaction last year, so we have a very strong support team. But a couple of things have happened. One, we had a couple of people

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Q&A

INTERVIEW
with Susie Siegesmund, IBM

Continued from page 41

come back to us who are very skilled individuals, have been consultants even at one point in time working with the products, and they've come back and joined the team. So we have an even stronger team. And then, with the Web interface, what is wonderful is that customers can cut and paste error messages. They don't have to tell my analysts something word for word, or write it down, or screen trap it or something and then call us up. We have much quicker turnaround.

Let's say you have a problem. You're doing an install or something, and you get some sort of a weird error message at two in the morning, and then you don't see it again, so you finish your install. You think, hm, I should call that in to support. Well, you're going to do it on Monday morning or something, because that's when we're open. Using our web interface, you can just trap it and the information about it and send it off to the support organization. We have really good response time on the web stuff because it has all the information. We have a form that gets you to fill out what we need to know, and then you have the ability to cut and paste. Between the two, we can get back to people more quickly. So I think that's driving satisfaction even higher.

SPECTRUM: One of the things we hear it is that the U2 group has two patents pending. Is this information also published in the IBM Research Journal?

SUSIE: It will be. It's very exciting for us. We have two things that we have done within this last year, one of which has just come out in UniVerse 10.2. That's the encryption of data at rest. You could always encrypt data at rest

in UniVerse. We have Basic commands, called encrypt and decrypt. But if you didn't think to do that when you were developing your application, you might have a thousand different routines that go together to make up your entire solution application. That's a lot of places to go back and look for every instance of credit card, Social Security number, or whatever it is you've decided now you need to protect. My engineers developed a technique where we're handling it from the dictionary level. You go in and indicate at the dictionary level what you want encrypted in a record, and the data server will handle it on the fly. So it's very, very powerful. It's the first implementation of anything like this in the MultiValue marketplace. And so we're getting a patent on that.

The other one, we have customers who use System Builder. System Builder gives you the ability to create processes and screens, and those people were having a hard time taking those things to the Web. They've got something that makes a screen, and they were saying, but we need to learn a whole other technology. What are we going to do, and how are we going to get these things on the Web? So we modified our product we used to call Redback. We have renamed it U2 Web Development Environment, U2 Web DE, for short. We have got an Eclipse-based tool that you fire it off and give it the dictionary stuff. It finds all the processes and things; it's basically a drag-and-drop capability. It generates the HTML, so you can make a basic web page. Then it's modifiable. But the basic ability to say I want to use this input routine behind this field is there for you. That technology of doing that mapping back and forth is the other thing that we are getting a patent on.

IBM, of course, is known for their research. And they're known for the number of patents they generate, particularly in software, but also in hardware. I don't know that it has ever been an emphasis for us or a thought

process behind anything we did before. We may have something that would have been patentable if we thought to do it at the time. But there's a focus on that. And because of some of the things we're doing right now are just very unique and taking the Multi-Value data store to that new level of capability, you will probably see us filing for more patents in the future.

SPECTRUM: There seems to be an effort to raise U2's profile as IBM products. What kind of things are being done in this regard?

SUSIE: Well first of all, I told you about the messaging for the data server for every need. That message we have been actively taking out to the analyst community, talking to them, and saying other companies may be telling you that they have a single data server, and that's the way the world is, and you should focus on a single product. We're saying one size doesn't fit all, and one technique isn't necessarily the right technique. You ought to use what you're comfortable with using or what makes sense to the application. So we've been actively going and talking to the analysts in the data server end of the spectrum and communicating this message.

IDC has just written a white paper for us called "because all data is not flat." It talks a little bit about the history, why we're different, what's different, and the strengths of the product. So IBM is behind that. The message that you'll get if you talk to someone in our data server community now it is that the fact that you can change an application and not have to rebuild your data store is one of the strengths of the U2 products. So we've started to identify those things, and that messaging is coming out.

We're also doing some web casts. We've just talked to the Systems P people, and we may be doing a video podcast with them as well. So we're beginning to be noticed by other groups within IBM as having a strong partner community and realizing that there are reasons that we can support them in more areas than just the data servers.

SPECTRUM: There seems to be an increase in attention given to your web site content.

SUSIE: Definitely. We have a very complete set of information on our page. There is a lot of information about the data servers, there's a link to that white paper IDC did, there's a letter from Ambuj Goyal, our General Manager, about the commitment to the products, and there's information out there about success stories. We're putting out success stories and quotes from our customers and partners. We try and get a partner, if it is involved, to give us an actual customer out there who will talk to us and say why they chose this application and why our products are instrumental to their success.

We also have a solutions guide, which is a great resource. It's interesting. We built it for the public, because it's on the public web site, right? But it's a wonderful resource for our sales reps. Because the sales reps who are looking for a solution, they've got a customer, and the customer needs a solution. And so it's one place they can go and say I need a membership solution and where can I find that?

So, we're doing all sorts of things. Just being part of this entire Information On Demand event is a wonderful showcase for the products and for the solutions that people have built on them.

SPECTRUM: Speaking of success stories, one of the exhibitors here at IOD with their own booth is a company called Pacific Decisions Sciences Corporation. A few months ago we saw some messages come across the U2-Users list talking about a benchmark that had been done that ran a UniVerse application up to 15,200 users.

SUSIE: On a single P-series. A p590. So yes they have. They are a call center application. And IBM Global Services had started using it when we had the printer division. We needed an application, went looking because they were going to do the online deployment

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where you have on-site printer support. They needed to have a way for people to log onto the web and say I need to send somebody out. So Global Services found PDSC, and they implemented that. So that's a U2 Web DE UniVerse solution for that deployment. Then Philips came to us about outsourcing, and Global Services and customized that application again, and we use it for that.

Most recently, when we spun off the PC division and sold it to Lenovo, part of that contract was that IBM would do the call center for them as an out-source activity, again Global Services. They were concerned about whether they should use this same application and would it scale up to what they perceived could happen worldwide. Think about the number of people that are using their products. So they ran the benchmark with PDSC. So they had a billion records. That's a lot of records! They watched response time because, as you know, we don't participate in TPCI benchmarks because they're SQL

based, and we don't operate efficiently on the standard, flat, SQL; we're good at UniSQL. So, that isn't the strength of our products, so we've never done those. But what they found was on this single, pretty beefed up p590 against a billion records was no discernable degradation in response time—15,200 users on that single box. It's a UniVerse application using SB and SB-client, and I think they interfaced it using Websphere, actually, for the Lenovo deployment.

Now based on that, they are also chartered with doing the new strategic call management system for IBM, and they've begun to roll that out. Unfortunately, the software group isn't first. The rest of hardware group is first on that deployment. But one day we'll be replacing the U2 home grown UniTrack application, which runs on UniData, with a very similar application on UniVerse provided by one of our partners. So that's exciting for us because we'll get all of IBM.

Continues on page 48

Why Do I Need To Learn

SQL?

BY LEE H. BURSTEIN

The truth is, you really don't need to learn SQL, or anything new for that matter, as long as your MultiValue application does everything you need for your business. While this may be the case in many organizations, sharing data with non-MultiValue environments and applications is increasingly the norm. SQL (Structured Query Language) remains the standard approach for data manipulation in most databases and data-oriented products outside of the MultiValue market. Some MultiValue database vendors recognize the acceptance of SQL and offer command line SQL as an additional way of accessing data.

Let's go back in time a bit (OK, more than just a bit) to the time when the MultiValue retrieval language was enough for information needs and decision making. We frequently refer to this time as "the good old days." As users and decision makers become more sophisticated and their use of software driven work stations increase, our reporting mechanisms are no longer sufficient. Increasingly, we need the ability to interface our legacy data with Windows-based reporting, analytical, and decision support tools. Frequently, these tools use SQL to retrieve data.

For those of us that have been around this market longer than we are willing to admit, it is unlikely that SQL was part of our vocabulary back in the 70s or 80s (SQL was originally developed in the mid 70s). From the 90s on, not only has it become part of our vocabulary, but it may drive ongoing and future development. It is almost impossible today to carry on a discussion with developers where SQL is not part of the conversation.

Every database supplier in the MultiValue market offers a tool to expose your data in an SQL compliant way to the outside world. There are third party vendors that offer similar tools that will work with all of the MultiValue varieties. Some MultiValue database suppliers provide a command line SQL interface, like you would expect to find from a normalized database supplier like MySQL, SQL Server, etc. There are even extensions to some versions of MultiValue Basic providing embedded SQL which allows a Basic program to maintain data in an SQL compliant data source.

There are even products in MultiValue that allow your Basic programs to directly maintain data in an SQL compliant data source. While these tools typically do not require you to use SQL, they are SQL driven (usually hidden from you), and users of the target database will use SQL to retrieve, and possibly maintain, data.

Let's examine these situations a little closer.

One of the most common SQL needs is when an end user wants to pull data from your MultiValue application to an Excel spreadsheet on their workstation. If the desire is for the user to be able to use a point-and-click approach to query the database, they are probably using an SQL query. While you do not need to be an SQL expert for the users to accomplish this, you will be involved in setting up the environment and helping the users query the MultiValue database. Knowledge of SQL is required to perform these functions.

While point-and-click SQL query building will work in about 80% of the queries, the users will eventually require SQL functionality not available via point-and-click. As users' sophistication increases, the point-and-click approach will fall short. They will start requiring sub-sets of data that require multiple tables, subqueries, and proper use of parenthesis. Again, they will probably rely on you for some of that SQL assistance if this is beyond the capabilities of the point-and-click facility.

A similar scenario exists for pulling MultiValue data into various Windows reporting and decision support products. Data is needed in these products on an as-needed basis. Typically, an SQL query is made by the reporting or decision support product to the MultiValue database, which returns the requested data. How that data is returned will play an important role in how useful the report or deci-

sion support result is. Once again, you may be called upon to help set up and assist users in achieving their goals.

Several MultiValue database vendors are now supplying a command line SQL interface to their MultiValue data. While this may be of little initial interest to you, it gives the MultiValue world the same type of access to its data that the relational databases offer. That could be important in an environment that has a variety of databases implemented, especially when most of these systems are SQL compliant. The opportunity for cross-pollination of database activity is now much easier.

It is also possible for a MultiValue application to make an SQL request for data to an SQL compliant database. This can be accomplished either through embedded SQL (in the Basic language) or an operating system command line SQL interface. In either situation, the data can be returned to the MultiValue application. Knowledge of SQL is

mandatory to achieve this. You may even need to learn some of the SQL nuances implemented in the target database that may not be found in others (similar to MultiValue retrieval idiosyncrasies found from one vendor to another).

This type of SQL capability could also promote a change in how developers are hired and the skills required. The Basic programming language can now be used to maintain data in an SQL compliant relational database as well as use SQL to maintain its own data. There are more developers who are SQL knowledgeable than those who are comfortable with MultiValue.

More and more of us are living in a heterogeneous database environment. The MultiValue application is only one of several information systems playing a part in the daily running of the business. Knowing how to manipulate the data in the non-MultiValue databases should only enhance your value to the organization. There are a lot of people who know how to work with SQL compliant databases. There are fewer people who know how to work with MultiValue databases. There are fewer still that are comfortable with both. Why not become part of The Few, The Proud, the SQL-wise. IS



LEE BURSTEIN has provided training, professional services, software development, system analysis, etc. to end-users and resellers for over 25 years. In 1989 he founded, and is president of, Dynamic Systems, Inc. providing training and services to IT professionals' world wide. Lee's training expertise is known all over the globe. He developed the jBASE database training programs used by a global banking reseller. Lee's consulting expertise is also known world wide. He has helped various institutions configure and implement fail-over/redundant computing environments, integrated data from dissimilar software products, and performed custom programming services, enhancing productivity.

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OpenInsight's

Place in the MultiValue World

BY MIKE RUANE, REVELATION SOFTWARE

OpenInsight is a well established MultiValue database and database development tool.

Revelation Software has been in existence with the same products and corporate identity since 1982, a feat that not every MultiValue company has performed.

Revelation Software markets (almost an oddity in the MultiValue world) OpenInsight as "The Application Developer's Toolkit" because it is so versatile. It can be used with either its own database, as a front end to other databases, or as a database for other front end tools. A true Graphical User Interface (GUI) tool, OpenInsight can be used as an IDE or 4GL tool for nearly all of the MultiValue databases in the market today.

Compared to the rest of the MultiValue community, where does Revelation Software, and specifically the OpenInsight product, fit in? The following address this question, and hopefully answers it satisfactorily.

OpenInsight's MultiValue Roots

OpenInsight is the Windows and Linux version of a DOS product known as

Advanced Revelation that was first introduced in 1987. Advanced Revelation was in fact an improvement of a prior product known simply as Revelation. Revelation was a product that was designed as a version of the Pick operating system on the then new IBM PC.

According to published accounts, in 1982 the five founders of Cosmos had the plan of taking the best features of the Pick OS into a PC environment. Using various flavors as their model, they developed a system that had a multivalued database, a Basic-like programming language named R/Basic, and a 4GL. They named this new product Revelation. An English-like reporting language was created and named R/List. A TCL window was supplied, as well as networking tools (PC-based networks were just beginning to appear at that time), and screen and dictionary building tools.

By 1987 the original developers had left, but the enhancements continued on the product, so much to the point that it was renamed Advanced Revelation, known colloquially as Arev. (The company was also renamed Revelation Software, a nod to the fact that most users equated the software name with the company name.) Arev had a new screen design tool named Paint, new user interface components such as Popups and Messages, plus much more. The back-end database was enhanced to allow frame tuning per table, and to be self-resizing.

In 1992 a Windows-based product was developed, and it was named OpenInsight. It retained nearly all the features

that the DOS products had but was written in and for a GUI environment. The Basic programming language was renamed Basic+ because of additional event-driven and object-oriented like commands. Over the years tools and functionality were added for the Web, Client Server, Java, and XML.

If it seems that this is a tremendous amount of innovation in just a few years, one must remember that Revelation Software was not working in the mainframe or minicomputer markets; it was firmly in the PC market. Being driven by a set of market forces different than the mainstream Pick market caused Revelation Software to innovate all the time or else be left behind. These innovations that occurred constantly over the years resulted in a product that allows developers to be extremely efficient, productive, almost always state of the art, and sometimes leading edge.

OpenInsight As a full IDE with database

OpenInsight works very well as an Integrated Design Environment with its own tightly coupled MultiValue database. A major difference between OpenInsight and the other MultiValue databases is that OpenInsight is a fully native graphical MultiValue product. There is no middleware to purchase. It is, for the most part, a GUI product written in itself.

There are the standard tools for creating tables, modifying dictionaries, creating data entry forms, and report creation tools, but there are many more features included in the product. There

is a full featured editor, a fantastic debugger (not that any MultiValue developers actually spend any time in the debugger, or so we hear), and deployment tools. OpenInsight contains User Interface tools for creating Messages, Popups, Help, and Wizards. It also contains a character interface for backwards compatibility for legacy MultiValue developers.

And why should any of this be of interest to MultiValue developers? There are a number of reasons:

Cost- OpenInsight is one of the most affordable databases in the MultiValue world on a per-seat basis, and on an ongoing basis.

Flexibility- OpenInsight allows developers to make changes to the system with a minimum amount of fuss or down-time. And if a developer writes an application in Windows, it can be backed up and then restored into Linux, allowing every developer to be a multi-platform developer.

Familiarity- OpenInsight, while being a full GUI tool that students coming out of school with Visual Studio experience can easily pick up, is designed by MultiValue developers. The product supports, understands, and reacts to multivalued data in screens and reports. The programming language will be familiar to any Basic programmer and a series of precompilers and extensions to Basic+ ensure that nearly all syntaxes in most flavors of Basic are supported.

Realistically, if you were purchasing software for your organization, would you purchase a character-based application or a graphical one? Especially if you had to make a presentation to a board or committee, it seems likely that the graphical-based application would carry more weight than the character one. OpenInsight will let MultiValue developers create graphical applications using their existing skills.

OpenInsight as a front end tool
As described above, OpenInsight has a powerful set of tools to make graphical

user interfaces for Windows, Linux, and the Web that interact with Revelation's own database engine.

OpenInsight works extremely well with IBM's UniVerse and UniData products (known as U2) because of work done by Revelation Software back in 1993 with Vmark. Using the InterCall libraries, the U2 connector is not a piece of middleware—it is a low level, native connection to the U2 data. In fact, it is such a low level connection that most of OpenInsight thinks that is connected to a standard Revelation database.

OpenInsight can also be a front end to Lotus Notes. Since 1994, OpenInsight has had a special set of tools and functions to work with Notes forms and views. In fact, before Notes release 4, OpenInsight was the preferred GUI tool for creating Notes-based applications.

OpenInsight can also be used as a front-end and development environment against ODBC data sources, SQL Server, or Oracle. In OpenInsight's Client/Server workspace, a developer can specify the connection parameters to the database, and then specify the tables and columns (or files and fields if you prefer) that will be used by that connection, and then can develop applications against that data source.

OpenInsight as a back-end database

OpenInsight also has the ability to serve as a database engine and data store for other front-end tools, such as Visual Basic, C-based languages, or even Web-based applications, just to name a few. OpenInsight has a fully defined Application Programming Interface (API) that developers can use to access our database engine. Once connected to the database engine, the developer can take advantage of all the features and benefits found in a MultiValue database, such as the speed of multi-table access using Reads and Xlates rather than inner and outer SQL joins, or the idea that both header and detail information can be contained in the same record.

OpenInsight has sample code available for developers to use as examples in C, C++, Java, Visual Basic, HTML, JavaScript, as well as others.

OpenInsight and the MultiValue Community: The Future

So what does the future hold for the OpenInsight and the MultiValue community? A very bright one, this author believes.

First, because OpenInsight can be a seamless front end to IBM's Universe and UniData databases, it offers the ability to create fully featured, graphical front ends to existing applications that are both cost effective and efficient. Because it works directly with the U2 databases and directly with the user, it is not a piece of middleware—it is the front-end development tool. And because it does much more than just create screens and menus, it provides a greater value than many other add-on tools.

Second, Revelation Software continuously invests in the development of OpenInsight, whereas some MultiValue database providers either remain static or provide very little innovation. In some cases vendors do provide new technology, but developers cannot move their products forward without investing in tremendous amounts of money or education. OpenInsight provides a number of tools that allow for an easy migration from these other products into an environment where the developer can reuse their existing Basic code, screens, and reports, but start to create graphical screens and reports at the same time.

Finally, OpenInsight is a modern development environment that is similar to what students are learning in school today. By being so, OpenInsight makes it easier for these students to develop new applications or learn a MultiValue development shop's standards and practices, thereby increasing the lifecycle of the applications that are in use out in the field.

One of the strongest selling points of MultiValue applications is that the

Continues on page 48

Q & A *Continued from page 43*

SPECTRUM: Let me see if I have this correct. Using this UniVerse application, IBM is using the U2 products not only to support its own products but to generate revenue from outside of IBM.

SUSIE: Oh, definitely. It bodes well for the future of the products.

SPECTRUM: It seems like it would be a bit difficult for U2 to “go away.”

SUSIE: I can understand why customers were nervous, because IBM was company four in three and a half years. We went through very rapid merger to become Ardent, acquisition by Informix, acquisition by IBM. And you always wonder what is going to happen to a product when that happens, because IBM might not have seen good value in the products. Although initially what they thought was we have a lot of customers and a

lot of partners, and IBM stands behind its customer base. So although other people were worried, I was never worried. But the it was hard to get that message out and convince people. But, yes, IBM definitely, it's a profitable business, it's good technology, and there are some fantastic applications written on it, and this is just a testament to that, that IBM is using it for implementation.

SPECTRUM: If you could be certain that one particular message stuck in people's minds about the U2 products this year, what would it be?

SUSIE: I think that the future is bright, and they better hang onto their hats, because we intend to continue to grow this business, and to be good players in information as a service. We're IBM, we're good at technology, and they can count on us. They can depend on us.

SPECTRUM: Thank you very much.

SUSIE: It's my pleasure.

OpenInsight *Continued from page 47*

developers who write them are able to take business rules and requirements and translate them into programs, and react to the changes required in a quick and efficient manner. With today's user having higher expectations regarding a graphical interface, ease of use, and portability, OpenInsight provides a haven where a MultiValue developer can leverage their existing knowledge and experience and continue to be productive and profitable. is

MIKE RUANE is President and CEO of Revelation Software. He can be reached via email at mike@revelation.com.

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2	PD49VP6LLP W/30	\$345.00	1	\$345.00	180
	Part Number: 68528				
	Description: Ruggedized PicoDot. Polarized Retro Laser				
3		\$0.00		\$0.00	YES

Secure Sockets for MultiValue *Continued from page 20*

different ways that you can end up with infected machines on your network, including the scenario where someone brings their laptop in and plugs it into the network, or uses a VPN connection to become part of the "fortress."

Side note: When the slammer worm was making its original rounds, I was working for a company that had just over 200 employees and probably about 300 to 400 computers. Most of those computers were running software that was vulnerable to slammer. The corporate firewall kept us nicely insulated for about a day, until an employee at an infected customer site used VPN to connect into the network from that customer's network. It took about five minutes to shutdown every computer in the office and the better part of a day to repair the damage.

The important thing to note is that this is a vulnerability that must be addressed.

Ways to Fix the Problem

For most MultiValue systems, terminal emulators and middleware all depend on plain text socket communications. This puts sensitive data at risk. You have several solutions, depending on your MultiValue platform.

Secure Your Terminals

Newer Platforms Provide Secure Telnet

If you are running on newer platforms such as Windows, Linux, or most of the current commercial Unix platforms, then you may have the option of setting up a secure Telnet server.

There are a number of Telnet clients that you can use.

Secure Telnet Wrappers

There are a number of Secure Telnet wrapper products available. While these do lower your risk, you remain vulnerable if spyware installs a layered network driver on the computer. Using that type of driver to gain

access, they can still capture your network's communication activity. This is considerably less likely to happen on a tightly controlled server system than on a user's system, so they still significantly reduce risk.

Secure Your Middleware

You should consider switching to middleware that allows you to communicate over SSL to your MultiValue system.

Sidenote: The FusionWare Direct product family supports SSL connectivity from ADO.NET for .NET 1.1 and 2.0, from OLEDB, and from Java, through the JavaAdapter. We support this connectivity to MultiValue systems hosted on almost any Unix or Linux platform, as well as on Windows.

If you have POS terminals or wireless devices or other devices that communicate sensitive data to your MultiValue system, you should upgrade it to use middleware that supports secure sockets.

If You Can't Convert, Isolate

If you have a device that you cannot upgrade, then consider isolating it. Give it its own network card and its own network cabling on the server and don't connect it to the entire network.

In Summary

Securing sensitive data is becoming both more critical and more difficult, but with some careful thought and planning, and especially in the light of new product offerings from FusionWare Corporation, it is possible to mitigate the risks explored in this article.

The FusionWare Data Access Product Group is built on robust proven technology to deliver MultiValue data to Windows and Java environments. Gain the competitive edge by leveraging your MultiValue data today with mainstream technology. **IS**

For more information, please contact: FusionWare Sales at 1-866.266.2326 x159

Order Cycle *Continued from page 17*

and they tell you about our featured products (product positioning on pages, descriptive sales copy).

I have one of my clerks do a window display (home page, searchable keywords) to attract browsers (browsers browsing via browser). The clerk tapes the current sales flyer to window so passers by can see the specials (product positioning).

Only after all of that do I need to worry about the cash register (checkout/cart pages, credit card processing, refunds) and out-of-stock (back orders, suggested alternate products) issues. We don't need an order process until we attract customers (ditto). Once someone buys, we need to help them to their car so they can get their purchases home (shipping). It's always good to follow up by calling customers when we get certain items back in stock (targeted e-mail marketing). And, of course, if we have to special order something, we should call those customers too (order tracking, e-mail updates on order status changes).

As you can see, the web isn't really about replicating the order process. It's about replicating the marketing, sales, and order process together. The next and final installment will focus on how service-oriented businesses are fundamentally different in their order process than product businesses. **IS**



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1. What is your job function/title?

- | | |
|---|---|
| <input type="checkbox"/> Principal/Owner | <input type="checkbox"/> Sales/Marketing |
| <input type="checkbox"/> President/GM/CEO | <input type="checkbox"/> Programmer/Analyst |
| <input type="checkbox"/> MIS/DP Manager | <input type="checkbox"/> Purchasing |
| <input type="checkbox"/> Controller/Financial | <input type="checkbox"/> Consultant |
| <input type="checkbox"/> VP/Department Head | <input type="checkbox"/> Other _____ |

2. Is your company a (check one):

- | | | |
|---|---|---|
| <input type="checkbox"/> Computer System Supplier | <input type="checkbox"/> Dealer/OEM/VAR | <input type="checkbox"/> Software House |
| <input type="checkbox"/> Consultant | <input type="checkbox"/> End User | <input type="checkbox"/> Other _____ |

3. What MultiValue Databases does your company use? (check all that apply)

- | | | | |
|--------------------------------|--|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> D3 | <input type="checkbox"/> Native MultiValue | <input type="checkbox"/> Reality | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> jBASE | <input type="checkbox"/> uniData | <input type="checkbox"/> UniVerse | <input type="checkbox"/> uniVision |

5. What major business/industry most clearly describes your company?

- | | | | |
|--|------------------------------------|---|---------------------------------|
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Medical | <input type="checkbox"/> Direct Marketing | <input type="checkbox"/> Legal |
| <input type="checkbox"/> Banking/Finance | <input type="checkbox"/> Dental | <input type="checkbox"/> Construction | <input type="checkbox"/> Retail |
| <input type="checkbox"/> Education | <input type="checkbox"/> Insurance | <input type="checkbox"/> Other _____ | |

6. What are your firm's approximate gross annual sales?

- | | |
|---|--|
| <input type="checkbox"/> Under \$500,000 | <input type="checkbox"/> \$500,000 - \$1 million |
| <input type="checkbox"/> Over \$1 million - \$5 million | <input type="checkbox"/> Over \$5 million - \$10 million |
| <input type="checkbox"/> Over \$10 million - \$25 million | <input type="checkbox"/> Over \$25 million - \$100 million |
| <input type="checkbox"/> Over \$100 million - \$500 million | <input type="checkbox"/> Over \$500 million |

IS 1/07

Webonomics

Continued from page 39

*** txt 4 me**

Ok, so I'm behind the times. My overseas relatives and nieces and nephews seem to know how to text me all day and night, thumbs ablazing. For me, though, I find certain cell texts to be more useful than others.

Yahoo alerts

I love the fact that I can get relatively up-to-the-minute sports scores on my cell phone. Just create an alert for your phone number on Yahoo and the service will send you anything from news updates to stock quotes, weather to Hollywood gossip.

Google without the E

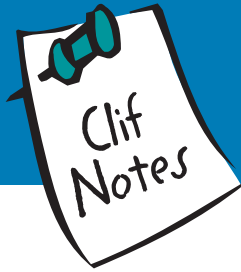
Just text anything to Google without the E (46645). Yesterday, I had to call the Walt Disney Concert Hall ticket office while driving there. Rather than spending \$2 for 4-1-1 service, I texted "disney hall 90007". Now, I don't know what the downtown LA zip code for Disney Hall was, but I knew the USC zip code. I could have typed "disney hall los angeles". Anyway, it sent me the address, and more importantly, the phone number I needed. Since the phone number was in the text message, I just clicked on it and got connected.

Likewise, I sent "from pasadena to lax" and got the directions. Unlike Yahoo, which pushes the data, you can pull the data down. See sms.google.com for all the nifty search tools. is



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Developer. ERIS has deployed enterprise-wide solutions on most MultiValue platforms and operating systems. HTM-Mel can be contacted at mel@eriscorp.com and visited at www.eriscorp.com. You can always call him directly at ERIS's Pasadena, Calif., offices: (626) 535-9658.



See If I Ever E-Mail You!

BY CLIFTON OLIVER

January. New Year's Day. The day when everyone makes New Year's Resolutions, even if it is to resolve not to make any more New Year's Resolutions. I used to make Resolutions, but then I would forget what they were by the end of the month. Experts in behavior modification recommend that goals, which are one way of thinking about Resolutions, always be written. So I wrote them down...and then would promptly forget them to re-read them for the next 11.9 months. It was a useful exercise, however. At New Year I could take out the list from the previous year, select a few that I "really" intended to get to this year, cross off a few that now bored me, and determine which ones I should spend the rest of the day feeling guilty about. Much more efficient. After all, we use lists and processes to streamline our projects and work-flow. Who wants to be inefficient in tracking and managing our neuroses. I mean, that kind of inefficiency could make you neurotic.

This year I decided to do something else. Rather than use the reflective time to look ahead at the year to come and determine what I wanted to do, I spent some time looking back at the past year and tried to figure out what I had learned and done differently that I wanted to be sure I continued. I am not going to list them all—there are too many of them. If I devoted just one column to each neurosis identified, I figure I've got enough material to last me until the July/August 2012 issue. Make that the September/October issue, because then I would have to write about the neurosis involved with writing about yourself all the time. But for this issue, I will indulge myself in describing just one area of changed outlook in the hopes that you might find similar changes of interest, or at least have a chuckle on my tab.

E-mail. Oh, my. I have a real love/hate thing going on with e-mail. It is a great way to stay in contact with friends, family, and coworkers. For business, it's fast, it's efficient, and it provides a

record of what has been discussed. Of course, as Mel has pointed out in a couple of his columns, that may not always be a Good Thing. I can certainly attest to that! But even when I'm not busy shooting my own foot off with ill-conceived e-mail snipes, there are two aspects of the medium I think I've overcome.

First is the fact that e-mail is not a guaranteed delivery mechanism, and not every e-mail client supports Return Receipts. E-mail just disappears from time to time, leaving no tracks. Yet most people using e-mail fail to recognize this. I've lost count of the number of times someone has said to me, in an accusatory tone, "Well, I sent **you** an e-mail. I don't know why **you** didn't get it!" Then there's that pause, as if they are waiting for me to apologize for not receiving their message. So these days if I send something Important by e-mail, I now take steps to follow up and make sure you received it instead of sitting here for three days getting irritated because you, obviously, don't see

the importance of our discussion. (Meanwhile, you're getting irritated at me because I've dropped out of our discussion and just disappeared.)

The second thing about my e-mail habits I learned, and continue to learn, to change is knowing when to ignore its existence. Most of us know (and many of you do a better job than I of practicing) that we should not write e-mail when in a bad state of mind. I've taken it one step further. Written language is tricky in conveying meaning. A large amount of meaning is conveyed not by the words we use but by our tone of voice and our body language. E-mail lacks these information tracks. I'm not suggesting we substitute recorded video clips for written messages. That would get me in trouble with some of the IT Luddites who still complain about HTML e-mail (and then probably spend several hours a day streaming junk from YouTube). But I am now quicker to terminate an e-mail conversation as soon as I get the slightest suspicion we may be misunderstanding each other, and I pick up the telephone. That has made a big difference. I find fewer days where my mind keeps going back to something I've received and analyzing, "Now just what did he mean by *that* comment?" So although my telephone bill goes up, my blood pressure goes down.

Although e-mail is a very important part of our lives, both private and professional, I think I've learned when to avoid using it.

Anybody bored enough to ask me why, in 2007, I still don't have a BlackBerry? ■



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