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35 IS YOUR DATA SECURITY ADEQUATE? Did you know that the weakest part of a security system is the user? All MultiValue databases provide tools to protect your data, but many of them aren't being used or applied to their full advantage. BY NATHAN RECTOR

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34 SPECTRUM SPOTLIGHT: KORE TECHNOLOGIES — INTEGRATING MULTIVALUE SYSTEMS WITH BEST-IN-CLASS SOLUTIONS Company on the rise Kore Technologies has found its niche "extending the enterprise through integrated best-in-class solutions." The San Diego-based company provides products and services to companies who want to integrate their MultiValue databases with other databases and applications, and KommerceServer, a set of Web-based e-Commerce and collaboration applications.

16 PROGRAMMING FOR SPEED IN OPENINSIGHT Time. There never seems to be enough and we usually wish we had more. As programmers, developers and consultants, to get more time, we need more speed. How can this be achieved and what exactly defines speed? BY MIKE RUANE

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Famous People *and* the Spectrum Show

For our final look back at the past 25 years counting down to the **25th Anniversary Spectrum Show** in Long Beach in March, we decided to reflect on the famous people we brought to the Spectrum shows along the way, and as you might guess, there's a story that goes along with every encounter.

Our first brush with celebrity was with famous ABC correspondent Howard K. Smith, whom we retained to be the keynote speaker at the 1984 Spectrum Show at the MGM Grand Hotel in Reno, Nev.

You would think that hiring a celebrity would be a straightforward transaction. We, the customer, make a deal with your agent for an agreed upon price; you, the celebrity, then do what you agreed for the price.

Mr. Smith was to speak at 8:00 a.m. the first morning of the Spectrum conference. The event was set up to be on MGM's formidable stage in the main showroom, and Mr. Smith was to sit on the dais with other dignitaries including Reno Mayor Peter Sferrazza.

The first glitch happened the afternoon before. Mrs. Howard K. was on the phone at the Reno airport; she was upset that there was no limo there to pick them up. The Smiths *always* get a limo. "What limo? The contract never said anything about a limo!" After calming Monica down, the MGM came to the rescue and sent a limo.

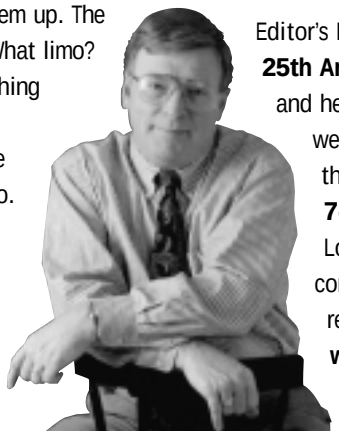
Disaster averted? Not so much. Mrs. Howard K.'s room didn't have a balcony. The Smiths *always* have a room with a balcony with sliding glass doors that open out to fresh air and the balcony. "What balcony? The contract never said anything about a balcony!" The MGM Reno hotel building didn't even have any rooms with a balcony, much less a window that opened. First and ten, Spectrum.

The saga continued. At our meeting with the Smiths that afternoon, we explained where in the hotel Howard would be speaking, that the mayor would be there, who the audience was, and what time Howard would be speaking. This was all spelled out in the contract; however, the Smiths hadn't bothered to read it. Mrs. Smith said, "Oh no, Howard can't possibly speak at 8:00. He has to watch the morning news and be on call in case ABC needs him in an emergency!" Right! Like Dan Rather has Howard on speed dial.

"What 8:00 a.m. speaking time? That was in the contract!" Touchdown, Spectrum.

Howard did speak at 8:00 a.m.

Don't miss this issue's "History of MultiValue" article to hear more stories about other famous people we encountered at a Spectrum Show.



Editor's Note: Be sure to attend the **25th Anniversary Spectrum Show** and hear Gus and Monica Giobbi welcome the delegation to this special event — **March 7-10, 2006**, at the Hilton Long Beach Hotel. For a complete schedule or to register, please visit **www.intl-spectrum.com**.

— GUS GIOBBI, CHAIRMAN, IDBMA, INC. —
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IDBMA's *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 IDBMA, Inc., 715 J Street, Suite 301; San Diego, CA 92101; Tel: 619/515-9930; Fax: 619/515-9933 **E-Mail:** requests@intl-spectrum.com; **Website:** http://www.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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MultiValue Reporting *and* Business Intelligence

BY ROSS MORRISSEY

Operational Reporting Versus Analytical Reporting

One of the great strengths of MultiValue systems is the efficient representation of transactions; we can express complex business logic succinctly in very few files. In the right hands, our rich, expressive query environment exposes these files, extracting the detail and summary transaction information we need to run our business. But, what if we want simpler access to operational data and quick export to spreadsheets or trending and drill-down analysis to improve our business? In this article, we will look at the complementary nature of operational reporting and analytical reporting and the strengths and weaknesses of their respective applications and third party tools.

Operational Reporting

Also called Enterprise Reporting or Transactional Reporting, these are typical "canned" reports or the ad hoc queries that a MultiValue expert can pull up so adeptly in one or two commands that it seems like black magic to the uninitiated. We've all had conversations like these:

"I need a list of last month's late orders!"

"Do you want that sorted by branch number?"

"Sure — you read my mind!"

"I need a list of all customers who ordered last month!"

"Do you want contact info with those addresses?"

"Contact info too — you deserve a raise!"

Unfortunately, sometimes requests are not possible because we don't have a MultiValue expert at hand — or the information we need to run the business is not captured directly by our applications, in the form we need. Resourceful workers will gather data manually and capture it with pen or spreadsheet — anything to get their job done — unfortunately this is a time-consuming and costly approach. We get effective operational reporting only when requirements align closely with application files because the extraction process is quite limited.

The actual reporting process consists of scanning a set of records and presenting elements on a screen or page in human readable form. This approach dates back to an era when resources were very constrained. We assemble and sort a set of candidate record keys; then, in one pass, read and format or summarize each record on screen or to a spool file. This minimizes system requirements because we only hold one source record (and any running totals and page layout information) in memory during the output phase.

In spite of the single-pass mechanics, the LIST and SORT verbs, combined with the information stored in dictionaries and a variety of display options, provide an enormously flexible method of defining reports. With enough experience, it is possible to create impressive output using built-in command-line reporting. In the eighties, I attended a seminar where an elaborate LIST statement was actually used to cut automatically numbered payroll checks. Unfortunately, this is still state-of-the-art for native MultiValue report output, and molding that output to fit the online world or populate a spreadsheet is not easy.

Ignoring output issues, a perfect report will still be out of date soon after we run it because of the nature of reports — they capture a snapshot of transaction data. Less obvious are changes to the requirements that drove the canned report in the first place. Solving these problems can turn into a real management issue. How do you rerun a report to capture the most recent data? Where is the report stored? What do we call it? We can certainly create Paragraphs or PROCs, but how are they stored, accessed, organized or maintained, and by whom? We can overwrite queries or forward queries to unauthorized parties or five different people can run the same query simultaneously — bringing our operational system to its knees.

Maintenance of queries is not the only management headache. The query language complexity and complexity of the underlying file layout also increase load on the IT department. Training end users to use select lists effectively and understand the query syntax takes time and there are few resources for

this type of training. Even with report training, exposure to the application dictionaries can often overwhelm the keenest end user. The net result: IT staff will be generating reports as long as they admit to knowledge of that black art, and they will always be behind the curve.

An exciting prospect for analytical reporting is the ability to supply these advanced tools to people in the field, allowing them to act as change agents pursuing goals instead of waiting for guidance.

Guided Operational Reporting with Report Generators

One solution to simplifying complex tasks is a "wizard" approach — breaking the reporting task down into smaller steps guided by a third party report generator. These have been around for a number of years and have recently embraced the familiar Web interface. Training is minimized because report generators hide much of the complexity of the underlying query language, and it is getting possible to create a report without direct knowledge of the underlying file structure. The earliest report generators checked query language syntax and prevented the creation of invalid queries. Today, report generators are also aware of file layouts and can help create queries that are both efficient and more likely to create desired results. Additional features include user-friendly menus and a security layer that controls access to data as well as query maintenance functions, reducing load on IT.

Other Approaches to Operational Reporting

We can also use ODBC or XML to pull operational data out of the MultiValue environment in order to facilitate reporting. In the September/October 2002 *International Spectrum* Magazine, author Michael Ballard devotes most of "MV ReportCard: Lessons Learned In MultiValue Reporting" to the overhead associated with ODBC, primarily to enable mainstream reporting tools like Crystal Reports to access MultiValue data. Michael does not paint a pretty picture. More recently, new middleware based on Microsoft's .NET technology has emerged as a possible reporting solution. The fact that .NET is based on XML solves some of the structural issues with ODBC, but it is an expensive proposition if your organization is not leveraging the .NET middleware for operational use too. Another solution using XML to preserve the MultiValue structure of the exported data is the new MITS Report product, described in the sidebar (see page 47).

Limitations of Operational Reports

Let's revisit those operational queries that we so easily dispatched earlier, but with an added wrinkle that will sound both annoyingly reasonable — and impossible with our "single-pass" query tools:

"I need a list of last month's late orders!"

"Do you want that sorted by branch number?"

"Sure — can you give me the percentage change from last month in order count and dollar volume too?"

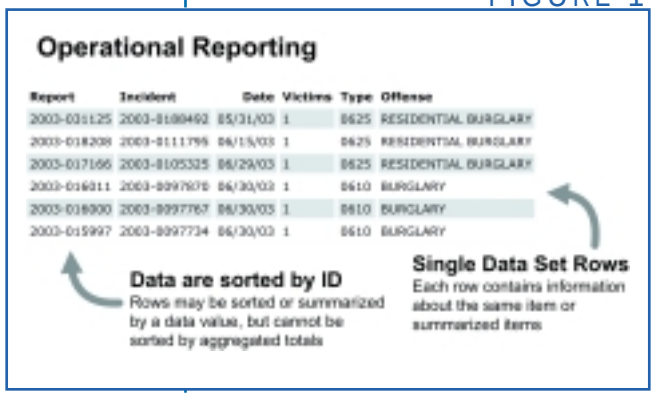
"I need a list of all customers who ordered last month."

"Do you want contact info with those addresses?"

"No, but I only really need the top 10 customers last month."

These kinds of queries are typical of analytical reporting. They are essential in today's business climate as managers seek to identify under- and over-performing aspects of their operations to reduce costs and improve results. They also underline the two main limitations of traditional reporting against operational files — the restriction to sorting by value forced by the single-pass technology and the inability to compare multiple sets of data (Figure 1).

FIGURE 1



This progression from operational to analytical reporting mirrors the role of the report recipient. An operational report might supply a list of late orders to help operations improve their turnaround. Middle management might look to a tactical report identifying branches with above or below average turnaround trends to gain insight or focus attention, while upper management may look at enterprise-wide turnaround figures to see if they meet strategic targets. An exciting prospect for analytical reporting is the ability to supply these advanced tools to people in the field, allowing them to act as change agents pursuing goals instead of waiting for guidance.

If you are not providing this analytical capability through application pro-

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MultiValue Reporting *and* Business Intelligence

Continued from page 7

grams or online analytical processing (OLAP), resourceful managers are surely taking pencil or spreadsheet in hand to get the job done on their own. For a sole proprietorship that may be fine, but the astounding return on investment for OLAP tools means almost any size organization can benefit.

Since operational reports work on one pass through the data, we cannot easily use them to compare different sets of data, for example, comparing sales numbers from month to month or ranking by summarized totals. It is possible to accomplish this analysis through custom programming, and some vertical applications do this with complex multi-pass BASIC code; typically generating a summary history file with delimited keys of the form year*period*product-type*product. This programming approach can yield powerful results that would not otherwise be available, but there are a few drawbacks.

Generating management reporting with analytical capabilities using BASIC programs involves an intimate knowledge of the underlying application as well as detailed insight into the reporting requirements. The authors of the application software may have the former but lack detailed specifics of the latter. Putting the hooks into your application to extract transactional information and load it into a summary file adds complexity to your code base. If you bundle this with transaction processing, you slow operations down; otherwise, you create another process to schedule and administer.

Reporting from these summary files can be performed with command-line queries, report generators, or programmatically. If you use traditional reporting methods to access this data, you are subject to their presentation limitations and interactive analysis is not possible. It is possible to create links manually between queries in some modern report generators, emulating interactive analysis, but mainly you gain the ability to view results easily online or to export to a spreadsheet for further manipulation. If you use a BASIC program to access the data, you can tailor the reporting, at the expense of even more added complexity — but users may still press for spreadsheet integration.

Business Intelligence and Analytical Reporting

A more general approach is using third party business intelligence OLAP or analytical reporting tools. These copy the transaction data into a structure optimized for comparing and ex-ploring summary totals with linked and pre-aggregated sets of data to enable trend and drill-down analysis. This creates a view of a process that allows you to derive insight quickly to help you improve that process (Figures 2-4).

Although business intelligence (BI) draws information from the underlying operational data, it is actually modeling the business process, not just assembling statistics. Reporting directly from operational data files to operate a business from day to day does not constitute BI. Reporting with a goal to improve the process, to track trends, to identify under-performing categories and the underlying root causes are the hallmarks of BI.

Operational systems break down a business process into individual transactions that can be performed independently, reliably, and efficiently; BI systems look at the business process as a whole and involve trade-offs that would be impractical in transactional systems. To provide rapid on-line analytical processing, we pre-aggregate transactions in a structure optimized for efficient navigation. Since each transaction can affect hundreds of elements in this structure, it is impractical to update this structure during the actual transaction.

Most BI solutions involve batched extraction and summary of transactions into a hypercube structure. We can usually make these batches arbitrarily small to allow transactions to

Continues on page 47

FIGURE 2

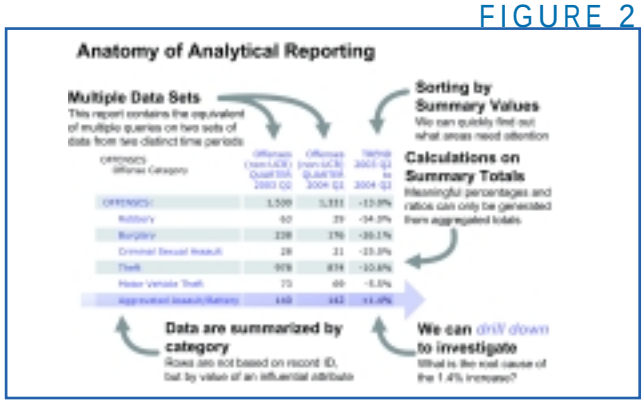


FIGURE 3

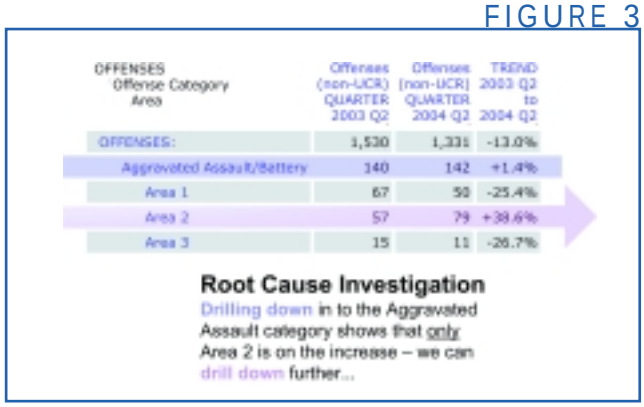
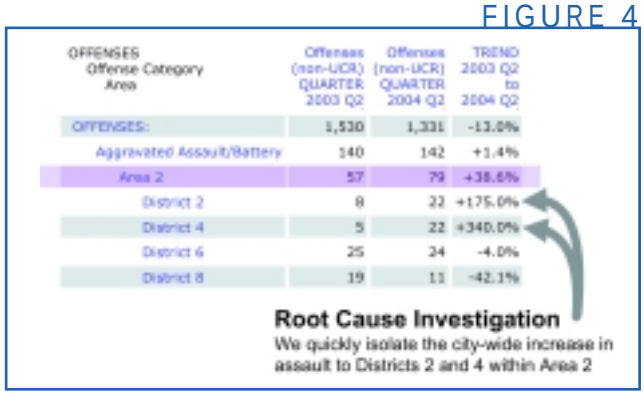


FIGURE 4



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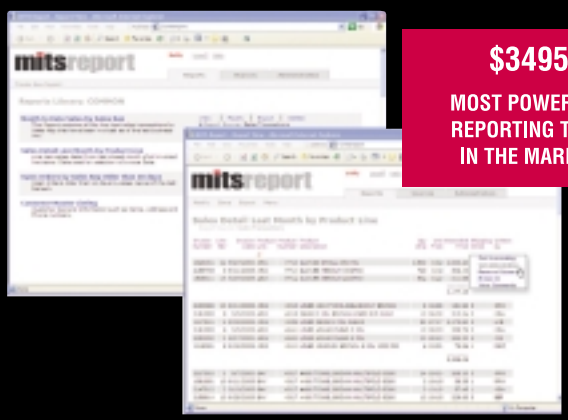

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Understanding the Real Benefits of the Ajax Technology

Making the Web More Interactive

BY MELVIN SORIANO

The Web is laden with flash, but the interaction itself is basically the mainframe-like data entry systems. Ajax techniques transition us into the world of GUI controls.

Sometimes I get things wrong and assume that people understand the benefits of certain technologies. Over ten years ago, I started writing and talking about the Web at Spectrum, and I might as well have been describing theories of interest rates, bond prices and arbitrage regulations. It took a few talks and articles to get folks to understand that there was a place for the technology at the MultiValue business table.

Likewise, in a previous issue, I gave some technical information regarding Ajax without really explaining to everyone the ramifications of the technology. I thought it best, therefore, to backtrack some and make sure we all understand what Ajax is all about.

After all, there's does seem to be hype about Ajax Web applications; you may be assuming that Ajax is some incredible new plug-in or programming language. I got an email that suggested that the reader was under the impression that Ajax was not possible because the browser wasn't able to download the Ajax plug-in.

So, as a reminder, you don't need to do anything particularly special. You can use Ajax right now. That is, I'm assuming you have a Web browser released in the past five years — Internet Explorer, Firefox, Safari, Netscape or Opera. If you've used Google Maps or GMail, then you've used Ajax applications.

These applications vastly improve the richness of Web applications. A well-written Ajax application changes in real-time; you won't be forced to wait for a page to reload any time you click on something. You can actually drag boxes around; the pages can refresh themselves with new data or images; pages can be re-formatted without re-downloading. And again, there's no special browser or browser plug-in required. Ajax is merely a programming technique that milks all the features of today's browsers to generate something that feels less Webby and more Windowsy.

What Ajax Does:

No waiting for the Edit checks: Traditional Web pages ask you to submit a form, wait a few seconds, grab a cup of coffee, watch the browser draw the page component by component, and

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then add whatever information was needed. Were you on a shopping cart page but forgot to enter the area code in a phone number? You'll have to start all over again. It's an electronic version of lather, rinse, repeat.

I can't even imagine how many e-commerce sales have been lost because the shopper encountered one too many error messages and gave up. Ajax removes the wait; the page does not reload — the browser responds with its edit checks as you go about your business.

Pages Update in Real-time: Ajax-enabled pages update themselves in real-time. Many news pages, including Yahoo for example, redraw the entire page at certain time intervals, such as every 10 minutes. In contrast, a browser using Ajax techniques will poll the Web server every few seconds in the background, so it's able to update any and only information that needs changing. The rest of the page does not change, flicker or move.

Graphic Interactiveness: The Web is laden with flash, but the interaction itself is basically the mainframe-like data entry systems. Ajax techniques transition us into the world of GUI controls. You might see animations such as dissolving text that tell you something's being saved, you can drag items around the page, you can see static text become editable fields when you move your mouse over it.

What Ajax Isn't:

Plug-in: Ajax applications do not use special browser plug-ins or other types of additional software.

Browser-specific: Just use a browser from this millennium and your Ajax Web page should work.

Proprietary: "Ajax" might be a common name in the pantheon of household marvels, but when it comes to the Web, Ajax is not a company, a product, or even a mythological figure. It's not even the name of a standard or international Internet committee. It's a programming technique that blends the benefits of several technologies.

Why Does Ajax Seem So New?

The term Ajax was coined only last year. The approach has been there for a long time, but until it was given a NAME, it was tough to encourage the use of some nameless programming technique. Ajax is pretty much just geek lingo. It stands for Asynchronous JavaScript XMLHttpRequest (with blue dots of DHTML and DOM, I suppose). So, we're talking about stuff that's been around: Javascript and DHTML, to let applications respond to mouse clicks and other events; DOM, so that Web applications manipulate the graphics and display; and XMLHttpRequest, so that the browser and the Web server can communicate without having to refresh the page. *Continues on page 14*

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Making the Web More Interactive

Continued from page 12

We Need Ajax:

Web not Windows: The Web isn't just some static page anymore. People are using Web pages instead of Windows programs to do most of their work. Ajax can be thought of as WWW 3.0.

Frustration: The point-and-click-and-wait Web page stinks. People expect better.

Multiple Desktops: People use more than one computer, so any applications that license and limit to only one location simply won't succeed. Ajax helps deliver powerful features without having to install software over and over.

GM technology: Google and Microsoft are using it, so we might as well accept that Ajax will be around.

Drawbacks of Ajax:

Limitations: Ajax is a blend of several technologies, but not all technologies. It doesn't do much of anything for multimedia, data storage, printing, printers, speakers or webcams.

Fast but not instantaneous: The data and edit checks still need to be processed by the Web server, a possible back-end server and the broadband connection. You'll find a vast improvement in interactive timeliness, but Ajax is no magical solution to a lousy Web connection or database server.

Internet is needed: If you're trying to use a PC without the Internet, you won't be able to use Ajax.

JavaScript reborn: Serious Ajax applications require strong proficiency in JavaScript, in addition to the other languages that are needed on the back-end.

Spaghetti code: You think it's easy to get into spaghetti code with BASIC? Imagine the potential when you blend

multiple technologies such as Ajax. Coder beware!

What's Actually Happening:

Ajax processing seems more akin to traditional GUI programs than traditional Web pages. The JavaScript monitors events and manipulates objects when defined events occur. The manipulation may head back to the Web server and perhaps a database server. Interestingly, there the interaction is asynchronous, as the event-listening is handled separately from the event-processing.

Here's a typical Ajax Transaction Flow Within the Browser:

Page Hit: Page gets requested in a link or URL.

Initialization: The page loads. Objects are initialized and possible event loops are started.

Event Loop: An event occurs on the browser, such as a keypress or mouse movement.

- The event is sent to one of the browser's objects, that in turn sends a request to the Web server.
- Web Server processes the event (with a possible run to a database server).
- The Web Server replies to the calling object.
- The object takes the reply and updates variables and calls functions, based on the initial request that was programmed.

So that's it. Ajax isn't something more than a combination of different tools with solid programming techniques. It's slick and clever, but more importantly it's vastly usable in many of our MultiValue forms. In future articles, I'll return to the technical aspects of Ajax and see how it can make your forms that much more user-friendly. **is**

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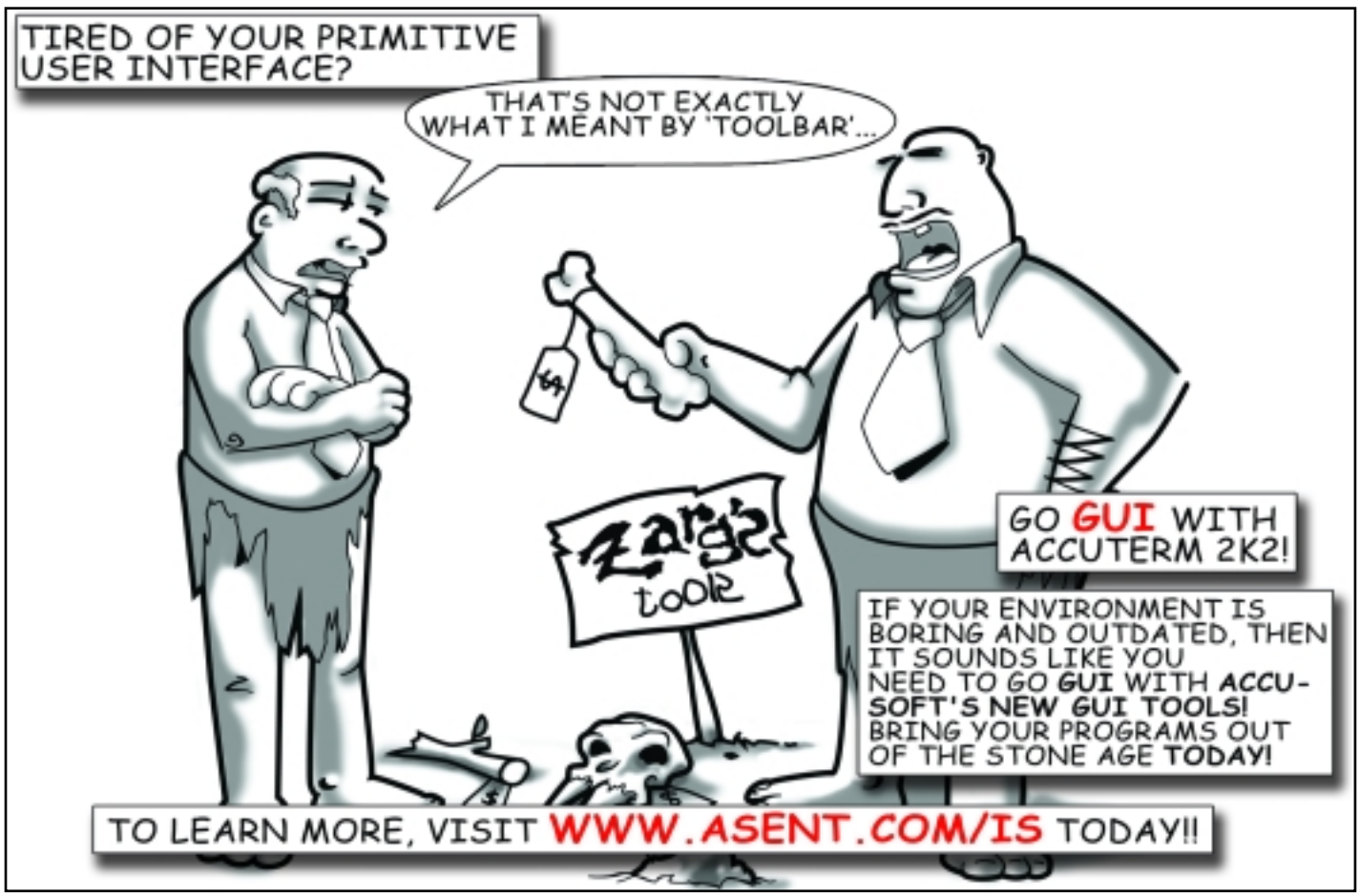

Programming for speed in OpenInsight

BY MIKE RUANE, REVELATION SOFTWARE

Time.

There never seems to be enough of it. We hate to waste it. We usually wish we had more. As programmers, developers, and consultants, to get more time, we need some speed. How can we achieve this? And what do we mean by speed?

For the purposes of this article, let's define speed as the ability to get a required task done in the least amount of time. And the areas we want to address for this article are speed in developing, speed in running the applications we develop, and speed in supporting, enhancing, debugging and modifying.

In this article, we'll be discussing tips and techniques that make sense in any programming environment, and then focus specifically on commands and techniques in OpenInsight's Basic+ that provide the biggest bang for the buck, as far as speed, when running.

Just to clarify, this isn't "pie in the sky" or "Ivory Tower" advice. Even though I'm president and CEO of Revelation Software, I still code nearly every day, and not just for OpenInsight. All of the developers here at Revelation Software also do work in the field as developers and consultants, so we have knowledge and experience with real world problems and needs. Now, on to the show.

Speed in Developing

Speed in developing is not a measure of how quickly one can type, or how many lines of code can be written in a day, although being a fast typist is an advantage. The average person typing makes an incorrect keystroke 3% of the time; some studies indicate that the error rate for programmers is nearly 20%. The following tips work for all flavors of MultiValue Basic, and even most other languages.

• **Create Reusable Routines** If you've done a lot of coding, you've doubtless encountered those occurrences where you find yourself writing a chunk of code, and it seems eerily similar to a chunk of code you've written before. The next time that happens, stop a moment. It's usually worth your while to create a centralized, parameterized routine that's generic. A generic routine like this can be used over and over again, and used safely because it's been run so many times that it's thoroughly debugged. I would warn against going off the deep end and making routines that are so generic that they become useless — just use some common sense.

• **Remember Where Things Are, or Have a Good Search Tool.** If you've been programming for a number of years, you may be familiar with the saying "If you haven't looked at your code in six months or more, it may as well have been written by someone else." I don't think that's necessarily the case, but sometimes you do forget what you've written before. If possible, keep a catalog, in your software, about some of the routines you've written, or, if all else fails, find or write a good search tool. We have one that we use written by a MultiValue developer named David Sigafoos. His tool is called FindInFiles; and I highly recommend it. Other MultiValue flavors certainly have similar tools; otherwise there is a niche market there to be exploited!

• **Be Consistent** Sounds easy, but many do not do it in practice. Name your variables the same from program to program when appropriate; it makes reading them easier, and lends itself more to cutting and pasting from one program to another.

• **Anticipate Change** When you're writing your code, know that it will be changed, either by you or another developer. Write your programs in such a way that you can modify them without having to tear them apart.

• **Tend to the Little Things** These are the little things that when used in a consistent manner and added to your own personal style, will make your programming life easier over time.

Some Little Things to Attend To

The devil is in the details, or so I've heard. Here are some tips specific to developing in OpenInsight that will make your development go faster.

• **Use standards!** Some shops require that a file be opened to a variable named f_filename; i.e. open BOOKS to F_BOOKS. This way you'll always know the file you're reading from or writing to. Another suggestion is to make your common variables end with an @ sign, so they can be differentiated at sight within a program. If you or your shop has standards, maybe you should review or enhance them. If you don't have any formal programming standards, it might be a good idea to write and use them now. Nothing fancy or complicated, just a set of rules and standards to follow.

• **Put spaces between the parameters of called subroutines or functions.** For example, this statement: X = XLATE ('BOOKS',@ID,12,'X') works fine, and so does this one: X = XLATE('BOOKS', @ID, 12,'X'). That's because most editors jump to the next blank space when the key combination of control-left arrow or control right-arrow are pressed. This is much quicker than arrowing or backspacing and typing it in again.

• **Don't embed functions within function calls.** Although it works, it can be a real bear to debug. Make the program two lines longer, and use the result from the first function call as a parameter in the second function call. When debugging it's much easier to see the values as they are passed.

• **Debugging - real and conditional.** Basic+ supports calling the debugger through the use of a DEBUG statement. But you don't always want to drop to the debugger every time as you are running through a program. In those cases, you can do a conditional debug — if condition, then debug.

• **Use Equates.** In OpenInsight, programmers can use an equate statement to have variables take on more meaningful names. For example, in the Basic+ function MSG, the parameter for the caption (title) to be displayed is the 12th parameter. In case I'm not sure of the number, or don't want to look it up, I'll just $Insert MSG_EQUATES into my program, and then I can just refer to the parameter with the name mCaption$, e.g. param<mCaption$> = "This is the title". Equates also make programs easier to read and faster to debug.

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Programming for speed in OpenInsight

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Speed in Running

While the tips for developing can make you a more efficient developer, programs are written and modified a few dozen times, but they are run hundreds or thousands of times. The following section will give specific items within OpenInsight that will show a developer where they can save enormous amounts of time. It's not that the alternatives are bad programming, but like any system, when you know some of the secrets, you can really get some great speed gains.

Fastest Ways for String Handling and Extraction in OpenInsight

OpenInsight, like all flavors of MultiValue, is just a large string handling database. All of our data is strings; we just extract and parse it out by characters that mean something special to our databases: ASCII 255, 254, 253, etc. And it's important to remember that because working with strings as strings is almost always faster than treating them as dynamic arrays.

As a note, the tests and speeds here were recorded on a copy of OpenInsight 7.2, running on a standalone Toshiba 6100 Satellite Pro, 2.0 gigahertz, with 1 gigabyte of RAM, running Windows XP. This is a fairly common laptop today. When working with a file I'm using a file named DEMO_CUST with 100,000 records.

For example, suppose you have a program that is building an array of 25,000 elements. Given that, we'll use a For-Next loop to build it, there are basically two ways to make it — as a string or a dynamic array. The first example uses dynamic arrays to add elements to the array. The second example uses string handling.

Example 1

```
for i = 1 To 25000
    array = i
Next i
```

Example 2

```
for i = 1 To 25000
    If Len(array) Then array:=@fm:i Else array = i
Next i
```

Which is faster? Number two. Example one takes 13.81 seconds on the test platform. Example two takes .05 seconds, so it's about 280 times faster. Wow!

Extracting data from strings is similarly disparate. For example, suppose we have an array with 20,000 elements. To loop through the array and examine every element, we have again two basic ways of doing it. The first, as seen in example 3, uses a For-Next loop and dynamic array operations to extract the elements, and example 4 uses a Loop-Remove string extraction process.

Example 3

```
num_items = Count(array, @fm) + (array # '')
For i = 1 To num_items
   item = array<i>
Next i
```

Example 4

```
col = ''
Loop
 Remove item From array at col Setting flag
While flag
Repeat
```

So, which is faster? Example 4. Example 3 takes an average of 8.5 seconds, while Example 4 takes .015 seconds. Again, the string processing is tremendously faster, about 500 times faster.

In cases where the arrays you are working with are only a few hundred or low thousands of elements, it's probably not worth the extra typing to use the string extraction syntax, and just stick with the dynamic array.

Cunning Use of Xlates

In Revelation, both our DOS products and OpenInsight, we have a command called XLATE. Xlate is a function that will go and pull data from a field or fields in a record in a file. It can either bring back the data from a single field, or from a whole record. It can be used like a READ, READO, or READV. Xlates are often used in our calculated columns to display information from another file when the key to that data is stored in the current file.

Xlates can be used to bring back either an entire record, or just the contents of a single field. Sometimes programmers will use an Xlate to get a field that is performing an Xlate itself. It is always faster to duplicate the functionality of the two Xlates in your program. It is also faster to Xlate an entire record rather than do multiple Xlates to the same record, although the difference is not that great; Xlate caches the record it has just read in case another Xlate call is made to it.

Continues on page 20

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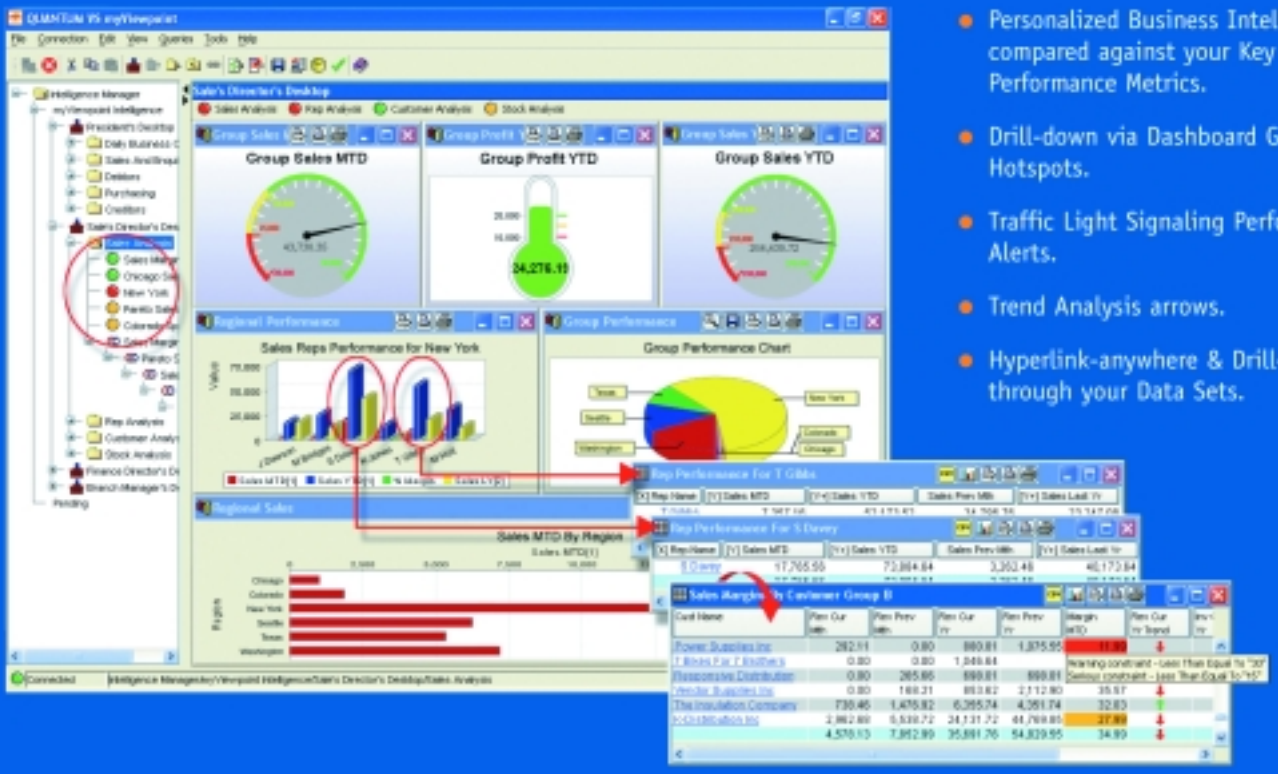

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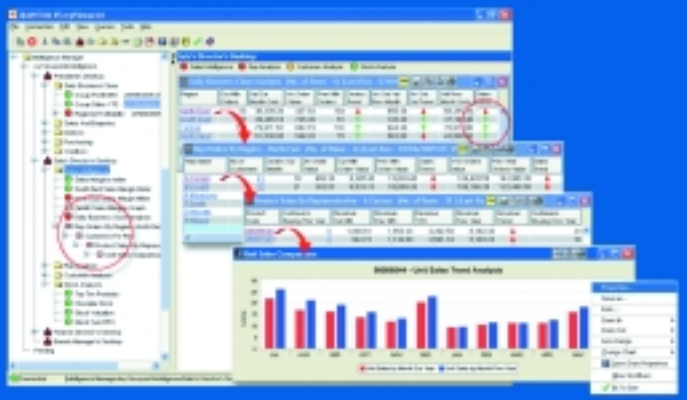

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Programming for speed in OpenInsight

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Selects, Indexes, and Btree.Extract

Nearly every reporting or processing program in a MultiValue system uses data files. Most of these programs do not deal with the entire file, rather just a subset of the data. These subsets are created using some variant of the basic SELECT command. OpenInsight's version of the SELECT command is called using the RLIST subroutine; it is effectively the same as an EXECUTE or PERFORM.

In OpenInsight, when you select on a field to have a value, you'll use a WITH or BY clause. A good rule of thumb in the Revelation world is that when you do a lot of reporting or selecting on a field, you put an index on that field, and in most cases you put a Btree index on it.

OpenInsight supports three types of indexing: Btree, Cross Reference, and Relational. Btree indexes, when they are built, build a unique list of the contents of the field that is being indexed, and builds a corresponding list of keys that are associated with those values. A Cross Reference is similar, except that it is used on strings, and there is a series of characters used as delimiters to parse the strings into component pieces. These component pieces are then indexed with a Btree. There is also an associated 'Stop List' which is a list of words that shouldn't be indexed, such as 'A', 'The', 'Inc', and so on.

A relational index keeps the keys from a secondary file stored in a multivalue field in another table, with the relationship back to the primary table being based upon the contents of a field in the secondary table. For example, suppose you had a file of classes and a file of students, and the class file had an ID, time, location, and a MV list of students, and the student file had an ID, name, address, email, and so on. If you wanted to see what classes a student was attending, you might have to run a select statement along the lines of SELECT CLASSES WITH STUDENTS CONTAINING "XXX". This will take more and more time every time an inquiry is made. However, if you added a new MV field in the Student file named CLASSES, and set up a relational index between the two tables, the new CLASSES field would contain the IDs of all classes that the student was in. From that point forward the CLASSES field would always be up to date, and could be listed as needed.

A good point to remember about OpenInsight's indexing is that once it is set up initially, the indexes maintain themselves automatically. When a write is made to a file, the changes to the indexed fields are tracked and put into a pending indexing file, and the pending changes are handled either by systems on the network with idle cycles, or updated just before a select statement.

Given that the indexes in OpenInsight make searches and selects faster from TCL or in reporting, how can they be utilized from a program? There are a number of index specific commands in Basic+, but the most frequently used is a routine named Btree.Extract, and it is almost always faster than doing a select statement. Looking at examples 5 and 6, both select all records from the DEMO_CUST file.

Using the two examples above, the SELECT takes about .01 seconds to run, while the BTREE.EXTRACT goes so quickly that the time is always measured as 0. If you multiply that by the number of times a particular process is run, the time savings is tremendous. So, Btree.Extract is definitely fast, and should be used whenever you need to get records using indexed fields.

A good point to remember about OpenInsight's indexing is that once it is set up initially, the indexes maintain themselves automatically.

Sorting Arrays - V119

Whenever you have a dynamic array that you want to sort, there are a couple of ways to do it: either looping and sorting yourself, or using V119, OpenInsight's sorting algorithm. (An aside — we really should change the name of this routine; I mean, V119 is just so intuitive that it's a sort routine.) Although there are many and various sorts that can be written using Basic+, V119 will always come out on top.

In the following examples, there is a variable named STRING which is an @FM delimited list of 250 items in random order. Example 7 sorts the list using a very efficient Loop-Remove-Locate algorithm, and gives us a sorted result. Example 8 does the same, but uses V119.

Example 5

```
ClearSelect
Call Rlist('SELECT DEMO_CUST WITH STATE = "CA" ', 5, '', '', '')
```

Example 6

```
hits = ''
Search_String = 'STATE':@vm:'CA':@vm:'NJ':@fm
Call btree.Extract(Search_String, 'DEMO_CUST', d_demo_cust, hits)
```

Example 7

```
new_string = ''
col = ''
loop
Remove item From string at col Setting flag
    Locate item In new_string by 'AL' Using @fm Setting lpos Then
        new_string = Insert(new_string, lpos, 0, 0, item)
    End else
        new_string = Insert(new_string, lpos, 0, 0, item)
    end
    While flag
    repeat
```

Example 8

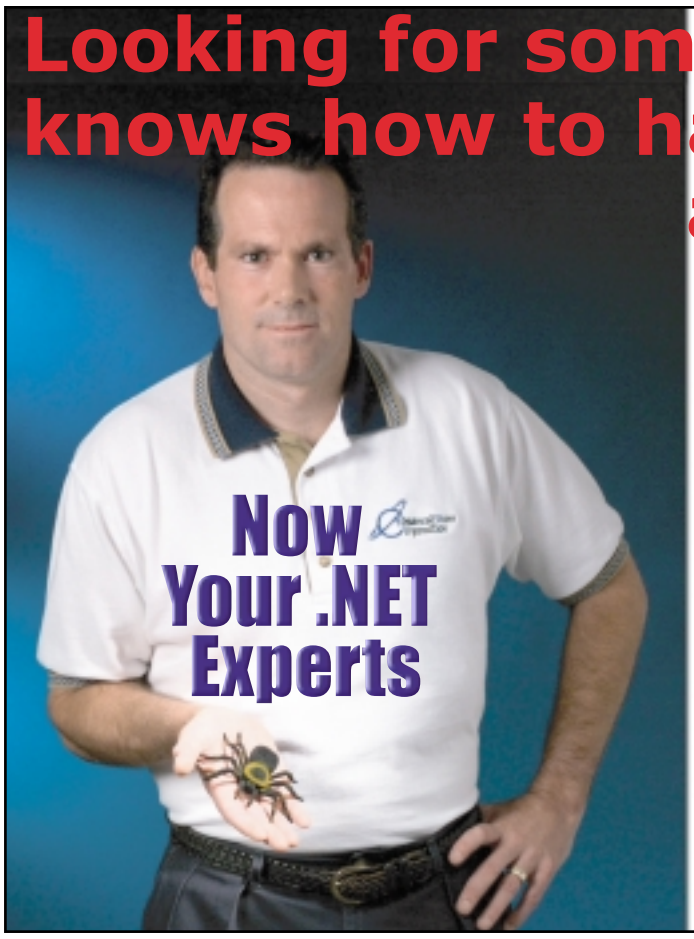
```
new_string2 = string
Convert @fm To @rm In new_string2
new_string2:=@rm
Call V119('S', '', 'A', 'L', new_string2, '')
new_string2[-1,1] = ''
Convert @rm To @fm In new_string2
```

As you've probably guessed by now, example 8 is the faster of the two, but how much faster? Again, difficult to tell, but the LOCATE takes about .02 seconds per test, and the V119 keeps registering 0. Recommendation: use V119 wherever possible.

If you're wondering about the parameters to V119 or to any of the commands or functions used in these examples, going into the system editor, typing in

Continues on page 22

FIGURE 1 Context Sensitive Help in the System Editor



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Continued from page 21

the command in a program and pressing the F1 key will bring up our context-sensitive help, as seen in figure 1.

Speed in Debugging

If you follow the tips and techniques above, enhancing and supporting your code should become easier. But debugging? How does OpenInsight make that easier? The answer is our debugger. The OpenInsight debugger can be called from a program, it can be hidden from the users, or it can be replaced with your own program. For the purposes of this article we'll limit the scope to calling the debugger from Basic+.

Calling the debugger from Basic+ is as simple as putting the DEBUG command in a program. It can either be called conditionally, or explicitly as seen in Example 9.

Example 9

```
STRING:= 'BRIAN SEAN JAMES GERARD JULIA GRACE NATANIAL NATE MIKE'
Convert ' ' To @fm In string
DEBUG
for j = 1 To 3
    scr = Msg(@Window, 'Running Test 6, iteration ':j :@fm:'U')
    call dostime(st_time)
```

Once the debugger call has been compiled into a program, when that line is executed during runtime, the debugger appears, as seen in Figure 2.

FIGURE 2 - The debugger screen

As can be seen, there are four windows in the debugger allowing viewing of source code, the call stack, global variables, and local variables. Clicking on any of the windows will provide a more detailed view of its contents. Figure 3 is a view of the local variables.

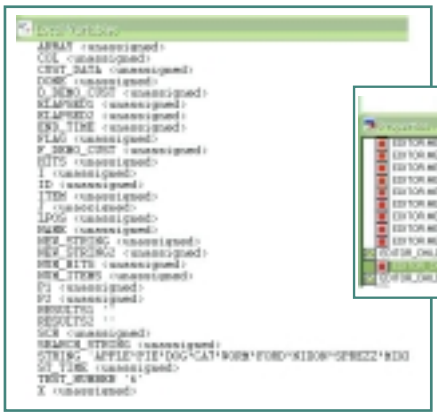


FIGURE 3 - Local Variables

Looking at the local variables we can see that many have not yet been assigned at this point in the program, but the variable STRING contains an @FM delimited string. Double-clicking on this variable will cause it to launch into a new window, with each field on its own line, as seen in Figure 4.

If a variable were to contain values or subvalues, they in turn could be expanded as well. As you can see, it is much easier to look at programs and variables this way than with many existing MultiValue debuggers. Also,

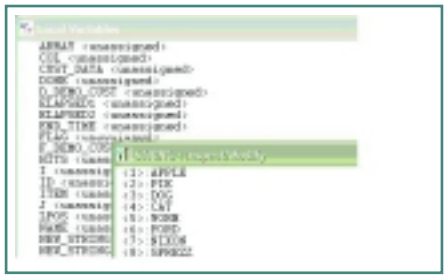


FIGURE 4 - A view of the local variable STRING

programs can be stepped through line by line, and there is even a window that will show all controls and properties for the windows currently open in an OpenInsight session. Figure 5 shows this window.

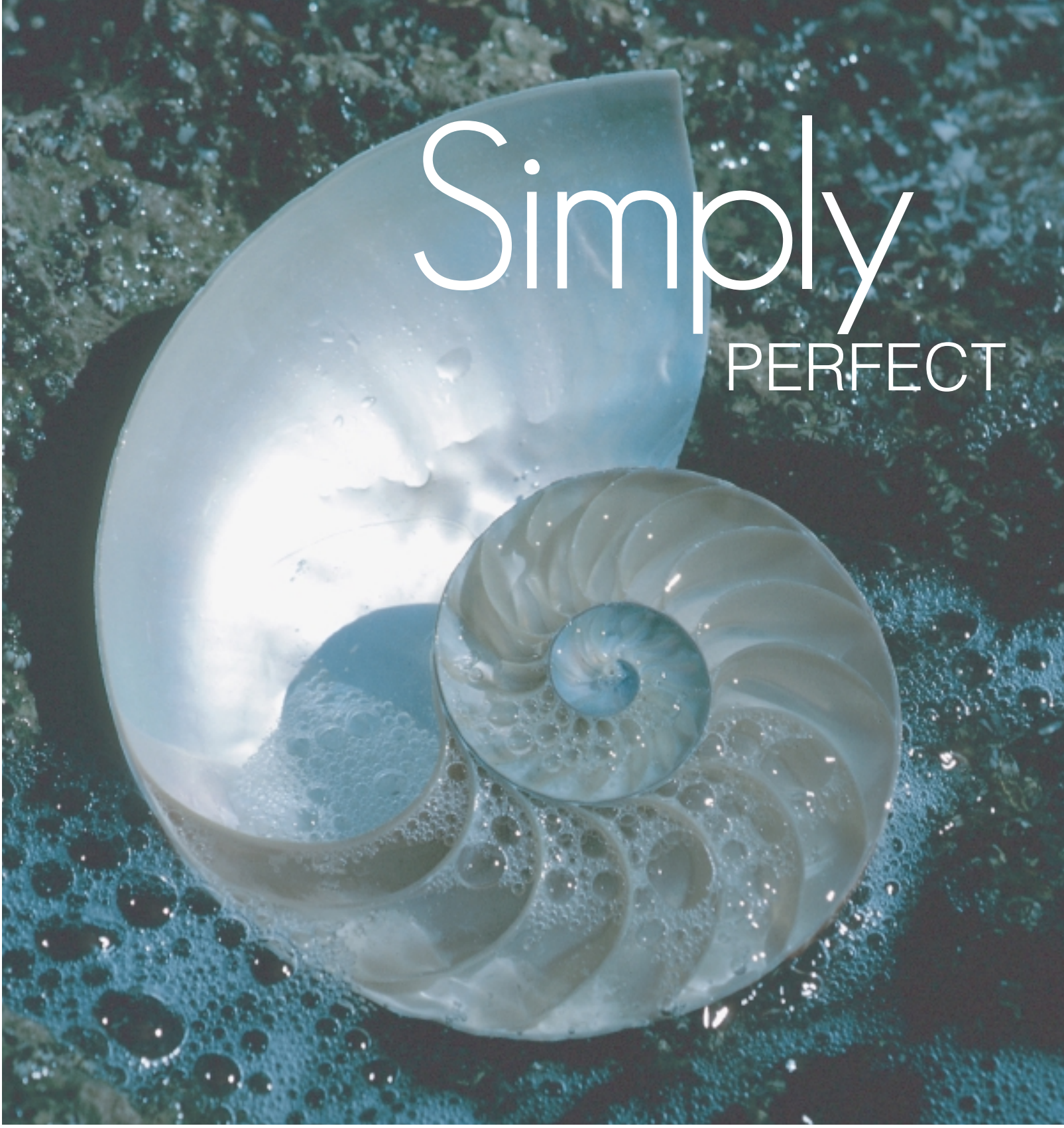
FIGURE 5 - The Properties window

I'd go as far as to say that OpenInsight's debugger is the best in the MultiValue world, and helps developers tremendously. It actually rates its own column, so watch this space in upcoming issues.

Wrapping It All Up

So, as can be seen in the examples above, there are good ways of doing things from a speed perspective, and there are better ways. The examples that have been provided are given in that they offer some of the biggest bang for the buck from within OpenInsight programs themselves. There are others, but lack of space doesn't permit us to expand on them.

Continues on page 44



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BY MARTIN PHILLIPS, Ladybridge Systems Limited

OpenQM

Where Are We and Where Are We Going?

The OpenQM project was launched a little over a year ago, bringing the already established QM MultiValue database into the spotlight by making the source code available under the terms of the General Public License (GPL). In this article, we will look at how this increased exposure has affected the product development and how we see the future.

The OpenQM project evolved out of an in-house tool that began its life back in 1992. This was taken forward for use as an embedded database in application software produced by Ladybridge Systems and was subsequently launched as a product in its own right in mid-2001, quickly attracting users around the world because of its low price and the ease of migration from Information-style environments.

The open source release in September 2004 was linked to announcements at both the London and U.S. International Spectrum conferences and was greeted with great interest by potential users and by some of the established vendors in the MultiValue market. Here was something that could revitalize the MultiValue database world, potentially reversing the trend where experienced users were leaving the industry while new entrants tended to be more familiar with fully normalized products such as MySQL or Oracle.

Within a matter of days of the GPL release, over 100 developers had signed up to work with the open source version. Some of these, as one might expect, were simply interested in seeing what they could get for free but others saw this as an opportunity to take MultiValue databases into places where they had not been before. At the same time, the launch of a free license for genuine commercial application developers resulted in a large number of applications and development tools being migrated to OpenQM from other platforms.

There has been some confusion amongst users about the relationship between the commercial and open source versions of the product. The name OpenQM is used to reference the whole project, both commercial and open source. This provides a coherent naming across all documentation, Web sites, product components, etc., and reinforces the availability of an open source version. The commercial product contains the most current certified product components. Any user with a "mission critical" system should use this as it is fully supported across Windows, Linux and FreeBSD by Ladybridge Systems and our dealers and distributors. The commercial product also includes other bundled components and the availability of additional services for its users.

The open source is a derivative of the commercial product, released in Linux form only, though users are free to migrate it to other platforms. The open source is not updated at every commercial release and hence tends to lag behind. Because we have no control over what the user does to this source, support services are limited and only available on a chargeable basis. The attraction of the open source is that it allows developers to add new features that require modification of existing components. They then have the option of offering those developments back to Ladybridge Systems for incorporation into the mainstream product.

The rules governing what can be done using the open source are set out in the General Public License. In simple terms, a user is free to use this source for their own purposes, but distribution is only allowed if the modifications are also released under the terms of the GPL.

The last year has seen OpenQM develop rapidly to meet the needs of new users.

So, who uses OpenQM? At the time of writing, licenses for the commercial version of the OpenQM database have been issued to users in 43 countries around the world. These users span industries as diverse as local government, education, law enforcement, medical systems, builders' supplies, retail sales, car dealerships, insurance, emergency service control rooms and, of course, software development.

The last year has seen OpenQM develop rapidly to meet the needs of new users. Many of these have come from Pick-style environments, so much work has been done to ease migration by adding features not previously in OpenQM such as A/S-type dictionary items, correlatives and Procs. Other developments have introduced new functionality that we believe to be unique to OpenQM such as dictionary link records, process dump files, cumulative fields in queries and a number of new QMBasic functions. Although most of this work has been done in-house, there have been some useful contributions from the open source community and there are some exciting projects in the pipeline.

We have chosen AccuTerm as our preferred terminal emulator as this combines a high-quality character mode interface with advanced graphical features to put new life into legacy applications. All commercial OpenQM licenses now include free activation of the AccuTerm terminal emulator, further driving down the cost of ownership of a complete MultiValue environment.

What does the future hold for OpenQM? As users migrate from other MultiValue environments, the product will continue to develop, adding new features to make the transition easier. OpenQM is not a clone of any other MultiValue environment and will never provide total compatibility, but the majority of the more important issues that arise in migration have been addressed. Moving to OpenQM will always require some work, but users who have already taken this step report that the benefits are well worth the effort.

The majority of OpenQM users are taking forward legacy applications. Often these come from "green screen" origins and the move to OpenQM is an opportunity to revitalize the application by adding a GUI front-end using the QMClient API. This was originally written for use with Visual Basic but was quickly extended into a library for use in C programs. More recently, at the request of a developer in France, support has been added for Fantaisie Software's PureBasic to enable development of GUI applications for Linux users.

With the growing use of Web-based applications, OpenQM can be used with Web-based tools such as Coyote and Freedombase. Alternatively, effective Web applications can be built in OpenQM with no external packages by use of a simple CGI or PHP front end. The dealers area of our Web site uses this latter approach to support the license generation screens. More advanced Web interfaces are under development.

Current versions of the commercial product run only on Intel platforms using Windows or Linux. A Mac version is running on a development system and other platforms are expected to follow in response to user demands as these arise.

Contrary to the strategies of most software suppliers, it is the policy of Ladybridge Systems to issue new releases of the commercial product very frequently, typically about every two weeks, leaving users to review the list of new features and decide if a release is of interest. This release strategy combined with what we believe to be unrivalled responsiveness in handling user enhancement requests results in a very rapidly developing product.

The low cost of OpenQM combined with the maintenance-free file system makes it ideal for "shrink wrapped" applications and, with even lower costs for high-volume single user licenses, this is likely to be an important market in the future. At the other extreme, OpenQM has been successfully tested with 1,000 simultaneous users on a Linux system and should be able to support larger user populations. **is**

MARTIN PHILLIPS is technical director of Ladybridge Systems Limited, a U.K.-based company specializing in MultiValue database software. For more information on OpenQM, visit www. openqm.com or come see us at the Long Beach Spectrum Show.

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"With 23 years in developing multi-value applications, QM/Linux is the finest platform I've used and the most cost-effective. Support is outstanding."

William G. Crowell, VP & CTO, Crowell Systems

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Integrating MultiValue Data with Microsoft Reporting Services

BlueFinity's Reporting Services Data Connector Allows MultiValue Developers to Utilize the Very Latest Microsoft Reporting Services Technology

A fundamental requirement for any modern business application is easy access to the underlying data, generally in the form of reports. For many organizations the challenge is getting the right information to the right people, at the right time. Organizations require flexible, on-demand access to business information to empower their employees to make informed decisions. Yet, MultiValue application developers, consultants and end users have all struggled when it comes to liberating their business data from their MultiValue databases. They have endeavored to build presentable reports, suffered poor functionality from MultiValue-only tools and experienced the vagaries of MultiValue ODBC implementations while attempting to use industry-standard reporting tools.

Microsoft has invested millions of dollars in the creation of the Reporting Services infrastructure in SQL Server 2005 to provide a scalable, easy-to-use reporting solution which integrates tightly with its development toolsets – and now, using BlueFinity's Reporting Services Data Connector, MultiValue users on all platforms have a gateway into this world-class technology.

Microsoft SQL Server Reporting Services (SSRS) is a comprehensive, server-based reporting solution that can author, manage, and deliver both paper-oriented and interactive, Web-based reports and services. SSRS supports a wide range of common data sources, such as OLE DB and Open Database Connectivity (ODBC), as well as multiple output formats such as familiar Web browsers and Microsoft Office System applications. It is flexible enough to be used in small business right through to large enterprises, and installs onto any Windows-based server able to support the .NET Framework.

The SSRS architecture allows third-party developers to integrate with its data acquisition components to facilitate report production based on a wide range of back-end datasources such as DB2, Oracle and SQL Server. BlueFinity's Reporting Services Data Connector (RSDC) supports the full feature set of Microsoft's Reporting Services product and allows it to be used against all of the major MultiValue database platforms with almost no extra work on behalf of the application developer. With support for multiple databases, multiple normalization techniques, fast data retrieval and wizard driven query creation, the RSDC product offers the most sophisticated, performant and cost-effective solution for any developer wishing to take advantage of Microsoft's excellent Reporting Services product.

Continues on page 28

mv.NET

mv.NET is a powerful and extensive toolset which enables MultiValue developers to harness the full power of both their MultiValue system and Microsoft's .NET application platform. Offering seamless integration with the Microsoft Visual Studio .NET environment, mv.NET provides a potent rapid application development environment fine-tuned for the MultiValue developer.

- Native .NET access to all major MultiValue databases including: D3, jBASE, mvBASE, Power95, Reality, UniData, UniVerse, UniVision, and others by request
- Complete development environment from Visual Studio .NET (both VS2003 and VS2005)
- Comprehensive session management capabilities
- Advanced MultiValue aware data-binding technology
- Full ADO.NET managed data provider

BlueFinity

...Reality V12.0

What does a modern database solution mean to you?

Would you expect it to deliver a high-performance cost-effective solution, scalable from one to many thousands of users? Would you look for resilience and security features to enable data to be kept safe and secure?

How about powerful characteristics allowing it to run across and openly integrate with many platforms, databases and applications? The option to migrate from other MultiValue platforms? And what about a high-performance SQL interface and Web Services and XML functionality to further build on its versatility?

So what does a modern database mean to you? To us, it means all of the above...to us, it means Reality V12.0

Powerful new features include:

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Reporting Services Backdrop

The professional's starting point for SSRS is the Report Designer, a complete IDE utilizing the functionality provided by Visual Studio. In fact, all of its functionality is supplied in VS 2005 Professional and above, so for those not inclined to purchase Visual Studio, a Reporting Services "only" version of Visual Studio is bundled with SQL Server 2005 for Report Designer. For the professional, therefore, reports can be developed and deployed and the BlueFinity RSDC employed to access all the major MultiValue databases. RSDC provides a simple-to-use wizard interface for the specification of the database connection, query and selection commands.

The Report Designer can be used to define a report layout, preview a report, and publish a report to a test or production server. Report Designer includes query builders, an expression editor, and wizards so that simple step-by-step instructions can be followed to create a report. Report Designer also supports advanced reporting features for professional report designers who understand query languages and expression languages.

In typical Microsoft fashion, the IT team has been provided with several tools ranging from the Web-based Report Manager through to the full SQL Server Manager Studio to manage and manipulate the reports deployed from Report Designer in a single, consistent manner. The ability to configure role-based security and to manage report server content by setting properties on data sources, reports, folders, resources, and report models is also available. Report management also goes as far as being able to configure report execution and report history, to set limits on processing time, to monitor and cancel pending or in-process reports, and to create and manage data source connections and schedules independently of the reports that they are associated with.

Reporting Services is also aimed at empowering the end user. A new Report Builder tool (WinForm based) is aimed at the user who wishes to create ad hoc reports using templates and pre-organized data, saving them directly to a report server. Reports that are created in Report Builder can be accessed, distributed, and managed just as easily as any other report. The templates mentioned above can be generated by someone in the organization who understands the business and the applications, who need not necessarily be someone on the IT team. They could use the Report Builder Model Designer to build the templates whereas developers can use the full Report Designer.

Integrating MultiValue Data with Microsoft Reporting Services *Continued from page 26*

RSDC allows SSRS users to utilize MultiValue data sources in their SSRS authored reports. By integrating with the low-level data provider interface of the SSRS product, RSDC allows MultiValue databases to supply data to SSRS's data acquisition phase. This approach has the advantage of allowing the full feature set of the SSRS Report Designer and Report Builder to be leveraged in the manipulation, format and display of MultiValue data in a wide variety of end-user focused reporting layouts.

RSDC provides real-time access to D3, jBASE, mvBASE, Power95, UniData, UniVerse and UniVision databases with a high-performance, secure and reliable data access connectivity. The seamless data integration with SSRS allows MultiValue developers to leverage the capabilities of their existing information systems and connect to custom data sources, produce additional output formats and deliver to a variety of computing devices. The RSDC product also has the advantage of leveraging the full power of the standard MultiValue dictionary layer with minimal work being required prior to data being made available to the Reporting Services infrastructure.

By utilizing BlueFinity's mv.NET product as the database connectivity solution, RSDC is able to offer unparalleled SSRS integration across a wide range of MultiValue platforms. RSDC makes use of the high-performance Adapter Objects (ADO.NET) functionality provided by mv.NET to provide the underlying connectivity to the MultiValue database — from there onwards SSRS takes over to provide the complete reporting package. [See mv.NET sidebar for more information].

David Cooper is one of the lead developers at BlueFinity International. He has worked within the MultiValue community since 1986 and has extensive experience authoring both end-user applications and developer tools. Cooper feels RSDC is a major breakthrough for the MultiValue community, as it enables MultiValue users to capitalize on mainstream technology.

"BlueFinity's RSDC provides a real opportunity for all the major MultiValue database users, both VARs and end users, to fully exploit the benefits of Reporting Services," Cooper says. "By enabling Reporting Services to access MultiValue databases as easily as SQL-based platforms, RSDC effectively 'levels the playing field' in terms of end-user reach to valuable application data." Cooper adds, "Our RSDC product provides the whole MultiValue community with a fantastic opportunity to ride on the crest of the Reporting Services wave currently being generated by the Microsoft marketing machine."

With Reporting Services, MultiValue databases can now be used to provide sophisticated, real-time (if required) report data using a wide variety of delivery mediums (Browser, PDF, rich-client, application-embedded), incorporating all of the reporting features (for example, cross database merging, drill down, drill through and charting) expected by today's demanding report consumer.

Reporting Services Data Connector is available now from BlueFinity International. For pricing or for more information, visit www.bluefinity.com or contact your BlueFinity reseller. **is**

Reporting Services Deployment Options

• **On-demand access over Web connections.** Use a browser to navigate a folder hierarchy to find and work with reports and other items. Reports can be referenced from a Favorites list in a Web browser, or link from a Web portal.

• **Sharepoint Web parts.** Reporting Services provides two Web parts for report viewing and report server folder navigation. The Web parts can be embedded in a Microsoft SharePoint Portal site to easily integrate with a report server deployment.

• **My Reports and My Subscriptions.** In Report Manager, store and manage reports and subscriptions in a personal workspace.

• **Subscriptions for E-mail or File Share Delivery.** Automate report delivery through a standard subscription and set report presentation preferences. Users who prefer to view a report in Microsoft Excel, for example, can specify that format in a subscription. Deliver a rendered report to an e-mail inbox. Set delivery options that control whether the report is delivered as a link or attachment. Deliver a rendered report to a shared folder. Set delivery options that control whether the report is overwritten or added to an existing folder.

• **Data-driven subscriptions.** Automate report distribution through data-driven subscriptions, which generate a recipient list and delivery instructions at run time from an external data source. Use a query and column-mapping information to customize report output for a large number of users.

• **Multiple options for integrating Reporting Services into standard .NET based applications.** And mv.NET from BlueFinity provides the ideal .NET development tool for MultiValue databases: URL access, The Report Server Web service, also known as the Reporting Services SOAP API, The ReportViewer controls for Visual Studio 2005.

Reporting Services Feature List

• **Report Layouts.** Tabular, matrix, chart, and free-form report layouts.

• **Ad hoc reports.** Create and save reports directly to a report server using Report Builder. Ad hoc reporting is supported through a thin client that is downloaded from the report server.

• **Drill-through reports and interactivity.** Add interactive features by providing links to related reports and reports that provide supporting details.

• **Parameterized reports.** Add parameters to refine a query or filter a dataset. Dynamic parameters get values at run time based on user selections (the selection of one parameter builds the value list for a second parameter).

• **Presentation formats.** Choose a presentation format when you open the report, or after you open the report. Choose from Web-oriented, page-oriented, and desktop application formats. Formats include HTML, MHTML, PDF, XML, CSV, TIFF, and Excel.

• **Custom controls or report items.** Embed custom controls or report items that you create or purchase from a third-party vendor. A custom control requires a custom report processing extension.

• **Navigation.** Add bookmarks and document maps to provide navigation options within a large report.

• **Aggregations.** Aggregate and summarize data using controls and expressions. Aggregates include sum, average, min, max, count, and running totals.

• **Graphical elements.** Embed or reference images and other resources that contain external content.

Why Visual Studio .NET

A Guide for MultiValue Developers

BY ROBERT HOUBEN

.NET and the MultiValue Developer

As an IT professional charged with maintaining and extending the functionality of a MultiValue system, you are probably wondering what impact, if any, the latest release of .NET will have on the work that you do and the decisions that you make.

As you read different articles about .NET, you probably encounter a lot of terminology, some of which may seem strangely familiar to you. The reason for this is that some of what .NET brings to Windows development are features that, as a MultiValue developer, you will have taken for granted. On the other hand, there is a lot in .NET that is both new and different from what you are familiar with.

I will try to demystify some of the new features, so that you know which ones you should be familiar with and which will be truly new to you. I will also explain why some of these features are important to you and why you should be moving toward adoption of them.

What Is .NET?

.NET actually consists of two components. There is the .NET framework, which is really a run-time environment for executing applications written using Visual Studio .NET, and there is Visual Studio .NET. Visual Studio .NET is an Integrated Development Environment (IDE) for building the applications and components that the .NET framework executes. I refer to them collectively as ".NET".

Visual Studio .NET 2005 (.NET Framework version 2.0) is the third release of Microsoft's latest generation development and run-time environment. Because Microsoft is involved, and in some cases a leader in so many standards bodies, .NET leverages W3C standards. In addition to this, Microsoft publishes its own "standards" such as OLEDB, ADO.NET and others. Because of their size and the sheer size of their developer base, these vendor-driven standards often become more firmly entrenched and achieve wider acceptance than those from standards bodies such as W3C, OASIS and ECMA. There are benefits to being the market leader!

Why not tap into $7 billion of annual R&D by leveraging a technology that is rapidly being adopted? This information is quoted by Forrester Research in response to a question asking, "Which platform will be used for the majority of your development work in 2004?" Forrester's response: "Four years ago. there was a big question as to whether Microsoft could get [current and new] customers onboard with [the .NET Framework]. That question has been answered: Microsoft has successfully done both." -Randy Heffner, Forrester Research, May 2004. Survey results were 44% J2EE and 56% Microsoft .NET usage.

.NET is really good for building rich GUI, n-tier and Web-based systems. It is also good for developing mobile applications. MultiValue systems traditionally have very little support for doing these things and what functionality exists simply can't be compared with the richness and completeness of what .NET offers.

Main Features of the .NET Framework

Common Language Runtime (CLR)

There are over 20 programming languages that are supported by the .NET framework, including the ones supplied by Microsoft. The most commonly known ones are C++, C#, VB.NET and J#. The important fact about the CLR is that it allows programs from one language to call methods and even inherit functionality from classes written in another language. This can be done without either class needing to have any special "knowledge" of the other programming language.

The reason this is important is that it means that regardless what language you write a component in, if it is written in a language that uses the CLR, any other programmer, regardless of language, can reuse this component in the future. This also decreases your dependence on a specific programming language, which increases your human resources options.

The CLR is able to do what it does in part because it enforces a few things. In particular data types need to be strongly enforced. The next few topics look in depth at aspects that strongly relate to what the CLR needs to enforce.

Common Type System

In order to allow different programming languages to interoperate, they need to share a common set of data types. Microsoft provides a rich and extensible set of data types. Any type that you extend with your own type can be used by any other programming language that uses the

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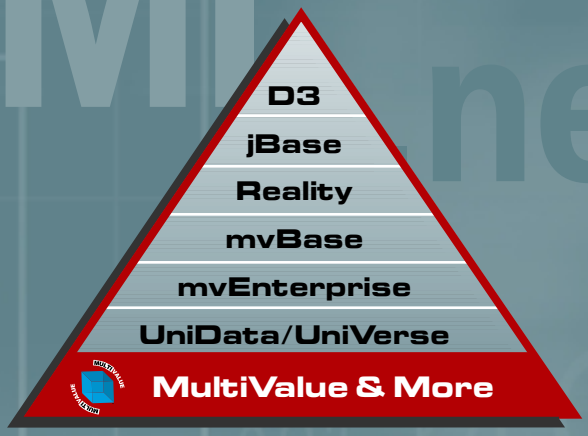
Gain Secure, Easy Access to Your MultiValue Data from Windows or Java Environments



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Why Visual Studio .NET

Continued from page 30

CLR, but they must all be based on the common types of the Common Type System. As a result of this, the CLR enforces strong typing.

Strong Typing

Visual Basic 6.0 and earlier had a data type called the variant, which was very similar to the MultiValue data type (everything is a string). It would automatically try to convert to the right data type for whatever operation you were doing and could always be referenced as a string. .NET no longer supports this data type.

Strong typing allows .NET to validate that a program is not using a data type in a way that is unsafe, further ensuring security and safety of your code. This is especially important when downloading components over the Internet.

Microsoft Intermediate Language (MSIL)

One of the huge benefits of .NET is that programs are not compiled into machine code, but into an intermediate language called Microsoft Intermediate Language (MSIL).

MSIL is compiled by a Just-in-Time (JIT) compiler (same as Java code) on the system where it is being executed. These JIT compilers have proven to be able to generate code that is as fast, and sometimes faster than precompiled code, as they can actually compile using instructions native to the processors on the machine. They can even optimize for multiple processors.

The really big benefit to you is that the MSIL can be moved to a Windows 32-bit or 64-bit Intel or AMD processor, or can be moved to an ARM processor on an Pocket PC or other mobile device, and the local JIT compiler will figure out the right machine code. This gives you a degree of portability for your application that you could only dream of before, while still giving you some of the best machine optimization (best performance) that you could expect!

Managed Code

For a Windows developer, this is a huge gain as I will discuss below, but first I want to explain why, as a MultiValue developer this should be no big deal to you. You see, you've always worked with managed code.

The word "Managed" in the term really refers to how memory is dealt with. In a MultiValue BASIC program, if you attempt to reference a static array with a subscript that is out of range, you get a "SUBSCRIPT OUT OF RANGE" error, either at compilation time, or at run-time. It is literally impossible to reference the next variable in memory inadvertently because you put the wrong number in the subscript. There is no need (and no way) to "free up" memory for a variable. If you return from the subroutine that declared it (by simply using it), the memory would be freed up when the system next needed it (garbage collected). All you worried about was putting the right thing into your variable and getting it out. You never worried about allocating or freeing memory, or accessing something you shouldn't.

In traditional Windows programming, this was not necessarily the case. VB programmers are used to having this level of protection, but C++ programmers were not.

Managed Code Is More Secure

CERT bulletins regularly contain a list of exploits that are making the rounds. Windows has its fair share of them, but there is a lot of trouble on other platforms, as well. It is safe to say that nearly all exploits happen in unmanaged code.

Managed Code eliminates whole categories of security exploits. This is one of the reasons for the widespread adoption of Java, which also uses managed code.

For Instance: Buffer Overruns

The exploits which are both the most common and most serious are generally buffer overruns. Without getting into too much detail, a buffer overrun occurs when a program uses a pointer to write to data, and increments or decrements that pointer beyond the boundaries of the variable whose address they are using.

Hackers take advantage of this scenario, resulting in some of the worst exploits.

Regardless whether this happens accidentally or intentionally, it's a bad thing.

Managed Code Is Less Prone to Bugs

Memory problems related to allocating, freeing and incorrectly referencing memory account for both the majority and most intractable bugs that developers have to deal with. In fact, the exploit listed above could actually be the result of a bug, and not an intentional exploit. I remember a beta version of Microsoft Word that wrote part of my document to the boot sector, many years ago. Norton Utilities saved the day for me, but I still lost a lot of time fixing the problem. Something somewhere in the system caused a buffer overrun bug, or referenced invalid memory.

Managed code makes it impossible to do this.

> One of the huge benefits of .NET is that programs are not compiled into machine code, but into an intermediate language called Microsoft Intermediate Language (MSIL).

Unmanaged Code

It is possible to create a project using Visual Studio .NET and write unmanaged code or code that is marked "unsafe." There may be situations where you want to use existing logic that counted on use of pointers or call legacy functions that use pointers. Unfortunately, if you use this feature, you can still create code that has buffer overruns and other memory problems. However:

- You can only do this in some languages (VB.NET does not allow this)
- You have to explicitly choose to do this
- In most languages that allow this, you have to mark the block of code where you are doing this, and,

• The metadata for the assembly notes this fact

• This may be a compliance issue for some IT environments

The last point allows you to enforce policies, so that an assembly (.NET Framework code) that you download over the Internet can be prevented from running unless it contains only "safe" or "managed" code.

Class Libraries

In most interaction with the Windows operating system and peripherals, the .NET framework provides a rich and usually extensible set of libraries which can be used to access system resources and perform other common tasks.

The benefit here is that regardless what your programming language is, you will be using the same libraries. This means that any programmer who becomes familiar with the .NET class libraries will be able to understand what your programs are doing when they interface with these libraries. The benefit to you is that you can call on a large pool of experienced, trained developers for doing this work.

COM Interoperability

.NET makes it easy for you to access legacy COM components. This means if you have existing COM components that you have written or licensed from third parties, you can use them. Keep in mind that these will NOT be written in managed code, so some of the benefits of .NET may be lost by going this route. On the other hand, there are many mature, well tested, reliable COM components available on the market, so having access to these is a true benefit.

Platform Invoke (P/Invoke)

.NET also makes it easy for you to call native Win32 or third party C++ functions. Again, doing this may lose you some of the benefits of managed code and the CLR, but if you have some reliable, mission-critical native code that you need to leverage, .NET makes it easy for you to do this.

ADO.NET

With almost every version of Visual Studio, Microsoft has enhanced the data access strategy. You can always continue to use the old strategy if you really want to, and the newer one is always better than its predecessor.

The current version is ADO.NET 2.0.

ADO.NET is not strictly speaking a library. It is an architecture. Microsoft provides libraries, functions and components that providers and consumers are expected to use or leverage, and a recommended approach to doing various tasks.

About five years ago, at a Microsoft Tech-Ed conference, the IT department head for a large multinational soft-drink company (who will remain unnamed) made the comment, "I don't care if it's a good standard, but if I'm using middleware I won't start until I have a standard!" This is a wise approach, in my opinion. If you are writing in a .NET environment, and you need to access data, your preferred approach should be to use an ADO.NET provider, and preferably one that follows the standard.

In particular, you should look for a provider that:

- Uses 100% safe, managed code for all run-time activities.
- Does not require a proprietary binding layer. If a provider implements their ADO.NET inter faces correctly you won't need anything proprietary — it should just bind. Most providers for MultiValue systems advertise binding objects.
- Supports the ability to "fill" a DataSet from an Adapter object.
- Allows you to create strongly typed datasets. This is a very powerful feature of ADO.NET. Unfortunately, we don't have the space to delve into this at this time.
- Allows you to use the ADO.NET libraries in the way that a .NET programmer would expect.
- Allows you to deal with data inconsistencies in a flexible way.
- Full support for multivalues and subvalues.
- A track record of protecting your investment in their products when new technologies are delivered.

FusionWare Middleware Products

FusionWare provides a full set of middleware products for the MultiValue community. Our products are available on the largest set of platforms, including platforms like PI Open, UltPlus and more that other vendors do not presently support.

Direct Access (JDA, OLEDB and now, ADO.NET)

For those customers wishing to have programmatic access to their MultiValue system without the complexity and layering of converting multivalue data to a relational view, the FusionWare Direct Data Access Server allows you to access your system using OLEDB (for legacy Visual Studio 6.0 applications) or ADO.NET, or from Java, using our Java Data Adapter technology.

Any mapped views and host procedures set up for this server are available to both Java, legacy Visual Studio 6.0 applications, Visual Studio .NET 2003 and Visual Studio .NET 2005 applications.

Relational Access (ODBC and JDBC)

For those customers who need to enable full relational access to their MultiValue systems for business intelligence purposes, the FusionWare Relational Data Access Server allows you to access your system using either JDBC or ODBC or both.

Any mapped views and host procedures set up for this server are available to both Java and Windows applications through these technologies.

Automatic Data Warehousing

The FusionWare mv2SQL server enables automatic data warehousing of data mapped on the FusionWare Direct Data Access Server directly into SQL Server, Oracle, DB2 or MySQL.

Service Oriented Architecture

The FusionWare Integration Server is an Enterprise Services Bus that enables the building, deployment and operation of Web services. The FusionWare Integration Server includes a specialized connector to allow you to leverage the Direct mappings and host procedures. It also supports Relational mappings and host procedures through JDBC. Using the FusionWare Integration Server, you can create services that your Web sites, applications and other departments can leverage to build out a powerful, flexible solution that consolidates your MultiValue system with other systems within your organization. **is**

Integrating MultiValue Systems With Best-in-Class Solutions

FOR THE MULTIVALUE FILE

COMPANY: Kore Technologies, LLC

PRODUCT LINES: Kourier Integrator, a set of applications that focus on business automation and integration, and KommerceServer, Web-based e-Commerce and collaboration applications.

HEADQUARTERS: San Diego, Calif. Additional offices located in Santa Cruz, Calif., and Scotts Valley, Calif.

RECENT DEVELOPMENTS: Expanding into vertical markets and creating a Value-added Reseller channel for publishers of MultiValue applications, allowing those developers to benefit from Kourier Integrator's capabilities by leveraging it directly with their applications.

MOTTO: "Solutions that work. People who care."

" Kourier Integrator was written specifically for MultiValue databases and allows an enterprise application to connect and exchange data with virtually any computer in the world." - ***Mark Dobransky, managing partner of Kore***

Kore Technologies is a company that is definitely on the rise—in terms of its visibility in the MultiValue market as well as in growth, charting six years of consecutive growth since it was founded in 1999. Kore primarily focuses on enterprise integration, specializing in "extending the enterprise through integrated best-in-class solutions." It currently provides its integration products to companies interested in integrating their MultiValue databases, such as IBM U2, D3, and mvBASE, with other databases and applications. While the Kore name has steadily been garnering more recognition in MultiValue circles, the company's visibility is about to increase even more as it launches a new venture to expand into vertical markets to allow developers to leverage Kourier Integrator directly within their applications.

Although Kore is a relatively new company as far as MultiValue history goes, its main principals and managing partners, Ken Dickinson and Mark Dobransky, are anything but new to the industry. With extensive backgrounds in the development and implementation of ERP systems, both have been in the software industry (and specifically MultiValue) for more than 20 years. Dickinson is an expert with enterprise business application software, specializing in product architecture and database design and is certified in production and inventory management (CPIM). Dobransky is a technology and system designs expert who developed "TurboSELECT," a MultiValue indexing technology which was embedded into the Ultimate Operating System years before indexing was available in the PICK database.

When they first founded Kore, Dickinson and Dobransky concentrated on providing products and services for DataFlo, a legacy ERP product, with an emphasis on product integration and e-Commerce products. The company quickly expanded to provide products and services to the MultiValue market in general. "We continue to be a leading provider of products and services for the DataFlo application, however, we have now added expertise in developing Web-based applications using Microsoft SQL Server database, Microsoft .NET, C#, and other technologies required to develop

robust applications for today's business requirements," Dickinson commented.

"Most of the employees at Kore are former employees of enterprise application software companies, specifically ERP software," said Keith Lambert, vice president of Marketing and Business Development. "Our combined experience incorporates a wealth of knowledge in many different types of businesses, products, and technologies. This unique blend of experience allows us to bring a level of insight and understanding to our clients' requirements so we can deliver the right solution—the first time."

A full-service organization with 15 employees, Kore is an IBM Business Partner and Microsoft Certified Partner. Its two primary product families are Kourier Integrator and KommerceServer, each with their own set of applications. All of Kore's products are turnkey solutions with the ability to be customized to client requirements.

The flagship Kourier product is aimed at business automation and integration and is the focal point of Kore's strategy to extend the enterprise through integrated best-in-class solutions. It is designed for companies using MultiValue databases who need to integrate with other databases or applications.

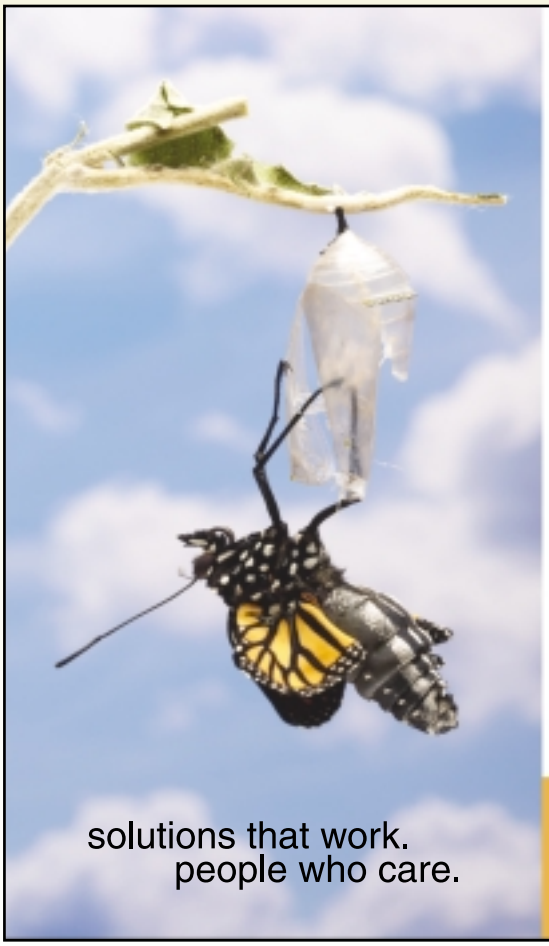
"Kourier Integrator can help companies restore the value of their MultiValue enterprise application, such as manufacturing, distribution, or financial, through business-to-business connectivity and best-in-class product integration," Dobransky remarked. "Many companies are implementing stand-alone software applications to improve specific areas of the business. With Integrator, these applications can function as though they were an integral part of the enterprise application, ensuring data consistency while eliminating costly and redundant data entry. Kourier Integrator was written specifically for MultiValue databases and allows an enterprise application to connect and exchange data with virtually any computer in the world."

Kourier Integrator provides a seamless integration between MultiValue databases and Microsoft's SQL Server databases via

Continues on page 36

"Kore believes Web-based applications are a very cost effective way to develop and deploy solutions that can help our clients extend their MultiValue systems. The Web offers a rich user interface and functionality that legacy systems have a difficult time matching. Our KommerceServer products are very powerful and are designed to integrate to back-office systems or to operate stand-alone."

- Ken Dickinson, managing partner of Kore



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Microsoft DTS or Integration Services by mapping MultiValue dictionaries to MS SQL columns automatically. This makes Kourier Integrator ideal for application integration, building data warehouses, or corporate data sharing.

"Versatility is the keyword for Kourier Integrator, and with it, we have helped our clients successfully integrate their MultiValue applications with other enterprise systems including Seibel, Oracle and Amazon.com as well as vertical applications such as SPS Commerce and Inovis (EDI), Forecast Pro, Costimator, and Filemaker," Dickinson said.

"Kourier Integrator is unique because it was designed specifically for integrating MultiValue applications to other databases and applications," Lambert added. "It is both a powerful and flexible Enterprise Application Integration tool (EAI), and an Extract, Transform and Load (ETL) tool. Kourier Integrator offers features and functions often found only in products costing many times more. Additionally, our Net Change technology is unique because it's able to track all changes to each record in a database, enabling Kourier Integrator to only process the rows that are new or changed when integrating applications—dramatically increasing the speed with which data integration occurs. Kourier Integrator also runs in the background and does not require additional database licenses."

Kourier Integrator:

Major Benefits

- Allows existing MultiValue applications/databases to connect with and exchange data with other corporate systems and databases, retaining investment in the MultiValue applications.
- Saves many hours of effort by eliminating the need to write specific programs to extract data from MultiValue databases.
- Simplifies the process of creating and updating data warehouse systems using Microsoft SQL Server databases by eliminating the need to manually write complex database update scripts.
- Net Change Database tracking enables faster data transfer and integration with other applications.
- Message-based architecture guarantees delivery of integration data and extensive message logs permit auditing of all transactions.
- Provides automated processing of all integrations via scheduled services and exception management of issues via event-driven e-mail alerts.

For more information about Kourier Integrator, please visit http://www.koretech.com/kore_integrator.asp.

While its flagship product is Kourier Integrator, Kore also sells and supports a complete suite of Web-based products called KommerceServer, designed to help extend the lifespan of MultiValue systems. "We totally support the MultiValue market and legacy systems and plan to continue doing so," Lambert explained. "Our goal is not to help clients move off of MultiValue applications, like some vendors, rather we want to help them maintain their investment and either integrate with other applications or develop functionality they don't have. This is where our Web applications come in."

The eCommerce and eBusiness Web solutions complement and extend the functionality of enterprise applications, increasing the usefulness and lifespan of existing products for a fraction of the cost to develop or purchase new software. "Our KommerceServer products are now very powerful applications that are available to

Continues on page 45

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Is Your Data Security Adequate?

BY NATHAN RECTOR

Business is Data. Data is Business. As an IT manager or consultant, we know this, but I'm still running into clients that are just now coming to this realization. It usually comes from the following statement:

"I can't run my business without my computer."

Now to be honest, this statement usually leads to a disaster recovery plan of some kind, but then they start thinking about other things, and up comes the security question. Most of the time they start thinking about hi-tech security measures like biometrics and other crazy and expensive options. What they don't always realize is that little things can be done without spending a lot of money.

All MultiValue DBMSes provide tools to protect your data, but they aren't being used, or applied to their full advantage. Even if you currently have security measures in place, you'll find a large security problem centered around your users. The user is the weakest part of a security system.

Why use security? Most people would say: "To keep unauthorized personnel from accessing or altering information." Yet historically, day-to-day users cause the most common security breach: theft.

The day-to-day users have easy access to your information and will know its value. The users generally have little or no restrictions on what can and cannot be accessed. Users have been known to sell company customer lists and payables and receivables files. How protected are your valuable files?

Even if you currently have security measures in place, you'll find a large security problem centered around your users. The user is the weakest part of a security system.

The National Computer Security Association (NCSA) determined that in the last five years the following areas have had a dramatic increase in theft:

- **Client or customer information -** 81%
- **Trade secrets (i.e.: pricing formulas, manufacturing technologies)** - 77.6%
- **New product plans** - 76.7%
- **Product descriptions** - 75.7%
- **Pricing data** - 71.8%

How much of this information is readily accessible to your users? Most of this information is required to operate the day-to-day business. Does your existing security extend beyond the regular logon checks?

While data alteration is a security risk, the more common threat is data theft. Most businesses are alert to data alterations and catch it before it causes too many problems. Whereas data theft has long-term effects that are rarely noticed, if at all, and many times impossible to repair. What would your competition do with your customer lists or accounting information?

Most software packages have basic security features built-in to keep information from being altered, but much of the software you find on MultiValue systems is custom. Many custom programs overlook, or bypass, existing security measures with the assumption it has already been dealt with.

If your current software does not have security options, then look at the features that are built into the operating system itself. Most MultiValue operating systems, if not all, have common security features such as passwords, file access and update codes, SYS levels, as well as debugger and TCL restrictions.

Passwords are the most commonly used security features in any system. They keep unauthorized personnel out of your data and restrict what information the average user has access to. Yet, passwords can become the weakest part of your security.

Users often create this weakness in security without knowing. To avoid this, users should be required to change their password often. Users should avoid easy to remember passwords like names, birthdays, phone numbers, addresses, and so on. They should also avoid using the same passwords repeatedly.

Writing down passwords is another common practice to be avoided. Users often write down passwords on post-it notes or desk calendars so they don't have to remember them. There is nothing like a written down password to cause security problems.

Another feature that can be found in MultiValue operating systems is access and update locks. These locks allow you to create security that the users can do nothing about. Access and update locks are applied to specific files and keep people from accessing and/or changing the information. Using access and update locks do require a little planning to set up, but once in place, they can rarely be changed by anyone other than the creator of the security system.

Other security features that can be found on most MultiValue DBMSes are SYS0, SYS1, SYS2, and sometimes SYS3. These restrictions are placed on whole accounts and restrict the use of specific TCL commands.

All these security features help keep unauthorized people from accessing or altering information, but what about protection against users who do have access? This kind of protection is more statistical analysis than hard protection like passwords.

By keeping audit trails on access and changes to key information, you can define patterns, or the lack of, in data access. Audit trails allow managers to deal with system abuse as well as watch for data theft. One place that audit trails should be closely watched is system access. When are your users accessing the system? How often do they access the system after hours or on their days off?

Another place an audit trail can be placed is on customer inquiry screens or inventory inquiry screens. How often does this employee access customer information? How long do they spend in the information? Are they accessing unrelated customer accounts one right after the other? I think you get the idea.

Another feature to keep in mind is limiting the kinds of data that is allowed to be printed. By limiting access to the kinds of data that can be printed, you will limit, if not plug, a hole that is often overlooked. Take a look in your accounting department. Do you see any accounts payable or receivable reports lying in the open? How about in the trash?

Since we are still far from a paperless workplace, printed information is found all over the office. Walk through your office. Count how many reports, screen dumps, or other printed material the users have on their desks or in the trash. You'll likely find some type of printout on everyone's desk. More than likely half of what you find will be key information, such as pricing or customer lists.

Every MultiValue operating system has security features built-in. The question is, are you using them? Security should never be limited to features that only keep unauthorized people from accessing or altering data. The most common theft of data will come from the people who already have access to it.

Remember, the weakest part of any security is its users. **is**

NATHAN RECTOR, a regular contributor to Spectrum, is owner of Natec Systems, a consulting firm specializing in D3, AP and R83 environments and custom programming. He can be reached at nrector@natecsystems.com or http://www.natecsystems.com.

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Mpower1 and TEMENOS Announce

Newly Focused Agreement for jBASE International

Mpower1 and TEMENOS have announced the completion of their newly focused Master Agreement for the sales, distribution and support of the jBASE database environment worldwide. Since September 2002, Mpower1, through its subsidiaries jBASE International Ltd. and jBASE International Inc., has been the exclusive distributor of the jBASE software, except where TEMENOS licenses jBASE in conjunction with their own application software. During this time jBASE has consistently expanded its client base year on year. The new agreement will result in this process continuing but with significant enhancements to customer service, additional functionality and cooperation between Mpower1 and TEMENOS to the benefit of jBASE users.

Mpower1 and TEMENOS have an experienced team of over 40 personnel addressing all aspects of the jBASE business and have ensured that product development and quality assurance through to sales and post sales support are strengthened going forward. This agreement further enhances the Mpower1 and TEMENOS offering to the MultiValue market and demonstrates their ongoing commitment to the jBASE product, its support and its development.

This new agreement coincides with the recent formal release of the next generation of jBASE software, Release 4, which is already seen as an established platform with over 100 installations worldwide. This stable and efficient platform will add significant value to jBASE users who can now confidently take advantage of the functionality and flexibility that is unparalleled in the MultiValue community.

Pete Loveless, jBASE CEO, stated: "Mpower1 are delighted to have reached this agreement with TEMENOS in respect of the ongoing jBASE product and business. We see a tremendous future with jBASE, particularly with the benefits of release of 4.1 and the further additional improve-

Tech Tip for SB+ from Ehab AbuShmais, IBM Advanced Technical Services

Issue: In SB+ GUI an Action bar option to execute G:U will not work. What is the best way to change screens Action bar in all files to work in GUI using the concept of G:U?

Solution: Changing the G:U to G:F2 in the Action bar will work in GUI. You can do that to one screen manually. To do this programmatically to all SB+ files screens, apply the following paragraph process. Create a paragraph process called GU2GF2, then copy and paste the sample code below. Next change the XX to be your system ID and run the paragraph process.

```
LOCAL L.FILELIST,LOOPY,L.OUTER.LOOP,L.OLD.REC
READV L.FILELIST FROM "XXCONTROL","FILES",1
FOR L.OUTER.LOOP = 1 TO DCOUNT(L.FILELIST,@VM) STEP 1
EXEC '>:SELECT DICT ':L.FILELIST<1,L.OUTER.LOOP>:' WITH F1 = "SCREEN"'
@RTN.FLAG = 0
WHILE @RTN.FLAG = 0 DO
  READNEXT @KEY
  IF NOT(@RTN.FLAG) THEN
    READ @RECORD FROM "DICT ":L.FILELIST<1,L.OUTER.LOOP>,@KEY
    L.OLD.REC = @RECORD
    FOR LOOPY = 21 TO DCOUNT(@RECORD<12>,@VM) STEP 1
      @RECORD<12,LOOPY> = REPL("G:U","G:F2",@RECORD<12,LOOPY>)
      NEXT LOOPY
    IF L.OLD.REC # @RECORD THEN
      WRITE @RECORD ON "DICT ":L.FILELIST<1,L.OUTER.LOOP>,@KEY
      END
    END
  REPEAT
NEXT L.OUTER.LOOP
```

ments to be released during the forthcoming months. As well as providing significant benefits to our customers, this latest agreement once again testifies to the long-term commitment of both TEMENOS and Mpower1 to jBASE and to the MultiValue market in general."

Clive A. Ketteridge, general manager of jBASE for the TEMENOS Group, commented that "the latest agreement is further evidence of TEMENOS' ongoing commitment to take the jBASE product forward year on year as well as a demonstration of what good working partnerships can deliver to the client."

About Mpower1 International

Mpower1 International Ltd. provides guidance and organization support to businesses at various stages of their development. Bringing a unique approach to joint business ventures, Mpower1 acts as an enabling partner for its clients sharing the responsibility, risk and reward of their business growth, while protecting the interests of its client. Utilizing decades of senior level management experience, Mpower1 facilitates business strategy development and deployment resulting in accelerated and sustainable corporate performance.

About TEMENOS

Founded in 1993, TEMENOS Group AG is a provider of integrated modular core banking systems to over 400 financial institutions in 110 countries worldwide. TEMENOS software provides banks with a single, real-time view of the client across the enterprise, enabling banks to maximize returns while streamlining costs. Whether providing 24/7 functionality to the wholesale, retail and private banking sectors, partnering with central banks on core system replacement, or working with the World Bank on solutions for the emerging markets, TEMENOS knows banking. The company has a transparent approach to its operations and brings to bear its experience, expertise, commitment and professionalism on every project. Headquartered in Geneva, Switzerland, the company has 39 offices in 31 countries and is listed on the main segment of the SWX Swiss Exchange (TEMN). www.TEMENOS.com.

About jBASE International

jBASE International is a leading supplier of database management software and Web enabling tools for developing, deploying, and maintaining business applications solutions. The flagship product, jBASE, was designed from the ground up to be an open database product that would bring the strengths of MultiValue technology into the mainstream computing market. With exclusive worldwide distribution rights, jBASE International offers technologies and assistance that allow businesses to thrive into the future. Visit www.jBASE.com for more information. **is**

Famous People and the Spectrum Show

This is the final chapter in the year-long nostalgic "History of MultiValue" series of articles leading up to the 25th Annual Spectrum Show which will be held March 7-10, 2006 at the Hilton Long Beach Hotel in California.

Williams & Ree, the "Indian and the White Guy

Many famous people, celebrities, and entertainers have appeared at past Spectrum Shows, and as you might guess, with many people of notoriety, there is a bit of drama that comes along with the excitement. (See Gus Giobbi's "From the Inside" introduction to this article on page 4). Here then are just a few behind the scenes glimpses of the most memorable.

Neville Wren, Premiere of New South Wales in Australia

Most Congenial

Charles Kuralt — Many of the celebrity keynote speakers at Spectrum attended the welcome reception the evening before the show opened and mingled with the show delegates. For many people, the most friendly and congenial was Charles Kuralt, CBS's endearing host of "Sunday Morning" and "On the Road," who was the keynote speaker at the 1985 Spectrum Show in New Orleans and who stayed the whole evening to chat with fascinated Spectrum Show attendees.

Most Mysterious

Arkady Shevchenko — A standing room only audience greeted Arkady Shevchenko, former Soviet Ambassador and Under Secretary of the United Nations as he delivered the 1986 Spectrum keynote address at the MGM Grand in Las Vegas. Author of the bestselling book, "Breaking With Moscow," Shevchenko also held attendees spellbound with personal, private cold-war related conversations at the Spectrum welcome reception the night before he spoke.

Most Relevant

F. Lee Bailey — A computer enthusiast as well as an attorney famous for defending the notorious (he numbered "The Boston Strangler" and Patricia Hearst as clients at the time), Bailey was one of few keynote speakers who could relate to the Spectrum audience. He spoke at the 1987 Spectrum Show at the MGM Grand Hotel in Las Vegas about "computer resistance" among many lawyers and the pioneering emergence of technology in the courtroom by enlightened judges. Bailey also delighted attendees at the Spectrum welcome reception for several hours before retiring to visit Sammy Davis Jr. who was occupying the suite next door.

Most Captivating

Captain James Lovell — The first person to travel to the moon twice, NASA veteran Captain James Lovell spellbound the Spectrum audience in Anaheim, Calif., in 1995 with his story and video presentation of his experience with the near disastrous Apollo 13 mission. The author of the bestseller "Lost Moon," whose story was soon thereafter released in the Apollo 13 movie starring Tom Hanks, was by far the most captivating Spectrum keynoter.

Also Notable — Other famous people who spoke or entertained at past Spectrum Shows included Jack Anderson, the famous Washington, D.C., journalist who wrote for TIME Magazine; Neville Wren, Premiere of New South Wales in Australia; Williams & Ree, the "Indian and the White Guy" duo from Tennessee; John Bertrand, who won the America's Cup from Dennis Connors for Australia; and of course, the all-time topper, the private Tina Turner Show for Spectrum delegates at the Sydney Hilton in 1985. **is**

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☐ President/GM/CEO ☐ Programmer/Analyst
☐ MIS/DP Manager ☐ Purchasing
☐ Controller/Financial ☐ Consultant
☐ VP/Department Head ☐ Other _____

2. Is your company a (check one):

☐ Computer System Supplier ☐ Dealer/OEM/VAR ☐ Software House
☐ Consultant ☐ End User ☐ Other _____

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

☐ D3 ☐ Native MultiValue ☐ Reality ☐ Other_____
☐ jBASE ☐ uniData ☐ UniVerse ☐ uniVision

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

☐ Accounting ☐ Medical ☐ Direct Marketing ☐ Legal
☐ Banking/Finance ☐ Dental ☐ Construction ☐ Retail
☐ Education ☐ Insurance ☐ Other _____

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

☐ Under $500,000 ☐ $500,000 - $1 million
☐ Over $1 million - $5 million ☐ Over $5 million - $10 million
☐ Over $10 million - $25 million ☐ Over $25 million - $100 million
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Programming for speed in OpenInsight

Continued from page 22

There are perhaps two other extremely important items to consider when thinking about speed: knowledge and patience. By knowing the system you are working on, the types of reports the users ask for, changes likely due to market fluctuations and so on, you can anticipate some of the bottlenecks that may occur. By knowing as much as you can about your development environment, you can probably use existing system functions, rather than reinventing them yourself, poorly. Patience will aid you when the users complain about speed, or when management complains about how long changes take to implement. By observing and examining the issues brought to you, and thinking before jumping into the code to make many small patches, you may be able to make one centralized fix or routine that will give performance gains for years to come.

And finally, we all benefit from newer, faster systems. A rising tide lifts all ships, as the saying goes, so make sure you're in port. OpenInsight systems can run extremely well, and these tips are some of the reasons why you should continue to use it, or start to use it. I'm looking forward to your call. **is**

MIKE RUANE is president and CEO of Revelation Software, developer of OpenInsight. The company can be reached at 800-262-4747 or www.revelation.com.

Kore Technologies

Continued from page 36

any company that is looking for robust Web eCommerce solutions that operate either standalone or can be fully integrated to any application," Dickinson stated. "Kore believes that Web products are the best way to develop and deploy applications that help our clients extend their MultiValue products to provide functionality not available in the legacy applications."

The core product of the KommerceServer suite is the webStoreFront application. KommerceServer webStoreFront is an eCommerce storefront solution that enables companies to open new sales channels and join the ecommerce revolution by offering their products on the Internet. KommerceServer webStoreFront supports both business-business (B2B) and business-to-consumer (B2C) requirements and includes significant out-of-the-box functionality that can handle most eCommerce needs without customization.

"Most of the eCommerce storefront software solutions today seem to end up a compromise," Lambert commented. "If feature rich, they invariably are difficult and costly to implement. If they are easy to implement, it seems they lack many essential features. webStoreFront is different — a no-compromise eCommerce storefront solution, delivering all the features you need while remaining easy to implement and cost-effective."

KommerceServer webStoreFront is developed with KommerceServer, Kore's advanced framework for building robust eCommerce and Web solutions. Built on a Microsoft SQL Server database and using Microsoft .NET, the architecture provides flexibility, security, and scalability required for enterprise applications.

Part of its unique design is that it was developed to work as an integrated solution, yet operate independently in a "near real-time" environment. "Our message-based architecture guarantees data delivery between applications and ensures data security and performance by separating back office application data from the Web application data, a critical factor in today's Internet environment," Dobransky said. "Supporting the Web application is a comprehensive MS SQL Server database that contains data structures similar to a complete ERP system, allowing the application to operate in either standalone capacity or integrated with a back-office application. Plus, this database can be used for business intelligence and operational reporting."

Behind the Scenes of KommerceServer webStoreFront

Key Features and Benefits

- Flexible product catalog with multiple price lists
- Comprehensive support for images
- Shopping lists that encourage repeat orders
- Multiple ordering metaphors: shopping cart, shopping lists, repeat orders, quick orders
- Complementary product suggestions for up-selling
- Credit card and foreign currency support
- Both quick and advanced search capabilities
- Integrated global site search
- Online catalog management with optional CMS (Catalog Management Software) integration

Benefits

- Makes it easy to deploy a powerful B2B or B2C Web storefront or product catalog to open new revenue streams and sales channels
- Look and feel can be customized to match existing Web sites
- Flexible role-based security model
- Microsoft .NET architecture provides flexibility
- Strong passwords and data security model
- Built upon robust Web application and eCommerce framework

For more information, visit http://www.koretech.com/kore_webstorefront.asp

When company founders started Kore, they envisioned what they wanted their company to stand for: "Solutions that work. People who care." This motto emanated from the original Kore team's experiences with other software companies they had worked for before starting Kore. "We felt there wasn't a strong relationship between the software vendor and their client; it was just about selling software," Dickinson elaborated. "Kore believes very strongly in creating software that does

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Kore Technologies

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what it's supposed to and building partnerships with clients with a sincere interest in the client's success and growth. Because of this, many of Kore's best clients are not only excellent business partners, but also good friends too."

Kore hopes to build more relationships and achieve more growth in its next business initiative. "Although we have had excellent success selling Kourier Integrator to the open MultiValue market as a general purpose EAI or ETL tool, we realize that a tool like Kourier Integrator often requires specific knowledge of an application to fully apply its powerful capabilities," Dobransky said. "Therefore, we are expanding into vertical markets and creating a Value-added Reseller channel for publishers of MultiValue applications. This will allow those developers to benefit from Kourier Integrator's capabilities by leveraging it directly within their application and using their application-specific knowledge to add value while integrating their product to other products, whether it's for building business intelligence data warehouses, integrating to eCommerce Web sites, or other application-to-application integration."

In addition, while the current release of Kourier Integrator is primarily designed for integrating MultiValue applications with applications using another database (such as Microsoft SQL Server or Oracle), there are many companies that need the capabilities of Kourier Integrator for non-MultiValue applications and databases. "Our next generation of Kourier Integrator will provide enterprise application integration capabilities between applications regardless of the database or technology being used," Lambert stated. "This next generation product will be developed using the latest Microsoft technology and will allow us to develop a more powerful product while opening new markets for Kore Technologies."

"Our next generation of Kourier Integrator, which will be developed using the latest Microsoft technology, will provide enterprise application integration capabilities between applications regardless of the database or technology being used and open new markets for Kore Technologies."

- Keith Lambert, vice president, Marketing and Business Development

As a Microsoft Certified Partner, Kore will embrace the new technology available in SQL Server 2005, such as Integration services, Analysis services, and Reporting services, to make its existing solutions more functional while enabling the company to develop new solutions such as business intelligence and analytics.

With its extensive background in MultiValue technology combined with expertise in areas such as Microsoft .NET, C# and the Web, there's no doubt Kore Technologies will continue to raise its profile in the MultiValue market and beyond. "Kore believes in the power and flexibility of the MultiValue environment and in the value of maintaining the investment that companies have in their existing MultiValue applications," Lambert concluded. "Kore provides the technology and solutions needed to retain that investment while extending the application where necessary with new functionality or integration to other best-in-class applications." **is**

mvQB - QuickBooks API for the Multi-Value Database

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MultiValue Reporting *and* Business Intelligence

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flow into the hypercube in near real time without putting operational transaction response time at risk. In OLAP tools other than MITS Discover, any update requires exporting the batches of transactions out of the MultiValue environment into a proprietary OLAP tool or staging area, adding complexity to the solution and limiting operational integration with the OLAP tool. MITS Discover runs within the MultiValue environment which greatly reduces the complexity of using this solution.

Using Hypercubes for OLAP Storage and Navigation

The standard approach for analytical reporting is the OLAP hypercube. Hypercubes arrange aggregate transaction totals along dimensions like customer, product, and date. We can obtain the transaction totals for any combination of dimension values by directly reading data from the hypercube instead of scanning all the source data. The great strength of the hypercube is that the number of underlying source transactions does not affect query speed. The hypercube also facilitates slicing and dicing — swift navigation from summary totals to finer-grained subtotals.

Examples of this technique: slicing subtotals for last month's most profitable sales rep to discover their product line mix and how it differs from under-performers, or discovering how community policing efforts have reduced property crime by area to evaluate program effectiveness.

The advantages to using an analytical reporting tool over writing BASIC programs for management reporting are similar to the advantages report generators have over the command line. Certainly, knowledge of the application and reporting environment is required, but we view these through the lens of a BI tool, not directly using BASIC programming and manual file access, which dramatically reduces the effort and complexity of the solution. We manage and schedule extraction and loading of transactional data automatically. The biggest benefit is the intuitive interaction of the GUI OLAP clients available for analytical reporting tools with their ease of export to spreadsheets.

Summary

This progression from manual approach through application development to managed third-party solution is similar for both operational reporting and analytical reporting. It may benefit your organization to move toward the managed end of the spectrum with its increased productivity and capability. There are several MultiValue reporting solutions available. Organizations will benefit most by identifying what their separate needs are for operational reporting and analytical reporting, and then finding the solutions that best satisfy both needs. **is**

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Developing MITS Report

With our MITS Business Intelligence/OLAP tool (now called MITS Discover) deployed at thousands of sites, we hear a lot about reporting. We found MultiValue users needed a self-serve operational report generator that shared traits with our analytical reporting tool:

- Simplicity and ease of use — hide any underlying query or file complexity
- Robust security — protect any sensitive data
- Low system impact — low burden on resources and absolutely no changes to any operational files
- Fast and interactive — report from millions of source records within seconds

Armed with these goals and using our proven data extraction engine, our development team set out to create a report generator that retained the clean MITS Discover interface and security model but used a data structure optimized for sorting and filtering transactional reports. This hybrid approach, using a snapshot of operational data from the MultiValue system while retaining its MultiValue structure, provides impressive benefits. Sorting and filtering benchmarks yielded sub-second response for datasets with hundreds of thousands of records. MITS Report changes the whole model of operational reporting interaction.

Rather than choosing their columns, selecting the appropriate records, and then waiting for the report, MITS Report users have the data immediately at hand, and are able to add and remove columns and filters at interactive speeds, seeing the actual data as they go. An added benefit is that the snapshot of data remains static while the MITS Report user is refining the report. With traditional report generators, each modification of a report requires another trip back to the source data, potentially changing the totals each time. With the MITS Report extraction technology, we only access the MultiValue system to refresh the report data as appropriate for the underlying business process, not for every report request. This way we protect the host system — and reduce the number of MultiValue licenses consumed.

We adapted the flexibility of the MITS Discover security model and custom menus to MITS Report. The row and column level security not only keeps information compartmentalized, it allows us to create one master report for use by many different individuals who then see only the data for their department and authority level. This security model also allows us to mix global and user-specific menus seamlessly.

We anticipate MITS Report will change the way people access their operational data, and they will start to use a term we hear a lot from the MITS Discover community — play. ***Fred Owen - MITS Report Product Manager***

FREE white paper "MultiValue Reporting & Business Intelligence" available at www.mits.com/wp

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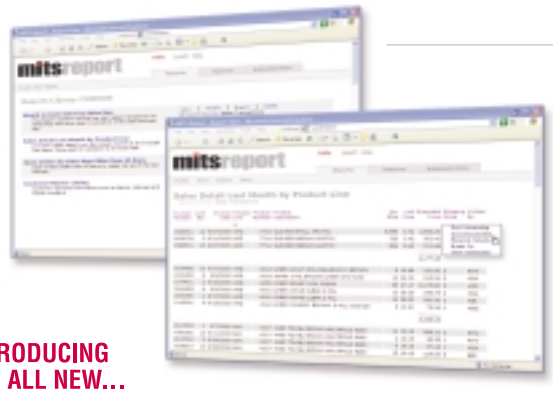

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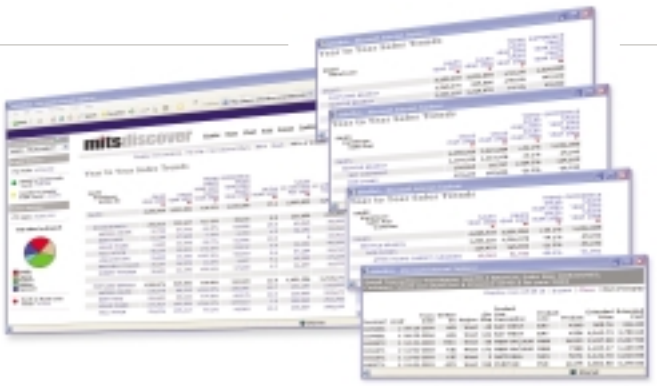

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