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**INSIDE:** Indexes and Migration

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THE MULTIVALUE  TECHNOLOGY MAGAZINE | NOV/DEC 2011

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**6 2011 MultiValue Industry End-of-Year Recap** The year 2011 continued to provide us with a number of challenges — changing economic conditions (improvements and setbacks), changing technologies, and changing market demands. But within all times of change there also exist opportunities. We asked some of our MultiValue partners to share with us some of their accomplishments from this last year and what to look for in the next.

**10 Indexes and System Migrations** When migrating a MultiValue application from one platform to another, especially from an older legacy platform to one that is more modern, the major goals are to simply get it done, get it working, and get it working correctly. Too often, however, we forget that the new platform may provide capabilities that can give us a dramatic improvement in the performance of our application. Replacing or supplementing application-based cross-referencing with system-supplied indexing is one of those areas to be considered. **BY MARK JOHNSON**

**12 Replacing Legacy Reporting with U2 DataVu** Dull, mono-spaced type, text-only reports usually provide the necessary information and get the job done. But just like the antiquated green screen programs, the appearance of these reports invokes a negative reaction from both users and management, creating an impression of obsolescence in an otherwise robust application. UniVerse and UniData users have a number of options for modernizing these reports, one of the newest of which comes from their database supplier, Rocket Software. **BY DAN MCGRATH, U2 PRODUCT MANAGER, ROCKET SOFTWARE**

**20 Session Management with PHP** As you begin to develop web-based MultiValue applications using a browser as the preferred user interface, one of the first changes in your thinking process has to be how your application communicates with the user. Unlike a traditional dedicated connection between user and server, web-based applications must deal with an ongoing series of non-persistent connections. How does your application know what you and the user were talking about a minute or two ago? Using the built-in capabilities of PHP, this article explores some of the issues of such session management. **BY KEVIN KING**

**24 Business Tech: Spending Down MultiValue** For many departments, the end of the year provides a time to take a look at the budgets and make use of any leftover funds. Of course, we do not want to be spending money just to spend it. Here are some ideas of some high-return ways to do that spend down. **BY CHARLES BAROUCH**

**26 Sending E-Mail from Your MultiValue Programs — Part 6: E-Mails with Attachments** In these articles have discussed various ways of sending e-mail, both plain text, HTML-based, and multipart containing both. This last part in this series on Sending E-mail from MultiValue applications discusses the topic and techniques for including attachments. **BY NATHAN RECTOR**

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# From the Inside

BY NATHAN RECTOR



Happy Holidays to all!

It's the end of the year — time to relax, family enjoyment, gift giving, and time to start planning for the year 2012.

Now that 2012 is just around the corner, it's time for me to start talking about what is coming. The International Spectrum Conference and Exhibition 2012 is in Florida on April 2nd-5th. That is less than four months away.

Have you taken a look at the conference details yet? If not, please do ([www.intl-spectrum.com/conference/2012](http://www.intl-spectrum.com/conference/2012)). You'll find many informative sessions that you won't want to miss. You will also find on the conference web site some documents and materials to help you justify attending the 2012 conference to your management. Look through the materials in the "Why Attend?" section to see sample Trip reports, Letter to the Manager, and other information to help out.

There will be a webinar on January 19th that will talk about what is going on at the conference this year. It will also provide you information to help you justify coming to the conference.

We will be providing the "Group Pass" again this year. The "Group Pass" allows up to five people from the same organization to attend the conference for an average of \$400 a person. Since the "Group Pass" gives you access to the full week, you can have company employees attend a few days, and then send another group of people for another few days. This way you don't have your whole IT department gone at the same time, and you still get the advantage of educating as many of your staff as you can.

To find out more on the 2012 Conference, go to the following web site:

<http://www.intl-spectrum.com/conference/2012/>

Watch for the Conference Brochure, which should be landing on your desk soon. There will be more helpful information provided in it as well.

**-NATHAN RECTOR**  
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# INTERNATIONAL Spectrum

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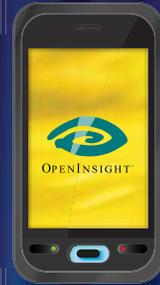
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# 2011

## MultiValue Industry

### End of Year Recap

#### Ashwood Computer

*What new features or services did Ashwood Computer, Inc. introduce in 2011?*

Due to our reputation within the MultiValue industry for providing excellent service and support, we significantly increased the size of our customer base in 2011. Because of this increase we sought out and were fortunate to hire a MultiValue experienced new employee whom we have since dedicated to the provision of Professional Services for our growing customer base. Additionally, we completed two exciting projects involving legacy MultiValue systems, one involving an ADDS Mentor to Universe v11.1 conversion effort and the other a Reality v2 to Reality v14 upgrade. These legacy systems upgrades are always exciting for our conversion team and for our new customers because we realize such an impressive performance boost. For example, one of the legacy processes we addressed went from taking over four hours a day to under four minutes a day!

*What was the greatest or most exciting thing that happened to your company or product in 2011?*

Ashwood's A-team pulled together, and we all worked hard on our certification to the latest new ISO 9001:2008 Stan-

dard. Ashwood Computer, Inc. passed our ISO audits, and we received our certificate of registration to the latest ISO standard 9001:2008! Our scope of our registration covers the design and development of information technology systems, including software, hardware, and services. Ashwood's Quality Systems have now been registered and audited compliant through three new ISO standards, the 9001:1994, 9001:2000 and now the 9001:2008 Standard.

Companies seeking services and assistance with their ISO registered information systems can contact Ashwood with confidence knowing that our systems have been audited and confirmed in compliance with the latest 9001:2008 Standard. This is very important to all companies registered and ISO certified!

*What would you like Spectrum readers to watch for in 2012?*

Take a look at your 2012 calendar, get this education expense approved, and make your reservations to attend the International Spectrum Conference in West Palm Beach NOW!

Visit Ashwood's booth during the exhibit sessions at Spectrum, meet our Ashwood A-team, and learn first-hand who we are and what we can do for you and your company.

Ashwood will be demonstrating the newest release of our MultiValue Developer's Toolset at the International Spectrum Conference in West Palm Beach!

We plan to offer several breakout session opportunities so that all attending can have a chance to preview the tools. And we will offer the opportunity at our booth to work hands-on with both the character and GUI versions.

FastBac DR will be ready in 2012 for our Windows MultiValue system users!

#### Entrinsik

*What new features or services did Entrinsik introduce in 2011?*

We've had a very exciting year here at Entrinsik. Our Informer software is an award-winning operational business intelligence solution enabling over a thousand organizations to access real-time data from multiple sources quickly and easily. This year we've added support for the D3 database management system. "The new features built into D3 9.0 provides software developers with all the tools needed to create and customize next-generation enterprise applications," says Janet Cioffi-Kennedy, Vice President Sales at TigerLogic Corporation. "And with Informer, developers can easily offer an integrated, flexible reporting solution that delivers the real-time insight their customers need to manage day-to-day operations."

We also introduced Informer data bundles for users of Vertafore and Datatel database management systems. The bundles include canned reports and data mappings allowing for instant implementation and rapid rollout to end users.



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This year we also redesigned our web site to provide a more interactive experience for site visitors, and we've seen a dramatic increase in site traffic and product interest.

***What was the greatest or most exciting thing that happened to your company or product in 2011?***

What's been exciting this past year has been the continued expansion of our Informer Partner Network, including Media Services Group who replaced their embedded reporting engine with Informer, TigerLogic who has partnered with us to offer Informer to the D3 user community, and Wynne Systems who integrated Informer into their product suite. We offer customers and partners a software developers kit (SDK) that allows them to extend the Informer environment via a plug-in framework to create default reports, metadata, new security drivers, a customized interface, hooks into legacy business logic, and other extensions.

Building on our solid reputation in the MultiValue space, we've made significant progress penetrating the relational database market and have incorporated into Informer key features such as preset table joins, simple connections to existing databases with no prior database setup required, and one-step report construction of SQL statements. In addition we've invested heavily in new development with a focus on building dashboard capabilities into Informer to provide organizations with visual insight and access into key performance indicators and metrics. With its low cost of ownership, ease of use, cutting edge technology and real-time access to data, Informer is well positioned to become the software of choice for businesses looking to make faster, smarter decisions.

***What would you like Spectrum readers to watch for in 2012?***

Launching Q1 next year will be Informer Dashboards, which will provide interactive visualization capabilities that enable end users to quickly iden-

tify operational issues, manage business performance, and uncover trends, all in real time from an easy-to-use drag and drop web-based interface. The enhancements will enable organizations to analyze data in a whole new way with implementation and rollout in days instead of months.

Beginning January 2012, we will be offering a solution that will assist Datatel users in migrating their Informer UniData-based mappings and reports to a SQL environment. In addition, we continue to extend Informer for use with additional databases with support for Open QM scheduled for release next year.

Building on the tremendous success of our first Informer User Conference (ICON) last year, we are finalizing details for the upcoming 2nd ICON Conference in March 2012 and are planning for an even more successful event in beautiful downtown Raleigh, NC, recently voted the #1 BEST CITY to live by Business Week. This year will be particularly exciting with the roll out of Informer Dashboards and the availability of the highly anticipated tool designed to assist Datatel users in migrating their Informer UniData-based mappings and reports to a SQL environment.

**InterSystems**

***What new features or services did InterSystems introduce in 2011?***

During 2011 InterSystems introduced a major upgrade to DeepSee and a new portal for Ensemble.

DeepSee, InterSystems' embedded real-time analytics capabilities software, now incorporates MDX business intelligence industry-standard query technology. It is now possible for an application to incorporate MDX queries providing a new mechanism for creating a result set. Additional enhancements include significantly increased query speeds, addition of dimension hierarchy to cube definition to deliver more granular indexing, and delivery of more intuitive user interfaces for defining the cube, analyzing data, and developing dashboards.

The InterSystems Ensemble rapid integration and development platform now has a completely redesigned user interface written using Zen, our Web 2.0 framework. The Ensemble portal has been redesigned from the ground up to better anticipate user needs. In addition to reduced requirements for clicking and typing, tabs make it possible for the user to have access to more choices and information without leaving the page. Finally, the business rules editor has been redesigned to enable easy creation of highly complex logic.

***What was the greatest or most exciting thing that happened to your company or product in 2011?***

It's always exciting when customers use InterSystems technology to enhance their business. Our MultiValue customers have been particularly proactive during 2011. For example:

Shift, an Application Partner in Brazil, has replaced its outmoded green screen user interface with a Web interface built using Zen. All pages have the same look, feel and data handling. The company was able to preserve its legacy MultiValue business logic while extending it to the new user interface. In addition, the company recently began using Ensemble and, as a result, won a deal requiring integration of 26 hospitals.

Providence Associates Medical Laboratories (PAML) used InterSystems' distributed service architecture to double the number of customers they service. In addition, they replaced its legacy approach for dealing with errors. PAML implemented an Ensemble-based workflow solution that queues errors for resolution by the appropriate individual and presents all relevant transaction information on one Outlook-like display. The result is the ability to process significantly more transactions with fewer resources than on the previous platform.

HealthPac Computer Systems, Inc. used the Zen functionality in CACHE to add new features to its billing system product. The new capabilities as well as a

*Continues on page 8*

## 2011 MULTIVALUE INDUSTRY'S END OF YEAR RECAP

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modernized interface were deployed in record time. Today, customers using the legacy MultiValue system have access to a richer feature set as well as a more user-friendly interface. Just as critical, HealthPac is winning larger customer contracts and has improved its positioning for future growth

### ***What would you like Spectrum readers to watch for in 2012?***

Building on the new technologies that InterSystems delivered this year, IT organizations will be implementing breakthrough applications at a rapid rate during 2012. Until quite recently, applications have typically been built to automate business processes. Now, most of that conventional work has been completed and attention is turning to changing — sometimes radically — the way that people work.

These breakthrough applications are typified by:

- Mass personalization, which means delivering whatever information an individual needs in the most appropriate format on virtually any platform.
- Access to all data in any format. This includes access to unstructured data, text, video, and images as well as the structured data which applications have been limited to handling in the past.
- Ability to drive informed action, which means that decisions will be made and operations and workflow will change as a result of the breakthrough application.

### **Ladybridge Systems Ltd**

#### ***What new features or services did Ladybridge Systems introduce in 2011?***

2011 saw the introduction of 64 bit versions of QM. Although the compactness of MultiValue applications makes the increased address space irrelevant, the 64 bit architecture provides some useful

performance benefits. The 64 bit version of the QMClient API is essential for use with some external packages.

We have continued to extend the environments from which QM can be accessed, including a new Java wrapper for the QMClient API. We have forged a strong relationship with FusionWare to bring their ODBC interface to QM and, at the time of writing (October 2011), are hopeful that both Entrinsik's Informer and Revelation's OpenInsight will be supporting QM by the end of the year.

We also published a "Teach Yourself QM" self-study training package that takes the student from potentially being a total beginner to being able to design and implement QM applications in a professional manner. Feedback on this has been very positive.

#### ***What was the greatest or most exciting thing that happened to your company or product in 2011?***

The major development for 2011 was the extended character set (Unicode) support in QM. This has entered beta test ahead of schedule and should be available on general release early in 2012. This development will form the basis of our presentation at the 2012 Spectrum Conference.

With shared servers and cloud computing in mind, we have introduced the capability for a Linux server to run multiple totally isolated instances of QM that do not require root access for system administration.

### **Revelation Software**

#### ***What new features or services did Revelation Software introduce in 2011?***

OpenInsight 9.3 which will be released in Q4 2011 incorporates a new encryption service (RTIDER) that system administrators can deploy to encrypt (on a folder, table, or field by field level) data in OpenInsight. Our OpenInsight for Web (O4W) web development toolkit includes additional support for mobile devices, such as tablets and

smart-phones. The 9.3 release will also include a Banded Report Writer (BRW) that is similar in functionality to Crystal Reports.

#### ***What was the greatest or most exciting thing that happened to your company or product in 2011?***

Over the past year Revelation Software has had continuous growth in new software licenses sold. This growth is result of our dedicated reseller and development community.

#### ***What would you like Spectrum readers to watch for in 2012?***

As long as the Mayan calendar does not run out on December 21, 2012, we will release OpenInsight v10, which will be our 64-bit implementation of the product.

### **Rocket U2**

#### ***What new features or services did Rocket U2 introduce in 2011?***

The major product releases for 2011 are:

- SB/XA 6.1 — Support for Custom .NET Controls, Office Automation Integration, Zoom and Resize, and more.
- U2 DataVu 2.0 — One-click charts, Quick Report Wizards, drill down scenarios, result set combining, and predictive analytics.
- U2 Clients — Due end of September. Combined release of all common clients as well as UDT and UV-specific clients. Will include a 64-bit ODBC Ansi Level 3 compliant driver for UniVerse!

Other releases that have or might happen by end of year:

- UniVerse rollout on all platforms as well as multiple patches (fixpacks). UniVerse 11.1 has a major feature of U2 Replication for High Availability and Report Server solutions.

Also included are External Database Access (EDA) for integrating U2 with external databases such as SQLServer, Oracle and DB2. Other features are a

*Continues on page 29*

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## U2 Migration Factory

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# Indexes and System Migrations

BY MARK JOHNSON

**O**ur MultiValue environment has been commercially available for almost 40 years. Serial-based systems, aka “native” systems ruled for the first 25 years with network systems arriving during the last 20 years. The comparisons between these two styles of systems is quite revealing.

The maximum “native” system was somewhere around 50-100 users, 32MB of main memory and perhaps 200-800mb of hard drive. These numbers pale when compared to the incredible resources of a modern system, although the user count may remain similar.

Today’s network applications come from two sources: A brand new installation or a migration from a “native” system. If the new installation was written for the network system, or heavily modified towards it, then it may have addressed indexes in several ways.

One of the originally installed features to native applications were XREF files. These were manually maintained by the programmer’s application and not the system.

The programmer had to update the XREF file with the appropriate fields to facilitate an easy lookup later using the cross referenced values. The pro-

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*"Manual XREF files don't normally participate with SELECT statements [or EDITOR changes]. System Indexes do."*

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grammer also had to make sure that the XREF file behaved properly if the source field was changed or the record was deleted.

Thus, there was always a manual rebuild program to go through the source file and rebuild the XREF file from scratch. Despite the best intentions, these manual XREF files do go astray, and the rebuild programs are almost mandatory.

Today’s MultiValue systems all have system-level INDEX commands to let the system take care of the indexing for us. While there is some consumption of space with either style of indexing, system-level INDEX commands participate much better in both updating the index and using the index.

Manual XREF files do not participate in EDITOR changes to the fields. System Indexes do. Manual XREF files don’t normally participate with SELECT statements. System Indexes do.

There are two kinds of fields that are usually cross referenced: simple and complex. The simple fields are dates, product codes, customer numbers etc. as their values are literal and easily policed by the application. These values

are easily cross referenced by older XREF files or system indexes.

Text-based fields are more complicated. Instead of being a single literal value, it may often be cross referenced by its separate words. A good example is the Customer Name field.

Being of no obvious structure, it often is also one of the most difficult fields to cross reference as it is usually human data and not validated by the application. Also, one would rarely cross reference the entire value of a text field in either method.

Supplemental to cross referencing Name style fields was a separate table of words to not cross reference. Words like THE, AN, A, COMPANY etc. returned too many choices. With space at a premium, omitting these keywords saved time as well.

Then, logic routines would parse the stored Name and update the XREF file with the words of the Name. Likewise, these routines would parse the inquiry request as well.

The purpose of these XREF files was to not have to run an A-Z SELECT statement through the entire CUSTOMER file. The statement QSELECT CUSTOMER-XREF SMITH was much faster — seconds rather than minutes.

If there were 40 customers having SMITH in their name, they would be returned immediately with the QSELECT request. The SELECT request would use square brackets or the LIKE opera-



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tor and may accidentally grab GOLD-SMITH or BLACKSMITH as well.

Ignoring text fields and theory, I will focus on the replacement of the XREF file style cross reference with the system index command(s) for simple fields..

Using the CREATE-INDEX command on the file/field will build and make available the index for that field (Some platforms require separate Create and Build commands. See your product's documentation for details.). Standard SELECT statements that filter for one value of that field will instantly become much faster as they inherit the effect of the index without additional programming.

The maintenance programs that used to manage the XREF files can then be changed to retire that function. Those programs that use the XREF file will have to be changed slightly. If the number of XREF'd files and fields are small, this is a manageable task.

The QSELECT statement that used the XREF file could be replaced with a standard SELECT statement. In Data/Basic, I use a subroutine called GET.IDS(TCL, IDS) that will process the TCL statement and return the item-ids in IDS. Thus the QSELECT ORDER-XREF 123456 statement (orders for customer 123456) could use SELECT ORDER WITH CUSTNO = "123456". Sidebar: My sub GET.IDS allows me to have one called reference to a program that I modify to suit the local MultiValue flavor it's on.

As I spend time both in ex-native systems as well as contemporary systems, I see a wide variety of XREF files. Many often contain orphaned records that cause me to find or write a rebuild program. Doing this enough has caused me to replace the XREF files with system indexes and let the system do the work.

In conclusion, there are two kinds of fields (simple and complex) and two kinds of methods (XREF and INDEX). Simple fields can be easily upgraded to

INDEX while complex fields may remain with XREF.

Also, the use of square brackets in an English statement or the LIKE statement may not be consistent across MultiValue platforms or utilize the INDEXes. Plus, INDEXes may not work with multiple filters or with multiple values for one filter.

As in all upgrades, proceed cautiously to see if the benefits appear after the change. **IS**

**MARK JOHNSON** is an independent MultiValue consultant with over 30 years experience on virtually all platforms. He specializes in maintaining legacy systems, helping his clients maximize their investment while participating with current technologies. When the time is right, he facilitates migrations to the proper contemporary platform. He can be reached at [majprogramming@gmail.com](mailto:majprogramming@gmail.com) or 908-601-4052.

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# Replacing Legacy Reporting with U2 DataVu

BY DAN MCGRATH

U2 PRODUCT MANAGER, ROCKET SOFTWARE

**W**e all know what they look like: hard-to-read reports with mono-spaced fonts and — aside from the columns of text and the occasional company header — completely barren. More often than not, customers must log into a terminal session in order to generate, print, or view the reports. These reports are almost never available in easily consumable or distributable formats such as PDF.

Today's users expect their information to be ready to use and available over the web or sent directly to their inbox. They want well-presented, professional reports that can be taken to a board meeting at a moment's notice. Using U2 DataVu, it is easier than you may realize to provide sleek reports to customers both online and via e-mail.

U2 DataVu allows you to query a UniData/UniVerse database to create and distribute visual reports that are not restricted to column and row text. It equips you with the ability to design your reports graphically and include images (such as page and/or report headers) as well as embedding charts.

It is important to overcome current limitations, particularly when migrat-

*Now you can completely remove the reporting load from production to your backup system without having to pay for full licenses.*

ing legacy Pick systems to systems such as Rocket U2 that have more advanced toolsets available. For example, if a current report is generated nightly and is automatically spooled to hardcopy, now can be an ideal time to change the report so that it is automatically e-mailed to everyone who requires it.

## Evaluating Your Options

When porting your existing text-based reports into U2 DataVu, you should approach it on a report-by-report basis. There are a number of methods you will need to consider when migrating your reporting to the new system: (1) the low-hanging fruit for when you report directly from your primary data files and can do a one-to-one port; (2) high-performance reporting by using temporary files generated in advance at set intervals to cover large/complex reports; and (3) where you completely

offload reporting from your production system.

How you proceed does not have to be the same for each report and will have several points of consideration. Take into account the performance requirements, how the customers will access the report, how they want it distributed in the future, as well as the complexity of the report itself, such as consolidating data from multiple files.

## The Low-Hanging Fruit

For an example of the first method, let us look at a simple report. We have a file called HQASSETS, which has seven dictionary items associated with it: BUSINESS\_UNIT, POSITION, NAME, TENURE, SALARY, BONUS, and TOTAL.PAY (just SALARY + BONUS via an I-Type). An HR professional might request that you generate a report on a monthly or yearly basis that would include a summary of this information by business unit and grouped by job position. In response to their request, you can produce an ad-hoc text report directly out of Retrieve/UniQuery like figure 1.

Migrating simple reports such as the one above (and BASIC-driven reports

*Continues on page 14*



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```
LIST HQASSETS BREAK.ON BUSINESS_UNIT BREAK.ON POSITION
  → NAME TENURE TOTAL SALARY TOTAL BONUS
  → TOTAL TOTAL.PAY LPTR
```

Fig. 1

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## REPLACING LEGACY REPORTING WITH U2 DATAVU

Continued from page 12

of similar complexity) is straightforward and is often the best way to start. Nothing boosts a project quite like a few quick wins at the start. So if you are short on time and mainly care about enabling greater access to the reports, consider the "Quick Reports" option which is ideal to quickly pull data out of your Rocket U2 system and into a simple report format for access via the web or by e-mail.

With only a bit more effort, an equivalent Visual Report in U2 DataVu can duplicate the report in figure 2 while also expanding upon your ability to display this data. Here is a Visual Report using this same data that also provides additional summary information, including embedded charts, for each business unit (fig. 3).

To develop this report, use the U2 DataVu development tool to create a

Visual Report that U2 DataVu Web can deploy to customers. As seen in figure 4, designing the above report is not overly complex, and the drag-and-drop interface gives you intuitive control.

### High-Performance Reporting

Not all reports can (or should) be migrated by directly reporting from your primary files. The most common reasons for this include complexity and performance.

When a report requires extensive processing of the data, you may be required to create temporary reporting files that are generated by a BASIC program. Generally, this will be a program that is either run explicitly at set times. It could also be the existing BASIC reporting program that has been repurposed as a PHANTOM to be scheduled at intervals (e.g., monthly) that are appropriate for the report.

Temporary reporting files can greatly reduce both the report generation time

for a user and can also mitigate against potential system performance impacts during peak hours of operations. Have you ever tried to use a production system when a few users are all running large reports? \*ZZZZZZZ\*.

One situation that would be appropriate for temporary reporting files would be when there is a large CUSTOMER file with a multivalued field linking to all the customer's orders in the ORDER file. Although Rocket Software developed U2 DataVu to handle multivalued fields, this would not help you if the report takes five minutes to return because it is busy summing the orders per customer for your entire customer base each time they run it.

You can create these temporary files by building a nightly PHANTOM program. This program will generate a file called CUSTOMER.ORDER.VALUE, which has a single record to contain the summed total value of all the orders for each customer. This temporary data can now be used either directly or via a dictionary item of CUSTOMER any time the total order value of a customer needs to be used as a value in, or as a constraint for, a report.

### Moving Reporting Off Production

The last piece of the reporting puzzle to consider is especially enticing for those running on high-availability Rocket U2 systems. Did you know that you can now do reporting from your secondary system running only on standby licenses? Now you can completely remove the reporting load from production to your backup system without having to pay for full licenses. Add in replication and you now have a hot-backup/live-reporting system without the risk of negatively impacting your core business functions.

### 1990 called; it wants its reports back

Why be stuck in the past when we have the tools that let you work in the present and prepare for the future? U2 DataVu enables you to provide in-

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HR Report by Business Unit							
BUSINESS UNIT	POSITION	NAME	TENURE	SALARY	BONUS	TOTAL	
Business Unit 1	VP	Borges	13	\$35000	\$1750	\$36750	
		Castillo	7	\$35000	\$1750	\$36750	
		Baker	15	\$30000	\$1500	\$31500	
		Gutierrez	4	\$35000	\$1750	\$36750	
		Spence	7	\$40000	\$2000	\$42000	
		Whelply	14	\$40000	\$2000	\$42000	
<b>Business Unit 1 Summary</b>			<b>6</b>	<b>60</b>	<b>\$215000</b>	<b>\$10750</b>	<b>\$225750</b>
Business Unit 2	HQ ITS	Burchett	12	\$10000	\$500	\$10500	
		Olguin	4	\$10000	\$500	\$10500	
		Petty	9	\$8000	\$400	\$8400	
		Cooper	11	\$6700	\$335	\$7035	
		Damstra	11	\$25000	\$1250	\$26250	
<b>Business Unit 2 Summary</b>			<b>5</b>	<b>47</b>	<b>\$59700</b>	<b>\$2985</b>	<b>\$62685</b>
Business Unit 3	HQ MKT	Carter	3	\$5000	\$250	\$5250	
		Bechard	6	\$8500	\$425	\$8925	
		Arnold	14	\$45000	\$2250	\$47250	
		Kanagaki	9	\$15000	\$750	\$15750	
<b>Business Unit 3 Summary</b>			<b>4</b>	<b>32</b>	<b>\$73500</b>	<b>\$3675</b>	<b>\$77175</b>
Business Unit 4	HQ HR	Brunner	6	\$5000	\$250	\$5250	
		Sharp	14	\$6700	\$335	\$7035	
<b>Business Unit 4 Summary</b>			<b>2</b>	<b>20</b>	<b>\$11700</b>	<b>\$585</b>	<b>\$12285</b>
Business Unit 5	HQ FA	Lozada	7	\$5000	\$250	\$5250	
		Binai	4	\$5000	\$250	\$5250	
		Osborn	8	\$5000	\$250	\$5250	
		Burke	3	\$5000	\$250	\$5250	
		Williams	5	\$7200	\$360	\$7560	
		De Carlo	7	\$6500	\$325	\$6825	
		Sims	7	\$6600	\$330	\$6930	
		Staton	11	\$6800	\$340	\$7140	
		Stanz	15	\$50000	\$2500	\$52500	
		<b>Business Unit 5 Summary</b>			<b>9</b>	<b>67</b>	<b>\$97100</b>
			<b>26</b>	<b>226</b>	<b>\$457000</b>	<b>\$22850</b>	<b>\$479850</b>

Fig. 2

formation to your customers when they need it and how they need it, all while looking stylish at the same time. With U2 DataVu your customers can also move beyond simple reporting with interactive dashboards that will allow them to get the most value out of their data.

Not being on a Rocket U2 database is not an excuse either. If you are still on a legacy Pick database, take advantage of the U2 Migration Factory to rejuvenate your system, and restore your ability to innovate! **IS**



DAN MCGRATH has worked in roles such as a Systems Architect at a financial institute, Research/IT Support for a

university and as a freelancer creating bespoke applications and websites prior to his current position as a Product Manager at Rocket Software. Dan is a member of the Australian Computer Society and has been involved in IT for over a decade. He has a Bachelor's degree in Computer Science (BCompSc) from the University of Wollongong.

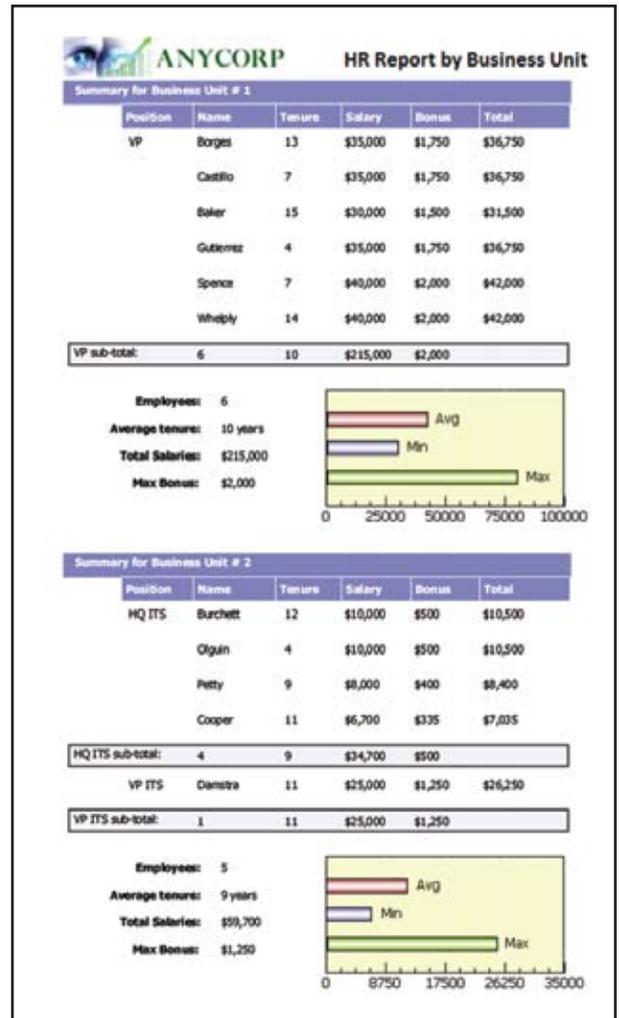


Fig. 3

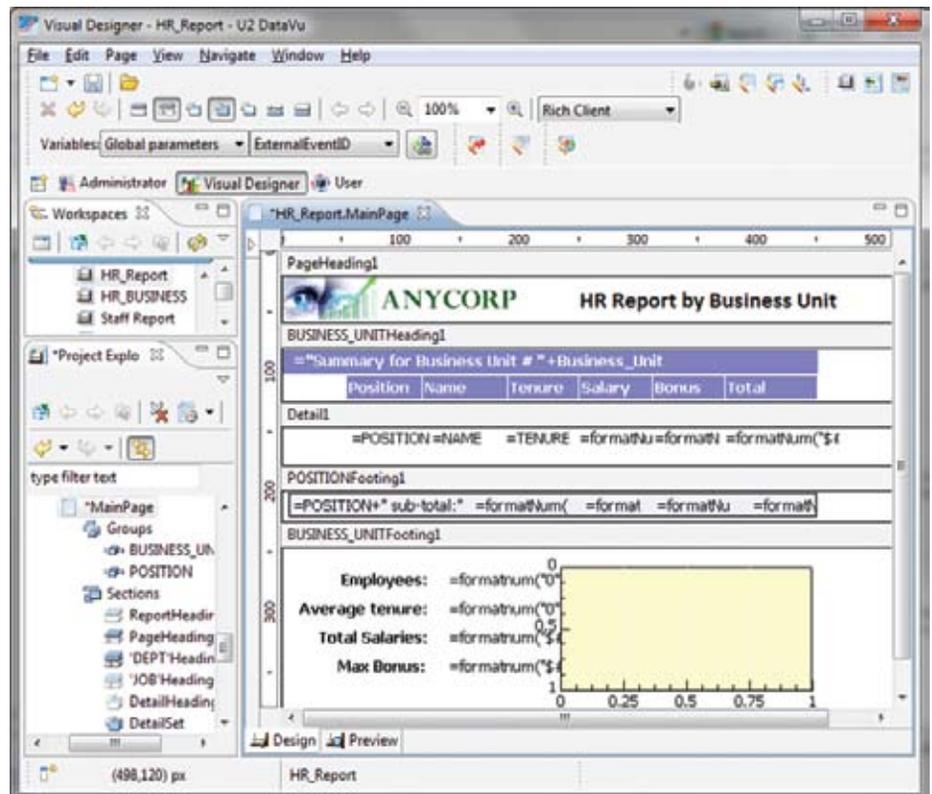


Fig. 4



## Datatel Takes Fastest-Selling Student Recruitment Solution to the Next Level

Datatel today announced the newest version of its successful Datatel Recruiter software. In the last 12 months, Datatel Recruiter has been selected by more higher education institutions than any other Strategic Enrollment Management solution, including adoption by numerous 2-year and 4-year colleges. The solution works with any Student Information System (SIS) and automates the recruiting life cycle so enrollment and admissions teams can do more with limited resources in a challenging budget environment.

Recruiter 2.0 capabilities now include:

- Flexible deployment options, including on-premise or Software as a Service (SaaS), that allow institutions to migrate from one deployment approach to the other to react to staffing and resource changes. The SaaS option outsources software hosting and management, enabling admissions and enrollment departments to focus on prospective students.
- Improved ability to target and reach prospective students that are “best-fit” for an institution. It delivers state-of-the-art Constituent

Relationship Management (CRM) functionality to recruit students that meet each institution’s unique admissions criteria so they will matriculate, be a strong institutional fit, persist, be academically successful, and graduate.

- Performance tracking enhancements, including new travel management features that enable tracking of recruiting events and trips and their effect on the admissions funnel, a new graphical dashboard, and additional reporting capabilities.
- Seamless integration with Datatel Web Content Management System (WCMS), which enables personalized targeting of Web content to prospective students.
- Deeper integration with Datatel Colleague that adds considerable value for institutions already running Datatel’s industry-leading ERP.

“We have seen tremendous demand for our Datatel Recruiter offering,” said John Speer, Datatel President and CEO. “Institutions are already realizing dramatic results by using the solution and we’re certain the momentum will continue with the flexible deployment options and other new capabilities in version 2.0.”

The enhanced capabilities of Datatel Recruiter 2.0 now create an even more compelling solution for admissions and enrollment professionals. Through Datatel’s partnership with Microsoft, Datatel Recruiter is powered by Microsoft Dynamics CRM 2011 and world-class hosting facilities supported by Microsoft, who has invested billions of dollars in infrastructure. Datatel

Recruiter makes it easier for admissions teams to manage their day-to-day operations by leveraging seamless integration with Microsoft Outlook and highly flexible dashboard, charting, and reporting options.

### About Datatel, Inc.

Datatel is a provider of innovative technology products, services, and insight to higher education. Colleges, universities, and technical schools across North America partner with Datatel to build Strategic Academic Enterprises dedicated to achieving student success. The company has focused on higher education since 1979. For more information, visit [www.datatel.com](http://www.datatel.com). ■



## Entrinsik to Offer SQL Migration Tool for Datatel Users

Entrinsik Inc. ([www.entrinsik.com](http://www.entrinsik.com)), developer of award-winning web-based operational reporting and analysis software, announced it will soon be offering a solution that will assist Datatel users in migrating their Informer UniData-based mappings and reports to a SQL environment.

Entrinsik’s Informer Web Reporting software is an operational reporting and analysis solution used by over 1000 organizations, including over 250 institutions using Datatel software. Without the need for complex

ETL processes, Informer accesses real-time data from multiple data sources including Colleague, Advancement, ODS, and any other data silos through one intuitive, interactive, web-based interface. Informer creates a self-service reporting environment where users can customize reports and perform real-time, on demand data analysis without IT assistance.

In order to help preserve this investment, Entrinsik is committed to assist with the conversion of Informer data sources using a Colleague UniData database to data sources using a Colleague SQL database. “We recognize that our Colleague-based clients have a huge investment in Informer, in terms of both time and effort,” says Tim Nicholson, Director of Informer Customer Service. “Given our well-established relationship with the Datatel user community, we understand reporting requirements and the data structure, making the development of a utility such as this possible.”

The utility is slated for general release January 2012.

“Typically, data migration can be a challenge for many organizations,” says Doug Leupen, CEO. “We’ve heard from many of our Datatel customers who are looking to migrate to SQL and developing this tool is our effort at delivering a resource that will help facilitate that process.”

### About Entrinsik, Inc.

Since 1984, Entrinsik has been developing, implementing, and supporting information management solutions that enable organizations to maximize performance and improve bottom

lines. Entrinsik's Informer Web Reporting is an innovative, award-winning operational reporting and analysis solution used by tens of thousands around the world. Over 1000 organizations around the world use Entrinsik's software every day. Entrinsik is headquartered in Raleigh, NC. For a demonstration of Informer or a free trial, call us today at 888-703-0016 or visit [www.entrinsik.com](http://www.entrinsik.com). ■



## P2 Energy Solutions Modernizes Excalibur MultiValue Application User Interface

P2 Energy Solutions has grown to become the largest independent technology provider to the energy industry. Its comprehensive set of tools enables operational decision-making and financial management for client firms engaged in various energy ventures, including oil, gas and alternative energy. Today, Denver-based P2 Energy Solutions has offices in six states, Dubai and Tunisia, and employs nearly 700 people. More than 1,200 global energy companies use its products and services daily to improve decision-making, gain clarity into complex workflow scenarios, and optimize efficiency.

### Situation

With more than 200 client firms using Excalibur, its financial, operational accounting stream and land management software, P2 Energy Solutions held substantial market share as a provider for emerging and mid-sized oil and gas companies. However, during Excalibur's decade-plus lifespan, the state of software in general continued to progress, offering new functionality that P2's earlier platform product didn't provide.

Tim Wadle, Excalibur product manager at P2, explained that by January, 2010, management decided it was time for a change. "The overall look and feel was outdated," he said. "At the time, Excalibur couldn't do things that contemporary architecture allowed, and we were losing in competitive situations because other products had a more modern user interface and greater functionality."

As examples, explained Wadle, P2 wanted to offer greater grid functionality for better data sorting. Colors and fonts in the user interface were limited, and developers had limited control over how the interface worked. Data presentation options were limited and clunky compared to newer platforms.

### Implementation

Implementation for Excalibur's "next-generation" product presented some challenges, noted Wadle, because the forms were written in Cuebic and SB+. These took considerable attention during the conversion process, but once they were addressed, the migration was relatively easy. Rocket U2's SystemBuilder Extensible Architecture (SB/XA)

allowed us to redevelop without modifying the underlying business rules.

"Rocket's team was very supportive," said Wadle. "We leveraged a lot of functionality within Rocket U2's SB/XA that other users didn't. They worked very closely with us to make sure they were meeting our needs and staying within our release schedule."

### Benefits

When the new version of Excalibur rolled out in April, 2011, it met with enthusiastic response within P2 as well as from its 225 end-users. Clients were highly pleased with the new flexibility that 'nexgen' Excalibur offers around the grid, since it allows them to interact with data in ways they couldn't before. In the prior version, for example, users could only view a single record. Now they get a full spreadsheet-type view that offers users a richer relationship with the data.

For developers, the new version offers added flexibility in extending the application, and leverages Microsoft Presentation Foundation to provide users with a clean, pleasing and contemporary interface. It also offers the ability to tie in to .NET controls, features data in tree views and links more easily to external applications.

"We've gotten very favorable feedback from the market," said Wadle, "from existing clients, third parties and new business opportunities. SB/XA really lays the foundation as we go forward to add value for our clients with newer features and functionality we couldn't provide before." ■



## NEW! U2 Clients now available

We have a new way of releasing the clients and tools that we used to label as UniData clients or UniVerse clients: now we'll release U2 Clients and DB Tools for both databases. U2 Clients will consist of the client APIs and DB Tools will comprise the tools based on the Eclipse development platform. Since most of the components of U2 Clients and DB Tools are the same for both UniData and UniVerse (only the ODBC drivers and the VSG utility are still specific to a database), we can release them for both databases at the same time. By releasing the clients and tools this way, we can release them more often and avoid some confusion (we won't have to ask UniData users to obtain the latest tool from the UniVerse clients).

The first U2 Clients version was just released. This release includes the following clients: UniRPC, UV/ODBC, UDT/ODBC, UniDK, JDBC, Intercall, UO, UOJ, UniOLEDB, UCI, UO.NET, UO.NET4CF, Dynamic Connect, VSG, and JPA.

All future releases of clients and tools will be made in either U2 Clients or DB tools. There will be no future releases labeled UniData clients or UniVerse clients. There will be no charge for either U2 Clients or DB Tools.

Also, please note that the U2 Clients release will be installed in the C:\U2 directory now. If your

*Continues on page 18*

# FROM THE PRESS ROOM

*Continued from page 17*

application depends on the install path, be sure to account for this pathname change.

The version number of the individual clients has changed to more easily identify the correct component and version number for support issues. Please view the U2 Clients readme contained on the package installation menu for details about component versions, product fixes, and important notes pertaining to this release.

If you have any questions about the new U2 Clients release, please contact us at [u2askus@rs.com](mailto:u2askus@rs.com) ■



## Synergetic Data Systems To Add Accounts Payable Workflow Using InterSystems Ensemble

Synergetic Data Systems, Inc. (SDSI) will begin the testing and development of an Accounts Payable (AP) Workflow module using InterSystems Ensemble development tool. Ensemble will be used to enhance the existing UnForm Workflow API Tool Set. Ensemble has been selected because of its flexibility and ease of deployment. UnForm Workflow

will be subscription based and Ensemble lends itself to this model. Accounts Payable Workflow will be a powerful addition to UnForm Document Management Solution.

SDSI has been developing software solutions since 1988 and currently has more than 9,000 deployed systems in 15 countries. SDSI's flagship product is the UnForm Document Management Solution (DMS). UnForm DMS is currently at version 8.0 and offers users complete control of document production, enhancements, delivery (via Email and Fax), archiving, browser based document retrieval and scanning. From the time you select "Print" in your application to the moment the document no longer has value to the company UnForm DMS offers you complete control of the document's "lifecycle".

With the addition of Accounts Payable Workflow to the UnForm DMS companies will have the ability to automate much of the duties of the AP Department. Using the proven principles of Rules, Routes and Roles in coming invoices will be automatically linked together with all supporting documents, such as, Purchase Orders, and Packing Slips and then delivered to the appropriate personnel who are authorized to make the approvals. Because no two companies' AP Workflow is the same UnForm's integration with Ensemble offers companies the ability to make changes and fine tune the Workflow to their needs. Deployment is slated for some time in the first quarter of 2012.

For more information contact Synergetic Data Systems, Inc. at 800-446-7371 or follow us on Facebook (search for 'UnForm'). ■

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[www.intl-spectrum.com/newsletter](http://www.intl-spectrum.com/newsletter)

# LETTER TO THE EDITOR

We recently upgraded to UniVerse 11.1.1 and I saw [Clif Oliver's] article. Slick!!

I've always wanted to drop in an audit when I cannot figure out where in the heck something is getting changed in our DataFlo system with thousands of lines of code.

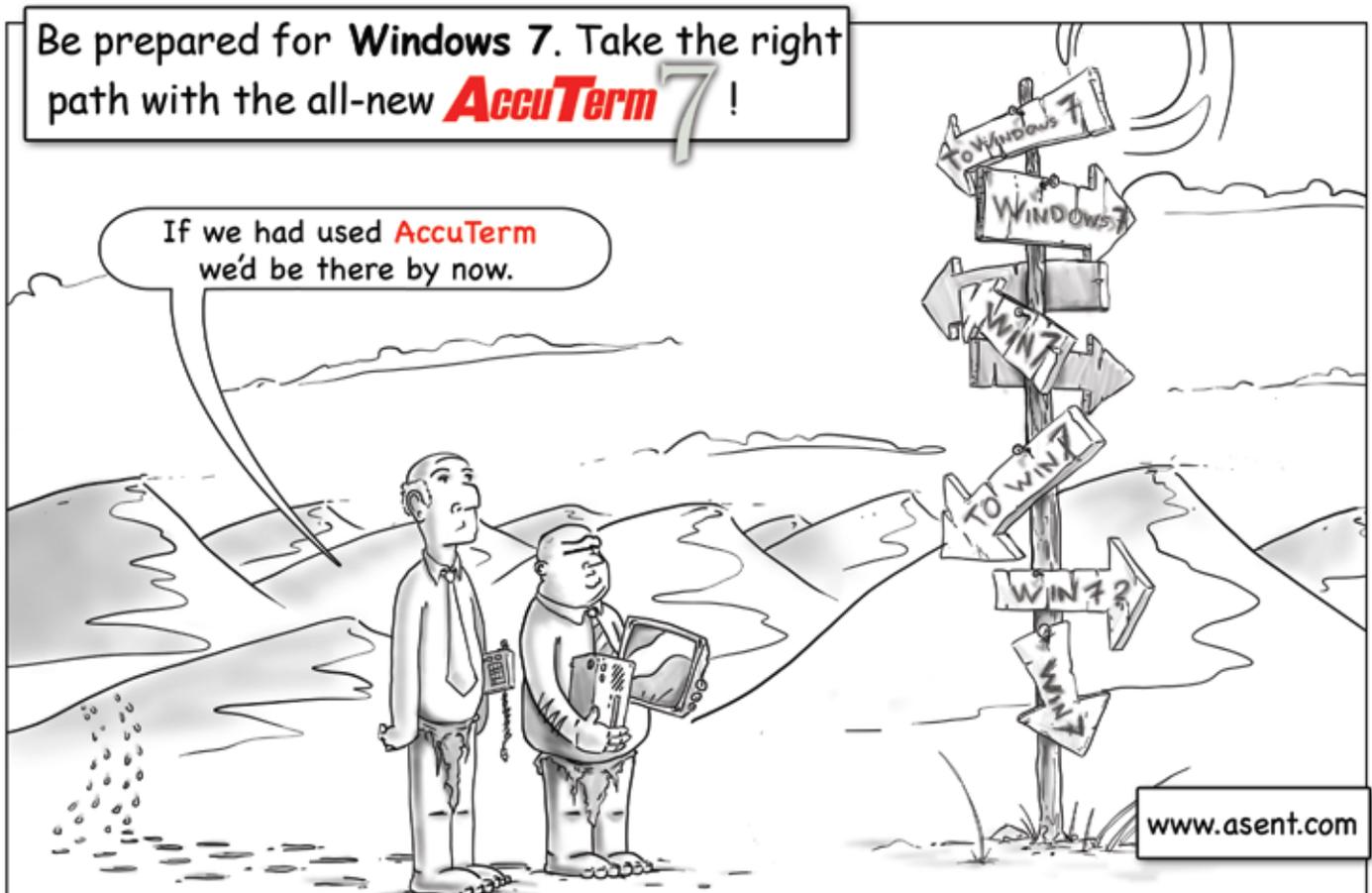
We have generic "whole record auditing" similar to this where it is explicitly called out in the code, but it is sprinkled here and there, and as time has gone by, I have added it everywhere I can find. But, there are still tons of places that do writes to files that are not audited. Rocket has finally provided this missing piece. I read about it this somewhere in the release notes, but it really didn't gel until I saw your article and I thought, perfect, this is just what I needed.

I downloaded the PDF, did some creative copy/pasting and was up and running in a few minutes. Now I have something I can deploy when the next "where did this come from" issue arises!

Anyway, just wanted to say thanks for article. BTW, International Spectrum should make it easier to contact the authors.

-Troy Buss

*Clif replies: Thank you very much for your feedback, Troy. I appreciate it both as the author and as Editor. We try to make sure Spectrum magazine provides day-to-day useful information as well as future-oriented thought provoking content. It is gratifying to know that in this case, we succeeded.*



# Session Management

## with PHP

BY KEVIN KING

In the past few issues we've been looking at the good, the bad, and the ugly of our long and illustrious history with the Telnet protocol. To briefly recap, the biggest benefit that Telnet offers is a persistent connection to our MultiValue applications. Unfortunately, we pay for this benefit by suffering through dropped connections, insecure communications, and antique-looking façades on otherwise excellent applications.

In contrast to Telnet, web applications using HTTPS can offer us excellent security, state-of-the-art user experiences, and most importantly HTTPS can offer improved reliability by reducing our dependence on persistent connections. While these are all Beautiful Things, there is one significant difference that cannot be overlooked — web-based communications are stateless; each request to the server is a brand-new connection to the application.

Without state, an application has no way of knowing it has seen you before. For example, when connecting to our MultiValue applications, we typically start by logging in to the server. Imagine what might happen if the server forgot you immediately after logging in! Yet this is exactly what happens with web-based communications; the

---

*"It's important to recognize that anytime we use user input or information stored on the user's browser we run the risk of a security breach. [...] Fortunately, we have a number of options for mitigating this risk."*

---

moment each transaction is complete, the server forgets you were ever there.

The PHP language, however, offers a stellar example of how state can be managed in a web-based application. While there are a multitude of web technologies and languages from which to choose we'll look at PHP today because the PHP solution is not only effective, it's curiously simple.

In PHP, state management is handled through *sessions*. A script that needs to manage state simply starts a session and from that moment on a single variable named `$_SESSION` can be used to store information that can be recalled later.

"That's it?" I can hear you say. "Session management is handled using ONE variable? How effective can ONE variable be?" Considering that one variable is an associative array and associative arrays can hold any amount or structure of information (memory limits notwith-

standing) that one variable could hold every bit of information in your application and still have room to grow.

To visualize this in MultiValue terms, think of this one variable as a big block of named common memory. This block can then hold other variables that can themselves hold more variables to a virtually unlimited depth. Associative arrays are a very powerful feature of the PHP language, but like all regular variables these arrays disappear when the script terminates. With session management, however, this `$_SESSION` variable sticks around until you say you're done with it or the user closes the browser, whichever comes first. PHP does this by saving this variable to disk when the script terminates and reloading that variable from disk the next time the session is needed.

Figure 1 illustrates a simple example of how this might be used. On line 3, the script calls a function `session_start()`. Believe it or not, this is all you have to do to enable session management in PHP. Once the session has been started we can work with the `$_SESSION` variable like any other variable, with one notable exception: Anything we leave in this variable at the end of our script will be available the next time we run this — or any — script on this site that uses `session_start()`.

On line 6 we use the `isset()` directive to determine if a particular variable exists in the `$_SESSION` array. This will tell us if this is our first time with this



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session or if we're coming back to a session that has been previously established. If our `$_SESSION` array does not have an entry called "number", we can say with confidence that this is our first time with this variable and initialize it to zero. Once all this housekeeping is done we can increment our variable and echo (print) the result. (See [intl.spectrum.com/s1043](http://intl.spectrum.com/s1043) to see this script in action.)

The first time this script runs it will print 1. Refresh the browser and it will print 2, then refresh again for 3, and the cycle continues. When the browser is restarted this sequence will start again at 1 because PHP only holds on to the session identifier as long as the browser is running. Close and reopen the browser and PHP will generate a new session and start over from 1.

There are times, however, when we may want our script to hold values indefinitely, even between browser restarts. Figure 2 shows a small tweak that enables this functionality. The `session_id()` function allows us to name our session so that anyone using this ID can access our session variables. If you're security conscious, this should raise a few hairs on the back of your neck as this will tell the script to not only retain your values across browser restarts, it will allow everyone to share — and potentially update — the same values! (To see this script in action, simply point your browser to [intl.spectrum.com/s1044](http://intl.spectrum.com/s1044).)

Here's the problem: Sessions in PHP are really disk files containing a serialized cache of variables. Using the `session_id()` function, we are effectively setting the name of that file. If we set this to a fixed name, as this example illustrates, every user will share access to that one file and its contents. This could be useful in some cases or a Very Bad Idea in others.

What about these sites where the site remembers my information between browser reboots but doesn't get my information confused with yours? Fig-

*Continues on page 22*

```
01 <?php
02 // Start a new session; this will create the
03 // $_SESSION variable
04 session_start();
05 // Initialize our persistent variable
06 if(isset($_SESSION['number']) == false)
07 {
08     $_SESSION['number'] = 0;
09 }
10 // ...increment it...
11 $_SESSION['number'] += 1;
12 // ...and show the visitor what we've done.
13 echo $_SESSION['number'];
14 ?>
```

Fig. 1

```
01 <?php
02 // Give the session an ID
03 session_id('spectrum');
04
05 // Start the session using the ID provided
06 session_start();
07 if(isset($_SESSION['number']) == false)
08 {
09     $_SESSION['number'] = 0;
10 }
11
12 $_SESSION['number'] += 1;
13 echo $_SESSION['number'];
14 ?>
```

Fig. 2

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## SESSION MANAGEMENT WITH PHP

Continued from page 21

ure 3 illustrates how this might work. When we're initializing our session variable (line 15) we can also set up a cookie on the user's browser (lines 17-18) containing their current session ID. Per the example, the browser will expire this cookie 24 hours into the future, but until then this gives us a place on their workstation where we can cache their session ID. (See [intl-spectrum.com/s1045](http://intl-spectrum.com/s1045) to see this in action.)

It's important to recognize that anytime we use user input or information stored on the user's browser we run the risk of a security breach. A seasoned hacker could simply edit their cookie to change their PHP session ID and our script would never know that the change had occurred. Fortunately, we have a number of options for mitigating this risk.

```
01 <?php
02 // Look for cookie value from the user's browser.
03 // If it's set, we'll assume
04 // that the cookie holds the session ID to use.
05 if(isset($_COOKIE['spectrum']))
06 {
07     session_id($_COOKIE['spectrum']);
08 }
09
10 session_start();
11 if(isset($_SESSION['number']) == false)
12 {
13     $_SESSION['number'] = 0;
14
15     // Initialize the cookie
16     // expire in 86400 seconds (1 day)
17     $expire = time() + 86400;
18
19     setcookie('spectrum',session_id(),$expire);
20 }
21
22 $_SESSION['number'] += 1;
23 echo $_SESSION['number'];
24 ?>
```

Fig. 3

In Figure 4 we've added a little more security by storing the IP address of the user in their session variable on the web server. The next time PHP loads that session, if the IP address of the session doesn't match the user's current IP address, we can destroy their current session, unset (erase) the current session information, and start a brand new session for the current user. The upside to this is that for a hacker to breach your site they would have to come to your site on the same IP address as the original user, which is unlikely. The downside to this, however, is if your site visitor routinely accesses your site from a computer with a changing IP address (as can be the case with different VPN connections) this script will see them as a hacker and will reset their session with some frequency. Still, that's a

small price to pay in this world of spammers and scammers where security is and must remain a primary concern. Of course, there are numerous more complex techniques available for greater security of session information.

Security aside, you may wonder about the performance of this kind of state management where the information is stored on disk and retrieved each time. Remarkably, it can be excellent. You certainly won't want to store gigs of information in the `$_SESSION` variable to be saved and restored on each connection, but looking at a typical MultiValue application you wouldn't typically hold gigs of information in memory anyway. (Sure, there are exceptions, but that doesn't make it a good idea.)

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```

01 <?php
02 if(isset($_COOKIE['spectrum']))
03 {
04     session_id($_COOKIE['spectrum']);
05 }
06
07 session_start();
08
09 // Check to see if this session has an embedded IP
10 // address.  If it does, we
11 // need to compare this to the current visitor's IP
12 // address and reset the
13 // session if they aren't the same.
14 if(isset($_SESSION['ipAddr']))
15 {
16     if($_SESSION['ipAddr'] != $_SERVER['REMOTE_ADDR'])
17     {
18         // delete the session file on the server
19         session_destroy();
20         // Unload session variables in memory
21         unset($_SESSION);
22         session_start(); // Start a new session
23     }
24 }
25
26 // Initialize our persistent variable and cookie
27 if(isset($_SESSION['number']) == false)
28 {
29     $_SESSION['number'] = 0;
30     $_SESSION['ipAddr'] = $_SERVER['REMOTE_ADDR'];
31
32     // expire in 86400 seconds (1 day)
33     $expire = time() + 86400;
34     setcookie('spectrum',session_id(),$expire);
35 }
36
37 $_SESSION['number'] += 1;
38 echo $_SESSION['number'];
39 ?>

```

Fig. 4

Overall, session management in PHP makes managing state very easy. With the session information read from and written to disk on each connection, a network hiccup is much less likely to create a mess of disconnected sessions. By accessing the application via HTTPS, we can get the best security available today. Finally, these technologies can open our applications to the widest audience possible while allowing us to leverage some of the most sophisticated user interfaces available.

Managing state is certainly no concern. Furthermore, all this is available right now. So what are we waiting for? **IS**



**KEVIN KING** is the President and Chief Technologist with Precision Solutions, Inc., a leader in technology solutions, support, and training. He is also the author of SB+ Solutions, an enthusiastic private pilot, and Christian guitarist and producer... as time allows.

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# Spending Down MultiValue

BY CHARLES BAROUCH

### It's the Most Wonderful Time of The Year

Not every business ends their fiscal year in December, but a lot of them do. End of year means end of year spending down. Likewise, it usually means a lean budget for January and February. I've been thinking a lot about my spend down. Let's talk about yours.

### Outside Insight

The economy has made a lot of talent available for short term assignment. Strategic hiring of consultants has gotten a lot of positive results. Look at your bottlenecks and think about surgical consulting strikes. The eighty-twenty rule — eighty percent of the project takes eighty percent of the time, the remaining twenty percent takes the other eighty percent of the time — comes from most of us being good at most of the job all of the time. Find the part you don't do as well: don't get stuck, farm it out.

For example, I have people I call in to review code and fix it or, perhaps, speed it up. Hiring them to write it is

---

*Go to your vendor's site  
and click every link that  
seems unfamiliar. You  
might well be surprised  
how many links you will  
find.*

---

outside of my budget — besides, writing code is something we're are good at. Hiring them to tweak has served me well. Likewise, others have hired me as a fixer. So long as the consultant's "that's easy" list includes your "that's hard" list, the match is a good one.

### Never Heard of It

People who don't work in IT/MIS often don't know what we can and can't do. Software guys are assumed to be hardware experts. Hardware guys are expected to be security experts. If you are a consultant, the assumptions are bigger because the audience is more diverse. The spend down is a great time to get training on the next big thing that your company assumes you already know.

Look at the upcoming projects. If you don't know what's coming, it might be a good time to poll your internal customers. There will always be surprises,

but we can get ahead of some of the issues.

### And the Score is Windows 7, Mac 10, iOS 5, and Android 4

Training isn't just about new-to-you technology. The tech you already use is moving forward at a frightening pace. For those who aren't MultiValue couch potatoes, part of the spend down might go for training. I have had weeks where I've worked in Delphi, Java, PHP, Javascript, and BASIC all in the same day. There is always something I need to know or need to know better.

Let's not forget our core technology. Every MultiValue brand has a way to the web, a way to GUI, and any number of other improvements. How many of us know all the offerings? Having the vendors add this great new stuff is pointless unless we take advantage of it. Here's a zero dollar way to get started: go to your vendor's site and click every link that seems unfamiliar. You might well be surprised how many links you will find.

### Soft? Where?

While we are getting all that training, it might be nice to actually buy the software we are learning to use. Some of our tech is free, some of our tech costs.



Digital Version  
On-Line

Scan Me!

My job has required me to have access design and layout software, not just application software. PHP is just a download away, but Serif or Adobe expect to be paid before you get their software.

For most of us, the green screen is gone. In its place is the browser, the smart phone, the laptop, the tablet... You don't need me to provide the litany of the new. All of that requires us to have the tools to dress our projects in style.

Along with software purchasing there may be other fees. Some of us have joined professional associations to get the support we need. Some of us pay developer fees. Think about all of the parts while you have the money at hand. It will be harder after New Year's.

### Little Iron

It is easy to focus on software. We still need switches, wires, hubs, and hard-

ware to run our software. Everything we buy needs a rack, a desk, or some other place to sit. Before we apportion all the cash to training, consulting, and software, we need to think about the physical infrastructure.

Every year, I spend down on domain names, outside hosting, new laptops, and other structural elements. Doing it now saves me from dealing with the bills when money is tighter.

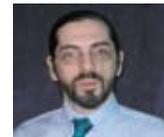
Even if you don't develop for smart phones, this might be the time to upgrade yours. We can't do our job if we can't keep up with calls, e-mail, and every other way we get project requests and updates. I even have one client who, I kid you not, prefers to do everything by text message.

### Money for Nothing

Looking back, we can all see spending that didn't pan out. That isn't an IT thing, it's an everyone thing. In plan-

ning this spend down, we need to look at where we have gotten bang for the buck in the past. Sometimes, as we review our lesser return on investment, we may find situations where the problem was that we didn't spend enough.

End of year may give us a relatively freer wallet, but it is still a limited amount. We have to use it wisely. One of the perks of wise spending is that ability to document your wins when asking for your new budget. Let's all position ourselves for a happy New Year. **IS**



**CHARLES BAROUCH** is the CTO for Key Ally, Inc. He is past President of the International U2 Users Group, and a regular Spectrum Magazine contributor.

Contact Charles at [Results@KeyAlly.com](mailto:Results@KeyAlly.com), or phone (718) 762-3884 ext 1.



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# Sending E-mail from Your MultiValue Programs

## *Part 6: E-mails with Attachments*

Now that we have talked about the sending Text and HTML enabled e-mails, we'll talk about sending e-mails with attachments. I'm sure this is what everyone has been waiting for me to cover.

Adding attachments to your e-mail is not much harder than sending e-mails with both Text and HTML. Like the Text and HTML e-mails, you are going to be sending a multipart e-mail. The difference between sending Text and HTML multipart e-mails and attachments is the type of multipart you use for each one.

With the Text and HTML e-mails you use the "multipart/alternative". With attachments, you use "multipart/mixed". Now I want you remember that you can nest multiparts together, so you each have Text and HTML section can be included with attachments. You just have to have a unique boundary id for the Text and HTML multipart sections and a unique boundary id for the attachment sections.

### **The Content-Type**

In the first article of this series, I talked about the e-mail header "Content-Type". This header defines how to process the information within the body of the e-mail. When working with multipart sections, you have to specify the Content-Type as "multipart/mixed" and then supply a boundary id that our information will be in.

Boundaries can be anything you would like, but they must be unique within the e-mail. When I talked about the "multipart/alternative" boundary id, I suggested using the current date, time, and message id. That works great, but now we have another multipart which needs to have its own unique boundary id.



Add a suffix or prefix to the that boundary id that will make it unique, and you now have a boundary id that you can use for your attachments. The suffix or prefix can be anything you like, but it can also be as simple as "\_a".

If you have a boundary id of:

```
68734-812jasj-o8711n181a
```

Then add a prefix of "\_a" for a unique id:

```
68734-812jasj-o8711n181a_a
```

Again, does this mean anything to the user or e-mail client? No. It is a bunch of random characters that are unique within the e-mail and within the multipart sections being used in the e-mail.

Here is the example of the content-type you will be using:

```
Content-Type: multipart/mixed;
  → boundary="68734-812jasj-o8711n181a_a"
```

Just like in "multipart/alternative", you separate your attachments from your message body using the boundary tag, but prefixing them with a "-". Then when you are done with your attachments, you include your boundary id with a "-" on front and back of the id. See figure 1 for an example.

### **Content-Type for Attachment**

Now that you have created the outline for your e-mail attachments, you have to define the section headers for each attachment. For the most part you can use a generic "content-type" of "application/octet-stream". This basically tells the e-mail client that this is binary data and to decide how to open it on its own.

There are several common attachment "content-types" you are likely to use. See figure 2 for a list of them.

Now that you selected the "content-type" you want to use, you will have should supply the file name to use as a default

“Save As” name. This is a subfield included on the “Content-type” line, much like the boundary id. The subfield name is “name”, and the syntax is like the following:

```
Content-type: application/  
→ octet-stream;  
→ name="report.csv"
```

## Content-Encoding

With attachments, “Content-Encoding” is very important. Since most attachments are not 7 bit or ASCII data, you will need to make sure you encode them with as either Quoted-Printable, or Base64.

Take a look at my last article regarding Quoted-Printable encoding. If you want to see the actual MultiValue code to do Quoted-Printable, see the resource section of the Intl-Spectrum.com web site and search for Quoted-Printable. You can do the same for Base64 encoding as well.

In most case you will be attaching a file that comes from your MultiValue database’s host file system. If you are on a Linux or AIX system, you can use the “base64” command-line tool to convert an existing file into a base64 encoding format (fig. 3).

## Content-Disposition

The Content-Disposition is not required, but recommended. It helps the e-mail client decide how to display the content within itself. You have two choices: attachment or inline. Never use inline unless you are using included images.

Content-Disposition is also another place to define what the “Save As” default file name will be. This is supplied by the subfield of “filename”. I suggest including both the “name” subfield in “content-type” and “filename” in “content-disposition” because you never know which one the receiving e-mail client will try to use as the default “Save As” file name.

*Continues on page 30*

```
Content-type: multipart/mixed;  
    boundary="68734-812jasj-o8711nl81a_a"  
  
--68734-812jasj-o8711nl81a_a  
Content-type: multipart/alternative;  
    boundary="68734-812jasj-o8711nl81a"  
  
--68734-812jasj-o8711nl81a  
Content-Type: text/plain  
  
Hello, this is plain text  
  
--68734-812jasj-o8711nl81a  
content-Type: text/html  
  
<html><body>  
<p>Hello, this is Html Text</p>  
</body></html>  
  
--68734-812jasj-o8711nl81a--  
  
--68734-812jasj-o8711nl81a_a  
<Attacment information>  
  
--68734-812jasj-o8711nl81a_a--
```

Fig. 1

```
application/pdf - PDF Document  
image/gif - GIF Image  
image/jpeg - JPG Image  
application/excel - CSV Data  
text/html - HTML formatted Data  
text/plain - Preformatted Text
```

Fig. 2

```
FILE.NAME = "/tmp/example.pdf"  
*  
*** Please note, different MultiValue systems will use  
*** something other than "!" to run a Host system  
*** command"  
*  
EXECUTE \!uuencode --base64 \: FILE.NAME :\ base64.tmp  
→ \ CAPTURING ENCODED.ITEM  
*  
*** remove the first and last line  
*  
ENCODED.ITEM = DELETE(ENCODED.ITEM,1)  
ENCODED.ITEM = DELETE(ENCODED.ITEM,DCOUNT(ENCODED.ITEM,  
→ @AM))
```

Fig. 3

The advertisement features a dark background with the text "mvpjp.com" in a large, white, sans-serif font. Below it, in a smaller white font, is "MULTI-VALUE PHANTOM JOB PROCESSOR". A paragraph of text describes the product: "MVPJP Increases the efficiency of your operations by scheduling and automating jobs to be run in the background. It is cost-effective, user friendly, and highly reliable." At the bottom left is a logo for "HANTOM MULTI-VALUE job processor" featuring a stylized figure.



BY MICHAEL COHEN, INTERSYSTEMS

## Accounts, Namespaces, and Databases in Caché

If you are migrating from another MultiValue system to Caché, an introduction to some key terminology differences would be useful.

Like all MultiValue systems, Caché understands the concept of an ACCOUNT. Each ACCOUNT contains a VOC or MD (the terms are used interchangeably). Users can be configured to automatically LOGTO an ACCOUNT when they login, and with permission, LOGTO other accounts. When they LOGTO an ACCOUNT, an optional user or LOGIN script can run.

Except in a few cases where traditional OS files are used, Caché stores most data, such as MultiValue FILES, in OS files named cache.dat. These are referred to as databases, and can hold multiple FILES. Databases automatically expand as needed and very efficiently store data in optimized B-trees.

Users typically access multiple databases simultaneously. For example, Caché ships with a database that contains our system code, another that contains the documentation, and a third for temporary data that may need to be written to disk. Developers typically store their code in one database and user data in another, or a few.

When you first import a MultiValue account into Caché, all data and code for the ACCOUNT are stored in one database (cache.dat). Separating your code and data into distinct databases is highly recommended and will make installation and upgrade of production applications easier. A Namespace is the Caché term for a collection of databases under one name. Using multiple databases this way achieves the same result as Q-pointers without having different ACCOUNTS. Please note that Q-pointers are supported as well. From a MultiValue perspective, a Namespace and an ACCOUNT are synonymous.

Since all database files are named cache.dat, they are distinguished by the folder they live in. The root folder for each Caché installation includes a folder named Mgr that contains our system code. Caché's root folder also contains a configuration file named cache.cpf. Among other things, this file defines where the system and user databases are stored.

Caché has always had a concept similar to MultiValue ACCOUNTs to help developers organize their programs and data. A cache.cpf file can define multiple Namespaces, each defining the system and user databases it references. Namespaces are a logical concept defined in the cache.cpf file.

So each MultiValue ACCOUNT is specified as a Caché Namespace that specifies all the databases for that ACCOUNT. MultiValue applications typically reference multiple ACCOUNTS. This is supported in Caché via Q-pointers and the Caché concept called mapping which can reference code and data from another Namespace/ACCOUNT.

Just as MultiValue users at The Command Line prompt are in an ACCOUNT, Caché users at a Terminal prompt are in a Namespace. When a Caché user types the command "MV" at a Terminal prompt, the MultiValue shell is started in that Namespace.

So for Caché, an ACCOUNT corresponds to a Namespace. The CREATE.ACCOUNT command has added an extra parameter indicating where to create the cache.dat file. **IS**

*Do you have a Tech Tip to share? E-mail it to [editor@intl-spectrum.com](mailto:editor@intl-spectrum.com)*

## 2011 MULTIVALUE INDUSTRY'S END OF YEAR RECAP

Continued from page 8

new Extensible Administration tool and enhancements to automatic data encryption. We are pleased to see the increased adoption of this major release.

- We may get our first iPhone/iPad viewer for U2 DataVu Web Reports and Dashboards by end of November (may be called iVu) (Q4).
- We may/should at least get out an Early Program for U2 DataGen – test data generator (Q4).
- We should get out wIntegrate 6.3 with a new GUI Form Designer that automates the Basic driver code (DEC).

### ***What was the greatest or most exciting thing that happened to your company or product in 2011?***

I would say the most exciting thing at Rocket Software is the company's implementation of its vision for the next chapter of growth, synergy, and creating outstanding results for customers, partners, employees, and shareholders. We are working on a number of initiatives to strengthen the whole business and as a result have seen significant investment in sales, marketing, product management, services, support, and development.

### ***What would you like Spectrum readers to watch for in 2012?***

Exciting new features and products across the portfolio. Major releases of UniData and SBXA; the full release of U2 DataGen; a combined release of U2 DB Tools — all the common Eclipse-based tools. New tools for schema management and improved interoperability enhancements.

Additional offerings from the broad portfolio of other Rocket Software business units. A VERY EXCITING U2 University event! More marketing, better processes, more growth and more fun!

## **SJ+ Systems Associates**

### ***What new features or services did SJ+ Systems Associates introduce in 2011?***

This year, our focus was on making PRC more companionable. PRC is a complete and compliant life-cycle management/IT governance tool, which was written in and for MultiValue environments. It has been refactored to be more platform-independent within MultiValue and to support more plug-ins to tools outside the environment. This makes PRC easier to interface in multiple development environments where other tools and products are involved. Within the MultiValue space this has included the Basic Developer Tool (BDT) from Rocket U2 and Design Bais, as well as multiple user interfaces such as SB/XA with XAML. It has always supported SB+ and a number of other MultiValue development tools and editors. PRC provides its own or can interface with other tools for source control/change control/version control, service request software and project management. PRC also includes a test framework, auto-

mates deployment (with rollback) and provides a wide range of reporting and auditing — all of which have enjoyed great new releases this year.

### ***What was the greatest or most exciting thing that happened to your company or product in 2011?***

Celebrating 20 years! It has been satisfying to dedicate our focus on the development and support of PRC for the past two decades. The world has matured around security and governance in so many aspects of our technology-based lifestyles. Nimbly responding to the requirements that have sprung from that has been both challenging and rewarding.

### ***What would you like Spectrum readers to watch for in 2012?***

More companies are developing in multiple platforms, managing multiple teams, and deploying to multiple locations. PRC will continue to make it easy for the MultiValue side to not only keep up, but to lead the way in overall software management and IT Governance. **IS**

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## SENDING E-MAIL FROM MULTI-VALUE – PART 6: E-MAILS WITH ATTACHMENTS

Continued from page 27

### Putting it together

Now that we know how to encoded attachments, let look at putting it all together. As you can see in figure 4, we have both a Text and HTML section to display your message, and then an attachment with CSV data.

While it looks a little strange at first glance, it really is a simple format to deal with. Just keep in mind that you have to have unique boundary IDs per multipart section, and that you separate your header information and the actual data in each section by a blank line between them (we talked about this in part 1).

By now, you should be able to create a complete e-mail with both Text and HTML body sections and attachments, and then send it to your clients or fellow coworkers. **IS**

```
Content-type: multipart/mixed;
    boundary="68734-812jasj-o871lnl81a_a"

--68734-812jasj-o871lnl81a_a
Content-type: multipart/alternative;
    boundary="68734-812jasj-o871lnl81a"

--68734-812jasj-o871lnl81a
Content-Type: text/plain

Hello, this is plain text

--68734-812jasj-o871lnl81a
content-Type: text/html

<html><body>
<p>Hello, this is Html Text</p>
</body></html>

--68734-812jasj-o871lnl81a--

--68734-812jasj-o871lnl81a_a
content-type: application/octet-stream; name="test.csv"
content-disposition: attachment; filename="test.csv"
content-encoding: 7bit

"Name", "Address", "Dollar"
"Joe", "100 Green Ave", "$100.00"
"Bob", "9 Garden Corner", "$154.00"

--68734-812jasj-o871lnl81a_a--
```

Fig. 4

The logo features the word "Open" in orange, followed by the letters "QM" in a large, bold, blue font.

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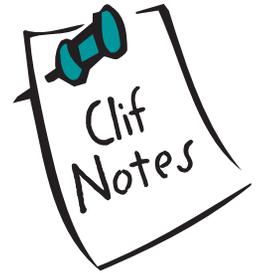
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# The Situation Is Excellent

BY CLIFTON OLIVER



**T**here is an oft quoted saying supposedly from Mao Tse-tung. “There is great chaos under heaven — the situation is excellent.”

I say “supposedly” because I have never actually sourced the reference. So I will have to take other people’s word that he actually said that. (Assuming he did, being a politician, he probably plagiarized it from someone else.) In any case, since I have never been interested enough to actually look it up, I don’t even know the context in which it was uttered. However, I have never seen it used in context anyway. So let’s just take it as it is.

Although not a fan of the Chairman, I have still always appreciated this out-of-context quote. To me, it’s a good soundbite about a positive way to view our sometimes tumultuous Information Services industry. Given what has been in the headlines the last couple of years, the first thing that may come to your mind when you hear the term “chaos” would be the economic roller coaster we have been on. That would certainly fit. But chaos gets a bad rap. Somewhere along the evolution of the language, in most people’s minds, it has come to be synonymous with changes that are almost always bad, hurtful, or destructive. But let’s look at it from a slightly different perspective.

Let’s look for just a moment at a couple of the various definitions of the word “chaos.” Using Merriam-Webster’s Unabridged Dictionary, you’ll see that one of the obsolete definitions equates it to “abyss.” If you follow up by checking the definition of that word, you see phrases like “bottomless pit,” or “place of punishment of the wicked.” And “Hell.” Is it any wonder that when someone says “It’s absolute chaos around here,” it is meant as a negative comment?

But if you keep reading, you find in more modern definitions the tone has tended to mellow. My favorite is, “a state of things in which chance is supreme.” To my mind, that is a pretty succinct definition of Life. Complexity and chaos

go hand-in-hand. Do you enjoy sitting on a sunny beach, sipping an adult beverage, and feeling cool ocean breezes ripple across your skin? You are benefiting from a chaotic system called “Weather.” Hoping to find a new fishing hole in that favorite stream of yours? Flowing water and erosion is a complex system governed by chaos.

Of course, the results of chaos are not always positive. Weather systems can produce destructive storms as well as soft island breezes. Too much chaotic water in the form of floods can lead to loss of life, property, and the decimation of that burbling trout stream you used to enjoy.

So chaos presents us with both positive and negative aspects. But you can’t have one without the other. We can, however, choose how we are going to react to what chaos hands to us. I think that is that “Free Will” thing people talk about.

So when I hear the quote, “There is chaos under heaven — the situation is excellent,” it reminds me that things are always changing. And it is when things are changing that opportunities arise. Whether the changes in question are downturns, upturns, or sputtering of the economy, or paradigm shifts within the Information Services industry such as cloud computing, mobile computing, breakthrough applications, etc., new opportunities are presenting themselves continuously. Take a look at the end-of-year recap article in this issue for some examples of people grabbing opportunities that were presented to them in 2011.

So as we all go into this holiday season, let’s keep in mind that a lot of the changes we are seeing in our MultiValue marketplace might not really be problems that have to be overcome. Some of them might actually be opportunity gifts in disguise.

Although I will admit, I have at times been given some gifts in pretty funky wrapping paper. IS



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