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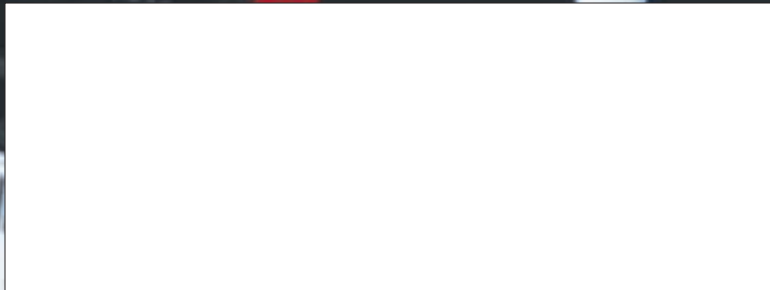
**TUG's own  
Beverly Russell  
Elected  
President  
of COMMON**

**November 17  
TUG MoM:  
Guy Vig, on  
V5R3 Control  
Language**



# *Highlights of the Fall '04 COMMON Conference in Toronto*

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TUG eServer magazine

is a regular publication of the Toronto Users Group for Midrange Systems (TUG), and is distributed to members and industry associates six times per year. It contains updates on activities of the group, as well as articles from members and non-members, which are of general interest to the "eServer community." All rights reserved. Articles may be reprinted only with permission. Manuscripts should be submitted to the Editor via email. (See address below.)

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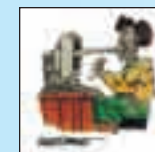
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# President's Corner

By *Léo Lefebvre*,  
President, Toronto Users Group for Midrange Systems

Here we are, a few days after the Fall 2004 COMMON Conference. As you know, this one was presented in Toronto, after an absence of sixteen years.

How does TUG relate to COMMON? Comparing TEC with a COMMON Conference would be like comparing a professional hockey team (like the Toronto Maple Leafs) with a Junior A hockey team. Both are presenting an excellent game of hockey for a different audience. The games are similar but the backup team is quite different. TEC presents six tracks during two days, COMMON about 30 each of the 4 regular days of sessions (not counting the Sunday events at COMMON). TEC relies on about 12 volunteers, COMMON has a multitude of volunteers (over 300) plus about fifteen people on staff. TEC is presented once a year, COMMON twice. TEC will have between 200 - 300 attendees, mostly from the Greater Toronto Area. The current attendance at COMMON is about 2,000 people (per conference) from all over North America. So, for TUG people, COMMON is like the model to follow.

The COMMON Conference promised to be a great place for TUG to promote



its own TEC. And TUG did not miss the occasion. TUG was all over the place, especially with the “flashing butterflies!” They were everywhere and they were the “talk of the town.”

TUG was the main “occupant” of the LUG booth (LUG = Local Users Groups) and TUG set a new standard in running a LUG booth at COMMON. At previous conferences the LUG booth was simply a table with two back panels and a couple of maps (a map of the USA and a map of the world) and one or two people to greet the visitors. With TUG, the LUG area had two tables, the same two back panels plus a complete pop-up booth! Most of the time, the place was staffed with two people and quite often three or four. Normally, the LUG booth barely opens during the COMMON Expo hours (i.e., two and half days.) TUG opened the booth early Sunday morning and kept it open until the end of the conference on Thursday afternoon. If you were at the conference, you could not miss the TUG booth. It was right at the center of the place and quite visible. Four volunteers were the core group of greeters: **Wende Boddy**, **Ed Jowett**, **Vaughn Dragland**, and **Glenn Gundermann**. Many others came to help – too many to enumerate. Along with TUG, two other area Users Groups were present at the booth: COiN (Central Ontario iSeries Network – Kitchener, ON) and MUGWNY (Midrange Users Group of Western New York – Buffalo).

What should we think of COMMON? To all of the Local Users Groups like TUG, COiN, MUGWNY and others, COMMON is a big brother, an example to follow, and a source ideas when needed. Many of the COMMON features have been replicated and adapted to local needs. Even TEC has borrowed ideas from COMMON. Many times we



*Léo Lefebvre*

refer to TEC as being a mini-COMMON (mind that once in a while we would like to call COMMON a TEC on steroids.) For LUGs, COMMON can also be a testing ground for speakers and topics. We check them out at COMMON: if the topic is popular, it should be a good topic to present at LUG meetings. Many good things can be said about COMMON but I would need lot more space. Let's just leave it here for now.

Unfortunately (or fortunately for our own TEC) it is unlikely that COMMON will be back in our territory in the foreseeable future. There are too many elements against a quick comeback. If you would like to discuss that, e-mail me at [leo@tug.ca](mailto:leo@tug.ca).

The coming of COMMON to Toronto was also marked by an unprecedented event. Two years ago, when I presented **Beverly Russell** to the TUG members as a newly elected COMMON board member, I challenged her to be the COMMON President when COMMON comes to Toronto. The good news is: she did it! Congratulations Beverly! The TUG Board and I, as well as the whole TUG membership are behind you. I knew you could do it! Bev is the second woman to be President of COMMON and the first Canadian ever!

As we close the book fondly on the events of October 2004, we now turn our eyes to the November MoM (once again at Woodbine) and an exciting year ahead in 2005...



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# – TUG MoM Review –

## The September 2004 Meeting of Members

By Stephen Bingham

Here we are at the start of another year for the Toronto User Group. Our twentieth year! The venue for the first meeting of the year was the IBM Toronto Software Lab. Early arrivals were treated to a tour of the IBM facilities. For those of you who have not had the opportunity to visit the lab, it is a place where long hours and hard work converge with an atmosphere of relaxation and harmony.

There are several theme areas in the lab, including a cottage setting. Perfect for those who are working to meet target dates and can't get away for the weekend. Just leave the cubicle behind and head down to the lounge, where the rustic atmosphere of cottage life can overtake the senses, while the wireless network and the IBM ThinkPad provide everything you need to get the job done. It's the best of both worlds, without the commute.

The first of our three speakers of the night was **Claus Weiss**, who polled the audience on who was using Remote System Explorer. Only a few hands went up. When he asked why people were not using it, the responses were: "selling it to management," "the learning curve," "installation problems," and "perceived security concerns." Claus pointed out that the learning curve for most programmers to move away from PDM into RSE and be back up to normal productivity would be approximately two weeks.



*Claus Weiss*

Our second speaker of the evening was **Peter Beggs** on IBM Business Integration. To start things off Peter ran one of IBM's classic commercials. The IT guys were showing the boss the new web site design and were all hyped up on the cool graphics. The boss then asked them if they could link all the business processes together to improve the customer experience and of course save the company money. They responded that they did not know how to do that. The boss was asking for Business Integration – the ability for applications to talk to each other so that all business processes can be linked together.



*Stephen Bingham*



Photos by Léo Lefebvre

TUG's new booth made its debut next to the moose at the IBM Toronto Lab.



Peter Beggs

In the IBM process, there are six capabilities to consider:

1. **Model:** How is the work done today? What are the costs, time and resources associated with the model? If we make a change to the process, what will happen? To illustrate, Peter walked us through a simulation of a business model using the WebSphere Business Integration Modeler.
2. **Transform:** An example of this is making your green screen applications available as HTML through a web browser.
3. **Integrate:** The business process model is created as a set of tasks. These tasks may be automated or performed manually. It is up to the IT department to put the tools in place to make the model execute.
4. **Interact:** The business process model may have several interactions. These will range from application

to application, to human intervention. Other examples will be waiting on a fax or e-mail verification.

5. **Manage:** The business and IT need to be able to look into the process and determine what and how to best optimize it.
6. **Accelerate:** Whenever possible use off-the-shelf products, or products that are easily customizable. There is no need to re-invent the wheel.



All of these capabilities are brought together via the Enterprise Service Bus. The ESB provides the capability to move information from one point to another.

## The 5th Wave

By Rich Tennant



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After the break, our President **Léo Lefebvre** addressed the group. He talked about our presence at COMMON which will be held prior to you reading this article. As one of the local user groups, we will be joined by COiN and the Western New York Midrange User Group in presenting **Skip Marchesani**.

As you may know, three board members have chosen to retire from the board. **Ed Jowett**, who has served 15 years, and held the positions of Secretary and Treasurer, will continue to be an active member of TEC committee. **Beverly Russell** who was most recently the treasurer of TUG, but has also served as President and Vice-President, is also a director of the COMMON users group. **Neil Andrus**, a co-founder and former President of TUG was unable to be with us for the evening. In addition we also have had a change in our IBM Liaison. **Dale Perkins** who has been our conduit into IBM for the past three years has been re-assigned. Our new IBM Liaison is **Stephen Quan**. A special "Thank you"

was given to these four individuals for all their time, effort and dedication over the years.

**Glenn Gundermann** took the stage to talk about TEC 2005. Mark your calendars for April 19<sup>th</sup> and 20<sup>th</sup>. Once again this year we are planning to have lab sessions the IBM Software Lab, as well as introduce testing for IBM certification.

After the break, **Mark Buchner** of ASTECH Solutions Inc. (our final speaker of the evening) took the stage to talk to us about the Enterprise Application Modernization process. The EAM process has 5 major components. Mark equated modernizing your applications to a home renovation project.

The first thing you want to do is an **Assessment** of your home. Determine how much money you have, and how the renovation will affect the net value of your home. In the IT world, we are more likely to be upgrading applications or the network as opposed to laying down carpet or putting on a fresh coat of paint. Before you begin you need a complete and honest appraisal of your assets. These assets can include your current network infrastructure, system architecture, IT staff and their skill sets.

The next component is **Requirements**. What are you looking for at the end of this renovation? Increased security? Usability? System performance or



Photos by Léo Lefebvre


### **Mark Buchner**

a new improved Business Process? This brings us to the third component: **Solutions**. In the example Mark used, we need to determine who will be accessing our system: employee's, partners or customers via the Internet?

There are several solutions available to help complete this task, but we need to refer back to our assets and determine what we have available to us. These include: iSeries Access for Web, HATS, Web Facing, and Java.

When choosing the tool, you need to consider the skills required, licensing fees and any requirements for 5250

cycles. The fourth and fifth components are **Infrastructure** and **Tools**. The infrastructure component includes your hardware, possibly a new i5, using micro-partitioning or a virtual LAN. Will you be using LINUX in your environment? Remote System Explorer is an example of a tool that may be required to complete this renovation and maintain it in the years to come.

Do you have any suggestions for future topics for the meeting of members or TEC. Drop us a line at [leo@tug.ca](mailto:leo@tug.ca). We want to hear from you. See you at the Woodbine Racetrack in November! 

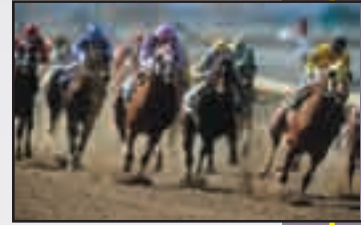




# THE AGENDA for our next Meeting of Members

## Wednesday, November 17, 2004

**LOCATION: Woodbine Racetrack  
(Highway 427 & Rexdale Blvd.)**



**TOPIC: CL Enhancements in V5R3**  
**SPEAKER: Guy Vig, IBM Systems Group**



**Biography:** Guy Vig is a senior software engineer with IBM Systems Group and has worked in Rochester, Minnesota and Toronto, Ontario on various parts of the operating system and compiler products for System/38, AS/400, and iSeries since joining IBM in 1978. Since 1992, he was a member of the software Design Control Group (DCG) for AS/400 and iSeries. As a member, and later the leader, of the DCG team, his areas of responsibility have included new and changed CL commands and software release-to-release compatibility. For V5R1, he coordinated the addition of two graphical user interface (GUI) CL command prompters, one in iSeries Navigator and the other in iSeries Access for Web. As the "CL Architect", he has worked on revitalizing the CL language on iSeries. Guy can be reached at [gwvig@us.ibm.com](mailto:gwvig@us.ibm.com).

### 5:00pm: Session 1 – Command Documentation

**Abstract:** iSeries customers have a variety of sources for command documentation, including online command help and the command documentation formats used in the iSeries Information Center. For V5R3, there were a number of changes which have improved the quality, consistency, and usability of CL command documentation for IBM's 2000+ CL commands. This presentation will explain why the changes were made, and the resulting benefits to both

iSeries customers and IBM. CL programmers and CL users will learn:

1. About IBM's investment in developing GUI CL prompters in V5R1 (there's a connection here, trust me).
2. Problems IBM faced in delivering all the forms of CL command documentation.
3. How the V5R3 solution represents a WIN-WIN for both iSeries customers and IBM.
4. Why the solution is of particular interest to programmers that create their own CL commands



### 6:00 pm Intermission TUG Meeting of Members (MoM)

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### 7:00pm: Session 2 – Control Language Compiler

**Abstract:** iSeries customers have been asking for a long time for extensive CL enhancements, and IBM has finally listened. This presentation will explain the enhancements delivered in V5R3 and how you can use them in your CL application programs. In addition, there will be a preview of CL compiler enhancements being considered for future releases of the operating system. Come and see what's new with CL; you might be surprised! CL programmers will learn:

1. About IBM's continued invest in CL commands in general.
2. Details on all the V5R3 enhancements to the CL commands which are part of the CL compiler.
3. How these enhancements will making CL programs easier to write and easier to maintain.
4. What IBM is doing to increase the speed of adoption of V5R3 CL compiler enhancements.

**What topics would you like to see in future? Drop us a line with your suggestions at: [leo@tug.ca](mailto:leo@tug.ca)**



# V5R3 Control Language

## STUNNING DEVELOPMENTS

By Dan Riehl and Guy Vig

In V5R3, IBM added 57 new CL commands and changed more than 240 commands. This isn't extraordinary because IBM enhances the set of CL commands every release. The big news is that some of the new and changed commands provide CL compiler features that CL application developers have been clamoring to see for many years. So let's look at the really cool CL stuff in V5R3.

### New Integer Data Types

It has always been a pain to call IBM APIs from CL programs or to use CL programs as exit programs to IBM functions because almost all the APIs and exit program routines use binary integer parameters. You can use the built-in function %BIN to load numbers into character \*CHAR variables and employ the \*CHAR variables as replacements for binary integer parameters. Though this technique works, it's always been a clumsy patch.

V5R3 solves that problem with two new binary data types: signed and unsigned integers, which can be either two or four bytes in length. So now your DCL (Declare CL Variable) statements can include the new binary data types \*INT and \*UINT, as **Figure 1** shows.

### Structured Programming Enhancements

One of CL's weak points has always been its lack of structured operations. You were limited to IF, ELSE, and GOTO. V5R3 finally brings CL program control flow close to what you can do in other languages by providing five new commands: DOWHILE, DOUNTIL, DOFOR, LEAVE, and ITERATE. **DOWHILE (test before loop).** **Figure 2** shows the command syntax for the DOWHILE command. The DOWHILE COND parameter has the same rules as those for the IF command's COND parameter. Though you can specify up to 25 nesting levels, the effective nesting level probably should not exceed five or six. Excessive nesting makes code difficult to read, write, and debug. To end the DOWHILE processing, you use an ENDDO command:

```
DCL  VAR(&EOF)  TYPE(*LGL)  VALUE('0')
RCVF
MONMSG CPF0864 EXEC(CHGVAR  &EOF  '1')
DOWHILE  COND(*NOT &EOF)
    IF  (*NOT &EOF) DO
        ... do some commands
    ENDDO
RCVF
MONMSG CPF0864 EXEC(CHGVAR  &EOF  '1')
ENDDO
```

**DOUNTIL (test after loop).** **Figure 3** shows the command syntax for the DOUNTIL command. The key difference between DOWHILE and DOUNTIL is when the testing of the loop condition occurs. DOWHILE performs the test before the commands are executed; DOUNTIL tests after the commands are executed. So the commands within a DOUNTIL loop will

always be executed at least once. Another difference is that DOUNTIL will continue looping so long as the loop condition evaluates as logically false, whereas DOWHILE will keep looping while the loop condition evaluates as logically true. Following is an example of a DOUNTIL command structure:

```
DCL  VAR(&EOF)  TYPE(*LGL)  VALUE('0')
DOUNTIL  COND(&EOF)
    RCVF
    MONMSG CPF0864 EXEC(CHGVAR  &EOF  '1')
    IF  (*NOT &EOF) DO
        ... do some commands
    ENDDO
ENDDO
```

**DOFOR.** **Figure 4** shows the command syntax for the DOFOR command. The DOFOR command has three required parameters — VAR, FROM and TO — and an optional parameter — BY — which defaults to +1. As the example in **Figure 5A** shows, the DOFOR loop will be performed 100 times. The variable &Counter will be set to the current iteration index, which is incremented by +1 on each iteration. The ENDDO command ends a DOFOR loop. The DOFOR loop in **Figure 5B** will be performed 10 times. The &Counter variable will start at 10 and will count down by -1 until &Counter is less than 1. **Figure 5C** shows that the DOFOR loop will use variables to set the FROM and TO values. These variables must be declared with \*INT or \*UINT specified for the TYPE parameter.

**LEAVE.** **Figure 6** shows the command syntax for the LEAVE command. The LEAVE command interrupts the loop processing of DOWHILE, DOUNTIL, or DOFOR. You may supply an optional label name, in which case, processing continues with the command following the ENDDO associated with the DOWHILE, DOUNTIL, or DOFOR command at the specified label name. In the following example, the DOFOR loop will be interrupted if variable &Check contains all blank characters, and control will pass to the command following the ENDDO command:

```
DCL  VAR(&Counter) TYPE(*INT) LEN(2)
DCL  VAR(&Check)  TYPE(*CHAR) LEN(10)
DOFOR  VAR(&Counter) FROM(1) TO(10)
    ... some commands here...
    IF  COND(&Check = ' ') THEN(LEAVE)
    ...some CL commands here...
ENDDO
```

Figure 1: Example DCL statement with new signed and unsigned integers

```
DCL &Offset TYPE(*UINT) /* Unsigned 4-byte binary integer */
DCL &Offset TYPE(*UINT) LEN(2) /* Unsigned 2-byte binary integer */
DCL &Length TYPE(*INT) /* Signed 4-byte binary integer */
DCL &Length TYPE(*INT) LEN(2) /* Signed 2-byte binary integer */
```

Figure 2: DOWHILE command syntax

```
DOWHILE COND(Logical variable or Logical expression)
```

Figure 3: DOUNTIL command syntax

```
DOUNTIL COND(Logical variable or Logical expression)
```

Figure 4: DOFOR command syntax

```
DOFOR VAR(Integer variable) +
      FROM(Integer constant, variable, or expression) +
      TO(Integer constant, variable, or expression) +
      BY(Integer constant)
```

Figure 5A: DOFOR loop set to perform 100 times

```
DCL VAR(&Counter) TYPE(*INT) LEN(2)
DOFOR VAR(&Counter) FROM(1) TO(100)
... some CL commands
ENDDO
```

Figure 5B: DOFOR loop set to perform 10 times

```
DCL VAR(&Counter) TYPE(*INT) LEN(2)
DOFOR VAR(&Counter) FROM(10) TO(1) BY(-1)
... some CL commands
ENDDO
```

Figure 5C: FROM and TO values set in DOFOR loop

```
DCL VAR(&Counter) TYPE(*INT) LEN(2)
DCL VAR(&Bottom) TYPE(*INT) LEN(2)
DCL VAR(&Top) TYPE(*INT) LEN(2)

DOFOR VAR(&Counter) FROM(&Bottom) TO(&Top) BY(1)
... some CL commands
ENDDO
```

Figure 6: LEAVE command syntax

```
LEAVE CMDLBL(Label Name)
```

Figure 7: Specifying the nesting level to return to

```
DCL VAR(&Counter) TYPE(*INT) LEN(2)
TEST1: DOFOR VAR(&Counter) FROM(1) TO(10) BY(2)
... some CL commands here
TEST2: DOWHILE COND(*NOT &EOF)
... some CL commands here
      IF COND(&Check = ' ') THEN(LEAVE CMDLBL(TEST1))
... some CL commands here
      ENDDO
... some CL commands here
      ENDDO
Next1:
```

Figure 8: ITERATE command syntax

```
ITERATE CMDLBL(Label Name)
```

Figure 9: Specifying the DO loop to which ITERATE applies

```
TEST1: DOFOR VAR(&Counter) FROM(1) TO(10) BY(2)
... some CL commands here
TEST2: DOWHILE COND(*NOT &EOF)
... some CL commands here
      IF COND(&Check = ' ') THEN(ITERATE CMDLBL(TEST1) )
... some CL commands here
      ENDDO
... some CL commands here
      ENDDO
```

If you use nesting, you can specify the label name to indicate which nesting level to return to. In **Figure 7**, control passes to the command following the ENDDO command that's paired with the DOFOR command at label TEST1, which in effect, passes control to label Next1.

**ITERATE.** **Figure 8** shows the command syntax for the ITERATE command. The ITERATE command causes a quick exit from the loop processing of DOWHILE, DOUNTIL, or DOFOR. You may supply an optional label name, in which case, processing continues with the ENDDO command associated with the DOWHILE, DOUNTIL, or DOFOR command at the specified label name. In the following example, if variable &Check contains all blank characters, control passes to the ENDDO command, and the loop is performed again unless the limit has been reached:

```
DOFOR VAR(&Counter) FROM(1) TO(10)
... some commands here...
IF COND(&Check = ' ')
THEN(ITERATE)
...some CL commands here...
ENDDO
```

If you use nesting, you can specify the label name to indicate which DO loop the ITERATE command applies to. In **Figure 9**, control passes to the ENDDO command that's paired with the DOFOR command at label TEST1. If the DOFOR limit value has not been reached, the loop is executed again.

**SELECT /WHEN /OTHERWISE.** The SELECT command allows for a case structure that evaluates several conditions and performs several dependent actions (**Figure 10**). The SELECT command has no parameters. Each WHEN command defines a condition that's tested within a SELECT structure. If the first WHEN condition is true, the command associated with the WHEN command is performed (which may be a group of commands if the command associated with WHEN is a DO command), and control is passed to the command that follows ENDSELECT. If the first WHEN condition is not true, each successive WHEN command is checked until one is found that has a condition that's true or the last WHEN command in the SELECT structure has been checked. If a WHEN command is

# Talk with the CL Architect

## CL Enhancements

- Ask About V5R3 Enhancements
- Discuss Future Enhancements
- Try New CL Documentation Tools



Photo by Léo Lefebvre

*Guy Vig at the IBM booth, during the Fall 2004 COMMON Expo, Metro Toronto Convention Centre*

checked and has a condition that's true, and no command is specified (a null THEN), control is passed to the command that follows ENDSELECT. The OTHERWISE command specifies the action to take if no WHEN condition is true. OTHERWISE isn't required in a SELECT structure.

### Support for Multiple Files

In the past, CL allowed only one DCLF (Declare File) command within a program. With V5R3, you can now specify up to five DCLF commands within a program, effectively increasing the number of files that can be processed in a CL program to five. When you process more than one file, specify the optional OPNID (Open file identifier) parameter, as **Figure 11** shows. Each OPNID must be unique within the program. If the MYDISPLAY file contains a field named CUSTNAME, the field &CUSTNAME is automatically declared in the CL program, just as it has always been. If the file CUSTFILE contains the field CUSTNAME, it will be declared in the CL program as &CUST\_CUSTNAME.

The field name is always prefixed by the OPNID name followed by an underscore. The CL variables that DCLF generates can be up to 22 characters long, but CL variables declared using the DCL command are still restricted to 11 characters (10 characters plus the leading ampersand). So, to move the database field to the display field, the command is:

```
CHGVAR    &CUSTNAME    &CUST_CUSTNAME
```

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## Larger \*CHAR Variables

The maximum size of character variables in a CL program has been 9,999 bytes. V5R3 raises that limit to 32,767 bytes. However, the DCLF command will only declare character variables for fields up to only 9,999 bytes. If an initial value is assigned to a character field, the maximum length of the initial value continues to be 3,000 characters.

## More Parameters

Before V5R3, the limit of incoming parameters allowed on the PGM (Program) and TFRCTL (Transfer Control) commands was 40, and the limit for outgoing parameters on the CALL (Call Program) command was 99. Under V5R3, the new limit for the PGM, CALL, and TFRCTL commands is raised to 255 parameters.

## Pass Parameters by Value

You can now pass parameters by reference or by value on command CALLPRC (Call Procedure). In the past, parameters had to be passed by reference, in effect, passing a pointer to the variable storage area. Here's an example of passing a parameter by value:

```
DCL VAR(&ITEM) TYPE(*CHAR) LEN(50)
DCL VAR(&PRICE) TYPE(*DEC) LEN(10 2)
DCL VAR(&RTNCODE) TYPE(*INT) LEN(4)

CALLPRC PRC(GET_PRICE) +
        PARM((&ITEM *BYVAL) (&PRICE)) +
        RTNVAL(&RTNCODE)
```

Figure 10: SELECT command structure

```
DCL VAR(&Option) TYPE(*INT) LEN(2)

SELECT
  WHEN COND(&Option = 1) /* Do nothing */
  WHEN COND(&Option = 2) THEN(CALL GLMAST)
  WHEN COND(&Option = 3) THEN(DO)
  ... some CL commands here
  ENDDO
OTHERWISE CMD(SNDPGMSG MSG('INVALID OPTION'))
ENDSELECT
```

Figure 11: Specifying the OPNID parameter

```
DCLF MYDISPLAY /* Optionally you can specify OPNID(*NONE) */
DCLF CUSTFILE OPNID(CUST)

RCVF OPNID(CUST)
MONMSG CPF0864 EXEC(GOTO EOF)

CHGVAR &CUSTNAME &CUST_CUSTNAME

SNDRCVF /* when no OPNID is specified, */
        /* the file using *NONE as the OPNID is processed.*/
        /* In this case, that file is MYDISPLAY. */
```

Figure 12: Generating UIM markup language for MYCOMMAND

```
GENCMDDOC CMD(MYCOMMAND)
          TODIR('/QSYS.LIB/MYDOCS.LIB/QPNLSRC.FILE')
          TOSTMF('MYCOMMAND.MBR') GENOPT(*UIM)
```

In this example, a copy of the value in variable &ITEM is passed to the GET\_PRICE procedure. A pointer to variable &PRICE is also passed, which will allow the GET\_PRICE procedure to change the value stored in the &PRICE variable. The maximum number of parameters that can be passed on CALLPRC remains at 300.

## Help Text Generator for User-Written Commands

How many of your custom-written CL commands have online help? IBM-supplied commands all have online help, and your commands can have the same type of online help text that IBM provides.

*iSeries NEWS* has published many articles over the years that address the creation of User Interface Manager (UIM) help text for display files and CL commands. But most folks who write their own CL commands don't take the time to add online help because it's been a pain to learn and write the UIM markup language for the help text.

In V5R3, you can use a new tool not only to help provide help text for your own commands, but also to generate HTML command documentation using the online help text for your own commands or IBM-supplied commands. The new CL command GENCMDDOC (Generate Command Documentation) can generate UIM markup language source code or HTML source code. The following command will generate an HTML file containing complete documentation for the IBM command CRTDTAARA (Create Data Area):

```
GENCMDDOC CMD(QSYS/CRTDTAARA)
```

If you specify to use the command defaults, the generated HTML file will be stored in a stream file named QSYS\_CRTDTAARA.html in the current working directory of the job.

The GENCMDDOC command in **Figure 12** will generate the UIM markup language for MYCOMMAND. The UIM source code will be stored in source file MYDOCS/QPNLSRC in member MYCOMMAND.

The help text that the command generates won't have the textual descriptions or much of the textual content of the full help document. But you will get all the UIM tags for the help sections, including command-level help, help for each parameter with

default values and special values, help for command examples, and help for the error messages that a user could monitor for.

Now all you need to do is edit the generated UIM, create the command help panel group by running the CRTPNLGRP (Create Panel Group) command, and re-create your command specifying the HLPID (Help identifier) and HLPPNLGRP (Help panel group) parameters to associate your command with your online help panel group.

The GENCMDDOC command is a byproduct of IBM's work effort in V5R3 to provide better accessibility and navigation for CL command documentation in the iSeries Information Center. GENCMDDOC provides a simpler-to-use interface to the Java CommandHelpRetriever class, which is part of the Java Toolbox support included with OS/400.

The Java Toolbox code uses XML and eXtensible Stylesheet Language Transformations (XSLT) to generate the HTML or UIM output.

### Using the New Features Sooner

The rule of thumb has always been that you can't take advantage of CL functions added in the newest release if you plan to take your compiled CL objects back to an earlier release. However, V5R3 is *not* a "business as usual" release for the CL compiler.


The folks in Rochester are aware that customers won't be able to move all their systems to V5R3 at once and, therefore, might have to defer using the new CL compiler features for a year or more, depending on the size of the customer's enterprise.

The Rochester team is working on a set of PTFs to enable users to employ the new CL functions (except for multiple files and the GENCMDDOC command) in CL source code compiled on a V5R3 system specifying a target release of V5R2M0.

At the time this article went to press, the V5R3 PTF numbers were SI13505, SI13508, and SI13509. Two V5R2 PTFs, SI13416 and SI13417, provide fixes needed to the CL runtime to handle the new features. The V5R2 PTFs will *not* let you compile CL source code that includes the new features on a V5R2 system. You must do the compile on a V5R3 system specifying TGTRLS(V5R2M0) or TGTRLS(\*PRV), save the CL objects specifying TGTRLS(V5R2M0) or TGTRLS(\*PRV), and restore the objects on a V5R2 system that has the V5R2 PTFs applied.

### Where Do We Go from Here?

More CL enhancements are planned for future releases, which may include subroutines, more data types (including pointers), more built-in functions, and some form of data structures. The goal is to make CL a multipurpose scripting language capable of accessing all IBM

APIs, including both program-level and procedure-level APIs, which other ILE languages, such as ILE RPG IV and ILE C, can call today. 

**Dan Riehl** is an iSeries NEWS technical editor, as well as president of and an instructor at The 400 School ([www.400school.com](http://www.400school.com)). You can e-mail Dan at [driehl@400school.com](mailto:driehl@400school.com).

**Guy Vig** is a senior software engineer with IBM Systems Group. He has worked in Rochester, Minnesota, and Toronto, Ontario, on various parts of the operating system and compiler products for System/38, AS/400, and iSeries since joining IBM in 1978. As the "CL Architect," he has worked on revitalizing the CL language on iSeries. You can e-mail Guy at [gwvig@us.ibm.com](mailto:gwvig@us.ibm.com).

Reprinted from an article which appeared in the July 2004 issue of iSeries News magazine.



The advertisement features the 'sofCast' logo with a colorful starburst above the 'a' in 'Cast'. Below the logo is the text 'powered by Decentrix'. To the right of the logo is the tagline 'Internet Business Simplified'. Below this is a screenshot of a web browser interface with four buttons: 'Design', 'Edit', 'Preview', and 'Publish'. The main content area of the browser displays text about sofCast Inc.'s service, a list of features, and contact information. At the bottom of the browser window is the URL 'www.sofCast.com'. Below the browser window is the Eclipse Technologies Inc. logo and text: 'Eclipse Technologies Inc. authorized representative 1-877-644-4482'.

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# Project Management Tales – No Time to Plan, Busy Coding

By *Debbie Gallagher*

*Each story in this series of Project Management Tales is true, but company names have been changed. Some stories occurred in Canada and others took place in the US and overseas.*



*Debbie Gallagher*

## Background

Acme Corporation was a mid-size retailer with offices in Canada and in France. They had two legacy systems, one in each country. Acme decided to replace both legacy systems with one common ERP system, including all financial and distribution modules.

## The Situation

Early in the project, a programmer in France was assigned to develop data conversion programs to load data from the two old systems into the new system. The programmer was fairly knowledgeable about the French legacy system but not familiar with the Canadian system or the new ERP system. In addition, although the programmer's experience with the French legacy system provided her with a reasonably good knowledge of the business and its system requirements, she had no experience with managing a project.

Several members of the implementation team expressed their concerns to the project manager. Surely the one programmer would not have time to plan and develop all of the conversion programs needed from both legacy systems. The project manager was not worried. The programmer had always got assigned tasks done in the past, and surely it wouldn't be a problem to code a couple of conversion programs.

## Action Taken

After several weeks, there was no visible action from the programmer and the other team members decided to get the process under way. The functional team leader for the Purchasing and Accounts Payable modules called a meeting to

discuss data conversion requirements for vendor master and purchase orders. The functional team leader for Sales and Accounts Receivable called a meeting to discuss conversion requirements for sales orders, pricing, and customer master. The programmer took some notes at these meetings and went away to start coding extracts from the French legacy system. She did not provide any confirmation to the team members about what would be delivered. In addition, she spent no time working on extraction of data from the Canadian system.

The team members continued to question the project manager about how the data conversion was going to get done. After a few more weeks, the project manager assigned a second programmer to write the data conversion programs for the Canadian data. The two programmers had no shared design to ensure that the separate work done for the two legacy systems would have similar results in the new ERP system.

The team members kept voicing their concerns to the project manager, that the data conversion was not well planned, that there might not be consistency in the data from the two countries and that the conversion might not be done on time. The project manager saw no need for the programmers to stop their programming responsibilities to create a plan.

At the project status meetings, it became clear that the team members and the programmers had different ideas about what was being delivered. As a result, additional meetings were held and the programmers took notes on additional files to be converted. When data was loaded into the new system for test-



ing, the team members were shocked at how many fields were missing or incorrect. The team members again approached the project manager with their concerns about the data conversion and whether it would be on time and of acceptable quality.

The project manager still thought it didn't make sense to stop and coordinate efforts between the two countries or to create a project plan at this late date. He decided that the programmers were too busy coding to be planning.

## Epilogue

When the go-live date was less than a month away, the system implementation was going according to plan, but the data conversion work was significantly behind, and the project manager started to worry.

Fortunately, the project manager was directed by the steering committee to delay the project go-live date by three months. Acme was acquiring another company and the system implementation would be delayed for a few months to allow Acme to focus on store amalgamations and training the new employees on Acme's way of selling products. The project manager was very relieved. He did not have to be the one to defer the go-live date due to a late and unsuitable data conversion.


## Conclusion

The project manager made an invalid assumption right from the start and kept to it even despite evidence that proved him wrong. He thought that since the French programmer had always got the

job done when given assigned tasks that she would also be able to deliver when the project needed to be defined, planned and managed. Project management was not a skill the programmer had developed yet and the assumption was therefore unfair.

In addition, although the project manager monitored the progress of the implementation project very carefully, he didn't pay much attention to the scope, resourcing and delivery of the data conversion. His mistake was to assume that data conversion was a small and easy task, compared to the ERP implementation. If he had ensured that a scope was defined and a plan was developed at the start, he would have known the extent of the work to be done.

The effort to define the scope and coordinate the efforts of the two countries would not have been a waste of time. Except for the company's timely acquisition of a competitor, the project manager would have faced an embarrassing and costly project delay, due to his reluctance to define and plan the data conversion. Unfortunately, both programmers seemed to be uncomfortable with asking for help. They would have been wise to insist to the project manager that they needed another resource assigned to them to do (or assist with) the planning and coordination of the two countries' requirements.

If the project manager wanted the programmers to develop management skills, it would have been useful to provide guidance for the programmers on how to plan and manage the work. 

**Debbie Gallagher** is a Manager at Deloitte, Toronto. She can be reached at (416) 643-8767 or [dgallagher@deloitte.ca](mailto:dgallagher@deloitte.ca).

[Debbie's previous "Project Management Tales" are available on her personal web site: [www.gallaghers.ca/debbie](http://www.gallaghers.ca/debbie).]

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# PLAN TO ATTEND TEC 2005

*By Dan Duffy*

“If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people.”

– Ancient Chinese Proverb (and something every boss should know!)



The purpose of this article is to encourage you to attend the TUG Technical Conference on April 19 & 20, 2005. In order to help you do so I have included a sample letter that you can use to further that goal. Please feel free to use it verbatim or edit it to make it more pertinent to your particular situation. If you would like a softcopy of the letter please e-mail Wende at the TUG office: [admin@tug.ca](mailto:admin@tug.ca) and she will send you one.



Dear \_\_\_\_\_,

I would like to attend the Toronto Users Group for Midrange Systems' (TUG's) 2005 Spring Technical Education Conference in Richmond Hill on April 19 & 20, 2005. TUG is the local users group for the IBM iSeries and the largest of its kind in North America.

There are a number of reasons I'd like to attend. Here are a few:

1. Keeping up with our core technology: The only constant in technology is change. The iSeries platform is no exception. While we may or may not make use of every new feature of the iSeries, such as multiple operating system environments, logical partitioning, dynamic resource allocation, and integrated Intel environments; it's important to know how they work and where they fit within our IT strategy. In addition I will have the opportunity to gather information on the latest in third-party products and enhancements for the iSeries at the vendor showcase that is held as part of the conference. I can give you or any of our staff an update when I return.
2. Learning from the experts. Enhancing what we already have: I believe we are using our iSeries to its fullest. Because it gathers almost all of the iSeries industry experts from around North America in one location the TUG Technical Conference allows me to check and make sure. It is a rare opportunity to discuss our company specific issues with the best in the business.
3. Networking: Over the course of two days I will network with my iSeries colleagues. What is that worth? Plenty! If I can save us time and money by learning from other people's experiences what to do (or more importantly sometimes – what not to do) we as a company are better off.
4. Value/Investment: The price for the TUG Technical Conference is only \$795 (or \$745 if I register by February 25 and get the "early bird" discount). There are other iSeries conferences offered in the U.S. The prices for those conferences are higher than the TUG Technical Conference and the technical content is no greater. When you add in travel costs and the fact that I would be out of the country for at least 3 days (minimum 1 for travel) the TUG conference is a bargain.

I would ask that you look at the conference fees as an investment in our company's human capital (me) and money well spent. Please let me know as soon as possible if you'll approve these funds as I would like to register early to save us money with the "early bird" discount.

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# At COMMON as a First-Timer

By Alkarim Sachedina

The IBM iSeries community in Toronto, and Canada at large, was the host to the largest IBM midrange systems Users Group conference in the world – COMMON. It has been sixteen years since this event was hosted in Toronto. Living in the greater Toronto area and never having attended COMMON, I thought this would be an opportune time to register myself and experience what my conference veteran friends have tried to convey. Although I have attended our annual Toronto Users Group Technical Conference (TUG TEC), I was told that this will be a unique experience. They were right, from Sunday October 17 at noon to Thursday October 21 at 8:00 pm I was experiencing COMMON!



*First-Timer, Alkarim Sachedina*



*Volunteers at the TUG / LUG table welcomed visitors to Toronto*

In actuality, it started earlier with visiting the [www.common.org](http://www.common.org) website and reviewing the online session guide. The theme of this conference was Enterprise Application Modernization. I was overwhelmed with the variety of Courses of Study (COS) offered at the conference. From technical bits & bytes to professional development there were more sessions I wanted to attend than there was available time. With each COS, there is a focused roadmap that assists in choosing the necessary sessions that are related; as these sessions are scheduled to avoid timing conflicts for the attendees.

As a first timer, I was very appreciative of being able to build my own grid from the session guide. As I browsed through each session that interested me, I added it my personal grid. It was then time to review my grid and see what my week was going to be. This is when I realized the magnitude of this conference. I found myself attending more than one session at the same time. Knowing this would be impossible, it was just as impossible to choose one session out of many. For each day there are

over 20 session rooms and each room has six sessions. In addition, there are hands-on labs, IBM Certification testing and the COMMON Expo.

Armed with a printed copy of my grid and registration information I headed to the Metro Toronto Convention Centre, the location of the COMMON Fall 2004 Conference, in time to register and attend the opening session scheduled for noon. COMMON Executive



*Bill Zeitler and Michael Borman unveiled the new IBM eServer i5 595*

VP **Rares Pateanu**, a local Torontonian, welcomed all the attendees to the conference. President of COMMON **Robert Boyson** in his remarks also welcomed us all and mentioned that there were 372 of us first timers at this conference. He then introduced keynote speaker **Bill Zeitler**, Senior VP at IBM Corporation. Mr. Zeitler talked about IBM's commitment to the iSeries and to keep pace with technological and business changes.

He then asked **Michael Borman**, General Manager of IBM eServer iSeries to join him on the stage, where they unveiled the new i5 eServer model 595. This is the high-end model with 64 processors.

With the opening ceremonies concluding, I headed to the First-Time Attendee session. The speaker at this session was **Trevor Perry** and in his unique comedic way helped us ease into the coming week. That followed a random drawing of prizes and generous helping of ice cream for all first timers. This session was very helpful as it highlighted some of the resources made available to all attendees to assist in getting through the week. One such resource is the COMMON Conference Daily (CCD) publication. This is published every day of the conference and has the highlights as well as the entire grid for the day. I found myself cross



Photos by Léo Lefebvre

### ***Popular COMMON speaker, Trevor Perry, will return to Toronto next April as Keynote Speaker for TEC 2005***

checking my personal grid with the daily publication for any last minute changes – both my choices made earlier and any schedule changes.

Another resource was the Cyber Corner where 30 laptop computers were set up with Internet access. I was able to review session abstracts and adjust my grid choices through the week. Next on my agenda was the iSeries Nation Town Hall meeting hosted by **Michael Borman**.

In the Town Hall meeting, Mr. Borman reiterated IBM's commitment to the iSeries and the fact that it was the first

system to have the POWER5 processor chip. This is also the forum where attendees have a chance to pose their questions to the IBM iSeries Executives. I was impressed by the candid responses to the questions that were asked. With the conclusion of the meeting, I visited the Expo and enjoyed the food at the reception. Sunday's publication of the CCD stated it is the "World's Largest iSeries-Related Expo". It was a great opportunity to meet with vendors and learn about their products. Talking to suppliers of some of the products used in our shop was an added benefit in strengthening a business relationship.



***Over 100 midrange exhibitors were on display at the COMMON Expo***

# – TUG MoM Review –

## The October 2004 Special Meeting of (TUG) Members at COMMON

By Stephen Bingham

At the recent COMMON Fall Conference in Toronto, TUG held a special “extra” Meeting of Members, in association with the other local users groups in the region (i.e., COiN and MUGWNY).


We kicked it off with an introduction by **John Reed**, Director of IBM eServer iSeries Client Availability Solutions. John talked to us briefly about the recent announcement of two new models of the i5 and where the i5 will be going in the future, including enhancements to the Power 5 chip and the next generation Power 6 technology. On a lighter note, John told us about a Website where you can view some of IBM’s classic eServer television commercials. Check out: <http://www-1.ibm.com/servers/eserver/series/seriesmyseries/videos.html>.



*Skip Marchesani*

Using a simple SQL statement, Skip was able to go through every record in his database, remove the hyphens and convert the data to a decimal format. Conversely, we also saw how easy it is to go the other way. By simply isolating the various parts of the phone number and concatenating them to each other with a hyphen in between, and converting the string in to a 12 character field.

Lastly Skip showed us the power of SOUNDEX. Have you ever tried to find someone’s name in the phone book, but were not quite sure how he or she spelled it? Soundex is a tool that checks for a match based on phonetics. Skip showed us the results of some of his test searches and the results were impressive. For a copy of Skip’s presentation, please visit our website at [www.tug.ca](http://www.tug.ca). Don’t forget to check out the link for TEC 2005.

I hope to see you at our next MoM, at Woodbine Racetrack on Nov 17<sup>th</sup>. 

Learning about other products that could be useful is just as beneficial. The day ended at the COMMON User Discussion Social (CUDS).



*Jim Sloan*

The theme at CUDS was “Ask the Experts”. Tables were designated with areas of expertise where IBM experts and session speakers made themselves available for one-on-one discussions and questions on topics of interest to the attendees. A long day ended with anticipation of what the rest of the week would be like.

For the rest of the week, each day started at eight in the morning and ended at five in the evening with numerous sessions. There were several special sessions during the evenings. On Monday there was a Local Users Group (LUG) special event where TUG members were invited to participate; full registration



Our guest speaker for the evening was **Skip Marchesani** with his presentation: “I didn’t know you could do that with SQL.” In just under one hour, Skip demonstrated the power of SQL. For his examples, Skip used a database of phone numbers that were stored in an Excel spreadsheet.

The phone numbers were formatted as a character field; and the area code, exchange, and phone number were separated by hyphens. The database had been uploaded to the i5, but Skip wanted to remove the hyphens and make it a packed data decimal field of (10,0).



*Lynne Schwartz (Executive Director of COMMON) with Wende Boddy (Association Manager of TUG)*

to COMMON was not required. **John Reed**, Director of iSeries Product Development and Business Operations, gave a brief outline on his priorities. All in attendance were then given privy to one of the sessions by **Skip Marchesani** – (See sidebar.)




**Volunteers: Ed Jowett & Glenn Gundermann**

On Tuesday evening, the Canadian iSeries Brand Executives from IBM met with Canadian customers. This was another unique opportunity to meet part of IBM's management team. **John Pratt**, iSeries/i5 Business Unit Executive, explained his responsibilities and future direction. Each of the eleven members of his team introduced themselves and gave us a brief summary of their functional responsibilities in Canada. We had a chance to ask questions that were more specific to Canadian needs and business issues.

Wednesday evening gave all members of COMMON a chance to attend the COMMON Meeting of the Members (MOM) and hear reports from the Board of Directors. Members had the opportunity

to direct their comments or questions to the Board. I stood up to comment, as a first-timer, that this was a great conference and question: when would COMMON return back to Toronto? **Rares Pateanu** commented: "That's a great question!" The week ended with Closing Session on Thursday evening. This was a last chance to meet with friends – both those I've known and those I met this week...

What a week this was! What an experience! In this conference I attended sessions that directly have an impact to my daily responsibilities at work, sessions that will help me personally and sessions that gave me a different perspective to our i5 (a.k.a. iSeries and AS/400) community. 

**Alkarim Sachedina** is a Business Systems Lead at Mattel Canada Inc. He is currently serving as the Treasurer for the Toronto Users group. Alkarim can be reached at [alkarim.sachedina@mattel.com](mailto:alkarim.sachedina@mattel.com).



**Beverly Russell, newly elected COMMON President**

Photos by Léo Lefebvre



*Opening Session, Fall 2004 COMMON Conference and Expo  
Metro Toronto Convention Centre, Toronto, Ontario, Canada  
Sunday, October 17, 2004*

# The IBM WebFacing Tool A Better User Interface

By Phil Coulthard and George Farr



In “An RPG-to-J2EE Roadmap” (August 2003, article at [www.iSeriesNetwork.com](http://www.iSeriesNetwork.com)), we introduced a simple roadmap for moving from RPG or Cobol to Java 2 Enterprise Edition (J2EE). So far, we’ve covered the Better Tools step in the roadmap (see “Remote System Explorer in WSDc 5.0,” and “Better Tools: iSeries Projects,” in previous TUG magazines. Now, we’ll turn to the next step: the Better User Interface.

This step involves adding a modern, Web-based user interface to an existing 5250 application. The IBM offerings at this step are the IBM WebFacing Tool and Host Access Transformation Server (HATS). Here, we introduce the WebFacing Tool; next month, we’ll discuss the new HATS offering. After that, we will present “Detour to WebSphere Development Studio Client 5.1,” where we take a small detour from the roadmap to talk about the new 5.1 release of WebSphere Development Studio Client (WSDc), which contains most of the tools described in the roadmap.

## A Simple Transition

The WebFacing Tool in WSDc provides a simple way for you to convert display file DDS into Web page source code in the form of JavaServer Pages (JSPs). These user interface source files are then deployed on WebSphere Application Server (WAS). At runtime, the data written from the application is intercepted at the WorkStation Data Manager and inserted into the JSPs, and the resulting Web page is sent to the Web browser. No change is needed to the application business logic, unless you need to code around a keyword not yet supported by the WebFacing Tool, or you want to optimize screen flow for the Web. A system

API (QqfEnvironment) is supplied to query whether you’re currently running in WebFacing or not, should you need this optimization. Other than WAS (Express or higher), you don’t need to purchase anything else in order to run a WebFacing application.

## Converting

Using the WebFacing Tool for the first time is simple. The wizard for creating a new WebFacing project prompts you for the DDS and UIM-help (User Interface Manager) members to convert, the overall style to apply to the generated Web pages, one or more CL commands to invoke the application, and whether to hard-code the user ID and password or prompt for them at runtime. Then, the wizard creates the project.

To convert a DDS file, you merely right-click it and select Convert. The conversion process takes a few minutes for each source member, as the project is populated with the results of the conversion.

**Figure 1** shows the resulting WebFacing perspective after a conversion. Notice the conversion log file on the right, which includes all the DDS keywords

found and their status for WebFacing support. The first column shows compile status, and the second is conversion status. Generally, you can ignore warnings. Also notice in the left window under DDS the members that were converted and, under each, the record formats in that member and the output files resulting from the conversion of that record format: a Java Archive (JAR) file containing the XML describing the field data, a JSP for the Web page, and another JSP for the JavaScript (so it will be cached by the browser).

## Running

Congratulations; your new Web application is ready to run. Simply right-click it and select Run on Server, which fires up the built-in copy of WAS and runs the converted application with a built-in copy of a Web browser (**Figure 2**).

When you’re running the local WebSphere test environment, the user interface is processed locally in the tools, although the business logic still runs where it has always been run, on the iSeries. Note that when a JSP file is first “touched,” it is compiled into a servlet, so you’ll find that your application runs slowly the first time through. Further, the built-in test environment is designed for testing and debugging, so it is less speedy than your production environment will be. However, you can run your application immediately, and that’s going to make you feel great. You can even cut and



**Figure 1:** A WebFacing project after conversion

paste the URL and send it to a colleague, salesman, or boss, and they can run it on your machine from their machines.

### Refining

If you're happy with the default conversion that WebFacing does, then you're done! Easy, isn't it? It was designed to be. But who is ever happy with any default transformation? Typically, we want to

for Version 5.1, as is the XML Record Metadata page, where you can turn off archiving of the generated XML for better team support. You can set many important properties in this dialog, so explore each page to see what it offers.

**Web settings.** Although the Properties pages are easy to change, they only support global settings such as colors and fonts.

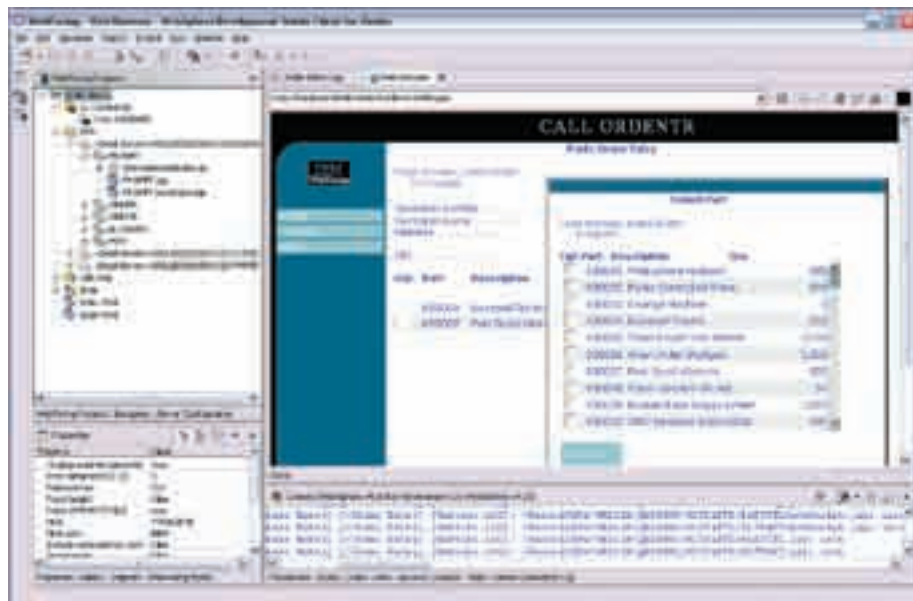


Figure 2: Running in the local test environment

customize the Web user interface and make it look more “Webby” and hence more attractive and competitive. This is where the full power of a development-time conversion becomes most apparent. There are three ways to affect the Web user interface: (1) by using Properties for the WebFacing project, (2) by using Web settings that are set in the DDS source, and (3) directly, by double-clicking on the generated JSP files and editing them. Let's look at these options one at a time.

**Properties.** The easiest way to affect what you see is to right-click on the project name and select Properties. You can change several properties; some of them require a re-conversion (under Conversion), and some require only republishing (under Run Time and Style). Figure 3 shows the Properties dialog with one of the pages open. This page is where you enable the function key buttons to appear within windowed records, as we saw in Figure 2. This is a new function

Often, you want to refine individual pages of your application. For example, you might want to hide some text, or show different text on the Web than on the green screen, or insert an image whose file name is determined at runtime from a named field. You might even want to change a selection subfile so that column 1 is hidden, and column 2 is a hyperlink that maps to typing “1” in column 1 and pressing Enter.

All this is possible with Web settings, and you don't need any HTML or JavaScript knowledge. Because Web settings are DDS comments, you also won't need to recompile your DDS, although you will have to reconvert your WebFacing project.

To work with Web settings, right-click the DDS member in your project and select Open With CODE Designer. This launches the follow-on to SDA, a really cool what-you-see-is-what-you-get designer for screens and reports. For Web settings, you simply open the design window, select the fields you want to affect, and go to the Web Settings tab. Figure 4 shows an example of a new 5.1 Web setting (at the bottom of the screen) that tells the conversion tool that the selected output field contains function key descriptions sent at runtime.

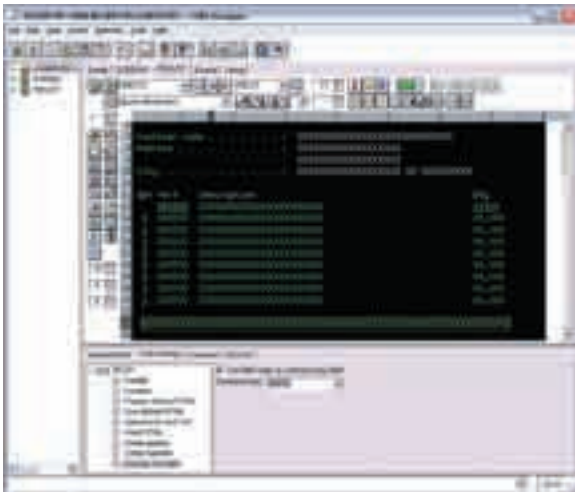
**Direct Editing.** Finally, you have the option of directly editing your generated JSP files. This is as simple as double-clicking on them to open them in the built-in JSP editor, known as the Page Designer. If you find this an attractive option, beware that when you next convert, the generated file will override your work. However, the previous version of the file is still there, and you can use right-click actions to compare and merge the two versions, or even replace the current version with the previous version. This is a nice capability, but it's tedious and error-prone, and IBM recommends you use this approach only if Web settings don't meet your needs.

### Publishing

After you've had a great deal of fun iteratively refining and re-testing your WebFacing application, you'll want to put it into production or at least test it in your production copy of WAS. To do this, you export the project as an enter-



Figure 3: Properties for WebFacing project



**Figure 4: Specifying Web settings**

prise archive (EAR) file to the IFS on your iSeries and then import that EAR file into WAS on the iSeries (or anywhere that WebSphere will run).

Someone on your team must become the designated WebSphere administrator, installing it on your server and configuring it. This is a strategic skill to have

these days, as WAS is becoming more pervasive, and more applications are shipped that need it. The good news is that today, it is much easier to work with the application server than ever before, especially with the Express version of WAS, which has a simplified Web-based console.

Once the application server is installed and configured, the importing of EAR files is straightforward and can be done by a developer or administrator.

**Help**

Web-enabling applications using the WebFacing Tool is rapidly becoming a cottage industry. Help is available from IBM and many Business Partners. IBM ships extensive documentation with the product, and online and offsite courses are available that teach both WAS

Express and the WebFacing Tool. To find courses, go to <http://www.ibm.com/series/websphere> and click Education.

A hands-on lab is also available online. For a quick tour of it, go to <http://www.ibm.com/software/awdtools/wds400> and click Library. IBM also offers WebFacing services, which you can find under the Services link. You can also find the IBM Redbook *The IBM WebFacing Tool: Converting 5250 Applications to Browser-based GUIs* at [www.ibm.com/redbooks](http://www.ibm.com/redbooks), and a book by IBMers Claus Weiss and Emily Bruner, *Understanding the IBM WebFacing Tool: A Guided Tour*, is available at <http://www.mc-store.com/mcpresonline/5216.html>.

Beyond IBM, many Business Partners now also offer their own WebFacing courses and services for helping do the conversions. These can be very useful to overcome missing keyword support, to provide enhanced functionality such as embedded system screens or pop-up calendar windows, or even just to create more appealing styles. You can find these Business Partners by looking at some of their WebFacing reference accounts at <http://www.ibm.com/software/awdtools/wds400> under the link for Success Stories. You can also try typing in "WebFacing" at Google!

**Phil Coulthard** works at the IBM Toronto lab, where he is the lead architect for application development tools and languages on iSeries.

**George Farr** works at the IBM Toronto lab, where he is the technical development manager for the RPG and VisualAge for RPG languages, as well as the new RPG and Cobol tools in WDS. Phil and George are frequent speakers at many conferences and user groups worldwide, and their books "Java for RPG Programmers, 2nd Edition" and "Java for S/390 and AS/400 COBOL Programmers", are available from Penton and MC Press.

This article was first published in iSeries News magazine.

# The 5th Wave

By Rich Tennant



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# COMMUNICATING WITH SAM

## Consolidating Storage Area Networks

### Question:

Currently our organization has a mix of Microsoft and OS/400 based applications. We have been mandated to provide a high availability solution for data management. Our Microsoft Server group has provisioned and implemented a SAN (Storage Area Network). The solution uses redundant virtual storage arrays with redundant Cisco fabric switches operating independently of each other. All of the virtual storage is managed in software. What is the best method to provide a similar solution for our iSeries? Can we leverage the existing network by integrating the solutions into a single homogenous environment?



Sam Johnston

### Answer:

With the advent of Canada's new privacy laws, increased scrutiny on companies in virtually every industry from regulatory bodies, and the overall pressure on corporate governance compliance, there is little doubt that we can expect exponential growth in the demand to secure, preserve and store data records. While SANs have become the norm in very large enterprises, these demands are likely to force even small organizations to re-evaluate their data storage practices.

Specific to your organizations' needs, it is definitely possible to perform a similar solution for your iSeries environment. You have a number of options and choices to make. In order to determine the right solution for your company you will have to make business and technology decisions. The iSeries is supported by two storage platforms – the IBM ESS and the EMC DMX storage products. So if your Microsoft group has one of these platforms you can leverage the same storage device and the network. It is one thing to have a copy of your iSeries data in a remote location, but it is another thing to use it in a disaster situation. From a business point of view you need to establish the Recovery Time Objective and the Recovery Point Object before deciding on the solution technology right for your organization.

If your requirement is for data resiliency or just replication, one of the next two

options should meet your business need. Assuming that you have a SAN storage device capable of supporting iSeries and you are running an iSeries with internal disk today, one simple option is to mirror the iSeries to the SAN storage device. As far as the iSeries is concerned the disk arrays are created as unprotected allowing the internal drives to be mirrored externally. The external disks must be the same size as the corresponding iSeries drives. This approach may meet your needs however it is important to point out that an iSeries, like all servers, will not mirror data that is in main storage. This approach offers a higher level of data redundancy but is not a true high availability solution.

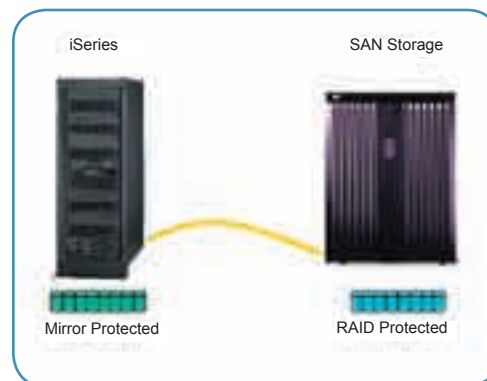
**Figure 1** illustrates a simplified point-to-point Fibre Channel connection, with an example of a direct connection between a server and a storage array. However, if the goal is to separate the storage arrays from the Host Servers and perhaps even provide multiple, redundant Storage Arrays to a single or Multiple Servers then a SAN switching architecture is required to

enable the interconnection of Host and storage. With the introduction of two switches and the appropriate fibre interfaces, the SAN Storage device can be located up to 10km from the iSeries on dedicated fibre or can be geographically more distant with an IP infrastructure and Fibre Channel over IP (FCIP) technology.

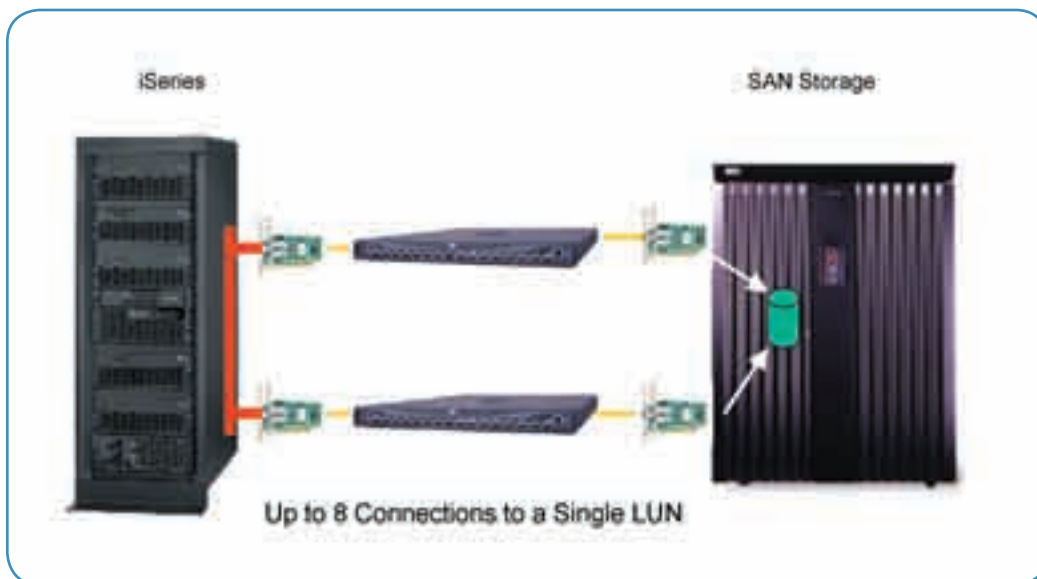
If you are planning on provisioning dual disk arrays in multiple locations for improved reliability then a decision must be made whether your database replication will be synchronous or asynchronous. For synchronous mode updates to the database replication is done in a real time fashion such that each data I/O must

complete on the remote end with acknowledgements back to the application prior to writing another I/O. Thus, under these circumstances the WAN must be low latency and highly reliable remembering propagation delay plays into

latency on a link. You will need to check your application specific tolerances. For asynchronous replication the I/O process locally is not dependent upon com-



**Figure 1. Point-to-point Connection**



**Figure 2. Multipathing**

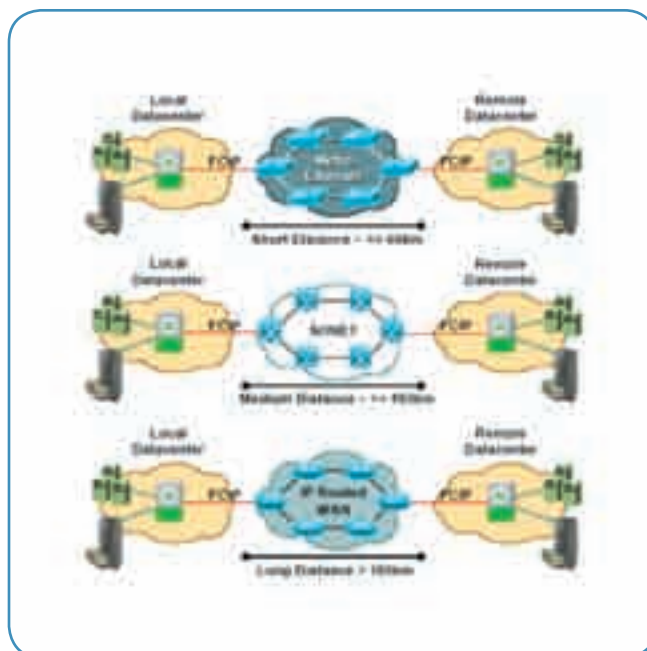
plete I/O to the remote storage array but is rather done as a separate process. This is a more cost effective approach but has some data replication considerations.

In V5R3 IBM has introduced a new capability for iSeries called multipathing. In **figure 1**, if we were to have a failure of the fibre host adaptor in the iSeries there would be no way to access the SAN Storage device. To ensure access to SAN storage, up to eight paths can be created for the same LUN (Logical Unit Number). The approach is to create multiple paths (**figure 2**) to the same LUN in the storage device by assigning them to different iSeries fibre host adaptors. The iSeries will recognize the paths and spread the I/O across all available paths using the “Round Robin” load balancing technique.

If you require system level high availability you will need a second iSeries to operate as part of a cluster or with High Availability Software. The machines can be located in different cities using Metro Ethernet, Sonet, or IP Routed WAN networks to connect the two sites. The iSeries supports a switched fabric at V5R2 and later. Switched fabric refers to

whenever a switch is used to interconnect Fibre Channel adapters. It is an intelligent switching infrastructure that delivers data from any source to any destination. **Figure 3** shows the most common WAN media using Cisco MDS switches.

The iSeries has become much more open to external storage over the past few releases. Robust solutions to improve data resiliency and disaster recovery times are easily created using OS/400



**Figure 3. SAN Extension**

operating system functions and industry leading SAN products from manufacturers such as Cisco and EMC. The question now really becomes, “What level of redundancy or recovery capability does the business need to ensure business continuity?” The SAN technology related to iSeries is now “harvest ready” and solutions are easily designed to provide disaster recovery and high availability capability at all levels.

Ultimately, Storage Area Networks, as with most solutions that we want to extend to the OS/400 envi-

ronment, require unique treatments due to the inherent architecture nuances that differentiate the iSeries from other platforms. Don’t let this alter your course. While your SAN solution will need to adapt to these nuances, it is essential that you take a consolidated approach. By creating a single SAN architecture and strategy, even when it needs to adapt to heterogeneous technologies, you will gain other operational benefits such as having a single group responsible for managing the solution, not to mention leveraging common network architecture for maximum efficiencies. **TUG**

**Sam Johnston** is a partner and Chief Technology Officer of Intesys Network Communications Ltd., providing value-added networking and e-commerce solutions to the iSeries community. He can be reached at (416) 438-0002 or via e-mail at [sjohnston@intesys-ncl.com](mailto:sjohnston@intesys-ncl.com). Any TUG member wishing to submit a question to Sam can forward their typewritten material to the TUG office, or to Intesys. The deadline for our next issue is Friday December 3, 2004.



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## AIX under the covers



**Jackie Jansen**

Did you know that more than 10,000 iSeries customers also run AIX? As most of you are aware, IBM has recently added AIX 5L Version 5.2 and Version 5.3 to its list of operating systems that will run on the eServer i5. The IBM eServer i5 can run i5/OS, Linux, and AIX 5L natively, and under the covers, Windows and Linux on Intel. This allows for a fast consolidation of AIX or UNIX applications while improving processor and storage utilization rates. The eServer i5 can now deploy new AIX applications and utilize additional databases such as Oracle. The new POWER5 hardware is required to run AIX simultaneously with IBM i5/OS.

5L V5.3 you can dedicate processors in increments of 1/10 of a processor to a partition. AIX 5L V5.3 also has support for virtual storage and virtual Ethernet. This allows all your disk drives to be managed as a single pool of protected storage. Virtual disks for AIX are implemented on the eServer i5 as Network Server Storage (NWSSTG) objects. You can define over 4,000 individual virtual networks that provide up to 1 Gbit/second data transfer between multiple partitions and multiple operating systems. There is currently no support within AIX for virtual CD/DVD or virtual tape. These resources must be owned and managed by AIX 5L. While i5/OS can host the virtual disk and networks for AIX, AIX cannot be a host for virtual resources.

Current iSeries customers should be aware that when you run AIX 5L in a partition you are, in essence, running an AIX server. This means that you will require AIX skills. The administrator will use OS/400 tools to administer an OS/400 (or i5/OS) partition and AIX tools to administer an AIX partition. AIX programmers will be happy to see the functions and tools that they are familiar with.

Since both the IBM eServer i5 and the eServer p5 are built on the same POWER5 technology users will see equivalent performance between eServer i5 and eServer p5 servers with the same configuration. The AIX 5L applications that run on eServer p5 will run unchanged on the eServer i5. AIX 5L does not require any interactive or 5250 CPW to run.



AIX 5L can take advantage of many of the recent enhancements announced on the iSeries and i5. Capabilities such as shared processor support with automatic movement of processors, support for dynamic movement of I/O resources between the partitions and capacity on demand are all available.

This announcement allows customers to simplify their IT infrastructure. You are now able to pool your hardware resources and optimize their use across multiple operating systems. AIX 5L will run in a partition on the eServer i5. A single partition acts like an i5/OS, Linux or AIX server. AIX 5L V5.2 requires full processors and does not support micro-partitioning. It also requires direct I/O. With AIX

automatic movement of processors, support for dynamic movement of I/O resources between the partitions and capacity on demand are all available.

A hardware management console or HMC is required when implementing AIX on eServer i5. The HMC essentially replaces the requirement for a primary partition on the eServer i5. It is required whenever you are implementing logical partitions.

For more information on running AIX 5L on eServer i5 see the IBM web site [www.ibm.com/iseries/aix](http://www.ibm.com/iseries/aix)

*Jackie Jansen is a Senior Consulting IT Specialist. She currently works in the IBM Americas Advanced Technical Support Solutions Centre. Jackie is a frequent speaker at iSeries Technical Conferences and User Group meetings. Contact her at [jjansen@ca.ibm.com](mailto:jjansen@ca.ibm.com).*

	AIX 5L V5.2	AIX 5L V5.3
Dynamic LPAR (processors, memory, and I/O)	Y	Y
Micro-Partitions (up to 10 partitions per processor)	N	Y
Uncapped Partitions (automatic movement of processor resources)	N	Y
Virtual Storage and Ethernet (through i5/OS)	N	Y
Direct I/O (managed by AIX 5L)	Y	Y

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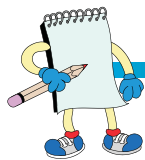
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# TUG NOTES


## **Ooops!**

We would like to sincerely thank **IBM Canada Ltd.** for the great **IBM Laser printer** that was given to TUG as one of the charity draw prizes at our 2004 Golf Tournament. This thank you should have been made a few months ago and we apologize for our tardiness. The lucky winner was **Randy Folmes** and he tells us that his **IBM Laser Printer** is just great!

## **Ed Jowett,**

fondly known as “Cowboy” is one of our retiring board members this September. Here is Ed in his new hat (presented to him as a gift of appreciation). A board member for 15 years, he has held various positions (Secretary, Treasurer, and Facilities Coordinator.) Ed has contributed in many ways and we are lucky that he has agreed to stick around as a volunteer.




 **Christalynn de Andrade (Mother Parkers) receiving her prize, a Mintek Portable DVD Player, from TUG President, Léo Lefebvre at TUG’s LUG booth during COMMON in Toronto.**

## **TUG’s Calendar of Upcoming Events**

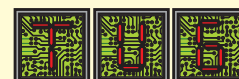
- ☒ **November 17, 2004 – MoM**  
(At Woodbine Racetrack)  
Speaker: Guy Vig  
“CL Enhancements in V5R3”
  - ▶ 5:00 Session: CL Compiler
  - ▶ 7:00 Session: Command Docs
- ☒ **January 19, 2005 – MoM**  
(At The Travelodge)
  - ▶ 5:00 Session: “The HMC”  
Speaker: Lisa Jobson
  - ▶ 7:00 Session: AIX & iSeries  
Speaker: TBA
- ☒ **March 23, 2005 – MoM**  
Speaker & Topic: TBA
- ☒ **April 19&20, 2005 – TEC**  
(Sheraton Parkway)
  - ▶ Executive Breakfast
  - ▶ Vendor Showcase
  - ▶ Keynote: **Trevor Perry**
- ☒ **May 18, 2005 – MoM**  
Speaker & Topic: TBA
- ☒ **June 15, 2005 – Golf Tournament**  
(Date may change)

## **Lucky Winners**

 of the door prizes at the September MOM (held at the IBM Toronto Lab) were: **Lydia Li, Harry Thiessen, Dawn Hayes, Jack Yin, Andre Berns, Harold Lucas, and Tony Sinn.** The winners all received books: “Understanding the IBM WebFacing tool: A guided Tour” by **Claus Weiss & Emily Bruner** (signed by Claus), “Java for RPG Programmers” by **Phil Coulthard & George Farr**, and “Untangling IT” by **Robert Tipton.** We wish to thank the authors for donating these educational books. Special thanks to the IBM Toronto Lab and in particular **Alison Butteril** and **Linda Cole** for helping us to host our meeting at this great facility. The guided tours were a big hit!

– Wende Boddy

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### Consulting



- › IT Strategic Planning
- › Process Mapping
- › Project Management
- › Business Continuity Planning
- › Disaster Recovery Planning
- › Outsourcing and Systems Management
- › Seamless Systems Integration
- › Financing

### Technology



- › **IBM** *e*server iSeries, pSeries, xSeries, Storage and Printing Systems
- › Remote Access Solutions
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## WHAT HAVE YOU GOT TO LOSE?

In the end, the bottom line is profitability. Return on investment is the critical measure of your decisions. You must weigh the inherent risks of any potential business ventures.

If managing the availability of your data and applications isn't on your radar, then you're facing certain loss. Who's accountable for that?

Do you know the annual cost of downtime for your business? Have you calculated how much revenue could be saved each year, simply by eliminating planned downtime alone?

Blair Technology Solutions offers the most comprehensive, widely used and affordable managed availability solution for today's ROI-minded business world. Call Blair to get an accounting of how your business can gain from seamless access to data availability and continuous operations.

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lost data, lost current revenues, loss of potential revenues, cost of idled employees, lost productivity, lost/spoiled inventory, system and data recovery costs, lost business opportunity, loss of goodwill, lost customers, loss of share value, lost customer loyalty, loss of reputation

