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Dr. Frank Soltis

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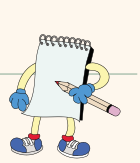
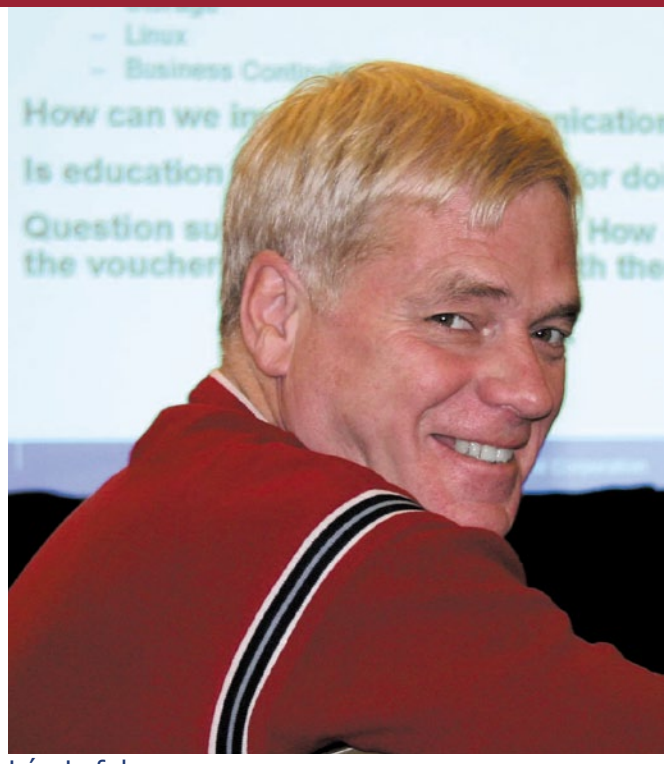


PRESIDENT'S CORNER

SEPTEMBER/OCTOBER 2007

By Léo Lefebvre,
President, Toronto Users Group
for System i



Léo Lefebvre

September already! Where did the time go? It feels like just yesterday that we were getting ready for TEC '007, and then it was gone. After TEC, we had our super May Meeting of Members with **Jackie Jansen** and **Randal Munson**. That too is now history! Last time we met was at the 19th TUG Golf Classic. Time flies, really. Could it be because it was summer time and the weather was great (at least in the Toronto area)? Could it be because TUG's 22nd season was excellent? Don't worry—our 23rd season is also looking very good with what we already have planned.

October 3rd

As you probably already know, **Dr Frank Soltis**, the main architect of the AS/400 will be at the TUG season opener meeting—where TUG will be partnering with IBM to present the "Canadian System i Directions Tour". Frank, the "father of System i" will talk about trends in the industry, the direction of POWER in IBM, and of course the direction of our beloved System i.

At the last meeting of our 22nd season, on May 30th, we all heard and loved **Jackie Jansen** talk about the new IBM DB2 Web Query product for System i. This product is so hot and we heard so many good comments about it that I believe you will also like our other October 3rd speaker **Robert Eckersly**, who will show us how to bring a new level of capabilities to Business Intelligence and reporting on System i.

November 21st

At the Living Arts Centre in Mississauga we will once again host **Alison Butterill** and **Trevor Perry**. While the final agenda and presentation are still to be finalized, PHP will be one of the main topics. Alison and Trevor make a great duo and their presentations are always award-winning.

January 23, 2008

Continuing our season, for our first meeting of 2008, on January 23rd, another great speaker from IBM, **George Farr** will be our guest for the meeting. George is now Product Line Manager for System i AD tools and compilers with the Rational Software Development division. **Tony Lewitt**, IBM 2nd line development manager and **Wendy Toh**, IBM development executive—both from Raleigh, NC are scheduled to assist George for that meeting. They are looking forward to meeting customers in the Toronto area.

TEC 2008

You see, for our 2007-08 season, we already have great meetings scheduled. But don't forget about our annual technical education conference. TEC 2008 will be our fifteenth annual and will be held on April 22 – 24, 2008. As most of you know by now, IBM is scheduled to announce/introduce the new V6R1 release of i5/OS (maybe i6/OS) sometime in February or March. So, you can be certain that the speakers at TEC 2008 will have all the time they need to update their presentations with the new V6R1 material. Stay tuned—we'll keep you informed of all you can expect from TEC 2008. Already I know that it will be a conference not to be missed!

Location Survey

In my previous column, I invited you to let us know your meeting location preference by filling out a survey on the TUG Web site. We had tremendous feed back from it and we are still compiling the results. In the next issue of the magazine, we will have a detailed review of the results. Those who filled out the survey and included their name have a chance to win a LACIE 500gb (value approx. $250.00) USB 2.0 external drive designed by Porche. The draw will take place at our OCTOBER 3rd Meeting of Members (MoM). We'll have our guest speaker Dr. Frank Soltis pick the lucky winner. The winner does not need to be present at the meeting in order to win, but who would miss a meeting with Frank?

New TUG Director

In conclusion, I would like you to welcome our most recent addition to the TUG Board: **Russell Pangborn**, professor at Seneca College. Because of our close association with the college, the TUG Board found it logical to have a Director representing Seneca and other colleges and universities who have a System i teaching program. If you want to know a bit more about Russell, read his column on page 17 in this magazine.

That's it for now, for my part. Don't forget if you have any suggestions, comments or thoughts, let me know. My e-mail address is leo@tug.ca.

TUG™ magazine

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

TUG is a not-for-profit organization that promotes knowledge of **IBM®** System i™, iSeries™, AS/400™, and other midrange technologies. Questions about the users group, and subscription enquiries, should be directed to our Association Manager, Wende E. Boddy, at the TUG office: **36 Toronto Street, Suite 850, Toronto, Ontario, Canada M5C 2C5.**
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* All articles are the views of the authors and do not necessarily reflect those of the TUG magazine or of the Toronto Users Group for System i.

What is a System i?

By Dr. Frank G. Soltis

Although most of the world's population would have difficulty answering the question "What is a System i ?" it should be a fairly straightforward question for those of us familiar with this server. Or is it? We may live with an AS/400, iSeries, or System i every day, but when it comes to defining exactly what it is, many of us may stumble a bit.

It's an IBM eServer. It's a midrange server. It's a business computer. It's used by businesses all over the world. It's sold in more countries than McDonald's hamburgers. It has the largest number of customers of any IBM server. It's all of this and more, but we still don't have a good definition of a System i and what makes it unique among servers.

With the movement to converged hardware among IBM servers and running the AIX operating system on System i, the definition of a System i has become increasingly blurred in some people's eyes. The purpose of this article is to try and clear up some of this blurred vision.

The Problem with Definitions

At the time of the model i890 announcement, I decided to write a whitepaper entitled "What Is a Mainframe?" The model i890 is clearly a mainframe-class server, and at the time we were thinking about simply calling it a mainframe. But you may have noticed that today IBM does not call the model i890 a mainframe, at least not in any official publications. The reason is that within IBM we could not agree on what was a mainframe.

On the surface, it seems that finding a definition for a mainframe should have been easy. After all, IBM has been building mainframes for almost 40 years. My search for a general definition of a mainframe quickly showed that finding a good definition was not going to be easy. To be sure, there were many different definitions, but they all seemed to fall into two distinct categories: broad general definitions and definitions that concentrated on some particular aspect of mainframe computing. Neither of these categories, unfortunately, provided a very good definition.

The general definitions of a mainframe most often describe only the size of the computer. For example, a mainframe is sometimes defined as a room or more of computer equipment. This definition also fits a PC server farm, and few would argue that a PC server farm is a mainframe.

Léo Lefebvre

Dr. Frank Soltis in a "Back to the Future" skit at the 2007 COMMON Annual Conference in Anaheim

Another widely used general definition describes a mainframe as a large computer for the commercial applications of Fortune 1000 businesses and other large-scale computing purposes. This definition also suffers from too many ambiguities. By this definition, any large computer that is used by a Fortune 1000 business to run commercial applications is a mainframe, and we know that is not true either.

The more specific definitions of mainframe usually get too specific. They usually define a mainframe by the particular operating systems it runs. If it runs zOS, MVS/ESA (OS/390), VM/ESA, or VSE/ESA, it is a mainframe. Some of these definitions go so far as to define a mainframe as the operating System itself. Linux running on a mainframe totally confuses these definitions. If Linux is a mainframe operating system, then any computer that runs Linux must be a mainframe. Again, not true.

It should be fairly clear by now that there probably is no good definition for a mainframe that satisfies everyone. A few years back, there was a joke circulating through the various S/390 user groups around the world that has become a personal favorite of mine for the definition of a mainframe: If you can pick it up, it's a PC. If you can't pick it up, but you can push it over, it's a midrange server. But when you can't pick it up or knock it over, it's a mainframe.

At 6 feet 8 inches tall and weighing almost a ton, you are definitely not going to push over an i890. By this definition, it is a mainframe. But since few others in IBM thought this was a good definition, we decided not to call the i890 a mainframe. We also never published my whitepaper.

The System i 595 is currently the largest System in the System i family. It offers multiplatform management and up to 64-way symmetrical multiprocessing capability. It can support 2 TB of memory, 381 TB of disk, and up to 216,000 CPW, but is it called a mainframe?

Finding a good definition for the System i entails all of the same problems as finding a good definition for a mainframe. We could simply say that a System i is any server that runs OS/400, but is there more to it than that?

It's Not the Hardware

One way to determine what a System i is, is to look at what it is not. For example, it is not a hardware box. Oh, IBM does sell you a black box, and on the front of that box, it does say "IBM System i," but the hardware is just the visible part of the System i. The System i itself is the virtual machine that resides inside the black box.

The System i has never been defined by its hardware. It is defined by software. This is in stark contrast to every other commercially available server, where the hardware architecture is the defining element of the server. This means that all software in these servers, including applications, is dependent on the underlying hardware architecture.

The power of not defining the server by its hardware was dramatically illustrated when the AS/400 processor technology moved from

Vaughn Dragland

Looking inside a System i

CISC to RISC in the middle 1990s. Customers saved the programs from their CISC machines, restored them on their new RISC machines, and the programs ran as full 64-bit applications without even having to be recompiled. No other server has ever made such a major hardware transition. Those that have tried failed. For example, Digital in the 1990s tried to move its VAX installed customers to RISC hardware but was not successful. Today others, including HP, are just beginning to make the transition to a new hardware base, and their success is by no means assured.

We used to talk about this design concept of a virtual machine as technology independence. In recent years, the term "virtualization" is being used more frequently to describe the use of software rather than hardware to define the interfaces to various parts of the server.

The point is that the System i is not defined by its hardware. That hardware can in the future change completely, and we will still have a System i. If it is not the hardware that defines the System i, it must be the software.

It's Not the Operating System

A few years back, there was a great deal of discussion in the industry about operating systems not being very important. Even though not everyone agreed, there were those who predicted that all proprietary operating systems would eventually go away. That hasn't happened yet, but there are still some people who believe it will.

Defining a server in terms of its operating system would seem to be a short-lived definition, especially if you believe that all operating systems are similar and that it is unimportant which one you choose. Without arguing for or against either side of this discussion, it is true that all operating systems do pretty much the same things.

Any computer science student can probably tell you that an operating system fundamentally does only two things. It controls all of the computer's resources, and it provides the base upon which applications are written. That student can also probably tell you that an operating system has four major components: process management, memory management, input/output, and the file system. On the surface, it seems hard to believe that one server can be distinguished from another solely on the basis of its operating system. This gives credence to the argument that one operating System is as good as another.

Notice also that the components of an operating system deal primarily with the underlying hardware. An operating system must know the details of the hardware. In other words, an operating system cannot be technology independent. Moving an operating system from one hardware platform to another requires a great deal of work, assuming you want to have an efficient implementation of that operating system. For example, it took nearly five years and hundreds of system programmers to rewrite the operating system when the AS/400 moved from CISC to RISC.

Because the operating System is dependent on the underlying hardware and must be heavily modified to run on different hardware, the System i is not defined by its operating system. If we were to change the operating system of the System i completely, it would still be a System i.

A Poor Choice for a Name

Now here's where it gets tricky. What is the operating system of the System i? If you said i5/OS (or OS/400), you would be wrong. None of those four major components of an operating system described in the previous section are in i5/OS. Simply stated, i5/OS is not an operating system, and it never has been.

Twenty nine years ago in October 1978, the IBM System/38 was announced. That system was the beginning of what has become today's System i. Because the S/38 was technology independent (defined by its software and not by its hardware), any component of that system that was hardware dependent was packaged as a part

Profile on Dr. Frank Soltis

Dr. Frank Soltis holds the title of IBM System i Chief Scientist. He is the creator of the technology-independent computer architecture and the single-level addressability that led to a totally new breed of IBM computers, including the AS/400, the iSeries and the System i. He participated in the definition of the Power processor architecture and led the effort to move IBM systems to the 64-bit Power processors. Variations of these Power processors are now used in consumer electronic devices; for example game consoles from Sony, Microsoft and Nintendo, and in the world's most powerful supercomputers.

The author of *Inside the AS/400* and *Fortress Rochester, The Inside Story of the IBM iSeries*, Dr. Soltis is a frequent speaker at computer conferences around the world. In addition to his responsibilities as an IBM Chief Scientist, he is an Adjunct Professor in the Department of Electrical and Computer Engineering at the University of Minnesota where he teaches graduate courses on advanced computer architectures.

Currently based at the IBM Development Laboratory in Rochester, Minnesota, he travels the world speaking on IT trends and technology advancements. In addition to his several award-winning books, Dr. Soltis has numerous technical papers and other publications to his credit. He holds more than 25 patents and published invention disclosures related to computer systems. In his spare time he enjoys working on and racing Porsches with his sons.

of the hardware. As a result, the operating system of the S/38 was packaged as part of the microcode. Microcode in those days was considered to be hardware.

Other system software that was not hardware dependent was packaged separately. This software package included the world's first commercially available relational database, functions to manage work in the system, a new control language, data definition interfaces, extensive security and authorization facilities, and some powerful program development tools. Because many of the functions in this system software package had to do with the overall control of the S/38, we decided to call the package Control Program Facility (CPF). CPF was not an operating System in the textbook sense, although it was sometimes called an operating system for lack of a better, more descriptive name. The real operating system of the S/38 was in the microcode.

In 1988, the S/38 was renamed the AS/400 — yes, we have renamed this system more than once. Someone, obviously a marketing type, also decided to rename CPF to OS/400. In hindsight, this was a huge mistake. Suddenly, CPF, with all its sophisticated functions and capabilities, was degraded to the level of a simple operating system. To this day, people still try to compare OS/400 to a Unix or Windows operating system. That's like comparing an aircraft carrier to a rowboat. They both float, but similarities end there.

When we again renamed this system from AS/400 to iSeries, some of us wanted to change the name of OS/400 to show that it was far more than just a simple operating system. That name change was never made because the OS/400 name was the only link that customers, many of whom weren't too happy about the name change anyway, had to the AS/400.

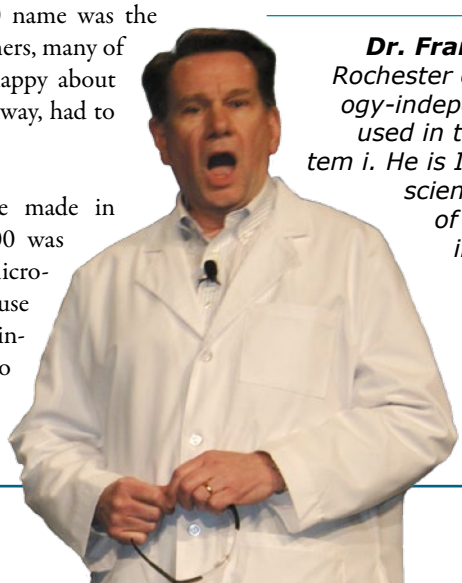
Still another change made in 1988 for the AS/400 was to drop the name microcode and instead use the name licensed internal code (LIC) to describe the system software that was dependent on the hardware. Microcode is part of the hardware, and customers can own the hardware. System software, including operating systems, is generally treated as licensed software. The name change meant that the AS/400 operating system, which had previously been considered hardware, became licensed software. With the introduction of the RISC systems, that licensed software became System Licensed Internal Code (SLIC). SLIC is the operating system of the System i.

i5/OS: The Defining Entity

There you have it. The one thing that made an iSeries an iSeries was OS/400, and what now makes a System i5 a System i5 is i5/OS. The specific hardware isn't important. It has and will continue to change in the future as more and more common components are shared across IBM's servers. SLIC, the operating system, is also not the big differentiator. It has undergone major changes over time and will change even more in the future as system software components are also shared among IBM servers.

i5/OS, on the other hand, is unique to the System i5. It is i5/OS that provides the control environment and the application environment that make the System i something very special. It is not the simple operating system that its name implies. Maybe someday in the future we will have the opportunity to give i5/OS a name that properly reflects its true value.

Meanwhile, the next time someone tries to tell you that in the future you will be able to buy a System i5 without i5/OS, set the record straight. Without i5/OS, it is not a System i. It's just another server. TMG



Dr. Frank G. Soltis *of IBM Rochester created the technology-independent architecture used in the AS/400 and System i. He is IBM's System i chief scientist and a professor of computer engineering at the University of Minnesota.*

This article is reprinted with permission from iSeries NEWS, September 2003, article ID 17055, www.SystemiNetwork.com. It was updated slightly to reflect new system names.

IBM Mashes System i with p (and More)

Then Separates Large from Small in Massive Organizational Shakeup

By: Chris Maxcer

In a set of massive organizational realignments, IBM is breaking up its Systems and Technology Group (STG) so that IBM can focus on the needs of its very large customers as well as the needs of its SMB customers—in addition to going after a bigger share of the $32 billion SMB pie. **Bill Zeitler**, IBM's senior vice president and group executive for the IBM STG, announced this July 18th in an internal IBM memo. That afternoon, IBM's System i General Manager **Mark Shearer** gave me a 25-minute briefing by phone, and I'm still trying to grasp all the details and ramifications. Basically, the IBM known by the System i world is moving and shaking in a way that may change the landscape forever.

Here are the basics:

IBM is merging its System i and System p technology groups and also breaking them apart into two new groups — one that focuses on very large organizations, and one that concentrates on SMBs. "I have noticed first hand, even the language you use, the requirements, the approach to the marketplace are radically different between our large enterprise clients and our small and medium business clients, and I think with having the discreet segmented approach . . . we're going to be a lot more effective," Shearer said. The enterprise group will be the "Power Systems" business unit, and it will focus on the 570 and 595. (Incidentally, we should see the first POWER6-based System i 570 announced next week, as well as a new granular "pay for what you use" approach to pricing for large customers. Shearer noted that IBM is moving at an extraordinary rate of speed on these changes.) The Power Systems business unit will be led by **Ross Mauri**. The new SMB business unit will be known as the Business Systems unit and will retain responsibility for the low-end System i products — the i550, i525, i520, and i515. It will be led by **Marc Dupaquier**. In addition to housing the System i, the Business Systems unit will bring other IBM technologies into the mix through a new integrated sales model in which IBM will approach customers on a total-solution basis rather than a separated, technology segmented model.

New SMB Roadmap

Shearer said IBM will develop an IBM roadmap for SMB offerings, integrating Web 2.0 services with middleware, and will change its sales structure so that IBM reps are offering more focused solution messages. "It just drives SMBs nuts when three different faces from IBM with three different proposals show up at their doors," Shearer said. In addition, changes are afoot for IBM Business Partners. It sounds like they'll have to play by the new rules, too, selling total IBM packages rather than simply concentrating on System i. "The majority of our Business Partners are many steps ahead of IBM on this because most of our Business Partners already sell multiple parts of the IBM product line. For example, most already sell the Unix solutions," Shearer noted. "In fact, less than 10 percent of the System i partners only sell System i. So our Partners really do embrace this model of solution selling rather than single-technology selling."

Mark Shearer Will Stick Around

"They just can't get rid of me," Shearer joked. He will lead the two new groups [as] Vice President and Business Line Executive. "I'll be driving the product strategy and the product plans for both the high and low-end POWER systems. So I'll have the hardware, the high-end, the blade, and modular, and I'll have all the software—i5/OS, AIX, and Linux, and by looking at it holistically, I think we'll be able to bring to market some innovative new products. I think it will be great for the System i client base because they will see i5/OS pop up in unexpected places," he said.

Clients Who Use System i

Shearer explained. "... it turns out that our System i clients spend three times as much money on Unix and Intel and external storage systems, and we don't help them simplify that yet. We don't help them manage that more effectively, and I think that by having more of a client orientation, the combination of the IBM businesses will be far more effective." TUG

Chris Maxcer *is the news editor of the System iNEWS Magazine which provides information to help you make strategic business decisions and assess System i hardware and software products.*

[Reprinted with permission from the August 2007 issue of the IBM System i iSay Newsletter — this article originally appeared in System i Network July 19, 2007. www.systeminetwork.com/isnblogs/maxedout/2007/07/ibm_mashes_system_i_with_p_and.html]

TUG AGENDA

WEDNESDAY, OCTOBER 3, 2007

Even Further Beyond Query/400: WebFOCUS, the Big Daddy to DB2 Web Query

5:00 pm Session Abstract

Several publications have listed Business Intelligence as the number one area of concern for CIOs in 2007. It may be for this reason that IBM has seen unprecedented interest in the new DB2 Web Query product on System i. What you may not know is that DB2 Web Query is a simplified version of WebFOCUS from Information Builders. In his presentation Robert will show how upgrading from DB2 Web Query to WebFOCUS brings a new level of capabilities to Business Intelligence and reporting on System i. He will give examples of the state of the art features available including advanced data visualization, report distribution, electronic publishing, data write-back, and data connectivity with hundreds of applications and databases. Business Intelligence is back with a vengeance on System i!

Robert Eckersley

Speaker: **Robert Eckersley** is the Alliance Manager for Information Builders Canada. He manages the partnership between Information Builders and IBM Canada. Robert is a frequent speaker on Business Intelligence at seminars and System i User Group meetings. Contact him at Robert_Eckersley@ibi.com.

AGENDA AT A GLANCE	
Time	**Topic**
5:00	WebFOCUS
6:00	Intermission / MoM & Networking (Complimentary Buffet)
7:00	System i Directions Tour

Please remember to register with the TUG office!

Send your suggestions for future topics to: leo@tug.ca

MoM Location

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600 Highway 7 East (at Leslie)
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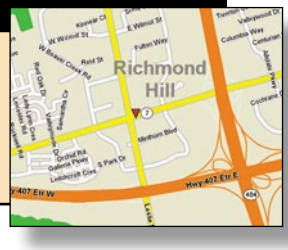
(Free underground parking)



IBM System i Directions Tour

7:00 pm Session Abstract

We are excited about having Frank touring several cities in Canada during the first two weeks in October. For anyone new to the System i, Dr. Soltis created the technology-independent architecture used in today's System i product family (and it's predecessors). Dr. Frank Soltis is IBM's System i Chief Scientist and a professor of computer engineering at the University of Minnesota. Don't miss the chance to hear the "father" of the System i talk about trends in the industry, the direction of POWER in IBM and of course Frank will discuss the direction of System i.

Dr. Frank Soltis

Speaker: **Dr. Frank Soltis** is regarded throughout the world as one of the most significant computer scientists of the twentieth century. Based on his Ph.D. dissertation research, he created a revolutionary computer architecture, which led to a totally new breed of computers. During the last decade he led the effort to define the architecture of the 64-bit PowerPC processors used in the IBM iSeries and pSeries servers. As the IBM Chief Scientist for System i5 he continues to define future directions for IBM systems.

Presented in conjunction with IBM Canada Ltd.

IBM®

System i Directions – IBM Cross Canada Tour with Dr. Frank Soltis

Roadshow Schedule

Tuesday, October 2 – Kitchener, Ontario
5 pm at Conestoga College
299 Doon Valley Drive
Held in partnership with the Central Ontario information Network (COiN) User Group
Register: www.ibm.com/events/ca

Wednesday, October 3– Toronto, Ontario
5 pm at Sheraton Parkway Hotel, 600 Highway 7 East, Richmond Hill
Held in partnership with the Toronto Users Group for System i
Register: www.tug.ca or www.ibm.com/events/ca

Thursday, October 4 – Winnipeg, Manitoba
5 pm at De Luca's 956 Portage Ave
Held in partnership with the Manitoba Midrange User group (MMU)
Register: www.ibm.com/events/ca

Tuesday, October 9 – Vancouver, British Columbia
12 noon at the TRIUMF Auditorium, UBC, 4004 Wesbrook Mall *
Held in partnership with the BC/i400 User Group
Register: www.ibm.com/events/ca
or email Sharon Catley at s.catley@smitmarine.ca

Wednesday, October 10 – Calgary, Alberta
9 am (location to be confirmed)
Register: www.ibm.com/events/ca

Wednesday, October 10 – Edmonton, Alberta
5 pm at West Edmonton Mall Conference Centre, 3rd Floor, Conference Room 5
Held in partnership with the Northern Alberta User Group (NAUG)
Register: www.ibm.com/events/ca
or email Ken Collins at ken.collins@exel.com

Thursday, October 11 – Saskatoon, Saskatchewan
12 noon at the Saskatoon Club, 417 21st St East
Register: www.ibm.com/events/ca

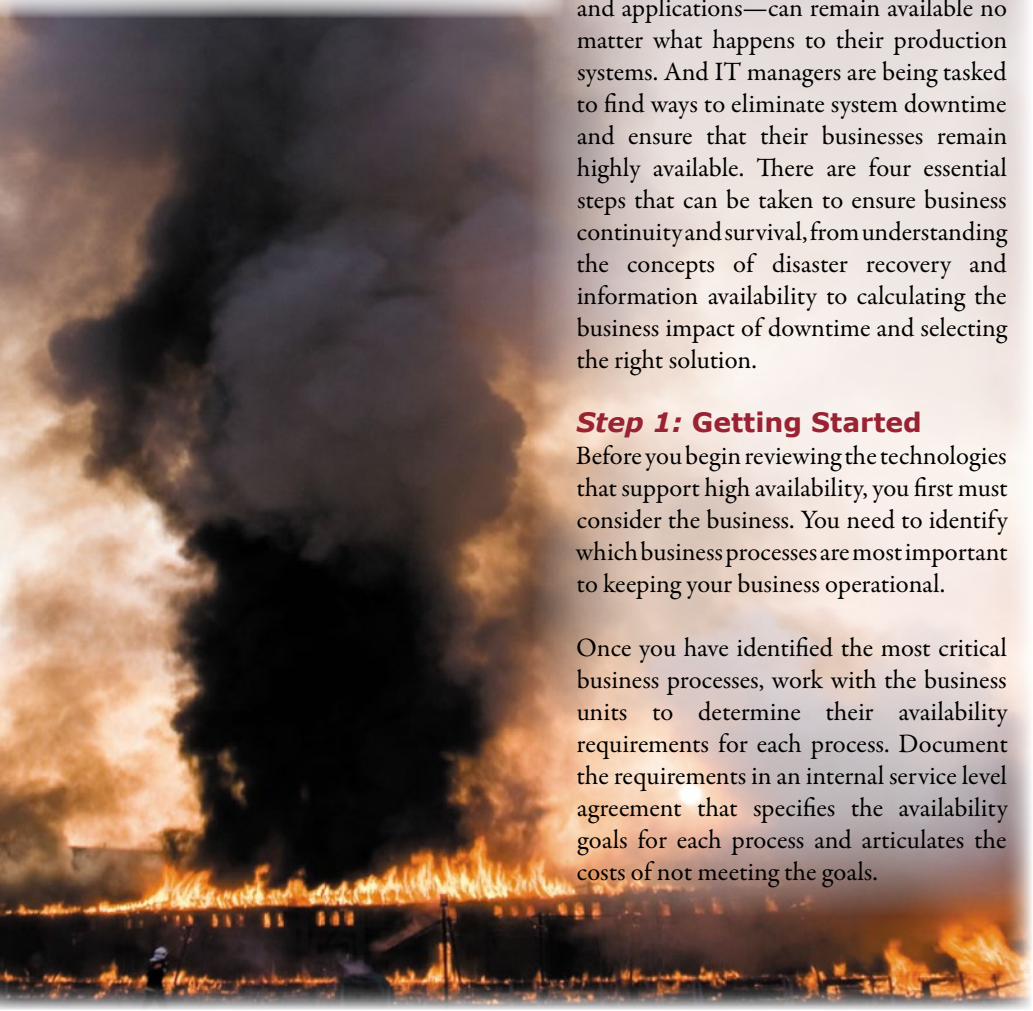
* All locations except Vancouver will have both Frank Soltis and Robert Eckersley. Vancouver will just have Frank Soltis and a tour of the TRIUMF facility.

Ensuring Business Survival

By Edward Vesely

Six years ago on September 11, 2001 I was tying the shoes of my six-year-old as she prepared for what should have been another cheerful, uneventful day at her elementary school. Instead we witnessed together the second airplane slamming into the World Trade Center. Since that moment, our world has changed dramatically.

My child likens these times to her *Series of Unfortunate Events* chapter books, letting me know in her own way that she understands bad things happen to good people and yet life goes on. Call me idealistic, but I am optimistic about her future and hold great hope that human resilience and ingenuity will overcome these challenges.



Businesses blaze in downtown Helsinki, Finland (Photo by Jari Aho)

High Availability Solutions Defend Against "Unfortunate Events"

The term "high availability" refers to a business application or system being able to switch to a backup system and continue processing whenever problems occur on the primary production system. According to market research firm IDC, 10 percent of all servers shipped will be part of a high-availability solution by 2009, accounting for 22 percent of all server revenue. And they predict that the disk-based data protection market will grow to more than $50 billion by 2010; those numbers include hardware and software.

Given this investment, executives want assurances that information assets—data and applications—can remain available no matter what happens to their production systems. And IT managers are being tasked to find ways to eliminate system downtime and ensure that their businesses remain highly available. There are four essential steps that can be taken to ensure business continuity and survival, from understanding the concepts of disaster recovery and information availability to calculating the business impact of downtime and selecting the right solution.

Step 1: Getting Started

Before you begin reviewing the technologies that support high availability, you first must consider the business. You need to identify which business processes are most important to keeping your business operational.

Once you have identified the most critical business processes, work with the business units to determine their availability requirements for each process. Document the requirements in an internal service level agreement that specifies the availability goals for each process and articulates the costs of not meeting the goals.

Edward Vesely

Documenting the cost of not meeting availability requirements helps you determine the value of a software investment used to improve availability. This information also helps you prioritize the processes to analyze. After documenting the service levels required, you can start analyzing the availability needs of each business process technology by technology.

Step 2: Assess the Financial Impact—Calculate the Cost of Downtime

How much does downtime cost your business? The answer may not be as obvious as you think. Unexpected IT outages can unleash a procession of direct and indirect consequences both short term and far reaching. The dollar amount that can be assigned to each hour of downtime varies widely depending upon the nature of your business, the size of your company and the criticality of your IT systems to primary revenue generating processes.

Step 3: Uptime and Business Resiliency—It's All About Recovery

Following any unplanned outage, how quickly must you have the organization up and running as close to normal business operations as possible? Remember, every minute costs you—take a look at your downtime cost per hour. Your recovery will depend on two objectives: your recovery time and your recovery point. These two measures will determine the optimum availability your organization will need.

1. Recovery Time Objective (RTO).
RTO defines how quickly you need to restore applications and have them fully functional again. The faster your RTO requirement, the closer you move to zero interruption in uptime and the highest availability requirements.

2. Recovery Point Objective (RPO).
RPO defines the point at which the business absolutely cannot afford to lose data. It points to a place in each data stream where information must be available to put the application or system back in operation. Again, the closer you come to zero data loss and continuous real-time access, the higher availability you will require.

You may have different RTOs and RPOs for each of your business critical applications. For example, a supply chain application that feeds a production plant may require a recovery time of only a few minutes with very minimal data loss.

Step 4: Select a Software Strategy for Successful Business Survival

When the real world costs of unplanned downtime are taken into account, an information availability solution is a cost-effective strategy for protecting businesses from serious injury. In particular, small to mid-sized businesses can benefit significantly from high availability solutions because they are generally more vulnerable to severe damage from unexpected outages and have fewer resources to stage a recovery.

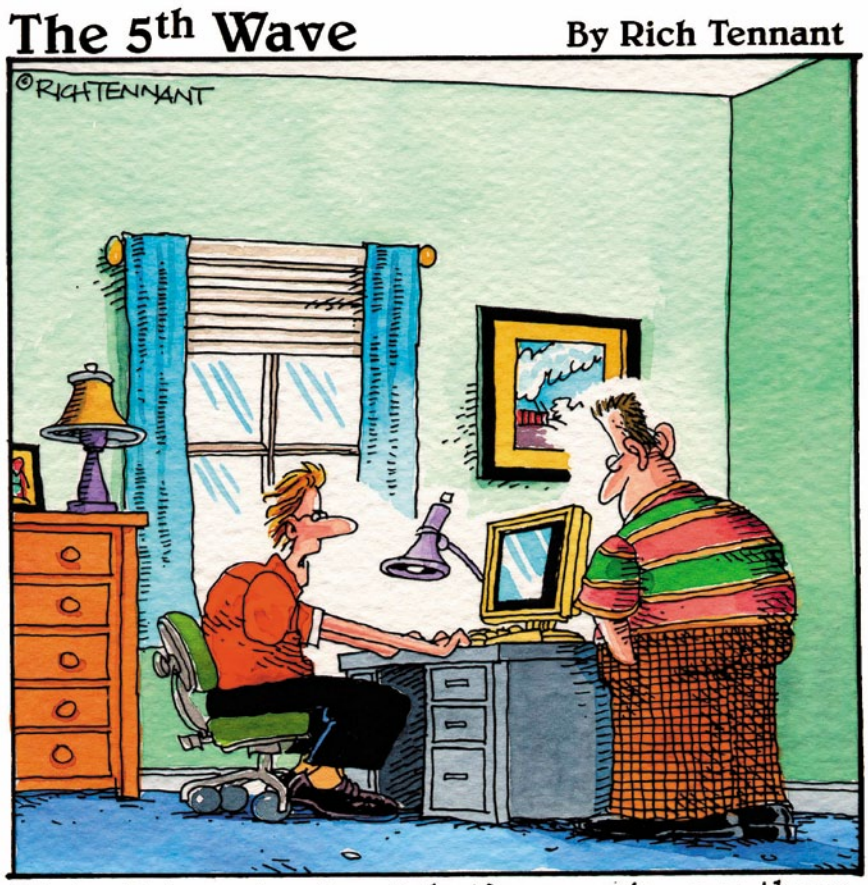
A high availability solution shouldn't be hard work or beyond your budget. There are affordable, easy-to-manage solutions that provide significant benefits to small and midsized businesses by minimizing the risks and consequences posed by unexpected IT outages. A high availability solution:

- Lowers the risk of significant costs to business such as lost revenue, productivity, legal penalties and brand damage caused by unplanned downtime
- Protects business relationships with customers, partners and suppliers by ensuring that applications and data will be available to satisfy their needs and unique schedules
- Enforces service level agreements by maintaining predictable RTOs and RPOs in the event of an IT outage
- Enhances ROI on existing resources by assuring they will be available to generate revenue and support business processes
- Ensures compliance with government and trade regulations by securing email and record retention requirements

In Closing

Certainly there are many internal and external factors that drive the decision to adopt one business continuity model over another. Every company should perform a business impact analysis and a risk assessment to determine exposure and requirements across the business, and then adopt a business continuity model that meets operational and financial objectives. In the words of Henry David Thoreau, "What people say you cannot do, you try and find that you can." TUG

Edward Vesely *is Senior Vice President, Worldwide Marketing at Vision Solutions, a leading provider of high availability, disaster recovery, and systems and data management software solutions.*



"I like Internet poker. What's annoying are those Word messages that keep coming up saying, 'It looks like you're trying to raise on the flop with a garbage hand. Would you like some help?'."

Why Is Your IT Project Being Audited?

By Debbie Gallagher

You're the manager of a system implementation or custom development project and have just been told that the project is being audited. There's a possibility that you aren't exactly thrilled about this. After all, the project is going well, or maybe it's over and the new system is humming along just fine. A common response by IT folks who haven't been exposed much to audits is "but I didn't do anything wrong, so why am I being audited?" The purpose of this article is to provide some information on the reasons why your IT project could be audited. You'll notice that the reasons have nothing to do with *you*!

Types of Auditors

First of all, you may have noticed by now that there are different types of auditors checking out your IT environment.

Here are some of the most common types of auditors that audit systems and IT processes in your organization every year:

- Financial statement;
- Controls certification readiness;
- Internal audit; and
- Regulatory.

The financial statement auditors are responsible for signing an opinion regarding the financial statements of your organization. Let's include here the folks who have to audit your controls for Sarbanes-Oxley, and any other internal controls audits. They will be from the same audit firm as the financial statement auditors and will generally perform one integrated audit to support both the financial statement opinion and the internal controls opinion. The systems focus of these audits is on IT processes and systems that could have an impact on the financial statements.

In preparation for the internal controls certification and audit, your organization may have hired auditors from another firm to help you get ready. They may be documenting your IT environment and providing feedback on control weaknesses, so that you can remediate prior to the controls certification audit. These auditors also will be financial-statement focused.

If your organization has an internal audit department, you will be used to seeing them almost every year. You may have also noticed that their focus is often different from that of the financial statement auditors. The internal auditors go beyond the financial statements to look at systems that affect operations, even if they have no financial statement impact. They frequently also have a mandate to verify that the organization's policies and procedures are being followed, or that value is being achieved for funds spent. The internal audit group may or may not be involved in assisting the financial statement auditors, depending on their mandate in your organization.

Debbie Gallagher

Regulators frequently also perform audits. For example, if you work for a financial institution, you are subject to audits by the Office of the Superintendent of Financial Institutions. Other industries also have regulatory auditors, and if you are in one of those industries, you know that these auditors will visit you every year. Their purpose is to verify that relevant regulations are being adhered to by the IT systems and processes in your organization.

The Annual Audit

The financial statements for your organization rely heavily on the systems in your organization—gone are the days of binders with 14-column paper! In performing their work, the auditors also rely on reports and data from those systems. As a result, the auditors are obligated to verify the management of many aspects of your financial systems. They will check out security, networking, communications, databases, and application implementation and maintenance. They may also evaluate business continuity planning and IT strategy. Depending on a variety of factors, the financial statement auditors may look at different aspects of your systems environment each year, say networking this year and databases next year. There may also be elements, like security, that do not follow a rotation plan, so are examined each year.

The internal auditors generally have a specific set of objectives each year, based on your organization's risk assessment and audit plan. As a result, they will look at different aspects each year that they visit you. As for regulatory auditors, the work they do will depend on the type of regulatory body they are and other factors relating to the industry and regulatory environment.

The Project Auditor

In addition to the usual array of annual auditors, you may also receive a series of visits from a specialist in IT project risk. This person or team will be hired by your project sponsor or client, who is looking for regular feedback throughout the project, so that risks can be managed timely. The hiring of this additional audit team is likely to occur in industries where there are a number of stakeholders to satisfy, or when the project is very large and high risk. The project risk audit team is likely to examine your project more frequently and in more detail than the various types of annual auditors.

The Project Audit

As part of the annual audit planning process, the audit team evaluates your organization and the risks in your environment. In this risk assessment, they are considering *inherent* risk, which is the level of risk that exists if there are no controls in your environment. So, for example, what would be the impact if everyone in the organization could sign a cheque, or if no one tested that new application system?

The audit team will then focus their work on the areas identified as highest risk. Although the areas of greatest risk vary by type of industry, a new system nearly always has a high probability of being identified as a medium or high risk. As a result, your IT project has a high likelihood of being audited, by the financial statement and controls certification auditors, the certification readiness team, the internal audit team, regulatory auditors, and maybe also project risk auditors. As noted earlier, the various auditors have different focus areas and objectives. As a result, you may find that your project is audited several times.

It's Not About You

So, as you can see, the project audit isn't about you at all. It's driven by the audit team's assessment of risk. In the next article, I'll provide some information on what the key areas of focus are likely to be on your IT project audit, if the project is an application development or implementation project.

Debbie Gallagher *is a Senior Manager, Canada IT Project Management Office at PricewaterhouseCoopers, Toronto. Debbie previously worked as a systems implementation consultant, and as IT auditor. She can be reached by email at debbie@gallaghers.ca.*

A Shift will Happen in the Future

By James O. Armstrong

No, it hasn't happened yet. But, the process has begun and it will continue — as more and more employers of every possible description in North America come to understand about the current and coming labor shortage.

Here are the current facts. There is already a North American shortage of nurses, teachers, truck drivers and warehouse workers, pharmacists, certain types of manufacturing employees and others. Plus, this analysis does not include the highly skilled worker shortage right now among technology companies in North America, which each year requires us to admit thousands of foreign workers with temporary visas to help us get this job done. And, even after we've taken this step, **Bill Gates**, who is the world's richest man, testified recently before the US Congress that the number of such highly skilled worker visas continues to be grossly inadequate to meet the current demand for such men and women.

Will this situation change for the North American economy in the future? Yes, it will, but not in the way you may expect, according to recent testimony from the current Vice Chairman of the Federal Reserve before the US Senate Labor Relations Committee. He, too, predicted that the labor shortage will continue and become such a significant factor that current economic growth, which has averaged 3 percent per year for the past 10 years, will actually drop by one third to 2 percent per year beginning in five years because of the anticipated labor shortage. With millions of Baby Boomers in North America, many of whom will choose at least some type of retirement, North America already knows that there are significantly fewer Generation Xers to take their place in the workforce. In short, North America cannot simply manufacture people.

At the same time, North Americans are living longer than ever before, thanks largely to the wonderful medical breakthroughs of recent years. In fact, one of four North Americans can now expect to live into their 90s on average. For their part, government pension plans and senior security plans change their requirements—depending on someone's date of birth. Further, not all of our Baby Boomers or Active Seniors want to stop working entirely (for a variety of different reasons, which range from needing the money to simply enjoying the work.)

Further, how often do we as individuals visit an Urgent Care facility near our homes on the weekend and wind up seeing a 72 year old semi-retired doctor (who used to be a surgeon in the area), who still likes to work with patients at least occasionally. We are also not surprised to see such men and women in a dentist's office, CPA firm, engineering company, financial planning office, stock brokerage or public relations firm either. In short, professionals are allowed to continue on the job on either a full-time or part-time basis in our society essentially as long as they desire to work and on schedules of their choosing. In addition, these older professionals are already helping now to bridge the labor shortage gap in their areas of expertise.

So, what about the rest of us?

Wouldn't it be a desirable outcome to have everyone else treated in the same way as these valuable professionals are now treated in our society? Of course, the answer to that question is an unqualified "Yes."

What is one of the greatest fears for someone, who is a Baby Boomer or Active Senior today? When someone is not yet ready to stop working completely, it is that "no one will want to hire me because I am too old." I believe that this type of individual thinking will change in our society primarily due to economic necessity, as more and more companies affirm their commitment to add men and women over age 40 to their staff, on a full-time or part-time basis or as independent contractors.

As Baby Boomers and Active Seniors, our generation also needs to check out the government, on every level. These important jobs will also see a massive turnover in the coming years, as a surge in retirements takes place in the area of essential government services. A grey haired acquaintance of mine with an excellent education and a high IQ recently secured a senior IT position in local government, after a 14 month, previously unsuccessful job search.

Just the Beginning

North America is right now in the beginning stages of responding to growing market pressures for available men and women to join their companies and other organizations. A noteworthy example of providing fringe benefits for part-time employment today emerges from Starbucks, which has received recognition for its forward thinking in this area. In addition, AARP several years ago established its annual awards program, which recognized top employers for its 50+ year old members. Prominent on this list are a whole group of outstanding hospitals. Schneider National, North America's largest truckload carrier which is based in Green Bay, Wisconsin, has also discovered the value of older husband-wife teams adding supplemental drivers to their fleet.

Will other companies and organizations make the same discoveries in the future? Simple supply and demand factors for available workers and managers will dictate the individual and collective answers to this question. The government may also step into this equation, perhaps even with tax incentives to companies to hire men and women above a certain age.

In conclusion, while it is hard to say when this shift will happen, we do know that it will gradually take place as more and more companies and other organizations realize the full dimension of our coming labor shortage and exactly how it will affect them. This shift will also be a positive one for Baby Boomers and Active Seniors alike since it will create a greater demand for them and for the continued use of their skills.

In addition, as one of our staffers recently put it to me, "It would be great just to see them (i.e. companies and other organizations) be neutral" in the hiring of older workers. On this point, our team agrees wholeheartedly. TUG

***James O. Armstrong**, is the president of NowWhatJobs.net Inc., and serves as the Editor of the web site: www.NowWhatJobs.net, which was set up to better inform individuals and employers about the current and coming labor shortage facing North America. In addition, James is the author of the book Now What: Discovering Your New Life and Career After 50 and is the president of James Armstrong & Associates, Inc., which is a North American media representation firm.*

Seneca College Column

By Russell Pangborn

Hello, my name is Russell Pangborn and I am a professor at Seneca College. Like a majority of this readership, my passion for System i technology has guided me through several years of an information technology career. Having been a main catalyst for Seneca's Computers Studies department's inclusion of AS/400 subjects, specialist designations and awards, I've now taken the next logical step with this column. My duties will involve supervision of a regular Seneca column in the TUG magazine.

Why Seneca?

There are several other colleges and universities in Ontario with a few of them including System i subjects. But, none of them have come close to the number of students involved with such a wide variety of iSeries subjects. I am not aware of any of them in Canada allowing a student to graduate with an iSeries Specialist designation and selecting top System i students from the graduates. Also, with a North American wide drop in enrolment in computer studies a few schools in Ontario have even lost their System i connection. Seneca has not. So, we have earned a spot in this magazine.

What will you hear about in this column?

Information about our Coop program, teacher and student perspectives, and the System i subjects currently being taught are just a few of the areas that can be covered. Also, we are not a one-dimensional department and I hope to convince some teachers from other areas to share their expertise. In 2004 the Canadian Information Processing Society (CIPS) recognized the breadth of our subjects when they certified our CPA and CPD diploma programs. These were the first college programs in the province to be accredited by CIPS. Open systems, game programming, object oriented software developers and database specialists all make our school very robust. We hope you find us interesting. TUG

***Russell Pangborn**, is the newest TUG Board Director. He can be reached at russell.pangborn@senecac.on.ca.*

JACKIE's Forum

iSeries Navigator Database Tasks

Jackie Jansen

I visited a progressive System i company recently and was surprised at their limited use of iSeries Navigator for interacting with DB2 for i5/OS. That visit prompted this column. I don't have anywhere near enough space to give iSeries Navigator the coverage it deserves. What I will try to do is highlight for you some of the capabilities and where you can go to get more information.

To start with, you need to realize that if you are reading this column chances are extremely high that you already own iSeries Navigator including the full database functionality. iSeries Navigator is IBM's GUI interface to DB2 for i5/OS and is an integral component of the operating system. The first trick is to make sure that you actually install the software that you are licensed to use. By default, when you install iSeries Navigator on your workstation the database functionality will not be installed. You need to do a custom install to activate most of the features discussed in this column.

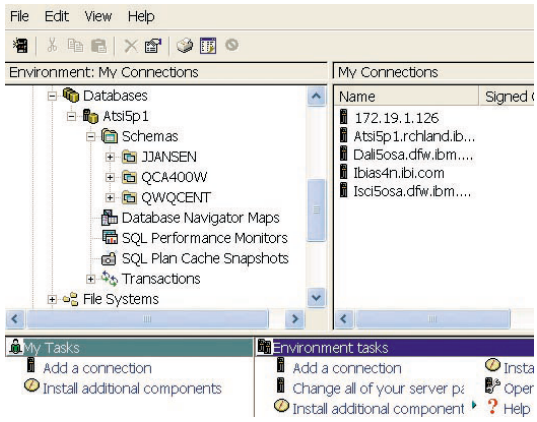
iSeries Navigator uses an explorer-like interface. This allows you to expand and drill down to the many different capabilities found within the tool.

Administration and Creation

From iSeries Navigator you can create all your various database objects such as libraries or schemas, physical files or tables, indexes, views, triggers and stored procedures. One interesting feature is the capability to reverse-engineer a library or schema. You can point iSeries Navigator to your library and ask it to generate the SQL that will allow you to recreate the library, complete with tables, indexes, triggers and more.

Another tool (discussed in previous columns) is our parallel database loader. If you want to import or export data to and from flat files such CSV files or ASCII extracts from other databases you will probably use the CPYFRMIMPF (copy from import file) or CPYTOIMPF (copy to import file) commands. These commands can be accessed from either a green screen or iSeries Navigator.

iSeries Navigator will also show you locked records. It will help with repairing database constraints. With iSeries Navigator you will have quick access to the rows in error. It will also allow you to reorganize tables and monitor the percent complete.



Performance Monitoring and Tuning

This is really the heart of the database enhancements to iSeries Navigator. iSeries Navigator is great for seeing the currently executing SQL for a given job or even finding SQL statements that have finished executing. When an end-user calls up and says "My query ran too long" you no longer have to ask them to rerun the problem query so that you can start to diagnose what happened. With iSeries Navigator you can view the SQL Plan Cache which will show you all the recently executed queries. It then goes one step further and asks if you would like to see the query execution depicted visually. This is called Visual Explain. To continue to make life easier for you, you can then have the "expensive" areas of the query highlighted so that you know where to direct your attention.

The index advisor has been greatly enhanced in V5R4. If your queries are using the SQL query engine (SQE) you will not only get more complete advice on what index you should create but you can see this advice consolidated for you across the system. Instead of looking at which index you would create to help improve the performance of a single query, the system will now take into consideration the recommendations from all the queries that you have run.

Additional functionality includes an easy interface to the QAQQINI table. This table is an absolute boon to helping you control query performance on your system. iSeries Navigator can help you evaluate when indexes were last used, not only to execute the query but also for statistical purposes. Last but not least, you have the capability to run the database monitor before and after major changes to your system and compare your results. No more hearing "I think my performance is worse now" from your users without being able to confirm or deny this statement.

The two web sites that contain additional information including labs that you can download, videos, presentations and much more detailed articles are: http://ibm.com/systems/i/db2 and http://ibm.com/servers/eserver/iseries/navigator. TUG

***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.*

Upcoming Events

Note: The September TUG Meeting of Members was re-scheduled to Oct. 3rd, in order to coincide with IBM's System i Directions Tour—with Dr. Frank Soltis.

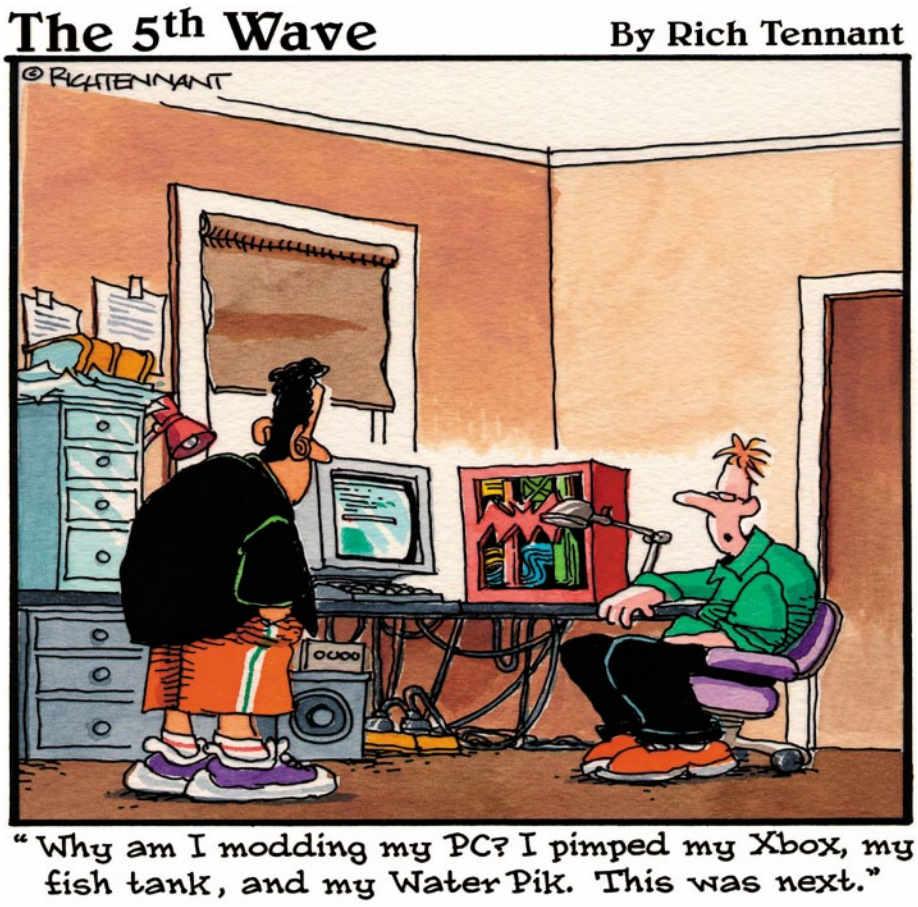
- **October 3, 2007: TUG MoM** (at Sheraton Parkway Toronto North) Joint meeting with IBM & TUG
  - 5:00 Speaker: **Robert Eckersley**
  - 7:00 Speaker: **Dr. Frank Soltis**
- **October 14 – 17, 2007: COMMON FOCUS 2007**, Columbus, Ohio
- **November 21, 2007: TUG MoM** (at Living Arts Centre Mississauga)
  - Speakers: **Trevor Perry** and **Alison Butterill**
- **January 23, 2008: TUG MoM** (at IBM Toronto Lab—to be confirmed)
  - Speakers: **George Farr** (Product Line Manager for System i AD tools and compilers with IBM's Rational Software Development division) plus special guests: **Tony Lewitt** (IBM 2nd line development manager) and **Wendy Toh,** IBM development executive — both from Raleigh, NC
- **March 19, 2008: TUG MoM**
- **March 30 – April 3, 2008: COMMON Annual Conference & Expo**, Nashville, Tennessee
- **April 22 – 24, 2008: TEC2008** (TUG's annual technical conference)
- **May 21, 2008: TUG MoM**
- **June 19, 2008: TUG Golf Classic** (20th Annual Golf Tournament)

C*RN BYTES

By Ken Davis

Wende is leaving,
And that makes us sad;
But she's going to have
FUN now,
And that makes us GLAD!

Nobody thought
that Wende'd be gone;
Shes been around forever!
But once she saw that
things were smooth,
She thought,
"It's now or Never!"



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