

# THE OMNI USER

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### **March Madness!**

Go George Mason! An unheralded mid-major making it into the Final Four. Kind of like our rarely advertised midrange server making it into IT departments throughout the Fortune 500. A bit of a stretch, perhaps, but it's fun to be in a year when the underdogs win out. And if you're an iSeries RPG programmer, you often know what it's like to be the underdog.

Anyway, March is coming in like a lion with a ton of news. For starters, OMNI has a new board (although you're still stuck with me for

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 $Edited\ by\ Joe\ Pluta\ -\ omni\text{-}comm@plutabrothers.com$ 

your newsletter). You can see the list of board members in the President's letter on the next page Yes indeed, our new President is getting right on the stick with an introductory letter.

Also, the Annual Technical Conference was an unqualified success! We had hundreds of people there, and we've gotten a lot of really positive feedback (and a little negative; we'll be watching the room temperatures a little more closely next time!). And the good reviews were from the speakers as well: Many IBMers were impressed with the turnout, which is to say with *your* commitment to the platform.

But we don't have time to rest on our laurels. The IT world is barreling ahead faster and faster, with all sorts of things from Intel chips in Apple computers to the (who'd'a thunk it!) delay of Microsoft's Vista operating system to the ever expanding technology of Web Services to the great new lineup of hardware and software for our beloved iSeries... er, System i5! Integration is the key, including working and playing with the Windows world (something Windows itself doesn't do so well sometimes!). To that end, we've got one of our most in-depth COMMON Corner articles ever, on setting up QNTC.

We're instituting the first LUG's O'Plenty column for LUG events, and look for even more new items in upcoming issues!

### **President's Letter**

- Mike Pavlak, OMNI Board President

Greetings! Spring is just around the corner and many things are new. A new operating system with V5R4; a new name for the iSeries in i5; a new marketing Vice President of iSeries marketing by the name of Elaine Lenox. And ... a new Omni Board of Directors! As your new president I have the privilege of introducing the new and returning board members for 2006. These folks will be working very hard to bring you the brightest and the best the i5 community has to offer.

### **OMNI 2006 Board**

President	Mike Pavlak	mike@pavlak.com
Vice-President	<b>YOU?!?</b>	
Secretary	Jim Miller	jmill0307@sbcglobal.net
Treasurer	Bill Parks	wparks@worldnet.att.net
Seminar Vice-President	Jerome Hughes	jromeh@comcast.net
Membership & DB Director	Sal Stangarone	sals@mrc-productivity.com
Communications Director	Joe Pluta	joepluta@plutabrothers.com
Advertising Director	Matt Gross	prrgg1@sbcglobal.net
Conference Director	Jim Vance	<u>JVance@Hendrickson-intl.com</u>
Webmaster	Dave Andruchuk	$\underline{dandruchuk@sungardfutures.com}$
Past President	Dale O'Leary	doleary@zysolutions.com
IBM Liaison	Joe Thompson	jwthomp@us.ibm.com

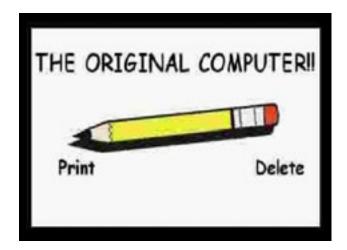
I would like to thank the board members from 2005 who are moving on. Their hard work and dedication made 2005 a winner. But now we look on to 2006. We are excited about the possibilities of the new year and the features of the new Operating System. Our March speaker, Howard Sylvester has years of experience with IBM and he will be updating all of us with the latest V5R4 information. There is a lot "in there" so plan to join us for dinner and a really good presentation on the latest the i5 operating system has to offer. The web site is up and ready for your registration so head to <a href="www.omniuser.org">www.omniuser.org</a> to register, right away. Don't miss out on your chance to get the goods on hardware and software updates for V5R4.

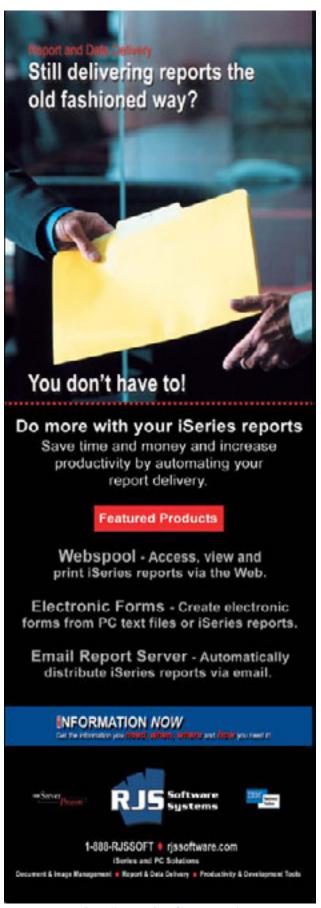
(NOTE: Yes, gentle reader, your so-called Communications Director botched it and you didn't get this letter in time. Won't happen again.)

We are still looking for another board member. Somehow we escaped without a Vice President. Are you an i5 fan? Got a few minutes to spare each month? Want to share your interests in the i5? Come to the next dinner meeting, grab a board member and join up! We can always use a little help planning and setting up for the next dinner meeting and event. It only tales a few minutes each month to provide the best i5 content in all of Chicagoland. Come on down and give it a try, I did!

Something new: Next month's meeting will be in a new venue. Due to some scheduling conflicts we were unable to secure the Embassy Suites, the long time home of the The Omni User. We are moving the April 18 meeting to the Great Escape restaurant in Schiller Park.

Thanks again to the 2005 board for a wonderful year and here's to the 2006 Board for blooming into a great new year!





http://www.rjssoftware.com/

## **Conference Summary**

WOW! What a show. The 18<sup>th</sup> Annual Omni User Technical Conference has come and gone. We had a really great turnout for the event and I would like to thank everyone who came for good technical content, networking and the latest in V5R4 related topics. The session evaluations have shown us that we are on the right track. But, we also have some opportunities for improvement. Through your session and conference evaluations you told us that we had just about the right mix of speakers and subject matter while we need to monitor room temperature a bit more closely.

We took copious notes and Jim Vance will take next years conference to new heights, and warmer breakout rooms! If you can spare a few hours to be a part of the dynamic group helping with the next event, please drop Jim a line at <a href="JVance@Hendrickson-intl.com">JVance@Hendrickson-intl.com</a>. He will be assembling the team for next years event real soon and even if you can only spare a couple of hours a month you can still make all the difference in the world.

I would like to thank the folks at the Drury Lane and Midwest Conference Service for their hard work in delivering what you told us was one of the best conferences ever! The venue was spectacular and we had very few technical problems thanks to the attentive supervision of the crew.

A special shout out to **Joe Thompson** and **IBM** for the great speakers. Many traveled over 100 miles to share their knowledge and you told us that they were great! Thank you to our local speakers, as well!

Last, but by no means least, our volunteers! This entire event was run by folks donating their spare time. Some a few hours and others a few days. But overall a nice event put on by people who have jobs and a love for the midrange platform just like you. Listed below are the volunteers who helped with this years conference. If you happen to meet one of these folks in the upcoming meetings, please shake their hand and congratulate them on a job well done. I will list their primary responsibility for the conference but please realize that many of these folks wore more than one hat and ALL contributed to the overall development of the event. They did a great job!

Jim Vance – Speaker Coordinator
Dave Andruchuk – Website
Bill Parks – Registration
Matt Gross – Vendor Registration
Cathy Kramer – Vendor Registration
Jim Miller – Registration
Don Burrel – Session Manager
Jim Scott – Session Manager

Yvonne Enselman – Registration
Paul Nelson – Setup and day of support
Jerome Hughes – MC of cocktail reception
Rodger Greif – Planning
Joe Pluta – Conference Brochure; planning
Joe Thompson – IBM liaison and speaker
recruiter

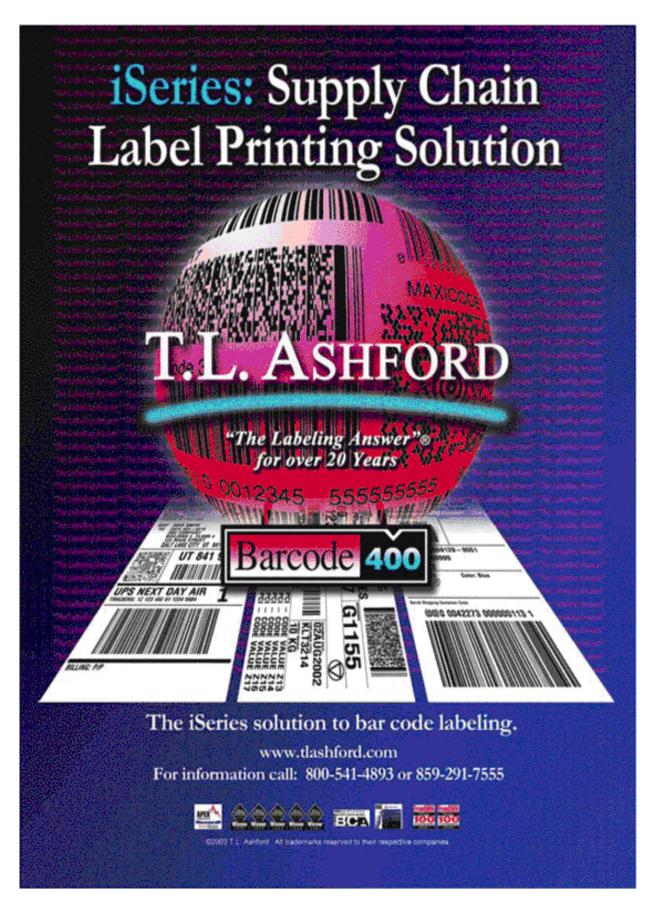
# **Pictures from the Conference**



Jim Herring holds forth on the new generation of iSeries hardware...



...to an enthusiastically packed ballroom.



### **March Meeting Recap**

And while the newsletter is technically out in March, it wasn't on time because you should be reading this **AHEAD** of the March meeting. We're still catching our breath from the conference; we'll get that straightened out in the next month's newsletter. The session was wonderful, however, with Howard Sylvester bringing us a wealth of information on the new System i5 hardware and the V5R4 i5/OS release. I didn't get to see Howard's presentation; I was in Detroit presenting a session on WDSC for RPG programmers to the Southeast Michigan iSeries User Group. But it's a great presentation, and I heard nothing but great comments about Howard's delivery. For those of you who missed it, you can get it right from the front page of the OMNI website: <a href="http://www.omniuser.org">http://www.omniuser.org</a>.

# **April Meeting**

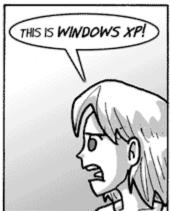
The April meeting is tentatively on the topic of collaboration. We'll bring you more information in the April newsletter, which I promise will be even more punctual than this one. One point of note: As you might have read in the President's letter, the meeting is being held at the Great Escape restaurant in Schiller Park.

 $\underline{http://www.greatchicagoribs.com/index.html}$ 









### IBM Redbooks/Redpapers

A monthly compendium of recent IBM Redbooks and Redpapers of interest to iSeries developers.

Linux on IBM eServer i5 Implementation Guide

Revised: March 3, 2006 ISBN: 073849187X 408 pages http://www.redbooks.ibm.com/abstracts/sg246388.html

PCI and PCI-X Placement Rules for IBM System i5, eServer i5, and iSeries servers with i5/OS V5R4 and V5R3

Published: February, 15, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/redp4011.html

IBM System i5, eServer i5, and iSeries Systems Builder, i5/OS Version 5 Release 4

Published: February, 14, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/sg242155.html

IBM System i5 Handbook IBM i5/OS Version 5 Release 4 January 2006

Revised: February, 4, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/sg247486.html

WebSphere RFID Handbook: A Solution Guide

Revised: February 4, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/sg247147.html

IBM Workplace Web Content Management for Portal 5.1 and IBM Workplace Web Content Management 2.5

Revised: January 30, 2006 ISBN: 0738494259 660 pages http://www.redbooks.ibm.com/abstracts/sg246792.html

IBM eServer i5, iSeries and AS/400e System Builder i5/OS V5R3: (October 2005—Draft)

Revised: January 24, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/sg242155.html

**Patterns: SOA Client - Access Integration Solutions** 

Revised: January 12, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/sg246775.html

IBM eServer i5 and iSeries System Handbook i5/OS Version 5 Release 3 (October 2005 -- Draft)

Revised: January, 6, 2006

http://www.redbooks.ibm.com/redpieces/abstracts/ga195486.html

Performance Management for IBM eServer iSeries and pSeries: A Systems Management Guide

Published: December 29, 2005 ISBN: 0738493240 258 pages

http://www.redbooks.ibm.com/abstracts/sg247122.html

Build a business process solution using Rational and WebSphere tools

Revised: December, 22, 2005

http://www.redbooks.ibm.com/redpieces/abstracts/sg246636.html

IBM eServer iSeries Windows Server Integration for Small and Medium Businesses: An Application-Serving Network Example using Citrix Access Suite on Integrated xSeries Systems

Published: December, 5, 2005

http://www.redbooks.ibm.com/redpapers/abstracts/redp0710.html

Deploying IBM Workplace Services Express on the IBM eServer iSeries Server

Published: November, 29, 2005

http://www.redbooks.ibm.com/redpieces/abstracts/sg246664.html

AIX 5L on IBM eServer i5 Implementation Guide

Revised: November 27, 2005 ISBN: 0738490539 426 pages

http://www.redbooks.ibm.com/abstracts/sg246455.html

# **LUGs O'Plenty**

This new section is devoted to upcoming LUG seminars, conferences and what have you. This includes things like golf outings and sponsored events. To get your LUG event on this list, contact me (Joe Pluta): <a href="mailto:Omni-comm@plutabrothers.com">Omni-comm@plutabrothers.com</a>.

April 24-26	Northeast IBM User Groups Technical Conference	http://www.neugc.org/
May 10	STATUS Day with Joe Pluta A seminar on WDSC	http://www.statususer.org/
June 9	Michigan iSeries Technical Education Conference	http://www.gomitec.com/

# **Upcoming Midrange Events**

March 28 5:00 pm	OMNI Monthly Board Meeting Board Members only	IBM 2 Lincoln Center Oakbrook Terrace, IL
March 26 - 30	COMMON Spring 2006 IT Education Conference & Expo Online Registration	Minneapolis Convention Center 1301 Second Avenue South Minneapolis, MN
May 8 - 12	IBM iSeries (spring) Technical Conference Online Registration	Fontainebleau Hilton Lake Buena Vista, FL
May 15 - 17	RPG World Spring 2006 Conference "The RPG Programmers Education Event" Online Registration	Orleans Hotel Las Vegas, NV
June 18 - 21	2006 iSeries & AS/400 Connection Conference "V5R4 is Here"  Online Registration	Naples Grand Resort Naples, FL

# **April 2006 COMMON Corner Reprinted from the December 2005 issue of COMMON.CONNECT**

### Hey! Where Did the Server Go? By Vern Yetzer

While great advances have been made in server technology, no commercially available server is able to jump to its casters and wander around the business. Despite this, IT personnel have been heard muttering, "Hey! Where did the server go?" This common question is not the result of the physical disappearance of a server, but rather the server's disappearance from its normal location in the corporate network. The disappearing server phenomenon is particularly alarming when the server is usually found within the bullet-proof confines of the i5/OS® Integrated File System (IFS).

QNTC is the i5/OS file system that allows iSeries applications and commands to seamlessly access Windows® and Linux servers throughout a network. It is the directory that contains a list of servers from your network. Since its initial release in V4R3, this file system has been gaining popularity as an easy way to share data between Windows® and iSeries applications. It is commonly used as a method for saving mission-critical PC application data, providing WebSphere® access to servlets, JSPs and documents stored on xSeries servers, and distributing i5/OS generated data to remote locations. As the file system has become a critical piece of the application environment, the availability of servers within the file system has become an important issue. Unfortunately, unlike other file systems that reside under the i5/OS IFS umbrella, the QNTC file system resides equally inside and outside the covers of the iSeries. When a QNTC user asks the question "Where did my server go?" the search will take them beyond the familiar commands and messages of the iSeries into the world of network hiccups, Windows® Network Neighborhood and open source operating systems.

This article will review some basic configuration tips that will help you avoid losing track of a server. Then it will present some tips and techniques for identifying and resolving the missing server problem.

### **Configuring QNTC**

In a basic network, no configuration is required to use the QNTC file system. The file system has been available on all AS/400s and iSeries since the V4R3 release. Since V4R3, entering the command "WRKLNK '/QNTC/\*" would give you access to the file system. However, in most cases some configuration is needed in order for the file system to access the desired servers.

Configuring the QNTC file system consists of setting up and starting iSeries NetServer, and synchronizing the user profiles between the iSeries and the servers you would like to contact. The most significant part of the QNTC configuration involves setting up iSeries NetServer. This configuration will determine which servers should automatically be included in the file system. The objects within the /QNTC directory represent servers within the iSeries NetServer's domain. By specifying the domain where the iSeries NetServer will reside, you determine which servers will appear within the /QNTC directory.

The tool for configuring iSeries NetServer is iSeries Navigator. **Figure 1** shows the iSeries Navigator general configuration panel for iSeries NetServer. In this example, the iSeries NetServer will be located in the NETSERVER domain. Therefore, the /QNTC directory will contain the names of the servers in the NETSERVER domain.

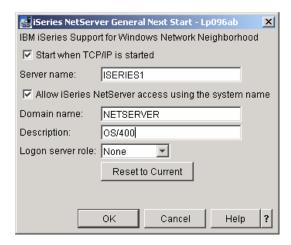


Figure 1

At this point, the QNTC file system configuration would be complete except that in most modern installations the network consists of a variety of physical network segments and TCP/IP subnets. Since the protocol used by iSeries NetServer to enumerate the list of servers is not routed through most networks, this means many servers would be hidden from the iSeries NetServer.

In these complex network environments, it 's important to have a Windows Internet Name Service (WINS) server configured. The WINS server will allow iSeries NetServer to locate names that are beyond the local network. **Figure 2** shows the iSeries Navigator WINS configuration panel for iSeries NetServer. The Primary WINS server address represents the WINS server that iSeries NetServer will use for determining a master browser for the NETSERVER domain and ultimately will determine which servers appear in the /QNTC directory. More detailed information on the iSeries NetServer WINS configuration can be obtained by accessing the iSeries Information Center at <a href="http://publib.boulder.ibm.com/infocenter/iseries/v5r3/ic2924/index.htm">http://publib.boulder.ibm.com/infocenter/iseries/v5r3/ic2924/index.htm</a>. Enter *WINS* in the search bar and click on *GO* for more WINS information.

With respect to the QNTC file system, the domain name and WINS server addresses are the two main items of interest in the iSeries NetServer configuration. Many "Where Did My Server Go?" problems could be resolved by understanding the effects of these two configuration parameters.

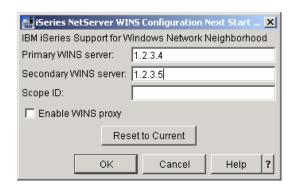


Figure 2

Once iSeries NetServer is configured, user authentication is the only remaining concern regarding QNTC setup. To authenticate a user with the QNTC file system, the password for the iSeries user profile must be synchronized with the authenticating password for the server that the QNTC file system is accessing, or

the iSeries Network Authentication Service (NAS) and Enterprise Identity Mapping (EIM) must be configured. While the lack of adequate authentication will not cause a server to disappear from the /QNTC directory, it will make the server inaccessible. The server will appear as a subdirectory in the /QNTC directory but the authentication process will fail and you will not be able to access your server data.

If your installation is using traditional password authentication, it's important to ensure that the correct passwords are being synchronized. Often a user will have more than one account that can be used to access a Windows server. In this case, you'll need to understand which user account the server is using for authentication.

The account used for authentication is determined during the early stages of a conversation between the QNTC file system and a server. During the initialization of a conversation, if the server identifies itself as a stand-alone Windows® or Linux Samba® server, then the iSeries user's password must match the user's local password on the server. Most servers deployed in today's complex corporate networks are part of a domain or active directory. The user accounts used by these servers are administered by a central system. When QNTC begins a conversation with a server that has centrally administered passwords, the server will identify itself as belonging to the larger domain. In this case, the iSeries user's password must match the password for the user profile in the domain. When QNTC attempts to authenticate with the server, the access will be denied if the password matches a local user profile on the server but doesn't match the domain-administered password. For this reason it is important to understand where passwords are being authenticated in your network.

By analyzing your network and properly configuring iSeries NetServer, you'll avoid many disappearing server problems.

### **Tracking Down a Missing Server**

Even though you have analyzed your network and configured the iSeries accordingly, something may change that causes a server to disappear from the /QNTC directory. Most "Where's the server" problems can be resolved by following a methodical approach to investigating the problem. The remainder of this article will explain the steps to take to resolve the typical "Where's the server" issue.

Before rolling up your sleeves and hauling out the tools to locate a missing server, you can often resolve the issue by asking, "What has changed in the network?" Changes that have caused servers to disappear include IP address and name changes in the network, iSeries NetServer configuration changes and physical relocation of server machines. It is always a good idea to consider these changes before you begin collecting traces.

The list of servers presented in the /QNTC directory has two sources: The server name is either created by the file system as a result of the iSeries NetServer network browsing process, or it is created using CL commands for creating directories. In this article, we're only concerned with the server names that have been created through the network browsing process.

Since the automatically created server directories are the result of the browsing process, if one of the server names that normally appears in the /QNTC directory is missing, you should begin by looking at the iSeries NetServer configuration. The configuration items that should be checked were discussed earlier in this article. Use iSeries Navigator to look for configuration changes.

If the NetServer configuration items have not been changed, then you need to verify that the domain controller's configuration is also unchanged. If the domain controller has changed to a different physical net-

work or TCP/IP network, it may not be receiving messages from the iSeries NetServer. Also, check the domain controller's Advanced TCP/IP, WINS server configuration to assure that both the iSeries NetServer and domain controller are still using the same WINS server.

If these checks have not located any changes in the network or server configuration, then it's time to break out the tools. There are many network analysis tools available and you may use the one of your choice, but here we'll use the iSeries Communication trace as an example because it is available to all iSeries users. In this article, we won't cover the details of each network packet, rather we'll focus on whether the network data is being sent and received in the expected flow. This information will allow us to resolve the majority of the missing server issues.

The questions we will address to track down the missing server are:

Is the iSeries locating a local browser? Is the iSeries requesting a list of servers? Is the iSeries receiving a list of servers?

We can answer all these questions using the iSeries communications trace (comm trace). If we observe that the iSeries is not receiving a response from the domain browser or receives an unexpected response, you may need to collect a network trace from the server you're attempting to contact in order to pinpoint the cause of the problem.

iSeries communications tracing is a troubleshooting function that allows you to capture the data that is being sent to and received from the network. After the data has been captured it can be dumped to a spool file and analyzed. More information concerning planning, capturing and printing communication traces can be found on the iSeries Information Center.

The first question to be answered was whether the iSeries is locating a network browser for our domain. To answer this, we need to collect a communications trace of the browsing process. Activate the communication trace using the commands shown here:

DLTCMNTRC CFGOBJ(myLine\_Name) CFGTYPE(\*LIN)
STRCMNTRC CFGOBJ(myLine\_Name) CFGTYPE(\*LIN)
USRDTA(\*MAX) MAXSTG(2M)

Figure 3

While the trace is active, enter the command:

WRKLNK '/QNTC/\*'

#### Figure 4

This WRKLNK command will cause the QNTC file system to request that iSeries NetServer query the network for a new list of servers.

After querying the network, end the trace and spool the results using the commands shown in Figure 5:

ENDCMNTRC CFGOBJ(myLine Name) CFGTYPE(\*LIN)

PRTCMNTRC CFGOBJ(myLine\_Name) CFGTYPE(\*LIN) CODE(\*ASCII) FMTTCP(\*YES)

### Figure 5

Now you can determine whether the browsing process was successful. Open the spooled output file and search for the word BROWSE. BROWSE will appear in the GET BACKUP LIST request where the iSeries was attempting to retrieve a list of backup network browsers and in the request response. If the word BROWSE does not appear in the trace, then the iSeries was unable to locate a network master browser for the domain configured in iSeries NetServer. iSeries NetServer could not determine where to send the BROWSE request. The network configuration needs to be investigated.

To verify the name of the available browser in your network, look at the network packet that contains the response to your browser request. The response is the second occurrence of BROWSE in the communication trace. After the second occurrence of BROWSE, there will be the name of a server in your network. **Figure 6** shows a portion of a response that indicates that MYSVR01 is a backup browser for this domain.

\*.BROWSE...k...MYSVR01.

#### Figure 6

If you don't get a successful response to the query for backup browsers or the BROWSE request is missing, there are several possible issues that need to be investigated. Start by checking whether there are domain browsers for the iSeries NetServer domain in the same physical network as your iSeries. If there aren't systems available to respond to the request, no server list will be present in the /QNTC directory. In networks with a WINS server, make sure that there is a domain browser configured to use the same WINS server as your iSeries NetServer. Once the configuration has been verified, check the WINS database and make sure that the domain name you are using is registered as a 0x1D Local Master Browser entry. When there is a domain browser active in either your local physical network or the WINS database, the trace will show a successful response to the GET BACKUP LIST request.

After browser issues have been resolved, the next question to address will be "Is the iSeries requesting a list of servers?" To answer this question, you need to continue searching the communication trace output that was collected earlier.

To verify that a server list is being received by the iSeries, search the communication trace for the request to list server names (SERVER ENUM). This request is identified by the string in **Figure 7.** Start the search at the point where the response to the GET BACKUP LIST request was received.

PIPE.LANMAN

The name of the iSeries NetServer domain should appear in the SERVER ENUM request. By examining the destination address for this request (Dest Addr), you will see that this request is sent to the browser that was identified in the previous search. The response to this request should contain the list of servers that will be used to build the /QNTC directory.

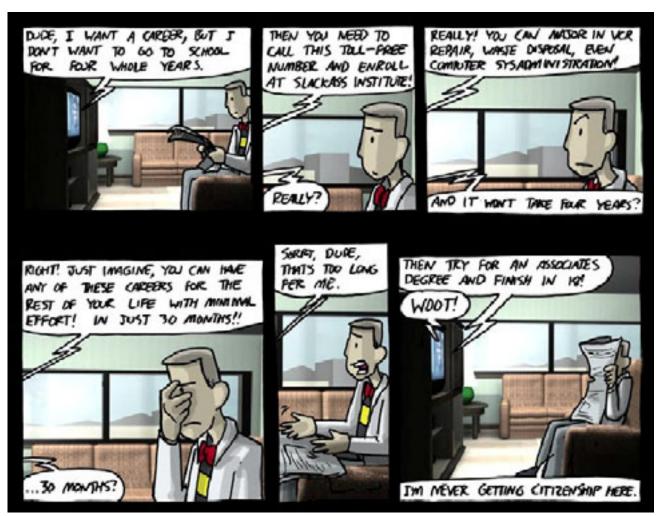
If the response to the SERVER ENUM request doesn't contain the name of the server that is missing from the /QNTC directory, then you need to investigate why the domain browser doesn't know about this server. Investigate whether the missing server is in a different domain. Is it located in a different physical network? Is it using a different WINS server than the domain browser? These are some possible causes of the "missing server" problem. To fully investigate this type of issue you may need to consult your Windows® technical documentation.

If the name of your server appears in the SERVER ENUM response, it should appear in the /QNTC directory. If it doesn't, you may need to contact IBM Support.

After answering the three questions for tracking down your missing server, you should know what caused the server to disappear. After resolving the diagnosed problem you will be ready to once again use your remotely stored data.

#### **About the Author**

Vern Yetzer is a software engineer on the File Servers and Clients team at IBM in Rochester, Minnesota.



## **A Note From IBM For i5 Developers**

iSeries developers recently received the following email. While it sort of enforces what we all knew — namely that tools that mess with the operating system would eventually cause some sort of IBM response — this also indicates to me that the platform is even more secure. You can judge the letter for yourself.

Dear System i5 Solutions Developer.

Announcement: Changes Needed to System State Programs

Within two years IBM plans to remove the i5/OS ability to restore system state programs not digitally signed by IBM. Only programs provided by IBM will be able to use system state. Any other system state programs will have to be changed to use supported interfaces accessible from user state.

It is anticipated that some new application programming interfaces will be needed to allow user state access to some functions that can now be accessed only from system state. If you find that you need such a new interface, please send your request to bvining@us.ibm.com.

No guarantee can be made that all requested interfaces will be provided. However, the sooner your needs are known, the more likely an interface can be supplied to meet them.

This action is being taken to enable a leap forward in the system's already-strong reliability and integrity. The highest levels of reliability and integrity cannot be achieved, even with extensive design and testing, if unknown code is accessing operating system control blocks and internal functions. For example, synchronization protocols used for accessing operating system data structures cannot be effective unless all accessing code uses those protocols. In addition, system state code that's not part of the operating system can degrade customer control of objects, because some functions perform reduced authority checking for system state code.

Thank you for checking your programs very soon if this integrity enhancement might affect them!

linda m. lovallo

IBM STG eServer Solutions

voice: 877-710-4780 tie-line: 349-4553