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# News Flash

## Glenn Robinson wows the CUA

On the 12th October the CUA hosted a one-day forum at IBM South Bank to provide members with detailed presentations on the facts about Linux and the Open Source community. A wide range of presenters from IBM, Novell, Red Hat and MITL explained the truth about Linux and where the industry experts believe it is running.

The last speaker of the day was Quattro Consulting MD, Glenn Robinson, who based his presentation on the use of Linux on IBM eServer i5 servers. Glenn described his own experiences of Linux on iSeries and i5 and how Linux can be deployed on iSeries and i5 using both the POWER Linux option in an LPAR or the Intel based Linux hosted on IBM xSeries servers integrated with i5/OS and OS/400.

Glenn summed up by saying: "With the new POWER5 processors the i5 is now the premier server platform for Linux. Users can now expect to achieve Linux reliability coupled with the additional reliability, flexibility and integration that the i5 and iSeries are already universally known for".

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# iSistance news

The technical bulletin from Quattro Consulting, the UK's leading independent technical consultancy for iSeries & i5

as and when required and has proven the flexible and responsive nature of the iSeries server in a client/server application environment.

As the machines are located offshore, both on separate islands, it was also important to consider the operational and systems management aspects of the servers. To date, Abbey International had been using Twinax devices as system consoles, the new servers were configured to utilise the LAN Console facility with Twinax console as a backup. LAN Console provided the ability for any of the iSeries, whether in Jersey or the Isle of Man, to use designated PCs as a system console. In fact, the server in Jersey was installed and configured from a PC in the Isle of Man using the LAN Console facility.

To enhance the availability of the system further, two Ethernet adapters were installed and configured to use the Virtual IP Address capability within OS/400. This allows multiple adapters to share a common IP address and should one of the adapters fail, the remaining adapter(s) will continue to operate without disrupting the LAN traffic to/from the iSeries server.

To fully utilise the power of the i810, Quattro Consulting implemented Ultrium2 Tape drives with cartridge autoloader to replace the 3570 already in use. This has been coupled with BRMS to allow Abbey International to run automated daily backups. With the speed of the iSeries and the Ultrium2 technology, the entire system can be backed up to a single cartridge in 25 minutes.

As with the previous OS/400 based servers used by Abbey International, the new iSeries servers with the Milvus G3 application continue to provide the core business services to the Bank with the new servers flexing their muscles sufficiently to ensure the iSeries remains the key server platform for Abbey International.

**Roger Wiseman, Senior Business Analyst, Abbey International enthuses:**

"The new technology has enabled us to greatly improve our operational efficiency by automating 98% of the manual tasks that were undertaken on a daily basis. Significant performance improvement has also been seen in areas such as JAVA Server and Query Processing, some reports that took hours now take minutes.

**In conclusion, Glenn Robinson, the MD of Quattro Consulting, comments on the migration:**

"Once again our commitment to our customers' needs has proven to be a winning formula. I am delighted with this particular implementation and the feedback we have received from the Bank. The iSeries has shown its true colours in Abbey International and I look forward to continuing our excellent relationship with this customer."

## Abbey International iSeries Implementation

Quattro Consulting recently assisted Jersey based Abey International to complete a successful server upgrade. Abbey International engaged Quattro Consulting to help with the logistics of the migration (including the strategic planning and installation of new hardware) from the existing iSeries 820 and AS/400 720, to two new iSeries 810 servers.

Quattro Consulting migrated from the existing 5250-based Milvus application to the Client Server Milvus G3 product. To ensure that the levels of service previously enjoyed by the user community were maintained, the decision was made to upgrade the Production and High Availability servers to iSeries 810 model #2486 Enterprise Editions.

The primary aim of the upgrade was to ensure that the Customer Services team (who regularly liaise with customers via the telephone) gain maximum benefits from the new application's functionality, without compromising on the current levels of performance. Due to the nature of the application, with its graphical front end and heavy use of ODBC, it was important to ensure that the iSeries provided sufficient horse power to interrogate the OS/400 based database and return the results to the user with minimal delay. To ensure that the incoming ODBC requests were processed as efficiently as possible, the iSeries Work Management environment was configured in such a way so that the ODBC requests were isolated from the remaining workloads. This ensures that this important workload always has the resources needed

# Feature article

The technical bulletin from Quattro Consulting, the UK's leading independent technical consultancy for iSeries & AS/400

## Shared Pools for Dummies

Although much of i5/OS and OS/400's complexity is hidden from the user by the easy-to-use Green Screen interface and the iSeries Navigator GUI, there is one area that I find most iSeries shops really struggle with - performance tuning.

Compared to other Operating Systems, i5/OS and OS/400 have an amazing ability to handle multiple workloads with great ease. I've seen many systems running financial applications with heavy database serving, file serving with NetServer, FTP and Telnet serving and mail serving with Domino whilst also managing Integrated Windows Servers.

We tend to take this functionality for granted, after all the system has been doing this successfully for many years. I still smile wryly when I'm in computer rooms and see one or two iSeries systems and then racks of ten or more Windows servers, each one running a single application or function.



The downside to this great ability of the iSeries is that it is not a simple task to implement this correctly. i5/OS and OS/400 allow us to 'carve' up the memory on the system and allocate this to the differing workloads. By default, IBM allocates the memory in to four shared pools:

- \*MACHINE Licensed Internal Code and OS/400
- \*SPOOL Printing
- \*INTERACT Green Screen sessions
- \*BASE All other jobs e.g. Batch, TCP/IP, ODBC, OS/400, SNADS

As you can see, the IBM defaults don't really help us in separating out the workloads. If I decide to put Lotus Domino on to a system it will also run, by default, in the \*BASE pool. The IBM defaults were suitable when the majority of AS/400 workloads were green screen, but these days we have many workloads on the system and, in general, the default memory allocation is no longer appropriate.

By using Shared Pools we can allocate memory in to separate areas, which can then be used by the subsystems running on the system. As well as the above four Shared Pools, there are a further 60 Shared Pools available for us to use in our memory allocation. As the name implies, a Shared Pool allows us to share the memory we have allocated between multiple subsystems.

If you run WRKSYSSTS command you will see the memory pools on your system. On one of our test systems we have:

System Pool	Pool Size (M)	Reserved Size (M)	Max Active	Pool	Subsystem	Library
1	148.90	86.35	++++	*MACHINE		
2	359.04	2.23	142	*BASE		
3	17.49	.01	12	*INTERACT		
4	.25	.00	1	*SPOOL		
5	348.99	.56	70	*SHRPOOL1		

Don't worry too much about all the different columns, just look at the Pool Sizes. You can see that in addition to the four default Shared Pools we also have \*SHRPOOL1 assigned some memory. Because a Shared Pool can be used by multiple subsystems, there is never anything in the Subsystem and Library fields.

On our system \*SHRPOOL1 is actually used by a Lotus Domino server in a subsystem called DOMINO00. There is no reason why we couldn't assign a second or third Domino subsystem to the same Shared Pool.

So, how do you assign memory to a pool and route a subsystem's jobs to the Shared Pool? First of all run the WRKSHRPOOL command. This will show you how much memory is on your system and how it is allocated amongst the Shared Pools.

To make the best use of Shared Pools we need to set minimum and maximum pool sizes and also set the QPFRADJ system value to allow the operating system to manage the memory for you within the guidelines you configure. I know many experienced OS/400 technical specialists who would argue this point with me.

My opinion is that OS/400 is pretty good at most things in terms of self-management, so why not allow it to manage your memory too by responding to your differing workload requirements. I believe all of my customers would bear me out on this.

A common thing to do is to move your batch jobs out of the \*BASE pool and in to its own memory pool. It may be that you just have the QBATCH subsystem for batch jobs or a number of other subsystems you use to run batch processes. We'll move QBATCH to its own pool. Run DSPSBSDB QBATCH and take option 2, Pool Definitions. You will see that, by default, there is one Pool ID assigned and this points to \*BASE. What this means is that any jobs running in the QBATCH subsystem will be routed to the \*BASE memory pool. Before we change this we should move some

memory to the Shared Pool we wish to use. We'll assume that you only allow one batch job to be active in the QBATCH subsystem at any time, as this will make the configuration slightly easier.

At the WRKSHRPOOL display enter some memory for \*SHRPOOL2. For one batch process I would allow about 10MB of memory, this is purely a guideline and is sometimes too low, but will be good for a start. For \*INTERACT I would assign about 4MB per Max Active job, and that would be generous in many cases.

Enter 10.00 in the Defined Size field and 1 in the Max Active field against \*SHRPOOL2. For Shared Pools running batch processes that will be processing database files I would also set the Paging Option to \*CALC. Press F11 twice and type some text against the Shared Pool such as 'QBATCH Pool'. This will help you to remember what subsystems are running in each Shared Pool. Press Enter to save your changes.

At this point we haven't actually moved any memory in to the Shared Pool, just configured our intent that we want memory put in to the Shared Pool when a subsystem using this pool is active, so let's change QBATCH to use \*SHRPOOL2. Type in:

```
CHGSBSD SBSDB(QBATCH)
POOLS((1 *SHRPOOL2))
```

This tells the system that jobs running in the QBATCH subsystem should be routed to \*SHRPOOL2. If QBATCH is already active then any running jobs will continue to run in \*BASE and any new jobs running in QBATCH will run in \*SHRPOOL2. At this point the system has to move memory in to \*SHRPOOL2, so where does this come from? The only place the system can move memory from is the \*BASE pool, but if there is insufficient memory available then the request is declined and the QBATCH jobs will continue to run in \*BASE.

When you look at the additional parameters on the WRKSHRPOOL display you can see there is much more you can configure. I will cover some of these in future Tech Tips, I don't want to fry your brain by covering everything in one issue but it does demonstrate how customisable the system is. IBM performance guidelines say that you should run 'like' jobs in their own memory pool. In the majority of cases, I recommend the following Shared Pool configuration in addition to the four default pools:

- BATCH – QBATCH subsystem
- TCP/IP and Host Servers – QUSRWRK and QSYSWRK subsystems
- File Serving (NetServer) and ODBC – QSERVER subsystem
- SNA – QCMN and QSNADS subsystems

In your environment you may not be using some of the above and, more likely, you will have other subsystems. The key is to group your subsystems in to 'like' workloads and then assign them to Shared Pools.

So, what's the benefit? By separating out your workloads you can improve your system's performance both in terms of throughput and reducing the impact of one workload upon the remaining workloads on the system. OS/400 itself runs a number of processes in the \*BASE memory pool, these can be impacted in terms of

performance if you also have your batch jobs running in \*BASE too. In most systems you will have a number of different workloads running in \*BASE, your objective should be to move as many of these workloads out of \*BASE and in to their own memory pools. Run the WRKSBS command and see how many of your subsystems are running in pool 2, this is the \*BASE pool. IBM's default memory configuration contravenes their own performance guidelines!

If you are new to this then tread carefully. What I've described here is just the starting point of providing a customised and balanced configuration on your iSeries system. Shared Pools and the Performance Adjuster have been with us for many years so the technology is proven. Start off by moving your batch workload out of \*BASE and in to a Shared Pool and don't be too surprised how little memory the average job requires. In the worst case all you need to do is run the following command to back out your changes:

```
CHGSBSD SBSDB(QBATCH)
POOLS((1 *BASE))
```

This really is the tip of the iceberg in terms of performance management but it is definitely the place to start. The Operating System does hide a great deal of the complexity of our system but, when we start looking at performance, it is very difficult to hide the complexity.

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## Meet the team – Glenn Robinson



Glenn Robinson is a Managing Director of Quattro Consulting, the UK's leading independent technical support consultancy for the iSeries, AS/400 and i5.

Glenn has over fifteen years of technical support and consultancy experience both on the platform, as well as within a Business

Partner environment. Over the years Glenn has worked closely with representatives of IBM UK and the AS/400 Development Labs in Santa Palomba, Italy. During his time working with AS/400, Glenn has managed some of the UK's largest AS/400 sites and most prestigious AS/400 users including: Harrods, Selfridges, Barclays Bank and Eagle Star.

Glenn's early experience of IBM Midrange began in programming before progressing on to the system related side of iSeries-AS/400. Glenn is also a specialist in PC Connectivity, OS/400 Security, Application and System Performance. Other areas of expertise include programming using RPGIV, RPG400, CL, COBOL and more recently PERL, C, Java and Net.Data in iSeries Internet related projects.