

### Quattro Consulting

Quattro Consulting is one of the leading independent iSeries technical consultancies in the UK. Formed in 1997, the directors of Quattro realised that most iSeries related service providers were not specialists on the technical aspects of iSeries, with their own expertise in software development, marketing and support. Quattro Consulting offer a unique service, assisting users to enable their iSeries to operate at full capacity and capability, irrespective of the application being run. Quattro's three founding directors have been involved with the iSeries since its release in 1988 and subsequently have amassed over 50 years collective OS/400 experience between them.

### Products & Services include

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# New kid on the block

Phill Jones joins the Quattro team as 'Technical Consultant' to support Technical Directors Mark Reeves and David Sefton in the field. Phill brings a wealth of technical and senior project management expertise to the Quattro team having spent 18 years in the IT hardware and software solutions industry. Phill has knowledge of all areas within Information Technology including high availability, server consolidation, performance & capacity management, storage management and e-business solutions. No stranger to the platform, Phill has over 11 years' experience on the AS/400 and has worked on iSeries since its launch. Phill is also an accredited IBM e-business Solution Advisor.

Phill is a keen sportsman and between 1986 and 1998 served as a Staff Sergeant in the Royal Signals (TA) where as a Radio Technician he was responsible for the development of a communications infrastructure to deliver NATO's first live email solution during an active role in Bosnia.

## New office for Quattro Consulting

As a result of continued business growth, Quattro has taken up residence in new offices, situated on the outskirts of Coleshill, Birmingham just off Junction 9 of the M42 and Junction 4 of the M6. Glenn Robinson explains the importance of the move: "With Quattro expanding and taking on new staff, we needed a central base where we could accommodate customer meetings and presentations. Our focus this year will be on further improving customer satisfaction and increasing our support services. We have installed the latest Voice Over IP telephone system as well as Broadband and wireless technologies. This will enable Quattro to 'prove' customer applications, thus testing technology before full installation".

Quattro has installed the very latest IBM i5 server, running OS/400 V5.3 and Domino V6.0.4, along with all the other servers (including LPARs) covering levels of operating system from V4.4 upwards. Thanks to the new infrastructure, all these machines can be made available to customers via the web, for upward (or indeed downward) compatibility testing as well as demonstrations of Linux and Domino on iSeries. New Address: Quattro Consulting Limited, 19A The Courtyard, Gorseley Lane, Coleshill, Birmingham, B46 1JA

## All iSeries and i5 users need iSist

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The Quattro iSist support contract has been developed for all iSeries, AS/400 and i5 users who need a more flexible, helpful and knowledge-based approach to technical services. All Quattro iSist packages offer the user the facility to gain immediate technical support, from the inevitable daily 'How do I do this.....' question, to the more detailed planning and implementation of an upgrade, application interface or the resolution of a serious problem.

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**Annual/Monthly subscription:** Customers may choose to be billed on a Annual or Monthly basis.

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<b>Tier 1</b>	0	Project days - 15 support hours	<b>Tier 1 +</b>	3	Project days - 15 support hours
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iSist packages start at just £2500 per year and can include 24x7 support.

### Enquire now

For more information about Quattro iSist support contracts, contact: Helen Thomas  
 Tel: 07071 700 400 Email: [information@QuattroConsulting.co.uk](mailto:information@QuattroConsulting.co.uk)  
 Web: <http://www.QuattroConsulting.co.uk>

# iSistance news

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

## Why Virtualization?

Julian Box looks at why a technology like Server Virtualization has a future in your organisation.

With the prevalence of network-based services, the typical organisation has experienced a significant increase in the number of physical servers on the network. This has the subsequent effect of increasing the management time to maintain each server installation and increasing the total cost of ownership.

There is a significant drive in the industry to break this trend and although a properly designed network should incorporate resilience by utilising multiple servers to deliver services, this does however cause the unwanted side effects already indicated.

The main movement in the industry is to truly utilise scalable systems. Typical IT departments have difficulty in supporting an ever-increasing installation base of servers. Most network designers appreciate that trying to squeeze more and more applications onto the same server causes contention issues between the applications and ultimately leads to reduced performance and reliability. Therefore, most designs only allow one key application per server to reduce application contention, improve reliability and assist in the management of the delivery of services.

This however causes issues in the maintenance of multiple servers; this is where Virtual Server Technology offers the advantages of reduced physical servers and the reliability and performance of multiple platforms. The main manufacturers of Intel based servers are bringing to market a new breed of server that has higher end aspirations.

The new high-end servers are designed to provide a consolidation base for an organisation's server based services. The hardware installed in the machines provides higher system availability than traditionally provided by Intel based servers and this, linked into systems monitoring applications, allows systems to pre-empt possible failure conditions.

The migration path provided by this approach offers many benefits to organisations that will employ this type of network design. If a subsequent new application was to be introduced into an organisation,

then the usual process of purchasing a new server platform is eliminated. Some additional disk and memory may be required along with a network card but that is all. The new server would be defined to the consolidated server platform via the virtual server software utilised by an organisation and the software loaded as normal. The new server would appear on the network as a normal physical server would. This is all achieved without the need to purchase and install a new server.

The key to a successful implementation of Virtual Server Technology is the reliability of the hardware on which it is installed. This must not be compromised on, as the advantages will soon disappear if the server on which multiple services are delivered fails.

### The Virtual Server Technology works in the following way:

1. Virtual Server Software (such as VMware's ESX) resides on the server platform. ESX is a proprietary Kernel that is optimised for resource sharing between Virtual Systems.
2. The physical resources within the high-end server are split between the virtual servers that are to be run on the chassis. Disks, memory CD-ROM etc. are all shared.
3. Once the physical resources are actually assigned, the loading of the operating system of the virtual machine can commence and this is completed in exactly the same way as on a normal physical server. The virtual server has a BIOS and behaves like a real server; you can even power it off via its virtual off button.
4. Once the server is built, the applications are then loaded in exactly the same way as normal servers.

The servers exist on the network in exactly the same way as a traditional server. The key advantages over traditional server implementations are as follows:

- Can cost less to implement due to less physical servers being required.
- Less space required in racks and therefore less racks and reduced cost.
- Reduced hardware maintenance costs
- Reduce support costs due to the reduction in physical servers.
- Improved reliability, less machines to go wrong.
- Scalability as a new system implementation does not result in yet another server.

Now this is true systems scalability!

Julian Box is the founder and Managing Director of the Ji Consultancy Group, which strives to achieve business solutions based on a design ethos of achieving the highest system availability as part of the default specification. Julian has over 19 years of experience in the industry, which includes 10 years of IBM Midrange and PC LAN experience and 9 years designing High Availability Systems within the banking and financial sector. For more information visit [www.jiconsultancy.co.uk](http://www.jiconsultancy.co.uk).

# Feature article

## Demystifying Integrate Servers & Windows Integration on iSeries

Many of you will remember the FSIO (File Server IO Processor) card introduced by IBM a good few years ago, 1995 I think. Basically, this was a PC motherboard with an Intel processor, LAN, memory and KVM ports which allowed you to run OS/2 inside the AS/400. IBM sold quite a few of these but they were always so far behind the current Intel technology that the FSIO got a bad name. The FSIO then became the IPCS (Integrated PC Server) and we could run Windows NT on this. Then came the INS (Integrated Netfinity Server) and, today, we have the IXS (Integrated xSeries Server).

The IXS is a very slick piece of hardware which still suffers a little from the bad reputation its predecessors had, but this is unfair. A couple of years ago the people at Rochester decided that what they do best is build iSeries servers, not PC servers, so the design and build of the IXS cards was handed over to the xSeries people. Because of this, the IXS card has pretty much kept up with current Intel processor technology, making the IXS a much smarter and more viable solution for organisations running iSeries and Windows servers.

### IXS Overview

People are still blissfully unaware of what the IXS can do for them. Many people seem to think that you need a specific version of Windows 2000 or Server 2003 to load on the IXS. This is not true, you load the same version of Windows that you would load on to any other stand alone Intel server.



A number of people have told me that their Windows technical staff don't want to learn complicated OS/400 commands. Again this is wrong, the Windows support staff won't have to learn anything new at all, they will just see Windows as they normally do.

So how does it work? The IXS fits in to PCI slots in your system unit or in an expansion unit. The card itself then presents 4 USB ports, a LAN port and ports for a keyboard, display and mouse. When you order the card you specify the amount of memory you want on the card and any additional LAN adapters too. So, now you need two things to get started, a CD drive so that you can load Windows on the IXS and some disks to load Windows on to.

OS/400 has special objects called Network Server Storage which are actually objects stored in the IFS under the /QFPNWSSTG folder. In essence these are virtual disks which can be assigned to IXS cards, and also to Linux and AIX partitions too. The IXS needs a minimum of two disks assigned to it, a C and a D drive. The C drive is used to load Windows and to boot from, the D drive is used to store the I386 directory so that a copy of the Windows drivers etc is always available.

To install Windows we need to run the INSWNTSVR (Install Windows NT Server) command, this is used to install Windows 2000 and Server 2003 as well. This is the only OS/400 command you will need to run, as everything else can be and should be done from iSeries Navigator. The INSWNTSVR asks for quite a few parameters including the size of the C and D drives. There are specific minimums but you can specify anything up to 64GB disks at V5R2 and up to 1TB at V5R3.

With the Windows CD in the iSeries CD drive and the parameters entered on the INSWNTSVR command OS/400 will create the C and D drives, link the drives to the IXS card, start the install of Windows from the CD and away you go. The command will also create a Network Server Description (\*NWSD) object. This defines which hardware resource (IXS card) your server will be using.

With the \*NWSD and Network Server Storage objects created you have virtualised your Windows server. This means that you have removed a good number of restrictions that standalone servers suffer from, including reliance on physical hardware. Once the install is up and running you will do the remainder of the install from the display you attached to the KVM port on the back of the IXS card.

Admittedly this is a simplified version of how to install Windows on an IXS but there really isn't too much more to it.

### What can I do with IXS?

Anything you want really. The IXS cards are badged Microsoft Hardware Compatible so there are very few solutions that you cannot run. The main drawback is in terms of additional hardware, as there are no expansion slots on the IXS you cannot add additional PCI cards to the IXS. There are 4 USB ports so any USB device will attach to the IXS just as it would to a standalone Intel server with USB ports.

One of the great things about the IXS is its ability to outperform stand alone PC servers when it comes to I/O processing. Remember Windows 'thinks' it has a C and D drive. These are actually objects on the iSeries disks. A standalone server has an arm per drive, the Network Storage Spaces are like any other OS/400 object so they are spread across all your disk arms. This means that when Windows accesses drive C the request is really being processed by the iSeries SLIC, so the Windows server benefits from the I/O performance of your iSeries disks. SQL server is a potential candidate for the IXS as it is generally I/O bound.

Ask a Windows administrator how they recover a damaged Windows server. They normally don't recover; instead they rebuild the server by installing Windows, applying Service Packs and then restoring the user data. This means that it is virtually impossible to get the server back in to exactly the same state as it was at the last backup. This is because Windows is very sensitive to the hardware installed, bios settings etc.. If we lose an iSeries we reinstall OS/400 from our last SAVSYS tape and then reinstall the non OS/400 data from our last backup tapes. Even if the system is a different iSeries model we can do this. Therefore we can completely restore our system, we don't rebuild it.

Windows people would love to be able to do this and we can help them. If you are saving the Network Storage Spaces as part of your daily backups then you can simply restore one or more of these objects and link it back to your IXS. If your server's C drive gets damaged you can restore the Network Storage Space from your previous OS/400 backup, link it to the server as the C drive and reboot. I have done this on a system, it works and it took a total of 15 minutes. Most Windows technicians would expect this to take at least a day on a standalone server.

Imagine you had two IXS cards in your iSeries, one a Domain Controller and one a development server. If the Domain Controller IXS card failed you could do this:

- [Power down the development server](#)
- [Detach the Network Storage Spaces from the development server \(this does not delete them\)](#)
- [Link the Network Storage Spaces from the Domain Controller server to the development server](#)
- [Power on the development server](#)

Your development server IXS is now your Domain Controller, this would take you about 5 to 10 minutes to do. OK, you're without your development server for now but when you get the faulty IXS card fixed you can link the Network Storage Spaces from the development server to the new IXS card and you have your development server back on line again.

## Virtual Hardware

IBM provides its own drivers for Windows running on IXS cards. These allow Windows to utilise virtual hardware. I've already discussed the virtual disk units but the IBM drivers also allow Windows to access the iSeries CD/DVD drive and tape drives too. So you can load new applications on to the Windows server from CD by using the iSeries CD drive. Windows thinks that it is just another CD drive and it has a drive letter just the same as a physical CD drive.

If you want to do Windows based backups using Backup Exec or any other Windows backup solutions, you can save the data to your iSeries tape drive. Again, Windows believes that tape drive is a physically attached drive.

Although the IXS comes with one LAN adapter, the INSWNTSVR command creates a virtual Ethernet adapter for use between the IXS card the iSeries, this uses the Virtual Lan function which is also used by LPAR. There's nothing special about this LAN connection, it can be used just like any other LAN connection, the difference is that it's inside the iSeries so it is secure and very fast.

## Current Technologies

The IXS card shipped by IBM at present is a 2.0GHz Xeon processor with Hyperthreading. Now you may be thinking that this is lagging behind the times compared to the latest 3GHz processors available on the market. Just as MIPS don't indicate how powerful an iSeries is, the same seems to be happening with Intel processors too, you are likely to find that the IXS's Xeon processor could outperform a standard 2.8GHz Intel processor.

I've discussed the IXS in this article but there is a second solution from IBM called the Integrated xSeries Adapter (IXA). This is a card which plugs in to a diskless standalone IBM xSeries server. Rather than having the server card located inside the iSeries, the IXA allows us to have the server external to the iSeries but attached to it via the iSeries High Speed Loop. All the functionality described above is true for the IXA. The IXA is often used when the IXS cannot fulfill a customer's server needs, such as an application requiring additional PCI hardware inside the server which cannot be done with an IXS.

As well as running Windows on the IXS and IXA, IBM will be making Linux available on the servers too, hopefully this month. You now have the option to run Linux on either POWER processors using LPAR or on Intel processors using IXA/IXS fully integrated with the iSeries.

Hopefully you can see that the technology has come a long way since the days of OS/2 on the FSIOP. The IXS and IXA solutions are very viable options for Intel server applications and, as with most iSeries solutions, it is simple to deploy and manage. The biggest hurdle for many organisations is gaining the acceptance of the Windows administrators, but once they see the benefits and they realise they have nothing new to learn, they do tend to become big fans of the technology.

There is far more to the IXS than I have covered here so it's worth visiting the Windows Integration website at:

<http://www-1.ibm.com/servers/eserver/series/windowsintegration/>

IBM are revamping the site at the moment to include information about Linux on the IXS and IXA so the URL may have changed by the time this article goes to press but you should still be able to access the information from the iSeries Solutions web page at:

<http://www-1.ibm.com/servers/eserver/series/ondemand/solutions/>