Feature article
Logical Partitions for the wary

Logical Partitioning for iSeries and AS/400 has been with us for four years and has proved to be popular and reliable as most features of OS/400 are. However, Logical Partitioning (LPAR) is still seen as the domain of the 'big boys'

News
It's official - the case for outsourcing IT

In a recent article that appeared in iNEWSwire UK (Issue 117 - 9th July) the iSeries specialist enterprise applications provider; JBS, announced that in a recent survey the majority of SME directors welcomed the outsourcing of IT functions.

Qatar National Bank choose Quattro iSist Support Contract

Qatar National Bank (QNB) has appointed Quattro Consulting to support their OS/400 platform environment in the Bank's offices in London. The technical support package is Quattro's new iSist Support Contract.

QNB is planning to centralise OS/400 based applications to their Doha Headquarters later this year using the London office as an offsite disaster recovery site. QNB had been searching for a suitable partner to help with the migration project and chose Quattro after

discussions with a number of support organisations and IBM Business Partners.

QNB's aggressive IT strategy for the forthcoming 12 months requires a skill set that provides for an environment utilising SNA Server, TCP/IP, security and OS/400 high availability in order to ensure that the centralisation project is planned and executed successfully. Quattro were chosen because of their proven track record in all these areas and a history of unquestionable customer satisfaction.

Established in 1964 as the country's first Qatari-owned commercial bank, with an equally balanced ownership structure comprising 50% Government of Qatar and 50% private sector shareholders, Qatar National Bank has grown to be the largest bank in Qatar. It controls assets representing 48% of the banking system in

which 15 banks are now represented (8 Qatari, 2 Arab and 5 foreign). The Bank operates the widest domestic network with 32 local branches and offices supported by 58 ATM locations and international branches in London and Paris.
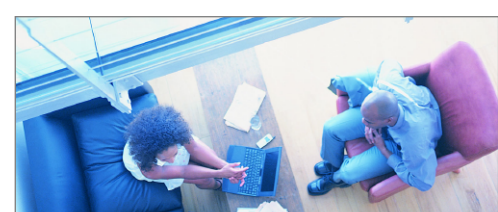
Quattro is pleased to welcome QNB to its growing list of customers subscribing to its increasingly popular iSist support programme.

For details visit www.quattroconsulting.co.uk

Feature article

Logical Partitions for the wary

Logical Partitioning for iSeries and AS/400 has been with us for four years and has proved to be popular and reliable as most features of OS/400 are. However, Logical Partitioning (LPAR) is still seen as the domain of the 'big boys'.

This is something I find hard to understand these days as even the smallest iSeries, the i800, has a CPW of 300, which is a decent amount of horse power for many SMBs. My belief is that many shops with 'smaller' iSeries and AS/400 systems don't fully understand LPAR, its benefits and the flexibility it can offer.

Not too long ago I had a discussion with a large organisation that has AS/400, iSeries and many other platforms. They are unable to upgrade from V4R5 as they still run OfficeVision functions integrated in to their applications. My suggestion was to upgrade their new 820s to V5 and create a secondary LPAR running V4R5 to continue running their application. A simplistic approach but one worth investigating I thought. Unfortunately the company's stance was that they had looked at LPAR previously and it wasn't something they were prepared to consider.

This is not an uncommon reaction when I have discussed LPAR with some organisations, others just feel it's only for 'big' systems and organisations. In this article I'd like to dispel some of the myths and hopefully demonstrate that LPAR is flexible, easy to use and there for all to use.

The basics

LPAR allows you run multiple OS/400 systems inside a single iSeries-AS/400 hardware package from V4R4 onwards. With V5R1 onwards you can also run 'Guest' Operating Systems alongside your OS/400 system(s). Presently the only guest supported is Linux, but I hear talk of running AIX as a guest also in a future OS/400 release. Be aware that Guests can only run on certain iSeries models but not on any AS/400 models. Guests are supported on the machines announced back in January 2003 which includes the i800 and i810.

The first releases of LPAR restricted each partition to whole processors. So, if you had a uni-processor system LPAR was not for you, as you could only run one partition on your system and that had to be OS/400. If you had a 2-way processor you could run two LPARs; OS/400 and OS/400.

With V5R1 came the facility to create a partition in units less than a whole processor, again this is not available on all models but it does open up LPAR to many more users. Now a uni-processor machine can have up to 4 partitions configured in any combination of OS/400 and Guests. If you have a 2-way processor you could even have one partition configured as 1.25 processors, meaning it will utilise 1 entire processor and 25% of the second processor, leaving 0.75% of a processor to use for further LPARs.

Some rules

In all cases the first (primary) partition must be OS/400, it cannot be a Guest Operating System.

OS/400 partitions have some rules that you need to be aware of. You cannot get in to the office and simply configure an OS/400 LPAR as there are some hardware requirements. Basically, each OS/400 partition requires:

- Processor resource. IBM supports a minimum 25% of a processor but you are allowed to configure down to 10% of a processor
- Minimum 64MB memory but 256MB minimum in the primary partition
- A system console – Ops Console, Lan Console or twinax
- At least one disk unit used as the load source for IPL
- A LAN adapter
- IOP to support the above

The disk(s), console, LAN adapter and IOP must be dedicated to the partition. As you can see this can require additional hardware on your existing box or requires some reasonable planning when ordering a new system or upgrade.

Each secondary partition is monitored and controlled by the primary partition and is an independent system. It is possible to IPL a secondary partition whilst the remaining secondary partitions and the primary partition carry on working normally. However, if the primary partition is IPL'd then all secondary partitions will also be IPL'd.

As well as sharing processors and memory it is also possible for OS/400 partitions to share tape drives. Only one LPAR can 'own' the resource but it can also release the resource to make it available to another OS/400 LPAR.

Linux as a Guest

With Linux you can create your partition on the fly as it has no dedicated hardware requirements. A Linux partition can share OS/400 resources such as LAN adapters, disk and CD-ROM. It is possible to assign dedicated hardware to Linux such as disk and Ethernet adapters and there are cases where this might be preferable and/or advisable. However, for many people trying to familiarise themselves with LPAR and Linux this won't be the case.

You'll also need a copy of Linux for iSeries, which you don't get from IBM, you'll need to purchase a copy from SuSE, Red Hat or Turbolinux. I believe it is possible to download the Linux kernel for PowerPC processor from the web, but I haven't tried this yet.

Communications

Although your partitions can have dedicated LAN adapters, it is also possible, and preferable, for your LPARs to communicate over internal LANS inside the system. There are three functions available to achieve this (spoilt for choice again) which are

- Virtual OptiConnect
- High Speed Link(HSL) OptiConnect
- Virtual Ethernet

The most easily configured is Virtual Ethernet. This function allows you to create up to 16 virtual Ethernet networks inside the system, no additional hardware is required. For each LPAR, you decide which virtual network the system will connect to, you may not want all systems available to each other.

Virtual Ethernet is very fast and can be compared to a gigabit Ethernet network in terms of performance. On a small test I carried out recently I copied a 28MB zip file between a Linux partition and OS/400 partition in only 3 seconds.

More recently I have been working with LPAR to demonstrate a three-tier ERP package. This is implemented on iSeries using both OS/400 and Linux. The Linux partition holds the server-based application code, which has been ported from Unix, and the OS/400 partition contains the libraries with the database files. The database is accessed by the application code using the IBM supplied Linux ODBC driver across a Virtual Ethernet between the two partitions. This has proved to be extremely fast and it is impossible to determine that the database is located on a different system running a different operating system from the application.

Software

One of the major benefits of LPAR is that you only need one license for OS/400 and the Licensed Program Products. The down side is that you will probably need a larger machine so you will need a license for a higher software group. Quite often this works in your advantage in terms of overall spend.

It is possible to have multiple OS/400 releases on a system, our system is currently configured with two OS/400 partitions, one running V5R2 and the other V5R1.

Configuration and Management

In the early releases of LPAR all configuration was done via System Service Tools (STRSRST command). This is still available but much of the configuration and management of the partitions is now done using iSeries Navigator. I realise this tool is still not over popular with many shops but I would urge you familiarise yourself with it as I believe you will need iSeries Navigator more and more in the future as OS/400 functionality moves away from the green screen environment.

V5R1 also allows us to dynamically move resources between partitions. For example, I may want to shrink the amount of processor and memory in a partition and assign the freed resources to one or more other partitions. These changes can be scheduled by the system so that they happen without you even having to be there.

IBM also provides a chargeable LPAR API Toolkit that allows you to write your own programs to manage the movement of resources between partitions.

Security

Since V5R1, IBM introduced Service profiles to provide improved security over the service functions. Prior to V5 if a user profile had Service authority you could control the entire system and its partitions. With V5R1 you can create up to 99 Service profiles and then grant these users authority to some or all of your partitions. Not only that, you can control which Service functions in each partition they have access to.

Where now?

LPAR is definitely here to stay, it is important to the future of iSeries. Hopefully we'll have AIX running as a Guest soon, I even heard once from an IBMer that it would be possible to run zOS (OS/390) as a Guest too but that IBM would be unlikely to release this. Once again, iSeries has proved to be as open and flexible as any other system on the market and we should be pleased that we have such a system.

This article is not meant to give you all the nuts and bolts of LPAR but to provide you with an overview of the functionality so that your organisation will consider LPAR as just another OS/400 function available in your kitbag.

References: iSeries LPAR home page: http://www-1.ibm.com/servers/eserver/iseries/lpar/
               iSeries Information Centre V5R1: http://publib.boulder.ibm.com/iseries/v5r1/ic2924/index.htm
               iSeries Information Centre V5R2: http://publib.boulder.ibm.com/iseries/v5r2/ic2924/index.htm
               iSeries OptiConnect: http://www-1.ibm.com/servers/eserver/iseries/opticonnect
               Redbooks: http://www.redbooks.ibm.com

               - LPAR Configuration and Management SG24-6251
               - Capacity Planning for LPAR on iSeries SG24-6209
               - Coexistence of multiple Lotus Domino releases in an LPAR environment on iSeries SG24-6593

Written by: Glenn Robinson, Managing Director of Quattro Consulting