



i5/OS on a Blade – At last

One of the worst kept secrets in IBM recently has been the introduction of i5/OS on a Blade. At the time of writing the introduction of i5/OS V6R1 is imminent and it is this version which will run on the Blade Server technology.

BladeCenter has been around for a few years now and is an extremely important product range for IBM as growth in Blade technology over the next few years is projected to grow at an astounding rate.

Traditionally Blade servers were designed to run Windows and Intel Linux but IBM has extended its Blade technology to AMD, CELL/BE and Power processors. In fact AIX and Power Linux, both available to run in LPARs on System i, are available to run on Power5 Blades. As usual good old i5/OS has been left until last.

Let's take a quick tour of IBM BladeCenter.

Chassis

This is the heart of the BladeCenter on consists of a box of sophisticated electronics. For commercial users IBM manufactures the

- BladeCenter E
- BladeCenter H
- BladeCenter S

Traditionally Blade chassis don't provide any disk resources to the Blade Servers but the BladeCenter S has space for up to 12 disk drives, basically a SAN within the Chassis. This means that the BladeCenter S chassis can hold a maximum of 6 Blade Servers. The E and H models do not provide disk drives in the chassis so provide space for up to 14 Blade Servers.

The S model can be rack or floor standing as it is designed to be located in an office whereas the E and H models are rack mount only.

Traditional servers have their own power supplies, fans, Ethernet and SAN adapters. The idea behind Blade technology is that the chassis provides all of this so that to blade servers just 'plug' in to the chassis and utilise the shared resources.

Ethernet

Each Blade Server has two integrated Ethernet adapters and these become part of the BladeCenter chassis internal networks when the Blade Server is plugged in. Two slots are available in the back of the chassis to connect one or two Ethernet switches from a number of manufacturers e.g. Cisco. The switch ports are configured as required and then connected to your physical Ethernet network.



SAN

SAN connectivity is similar to Ethernet in that two slots are available in the back of the BladeCenter for SAN switches. Again, multiple vendors manufacture these switches, Brocade, for example. In order for a Blade Server to connect to the internal circuitry to use the SAN switches a Blade requires a SAN adapter and again there are various options, Qlogic or Emulex are two options. With this adapter in the Blade it has access to one or both of the SAN switches.

KVM

The Chassis has keyboard, video and mouse ports which are shared and switchable between the Blade Servers in the chassis.

Management Module

In order to manage and configure all this technology the BladeCenter has a Management Module. Think of this as a built-in HMC for the BladeCenter. The MM has its own network port so it can be accessed via the physical network and managed by administrators or via IBM Director.

Blades

IBM offers Blade Servers with the following processors:

- Intel
- AMD
- Cell/BE
- Power5
- Power6

Blades generally provide one or two dual or quad-core processors, some memory, space for one or two disks and a PCI card. It is also possible to fit an expansion blade to a Blade server to provide additional disk and/or PCI slots. The I/O Expansion Blade takes up a Blade slot in the chassis.

There is much more to BladeCenter technology but that's the important bits in a nutshell.

JS22

Recently IBM has extended the Blade Server range to include the Power6 processor providing enhanced performance, efficiency and reliability in the new JS22 Blade Server. The JS22 Blade Server has been designed to run IBM's flagship 64bit operating systems i5/OS and AIX as well as the Open Source Power Linux from Novell SuSE and Red Hat.



The JS22 is powered by an IBM POWER6 Quad Core processor running at 4.0GHz and includes IBM's PowerVM Virtualisation Management software providing processor, memory, network and I/O virtualisation on the Blade.

Features include:

- Up to 10 Virtual machines per core
- Integrated Virtual Ethernet Adapter
- Calibrated Vector Cooling and IBM EnergyScale technology allowing customised power consumption of the Blade
- 11,000 CPW

That's enough stats on the JS22, how do we use it with i5/OS?

i5/OS on a Blade

Shock Horror! i5/OS on a JS22 does NOT support physical disks. Those of you who read my previous articles will know I started discussing the use of the Virtual IO Server (VIOS) which is a specialist LPAR available on System p and i implemented to provide virtualised storage and ethernet to other LPARs on the same machine. Kind of like VMware does except we did it first.

VIOS and all the other POWER Hypervisor functions such as VLAN, Micropartitioning etc, have now been given a name, PowerVM. The PowerVM functions are required on JS22 when running i5/OS as an LPAR as the VIOS component has to be used to 'own' the physical Ethernet adapters and storage provided by the SAN. This is very important, i5/OS on a JS22 can ONLY use storage from the IBM DS4000 range of SANs so be careful when looking at this option.

With VIOS 'owning' the Ethernet and SAN resources it is then presented to the i5/OS LPAR(s) on the Blade and you're away.

One big shocker is that the JS22 only support a maximum of 32GB memory. This has to be shared between PowerVM, VIOS and your LPAR(s). Remember that you can have multiple LPARs on your JS22 using any combination of i5/OS, AIX and Power Linux.

Another restriction is that the JS22 Blade can only support one internal disk drive. This drive is used to store and run VIOS, not i5/OS. However this is a single point of failure for the entire Blade Server. There is talk of a dual-core Power6 blade being introduced later and that this will have the capability for holding two internal disk drives.

Backups are another potential issue. i5/OS on a JS22 cannot have its own tape adapter so backups must be done via the VIOS or the SAN.



Via the SAN requires the use of Flash/VolumeCopy services within the DS4000. This is not especially difficult but it means that you are using SAN functions and commands to take copies of your i5/OS LUNs rather than using native i5/OS save/restore commands.

Alternatively you will use i5/OS save/restore commands to save to virtual optical discs presented to i5/OS by the VIOS. Once the saves are complete you can then use a VIOS command to save the images to a tape drive available to the VIOS. You could also have the VIOS make copies of these to the SAN. Not straightforward whichever way you do it.

Is it worth it?

From a pure technical point of view, yes it is. From a commercial perspective, maybe. If you already have BladeCenter H and are looking to host new or additional i5/OS workloads then it's definitely worth investigating.

BladeCenter is a superb technology and can bring businesses tremendous cost savings in physical space, heating and power usage. It bodes well that i5/OS is now part of that but Blade technology is not always the right solution. The new Power6 System p 520's have just been announced so I'm sure we'll soon see a Power 6 System i 5xx box too. The options between JS22 Blade technology and Power 6 5xx models will cover all the bases for some time to come.

<http://www-03.ibm.com/systems/bladecenter/hardware/servers/js22e>