

Right Platforming

By Jaqui Lynch

“The mainframe is dead”, “AIX is dead”, “Linux will be the only survivor”. Pick up any magazine today and it is likely you will still find one of those statements (or similar) in it. Add to this the statements being made by corporate leaders about focusing more on high profit services and new opportunities and it becomes difficult for anyone to figure out what the best platform to invest in will be. Do you stay with the legacy mainframe or AIX, do you invest in Linux so you can take advantage of all those kids coming out of college who have been using Linux for years or do you take some completely different path like outsourcing or using a public cloud or similar solution. And, of course, if you choose Linux then what platform do you run it on – X86, POWER, Mainframe?

These are some of the many choices we all face every day, but we err in thinking that we have to pick one. Instead we need to think about the business needs, the applications that will best support them and then translate that into platform decisions. Just because I focus on POWER does not mean I think the only answer is AIX, IBM i or Linux on POWER. There are times when the correct answer is some combination of those, or a mainframe or even occasionally x86. This is where Right Platforming comes in.

Right Platforming is about putting the workload on the platform and operating system where you get the best price performance coupled with any security and other needs. The primary consideration is the application you want to run – what are the performance and security needs? These often drive the platform choice. Additionally I always look at what platform the application is developed on and how quickly the other platforms come out with new releases and updates. I like to have my workloads on a platform that I know the company can quickly support. Other considerations are also around the personnel in house and whether there is the possibility of outsourcing for support for platforms that you currently don't have personnel to cover. Finally there is the cost which varies per platform. And of course there is the whole Cloud discussion. So let's look at some of these.

Performance includes scalability as well as I/O, CPU and memory performance. These all come down to architectural decisions made in system design. First we will address the mainframe.

Mainframe

The mainframe is an immensely scalable high performance system. According to the Register “the z13 has enough grunt to handle “real time encryption of all mobile transactions at any scale” – all the way up to its claimed 2.5 billion transactions a day capacity”. This system is not only incredibly scalable far beyond anything Intel can approach, but it supports HADOOP for analytics, OpenStack and DB2 BLU running on Linux. The system supports several

operating systems including z/VM, z/OS and Linux on Z, and will currently run 160 cores per cabinet with up to 50 virtual servers per core. I started working on mainframes in 1977 with an OS/370 145 and an OS/370 168 MP with nowhere near the CPU or memory capacity of these systems, never mind the I/O capabilities.

It is very clear in my mind that there is no way the mainframe is dead or dying – it has come a very long way and has proven to be incredibly adaptable along the way. In fact, the mainframe has been an innovator with its use of specialized cores such as IFLs, ZIIPs and so on.

It can push I/O like nothing else and provides great scalability and CPU and memory performance. This is where you want to run your huge mission critical applications, the ones that can benefit from the security and reliability of a Sysplex environment. When determining operating system on the mainframe, there are a couple of things to consider. Look at whether the software will run in a Linux IFL and whether there are pricing advantages from doing so. I remember originally installing a Linux IFL on my mainframe to run print servers and DB2 connect servers – they were fast, stable and doing so reduced my z/OS and other costs at the time. This is an evaluation everyone should do. The mainframe is no longer legacy – it is perfectly capable of playing in the world of cloud and analytics while still providing performance and security. The mainframe will be around for a very long time for a couple of additional reasons – there is too much software that just won't migrate well to other architectures and nothing moves I/O like a mainframe.

POWER

POWER has come a long way since the RS/6000 days. The new integrated POWER systems scale from very small 4 core 2U systems to incredibly powerful 192 core 22U systems. They now support up to 16TB of memory on the largest servers. The POWER servers run AIX, IBM i and Linux. IBM is targeting new applications in the Linux space and is now providing Linux only servers in the POWER8 range that come with significantly discounted pricing or the option of a Linux IFL on a POWER server. The IFL is where certain cores and memory are dedicated to Linux only and they come with discounts on the software including a reduction in the PVUs used for pricing IBM products like DB2.

With the new architecture built into current POWER servers the memory bandwidth and the ability to drive I/O is incredible. A properly tuned POWER system can scale and perform incredibly well, especially when paired with Flash storage. Additionally IBM has updated their systems to support either PowerVM or PowerKVM as the hypervisor for virtualization and the servers can now support both little Endian and big Endian operating systems at the same time. This makes porting between Intel and POWER much simpler. POWER also has significant redundancy built into the hardware and the software which means it is capable of providing uptime similar to that provided by mainframes. Using

PowerHA or other software it is possible to have automated failover as well as some very robust DR (disaster recovery).

X86/Intel

Of the three platforms, this is the least reliable platform and the I/O performance tends not to be as good as the other two platforms, especially when the server becomes overcommitted. However, it can be cheaper if you buy no-name systems. X86 systems are no longer the small systems we think of on our desktops – some of these servers are very powerful.

So how do we decide?

The first thing to look at is the business need and the application that has been chosen to meet that need. Everything should come back to that. The application may have multiple components including Web edge servers, Websphere application servers, Web servers, a Database and possibly some queue servers or other types of servers. What you need to look at is the whole picture and which platforms each component can run on.

It usually becomes very obvious that one platform is not the answer. For each component you need to figure out where it can run and where it is best supported. If the answer is z/OS on zseries for the database and POWER for the WAS and queue servers and x86 for the rest then that is your best choice. If all the corporate data is already on the mainframe then it may well be best to leave it there rather than deal with taking extracts to another platform.

As a rule of thumb I tend to keep databases and other high I/O systems on either the mainframe or POWER. If it requires significant I/O or memory bandwidth then those are the two platforms to look at. This applies to analytics and cloud systems as well. Additionally, if virtualization with separation is key then look at POWER for its ability to virtualize virtual servers yet still allow them to communicate with each other using technologies such as virtual Ethernet. And don't be afraid to look at alternate operating systems on these servers. Linux runs on all the platforms right beside the proprietary operating systems. The advantage of z/OS or AIX over Linux is that they were designed for the chip they are running on whereas Linux is adapted to it. This means that they can perform better in some circumstances. The advantage of Linux is that most up and coming technicians speak Linux so it is easier for them to become productive quickly.

Pricing

As soon as you mention mainframes or POWER someone throws up the pricing flag. When making an analysis (TCO or TCA) it is important to include all the costs, not just upfront ones. These costs do not include just the software and hardware but also the ongoing maintenance and people costs as well as the costs for all the test and development and QA, etc environments and the rack space, power and cooling associated with those. When you look at all of those

there are times when the POWER servers or the mainframe actually come out less expensive than the alternatives. When you add in the additional unrealized costs for outages (planned and unplanned) this can be significant.

Summary

Right Platforming involves finding the right combination of meeting the applications needs, performance, security and pricing. The need to meet regulatory requirements such as HIPAA, DISA or PCI plays heavily into many of these decisions as well. There is no perfect answer that says that AIX and POWER will rule the world or that the mainframe will do so or that Linux on Intel will take over – this is a world in which there are no absolutes. Applications and clouds can run just as happily on any of the platforms out there today – it is just a matter of correctly matching the various needs of each component of the application to the platforms available to run the components.

Right Platforming is about making a change in our thinking, getting out of our silo mentalities where we are busy protecting our jobs and our data center turf. It is time to think about the business – the best way to protect your job is to be adaptable and to think about what is best for the business so you can leverage technology to get ahead of your competitors. This requires a team approach and this may need strong management in order to make it happen. But once it does happen you can provide a seamless, redundant and high performing environment for your applications.

References

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