The King is Dead – Long Live the Mainframe

Is IBM's Revitalisation of the Market Working?

Roy Illsley

According to reports, currently 70% of organisations and governments are running critical applications on mainframes, but what this figure does not tell the reader is the reasons behind these numbers. Organisations could be maintaining these applications on the mainframe because it is too expensive to migrate them to another platform, or they could be delivering an excellent service to the organisation cost effectively. It is for these reasons that the re-birth of the mainframe, or the concept of a single computing engine, has long been debated with proponents from both sides of the debate presenting valid arguments for or against.

However, the current modern day mainframes bear little or no resemblance to the devices that I worked on 25 years ago. Therefore, the real debate is how the current day mainframes compare to the plethora of other technologies available. Butler Group believes that mainframe adoption will see steady growth in certain key vertical markets such as financial services and government, and in specific geographies, particularly China, India, and South America. We believe the wider adoption of the mainframe beyond these markets will be influenced by developments in the Service Oriented Architecture (SOA) paradigm, and the impact that the advancements in the capabilities of x86 server virtualisation is having in the market.

Server virtualisation is mainly being used currently as a method of consolidating distributed computing power onto fewer physical devices; one of the main drivers behind this adoption is the growing 'green' debate. There is a need for all organisations to consider their carbon emissions profile, which for many organisations is represented by its energy consumption. The data centre is a significant consumer of an organisation's energy requirements; therefore, many IT departments are investigating technologies that can reduce the amount of energy used. According to IBM, a single Z9 mainframe consumes 1/12th of the energy required for the equivalent distributed computing. However, IBM do not state whether this is an equivalent virtual computing environment or a traditional physical one, but in either case the Z9 consumes less power.

Another element of the 'green' debate is the floor space required by organisations, which in major cities carry a significant overhead. The new IBM Z9 has a footprint of only 27 sq ft, and when this is combined with power saving represents a compelling argument in certain circumstances. Financial services organisations tend to be located in city centre buildings where space is at a premium, and available power supplies are limited. Therefore, it is not surprising that in the City of London and Wall Street for example, mainframes are becoming more popular. IBM states that in New York the number of members of a local mainframe user group has risen from four in 2000 to 80 today, and has seen similar expansion in another eight major cities worldwide.

The events of 9/11, hurricane Katrina, and 7/7 have focused organisations' attention on the need for simple and reliable Business Continuity (BC) plans. This is an area in which mainframes have traditionally been strong, by locating a standby system in a different location, and by using replication technologies to provide organisations with a 'hot standby' system. These 'hot standby' systems are capable of being activated within minutes of an organisation declaring its intention to switch to the standby system. The major issue for organisations is that the standby system is, effectively, a redundant expensive piece of computing hardware. However, server virtualisation has enabled distributed computing environments to provide high availability services using the existing infrastructure. This enables a more cost effective solution, but is also more complicated to manage and implement when needed, and it does not provide the guarantee of the simpler mainframe replication solution. Of course, distributed servers can also be replicated on redundant equipment, but there is very little difference in terms of cost or speed of implementation between the mainframe and distributed BC solution.

Supporters of server virtualisation extol the virtues of the technology in terms of its ability to provide the organisation with a flexible and responsive infrastructure; IBM's response to this was to offer Linux on the Z series, which supports server virtualisation on a single central computing platform. The main advantage the mainframe offers over the distributed virtualisation solution is its size. A single Z9 can accommodate up to 350 separate Virtual Machines (VMs). This ability means that implementations of any new VMs is quick and simple in the mainframe environment, providing the capacity exists to support the workload, whereas in the distributed environment this may require additional hardware to be implemented. Tarquinio Teles, CEO of Brazilian on-line gaming company

At a glance

- Butler Group believes that mainframe adoption will see steady growth in certain key vertical markets.
- According to IBM, a single Z9 mainframe consumes 1/12th of the energy required for the equivalent distributed computing.
- The main advantage the mainframe offers over the distributed virtualisation solution is its size; a Z9 can accommodate up to 350 separate Virtual Machines (VMs).
- One of the biggest arguments against organisations implementing mainframes has been the concerns many organisations have over the limited number of suppliers in the market.
- Another argument against mainframes has been the lack of commercially available software developed on the platform.

Roy Illsley
Senior Research Analyst
roy.illsley@butlergroup.com

Hoplan, stated that using a Z9 mainframe they could create and activate a new VM in 3 minutes, which in a dynamic industry like on-line gaming provides them with a competitive edge, because having to meet fluctuating demand is part of the on-line gaming industry.

SOA is described by Butler Group as a standards-based infrastructure upon which defined, self-contained, and non-reliant functional components can be stored, identified, created, deployed, and consumed. The problem with SOA adoption is not that the technology cannot deliver, or that organisations do not understand its possibilities, it is the fact that for SOA to be widely adopted it must adhere to the principle of open standards. Over the last couple of years, the mainframe has been transformed by the use of Web-services and Enterprise Service Bus (ESB) as methods of exposing the wealth of information it contains. IBM, by making its WebSphere portal product available for Z series, has provided mainframe customers with the technology to use the mainframe as the heart of any SOA implementation. However, wider adoption of mainframes as the central plank of any SOA implementations is being frustrated by the lack of open standards.

Another example to support the view that the mainframe is in decline is the falling demand for mainframe skills in the marketplace. When was the last time you saw an advert for a COBOL programmer? However, western economies and educational establishments may be neglecting these skills in favour of newer .NET and Java ones, but other economies, notably China, India, and South America are seeing a resurgence of interest in mainframe skills. It was not surprising, therefore, that IBM chose to announce the latest Z series model from China earlier this year.

According to Datamonitor, 80% of the cost of running a data centre comprises labour costs, and the mainframe, according to its supporters, requires less people to manage it than the equivalent distributed environment. Bill Homa, CIO of US-based supermarket chain Hannaford Brothers, is quoted as saying: "It's easier to manage the mainframe than a bunch of Windows servers. We have a smaller staff running the mainframe and those functions run 80 % of our business". Statements such as these need to be verified and translated to the individual organisation's specific operating environment. While it is recognised that managing central computing is less labour intensive, other solutions such as outsourcing and offshoring have an influence on this particular debate.

The other major strength of the mainframe has been its security. IBM has stated its Z series product range is certified to EAL5 standards, which represent the highest available. Therefore, it is not surprising that mainframes are used in situations that demand high levels of security, such as financial services, defence, and key government institutions. In fact, the mainframe can now act as a centralised repository of encryption keys to facilitate security management. In addition, the Z9 utilises Crypto Express2 PCI-X adapters as accelerators that handle up to 6,000 Secure Sockets Layer (SSL) handshakes per second, enabling fast, secure on-line transactions, which makes the mainframe an ideal platform for dealing with applications such as on-line credit card transactions.

One of the biggest arguments against organisations implementing mainframes has been the concerns many organisations have over the limited number of suppliers in the market. This particular concern is not getting any better, as the number of manufactures that have mainframe-class devices continues to reduce. Although the concern of many organisations is the lack of competition, Butler Group believes that this is less of an issue: the mainframe should be considered as just another IT solution competing with all the other formats. We consider the biggest issue is the perception that organisations will be locked-in for a considerable length of time with a mainframe solution. Historically, this has been measured in decades, but with new low-end devices and on-demand facilities this is not necessarily the case today.

Another argument against mainframes has been the lack of commercially available software developed on the platform, which at best tends to be ported to the system at a later date, or not at all in some cases. This has created the 'in-house' or customised solutions that have become associated with many mainframe implementations. However, since IBM announced support for Linux on its Z series this has become less of an issue.

IBM in a recent announcement on Z series stated that it has experienced a 7% YTY growth and a two point share gain as of Q2 2006 results, and goes on to state that it now has over 1,000 Linux customers on the platform. The New York Times states that currently mainframe hardware sales account for only 5% of IBM's revenues, but mainframe-related hardware, software, and services combined account for 25% of its revenues. Therefore, it is obvious why IBM is keen to ensure the mainframe remains relevant to organisations. This situation also has advantages for customers: IBM has stated that it will continue to invest heavily in its mainframe technology. To illustrate this point, IBM recently announced the introduction of the new Z9 business class aimed at Small- and Medium-sized Businesses (SMBs), with the entry level device being priced at under US$100,000.

The mainframe has created a solid user-base in the financial services and government sectors based on its reliability, security, and performance capabilities. However, the challenge for the mainframe is to move beyond this traditional perception, and move towards being considered as one possible solution in simplifying the data centre, and making IT more flexible.