Mainframe revolution

Used mainly by large organisations for critical applications, mainframes as a technology is here to stay. **Sangeetha Kandavel** finds out the trends in mainframe and its future.

"The costs of managing clusters (the network, cabling, connections, data replications, power consumption, people costs of managing the various servers etc) becomes very high. That is not the case with mainframe"

Sreenath Chary

The year 2006 was a great year for the Mainframe Industry. Mainframe revenue has grown 25 per cent in the third and the last quarter of 2006 and it is hitting the markets again, says Sreenath Chary, Business Unit Executive-Systemz, IBM, India. In an Interview with **Deccan Herald** Sreenath shared his views about mainframe, here is a quick FAQ on the issue.

DH: ***The prevalence of mainframe today in the context of the current technologies?***

Sreenath: The major sector that depends on mainframe is the banking sector. Transaction volumes in banks are high and can't afford downtime, 300-400 million dollars will be lost in seconds during downtime.

The Reserve Bank of India depends on mainframe for all their transactions. The airlines and securities depository are some of the major players who use mainframe.Mainframe can support thousands Virtual Linux servers in a single mainframe and the first 64-bit Linux platform for the SAP application server was a mainframe.

Is there resurgence in mainframe usage? What is the demand like?

With the introduction of the Offload engines (zIIP & zAAP &IFL) for database accesses, Java and Linux respectively, the TCO of a mainframe is superior to any other platform. Given the robustness of the zOS platform, z Hardware, most companies are finding the mainframe as a hub in a Services oriented Architecture (SOA) environment to be the best. Hence there is a major resurgence in mainframe usage around the world. Mainframe has become one of the most open platforms capable of running Linux, zOS & zVM and all at the same time in different partitions using the virtualisation engine, which is absolutely key to server consolidation.

Typically most UNIX servers are utilised at around 5-15 per cent. A mainframe can be utilised at 100 per cent without any issues, as it is capable of scaling up and out. This can reduce tremendous cost for any organisation. Mainframe enjoyed 14 per cent growth rate in the 250K server segment over the last 5 years.

What are the world trends in mainframe?

SOA is using mainframe as a hub, by converting legacy CICS/IMS (Customer Information Management System/Information Management System) applications into services and linking them into Java based presentation front ends, thus getting the best from technology by flexible business processes, investment protection, future proofing, without compromising on scalability, availability, security and lower TCO. If an organisation wants to implement best practices, it would mean, creation of a enterprise service bus to carry all the data and messages for the organisation on a common bus with common standards, and secondly a central location for data, and lastly one repository for all business rules/processing logic to allow reuse across an enterprise.

What if competing hardware technologies, such as a cluster of web servers (not from IBM) could well serve the same purpose?

Cluster technology is nothing new, they are provided by everybody, including IBM. However, beyond a certain number of individual machines that are clustered, the costs of managing the cluster (the network, cabling, connections, data replications, power consumption, people costs of managing the various servers etc) all become very high. If clusters run at low utilisation, then the problem is huge and given the reliability of UNIX/Intel boxes.

UNIX servers are used only 5-15% of the time? In that context how mainframe can be fully utilised?

The reliability of UNIX/INTEL boxes is not very high. Most organisations don't increase load on any particular box in fear of losing precious data or face a major outage if the box fails. The moment the organisation realises that the machine is processing more transactions or data and is going beyond 30 per cent utilisation, they add one more server to spread the load to a new machine and get the utilisation back to a low level.

The analogy is like the link in a chain that is carrying load, beyond a certain load; you can add a second link and a third link to ensure that even if one link fails, the second link stays on instead of ensuring a better link the first instance. This results in typically very low utilisation percentages.

Whereas the mainframe's reliability is measured in decades. MTBF for a processing chip on the mainframe is about 70 years!

So mainframes are typically run at 90-100 per cent utilisation continuously. The Toronto Dominion Bank recently celebrated their 10th consecutive year of running continuously with zero down time. That is how the name system z came up (z for zero downtime)

Mainframe has never been hacked, why? Mainframe is a proprietary to IBM as Windows is to Microsoft. How come MS Windows has been such a big target for hackers but not mainframe?

Windows is an operating system started off as being meant for one user only, and they could run only one program at a time, and it was written to manage real devices in the PC, that is, it was limited to what the PC had (eg.,640K).

When it was realised that this approach meant that programs which required more hardware capacity (like memory) could not be written, special routines that virtualised hardware had to be written. However, the underlying operating system files etc were all open to anyone who wanted to install software, that is, any programmer could overwrite system software causing malicious or unintended damage.

The operating system grew organically and tries to mimic multi- user environment, virtualisation and allowing multiple programs at the same time etc, but this has been developed as additions and not designed from ground up. Hence the stability issues and issues of hacking because the entire system software etc was open for anybody to overwrite with their own code. Mainframe OZ (zOS) on the other hand was written ground up to be virtual, multi user system, multi program system. The hardware was always virtualised and programmers do not deal with physical limitations of the system.

Next, Operating system files and production code always was protected by the creation of a strict discipline and the creation of special libraries from which they could be run. This is controlled by system programmers.

Application programs never replace operating system files unlike in Windows or UNIX (to a lesser extent). This created this environment never to be hacked to date.

Future of mainframe?

Mainframe is the key competency with excellent growth potential for technical professionals and the IT industry. Around about 20,000 people are required to work on this platform by 2010. There is a huge demand for system programmers, database administrators and technical solution managers.

Mainframe should be made open and we should make people understand that Java can be done through mainframe. IBM is creating the mainframe community and is working with academia to start this sooner. Mainframe is coming into picture and is not going to disappear.