THE VIRTUAL REALITY

Server virtualisation may be well on its way to being a ubiquitous deployment, but the journey is not as easy as it appears.

NETWORK WORLD

Server virtualisation has emerged as an extremely popular enterprise deployment. By running multiple virtual machines on a single physical chassis, organisations can save costs, increase utilisation and simplify operations.

However, while the ROI is simple, the same cannot be said for the implementation itself. Or, at least, the effect it has on data centre infrastructure designed to support traditional server models.

A recent study conducted by Vanson Bourne on behalf of Brocade revealed that, although data centre virtualisation and cloud computing are being widely embraced, IT managers across the world are struggling to make their networks meet performance benchmarks, despite ongoing investments.

The biggest barrier to adopting these new technologies, Brocade said, seemed to be having to sustain — at great cost — ageing legacy systems.

Ninety-one percent of the 1,750 IT decision makers surveyed believe that their current IT infrastructures still require substantial upgrades in order to meet the demands of virtualisation and cloud computing.

This is despite the fact that organisations are committed to technology investments — the report said that over three quarters of respondents claimed to have updated their IT environments in the last three years.

While ageing legacy systems are less of a concern in the emerging market of the Middle East, concerns still exist. Following the study, Brocade confirmed that legacy systems were causing a barrier to deploying new technologies at Middle East organisations.

That doesn't mean it's holding them back altogether, as regional studies reveal the extent of adoption in the region.

"Our surveys show a 15 percent virtual server adoption, which we feel will grow to 40 percent in three years," says Jatin Sahni, Vice President, Large

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of IT decision makers believe their current IT infrastructures still require substantial upgrades to meet the demands of virtualisation and cloud computing.

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of total new physical x86 servers in 2016.

Enterprise and Business Solutions Marketing, du. "We believe it would be the growth area to watch out for. The obvious benefits of costs and scale make it attractive. Also, the fears of security are being increasingly addressed."

According to Gartner, the adoption rate of server virtualisation in 2012 was predicted to be 14.3 percent of total new physical x86 servers, and will reach 21.3 percent of total servers in 2016. Furthermore, Gartner said total virtual OS instances would contribute 70.2 percent of total OS instances in 2012, and reach 82.4 percent of total OSes in 2016.

Cisco confirms the "very strong growth" in Middle East adoption. "Virtually every enterprise account and service provider that we're talking to is engaging in a combination of consolidation and virtualisation activities in their data centres," says Mark Hosking, Regional Sales Manager, Unified Computing, Cisco.

"Depending on which analyst you talk to, they'll tell you, on average, in a traditional data centre, that the actual CPUs on the servers are only used at between 10 and 15 percent of their capacity."

Choking up

A very traditional data centre problem arises every time a new project or business requirement comes along. The IT team provisions more infrastructure in the silo for that project or application, resulting in a large physical server sprawl that chokes the data centre.

Subsequently, virtualisation vendors offer organisations the appealing proposition of increasing the utilisation of assets.

"Enterprises are implementing server virtualisation as a move towards consolidation, thereby reducing power and space requirements," says Rajesh Abraham, Director of Product Development, eHDF.

"This trend is especially true for the Middle East, where businesses are consolidating their IT

requirements and virtualisation is becoming a part of their journey to the cloud."

However, the attraction of virtualising servers is often enough to blind CIOs from the reality that the deployment will stress data centre infrastructure that has been designed to support traditional models.

The first stress point is finding the physical resources to rack, power and cool the servers.

"Even with virtualisation, large enterprises can have several thousand servers," says Mervyn Kelly, EMEA Marketing Director, Ciena. "The growing amount of physical servers can often trigger the need for a larger data centre."

Cost savings also become another stress point. Perhaps the biggest testament to this was Google's reported realisation that it could save approximately $1,500 per server by building an efficient rack design.

Other organisations are looking to save costs and simplify deployment by bringing together systems with servers, storage and network, and managing it all within a single unit.

Kelly adds that a further stress to the data centre comes because better inter-data centre networking is required in order to move virtual machines between company-owned data centre facilities and off-site cloud service providers.

According to A. N. Rao, Senior Vice President, IT Infrastructure Services, Cognizant, all aspects of data centre architecture are impacted by higher virtualisation adoption.

"The power and cooling solutions, which tended to cater to a more predictable and static environment, are not expected to be dynamic as the workloads float across systems and data centres. So the sizing, lay-out and implementation of data centres are different."

In case of infrastructure architecture, the network layer is impacted immensely, he adds.

"Traditionally, the network architecture followed a hierarchical structure — access, aggregation and core — and the traffic was more north-south bound. As applications get more distributed on the virtual layer, there is greater traffic between servers in the same tier, thus increasing the east-west traffic."

Changing design

Another often overlooked outcome of virtualisation is the effect it has on the design and architecture of a data centre.

Traditional methods used in the design of the data centre were based on application requirements mapped on the same number of physical machines.

Virtualisation is playing a big, if not essential, role in changing that, says Anurag Verma,

Telecom Operations and Managed Services Lead, Smartworld.

"Today, the virtualised data centre can reduce the capital expenditures from up to 60 percent of the traditional design by installing multiple applications and operating systems on to a single virtualisation host."

Furthermore, cooling and airflow requirements change as the number of servers increase, adds Vipin Sharma, Vice President, Tripp Lite.

"Power efficiency and correct power distribution is and will always be critical in operating a data centre," Sharma says. "But this has to be done in a sustainable manner — something that the enterprise sector is also starting to look into.

"Likewise, everything has to be monitored in real time, down to the socket level and cable connection to ensure that the data centre runs continuously and efficiently despite an increasing demand."

Subsequently, it is vital for CIOs that deploy server virtualisation to revisit their data centre network design to support the new strategy.

The input/output (I/O) throughput must not become a bottleneck to the virtual processing as data is written to storage, sent to users or sent between machines, Kelly advises.

"As a result, the internal data centre network often must be re-architected to 10 Gbps Ethernet links and high speed 8 or 16 Gbps Fibre Channel links," he says. "These links support the increased input/output workloads from a fully virtualised physical server operating at peak efficiency rates."

Virtual machines that have tight integration should reside with the same host, which in turn, will reduce the network traffic beyond the host, Verma adds.

Whilst the promise and attraction of virtualisation is indeed very real, there are big challenges in embracing it in an effective way.

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Traditional architectures from the traditional vendors were never built to meet the demands of a virtualised and automated data, which is something CIOs must remember when racing to virtualise servers.

"Beyond virtualisation, the dynamic nature and delivery of IT that a lot of organisations are now looking into — cloud computing is very topical — is putting a lot of stress on traditional IT architectures," Hosking says.

"To incorporate virtualisation, which is required and is a prerequisite because it gives elasticity to the architecture, you have to automate that architecture — you can't do it all manually. That's where traditional data centre infrastructure is a big inhibitor."

According to Sharma, the common pitfalls that companies make when deploying virtual machines include not having the right network infrastructure, having insufficient power to support its network of machines, and failing to distribute energy within its network more efficiently.

"The lack of a proper monitoring system could lead to a failure to conserve energy where and when possible," he says. "The design of a data centre is also important as this could result to inappropriately located cold and hot aisles, which could impact the airflow and heat retention of a facility."

It thus appears that the mindset of IT teams, not just in the Middle East but around the world, should change in order to make virtualisation projects successful.

With virtualisation, it is no longer about who owns a piece of hardware and who has control over it.

"The environment is moving significantly towards 'shared platforms, and virtualisation is enabling that," says Rao. "Therefore, viewing virtualisation programmes as merely technology interventions without adequate organisational change management can render a virtualised environment more bureaucratic, and much less flexible and agile than envisaged." ∎

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