Get ready for thinking, learning data centres

Why software-defined data centres are going to transform your business

Enterprises are moving toward business workload-aligned computing, transforming their data centres using a software-centric approach. Virtualisation is playing a key role, helping to deliver faster, more agile, business-centric services, and meet consumer and market demands more effectively. Organisations that fail to prepare for a software-defined future are heading the way of the dinosaurs – don't let that be you.

By Arif Mohamed

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Data centres are becoming Software-Defined Data Centres, with virtualisation giving rise to thinking and learning capabilities.

IT infrastructure and operations are getting more sophisticated as data centre and cloud platform developers such as VMware, OpenStack and Microsoft explore the next generation of virtualisation technology.

Advances in Software-Defined Data Centres (SDDC) are giving rise to exciting new technologies such as application containerisation, storage and network virtualisation across hybrid cloud environments, and self-managing 'autonomic' and self-healing systems.

As a result, the future of the SDDC is one of increasing automation, agility and business-alignment, says Tikiri Wanduragala, EMEA Senior Consultant at Lenovo.

He notes that the move to SDDC started with virtualisation around 2001. "This was driven by the efficient utilisation of resources, and agility: the speed at which you can start and stop servers or scale them up. If you want to move a physical server from Europe to America, it would take days, but if it's a virtual server, it just takes an email. Virtualisation enables businesses to operate in a very dynamic, very exciting market."

Wanduragala adds that SDDCs allow enterprises to operate more flexibly than they can with conventional data centre infrastructure. "With the traditional data centre, you dedicate resources to an application and tie their capacity down to that project. But with a software-defined approach, you specify the capacity you need and the resources get allocated more flexibly, such as processing, storage and networking. It's a far more efficient use of resources."

Extending virtualisation

Virtualisation-centric SDDCs are quickly maturing in other important areas, when combined with technologies such as big data analysis, mobile computing and predictive analytics.

As a result, IT operations are becoming far more automated and are already gaining the ability to fix themselves.

For example, the most common automated operations are fault detection and diagnosis, error fixing, maintaining security, and predicting and preventing likely failures or errors. Data centre automation is also frequently used to update and patch software, and for backup and recovery.

In the next five to 10 years even more advanced systems will emerge: particularly 'thinking' and 'learning' data centre systems that use artificial intelligence (AI) technology to adapt, predict and anticipate resource allocation; orchestrate workloads; and automatically manage policies.

Systems that 'think' use algorithms and intelligence to find meaning in data, and make judgement-oriented decisions. 'Thinking' capabilities can be applied to operational analytics, predictive service delivery, workplace automation or closed-loop automation.

On the other hand, systems that 'learn' can understand context, interpret and adapt to users or other systems, and predict and prescribe actions. 'Learning' systems can be used for data centre capacity management and forecasting, or for delivering actionable insights such as anomaly detection and fault protection.

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All of these things, says Wanduragala, are part of a bigger picture: the move toward automated and smart business, based on a digital backbone that includes a SSDC, which is equipped to support the agile organisation.

"With self healing, resource management and orchestration, we have built a lot of it into our Lenovo servers," he explains. "For example, with hardware predictive failure analysis, most hardware parts have a tendency to show when they are going to fail: fans may vary their speed, and a disk drive or memory might indicate that it is becoming less reliable. As a result, you can move things off your server prior to the failure."

Intelligent energy consumption

Another area where intelligence can be used to optimise both resources and cost is in the efficient management of energy consumption: a major issue for most data centres. To address this, Lenovo has designed an Efficiency Mode for its System x M5 series of servers, giving them the ability to manage energy consumption efficiently. These servers operate autonomously, optimising the processor frequency, based on dynamic workload changes, so they can obtain the best performance/power ratio.

Hyper-converged appliances create data centre flexibility

One effective way to simplify your data centre infrastructure and make it software-enabled is by introducing hyper-convergence: technology that brings together server, storage and virtualisation in a centrally managed appliance.

Lenovo has partnered with Nutanix, the market leader in hyper-convergence, to develop such appliances and enable enterprises to benefit from greater efficiency, agility and ROI in their data centres.

Data centre resource management

Another element that helps businesses deploy the right underlying data centre infrastructure for the SDDC is Lenovo's XClarity Resource Management Solution, reveals Wanduragala.

"Our XClarity management platform enables you to manage everything from the processors all the way up to the software, using a centralised dashboard interface. It reads all the vital performance and operational information from the hardware and gives you the option to pass this information to the middleware, hypervisor or the application, so they can act on it.

"In addition, with XClarity your operators and application managers don't have to learn anything new: you can use your existing management interface. Also, you can start patterning your operations, using scripts to automate activities you do regularly. If you can document it, you can automate and orchestrate it," he quips.

Choose your building blocks

SDDCs are fast becoming a requirement for the modern enterprise, with one big advantage being that there many manufacturers are developing server, storage, networking and software products and services that work together: from Lenovo and VMware to Netanya and Cloudian.

This means there are plenty of choices when it comes to data centre building blocks, and you can use them to create, automate and scale your IT infrastructure deployment today. The secret is in laying the right foundation: one that enables you to become an automated enterprise, highly digitised, highly efficient, and able to respond and adapt quickly.

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