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On-prem, virtualised, cloud, hybrid: Reimagining the enterprise data centre
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Article by NetEvents technical editor Alan Zeichick

Pick a timeframe in the future. Two years. Five years. Ten. Then imagine what the enterprise data centre will look like. Maybe it's a large glass-walled air-conditioned space filled with racks with blinking lights and a never-stopping hum. Maybe it's a bill that arrives once a month, containing the charges for processor, storage, and bandwidth utilisation. Maybe it's both. Maybe it's neither.

But first, beware the hype and competing claims about virtualisation, advises Mike Sapien, VP and Chief Analyst, Enterprise Services, at Ovum. "A lot of the hype has been cleared away, and it's not as overhyped as it used to be."

"Many customers understand virtualisation's value," he continued, "and know where it's best deployed, and where it's not a good fit." Sapien explains that it will be interesting to see where SD – that is, software-defined – technologies will make the biggest difference for enterprise applications. "They are unique applications: storage, compute, networking, and WAN. Each of those applications has its unique use-cases where it will be successful."

Sapien added, "Some of those use-cases will become more dominant; you'll see a number of very successful implementations, and fewer of the hundreds of experiments and proofs-of-concepts that are happening now."

Repository for Containers

Murli Thirumale, Co-Founder and CEO of Portworx, envisions the future data centre as a repository for applications deployed in containers.

“The container — which is a relatively new kind of technology — is really a packaging mechanism for applications. Containers enable apps to run anywhere. So if you imagine a container could run at any node, either in the cloud or on-prem, then the data needs to be there, and so we make data available everywhere,” he said.

Thirumale continued, “The changes we see now are about making things not merely efficient and fast, but driven by innovation. This latest movement is being led by developers who are accelerating innovation, and the anchor is cloud-native, which allows very rapid code development.”

“As this transformation is happening, the world now has to become cloud-native. This incorporates all of the benefits of the past, including virtualisation and on-demand, but makes it happen both on-prem and in the cloud,” he concluded.

The Future Is a Multi-Cloud World

Ajay Singh, General Manager for Cloud Management at VMware, explained that his company has evolved from virtualisation to embrace the public cloud and container-based technologies to support digital transformation.

VMware wants to support any application running anywhere, he said. “Any application means whether it is your classic legacy applications, from the old days, to virtualised applications running on virtualised stacks, to cloud native applications that enable agility and speed.”

“We must recognise that it is a multi-cloud world,” he continued. “Most of our customers are looking to use one, two, three, five different clouds. How do you actually be the air traffic controller that enables you to leverage the resources of all these amazing public cloud data centres that are mushrooming around you? At the same time, you must meet your objectives around risk, compliance, and cost.”

If You Build, Build on Linux

Build? Don't build? That's the question, said JR Rivers, Co-Founder and CTO of Cumulus Networks. “Traditionally, companies would build a data centre and would employ IT people and buy tons of heavy, expensive equipment. That question is up for debate today.”

He doesn't have an answer to building or not building – but he sees Linux as key for physical or data centres. “When people build, what we see them doing is making a very conscious decision to build around Linux. Technologies that revolve around Linux — storage, networking, and compute — are going to come to the forefront and provide meaningful solutions to customers. If you build, you're going to build on Linux.”

The Cloud is Like a Hotel

Secondary storage – that is, any data that's not mission-critical to today's tasks – will live in the cost-effective cloud, not in costly on-prem storage devices. That way, the data is readily and rapidly accessible, but isn't tying up floor space. That's the view of Mohit Aron, Founder and CEO of Cohesity. “We have literally a mess in the data centre, and what we're trying to do is build a Google-like scalable platform on which we can consolidate all these workflows. So that's the phenomenon we refer to as hyper-convergence of secondary storage.”

“What about the cloud? What about containers and virtualisation? I think of the data centre as owning a house, and I think about the cloud as like renting a hotel room — with the same pros and cons,” he

continued. “In your house, you get a little bit more control over what you want to buy. You get a little bit more security. You're not worried about noisy neighbors. In the hotels you get a little bit more flexibility. I drive to Lake Tahoe once in a while. I rent a hotel and be done with it. It can be great for flexibility.”

Aron explained that, “The data centre and the cloud offer the same services, just like a house and a hotel. But if your house is very messy or if your data centre is very messy, wouldn't you want to live in a nice clean hotel suite?”

The Future Data Centre Must Be Automated

In any future data centre, it's important to get the operational model in networks to function correctly, and that means significant levels of automation, said Mansour Karam, Founder and CEO of Apstra.

“Ultimately, it's about the ability to deliver business services quickly,” he said, “which means you need to have the ability to deploy applications quickly and for that you need to be able to dynamically deliver on your network services. The only way to do that is through programmability and through autonomous operations. By effectively implementing automation in the future data centre, you'll get massive improvements in agility, which will essentially drive the rest of your business.”

Both Clouds and Data Centres Can Drive Security

Virtualised resources, whether in a physical enterprise data centre or in the cloud, can be an asset for security.

“With network virtualisation, you have the ability to do east-west micro-segmentation and really lock up the access to only when somebody's trying to use an application,” said VMware's Singh, referring to traffic that's running between servers within a cloud or data centre. “That's the only time you open up access.”

“The majority of the security infrastructure tends to be layered against the north-south breach,” Singh added, referring to traffic that flows in and out of the cloud, such as to communicate with end users or external services. “But today, you have to assume that your north-south perimeter is going to get breached. Somebody is going to get phished. Something like that is going to happen. The east-west traffic then starts to matter dramatically. That's where the software-defined inner centre and software-defined networking brings you the ability to really lock down that east-west axis.”

The Future Data Centre is an Open Question

Nobody knows exactly what the future data centre will look like. Some believe the future lies in the public cloud. Others point out that new enterprise data centres are still being constructed. However, it's clear that many organisations will choose a hybrid model, keeping some applications and storage on their own hardware inside the enterprise firewall, and other data and applications living in the cloud. There will be a great deal of virtualisation, and automation will play a large role in managing future data centres' infrastructure, servers, and applications. Beyond that – it's anyone's guess!