HKCSView: Ted Suen shares the changing IT outsourcing priorities in the digital era page 38

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PAGE 18

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Envisioning the future data centers

Data centers in the future will be AI-driven, software-defined, resilient and sustainable

By Carol Ko

As enterprises pursue digital transformation, data centers need to be more dynamic and agile. To enable their organizations to compete in a digitally driven world, CIOs are continuously tasked to develop strategies that drive revenue and profitability growth.

At the 9th annual DataCenter Summit 2017 organized by Questex Asia in July, seven senior IT executives were invited to exchange insights on the topic of "Embracing digitalization—transforming the traditional data centers into cost-effective and profitable data centers." As data center operations are increasingly aligned with the business, how will they change over the next few years?

AI takes control

Moderator Barry Lewington, principal consultant and head of professional services at PTS Consulting, asked the panelists the major drivers that they believe will reshape the data center market in the short term.

The last few years saw a boom of IT infrastructure technologies, making data center administration both interesting and burdensome, according to Andy Chun, associate professor (computer science) and former CIO, City University of Hong Kong (CityU).

With over 30 years of experience in IT and artificial intelligence (AI), plus his previous experience of overseeing the design and construction of a data center at the CityU, Chun believed the future of data center lies in AI.

"I have great respect for people who work in data centers, where a lot of interesting technologies are at play: consolidation, virtualization, hyperconvergence, different network typologies, different architecture and software-defined, etc," he said. "Managing such a complex ecosystem is really challenging. I think it's about time we hand that over to AI. Let them do the job right."

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Chun said AI has a lot to contribute to data center administration.

"It's very hard for humans to, in real time, consider hundreds of data points to come up with a decision on how to make the best use of IT resources, including networking resources, server resources, bandwidth, etc. AI, on the other hand, offers technologies like deep learning to make the most informed decisions for you."

Fully software-defined

As businesses demand greater agility and faster time to market, their IT infrastructure needs to be as agile and scalable to enable on-demand resource provision, and charging in an opex model.

"In the future, data center administration will be more about managing services, and less so about managing assets," said Dave Chen, chairperson of Enterprise Architecture Special Interest Group of Hong Kong Computer Society. Further, he predicted that data centers will become fully software-defined, dynamic and highly distributed.

At this juncture, Mark Carr, chief architect at The Hong Kong Jockey Club, took it further and suggested that "software-defined everything" will occur in data centers, spanning network, security to IT services in general.

"About six years ago, Cisco started to move away from building their own purpose-built switches, and started to use software-defined switches instead. That was a defining moment when I started to think about what data centers would be like in the future," he recalled.

Concerning application developers, Carr suggested "application developers don't seem to care about data center operations these days." He added that application developers nowadays tend to simply adopt codes from the internet and incorporate them. "What they don't appreciate is how to actually keep the application running in a data center, and how to manage the application over its lifetime."

"If an IT organization cannot create a software-defined environment, and make the application developers work within a rigid development framework, then IT needs to build out data centers with redundancy built into it," he advised.

Resilient data centers

As IT leaders ponder how to make data centers profitable, they should also think about how to make data centers

Senior IT executives discuss ways to make data centers profitable in the future

resilient. A resilient data center is one that will keep downtime and the cost of disaster recovery to a minimum.

Epsilon Ip, head of enterprise architecture and information security at Hutchison Ports, oversees two functions at the company: enterprise architecture and information security. He noted the significance of data center operations by quoting the example of a ransomware attack outbreak occurred in June. PetyaWrap affected 80 companies and 12,000 computers worldwide.

"In our [shipping] industry, one of the leaders, Maersk, was hit by PetyaWrap, causing its termini in 17 countries to go down, and the termini were unable to load the containers for the ships for several days," Ip said. "They had to operate on phone calls and papers — this was like going back 20 to 30 years."

According to Ip, technologies like cloud computing, hyperconvergence, containerization, and microservices help to build resilience in data centers. They help to build redundancy in data centers, and allow them to recover faster from disasters.

"With these technologies, our data centers stand better chances of surviving the next wave of cyberattacks or global disasters like Petya or WannaCry," said Ip.

Sustainable approach

Finally, HKJC's Carr noted that IT organizations need to build and operate data centers with sustainability in mind.

"At present, during the Jockey Club meetings (horse races) on Wednesdays, we have massive compute requirements to get all of the bets through," he said. "But on Thursdays when there is no race, the computing resources are basically left idle. So we have to do something to make sure the idle resources are utilized."

Carr added that HKJC plans to build new data centers over the next few years.

"We now have a sustainability approach. Moving forward, we want to try to maximize the use of our data center, and drastically reduce the amount of the electricity we use. We'll also start to automate things, build load when we need them and collapse them when they are not in use," he stated. ◂

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