Furniture manufacturer deploys data center SDN despite fear of change

After learning about the benefits of data center SDN technology, Steelcase Inc. overcame a fear of change and made the leap to Pluribus Networks' Netvisor operating system.

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Office furniture manufacturer Steelcase Inc., prides itself on producing innovative products, but in 2014, the company, based in Grand Rapids, Mich., invested in a different sort of innovation -- software-defined networking. Steelcase deployed software-defined WAN technology at 30 of its remote sites around the world before turning its attention to the data center.

While transitions from traditional WANs to SD-WANs are increasingly common, less so -- especially within mainstream enterprises -- are data center SDN deployments. The maturity of data center SDN technology is often questioned and the transition deemed too difficult for any but webscale organizations. But about the time Steelcase began considering SD-WAN, a number of factors compelled the company to also weigh the advantages and disadvantages of data center SDN.

Matthew Bielecki is a consulting network engineer for Steelcase -- one of around 10,000 Steelcase employees,

but one of just two network architects. As such, he played an important role in Steelcase's software-defined journey, which he presented at the 2016 Open Networking User Group fall conference.

In 2014, Steelcase's active data center used a leaf-spine topology and ran on 10-year-old proprietary switches. The company's server team was begging for more 10 gigabyte (GB) capacity, but Bielecki said adding four more 10 GB ports would have cost the company around

$100,000. At that time, Steelcase decided to sell the building that housed its data center, forcing the company to move network operations within a six-month time frame. Steelcase began to consider its options.

"We looked at that [amount] and said, 'OK, do we invest all this money in old hardware, or do we invest in the other side?'" Bielecki said.

Pluribus presents a software-defined alternative

Enter Pluribus Networks. Based in Palo Alto, Calif., Pluribus aims to disrupt the networking industry with its network fabric and data center SDN products. Bielecki said he received a cold call from Pluribus inviting Steelcase to test a new product -- a distributed operating system called Netvisor that runs on Open Network Install Environment switches from the Open Compute Project.

"The Virtualization-Centric Fabric platform pulls the [network] switches together to deliver a bunch of [software-defined] services on top," said Kumar Srikantan, CEO of Pluribus Networks. "Those services are adaptable and extensible through software modules that we can enhance, so we don't need hardware."

Originally, Bielecki was leery of this virtual approach. In fact, he said it took him three meetings with Pluribus representatives before the process began to make sense to him.

"The idea is that SDN can work in an enterprise data center, which is really revolutionary for us to hear," Bielecki said. "When we first started looking at it, in my mind, I thought it was more of a play for web-hosting centers that needed rapid development and rapid deployment, switches and tearing down switches -- things like that."

Once Bielecki better understood Pluribus' data center SDN offering, he said Steelcase began methodically evaluating the technology. Taking the emotion out of the decision-making was necessary, he said.

"We are engrained with incumbents and it's really hard to think of reasons to move away from them," he said. "We were terrified of moving to something new, but we knew we had to."

Bielecki said Steelcase wrote down about 25 pros and cons, comparing Pluribus' data center SDN with more traditional options. The list comprised factors such as cost, complexity, design flexibility, performance, visibility and risk. The Pluribus alternative bested traditional alternatives in every category except risk.

An added bonus, Bielecki said, was Pluribus' commitment to open standards, which reduces vendor lock-in.

"You don't need a special box to solve a special function," Srikantan said. "That's one of the promises of SDN -- how you can take advantage of [the switches] with different software loads on different capabilities and change the personality of them."

The data center SDN transformation begins

Steelcase was introduced to Pluribus in March 2014. One year later, the companies had completed demonstrations, design sessions and proof of concepts, and were ready to roll out the design -- which Bielecki said took less than two weeks to create.

"We connected our Layer 3 part of our existing network to a Layer 3 part of the Pluribus network -- just to see if we could exchange routes. And after that, we added a spine and leaf," Bielecki said.

Little by little, Steelcase migrated virtual LANs, servers and different areas of the network. Eventually Steelcase's entire data center's worth of switches was on a single rack, resulting in considerable power and space savings. Bielecki said he and Steelcase's other network architect configured, set up and peered 14 routers within an hour. The complete data center SDN transformation took less than eight months.

Steelcase's new data center layout is just like its old setup, but virtualized. If Steelcase wants to add an additional data center, it simply needs to add another leaf and connect it to the spine. And now, Bielecki said if Steelcase wants to add another 10 GB port on a Pluribus switch, it costs just $100.

Bielecki advised companies considering data center SDN to ask detailed questions, look past the marketing hype and get to the core of how a company actually does something. He also urged enterprises considering a software-defined transition to move forward with a proof of concept.

"[A proof of concept] doesn't cost anything, and you can get a better understanding of what the technology can bring," he said. "Get a couple switches in and play around with them. That will help alleviate some of the fears."