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John Burke

Sir Isaac Newton said that if he appeared to have seen further than others before him, it was because he had been "standing on the shoulders of giants." Today, network administrators who want to gaze further into how their networks are performing need to plant their metaphorical feet on the shoulders of a new giant: software-defined networking (SDN).

SDN encompasses many technologies, but its key characteristics are centralized, policy-driven management; programmability; and the ability to separate its control plane (which makes decisions about network behavior) from its data plane (which is charged with actually handling network data packets).

In its 2016 Cloud and Data Center Benchmark, Nemertes found that 24.3% of companies are already deploying SDN or have plans to do so before year's end.

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ACI, NSX AND BEYOND

Currently, most data center SDN deployments center on either Cisco's Application Centric Infrastructure (ACI) or VMware's NSX.

An ACI deployment is defined by the Application Policy Infrastructure Controller (APIC) that communicates policy to constituent data-plane devices and monitors their performance. Management and monitoring tools can pull network and application performance data via the APIC's management APIs. And because ACI extends to virtual Cisco switches, that information can include goings-on inside the virtual environment.

An NSX deployment is centered in the virtual environment (VMware or not) and can deliver information about performance from the perspective of virtual servers, switches and appliances. It cannot directly collect data from and report on the physical network underlying its virtual networks, however. So other tools have to fill in the gap, such as VMware's own vRealize Operations, via its management pack for network devices, or with standard network monitoring tools such as those from Hewlett Packard Enterprise or SolarWinds.

However, ACI and NSX are not the only games in town. The rise of SDN was sparked by the development of OpenFlow, an open standard for

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communications between data plane and management plane. Neither ACI nor NSX is OpenFlow-based.

Those relying on OpenFlow-based networking can get rich reporting data from their SDN controllers. Also, some traditional network management tools, such as HPE's Network Node Manager i, have been extended so they can talk to SDN controllers. This allows these apps to be used to monitor performance across an OpenFlow SDN infrastructure, or a hybrid network.

Some IT shops even use SDN to expand their visibility into non-SDN networks, for example by deploying Big Switch Networks' Big Monitoring Fabric.

NFV AND SD-WAN FOR MORE LEVERAGE

These technologies all rely on using the network to report on itself, but sometimes IT needs deep packet inspection or other complex analysis right at the site of the problem. At the same time, the rapid infusion of network functions virtualization (NFV) into the network is promising to make it possible to deploy traffic-sampling analytical probes into the network where needed.

Of course, the WAN is also part of the network, and SD-WAN is spreading even more rapidly than data center SDN: 27.3% of organizations in our benchmark have deployed SD-WAN, or will before year's end. SD-WAN, bringing

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centralized and policy-driven management to the WAN, also gathers detailed performance and utilization information about WAN traffic. In fact, many who deploy SD-WAN run it first in a discovery/visibility mode (not actively shaping traffic), to better understand how the business uses the WAN. They can then more easily map out the policies they need to put in place to control performance and behavior.

With SDN (plus NFV and SD-WAN) technologies to lean on in the future, IT administrators can once again gain the depth of visibility they need to better understand how the enterprise uses the network; how well the network is meeting their needs; and what steps they should take to upgrade the network to meet performance and reliability requirements.

John Burke is CIO and principal research analyst with Nemertes Research. With nearly two decades of technology experience, he has worked at all levels of IT, including end-user support specialist, programmer, system administrator, database specialist, network administrator, network architect and systems architect. He has worked at The Johns Hopkins University, The College of St. Catherine, and the University of St. Thomas.

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