SONiC NOS faces challenges fitting in with mainstream

Seven years of development by the open source community have failed to carry Microsoft-created SONiC significantly closer to becoming an alternative to the proprietary network operating systems found in mainstream data centers.

Instead, SONiC, or Software for Open Networking in the Cloud, remains an NOS for cloud providers and enterprises running massive data centers. Companies using SONiC include China-based Alibaba and Tencent, Microsoft Azure, Comcast, eBay and Target.

For those companies, SONiC significantly reduces the cost of data center operations by delivering network automation at scale. It does so by rolling infrastructure management into cloud-native software on top of switches and routers.

For most enterprises, that architecture is too much of a departure from what they have through traditional suppliers.

Gartner clients bring up SONiC in roughly 10% of conversations about network infrastructure, analyst Andrew Lerner said. But only less than 5% adopt the technology in some form.

"[SONiC's] adoption today -- as we sit right now, line in the sand -- is very, very low," Lerner said. "Adoption going forward is still single percentage points of [possible] customers."

Gartner estimates that between 100 and 200 enterprises have SONiC running in production in their data centers, out of a potential market of more than 100,000 data centers. The users are not the run-of-the-mill enterprise.

"These aren't like Jimmy chicken shack kind of customers," Lerner said. "These are big-scale customers."

Indeed, IDC predicts that Ethernet data center switches running SONiC will generate more than $2 billion in revenue from hyperscalers, tier-2 cloud providers and telecom service providers by next year. In 2022, the total Ethernet switch market reached $36.5 billion globally.

SONiC is a "bloody mess"

Startups like Hedgehog hope to broaden the enterprise market for SONiC. The company has fewer than a half-dozen employees and raised roughly $4 million in funding last year, according to Crunchbase.

Hedgehog opened for business last November, working with partners on a SONiC product for the edge, CEO Marc Austin said. The company believes there's a market for SONiC under computing systems that process data for AI applications running on premises and in the cloud.

Currently, SONiC isn't in a state that's useful to enterprises that buy their network infrastructure and support from incumbent vendors like Arista, Cisco or Juniper Networks.

"SONiC today is kind of a bloody mess," Hedgehog CTO Mike Dvorkin said.

Preparing SONiC to run on specific commodity hardware requires a lot of development work to ensure the NOS can use the device's services.

SONiC proponents tout its switch abstraction interface as the technology for running the NOS on generic hardware. However, the SAI generally works but requires developers to write and test code for specific services, Dvorkin said.

Examples include integration with the hardware's fan controllers or turning on the front-panel LEDs, which provide a quick notification when there's a connection problem.

SONiC developers are slow to fix bugs related to specific network hardware, Dvorkin said. The internet hosting service GitHub, a subsidiary of Microsoft, provides the organizational structure for SONiC development and version control.

Approval for code changes requested by outside developers like Hedgehog can take a long time. "The community is not super fast in accepting changes," Dvorkin said.

Last year, Microsoft handed the responsibility of overseeing SONiC development to the Linux Foundation. Microsoft released SONiC as open source software in 2016.

Ultimately, Hedgehog believes there's a market for Sonic if it can deliver turnkey infrastructure that provides dramatically more capacity at the same price or less than current proprietary infrastructure. To do that, the company is working with the roughly 10 members of its partner program.

"These are folks who have signed up to get early field trials of the product," Austin said. "They're advising us on what to build."

SONiC's fastest path to the enterprise

The quickest way for SONiC to reach mainstream enterprises would be through the networking industry's largest suppliers, Lerner said. However, Arista, Cisco and Juniper focus on their proprietary systems, supporting SONiC on hardware sold to companies using the technology in hyperscale data centers.

[SONiC's] adoption today -- as we sit right now, line in the sand -- is very, very low. **Andrew Lerner** Analyst, Gartner

"While some of these vendors support SONiC, they don't lead with it," Lerner said. "If they're not leading with it, its adoption is going to be delayed."

The best opportunity for SONiC startups is new, fast-growing companies that need to quickly scale a network to support cloud applications, such as AI, experts said. Those companies start from scratch and skip the complex process of transitioning from proprietary to open-source technology.

Lerner agreed. "Any new buildout of data center infrastructure is absolutely an opportunity for SONiC to gain share."