

IDC forecasts that Software for Open Networking in the Cloud (SONiC), an open source Linux network operating system (NOS), will grow into a datacenter switch market worth \$2 billion in 2024.

Why SONiC Has the Potential to Become a True "Linux of Networking"

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Questions posed by: Dell Technologies

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Q. Why do you think SONiC has the potential to be the "Linux of networking"?

A. Software for Open Networking in the Cloud (SONiC) is an open source network operating system (NOS) that was first developed and released by Microsoft in 2016 and contributed to the Open Compute Project (OCP) the following year. Although not yet widely adopted by enterprises, SONiC continues to evolve, attracting a growing community-based ecosystem that is driving it into new use cases and adding extensively to its feature set.

Today SONiC is used extensively in the cloud datacenters of Microsoft and LinkedIn and increasingly at Chinese hyperscalers such as Alibaba and Tencent. SONiC is also gaining interest from tier 2 cloud operators, communications service providers (communications SPs), cable MSOs, and even at a small number of large enterprises. It is currently deployed primarily on top-of-rack (ToR) Ethernet switches in cloud-scale datacenters. However, the industry support it has received and the features it continues to add are helping extend its reach not only to leaf-spine networks in cloud datacenters but also to converged networks, WANs, and other routing use cases.

As a result, SONiC has emerged as the leading open source standard bearer for network disaggregation, which involves the decoupling of network software from the underlying hardware on which it runs, as well as, more recently, the modular decoupling and composability of individual software functions. IDC forecasts that the SONiC datacenter switch market — comprising OEM and ODM switches that ship with or run SONiC in production environments — will account for \$2 billion in revenue in 2024.

Q. What are the benefits associated with using SONiC in the datacenter?

A. SONiC's objective is to deliver a NOS with the following attributes:

- » **Platform agnostic** — Able to operate across network hardware and work with a range of higher-layer automation and orchestration tools
- » **Agile** — Able to support and incorporate functionality at the velocity required by modern cloud datacenters
- » **Extensible** — Able to provide the programmable flexibility to evolve in support of new features and capabilities
- » **Reliable** — Able to provide robustness and integrity partly through precluding the "code bloat" associated with traditional monolithic NOSs

SONiC not only is based on Linux — running on Debian Jessie and ported to Ubuntu (as a snap) — but also takes the form of container-based microservices. Customers can adopt only the features they need, eschewing those they don't need, and thus realize cost and productivity savings. Further, SONiC, because it is Linux, allows organizations and operators to benefit from consistent automation tooling across their datacenters, including their datacenter networks, offering an opportunity to consolidate toolsets, increase operational efficiencies, and bring the network architecture and operations into better alignment with application, developer, and business requirements.

Q. How is SONiC different from traditional network operating systems that run on datacenter switches?

A. Until recently, network devices were analogous to the mainframe. A network device was a closed, vertically integrated entity, with proprietary network silicon, software, and interfaces all wrapped in metal and offered as a monolith. SONiC is representative of both open source and network disaggregation, which involves the decoupling of network software from the underlying hardware, as discussed previously. Basically, this means that open source communities and third-party vendors could develop network functions and services that would run as SONiC applications atop the Switch Abstraction Interface (SAI), which allows SONiC to run across network hardware platforms powered by a wide range of network silicon.

The SONiC base, which constitutes a switch layer, sits above SAI and provides core features such as database platform and switch state service (SwSS), as well as support for Quagga, FRR, LLDP, SyncD, and RedisDB. Containerized network applications reside above the SONiC base, supporting a range of network protocols such as SNMP, BGP, DHCP, and IPv6 as well as more recent support for VLAN Trunking, virtual routing and forwarding (VRF), and RDMA over Converged Ethernet (RoCE). There is an opportunity here for vendors to develop SONiC applications, too.

Q. What are the challenges associated with using SONiC?

A. It's a departure from how network devices, such as datacenter switches, have been designed, developed, and sold by vendors and how they have been procured, deployed, and operated by enterprises. Change always requires adaptation, by the vendor community and by organizations that consume technology. Many vendors are trying to devise viable business models for SONiC; on the enterprise side, organizations want assurances that adoption of SONiC will not involve a high degree of complexity, extending from initial procurement through provisioning and deployment as well as ongoing service and support.

That said, SONiC does fit well into a new cloud-centric operating model that IDC believes will become increasingly prevalent in organizations over the next few years. We're moving from siloed, device-centric, and hardware-defined operational models to a model in which processes and workflows are automated and programmable, software driven, and cloud centric, so the network must be comprehensively automated and aligned with that model. A Linux NOS is a good network foundation for that model.

Q. If enterprises are considering adoption of SONiC, how should they proceed?

A. Enterprises will need to ensure that they've thought carefully about their application environment and how SONiC will fit into it and support it. SONiC, especially given its origins and initial purpose, fits well with application-oriented, software-defined, and cloud-centric environments. It's a natural complement to datacenter network modernization in those environments.

To derive full value from SONiC, in operational efficiencies and savings and on the capex side, enterprises will also need to consider whether they have the right resources, including skill sets and tooling, to take full advantage of the technology. In this regard, enterprises should think about whether they want to consume SONiC, whether they want to take a DIY approach, or whether they prefer to adopt a curated model that includes SONiC, network hardware, and professional services and support. For many enterprises, this latter approach has significant appeal because it gives them assurances related to services and support.

About the Analyst



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Brad Casemore is IDC's Research Vice President, Datacenter Networks. He covers networking products and related technologies and platforms typically deployed in the datacenter. Mr. Casemore also works closely with IDC's Enterprise Networking, Server, Storage, Cloud, and Security programs to assess the impact of emerging IT and converged and hyperconverged infrastructure.

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