# Revolutionizing Open Networks: Exploring the Power of SONiC NOS

In this article, we aim to guide enterprises and service providers in determining whether SONiC, a popular open-source network operating system, is a viable choice for enhancing their on-premises data center and private cloud networks.

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## The Evolution of SONiC: From Microsoft's Network to an Industry-Recognized Solution

The open network operating system SONiC (Software for Open Networking in the Cloud) initially originated from Microsoft’s need to effectively manage switches from multiple manufacturers within their expansive network infrastructure. Over time, it has evolved into a well-

established solution with a broad range of features and functionality to cover data-center, enterprise, and telecom use cases.

One of the primary problems SONiC solves is the need for a network operating system that is highly adaptable and allows optimizing OpEx, gaining control over the network, and avoiding vendor lock-in.

Proprietary systems often lack the flexibility required to meet the diverse demands of modern businesses, leaving users heavily dependent on the provider for updates, feature enhancements, and support. This dependency extends to the financial aspect as well, since users are obligated to regularly pay substantial fees.

The open networking concept involves the decoupling of hardware and software components, driving interoperability and innovation, as vendors often offer bundled solutions.

## Decoding SONiC: What Makes it a Standout Network Operating System

SONiC is as a Linux-based NOS built on a Switch Abstraction Interface (SAI) that ensures an API layer across various ASIC vendors and the NOS. Its open-source nature offers adaptability, scalability, and flexibility, benefiting from ecosystem collaboration between hardware manufacturers, service providers, and enterprises. It provides a level of control that was previously unavailable.

Its architecture is structured on a three-layer system, ensuring robust performance and adaptability across various hardware configurations. In other words, SONiC is

a collection of kernel patches, device drivers, utilities and more, combined with Linux distribution.

Over time, SONiC has garnered recognition as a proven solution for industry giants like Alibaba, eBay, LinkedIn, Tencent, and more. The adoption of this NOS has not only enabled substantial long-term cost-efficiency for these companies in their network infrastructure but has also streamlined network management by aligning the top application level with the infrastructure.

SONiC's **cloud-native design** stands out as a significant advantage. It guarantees smooth integration with cloud-based applications, enabling organizations to unlock the full potential of these technologies.

**The container-based architecture** enables seamless operation with different components, allowing businesses to tailor NOS to their unique use cases and evolving networking standards. Everything within SONiC is a part of a specific container. Each of these containers can be updated, customized, loaded with more features, etc. so that you could bring in the set of software you need and upgrade the systems running on the switch.  To add a new capability, engineers develop a new container and deploy it on switches. This containerization allows for a wide variety of configuration and management tools on top of SONiC, and thus for tying the switches to the overall service management platform.

In the world of open projects, success often depends on community engagement. In the case of SONiC, everything has come together seamlessly because **a dynamic community of networking experts** actively contributes to its development. Moreover, oversight from hundreds of companies and thousands of developers has made SONiC into a highly secure and resilient system.

PLVision has also played an important role in shaping SONiC since its early days. We are among the top 15

contributors to SONiC, alongside technology giants like Broadcom, Google, Nokia, and others. Furthermore, in 2023, our leading expert was elected as a General Member Governing Board Representative for the SONiC project, showcasing our deep involvement and leadership in the open networking community.

Overall, SONiC is actively growing, receiving regular updates to continually improve its efficiency, expand its feature set, and enhance its readiness for integration with third-party solutions.