SONiC in the Real World

The growing industry traction for **Software for Open Networking in the Cloud (SONiC)** has generated plenty of interest across different market segments. Known as an open-source initiative today, SONiC was originally created by Microsoft in 2016 to power their Azure cloud infrastructure connectivity. SONiC is Debian-based and has a microservice-based, containerized architecture where all major applications are hosted within independent Docker containers.

While it started primarily with hyperscalers, both enterprises and service providers are now more broadly considering SONiC (Software for Open Networking in the Cloud) for their networks. Use cases that can benefit from disaggregation and the open NOS ecosystem are ideal candidates for SONiC adoption. In this blog, we'll address some key questions on SONiC's adoption, where we share both Microsoft's perspective as the operator and Cisco's perspective as the vendor in a Q&A format. Let's jump right in then, shall we?

Why is SONiC fundamental in building the next-generation network?

Microsoft (operator): By decoupling network software from the underlying hardware platform, SONiC empowers Microsoft to innovate faster to advance Azure cloud networking infrastructure – one of the largest hyperscale networks on the planet, to satisfy diversified and fast- growing customer requirements. It offers Microsoft the flexibility to create the next-generation network solutions and innovate together with hardware vendors while leveraging the strength of a large ecosystem and open community.

Cisco (vendor): At its core, the inherent open nature of SONiC makes it very conducive for collaboration between vendors and operators that's instrumental for innovation. With the new Cisco 8000 product portfolio running community SONiC, we have a unique advantage as an industry leader in enabling disaggregation for next-generation networks. One of the most exciting value

propositions with SONiC is the strong community support. Building architectures today that solve problems for tomorrow requires a culture of partnership across boundaries that an open-source community offers. With its microservices-based architecture, SONiC makes plug and play simple. From a vendor's standpoint, integrating different value-added components can now become seamless. Next-generation networks are built on innovation, thought leadership, strong community, and collaboration. With all its attributes, SONiC sets the foundation to foster the same.

What unique value does SONiC add?

Microsoft: SONiC provides Microsoft with a simplified and uniform software stack to manage the heterogeneous underlying devices from multiple vendors to run a reliable network with fast feature development and deployment velocity. It gives us the capability to access innovative silicon and hardware innovations.

Cisco: For a vendor, SONiC optimizes time to market. Feature development and test is now centered only on vendor-specific components (i.e., full stack vs compatibility layer). SONiC makes it easier and faster to support newer use cases and diversify technology investments with potentially lower engineering cost. The one SDK advantage with Cisco 8000 gives it a competitive leverage for SONiC portability across systems, so it's viable for a myriad of network roles and use cases. The open-source nature of SONiC fosters partnership with third-party applications on vendor platforms in a very modular and structured way, making advanced programmability a reality in new generation networks.

What problems does SONiC help alleviate?

Microsoft: With SONiC, Microsoft can deploy new features and fixes rapidly across variant hardware platforms to satisfy our business requirements. The time to mitigate and repair problems has significantly decreased. It also relieves the churn from deprecating a specific hardware, which improves network reliability.

Cisco: Some key problems SONiC helps address include flexibility with vendor-specific release models and cadence, uniformity in software component implementation across vendors, and homogeneity in automation frameworks across platforms. An agile release model becomes a reality with SONiC. Here's where the real power of using vendor-validated community SONiC comes to fruition. Operators can customize SONiC by upstreaming feature additions to enable their snowflake architectures while vendors can holistically validate functionality and performance on their platforms.

With SONiC, disaggregation can reach its fullest potential, giving both vendors and customers an opportunity to control their own destiny while still working towards a common goal. Having uniformity in protocol implementations so they're standardized across different vendor ecosystems is pivotal in building a homogenous automation framework. Vendors can focus development on uniform implementations without significant interoperability concerns. This makes automation easier.

How does SONiC change the operating model?

Microsoft: SONiC leverages modern, container-based architecture to decouple the component dependencies so each component can innovate independently. Microsoft can easily enable new features to satisfy our business requirements. Meanwhile, the automated CI/CD process enables delivery of high-quality images. Microsoft collaborates with the SONiC community and hardware vendors to enable new features and tackle hot issues. SONiC creates an open, collaborative, community-based, and fully automated operation model. Microsoft views software-hardware co-design as an exciting area with ample opportunities for innovation.

Cisco: New learnings are expected with any new open NOS adoption and SONiC is no different. From an engineering perspective, there's a reduction in the development and test pipeline/model. Vendors can now invest efforts more on vendor-owned components instead of a traditional top-down full stack approach. The support model aligns to the same trajectory wherein shared responsibility can be assumed by all stakeholders for customers who don't want to build everything in-house. The commercial model also accommodates

changes in the system to facilitate a more inclusive approach to building things.

What's your view on SONiC's future evolution?

Microsoft: SONiC has been adopted by enterprises and cloud providers for on-prem and in-cloud datacenter scenarios. SONiC is also being actively extended to more new scenarios and hardware by community talents. SONiC will go beyond datacenter and empower next-generation network innovations like edge, IoT, and 5G as well as extend beyond the physical network to empower software-defined networking (SDN) scenarios. SONiC will go beyond network and accelerate the computations by offloading workload from CPU.

Cisco: SONiC is here to stay and it's trending to be the Linux of the networking world. SONiC has been adopted by large networks and is being deployed across multifaceted use cases. With great power comes great responsibility and this applies to SONiC as well. As SONiC gains wider adoption, it will keep maturing to enable more feature rich capabilities. Orchestration and automation ecosystems will continue to diversify, offering the opportunity for newer orchestration controllers and provisioning frameworks to further enrich SONiC and take programmability to new heights while enabling new use cases such as 5G and IoT.