First Look

Accelerating Innovation with Enterprise SONiC Distribution by Dell Technologies

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Challenges: [1]

55% The percentage of organizations that view **becoming more operationally efficient** as a top objective of their digital transformation initiatives.

95% The percentage of organizations that view their IT environments as **equally or more complex** than they were two years ago.

As organizations undergo digital transformation initiatives, they want to become more efficient when operating and managing increasingly complex IT network infrastructures. The complexity is especially apparent as organizations continue to maintain multi-vendor networks built on traditional networking solutions with tightly coupled hardware and software.

In recent years, organizations have embraced the concept of open networking. By using open source software to speed up the development of networking features to meet their business needs, organizations can avoid negotiating product roadmaps with vendors or developing clumsy and complex workarounds. Adopting an open networking approach also enables organizations to develop network functionality on their hardware of choice instead of proprietary hardware. Enterprises can then easily develop and deploy networking capabilities throughout the IT environment.

To meet the demands of today's enterprise IT networks, organizations would benefit from an open networking platform that has already been proven to operate in large-scale environments. Organizations would also benefit from access to ongoing technical support that can address continuous software maintenance, thus allowing the business to focus on the development of innovative services for their customers.

Enterprise SONiC Distribution by Dell Technologies

Enterprise SONiC Distribution by Dell Technologiesis an open networking solution that combines open source networking software with enterprise-level support. Leveraging the open source Debian Linux distribution, this open networking operating system is based on Software for Open Networking in the Cloud (SONiC), a platform developed originally by Microsoft to address its own cloud-scale networking needs and build containerized applications within Microsoft Azure. Microsoft also developed SONiC so that it could accelerate any debugging or network issue resolution in-house, making it easier to meet internal service level agreements (SLAs) with end-users.

Organizations using Enterprise SONiC Distribution by Dell Technologies can benefit from code contributions made continuously by over 40 software platform and semiconductor companies in the SONiC ecosystem, including those contributions made by Dell Technologies since SONiC's inception.

To enable enterprises to innovate on networking functionality that can meet their unique business needs quickly, they can leverage the Switch Abstraction Interface (SAI). The SAI version of the Open Network Install Environment (ONIE) acts as a standardized API of the Enterprise SONiC Distribution platform for developing networking capabilities on the customer's choice of hardware. Using this version of SAI, the Dell Technologies' platform enables organizations to develop innovative networking features on the NOS of their choice across the Dell EMC PowerSwitch Z or S Series product lines.

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[1] Source: ESG Master Survey Results, *2020 Technology Spending Intentions Survey*, December 2019.

Dell Technologies also enables enterprises to leverage functions associated with other products that help in designing, configuring, and operating SONiC-based switches, including Dell EMC Fabric Design Center, Dell EMC SmartFabric Director, Dell EMC OpenManage Enterprise, and select third-party applications. By using APIs associated with these products, organizations can programmatically integrate existing capabilities with Enterprise SONiC Distribution by Dell Technologies.

Enterprises using the Dell Technologies' open networking platform can also leverage SONiC's modular architecture supported by containerization to make IT operations more efficient. Unlike monolithic software systems, the Enterprise SONiC Distribution platform can be modified or debugged easily without having to touch the entire code base. Since containers isolate the code for specific network functions and features, organizations only need to update software to address bug fixes, patches, or upgrades associated with affected containers. This isolation also helps to minimize network downtime.

Integrated Network Management

Containerized Applications

SONiC

PowerSwitch
Z series

PowerSwitch
S series

While SONiC is open source code, Dell Technologies has ensured that its platform can operate in enterprise-level IT networks via extensive hardware and software testing and validation through a myriad of large-scale enterprise use cases. To further encourage enterprise adoption, Dell Technologies has included numerous management options, specifically a centralized management framework CLI and advanced telemetry, to aid IT support teams in daily network management and monitoring. Enterprises can also use other programmatic interfaces supported by the Enterprise SONiC Distribution platform, such as those employing representational state transfer (REST), gRPC Network Management Interface (gNMI), and gRPC Network Operations Interface (gNOI), for network management purposes.

Unlike companies that use SONiC only, those leveraging Dell Technologies' platform can also benefit from global enterprise-level support. Customers can rely on Dell Technologies' technical support for hardware issues and software-related updates, upgrades, and issue resolution. Enterprises ultimately benefit from the flexibility and agility of open source networking development with the technical support expected by enterprises today.

ESG Demo Highlights

ESG performed joint testing of the Enterprise SONiC Distribution platform to determine how it can help organizations to become more efficient in their daily IT operations.
- ESG first examined the four primary interfaces that administrators use to manage the open source SONiC network operating system:
  - *SONiC Linux shell CLI* for network and switch configuration.
  - *Minigraph.xml* for enabling legacy configuration workflows.
  - *Config_db.json* for acting as a repository for configuration tables.
  - *FRR* for routing protocol configuration.

  Each interface presents a different way to configure SONiC within an organization's network. We then noted how Dell Technologies use of the management framework CLI screen in its Enterprise SONiC Distribution platform integrates the execution of functions from the four interfaces into one view. This single view minimizes administrator time in switching between separate screens to complete configurations of any switch running SONiC.
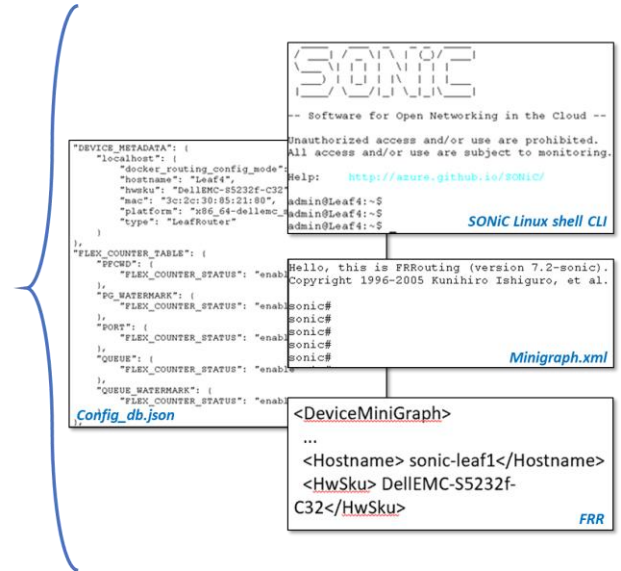
- ESG then viewed the command syntax of the four separate interfaces against that on the single interface for the Enterprise SONiC Distribution platform. We saw that an administrator would need to know the command syntax unique to each interface if a single CLI were not available. With the management framework CLI, command syntax is consistent for switch configuration. Creating a consistent syntax can help an administrator learn how to navigate the management framework CLI faster, as opposed to learning and remembering the syntax for the four original SONiC interfaces. Time to value and time to perform administrative tasks decrease, making IT operations more efficient.

- ESG also noted how the single management framework CLI contributed by Dell Technologies provides a simple and consistent way for a network administrator to create and manage alerts across all switches running SONiC. The common syntax provided by the management framework CLI enables network administrators to develop alerts that can be understood and addressed by the IT team, minimizing the time to diagnose and resolve network issues.

First Impressions

Organizations that embrace open networking seek more control over the deployment of software-based networking functionality as business needs arise. While open source networking platforms provide a viable alternative to purchasing proprietary solutions with tightly coupled hardware and software, organizations also seek a solution that can meet the demands of enterprise IT environments and provide adequate ongoing technical support to minimize network downtime.

ESG conducted an initial review of the Enterprise SONiC Distribution by Dell Technologies. We validated how Dell Technologies has contributed to the SONiC platform so that enterprises can extract the most value. We noted that commands for switch configuration can now be completed via one interface, as opposed to the four disparate interfaces offered by the original SONiC platform. Command syntax is also consistent, helping administrators to quickly learn and adopt the management framework CLI into daily IT operations. Dell Technologies also enables the integration of other Dell EMC products, specifically Fabric Design Center, SmartFabric Director, and OpenManage Enterprise, as well as select third-party applications via APIs so that customers can better design, configure, and operate a SONiC-based enterprise-grade network.