First Look

Achieving High Performance and Throughput with Dell EMC PowerSwitch Z9432F-ON Series Switch

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Challenges:[1]

38% The percentage of organizations that view ***higher data volumes*** as a top reason for increasing network complexity.

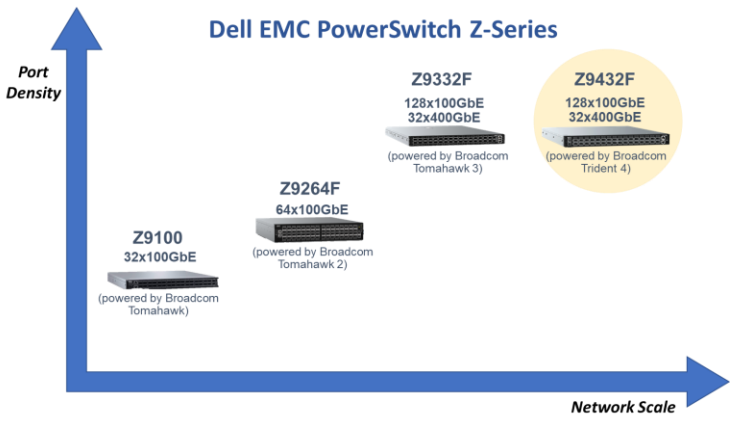
35% The percentage of organizations that view ***straining network infrastructure*** as a top challenge for supporting an increased number of remote workers.

Today's networks are handling higher traffic volumes as organizations deploy applications, such as streaming video, artificial intelligence (AI), and machine learning (ML). With organizations implementing technologies like remote direct memory access (RDMA) and all-flash arrays (AFAs) to enable faster processing and access of larger amounts of data, maximizing an IT network's performance and bandwidth becomes paramount in handling the increase in data traffic. The challenge lies in upgrading current leaf-spine data center fabrics that use 100GbE links to maximize performance and connectivity.

Organizations have traditionally deployed proprietary switching platforms to support the transport and aggregation of network traffic via scalable leaf-spine architectures. However, a majority of switching platforms continue to be fixed in both port numbers and link speeds. Expanding the leaf-spine architecture has entailed purchasing and deploying more switches to increase overall throughput, especially as more organizations see the need to go beyond 100GbE connectivity. Yet, increasing the number of switches leads to more network complexity. With added complexity comes the challenge of optimizing overall performance and throughput.

Relying on proprietary switching platforms also limits the ability for organizations to use operating systems that can best address how to build and manage their IT networks. This issue especially arises as more organizations have extended and scaled their IT environments from the data center to the cloud through the consumption of public cloud infrastructure services, public cloud applications, and cloud-native services. Today's proprietary operating systems have not been designed to effectively optimize and manage traffic traversing these hybrid networks.

Meeting these unique demands requires a solution that will enable a high performance, high throughput platform that can scale to support low latency connectivity across the on-premises data center fabric network and into the cloud. The switching platform would ideally enable support for multiple open network operating systems so that organizations can choose the one that best serves their needs.



Dell EMC PowerSwitch Z9432F-ON Series Switch

The Dell EMC PowerSwitch Z9432F-ON Series Switch, a high-density, open networking switch is the latest release in the PowerSwitch Z Series. With its multi-rate support,[2] the PowerSwitch Z9432F-ON enables cost-effective connectivity up to 400GbE. This switch has been designed for networks to support intensive storage and compute traffic dictated by modern applications such as cloud internet of things (IoT), AI/ML, and streaming video requirements.

PowerSwitch Z9432F-ON has been designed to support up to 25.6Tbps non-blocking, full duplex switching, which helps the

[1] Source: ESG Master Survey Results, *2021 Technology Spending Intentions Survey*, December 2020.

[2] The Dell EMC PowerSwitch Z9432F-ON Series Switch supports 10/25/40/100/200/400GbE connectivity. (50GbE support is planned for future release.)

switch to deliver line-rate performance under full load. This enables the switch's multi-rate support (via breakout cables) for its 32 physical 100GbE/400GbE switch ports. Port speed configurations include:

- 32 400GbE ports.
- 64 200GbE ports (via breakout cables).
- 128 100GbE ports (via breakout cables).
- 128 10G or 25G connections (via breakout cables).

With PowerSwitch Z9432F-ON's flexibility in supporting multiple high-speed connections, organizations can provision the appropriate port speeds as business needs require. While this switch is ideal for functioning as a "super spine" (with the switch's dual 100/400GbE support) and end of row data center switch, it can support any leaf-spine architecture. This flexibility can also help organizations to minimize the need for hardware upgrades as the network scales and traffic patterns change, as PowerSwitch Z9432F-ON can be configured to handle multiple connections from 10GbE to 400GbE within one rack unit (RU). Organizations no longer have to rely on traditional high-density switch chassis housing multiple low- or high-speed switches. Instead, PowerSwitch Z9432F-ON delivers a higher density switch within a smaller footprint.

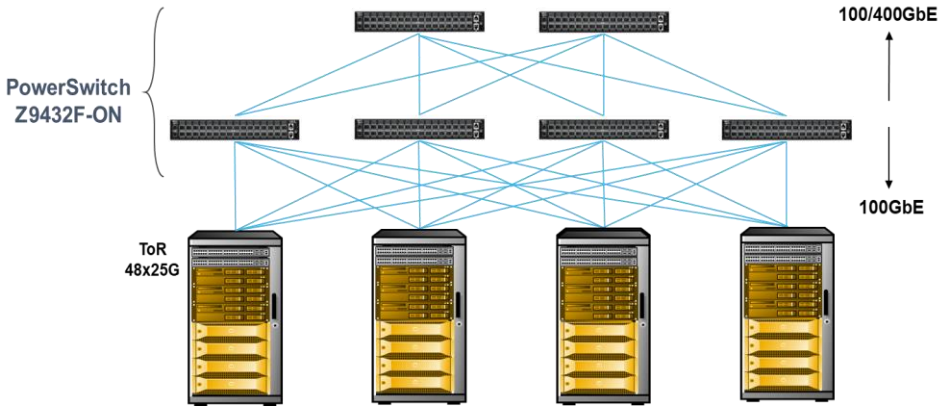
PowerSwitch Z9432F-ON's flexibility is also demonstrated via its support for Linux-based open networking operating systems, specifically Dell EMC SmartFabric OS10 and Enterprise SONiC Distribution by Dell Technologies. While both operating systems can support the buildout of enterprise-grade networks, organizations can also develop additional networking capabilities, outside of the open-source community, tailored for specific needs unique to their business operations. By providing a choice in operating system used on the PowerSwitch Z9432F-ON, organizations can select one that best meets their networking configuration and management needs.

Customers deploying PowerSwitch Z9432F-ON also receive global enterprise-level technical support for issue resolution. For those that have also deployed Dell SmartFabric OS10 or Enterprise SONiC Distribution by Dell Technologies, Dell support will provide software-related updates and upgrades.

ESG Highlights

Based on our initial evaluation of the PowerSwitch Z9432F-ON, ESG noted the following:

- With its high-density footprint and multi-rate support, PowerSwitch Z9432F-ON can simplify migration to core fabric networks supporting 100GbE, 200GbE, and 400GbE.
- Scaling to 400GbE is easier to accomplish when deploying PowerSwitch Z9432F-ON as both spine and leaf switches. Network architecture can be simplified with PowerSwitch Z9432F-ON, as achieving 400GbE speeds does not require consuming four 100GbE ports. Less hardware can be deployed, subsequently decreasing overall capital expenses.



- Organizations that install Dell EMC SmartFabric OS10 software onto the PowerSwitch Z9432F-ON can leverage Dell Technologies' support of Layer 2 and 3 switching and routing protocols with integrated IP services, quality of service, and manageability and SmartFabric Services automation features that organizations need in building out enterprise-grade networks.

- Users of PowerSwitch Z9432F-ON can leverage Ansible[3] code for automating select switch configuration tasks (specifically VRRP, L2 static routing, ACL management, and AAA-enabled network access), reducing time and money spent on provisioning and configuration.
- With Dell EMC SmartFabric Director software, organizations can automate and simplify the provisioning and monitoring of an intent-driven data center fabric comprised of Dell EMC PowerSwitch Z Series switches, including those closely integrated with a virtualized overlay network such as VMware NSX.

First Impressions

Data volumes will only continue to grow as organizations employ more data-intensive applications within their hybrid cloud environments for the foreseeable future. With the increase in network traffic comes strained network resources to support high-performance, low-latency connectivity from the IT network edge to core data centers and cloud resources. Increasing network capacity without increasing network complexity and related capital and operational costs is an ongoing challenge that organizations need to address.

ESG's initial review of the Dell EMC PowerSwitch Z9432F-ON Series switch reveals that organizations can facilitate high performance and low latency connectivity throughout their data center fabrics and into hybrid clouds. Multi-rate support, from 10GbE up to 400GbE, positions the PowerSwitch Z9432F-ON as a flexible solution to address both core and aggregation network needs, decreasing the need to deploy and manage high density chassis. With support for open network operating systems, organizations retain their ability to choose one that best suits their needs, especially those that have extended their IT environments into the cloud. With the combination of PowerSwitch Z9432F-ON's hardware and software, organizations are poised to manage and scale their network with the flexibility needed to meet demands for high-performance network throughput.

[3] Ansible is open-source language that helps organizations to automate software provisioning, configuration management, and application deployment.