



# PowerEdge MX-Series Fabric Management

Technical Note by:

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## SUMMARY

The Dell EMC PowerEdge MX-Series offers a wide range of connectivity options. Optional switch modules provide full L2/L3 switching capabilities and implement industry standard Open Networking technologies for true software defined networking. Additionally, customers can choose to enable SmartFabric Services to greatly reduce the administrative burden of switch management.

## Background

The new PowerEdge MX-Series platform offers a wealth of networking options designed to scale from a single chassis to many. Offering a Future Forward design, MX-Series networking offers end to end 25GbE/100GbE connectivity while still maintaining backwards compatibility with 1/10/40GbE networks.

For single chassis requirements, the MX5108n Ethernet switch provides low latency, high bandwidth network access and supports a variety of uplink types.



MX5108n

For more demanding environments, the MX9116n Fabric Switching Engine reduces latency and increases bandwidth even further, while scaling up to 10 chassis. This model adds 32G Fibre Channel and Fabric Expansion capabilities via Dell EMC's Scalable Fabric Architecture. The MX9116n also supports heterogeneous rack servers and other Ethernet devices, for a total of 104 devices.

Both switches support Open Networking, Full-switch and SmartFabric operating modes.



MX9116n

Each system supports ONIE, enabling the option for third party SDN solutions from Dell EMC Networking partners. Most installations, however, will be deployed with Dell EMC Networking OS10 Enterprise Edition, which can operate in two modes:

Full-Switch mode provides industry standard L2/L3 switching with full customization and can be configured using the Command Line Interface (CLI), API, or DevOps solutions such as Ansible.

SmartFabric Services is the latest Dell EMC Networking innovation and is designed to greatly reduce the complexity of fabric configuration, management, failure remediation and firmware updates. SmartFabric Services also provides I/O aggregation, Active-Active multi-pathing and physical topology validation.

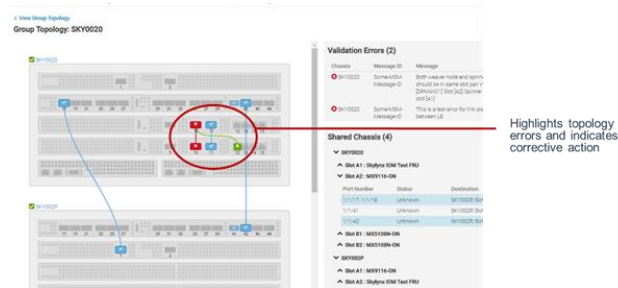


## SmartFabric Services

In SmartFabric mode, these devices provide I/O aggregation to eliminate complex upstream switch configuration. By providing Active-Active multi-pathing to all hosts, load balancing and fault tolerance is delivered seamlessly. In addition, error prone tasks like VLAN and priority assignments are attached to server profiles and drive automated Quality of Service (QoS) configuration on the switch. Management is achieved with a single CLI and/or API to manage multiple switches and multiple fabrics.

With an unprecedented level of automation for a Modular design, Firmware updates are managed at the “Fabric level” to ensure consistency and in the event of replacement, the new device will be updated automatically and physical topology confirmed before the new switch is brought on-line.

SmartFabric Services automatically detects misconfiguration and link level failure conditions and notifies the administrator of the error as well as corrective actions required. Upon resolution, the system will automatically “heal” the fabric once the conditions are resolved.



## Scalable Fabric Architecture

One of the critical design elements that have made Modular servers so popular is their ability to consolidate administration functions for all servers into a single management console. The new MX Scalable Fabric Architecture extends this concept even further with the development of the new MX7116 Fabric Expander Module.



MX7116 Fabric Expander Module

With this innovation Dell EMC Engineers were able to deliver a robust fabric expansion solution that integrates with the MX9116n Fabric Switching Engine to connect up to 10 MX-Series chassis together into a single, manageable domain. Installed in pairs, full fault tolerance can be achieved without adding additional switches. This device is completely unmanaged, performs no switching functions, runs no OS, and has a latency of only 55ns. It reduces cabling and provides a seamless connection back to the MX9116n with no port to port oversubscription.

## Conclusion

The Dell EMC MX-Series was designed specifically to help customers facilitate their move to a more automated, resilient and high performing infrastructure. For those customers not yet ready to make this move, traditional management process can be used to configure the networking elements of the MX-Series infrastructure using Full-Switch mode or Open Networking but for those looking for ease of use, self-healing technologies, automated configuration of VLAN and QoS as well as the convenience and cost savings of reduced administration, SmartFabric Services is the ideal solution.