

Dell PowerConnect Simple Switch Mode (SSM) High-Level Overview

Victor Lama

Dell Fabric Specialist – G500

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The Dell Power Connect M6220, M6348 and M8024 blade switches provide enterprise-grade 1/10-G Ethernet switching capabilities for high-performance Dell m1000e blade server deployments. They offer the flexibility to be easily deployed as port aggregators for streamlined interoperability with Top-of-Rack (ToR) platforms from multiple vendors – or as fully-featured Ethernet switches that offer advanced layer 2 and layer 3 functionality, such as PVLANS, QoS, 802.1x security, RADIUS and TACACS+, RIP and OSPF routing, ACLs, advanced management through SNMPv3, and configuration management through CLI and GUI interfaces, to name a few.

Port aggregation is enabled when the blade switch is placed in Simple Switch Mode (SSM). SSM allows those who have limited expertise in managing Ethernet bridges the ability to deploy a loop-free switching solution without having to configure the Spanning Tree Protocol (STP) or engineer its integration into the existing environment. This capability is in keeping with the desire to reduce the overall complexity of a multi-tiered switching architecture, especially in light of virtual hypervisor and blade switching deployments. Thus, port aggregation lends itself to the creation of next-generation “flat” data center networks that are scaled *out* horizontally, not scaled *up* vertically.

SSM works by “pinning” a blade switch’s downlink ports to one or more uplink ports to form an Aggregator Group (AG). A downlink port is one that is directly connected to the server blade’s LOMs and mezzanine cards through the traces on the Midplane of the blade chassis. The uplink ports are external and connected to the ToR switch via copper or fiber optic cables, depending on the requirements of the deployment scenario. Multiple AGs can be configured within a stand-alone switch or across stacked switches for added flexibility and redundancy.

To keep traffic from different AGs separated from each other, and thus prevent bridging loops, a switch operating in SSM mode will automatically assign a VLAN identifier to each AG. This precludes the need to configure STP. And for more optimal oversubscription ratios, multiple uplink ports can be associated with the same AG. As ports are added, an SSM-enabled switch will dynamically configure a LACP bundle without any administrator intervention. Traffic will then be distributed across the LAG using a configurable hashing algorithm. The result is a simplified, loop-free switched environment with predictable traffic patterns and deterministic failover.

To summarize, the advantages of deploying SSM are:

- Port Aggregation is easy to configure. Simply map internal ports to external ports, assign a VLAN to the group (if required), and it’s ready to go.
- Automatically configures multiple external ports into an LACP trunk group.
- By using Aggregator Groups, the feature provides loop-free operation without using STP.
- Works across a stack of switches (M6220 and M6348) so that you can now manage switches as one via the easy-to-use interface.

- Seamless interoperability - Uplink looks like NIC ports to the network.
- Port Aggregation is completely interoperable. Dynamic (via LACP) and static link aggregation is supported on the external ports.

Note, that a simplified switching deployment using SSM means that certain functionality is necessarily removed:

- No SNMPv3
- Restricted management interface
- Limited configuration
- Certain commands, such as routing-related features and QoS, are not supported.

