



Mellanox Spectrum™ – The Ideal Switch for Edge Computing

INTRODUCTION

The volume and variety of internet-connected devices and services is exploding. Security cameras, phones, smart machine sensors, virtual reality headsets and televisions are just a few examples of daily use connected devices. These devices have the potential to generate vast amounts of data that needs to be processed.

Traditional datacenters are centralized. Processing all the data from connected devices centrally is not only prohibitively expensive but also degrades performance. Customers are looking at edge computing as a solution. With edge computing, data is processed closer to the connected device endpoints.

THE CHALLENGE WITH EDGE NETWORKS

Unlike centralized cloud data centers, the edge infrastructure is geographically dispersed to bring low latency and high-performance processing power closer to the endpoints. This makes the provisioning and monitoring of the edge infrastructure a challenge. In many cases, the edge infrastructure hosts a few servers in a rented space in colocation facilities, with limited space, power and cooling capacity.

Traditional datacenter switches contain too many ports and are too large for use in small edge installations. Additionally, traditional switches consume a lot of power and create traffic-latency and jitter issues.

THE SOLUTION

The Mellanox edge solution consists of 1/2 width SN2010 and SN2100 Spectrum Ethernet switches running Mellanox Onyx or Cumulus Linux network operating system. The SN2010 supports 18x25GbE and 4x100GbE while the SN2100 switches are 100GbE-optimized with support for 16x100GbE ports. The 100GbE ports can be independently split into 4x25/10GbE ports. Mellanox Spectrum Ethernet switches are ONIE-bootable and support multiple operating systems including Mellanox Onyx and Cumulus Linux.

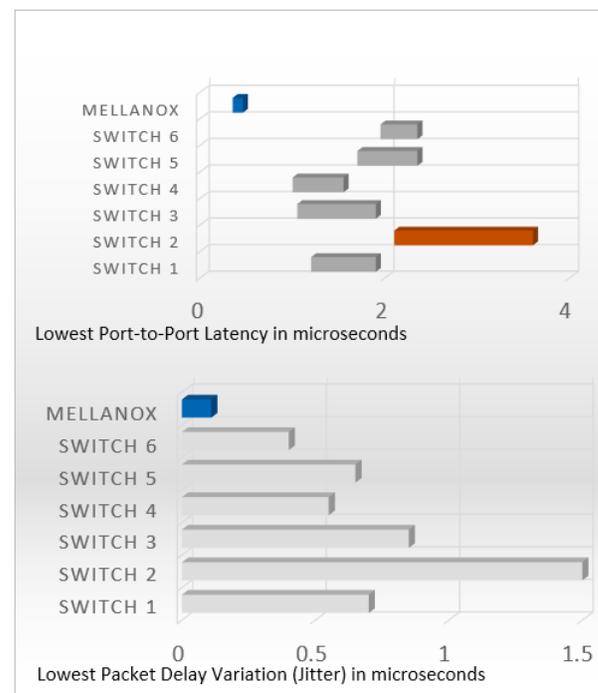


Figure 1: Spectrum for Edge: Lowest port-to-port latency and jitter in microseconds

Key Benefits

Compact Form Factor

With its compact 1/2 rack width form-factor and sub-100W power consumption, the SN2010 and SN2100 switches are ideal for edge networks with space and power constraints. SN2010 and SN2100 can also be used to provide physical 1+1 redundant network connectivity in a single 1U space.

Containerized Applications

Mellanox Onyx allows containerized applications to be run on the switch system itself. With this infrastructure in place, lightweight applications such as remote discovery or element provisioning and configuration can be hosted in the fabric without having to add additional external server infrastructure. This provides the added benefit of eliminating additional servers, power and complexity.

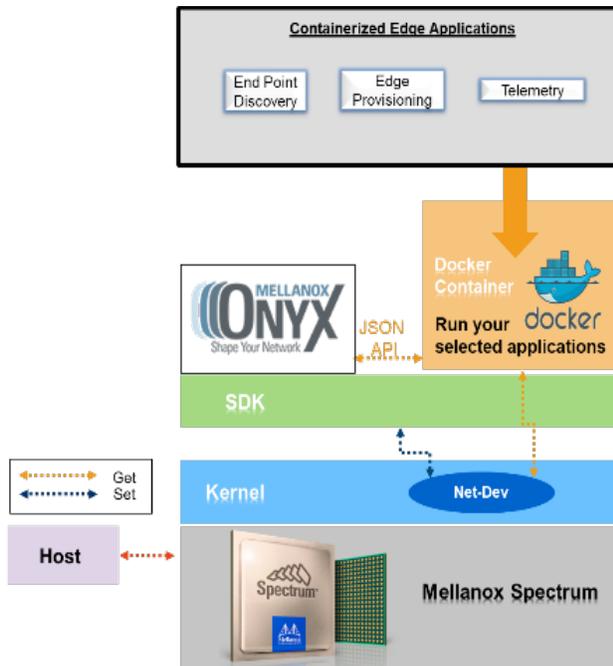


Figure 2: Mellanox Spectrum switch for Edge can host containerized applications

Automation

Edge infrastructures should support remote management, smart orchestration and automation frameworks. Both Cumulus Linux and Mellanox Onyx are modern network operating systems with full support for automation hooks like ZTP as well as tools such as Ansible and Puppet.

Datacenter Interconnection

Edge infrastructures frequently need connectivity back to private and public cloud resources. Cumulus Linux supports controllerless network virtualization and datacenter interconnect solutions based on BGP EVPN VXLAN. With support for over a 100K VXLAN tunnels, Mellanox Spectrum switches boast the best VXLAN scale in the market.

Telemetry

Spectrum Ethernet switches have visibility and telemetry features that can be used to identify and troubleshoot network performance issues. The underlying Spectrum silicon provides rich telemetry information which can be harvested using a containerized streaming telemetry application and dashboarded using open sources tools such as Kibana.

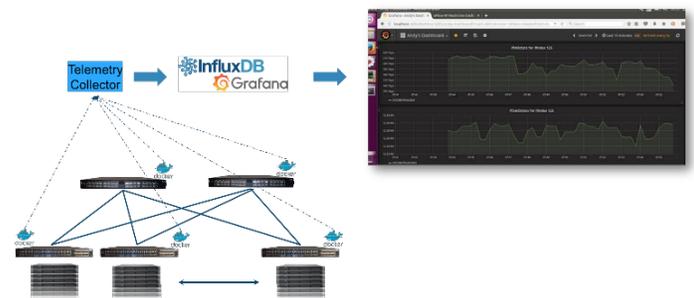


Figure 3: Harvesting & dashboarding rich telemetry information

CONCLUSION

Traditional cloud datacenters are centralized by nature. Edge computing departs from the traditional cloud paradigm by moving compute to the edge of the data center physically closest to the end-points. Edge data centers have stringent space, power and cooling requirements. Additionally, the edge datacenter racks have fewer servers but demand high performance and low latency. Mellanox SN2010 and SN2100 Spectrum Open Ethernet switches running Mellanox Onyx or Cumulus Linux are best suited for edge datacenters.