



Mellanox SN2010 – Ideal Switch for Media & Entertainment (M&E) Networks

INTRODUCTION

Media production companies are addressing the explosive demand for bandwidth and performance with affordable Ethernet and IP interconnect technologies. Due to the rapid adoption of 4K and 8K Ultra-High-Definition (UHD) media streams, today’s M&E applications require higher performance and lower latency interconnects. Importantly, due to the time-sensitive nature of video, media endpoints are particularly sensitive to network jitter.

Outdoor broadcast units (OBUs) and mobile video flight cases typically have stringent space and power constraints that are increasingly difficult for legacy data-center switching products to accommodate.

Production and broadcasting facilities are undergoing a transition from using Serial Digital Interface (SDI) to IP as the video transport mechanism. This opens up a whole new set of operating requirements for Ethernet switches – power, cooling, space and physical robustness, etc.

CHALLENGES TO THE STATUS QUO

Traditional vendors tend to simply re-position their vertically integrated and black-box data center Ethernet switches to the M&E market. Since these switches are purpose-built specifically for the data center racks, they are unable to meet the physical and digital constraints imposed by other media use cases. Legacy data center Ethernet switches introduce jitter, drop packets during bursty traffic conditions and are not a good fit for broadcast traffic. Additionally, it is difficult for legacy closed systems to support third-party applications or interfaces such as SDI for media applications.

THE SOLUTION

Mellanox Spectrum™ half-width SN2010 Ethernet switches running Mellanox Onyx™ Network Operating System (Onyx) is the ideal interconnect solution for M&E applications. While 10GbE is no longer sufficient to support 4K and 8K UHD media streams, the SN2010 supports 18x25GbE and 4x100GbE at line rate with consistent low latency.

Onyx delivers an integrated switch software solution, which is optimized for M&E. Onyx supports L2 and L3 multicast protocols, PTP, Open Flow, network automation, on-switch applications and improved traffic telemetry infrastructure.

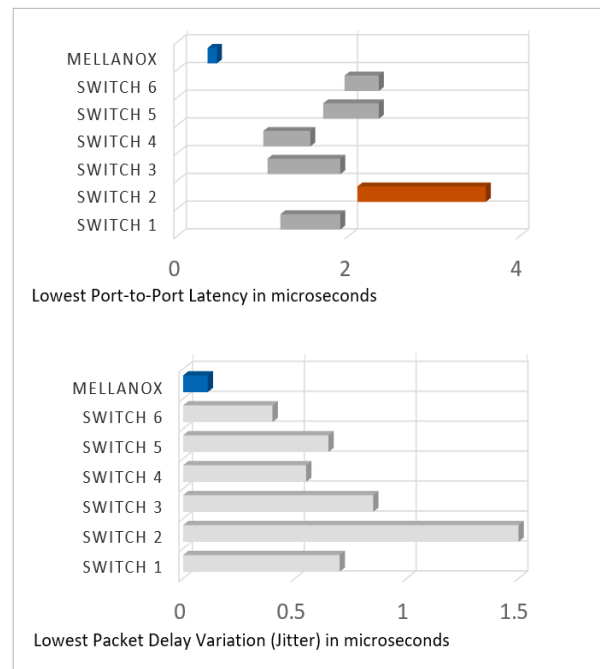


Figure 1: Mellanox switches deliver consistent low latency

Key Benefits

Power, Space and Cooling

With its compact ½ rack width form-factor and sub-60W in power, SN2010 is ideal for flight case and mobile video broadcasting applications. SN2010 can also be used to provide physical 1+1 redundant network connectivity in a single 1U space.

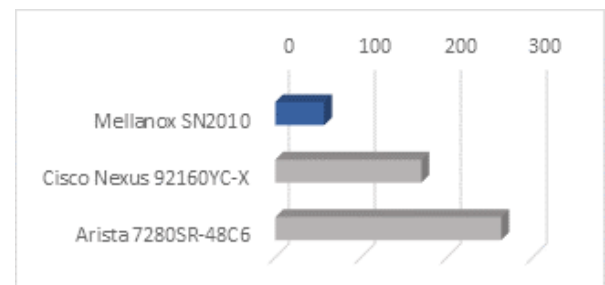


Figure 2: Mellanox SN2010 has the lowest power footprint

Containerized Applications

Mellanox Onyx allows containerized applications with full access to an SDK to run on the switch system itself. With this infrastructure in place, lightweight applications such as media endpoint registration and discovery or element control and configuration can be hosted directly in the fabric without requiring an additional external server infrastructure.

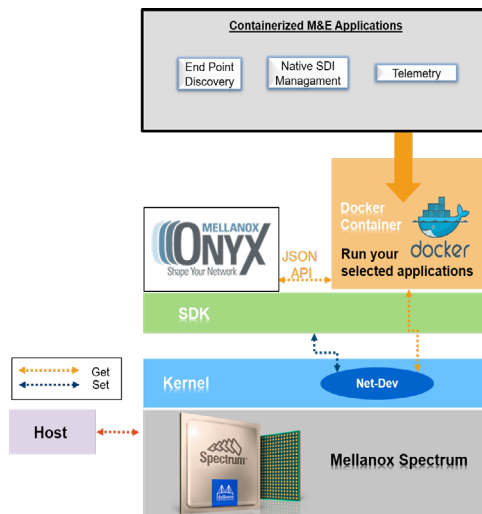


Figure 3: Mellanox switches can host containerized applications

Scalable PTP Support

M&E applications are increasingly relying on SMPTE 2059 PTP profile to accurately timestamp packets and synchronize media endpoints. The SN2010 platform running Mellanox Onyx supports scalable PTP on both Layer-3 routed interfaces as well as on any number of routed and non-routed VLAN interfaces. The SN2010 can act as a PTP master for over a 1000 endpoints. This improved scale is especially useful for topologies with a large number of endpoints that need accurate timing synchronization.

SDI Support

Many media endpoints still use Serial Digital Interface (SDI). The SN2010 supports third-party transceivers and adaptation nodes that can bridge SDI to Ethernet. Additionally, a Mellanox Onyx container application infrastructure can be used to run appliance management applications.

Automation

Mellanox Onyx is a modern network operating system with full support for automation hooks like Zero Touch Provisioning (ZTP) as well as tools such as Ansible and Puppet. Mellanox NEO is a powerful platform that can be used in conjunction with Onyx to manage and orchestrate a scale-out M&E fabric.

SDN, OpenFlow 1.3 and Hybrid-mode

With support for the rich Software-Defined Networking (SDN) via OpenFlow 1.3, SN2010 can integrate with controllers such as Floodlight, ODL, ONOS or third-party controllers to provide a powerful and self-contained M&E infrastructure. Onyx also has the added benefit of being able to run both a traditional network stack and Open Flow on the same set of ports at the same time, providing true flexibility in terms of network control layers.

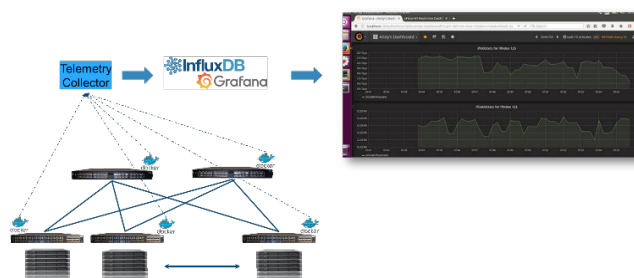


Figure 4: SDN Support via OpenFlow 1.3

The SN2010 platform's visibility and telemetry features are capable of identifying and troubleshooting 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 source tools such as Kibana.

Media traffic is bursty, yet transient microbursts are hard to detect, measure and quantify. Spectrum's hardware-based buffer monitoring feature samples the buffer occupancy levels at a rapid pace, while summarizing the measurements in a compact histogram format.

CONCLUSION

Major media companies are adopting Ethernet technologies to address the increasing need for high bandwidth, high performance and low latency, at an affordable price point. The SN2010 with its compact form factor, low power footprint, and robust datapath is ideal for M&E interconnect applications.

The Onyx operating system with its automation features, support for containers, PTP and Openflow1.3 is a great fit for M&E environments. SN2010 running Mellanox Onyx provides highly effective, high performance and agile interconnect solutions for M&E applications at affordable price points.