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Augtera

Bringing Fibre Channel Reliability to NVMe/TCP with AI

Augtera AI-based Network Operations and Dell Technologies NVMe IP SAN Solutions.

NVMe/TCP with Augtera Networks and Dell Technologies

A software-only AI solution that can be deployed on a collection of VMs in your premises network or using Augtera Software-as-a-Service (SaaS) offering

Real-time network observability and alerts enabling operators to quickly detect and isolate exactly where the issues are occurring and focus on a resolution

Optimum availability and performance of business-critical applications by identifying and acting on potential storage network failures before they happen

Automated correlation of network issues resulting in a near 60% reduction of time spent isolating root cause of the incident and implementing a resolution

More secure NVMe/TCP storage environment backed by an active monitoring and reporting security system across the infrastructure

Introduction

Today's enterprise and service provider organizations face a challenging environment as their IT infrastructures struggle to keep up with the exploding data and traffic demands being driven by the transformation occurring within the data center, at the edge, and across cloud configurations. Now more than ever, connectivity across an organization's infrastructure plays a mission critical role in delivering services when and where they are needed near real-time.

The introduction of flash storage media, specifically Non-Volatile Solid-State Devices (SSDs), and the adoption of the Non-Volatile Memory Express (NVMe) protocol is rapidly changing the landscape of modern storage platforms. These new technologies help to greatly improve the performance of storage arrays by incorporating a simplified, low-latency 1/0 stack and a higher performance multiqueue architecture.

In addition, the recent emergence of new open standards like NVMe/TCP are giving network operators viable choices for migrating from older fibre channel Storage Area Networks (SANs) to cost-effective and higher-performing Ethernetbased SANs running TCP/IP. These lower cost IP SAN-based solutions will enable enterprises and providers to build highly-scalable storage environments over wider distances.

However, as with any modern network infrastructure its imperative network operators manage these new SAN environments to make sure they are operating at their peak efficiency and that they have the proper tools and procedures in place to do so.

Challenges

During the migration to these new NVMe/TCP SAN environments, organizations must ensure the underlying IP-based SAN infrastructure is meeting the performance, reliability, stability and security requirements of these new storage configurations in both separate or converged Local Area Network/SAN deployments. In particular these deployments should not be experiencing any traffic congestion or dropped packets that impacts storage traffic.
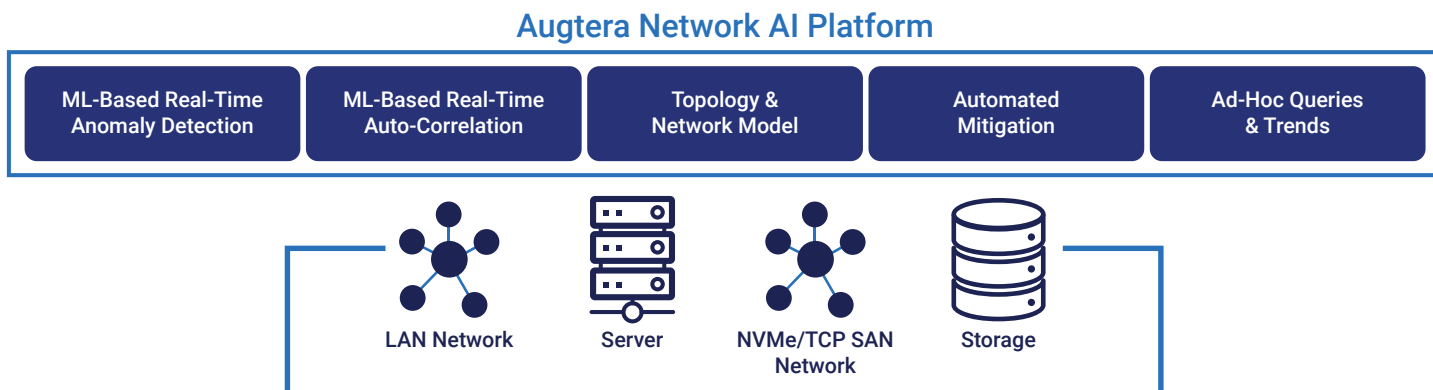
Network operations teams across multiple organizations are finding that legacy, siloed, and device-centric network monitoring tools and strategies are not capable of meeting the demands of this network infrastructure modernization. These piece meal management solutions are very difficult to use, manually intensive, and reactive in nature. In addition, network operators are required to dig through a large amount of noisy network alerts and tickets that could take hours or days to investigate and then mitigate.

AI-Based Network Monitoring and Automated Operations for NVMe/TCP from Augtera Networks

Using the Dell Technologies NVMe IP SAN solution, Augtera Networks has engineered a complete end-to-end NVMe/TCP network monitoring solution to help provide enterprise organizations with the agility to stay ahead of growing workload demands with modern, automated, and secure storage connectivity both today and as they migrate to the cloud.

Dell Technologies is leading the industry by providing a comprehensive NVMe/TCP validated ecosystem and pursuing a standards-based approach to NVMe-based discovery automation with their Centralized Discovery Controller solution. At the heart of the solution is Dell's SmartFabric Storage Software, a centralized discovery controller that helps to automate NVMe/TCP end-to-end configuration, connectivity, and management of a server host and storage subsystem.

IMAGE 1: Augtera AI solution with NVMe/TCP

Augtera Network AI Platform

ML-Based Real-Time Anomaly Detection	ML-Based Real-Time Auto-Correlation	Topology & Network Model	Automated Mitigation	Ad-Hoc Queries & Trends

LAN Network   Server   NVMe/TCP SAN Network   Storage

Augtera provides a purpose-built AI platform, designed to enable proactive network operations. This solution collects network telemetry from all data sources including networking devices, message buses, APIs, and other collection solutions and applies Machine Learning (ML) algorithms to this data to identify actional anomalies or "AI Insights" that are critical for ensuring NVMe/TCP SANs are congestion free. Network operators are able to run a NVMe/TCP SAN network that meets high availability levels while simplifying ongoing maintenance and troubleshooting of these networks.

Key features of the platform include:

- **Consolidated dashboard views and topology—** end-to-end view of all events, anomalies, traffic utilization, metrics across servers, the NVMe/TCP SAN fabric, and fabric or server ports connected to storage. This includes a real-time topology view of events, anomalies and metrics across the network fabric and servers as well as in and out traffic utilization heatmaps for the switch fabric and host interfaces.

- **Proactive issue detection and notification—** automatically learning normal traffic patterns and identifying misbehaviors with very high accuracy through advanced ML based anomaly detection of TCP traffic flows. Detection of any degradation or congestion, identifying impacted TCP flows, and automatically notifying operators using collaborative tools like Slack or enterprise ticketing tools such as ServiceNow.

- **Automated correlation of network events and ticketing—**automatic topology-based correlation of control plane, data plane and system events and ML anomalies and creating contextual and relevant alerts/tickets.
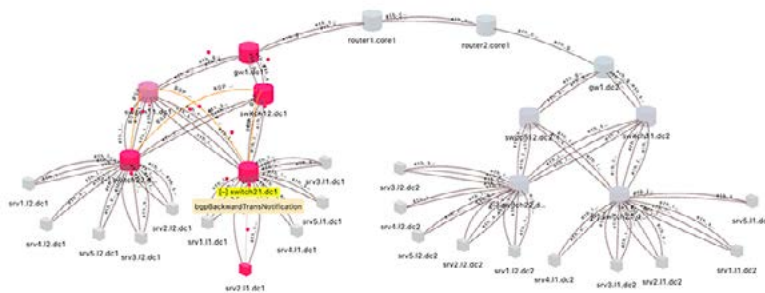
- **Automated mitigation**—optional feature for operators to have the AI platform automatically make changes on network switches to help mitigate application performance impacts caused by link flaps, errors or optical degradation.
- **Preventing outages due to optical failures**—ML-based anomaly detection, without using thresholds, on optical metrics ingested from networking devices resulting in the detection of optical degradation well in advance of any critical outages.
- **Stronger security posture**—by proactive ML-based monitoring for and detection of anomalies in traffic and flow patterns such as a burst of packets from a new host to a storage port.

Key Benefits

When deploying the Dell Technologies NVMe IP SAN solution along with Augtera's Network AI platform, organizations will be able to ensure an optimum network environment for their critical applications and workloads. In addition, they will be able to increase network operations productivity while dramatically reducing operations expenses.

The key benefits of this combined solution include:

- **A software-only AI solution** that can be deployed on a collection of VMs in your premises network or using Augtera Software-as-a-Service (SaaS) offering
- **Real-time network observability and alerts** enabling operators to quickly detect and isolate exactly where the issues are occurring and focus on a resolution
- **Optimum availability and performance of business critical applications** by identifying and acting on potential storage network failures before they happen
- **Automated correlation of network issues** resulting in a near 60% reduction of time spent isolating root cause of the incident and implementing a resolution
- **More secure NVMe/TCP storage environment** backed by an active monitoring and reporting security system across the infrastructure

Summary

Whatever the size of your organization, Augtera Networks and Dell Technologies can help you derive the full value out of your storage and networking investments. We offer proven end-to-end NVMe/TCP solutions, an innovative AI/ML-powered network operations platform, comprehensive global services, and a shared vision that sets the pace in a rapidly changing industry. To find out how we can help you and your network, contact your Augtera Networks representative today.

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