Solution Brief

virtana

Virtana and Dell Technologies — Better Together

As Dell customers seek cutting-edge technology to power their mission-critical applications, they also need an intelligent way to contextualize, monitor, and manage those workloads. Virtana's high-fidelity and application-centric monitoring, cross domain-visibility, and workload intelligence observability platform complements the entire portfolio of industry-leading Dell solutions.

The Virtana Difference

Cross-domain visibility: Virtana's network, compute, hypervisor, and container integrations expand insight beyond the storage layer to provide a unified view of performance across tooling that's traditionally siloed. This enables alignment of cross-functional teams through a common set of data points and capabilities. It provides a topology view that contextualizes the complete data path from application to storage volume.

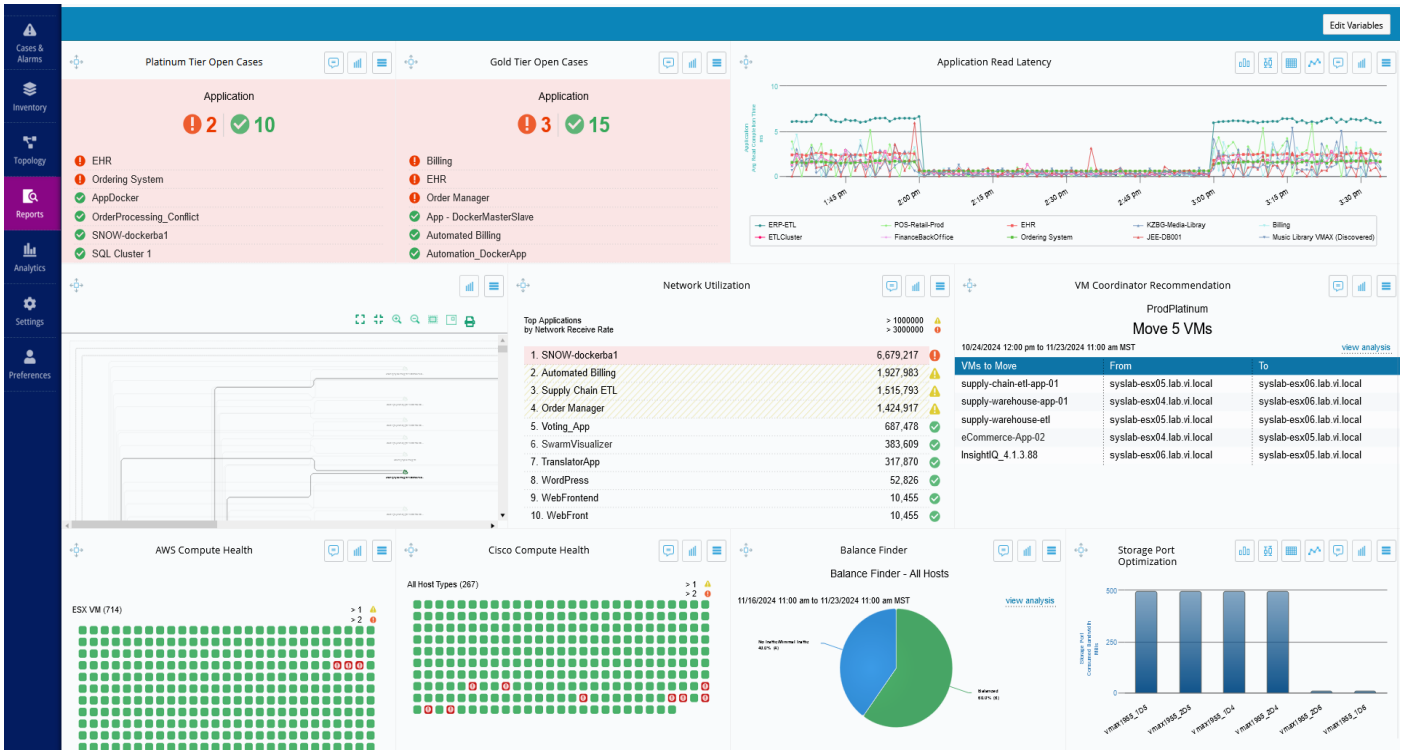
Application-centric monitoring: With Virtana, you can guarantee continuous availability and performance against SLO/SLA for mission-critical applications. Virtana automatically maps infrastructure components to the applications that are consuming its resources, adding business-level context to high-fidelity data. This enables you to understand application and infrastructure interdependencies as the foundation for digital transformation initiatives.

Advanced analytics: High-fidelity data collection and persistence facilitate highly accurate results and recommendations from our AI/ML-based analytics engine. With Virtana's advanced analytics you can be alerted to observed deviations in workload behavior and leverage runbook-style investigations with remediation steps that can trigger autonomous action through bi- directional integration with Service Now.

You can constantly ensure that your workloads are balanced and optimized, and consistently predict infrastructure bottlenecks and time to compute, network or storage resource exhaustion.

Workload intelligence: Virtana delivers granular performance metrics for intelligent workload placement. Workload profiling enables data-driven digital transformation decisions, enabling you to "know before you go" for successful technology refresh in the private cloud and to determine which workloads are best fit for hybrid cloud solutions like APEX. You can see how applications will perform in their destination state, and what will they cost compared to on-premises deployment. And you can improve capacity forecasting with highly accurate predictions of future resource consumption across compute, network, and storage.

Rich dashboards: Virtana's comprehensive understanding of the data supply chain provides the basis for rich dashboards that deliver service assurance, visibility, and control to administrators, architects, and executives.



Ease of deployment: It's never been easier to deploy Virtana and Dell technologies together. The Virtana Platform has evolved into a modern, distributed microservices- based architecture that can be deployed on VMware. You can now leverage our flagship performance probes for up to 32G FC traffic, we now have agentless, software- based integration with coverage across:

- **All major Dell storage offerings:** PowerMax, PowerStore, PowerScale, PowerFlex, VxRail, XtremIO, Unity, and VPLEX (coming soon)

- **Connectrix switching:** Brocade (Including SANnav) and Cisco (including Nexus and telemetry streaming from MDS),

- **Compute:** operating system (Linux, Windows, Solaris), hypervisor (ESX, Hyper-V, KVM), Kubernetes, Cisco UCS

Virtana delivers unprecedented visibility and actionable insights into the performance, health, and utilization of hybrid IT infrastructure, while Dell/EMC's storage solutions deliver enterprise-class performance and scale.

Together, Virtana and Dell empower you to:

1. Cost-effectively ensure the performance and availability of mission-critical applications

2. Proactively prevent infrastructure-related slowdowns and outages

3. Enable business agility and digital transformation across private, public, and hybrid clouds

The Virtana Difference

Block and File Storage Solutions

PowerMax

PowerMax is a fitting solution to power the most mission-critical workloads that can't afford any downtime or compliance issues. Paired with our software-based integration for PowerMax (formerly VMAX), Virtana IM can ensure continuous availability and performance at any scale. You can:

- Guarantee end-to-end performance and avoid upstream infrastructure bottlenecks while leveraging the fastest storage media and protocols (NVMe, flash, or storage class memory)
- Add business-level context by automatically grouping related infrastructure components and high-fidelity metrics into applications
- Ensure business continuity by monitoring replication functions like SRDF and SnapVX

Use predictive capacity forecasting to track your infrastructure's efficiency, and alert you to potential future resource exhaustion and bottlenecks

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- Pair with industry-leading wire data collection and switch telemetry for deep protocol analysis of every transaction at massive scale

PowerStore

According to Dell.com, "the groundbreaking PowerStore family of all-flash data storage appliances transforms traditional and modern workloads with a data-centric, intelligent, and adaptable infrastructure that delivers revolutionary new capabilities." With the Virtana IM integrations for PowerStore, you can fully realize the value of these industry-leading innovations. You can provide business-level context to applications that are hosted on external compute. Paired with our Kubernetes integration, Virtana helps guarantee performance of PowerStore's container storage module (CSM) for file- and container-based workloads at block storage speeds.

Combined with our hypervisor integration for vCenter, Virtana provides unified observability for storage provisioned as vVols and other VMware functions like VAAI and VASA. You can leverage Virtana's workload intelligence and analytics engine to validate and augment PowerStore autonomous operations, including automated data placement, resource balancing, dynamic node affinity, and assisted migration. And, you can pair with Virtana's legacy Dell/EMC storage integrations, like Unity and XtremIO, to effectively plan, monitor, and benchmark application performance before, during, and after migration to PowerStore.

PowerScale: Any Data, Anywhere

PowerScale supports a wide range of data types and diverse workloads. Combined with our software-based integration for PowerScale (formerly Isilon), Virtana IM provides full-stack end-to-end visibility of PowerScale clusters, protocol flows, and the applications and servers consuming those resources. This enables you to

- Assure the performance, availability, and efficiency of workloads on PowerScale clusters regardless of protocol (NAS [NFS, SMB], big data [HDFS], S3, HTTP, or FTP)
- Gain comprehensive visibility and unparalleled correlation for easy identification and root cause analysis, even for the most challenging issues
- Validate policy-based workload placement and resource tiering
- Ensure the storage efficiency of OneFS, and proactively identify upcoming resource constraints

Unity / Unity XT

Unity XT storage arrays are designed for performance, optimized for efficiency, and built to handle multi- protocol and hybrid-cloud workloads. These hallmarks all align directly with Virtana's key competencies:

- Provide application context for workloads running on Unity infrastructure
- Combine with OS, vCenter, and Kubernetes integrations for full compute to back-end storage visibility regardless of storage pool resource type (block LUNs, file systems, or vVols)
- Enable predictive capacity forecasting to project time to required expansion or refresh
- Enable data-driven decisions on best technology refresh and workload placement options based on granular insights from Virtana IM
- Guarantee seamless technology refresh before, during, and after migration, combined with our PowerStore or other storage integrations for the destination array

XtremIO

Enterprise customers have historically deployed some of their most resource-intensive applications on XtremIO storage. Combining XMS-level data from Gen1 and Gen2 XtremIO systems with the cross-domain visibility of the Virtana Platform helps ensure availability and performance of these applications in their current state, and also helps plan for their future. You can combine real-time and historical capacity usage, performance, and health information from the physical and logical components of the X-brick architecture with additional metrics from related interconnected infrastructure. You can gain visibility into which XtremIO resources an application is consuming, as well as gather latency metrics at the host, volume, and application levels, and understand how these relate to tracking against application SLO/SLAs.

And you can enable seamless technology refresh by providing unique insights into the workloads that currently reside on XtremIO:

- Before: Data-driven decisions on workload placement pre-technology refresh
- During: Combine with PowerStore, PowerMax, or other storage integration to monitor during migration
- After: Benchmark performance vs. legacy systems

VPLEX

VPLEX creates a flexible storage architecture that enables data portability and helps maximize asset utilization across active-active data centers. VPLEX customers can choose a hardware monitoring device, a software-based integration, or both to monitor their environments. The hardware option collects data that will definitively pinpoint error conditions and latency within a VPLEX environment. The software-integration option includes visibility through the abstraction layer of storage virtualization and automatically maps application workloads to infrastructure, from compute through network to back-end storage. This integration provides visibility beyond the storage virtualization layer offered by VPLEX, providing IT teams with a more complete picture of how their applications are performing.

Software-Defined Storage Solutions

PowerFlex

PowerFlex delivers extreme flexibility, massive performance, and linear scalability as the foundation for organizations to modernize their data center and workload infrastructure. Virtana IM provides full-stack visibility across the applications and servers consuming and mounting PowerFlex resources, clusters, and storage pools, and the network flows between clients and resources. It enables you to:

- Gain real-time and historical performance visibility from the PowerFlex system, client (SDC), storage (SDS), volumes, storage pools, and protection domains
- Dynamically map and create logical equivalency between resources discovered by our vCenter integration (like ESX datastores) and PowerFlex entities (like volumes)
- Auto-detect excessive evictions and identify resource hogs and noisy neighbor problems
- Know when a rebuilding/rebalancing process impacts performance

VxRail

VxRail delivers converged infrastructure, founded on VMware vSAN. You can combine the flexibility of this HCI solution with the performance assurance provided by Virtana IM's vSAN and Kubernetes integrations to create an ideal platform for innovation across core, edge, and cloud:

- Understand how applications stress converged and hyperconverged infrastructure
- Visualize converged infrastructure topologies from client to storage to device
- Get real-time and historical performance visibility from application to storage
- Continuously monitor CI and HCI environments for capacity issues across compute, network, and storage
- Identify and resolve high write cache evictions, rebuild/rebalance activities, noisy neighbors, and more
- Combine with Virtana IM integration or Kubernetes for enhanced visibility into container workloads running on HCI

VxBlock

VxBlock integrates powerful Dell storage and data protection into a turnkey converged system supporting all your high-value, mission-critical workloads— from the core data center to the cloud. Virtana IM is certified to deploy directly within VxBlock, and Virtana has software-based integrations for every layer of the VxBlock architecture to completely unite performance monitoring for this converged solution, regardless of the storage, networking or compute configuration options chosen:

- Storage integrations: PowerStore, Unity, PowerMax, XtremIO, and PowerScale
- Networking integrations: Cisco Nexus and Cisco MDS, including telemetry streaming
- Compute integrations: Cisco UCS, vCenter, OS, and Kubernetes layers

Switching Infrastructure (Connectrix)

The Dell Connectrix family of directors and switches moves your organization's vital business information to where it's needed quickly and securely, with the highest performance, the highest availability, and unsurpassed reliability. Combine it with Virtana's software-based switch integrations, which gather data via SNMP/SMI-S or OS-API based sources, to:

- Dynamically map applications to storage resources such as fabrics, switches, vLANs, ISLs, switch ports, and storage array ports
- Gain context into application dependencies and behavior via NetFlow, sFlow, and JFlow data ingestion from PowerSwitch devices
- Automatically identify and resolve slow drain conditions and application workload changes using analytics-driven runbooks
- Trend, forecast, predict, and alert on capacity usage across network resources (ports, switches)
- Create topology-based views in application context with health and utilization metrics from Cisco MDS, Cisco Nexus, and Brocade
- Stream high-fidelity telemetry performance metrics from the Cisco MDS line of switches (Cisco Nexus and Brocade via Apache Kafka Stream from SANnav coming in 2H 2022)

PowerEdge and Host Monitoring

Combine the reliability and performance of the Dell PowerEdge line of servers with Virtana's OS, hypervisor and container-level integrations for true visibility into the compute layer that powers mission-critical applications.

You can:

- Automatically map applications and service tiers to hybrid compute infrastructure
- Trend, forecast, predict, and alert on capacity usage across all compute resources (CPU, memory, network, disk)
- Optimize placement of compute workloads across your virtualization estate to improve performance and eliminate migration churn
- Rightsize application components based on usage and business value, and apply changes within your change governance policies
- Leverage Virtana IM integration with UCS Manager to eliminate the challenges associated with