



Turning Data Into Answers

PLATFORM OVERVIEW



Overview

VirtualWisdom is the industry's leading monitoring platform for Infrastructure Performance Monitoring (IPM). It empowers customers to deliver on the complex requirements of their storage to application infrastructure. The platform provides insights into the performance and availability of the end-to-end system—across physical, virtual and cloud environments. It intelligently correlates and analyzes an unmatched breadth and depth of data, transforming data into answers and actionable insights. This enables IT teams to promote and guarantee performance-based service level agreements (SLAs), enhancing the value of the infrastructure. With new insights, IT teams are taking control of their environment, working collaboratively to drive positive business outcomes.

Business Drivers and Business Value for VirtualWisdom IPM

Infrastructure is expensive, costly to maintain, and often difficult to scale. While transitioning to virtualized and cloud environments helps reduce capital expenditures (CAPEX) on physical hardware, IT has replaced this outlay with increased expenditures for management software and additional staff. Further complicating things, the resource-intensive applications available today have spurred the introduction of DevOps teams to manage the deployment of the virtual environments that the applications live in. Meanwhile, Enterprise IT doesn't have a uniform basis for understanding how the underlying infrastructure is performing. They are challenged to correlate disparate metrics across a heterogeneous environment that constantly changes. What is needed is a purpose-built solution that adapts and scales to this constant state of change and complexity—one that provides definitive answers to the most complex questions.

VirtualWisdom seamlessly brings all of this disparate data together—correlating and analyzing it in real-time—providing an authoritative understanding of performance, health and utilization. The insight that VirtualWisdom provides to every level of IT and application teams—from executive to specialist—enables them to assign performance-based guarantees to their mission-critical applications, regardless of whether they are operating in physical, virtual, or cloud computing environments. These answers and insights help them manage and optimize their infrastructures no matter the complexity—increasing efficiencies, mitigating risk of unplanned downtime—and delivering true ROI.



COST

RISK

CYCLE TIME



PERFORMANCE

AVAILABILITY

UTILIZATION

The Industry's Only Analytics Platform for IPM

Our award-winning platform is built from the ground up with a focus on performance management and helping your applications and infrastructure perform better together. The powerful analytics database and intuitive user interface (UI) deliver entity-centric, real-time visualizations of thousands of metrics across physical, virtual, and cloud environments. And our revolutionary performance management and troubleshooting analytics turn real-time data into answers quickly. VirtualWisdom 5 introduces our new NAS Performance Probe for NFSv3 environments.

Why Entity-Centric Performance Management is Critical

Entities are logical and intuitive groupings of systemwide devices and workloads that provide a highly accurate understanding of health, utilization and performance—based on function, correlation and interdependency. Entity-centric performance management enables you to manage in the way that makes the most sense based on role, responsibility or concern. Whether the focus is storage, switches, servers, or applications, VirtualWisdom provides the insights and answers that you need in the context of your environment. The entity-centric approach provides complete understanding of how the end-to-end system supports any and all mission-critical applications and workloads.

Death of the Device—Rise of the Entity

Companies have been forced into the role of system integrator as a direct result of perpetually increasing complexity and abstraction. Newly introduced converged solutions attempt to solve this challenge, but fall short. Now, virtualization, cloud-computing and software-defined are driving the death of devicebased tools and management tools in enterprise IT. Going forward, the only credible solution for managing availability, performance, cost-optimization and complexity is to leverage an entity-centric approach.

VirtualWisdom Applied Analytics

With Applied Analytics, we took the expertise gained from working with hundreds of enterprise clients and built it right into the platform. The analyses that used to take experts hours or days to execute is now executed in seconds – turning data into answers.

Balance Finder ensures that the hosts in the environment have functioning path failover to ensure availability in the event of a failure. To do this, it compares traffic patterns of all the ports associated with a single host to determine whether the multi-pathing software is functioning as intended.

Event Advisor enables you to specify an entity and a timeframe, and provides a prioritized list of potentially interesting events (spikes, relevant performance issues, anomalous behavior, etc.) and time periods requiring attention, ranked by magnitude and duration.

Queue Solver recommends the resetting of an execution (or queue depth) throttle on the HBA card(s) of specified host(s), which enables you to optimize the read or write response time of those hosts.

VM Coordinator Recommends optimal placement for VMs across an ESX, Hyper-V, or PowerVM clusters, and recommends reconfigurations to reduce contention for CPU or memory resources.

VM Deployment Advisor identifies how many virtual machines can be added to each ESX, Hyper-V or PowerVM cluster in a given environment, and where best to place them

Trend Matcher enables you to identify the sources of recognized and emergent issues. Leveraging baseline trends (specified by you or by Event Advisor), and target metrics, it compares against every device over specified timeframes and provides lists of correlated matching devices. For example, for the amount of time spent at zero buffer-to-buffer credits, Trend Matcher finds devices (such as HBAs) that are very busy only during buffer-credit issue periods. It also recognizes seasonal patterns to help reduce false alarms.

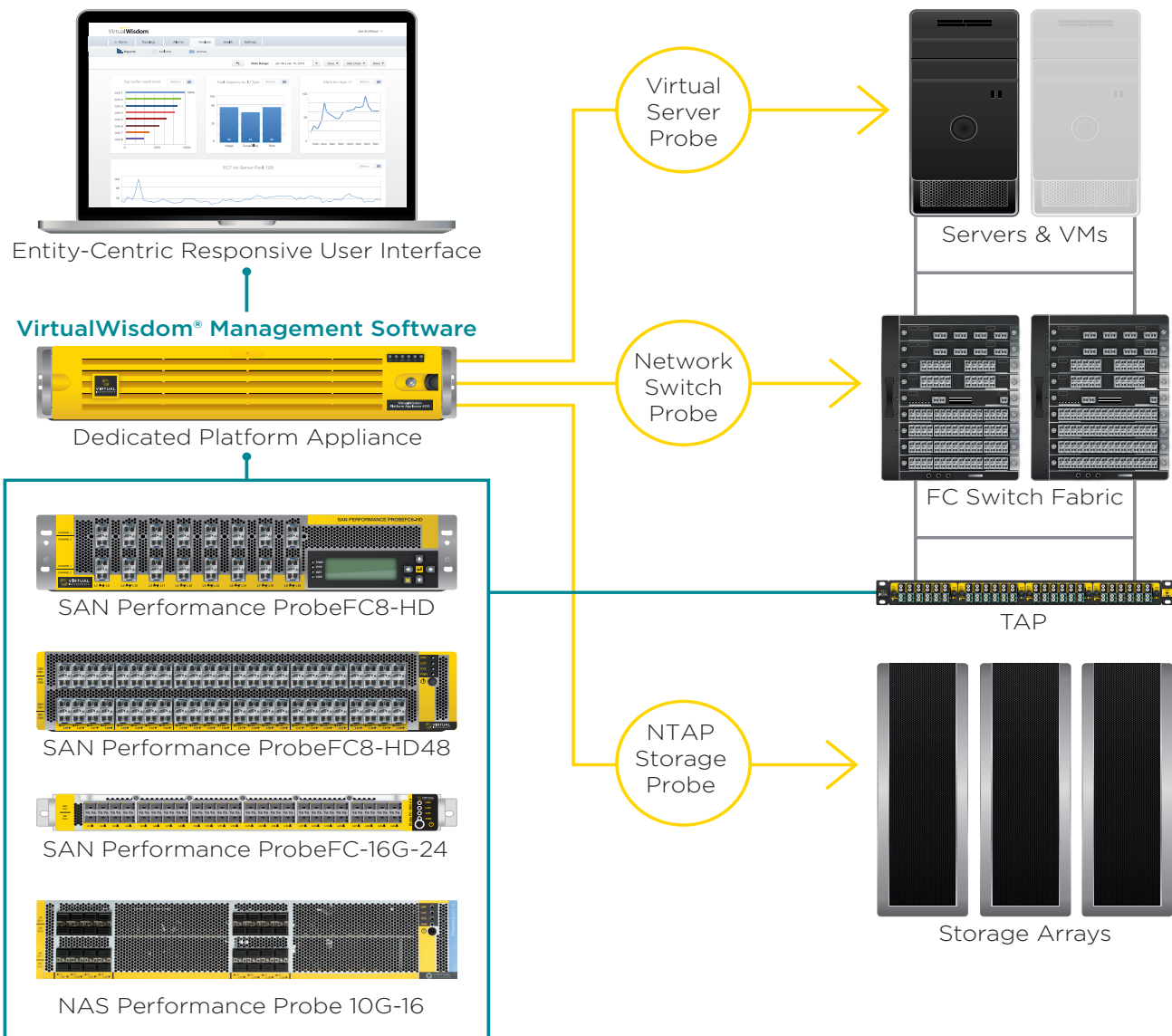


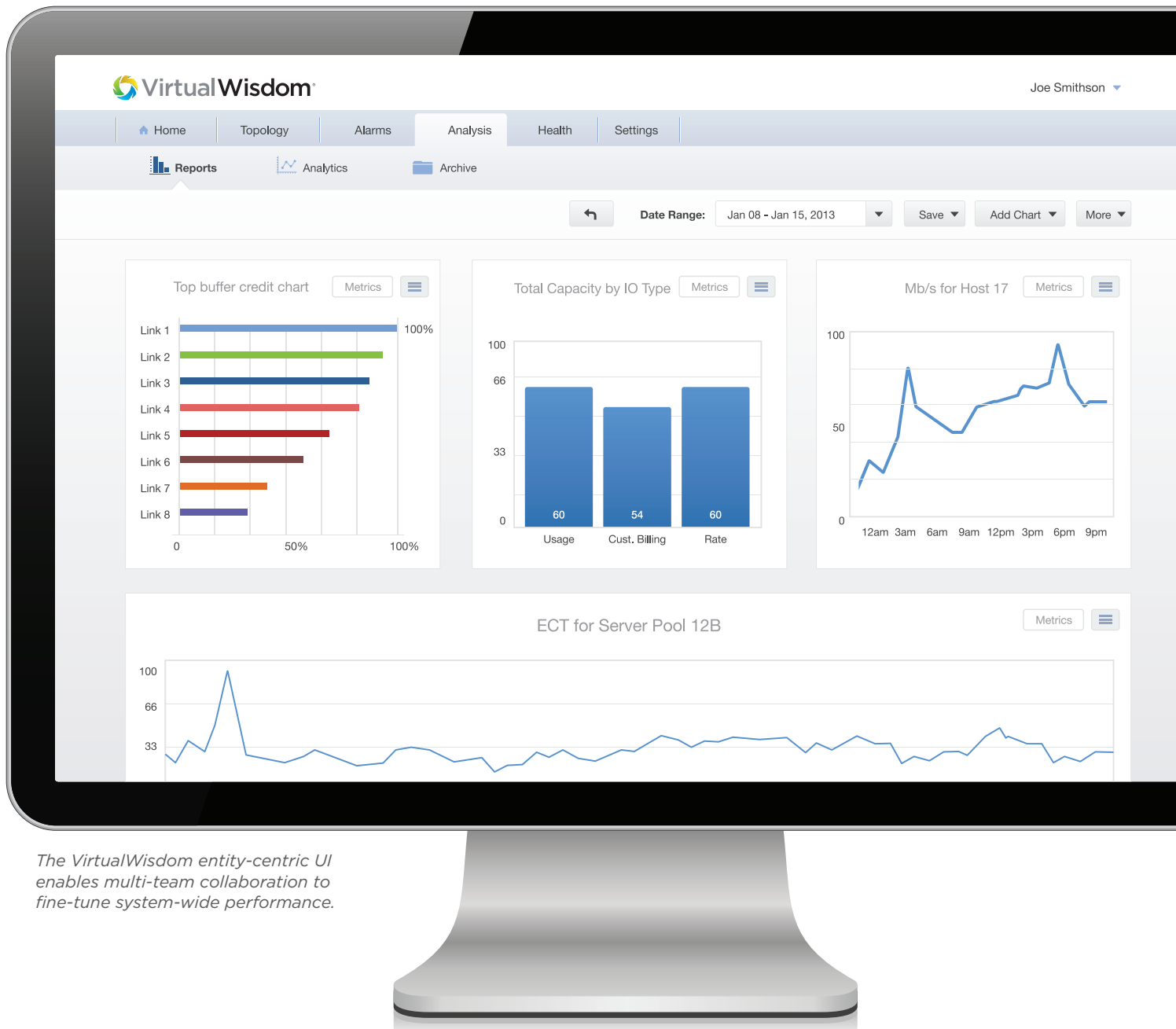
The Trend Matcher “heat map” is the first step in problem resolution drill-down. It identifies the entities with the highest correlation to spikes seen in Read Payload Rates, showing degrees of correlation on the Y axis and number of matches on the X axis.

VirtualWisdom Platform Architecture

The VirtualWisdom Platform is composed of a fully integrated combination of VirtualWisdom software and hardware probes and the purpose-built VirtualWisdom Platform Appliance. This powerful combination of hardware and software, all fully developed, integrated, and tested in-house at Virtual Instruments, ensures the highest levels of performance, scalability, and serviceability.

VirtualWisdom's unique combination of software and hardware probes persists, correlates and analyzes a breadth and depth of data never before possible—wire data collected from throughout the end-to-end infrastructure. This highly accurate and comprehensive solution enables customers to start managing performance, stop reactive troubleshooting, and achieve cost optimization across their infrastructure.





The VirtualWisdom entity-centric UI enables multi-team collaboration to fine-tune system-wide performance.

VirtualWisdom Responsive User Interface

The VirtualWisdom intuitive interface broadens the value of the VirtualWisdom solution to the entire organization, from IT operations to line of business leaders. With it, they can effectively perform comprehensive analysis, collaborate, and make informed decisions based on definitive insights about how applications and infrastructure are performing.

The dynamic, entity-centric UI enables multiple teams to quickly and confidently answer questions—and deliver the right information at the right time. This means regardless of function (application, server, storage, virtualization, etc.), you can collaboratively fine-tune infrastructure performance based on business, application, workload and SLA requirements.

Virtual Server ProbeVM Family

The ProbeVM Family of software-based probes collect and present hundreds of performance and utilization metrics from the associated physical server and hypervisor estate—including CPU utilization and status, memory utilization, disk I/O requests and capacity, as well as network requests and utilization.

The VirtualWisdom ProbeVM family supports VMware vSphere®, IBM PowerVM®, and Microsoft Hyper-V® environments, presenting hundreds of performance and utilization metrics from across the virtual estate.

The metrics are persisted and correlated with data from other VirtualWisdom probes and infrastructure data to build a complete picture of the end-to-end system for each virtual machine or physical server.

Storage Network ProbeSW

This standards-based software probe leverages SMI-S and SNMP to collect extensive metrics from the Fibre Channel Switching infrastructure (regardless of manufacturer or type of switch), from director class to top of rack FCoE, embedded gateway or other FC Standard switching devices.

SAN and NAS Performance Probes

Our family of hardware-based SAN and NAS Performance Probes are the most advanced, high capacity line-rate data inspection and analysis devices available. They inspect, process and analyze every frame and packet header in real-time. They capture the true, unaltered, I/O profile of the actual application traffic, detecting application performance slowdowns

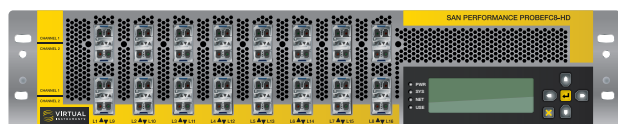
and transmission errors by measuring every I/O transaction from start to finish. The SAN Performance Probe family consists of an (8G) 16-port model, a high-density (8G) 48-port edition, and a (16G) 24-port model. The ProbeNAS is a (10G) 16-port device. This product family delivers the full range of cost and density options customers require.

Array ProbeNTAP

VirtualWisdom introduces NTAP Storage Probe as the first of many storage array software probes that help provided additional visibility into how the storage array impacts the end-to-end system performance. ProbeNTAP is an API-based NAS storage software probe that collects and correlates health and utilization data from the underlying NAS arrays (NetApp OnTAP8 Clustered Systems).

SANInsight® TAP Patch Panel System

Traffic Access Points (TAPs) provide a passive, failsafe access point to Fibre Channel network traffic on the TAPped link. This makes the light available for real-time performance monitoring, deep problem diagnosis and protocol layer analysis. TAPs are non-powered, non-mechanical devices that reflect a small portion of the signal through the TAP to another port, which provides a copy of the light to upstream, out of band probes. The passive TAP does not introduce any latency or overhead, has no impact on application or SAN/NAS performance, and is integrated with several industry leading Patch Panel Systems for simple deployment.



ProbeFC8-HD



ProbeFC8-HD48




ProbeFC-16G-24



ProbeNAS-10G-16



SANInsight TAP Patch Panel

A black and white photograph of a man in a white shirt and tie, standing in a server room. He is pointing his right index finger towards a server rack. The room is filled with rows of server racks, and the ceiling has a grid of fluorescent lights. A large, dark blue diagonal overlay covers the right side of the image, containing white text and the Microsoft logo.

“Virtual Instrument’s time to detection and resolution is incredibly valuable. I don’t want to understate that. The level of detail that we can get — there is just no other product out there that can give us that granularity.”

Engineering Lead



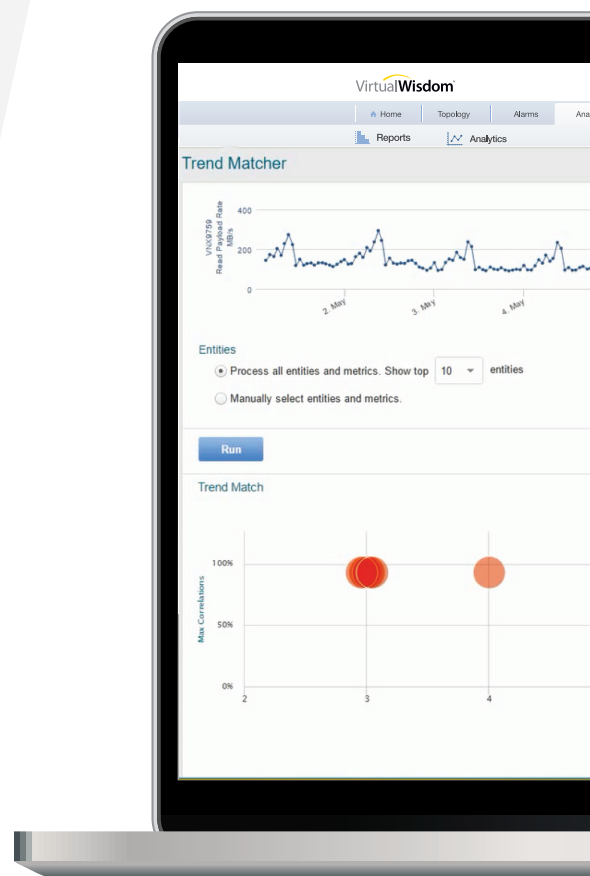
Solutions: Problems that Virtual Instruments Solves

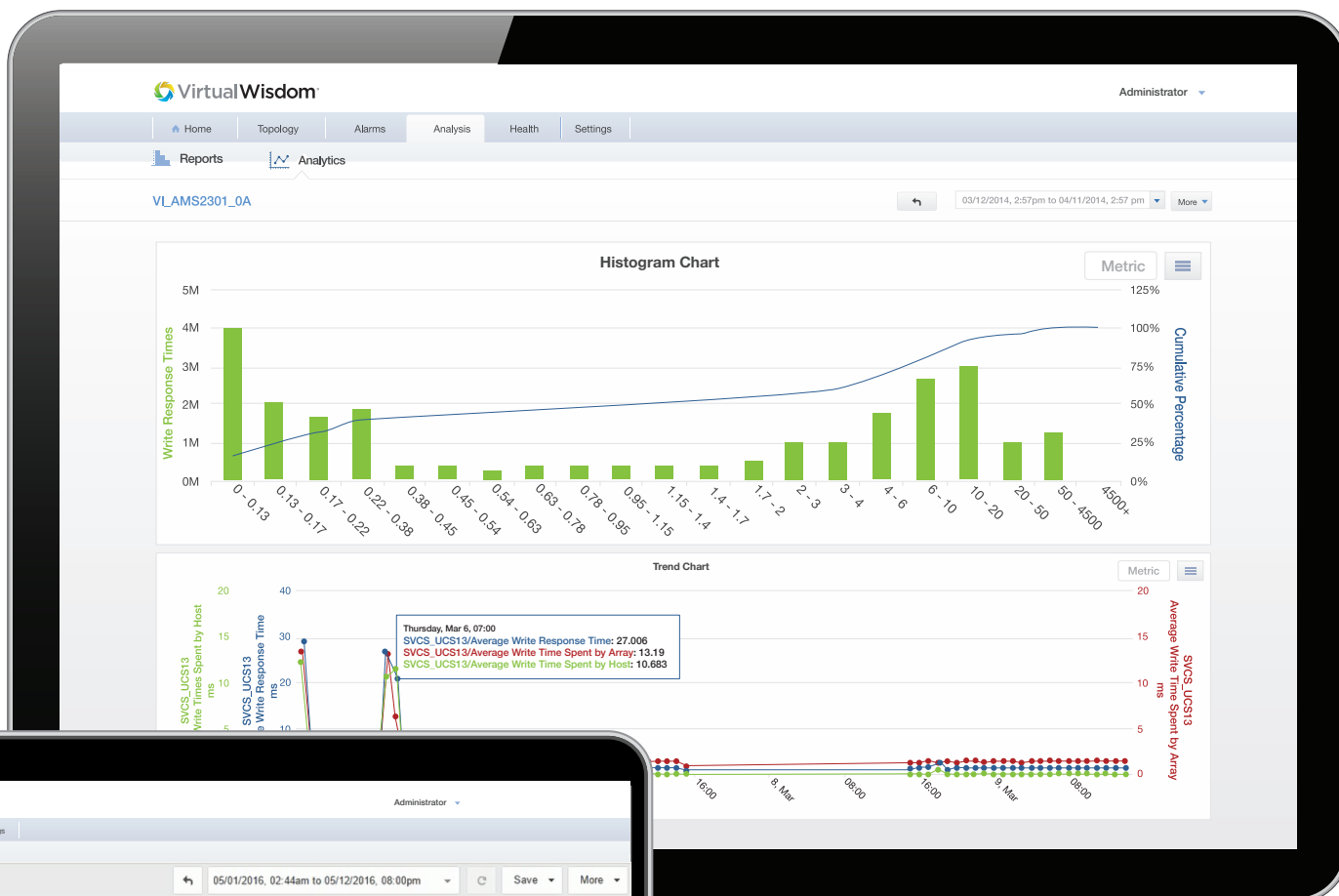
How to Implement, Measure, and Report on Performance Based SLAs

In today's highly virtualized and cloud-based environments, delivering highly responsive applications and data is about more than just availability—it's about guaranteeing performance. What is even more important, is to be able to definitively measure and report on the specific performance being delivered, based on the application, line of business or tier of service. The visibility required to develop and deliver performance-based SLAs cannot be provided by individual device-specific data or polling-based "averages of averages"—it must be based on a comprehensive view of the end-to-end system and granular measurement of actual infrastructure response times. VirtualWisdom is the only IPM platform that provides precise data on system-wide performance by measuring every transaction, in real time, on the wire. This enables you to establish accurate baselines and measure changes over time, based on the actual workload and associated response times. With VirtualWisdom you can confidently deliver and report on SLA performance, providing visibility and accountability at all levels of the organization.

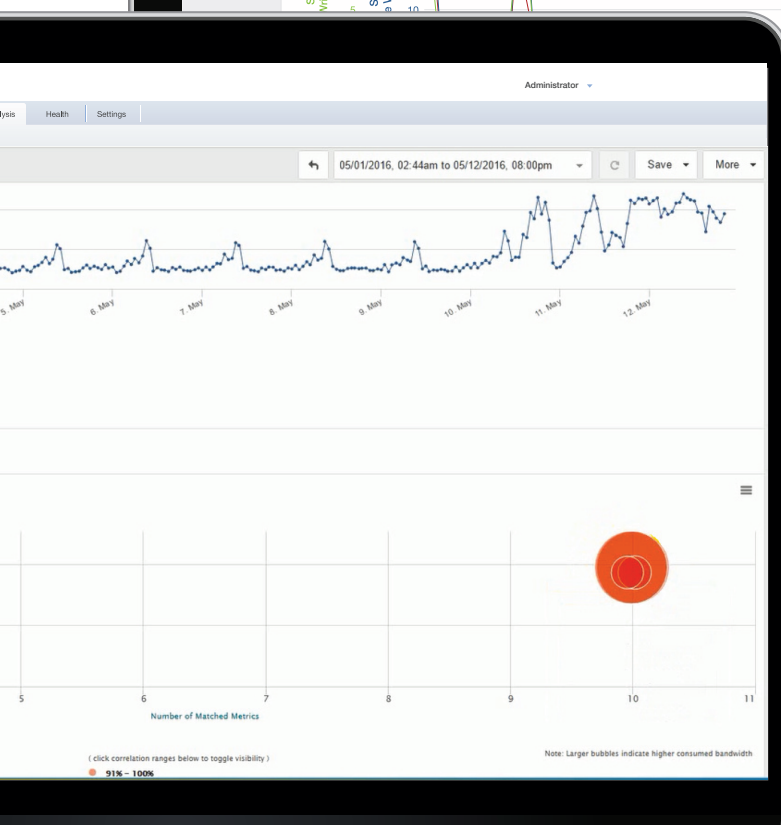
How to Characterize Application Workload to Ensure Infrastructure Alignment

The success of your business is heavily reliant on how well your mission-critical applications and workloads are performing. Historical approaches to ensuring peak performance and optimal business results have focused on continuously deploying the newest, fastest, best infrastructure available to support those workloads. The sheer growth rate of today's infrastructure demands an alternative to just "buying more". Virtualization, cloud, and now software-defined strategies are all attempts to drive higher utilization to curb that expense. In reality, this has created a layer of abstraction that makes it even more challenging to determine the true application workload or the appropriate infrastructure to support the required level of performance. It is no longer sustainable to blindly provision the same resources, or the fastest, newest technologies for all your applications, since all have vastly different workload characteristics and requirements to perform at their optimal levels. VirtualWisdom provides the detailed workload analysis required to always deploy the right workload on the right tier of infrastructure.





VirtualWisdom is the only platform that helps you proactively identify and resolve issues before they impact performance and availability.



The VirtualWisdom entity-centric UI enables multi-team collaboration to fine-tune system-wide performance.



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How to Move From Reactive Troubleshooting to Proactive Problem Avoidance

Regardless of how well architected and implemented today's physical, virtual and cloud-based infrastructures are, it is inevitable that at some point you will have to react to performance or availability issues that catch you off-guard and are challenging to identify and resolve. This 'after the fact' approach to troubleshooting usually requires the involvement of multiple teams, many with different sets of data and information. In most cases, root cause is inferred or never definitively proven.

VirtualWisdom is the only IPM platform that helps you proactively identify and resolve issues before they impact performance and availability. The unparalleled breadth and depth of system-wide metrics, combined with the power of entity-centric reporting, alerting and analytics, enables you to absolutely know the answer—before there is an impact, before you get a call from the application user. Don't guess, know — and avoid the problem before it keeps you and your team up all night!

Virtual Instruments Services

Virtual Instruments offers a variety of services that help customers augment their existing IT staff with highly trained infrastructure performance management specialists.

QuickStart Platform Installation and Training Services

Platform installation, project management, initial configuration and user introduction are packaged into the initial implementation. Training classes are available to introduce, expand and enhance the user experience with the platform.

Critical Infrastructure Audit (CIA)

The CIA service includes delivery of best practices, baseline reporting, advanced analysis and alert investigation. In many cases, this service is delivered in direct support of large scale migration and consolidation projects. This service can be delivered as a stand-alone solution that is inclusive of a dedicated, targeted deployment of the VirtualWisdom Platform, or as auxiliary services in a currently installed account.

Virtual Instruments Managed Service (VIMS)

Managed Services deliver monthly health, utilization and performance reports, track progress against key KPIs and help customers proactively manage their VirtualWisdom environments. They are focused on improving the performance and availability of customers' mission-critical applications by augmenting their existing staff.

Virtual Instruments-as-a-Service (VlaaS)

VlaaS is a flexible deployment of the VirtualWisdom Platform delivered as an operating expense or subscription. All VirtualWisdom software and hardware probes can be deployed in the customer or service provider data center (or both) without incurring upfront capital expenses. Expert Services are often included in VlaaS to ensure customers maximize the value of their VirtualWisdom deployment.

PROWisdom

PROWisdom offers focused workshops and services to help independently manage your infrastructure using VirtualWisdom. It features a baseline PROWisdom report (Health, Utilization, and Performance), configuration of alarms and reports, and advanced training to support full operationalization, including a runbook.

How VirtualWisdom Complements Your Current Management Solutions

Today's most common management solutions—such as Enterprise Management Frameworks, Storage Resource Managers, Virtual Server Monitors, Application Performance Monitors, and SAN Fabric Managers—all lack continuous real-time monitoring of application workload across the end-to-end system. These legacy management products typically poll devices and average the metrics over 5–20 minute periods, which render them incapable of managing performance and insufficient for identifying and resolving problems. The VirtualWisdom platform is the only solution that can non-intrusively optimize the performance and availability of applications by measuring and correlating actual workload from the VM, Physical Server, Switch Fabric and Storage.

The VirtualWisdom platform enhances your current management solutions with:

- A comprehensive view of the entire opensystems stack to find problems undetectable by software-only monitoring
- Highly accurate and detailed continuous real-time, unbiased monitoring — for definitive insights
- Deterministic pinpointing of root causes and impacts on infrastructure and application performance
- Trending and analysis for proactively identifying emergent issues before they impact performance
- Performance trending to identify hardware degradation, to enable preemptive component replacement before failure
- Fibre Channel and NAS network statistics such as pending exchanges, to tune queue depths for maximum application performance
- The ability to determine if configuration changes are affecting application and infrastructure performance by examining systemic latency
- Heterogeneous support of all SAN devices, including storage switches, arrays, and NAS and Fibre Channel components.



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