

VirtualWisdom[®] Overview

VirtualWisdom[®] optimizes the performance, availability, and utilization of virtualized infrastructures and Fibre Channel Storage Area Networks (SANs)

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VirtualWisdom[®] virtual infrastructure optimization products and services provide comprehensive, real-time instrumentation and measurement that allows IT managers to optimize the performance, utilization, and availability of their SANs and virtualized IT infrastructure, including private clouds. It eliminates the risk of deploying tier 1 applications in a virtualized environment, and drastically reduces the resources required to troubleshoot I/O problems and optimize application response times.

For SAN managers, VirtualWisdom provides comprehensive instrumentation and Storage Area Network (SAN) I/O measurement capabilities that reduce application response time, increase availability, and improve resource utilization. VirtualWisdom is the leading SAN monitoring and performance optimization product. VirtualWisdom is the only product that can non-intrusively improve the performance of applications and enable you to proactively prevent I/O problems from affecting users in real time by analyzing actual SAN I/O traffic data.

For server and virtualization managers, VirtualWisdom adds SAN I/O intelligence for comprehensive virtualized application performance optimization and troubleshooting, enabling a more balanced deployment of virtual machines based on real-time measurements and feedback of I/O performance and utilization data. By identifying virtualized application performance bottlenecks in the SAN, VirtualWisdom results in significantly higher virtual infrastructure utilization and helps administrators deliver on the promise of reduced capital and operational costs and improved business agility promised by server virtualization.



The Need for Virtual Instruments

VMware and SAN administrators can implement all or portions of the VirtualWisdom capabilities to address specific performance or availability issues, verify service level agreements, and provide deep monitoring and analysis of the virtualized data center. IT organizations that manage high levels of complexity in their IT infrastructures require a sophisticated set of capabilities for the diagnosis and prevention of application slowdowns caused by the SAN. SAN complexity is driven by the heterogeneity of storage subsystems, host bus adapters (HBAs), operating systems, fabric switches, Wide Area Networks (WANs), multi-site replication, storage virtualization, and the continued 50% annual growth of data and bandwidth utilization. The larger the SAN, the higher the risk of problems. The consolidation of systems infrastructure, accelerated use of server and storage virtualization, Information Lifecycle Management (ILM) architectures, and the addition of new SAN technologies, further complicate the IT administrator's ability to characterize "normal" infrastructure operation.

Typical IT management tools cannot provide the sophisticated diagnosis and prevention capabilities necessary to maintain such complex, heterogeneous, fast-changing environments. Application and virtualization monitoring tools are adequate for optimizing the server environment, but sorely lack I/O subsystem monitoring and analysis capabilities and can't be used to find the root cause of performance bottlenecks. Because the biggest cause of application latency is in I/O, these tools don't offer the capability to effectively mitigate the risks of running mission-critical applications in a virtual server environment.

Acute application problems and outages must be diagnosed swiftly, without vendor finger-pointing or time wasted in waiting for the appropriate analysis tools to be deployed. Chronic problems must be proactively detected and resolved before they become acute. To prevent these problems, ongoing IT practices must include baseline comparisons of I/O performance, bandwidth utilization, and average I/O completions to verify that changes in hardware, firmware, or configuration do not adversely impact business-critical applications or SAN services.

Good I/O performance is the most critical component to superior application performance. The key to achieving good I/O performance is deploying instrumentation technology that directly measures what is going on at a deep level in the transaction workflow, from the virtual machine all the way to the storage array. After the virtual infrastructure is instrumented and measured, Virtual Instruments makes it easy to analyze the data for optimal performance, availability and resource utilization.

Business Benefits

VirtualWisdom has been successfully deployed across scores of large-scale, Global 2000 enterprises that have proven VirtualWisdom's unique capabilities – combining comprehensive, real-time monitoring of SAN traffic utilization, performance, and availability – to drive significant business and operational benefits. The reason is simple: if you can measure it, you can manage and optimize it. The primary benefits of VirtualWisdom include:

1. SAN operational efficiency for OpEx savings

VirtualWisdom is the best solution to help IT proactively identify and troubleshoot I/O problems. VirtualWisdom helps IT dramatically minimize the time to problem identification and resolution, reduces the number of trouble tickets, and allows SAN and VMware administrators to spend more time on solving other business challenges and implementing revenue-generating initiatives. Our customers frequently report both a large reduction in the number of trouble tickets and a much faster time to resolution from their use of VirtualWisdom – by up to 80%.

2. Infrastructure CapEx savings - storage link optimization

VirtualWisdom helps determine optimal use of virtualized server and SAN infrastructure and eliminates over-provisioning. VirtualWisdom finds underutilized resources, enables rebalancing, and helps IT avoid buying unnecessary servers, storage, or switch ports. VirtualWisdom also helps determine when and how much future storage networking capacity to acquire. As an example, we typically find that storage port utilization can be increased by 50% or more. The industry average "all in" cost of a storage port – comprising a storage port, core switch port, attendant cabling, and associated power, cooling and floor space – is approximately \$4,000 per port. If VirtualWisdom can help eliminate or defer the purchase of an additional 32 ports (\$128,000) for one business unit, the cost of deploying VirtualWisdom is easily justified.

3. Infrastructure CapEx savings - tiered storage optimization

VirtualWisdom ensures that IT uses the optimal class (tier) of storage resulting in increased utilization of lower-cost storage, based on actual measured response times across the SAN infrastructure. Existing VirtualWisdom customers have found that this level of objective, verifiable information allows them to deliver Tier I SLAs

Business Benefits (cont.)

with less-costly Tier II storage devices. The cost benefits of latency-based storage tiering can be very compelling, with the price difference between Tier I and II storage between \$5,000 and \$10,000 per terabyte. Finally, by helping reduce investments in server and SAN hardware by up to 50%, organizations also spend substantially less on management software licenses, power, cooling, and floor space.

4. Better tracking and adherence to SLAs enables better support of mission-critical applications and the move to private cloud infrastructures

VirtualWisdom provides historical and real-time performance dashboards, helping to focus problem identification and resolution in heterogeneous environments. This translates to less downtime and fewer performance problems, to help maintain SLA compliance. This is becoming even more critical as many enterprises are moving to private cloud deployments, and need some way to track and report on infrastructure SLAs. Our customers typically manage the most important, mission-critical data in their company and

use VirtualWisdom to improve uptime and prove adherence to various compliance requirements. These include external compliance standards such as Basel II in Europe or HIPAA in the US as well as internal SLAs. Outsourcers and service providers (especially SAAS providers) find these capabilities extremely beneficial in tracking SLAs.

5. Higher revenues through accelerated application & SAN deployments

VirtualWisdom delivers the required visibility to ensure a successful virtual server or SAN deployment and additional infrastructure deployments. IT can monitor production deployment rollouts in real time to ensure all is performing as expected, with no misconfigurations or version incompatibilities. VirtualWisdom finds performance problems, and helps improve application performance. VirtualWisdom also helps validate new technologies by providing real-time measurements to determine the positive or negative performance impact of IT infrastructure changes.



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