# VirtualWisdom® & Software-only Management Tools Tech Brief

## Ten Ways that VirtualWisdom Compares to Software-only-based Management Tools

Virtual Instruments is a leading provider of innovative solutions to instrument, measure, analyze, and optimize fibre channel Storage Area Networks (SANs) and virtualized server infrastructure.

Datacenter Network Monitors, Operations Managers, VM Monitors, SRMs, NPMs, APMs, and the other alphabet-soup of performance managers/ monitors such as SolarWinds Storage Resource Monitor, NetApp's OnCommand Insight, Brocade Network Advisor, New Relic's APM and Insight, VMTurbo's Operations Manager, Splunk Enteprise+apps, Aptare StorageConsole, VMware's vRealize tools, and dozens more, all share two common attributes. First, storage performance is not their #1 mission, and second, they do not monitor performance "on the wire". They read log files, and poll discrete devices via a variety of protocols, but they do not see every I/O from the VM to the LUN. So they take averages, and averages miss important events.

This is not to say that these products do not have value; in fact, they do. Most are built for discovery, capacity planning, operational planning, simple performance reporting and alerting, insights into application issues, and other features. Some even add active resource management.

But VirtualWisdom is the only platform that can non-intrusively optimize the performance of applications, in continuous real-time by measuring actual SAN I/O traffic data, from the VM to the datastore, at huge scale, without agents, or dependencies on storage vendor's APIs or firmware releases.

## VirtualWisdom:

1. Adds continuous real time monitoring and filtering that calculate statistics based on seeing "all" the fibre channel frames that are traveling through the fibre channel SAN, from the VM to the LUN, while adding no latency or risk. Software-only-based tools poll and average metrics. Imagine asking this question: "Do I ever hit 100% utilization on a datastore?" And you're getting the answer from a 5-minute average from a software only tool. Maybe utilization is 100% for 2 minutes, then its 50% for 3 minutes. That would show up as 70% utilized, and you would think you have room to grow! At VirtualWisdom's one second granularity, you would know without a doubt that you are exhausting that resource.

   And VirtualWisdom does more than simply measure and monitor; it filters and alerts. The intelligent probes automatically gather, analyze and report on relevant statistics taken from every SAN transaction. So in real time or for any historical period, it can report on metrics like the top 10 most utilized ports or the LUNs with the worst write exchanges. With software-only-based tools, you can get reports on port or VM utilization, but there's no inherent intelligence that quickly leads you to trouble spots. VirtualWisdom's advanced analytics are designed to do more than correlate events, they lead you to the problem cause. And our case-based and seasonal alarms ensure that you're only alerted to events that are truly critical. Most monitoring tools create so many alerts that they are often simply turned off.


### Summary

SRMs generally excel at providing broad support for a wide array of SAN components, including VMs. Disciplines include discovery, capacity planning, quota mgmt, chargeback, change management, provisioning, configuration mgmt, and others. The design goal is "single pane of glass" storage management, which, according to Gartner and all other storage analysts, is still years away, at best.

Other monitoring tools, like APMs, NPMs, and VM Monitors, may track application metrics, network metrics, server and VM metrics in addition to some storage data, but storage performance is not what they are built for. And they are not deep or granular enough to provide support for mission critical applications. They miss important events / data.

VirtualWisdom is purpose-built for large enterprises which, to stay competitive, must optimize application performance, availability, and resources in their SANs, while capping costs.

Though all tools claim to do some level of performance and root cause analysis, none have the specialized capabilities of a product that looks at the FC SAN on the physical level, what is referred to as "wire data". None can see what VirtualWisdom sees or find what VirtualWisdom finds. It's not hyperbole to claim that VirtualWisdom is the standard by which others are judged. If you have applications which cannot slow down or go down.

2. Instantly proves whether or not the, or changes to the SAN, are the cause of application slowdowns. Software-only-based tools can infer causality; but can't prove it, because they have no metric that reports the effect of the SAN infrastructure on application latency.

   Software-only-based tools usually report IOPS or MB/s, which are readily available, but are not very worthwhile measures of true storage performance, unless your application is backup. By far, the best measure of performance is the effect of the SAN on application response time for every transaction. Looking at IOPS or MB/s is like looking at an automobile speedometer, and guessing how long it takes to go to the market for a loaf of bread. Some tools offer latency figures, but as averages, they are only useful for high-level views of performance.

3. Adds a dedicated traffic and protocol approach to monitoring applications to ensure accurate knowledge about the data movement and data integrity throughout the SAN. VirtualWisdom does not depend on vendor APIs so it supports all storage equally and without any excuses. Software-only-based tools poll at intervals, and depend on component APIs and specific firmware releases. What happens when that API changes, or a new device is introduced, or you acquire a new division that has components not supported by Software-only-based tool? You get to file a "bug report" and wait for the release with that support.

4. Adds virtually unlimited event recording and real time capture capabilities. Software-only-based cannot capture and record events, which causes a significant hole in performance analysis. They may keep some history, but not of every transaction; they keep aggregates or samples, which again, often miss critical problems, and are usually time-limited. With VirtualWisdom, you can replay exactly what happened "last April 30th at 3:33PM" and find those intermittent problems.

5. Adds performance trending of SAN device components to identify hardware degradation and preemptively replace components before they actually fail. Our customers report that due to this preventive capability, severity 1 problems are drastically reduced in their datacenters. Software-only-based tools can see errors at higher layers of the network stack. Finding Fibre Channel/SCSI errors at lower hardware levels would depend on whether the error is severe enough to filter up to the higher network protocol layers. This dependency leads to the high probability that many hardware related errors will go undetected, leading to performance bottlenecks, hardware device failures, and could eventually lead to a disruptive network failure.

6. Adds the ability to gather in-depth Fibre Channel network statistics such as pending exchanges to tune queue depths for maximum performance. Most monitoring products do not report on queue depth level, nor will they accurately report on the effect of queue depth changes. Most SANs today are getting sub-optimal performance because their admins have to guess at how to set queue levels. Set your queue depths properly and see a free performance boost!

## What Gartner says:

In its paper entitled "Optimize IT Operations Using ITSM, ITIL, and DevOps", Gartner has a lot to say about the merits of "wire data" and how it's becoming increasingly important. We encourage Gartner customers to acquire this report.

Select Gartner quotes:

*"While log data will certainly have a role in future monitoring and analytics, it is wire data — radically rethought and used in new ways — that will prove to be the most critical source of data for availability and performance management over the next five years."*

*"Require the IT Operations Teams to Exploit Wire Data as a Source of Information and Springboard for Analysis of the Entire IT Infrastructure and Application Portfolio in Production."*

*"Machine data extracted from the nodes of an IT system will continue to contribute important information about the IT system state and behavior. However, wire data gleaned from the movement of packets across the network links ... provide the core input to any availability and performance analysis."*

7. Adds reporting on whether multi-pathing is actually working. Most monitors show if LUN path redundancy is configured, but don't report on whether the paths are actually live and functional. If your application is mission-critical, you have to know if your paths are redundant (and how utilized).
8. Adds the ability to determine if configuration changes are affecting SAN performance by examining SAN latency. You can use VirtualWisdom to compare performance and health before and after SAN changes to catch configuration problems before they impact business. This is particularly important in private cloud deployments which make extensive use of virtualization, which further reduces the transparency of problem cause and effect. Most monitors do not report on infrastructure I/O latency.
9. Provides a dashboard that correlates literally hundreds of metrics from the VM/application to the storage LUN/datastore, and provides a Heat Map to discover where the meaningful correlations are, substantially reducing the work required to find the "needle in the haystack". It provides a single pane of glass for the storage and the VM admins, including vSphere, Hyper-V and PowerVM admins.
10. Is scalable to the largest enterprise datacenters in the world, today supporting SANs with over 85PB of storage and over 50,000 switch ports. Talk to our existing customers.

And as a bonus (#11), VirtualWisdom can be used to export production application workload profiles to Load DynamiX Enterprise, for creating the most realistic workload models, enabling IT architects to choose the best technology, products and configurations for their specific applications.

## Summary

Because of its unique design and continuous real time physical layer monitoring of wire data, Virtual Instruments' VirtualWisdom can perform crucial functions that other systems cannot. VirtualWisdom is like a virtual SAN administrator. It constantly scans for problems, alerting you if they find any, then have an expert set of tools to zero in and resolve them. If you have applications that cannot go down or slow down, call us for a demo. And if you're down now, call us and learn about unique-in-the-industry SOS Emergency service!

*"We don't need tens and hundreds of Infrastructure Admin's because we've got a solution that will allow us to do the monitoring and alerting."*

Simon Close
HEAD OF STORAGE, WM MORRISON SUPERMARKETS PLC

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