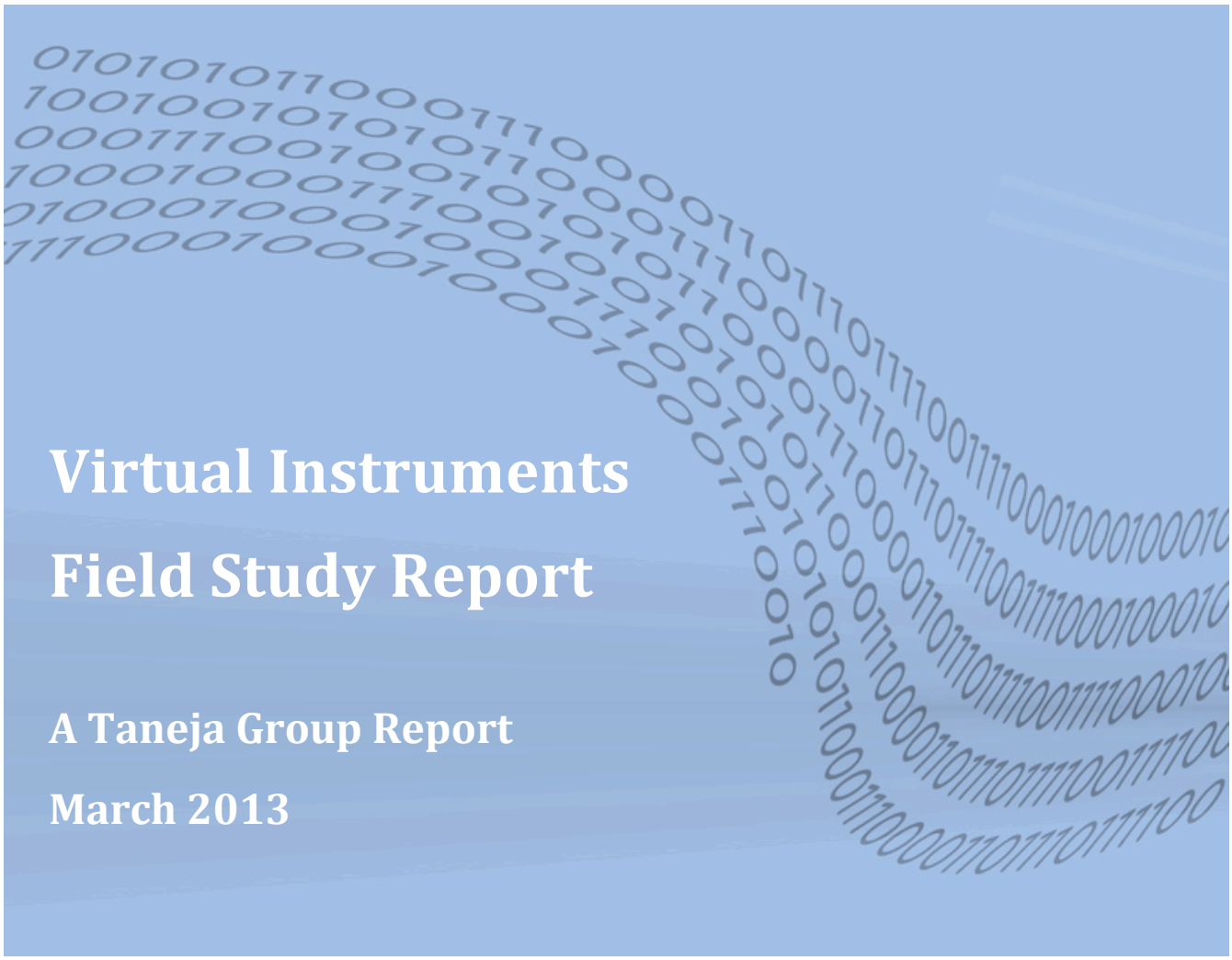
TANEJA GROUP
TECHNOLOGY ANALYSTS

FIELD STUDY REPORT



Virtual Instruments
Field Study Report

A Taneja Group Report

March 2013

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VIRTUAL INSTRUMENTS FIELD STUDY REPORT

MARCH 2013

Taneja Group conducted in-depth telephone interviews with six Virtual Instruments (VI) customers. The customers represented enterprises from different industry verticals. The interviews took place over a 3-month period in late 2012 and early 2013. We were pursuing user insights into how VI is bringing new levels of performance monitoring and troubleshooting to customers running large virtualized server and storage infrastructures.

Running large virtualized data centers with hundreds or even thousands of servers, petabytes of data and a large distributed storage network, requires a comprehensive management platform. Such a platform must provide insight into performance and enable proactive problem avoidance and troubleshooting to drive both OPEX and CAPEX savings. Our interviewees revealed that they consider VI to be an invaluable partner in helping to manage the performance of their IT infrastructure supporting mission critical applications.

VI's expertise and the VirtualWisdom platform differ significantly from other tools' monitoring, capacity planning and trending capabilities. Their unique platform approach provides true, real-time, system-wide visibility into performance—and correlates data from multiple layers—for proactive remediation of problems and inefficiencies before they affect application service levels. Other existing tools have their usefulness, but they don't provide the level of detail required for managing through the layers of abstraction and virtualization that characterize today's complex enterprise data center.

Most of the representative companies were using storage array-specific or fabric device monitoring tools but not system-wide performance management solutions. They went looking for a more comprehensive platform that would monitor, alert and remediate the end-to-end compute infrastructure. The customers we interviewed talked about why they needed this level of instrumentation and why they chose VI over other options. Their needs fell into 6 primary areas:

1. Demonstrably decrease system-wide CAPEX and OPEX while getting more out of existing assets.
2. Align expenditures on server, switch and storage infrastructure with actual requirements.
3. Proactively improve data center performance including mixed workloads and I/O.
4. Manage and monitor multiple data centers and complex computing environments.
5. Troubleshoot performance slowdowns and application failures across the stack.
6. Create customized dashboards and comprehensive reports on the end-to-end environment.

The consensus of opinion is that VI's VirtualWisdom is by far the best solution for meeting complex data center infrastructure performance challenges, and that the return on investment is unparalleled.

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What Is VirtualWisdom?

VI's VirtualWisdom is an Infrastructure Performance Management platform. It enables continuous, real-time, unbiased monitoring and measurement of infrastructure performance in terms of systemic latency, utilization and health across the physical and virtual, server, switch and storage. It also identifies the root causes of failing infrastructure components.

Leveraging a unique combination of hardware and software probes, passive optical Traffic Access Points (TAPs), advanced data correlation and analysis, and proprietary dashboards, VirtualWisdom users can immediately identify application slowdowns caused by infrastructure components such as servers, HBAs, switches, cables, storage arrays and storage drives. This enables IT operations to quickly resolve performance and latency problems in the infrastructure. Further, IT operations can easily customize the VirtualWisdom dashboards to provide role-based visibility to the server, application, business unit and executive management teams.

VirtualWisdom captures and analyzes granular application I/O across virtualized VMware and AIX VIO servers, SAN storage fabrics and storage arrays. This level of visibility allows IT to quickly identify the root causes of intermittent or obscure latency problems across the entire stack—and remediate problems and improve I/O performance in a matter of minutes instead of days or weeks. This in turn positively affects application performance, directly impacting the ability to meet or exceed service levels and business goals at the lowest total cost.

VIRTUALWISDOM PLATFORM ELEMENTS

- **SANInsight TAP Patch Panel System.** Traffic Access Points, or TAPs, are out-of-band optical devices that 'tap' into the Fibre Channel connections between devices—capturing real-time line rate Fibre Channel frame headers. TAPs are passive devices and do not impact storage or application performance.

- **VirtualWisdom Probes.** Both software and hardware based probes collect granular and comprehensive metrics from the virtual and physical layers of the infrastructure.
    - **The Virtual Server Probe** software collects metrics from VMware ESX servers using vCenter, including CPU and memory utilization, status, IO requests and much more.
    - **The SAN Availability Probe** software collects key data from Fibre Channel SAN switches via SNMP, probing each port by its attached device type. The number of frames and bytes and key faults are all tracked and recorded.
    - **The SAN Performance Probe** hardware monitors the Fibre Channel SAN links and analyzes the frame header for each unique 'Initiator, Target and LUN' (ITL) in real-time, at up to 8 Gbits/s line rate. The probe captures the true I/O profile and identifies actual systemic latency and errors.

- **VirtualWisdom Server.** This software runs on a server platform and collects, aggregates, correlates and reports metrics from the VirtualWisdom probes. The server stores the metrics in a high-performance database and provides real-time alerting, historical trending and reporting, as well as predictive 'what-if' modeling. The VirtualWisdom dashboard dynamically displays a summary of physical and virtual infrastructure performance, utilization and health according to any specific 'User Defined Context'.

VI sells its solutions worldwide and deploys them with the help of a committed partner ecosystem.

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Detailed Field Study Results

In the following sections we describe the interviewee's role and responsibilities, their data center challenges, and their VI deployment details. We also include key quotes and summarize the customer's experience. Most of the customers granted permission to use their names and company names. A few remained anonymous due to their companies' privacy policies.

CUSTOMER INFORMATION

Industry	Title	Use Cases
Financial Services	Vice President, Global Storage	Decrease storage costs, gain actionable insight
Retail	Head of Storage	Track performance improvement for a large migration project, monitor mixed new and legacy storage
Technology	Lead, Operations and Engineering	Troubleshoot slow draining devices in the fabric, improve monitoring and alerting in a large active site, improve switch utilization and server consolidation for cost savings
Technology	Senior Director IT Operations	Proactively identify and solve data center issues, achieve five 9's SAN availability
Government	Storage Lead	Comprehensive alerts and reports on entire server-to-storage stack, integrated and cohesive views across multiple data centers
Telecommunications	Director of Infrastructure Engineering and Operations	Ability to optimize expenditures on internal infrastructure, improve infrastructure diagnostics and insight

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Customer #1: Financial Services Leader – Vice President, Global Storage

We interviewed a senior executive for global storage and Citrix deployments at this financial services giant. His scope of responsibility includes engineering solutions, mainframe operations, and open systems management.

CHALLENGES AND DRIVERS

Challenge: Decrease storage costs. The executive's team is responsible for storage-related cost savings across the enterprise. Server-related performance, in fact, drives storage costs, and the executive needed a way to manage and control the server-to-storage relationship.

Challenge: Range of insight. The team needed actionable insight into its virtualized server environment to make intelligent storage decisions. They required analysis of real-time data ranging from the application, to the server, to the fabric, and to the storage frame, for accurate sizing, monitoring, and root cause detection.

VIRTUAL INSTRUMENTS EXPERIENCE

The executive was already familiar with VI from his work at a major bank, and he drove the VI proof of value (POV) project once he arrived at his present position. During the POV phase, a remote legacy system started having performance issues. VI proved itself with its mobile SOS service engagement and the deployment of a 'PAK', which stands for Portable Analysis Kit. A PAK is a mobile unit that ships to any site worldwide, is quickly deployed and immediately helps to identify system-wide performance issues.

Decreased storage costs were the executive's first and foremost driver. He was mandated to save 20% on storage costs but he could not save that amount of money simply by negotiating for lower vendor prices. Instead, he needed to be proactive by implementing new technologies that improved application performance by optimizing the entire open system.

The state of affairs at the enterprise was: If applications slowed down, then the business units would simply buy more storage. But now, armed with highly accurate real-time metrics from VirtualWisdom, the executive was able to meet with business managers and conclusively prove that his team was able to save them $1 million in storage costs for their business unit.

The executive then used the example of a business unit paying heavy departmental storage costs. The team used VirtualWisdom on the SAN environment and found that although the unit was being charged for 200TB and were requesting an additional 100TB, they were only actually using 50TB a month. Furthermore, they were on Tier 1 storage and could have easily gone to Tier 2. These kinds of quantifiable cost savings were not available before VirtualWisdom.

VirtualWisdom also helps the enterprise create utilization and response reports for its storage vendors, which in turn keeps the vendors honest. The executive has a background in enterprise storage management professional services. He's experienced many environments where customers worked with their vendors' professional services to heavily customize their management tools. This made upgrades very challenging, and the executive preferred to invest in tools that would already do what he needed to do.

In addition to hard cost savings through storage optimization, VirtualWisdom worked across the open systems environment to diagnose, prevent and restore services. Ultimately, this also saved money since downtime equated to dollars, and fast mean time to resolution drove down server and

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storage costs. Additional savings accrued from retiring other tools, increasing density, increasing performance numbers, and more.

KEY QUOTES

"In the enterprise, it's all about root cause analysis. Things are going to break (especially in the financial industry). It's about how quickly you can restore the service, but you can't prevent it if you don't know what the root cause is."

"Having served as the outsourcer with a bunch of tools, it takes a lot to get my attention from the tools perspective. Very rarely do tools do what they say they can do – VirtualWisdom does."

"I can say to my teams, retire your other tools. VI gives me not only storage numbers but server numbers. It gives me CPU numbers and helps me increase server density by a factor of 10 and reduce storage needs. That is a huge chunk of storage that we can reclaim."

SUMMARY

Applications, users and data drive server and storage costs. But servers and storage are rarely if ever fully optimized to handle these demands. VirtualWisdom gives the executive true utilization and response numbers and a path forward to optimizing the server and storage, resulting in storage reclamation and cost reduction.

Customer #2: Wm Morrison Supermarkets PLC – Simon Close, Head of Storage

Simon Close is Head of Storage for Wm Morrison Supermarkets plc. This large supermarket has 131,000 employees. As Head of Storage, Close and his team provide solutions for all storage technology requirements. Their responsibilities include connectivity, centralized disk storage, monitoring solutions, and provisioning for backup and restore.

CHALLENGES AND DRIVERS

- **Challenge: Track performance improvement for a large migration project**. Close needed to establish performance baselines for legacy equipment and track performance and response time improvements for a large, complex migration.

- **Challenge: Effectively monitor new and legacy storage environments.** Assure performance and response time improvements by monitoring and remediating issues within both the old and new storage environments.

VIRTUAL INSTRUMENTS EXPERIENCE

When Close arrived at Morrisons, the business was considering purchasing VirtualWisdom. He had used the platform previously, and was familiar with it and aware of its capabilities. One of his mandates was to consolidate multiple storage vendors into a single supplier. They needed to have visibility into the consolidated storage environment to be certain they were making the right decisions, so they used VirtualWisdom to take a pre-consolidation legacy baseline and compare it to the new environment. The only way they could accomplish this was with a platform like VirtualWisdom, so the team made a number of additional investments.

The baseline numbers that VirtualWisdom afforded them were their key drivers for the success of the project. For example, during the migration the array experienced some anomalies that would have impacted performance down the line, but it wasn't obvious at this early stage. VirtualWisdom

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identified the culprit of the suspect behavior, and enabled the team to hold their storage vendor accountable.

Close also saw unusual I/O performance lags on a server they had migrated to the new storage platform. Using VirtualWisdom diagnostics and performance metrics, he proved to the storage vendor engineers that the problem was located not in the server, but in the array, and had it fixed before hundreds more servers were migrated. Close pointed out that the storage vendor's own array tools did not show anything wrong in the array, and that it took VirtualWisdom to prove that the storage was the source of the problem.

Though not everything is a storage problem by any means, storage gets blamed for a lot of issues that are happening elsewhere. With VirtualWisdom, Close and his team were able to produce metrics that demonstrated to the rest of the IT division exactly where problems occurred and exactly who was responsible. If there was an issue with storage, then Close's team would be on it. If the issue was with the server or fabric, his team was able to prove it. VirtualWisdom helped Close's team significantly improve response times and enabled metrics informed discussions.

The next phase of the project is to roll out VirtualWisdom dashboards to the applications teams and operations center so they can be familiar with centralized storage issues. Close's team can do this because of the ease of creating role-based dashboards within minutes instead of hours or days. Whether the dashboard is for IT, managers or executives, it's simple and quick to create flexible views.

Customer service and sales support has been excellent. Close demands continuity from his vendors, rather than just seeing sales representatives once a year when it is time to set and invest budgets. With VI, wherever they are in the deployment cycle the VI team is engaged and present for Close and his team. VI and Morrisons have created a reciprocal relationship, which is a win for both. The reciprocal relationship extends to development. Close recently spoke with VI's engineers who walked him and his team through a new User Interface and usage paradigm. Close shared his thoughts of how users would generally approach a diagnosis and how other changes in the interface would help them. VI is acting on the suggestion because they want to be able to deliver to the customer products that mirror the customer's best practices for use.

KEY QUOTES

"We have tools like Oracle for their databases or HP as a framework tool. They're fine for what they do, but with the features that VirtualWisdom provides I don't see that it would be replaced by anything else that I've seen to date. Technology guys will always use their favorite tool, in storage ours is VirtualWisdom*. We do not usually run array specific diagnostic tools unless we need to provide something very specific to the supplier."*

"We've had lots of support from the VI support organization, both proactive and reactive."

"VI listens to what customers want and need. Whatever the feature is, if there is a customer requirement for it, they'll do it."

SUMMARY

Close reports that overall performance and response times have improved up to 75%, which is a massive benefit to the company. The VirtualWisdom platform has allowed them to demonstrate value for big money savings and business agility, and enables the team to confidently move through their transformation and consolidation initiatives. Given their large and highly complex environment they could not have accomplished this without VirtualWisdom.

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ABOUT WM MORRISON SUPERMARKETS

Wm Morrison Supermarkets plc was founded in 1899 in Bradford, West Yorkshire, England. Morrisons is still headquartered in Bradford and is one of the largest supermarket chains in the United Kingdom. Morrisons currently operates more than 450 superstores in the UK.

Customer #3: Microsoft – Steve Atrosh, Lead, Operations and Engineering

Steve Atrosh is Lead, Operations and Engineering for Microsoft Ad Center. He is an influencer and decision maker. His small department has a big responsibility: each staff member is responsible for managing about 3.6PB of data per person. Atrosh and his team have hands-on experience with all of the products they are researching. They also consult with their Microsoft peer teams.

CHALLENGES AND DRIVERS

- **Challenge: Troubleshoot slow draining devices in the SAN fabric.** Tracking down performance lags in a large data center was very time-consuming. Atrosh needed to speed up the process from days to minutes.

- **Challenge: Improve monitoring and alerting.** A large live site required continual monitoring and alerting to proactively solve problems and optimize performance.

- **Challenge: Improve switch utilization and server consolidation.** Atrosh needed to consolidate the number of switches in large data centers for big CAPEX and OPEX savings.

VIRTUAL INSTRUMENTS EXPERIENCE

Atrosh was aware of VirtualWisdom for some time but believed that his storage team was too small to leverage it. He and his team decided to have a second look and immediately saw how it could benefit them.

His team did proof of value testing in a production environment – one of their biggest data centers. They tested to see how VirtualWisdom would monitor and troubleshoot common problem scenarios. They did not feel the need to do a formal POC with competitive products, but reviewed competing specs and comparative analyses. Nothing else offered the depth that VirtualWisdom delivered. For example, they frequently saw occurrences of slow draining devices in the fabric but tracking down the cause was time-consuming and difficult. One team member might take days to track down an elusive problem. This has a big impact on a small team that needs to be highly efficient.

In contrast, VirtualWisdom took just minutes to pinpoint the slow drain problems. The VI team was instrumental in helping to identify the problem, which turned out to be the switch vendor. Atrosh reported that the VI team went far beyond any existing obligations to help them understand how to solve the issue.

They immediately recognized the value of having VirtualWisdom in their production environment. They also were able to use VirtualWisdom to improve monitoring and alerting for the live site. VirtualWisdom's vendor-agnostic capabilities gave Microsoft the comprehensive monitoring and alerting platform they needed. The successful test caught the attention of more Microsoft teams, who are now either testing VirtualWisdom, or are on a procurement course.

Better switch utilization and server consolidation was another major driver for using VirtualWisdom. Atrosh anticipates that they can free up hundreds of ports in just one data center, resulting in a significant cost savings. They intend to roll out this leaner configuration over other data centers for further consolidation and savings.

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Atrosh uses array tools and Microsoft's own SRM product as well. VirtualWisdom complements and fine-tunes those tools. There is no one else that handles storage environments in the way that VirtualWisdom does and it offers unique insights. His team has since retired competitive monitoring tools in favor of VirtualWisdom. The team plans to customize and export dashboards to internal customers so they have visibility into their own environments. Since Atrosh's team makes almost weekly changes to the infrastructure, they can immediately see how changes affect the I/O stream.

Going forward, Atrosh would very much like to see more development around Hyper-V. He feels that VI is going in the right direction, including working to implement additional protocols as Microsoft reduces their footprint and moves toward a cloud infrastructure.

KEY QUOTES

"VI'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 I'm aware of that can give us that granularity."

"Cost savings are important. But I'm a front line manager; the most important thing is to avoid site outage. That's what I do. VI helps us keep the sites running."

"Storage needs are ongoing. The arrays get bigger and denser and managing them is a constant effort. It consumes most of my team's time and I see no end in sight. We need VirtualWisdom to help us do it."

SUMMARY

VirtualWisdom plays a crucial role in monitoring and detecting issues in large and complex data centers, making it an invaluable tool for Atrosh and Microsoft. Maintaining uptime in their environment is critical, as every second down costs revenue. VirtualWisdom has been in their production environment for six months and has helped Atrosh and his teams overcome big challenges and issues. They are preparing for additional investment in VirtualWisdom to optimize performance and ROI.

ABOUT MICROSOFT

Founded in 1975, Microsoft is headquartered in Redmond, WA. Microsoft is a top global technology company and employs nearly 100,000 people around the world.

Customer #4: VMware – Eric Lasota, Senior Director IT Operations*

Eric Lasota is Senior Director IT Operations and is responsible for systems planning and business performance. He has thirteen members on his team. His colleague, a systems administrator and VI administrator who carries out the technical work, was also interviewed.

CHALLENGES AND DRIVERS

- **Challenge: Proactively identify and solve issues.** A 2011-2012 company initiative called for IT to granularly monitor environments to provide proactive solutions to problems. IT needed tools that would enable them to do preventive maintenance and to identify and troubleshoot weaknesses in their data centers.

- **Challenge: SAN performance that meets or exceeds SLAs.** The five 9's uptime figure applies across the entire IT organization, leaving just a few minutes for acceptable downtime a year in individual divisions.

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VIRTUAL INSTRUMENTS EXPERIENCE

Lasota's role is to identify needs and find solutions. In this case VI had the potential to give him what he needed by meeting certain criteria that no other competitor was able to match. VirtualWisdom automates work that generally doesn't get done because previous monitoring methods weren't comprehensive or accurate enough. They were manual, highly inaccurate, time-consuming and labor-intensive processes. VirtualWisdom was able to provide monitoring and logging information about their system not only locally but around the world as well.

Once Lasota had researched VI and its competitors, he turned the proof of value (POV) project over to his colleague, the systems administrator. The team did the POV with VirtualWisdom software in a purposely 'time-bound' period. The systems administrator and his team monitored two separate production environments and then gave Lasota highly positive feedback on the VI solution.

For example, the sites had experienced some slowdown and the team could not manually discover the source of the problem. Using VirtualWisdom, the systems administrator identified the source of the problem: two outdated, underperforming 2 GB HBAs that they thought had already been replaced. The team informed the networking team who replaced the HBAs immediately. In another instance, a switch was reporting multiple errors. Using VirtualWisdom, the team immediately identified a single cable among hundreds that was the source of the problem.

Lasota and his team have also found that VI support is there when they need them. A recent issue was a severe performance problem on a critical system. Lasota and his team contacted VI support around midnight and the problem was solved in less than 10 minutes instead of the 3-4 hours it would have taken without VI.

The team uses VirtualWisdom for performance improvement, but their main concern is issue resolution. The team's primary driver is SAN performance that meets or exceeds application SLAs. VirtualWisdom allows the team to proactively solve issues and routinely prove that SAN utilization is under capacity. The team can proactively monitor the utilization and health of ports, switches, and HBAs and can remediate elements under their management, or immediately inform the appropriate department.

KEY QUOTES

"We wanted to push the purchase through but budgets had already been set and I had to conduct my own internal sales campaign. The decision was made to go ahead and we were very happy. "

"No other tool we can think of can identify recurring errors on a port like VI does."

"Of all the support I've gotten from vendors, VI is about as good as it gets. There is a fine line between being overbearing and being involved. I think they've walked that line very well. We've had VI engineers in who have called their own support to escalate the issue up."

SUMMARY

Lasota reported that no vendor is perfect, but without VI they would have a severe monitoring deficit and hourly and daily visibility would disappear. Lasota's team is now adding hardware probes from VI to complement their software-based troubleshooting and monitoring. The team intends to use the probes to increase optimization. Lasota has also submitted a request to increase their licenses so they can monitor their non-production as well as their production environment.

**Eric Lasota has since moved on from VMware after the interview was conducted*

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Customer #5: Public Entity – Storage Lead

We spoke with a Storage Team Lead for open systems at a public client entity. The open systems group manages more than 1PB of storage. The Lead is responsible for researching and recommending technology, running proof of concept projects, and for managing SAN storage. She was also charged with improving processes and data center performance and began looking for technology tools for the job.

CHALLENGES AND DRIVERS

- **Comprehensive reports on entire server-to-storage stack.** The team needed to monitor the stack so they could identify and fix storage-related problems, and alert other teams if an issue was application, server or network related.

- **Integrate data center views.** The Lead and her team are responsible for two data centers and needed a cohesive view of them both for troubleshooting and integration.

VIRTUAL INSTRUMENTS EXPERIENCE

The Lead initiated the new process because, with a small team, she needed the ability to effectively manage large volumes of stored data. With VirtualWisdom, the team can either fix a storage-related problem or pass it on to the appropriate team. The Lead can also produce storage-related metrics that prove at any given date and time that a problem was not storage-related.

The client purchased the VirtualWisdom platform. They use Hyper-V but are moving more virtual operations onto VMware, and so will do a POV for the VMware Probe. They use it primarily for monitoring and to dive deeper when necessary. They consistently use the historical data trending functionality to track performance growth and issues over time. The Lead also makes extensive use of custom reports.

The Lead and her team balanced performance and cost by continuously monitoring their most critical storage while receiving scheduled reports on all other storage assets.

The Lead commented that anyone who has a data center or large SAN must do end-to-end monitoring. She has found that VirtualWisdom has made troubleshooting and reporting very efficient and fast.

KEY QUOTES

"I like the deep dive from the SAN level; I can go all the way down to the HBA. I can even tell if the cable is bad."

"We like that they're vendor agnostic."

SUMMARY

If there is a problem the team can remediate problems that are storage-related, and not spend time trying to track down problems that are in fact not related to storage. VirtualWisdom also lets them pinpoint issues for non-storage teams, which aids the entire client entity.

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Customer #6: T-Mobile – Dan Spurling, Director of IT Platform Engineering and Operations

Taneja Group spoke with Dan Spurling, Director of IT Platform Engineering and Operations for T-Mobile USA. Spurling manages the infrastructure group that includes servers, storage, mobility and data center operational teams. There are about 150 people in the group.

CHALLENGES AND DRIVERS

- **Challenge: Justify expenditures on internal infrastructure.** Telecomm companies are laser-focused on building out superior telecommunications systems and services for end-users. As such, internal expenditures must be firmly tied to business value.
- **Challenge: Improve infrastructure diagnostics and insight.** IT expenditures are subject to a corporate initiative to drive down costs and reduce application outage time. Spurling needed an infrastructure management tool that would justify its cost by yielding deep insight for fast remediation, cost savings and performance improvement.

VIRTUAL INSTRUMENTS EXPERIENCE

When Spurling joined T-Mobile his team had been evaluating the VirtualWisdom platform as a comprehensive toolset to provide insight into SAN infrastructure performance and fault data. In order to justify the cost of the purchase, Spurling contracted with VI Professional Services to conduct two consulting projects, both of which resolved a significant outage. After seeing the positive results the team was able to justify the VirtualWisdom purchase.

The purchase was primarily driven by operational needs, but Spurling also justified the purchase with an eye towards improving future performance and optimizing his spend. After VirtualWisdom was implemented, Spurling and his team began seeing how the software could help save money on storage purchases and operations by providing needed insight into storage purchases based on data growth and workload IOPS projections. Armed with accurate information, the team has reduced storage system purchases and optimized the ratio of SATA and Fibre Channel disk to increase capacity, maintain performance commitments and lower purchase cost.

Spurling also recognized the value that VirtualWisdom provides in terms of better, more informed communications with other teams within the IT department. When a teammate contacts him with a complaint about slow application performance, his team turns to VirtualWisdom for an accurate picture of the entire system. The software enables visibility into what kind of storage issue the application is experiencing and can pinpoint where the issue is—and the appropriate team can immediately get to work on resolving.

VirtualWisdom's self-service functionality enables the team to work directly with its partners in IT to optimize how an application performs relative to the infrastructure it's riding on. VirtualWisdom dashboards enable greater visibility into and understanding of storage health by allowing users to view, in real-time, both the storage devices and connections between the devices and the arrays. This enables the team to rapidly, accurately and comprehensively triage situations without going down incorrect troubleshooting paths.

KEY QUOTES

"We had to consider cost relative to value. More instrumentation does not always equal increased availability; there is a point of diminishing returns. We had to ensure the VirtualWisdom platform was indeed going to improve and increase availability, and once we saw what it could do, we invested. We recognized the value and knew we could use it effectively."

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"I could not speak more highly about the sales team, support team, or executive team at Virtual Instruments. They build trust and are devoted to our success, making the adoption curve much shorter."

SUMMARY

Spurling considered a matrix of impact and resolution costs - measuring the impact of outages, lagging performance and increased complexity against the costs of instrumentation. The increased visibility gained by implementing VirtualWisdom has enabled the team to reduce overall operational costs, the number of application outages and outage length. Fast remediation, cost savings and performance improvements have been realized.

ABOUT T-MOBILE

Based in Bellevue, Wash., T-Mobile USA, Inc. is the U.S. wireless operation of Deutsche Telekom AG. By the end of the third quarter of 2012, approximately 131 million mobile customers were served by the mobile communication segments of the Deutsche Telekom group — 33.3 million by T-Mobile USA — all via a common technology platform based on GSM and UMTS and additionally HSPA+ 21/HSPA+ 42. T-Mobile USA's innovative wireless products and services help empower people to connect to those who matter most.

Taneja Group Opinion

The six VI customers we spoke with represent industry leading brands across several vertical markets. The common thread was that they all depend on large data centers and storage networks running mission critical applications. Complex infrastructure requires continuous, real-time monitoring across the entire stack; however, there is a surprising lack of available solutions that can do what VI can. There are specific server, fabric and storage tools that monitor the health of any given device, and data centers need these, but there are few tools that can monitor the entire stack and are also capable of deep reactive and proactive performance monitoring. These tools offer some visibility, but not the ability to correlate information across multiple systems.

Taneja Group recommends that anyone responsible for data center operations and performance management seriously consider VI's VirtualWisdom platform for deep and broad insight into the compute stack. VirtualWisdom provides insight across physical, virtual and cloud environments. Tools for monitoring virtual or logical layers are useful and VirtualWisdom does that as well, but ignoring the physical layer is a recipe for disaster when a lowly cable can take down or slow the performance of a Tier 1 application. Even when the physical problem is a poorly performing switch, the problem cascades throughout a complex infrastructure—and the whole business suffers since it can't meet its service level goals. VirtualWisdom's cross-domain correlation capabilities enable horizontal correlation across storage, server and networking domains to solve issues and optimize data center operations. On top of this, VirtualWisdom is real-time, unbiased and non-disruptive, with extremely low overhead—since the last thing a data center needs is a performance optimization tool that sucks up compute cycles or otherwise interferes with production processing.

Based on this primary research, we believe that VI is way ahead of its perceived competitors in providing IT managers with the insight they need to manage and optimize the compute stack from servers to storage for application-aligned infrastructure performance. In concert with device-specific toolsets, the VirtualWisdom platform gives data center and storage managers a proven solution for monitoring and controlling even the most complex data center infrastructure.

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