US Government Agency

VirtualWisdom helps large US Federal Agency achieve comprehensive visibility and definitive insights with VirtualWisdom Infrastructure Performance Analytics (IPA) platform—ensuring application performance and availability.

Helps smooth the path to increased adoption of virtualization technologies.

Agency Overview

VirtualWisdom helps large U.S. Federal Agency achieve definitive insights to ensure application performance and availability—and helps smooth the path to increased adoption of virtualization technologies.

IT Environment and Role

The agency's data center houses over 3 petabytes of data in the main datacenter, with additional storage in the secondary and disaster recovery sites. Thousands of physical and virtual AIX, Linux, Windows, and mainframe servers support storage systems from HDS, EMC, and NetApp, with over 6,000 Fibre Channel SAN ports provided by Brocade. Even a small slowdown in the primary application performance could result in unacceptable backups and delays for the over 300 sites accessing those applications, costing literally hundreds of millions of dollars, or delaying the processing and workflow of tens of thousands of agency constituents per hour.

CASE STUDY:

Challenges
- Finding configuration problems that impact performance and availability
- System-wide infrastructure and application performance problem diagnosis
- Accelerating deployment of virtualization

Solution
- VirtualWisdom IPA Platform
- Virtual Instruments professional services consulting

Agency Benefits
- Decreased time to resolution is accomplished by monitoring the systemwide infrastructure with VirtualWisdom
- All Fibre Channel devices supported without need for APIs
- Proactive, definitive problem detection to ensure application response times by measuring and comparing system-wide latency against application latency
- Proactive identification of failure patterns and borderline cases before major performance issues occur
- "What if" analysis enabled modeling of planned infrastructure changes and application response times — forecasted to the millisecond using actual performance data.

Challenge and Solutions

- **System-wide infrastructure performance problem diagnosis:** When a performance problem arises, the agency can start investigating at either the server or storage tier, but it's often not clear which approach is optimal. The server might have a busy LUN or might have a queuing problem, or there might be congestion between ISLs in their edge/core/edge topology. They needed a rapid drill-down solution to help point to the first places to look for problem root cause.

- **Accelerating deployment of virtualization:** The agency Information Technology team is expected to bring new applications online faster with more absolute accountability through a service-based computing model. In addition to server virtualization, storage virtualization will enable a tiering model based on service levels.

VirtualWisdom Value

Troubleshooting the IT infrastructure

Decreasing time to resolution is accomplished by monitoring the IT infrastructure with the complete set of VirtualWisdom probes. The ability to prove whether or not the IT infrastructure is to blame for slow application performance within minutes focuses the right team on the task and allows other teams to remain focused on other tasks. Running historical reports to look back in time enables faster time to problem identification and resolution. In some occasions, a troubleshooting probe may be configured to "capture" the moment of failure, reducing the overall time to discover the root cause. VirtualWisdom is the only Infrastructure Performance Analytics platform that monitors and sends alerts about storage access times, congestion, link errors, and SCSI errors, and generate trend reports that show the behavior of a heterogeneous IT infrastructure, over time. This information helps to expedite troubleshooting and allows the agency to prove whether the problem is in the SAN or elsewhere, such as the application or server. This simple first step often speeds troubleshooting by days or even weeks.

Heterogeneous Support

Most SRM tools are optimized for the systems supplied by the storage vendor who builds that SRM product. Because VirtualWisdom monitors the IT infrastructure at the physical layer, it has no use or need of vendor APIs. With VirtualWisdom, the robustness and quality of support is identical in all the various vendor implementations. The agency uses systems from many vendors and appreciates the value of a monitoring and analysis platform that offers an unbiased view of performance no matter who supplies the infrastructure. Learning curves are shortened, staff training is optimized, and the agency is free to select the storage system or virtualizer that best supports a particular initiative.

Application Performance

Ultimately, the agency's storage staff is judged by how effectively it supports the application consumers. VirtualWisdom offers proactive and definitive problem detection and helps maintain application response times by measuring the net effect of the

> *We just can't have a system down or even slow. Our success is measured by 24x7 real time access to our applications. That being said, it's important to be able to charge our customers for services they are actually using. To do that we have to build a service oriented architecture with modern monitoring and analysis tools.*

Gregory Phillips
Chief Architect, Phillips Technology Solutions, serving as Principal Systems Architect for one of the agency's Data Center Operations Groups

entire IT infrastructure on application latency. With VirtualWisdom, it's pretty easy to demonstrate that everything in the IT infrastructure is balanced.
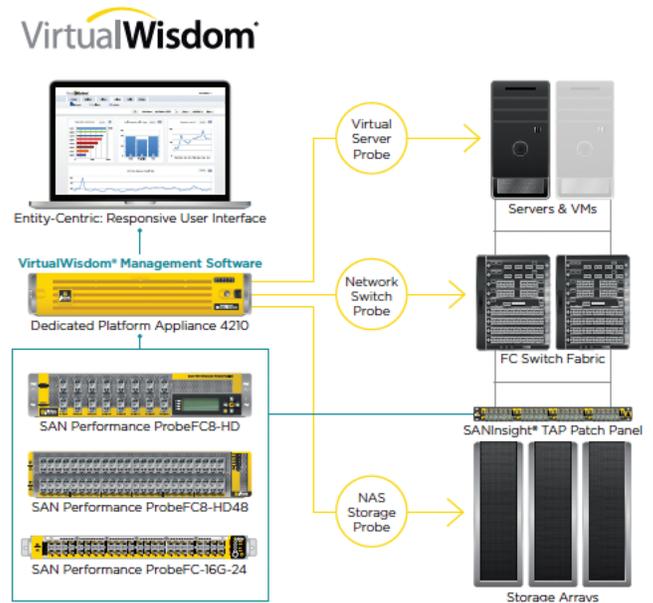
Optimizing Use of Storage

The agency expects VirtualWisdom to help determine when and how much future SAN capacity to acquire. VirtualWisdom helps ensure that IT is using the right class (tier) of storage by enabling the agency to utilize lower cost storage while maintaining performance SLAs. A good process is to look at each application, measure latency, IOPs, cache hits and review the historical data to determine which applications to move to lower tiers. The key to re-tiering is the use of storage virtualization. What used to take many months, can now take less than a week.

Predictive Analysis

Hardware failures can be classified into two categories: unpredictable/sudden faults & predictable/borderline failures. By analyzing fault trends, the agency can begin to see patterns of failure, and therefore catch the borderline cases before a major meltdown occurs. With VirtualWisdom, infrastructure administrators can monitor fault trend reports to capture escalating errors before a total failure occurs. Replacing a failing component is a way to handle trend-able hardware failures to help prevent outages. And with VirtualWisdom's "what if" capability, planned changes to the infrastructure can be modeled, and the effect on application response time can be forecasted to the millisecond, using actual production performance data. So many change or configuration-related problems can be avoided.

Lessons Learned

According to Greg Phillips, Chief Architect Phillips Technology Solutions — http://www.phillipstechnologysolutions.com/, serving as Principal Systems Architect for one of the agency's Data Center Operations Groups, "When in doubt; put the TAPs in. And when you're doing infrastructure upgrades; replace patch panels." This allows complete nondisruptive monitoring immediately or at a later date. Second, Mr. Phillips advises to pay close attention to I/O considerations during planning for consolidation. Consolidating virtual servers onto existing physical servers can create bottlenecks in the SAN as more data is pumped through existing SAN links. It's important to utilize N_Port ID Virtualization (NPIV) to help measure the I/O from the VM to the LUN in real time to avoid unexpected slowdowns.