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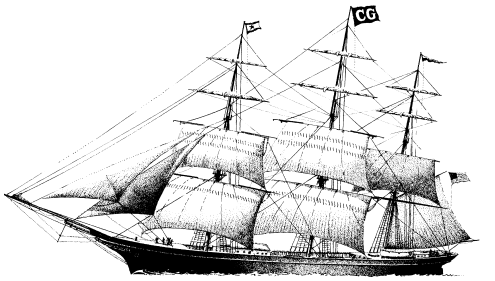

Navigating Information Technology Horizons℠

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Akorri's BalancePoint Fills Unmet Need for Virtualization Diagnostics

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Management Summary

Something happened on the way to today's "Virtualize Everything" and "Cloud Anything" computing environments. Whether your new virtual IT environment is internal or external, whether it is primarily a server play or one that also involves storage, there is a potential rift forming in the evolving infrastructure. Fortunately the rift is being addressed by Akorri of Littleton, MA, with its *BalancePoint* product.

Like any rift, sometimes it might be an obvious hole, sometimes not. The more obvious rifts can be either addressed or avoided by due diligence on the parts of users and vendors. More dangerous, however, is the rift not so easily seen. In our vernacular, users can stumble upon unexpected issues or even fall into the chasm. Such is the case with performance in newly virtualized environments. When moving from *P to V* (physical implementations to virtual ones), users expect the same or better performance with lowered costs. Sometimes this expectation is unrealized or all too often the improvements are short-lived.

Performance Erosion

Just as pollution takes a while to build up and only then becomes a problem, virtualization performance issues can mount slowly and then pick up speed. Only when that happens, the honeymoon period of immediate infrastructure cost savings tends to wane. As performance erodes over time, users begin to complain that SLAs (Service Level Agreements) are not being met. IT departments encounter virtualization-specific issues they did not see in physical-only deployments. To whom do they turn? First, they probably turn to their tried and true support teams from their tried and true vendors. However, as we will see, domain-focused tools may be nice, but possibly are not good enough in virtualized environments.

Change Creep vs. Deliberate Steps

Do you remember the lesson from high school physics described by your teacher? A frog placed in a pot of boiling water will jump out as quickly as possible upon feeling the heat. However, a frog placed in cold water that is heating on a stove will simply tolerate the heat and pain that comes from the water's quickly rising temperatures, never react to them, and likely will die. Virtualization is analogous. Does performance erode, but ever so slowly, until one day it crosses the pain threshold? Deliberate steps such as removal of a server or reconfiguring a resource pool would show up immediately but change creep is more insidious.

The newly virtualized IT environment is quite similar. Immediate progress may be seen in the form of lower costs and more efficient usage of compute and storage assets. However, once the performance characteristics of the virtualized environment begin to erode, you want to have some *key performance indicators (or KPIs)* to tell you what to fix. And, you want experts advising you and your team about how to interpret the key performance indicators for your particular situation. Akorri provides virtualization environment KPIs and backs them up with actionable recommendations based on their expertise and their proprietary database. First, however, let's level set what we mean by virtualization.

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Virtualization Reexamined

Most definitions for virtualization include the term "abstraction of computer resources", such as memory, processors, storage and the network so that those resources may be separated from their physical implementation. They are then managed (moved, altered, re-hosted, aggregated, pooled or further abstracted) as *logical* rather than *physical* entities. The point of abstraction is a self-contained Virtual Machine (VM), which includes the operating environment and application(s), and sometimes the data, too. The VM can be run on different hardware platforms or can be run on several hardware platforms simultaneously. Server virtualization usually involves the introduction of a new layer into the hardware/software/networking stack called the *hypervisor*. Hypervisors sit just above the hardware and allow multiple VMs to run as if each owned was a standalone server. They also monitor guest operating systems.

Adding the hypervisor layer between the physical server and its operating system means that applications can be separated into modules each containing operating system services. Because these modules can be moved easily, they can be migrated from overpopulated servers to underutilized ones, thereby balancing utilization of compute and storage resources. Applications can be migrated much more easily in a virtualized environment.

Quick Hit Advantages of Virtualization

With virtualization done properly, the result can be the more optimal use of physical resources system wide, lower power and air conditioning costs, and postponement or elimination of future hardware purchases. Often systemwide performance is increased drastically with the parallelism of more work simultaneously being done by like resources. Management of resources uses an elastic pool concept that shrinks and grows on demand. System management is at an aggregated layer so that operations are against the pool rather than against repeated members of the pool. New pricing models can be instituted whereby the business unit only pays for what it uses and not for over capacity. Hence, we are seeing enthusiasm with virtualization in many locales across most industries. So what's not to like?

Virtualization Benefits Can Also Bring Baggage

The first hint of problems comes during initial planning stages. Configuration and capacity planning is more difficult because it is hard to visualize how the virtualization piece parts fit together. Capacity can be migrating around the entire infrastructure. Similarly, service level management is not straightforward because IT does not have experience in what to promise its users. Service Level Agreements will have to be rewritten for the entire user community.

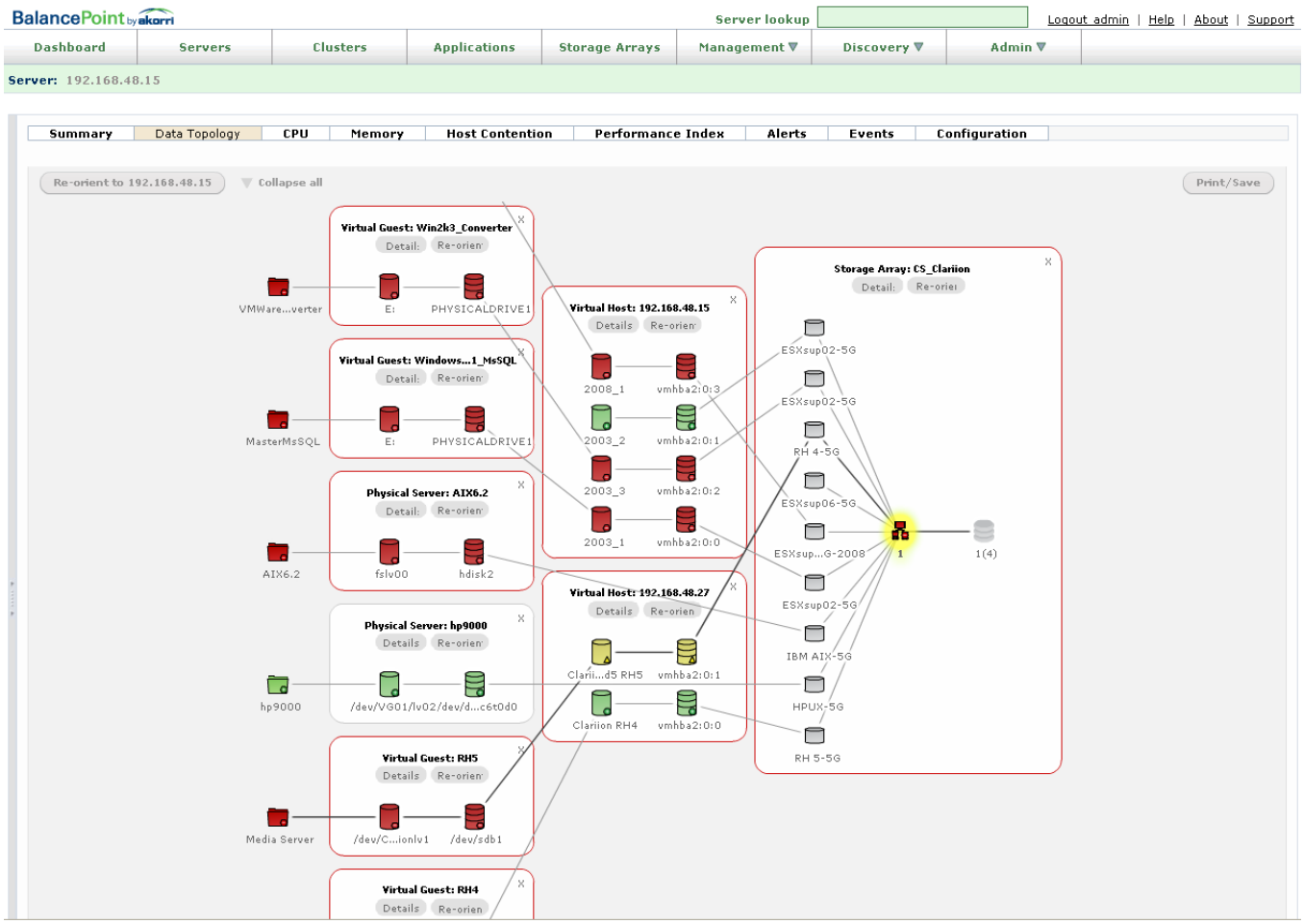
Problems with performance can start arising as soon as "The Day After". Caught up in your zeal to make IT more efficient, you may push the virtualization idea a step too far by putting too many VMs on physical servers and storage or not balancing their distribution well, resulting in VM contention for shared resources and application performance degradation. Other places and conditions causing trouble might be out-of-date policies, configuration inconsistencies, or out-of-date performance characteristics of hardware. Still other trouble spots are contention for resources (also known as thrashing) and improper load balancing. Before Akorri and its *BalancePoint* product line, there were domain-focused tools, such as network tools for the interconnection, storage tools for the storage, application optimization tools for applications, etc. Akorri has answered this call with tools that identify problems cutting across multiple domains.

Savvy users will look for more general-purpose virtualization tools – ones that cross all the domains in the user's infrastructure. By employing them, they avoid the silo-specific issues of a different user interface (UI) for each tool and possible inconsistent diagnostic information leaving the user to sort out which diagnostic messages to act on and which ones to ignore. One such tool is Akorri's *BalancePoint*. As described below, BalancePoint will help the administrator using it by channeling his thinking toward proper steps to take along the virtualization path, setting the right goals, and ultimately moving them closer to the promises of the virtualization goal line.

BalancePoint to the Rescue

BalancePoint, especially Version 3.0, is a performance analysis tool appropriate for both physical and virtual environments. It is used to troubleshoot performance issues, optimize performance system-wide, plan infrastructure capacity including the use of modeling, and manage service levels. The product's differentiation is that it can find performance opportunities from the storage looking upward or from the server looking downward. It examines the entire hardware/software stack and as such represents an authoritative end-to-end view. The use and importance of this cross-domain approach perfectly matches the state of

Exhibit 1 — A Dynamic Topology Map



BalancePoint provides a dynamic topology map – so you can see potential contention spots across virtual servers, host servers, SAN, and storage – then double-click to drill down and view the application contention analysis.
Source: Akorri

virtualization efforts now ongoing in most firms.

BalancePoint customers can gain visibility into their virtual system, diagnose performance issues, remediate those issues on a cross-domain basis, and learn throughout the process, so that future-looking modeling can be a viable option. (See Exhibit 1, above.) These same tools can make predictive assessments without incurring the wrath of an out-of-control, live application. Data center planning is so much easier and far more effective with BalancePoint.

Performance vs. Inefficiency of the Environment

No one wants to have a wasted dollar (or penny these days) tied up in their infrastructure. Throwing expensive hardware and software at performance problems has been a tried and true approach that few can afford anymore. Now, however, it is better to reach a nice balance between over configuration and reasonable performance – a *balance point*, so to speak. Akorri's choice of BalancePoint as its product name is terrific because it represents the ideal for a range of optimal performance analytics involving multiple hardware and software modules so typical in virtualization environments.

Achieving More with the Right Key Performance Indicators (KPIs)

Used in conjunction with Akorri's proprietary database, BalancePoint's KPIs give you much better visibility into your entire system. (See Exhibit 2, on the next page.) For example, upon discovery, the Application Contention Analysis tool builds a color-coded resource map showing virtual and physical servers, SANs, and storage, including resource pools that each application uses and/or shares with other applications. The map can be used to visualize the true nature of the virtual data

Exhibit 2 — BalancePoint's Key Performance Indicators (KPIs)

- ***Application Contention Analysis*** – shows which applications are competing for resources
- ***Infrastructure Response Time*** – shows performance delivered to the application by the total resources assigned to it
- ***VM CPU Efficiency*** – compares guest O/S perspective with actual VM usage
- ***Performance Index*** – Scores balance between application requirements and infrastructure's ability to deliver from physical server perspective
- ***VM Performance Index*** – scores balance between application requirements and infrastructure's ability to deliver from Virtual Machine perspective
- ***VM Resource Entitlement Analysis*** – shows actual usage versus allocation
- ***Virtual Resource Pool Entitlement Analysis*** – shows actual usage vs. allocation
- ***VM Host Resource Contention*** – shows CPU and memory in one view
- ***VMware Cluster Capacity*** – shows cluster usage by server or resource pool
- ***Abnormality Analysis*** – dynamically shows performance against thresholds and normal behavior
- ***Data Center Reporting*** – produces infrastructure scorecards, capacity and performance summaries and forecasts

Source: Akorri

center with the depiction ready from the user's browser. More importantly, it can show contention bottlenecks that need resolution. For those new to virtualization, just having a visual representation of the virtualized infrastructure is a huge step forward. Identifying bottlenecked locations and subsequent remediation is all the better.

Akorri KPIs help ferret out performance erosion with the help of its proprietary database. The database represents a huge benefit for virtualization customers. User experiences can be tracked. Trends can be identified per customer or across several like-sized or same-industry users. Everyday, the database is building its experience base. Remediation techniques can be identified, catalogued, and modeled. Thus, results and recommendations from BalancePoint today are better than yesterday, last week, or last year.

A particularly valuable KPI is Infrastructure Response Time. (See Exhibit 3, at the top of the next page.) This unique Akorri metric normalizes round trip response time from application request until that request is ready and available for use. It can be used to isolate infrastructure delays versus problems with the application itself in a root cause analysis program. The CIO can use this information to prove to the business that his/her infrastructure is showing good levels of performance to the user community. It can isolate problem areas for future remediation. It is sometimes used to justify additional investments for the IT infrastructure.

Seasonal and Time of Day Variances

Perhaps time of day affects contention for resources but really is perfectly normal, such as when backups are being run or when beginning-of-day or end-of-day or end-of-quarter processing makes the infrastructure very busy. BalancePoint is sophisticated enough to take such anomalies into account by noting, for example, that a 1 sigma difference is expected but greater than 1 sigma is a warning for more analysis to be conducted. Similarly, thresholds can be set and monitored as a way to determine headroom. Akorri's mantra is "Reach the threshold…take an action."

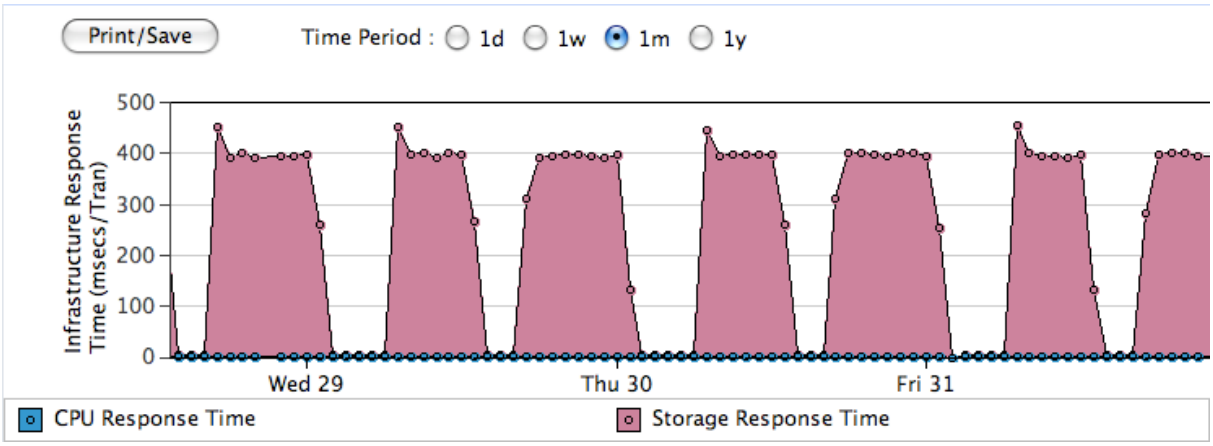
Putting It All Together

It can be argued that KPIs can be created by any provider of software. Akorri's current list certainly is a reasonable set and it will be growing with each new release. Meaningful differentiation comes from usage of the KPIs individually and in combination. Akorri offers an ever-growing repository of performance information based on the customer's real data.

Suppose your firm has a performance problem but no readily apparent cause. Balance Point uses best practices that have been compiled from storage and application vendors using their documentation about topologies, table set up, and known problem avoidance. It makes recommendations on those best practices based on the configuration of the user. The database collects up to 18 months of historical information, so that it can do historical trending and analysis. This same data is used for predictive modeling about future performance using extrapolation. Both users and Akorri support staff have access to this information.

The importance of this database cannot be overstated. Data is from the real world. Problems are not simulations but actual circumstances. The database gets bigger (and smarter) every day –

Exhibit 3 — Displaying Infrastructure Response Time



Infrastructure Response Time is the time it takes for the system to perform work submitted by an application and thus directly shows the system's infrastructure responsiveness. In this example, Infrastructure Response Time shows a large recurring storage bottleneck.

Source: Akorri

with each passing event. Solution recommendations get refined continuously.

Performance Policy Setting

Once you have the advantages of Akorri KPIs and their recommendations for performance improvement, how are action steps best implemented? You now have the information to create templates and canned procedures for your users that more fully enforce business-based policy. By largely templating the human element of variability (and error) out of the equation, the situation is improved. Procedures and templates are validated by testing and quality assurance. However, who should be setting the policy in the first place? It is best for business users and management to decide priorities and *what* to prioritize. IT, on the other hand, is in the best position to determine *how* to implement the changes technically. It is a team approach. Should IT come up with a novel technical approach, it should be implemented only with the advice and consent of the business users and their management.

Switzerland Style Agnosticism – Neutrality Plus Trust

As a software tool manufacturer, it is important that Akorri maintain its neutrality with regard to finding performance bottlenecks. Issues and faults could lie in any domain between the user and his data. This means that Akorri must be on a first name basis with the end user, the hypervisor provider, the operating system provider, the application provider, the network provider, the storage provider, and the server provider, and any other provider in the entire computer stack. Each must have confidence and trust in Akorri's neutrality and be responsive to Akorri's suggestions.

For example, Akorri may recommend that the storage provider re-provision storage using the native storage element manager. Storage systems can vary widely from vendor to vendor and model to model. Each has an optimized element manager to make changes to their respective storage environments. Switzerland has no standing army and neither does Akorri. Rather, Akorri makes recommendations and leaves the actual remediation steps in the expert hands of those with specific domain knowledge and access, either within the customer or at the vendor.

Who Will Use BalancePoint?

The job title of the user of BalancePoint likely varies from firm to firm. The typical BalancePoint user is the virtualization owner. Their title could be VMware Administrator, Systems Administrator, or Windows Administrator. The storage owner or Storage Administrator is also a common user. Any or all of these individuals can utilize the BalancePoint features in their jobs because each of them soon will be challenged by performance questions. Each of them, either now or soon will benefit from adding BalancePoint to their repertoire of diagnostic tools.

BalancePoint as a Personal and Professional Growth Opportunity

BalancePoint should not pose a threat to incumbent personnel with "Administrator" attached to their title. Rather, BalancePoint gives each of them a new tool to use to address the new realities of providing support in the virtual world. How-

ever, BalancePoint provides something even more persuasive and certainly longer lasting – a new professional growth path. Given that more and more administrative steps are becoming automated by specialized scripts, canned processes, and policy steps, many of the duties of narrowly-specialized administrators are being subsumed by automation and are just plain going away. Becoming an expert in BalancePoint is representative of a growth path into the virtualized future. As there aren't very many virtualization administrators nor virtualization tool experts (at least not yet), this represents a chance to enhance your skill set.

Sustainability

Sustainability is important to the buyer, particularly when the seller is still in start-up mode. No one wants to over-invest in products that become fundamental to the success of the business. No one wants to rely on a firm that does not have an infrastructure deep enough and strong enough to support their firm's expected usage patterns.

Not only is the BalancePoint product congruent with today's problems, it will become a staple for tomorrow's. Akorri has patent-pending technologies used in the solution, especially in the analytics used to model, diagnose, and forecast deficiencies. It is these analytics and their processing, as well as the recommendations they generate that constitute Akorri's added value; this is the DNA of BalancePoint.

Akorri uses modern Agile-based software development tools and methodologies and up-to-date engineering approaches not bridled with legacy problems and anachronistic designs. For example, BalancePoint is agent-less software. This design point means that round robin of activities for agent maintenance and upgrades can be avoided. It also means excess system space (both memory and processing power) is not consumed by monitoring agents sitting on each and every server.

The business model is appropriately sized for the business expected. Importantly, Akorri has not overstepped its supply lines as it has strong presence in USA, UK, Germany, Switzerland, and Australia, but only now is opening a reseller relationship in Brazil and Japan. They are taking a go-slow approach in non-English speaking countries, so as to preserve and extend their support structures to match the pattern of incoming deals. Their idea pipeline is full with next generation product enhancements already in the design and engineering stages. Future emphasis is likely to be on automating actions deemed ripe for change, but always with inputs from the staff responsible for the success of the project. Akorri expects its development agenda to include support for more virtual environments such as *Hyper-V* from Microsoft and *Xen* from Citrix. As new KPIs are developed, all virtual environments will be beneficiaries of Akorri research and development.

Akorri uses "almost viral" marketing, including social networking on akorriblog.com, Twitter, and LinkedIn. Users are encouraged to tell their stories on the Internet so that others may learn from word of mouth testimonials by peers facing similar challenges. Meanwhile, BalancePoint usage is permeating the customer organization almost like a contagion. Success in one area of operations breeds usage in other areas. Akorri calls this the "second sale" concept. It is a far easier challenge to overcome than making the first sale for a new application into a new name account. Akorri's channel partners are co-beneficiaries of this approach.

Staying in Touch with Users

Akorri's use of a customer portal on the Internet allows for two-way communication. First, of course, is that it is password controlled so that both sides of the information exchange can be reassured that their correspondence will be kept private. This is the place where Akorri publishes answers to Frequently Asked Questions (FAQs). It also serves as a platform for users to make product enhancement suggestions that can be acted upon for future releases. Plus, customers can get access to support teams to help them work out site-specific issues.

Conclusion

For users now in the planning stages of P-to-V migration projects, it is essential to include virtual infrastructure performance tools in your bag of tricks. Especially if you are already experiencing performance issues, you should evaluate Akorri as a company and BalancePoint as a tool worthy of your consideration. If so, you can be assured that recommendations being made will include actionable steps with immediate payoffs. What more could you want?

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