



# Research Report

## CA Technologies in Application Performance Management *Bridging the Gap Between Mainframe and Distributed Systems for Improved Application Performance*

### **Introduction**

There are many information technology (IT) executives who believe that once they have virtualized their computing environments, they have “moved to the cloud”. And, in a way, they have. Their clouds can find resources, pool those resources, and make them available to applications that need additional processing power. And their clouds can also use these resource pools to “fail-over” (switch to another computer should the computer being used fail). Further, these virtualized pools can be used to set up test-bed environments where software can be deployed and tested on the actual equipment upon which it will be deployed — without having to purchase and deploy a separate test-bed environment.

***By adopting virtualization technology, IT executives have been able to increase overall system utilization (unused resources are put into a virtualized pool where they are used instead of wasted), and they are able to lower costs (by not having to purchase as many systems).***

At *Clabby Analytics*, however, we would argue that these IT executives are only partially on their journey to cloud architecture. To really “move to the cloud” and take full advantage of all the cost savings that clouds offer, IT executives need to also invest in software that:

1. Automatically provisions cloud environments (provisioning is the build-up or tear down of systems images — a process that most IT shops still perform manually. By taking this manual labor out of the picture, IT organizations can significantly lower their systems management costs);
2. Secures information at rest (behind the firewall) and information on the fly (in transit on the network); and,
3. Troubleshoots and streamlines application flow within the cloud.

This *Research Report* focuses on the third point: troubleshooting and streamlining application flow within the cloud. It describes what application performance management (APM) and business transaction management (BTM) are — and why they should be of paramount importance to organizations that are serious about building efficient cloud environments. To illustrate how APM and BTM products work, we use CA Technologies’ APM product offerings as a backdrop. And our primary reason for choosing CA APM is this: we like the way that it provides *cross-enterprise* (cross-platform) application performance monitoring and management that enables transactions to be viewed and traced through across distributed systems as well as mainframe environments.

## CA Technologies in Application Performance Management

### *IT Strategic Planners: Ask Yourself These Questions*

What happens when a transaction is sent into a cloud for processing? Which physical and virtual resources does it use (how do you do capacity planning in a cloud if you don't know which resources a given transaction is using)? What dependencies does the transaction have? If the transaction is performing poorly, how can the fault be isolated? If the transaction misbehaves intermittently, how can that fault be isolated? And, how do you tune transactions in the cloud to improve performance? Now apply all of these questions to all of the applications that your organization runs...

*Tracking application and transaction faults in a distributed systems environment or a cloud can be bedeviling. Tracking the behavior of applications and transactions involves following applications and transactions as they hop from server to server making database calls, reads and writes along the way. It also involves tracking business process flows to ensure that transactions execute efficiently. For enterprises that are using the wrong tools, tracking transactions and monitoring/managing business process flows in a cloud architecture can be extremely time-consuming and vexing.*

### *What Is Application Performance Management?*

The practice of tracking application behavior across a distributed computing environment is called application performance management. The practice of tracking transactional behavior across information systems is called business transaction management (BTM is a segment of the application performance management marketplace).

As defined by Wikipedia, “application performance management, or APM, refers to the discipline within systems management that focuses on monitoring and managing the performance and service availability of software applications. APM can be defined as process and use of related IT tools to detect, diagnose, remedy and report application’s performance to ensure that it meets or exceeds end-users’ and businesses’ expectations.” Wikipedia also describes the two primary methods of measuring performance to be (1) resources used by applications and (2) end-user response time of application. APM tools are common for Java and .NET web applications, and typically can measure response time and identify the root cause of performance issues.

Application performance management has become increasingly important in large enterprises that typically have complex heterogeneous infrastructure and a broad mix of mission critical web-based applications. With businesses adopting a mix of public and private clouds, applications may be distributed across systems that aren't directly managed by the customer.

Think about a typical on-line transaction. When an order is placed online, for example, a number of sub-transactions are triggered- such as (1) an inventory check to verify the item is in stock, (2) credit check to ensure the purchaser’s credit card information is valid. (3) customer email with order confirmation (4) set up shipment (5) email shipping and tracking information to customer. When a user initiates a single on-line business transaction, all these sub-transactions take multiple hops through various applications and infrastructure components. An issue at any point in any of the sub- transactions along the way can impact customer service and breach SLA’s. Not having insight into this complexity lengthens the

## CA Technologies in Application Performance Management

time to resolve issues and increases the number of resources that must be deployed to identify and solve the problem. APM tools provide the visibility that is necessary to identify problems, facilitating problem resolution and improving quality of service and customer satisfaction while at the same time reducing operational costs.

A recent study conducted by IDC, “Achieving Business Value and Gaining ROI with CA’s EITM Software for Optimizing IT Infrastructures” reports that employing APM tools can increase IT staff productivity by as much as 16.8%, user productivity by as much as 43.3 % and reduce infrastructure management costs by as much as 36.8 %.

### *CA Technologies in the Management, Cloud, and APM Marketplaces*

CA Technologies is the #1 management software vendor (according to an August 2010 Forrester Research Report) with annual revenues of 4.5 billion. Headquartered in Islandia, New York, CA has offices located throughout the world. According to CA, customers include the majority of the Forbes Global 2000, with 9 of the top 10 global banks, 4 of the top 5 global insurance companies and 9 of the top 10 global telecommunications companies. CA devotes roughly \$500 million and 5000 people each year to designing and supporting software. Acquisitions also play a key role in expanding CA’s IT management capabilities.

CA Technologies is aggressively pursuing the growing cloud market and has made several acquisitions in the cloud space this year including Nimsoft (cloud infrastructure monitoring), 3Tera (turnkey cloud computing platform) and Oblicore (cloud service level management) and Cassatt (policy-based intelligence). In May 2010, CA Technologies announced the Cloud-Connected Management Suite, a set of products to manage cloud services and designed to help run IT as a supply chain: CA Cloud Insight, CA Cloud Compose, CA Cloud Optimize and CA Cloud Orchestrate.

Two acquisitions have contributed to CA Technologies APM suite of products. Wily Technology, a privately held company, was founded in 1998 and acquired by CA Technologies for \$375 million in March of 2006. The acquisition expanded the company’s ability to manage application performance in distributed environments, and is the core of CA’s Application Performance Management solution. In 2009, NetQoS, a provider of network performance management and service delivery solutions, was acquired. NetQoS technology adds network flow monitoring, unified communications management and network-based response time analytics to the APM product portfolio, enabling monitoring of both web and non-web applications.

### *A Closer Look at CA Technologies in the APM Marketplace*

Many vendors offer APM software solutions that can troubleshoot, control, and manage for applications within a distributed computing or cloud environment. In fact, we’ve written reports about several of these vendors. And, as we dig deeper and deeper into various vendor’s APM/BTM offerings, what we are finding is that there are very significant differences in the approaches that these vendors use (some vendors can only measure activities in silos using a network sniffer/time-based correlation approach to find problems; while others use a deterministic, transaction monitoring/-management approach that can span across server tiers while providing a topological overlay of transaction behavior that

## CA Technologies in Application Performance Management

represents how a transaction is behaving in real time). In this section, we examine CA's APM market positioning more closely.

### *CA APM – The Transaction Is King*

CA Technologies application performance management product for distributed systems is named, ironically, CA APM. (CA Cross Enterprise APM extends these capabilities into mainframe environments when CA APM is deployed with CA SYSVIEW – more on that below). CA APM links end-user experience, transactions and applications with the underlying systems and network infrastructure providing an understanding of real-time performance and service levels across heterogeneous, constantly-changing infrastructure. With this integrated approach, the infrastructure can scale dynamically — expanding and contracting to deliver consistent performance and proactive problem resolution.

When we were briefed by CA Technologies on this product, the company used a phrase that sums up their APM product strategy — “*the transaction is king, it is the one constant regardless of platform, architecture, or deployment in physical, virtual, or cloud environments*”. CA APM tracks all transactions all the time. And by so doing, CA Technologies' APM software can help IT managers isolate the source of problems and/or tune applications for maximum performance because CA APM can show an application's behavior as it transitions through a distributed or cloud environment.

*In today's dynamic, virtualized infrastructure, application/transaction tracking can be used to effectively monitor performance and end user experience. Looking at the performance characteristics of distinct aspects of the infrastructure (database, servers, networks etc.) and then trying to piece it together doesn't provide an accurate or complete picture of what's happening in real-time. CA APM uses byte-code instrumentation, a technique that modifies the application dynamically at run-time to collect performance data. Byte code instrumentation uses agents inside the Java virtual machine (JVM) or Common Language Runtime (CLR) to collect code-level metrics that measure the performance of individual objects and methods, providing deep diagnostics into applications – so deep that a problem can be isolated to a specific line of code. Not only does this approach provide a wealth of detailed data, it also is very low overhead — which means that it can be used 24x7 for large applications in production environments, with little or no impact. Although other APM tools use this approach, CA invented and patented the technology.*

Clabby Analytics has reviewed several BTM/APM products including CorrelSense, SharePath, OpTier, CoreFirst, INETCO Insight and Nastel AutoPilot. These products typically use some form of network or server-based agents and/or event collectors instead of byte-code instrumentation to collect transaction-based performance data. The benefit of using byte-code instrumentation is in the depth and breadth of application specific information that is gathered -- enabling application issues to be quickly pinpointed, diagnosed and resolved. The down-side of APM tools using byte-code instrumentation is that they can be complex to install, implement and use. CA claims, however, that in Proof of Concept (POC) scenarios, they typically install in a matter of hours and have meaningful results before competitive solutions are even deployed and ready to start collecting data.

### **CA Cross Enterprise APM — Product Description**

CA Introscope, CA Customer Experience Manager (CEM) and Net QoS Super Agent (add-on) comprise the CA APM solution. With CA APM Rev. 9 (released Q2 2010), the

## CA Technologies in Application Performance Management

products were merged, but some prior customers may just have CA Introscope or CEM, and CA will continue to support those customers. By using CA APM with CA SYSVIEW Performance Management (CA SYSVIEW), transactions can also be managed and traced as they traverse from distributed to mainframe environments — this combined solution is known as CA Cross Enterprise APM.

*CA Wily Introscope monitors mission-critical Java and .NET web applications to detect and resolve performance and availability issues proactively. CA Customer Experience Manager enables IT to understand the online experience of end-users by analyzing transactions in real-time to identify variability in end-user experience and find where and why transactions are getting bottlenecked. And NetQoS SuperAgent leverages embedded instrumentation and integration in TCP/IP networks to provide a comprehensive view into network and application performance, adding the ability to monitor both web and non-web applications. CA SYSVIEW has been integrated with CA Wily Introscope, so when customers buy CA APM, they have all necessary functionality to expose mainframe transaction data. Full-blown performance monitoring and management is obtained by purchasing CA SYSVIEW.*

Many tools on the market manage only distributed systems or only mainframes — CA Cross Enterprise APM manages both. Since distributed applications are typically comprised of transactions that have a “back-end” component that resides on a mainframe, linking the two environments is the only effective way to find the root cause of application issues that are affecting end-user response time. Performance bottlenecks can be identified not just as “a mainframe issue” but the actual root cause can be found, saving time and resources in problem identification and resolution.

### *How CA Cross Enterprise APM works*

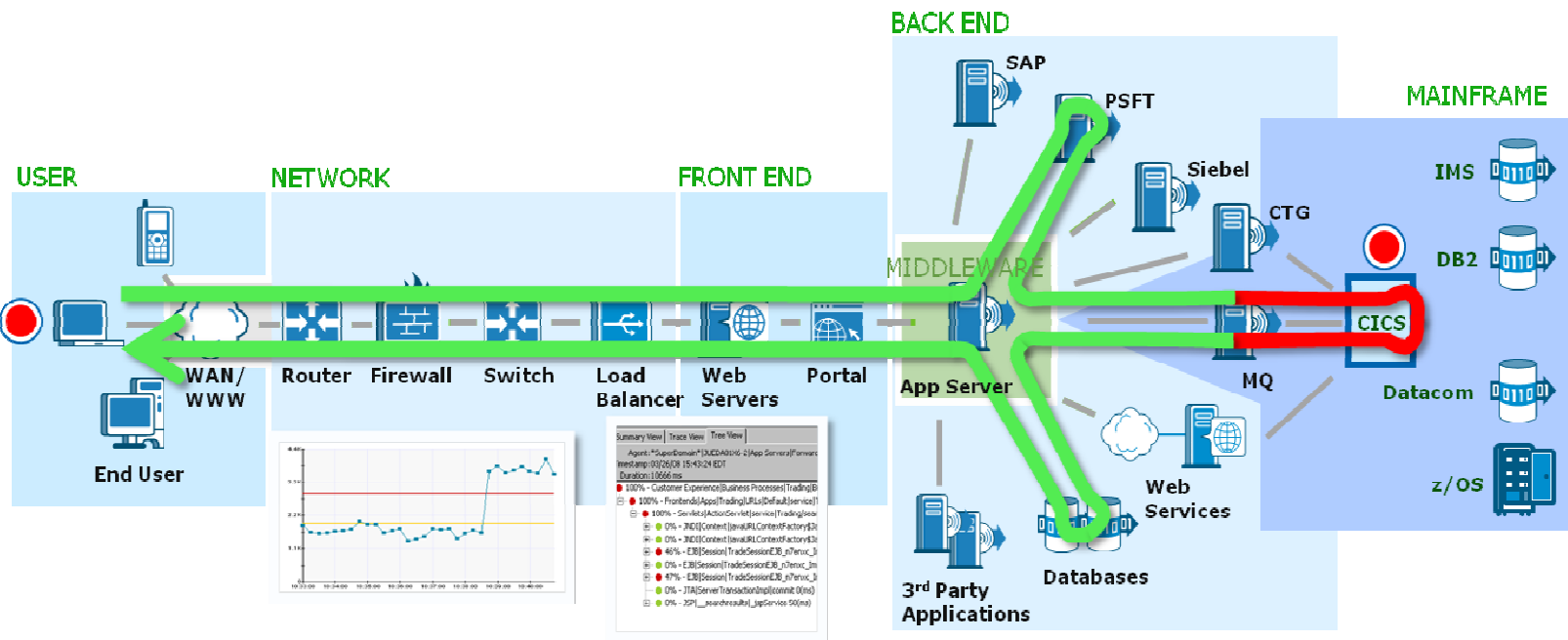
The CA Wily Introscope component [of CA APM] captures what is happening to the transaction as it is flowing through multiple layers of distributed infrastructure. But the back-end of the transaction – that is what happens to the transaction as it passes through the mainframe – has been a “black hole” hole for CA Wily Introscope. By integrating CA SYSVIEW, transaction data from CICS on the mainframe is collected and passed to CA Wily Introscope. Tagged with a unique identifier, CICS data is merged with transaction information from other tiers, so distributed transactions can be linked to their impact on CICS resources. Transaction data and metrics are displayed in a consolidated dashboard view (See Figure 1 next page). This enables the administrator to look at each tier of the transaction, and determine what layer of the infrastructure may be causing an end-user response time issue. Normal and abnormal timeframes for each tier can be defined and alerts can be automatically triggered when a threshold is reached. For example, “CICS waiting on DB2” or “CICS waiting on z/OS”. Drill-down capabilities isolate the root cause of performance issues.

#### **Key benefits of CA Cross Enterprise APM include the ability to:**

- 1) Monitor high level system health from a consolidated dashboard view**
- 2) Capture what is happening in IBM CICS (on a z/OS mainframe) and include that information in the individual transaction trace so aggregated transaction data can be viewed and analyzed in real-time.**

## CA Technologies in Application Performance Management

**Figure 1 — A Cross Enterprise APM includes Mainframe CICS Data in Transaction Trace Enabling Monitoring and Management of Mainframe and Distributed Systems Applications From a Single Dashboard**



Source: CA Technologies 2011

CA Cross Enterprise APM has a broad range of support for multiple platform types. Distributed systems support includes .Net, Java, and middleware including Websphere, TIBCO webMethods, JBoss, and SAP WebLogic. Mainframe support includes z/OS, JES2, USS, CICS, IMS, TCP/IP, MQSeries and CA Datacom/DB.

Both virtual and physical infrastructure are supported – with CA’s APM architecture integrating all these computing platforms into a single unified solution easily managed from a common dashboard.

Because all transactional performance data is captured, CA Cross Enterprise APM is used for problem isolation, root cause analysis, capacity planning, compliance/quality initiatives, SLA management, availability monitoring and incident triage. CA Cross Enterprise APM can also be used in application development and test phases to proactively identify problems before the application is put into production.

## CA Technologies in Application Performance Management

CA Cross Enterprise APM features include:

### *Simplified management*

- Dashboard provides status display to assist in identifying trends and anomalies;
- Customizable graphical dashboard displays can be tailored for individual users;
- Application triage mapping (see Figure 2 next page) enables IT personnel to discover and triage application performance issues across functional silos;
- Integrated with other CA solutions: CA CMDB, CA SPECTRUM Service Assurance, CA NSM, CA Automation Suite for Data Centers, and can monitor CA SiteMinder and CA Service Desk;
- Third party integrations include HP Operations Center, HP Open View, HP BAC, Netuitive, IBM Tivoli, Microsoft Systems Center Operations Manager, BMC Event Manager, 3Tera AppLogic;
- Business process mapping provides a visual map of services;
- Web-based, client-server and mainframe support enables all platform types to be managed by a single solution; and,
- Links computing “silos” for quicker problem resolution in large enterprises that span multiple geographies and time zones.

### *Application lifecycle management*

- Proactive problem identification in pre-production (development, test, QA) and production environments speeds time-to-market and facilitates problem resolution; and,
- Analytics engine models application behavior so applications can be simulated during testing with no impact on users.

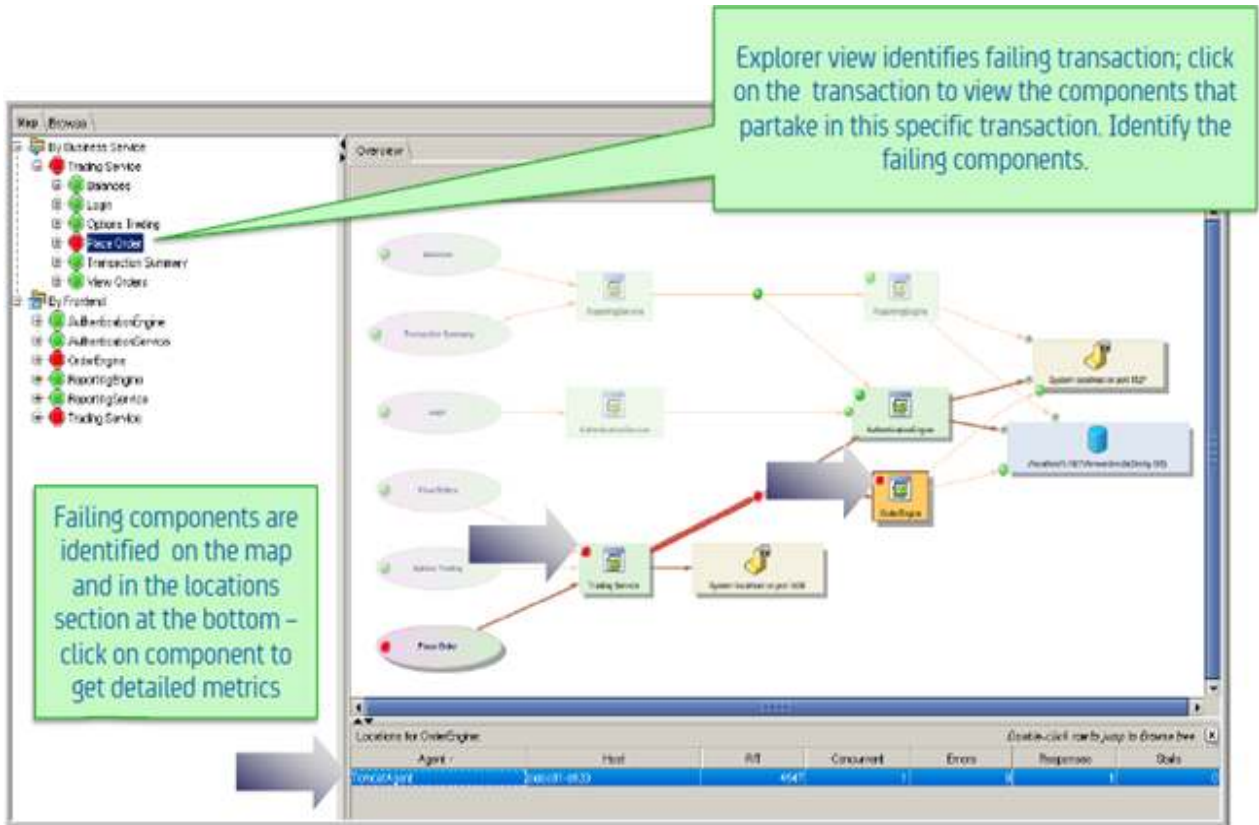
### *End-user experience management*

- End-user experience management combined with deep-dive diagnostics;
- Problems linked to end-user experience, so issues can be prioritized based on business impact and/or type of affected user; and,
- SLA reporting summarizes performance, availability and end-user experience data.

### *Detailed performance data and analytics*

- Application aware infrastructure management links infrastructure issues to application performance;
- Automatically launched TCP or ICMP traceroutes identify the slowest hop in a data path when network performance issues arise;
- Detailed analysis on scope, severity and business impact of problems as well as cost, resource utilization and configuration information; and,
- Autodiscovery visibility into web apps and SOA and underlying infrastructure.

***Figure 2 – APM Application Triage Map: Dynamic Transactional Mapping in Real Time***



Source: CA Technologies 2011

## ***CA Technologies Differentiators***

CA Cross Enterprise APM's support for transaction tracing in both mainframe and distributed systems environments is a major differentiator and particularly important for large enterprise customers. CA APM (distributed systems component) is platform independent and can be used in Java, .Net and mixed platforms, so IT users have a single tool that can be used to integrate data collection and display, easing management and improving efficiency. Integration with CA SYSVIEW enables support for both mainframe as well as distributed systems providing visibility across enterprise infrastructure. The ability to track transactions in physical, virtual and cloud and hybrid infrastructures enables customers to employ a range of application delivery models, while still retaining the ability to monitor performance and SLAs.

CA Cross Enterprise APM is complemented by other products in the CA service assurance portfolio that can offer additional integrated services. Other APM vendors don't offer the breadth that CA does, and in many cases must offer additional capabilities through partnerships. For example, CA eHealth Performance Manager provides alerts of potential bottlenecks, degradation and impending failures and reports the need for repair, reconfiguration or capacity upgrades by collecting statistics from networks, systems and databases. CA Spectrum Service Assurance (SA) correlates and analyzes information from

## CA Technologies in Application Performance Management

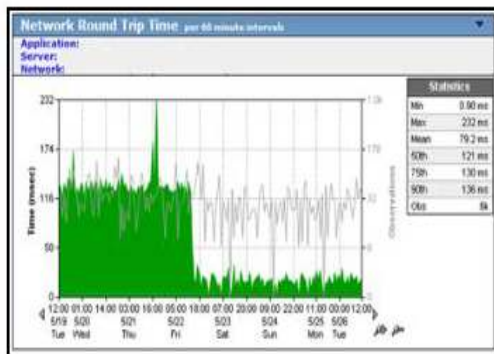
infrastructure, application performance and other management tools used to manage various infrastructure elements. In real time, CA Spectrum SA visualizes service components end-to-end, dynamically calculates how they impact services when their status changes, and performs root-cause analysis.

CA's new Unified Service Model is a Dynamic Real Time Operations model that is continuously updated from the individual information repositories from both CA and third party solutions. Because this is a real-time model with near-continuous data feeds, configuration and other changes that may affect service delivery levels are more current than static implementations that require manual intervention to update CMDB-like repositories.

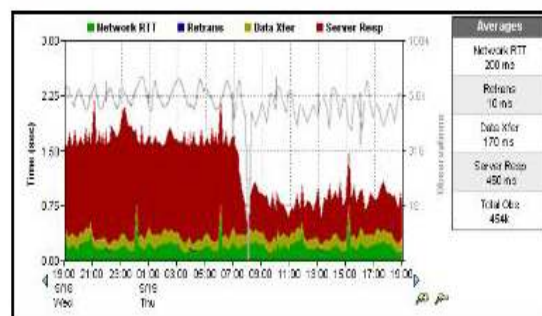
Out-of-the box support for SOA and leading middleware provides dynamic and automatic discovery simplifying management of complex and dynamic infrastructure. And CA Cross Enterprise APM can be used throughout the application lifecycle – in pre-production to identify potential issues prior to application roll-out, and in production to monitor performance, identify problems proactively and link those to their effect on end-user experience (See Figure 3 below for examples).

**Figure 3- Decision Support Throughout the Application Lifecycle**

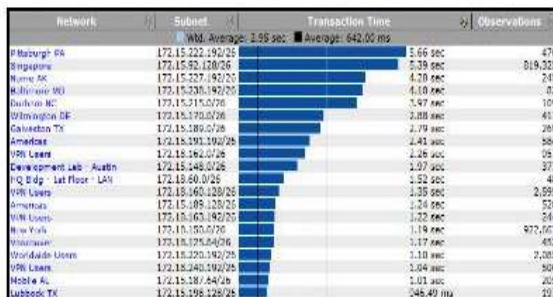
### 1. Document the results of QoS changes



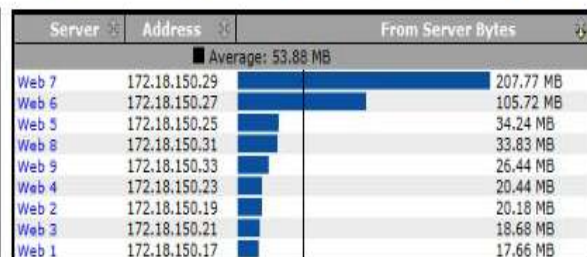
### 2. Prove the value of a server upgrade



### 3. Compare network latency across sites



### 4. Evaluate the performance of a load balancer



Source: CA Technologies 2011

## CA Technologies in Application Performance Management

### *Summary Observations*

*Clabby Analytics* has been closely following the application performance management and business transaction management market segments over the past year. We believe that as businesses increasingly adopt cloud-based business models in heterogeneous virtualized environments, APM and BTM tools are essential.

As we examined CA Technologies CA Cross Enterprise APM, what we found is that it offers a complete set of management tools for proactive monitoring and management of application performance. It provides a deep-dive diagnostic capabilities with end-user experience monitoring, and the broad support for a range of operational and IT environments including mainframe and distributed systems.

As we compared CA Cross Enterprise APM to other APM and BTM product offerings, what we found is that it is:

- *Capable of integrating CICS transaction metrics into transaction trace* — enabling an end-to-end composite view of enterprise application performance;
- *Surrounded by a whole suite of systems, storage, network, application, and database management products* — products that can help troubleshoot problems across the entire spectrum of information systems environments;
- *Part of an even larger unified service model* — that filters, correlates and presents data based on organizational roles with specific responsibilities, eliminates much of that complexity; and,
- *Graphically/dashboard driven* — information is displayed in a friendly dashboard view that presents the appropriate level of detail of all transaction information to IT managers and administrators, making the product easier to use than older, character-driven management environments.

But what really stuck with us was CA Technologies' statement that they approach and work with customers as strategic partners. With CA Technologies' huge installed base, leadership position in IT management software, industry expertise, and the vast resources devoted to selling and supporting software, CA Technologies is certainly in a position to do just that. For global enterprise customers who are considering public, private and hybrid clouds, APM tools are essential. And when buying APM from CA Technologies, buyers are purchasing a product from a large, well established company with a broad and deep management portfolio, a large research and development budget, a major commitment to the application management marketplace, and global reach.

---

**Clabby Analytics**  
**<http://www.clabbyanalytics.com>**  
Telephone: 001 (207) 846-6662

© 2011 Clabby Analytics  
All rights reserved  
April, 2011

*Clabby Analytics is an independent technology research and analysis organization that specializes in information infrastructure and business process integration/management. Other research and analysis conducted by Clabby Analytics can be found at: [www.ClabbyAnalytics.com](http://www.ClabbyAnalytics.com).*