Application Performance Management: New Opportunities Demand a New Approach
Introduction

On an ever-increasing basis, the typical organization’s core business processes rely on a combination of applications and the supporting IT infrastructure. One of the implications of that situation is that if those applications, or the infrastructure that support them, are not performing well, then neither are those core business processes. In most cases, when a core business process is not performing well, the company loses revenue.

The traditional approach to managing application performance that most IT organizations have implemented has three key characteristics:

1. It focuses on the production environment
2. It focuses on managing individual technology domains with the assumption that if each domain is performing well, then the application is performing well
3. The tools, and the information they provide, are used entirely by the IT organization

The traditional approach to application performance management is fundamentally flawed. One manifestation of those flaws is that in the majority of cases when the performance of an application begins to degrade, the degradation is noticed first by the end user and not by the IT organization. Another manifestation of those flaws is that in the majority of instances in which a business critical application is performing badly, the IT organization is unaware of the cause of the degradation and so has to bring together a team of people to identify the cause and resolve the problem. This approach is resource intensive and tends to significantly increase the amount of time it takes before the application and the related business processes are again performing normally.

One goal of this white paper is to describe an innovative approach to application performance management that dramatically increases the efficiency and effectiveness of the processes that IT organizations use to develop and manage applications. This new innovative approach results in a reduction in the amount of time it takes to troubleshoot application performance issues and it enables a company’s business unit managers to make informed decisions that impact the functionality and performance of an application during the development process. Another goal of this white paper is to describe how this new innovative approach can enable IT organizations to better manage application performance and can simultaneously provide a company’s business unit managers with insight into their key business processes. To help to achieve those goals, this white paper will incorporate the results of a survey that was distributed in April 2012 to the subscribers of Webtorials. Throughout this white paper, the 190 IT professionals that completed that survey will be referred to as The Survey Respondents. In addition, this white paper will incorporate the results of an interview that was conducted with a senior performance engineer and a manager of performance engineering at a major financial institution. Throughout this white paper, the company that was interviewed will be referred to as The Financial Institution and the interviewees will be referred to respectively as The Performance Engineer and The Performance Manager.

The Emerging Environment

The introduction identified three of the key characteristics of the traditional approach to managing application performance. Another characteristic of that approach was highlighted by The Survey
Respondents in their response to the question “When your IT organization is in the process of either developing or acquiring an application, how much attention does it pay to how well that application will perform over the WAN?" Roughly three quarters of The Survey Respondents indicated that their IT organization places at most moderate emphasis on performance while either developing or acquiring an application. Given that the performance of business processes is closely linked to the performance of the enabling applications, this means that in the vast majority of instances when a company is acquiring or developing a new application, at most a moderate attempt is made to understand how that new application will impact the performance of key business processes and the associated revenue.

IT organizations currently have a number of opportunities to provide demonstrable business value. However, as described in *The Why and the How of Building Application Performance into Application Development*, the adoption of these opportunities will further increase the difficulty associated with application performance management. This increased difficulty further adds to the requirement for IT organizations to adopt an innovative approach to managing application performance and the associated business processes. The opportunities facing IT organizations, and the related business benefits include:

- Server Virtualization
- Cloud Computing
- Mobility

**Server Virtualization**

In order to quantify the interest that IT organizations have in server virtualization, The Survey Respondents were asked to indicate the percentage of their company’s data center servers that have either already been virtualized or that they expected would be virtualized within the next year. Their responses, which are shown in Table 1, highlight the strong and growing interest that IT organizations have in virtualizing their data center servers.

<table>
<thead>
<tr>
<th>Have already been virtualized</th>
<th>None</th>
<th>1% to 25%</th>
<th>26% to 50%</th>
<th>51% to 75%</th>
<th>76% to 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18%</td>
<td>30%</td>
<td>25%</td>
<td>16%</td>
<td>11%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expect to be virtualized within a year</th>
<th>None</th>
<th>1% to 25%</th>
<th>26% to 50%</th>
<th>51% to 75%</th>
<th>76% to 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11%</td>
<td>28%</td>
<td>24%</td>
<td>25%</td>
<td>12%</td>
<td></td>
</tr>
</tbody>
</table>

The way to read Table 2 is that currently 27% of IT organizations (i.e., 16% + 11%) have already virtualized the majority of their data center servers and that percentage is expected to increase to

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1 Most applications are developed over a Local Area Network (LAN) but once put into production, they run over a Wide Area Network (WAN). LANs and WANs have notably different characteristics and these differences often mean that an application that runs well over a LAN runs poorly over a WAN.

37% within a year. According to The Survey Respondents the great interest in server virtualization is driven primarily by two factors. Those factors are that the deployment of server virtualization significantly:

- Reduces both CAPEX and OPEX.
- Increases the ability of the IT organization to respond to new business demands and to increase application availability.

Cloud Computing

While there is not a definition of cloud computing that is universally agreed to, it is generally agreed to that there are three forms of cloud computing\(^3\): public, private and hybrid. Public cloud computing refers to companies acquiring applications and infrastructure services from a cloud service provider (CSP) on what amounts to a rental or pay for use basis. Salesforce.com is an example of a popular public cloud computing solution. Private cloud computing refers to IT organizations implementing the same techniques as CSPs do in an attempt to offer solutions that are similar to those provided by CSPs. These techniques include virtualization and automation. Hybrid cloud computing refers to an IT environment that is comprised of both public and private cloud computing solutions.

The Survey Respondents were asked to indicate that factors that are driving their company to implement cloud computing. The two factors that were mentioned the most frequently were:

1. Lower cost
2. Reduce the time it takes to deploy new applications and services

Because of the compelling benefits that it provides, the majority of IT organizations have already implemented cloud computing and the implementation of cloud computing is expected to increase significantly over the next few years. “The worldwide market for public cloud services will grow 19.2% in 2012 to $111 billion, up from $93 billion in 2011,” according to Gartner’s Forecast Overview: Public Cloud Services, Worldwide, 2011-2016, 3Q12 Update\(^4\). Gartner forecasts that the public cloud services will grow to $211.85 billion by 2016. “Gartner is forecasting a CAGR for IT spending of 3.5% from 2011 through 2016, while the public cloud services spending compounded growth rate is forecast to be almost 18% over the same forecast period.”

Mobility

Over the last few years there has been a dramatic growth in the number of mobile employees. Up until a couple of years ago, most IT organizations attempted to control the types of mobile devices that could access the corporate network. For example, it was common two years ago for IT organizations to either not allow any user owned devices to access the network or to standardize on one device, usually a Blackberry, which would be allowed network access. The last few years, however, have seen a dramatic shift driven by the desire on the part of employees to bring an

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increasing array of smartphones and tablet computers to work and to use those devices to access applications. Now most organizations have adopted the bring your own device (BYOD) movement and as a result, these organizations now allow a wide variety of user owned devices to access their network.

The combination of mobility and BYOD provides a number of significant business benefits, including:

1. Improved employee productivity
2. Enhanced collaboration
3. Increased employee retention
4. Reduced spending on sourcing of end user devices

The Business Value of Application Performance Management

The preceding sections of this document identified a number of reasons why effective application performance management is important to business managers. Those reasons included that fact that effective APM is needed to:

1. Ensure that when applications are put into production, that the applications and the business processes that they support are exhibiting optimal performance.
2. Minimize the amount of time it takes to identify and resolve the cause of degraded application performance and the related degradation in the performance of the associated business processes.
3. Enable organizations to fully realize the opportunities presented by virtualization, cloud computing and mobility without sacrificing the ability to respond to the associated management challenges.

In addition to the opportunities facing IT organizations, there are opportunities facing business managers that also require a new, more effective approach to application performance management. One of these opportunities results from using application performance management tools during the application development process and was highlighted by the interview that was recently conducted with The Performance Engineer and The Performance Manager. In that interview, The Performance Engineer pointed out that there is a lot of focus within The Financial Institution on setting and meeting SLAs. He gave the example of where the SLA of an application that was recently under development called for a five second response time, but that the pre-production testing they did showed that there would be a nine second response time. This data was brought to their business partners because “It is the business partners that have to determine how they want to spend their funds. They could require code changes or they could require broader architectural changes.” The Performance Engineer went on to say that the pre-production test data that they bring to their business partners helps the business partners decide how much of their funds they will spend on the functionality of a new application and how much they will spend on the performance of that application.

The Performance Manager emphasized the importance of starting to do performance testing early in the application development process and to continue with the testing throughout the application development process. She added that “We are talking about millions of dollars to develop these
applications and if there is a performance issue on a key transaction, our business partners want to know about that early on so that they can make the decision whether or not to shift additional resources to the project.”

Another opportunity facing business managers that also requires a new, more effective approach to application performance management is that application management can provide business managers with valuable insight into the transactions that support their key business processes. This insight can either come directly from the application performance management tools or from these tools used in conjunction with other business intelligence (BI) tools, and in either case the results should be presented in an easy-to-understand dashboard.

For example, using application performance management tools, business managers can monitor the number of:

- People who made a purchase at a store
- Packages that were shipped and the number of people who tracked their shipment
- People who logged onto their bank account and checked their balance
- People who moved money from one account to another account
- Music and/or movie downloads
- People who added money to a pre-paid store card

Using the first element in the above list as an example, combining application management and BI tools, would enable a business manager to know not just the number of transactions, but how much was spent, both in total and by categories such as the size of the transaction.

**Summary and Call to Action**

While the vast majority of IT organizations have already implemented application performance management, only a small minority of IT organizations have realized the promised benefits. The inability of IT organizations to fully realize the promised benefits of application performance management has a significant business impact because in the majority of instances in which the performance of a business critical application is performing badly, the company loses revenue.

IT organizations must modify their approach to application performance management in order to minimize both degraded application performance and the associated reduction in revenue. As IT organizations are making these modifications they must be cognizant of the fact that a number of opportunities are emerging that will both further exacerbate the difficulty of the existing management challenges as well as create some new challenges.

The key opportunities facing IT organizations include:

- Server Virtualization
- Cloud Computing
- Mobility

The key opportunities facing a company’s business managers include:
• Ensuring that the applications that are developed or acquired will effectively support business processes and revenue generation
• Gaining insight into the performance of their key business processes

In order to provide benefits both to the IT organization and to the business units, the new approach to application performance management that IT organizations need to adopt must have a focus not on technology domains, but on business transactions. In order for this new approach to enable IT organizations to rapidly identify and resolve the cause of degraded application performance, the new approach must include the ability for end-to-end monitoring of every transaction, from the end user through to the corporate data center and in many circumstances, off to a cloud service provider. In order to maximize the business value of application performance management tools, these tools should also offer an easy-to-understand dashboard that provides business managers with insight into the performance of their key business processes.

A major component of the new approach to application performance management is the ability to test for application performance both during application development as well as prior to implementing a significant change to the IT infrastructure such as mobility, server virtualization or cloud computing. This follows because having this ability enables IT organizations to both eliminate most, if not all, of the potential sources of degraded application performance and it also enables the company’s business managers to influence the development of applications, or the implementation of changes, that impact their business processes. The business value of using application performance management tools in pre-production increases dramatically if the IT organization also uses those same tools to manage the ongoing performance of that application. This follows because if the application development teams and the operations team have a common view of the application and the factors that cause performance degradation, this dramatically reduces the amount of time and resources that it takes to identify and resolve the cause of degraded application performance.