WHITE PAPER

Business Transaction Management: Facilitating the Management of Virtual Environments

Sponsored by: OpTier

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IDC OPINION

Virtualization is fast becoming a mainstream technology for enterprises looking to lower costs, improve the operational effectiveness of their IT infrastructure, and better align business processes with IT. But with the flexibility in responding to changing business needs and other benefits provided by virtualization comes the challenges of obtaining visibility and managing the multiple logical representations of physical IT resources. As virtual machines (VM) are increasingly being used in production, better manageability of these highly dynamic virtual environments is becoming a top priority for IT organizations.

Virtualization management challenges are exacerbated by the evolution of IT infrastructure, which has become a complex multi-tier environment where application components are spread across multiple systems. As a result, an organization's ability to monitor and control application performance effectively across the physical and virtual layers is significantly hampered.

One emerging technology that can help address the problem of managing performance in a virtualized environment is Business Transaction Management (BTM). BTM focuses on business transactions as the focal point for managing applications. It can bring a most valuable perspective to managing virtual and dynamic IT environments by providing granular visibility into each transaction executed by any user at all times. This level of granularity provides a business-focused mechanism for understanding and controlling multiple moving parts – both virtual and physical at the infrastructure level – from a business perspective.

SITUATION OVERVIEW

Introduction

Virtualization has become a key requirement for enterprise data centers, to help IT departments reduce costs and improve service delivery, among other things. Offering such benefits as improved utilization and consolidation of computing resources and reduced time to deployment of new applications and IT services, virtualization is a key enabler of Dynamic IT, which IDC defines as a model for creating a high-performance IT capability that can support the rapid pace of business change. Virtualization is also a very likely candidate to serve as the enabler of true dynamic applications, especially in Service Oriented Architectures (SOA) that are emerging as the computing platform of tomorrow.

Virtualization supports these models by transforming physical IT resources into logical pools that can be allocated according to changing business priorities and needs. The

software creates the impression of a single computing resource for the end user, even though the actual computing environment might be made up of distributed systems housed in data centers across the globe. Virtualization can break the link between a given function and the underlying systems, meaning that functions can survive the loss of their original host systems.

In enterprise data centers, virtualization is commonly used to make a single, large system appear to be many systems, capable of running multiple operating system instances and/or applications in isolation on dedicated hardware resources. In addition, virtualization is increasingly being used for logical clustering, which makes many systems appear to be a single computing resource running in a single operating environment (to increase availability by allowing workloads to be moved to alternate hardware resources via virtual machines).

The virtualization market is growing strongly. In the next few years, virtualization is expected to expand further and deeper into enterprise-wide implementations. The rapid adoption of virtualization solutions does not come without a downside, though. Organizations implementing virtualization are often faced with a number of challenges in controlling and managing the multiple VMs deployed in their data centers, including:

☑ **Complexity**: The move to a virtual environment adds another layer of abstraction, further detaching business activities executed by end users from the physical process and machine on which requests get executed, making an already daunting task of troubleshooting (e.g., tackling performance issues) much more complex. Virtualization is often used to help consolidate data center components by moving to a shared execution environment. This move typically results in further complications, such as difficulty in knowing which applications are utilizing the same shared environment at any given moment – and to what extent.

☑ **Loss of Visibility:** In virtual environments, multiple application instances, or their underlying components, can be running on multiple physical servers, allowing for rapid workload re-allocation or distribution in cases of application failure or underperformance. This capability is geared towards meeting higher server utilization goals while assuring that service delivery requirements are met. While this method can clearly improve application performance and manageability, it also presents a serious challenge to application owners and datacenter managers in terms of understanding where a service, or transaction, is actually running. Such visibility is essential for ensuring proper function of applications, as well as customer satisfaction.

☑ **Application Contention:** Virtualization creates the impression of having more computing resources that can physically be allocated in run-time to meet varying application demands. One common problem in virtual environments is resource contention between VMs hosted on the same system. In cases where one VM consumes more computing resources (e.g., CPU, memory, disk space, network resources), the performance of business-critical applications running on other VMs on the same host are likely to be affected.

These risks, as well as others related to the adoption of virtualization, often result in disruptions to IT operations. For example, application contention problems might lead to service delivery violations when a given application is not getting the resources that it needs to run appropriately. In addition, the dynamic nature of virtual environments,

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where servers are frequently provisioned and de-provisioned in response to changing demands, makes it difficult to estimate resource requirements on an ongoing basis. These operational IT issues might not only keep organizations from fully capitalizing on the benefits of virtualization, but also potentially impair business performance due to underperformance of critical applications.

BTM to Ease Virtualization Management Pains

As virtualization is increasingly being used by organizations to support business critical applications such as customer-facing applications, front-office applications, and ERP and CRM, IDC expects the demand for virtualization management solutions to rise significantly in the coming years.

Virtualization makes IT infrastructure much more difficult to manage, requiring a CIO to have fewer, more highly-skilled professionals on hand to help ensure that the environment is always available. Current virtualization management solutions focus on the VMs themselves, both from an administrative and resource allocation point of view.

To confidently run business-critical applications on a flexible, virtual infrastructure, such management technologies must evolve to include visibility and control over service delivery, business transactions, and end-user experiences across virtual boundaries.

A key emerging technology that facilitates the management of distributed applications in virtual environments is Business Transaction Management (BTM). BTM introduces a new approach to managing applications in complex computing environments and bridges two major trends in the IT management space – 1) the need for more granular application management that can address the highly distributed and fragmented structure of modern applications (especially composite applications); 2) the need to manage IT infrastructure from a business perspective. Thus, BTM represents the next step in the evolution of IT management.

Another notable trend related to BTM is the growing demand for managing IT from a business perspective, as manifested in emerging practices such as Business Process Management (BPM) and Business Service Management (BSM). BTM addresses this need by tracking and monitoring all business transactions executed by all users on an ongoing basis – effectively mapping business activities, down to the specific IT resources that they utilize at any point in time, in their delivery.

BTM can provide organizations with capabilities such as identifying transaction failures and reasons for failure, pinpointing bottlenecks within transaction flows and mapping them to the infrastructure, and measuring transaction completion time against service delivery requirements. Some solutions in this space also provide the proactive capabilities of detecting problems (e.g., load peaks, latency) before they affect the business. Other solutions allow for prioritizing specific transactions or transaction types based on pre-defined rules (e.g., size of transaction, identity of a customer) by appropriately allocating computing resources in a dynamic manner.

These capabilities of BTM are highly relevant for addressing virtualization management challenges such as the complexity, application contention, and business visibility issues cited above. These problems are further exacerbated in modern IT architectures (i.e., grid, clustering, and SOA) in which virtualization allows the processing of a transaction to be distributed over multiple, dynamically allocated

computing resources. In these environments, BTM delivers essential visibility and control over business transaction paths through the different physical and virtual tiers, identification of performance problems, and understanding the business context of technical issues.

For example, an intensive computing task in a virtualized grid infrastructure typically spans multiple nodes, each of which performs a different part of the task. This division provides organizations with flexibility in allocating computing resources to given tasks, thus enabling them to respond faster to changing business demands. But given the difficulty of keeping track of each node and its performance, and correlating all the multiple sub-tasks, the agility achieved by virtualization often requires a trade-off in the form of loss of visibility (from an IT and business perspective).

BTM addresses these issues by pinpointing and potentially de-allocating specific under-performing grid nodes that slow down a business transaction. In addition to improving the utilization of virtual resources in distributed computing environments, BTM can, in fact, facilitate the shift to distributed computing environments by providing a more efficient means to measuring performance, and a framework for aligning IT with business objectives.

OpTier BTM Solutions

Founded in 2002, OpTier is an emerging BTM vendor. The company has recently completed a third round of financing, bringing the total capital raised since its inception to $47 million, and has added Cisco as a strategic investor. OpTier's customers include large enterprises such as Wachovia and Blue Cross Blue Shield of Minnesota. The company's investors include Pitango, Carmel Ventures, LightSpeed, and Gemini.

OpTier's CoreFirst® product uses lightweight agents deployed at the different tiers of an application environment to automatically detect, track, and analyze transactions across all tiers of the IT environment, and creates "live" and historical topology maps of business activity at the transaction level, essentially linking the business context with underlying IT components. In addition, the product enables the assurance of business transaction service delivery and pinpoints performance problems in real-time. Another key functionality provided by CoreFirst is the option of allocating IT resources to prioritize core business transactions or specific users according to defined business-driven policies. At the same time, non-critical transactions such as routine administrative processes can be treated as a lesser priority and accordingly allocated fewer resources.

OpTier acknowledges that the notion of using CoreFirst's capabilities for virtual environment management was driven by customer demand. The company has recently partnered with Sun Microsystems to support its Solaris 10 virtualization capabilities and with DataSynapse, a provider of application virtualization solutions. OpTier has made CoreFirst virtualization-aware and is actively engaged with Sun in doing business at several large Fortune 500 companies.

DataSynapse's GridServer creates a grid computing environment in which application workloads can be distributed over existing IT resources in real time, based on changing business needs. CoreFirst provides GridServer customers with business transaction visibility and real-time, cross-tier monitoring capabilities. This combination enables customers to obtain a business view of transactions in grid environments and

define and optimize resource allocation policies based on the predicted impact of business transactions.

OPPORTUNITIES/CHALLENGES

Virtualization management challenges are expected to exacerbate over the next few years, as virtualization continues to grow within enterprise data centers. Looking forward, new technological approaches will be required to address related problems such as complexity, loss of business visibility, and day-to-day operational IT problems. One such approach is BTM, which facilitates the management of virtual environments by providing granular visibility into business transactions across virtual and physical tiers.

As an emerging BTM player, OpTier is focused on expanding its enterprise customer based. To accomplish that objective, the company should be able to address various types of enterprise deployment scenarios. In light of the growing adoption of virtualization technologies in enterprise production environments, teaming with virtualization partners such as Sun and DataSynapse, and showcasing the unique role that BTM can play in managing complex virtual environments, are important for OpTier's future growth. Looking ahead, to capitalize on this market opportunity OpTier should seek additional partnerships with leading virtualization technology providers and management vendors.