



## Research Report

### Following Transactions Through the Cloud: Better Put OpTier in Your Budget

#### *Executive Summary*

So your organization has chosen to build a computing cloud (a highly-virtualized, distributed computing architecture). Congratulations!

Now, let's see your budget to implement this cloud (bet it looks something like this):

- X amount for virtualization software;
- X amount for additional virtualization infrastructure and management software;
- X amount for physical systems management software;
- X amount for distributed resource management software; and,
- X amount for deployment/integration services.

Spend this money and presto — you'll have a cloud — right? Wrong-O. What you're missing are two very important ingredients: 1) where's the line item for security software and related testing; and, 2) where's the line item for application/transaction management?

***Cloud computing promises many things: potentially limitless scalability; on-demand infrastructure: services and applications; ease of management; better performance; and improved capacity utilization. But most clouds also need to be secured (data needs to be protected and access rights need to be enforced); and, for mission critical applications, enterprises must be able to track what happens once a transaction enters the cloud***

Securing a cloud is not radically different from securing a typical distributed computing environment. To secure your cloud, follow the best practices advice put forward by the ITIL (IT Infrastructure Library) organization. A good book on this topic can be found here: [http://www.iso27001security.com/html/itil\\_v3\\_security\\_book.html](http://www.iso27001security.com/html/itil_v3_security_book.html).

But within a cloud – troubleshooting, managing transaction flows, reporting on SLA's, change management, performance tuning and capacity planning – simply can't be done without service management tools. For clouds to gain widespread acceptance, businesses will need business transaction management. To manage business transaction flows within a cloud, you can use sniffers, a time correlation approach, and a number of discrete tuning and capacity planning tools to troubleshoot your cloud. Or you can turn to a vendor that has architected an integrated application/transaction service management solution for the cloud. Sniffers can be effective in trouble-shooting in a *siloes* environment, but only integrated application/transaction tools can *follow a transaction* through the cloud. As a result, *Clabby Analytics* suggests that you take the integrated transaction management route.

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Business Transaction Management (BTM) software (service management software that is capable of tracking transactions and business process flows through the cloud) is a growing market with vendors offering a range of different approaches. OpTier is one such vendor. Clabby Analytics likes the OpTier approach, which focuses on business transactions, and captures not just the transactions themselves, but the business context of that transaction as well. In this *Research Report*, we take a closer look at the OpTier product set and show how this software can be used to troubleshoot transaction flows and monitor business events in real-time within a cloud environment.

### ***What Is BTM Software?***

The BTM market is an offshoot of the application performance management (APM) market. As defined by Wikipedia, APM “refers to the discipline within systems management that focuses on monitoring and managing the performance and service availability of software applications.” APM tools measure the resources used by a particular application as well as the response time of the application - to manage and optimize the end-user experience. But APM products do not capture all the transaction data – APM uses a sampling technique which takes a subset of transactions and averages them - so potential issues can be missed. APM tools can monitor and report on a specific tier – network, server or database for example – and then provide in-depth metrics on that tier. Unlike BTM, APM will not detect problems happening between tiers – these blind spots can only be detected by a BTM tool. As a result, APM tools are most useful when used in conjunction with a BTM tool to provide a “deep dive” into the problem area once it is identified. Because BTM follows the path of each and every transaction, BTM provides autodiscovery of transaction flows, tracking of CPU resource utilization for each transaction flow, and automatic detection of configuration changes. One other benefit of BTM is the automatic classification of transactions in a business context. BTM delivers end-to-end transaction tracking throughout all tiers of the transaction - very important in virtualized information systems. Particularly in cloud environments, businesses will want to employ both APM and BTM.

BTM software fits into a category of software known as *IT service management*. IT service management is exactly as its name implies: a way to manage a collection of IT services. A more formal definition can be found at [www.itil.org](http://www.itil.org):

***“IT service management is the framework which plans, monitors and controls the quality of the delivered services. The correcting variables are derived from the business targets and customer orientation as well as cost optimization”.***

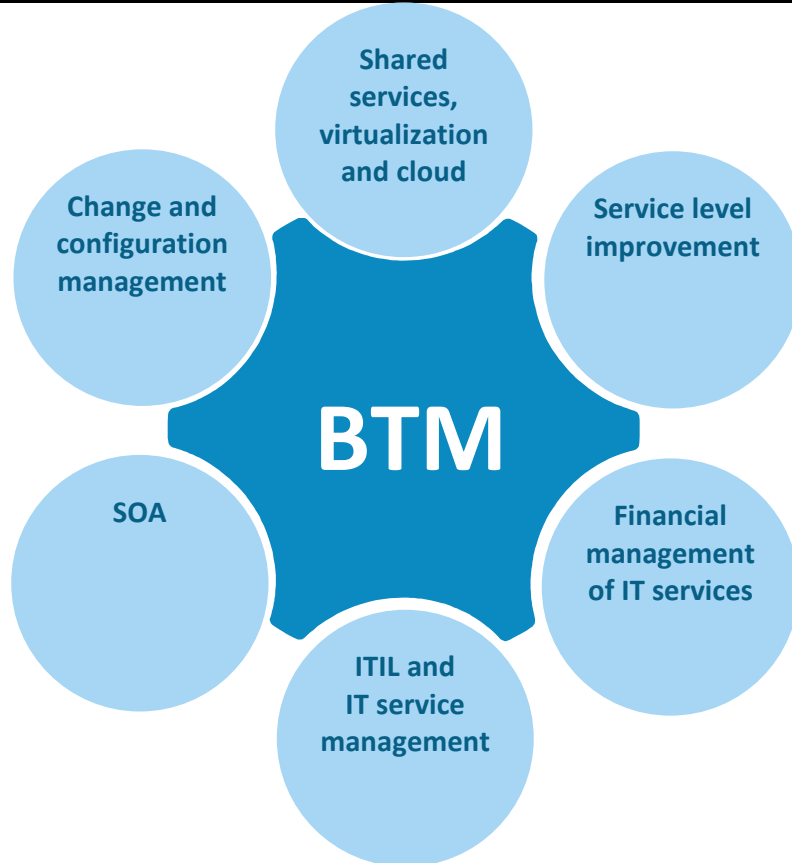
***To align with these “business targets”, service management focuses on services that IT delivers to the business such as e-mail or accounts payable/accounts receivable/general ledger or corporate intranet — as opposed to focusing on physical systems management or database administration or other IT activities.***

IT service management software automates redundant, repetitive IT tasks, integrates those tasks into a single group of common services (such as availability services, or storage services, or security services, etc.) — and then provides a dashboard view of how those integrated tasks are performing. From these dashboards, services can be monitored and controlled — and corrective action can be taken if need be.

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Typically, BTM service management software provides for the management of shared services and virtualization, change and configuration management, service-oriented architecture management, and IT resource management and optimization (as illustrated in Figure 1). BTM service management software is essentially “glue code” for these types of services.

***Figure 1 — BTM Software — “Glue Code” for Transaction Service Management***



Source: OpTier — May, 2010

### ***What Problems Does OpTier’s BTM Suite Solve?***

Computing clouds are amorphous. Resources in cloud environments are constantly in flux — they are placed into resource pools; then reallocated to perform various computing tasks; and are then ultimately returned to the virtual resource pool where they can again be reallocated to the next computing task that needs them. This constant flux can create major management challenges as information technology (IT) managers attempt to track application and business process flows across network, server and storage tiers within their organizations.

In the past, to manage applications and process flows within distributed computing environments, IT managers have used a method that involved using a network sniffer to trace application movement and activity, combined with a time correlation algorithm to isolate the source of a problem. Using this approach, a network sniffer was used to collect snippets of a transaction flow — and those snippets were then used to help isolate the

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location of a server or a process on a server that is experiencing a resource consumption spike or service elongation. By combining this data with a time correlation approach (an approach that essentially looks at time stamps when a transactional failure occurs — and then tries to find a corresponding failure that occurred at the same time somewhere else in the cloud) IT managers were able to “guess” at the source of a problem and then fix it. APM tools have issues too. Although an APM tool can do a “deep dive” into a specific tier using a tier-specific tool (database tool, Java/.NET tool, message layer tool etc.), valuable time is spent analyzing all tiers when a BTM tool could have quickly isolated the source of the problem, saving valuable IT time spent in problem identification.

Both the “sniffer” approach and APM have limitations, primarily because they cannot weave the snippets collected into a cohesive view of how a transaction behaves as it multi-hops through a morass of servers. By not being able to monitor a specific transaction flow as it makes its way through a distributed computing environment or cloud, discrete transaction problems that are low volume or that hang anywhere in a transaction life-cycle are missed. Extra effort (and sometimes a team effort) is required to help locate the source of these types of problems.

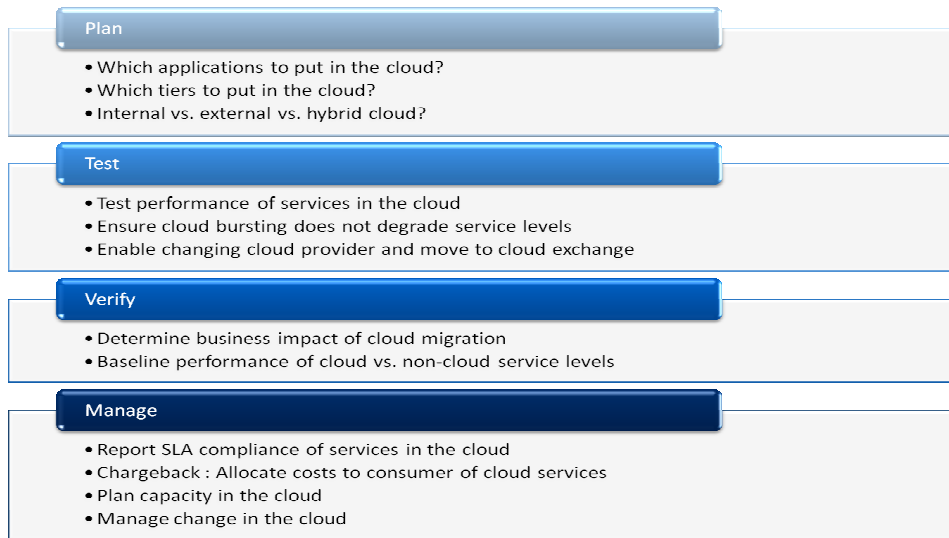
BTM offers an alternate approach. As examples, HP’s TransactionVision, MQSoftware’s Q!Pasa, and OpTier’s CoreFirst combined with Experience Manager, and a variety of IBM’s Tivoli products do *instance level transaction monitoring using a deterministic approach*. Some track the entire transaction end-to-end and other tools track within a specific layer. These vendor’s products can thread together and topologically to follow a transaction as those transactions make their way through multiple systems in a cloud. Using this approach, cloud managers and administrators can view an accurate representation of transactional dependencies, transaction resource usage, transaction service levels, and other elements that pertain to transaction management. And with this data, these managers and administrators can isolate problems in the application, database, or middleware layers — and bring in the right human resources (from application /database /infrastructure organizations) to fix those problems. This improved visibility into the path of the transaction provides insight that supports (1) better capacity planning (instead of blindly adding more servers or storage in an attempt to improve performance) (2) improved change management (by providing data that will measure the impact configuration changes) and (3) service dependency mapping (by showing if a problem in a particular layer will impact service delivery to the end user).

Of these vendors, we have seen the OpTier products demonstrated — and have spoken with OpTier executives. What stands out about OpTier is that IT managers and administrators can clearly see the progress of an application or transaction as it crosses multiple tiers within a cloud. OpTier tracks each and every transaction from end-to-end. Further, IT personnel can gather performance and resource utilization data — simplifying the process of tuning performance within a cloud, as well as assisting in providing background data needed for capacity planning. This approach is highly integrated and very accurate — making it easy to track application/transaction behavior within a cloud environment. This integration, combined with the accuracy of the data that OpTier collects, makes it possible to effectively manage transactions as they cross tiers in cloud environments. Add to this OpTier’s ability to track the business context of each transaction, as well as monitor, filter and correlate both IT and business events, including those captured by OpTier as well as

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many third-party sources (unlike other BTM tools), and you have a unique solution. The OpTier suite gives cloud administrators the visibility to manage and maximize the potential of cloud solutions, and cloud consumers the SLA and resource visibility they need in order to trust that they are getting the service they need from the cloud- for the right price.

### Figure 2 – Managing the Cloud Lifecycle



Source: OpTier — May, 2010

### *About OpTier*

OpTier is a privately held company, founded in 2002, is a maker of BTM software. The company is based in New York, and also has offices in the UK and France, and development facilities in Israel. From an earnings perspective, OpTier recently announced strong revenue growth for the second half of 2009, as well as 115 percent revenue growth year-over-year growth.

OpTier's BTM software shows that it provides a graphic, topological view of an application as it travels across tiers through the cloud. This tracking information enables IT personnel to observe application/transactional behavior as applications interact with databases as they traverse a cloud environment (this view is highly useful when it comes to troubleshooting). OpTier BTM tracks and saves *every* business transaction using a unique low-overhead technology. And this software can also provide a view of resource utilization that can assist in capacity planning, obtain a complete real-time service dependency map, manage changes without impacting users, and provide business impact data to your CMDB.

OpTier's BTM software is focused on the financial services, government, healthcare, manufacturing, retail and telecommunications industries. With numerous installations in the Fortune 1000, OpTier serves customers such as Morgan Stanley (also an investor), Deutsche Bank, Wachovia, Blue Cross/Blue Shield and Avery Dennison.

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### *A Closer Look: OpTier Business Transaction Management with Business Events Module*

OpTier's BTM Suite is an automated end-to-end business transaction tracking environment that includes real-time end-user experience monitoring, and data center flow monitoring. OpTier BTM uses software agents to discover, monitor and analyze all business transactions across all tiers – and provides these capabilities in virtualized cloud environments. Components of OpTier BTM include CoreFirst and Experience Manager. Introduced in July 2010, the Business Events module adds complex event processing (CEP) to OpTier BTM. Let's look at these components more closely.

#### *CoreFirst*

CoreFirst performs “transaction flow” detection using a patent-pending Active Context Tracking (ACT), a non-intrusive technology that tracks every transaction as it traverses each tier -following applications and transactions as they hop from server to server making database calls and performing reads and writes along the way. In real-time, ACT constructs business transactions out of smaller work units, and associates all work units with the logical business transaction instances to which they belong. ACT differentiates OpTier BTM from other message-based BTM tools (like HP's Transaction Vision and BMC Middleware Management (formerly Q Pasa!) in two ways – first, it tracks transactions end-to-end starting from the end-user, not just in the message bus environment, and second, it combines transaction information with business context. For example, rather than identifying a transaction by an ID #, the transaction is identified by the type of transaction, (a stock trade or cash transfer, for example), who initiated the transaction, and the time of the transaction. This added information provides a complete picture that links IT issues to business transactions – providing a business centric, rather than IT-centric view.

Functions performed by CoreFirst include:

- Monitoring transaction response times;
- Identifying and resolving issues in transaction sequence;
- Benchmarking business transaction performance and providing automatic alerts;
- Recording every business transaction executed including time spent and resources consumed at each tier;
- Showing bottlenecks, and tier-specific metrics from a transaction perspective;
- Identifying latency related performance issues; and,
- Providing “total cost per transaction” reports and identifying resource constraints.

#### *Experience Manager*

OpTier's Experience Manager provides:

- Standalone 24x7 end-user experience monitoring tool
- Can be used in conjunction with CoreFirst to monitor two-way transaction flow from the end-user back to systems in the data center
- Real-time visibility into application availability, response time and end-user behavior
- Historical analysis of transaction usage by users, geographies, and groups

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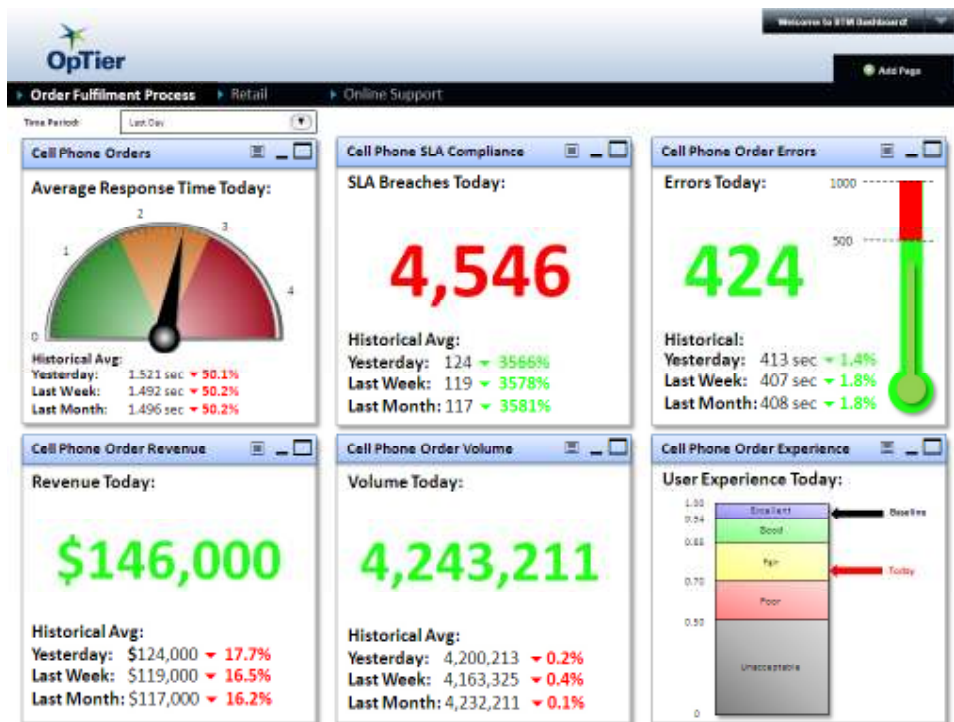
- Alerts sent regarding transactions that are not meeting their pre-defined end-to-end response time objectives and collect this information for follow-up alerts when the percentage of slow or failed applications exceeds the predefined thresholds
- Dashboards provide information about cost per transaction, number and location of users impacted, their locations, and the number of failed transactions
- Measures application performance and compares against Service Level Agreements (SLAs) and issues alerts when performance falls under pre-defined SLAs
- Determines if the source of the problem is in the network or an application tier.

### ***Business Events Module***

The Business Events Module enhances OpTier's ability to tie business events to IT operations by combining BTM and CEP capabilities. As defined by Wikipedia, "Complex event processing refers to process states, the changes of a state exceeding a defined threshold of level, time, value increment or just of a count as the event. It requires the respective event monitoring, event reporting, event recording and event filtering."

Based on a CEP technology from Aleri (acquired by SAP/Sybase), the Business Events Module (sold as an add-on to CoreFirst and Experience Manager) takes real-time event data streams from a range of sources including OpTier BTM, market data streams, internet commerce sites, files, supply chain & distribution data. This event data is filtered and correlated, and based on pre-established rules and thresholds which define business "normal" or business "abnormal", certain actions (such as sending an alert) are taken. Event information can be customized and displayed via a role-based dashboard.

***Figure 3 – Customized dashboard view reports business events***



Source: OpTier — September, 2010

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Features of Business Events Module:

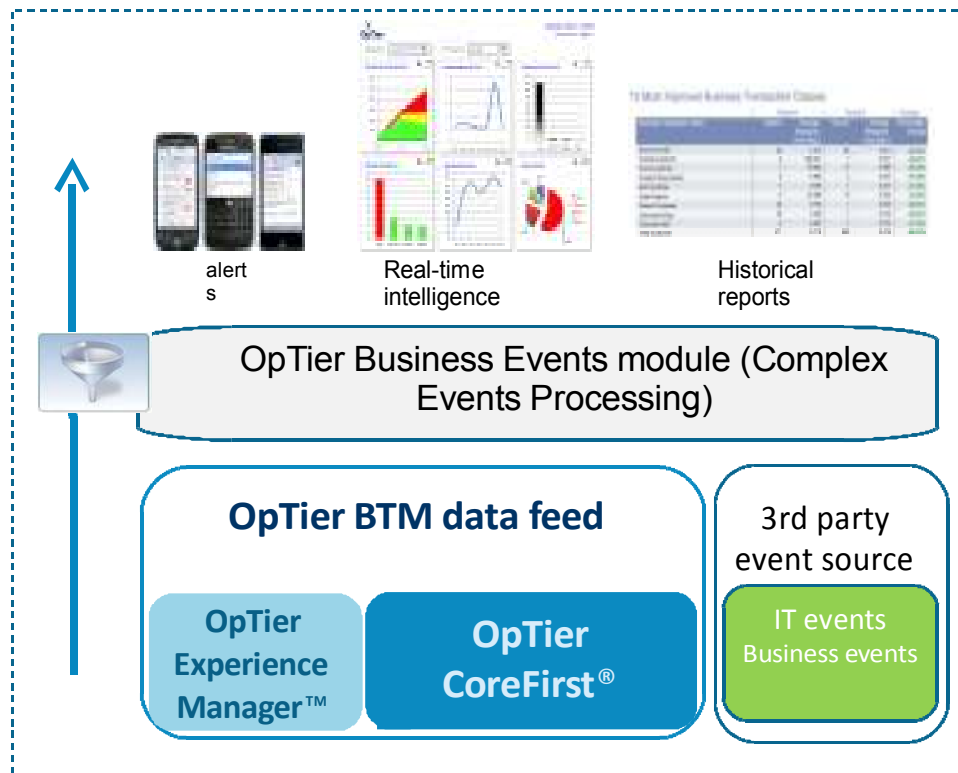
- Key Performance Indicator's (KPI's) can be customized to business needs
- Wide range of input data streams (internal and external) can be accepted, filtered and correlated
- Generates IT and business alerts (for example if stock price drops to a pre-set level)
- Compliance issues can be monitored and detected
- Real-time data collection and alerts enable proactive management
- Predict SLA failures based on historical trends

*Instead of having to use multiple tools to manage transactions in the cloud, OpTier's BTM suite provides an integrated service management view of a transaction's flow through a cloud (providing business visibility). This simplifies troubleshooting, and helps IT managers perform performance tuning, capacity planning and change management. Further, the combination of these products ensures business continuity by helping to proactively avoid outages, minimize service restoration times, reduce operational costs (especially those related to human labor), improve return-on-investment and customer service.*

*Figure 2 shows how CoreFirst, Experience Manager, and the Business Events module work together to provide a view of a business function (or business flow) and the underlying core technology that supports it. By using this product tandem, IT managers can quickly isolate problems and begin the fix process.*

**Figure 2 – How OpTier BTM and Business Events module work together to identify and report on problems**

### Continuous intelligence for better decisions



Source: OpTier — September, 2010

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OpTier Business Events module has been designed based on feedback from several key customers who requested more emphasis on business related monitoring and reporting. Some of the kinds of things that can be done with the Business Events module include:

In financial services:

- Define advanced service level thresholds/alerts on business processes and transaction activities
- In loan applications, for example, banks can understand impact of IT issue (how many loans are affected and much money is involved)
- Predict SLA failures based on historical performance data
- Use information collected in real-time to target special offers to customers

For Telecommunications' order fulfillment:

- Number of orders delivered on-time and average order process duration
- Is any step in the process causing an unusual delay
- What orders are at risk and what is the business impact
- What is the revenue impact of delivery delays

Other telecommunication examples:

- Detect deviations on normal provisioning process behavior
- Proactive alerts (for example cell tower down) to predict/prevent customer issues
- Identify process delays that impact revenue, customer satisfaction and productivity
- Streamline order handling and use for competitive advantage

### *OpTier and the Private Cloud*

It should be noted that although OpTier's business suite can be used in traditional distributed computing environments, it provides special benefits to IT strategic planners who are building private cloud environments. OpTier has customers who are using CoreFirst, Experience Manager and Business Events module in private cloud environments today. OpTier provides true end-to-end service management by including visibility into both the virtual and physical, capturing these metrics of cloud- based transactions:

1. Time per transaction - enables performance management by identifying and resolving performance issues before an impact occurs — helping to ensure that critical business transactions execute successfully in order to meet business goals and SLA commitments.
2. Resource utilization per transaction - with this information, administrators can do capacity planning. In many cases, administrators - due to lack of visibility into the cloud - will over-provision. With OpTier, capacity needs can be “right-sized”, saving money on both compute resources and management.
3. Cost per transaction - since clouds are based on a “pay-as-you-go” model, this cost data can be used for charge-backs or activity-based costing
4. Tier-specific transaction information – OpTier's role-based dashboard provides source-of-the-problem information that can be used to clearly show which stakeholder has the responsibility to fix that problem (eliminating finger-pointing)
5. Correlation of IT and Business Events – Business Events module's CEP engine collects, filters, and correlates events from a wide range of internal and external sources and provides customized dashboards, reports and alerts on business metrics.

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### *Summary Observations*

From a management perspective, clouds require a shift in management focus. IT managers and administrators have, for years, focused on the management of physical resources within their distributed computing environments. But managing resources within a cloud necessitates a shift toward the management of virtualized (logical) resources. And the management software industry is shifting toward the management of collections of “services” within the cloud (service management) — rather than the management of discrete components.

New, deterministic BTM service management products are now available to help IT managers gain insight into their amorphous cloud environments. These products help overcome the challenges of virtualized environments by providing real-time visibility of each and every transaction as it progresses through the cloud. By providing detailed metrics on time, resource utilization and cost per transaction, administrators gain useful information for capacity planning, configuration management, performance tuning, problem isolation, and pay-per-use models. And these products help lower operational costs because they reduce the amount of time a manager or administrator must spend troubleshooting the root cause of a problem — and then fixing it.

When evaluating these BTM tools, ensure that the tools that your enterprise chooses are capable of monitoring/managing transactions *across multiple tiers* (this will simplify troubleshooting). This point is critical because troubleshooting transactional problems very often involves traversing server, network, database and application tiers (and the BTM tools offered by several vendors do not have this cross-tier capability). Also, make sure the tool that your organization chooses is capable of capturing resource consumption at each tier a transaction traverses (this is important for cloud performance management and capacity planning). Look for a tool (like OpTier) that tracks a transaction from end to end, and provides auto-discovery of all transaction flows, saving time on configuration management. Lastly, select a product that is capable of linking and correlating IT and business events, and the impact that IT events will have on business outcomes (revenues, customer satisfaction, orders processed, claims handled etc.)

*Clabby Analytics* has reviewed a range of BTM and APM tools this year (for these reviews see [www.clabbyanalytics.com](http://www.clabbyanalytics.com)). After speaking with OpTier earlier in the year, we were recently updated with the introduction of the Business Events module. We are very impressed with the simplicity and thoroughness of OpTier’s BTM service management offerings and the strategic direction OpTier is taking, continuing to improve the integration between IT and business (and apparently we are not the only ones given OpTier’s strong showing in the Fortune 1000 and in large enterprise-wide installations such as Morgan Stanley and Deutsche Bank). From our perspective, OpTier is well positioned for growth as the momentum increases in cloud computing.

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