



Run your cloud

Operate for excellence

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- SUMMARY 5

A dawning horror spread through Peter's mind. As head of IT for a start-up specializing in infrared grills and the software necessary to run them, he had recently moved to the cloud for extra development, simulation, and testing computing power. Peter put together what he thought would be a basic, low-maintenance cloud, figuring it would come in handy when they ramped up staff for new releases and the summer selling season.

However, once his internal users realized they had more power, they were finding multiple ways to use it. Now they were filing tickets, complaining about performance, and requesting maintenance on their services day in and day out. In addition, Peter was surprised to find there was still a demand for grills in New England during the winter, a regional blip that he hadn't anticipated. He had thought these cloud services were short term, but now he saw that they needed regular maintenance.

EXECUTIVE SUMMARY

Cloud operations is about running and optimizing your hybrid cloud to deliver superior service by understanding the current state of your resources and how they will need to change to meet future needs. While often perceived as temporary, most cloud services live for months or even years. When you add up all the operating systems, middleware, tooling, applications, and hypervisors in the average IT environment, this management task can overwhelm many organizations with ongoing maintenance and repair.

When a cloud is designed and implemented, it is important to do three things to ensure it continues to meet business needs:

- » Proactively monitor for performance and capacity
- » Implement compliance and configuration management
- » Provide ongoing financial transparency and chargeback

PROACTIVELY MONITOR FOR PERFORMANCE AND CAPACITY

PROACTIVE SERVICE PERFORMANCE MANAGEMENT

The business relies on IT to deliver high quality of service on key applications, optimizing the end-user experience for all users and enforcing service level commitments. Once your hybrid cloud is up and running, IT will want to enforce consistent service levels for both private cloud services and externally-hosted services.

As your IT environment transitions to a hybrid data center, including both virtualized and cloud infrastructure, you need to consider the integration between current IT processes.

- » First, your monitoring and event management processes need to be updated to provide proactive and automated detection, isolation, prioritization, diagnosis, and resolution of end-to-end performance and availability issues related to dynamically changing business services. A unified performance, availability, event, and impact management solution is needed, specifically to manage high volumes of business service data and events collected across multiple platforms, vendors, and sources; to include components that are managed, but not owned, by IT.
- » Second your monitoring solution should be able to factor in recent configuration changes, as well as capacity information, when performing root cause analysis. Because changes are often the cause of performance issues, it is important to know if a change occurred just prior to a performance or availability issue. Given the volatility of the cloud environment, there is also a higher potential for capacity-related issues to impact service performance and availability. As a result, an integrated performance, configuration, and capacity management solution is needed to ensure that operations staff can quickly and efficiently isolate the cause of an issue and resolve it in the most cost-effective manner.

BMC Cloud Operations Management monitors behaviors and policies for exceptions in all attributes of a cloud service, such as resource utilization, queue sizes, user response times, and transaction volume. It proactively detects and exposes unavoidable irregularities, thus enabling you to remediate issues before the service — and your business — are affected. By integrating with BMC Cloud Lifecycle Management and BMC Remedy Change Management (for change information), BMC Cloud Operations Management provides immediate visibility into the impact of changes on performance and availability. In addition, predictive capacity alerts provide insight into potential capacity shortfalls well in advance of any service or business impact.

CONTINUOUS RESOURCE OPTIMIZATION

In the cloud, IT must continuously anticipate and meet the changing capacity needs of the business, while also ensuring optimal performance and cost. Companies are adopting continuous, business and services-aware capacity optimization as a new approach to IT resource optimization.

As organizations begin to move more of their workloads to the cloud, two things happen to capacity:

- » First, the underlying physical hardware, such as compute, network, and storage systems, is shared across more workloads, which introduces more management complexity. As the number of cloud services increases, so too do the complexity and dynamic nature of the environment, introducing more interdependencies and ongoing change among the various components. Any given component has the potential to impact many others, thus driving the need for active management and modeling of its capacity with respect to the business services it supports, as well as their key performance criteria (e.g., orders per minute). What's more, in a cloud, when services appear and disappear based on user-demand, the provisioning placement engine needs accurate and up-to-date visibility into current resource capacity in order to properly decide where and how to place services.

- » Second, there is an increasing need for IT to view its operations from a business perspective. Effective resource optimization balances cost against capacity, and supply against demand, to ensure that sufficient IT resources are available to meet current and future business requirements. Capacity management tools, therefore, should combine flexible visualization, automated exception-based analysis and reporting, and a wide range of scenario-planning capabilities to provide a comprehensive solution for ensuring cost-effective, optimal business service performance and alignment.

BMC Cloud Operations Management enables continuous resource optimization, delivering business and services-aware capacity planning for modern data centers comprised of physical, virtual, and cloud technologies. The solution lets you plan for immediate and future capacity requirements, as well as ensure existing capacity is optimized. It integrates with BMC Cloud Lifecycle Management for self-service provisioning, with BMC Atrium Discovery and Dependency Mapping to track cloud service relationships and dependencies, and with the BMC Atrium CMDB for key asset information.

IMPLEMENT COMPLIANCE AND CONFIGURATION MANAGEMENT

CONFIGURATION MAINTENANCE

Complex IT environments, whether cloud or traditional, are not static. As soon as a configuration is deployed, it begins to drift from its original desired state. This may be due to human action or to automated systems at work; may occur as part of new deployments; or may be driven by routine tasks, such as upgrading or patching components.

Cloud environments tend to evolve more quickly than traditional ones, meaning that the desired state itself can rapidly change. Simply locking down configurations would limit the usefulness of the cloud by preventing it from evolving in response to users' changing requirements.

Changes, however, occur at many different levels of the environment — from the physical or virtual infrastructure, to the operating system and basic management agents (backup, anti-virus, and security), to the database, middleware, and application levels that support the business service. Each of these levels is administered by different IT administrators, and some, like security teams, traverse all levels. In a hybrid cloud model, some levels may be administered beyond the walls of your company, as well.

Configuration maintenance, therefore, is not a trivial task. It requires the ability to compare the current live state of the system at all levels against its desired state. The comparison enables administrators to capture so-called "out of band" changes: changes that may have occurred outside of normal procedures. These could result from emergencies, or even from incomplete integrations of processes with change management systems.

The level of detail is critical to avoid "false positives" or "false negatives". False positives occur due to too much detail, thus causing superficial differences to set off alarms. False negatives occur due to too little detail, thus causing monitoring tools to miss critical distinctions. The correct level of detail will flag all real and material differences that can impact the business service.

Identifying changes is only half the job. Manually correcting those differences is often a lengthy process, which can introduce new errors. In a fast-moving cloud, users require that errors be remedied quickly and correctly, and that corrections not introduce a cascade of new problems. Therefore, automated configuration maintenance is the only way to ensure that the system's configuration does not drift from the desired state over time, while also ensuring that any corrections will happen quickly.

BMC Cloud Lifecycle Management, with its integrated BMC BladeLogic Automation solution, enables cloud administrators to review the configuration differences that have been identified, so they can determine which should be accepted and documented and which need to be remediated. For those requiring attention, automation will make only the changes required — accurately and without creating unintended consequences. By automating the entire configuration management process, the integrity of the cloud environment is assured.

COMPLIANCE MANAGEMENT

Compliance management goes hand in hand with configuration management. A similar process, compliance defines a desired state and audits regularly to ensure alignment with that state. However, compliance aligns that desired state not just with the internal needs of IT, but also with the external regulatory requirements that govern an industry, geography, or type of data. Regulatory requirements include PCI, Sarbanes-Oxley (SOX), HIPAA, CIS, and others.

There are multiple elements to ensure compliance in your cloud environment:

- » First is the decision of where to deploy workloads that are bound by compliance requirements. When a user requests a compliant workload, the cloud management system should place that workload in an approved environment, whether that be a well-secured area of a private cloud or an approved external environment. Increasingly, public clouds are being improved to meet compliance regulations, and thus are becoming a real alternative, even for these workloads.
- » Second, once placed in an appropriate environment, the workload must be continuously audited against that desired state, in a parallel process to configuration management (above). If this process were to yield deviations, correction of those errors in an automated and timely manner is imperative.
- » Third, compliant environments must be easily audited by the internal security team and external auditors. Thus, having an automated way of easily extracting an audit report will ease the process of meeting these needs as they periodically emerge.

BMC Cloud Lifecycle Management helps you provide compliance through BMC BladeLogic Automation, while also managing your cloud environment through a policy-based Service Governor. Similarly, BMC Remedy Change Management tracks and verifies all changes to the cloud environment and individual cloud services.

PROVIDE ONGOING FINANCIAL TRANSPARENCY AND CHARGEBACK

CHARGEBACK

One of the many benefits of a cloud is that you can track consumption of resources and assign a cost to that consumption. IT organizations benefit from alignment of business metrics with IT operations, enabling users to factor financial information into their cloud decision-making. Through showback or chargeback reports, you can give each business unit a view of their monthly consumption. True chargeback involves inputting consumption and cost calculations into your organization's financial systems.

IT investment cycles also benefit from financial transparency. Cloud resources must be ready and waiting for new requests to come in. That means hardware and software need to be procured in advance of the end user "buying" it. As a result, the flow of payments to IT has shifted. Historically, IT bought hardware and software to support funded projects. With the increased proliferation of cloud computing, however, IT now buys hardware and software before it even knows what projects are coming. In order to be prepared for incoming demand, IT must have the financial transparency to make investments today to meet projected demand tomorrow. Chargeback mechanisms, therefore, must communicate prices to users as they procure services, tally up reports for budget discussions, and often feed into internal financial systems.

Built into BMC Cloud Lifecycle Management is the capability to associate prices not just with cloud services, but with features of those services at a granular level. With its integration with BMC Cloud Operations Management, metered reporting can communicate these prices to the business for financial transparency.

CHANGE AND AUDITABILITY

Over time, changes will be performed on services running in your cloud. Some will derive from configuration drifts, and will be captured by configuration management. Some will be those very resolutions implemented by the configuration management system. Others may be associated with user requests — for more resources, for different software, or for different infrastructure configurations.

At any given time, it is ideal to have a snapshot of the state of the system and the changes that have occurred over time. That snapshot is critical to auditing, but is also invaluable for triaging problems with the workload or its performance. Stored in a configuration management database (CMDB), an accounting of every workload in the cloud should reflect its current state at all times, as a single source of truth.

However, maintaining that view cannot be arduous. It must be automatic. BMC Cloud Lifecycle Management, combined with BMC Remedy Change Management, makes this easy. Every action taken on a workload by a user or the system is automatically tracked in the change management system and CMDB, without user intervention or awareness. Every request for more memory creates a ticket, which is logged and automatically approved, immediately.

Of course, there can be exceptions to this rule. Certain requests and changes may require manual approvals — and those exceptions can be set as rules within the system. The power of this integration is the flexibility to seamlessly enforce the appropriate process at the right times.

The end result is a remarkably well-controlled cloud. Freedom, flexibility, and agility are preserved, while documentation and control are maintained.

SUMMARY

Clouds are more dynamic than traditional IT. Services can move, grow, shrink, and find a home in a public cloud. In order to make sure that your cloud is receiving all that it needs to help your business thrive, you must continuously optimize performance and capacity, maintain configurations and compliance, and unify and automate chargeback and change management processes. By doing so, you will be able to run a big cloud with fewer people, identify and solve issues earlier and faster, and improve the efficiency and accuracy of your cloud service delivery.

BMC is helping organizations govern their cloud environments today. Through cloud governance and compliance, the business challenges of cloud — from compliance to IT costing — are addressed. With robust offerings in configuration compliance, regulatory compliance, and chargeback and financial management, BMC can help you provide “good governance” for applications and services moved to the cloud, infusing the tenets of Business Service Management throughout the cloud environment.

To learn more, please visit www.bmc.com/cloud.

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Business runs better when IT runs at its best. Tens of thousands of IT organizations around the world — from small and mid-market businesses to the Global 100 — rely on BMC Software (NASDAQ: BMC) to manage their business services and applications across distributed, mainframe, virtual and cloud environments. BMC helps customers cut costs, reduce risk and achieve business objectives with the broadest choice of IT management solutions, including industry-leading Business Service Management and Cloud Management offerings. For the four fiscal quarters ended September 30, 2012, BMC revenue was approximately \$2.2 billion.

