

# Capacity Management Ensures Success for Enterprise Cloud Consumers

At one time or another in our lives, we have all looked up at the clouds; watching a never-ending parade of different forms and faces that stimulate our imagination. Many of the clouds are friendly and beautiful. Some are dark and threatening.

The many faces of cloud computing are no different. When done right, it can help your business soar. When not well thought out, it can rain on your parade and provide you a thunderstorm of woes.

This paper will try to clarify the many different facets of cloud computing and help your enterprise make informed decisions when leveraging cloud computing. Our goal is to help you dodge the dark clouds and guide you toward improved services and increased profits.



## **About the Author**

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## Is Cloud Computing All Hype?



Cloud computing is looming large on the horizon. It is one of the most talked about business models for enterprise computing in recent history. Is it all hype? What is cloud computing? Why is everybody talking about it? What does it mean for your IT operations?

A recent Forrester Research survey of 962 enterprises showed that 25% are budgeting for, implementing or already using cloud computing from external service providers. 22% are budgeting for, building or using internal clouds. While there is an enormous amount of hype surrounding cloud computing, certainly more than for any business model in a long time, it's hardly a fad, and many feel cloud services will become more and more prevalent in the future.

## What Is Cloud Computing?

Many of us are already using cloud services and don't even realize it. The hundreds of thousands of users of Salesforce.com's CRM platform already know the benefits of a Software-as-a-Service approach, and many others are using outsourced applications like Google Apps. Cloud can deliver immediate technical and profitable business value. It makes sense to look past the hype and examine the real issues, challenges and potential problems that need to be addressed before it can truly be a ubiquitous and beneficial computing tool.

The National Institute of Standards and Technology (NIST) defines cloud computing as "a model for enabling convenient, on-demand network access to a shared pool of configurable resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

NIST also defines three service models for cloud computing:

- **Software-as-a-Service (SaaS)**  
The capability provided to the cloud consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.
- **Platform-as-a-Service (PaaS)**  
The capability provided to the cloud consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.

- **Infrastructure-as-a-Service (IaaS)**  
The capability provided to the cloud consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

## Every Cloud Has a Silver Lining

Currently, typical applications of cloud computing include:

- Test and development
- Functional offload such as batch processing and/or storage
- Cloud bursting or overdraft protection to handle peak workloads
- Web application development and hosting

Whether implementing internally or contracting externally, cloud computing offers the promise of lowering infrastructure spending by allowing resources to be shared and used more efficiently; permitting businesses to pay for only the amount of service they consume. This sharing of compute resources across all business units and optimizing utilization of resources in the data center is appealing to CTOs and CIOs.

The early cloud adopters are pursuing these benefits:

- Cost economics (OPEX vs. CAPEX and reduced TCO, personnel, and support/maintenance costs)
- Flexibility and Agility
- Scalability
- Speed to market

While the rewards of cloud computing appear to be crystal clear, there are risks that your business needs to consider closely:

- Security
- Lack of control
- Performance and availability
- Legal/regulatory
- Runaway capacity usage

In order to avoid these risks and reap the benefits of the cloud, proper planning is an absolute necessity. Without good plans, significant business and technical problems may occur. Poor virtualization and failover plans can put your organization in a position where the failure of just one server results in service disruptions, lost transactions, dissatisfied customers, reduced revenues, and damage to the company's reputation and brand.

## The Enterprise Perspective

From the enterprise cloud computing subscriber's perspective, there are capacity management strategies that will help ensure a successful cloud implementation. The primary questions the prospective cloud subscriber needs to ask are:

1. How much is it going to cost?
2. What are the minimum capacity levels I need to maintain (and purchase)?
3. What quality of service will I get?

Those questions are very much related. But to get to an idea of how much cloud infrastructure you need to consume and therefore how much it will cost, you first need to fully understand what your resource requirements are and how much capacity (minimum resources) will be required to maintain an acceptable level of service for the applications riding the cloud. Below are some strategies that can help you maximize your probability of success as you implement your cloud project.

### Right Size the Cloud

Just like you need to right size your enterprise IT environment to ensure availability and performance at a reasonable cost, you need to understand the capacity requirement of the applications that you intend to operate on the cloud. Starting from capacity planning processes and software tools applied in your test and development labs, you can use analytic modeling to predict the "footprint" your applications will have when they are rolled out using cloud resources. This allows you to evaluate the economics of cloud prior to purchasing, launching and consuming third party cloud resources. You will know how much cloud you really need as compared to housing your application services in-house.

### Your Provider Should Use Best Practices

When considering the use of cloud services, can you really afford to sling your applications over the wall to the cloud service provider and hope and trust that performance will meet end-user requirements? No, the better strategy is to perform a due diligence evaluation of your cloud provider. Inquire to determine what measures your provider will use to mitigate your risks and ensure adequate performance.

Your cloud provider should be experienced and dedicated to using IT Service Optimization best practices. Ideally, these best practices will include a predictive analysis of your applications to provide proof the provider's infrastructure will be able to handle your workloads. What are the expected CPU utilization levels? What are the network and infrastructure components of response? What if end user demand spikes over the holiday retail period? What if the workloads dynamically relocate to other areas within the cloud virtualized systems? How will your applications perform under various operating scenarios and demand profiles? These questions can be answered using the same predictive modeling software we mentioned in the previous section, except now the cloud provider rather than the consumer is using the tools. Such tools, based on queuing theory, can help the provider quickly build highly accurate performance models to help you gain the confidence you need to move forward with your cloud computing strategies.

## Validate Performance Against SLAs

It's important to negotiate Service Level Agreements (SLAs) with your cloud service provider, but how do you keep the cloud service provider honest on SLA compliance? What reporting mechanisms are you using for your real-time, weekly, monthly SLA compliance reviews? Do you have alarming and alerting mechanisms to provide you with advanced warning that your cloud applications are nearing SLA threshold violations?

State-of-the-art capacity management software tools can provide visibility to the performance of your applications in the cloud to ensure SLA compliance. Not only should you insist on adequate measurement and reporting from your provider, you should also use your own tools to monitor and report on performance, giving you a way to double-check on the reports from your provider.

## Get Your Money's Worth

Are you over-provisioned, under-provisioned or on-target for your applications operating in the cloud? How do you know for sure? If you are paying by processor, frame, or virtual machine guest, are your applications consuming a sufficient proportion of the allotted capacity?

Measuring usage of virtual machine CPUs is not as straight forward as physical frame CPUs. Do you really know how much of your assigned virtual machine your applications are consuming? Keep your cloud service provider honest by collecting application performance metrics in the cloud. Use the proper performance management tools to "look inside the cloud" and know with high confidence that you're consuming your fair share and not leaving money on the table.

Whether for external cloud, internal cloud or hybrid cloud, capacity management best practices and tools can make the difference between profit and loss, success and failure for your cloud computing initiatives.

## Why TeamQuest?

TeamQuest Performance Software includes analytic modeling capability for making quick predictions regarding how different configurations will perform, enabling enterprise IT organizations to plan and compare on-cloud and off-cloud IT implementations. This can help IT organizations to determine the lowest cost delivery mechanisms for application services while ensuring that service levels will be met reliably. For example, one TeamQuest customer was able to show that CPU utilization of their existing servers was not only meeting required service levels but that performance would not degrade despite higher forecasted usage rates. This analysis saved the company \$4 million by avoiding unnecessary IT infrastructure expansion.

TeamQuest Software can help you determine the lowest possible cost of an internal cloud or a conventional non-cloud implementation. With cooperation from your potential third party cloud provider, you can also make predictions regarding performance and costs using their services, enabling a sound financial and risk-based assessment of their services.

TeamQuest Software can be used both by cloud providers and consumers in monitoring and reporting on performance, ensuring that service levels are met and accurately reported. The tools also provide powerful analysis capabilities that can be used by any IT organization to quickly find and correct problems before users are affected.

When considering cloud computing strategies for your enterprise IT operations, don't leave your cloud-bound applications to chance; invest in performance and capacity management tools. Optimize your cloud environment. Validate performance against SLAs. Don't overspend and don't leave money on the table. Invest in TeamQuest. We can help.

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