

# Capacity Management Enhances Cloud Computing Profitability

Large full-service telcos are in a position to use their global networks and datacenter footprints as service delivery platforms (SDPs) for the creation, distribution, and management of infrastructure- and applications-oriented capabilities for enterprises, SMBs, consumers/prosumers, and partners. Telcos need to jump into the cloud feet first and put a stake in the ground to influence the evolution of the cloud ecosystem. IDC, July 2009

## About the Author

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## Is Cloud Computing ALL Hype?

An impending storm is coming. The cloud is looming large on the horizon. Cloud computing is one of the most talked about technology and 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, 25% are budgeting for, implementing or already using cloud computing from external service providers. 22% are budgeting for, building or using internal clouds. So while there is an enormous amount of hype surrounding cloud computing, certainly more than for any technology 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. But cloud has the massive potential to deliver immediate technical and profitable business value. First, we need to look past the hype and look at the real issues, challenges and potential problems that need to be addressed before it can truly be a ubiquitous and beneficial computing tool.



*Cloud computing is 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.*

*Source: National Institute of Standards and Technology (NIST)*

NIST also defines three service models for cloud computing:

- **Cloud Software-as-a-Service (SaaS)**  
The capability provided to the 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.

- **Cloud Platform-as-a-Service (Paas)**  
The capability provided to the 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.
- **Cloud Infrastructure-as-a-Service (IaaS)**  
The capability provided to the 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, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

## Every Cloud has a Silver Lining

With all the talk about cloud computing and with a different definition depending on who you talk to, is there actual business value to cloud computing? The most typical applications of cloud computing include:

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

Cloud computing offers the promise of lowering infrastructure spending by allowing resources to be shared and used more efficiently and allowing business units to pay for only the amount of service they consume. The idea of sharing 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  
TCO, OPEX vs. CAPEX, Personnel, Maintenance Costs
- Flexibility and Agility
- Scalability
- Speed to Market
- Capacity Management

With cloud computing promising to be the biggest thing in the technology world since the invention of the word processor, you can bet TM Forum is going to be front and center in areas where we excel, such as managing cloud services and achieving transparency of product features, service levels, metrics and benchmarks.

**Martin Creaner,**  
**President and COO,**  
**TM Forum**

In order to reap the benefits of the Cloud, putting proper planning in place is an absolute necessity. Without good plans, significant business and technical problems may occur. Poor virtualization and failover plans can put your organization in 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. If you cannot measure it, you cannot control it.

## Leveraging the Cloud for Service Provider Profits

A telecom network is at heart at multitenant environment that telcos leverage to offer multiple services to multiple customers through the use of capacity management techniques that ensure optimal resource allocation and quality-of-service levels. Telcos also have massive OSS/BSS infrastructures that tie together network layer and datacenter elements. This infrastructure, anchored by datacenters that centralize service and management functionality previously distributed across multiple central offices, can serve as back-end infrastructure that end users access via the front-end service delivery method known as cloud.

**IDC, July 2009**

The initial cloud computing service providers offering Cloud IaaS services offer customers the ability to purchase compute power based on consumption, much like electricity. Almost all early entrants to the market use virtualization technologies and support a variety of operating systems, Web servers, and databases. These physical resources can be sliced into discrete chunks for allocation to one or many cloud subscribers. A cloud provider needs a good understanding of their own capacity and an ability to predict both capacity and huge fluctuations in demand load. Initially predictions may be based on rough "rules of thumb" estimates and linear trends, but ultimately need to be based on scientific method and application of predictive modeling technology powered by proven Queuing Theory algorithms.

From the perspective of the cloud service provider, performance management and capacity planning best practices and software tools can enhance your cloud-based business models by offering solutions to ensure subscriber satisfaction and provide premium revenue generation options. Below are strategies that can help you maximize profitability and customer satisfaction for your cloud computing service:

### **Premium Revenue Generation**

In the highly-competitive communications industry, you need to consider all potential revenue generating strategies for your cloud computing business. To date, the pricing models in the market and associated Service Level Agreement (SLA) contracts are fairly uniform. As the famous Henry Ford quote goes, "You can have any color you want as long as it's black."

By integrating performance and capacity management technologies into your operation, you have the ability to provide differentiated services and SLAs which will give your customers more service options

and provide you with additional revenue streams. You may consider adopting one or more of the following services for your business:

- Tiered SLAs (Platinum, Gold, Silver, Best Effort, etc)
- Storage & management of historical performance & capacity data
- Workload Performance & IT Resource Utilization Reporting
- Co-planning: Hybrid cloud architecture performance analysis & capacity planning
- Analytics-as-a-Service
  - Predictive Modeling: performance vs. demand projections
  - Pre-deployment planning
  - Application performance benchmark vs. load profiles
  - Performance analysis and capacity planning



### **Avoid SLA Penalties**

Are you meeting your negotiated performance thresholds in your contracted Service Level Agreements (SLAs)? How do you know if the SLAs that you've set are reasonable? What is the basis for defining acceptable compliance penalties? What reporting mechanisms are you using for your real-time, weekly, and/or monthly SLA compliance reviews? Do you have alarm and alert mechanisms to warn you when you are nearing SLA threshold violations? With state-of-the-art capacity management software tools you can provide visibility to the performance of your customer's applications in your cloud infrastructure to ensure SLA compliance, maximize customer satisfaction and minimize SLA penalties.

### **Oversubscribe Your Cloud**

Oversubscription, or overselling of your network is standard operating procedure. It's been around as long as the telecommunications industry has been selling dial-tone. So why shouldn't you oversubscribe your cloud compute infrastructure too?

In order to stay competitive and maximize the utilization of your investments, you must think in terms of overselling your cloud infrastructure. Oversubscription provides you the capital and cash flow to continue to grow your infrastructure. What are the chances that 100% of your customers will be using 100% of their provisioned capacity at any one point in time?

No matter how you've architected your cloud and what your business model is, determining the optimal capacity and having the tools and processes to monitor, analyze, report and model is mission critical to the success of your cloud computing infrastructure and business

model. Capacity management best practices and tools allow you to manage the risk of oversubscription with the financial benefits of optimized cloud infrastructure utilization.

### **Measure & Report Relative Usage**

Is your cloud deployment a multi-tenant model? Are many customers sharing the same physical resources through virtualization technologies? If so, how are you determining which customers are using what in multi-tiered environments (Web, application, and database) on your cloud? How do you track all your customers and ensure users are operating within contracted limits? With the right performance analysis technologies you can group distinct users into dedicated IT resource workloads to measure and report on customer usage, and determine if your customers are bursting beyond their contracted capability.



Don't leave money on the table. Having tools that provide the visibility into your cloud to measure and report on actual capacity usage per customer will set your cloud apart and ensure that you are maximizing your profitability.

The right capacity management strategies for your cloud computing business are dependent on your target customer profile. Who are you selling to and what is the core business value that you are delivering? Are you offering web-site hosting, cloud bursting, test & development, functional offload, or other? Understanding your core competencies and those of your target clients will help you more accurately predict your customer's capacity requirements. No one size fits all, but with capacity management best practices and state-of-the-art software tools, your probabilities of success for your cloud computing service will be maximized.

## **Why TeamQuest?**

TeamQuest Performance Software solutions enable telecom companies to plan for future capacity while optimizing the use of existing infrastructure investments. How?

With TeamQuest, you can run your cloud infrastructure closer to the edge of your performance and compute capacity thresholds without risking applications performance. By applying capacity management best practices with state-of-the-art software like TeamQuest, you can consider overselling your cloud to maximize revenue potential. TeamQuest allows you to collect real-time performance statistics and

apply highly accurate predictive modeling to give you a clear picture of how the cloud systems will perform in advance. TeamQuest will also help you set alarm thresholds to give you advanced warning before costly service levels are violated which will help you keep costs at a minimum and customer satisfaction at a maximum. TeamQuest can also help with the measurement and reporting of relative cloud usage, allowing for accurate apportionment of charges. Again, if you cannot measure it, you cannot control it.

Telecommunications companies must predict IT service performance and determine optimal configurations to assure availability and minimize cost while meeting demand. Maximize the revenue potential of your cloud computing business and ensure customer satisfaction; invest in performance and capacity management tools. Optimize your cloud environment. Validate performance against SLAs. Offer premium revenue-generating services. Don't leave money on the table, invest in TeamQuest. We can help.

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