White Paper

Demystifying the Cloud

Cloud computing of late has become the new buzz word joining the ranks of terms including; grid computing, utility computing, virtualization, clustering, etc. However, the problem is that everyone seems to have a different definition.

This paper, on Demystifying the Cloud ,touches upon the various attributes of Cloud Computing Services. It also offers perspectives on various aspects of Cloud Computing; types of services, deployment models and essential ingredients for success. It also makes an attempt to demystify the common misconceptions associated with Cloud Computing.

About the Author

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Venguswamy Ramaswamy, or "Swamy" as he is better known, globally heads the TCS Small and Medium Business (SMB)-iON. iON is a strategic business unit of TCS and provides end-to-end business solutions to the SMB segment.

In his previous role, he was the Director of TCS' Global Consulting Practice (GCP) and was instrumental in the structural formation, development and positioning of TCS' consulting offerings. Consulting Magazine has named him amongst the top 25 consultants of the year 2007.

During his 16 year tenure at TCS, Swamy has held several strategic positions including managing key customer relationships, building and heading the Process Consulting group, managing the Corporate Resource Management function, leading numerous Centers of Excellence, as well as launching TCS' first steps in geographies such as Hungary and China.

Swamy is a firm believer in the power of IT to create business value and is known for his interest in Innovation & Quality and expertise in Six Sigma. He is also recognized as a champion of many digitization drives within TCS, including deploying digital platforms for Six Sigma, creativity and talent acquisition.

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The Cloud Computing

Cloud Computing is defined as "a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies". IT-enabled capabilities that are delivered as a service include servers, storage, networks, software and applications. A cloud computing service exhibits the following five attributes: (1) Scalable and Elastic (2) Shared (3) Metered-by-use (4) Service-based (5) Delivered over Internet.

Scalable and Elastic: The IT service scales up or down – automatically as per the consumer demands. To the consumer, the available capacity appears to be infinite and can be purchased or released in any quantity, at any time.

Shared: The underlying IT infrastructure, software and applications are shared among consumers of the service. This shared pool of resources is used with maximum efficiency to build economies of scale and to dramatically reduce cost per consumer.

Metered-by-use: The IT service provider measures service usage per consumer. Payment for the service is then based on usage and not on the cost of IT equipment. Consumers thus save substantially on upfront costs. Service providers offer different pricing plans such as per-minute plans, per-user-per-month plans, fixed plans and even free plans. Consumers may choose the plan that suits them best.

Service-based: The service is well-defined and service levels such as availability and response time are clearly articulated. A self-service interface enables a consumer to upgrade computing capabilities, as required, without any interaction with the service provider. Advanced services may be offered based on a

differentiated pricing plan.

Delivered-over-Internet: The service is delivered over Internet. Users can access the service from anywhere and at any time.

Types of Cloud Computing Services

Cloud Computing is the most appropriate model to deliver IT services to Small and Medium Businesses (SMBs). SMBs are constrained on capital, have limited technical know-how and find IT talent expensive and volatile. Cloud computing brings the same technology employed by large enterprises, to SMBs at affordable costs, in a centrally supported, shared-service model.

Infrastructure as a Service (IaaS) A consumer can rent processing power, storage space, network bandwidth and other fundamental computing resources. Any software including operating systems and proprietary applications can be deployed and run in this rented infrastructure. The consumer has complete control over operating systems,storage, applications and select networking components (e.g., firewalls, load balancers) that have been provisioned for exclusive use.

Platform as a Service (PaaS) This service, used by software companies, provides a ready-to-use platform to deploy web-based applications directly. Software developers use free tools to rapidly develop custom applications for such platforms.

Applications are tested, deployed and managed from within the development environment. Developers focus on functionality, while benefiting from the cloud computing platform's ability to scale the application and to meter its usage.

Software as a Service (SaaS)

Consumers use a web browser to directly access an application hosted by the provider on a cloud infrastructure. A web-based email application is an example of Software-as-a-Service. To the limited extent made available by the service provider, consumers can configure the application as per their needs.

Cloud Deployment Models

Private cloud A private cloud infrastructure is owned or leased by a single organization and is operated solely for its business.

Community cloud The community cloud is shared by several organizations and supports a specific community that has shared concerns. For example, small businesses operating in a cluster often serve the same market and have similar compliance requirements. A community cloud can effectively serve all such businesses in the cluster.

Public cloud The public cloud is owned by a service provider organization that offers cloud services to the general public or to a large industry group. Amazon Web Services and Rackspace's services are aimed at individuals and workgroups. Terremark and Verizon offer public cloud services for enterprises.

Hybrid cloud The hybrid cloud is a composition of two or more clouds that remain independent but are bound together by standard or proprietary technology that enables data and application exchange.

Essential Ingredients for a Cloud's Success

Cloud computing is being widely heralded as the next revolution in computing technology. For 2010 as well as 2011, Gartner has identified Cloud Computing as the topmost technology in its annual list of top 10 strategic technologies.

Essential ingredients of a high-quality cloud computing service that accelerate its adoption are:

Reliability: The cloud infrastructure needs to be scaled to meet new demands, cyclic peaks and the occasional load bursts. This calls for sound capacity planning, scalable data center design and deep investments. A resilient infrastructure too is necessary to deliver a highly available service.

Business Continuity: Enabling a business to continue its operations in face of a disaster is as important to an SMB, as it is to any enterprise. An ability to recover from a disaster, calls for investments in redundant capacity at an alternate location. All affected SMBs may then be served from such a backup facility. Economies of scale work in favor of cloud computing, to provide such sophisticated service by default to SMBs.

Security: Data Security is of prime importance to any business. A cloud service provider needs to secure its infrastructure, its applications, as well as the stored business data. Physically securing the data center facility, performing background checks of all personnel, maintaining access logs, shielding the data center with firewalls, embedding systems to ward-off hacking attempts, anti-virus softwareand regular software patch updates, are some of the practices that secure the infrastructure.

Controlling access through strong passwords, limiting access as per a user's privileges and secure programming practices help make applications secure. Encryption and masking of sensitive information, segregation of each customer's data, automated off-site backups and maintaining a history of changes to data, finally make the data secure.

A vigilant service provider would get the service tested by experts (ethical hackers) to find vulnerability and pre-empt attacks that compromise security. Clearly the service provider needs to be equipped with wide-ranging expertise to adopt a multi-pronged approach for foolproof security.

High Performance: For the next few years, affordable broadband connectivity will remain unreliable in parts of urban India. In the interiors of India, connectivity is sporadic. A cloud-based application used by Indian SMBs should be able to work on a constrained network, while continuing to provide a fast response. Techniques such as network compression, local and server-side caches, segregating heavy reporting loads from the transaction load are employed to deliver a high performance service.

Configurable: A shared cloud-based service often enforces identical application behavior for all users of this service. SMBs, then have little flexibility to configure the service as per their needs. It is important to recognize that every business is unique and to provide a configurable behavior while operating off a shared infrastructure.

Configurability widens the addressable market and improves adoption of a cloud-based service.

Transparent Pricing: With metered usage and published pricing plans, cloud service providers offer one of the most transparent pricing structures in IT industry. SMBs can release capital expenditure blocked in expensive IT equipment, can accurately budget their operational expenditure, can opt for a pricing plan that suits their budget and finally pay for what they actually use.

Common Misconceptions

Virtualization v/s Cloud Computing: Very often, Cloud Computing and Virtualization are mistaken to be the same. Virtualization is basically one physical computer pretending to be many computing environments, while cloud computing refers to many different computers pretending to be a single, scalable, computing environment. While servers that host the cloud computing services may be virtualized to optimize use of resources, by no means are the two terms interchangeable.

Managed Hosting v/s Cloud Computing: Similarly, there is confusion about a managed hosting service and cloud computing. Managed hosting services are designed to handle static and continuous IT loads like email and messaging, back-office systems, databases and inhouse ERP/ CRM. Cloud computing services have the ability to handle dynamic and 'bursty' loads such as batch processing, backups, test/ development/ QA environments and business recovery in case of a disaster. A managed hosting service manages applications and software licenses that are typically owned by the enterprise. Cloud-based service components such as applications and operating systems are never owned by consumers. They can be accessed for a usage fee.

Real Cost Savings: While the cost of purchasing raw hardware and renting it as a service may turn out to be the same, the savings come from administrative costs and overheads. In commercial environments, there is usually one administrator per forty servers. On the other hand, a cloud service has one administrator for 1,000 identical servers. Also, what one buys with cloud is not just raw hardware but a computing platform - the cost of software is thus offset. Energy savings from moving power-guzzling, under-utilized servers to the cloud are significant. Changing all office desktops to thin computing platforms that provide just-about enough hardware to access web-based applications, can further reduce the energy bill. The real value proposition here is an elastic capacity that is available at commodity pricing.

TCS "IT-as-a-Service" - A major milestone in Cloud Computing History

The ICT market today lacks a credible cloud service provider who meets the end-to-end ICT needs of an SMB. Smaller providers lack the ability to provide a sustained service to SMBs for years ahead. The large IT service providers continue to target the enterprise market and Global 2000 companies. Tata Consultancy

Services (TCS) is an exception here. TCS has conceptualized the "IT-as-a-Service" business model to leverage cloud computing and change the ICT consumption pattern among SMBs.

TCS has pioneered the integration of all hardware, network, software and services in a path-breaking IT-as-a- Service. The unique cloud based model proposes minimal upfront capital investment for complete IT adoption, with subscription based payment for usage of its integrated solution suites. Based on a "build-as-you- grow, pay-as-you-use" principle, the model provides options to rapidly scale IT solutions up or down based on customer's business requirements. The launch of IT-as-a-service promises to add an altogether new dimension to cloud-based IT industry.

1. Gartner Highlights Five Attributes of Cloud Computing
   – *Gartner Press Release dated 23-June-2009.*
2. Gartner Identifies the Top 10 Strategic Technologies for 2010
   – *Gartner Press Release dated 20-Oct-2009.*
3. Gartner Identifies the Top 10 Strategic Technologies for 2011
   – *Gartner Press Release dated 19-Oct-2010.*

Why iON

iON provides comprehensive solutions that address varied IT requirements. From network to ERP, iON is offered as a single service, in a pay-per-use model, allowing you to leverage the solution's true potential. iON ensures integration of all processes along with ease of use.

iON promises:

- **High performance in normal broadband;**
- **Stringent security and data privacy ;**
- **Guaranteed availability (99 per cent uptime);**
- **Disaster recovery;**
- **Reduced need for IT staff.**

iON, therefore, manages your processes while you use the software. You gain from:

Integrated solutions
We ensure that all your solutions are connected. For example, if you are using a CRM along with an ERP, and have a document management system to organise your files, we ensure that these solutions are connected and work as one. So for you, it is simply IT and not applications.

Increased agility
We bring in the agility to keep pace with changing processes or a new line of business. We help you configure the processes to work differently or simply choose new practices recommended by the software. Our activation system flags on best practices while the system is running. As you pick and choose, we give you more options to choose from.

A pay-as-you-use model
This model eliminates capital investment as we provide the IT infrastructure and software on rent. You pay as you use and only for the number of users who actually use the software. The rent is charged monthly. Typically, the cumulative rental for three years is equal to the capital cost of acquiring similar or lesser software with one-time payment. Usually, the ROI exceeds rental within three months, when best practices are well followed. The rental includes maintenance and training, with no hidden costs.

Personalised solutions
Although this is a cloud service, the software is configurable to each business. You will always get the flavour of your own business by picking and choosing what processes you would need.

Automatic upgrades
We continuously invest in our solutions to ensure best practices. We enrich the software based on user feedback and business and statutory changes. We ensure the upgrade without disrupting the user.

TATA CONSULTANCY SERVICES
Experience certainty.

About iON
iON is Tata Consultancy Services' strategic unit for Small and Medium Business. iON provides end - to - end business solutions to the SMB segment, the growth engine of the economy. iON caters to the needs of multiple industry segments with best practices gained through TCS' global experience, domestic market reach, skills, know-how and delivery capabilities.

For more information, visit us at **www.tcsion.com**

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About Tata Consultancy Services (TCS)
Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at **www.tcs.com**

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