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A BRIEF STUDY OF CLOUD COMPUTING

A Brief Study of Cloud Computing

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Cloud Computing is an innovative approach for the use of shared computing resources. It groups large number of compute servers and other resources. Cloud computing typically offers the combined capacity of resources on an on-demand, pay-per-cycle basis. The end-user of this on-demand computing network is usually unaware of the physical location of servers. They just switch to the application to the cloud. This flexibility is the key advantage to cloud computing and distinguishes it from other forms of grid or utility computing and software as a service (SaaS). The ability to launch new instances of an application with minimal labor and expense allows application providers to Scale up and down rapidly. It facilitates to recover from a failure, bring up development or test instances, roll out new versions to the customer base and efficiently load test an application.

However it is true that earlier there are technologies that provides quite good environment for working on the shared network.

Like grid computing which address two distinct but related goals, providing access to IT resources and aggregating processing power. Grid computing provides adaptive software infrastructure. It makes an efficient use of low-cost servers and modular storage, which balances workloads more effectively and provides capacity on demand. Another previously pronounced technology is the utility computing.

Utility computing is a service based model in which a service provider makes computing resources and infrastructure management available to the customer as needed, and charges them for specific usage rather than a flat rate. The utility model seeks to maximize the efficient use of resources and/or minimize associated costs.

Based on the self-managing aspect of computing technology which stands it on the most effective route, a technology lies is autonomous computing.

Autonomic systems distinguish themselves from the other systems as they have the capability to configure, heal, optimize and protect by its own.

Capability to configure - This capability enables the system to adapt to unpredictable conditions.

Capability to healing - It can prevent and recover from failure by automatically discovering, diagnosing, circumventing, and recovering from issues that might cause service disruptions.

Capability to optimize – This capability enables the system to continuously tune itself.

Capability to protect – This feature can detect, identify, and defend against viruses, unauthorized access, and denial-of-service attacks.

Besides all these facts cloud has overwhelming features that make it ahead of all these types of computing technologies as it have the traits of these technologies with its own security concerns. So, let's move to the cloud to be in the sky of resources.

THE INTRODUCTION OF CLOUD COMPUTING

Cloud computing is a model [CC09]for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. It is a model [NC10] for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services). This model was rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics viz. on-demand self-service, broad network access, resource pooling, rapid elasticity and measured Service. It holds three service models:

• Cloud software as a service

- Cloud platform as a service

- Cloud infrastructure as a service

These service models ensures the hazard free service on any grounds. It converges with four deployment models private cloud, community cloud, public cloud and hybrid cloud. The Cloud Computing model offers the promise of massive cost savings combined with increased IT agility. It is considered critical that government and industry begin adoption of this technology in response to difficult economic constraints. However, cloud computing technology challenges many traditional approaches to datacenter and enterprise application design and management. Cloud computing is currently being used; however, security, interoperability, and portability are cited as major barriers to broader adoption.

CLOUD COMPUTING ENVIRONMENT

Cloud computing environment is adopted always to expect that the cloud environment is solely dedicated to them and nobody else can break its security. [CE10] Security, performance and interoperability of the cloud environment should be at the top of every data center's checklist when considering how best to influence cloud resources.

Cloud computing, though rapidly coming into its own, is a term that is almost as vague and effluvial as its namesake. The cloud essentially means "Internet resources" – offering so many varied benefits that it's really up to the data center to define what suits its business purposes. Businesses can use the cloud to offset their IT investment. This enables a focus on mission critical work in the data center or – at the other end of the spectrum – leverage cloud resources to automatically handle whatever workload is required. [BW11] Many businesses and government agencies demand cloud services to provide continuous operational availability and security. To make this a reality, they will require a threshold policy on resource management for application testing and production. Now there is a need of threshold policy arises and to discuss how it can help to balance workload demands dynamically in a cloud environment.

In a cloud environment, a threshold policy is a desired, to check and manage resources when workload demands need to be balanced dynamically after reaching a predetermined threshold level. The policy tells the system to create instances of the necessary resources depending how much workload demands exceed the threshold level. There are some key attributes that elucidate threshold policy. These include:

- **Response times**

The response time is the period between the time the system detects workload demands reaching the threshold level and the time it creates the additional resource instances must be as near to instantaneous as possible. When workload demands return to a point below the threshold level, the system will de-allocate these resources and put them to other use.

- **Influential considerations**

The information in threshold policy is influenced by the type of cloud service, consumer's control over hardware and software systems and the type of industry consumer holds.

- **Service provider's policies**

The cloud service provider may be either internal within an organization-controlled data center or hosted externally by a member of the telecommunication industry. The provider must ensure integration with back-office systems so that ordering, provisioning, metering, rating and charging, billing and other functions support consumer activities and transactions.

These threshold policies can be applied when system automatically detects the threshold limits and updates the requirement as per the need of time. That is the system quickly created additional instances of resources to balance workload demands dynamically. [CE08] There are certain attributes as follows that specifies the constraints before moving in the cloud environment.

Standards

To the extent possible, get assurances from the vendors and cloud providers that the systems are standards-based, will operate with other systems one intend to adopt as part of its technology strategy, and are able to grow with business both in terms of capacity and complexity.

Security

To increase the likelihood that virtualized environment will be sufficiently secure, security should be one of the determining factors in the evaluation and selection of both software and services vendors. The negotiated agreement should consist of the periodic security assessments and assigning responsibility for security incident detection, reporting, response and mitigation.

Data Handling

Protecting sensitive corporate and customer data should be a priority [CE08] while considering a virtualized environment that enables a vendor to manage or store that data. Before positioning data in the hands of a vendor, a demonstration should be done by the vendor on its data protection and business continuity capabilities. Also before moving

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forward a service level agreement must be well stated.

Interoperability

Interoperability provides [CE10] you with more secure data centers that Alerts must be provided by the cloud service provider when the server under it is at risk. The minimal amount of time must be specified which actionable information can be received.

Performance – Ensure that performance is maintained at an acceptable level [CE08] so that users don't experience significant lags when they are trying to carry out a particular task. The cloud should not be a performance detriment to the overall ability to do business. A traffic accelerator that optimizes the throughput between two sites and allows user to accelerate the data center-to-cloud resource combination is one good solution.

THE SPEEDY EMERGENCE OF CLOUD

Initially the adoption of cloud was a big cumbersome problem for technology tycoons, but as and when acceptability of this computing technology increased it is seems to be adaptable for those hesitates to move in. Even now organizations are continually making research on the development and security of their applications that run under cloud environment. Many organizations noticed the difference in the overall cost of implementing their resources that they realized is less than the cost of moving from traditional environment to the cloud environment. [TG09] There are many reasons why organizations of all sizes and types are adopting this model of IT. It provides a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Ultimately, it can save companies a considerable amount of money. Customers can avoid spending large amounts of capital on purchasing and installing their IT infrastructure or applications by moving to the cloud model. Capital expenditure on IT reduces available working capital for other critical operations and business investments. Cloud computing offers a simple operational expense that is easier to budget for month-by-month, and prevents money being wasted on depreciating assets. Additionally, customers do not need to pay for excess resource capacity in-house to meet fluctuating demand. It reduces administration cost as IT solutions can be deployed extremely quickly and managed, maintained, patched and upgraded remotely by the service provider. Combining resources into large clouds reduces costs and maximizes utilization by delivering resources only when they are needed. Businesses needn't worry about over-provisioning for a service whose use does not meet their predictions, or under- provisioning for one that becomes unexpectedly popular. Cloud computing customers can benefit from the economies of scale

enjoyed by providers, who typically use very large-scale data centers operating at much higher efficiency levels, and multi-tenant architecture to share resources between many different customers. Scalability and flexibility are highly valuable advantages offered by cloud computing, allowing customers to react quickly to changing IT needs, adding or subtracting capacity and users as and when required and responding to real rather than projected requirements. Cloud-based IT services let you access your applications and data securely from any location via an internet connection. It's easier to collaborate too; with both the application and the data stored in the cloud, multiple users can work together on the same project, share calendars and contacts etc. Recent research has indicated that around 90% of businesses do not have adequate disaster recovery or business continuity plans, leaving them vulnerable to any disruptions that might occur. Cloud's capability to store both data and application inside it avoids such kinds of disruptions. Cloud not only provides so much functionality to its users but also security is the major term in its dictionary.

In India, cloud services provide [ET10] an excellent opportunity. Indian markets have emerged as a huge advantage over matured markets as they can skip a lot of legacy applications and investments. India can go straight to cloud services. In fact, scaling fast enough is must to live up to the demand. The momentum is really beginning to take-off in India. It's been a great relationship with the large Indian system integrators and cloud services on their mind as it is in the mind of their customers. Cloud services allows flexible payment model like 'pay as you go', for which there is a huge pent up demand in India.

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