IMPACT: International Journal of Research in Engineering & Technology (IMPACT: IJRET)
ISSN(E): 2321-8843; ISSN(P): 2347-4599
Vol. 3, Issue 6, Jun 2015, 11-18

FUTURE SCOPE OF CLOUD COMPUTING

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ABSTRACT

Cloud computing provides with dynamically scalable infrastructure and virtualized resources that allow application to meet infinite demands , with cheap and reliable services to customers and assuring them with QoS inspite of unpredictable consumer behavior.

In this paper we present ,factors that lead to emergence of cloud computing , comparative study from traditional system, principles of cloud computing, services provided by cloud computing, some case studies of Amazon.com, Google app engine and salesforce.com, recent advances and future scope of cloud computing.

KEYWORDS: Cloud Computing, Networking

INTRODUCTION

cloud computing emerges as a hot topic from 2007 due to its ability of offering dynamic IT infrastructures, QoS guranteed computing environments and configurable platform services.

With web 2.0 has potential to change the face of entire computing industry and may signal of return to age of centralization with data application and processing powers with user having online utility interface. Amazon , Google, IBM are with cloud computing revolution.

Loosely speaking, cloud computing is a style of computing paradigm in which typically real-time scalable *resources* such as files, data, programs, hardware, and third party services can be accessible from a Web browser via the Internet to users (or called customers alternatively). These users generates service requests at a given rate to be processed at the service center hosted by the service provider through the cloud. according to QoS requirements and for a given fee.

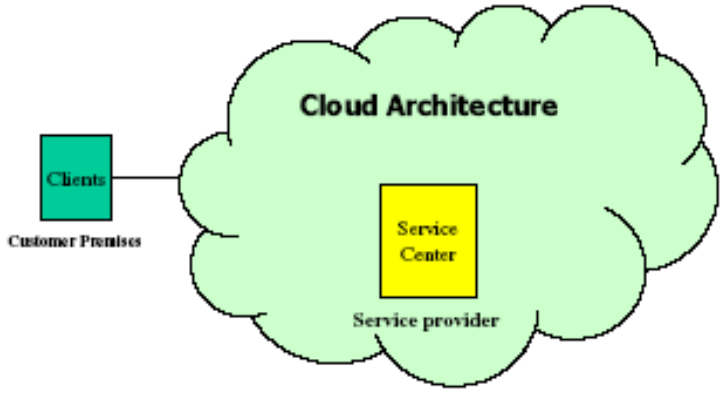

Figure 1: A Computer Service Scenario in Cloud Computing

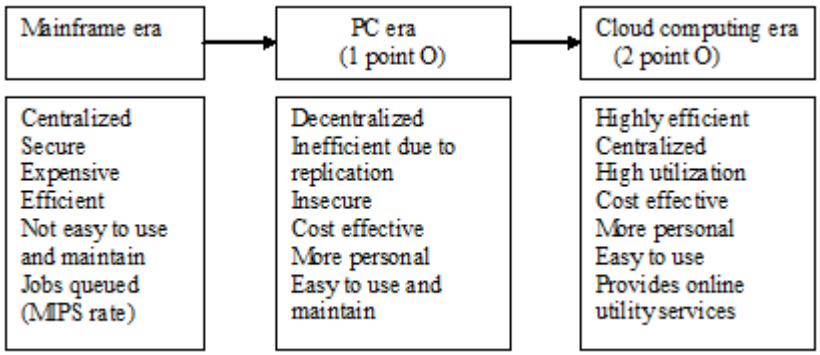

Figure 2: Comparative Study from Traditional System

Basic Need for Cloud Computing Emergence

"High demand to grow ,to scale, to meet increasing customer demand this lead to move from single web server database mode to service oriented massively scalable distributed system" in voice of Jinesh Varia Evangelist of Amazon.com.

Basic Principles of Cloud Computing

- 1.Elastic unlimited capacity
- 2.pay as you go
- 3.simple ,reliable and fast

Cloud Computing Functionality

SaaS Software as a Service

Software or application is hosted as a service and provided to customers across the Internet. This mode eliminates the need to install and run the application on the customer's local computer. SaaS therefore alleviates the customer's burden of software maintenance, and reduce the expense of software purchases by ondemand pricing.

Existing commercial SaaS offerings include horizontal business services such as CRM (E.g. Salesforce.com) and Larger organisations such as Amazon21 and Microsoft22

HaaS Hardware as a Service

HaaS: Hardware as a Service Hardware as a Service was coined possibly at 2006. As the result of rapid advances in hardware virtualization,IT automation, and usage metering and pricing,users could buy IT hardware - or even an entire data center/computer center - as a pay-as-you-go subscription service. The HaaS could be flexible, scalable and manageable to meet your needs

Daas Data as a Service

Data in various formats, from various sources, could be accessed via services to users on the network. Users could, for example, manipulate remote data just like operate on local disk; or access data in a semantic way on the Internet

PaaS Platform as a Service

From the consumer's viewpoint, PaaS software probably resembles SaaS, but instead of software developers building the program to run on their own Web infrastructure, they build it to run on someone else's. For example, Google offers Google App Engine, a service that lets development organizations write programs to run specifically on Google's infrastructure..

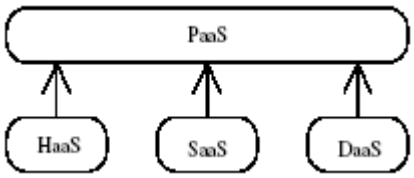

Figure 3: Cloud Functionalities

IaaS Infrastructure as a Service

Similar to PaaS, IaaS lets the development organization define its own software environment. This basically delivers virtual machine images to the IaaS provider, instead of programs, and the machines can contain whatever the developers want. The provider can automatically grow or shrink the number of virtual machines running at any given time so that programs can more easily scale to high workloads, saving money when resources aren't needed.

About Google Apps

Whether your business is moving everything to the cloud, or struggles to give employees access to critical information, or just wants an affordable email solution, Google Apps can help you stretch resources and work smarter. Google Apps offers simple, powerful communication, and collaboration tools for enterprises of any size in business, education, or government—all hosted by Google to streamline setup, minimize maintenance, and reduce IT costs.

Google-powered e-mail, IM, and calendaring help users stay connected and work together effectively. The essential collaboration tools—Google Docs, Google Video, and Google Sites—boost productivity and encourage innovation. Google Apps has multiple layers of protection to keep your business data safe and secure. Google operates one of the largest networks of distributed data centers in the world, and the company goes to great lengths to protect the data and intellectual property on these servers. Each piece of content can be as private or as public as necessary.

Google Apps includes a 99.9% uptime guarantee. Phone support is available for critical issues. Google strives to make Google Apps as open as possible, with full accessibility and an ever-growing library of plug-ins. In addition, the Google Apps engine provides an infrastructure for people to do their own applications development within the Google Apps architecture.

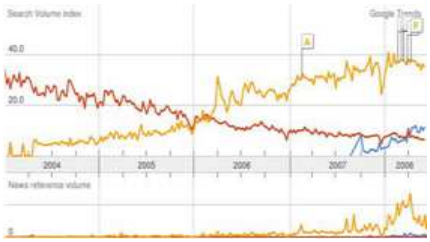

Figure 4: Cloud Computing in Google Trends

As reported in Google trends (Figure 1), Cloud computing (blue line), which is enabled by Virtualization technology (yellow line), has outpaced Grid computing [7] (red line).

AMAZON CLOUD COMPUTING

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable computing capacity in the cloud. It is designed to make web-scale computing easier for developers. Amazon provides following cloud computing based services:

Amazon Elastic Compute Cloud (Amazon EC2)

Amazon SimpleDB

Amazon Simple Storage Service (Amazon S3)

Amazon CloudFront

Amazon Simple Queue Service (Amazon SQS)

Amazon Elastic MapReduce

Amazon Relational Database Service

Amazon provides IaaS services through its elastic cloud computing (Amazon EC2). These account holders receive public-key credentials for connecting to the servers and managing their applications, particularly virtual machine examples that run as the client's user. Unfortunately, Amazon currently lets a user have only one set of credentials per account. This makes it difficult to run applications in multiple pieces, with each piece administered separately either by business function or geography.

SALESFORCE CLOUD

Salesforce.com is the enterprise cloud computing company. Features provided by salesforce in field of cloud computing:

Customers are Building and Deploying PaaS Apps in the Cloud Revolutionary Utility Pricing for Force.com Platform-as-a-Service Force.com PaaS - A Cloud Computing Architecture for the Enterprise Force.com Platform and the AppExchange.

Force.Com Cloud Platform

The Force.com cloud platform makes building applications faster and easier than ever. It includes a database, security, workflow, user interface, and other tools that step you through the process of building powerful business applications, Web sites, and mobile applications.

Future of Cloud Computing

According to a survey by Gartner, "Nearly 90 percent of organizations surveyed expect to maintain or grow their usage of software as a service (SaaS), citing cost-effectiveness and ease/speed of deployment as primary reasons for adoption."

#"By 2011, early technology adopters will forgo capital expenditures and instead purchase 40 percent of their IT infrastructure as a service," states Gartner Group.

#"Increased high-speed bandwidth makes it practical to locate infrastructure at other sites and still receive the same response times."

#69 percent of America's Internet users are using some form of Internet-based computing, such as web-based e-mail or photo storage, according to a study by Pew Research Center.

#By 2013, 12 percent of world software market will be Internet based forms of SaaS and cloud computing, according to Merrill Lynch.

What impact will a long-term, global recession have on cloud computing? A survey by ScanSafe, a SaaS provider of security services, revealed that 78% of IT managers believe economic uncertainty makes SaaS more appealing.

Cloud-Scale Repository Design

Content spaces require a core repository architecture that takes advantage of cloud implementation while giving "owners" sufficient control over and access to "their" content. Operational characteristics that distinguish Fractal from current repositories include the ability to scale out for very large numbers of tenants and up for tenants with large numbers of objects; to distribute data across multiple storage nodes; to tolerate node failures (i.e. self healing); and to provide differentiated levels of service on a per-tenant basis and track resource usage (storage, bandwidth).

At cloud scale, a repository needs to support thousands of content spaces and millions of documents, concurrently

Accessed by tens of thousands of users. Supporting the sophisticated policy-based automation required for content

Spaces over such large volumes of data and requests is challenging.

Problems Related With Cloud Computing

The related problems inherent in multi-tenanted content management, including isolation, sandboxing, scaling, and usage tracking, which will continue to be an on-going problem for cloud infrastructure service providers.

In a cloud-based software environment, physical security is stronger because the loss of a client system does not compromise data or software. However, how secure is the service provider's system against outside attack? What do you feel about possibly having your proprietary business information in the same cloud as your competitor's? What happens if there is a system failure – is the data secure? How reliable is your service provider? These are all questions you should ask when evaluating the cloud computing alternative.

Major Challenge is to Incorporate Security Guaranted Qos

Security area require more attention for cloud computing architecture

Security Issues in Cloud Computing

Platform Security

Each of Fractal's technical threads presents its own security challenges. For example, the cloud-scale repository

Poses problems inherent to multi-tenanted content management, including isolation, sandboxing, scaling, and usage

Tracking Allowing users access to programmable behaviors introduces many security issues, especially guaranteeing

Safe execution The service runtime must ensure that the intellectual property embodied within both services and content is protected.

Required Actions to Make Cloud Secure

#Intruders would have to be restricted access to the source code, and providers often work hard to provide clean, unbreakable barriers between customers. Security can differ greatly from application to application, from platform to platform, and from provider to provider, however.

#Authentication credential management poses another cloud security concern.

#Artificial Immune System (AIS) in danger theory is a new intelligent problem-solving technique.should be incorporated to increase the efficiency of cloud based application. The protected resources are defined as self, while the others (including the intrusion) are defined as nonself. The central idea of the Danger Theory is that the immune system does not respond to nonself but to danger.This is used as a tool to define danger signals on continuously changing parameters.

Yet on the whole, the cloud holds must promise for guarantee security over application.

Future Work and Scope

The world of computing is moving away from the on premises IT model, where you keep buying servers, PCs and software licenses as your business grows. Cloud computing disrupts the conventional model and opens a new IT path for the small-to mid size business: “clouds” of computing power, accessed over the Internet, become your server and your data center. Among the clouds: inexpensive applications that users can access on demand from any location and through a variety of devices.

Cloud computing—or SaaS, if you prefer—frees up budget for companies hand-cuffed by IT expenses. Instead of purchasing additional software licenses and hardware for new employees and new locations, businesses can simply open new employee accounts with providers of their cloud based services to expand computing capacity

With the workload factoring technology in cloud computing, the hybrid cloud computing model allows enterprise IT systems to adopt a hybrid cloud computing model where a dedicated resource platform runs for hosting application base loads, and a separate and shared resource platform serves trespassing peak load. Given the elastic nature of the cloud infrastructure, it creates a situation where cloud resources are used as an extension of existing infrastructure.

It’s not an all or nothing decision; companies can ease into the cloud without abandoning established infrastructure and applications. For the future work, extending the hybrid cloud computing model scope to stateful applications such as n-tier web services is a natural and challenging step. Many new problems arise such as session maintenance, service time estimation, and data consistency. We are working on a fast data on demand service and integrating the dynamic web service scaling approach proposed in into our mechanism.

CONCLUSIONS

Cloud computing and SaaS represent a completely different kind of client computing. The future of collaboration will focus on building and sustaining communities around content, and we envision scalable cloud-hosted objects called content spaces that will support ecosystems of users and developers growing around content and content-related tasks and ideas. Content spaces will enable seamless collaboration around items of content, in a manner far beyond the capabilities of today's tools. A new generation of platform, optimized for the creation and composition of cloud-based services to deliver content spaces to a wide range of users across many domains, will give users, developers and service providers the freedom to build content- and user-centered solutions driven by individual requirements and preferences.

Critically, future applications based on content spaces will be aggregations of behaviors that are bound to and augment content, rather than content being the by-product of applications.

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