Emerging Technology: Cloud Computing

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Mr. Joynath Mishra
Assistant Professor (Guest)
Department of Computer Science and Information Technology

Mahatma Gandhi Central University
Bihar, INDIA

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Outline

U4 Cloud
Computing

Mr. J. Mishra
MGCUB, INDIA

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Introduction
Importance
Characteristics
Cloud Models
   Deployment Models
   Service Models
Terminology
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Objectives

- Context of cloud computing
- Architechture of cloud computing
- Importance and applications of cloud coputing

Introduction

- Online virtual computer platform with minimum management
- Facilitates to create, configure, and customize applications online
- Huge amount of data storage in online
- Manipulating, configuring, and accessing the applications online
- Cloud Computing is both a combination of software and hardware over online
- It is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the internet with pay-as-you-go pricing
- Cloud Computing is a model for enabling ubiquitous, 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.

Figure 1: Computer servers over the internet can be in the form of servers, storage, databases, networking, software or analytics etc. The principal idea behind cloud computing is that files can be kept on a remote database as opposed to the traditional way of using a hard drive or local storage. This ensures that an electronic device has access to data or software if they have a connection to the Internet, i.e. the cloud[1].

Benefits

1. Cost
2. Speed
3. Scalability
4. Productivity
5. Performance
6. Realibility

Computer Environment

- Browser-based dashboard that makes it easier for IT professionals and developers to order resources and manage their accounts
- REST APIs and a command-line interface (CLI) give developers multiple options to utilize service

Essential Characteristics

1. On-demand self service
2. Broad network ccess (ubiquitous network access)
3. Location independent resource pooling
4. Rapid elasticity
5. Measured service

Concern related to cloud computing

- Maturity: Is the technology ready for production-level deployment?
- Standards: Still being developed
- Security concerns: Multiple customers sharing the same resources
- Interoperability: Many different vendor APIs
- Control of data: Organizational level of comfort with data being outside traditional IT

Cloud Models

1. Deployment Models
2. Service Models

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Cloud Models(Contd...)

Deployment Models

The establishing of type of cloud computing architure, installation and configuration of it called as deployment model

Private Cloud Computing

1. Physically located on the company's on-site datacenter (on-site).
2. Some companies also pay third-party service providers to host their private cloud

Community Cloud Computing

1. Similar type of IT sectors forms the community cloud network
2. These are highly facilitated with the community related network

Public Cloud Computing

1. Third-party cloud service provider
2. All hardware, software and other supporting infrastructure is owned and managed by the cloud provider
3. Browser based access

Hybrid Cloud Computing

1. Combine public and private clouds
2. Data and application movement takes place easily
3. Enhance greater exibility and more deployment options

Software as a Service(SaaS)

1. Service on software applications service over internet
2. Cloud providers handle any maintanence (upgrades, patching)

Platform as a Service (PaaS)

1. Virtual environment for developing, testing, delivering and managing software applications
2. Easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure

Infrastructure as a Service (IaaS)

1. IT infrastructure servers and virtual machines (VMs), Operating Systems
2. Storage from a cloud provider

Cloud Models (Contd...)

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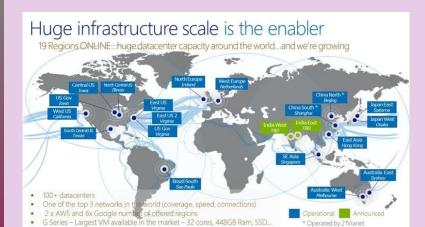Terminology
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Figure 2: Microsoft Azure Data Centre spread over whole world, A massive global footprint[2].

Data Centre

- Cloud computing hardware centre
- Provides data storage and software accessibilite remotely over the network

Cloud Software

- Data and applications accessibility platform for cloud service
- Examples: proprietary(Microsoft Azure, GCP, AWS) and open source(OpenStack, Cloud Foundry)

Figure 3: Cloud town of Microsoft to Build Fifth, Massive Western US Azure Region (US West Coast, Microsoft)

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Terminology (Contd...)

Cloud Softwares

OpenStack (open source)

- Controls large pools of compute, storage, and networking resources through web interface

Cloud Foundry (open source)

- It automates, scales and manages cloud apps throughout their lifecycle
- Applications can be written in just about any language and are deployed

Amazon Web Services (public cloud)

- Services: computing, storage, databases, analytics, networking, mobile, developer tools, management tools, IoT, security and enterprise applications

Google Cloud Platform (public cloud)

- Sevices: build, test, and deploy applications on Google's highly-scalable and reliable infrastructure for your web, mobile, and backend solutions, storage, virtual resources such as virtual machines (VMs)

Microsoft Azure (public cloud)

- Secure public cloud used for business purpose
- Integrates the cloud services
- Services are similar to other cloud services

1. Lower computer costs
2. Improved performance:
3. Reduced software costs
4. Instant software updates
5. Improved document format compatibility
6. Unlimited storage capacity
7. Increased data reliability
8. Universal document access
9. Easier group collaboration
10. Device independence

1. Requires a high speed constant Internet connection
2. Features might be limited based on purchased service
3. Can be slow due to network problem or increase of load to server
4. Stored data can be lost due to natural disaster
5. Stored data might not be secure based on company policy

Uses of Cloud Computing

1. Create new apps and services
2. Deliver software on demand
3. Store, back up and recover data
4. Analyse data for patterns and make predictions
5. Host websites and blogs
6. Stream audio and video

Cloud services in Literature/Research

1. Digital Library of literatures
2. Video tutorials/ lucture series
3. High speed computing platform
4. High amount of data storage

Exercise

- What are the benefits of cloud computing?
- Describe about deployment model of cloud computer.
- Describe about service model of cloud computer.
- What do you mean by datacenter and cloud software?
- Describe about any four cloud softwares and their services.

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Get in touch via...

+91 9046174189

jaynath4025@gmail.com

Thank You...