

Terna Engineering College

**Computer Engineering Department**

Program: Sem VI

**Course: Cloud Computing Lab (CSL603)**

**Faculty: Preeti Patil**

**PART A**

**(PART A: TO BE REFFERED BY STUDENTS)**

## **Experiment No.1**

### **A.1 Aim:**

**Study of NIST model of cloud computing**

### **A.2 Prerequisite:**

Knowledge of Networking, Distributed Computing and knowledge of Software architectures.

### **A.3 Objective:**

Objectives this experiment is to provide students an overview of the Cloud Computing, its Architecture and deployment models, service models.

### **A.4 Outcome: (LO1)**

After successful completion of this experiment student will be able to

- understand the architecture and services of cloud computing
- advantages of cloud computing

### **A.5 Theory:**

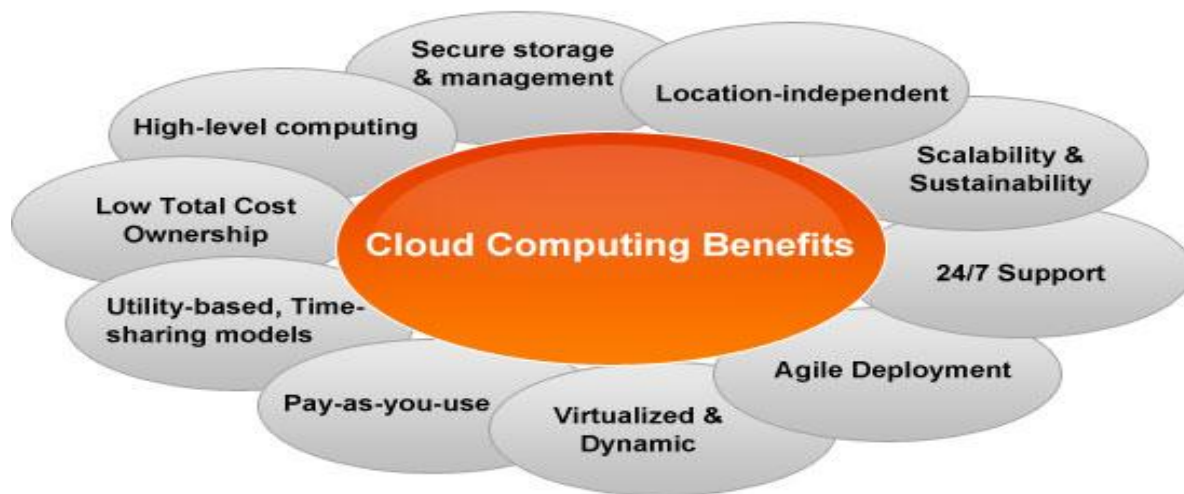
**Cloud Computing:** Cloud computing is the dynamic delivery of IT resources and capabilities as a Service over the Internet. Cloud computing encompasses any Subscription-based or pay-per-use service that, in real time over the Internet.

### **Characteristics of Cloud Computing:**

1. On-Demand Self-Service
2. Optimal Resource Utilization
3. Minimize licensing new software
4. Reduce capital costs
5. Improve accessibility
6. Resource Pooling
7. Rapid Elasticity

### **Benefits of cloud:**

1. Cost
2. Superior Infrastructure and Support
3. Scalability and flexibility
4. Reliability



**Figure 1- Benefits of Cloud Computing**

## Types of Cloud:

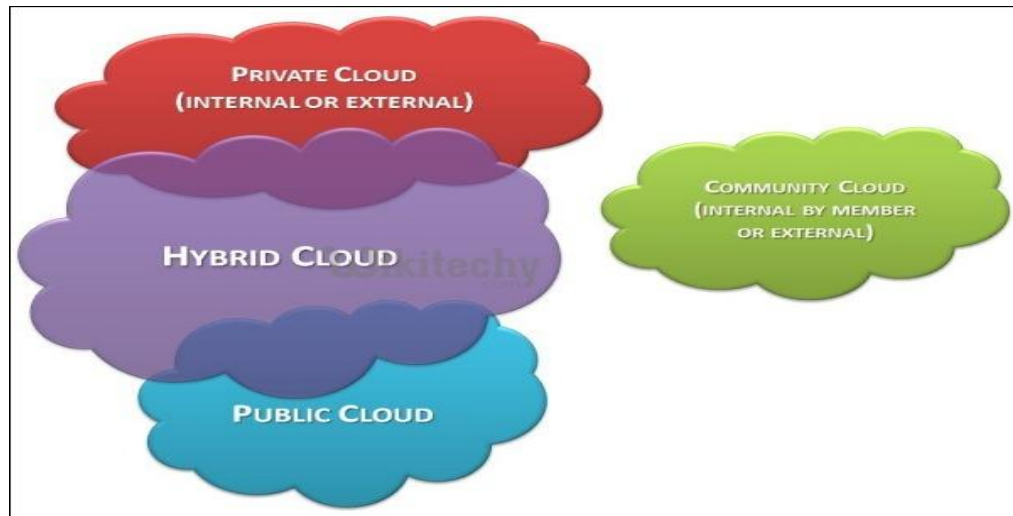
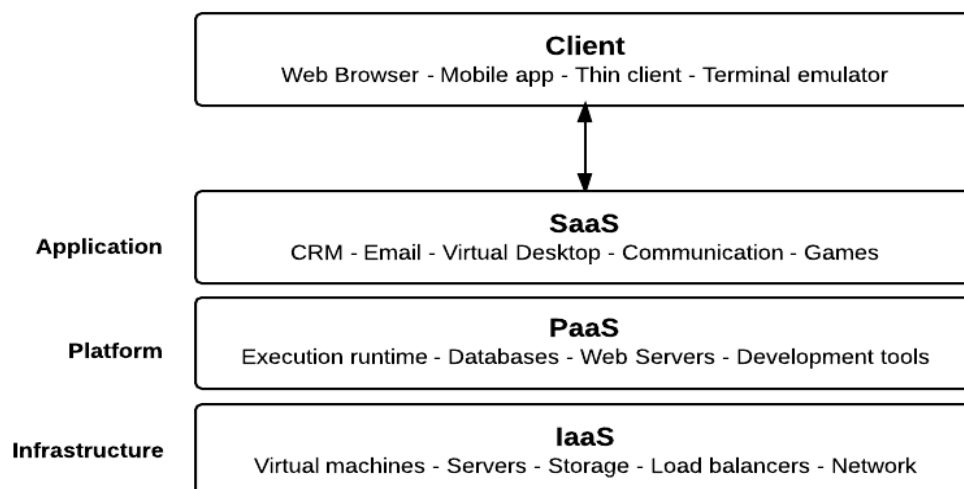


Figure 2- Types of Cloud

## Service Models:

1. **Infrastructure-as-a-service (IaaS)** - It can be defined as the use of servers, storage, and virtualization to enable utility like services.
2. **Platform-as-a-service(PaaS)** - It is a development environment where a customer can create and develop applications on a provider's computing environment.
3. **Software-as-a-service (SaaS)** - It is software provider delivers and hosts an application, without the need for the customer to house and maintain the application in its own data center.



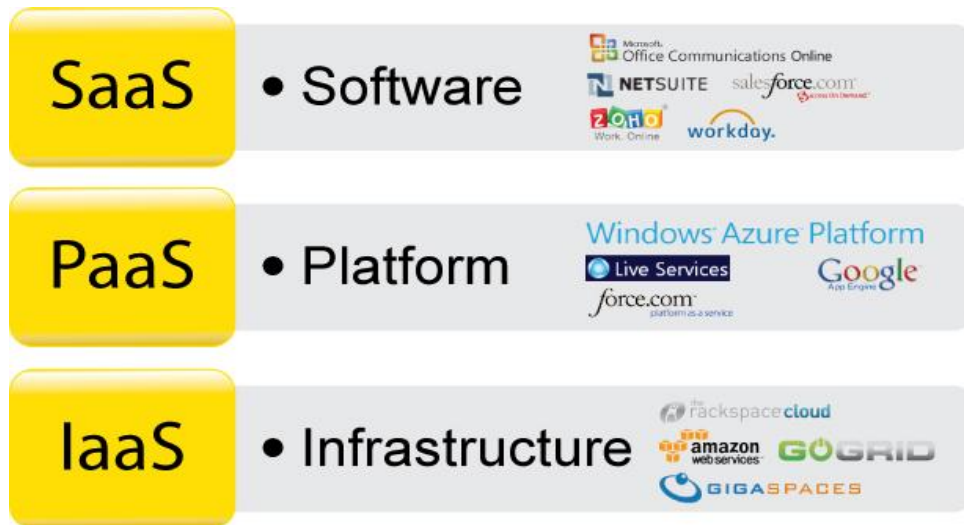


Figure 3- Service Models

### NIST(National Institute of Standard and Technology)model of cloud Computing

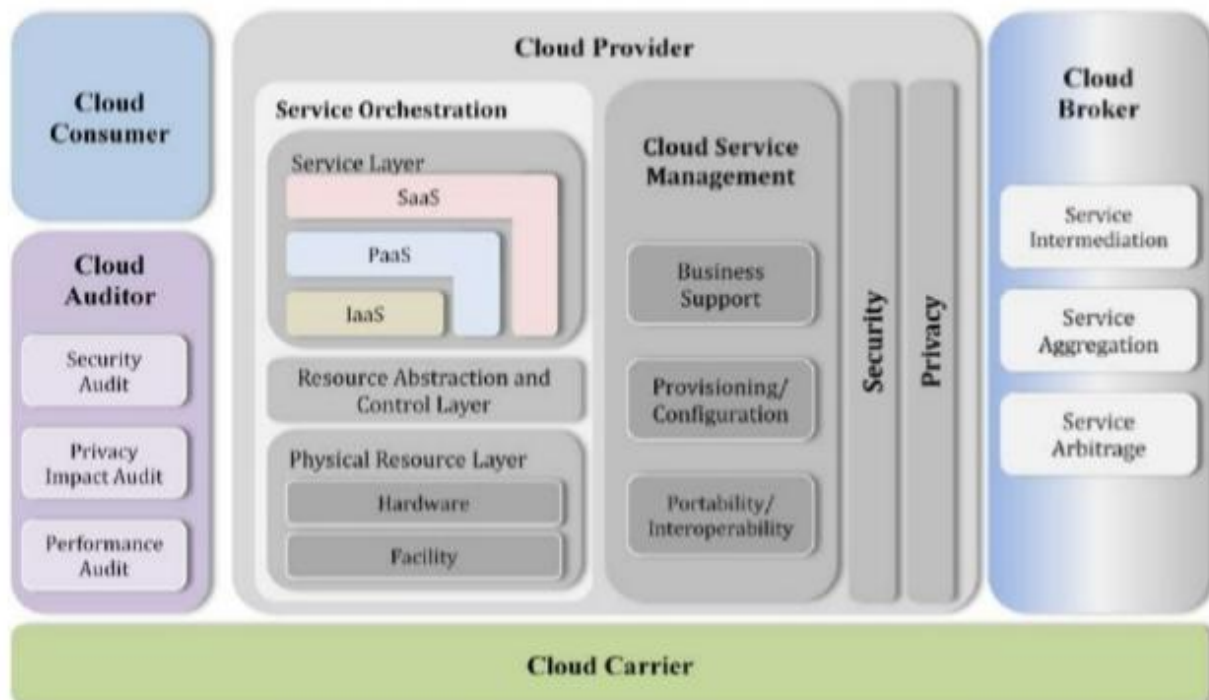


Figure 4- NIST model of Cloud Computing

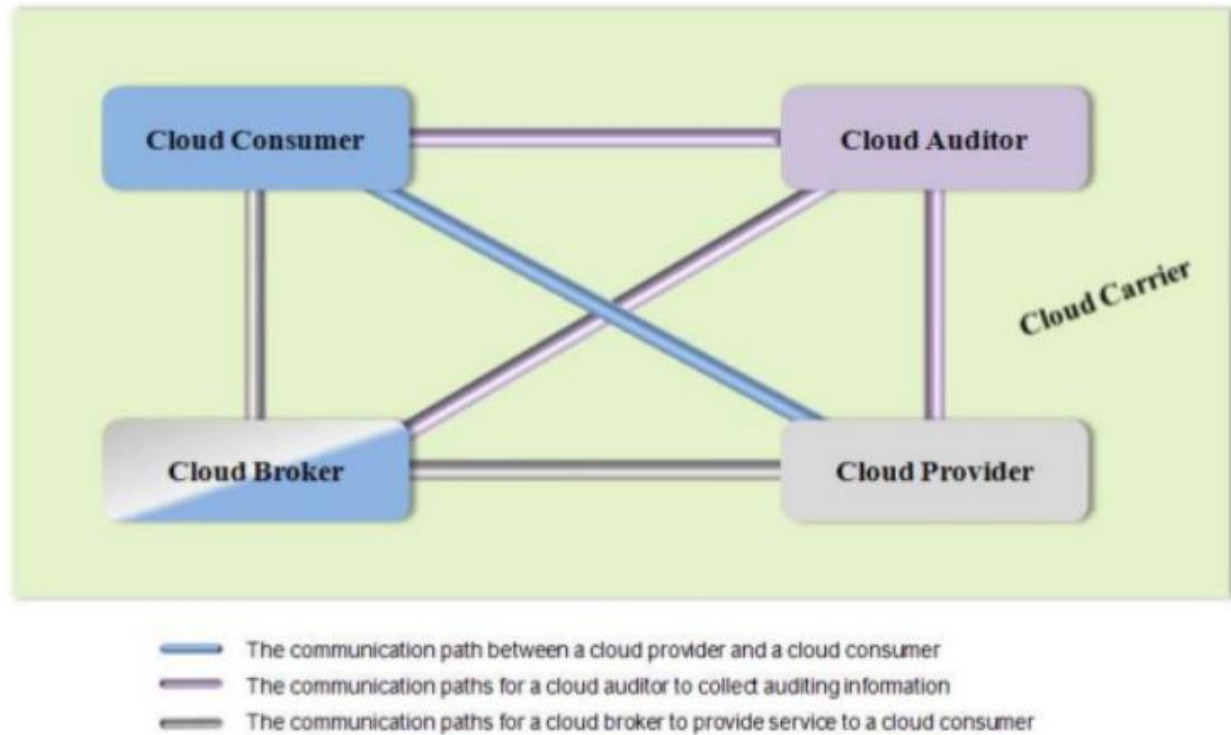


Figure 5 Interaction between actors in cloud Computing

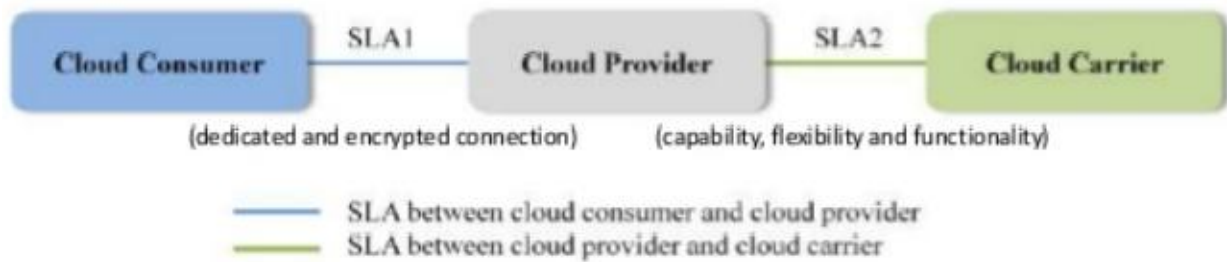


Figure 4: Usage Scenario for Cloud Carriers



Figure 6 Usage Scenario of Cloud Auditors

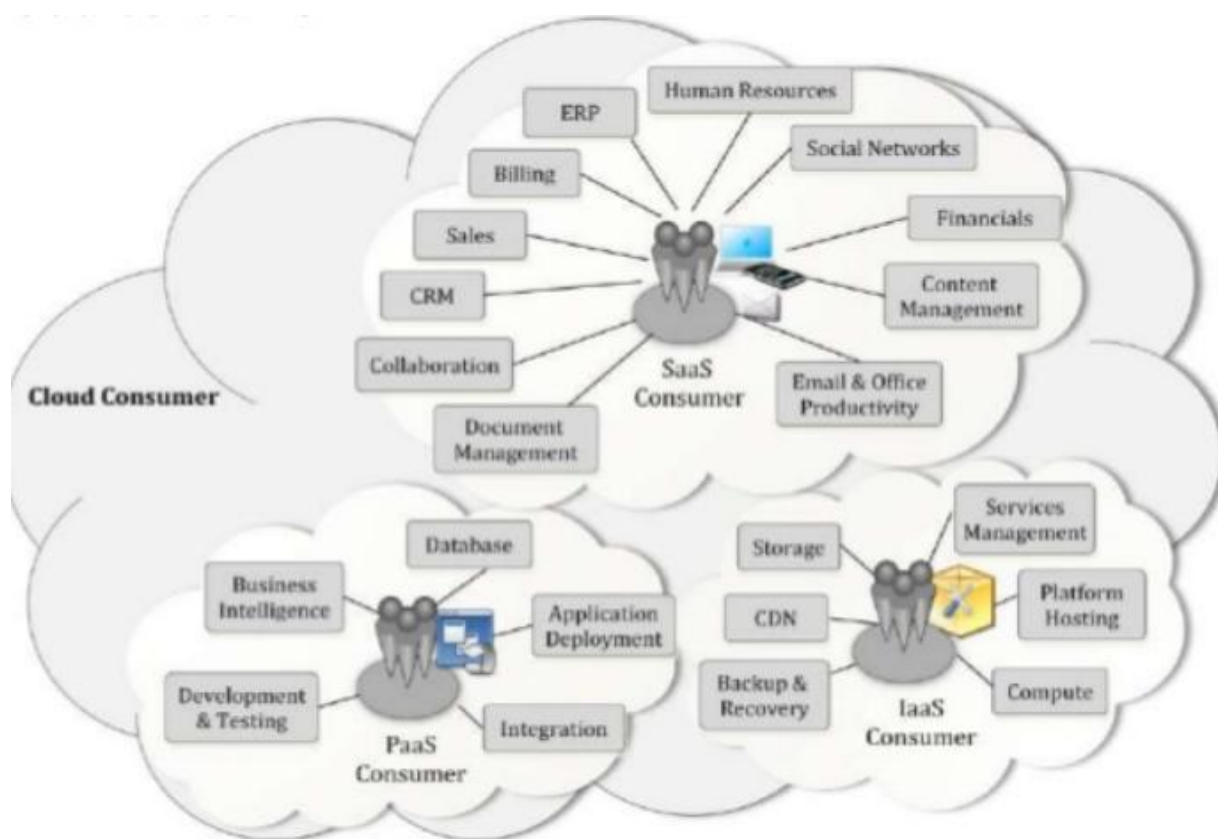


Figure 7 Services Available Over Cloud

**PART B****(PART B: TO BE COMPLETED BY STUDENTS)**

*(Students must submit the soft copy as per following segments within two hours of the practical. The soft copy must be uploaded on the ERP or emailed to the concerned lab in charge faculties at the end of the practical in case the there is no ERP access available)*

Roll No.: B 310	Name: Bhatt Pranjal Deepak
Class : TE-B	Batch : B2
Date of Experiment:	Date of Submission:
Grade :	

**B.1 Question of Curiosity:**

*(To be answered by student based on the practical performed and learning/observations)*

*Q1: Discuss the advantages and disadvantages Cloud Computing.*

*ANS: Advantages:*

- 1. Cost-Efficiency: Reduces upfront costs for hardware and maintenance.*
- 2. Scalability: Easy to scale resources up or down as needed.*
- 3. Accessibility: Data and applications are accessible from anywhere with an internet connection.*
- 4. Disaster Recovery: Built-in data redundancy and backup mechanisms.*
- 5. Flexibility: Supports remote work and collaboration.*
- 6. Automatic Updates: Providers handle software updates and security patches.*
- 7. Environmentally Friendly: Shared resources lead to energy efficiency.*

*Disadvantages:*

- 1. Security Risks: Sensitive data might be vulnerable to breaches.*

- 2. Downtime: Dependent on internet connectivity and service provider uptime.*
- 3. Limited Control: Users have less control over hardware and software settings.*
- 4. Hidden Costs: Unpredictable pricing models may lead to unexpected expenses.*
- 5. Vendor Lock-In: Migration between providers can be challenging.*
- 6. Regulatory Compliance: May not meet all industry-specific compliance standards.*

*Q2: List suitable Cloud application used by top most IT companies.*

*ANS: 1. Amazon: Amazon Web Services (AWS), Alexa, Amazon Prime Video.*

*2. Google: Google Workspace, Google Cloud Platform (GCP), YouTube.*

*3. Microsoft: Microsoft Azure, Microsoft 365, Teams.*

*4. IBM: IBM Cloud, Watson AI.*

*5. Salesforce: Salesforce CRM, Marketing Cloud, Service Cloud.*

*6. Adobe: Adobe Creative Cloud, Adobe Experience Cloud.*

*7. Oracle: Oracle Cloud, Oracle Database.*

*Q3: List all Cloud Providers.*

*ANS: 1. Amazon Web Services (AWS)*

*2. Microsoft Azure*

*3. Google Cloud Platform (GCP)*

*4. IBM Cloud*

*5. Oracle Cloud*

*6. Alibaba Cloud*

*7. Salesforce*

*8. SAP Cloud*

*9. DigitalOcean*

*10. VMware Cloud*

*11. Rackspace*

*12. Tencent Cloud*



*Q4: List Various SaaS Services*

*ANS: 1. Google Workspace (Docs, Sheets, Slides)*

*2. Microsoft 365 (Word, Excel, PowerPoint)*

*3. Salesforce CRM*

*4. Dropbox*

*5. Slack*

*6. Zoom*

*7. Adobe Creative Cloud*

*8. Shopify*

*9. HubSpot*

*10. ServiceNow*

*Q5: List Various PaaS Services*

*ANS: 1. Google App Engine*

*2. Microsoft Azure App Services*

*3. AWS Elastic Beanstalk*

*4. Heroku*

*5. Red Hat OpenShift*

*6. IBM Cloud Foundry*

*7. Oracle Cloud PaaS*

*8. SAP Cloud Platform*

*9. Mendix*

*10. Apache Stratos*

*Q6: List Various IaaS Services*

*ANS: 1. Amazon Web Services (AWS EC2, S3)*

*2. Microsoft Azure (Virtual Machines, Blob Storage)*

*3. Google Cloud Platform (Compute Engine, Cloud Storage)*

*4. IBM Cloud Infrastructure*

5. Alibaba Elastic Compute Service (ECS)
6. Oracle Cloud Infrastructure (OCI)
7. DigitalOcean Droplets
8. Rackspace Cloud Servers
9. VMware vCloud
10. Linode Cloud Hosting

## **B.2 Conclusion:**

***(Students must write the conclusion as per the attainment of individual outcome listed above and learning/observation)***

*The NIST model provides a standardized framework for understanding cloud computing's essential characteristics, service models, and deployment types. It enables organizations to make informed decisions, ensure scalability, foster innovation, and align with compliance requirements, making cloud adoption efficient and secure.*