

# Application of Cloud Computing and Its Challenges

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**Abstract:** Cloud computing is a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using Internet Technologies. This paper discusses various types of application and technical approach involve in cloud computing such as Cloud Software as a Service (SaaS), Cloud Platform as a Service (PaaS), Cloud Infrastructure as a Service (IaaS). Also application of hosting services in onshift online by redhat.

**Keywords:** IaaS,PaaS, SaaS, Resource pooling, redhat

## 1. Introduction

Cloud Computing is currently one of the new technology trends (broadband internet, fast connection and virtualization) will likely have a significant impact on teaching and learning environment. Senior people in charge of their business place challenge how to redesign their IT operations to support their business units in the light of different technology trends so they can achieve their corporate objectives. Rising business demands are forcing responsible IT people to consider new ways to reallocate their limited internal resources to better support their corporate priorities [2].

## 3. Service Models of cloud computing by National Institute of Standards and Technology (NIST)

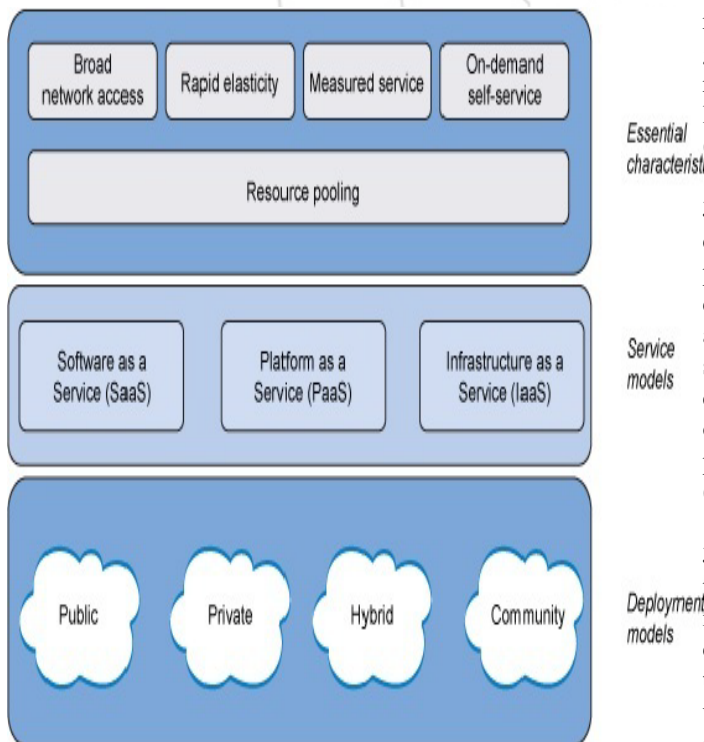


Figure 1: Cloud computing Model.

**3.1 On-demand self-service** – Users can automatically provision their own computing resources as needed and without requiring human intervention, typically through an

interactive portal that enables them to configure and manage these services themselves. [7]

**3.2 Broad network access** – Resources are available via the network and can be accessed by multiple devices, including smart phones, tablets, laptops, and desktops. [7]

**3.3 Rapid elasticity** – Resources can be quickly and transparently expanded or contracted depending on demand. Scaling is automatic to users, and provisioning what they need is transparent. [7]

**3.4 Measured service** – Usage is measured and can be monitored, controlled, and reported for transparency. [7]

**3.5 Location-transparent Resource Pooling For Multiple Tenants.** [7]

Compute, storage, and networking resources are pooled to serve multiple user groups (tenants) with different physical and virtual resources that can be dynamically assigned and reassigned according to user demand. Because users generally have no control of the exact location of the resources, there is a sense of location independence, although location may be specified at a higher level abstraction (country, state, data center).

**3.6 Cloud Infrastructure as a Service (IaaS):** The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems; storage, deployed applications, and possibly limited control of select networking components (e.g. Host firewalls, EC2 Eucalyptus). [4].

**3.7 Cloud Platform as a Service (PaaS):** The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations. [4] (For developing and hosting web applications in Google-managed data centers. Applications are sandboxed and run across multiple servers.), Java Virtual Machine.

**3.8 Cloud Software as a Service (SaaS):** In the software-as-a-service (SaaS) cloud model, service providers supply the hardware and software products and interact with the user through a web portal. Services can be anything from Web-based email to inventory control and database processing Cloud Platform as a Service. [3] Frontend Application e.g. Google Docs, Yahoo Email, Cloud printing, Calendar events.

#### **4. Platform as a Service in openshift online by redhat. Self-Service, On-Demand Application Stacks and PaaS [5]**

**4.1 Languages:** Write your applications in Java, Ruby, Node.js, Python, PHP and more. The OpenShift platform allows developers to choose the right tool for the job, and make a different choice for each project as needed.

1) **4.2 Databases:** *OpenShift gives you access to a private database instance with full control. Choose between classic relational and modern NoSQL datastores including [MySQL](#), [PostgreSQL](#), [MongoDB](#), and [SQLite](#).*

2) **4.3 Source Code Version Management [5]**

The OpenShift platform includes the Git distributed version control and source code management system. The Git protocol secured with SSH is used by developers to check code into the secure Git repository residing within their application container with OpenShift. Git allows both fast, secure and controlled management of application source code versioning.

**4.4 Streamline the Delivery Process**

3) **Continuous Integration And Release Management:** The OpenShift platform includes Jenkins for [continuous integration](#) and release management. Jenkins can perform tests upon code check-in, orchestrate the build process, and automatically promote or cancel an application release based on results of the tests or build. This automated release management becomes a critical part of streamlining the application development.

4) **4.5 Flexible Capacity [5]**

**5) Gears:** Gears are secure containers for your code. Each gear is allocated CPU, memory, disk, and network bandwidth. You can use a single gear to create an entire web application complete with a private database instance. Use multiple gears to create multiple applications or configure your applications to automatically scale in response to web traffic.

**B. 4.6 Heavy Duty Tools [5]**

**Responsive Web Console :** The OpenShift platform also includes a rich web console Developer interface that has a responsive UI design so that it can be easily viewed on devices ranging from mobile smart phones and tablets to

1) laptop and desktop workstations. Developers can create, modify, and manage their applications from within the web console. [Access the web console](#).

**C. 4.7 Open and Extensible [5]**

1) **Marketplace Add-Ons:** The [Marketplace](#) provides users of OpenShift Online with self-service, on-demand provisioning of Add-on Services. Add-ons are categorized

generally into two areas, application services and devops services. For application services, common uses include data persistence, search, caching, messaging, and more. For devops services, Add-ons provide software lifecycle capabilities such as continuous integration and load testing.

**D. 4.8 Support & Services [5]**

1) **Product Help:** The [Developer Portal](#) is the first destination for developers to find the information they need about OpenShift. The 'openshift' tag on [Stack Overflow](#) is watched round the clock by an army of developers, evangelists, and OpenShift devotees.

#### **5. Basic Challenges in cloud computing**

Cloud computing is an emerging technology with shared resources and lower cost that relies on pay per use according to the user demand. Due to its characteristics, it may face lots of threats and problems in the scopes of security. Cloud computing service provider should make sure that the server is well secured from all the external threats it may come across. A cloud is good whenever good security is provided by the service provider. The cloud service provider for cloud makes sure that the customer does not face any problem such as loss of data or data theft. When a malicious user can access the cloud by act as a legitimate user, there by infecting the entire cloud. This leads to affects many customers who are sharing the infected cloud. [8]

## **2. Conclusion**

Cloud computing as an exciting development is a significant alternative today's educational perspective client (User or Administrator) have the opportunity to quickly and economically access various application platforms and resources through the web pages on-demand. This automatically reduces the cost of organizational expenses and offers more powerful functional capabilities.

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