

# REVIEW: LAYERS ARCHITECTURE OF CLOUD COMPUTING

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## Abstract

Cloud computing architectures are designs of applications that use Internet-based on-demand services on different. This paper discusses how cloud computing architectural have provide the services i.e. web services through layers of cloud computing architecture and development model of cloud computing Architecture.

## Introduction

The term cloud computing seems to originate from computer network diagrams that represent the internet as a cloud [3]. A cloud computing system is a set of resources designed to be allocated ad hoc to run applications, rather than be assigned a static set of applications as is the case in client/server computing. Virtualization technologies enable the abstraction and pooling of resources to be shared across the organizations[1]. Data canters are designed around virtual machines, which are the new atomic units of computing. Cisco brings a similar architectural innovation to this phase called “unified fabrics.” This architectural enabler virtualizes different types of networks (LAN, SAN, and IPC) into one single unified fabric.

## Cloud Computing

A cloud computing architecture consists of a front end and a back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the “cloud” section of the system.

### A. Front end (Cloud Computing Architecture)

The front end of the cloud computing system has client’s devices (or it may be a computer network) and some applications are needed for accessing the cloud computing system. All the cloud computing systems do not give the same interface to users. Web services like electronic mail programs use some existing web browsers such as Firefox, Microsoft’s internet explorer or Apple’s Safari. Other types of systems have some unique applications which provide network access to its clients.

### B. Back end (Cloud Computing Architecture)

Back end have to some physical peripherals. In cloud computing, the back end is cloud itself which may various computer machines, data storage systems and servers.

## Layers Architecture of Cloud Computing

In the layers architecture of Cloud computing, cloud service providers into three categories:

- **Software as a service**
- **Platform as a service**
- **Infrastructure as a service**

#### **A. Software as services (SaaS)**

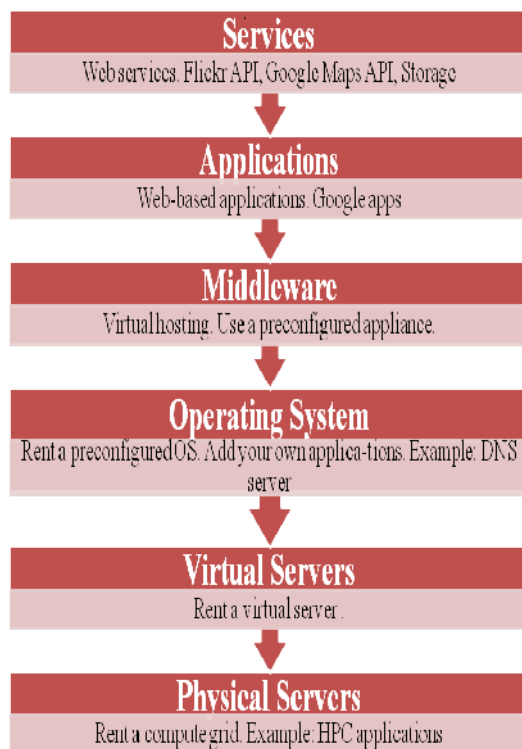
Software as a service provides a complete web application offered as a service on demand. We can access any web applications like that web services, google mapping API, Flickr API etc.

#### **B. Platform as a service (PaaS)**

To wrapped layers of software and provide services as Platform that can be used to build higher-level services. There are at least two perspectives on

To depending on the perspective of the producer or consumer of the services:

- A platform by integrating an OS, middleware, application software, and even a development environment that is then provided to a customer as a service.
- To encapsulated service where applications are developed using a set of programming languages and tools provider through an API. The customer interacts with the platform through the API [5].



**Figure: 1 Layers Architecture of Cloud Computing[5].**

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### C. Infrastructure as services

Infrastructure as a service to delivers basic storage and standardized services over the network. Servers, storage systems, switches, route and other systems are pooled and made available to handle workloads that range from application components to high-performance computing applications. use the resources to deploy and run their applications. Low level of abstraction that allows users to access the underlying infrastructure through the use of virtual machines.[3]

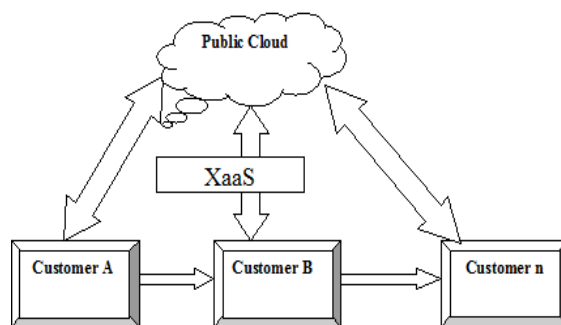
### Development Model of Cloud Computing

In the development model of cloud computing consists of three parts: Public Cloud, Private Cloud and Hybrid Cloud

#### A. Public Cloud

Public cloud provides the web applications and others applications are made available to the general public by a service provider. These services are free or offered on a pay-per-use model. Public cloud service providers like Microsoft and Google access only via Internet (direct connectivity is not offered). NetCracker's XaaS enables Communications Service Providers (CSPs) to manage complex, single-platform-based application environments. This enterprise- and mass market-oriented offering is based on proven IT, telecom, and network deployments. XaaS pre-integrates with NetCracker's Customer Management, Product Management, End-User Devices, and Service Fulfillment & Assurance offerings, which reduces integration costs, brings data consistency, and streamlines deployment.

**CaaS (Communications as a Service):** offers a variety of advanced IP-based communications and collaboration capabilities based on the cloud computing model

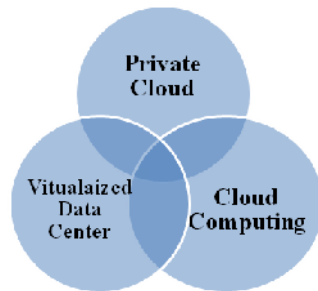


**Figure 2: Public Cloud**

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### B. Private Cloud

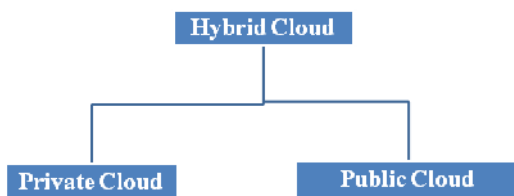
Private cloud is cloud operated for a single organization, whether managed internally or by a third-party and hosted internally or externally.



**Figure 3: Private Cloud**

### C. Hybrid Cloud

Hybrid cloud is a combination of two or more clouds (i.e. private and public) that remain unique entities but are bound together, offering the benefits of multiple deployment models.



**Figure 3: Hybrid Cloud**

#### Example of Cloud Computing

There are plenty of examples of applications that could utilize the power of Cloud Architectures. These range from back-office bulk processing systems to web applications. Some are listed below:

#### A. Processing Pipelines

- Document processing pipelines – to convert the Microsoft Word to PDF over cloud computing network when needed [5].
- Video Translate pipelines – to convert AVI to MPEG movies over cloud computing network when needed[4] .

#### B. Batch Processing Systems

Batch processing of the job at perform by different resources at simultaneously by any devices concerns as example of batch processing system[5].

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**Protocols Used in the Cloud Computing**

Cloud computing have several protocol to be use as follows:

- CDMI Protocols
- NFS Exported Protocol
- CIFS Exported Protocol
- OCCI Exported Protocol

**A. Cloud Data Management Interface (CDMI) Protocols**

CDMI stands for Cloud Data Management Interface. The exported protocols from CDMI containers may be used by the virtual machines in the cloud-computing environment as virtual disks on each guest as shown. With the internal knowledge of the network and the virtual machine manager's mapping of drives, this infrastructure may associate the CDMI containers to the guests using the appropriate exported protocol.

**B. Network File System (NFS) Exported Protocol**

The information required is exactly what the server implementation will use to do the export. Normally this information is contained in the /etc/exports file on a server or the equivalent. Administrators should be aware that lines may be automatically added to that file for each CDMI container that is exported.

**C. Common Internet File System (CIFS) Exported Protocol**

CIFS Stands for Common Internet File System. To export a container via CIFS, the information required is exactly what the server implementation will use to do the export. Where this information is contained on a server is implementation dependent. The server may add or delete lines automatically to and from that file for each CDMI container that is exported or unexported.

**D. Open Cloud Computing Interface (OCCI) Exported Protocol**

The Open Cloud Computing Interface (OCCI) is an open protocol for cloud computing services. OCCI provides a "clean channel" over which any suitable format can travel without modification or wrapping, using HTTP to its full extent in the way it was intended. Each resource (i.e. a compute node) is identified by URL(s) and has one or more native representations (i.e. Open Virtualisation Format or OVF) as well as a generic XHTML5 rendering. As such OCCI simultaneously presents both a machine interface (using native resource renderings) and a user interface (using HTML markup with forms and other web technologies such as Javascript/Ajax) so as to satisfy all common use cases.

**Advantages of cloud Computing**

Cloud computing architecture has several advantages as follows:-

- Cost
- Network
- Innovative
- Expandability
- Speed to implementation

**A. Cost**

Cost means that cloud computing, as an architectural solution, is typically less expensive than solutions deployed in traditional data centres when considering the cost of the hardware, software, and human resources that have to maintain the systems[2].

**B. Network**

The clouds are in the Internet, and the Internet is connected to many other things that add value, including social networking sites, commerce APIs, mapping APIs, and other clouds.

**C. Innovative**

Innovative means that cloud computing and the solutions it provides now are new, modern, and innovative, and it will continue to have a lot of innovative features that provide a lot of value for the money invested.

**D. Expandability**

You can add as much capacity as you need, when you need it, just by increasing spending. There is no need to place of hardware and software in the wings just waiting for an opportunity to go into production.

**E. Speed of Implementation**

The time to implementation of cloud computing can be vary as per circumstances. You are not purchasing hardware, installing operating systems, or getting permission to take a portion of a data center.

**Issues in Cloud Computer Architecture**

The main issues in the cloud computing architecture are security issues. The following issues are concerned with cloud computing

- Security
- Control
- Openness

- Compliance
- Service-level agreements

#### **A. Security**

In the cloud computing, security has important over network. Three kinds of entities try to attack the cloud computing. External attackers can modify Internet communications between a user terminal and service program. Malicious users try to attack other users to steal secret information or using a service without the correct permission.

#### **B. Control**

When a cloud computing provider, you are giving up control of that aspect of your IT infrastructure. Sometimes some policy and find your account is shut down. Or your provider could go out of business and shut off your service. There are always risks when you depend on another company that you do not own or control. You need to factor these considerations into the case for cloud computing.

#### **C. Openness**

Openness means that many cloud platforms are proprietary in nature. Once you have written your system using the provider's language and architecture, you may find that moving that system to other cloud providers or back into your enterprise is cost prohibitive.

#### **D. Compliance**

Compliance means that those who have to live with audit compliance issues may find that cloud computing providers do not provide the logging and auditing features you need to stay compliant with the many laws that corporate America has to follow.

#### **E. Service-level agreements**

Service-level agreements record a common understanding about services, priorities, responsibilities, guarantees, and warranties between the cloud provider and the cloud user.

### **Standards of Cloud Computing**

A cloud standard is one of a number of existing, typically lightweight, open standards that have facilitated the growth of cloud computing, including[7]:

- Application
- Communications (HTTP, XMPP)
- Security (OAuth, OpenID, SSL/TLS)
- Client
- Browsers (AJAX)

- Offline (HTML 5)
- Infrastructure
- Virtualization (OVF)
- Platform
- Solution stacks (LAMP, Space-based architecture)
- Service
- Data (XML, JSON)
- Web Services (REST)

### **Conclusion**

In the paper there have review about that traditional have not ability to share the resources over network, but in the cloud computing system the resource can share by any devices over network. But the cloud computing have some issues that is resolved in the next generation means new technology of cloud computing.

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