Cloud computing is a utility-oriented and Internet-centric way of delivering IT services on demand.As seen in the image below.

Cloud computing architecture includes:

1. IaaS, Infrastructure as a service
2. PaaS, Platform as a service
3. SaaS, Software as a service

From the book of Sir Rajkumar Buyya

Cloud Computing Architecture

Cloud infrastructure can be heterogeneous in nature because a variety of resources, such as

- Clusters
- Networked PCs,
- Databases
- Cloud application
- Cloud programming tools
- Hosting platforms
- Virtual machines, etc are used.

From the diagram above, we will discuss about:

1. IaaS
2. PaaS
3. SaaS
4. User applications
5. User-level middleware

6. Core middleware
7. System infrastructure

1. IaaS:

1. IaaS stands for infrastructure as a service.
2. Infrastructure as service or IaaS is the basic layer in cloud computing model.
3. IaaS offers servers, network devices, load balancers, database, Web servers etc.
4. IaaS examples can be categorized in two categories
    1. IaaS Management layer
    2. IaaS Physical infrastructure
5. Some service providers provide both above categories and some provides only management layer.
6. IaaS management layer also required integration with ohter IaaS solutions that provide physical infrastructure.
7. Main technologies behind IaaS is hardware virtualization.
8. Some examples:
    - Amazon Web Services (AWS),
    - Microsoft Azure,
    - Google Compute Engine (GCE)

To read more about IaaS click here

2. PaaS:

1. PaaS stands for platform as a service.
2. PaaS provides a computing platform with a programming language execution environment.

3. PaaS offered to the user is a development platform
4. PaaS solutions generally include the infrastructure as well.
5. PurePaaS offered only the user-level middleware.
6. Some examples:
    - Google App Engine
    - Force.com

To read more about PaaS click here

3. SaaS:

1. SaaS stands for software as a service.
2. Software as a service (SaaS) allows users to connect to and use cloud-based apps over the Internet.
3. SaaS is the service with which end users interact directly.
4. Some examples:
    - Gmail
    - Google drive
    - Dropbox
    - WhatsApp

To read more about SaaS click here

4. User applications:

1. It includes cloud applications thruough which end user get intercact.
2. There may be different types of user applications, like scientific, gaming, social etc.
3. Some of the examples are Gmail, Facebook.com, etc.

5. User-level middleware:

1. It includes cloud programming environment and tools.
2. There may be different types of programming environments and tools depends on the user applications.
3. Some of the examples of user level middleware are web 2.0, libraries, scripting.

6. Core middleware:

1. It includes cloud hosting platforms.
2. It manage quality of service.
3. Execution management.
4. Accounting, metering etc.
5. Virtual machines are the part of core middleware.

7. System infrastructure:

1. It includes cloud resources.
2. Storage hardware
3. Servers, databases are part of it.