

# **CLOUD SERVER**

---

## **Network Architecture and Server Planning**

**İsim Soyisim 1**

**İsim Soyisim 2**

### **CONTENT**

- I. Abstract**
- II. Introduction**
- III. What is Cloud Server?**
- IV. Cloud Computing Architectural Structure**
- V. Traditional Servers vs. Cloud Servers**
- VI. Big Data and Cloud Relations**
- VII. Cloud Computing Basic Concepts**
  - **Deployment Models**
  - **Service Models**
- VIII. Advantages of Cloud Server**
- IX. Disadvantages of Cloud Server**
- X. Cloud Server Example with Comparision**
- XI. Conclusion**

## **1.Abstract**

Cloud computing is a model of computing technology that can serve anywhere with network access, has location-independent resources, provides fast scalable hardware and software, and can respond to transaction requests that are "pay as you use".

This report will describe cloud computing in terms of its properties, architectural structure, working scenarios and service models, advantages and disadvantages of cloud computing in comparison with current cloud computing examples.

## **2.Introduction**

As the number of Internet users increases and the quality of the images and designs increases, we process with large files and create more loaded web sites. We also need a bigger space to store bigger data and we are looking for a wider movement area. Cloud computing, that takes place to meet this need, enables storage without the need for a physical medium and capacity problems.

The foundations of the cloud computing idea were laid down in the 1950s. By modernizing Amazon datacenters, it played a key role in the development of cloud computing, enabling Amazon S3, the first true cloud computing service, to enter service in 2006. By the middle of 2008, Gartner (Consulting and Research Company) pointed out that cloud computing has the potential to change the relationship between users and suppliers in the IT services sector. Since 2008, it has been widely used in the world. This technology, which has been widespread in our country for the past few years, continues to grow rapidly.

The exit point of the cloud concept is based on simple network diagrams, which are derived from the cloud representation of the internet. Cloud computing is divided into two parts: scalable, real-time service, infrastructure and applications can be operated from servers located in different parts of the world. Cloud Computing is divided into work models and service models. Cloud Computing work models are examined under 4 headings as public, private hybrid and community. The services provided by cloud computing users are SaaS (software as a service), PaaS (platform as a service) and IaaS (infrastructure as a service). Today's popular cloud computing applications and services, Google Mail, Google Docs, Icloud, Amazon and many other cloud computing models are available through.

### 3.What is Cloud Server?

Cloud Server, processor, memory, etc. is a virtual server model that utilizes virtualization technology that provides resources from a virtual resource pool and can update them instantaneously, is charged hourly, and does not have data center dependency. Cloud servers possess and exhibit similar capabilities and functionality to a typical server but are accessed remotely from a cloud service provider. A cloud server may also be called a virtual server or virtual private server.

#### Key features:

- Computing infrastructure that can be physical, virtual or a mix of the two depending on use case.
- Has all the capabilities of an on-premises server.
- Enables users to process intensive workloads and store large volumes of information.
- Automated services are accessed on demand through an API.
- Gives users the choice of monthly or as-you-use payment.
- Users can opt for a shared hosting plan that scales depending on needs.

### 4.Cloud Computing Architectural Structure

The main actors are divided into 3 groups as Consumer, Service Provider and Service Developer.

**Consumer :** They are the institutions or individuals who consume the services (software, platform or infrastructure services) provided by the service provider. They usually use the services they subscribe to according to the "pay as you go" model. The subscription is performed within the program via the provided web interface or programming interfaces (APIs). The service provider should be able to provide detailed analytical information about the use of the customer service. The service provider provides the necessary assistance to use the user service and to remedy any problems that arise during use. Consumer; subscription, management, help, service consuming operations through the access layer. Access layer, web interface and APIs.

**Service Provider:** The service provider plans and installs the service and delivers it to the consumer. The services provided are basically infrastructure (IaaS), platform (PaaS), software (SaaS) services. The applications and services developed by service developers are based on these application layer. The hardware layer at the bottom of the drawing shows the physical hardware on which the services are running. Presenter, data storage devices, communication equipment are some of them. Servers are usually x64 based, low cost equipment. Immediately above the hardware, the part expressed by the kernel software is the operating system or the virtual machine management layer. Virtualization starts at this stage.

On top of the core software are virtualized resources such as information processing, data storage, communication networks. Virtualization is the most prominent feature of Cloud Services (automatic provisioning, pay as you go, and elasticity). In order for this to work smoothly, the service provider needs to create basic management services. These are shown on the right under Management heading. One of the most important functions is the fact that all provisioning processes have been passed on in the form of automated workflows, from assigning resources from the user's subscription to making the new equipment added to the system ready for use.

**Service Developer:** The service developer receives the basic services provided by the service provider and creates new applications or services. For this, service creation, broadcasting and monitoring functions need to be provided by the service provider. The analytical knowledge about the service you create is important for the developer and must be provided by the service provider. The opportunities for the service developer are limited to the imagination. It may be that it develops a completely new service, or markets the existing service to a domain by creating its own brand.

**Note:** The physical server hardware in which the cloud servers reside is redundant to failure situations. If the cloud server service is configured in the cluster infrastructure and there is a problem, the service purchase continues from the other backup server. The receiving service continues to operate uninterrupted.

## 5.Traditional Servers vs. Cloud Servers

Traditionally, there are two main options for hosting; shared hosting and dedicated hosting.

- **Shared Hosting**

- I. The cheaper option, as servers are shared between the hosting provider's clients (eg one client's website is hosted on the same server as those other clients).
- II. Suitable for small enterprises, where the required capacity is relatively low.
- III. Setup is inflexible and can not cope with a large amount of traffic

- **Dedicated Hosting**

- I. A much more advanced form of hosting, where clients purchase whole physical servers.
- II. The entire server is dedicated to one client, with no one else sharing it.
- III. In some instances, a client may utilize multiple servers which are all dedicated to their use.
- IV. Capacity needs to be predicted, with enough resource and processing power to cope with expected traffic levels. If this is underestimated, it can lead to a lack of necessary resources during busy periods, while overestimating will mean paying for unnecessary capacity.
- V. Allows for full control over hosting.

- **Cloud Hosting**

- I. Clients get the best of both worlds: resource can be scaled up or scaled down accordingly, making it more flexible and therefore, more cost-effective.
- II. When there is more demand placed on the servers, capacity can be automatically increased to match demand without needing to be paid for on a permanent basis.
- III. Cloud servers can run on a hypervisor. The role of a hypervisor is to control the capacity of operating systems so it is allocated where needed.
- IV. Cloud servers offer more redundancy – if one server fails, others will take its place.
- V. There are multiple cloud servers which are available to each particular client. This allows computing resource to be dedicated to a client if and when it is necessary – additional capacity is temporarily accessed when required, and then removed when no longer needed.

## 6. Big Data and Cloud Relations

Big Data; structured or unstructured data obtained over time, ie not yet made available by processing with conventional methods or means. In short, we can say that the computer is not big enough to handle.



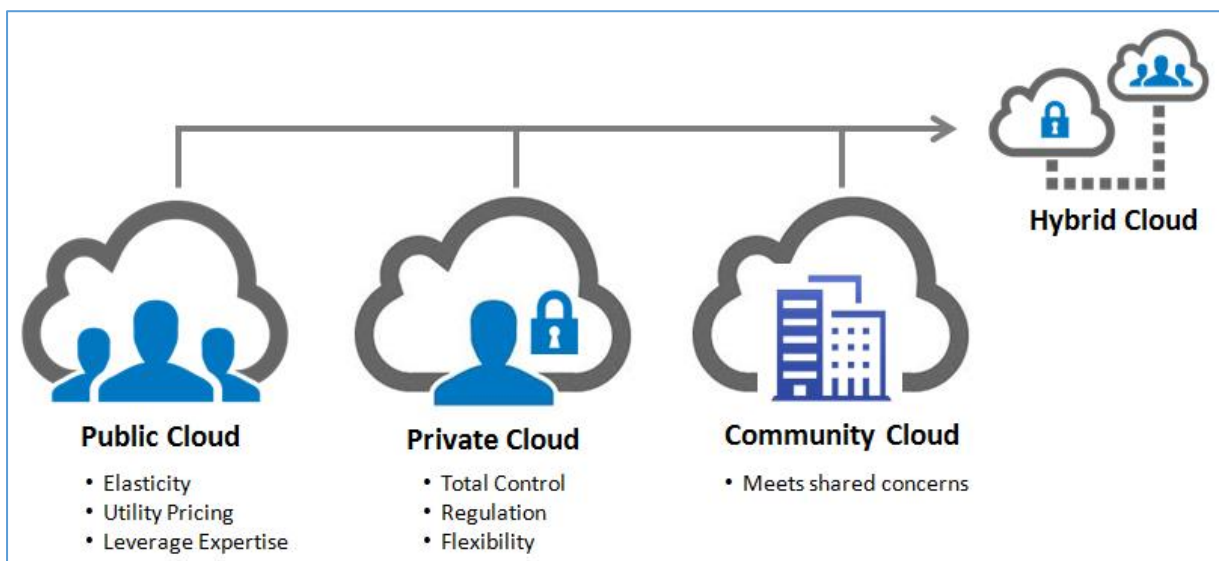
In the last few years 90% of the data have been produced. The data is stored on our mobile devices, software records, cameras, microphones, social media, internet, all of our movements are now processed in the information stream. In a short time it is thought that almost all movements will be directed to the servers as a flow of information. Cloud computing has helped to lift the boundaries of storage and computing power, and to open up a big picture. In the last few years, data has been growing continuously in terms of size, diversity and complexity, and it has been ensured that it becomes a solution center with cloud computing by removing the big data issue from a problem.

## 7. Cloud Computing Basic Concepts

There are certain services and models working behind the scene making the cloud computing feasible and accessible to end users. Following are the working two models for cloud computing:

### 7.1-Deployment Models

This technology, which comes face to face with 4 different types, allows to be used in different areas in different forms.



**Public Cloud:** A cloud technology set up with servers on the Internet. For example, e-mail can be shown as an example of this type of payment that you will use in small and medium-sized companies as much as you use.

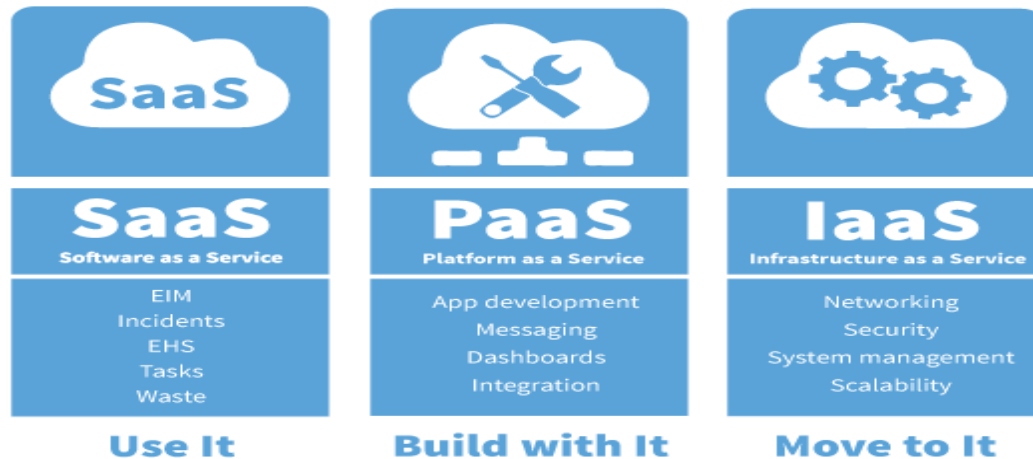
**Private Cloud:** Information is a cloud technology preferred by big companies that matter. All information is under the hands of the builder and the access is secure and confidential. Microsoft provides this with the help of Hyper-V and the System Center Product Family.

**Hybrid Cloud:** Cloud technology emerging from the combination of Public and Private Cloud. There are differences in the combination ratios depending on the volume of the companies.

**Community Cloud:** Cloud technology that houses services shared with a few companies. Community members have access to practice and data.

## 7.2-Service Models

Service Models are based on Cloud Computing. These can be categorized into three basic service models as listed below:



### Infrastructure as a Service (IaaS)

IaaS infrastructure service is the basic service of Cloud Computing. With IaaS, a virtual server is created and a cloud server service is provided to the users.

With the cloud infrastructure, virtual server resources are dedicated to you. With IaaS you have a flexible infrastructure. For example, in the web sites that organize the holidays, the server resource needs are increased close to the beginning of holiday seasons. The resources used can be increased / decreased by using the flexible nature of Cloud Computing.

IaaS is the delivery of technology infrastructure as an on demand scalable service. IaaS provides access to fundamental resources such as physical machines, virtual machines, virtual storage, etc.

- Usually billed based on usage
- Usually multi tenant virtualized environment
- Can be coupled with Managed Services for OS and application support

### Platform as a Service (PaaS)

PaaS allows application developers to develop their projects by providing layers of hardware and software. This service includes system management, operating system, programming

language environment, database etc. platforms. Since system administration is performed by the service provider, you only manage your applications and data. For example with PHP you code a software. You do not have to deal with the SQL and web server infrastructure of the software you code. PaaS only provides the platforms your software needs to work with.

PaaS provides the runtime environment for applications, development & deployment tools, etc. PaaS provides all of the facilities required to support the complete life cycle of building and delivering web applications and services entirely from the Internet.

Typically applications must be developed with a particular platform in mind.

- Multi tenant environment
- Highly scalable multi tier architecture

### **Software as a Service (SaaS)**

The SaaS software service provides the cloud with programs such as CRM, ERP, finance and accounting software that users need.

For companies operating in different locations, SaaS does not create extra software costs and provides a serious economic advantage. The best example for SaaS is Gmail. With this service from Google, you can send mail, edit your documents and back up your files. You can do all of your work even if you do not have the software knowledge.

SaaS model allows to use software applications as a service to end users. SaaS is a software delivery methodology that provides licensed multi-tenant access to software and its functions remotely as a Web-based service.

- Usually billed based on usage
- Usually multi tenant environment
- Highly scalable architecture

## **8. Advantages of Cloud Servers**

- **Not affected by hardware failure**

Using a Cloud Server is not affected by hardware failures. Cloud server's resources such as processor, memory, hard disk are all virtualized resources. If there is a virtual breakdown in one of these, a new one in the pool is commissioned and started to work in a very short time, without the opportunity to understand that something is broken.



- **Eligible Cost**

For cabin areas that normally fit several servers, cloud technology allows thousands of servers to fit in, as well as the ability to run these servers with less power (about a tenth) than dedicated / physical servers with similar resources. When this reduction in operating costs is reflected to the user, cloud servers become more affordable. Moreover, the hourly charging system allows to stop and save money when the server is not in use.

- **Provides Uninterrupted Continuity**

It will not wait for new resources to be added to the server to update memory, hard disk, or storage space. All necessary updates are made easily through the User Panel, starting to work with new resources in a few minutes

- **High Performance**

The performance of today's most powerful personal computers can be achieved with minimum resource usage. Because of this, computers using cloud computing have low-capacity hard disk, memory and processor, will not cause performance loss and low hardware will bring low hardware cost.

- **Increased Data Security**

Hard disks have failed at least once and become unusable, and all the data they contain becomes unreachable. With Cloud Computing, there is no data loss because the data is stored on the internet. Because a copy of each data you find is automatically copied to another server.

- **Team work**

One of the biggest advantages of Cloud Computing is that multiple people can edit on the same document at the same time. For example, Google Docs' account table application allows multiple people to work on the same document at the same time.

In addition, since the files are stored in the cloud instead of the personal computers, users can access the most up-to-date version of the document anytime with any computer with internet connection.

## **9. Disadvantages of Cloud Servers**

- **Internet Connection Requirement**

If you are not connected to the internet, you will not be able to use web-based applications and services, and your work may be interrupted because you will not be able to access the documents in the cloud.

- **Smooth Operation at Low Speed**

Web-based applications are designed according to the broadband internet, so if you connect to internet via dial-up or GPRS, cloud computing services and applications will be running much slower than normal. The same can happen if your broadband internet connection slows down. In addition, your broadband internet connection will offer a low loading speed, and data backup will lead to a long wait.

- **Slow Running of the Application**

Even if you have a fast connection, if the server running web based application and service is overloaded, the application you are using may run slower than normal.

- **Vulnerabilities**

Although it is a good thing to have all your documents in the cloud, malicious people can arrange various attacks on cloud servers to make your personal data unusable or unusable. This possibility is very low.

- **System Updates**

If you are running software on the cloud, the software you use may cause problems with this update when the cloud infrastructure is updated. Since the system that runs the cloud is not in your control, the software you install on the cloud is less under control than the system with the classic server.

- **Inexperienced cloud operator**

If the company that operates the cloud system you are servicing does not perform the necessary maintenance and services, you may lose all your data in a cloudy cloud.

- **Contraction of business fields**

This is one of the final disadvantages that the hardware and software maintenance and repair costs will decrease with the development of the services, and accordingly the business fields of the IT specialists are doing this job.

## 10. Comparisons Between Clouds

Two of the best known cloud storage solutions are **Google Drive** and **Dropbox** for reasonable reasons. We compare these two to their properties and decide which one is better.

- **Free Storage**

Both services offer free storage for those who want to try out these services before paying for more expensive and permanent options. Google Drive has become standard with a 15GB free domain option, while Dropbox is only a 2GB option, and it's on its feet.

However, Dropbox offers a number of options to increase your free storage space. Each account brought to the free account is a friend, family member, etc. free space for up to 16GB. It also offers an extra 500MB of space for replies to questions asked on Dropbox forums in the near future.

- **Paid Storage**

For personal users, Dropbox offers a very simple payment plan because there is only one payment plan. Dropbox 'Plus' account provides terabytes of storage space in almost the same proportions as basic and business accounts. On the other hand, they are paying \$ 100 a year and \$ 10 a month. There is also a window service where you can view past downloads, which you have to pay an additional \$ 40 per year.

Google offers three different options, apart from a free account. The entry level account applies a charge of \$ 2 per month for 100GB, \$ 10 per month for 1 terabyte, \$ 100 per month for 10TB.

- **File Mapping**

Dropbox offers file mapping options for many devices and operating systems, including desktops and mobile platforms. Dropbox Linux-assisted and intelligent-sync feature syncs only the changes made, not the entire file or folder

While Google Drive's sync feature supports pairing with multiple operating systems, it does not support Linux. So you have to reload or download the files to sync.

- **File Sharing**

Google Drive allows you to share files and folders directly from the mobile app or web browser interface or via email access, which you'll do as your trusted partners. It also permits

viewers and viewers to share with them, allowing them to take action. The only negative side is that if the links do not have past their usage dates or passwords, you may create a potential security issue if you do not remove the files or folders you share.

Dropbox offers a flexibility that allows you to design shared folders and files. Pro account holders can set passwords and expiration dates for connections, so they can protect their data for a long time. At the same time, you can also set editing permissions for users.

- **External Support**

Google Drive can quickly save and store Gmail attachments. Google Docs, Sheets and Slides, however, make it easier to work with teams. There are more than 100 apps for Google Drive in the Chrome Web Store. This leads to more potential storage than their competitors.

Dropbox also has some of its own service integrations. Personal users can open Office documents and edit them in Dropbox through Microsoft's partnership. This also facilitates collaborative work. Dropbox Business users also have features such as instant messaging via Slack with PDF viewing and sharing with Adobe.

- **Sync Speed Comparison**

To find out which of Dropbox and Google Drive has the fastest sync speeds, it is performed a series of upload and download test using a 2500MB compressed folder compared of different types.

These test were performed over a broadband connection with upload speeds of 12Mbps and download speeds of 160Mbps. Here are the results:

Upload time	Download time
Dropbox	4:32
Google Drive	3:07

Dropbox had the slowest upload time of the three services in tests. However, that is not the whole story when it comes to sync. When you are working with collaborators, what is more important is how quickly you can see each other's changes. For that, in theory, Dropbox's ability to perform block-level sync on all file types should give it the advantage over Google Drive and One Drive.

- **Security and Privacy**

Dropbox encrypts 128-bit AES standard encryption on your behalf while 256-bit AES standard encrypts files in a stable state.

Google Drive encrypts moving files with 256-bit AES, while still files are encrypted with 128-bit AES. This service also uses a dual factor authorization system.

## **11.Conclusion**

With Cloud Computing, businesses can purchase computing, storage and connectivity resources as much as they need and have the services they can use on the environment they can manage. With the "Virtual Data Center", it offers enterprise services that can be resiliently expanded to businesses without first investment cost.

It enables companies to save on initial investment, renovation, infrastructure, management costs. With the virtualization fetches and the minutes of the configuration of a new server to be removed and configured. Businesses can meet their server needs much more flexibly and quickly.

Cloud hosting has come a long way, and several large enterprises have been using it for years together, but for the small business owners to be able to look at it, pricing will have to come down further.

Having said so, the pricing has considerably come down over last 4-5years, and folks have learned the advantages of cloud hosting, which is compelling the mid-size organizations to make a move to the cloud arena.

Many businesses have made a worthy investment by moving to the cloud, while others haven't yet invested in the infrastructure required to make a transition to the cloud. The main reason why cloud computing isn't as popular as it could have been being that the cost factor is still a concern for small businesses.

## 12. REFERENCES

- [1] <http://www.endustri40.com/bulut-bilisim-cloud-computing-nedir/>
- [2] <https://www.slideshare.net/ProfEdge/introduction-to-cloud-computing-23970527>
- [3] <https://yukselis.files.wordpress.com/2012/01/bulutbilic59fimekitabc4b1.pdf>
- [4] <http://dergipark.gov.tr/download/article-file/223390>
- [5] [https://www.researchgate.net/publication/307545682\\_Bulut\\_Bilisim\\_Teknolojisi\\_ve\\_Bulut\\_CBS\\_Uygulamalari](https://www.researchgate.net/publication/307545682_Bulut_Bilisim_Teknolojisi_ve_Bulut_CBS_Uygulamalari)
- [6] <http://plusclouds.events/2016/08/31/>
- [7] <https://www.cloudwards.net/dropbox-vs-google-drive-vs-onedrive/>
- [8] <https://radore.com/blog/bulut-bilisimin-hizmet-modelleri-nelerdir-iaas-paas-ve-saas-nedir.html>