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## Cloud Computing

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale. Rather than keeping files on a proprietary hard drive or local storage device, cloud-based storage makes it possible to save them to a remote database. As long as an electronic device has access to the web, it has access to the data and the software programs to run it.

Cloud computing is a popular option for people and businesses for a number of reasons including cost savings, increased productivity, speed and efficiency, performance, and security.

### ▪ Characteristics of Cloud Computing

1. **On-demand self-service:** You can use it whenever you need it and pay per use. Think of it as electricity. In essence, the cloud is a form of utility computing. You create an account or pick your provider, and your services will be available to you anytime. You are billed at the end of the month only for what you used. This form of storing and accessing your data gives you full control over your resource usage and spending.
2. **Broad network access:** You must be able to access from across the web using any device with internet connectivity. Wherever you are, your cloud data will be accessible through web browsers, as well as on a laptop or mobile devices. The reason for this is the fact its underlying infrastructure includes servers on multiple locations.
3. **Resource pooling:** Multiple tenants can share the same space, and resources can be assigned, re-assigned, and distributed as needed. You can be anywhere in the world and still have equal access as everyone else, provided you have internet access.
4. **Rapid elasticity:** Cloud can grow and shrink as much as possible without affecting any of its users or their information. For example, if your business is experiencing peak traffic, the cloud can expand to accommodate all the new requests.
5. **Measured service:** You can examine how often people are using the cloud. Many cloud service providers utilize a pay-as-you-go model to ensure that their clients are getting what they pay for, no more and no less. Once again, this can be compared to electricity as you get billed for the amount that you use.

### ▪ Types of Cloud Computing

1. **Public Cloud:** Public cloud services are best for development systems and web servers. Your cloud computing provider will give you a slice of their digital space that they must share with other tenants.



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These types of clouds are cost-efficient since a pay-as-you-go model operates most. You pay for the number of hours you need to use the cloud and can exit whenever you complete your work. There are no obligations that require you to pay more than you need.

## 2. Private Cloud

Private clouds offer what their name suggests: privacy. You do not have to share your digital space with anyone else. Private cloud platforms are typically built in-house, and they belong to you and your business. They can also be configured in a third-party data centre and still provide an advanced level of privacy.

Larger organizations and clients who are concerned about security favour private clouds. The reason for this is primarily the fact that these clouds offer more defense than their public counterparts. Companies that need to protect sensitive information like customer data rely on private clouds.

## 3. Hybrid Clouds

Hybrid clouds are the best of both worlds. If you are using a hybrid cloud, you can control an internal database and use the public cloud when needed. There might be times when you will need to move data and applications from the private cloud to the public cloud, such as scheduled maintenance, blackouts, and natural disasters. The ability to seamlessly migrate information is perfect for cloud-based disaster recovery and preventing data loss.

The flexibility of hybrid clouds is excellent for scaling as any overflow can regulate in the public cloud. Furthermore, you can keep all non-sensitive tasks in the public cloud while safeguarding the essential data in the private cloud.

Regardless of how large your company is or what industry it serves, there will always be a cloud solution that best fits your needs. Take the time to compare the advantages and disadvantages of each kind before deciding.

### ▪ Examples of Cloud Computing Services:

#### Cloud Storage and Hosting

Keeping essential documents in a central online storage location makes it easier for everyone to access them. Cloud storage is vital for businesses with employees whom all need to obtain the same information to do their work. It increases collaboration and efficiency among organizations.

Cloud storage is also handy for personal use as you can keep your necessary documents on a web server to access later. Just look at Google Docs or OneDrive. You no longer need to carry around a flash drive to edit your spreadsheets or read your files.



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## Cloud Backup

Backing up files in the cloud is by far the most efficient way to ensure their availability. Cloud backup solutions create multiple copies of files and store data in different locations. This way, you do not have to worry that your files will be lost in case one of your or your provider's cloud server goes down.

## E-mail

People send about 105 billion emails every single day. Millions of newsletters, greetings, and reminders make their way into people's inboxes across the world. None of this would be possible without the cloud infrastructure.

## Business Intelligence

The availability of cloud-based BI systems triggered some of the most revolutionary changes in businesses. Complex data analytics, processing, and reporting systems are now available via the Internet at low price points. A single license can be transferred to multiple users, requiring no lengthy installation or setup.

### ▪ Types of Cloud Services

Cloud services are as varied as the types of clouds themselves. You can purchase three different kinds of cloud services:

**Infrastructure as a service (IaaS)** saves you money on buying physical data centers or servers. You pay as you go and only pay for as long as you need or use the service. IaaS allows you to adjust your scale depending on your demand quickly.

**Platform as a service (PaaS)** has everything you need for your business applications. It comes complete with infrastructures such as networking, online storage, and servers, as well as database management systems, development tools, and more. PaaS is designed to help create, test, develop, and update your application.

**Software as a service (SaaS)** is what you get whenever you download a new app for your phone. Companies create and develop their software and then lend it out to buyers. Businesses such as Autodesk, Lending Club, Microsoft, and IBM all generate revenue from SaaS.

### ▪ Benefits of Cloud Computing

The examples mentioned above are just the tip of the iceberg. Cloud computing has so many uses that it seems almost impossible to count them all. Every company can find a use for cloud services one way or another.



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1. Always-on available storage: The cloud provides an easy way to hold all your necessary data. You can rent cloud storage at a low price and scale it according to your demands. You no longer have to use an external hard drive or build an in-house data centre.

2. Disaster recovery solutions: You need data protection when catastrophe strikes. Preventing as much data loss as possible is critical regarding time, money, and efficiency. Cloud provides a much faster, and cost-effective disaster recovery than traditional solutions could ever offer.

Sometimes, the best way to deal with a tragedy is to prepare for it beforehand. You should always consider any worst-case scenarios since most catastrophic events are unplanned. Before cloud computing, you would have to distribute and collect various tapes and drives and then transfer the data to a central location. Now, you can just click a few buttons and have it done for you.

3. Cost savings: The process helps for saving cost and no longer need to buy a ton of external hard drives to keep your critical information. Companies can save up to 43% annually by migrating virtualized operating system instances in the cloud. In addition to that, the cloud gives you access to professional staff, advanced security systems, and cutting-edge hardware and software, which adds up to the projected savings. Cloud service providers that utilize a pay-as-you-go model are especially useful since you will never have to spend money on services that you are not using.

4. Consistent updates: The software is continuously being improved to increase security, efficiency, speed, capability, and reliability. On the other hand, updated hardware would require you purchasing a new device to enjoy the recent improvements. Software updates are consistent and usually don't need any extra costs.

5. Business continuity: Ensuring business operability in case of a disaster is a significant challenge for most organizations. However, when a single minute of downtime can cost you more than implementing a backup and disaster recovery solution, business continuity management becomes a priority.

The cloud offers disaster recovery and business continuity solutions. You can rely on it to keep your data and applications active even if a disaster physically strikes your business. With a solid business continuity plan and right cloud solutions, you can minimize the effects of potential disruptions.

6. Improved collaboration: People can work together more efficiently and efficiently than ever before. Who needs to book a conference room or take an international flight when large groups of people from all over the world can merely meet over a Skype call? Nobody needs to print out copies of the latest report since they can all access it from the cloud.

Cloud collaboration tools offer important advantages to employees. They can make use of file versioning or real-time editing any time. They can access data, applications, and services remotely from any device. All that boosts their productivity and, eventually, company's profits.



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7. Increased capacity: You no longer need to guess if you will have enough ability to build or destroy an application. Clouds can adjust upwards and downwards depending on what your business needs. The flexibility ensures that you will always be able to utilize cloud services regardless of what your business is doing.

8. Performance and speed: The cloud commoditizes enterprise-grade technology, making it available to smaller companies as well. This form of utility computing makes emerging technologies available to businesses at an affordable price point.

User can access high-performance hardware and software to improve your operations. The opex-based delivery model makes cloud resources accessible to businesses of any sizes. You just need to pick the solution that meets your needs best.

9. Data security: Keep user data secure and make sure that it does not fall into the wrong hands.