



Cloud Computing vs Cloud Storage: A Comparative Study

Dr. Surender Kumar

Associate Professor & Head, Post Graduate Department of Computer Science, Sri Guru Teg Bahadur
Khalsa College Sri Anandpur Sahib, (An Autonomous College) Punjab, India

Email: drsurender.sgtb@gmail.com

DOI : <https://doi.org/10.5281/zenodo.20690433>

ARTICLE DETAILS

Research Paper

Accepted: 20-05-2026

Published: 10-06-2026

Keywords:

Cloud Computing, Cloud Storage, SugarSync, IDrive, Dropbox, Google Drive, Norton Cloud Backup, Livedrive, Amazon Elastic Beanstalk, Microsoft Azure, Heroku.

ABSTRACT

The terms **cloud computing** and **cloud storage** are often used interchangeably. Although they are closely related and both originate from cloud technology, they represent different concepts. **Cloud computing** is a type of Internet-based computing that provides shared computing resources, such as processing power, applications, and data storage, on demand. It enables individuals and organizations to access and process data through privately owned or third-party data centers that may be located anywhere in the world. Cloud computing offers numerous benefits, including scalability, flexibility, cost efficiency, and remote accessibility. However, certain security and privacy risks associated with cloud computing should also be considered. Some well-known cloud computing service providers include Amazon Elastic Beanstalk, Microsoft Azure, and Heroku. **Cloud storage** is a data storage model in which digital data is stored in logical pools, while the physical storage may span multiple servers and locations. The storage infrastructure is typically owned and managed by a hosting company. Cloud storage providers are responsible for ensuring data availability, accessibility, security, and system maintenance. Individuals and organizations can purchase or lease storage capacity from these providers to store personal, organizational, or application data. Cloud storage services can be accessed through cloud computing platforms, web service application programming interfaces (APIs), cloud storage



gateways, desktop applications, or web-based content management systems. Numerous cloud storage providers are available in the market, including SugarSync, IDrive, Dropbox, Google Drive, Norton Cloud Backup, and Livedrive. Each provider offers unique features and services, so users should carefully evaluate their requirements before selecting a cloud storage solution.

1. Cloud Computing

Cloud computing is a technology that delivers computing services over the Internet. It provides users with access to shared computing resources, such as servers, storage, applications, and processing power, whenever they are needed. These services allow individuals and organizations to store and process data in private or third-party data centers that may be located anywhere in the world.

Today, cloud computing is used by individuals, businesses, educational institutions, and government organizations. Companies of all sizes, from small businesses to large multinational corporations, rely on cloud computing to improve efficiency and flexibility.

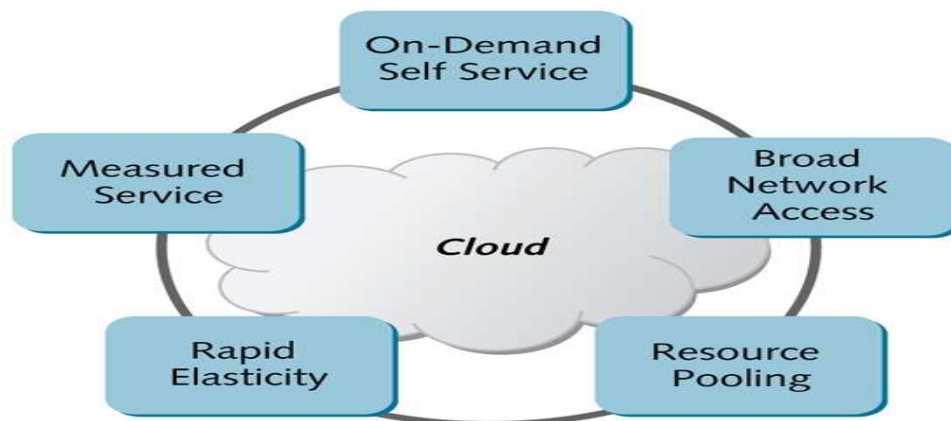
One of the main advantages of cloud computing is that users can access their data and applications from anywhere using any device with an Internet connection. Instead of storing information only on a personal computer or a local office server, data is stored securely in the cloud and can be accessed whenever needed. Authorized users can log in and work from any location, making remote work and collaboration easier.

Cloud computing also keeps data synchronized across connected devices. Any updates made to files or applications are automatically reflected for all users, ensuring that everyone has access to the latest information.

In a cloud environment, users can store and share files, run applications, and collaborate with others in real time. Team members in different cities or even different countries can work together on the same document, project, or presentation. Even when users are away from the office or cannot access their local servers, cloud-based data remains available, up to date, and accessible anytime, anywhere.

1.1 Essential Characteristics of Cloud Computing

The five essential characteristics of the cloud computing model were defined by the National Institute of Standards and technology (NIST) and have since been redefined by number of architects and experts. According to NIST, Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.



- **On-demand self service:** A business will secure cloud-hosting services through a cloud host provider which could be your usual software vendor. You have access to your services and you have the power to change cloud services through an online control panel or directly with the provider. You can add or delete users and change storage networks and software as needed. Typically, you are billed with a monthly subscription or a pay-for-what-you-use scenario. Terms of subscriptions and payments will vary with each software provider.
- **Broad network access:** Your team can access business management solutions using their smartphones, tablets, laptops, and office computers. They can use these devices wherever they are located with a simple online access point. This mobility is particularly attractive for businesses so that during business hours or on off-times, employees can stay on top of projects, contracts, and customers whether they are on the road or in the office. Broad network access includes private clouds that operate within a company's firewall, public clouds, or a hybrid deployment.
- **Resource pooling:** The cloud enables your employees to enter and use data within the business management software hosted in the cloud at the same time, from any location, and at any time. This is an attractive feature for multiple business offices and field service or sales teams that are usually outside the office.



- **Rapid elasticity:** The cloud is flexible and scalable to suit your immediate business needs. You can quickly and easily add or remove users, software features, and other resources.
- **Measured service:** Going back to the affordable nature of the cloud, you only pay for what you use. You and your cloud provider can measure storage levels, processing, bandwidth, and the number of user accounts and you are billed appropriately. The amount of resources that you may use can be monitored and controlled from both your side and your cloud provider's side which provides transparency.

1.2 Best Cloud-Computing Service Providers

There are numerous cloud computing service providers available in the market. We will discuss most commonly used service providers of cloud computing.

- **Heroku** is an impressive cloud-hosting platform that is both robust and easy to use. Its suite of powerful features includes compatibility with every major Web language, fast application deployment, monitoring and analytics, an intuitive user interface, easy scale management and simple third-party add-on integration from outside vendors. Heroku also provides a collection of tutorials and documentations for uncomplicated utilization.
- **Amazon Elastic Beanstalk** is an excellent cloud platform that offers a comprehensive set of cloud-computing tools. Its services include Amazon EC2 (Elastic Compute Cloud), a Linux or Windows server for your cloud; Amazon S3 (Simple Storage Service), where you can store files like documents, photos, videos and more; Amazon RDS (Relational Database Service) for databases; and Amazon ELB (Elastic Load Balancing), which essentially manages traffic in and out of your cloud. You can select which of these simple-to-use tools you'd like to use, or choose all of them for maximum capability and cloud management.
- **Windows Azure** is perfect for anyone who wants to source out all the administrative tasks associated with cloud computing. Windows Azure offers a platform-as-a-service that handles everything from setting up and configuring to updating and maintaining your cloud server. It is also one of the few services that support .NET applications. Included in the Windows Azure package are in-depth documentation and tutorials, as well as email and phone support, making it one of the most user-friendly cloud services out there.
- **Cbeyond** is a cloud service and communications provider for SMBs, also suggests finding cloud-computing services that offer both cloud and network connectivity to simplify logistics, save money and avoid the headaches of dealing with multiple vendors.

2. Cloud Storage

Cloud storage is a way of storing digital data on remote servers that are managed by a service provider. Instead of keeping data on a single computer or server, the data is stored across multiple servers, often located in different places. The cloud storage provider is responsible for maintaining the servers, keeping the data secure, and ensuring that it is always available when needed.

Individuals and organizations can purchase or rent storage space from these providers to store personal, business, or application data. Cloud storage services can be accessed through cloud-based applications, web services, APIs, cloud storage gateways, or web-based content management systems, allowing users to easily store, manage, and retrieve their data over the Internet.



Professionally, businesses use cloud storage to save and share documents and widely used files. Personally, people use cloud storage to manage their email and save media. It is also very handy as a data backup solution that can assist in disaster recovery. When compared to traditional hard drive management, cloud storage also tends to be cheaper and more flexible.

2.1 Features of Cloud Storage Providers

Automatic Backups

Automatic backups offer the convenience of configuring backup jobs to occur based on a preset time and date. The feature alleviates the need for the user to have to remember to manually run the job. Once the feature is configured, you can rest assured that a copy of your data will be stored on your online account.



In the event that you shut down your computer in the middle of a backup job, it will automatically resume once the computer is powered back on.

Incremental Backups

A feature that ensures only files which were modified, or newly created, since the last backup is saved to your cloud storage. The feature is important in that it is efficient, quick, and saves precious space from getting eaten up by duplicate documents.

File Archiving

Without this feature, older files are automatically deleted and replaced by their newer versions. File archiving preserves older versions so that, if needed, they can be accessed. Regardless of the number of previous versions, file archiving will keep a copy of each.

Open File Backup

Unexpected events such as power outage or hard drive failure, to name just a couple, can take place while you're in the middle of working on a document. The open file backup feature ensures that even open documents are backed up.

Remote Access

A feature that allows you to access stored files from any computer whenever the need arises. All that's required are the login details for your cloud storage account. This feature comes in very handy for those who are frequently on the move and may need to access files while on a flight, in a meeting or simply out of the office.

File Security

This is a must-have feature. Providers of secure online backups encrypt files during both transfer and storage; otherwise, your data is liable to be intercepted and read by malevolent parties. Most cloud storage companies use SSL and 256-bit AES encryption.

File Sharing

The file sharing feature gives the ability for multiple users to access files, on your online account, from wherever they may be. The feature is especially useful for those who need friends, family or co-workers to be able to view some or all files stored on the account.



2.2 Best Cloud Storage Providers

There are numerous cloud storage providers available in the market. But we will discuss some best cloud storage providers which are as follows:

Sugarsync

SugarSync is a cloud service that enables active synchronization of files across computers and other devices for file backup, access, syncing, and sharing from a variety of operating systems, such as Android, iOS, Mac OS X, and Windows devices. For Linux, only a discontinued unofficial third-party client is available.

The SugarSync program automatically refreshes its sync by constantly monitoring changes to files—additions, deletions, edit—and sync these changes with the SugarSync servers. Any other linked devices then also sync with the SugarSync servers. Deleted files are archived in a "Deleted Files" folder. In the event the local sync folder is stored on a device which later becomes unavailable (secondary hard drive failure, etc.), the SugarSync program will interpret this event as if the user had purposely deleted the entire synchronization folder, resulting in deletion of all files from the user's storage account. Due to this limitation, it is best to only store the local synchronization folder on the boot drive. Files deleted by the user are not actually removed from SugarSync servers until the user does so manually, however recovery of a larger nested folder structure may be difficult.

Dropbox

Dropbox is one of the only services to offer clients for Linux and Blackberry, alongside the usual Windows, Mac OS X, Android and iOS standards. There's an official Windows Phone app too.

The latest update adds the ability to sign PDFs right from Dropbox, plus a few iOS-specific features such as sharing files in iMessage and watching Dropbox video while working in another app on an iPad.

Dropbox works by creating a local folder on your device or PC that then syncs with an online version. This means you have all your data available whether you are on or offline. This doesn't apply to mobile devices, though: you can make select files available offline on your tablet or Smartphone (they're all offline by default), and offline editing is among the best we've seen.

Folders and files can also be shared with others but you cannot set permissions on the Basic account, so files can be edited (and even deleted) by other users. The Basic account is not a total disaster, though, as



Dropbox backs up any changes to files for 30 days. So if you need an older version or want to undelete a file, it is still there.

Microsoft OneDrive

Microsoft's OneDrive is a tempting cloud storage offer for many Windows users. The basic account offers 15GB of free storage, plus an additional 15GB if you link your camera roll to the service. If you sign up for Office 365, you get unlimited storage space.

OneDrive uses Microsoft's Modern UI design. Lines are clean and you can select between the boxy style or a more traditional file tree. Folders and files can be created on the web, including Office and OneNote formats thanks to tight Office Online integration. Selective sync was introduced with Windows 10, meaning you don't have to have all of your OneDrive files taking up space on every laptop and PC.

There is also a social element to the web version, as various popular social networks are available to be linked to your OneDrive account. This might not improve productivity, but it will make it easy to share files with colleagues. In doing this you can set permissions for each user ranging from read-only to complete editing ability, even if you're using the free version (unlike Dropbox which requires Dropbox Pro).

There is also a feature that allows you to remotely access files on another PC via the OneDrive website. If privacy is a major concern then it should be noted that Microsoft reserve the right to scan your files to look for what it would deem objectionable content. This could be copyrighted material or things of an explicit nature. Apple has a similar policy, making the two potentially more intrusive than their competitors.

Google Drive

In much the same way as OneDrive links into Microsoft products and iCloud to Apple, Google Drive is at the heart of the various online services that Google currently offers, and is definitely one of the best cloud storage services.

You get 15GB of free space when you create a Google account - or link to an existing one. In fact, you already have a Drive account if you use Gmail, Google Calendar, or even YouTube.

Drive works in the same way as most cloud storage solutions, with a local folder on your PC linked to a duplicate cloud version. Versioning is supported, as is real-time collaboration on documents via the



Google Docs app. Clients are available on PC and Mac, with mobile versions for Android and iOS, but Google and Microsoft's supposed ongoing feud looks to keep the service off Windows Phone for a while to come.

There's selective sync, so you can choose which folders sync on each PC or laptop.

On the whole, the interface across the apps is smart and simple to navigate, with a basic file tree showing where your data is kept. You can choose specific files to be available offline on the mobile versions, and these can be edited - if they were created in Google Docs - then synced when you return online. For other formats (such as Word) you'll need to open them in another app - thus creating a duplicate copy.

Data stored on Drive is, similarly to Apple, encrypted in 128-bit AES rather than the 256-bit employed by Box, OneDrive, and Dropbox. Google asserts that it won't pry into the content of your Drive folder unless compelled by law enforcement agencies, and you can set up two-step verification on your account to add another layer of security.

Mega

Mega is a New Zealand-based company that was set up by the German-born entrepreneur Kim Dotcom in 2013, who now has no involvement with it. Mega puts its security credentials front and centre. Unlike some of its rivals, this service provides encryption in every part of the process. So anything you send to the cloud is encrypted locally, on-route, and on the destination server.

Mega itself doesn't have any way of accessing your information, as you hold the encryption key. The upshot of all this is that anything you store on Mega is only able to be opened by you. To achieve this there are local clients for Windows, OS X, and Linux, plus there are also secure browser plugins for Chrome and Firefox. Apps are available for iOS, Android, Windows Phone, and even Blackberry.

Sharing is easy with other members of Mega, behaving in much the same way as Google Drive and Onedrive, by allowing you to send an invitation to a friend and set the level of actions they can complete (view, edit, etc.) You can also send links to non-Mega users, but this involves also privately sending them an encryption key so they can access the files.

A few secure communications features are coming: video chat, voice calling, email and IM. These are encrypted end-to-end, making them more private than Skype or Google Hangouts.



Tresorit 3.0

There are several services that offer secure storage in the cloud, but Tresorit 3.0 is definitely one of the best.

One of the reasons that Tresorit is so secure comes down to the way files are encrypted. With a local client installed on either your Windows or OS X machine your data is encrypted locally, then sent, using TLS, to the Tresorit servers where it remain encrypted. You retain the decryption keys (not that you'll ever see them) and not even the staff at Tresorit can access your files, thanks to their Zero-Knowledge policy. To add a further level of security you can enable two-step verification, so even if someone steals your laptop or ID, they'll need your phone to access the data. The servers are also based in the EU and governed by Swiss privacy laws which should keep it out of the hands of any invasive national agencies that feel it is their right to purloin your personal information.

Tresorit has updated its interface for version 3.0 to feel more 'native' on Windows and OS X, but there's also the web portal and mobile apps (Windows Phone, iOS, Android, and Blackberry) that look good, are simple to use, and perform reliably. On the desktop client you can drag folders from other drives into the Tresorit app and it will encrypt and sync the files up to the cloud but leave them where they are on your machine, so you don't have to restructure your files to fit in with Tresorit. Alternatively you can save files directly to the My Tresors folder and it will be available through any Tresorit app.

3. Conclusion:

Cloud computing and cloud storage are related but different technologies. Cloud storage allows users to save, access, and share data over the internet using remote servers, as seen with services like Google Drive, Dropbox, and iCloud. Cloud computing, on the other hand, uses remote servers to process data and perform tasks, such as running software applications through Software as a Service (SaaS).

The main differences are that cloud computing focuses on processing and transforming data and requires greater computing power, while cloud storage focuses on storing and sharing data and requires more storage capacity. Cloud computing is mainly used by businesses, whereas cloud storage is widely used by both individuals and organizations.

References

- <http://cloudnewsdaily.com/cloud-storage/>



- <http://www.businessnewsdaily.com/5215-dangers-cloud-computing.html>
- <http://www.pcadvisor.co.uk/test-centre/internet/best-cloud-storage-services-2017-uk-best-online-storage-services-3614269/>
- https://en.wikipedia.org/wiki/Cloud_computing
- <https://www.quora.com/Which-is-the-basic-difference-between-cloud-computing-and-cloud-storage>
- https://en.wikipedia.org/wiki/Cloud_storage
- <http://erpbloggers.com/2013/07/the-five-essential-characteristics-of-cloud-computing/>
- <https://www.linkedin.com/pulse/five-essential-characteristics-cloud-computing-sankar-somepalle>