

A Comparative Study of Evolution of Storage Media and Cloud

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Abstract: At present, a number of devices are available in market to handle huge amount of data. The speed of growth in the field of data storage is unbelievable. Researchers are trying day by day to find ways to store information. Most common storage media used are CD-ROM, USB Key, and DVD etc. Floppy disks and cassette tapes have been forgotten except for the most nostalgic. The next generations have simply forgotten about the technology that helped evolve the efficient computer storage systems we all use every day. As time humanity continues to push the envelope of innovation to create new possibilities. In today concern security and centralization of data is most important issue. Cloud computing is the most popular way for centralized data access. In this research paper previously used storage media and cloud storage is studied along with their benefits and future scope.

Keywords: Cloud Computing Survey, Data Storage, Public Cloud, SaaS



I. INTRODUCTION

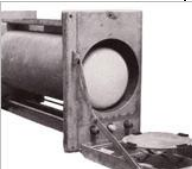


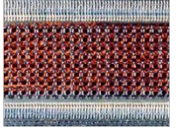

In past 80s and 90s the use of data was comparatively very less. Floppies or CDs are used to store and carry small amount of data. But by the time the demand of data and storage media is increased. New devices such as portable hard discs or Blue ray discs are introduced to carry large amount of data. Along with storage the sharing of data and using same data at multiple places was the primary demand of users. So that cloud computing and cloud storage is introduced.

II. LITERATURE SURVEY

Cloud computing or cloud storage also known as shared computing is a kind of Internet-based computing, where shared resources, data and information are provided to computers and other devices on-demand [2]. Cloud storage means storing data centralized in any online medium. So that the same data can be used by multiple users. Here the most popular ways of storage device used in past are given in the table below:

TABLE: HISTORY OF STORAGE MEDIUMS [2]

1928 Magnetic Tape Fritz Pfleumer, a German engineer, patented magnetic tape in 1928. He based his invention off Vlademar Poulsen's magnetic wire.	
1932 Magnetic Drum G. Taushek, an Austrian innovator, invented the magnetic drum in 1932. He based his invention off a discovery credited to Fritz Pfleumer.	

1946 Williams Tube Professor Fredrick C. Williams and his colleagues developed the first random access computer memory at the University of Manchester located in the United Kingdom. He used a series of electrostatic cathode-ray tubes for digital storage. A storage of 1024 bits of information was successfully implemented in 1948.	
1963 Music tape Philips introduced the compact audio cassette in 1963. Philips originally intended to use the audio cassette for dictation machines; however, it became a popular method for distributing prerecorded music. In 1979, Sony's Walkman helped transformed the use of the audio cassette tape, which became widely used and popular.	
1966 DRAM (PDF) In 1966, Robert H. Dennard invented DRAM cells. Dynamic Random Access Memory technology (DRAM), or memory cells that contained one transistor. DRAM cells store bits of information as an electrical charge in a circuit. DRAM cells increased overall memory density.	
1968 Twistor Memory Bell Labs developed Twistor memory by wrapping magnetic tape around a wire that conducts electrical current. Bell Labs used Twistor tape between 1968 to the mid-1970s before it was totally replaced by RAM chips.	
1970 Bubble Memory In 1970, Andrew Bobeck invented the Bubble Memory, a thin magnetic film used to store one bit of data in small magnetized areas that look like bubbles. The development of the Twistor memory enabled him to create Bubble Memory.	

1980 CDDuring the 1960s, James T. Russel thought of using light to record and replay music. As a result, he invented the optical digital television recording and playback television in 1970; however, nobody took to his invention. In 1975, Philips representatives visited Russel at his lab. They paid Russel millions for him to develop the compact disc (CD). In 1980, Russel completed the project and presented it to Sony.	
1981 3.5" FloppyThe 3.5-inch floppy disk had significant advantages over its predecessors. It had a rigid metal cover that made it harder to damage the magnetic film inside.	
1984 CD RomThe CD-ROM, also known as the Compact Disk Read-Only Memory, used the same physical format as the audio compact disks to store digital data. The CD-ROM encodes tiny pits of digital data into the lower surface of the plastic disc, which allowed for larger amounts of data to be stored.	
1987 DATIn 1987, Sony introduced the Digital Audio Tape (DAT), a signal recording and playback machine. It resembled the audio cassette tape on the surface with a 4 millimeter magnetic tape enclosed into a protective shell.	
1993 DLT (PDF)The Digital Equipment Corporation invented the Digital Linear Tape (DLT), an alternative to the magnetic tape technology used for computer storage.	
1994 Compact FlashCompactFlash (CF), also known as "flash drives," used flash memory in an enclosed disc to save digital data. CF devices are used in digital cameras and computers to store digital information.	
ZipThe Zip drive became commonly used in 1994 to store digital files. It was a removable disk storage system introduced by Iomega.	
1995 DVDDVD became the next generation of digital disc storage. DVD, a bigger and faster alternative to the compact disc, serves to store multimedia data.	
SmartMediaToshiba launched the SmartMedia, a flash memory card, in the summer of 1995 to compete with MiniCard and SanDisk.	
Phasewriter DualThe Phasewriter Dual (PD) was the first device that used phase-change technology to store digital data. Panasonic introduced the Phasewriter Dual device in 1995. It was replaced by the CD-ROM and DVD.	
1997 Multimedia CardThe Multimedia Card (MMC) uses a flash memory card standard to house digital data. It was introduced by Siemen's and SanDisk in 1997.	

1999 MicrodriveA USB Flash Drive uses a NAND-type flash memory to store digital data. A USB Flash Drive plugs into the USP interface on standard computers.	
2003 Blu Ray (PDF)Blu-Ray is the next generation of optical disc format used to store high definition video (HD) and high density storage. Blu-Ray received its name for the blue laser that allows it to store more data than a standard DVD. Its competitor is HD-DVD.	
Cloud Backup SolutionsZetta's cloud enables businesses to protect data using backup, recover from a disaster, and archive unused files using only a lightweight software client and Zetta's bi-coastal datacenters. As storage hardware and internet bandwidth continue to develop, so will Zetta's performance.	

I. CLOUD COMPUTING

Even devices such as printers can be shared via cloud with such kind of infrastructure. However, cloud storage does have the potential for security and compliance concerns. A basic cloud storage with shared resources is shown in the figure given below:



Figure 1: A model of Cloud Computing and cloud storage model showing shared resources.

There are many benefits having Cloud storage for businesses and end users. This cloud storage can be categorized as public cloud, private cloud or hybrid infrastructure. Three of the main benefits of cloud computing includes:

- Self-service provisioning: End users can spin up computing resources for almost any type of workload on-demand.
- Dynamic Network Structure: Companies can scale up as computing needs increase and then scale down again as demands decrease.
- Pay per use: Computing resources are measured at a granular level, allowing users to pay only for the resources and workloads they use.

II. TYPES OF CLOUD STORAGE

This cloud storage can be categorized as public cloud, private cloud or hybrid infrastructure. Private or Corporate cloud services are delivered from a centralized data center to users. This model offers dynamic network structure where the implementation can be molded according to demand.

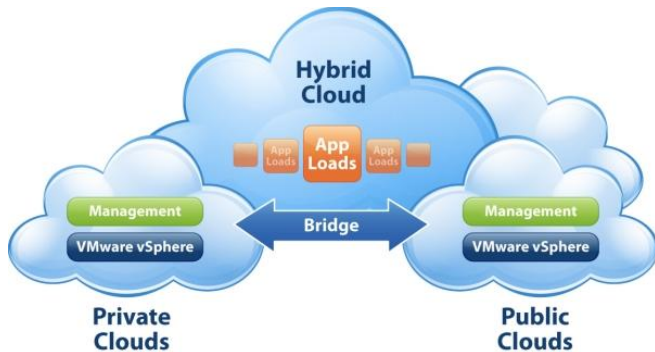


Figure 2: Public, Private hybrid cloud storage with shared data and data management

In the public cloud model, a third-party provider delivers the cloud service to the user according to need over the Internet. Users only pay for the CPU cycles, storage or bandwidth they consume. Leading public cloud providers include Amazon Web Services (AWS), Microsoft Azure, IBM/SoftLayer and Google Compute Engine.

III. ADVANTAGES AND DISADVANTAGES OF USING CLOUD STORAGE

Advantages of Cloud Storage

1. Usability: Exchange of files between different file system is very easy.
2. Bandwidth: Shared storage saves bandwidth. Rather than mailing individual file user can directly access same file without occupying too much bandwidth.
3. Accessibility: Stored files can be accessed from anywhere via Internet connection.
4. Cost Savings: Businesses and organizations can often reduce annual operating costs by using cloud storage; cloud storage costs about 3 cents per gigabyte to store data internally. Users can see additional cost savings because it does not require internal power to store information remotely[3].

Disadvantages of Cloud Storage

1. Usability: Be careful when using drag/drop to move a document into the cloud storage

folder. This will permanently move your document from its original folder to the cloud storage location. Do a copy and paste instead of drag/drop if you want to retain the document's original location in addition to moving a copy onto the cloud storage folder.

2. Bandwidth: Several cloud storage services have a specific bandwidth allowance. If an organization surpasses the given allowance, the additional charges could be significant. However, some providers allow unlimited bandwidth. This is a factor that companies should consider when looking at a cloud storage provider.
3. Accessibility: If you have no internet connection, you have no access to your data.
4. Software: If you want to be able to manipulate your files locally through multiple devices, you'll need to download the service on all devices[5].

IV. CONCLUSION

A number of storage media are studied and cloud storage is introduced. With this study it can be concluded that in future it is possible to completely replace other storage medium. As per security respect cloud storage provides very high security for the data of end user.

Reference

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