

# Comparative study of characteristics of traditional Database and cloud database: An Approach for Data Migration

Vijaya R. Kumbhar

(Research Student, Dept of Comp. Sci., University of Pune )

Assistant Professor,

Indira College of Commerce & Science, Pune

contactvijayak@iccs.ac.in ,

contactvijayak@yahoo.co.in

Dr. Ajay Kumar

(Research Guide)

Director, Jaywant Institute of Computer Applications,

Pune.

ajay19\_61@rediffmail.com

**Abstract** - The information technology has grown tremendously during the last two decades and information sharing and exchange has been changed from standalone machine to networking, networking to internet, internet to cloud environment. The use of database in this context has also changed due to the business requirement and functionalities provided. In this paper, we present a survey of databases used from traditional computing environment to cloud environment. The aim of this paper is to provide a better understanding of usage and the issues & challenges of the databases used in cloud environment

**Keywords** - Data Migration, Traditional Databases, Cloud Databases, Cloud Environment, Data Centers.

## 1. INTRODUCTION

Data is collection of raw facts from which some conclusions might be drawn. Today most of the data computerized and stored in 0's and 1's format.e.g. EBook, digital movie, digital image etc. These data can be classified as structured or unstructured. The structured data can be stored in row and column format whereas unstructured data and its elements cannot be stored in row and column format .The structured data is called as database and unstructured data is classified as images, manuals, forms, contracts, Email attachments etc.[1]

The term *bigdata* is new and evolving concept, which refers to data sets whose sizes are beyond the capability of commonly used software's. It includes both structured and unstructured data. Analyzing bigdata requires new techniques, architectures and tools that provide high performance, massively parallel processing data platforms and advanced analytics on the data sets. Hence traditional database may not satisfy the current and future need of these *bigdata*. [1]

### Traditional Databases:

Database is collection of inter-related tables, whereas tables are combinations of rows and columns, i.e. the data is stored in row-column format. Local Database is the database stored on stand-alone computer.

Networked Database is one which is stored on a computer or server connected to a network & accessible to all computers

connected to a network. e.g. Microsoft Access, Oracle, MySQL, SQL Server etc. [1][2]

### Cloud Databases:

Online/Web based/Cloud Database is now the new and very fast growing database on cloud of servers somewhere on internet, which is accessible by any authorized user with an internet connection.[1],[2] e.g. Amazon RDS, IBM DB, Blist, Cebase, DabbleDB, MyWebDB, QuickBase, TeamDesk, Trackvia, ZohoCreator, Zoho DB and Reports, Cassandra, Mongo DB, Hbase etc.

### Properties

Traditional databases generally has the properties atomicity, consistency, integrity, durability whereas the cloud database should have the properties availability, security, scalability, performance, data integrity, capacity, manageability, elasticity, information accountability, cost effectiveness, predictability and flexibility[1].

### Storage Capacity

The traditional database has the storage capacity up to few millions of records. As MS-Access can store up to thousands of records, MySQL can store and handle 300 million records and SQL Server can handle up to 800 million records. As cloud database has been developed for storing large datasets and big data, it can handle more than million data.[6]

### Storage Media & location

The database was stored on standalone machine in initial days, and then on server (most probably dedicated server) .It was stored on magnetic tapes or on magnetic disks. As cloud database is the database stored over internet, it is basically stored in one of the secured data centers. More specifically it is stored in tape reels or disk packs.[1]

### Database transfer Media

The database was needed to transfer before cloud computing and the media used for travelling was floppy disks then pen drive, CD's, portable hard disks etc. As cloud

database location is not known to users, user need not worry about it and no need to transfer it, as it is available over internet.

### Security & Protection

The data inside traditional database is fully secured as location and users are known to the administrator whereas cloud database cannot give 100% guarantee as users, storage and overall usage is increasing day by day. As third party is involved in storing and maintaining the database, consumers don't trust the cloud database.

### Read and Write performance

The traditional database is stored on stand-alone machine or on LAN; hence it is very fast in reading and writing the records of database and also in handling the data. Due to increasing popularity of cloud database and improved algorithms, cloud database is also giving good performance but as the location is far away from client machines it is not as good as traditional database.

### Disaster Recovery

As the traditional database is stored on only one location or within a network, if any natural disaster occurs, there is no way to recover from it, whereas cloud database uses relocation within different continental area, so disaster at one location will destroy only one copy of database and other copies can be used to recover the database.

### Technology for data storage, retrieval and conversion

In traditional Databases we can store the databases using RAID (Redundant Array of Inexpensive Disks) architecture, which is generally used to maintain the security. There are many levels of RAID i.e. RAID 0 to RAID 6.

### File System

The traditional database uses general file systems depending on operating system and partition. e.g, FAT 16, NTFS, ext3 or ext4 etc. whereas in cloud database there are two ways to store the data, one where the database and SQL concept is used and other where No-SQL concept is used.

### Cost

The traditional databases has to be purchased as entire product though it is used for personal to business applications and for smallest to largest number of records, the cost involved is same. But for cloud database the cost involved for personal use to business applications and from smallest to largest number of record is different. The concept of different cost involved is called as Pay-as-you-go model.

## II. DISADVANTAGES OF TRADITIONAL DATABASES

### a. Maintenance

The traditional databases are stored and installed at client side; it is maintained by the owner only.

### b. Sharing of database

The traditional databases are stored on stand-alone machine or on server; hence if it has to be shared amongst users, it is possible using backup of database whenever it has to be shared.

### c. Retrieval of updated data

The traditional databases are stored on stand-alone machine or on server; hence it is very fast in accession of the database, if it is required on the same machine, but if the database has to be shared at different geographical location for every updates then it has to be backed up and send to other location, for which some time is elapsed.

## III. BENEFITS OF CLOUD DATABASES

### a. Maintenance by cloud vendors

The cloud databases are stored at data centers managed by cloud vendors, also maintained by the cloud providers.

### b. Sharing of database

Cloud database itself is stored on internet; it can be shared amongst the users without creating the backup.

### c. Faster Retrieval of updated data

As the cloud databases are stored on internet, it can be accessed and shared amongst authenticated users of the respective database.

### d. Pay-as-you-go model

The cost involved in cloud database is according to numbers of users, records and usage range i.e. from personal to business applications, different cost is involved. Hence cost flexibility is achieved.[8],[9]

## IV. CONCLUSION

In this paper term database with its relevance to data is given. Also a comparative summary has been provided in the form of a table. The traditional database and cloud database is compared w.r.t storage media, security, protection and efficiency. It is clear from the study that none of the database is weak but according to today's need, one has to move to cloud database. Cloud Database is an enhanced approach to service the needs of Business Intelligence (BI), data warehouse, and analytical applications where scalability, performance and simplicity are paramount.

## V. REFERENCES

1. *Information Storage and Management* By Somasundaram Gnanasundaram, Alok Srivastava.
2. *Cloud Computing* By Michel Miller.
3. *Cloud Computing* By Brain J.S. Chee, Curtis Franklin, Jr.
4. *Cloud Computing – A practical Approach* By Anthony T Velte, Toby Velte, Robert Elsenpeter.

5. Punam Bajaj ,Simranjit Kaur Dhindsa, “ A Comparative study of database systems”, *International Journal of Engineering and Innovative Technology*, Volume 1, Issue 6 June 2012,ISSN:2277-3754.
6. [Stackoverflow.com/questions](http://Stackoverflow.com/questions)
7. Jean-Daniel Cryans, Alain April, and Alain Abran,” *Criteria to Compare Cloud Computing with Current Database Technology*”, Springer-Verlag Berlin Heidelberg 2008.
8. Daniel J. Abadi, “Data Management in the Cloud: Limitations and Opportunities”, *Bulletin of the IEEE Computer Society Technical Committee on Data Engineering*.
9. Sunil Kamath ,Ashraf Aboulnaga,Kenneth Salem,Ahmed A. Soror,Umar Farooq Minhas,Peter Kokosielis,“Deploying Database Appliances in the Cloud”, *Bulletin of the IEEE Computer Society Technical Committee on Data Engineering*.
10. Samiul Islam ,Farah Habib Chanchary , “Data Migration: Connecting Databases in the Cloud”, ICCIT, 2012
11. Thibault Dory, Boris Mejias, Peter Van Roy, Nam-Luc Tran,” *Measuring Elasticity for Cloud Databases*”