File System vs DBMS: Key Differences

By Richard Peterson · Updated October 7, 2021

What is a File system?

A file system is a technique of arranging the files in a storage medium like a hard disk, pen drive, DVD, etc. It helps you to organizes the data and allows easy retrieval of files when they are required. It mostly consists of different types of files like mp3, mp4, txt, doc, etc. that are grouped into directories.

A file system enables you to handle the way of reading and writing data to the storage medium. It is directly installed into the computer with the Operating systems such as Windows and Linux.

What is DBMS?

Database Management System (DBMS) is a software for storing and retrieving user's data while considering appropriate security measures. It consists of a group of programs that manipulate the database. The DBMS accepts the request for data from an application and instructs the DBMS engine to provide the specific data. In large systems, a DBMS helps users and other third-party software to store and retrieve data.

KEY DIFFERENCES:

- A file system is a software that manages and organizes the files in a storage medium, whereas DBMS is a software application that is used for accessing, creating, and managing databases.
- The file system doesn't have a crash recovery mechanism on the other hand, DBMS provides a crash recovery mechanism.
- Data inconsistency is higher in the file system. On the contrary Data inconsistency is low in a database management system.

DBMS system, it is easy to implement complicated transactions using SQL.

- File system does not offer concurrency, whereas DBMS provides a concurrency facility.

Features of a File system

Here are important elements of the file system:

- It helps you to store data in a group of files.
- Files data are dependent on each other.
- C/C++ and COBOL languages were used to design the files.
- Shared File System Support
- Fast File System Recovery.

Features of DBMS

Here, are essential features of DBMS:

- A user-accessible catalog of data
- Transaction support
- Concurrency control with Recovery services
- Authorization services
- The value of data is the same at all places.
- Offers support for data communication
- Independent utility services
- Allows multiple users to share a file at the same time

Difference between filesystem vs. DBMS

File System	DBMS
A file system is a software that manages and organizes the files in a storage medium. It controls how data is stored and retrieved.	DBMS or Database Management System is a software application. It is used for accessing, creating, and managing databases.
The file system provides the details of data representation and storage of data.	DBMS gives an abstract view of data that hides the details
Storing and retrieving of data can't be done efficiently in a file system.	DBMS is efficient to use as there are a wide variety of methods to store and retrieve data.
It does not offer data recovery processes.	There is a backup recovery for data in DBMS.
The file system doesn't have a crash recovery mechanism.	DBMS provides a crash recovery mechanism
Protecting a file system is very difficult.	DBMS offers good protection mechanism.
In a file management system, the redundancy of data is greater.	The redundancy of data is low in the DBMS system.
Data inconsistency is higher in the file system.	Data inconsistency is low in a database management system.
The file system offers lesser security.	Database Management System offers high security.
File System allows you to stores the data as isolated data files and entities.	Database Management System stores data as well defined constraints and interrelation.
Not provide support for complicated	Easy to implement complicated

The centralization process is hard in File Management System.	Centralization is easy to achieve in the DBMS system.
It doesn't offer backup and recovery of data if it is lost.	DBMS system provides backup and recovery of data even if it is lost.
There is no efficient query processing in the file system.	You can easily query data in a database using the SQL language.
These system doesn't offer concurrency.	DBMS system provides a concurrency facility.

Advantages of File system

Here are pros/benefits of file system:

- Enforcement of development and maintenance standards.
- Helps you to reduce redundancy
- Avoid inconsistency across file maintenance to get the integrity of data independence.
- Firm theoretical foundation (for the relational model).
- It is more efficient and cost less than a DBMS in certain situations.
- The design of file processing is simpler than designing Database.

Advantages of DBMS system

Here, are pros/benefits of DBMS system:

- DBMS offers a variety of techniques to store & retrieve data
- Uniform administration procedures for data
- Application programmers never exposed to details of data representation and Storage.
- A DBMS uses various powerful functions to store and retrieve data efficiently.
- Offers Data Integrity and Security
- The DBMS implies integrity constraints to get a high level of protection against prohibited access to data.
- Reduced Application Development Time
- Consume lesser space

Application of File system

Here, are an important application of the file system:

- Language-specific run-time libraries
- API programs using it to make requests of the file system
- It is used for data transfer and positioning.
- Helps you to update the metadata
- Managing directories.

Application of the DBMS system

Here, are important applications of the DBMS system:

- Admission System Examination System Library System
- Payroll & Personnel Management System
- Accounting System Hotel Reservation System Airline Reservation System
- It is used in the Banking system for Customer information, account activités, Payments, déposits, loans, etc.
- Use for Airlines for reservations and schedules
- DBMS system also used by universities to keep call records, monthly bills, maintaining balances, etc.
- Finance for storing information about stock, sales, and purchases of financial instruments like stocks and bonds.

Disadvantages of File system

Here, are cons/drawback of the file system:

- Each application has its data file so, the same data may have to be recorded and stored many times.
- Data dependence in the file processing system are data-dependent, but, the problem is incompatible with file format.
- Limited data sharing.
- The problem with security.
- Time-consuming.

Required lots of labor work to do.

Disadvantages of the DBMS system

Here, are some cons/drawbacks of the DBMS system:

- Cost of Hardware and Software of a DBMS is quite high, which increases the budget of your organization.
- Most database management systems are often complex systems, so the training for users to use the DBMS is required.
- The use of the same program at a time by many users sometimes lead to the loss of some data.
- DBMS can't perform sophisticated calculations
- Data-sets begins to grow large as it provides a more predictable query response time.
- It required a processor with the high speed of data processing.
- The database can fail because or power failure or the whole system stops.
- The cost of DBMS is depended on the environment, function, or recurrent annual maintenance cost.

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