Here are five challenges of file-based storage systems that were effectively addressed by Database Management Systems (DBMS):

1. Data Redundancy and Inconsistency:
   * Challenge in File-Based System: In file-based systems, data redundancy was common, as the same data might be duplicated across multiple files. This redundancy increased the risk of inconsistency, as updates to one instance of data might not be reflected in others.
   * How DBMS Addressed It: DBMS minimizes data redundancy through the use of a centralized database, where data is stored in tables with relationships. Data integrity is maintained through constraints and atomic transactions, ensuring that updates are consistent across the entire database.
2. Limited Data Retrieval and Query Capabilities:
   * Challenge in File-Based System: Retrieving specific information from numerous files was cumbersome in file-based systems. Complex queries were difficult to formulate and execute.
   * How DBMS Addressed It: DBMS introduced structured query languages (e.g., SQL) that enable users to write powerful queries for data retrieval. It optimizes these queries for efficient execution, allowing users to quickly retrieve the data they need.
3. Concurrency Control:
   * Challenge in File-Based System: In file-based systems, managing concurrent access to data by multiple users could result in data corruption or inconsistency.
   * How DBMS Addressed It: DBMS provides robust concurrency control mechanisms to ensure that multiple users can access and modify data simultaneously without causing conflicts. Transactions are managed to maintain data integrity.
4. Lack of Data Integrity Enforcement:
   * Challenge in File-Based System: Enforcing data integrity constraints, such as ensuring that relationships between data are maintained, was challenging in file-based systems.
   * How DBMS Addressed It: DBMS allows users to define integrity constraints within the database schema. These constraints are enforced automatically, ensuring that data remains consistent and accurate.
5. Scalability and Maintenance:
   * Challenge in File-Based System: As data volumes grew, maintaining and scaling file-based systems became increasingly complex and inefficient.
   * How DBMS Addressed It: DBMS offers scalability options, such as distributed databases and cloud-based solutions, to accommodate growing data needs. Maintenance tasks, like data backups and performance optimization, are streamlined through DBMS tools and utilities.