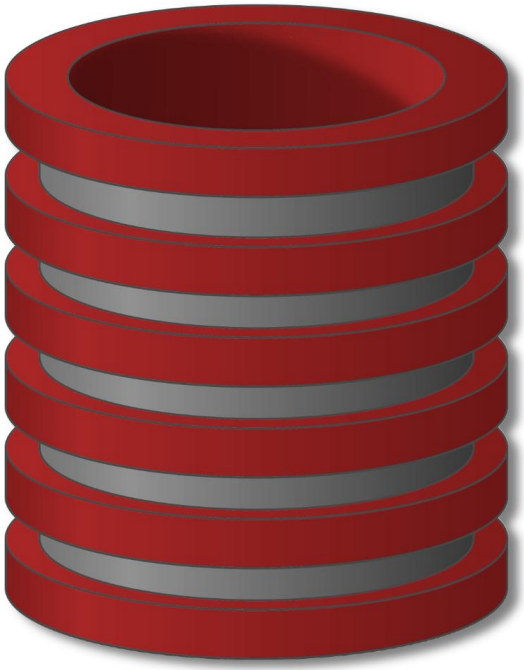

Introduction to Databases

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Intro to Databases

Database Management System (DBMS) provides….

… efficient, reliable, convenient, and safe multi-user storage of and access to massive amounts of persistent data.

Intro to Databases

- Massive – terabytes
- Persistent

that the data in the database outlives the programs that execute on that data.

The data is what sits there and then program will start up, it will operate on the data, the program will stop and the data will still be there.

Very often actually multiple programs will be operating on the same data.

- Safe – hardware, software, power, users

database systems have a number of built in mechanisms that ensure that the data remains consistent, regardless of what happens.

- Multi-user – concurrency control

many users might be operating on the same database but be operating on different individual data items.

- Convenient < Physical data independence
  high-level query languages declarative

the operations on the data are independent from the way the data is laid out.

- Efficient – thousands of queries/updates per second.
- Reliable – 99.99999%

Intro to Databases

- Database applications may be programmed via "frameworks"
- DBMS may run in conjunction with "middleware" (application servers, web servers,)
- Data-intensive applications may not use DBMS at all

DBMS itself

Key concepts

- Data model

  Set of records, XML, graph in the form of nodes and edges.

  hierarchical structure, of labeled values.

- Schema versus data

  Types — Variables

- Data definition language (DDL)

  Set up schema

- Data manipulation or query language (DML)

  Querying and modifying

Key people

- DBMS implementer

  Builds system

- Database designer

  Establishes schema

- Database application developer

  Programs that operate on database

- Database administrator

  Loads data, keeps running smoothly

Intro to Databases

Whether you know it or not, you're using a database every day

Hour.