

DATABASE SYSTEMS

Architecture

Presentation by

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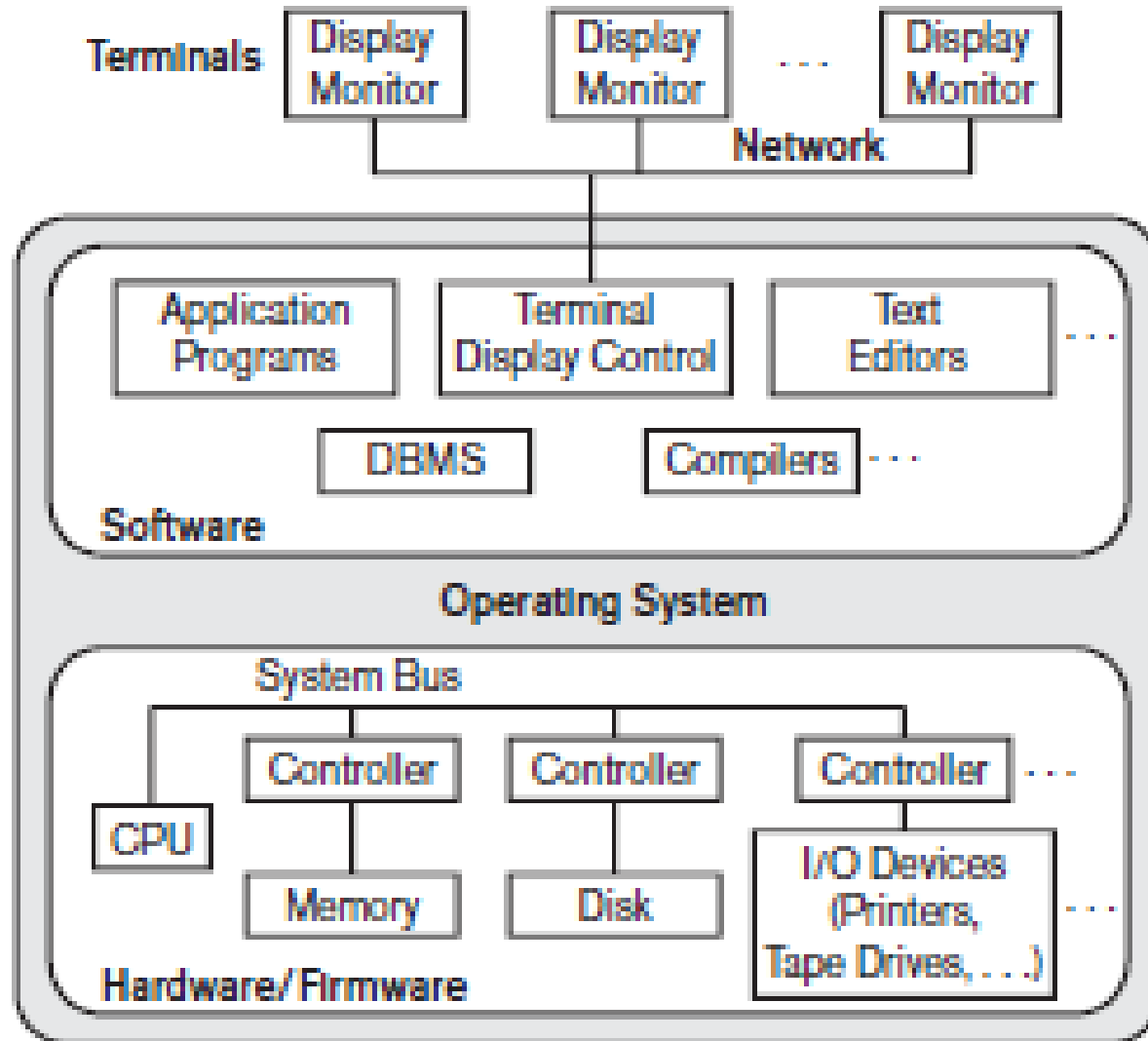
Database Systems Architecture

- Centralized DBMS Architecture
- Client Server Architecture
 - Two Tier Client/Server Architecture for DBMSs
 - Three-Tier Client Server Architecture for Web Applications

1. Centralized DBMS Architecture

- Database systems can be centralized, where one server machine executes operations on the database.
- provide main processing for **user application programs, user interface programs** and DBMS functionality
- User accessed systems via '**dumb**' computer terminals **that only provided display capabilities, with no processing capabilities.**
- All processing was performed remotely on the computer system, and only display information was sent to the terminals, connected via a network.
- Dumb terminals were replaced with workstations, which led to the client/server architecture.

Centralized DBMSs Architecture



2. Client Server Architecture

Client – a user machine that provides **user interface** capabilities and local processing.

Server – machine that **provides services to client** machines such as file access, printing, and database access.

Client Server Architecture

- Define **specialized servers** with specific functionalities (file servers, print servers, web servers, database servers)
- Many client machines can access resources provided by specialized server.
- Client machines provide user with the appropriate interfaces to utilize servers, as well as with local processing power to run local applications.
- Some machines are client sites, with client software installed and other machines are dedicated servers.

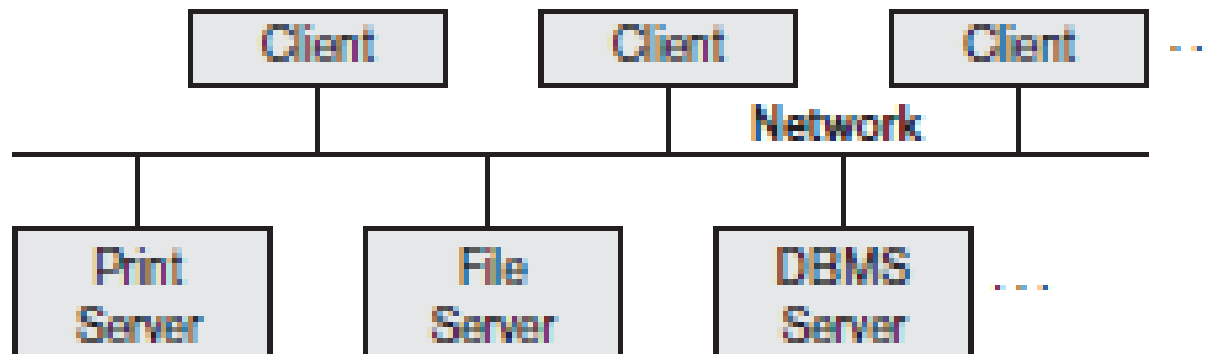
Two –Tier Architecture

- Systems are called two tier architectures because the **software components are distributed over two systems**, the **client and server**.
- **Query requests** are sent from the client to the server, and the **server processes the request** and sends the result to the client.
- In such systems, **the user interface and application programs run on the client**, when **DMBS access** is needed, the program establishes a connection to the DBMS on the server side. Once the connection is created, the client can communicate with the DBMS.

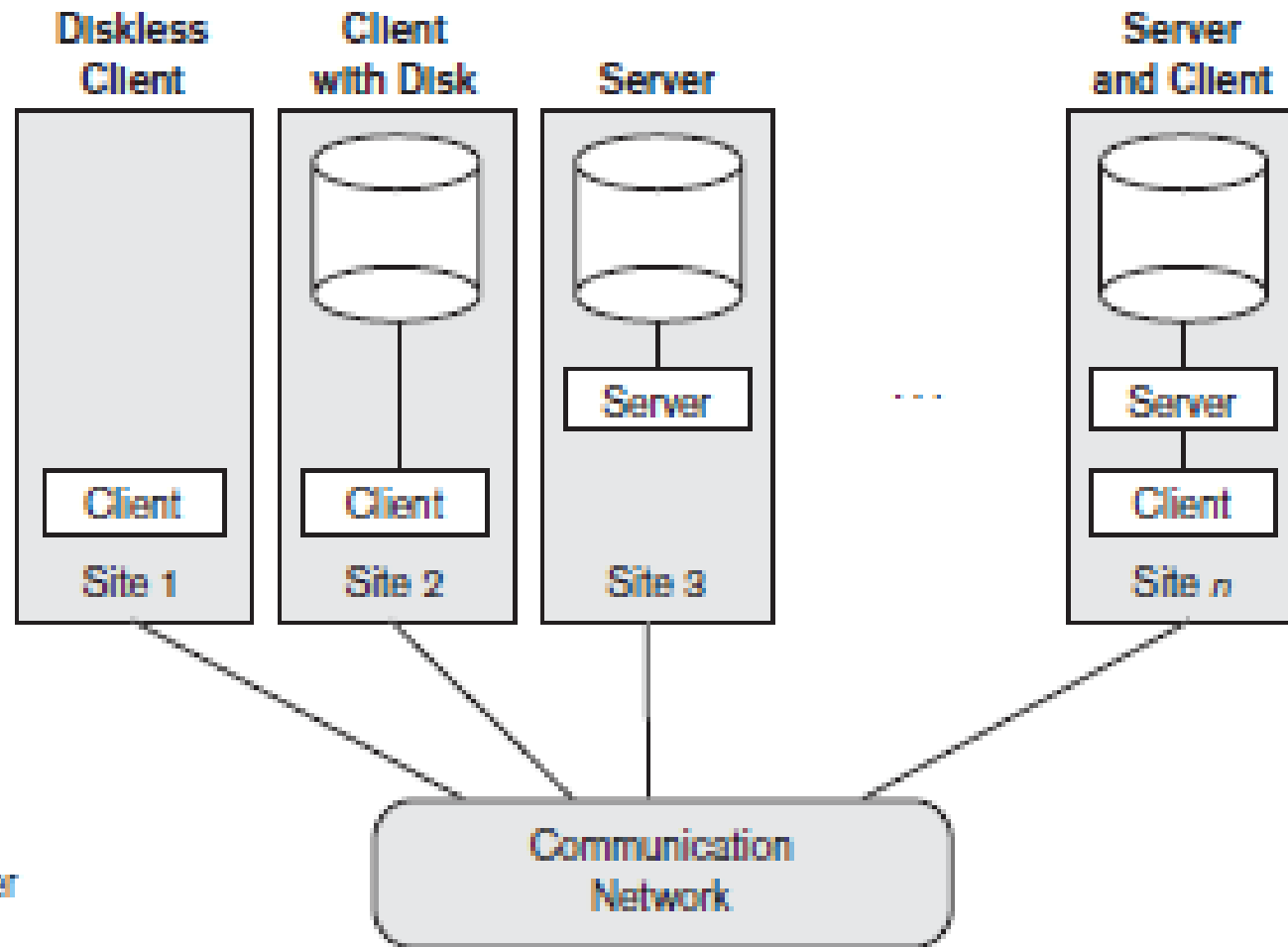
Two –Tier Architecture

- ODBC (**Open Database Connectivity**) is a standard that provides an application processing interface which allows client side programs to call the DBMS as long as both sides have the required software. Most database vendors provide ODBC drivers for their systems.
- Client programs can connect to several RDBMS and send query and transaction requests using the ODBC API

Two –Tier Architecture - Logical

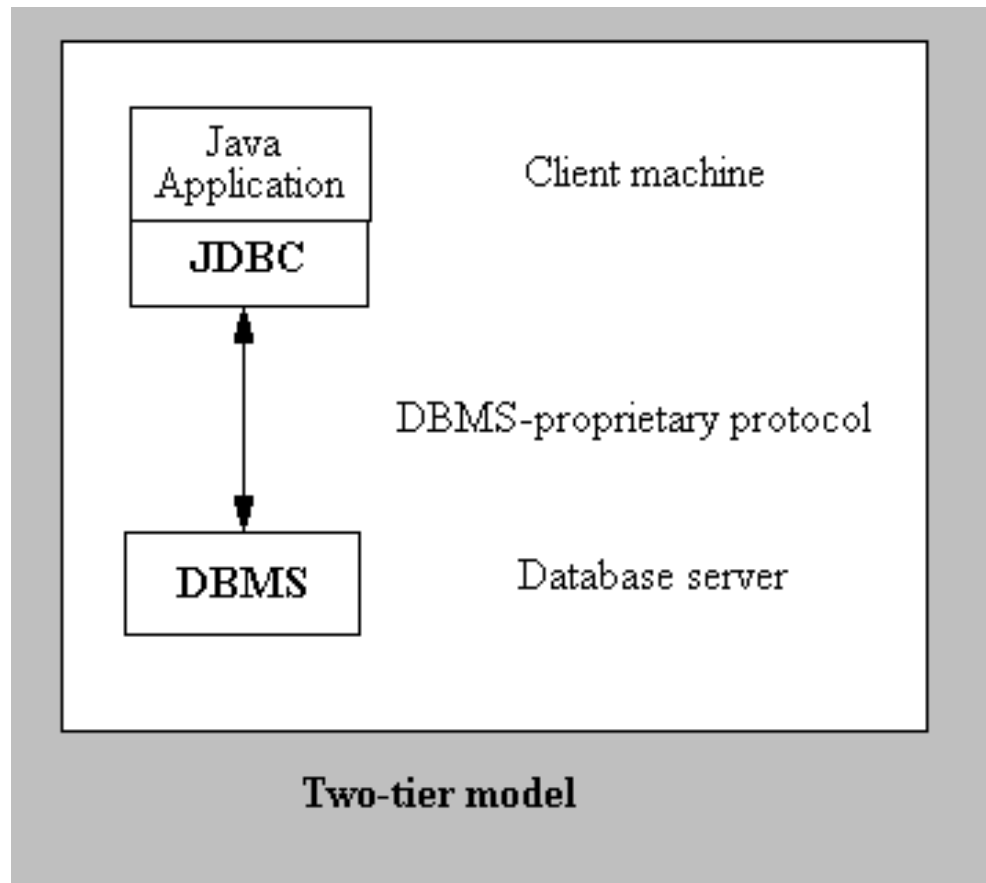


Two –Tier Architecture - Physical



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Two tier example

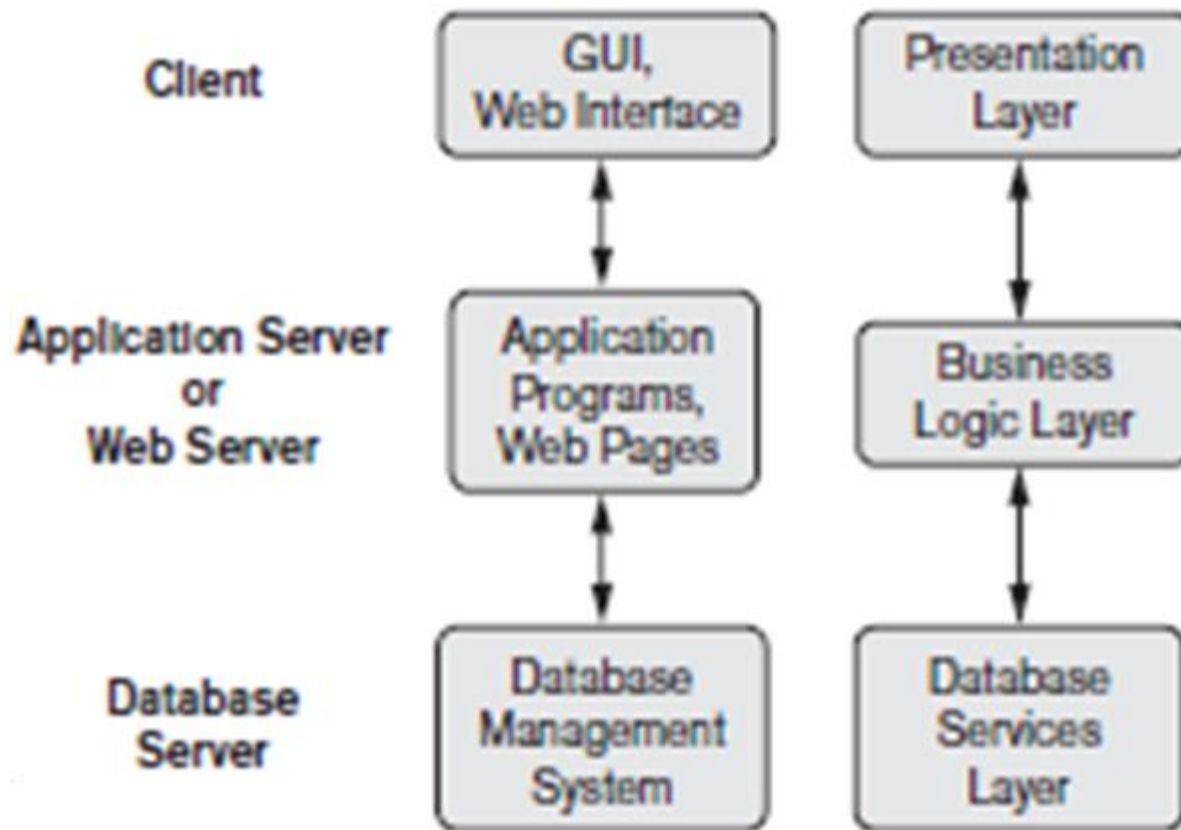


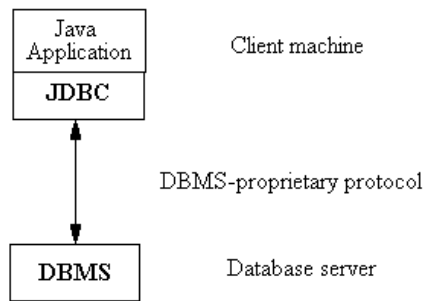
Three tier Architecture

- Many web applications use three-tier architecture, which adds an intermediate layer between the client and the database server.
- The middle tier is called the **application server**, or the **web server**. Plays an intermediate role, by storing business rules (procedures/constraints) used to access data from database.

Three tier Architecture- Advantages

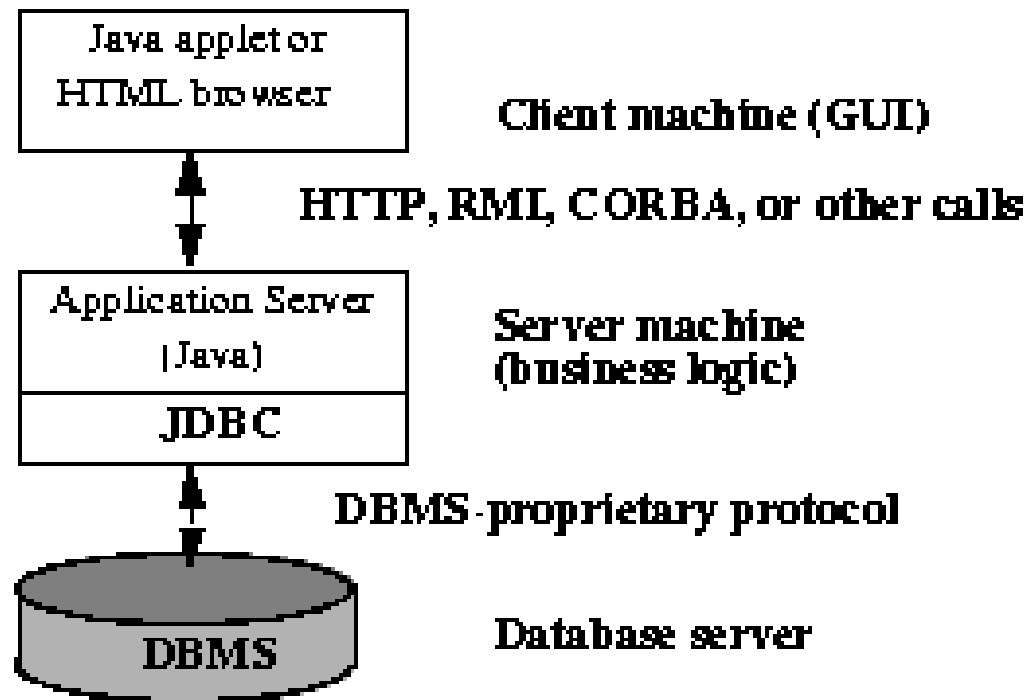
- MIS directors find the three-tier model very attractive because the middle tier makes it possible to maintain **control over access** and the **kinds of updates** that can be made to incorporate data.
- It simplifies the deployment of applications
- Can improve **database security** by checking the clients credentials before forwarding request to database server.





Two-tier model

Three tier example



Thank You!