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# E-commerce Architecture

# Client Server Architecture

- E-commerce is based on client/ server architecture
  - Client processes requesting service from server processes
  - First used in 1980s, the model improves to be e-commerce usability, flexibility, interoperability and scalability.
- In e-commerce the client is defined as the requestor of a service and a server is the provider of the service
  - Browser is the client and the customer, the computer that sends the HTML files is the server
  - The server can also be a computer program that provides services to other computer programs
- A web server is the computer program that serves requested HTML pages or files.
  - Uses client/server model and http(hypertext transfer protocol)
  - Every computer on the internet that contains a web site must have a web server program.

# Client Server Architecture

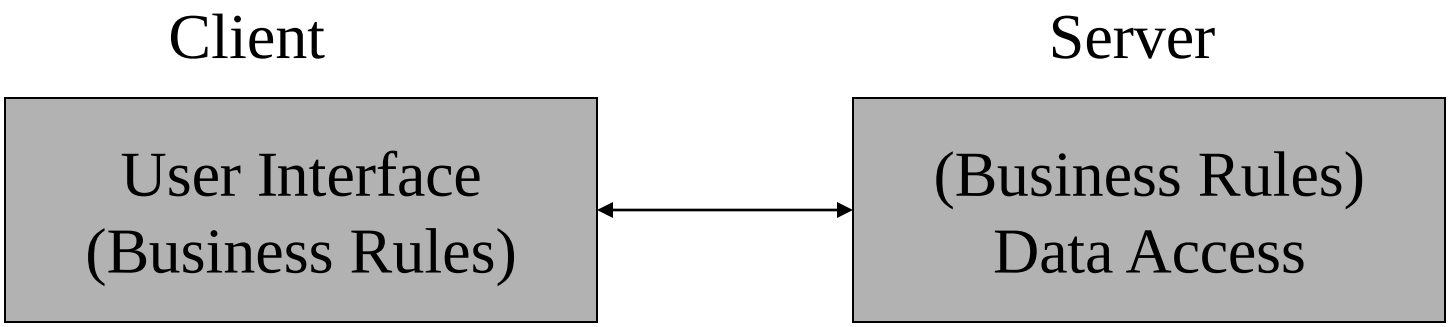
- Most popular web servers are Deerfield’s WebSite and Microsoft’s Internet Information Server (IIS)
- Web servers are included as part of a larger package of internet and intranet related programs for serving e-mail, downloading requests for FTP files and building and publishing web pages.
- Typically the e-commerce customer is the client and the business is the server.
- In the client/ server model single machine can be both client and the server
- The client/ server model utilises a database server in which RDBMS user queries can be answered directly by the server

# Client Server Architecture

- The client/ server architecture reduces network traffic by providing a query response to the user rather than transferring total files.
- The client/ server model improves multi-user updating through a graphical user interface (GUI) front end to the shared database.
- In client/ server architectures client and server typically communicate through statements made in structured query language (SQL).

# Two-Tier Architectures

- The user system interface is usually located in the user's desktop environment and the DBM services are usually in a server that is a more powerful machine that services many clients.



# Two-Tier Architectures

- It runs the client processes separately from the server processes, usually on a different computer:
  - The client processes provide an interface for the customer, and gather and present data usually on the customer's computer. This part of the application is the presentation layer
  - The server processes provide an interface with the data store of the business. This part of the application is the data layer
  - The business logic that validates data, monitors security and permissions, and performs other business rules can be housed on either the client or the server, or split between the two.
    - Fundamental units of work required to complete the business process
    - Business rules can be automated by an application program.

# Two-Tier Architectures

- Typically used in e-commerce
  - Internet retrieval, desicion support
- Used in distributed computing when there are fewer than 100 people simultaneously interacting on a LAN.
- Implementation of processing management services using vendor proprietary db procedures restricts flexibility and choice of RDBMS for applications.
- Also lacks flexibility in moving program functionality from one server to another.

# Three-Tier Architectures

- Also called as multi-tier architecture
- A middle tier is added between the client environment and the DBM server environment
- Variety of ways to implement:
  - Transaction processing (TP) monitors
  - Message servers
  - Application servers

# Three-Tier Architectures with TP Monitor

- The most basic type
  - Type of message queuing, transaction scheduling, prioritisation service
- Client connects to TP instead of the DB server
- The transaction is accepted by the monitor which queues it and takes responsibility to complete it by freeing up the client
- When a third part provides this service it is called TP heavy
- When it is embeded in the DBMS, it can be considered 2-tier and is referred to as TP lite

# Three-Tier Architectures with TP Monitor

- TP monitor provides:
  - The ability to update multiple DBMSs in a single transaction
  - Connctivity to a variety of data sources (flat files & non-RDBMSs)
  - The ability to attach priorities to transactions
  - Robust security
- More scalable than a 2-tier architecture
- Most suitable for e-commerce with many thousands of users

# Three-Tier Architectures with Message Server

- Messages are prioritised and processed asynchronously
  - Headers contain priority info, the address, the id no
- Message server connects to the RDBMS and other data sources
- The message server focuses on intelligent messages, whereas the TP environment has the intelligence in the monitor and treats transactions as dumb data packets
- They are sound business solutions for the wireless infrastructures of m-commerce.

# Three-Tier Architectures with an Application Server

- Allocates the main body of an application to run on a shared host rather than in the user system interface client environment
- The application server does not drive GUIs rather it shares business logic, computations, and a data retrieval engine.
- With less sw on the client
  - There is less concern with security,
  - Applications are more scalable
  - Support and installation costs are less on a single server than maintaining each on a desktop client.

# Three-Tier Architectures with an Object Request Broker Standard

- Need for improving interoperability and object request broker (ORB) standards in the client/ server model.
- ORB support in a network of clients and servers on different computers means
  - A client program (object) can request services from a server program
  - Object without having to understand where the server is in a distributed network or what the interface to the server program looks like
- ORB is the programming that acts as the mediary or as a broker between a client request for a service from a distributed object or component and server completion of that request.

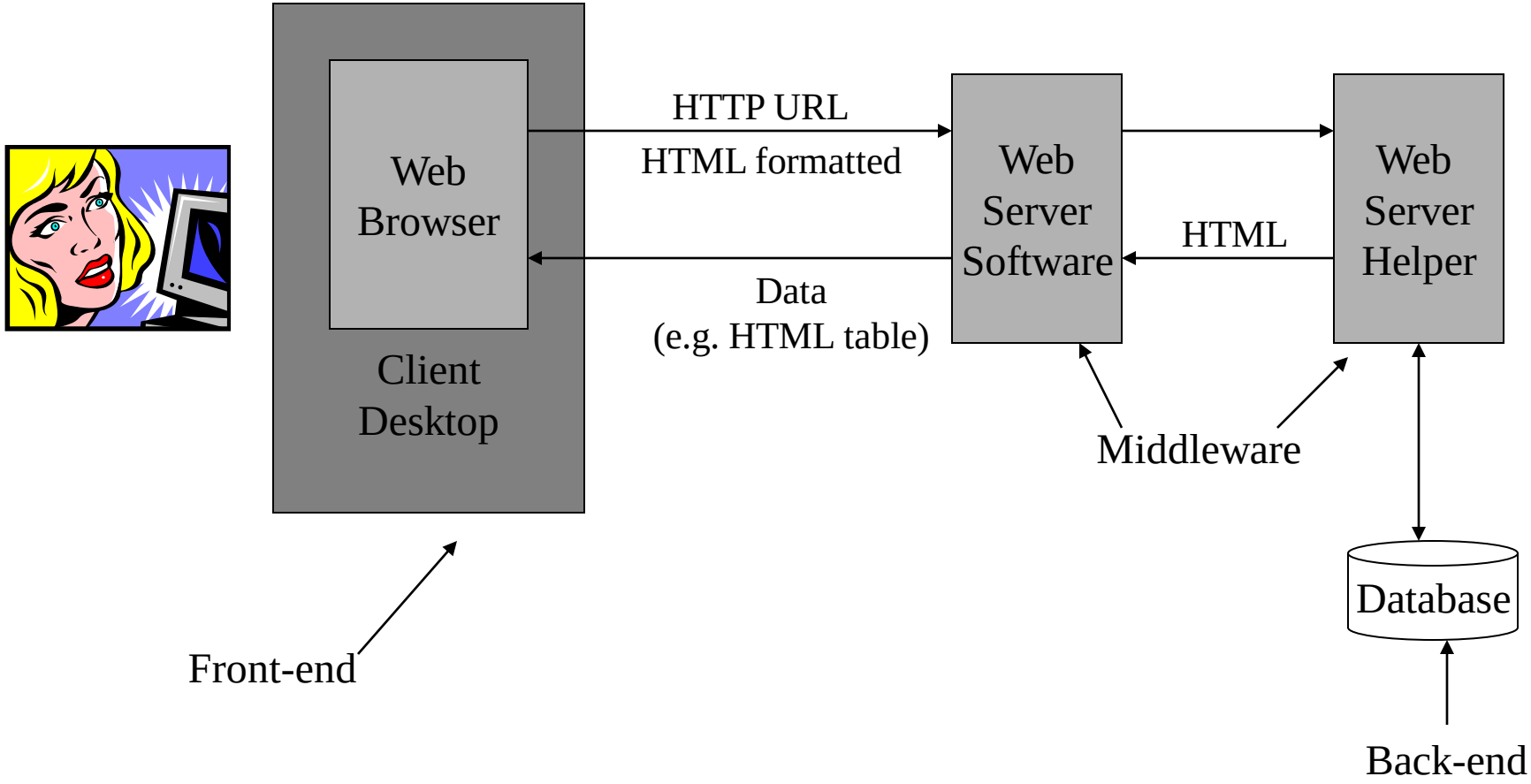
# Three-Tier Architectures with an Object Request Broker Standard

- There are two prominent distributed object technologies:
  - Common Object Request Broker Architecture (CORBA)
  - Component Object Model (COM)
- The industry is working on operability between CORBA and COM

# Distributed Enterprise Architecture

- Based on ORB technology
- Uses shared, reusable business models on a business enterprise-wide scale.
- Standardised business object models and distributed object computing are combined to give greater flexibility to the business
- With the emergence and popularity of ERP sw, distributed enterprise architecture promises to enable e-commerce to extend business processes at the enterprise level.

# The Relationship Between E-commerce and Web Database Constructions

- E-commerce is dynamic and constantly evolving, supported by technologies that are constantly changing
- Database storage is the oldest technology and currently used by e-commerce
- Business can implement
  - New sales and marketing channels
  - Customer support
  - Exchange of documents with other businesses
- Transact over the internet using web interfaces to interact with back-end relational databases

# A Simple E-commerce Web Database Construction Model