

# Web Architecture

AN OVERVIEW

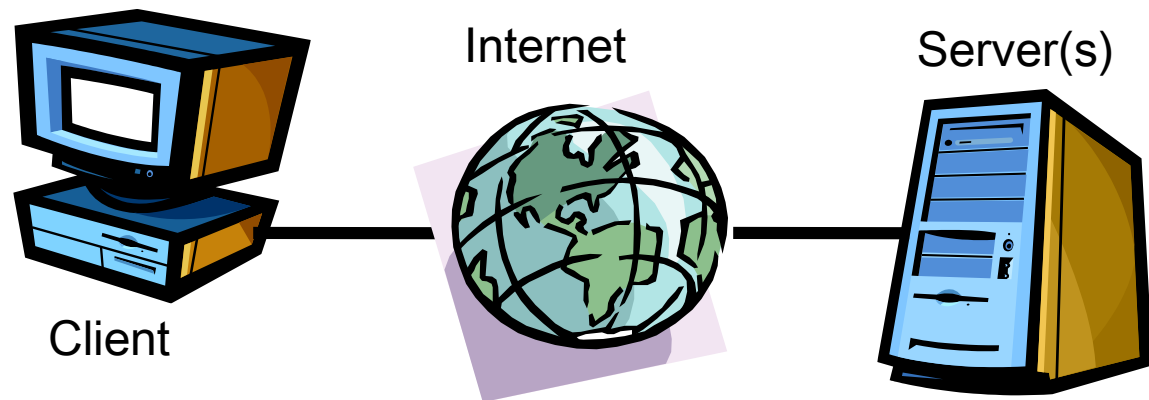


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# General web architecture

- Historically, the client is a web browser
- But it can be also
  - A mobile application
  - A desktop application
  - Other server applications

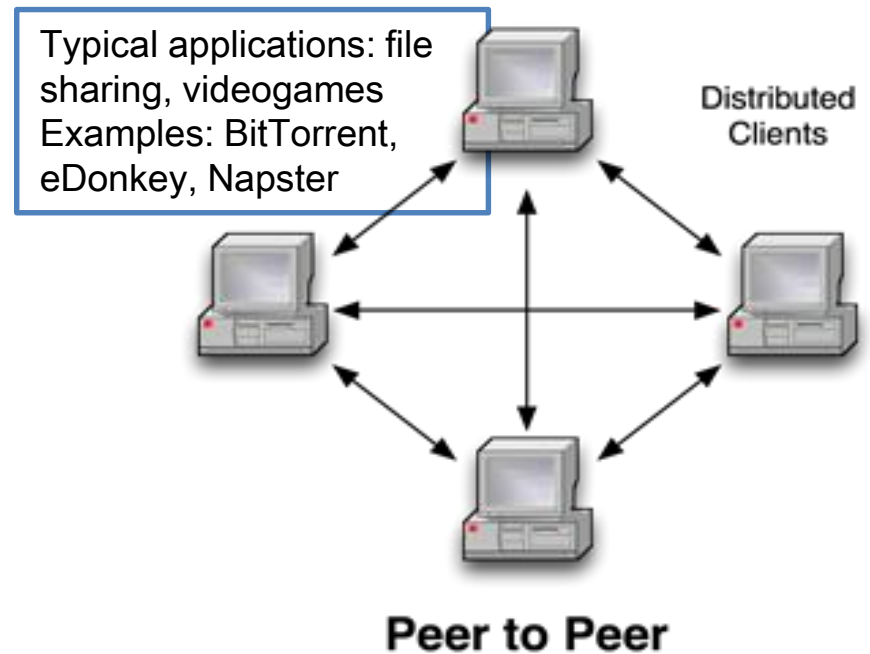
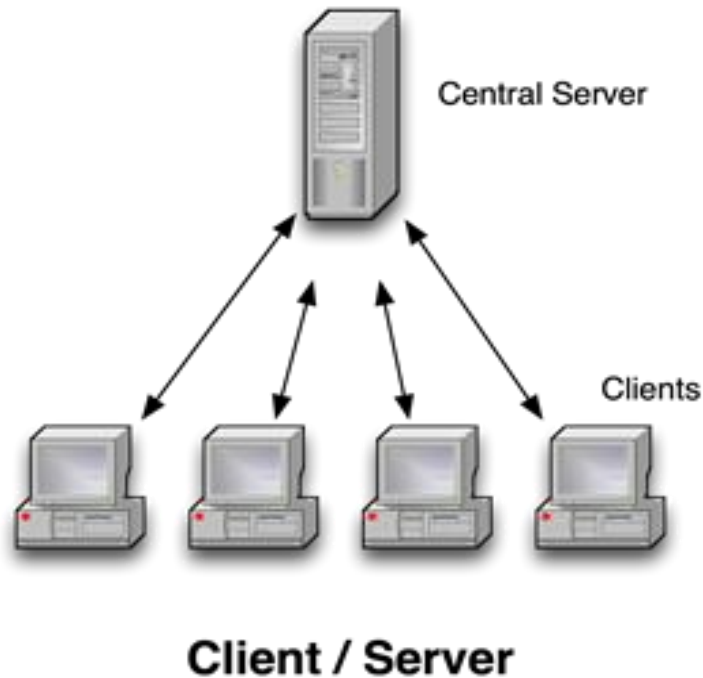


# Components

- One or more connections to the Internet by means of an Internet Service Provider (ISP)
- One or more servers implementing each tier/level of the architecture
- One or more physical networks for interconnecting the servers
- One or more network devices (router, firewall, switch) which implement communication and security policies

# Distributed architecture

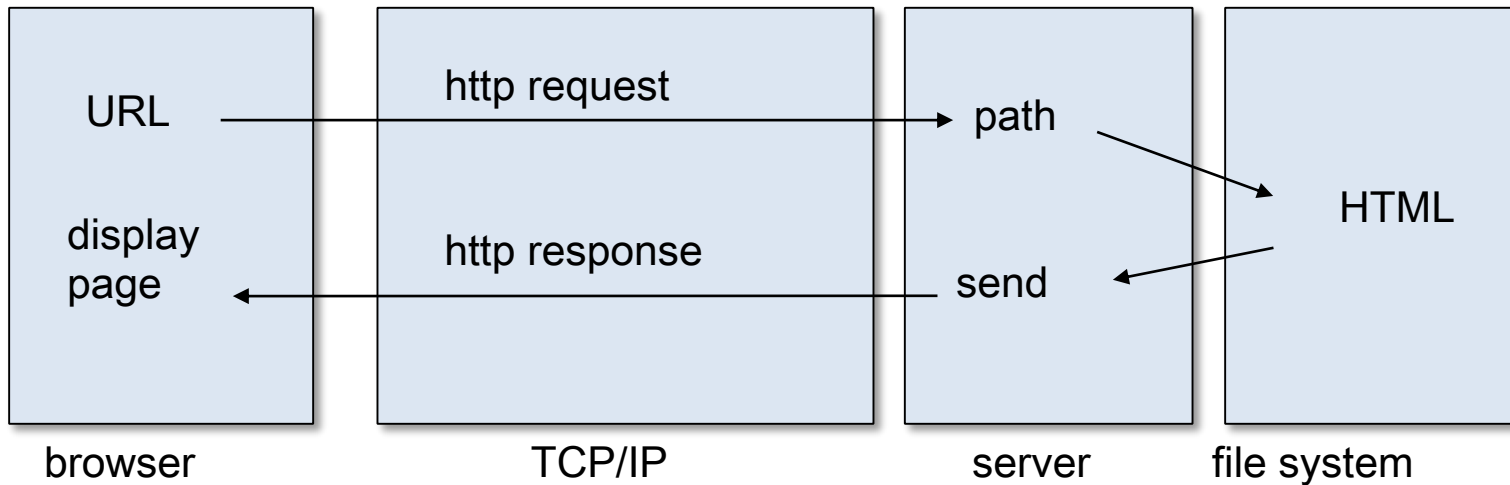
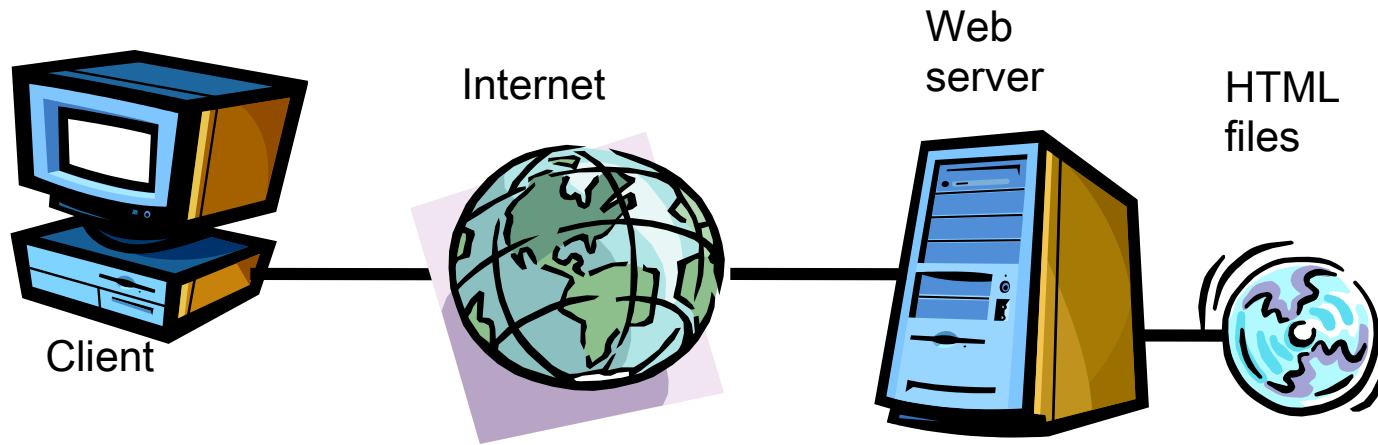
- Two main approaches



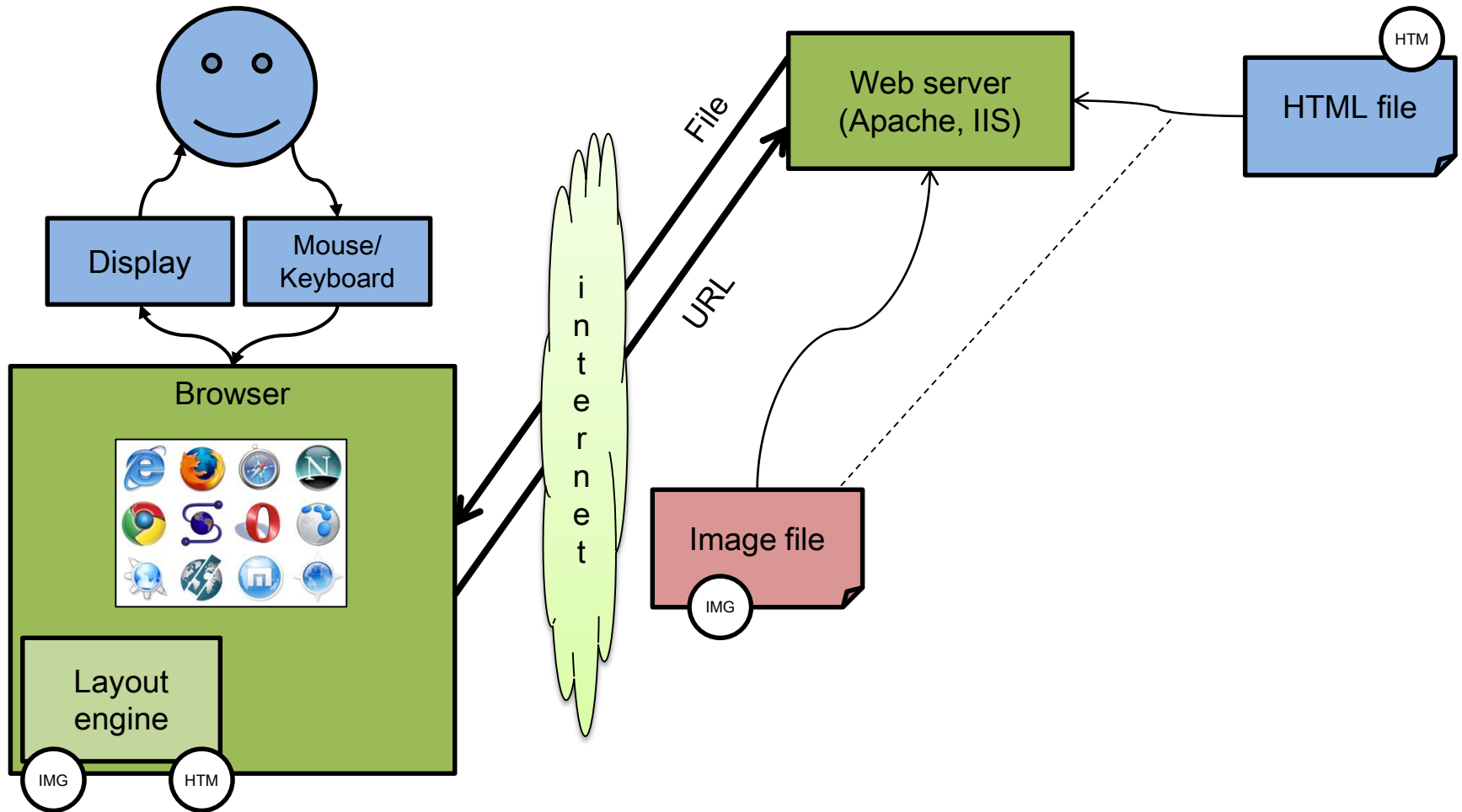
# Web server

- Logical definition
  - A process that runs on a host that relays information to a client when the client sends a request
- Physical definition
  - A host computer on a network that holds information (e.g., Web sites) and responds to requests for information
- Manages the HTTP protocol (handles requests and provide responses)
  - Receives client requests
  - Reads static pages/contents from the filesystem
  - Activates the application server for dynamic pages/content generation (server-side)
  - Provides a file (HTML, or other) back to the client

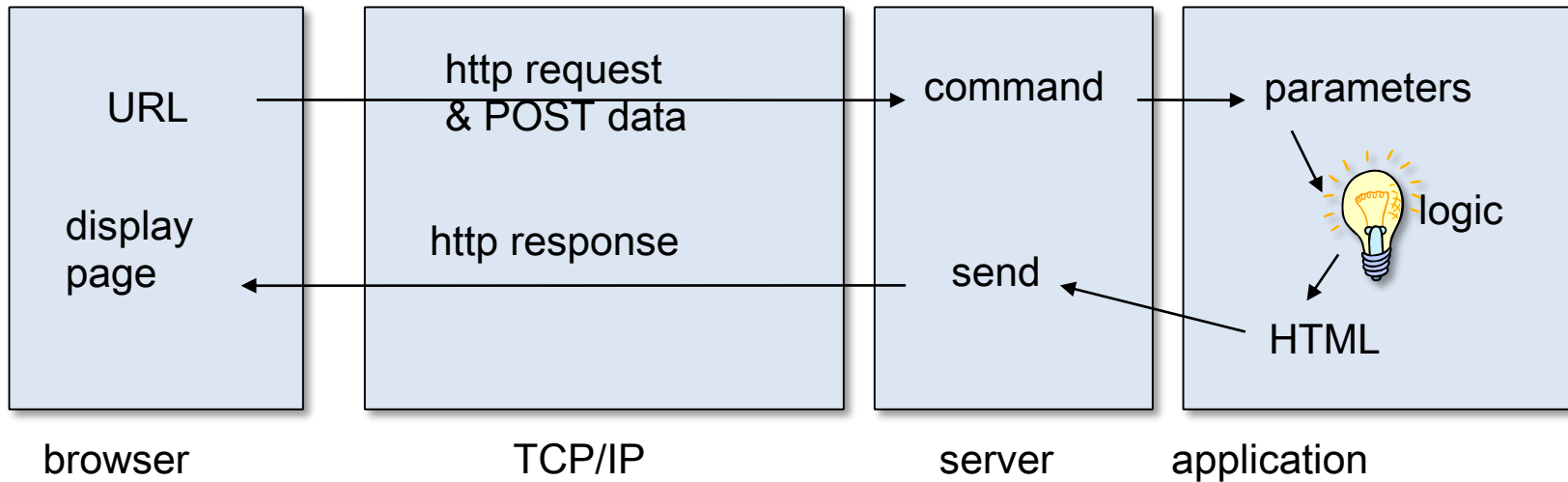
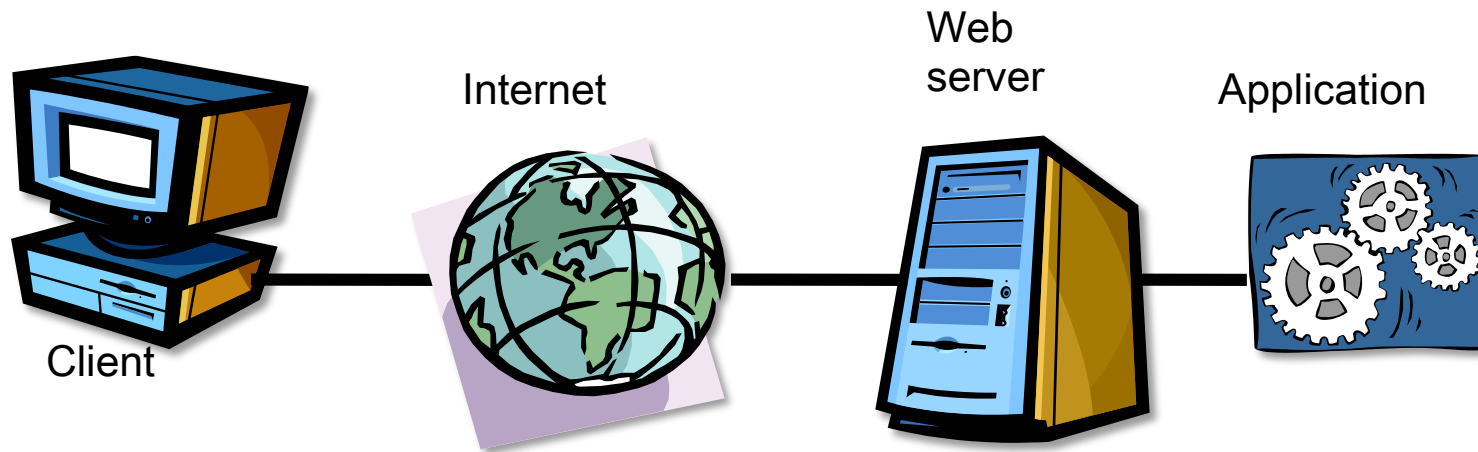
# Static web transaction



# Static web transaction



# Dynamic web transaction



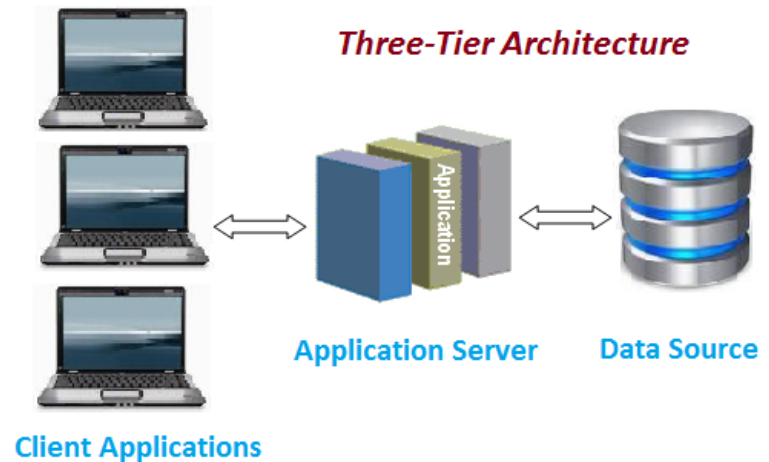


# Application server

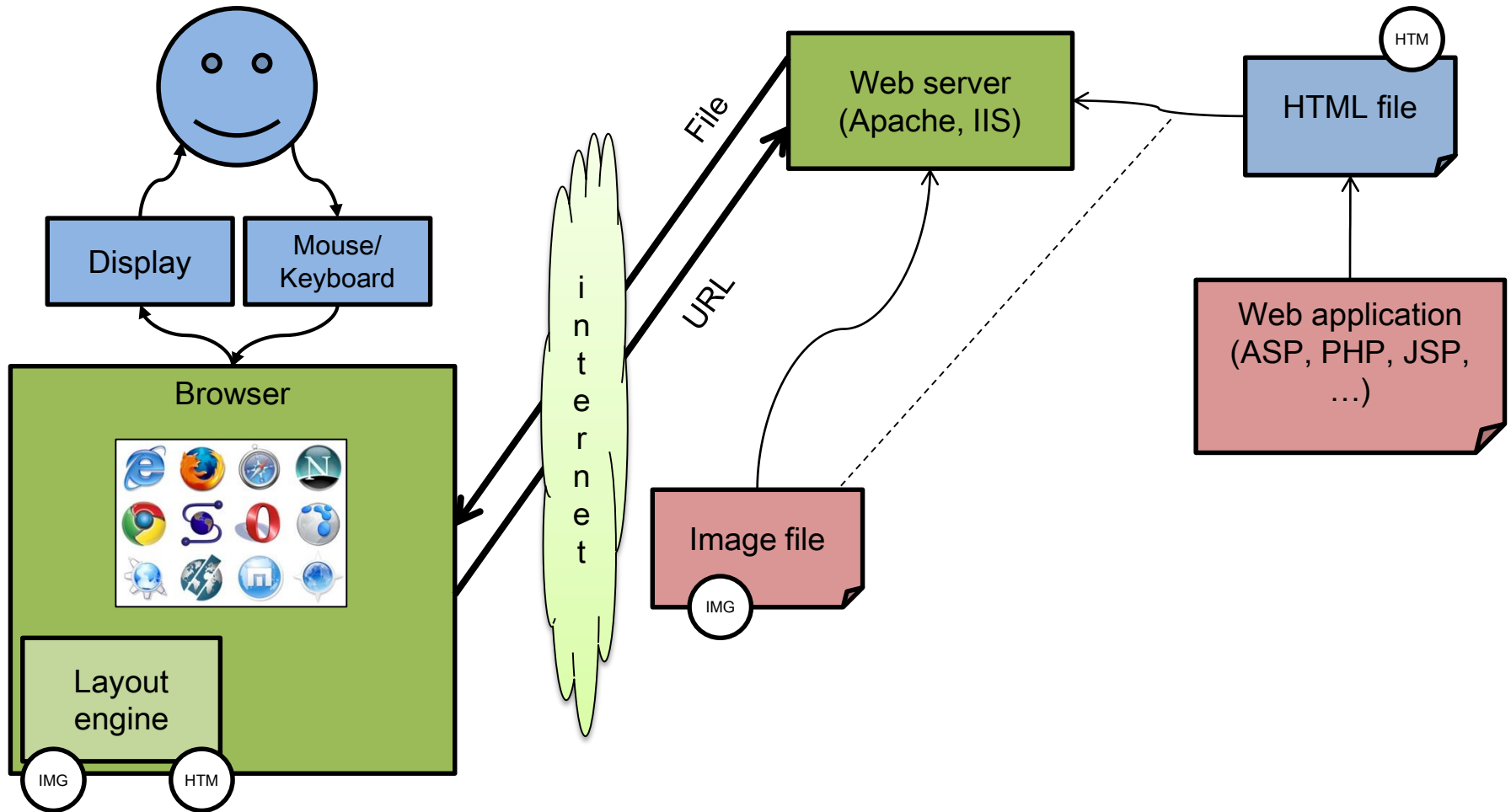
- A server program in distributed network that provides the business logic for an application program
- Dynamic page generation and content generation
- It's the middle tier between the client browser and the data residing on a database
- Implements the session mechanisms
- Different technologies and architectures are available
  - Java servlets, ASP (active server pages), JSP, PHP, PERL, Python, Ruby, ...

# Three-tier architecture

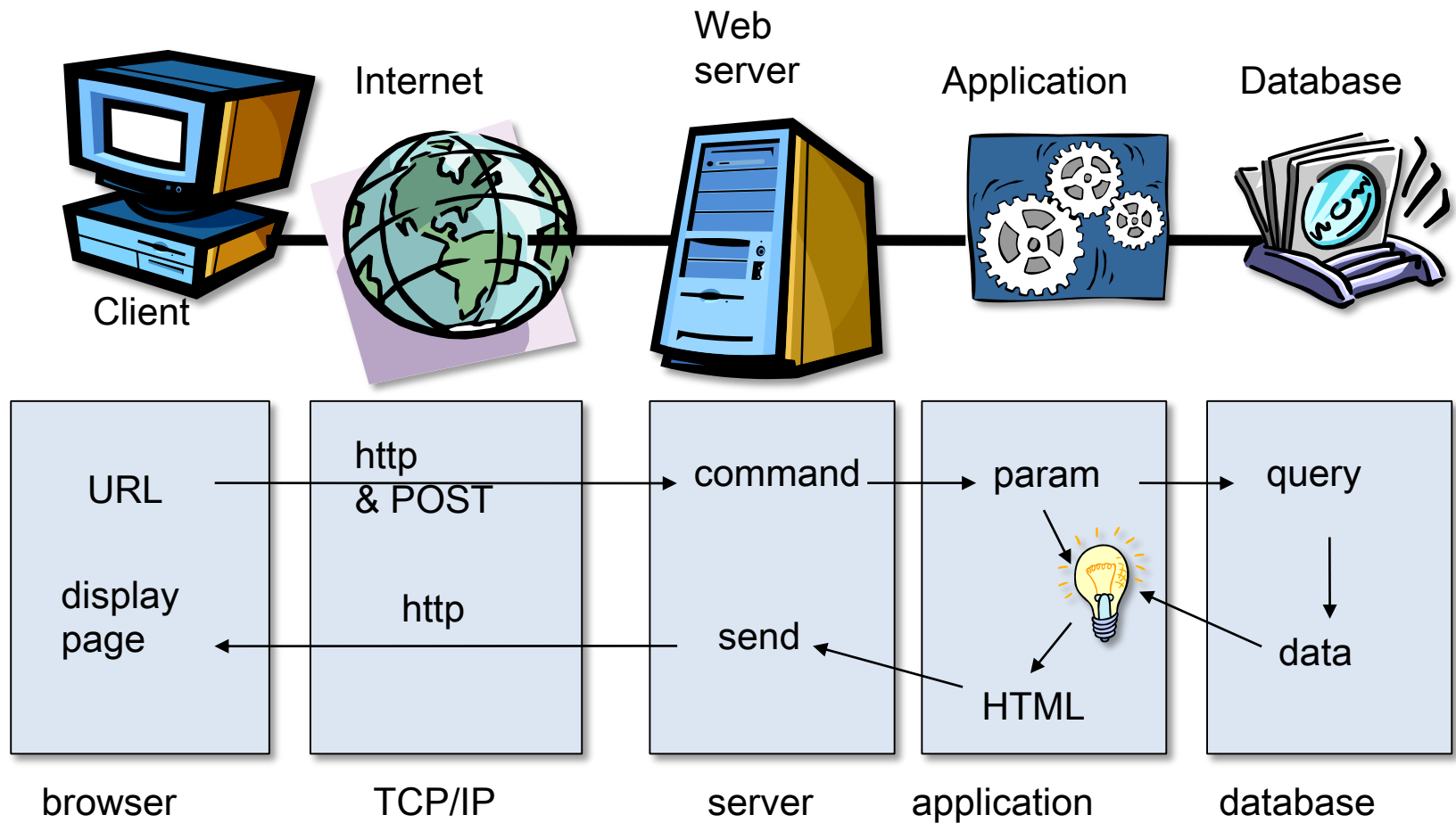
- Client–server software architecture pattern in which the user interface (presentation), functional process logic (“business rules”), computer data storage and data access are developed and maintained as independent modules
- Composed of
  - A first-tier, front-end, Web browser-based graphical user interface, usually at a personal computer or workstation
  - A middle-tier business logic application or set of applications, possibly on a local area network or intranet server
  - A third-tier, back-end, database and transaction server, sometimes on a mainframe or large server



# Dynamic web transaction



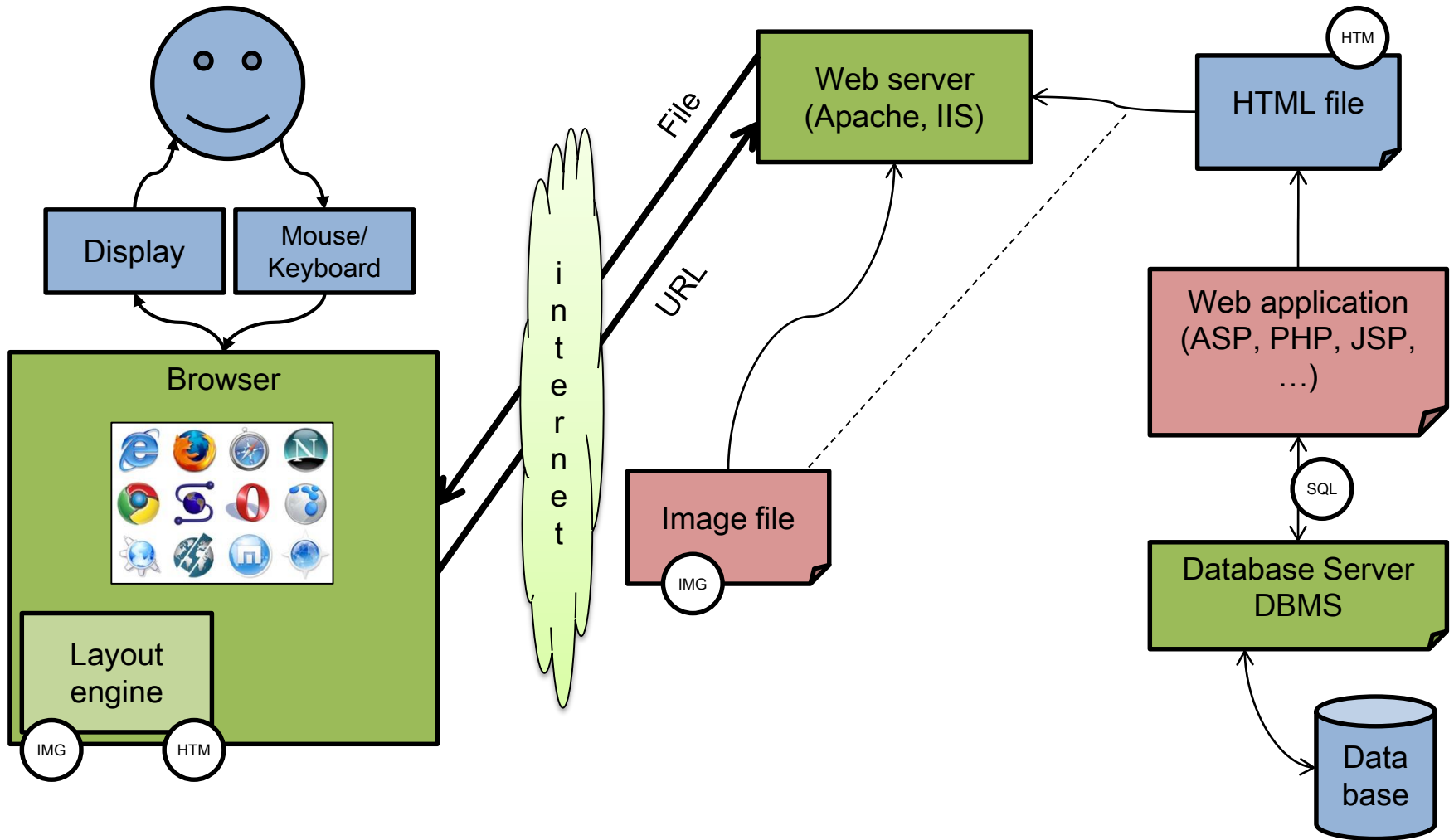
# Database-driven transaction



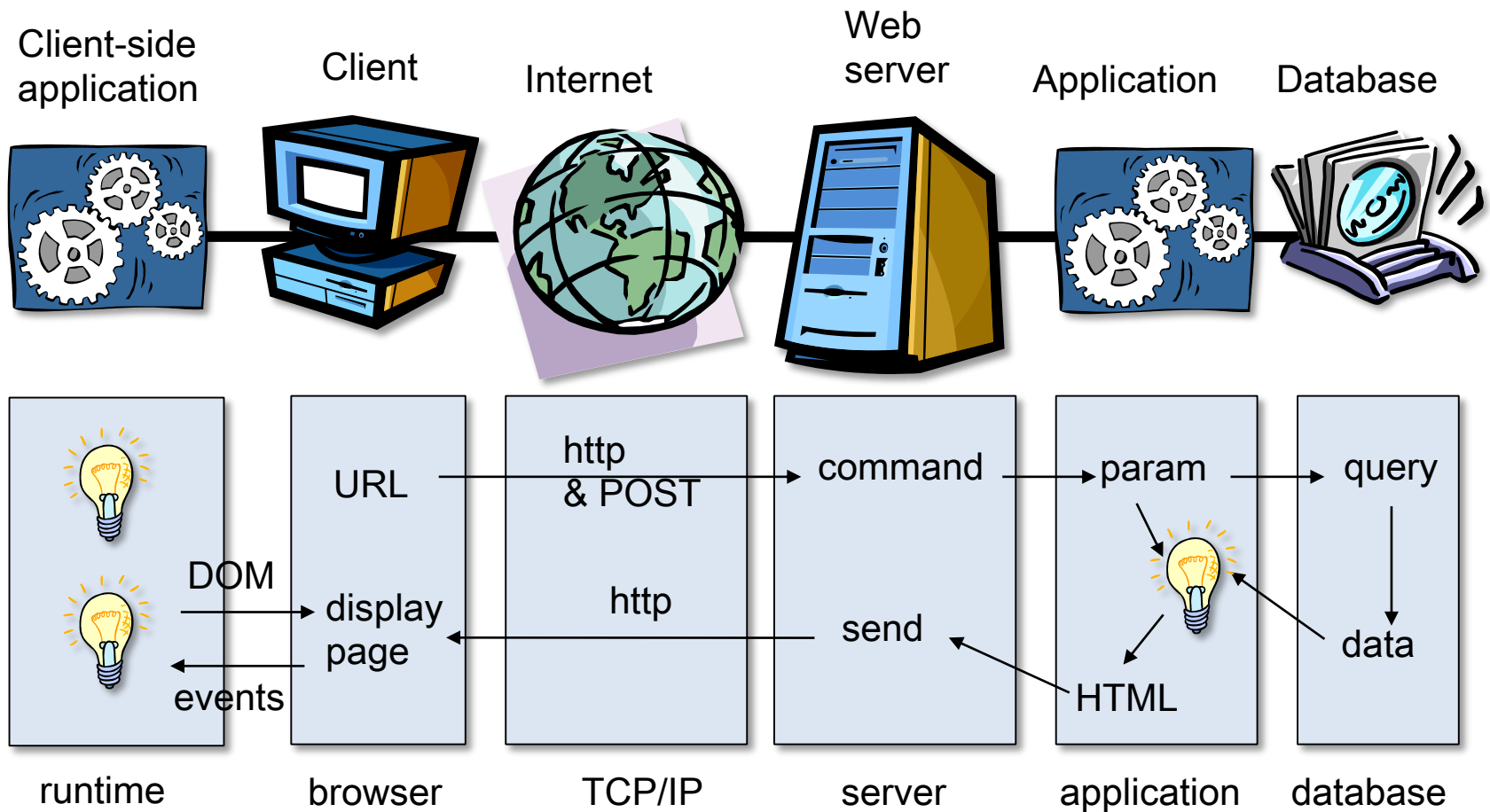
# Database server

- Stores the data on which the application server works
- Executes the queries issued by the application server
  - Updates the stored data
  - Inserts new data
  - Provides query results back
- The most frequent/complex queries can be implemented internally as stored procedures (pre-compiled queries with parameters)
- Standards
  - SQL (structured query language), ODBC (open database connectivity) to access data bases

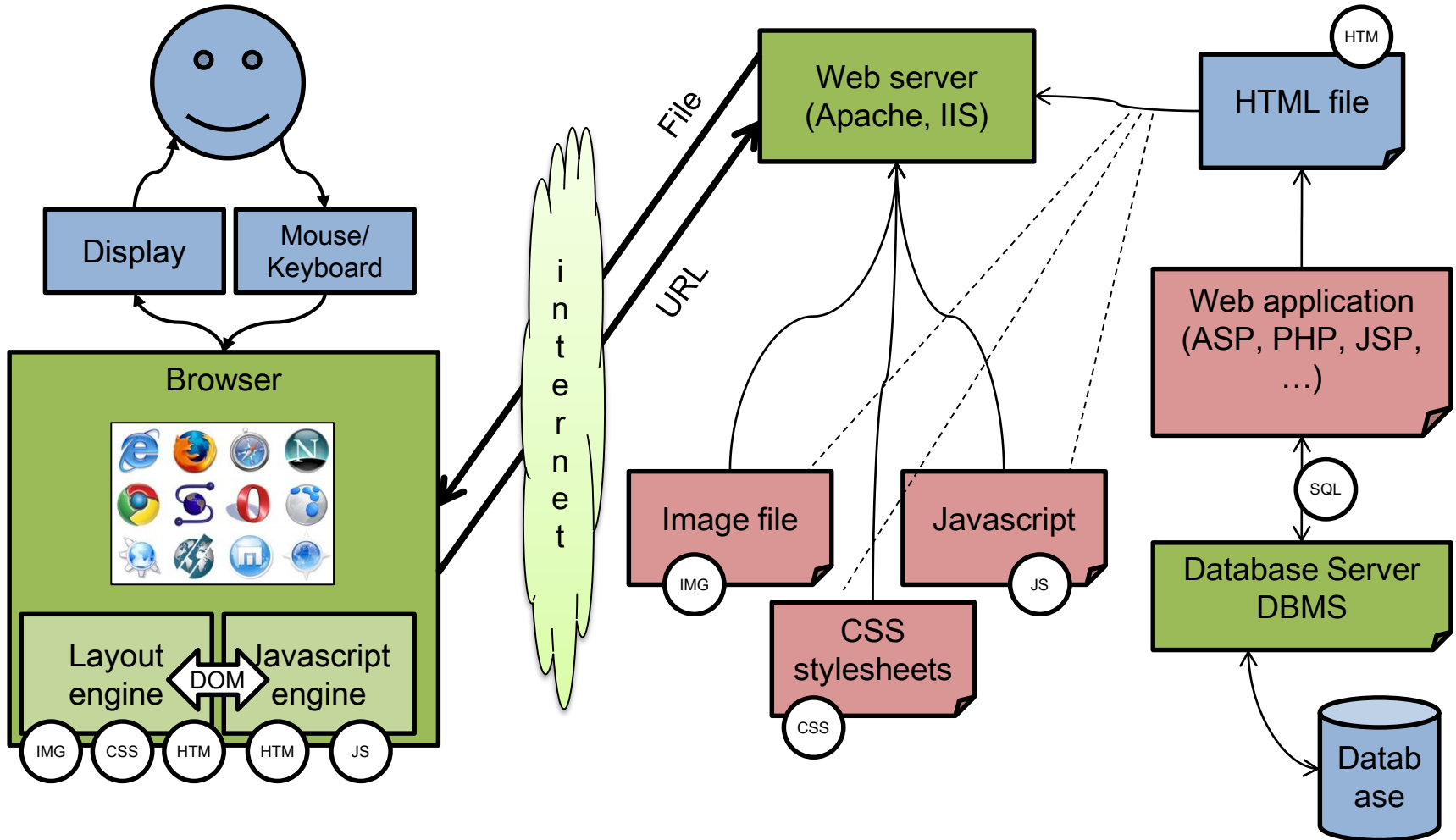
# Database-driven transaction



# Rich-client asynchronous transactions

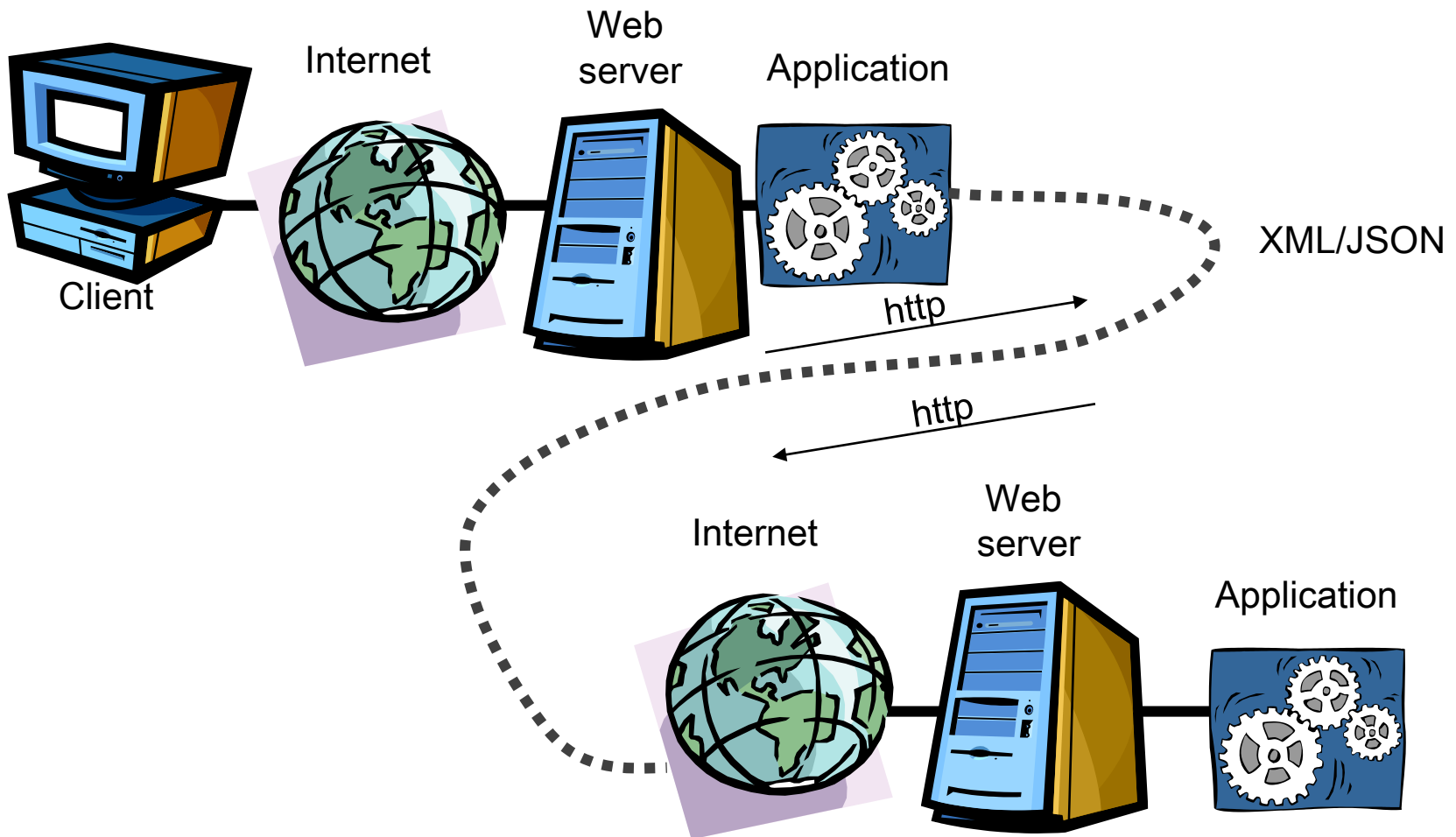


# Rich-client asynchronous transactions

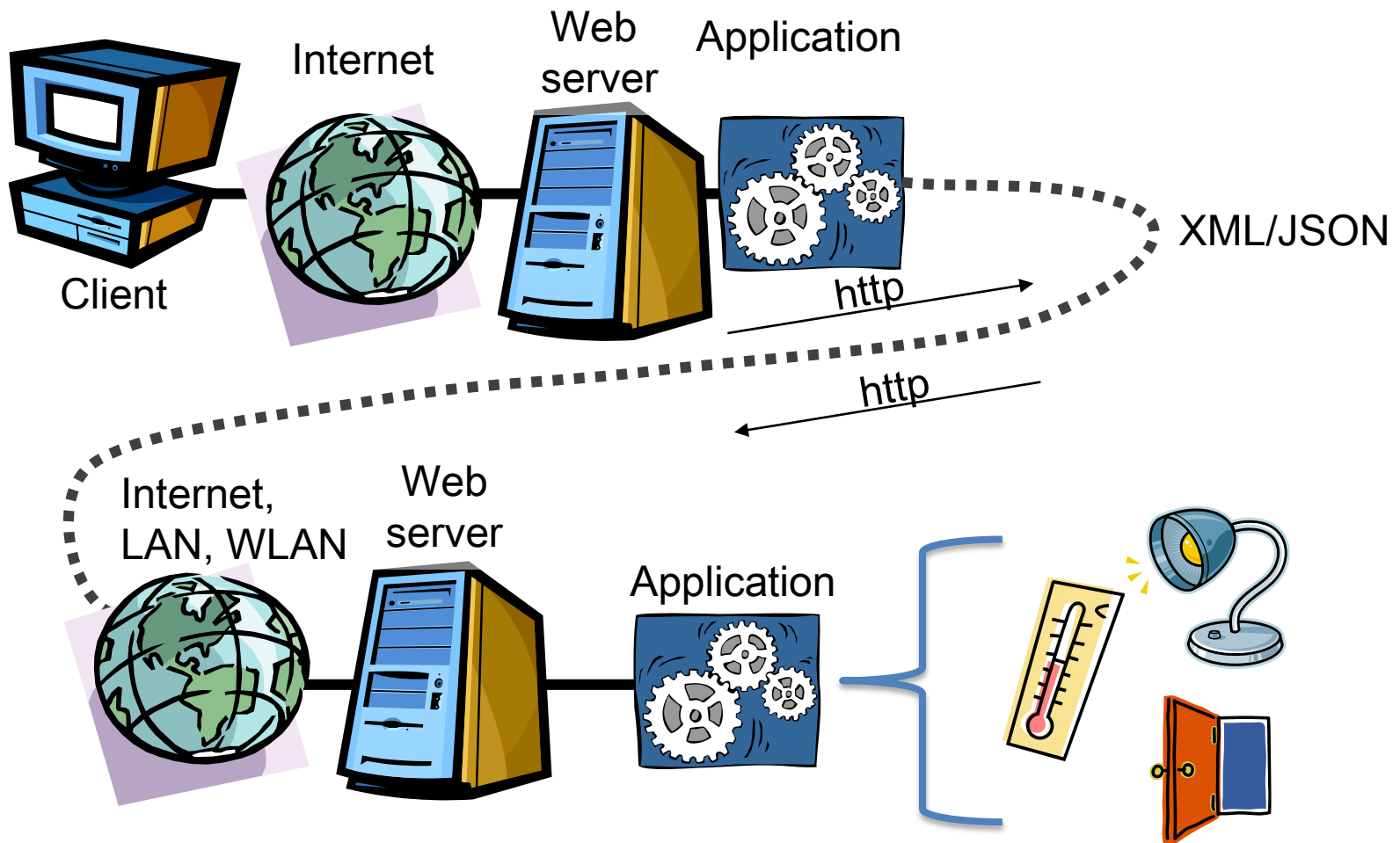




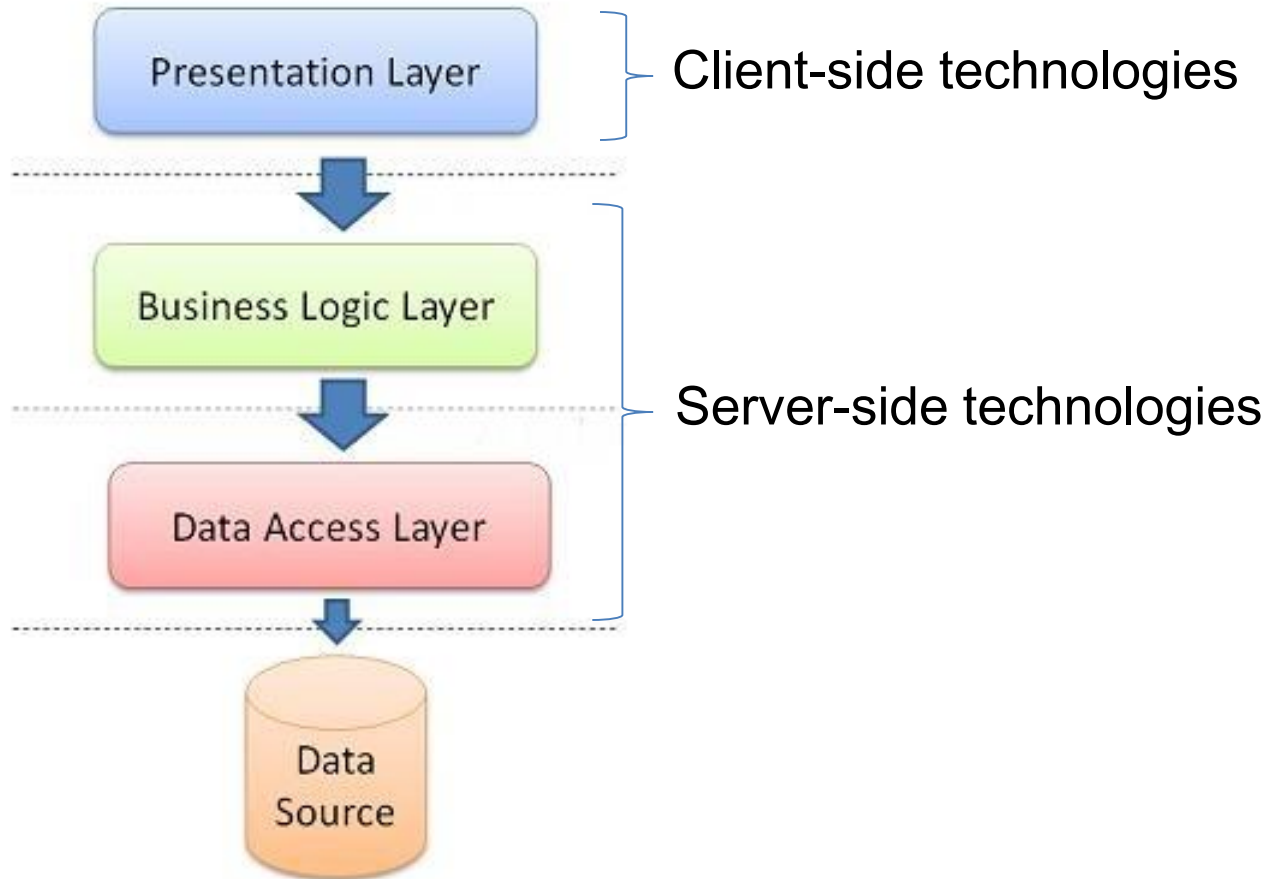
# Distributed transactions



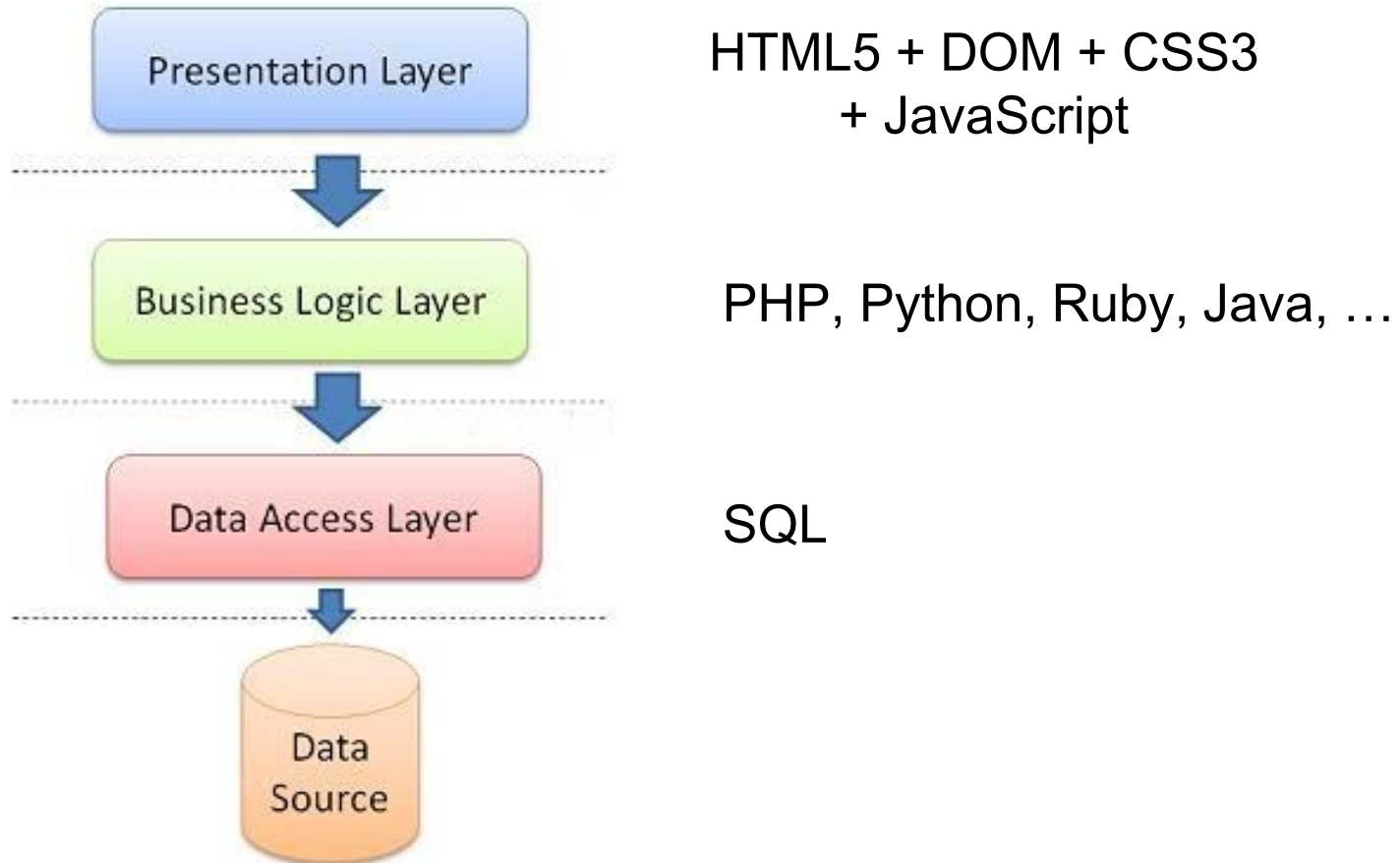
# Ambient control



# Web technologies and languages



# Web technologies and languages



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