

Web Architecture

AN OVERVIEW

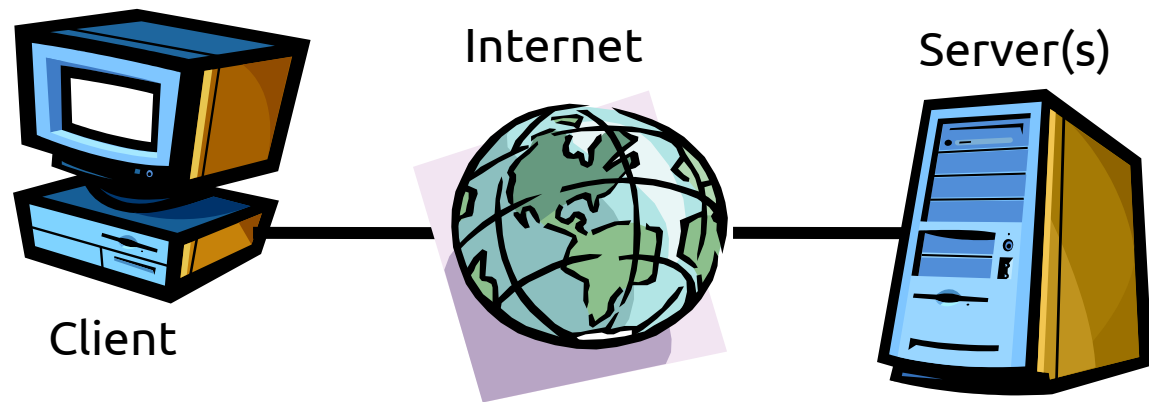


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General web architecture

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

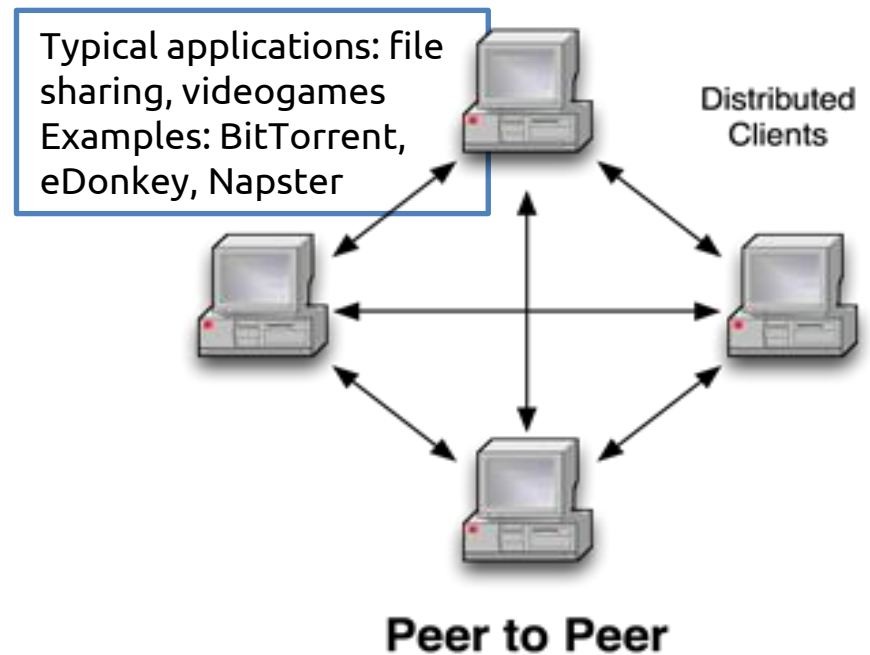
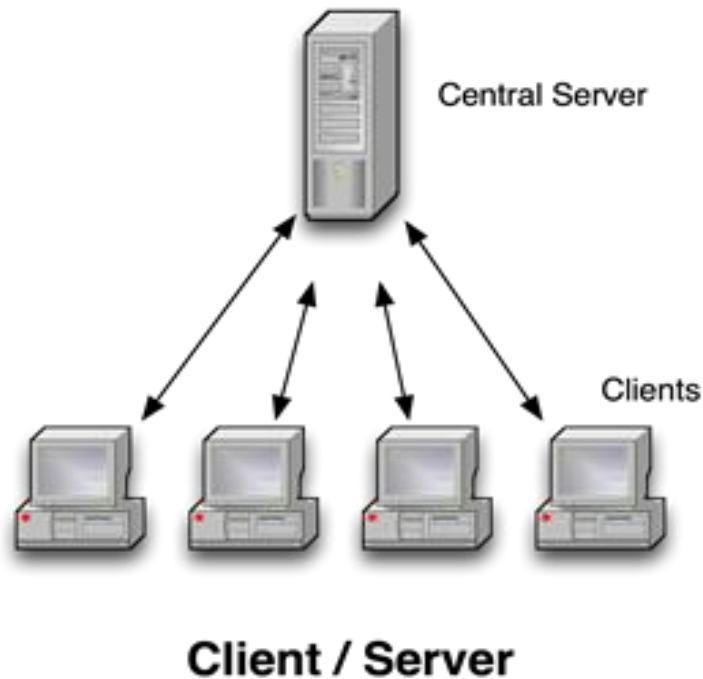


Components

- 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

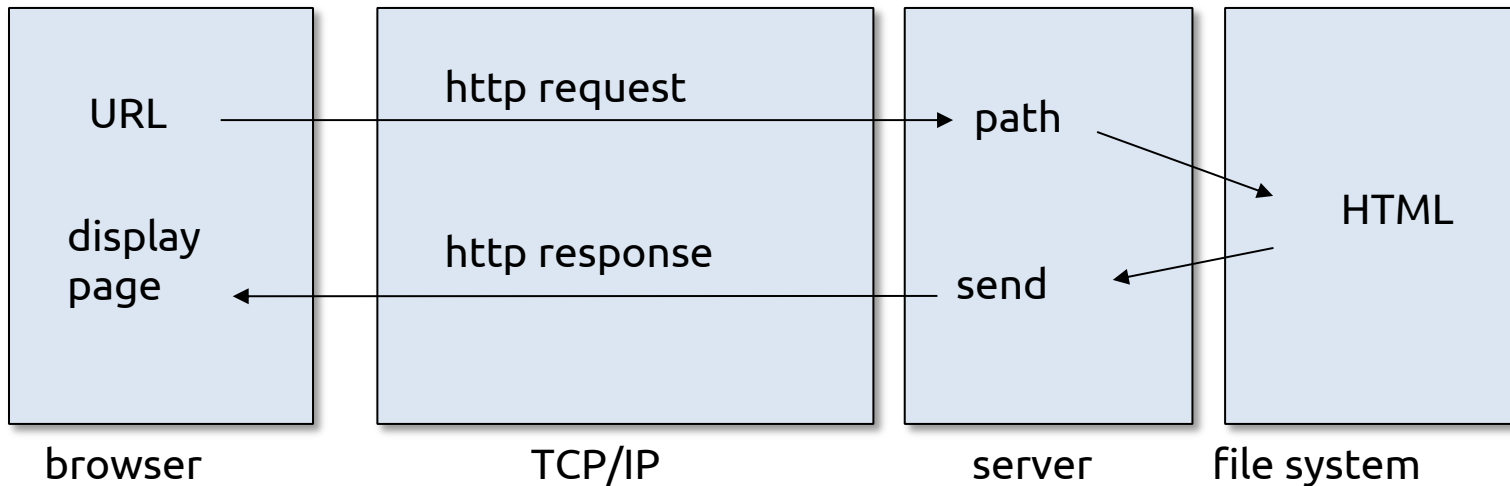
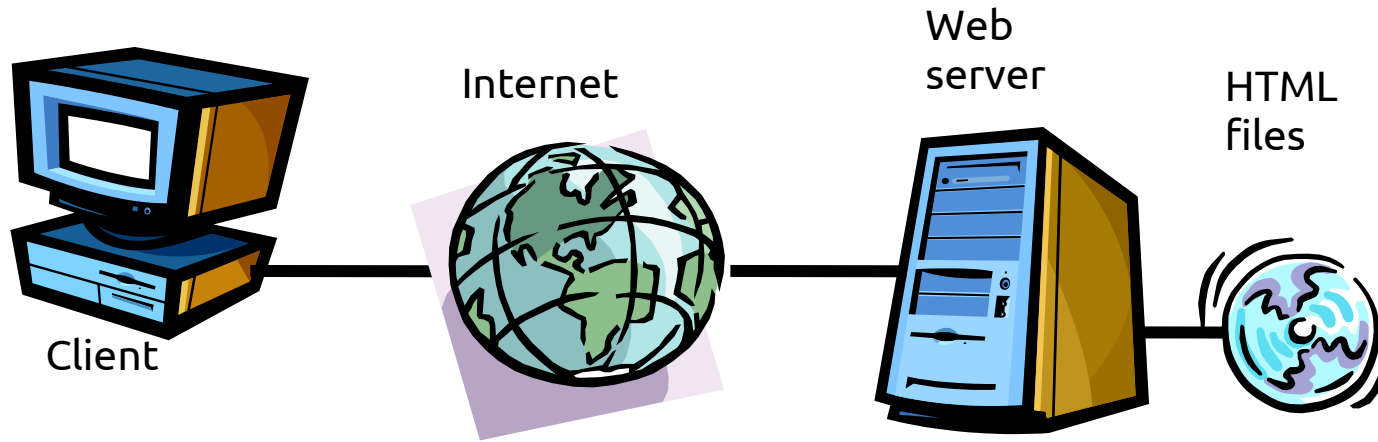
- Two main approaches



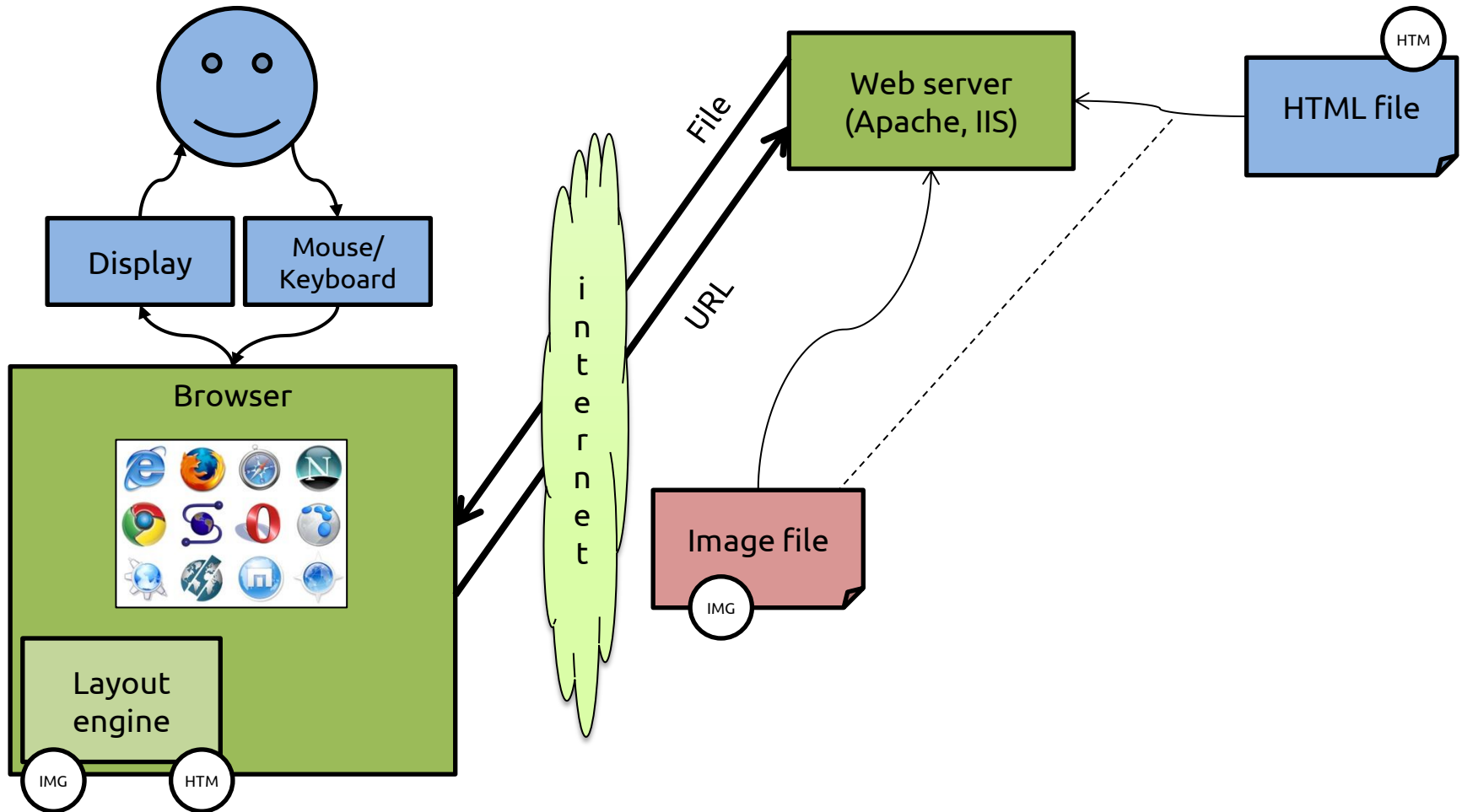
Web server

- 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

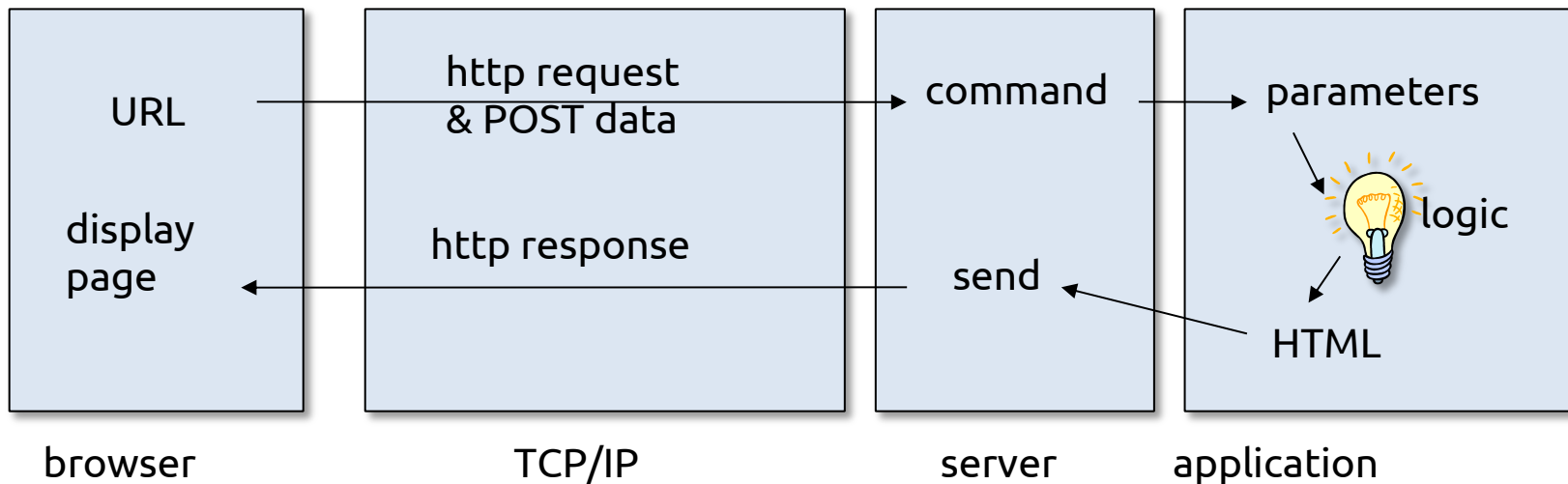
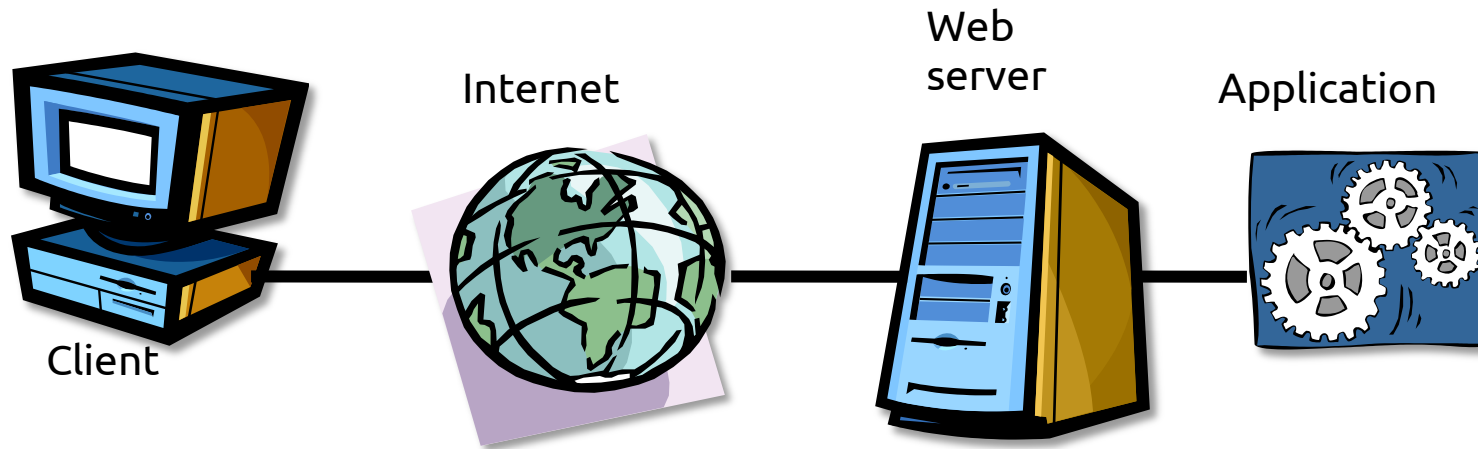
Static web transaction



Static web transaction



Dynamic web transaction

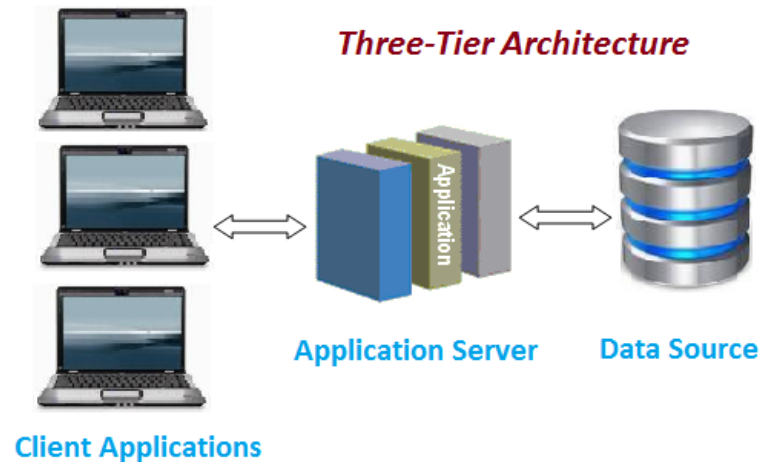


Application server

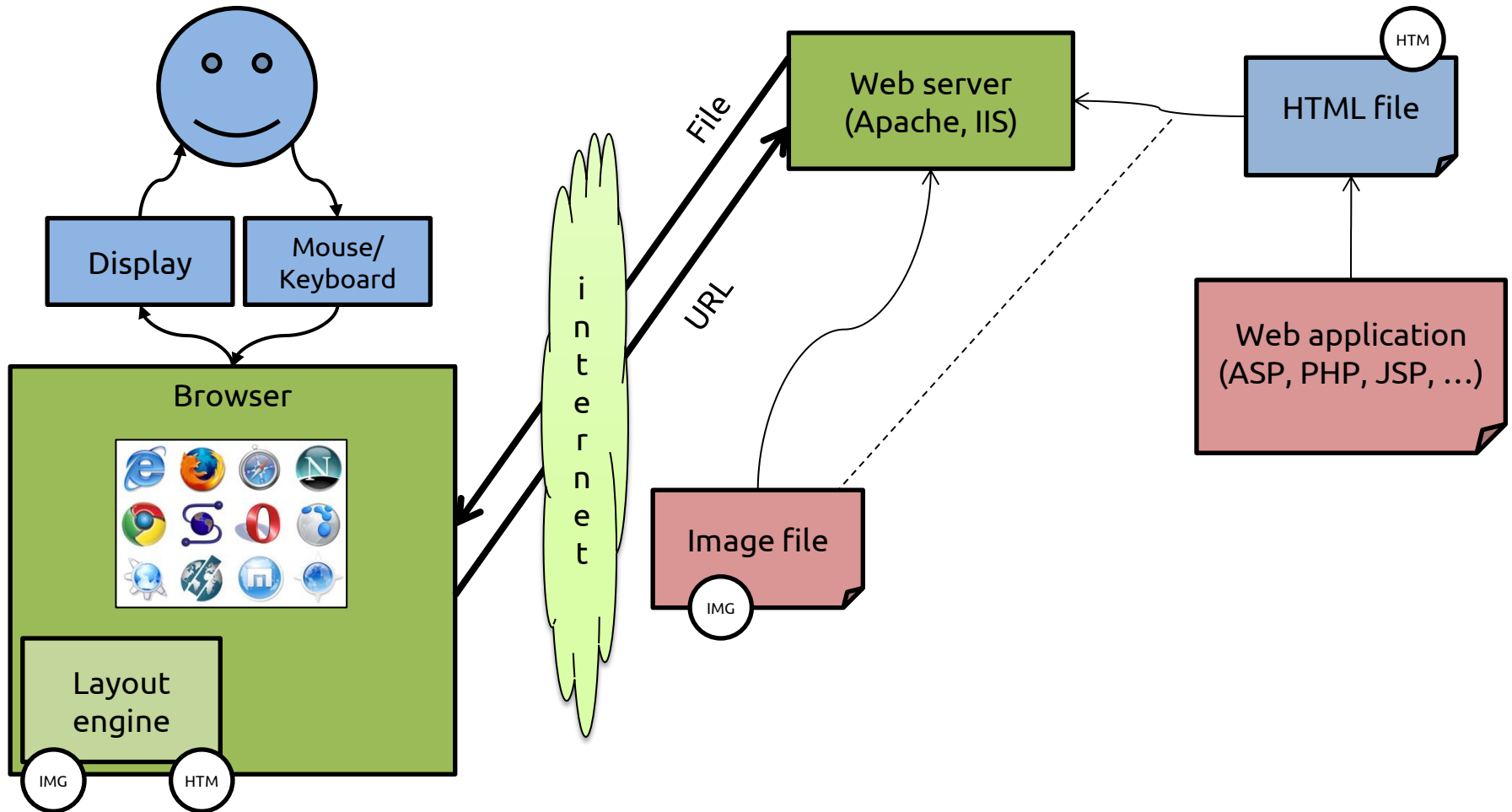
- A server program in distributed network that provides the business logic for an application program
- Dynamic page generation and content generation
- It's the middle tier between the client browser and the data residing on a database
- Implements the session mechanisms
- Different technologies and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

Three-tier architecture

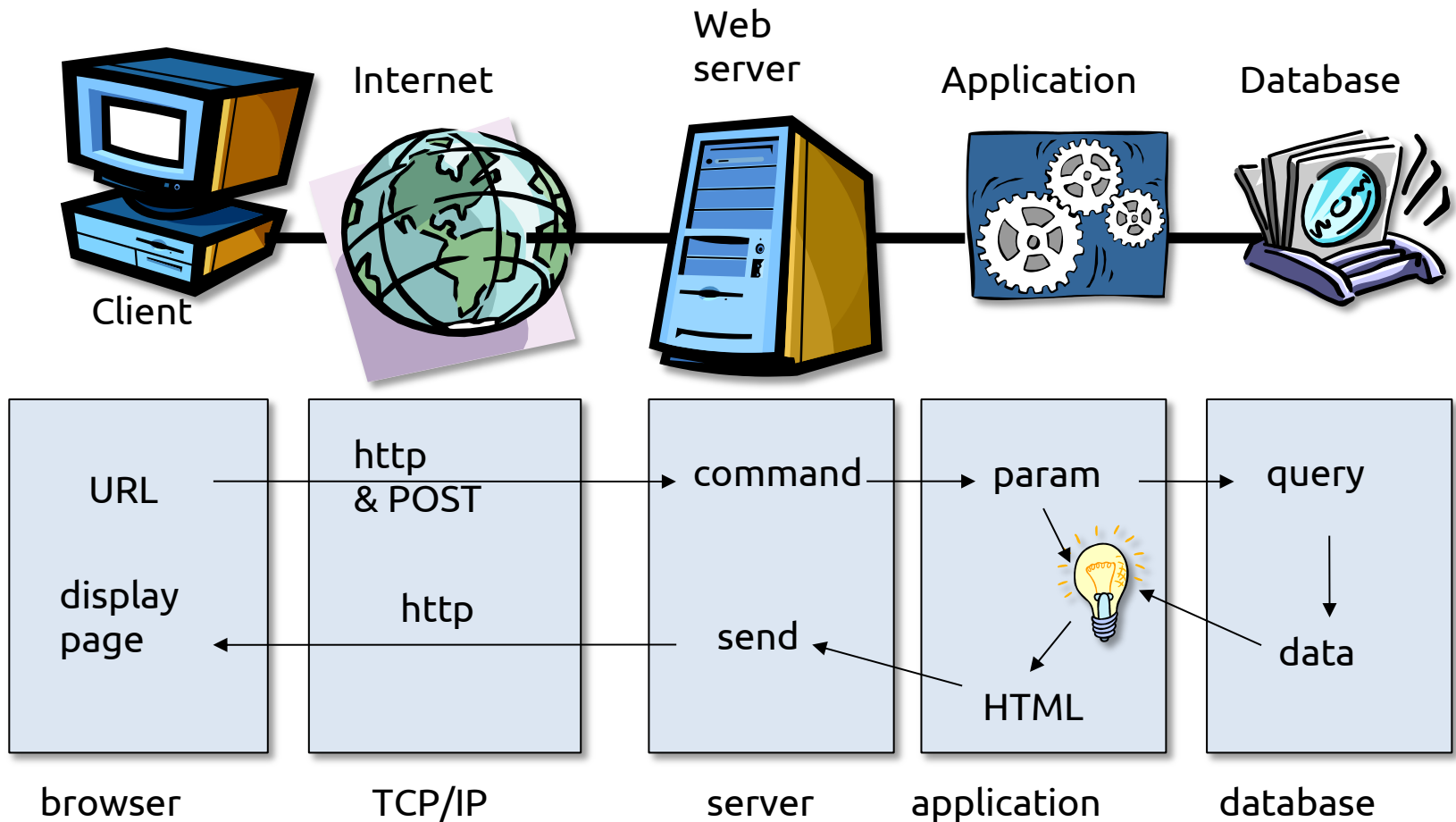
- Client–server software architecture pattern in which the user interface (presentation), functional process logic (“business rules”), computer data storage and data access are developed and maintained as independent modules
- Composed of
 - A first-tier, front-end, Web browser-based graphical user interface, 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



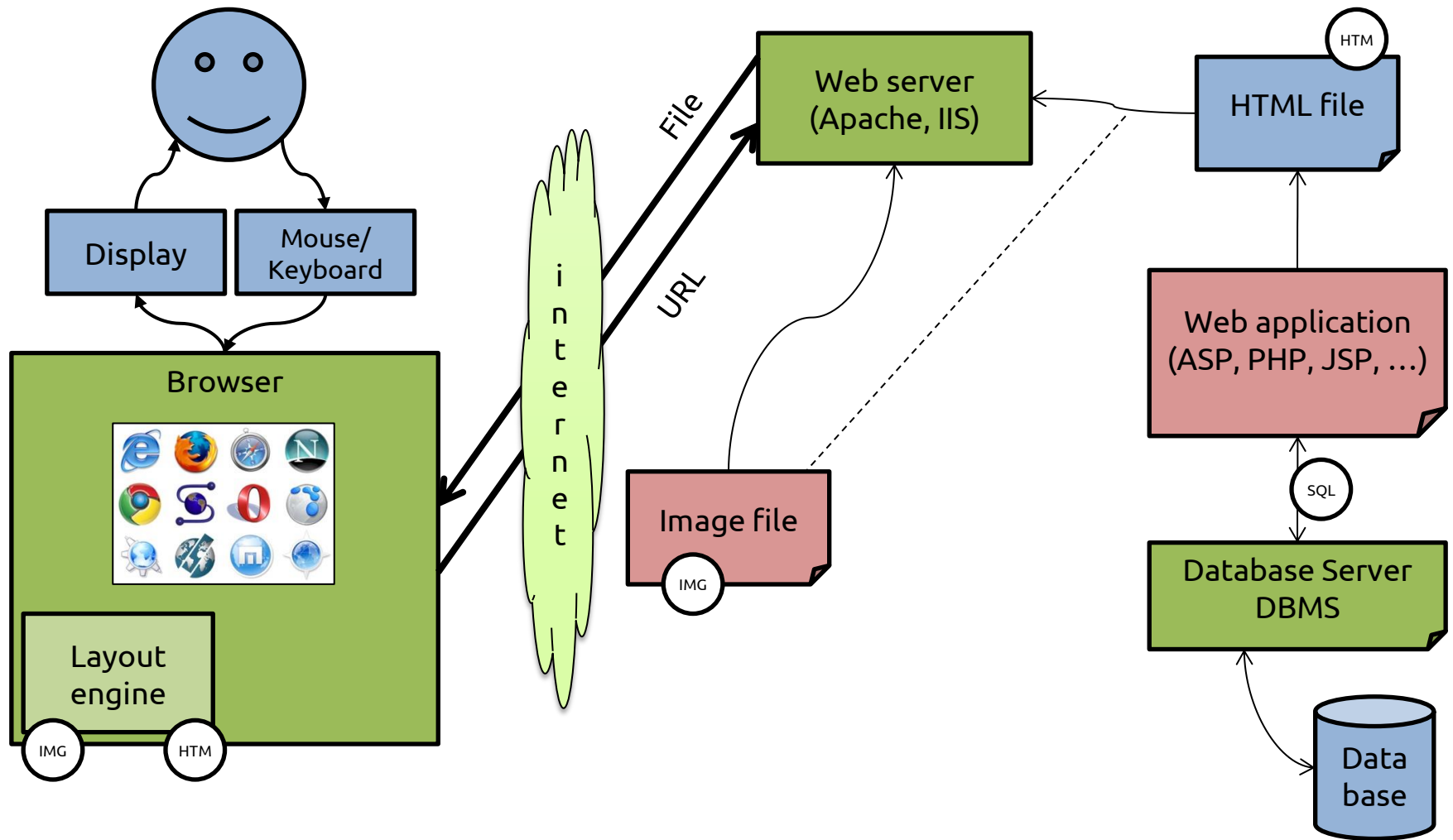
Database-driven transaction



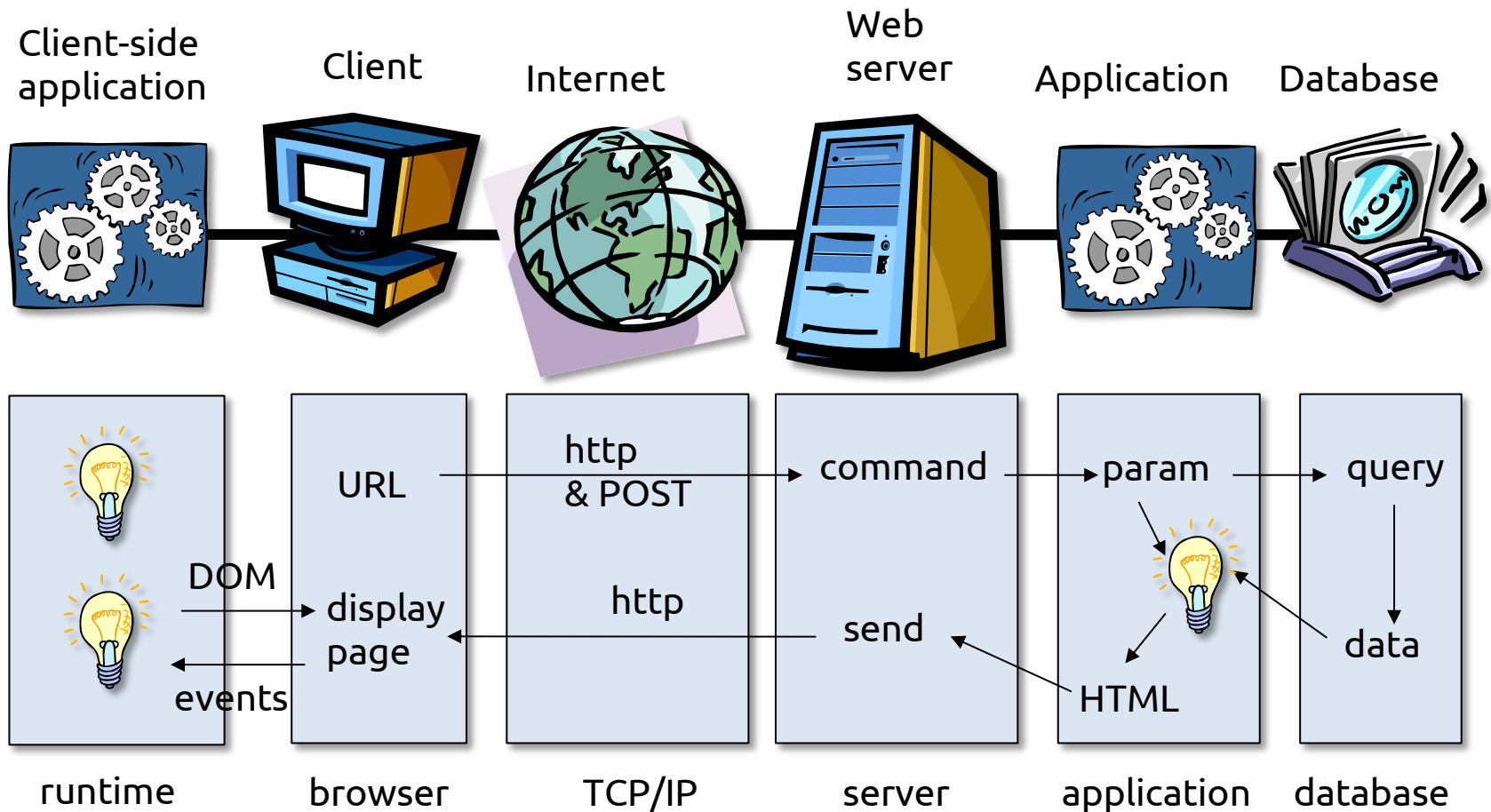
Database server

- 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

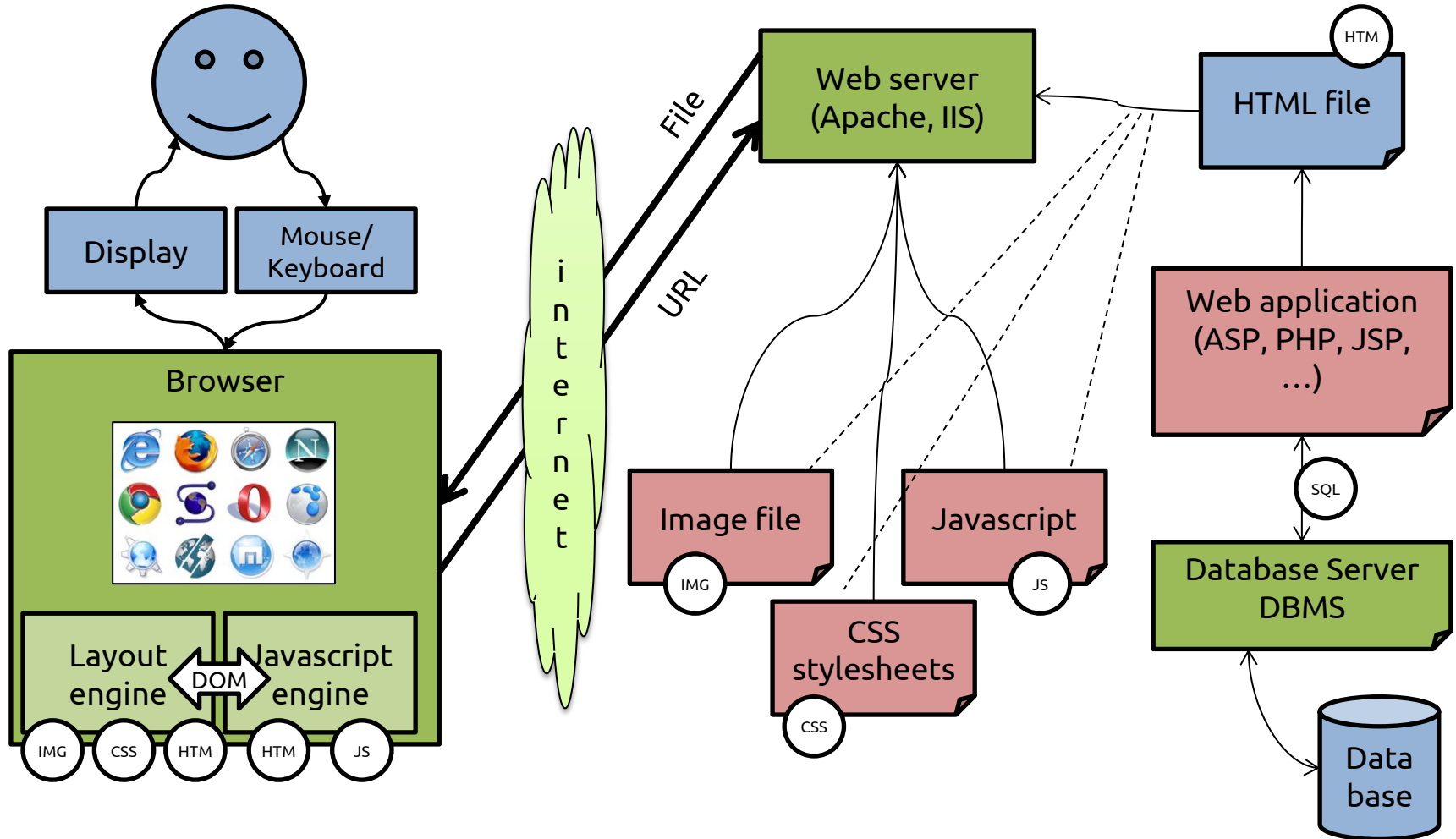
Database-driven transaction



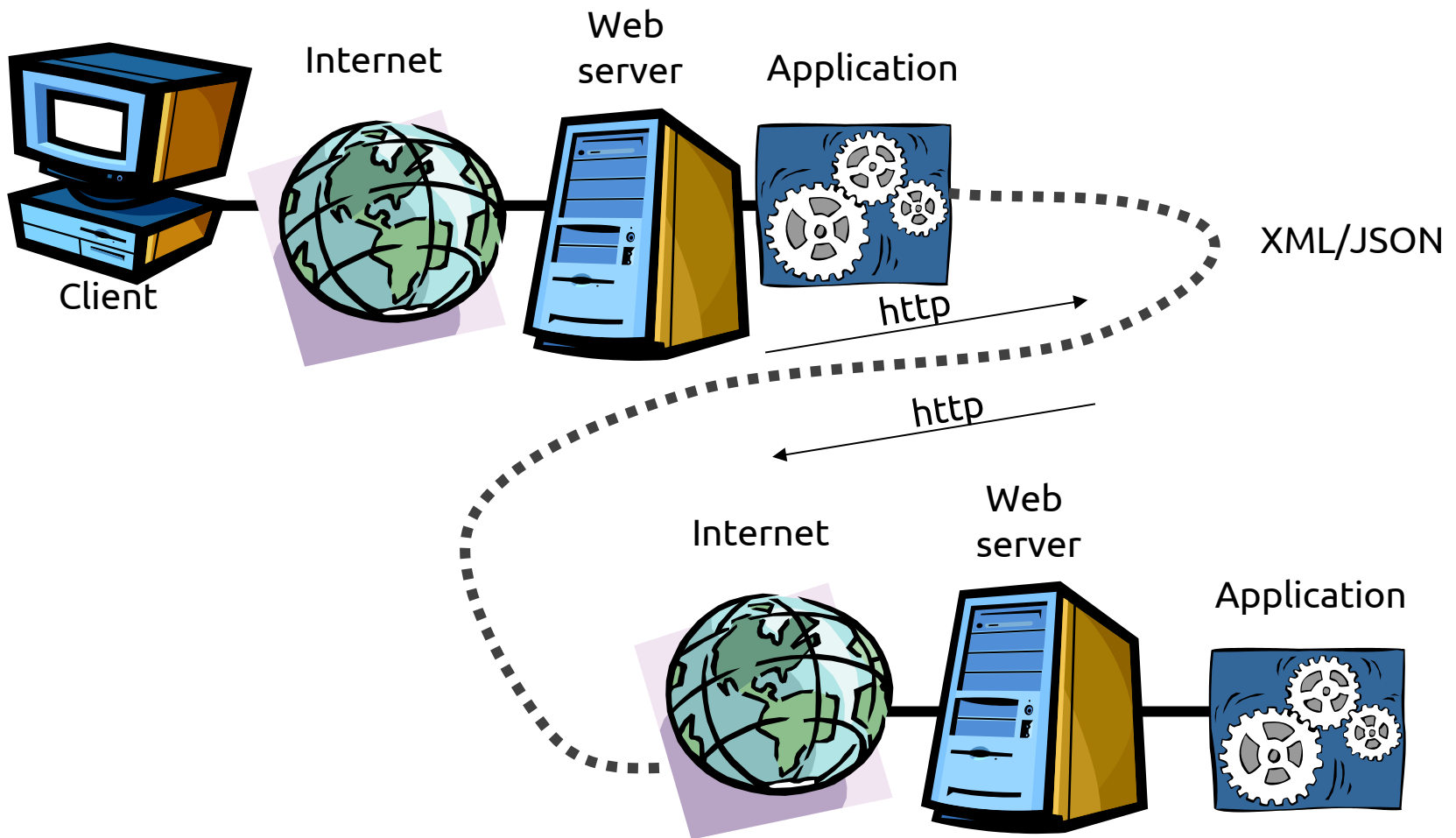
Rich-client asynchronous transactions



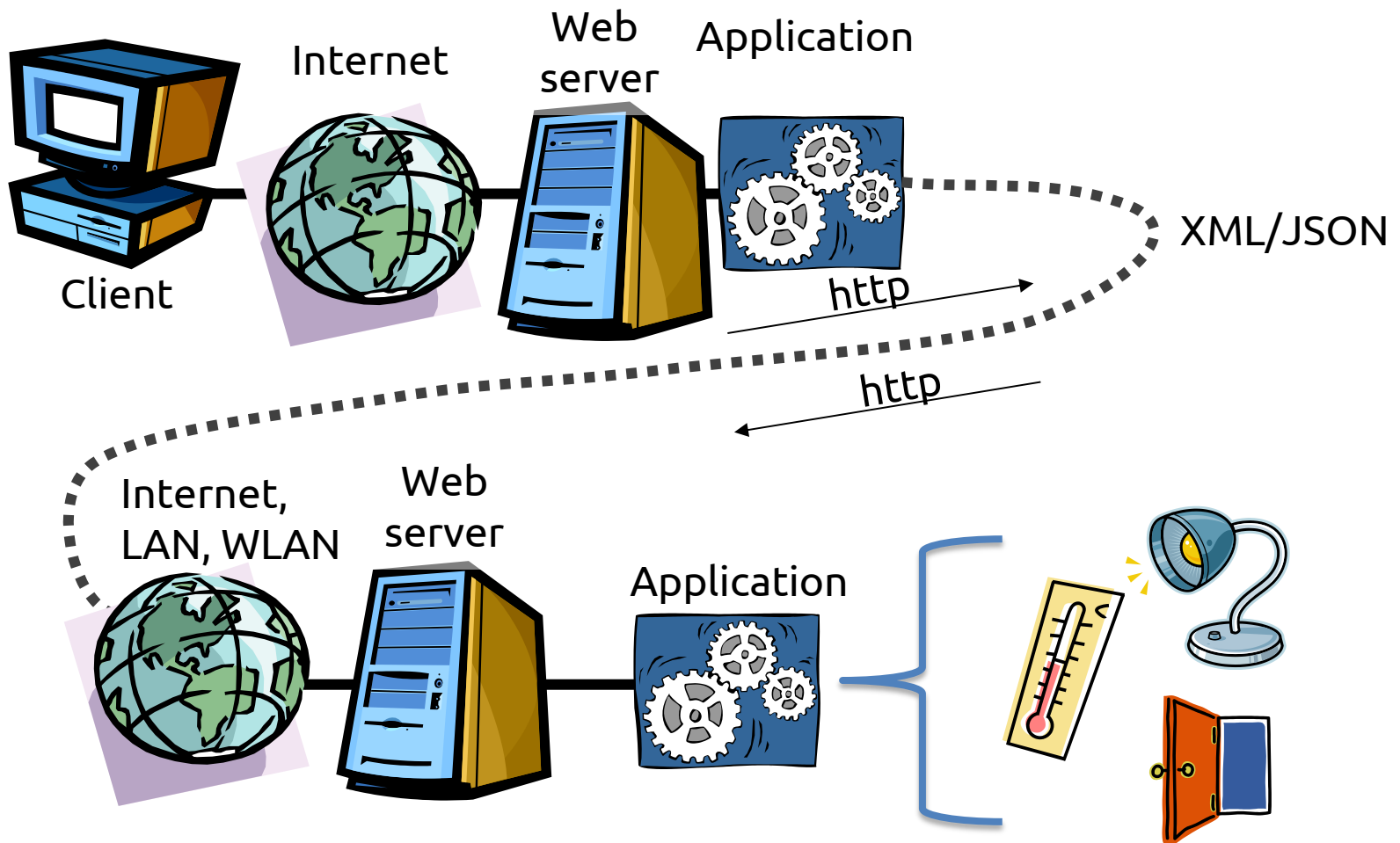
Rich-client asynchronous transactions



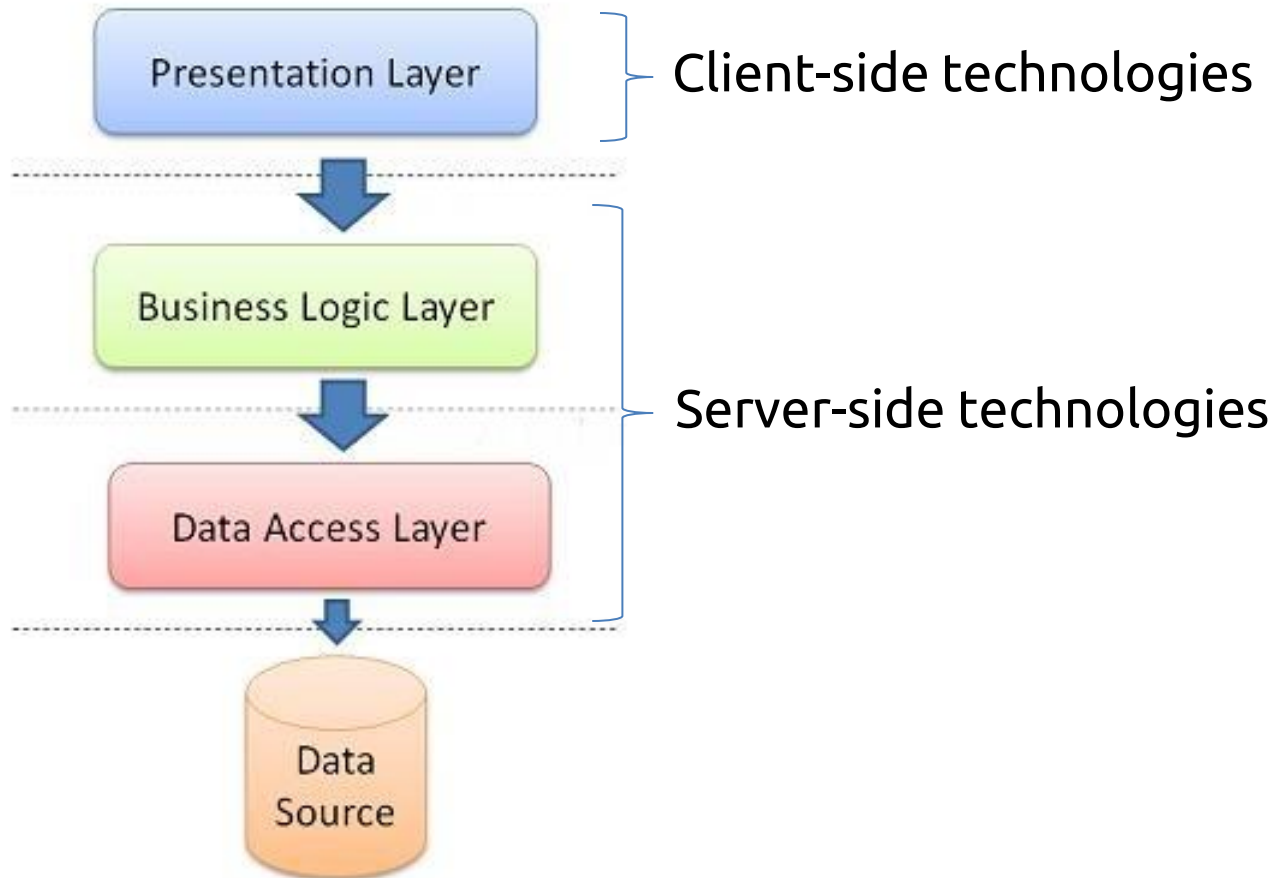
Distributed transactions



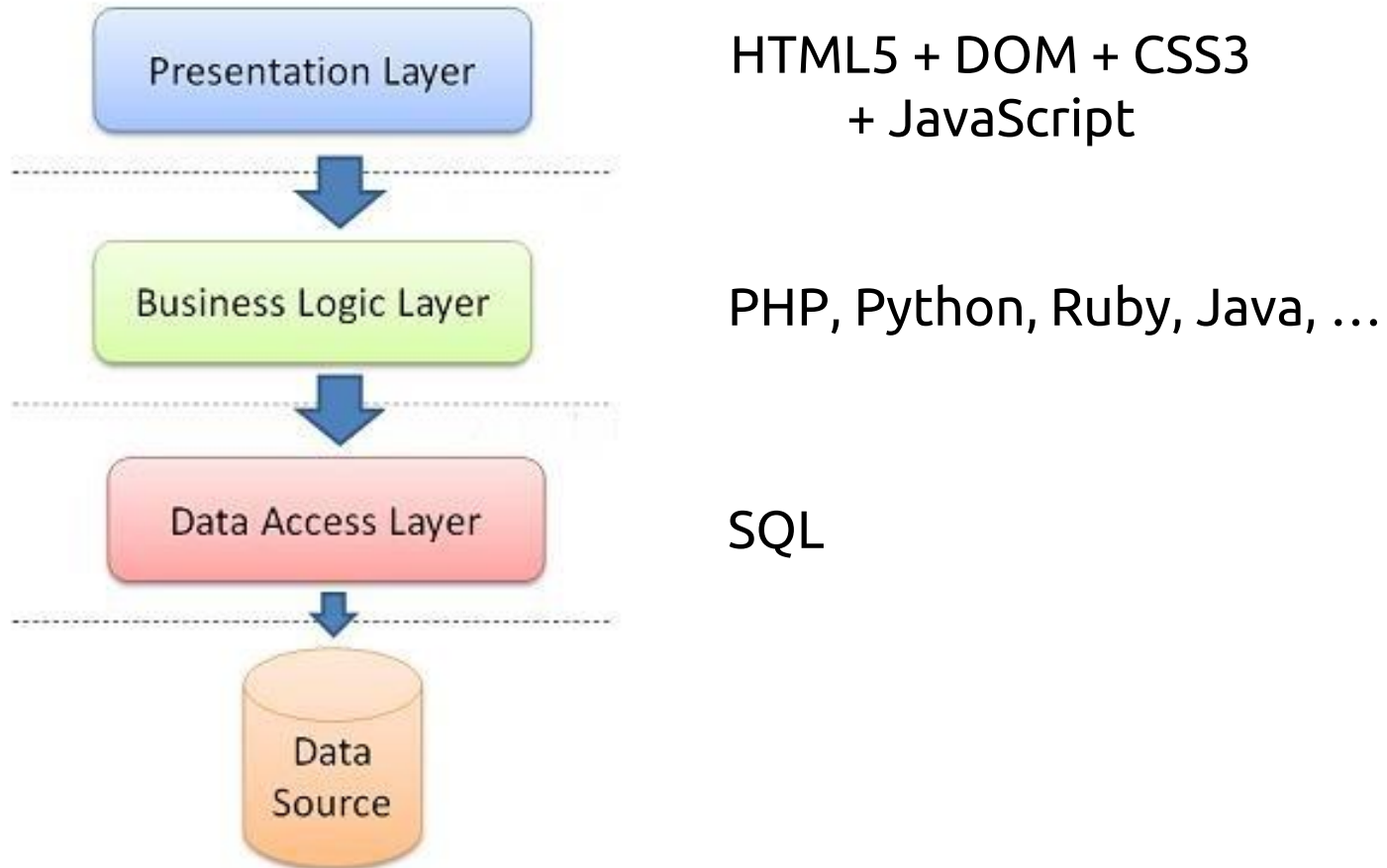
Ambient control



Web technologies and languages



Web technologies and languages



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