

Web Architecture

AN OVERVIEW

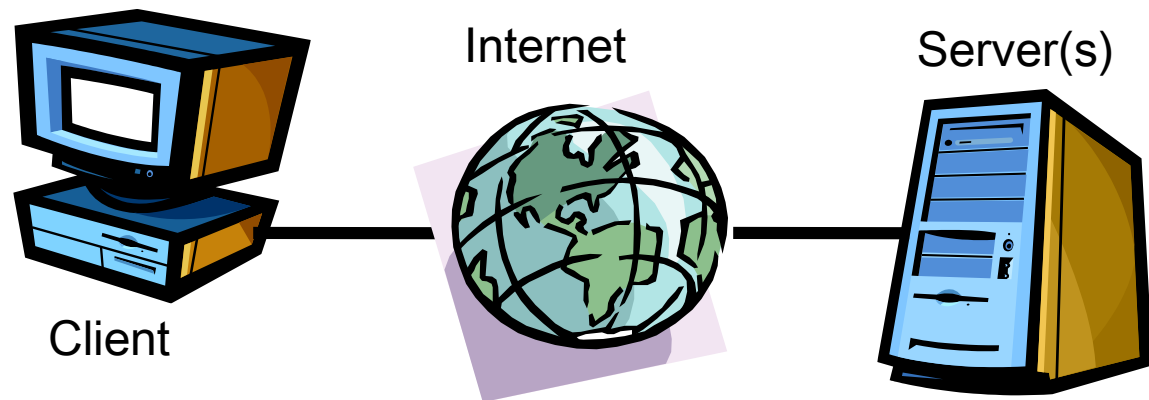


POLITECNICO
DI TORINO



General web architecture

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

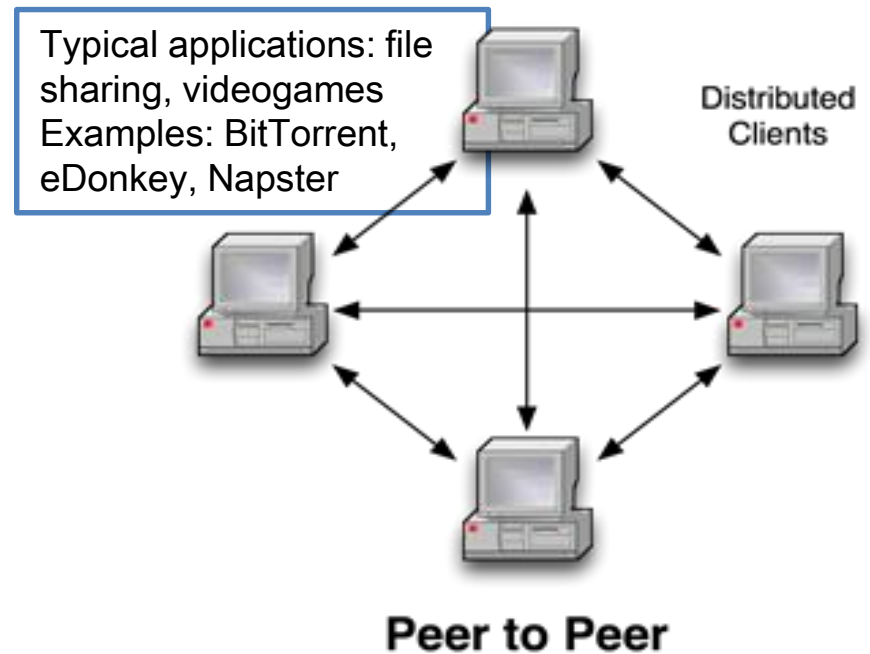
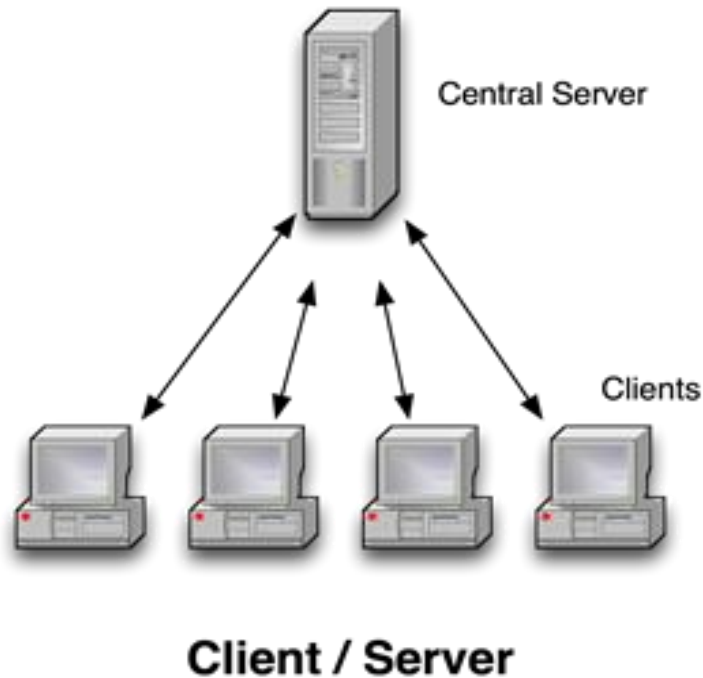


Components

- 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

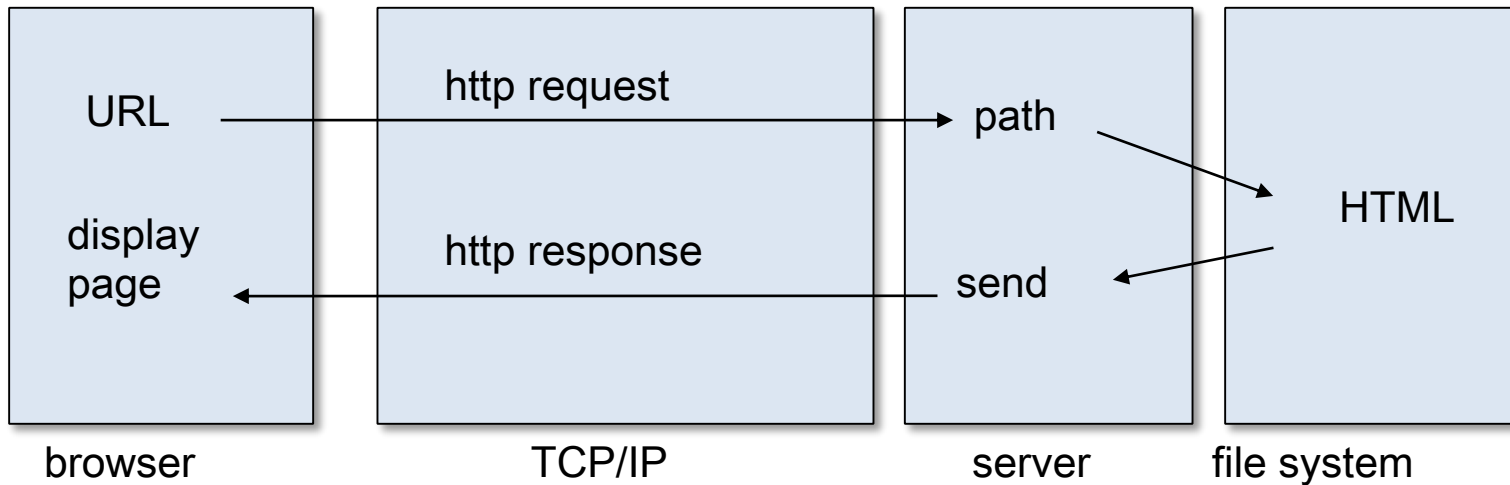
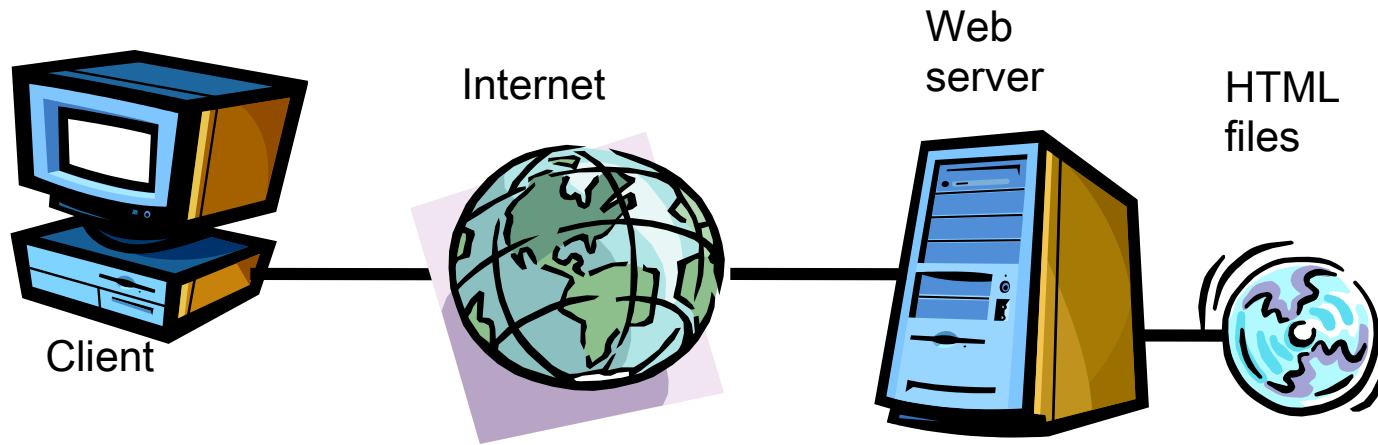
- Two main approaches



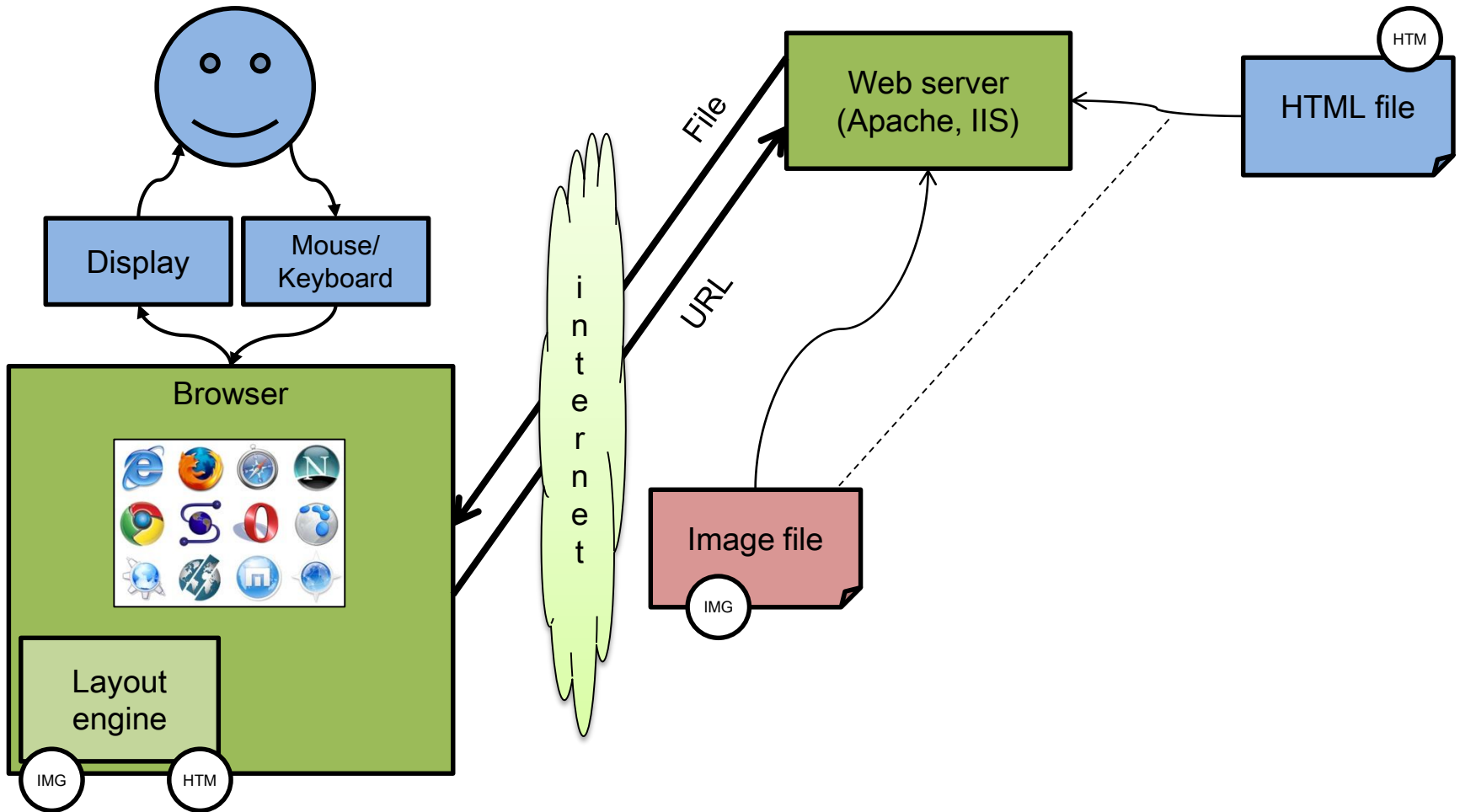
Web server

- 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

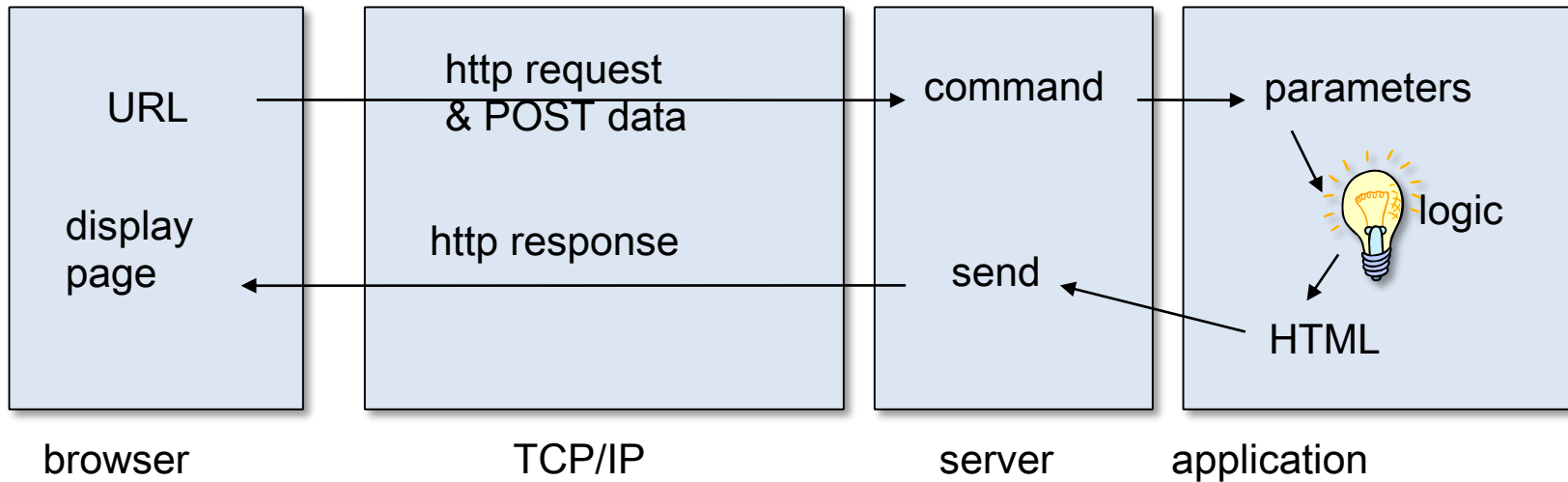
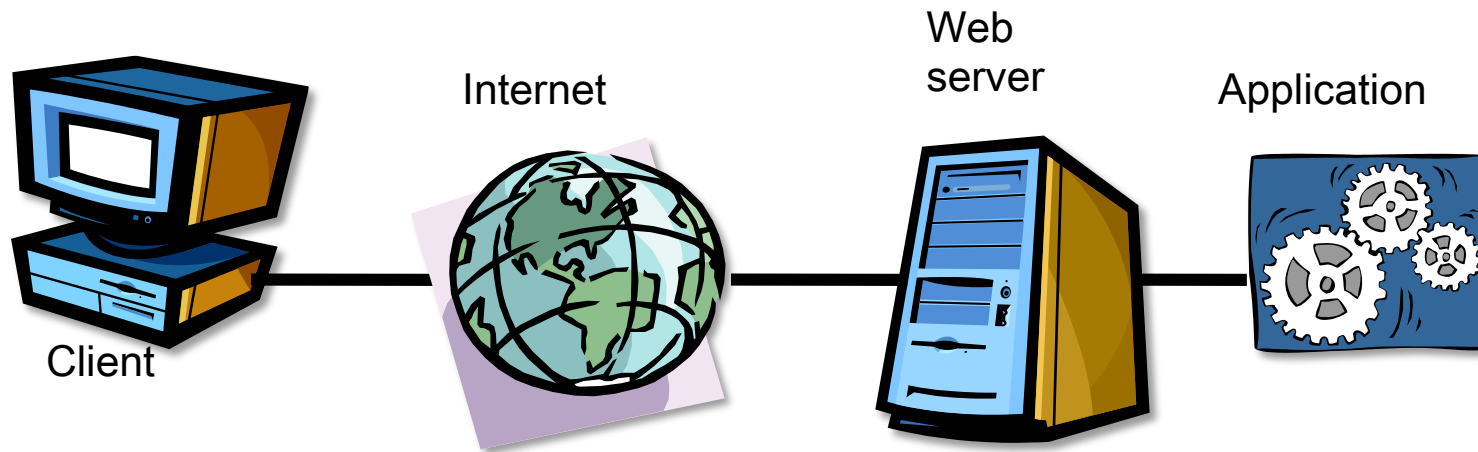
Static web transaction



Static web transaction



Dynamic web transaction

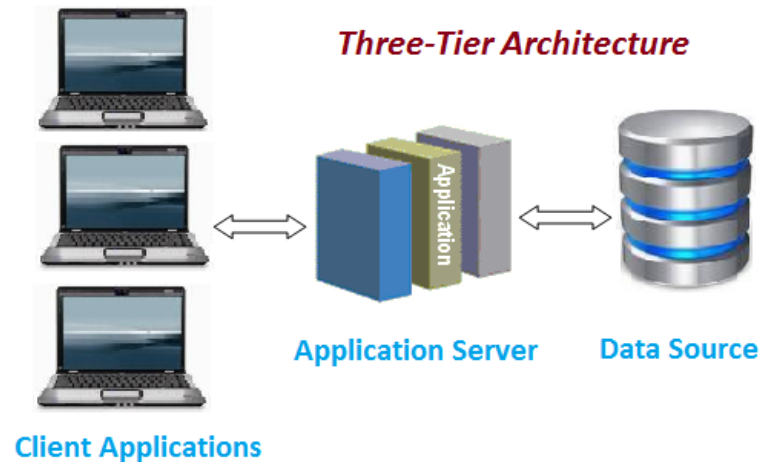


Application server

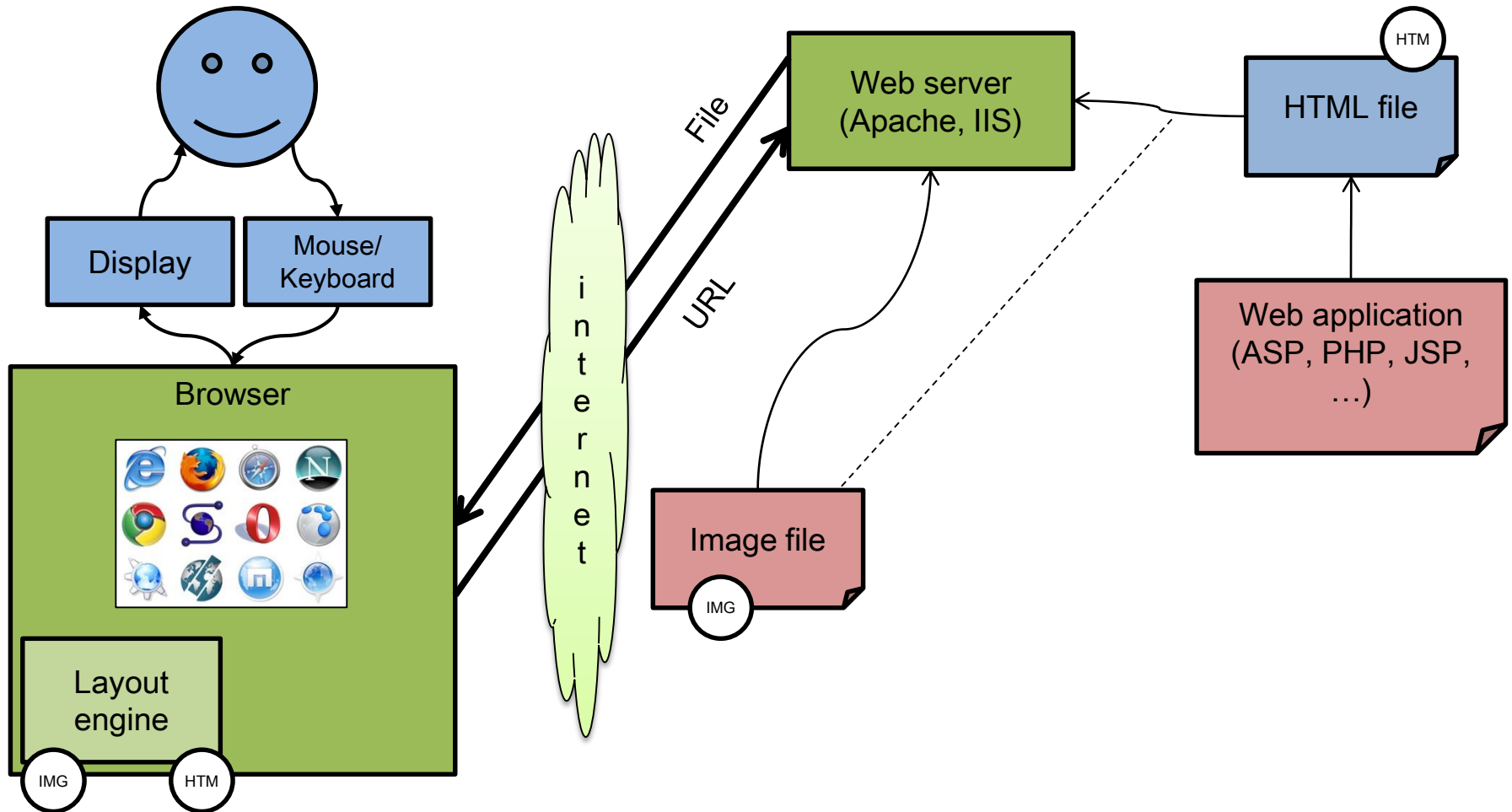
- A server program in distributed network that provides the business logic for an application program
- Dynamic page generation and content generation
- It's the middle tier between the client browser and the data residing on a database
- Implements the session mechanisms
- Different technologies and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

Three-tier architecture

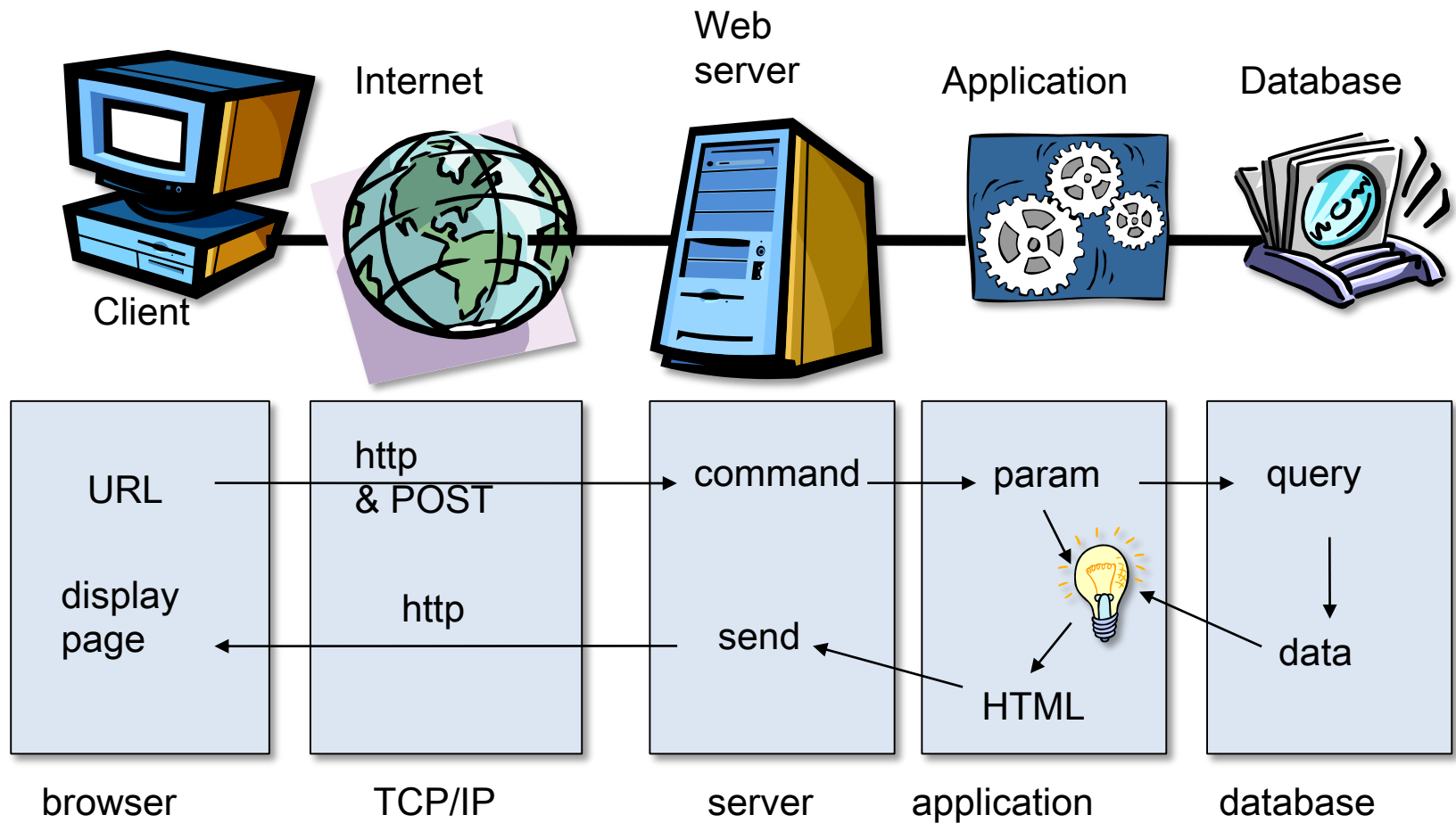
- Client–server software architecture pattern in which the user interface (presentation), functional process logic (“business rules”), computer data storage and data access are developed and maintained as independent modules
- Composed of
 - A first-tier, front-end, Web browser-based graphical user interface,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



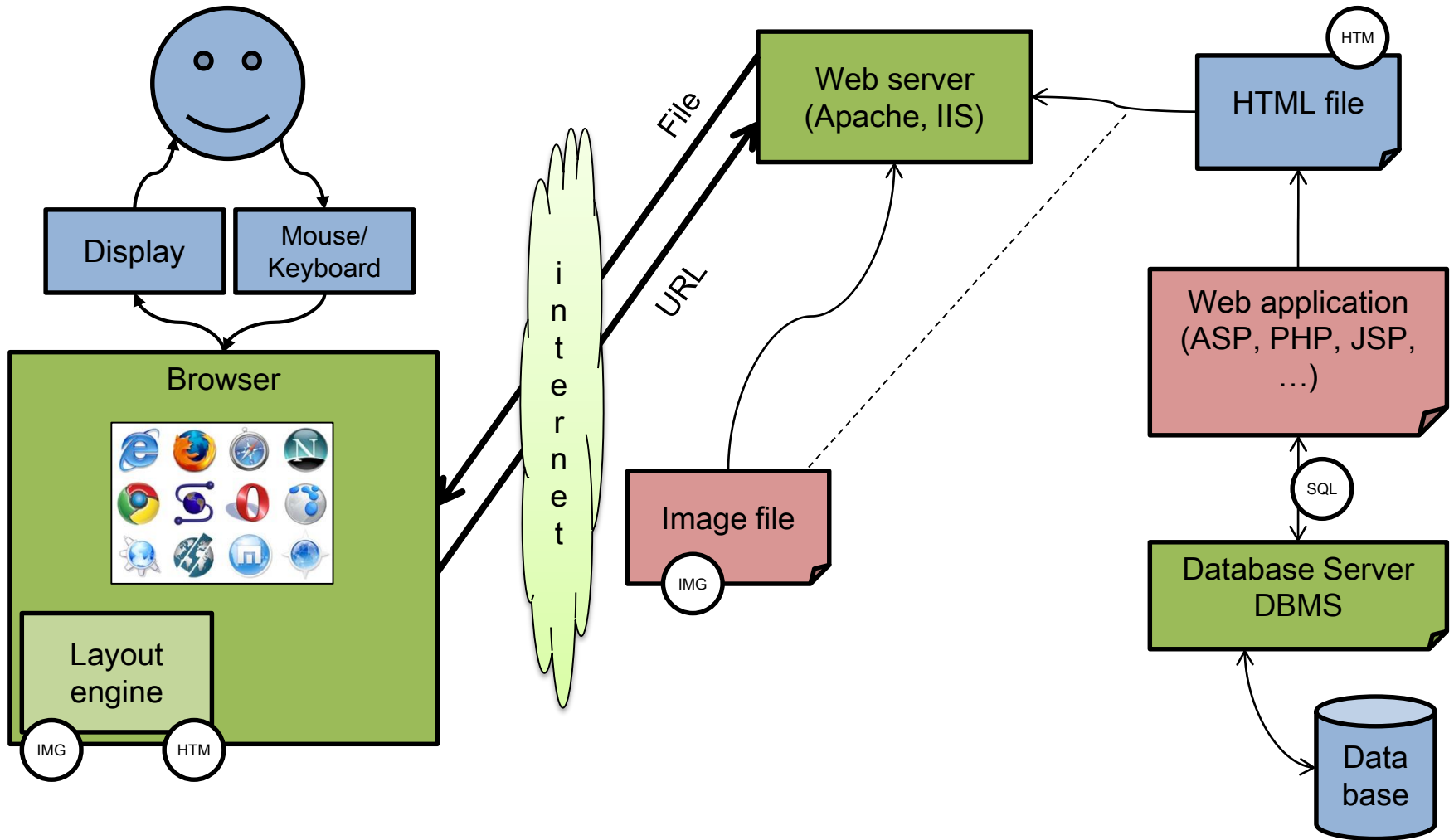
Database-driven transaction



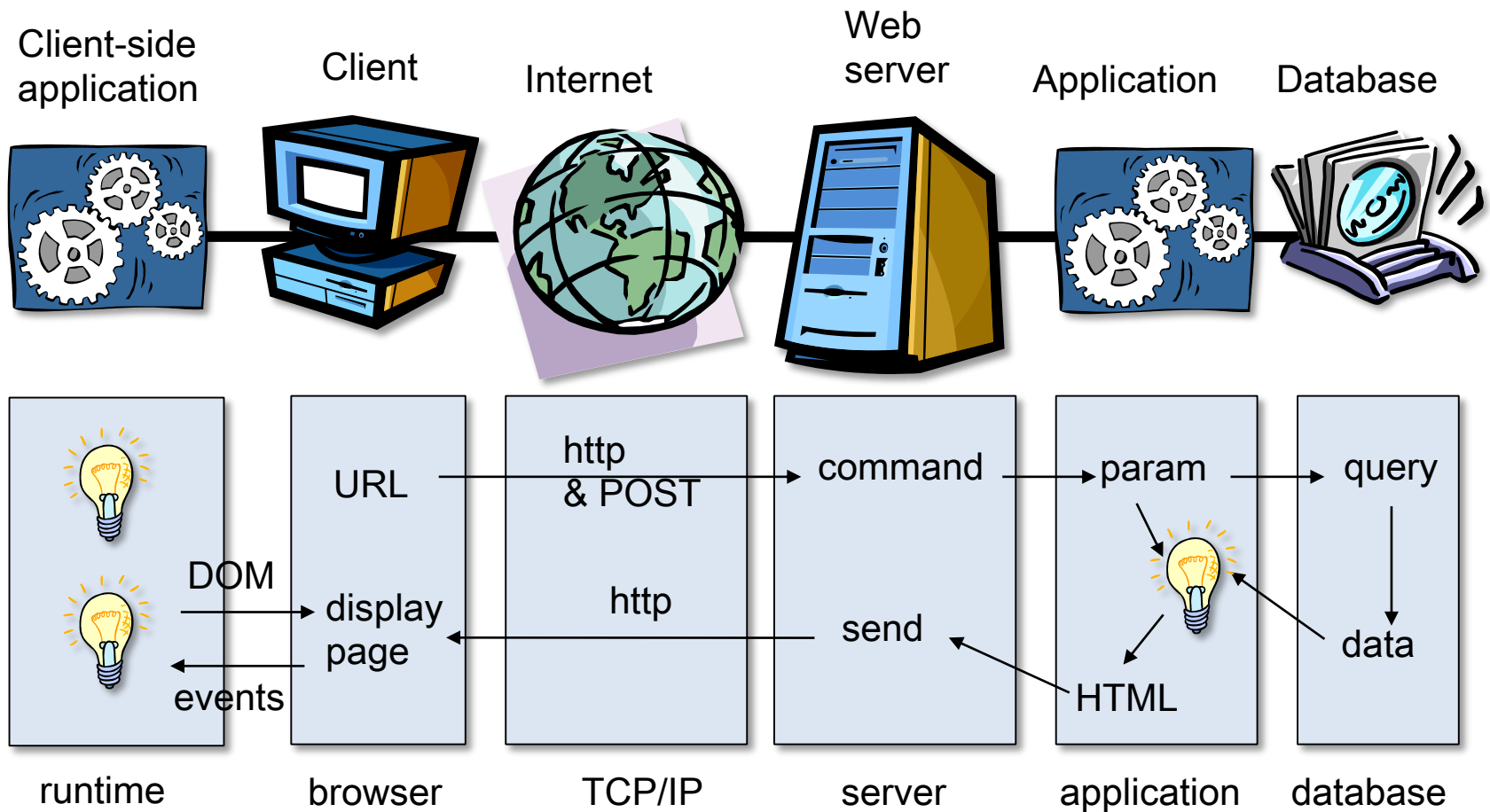
Database server

- 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

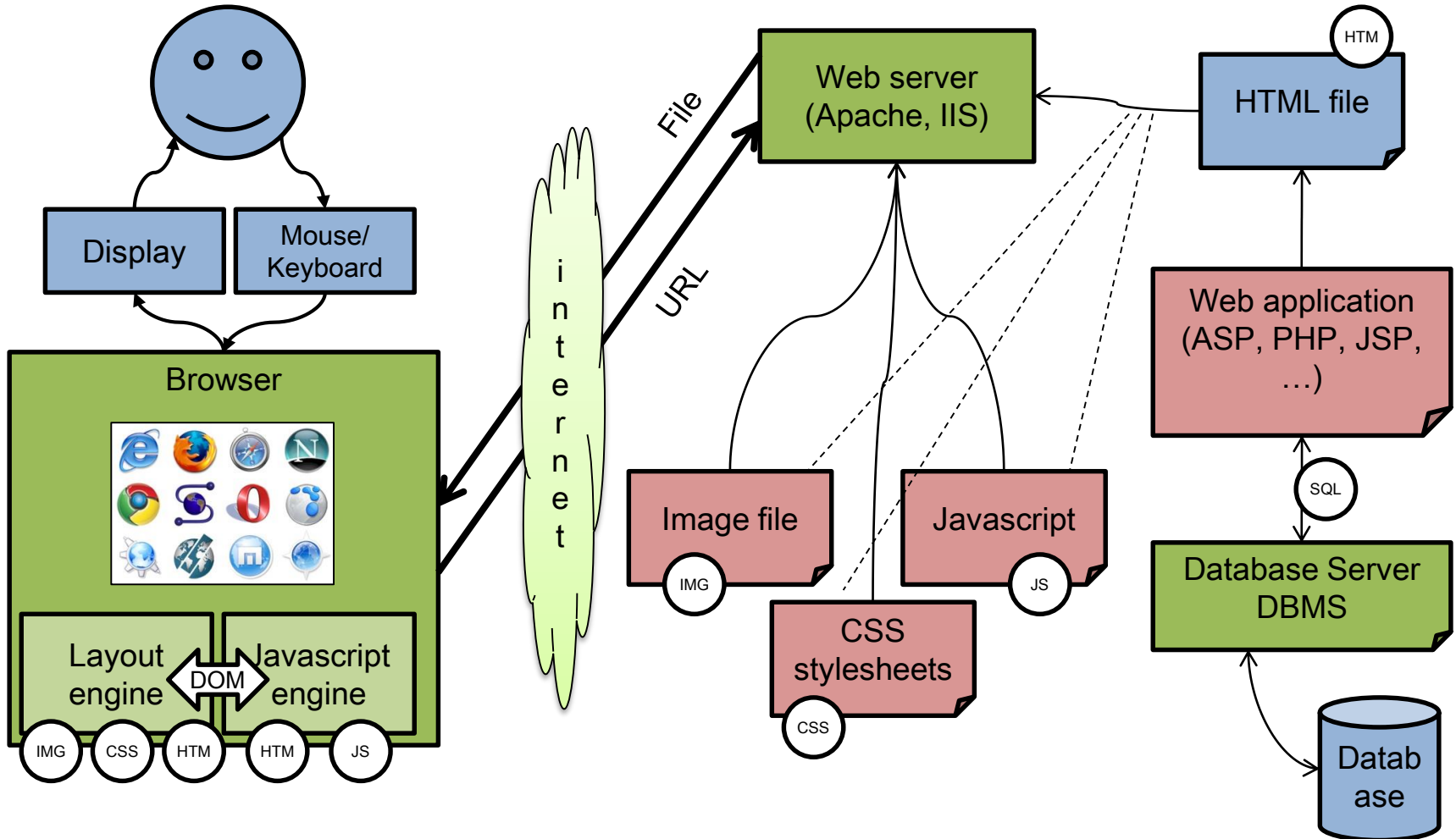
Database-driven transaction



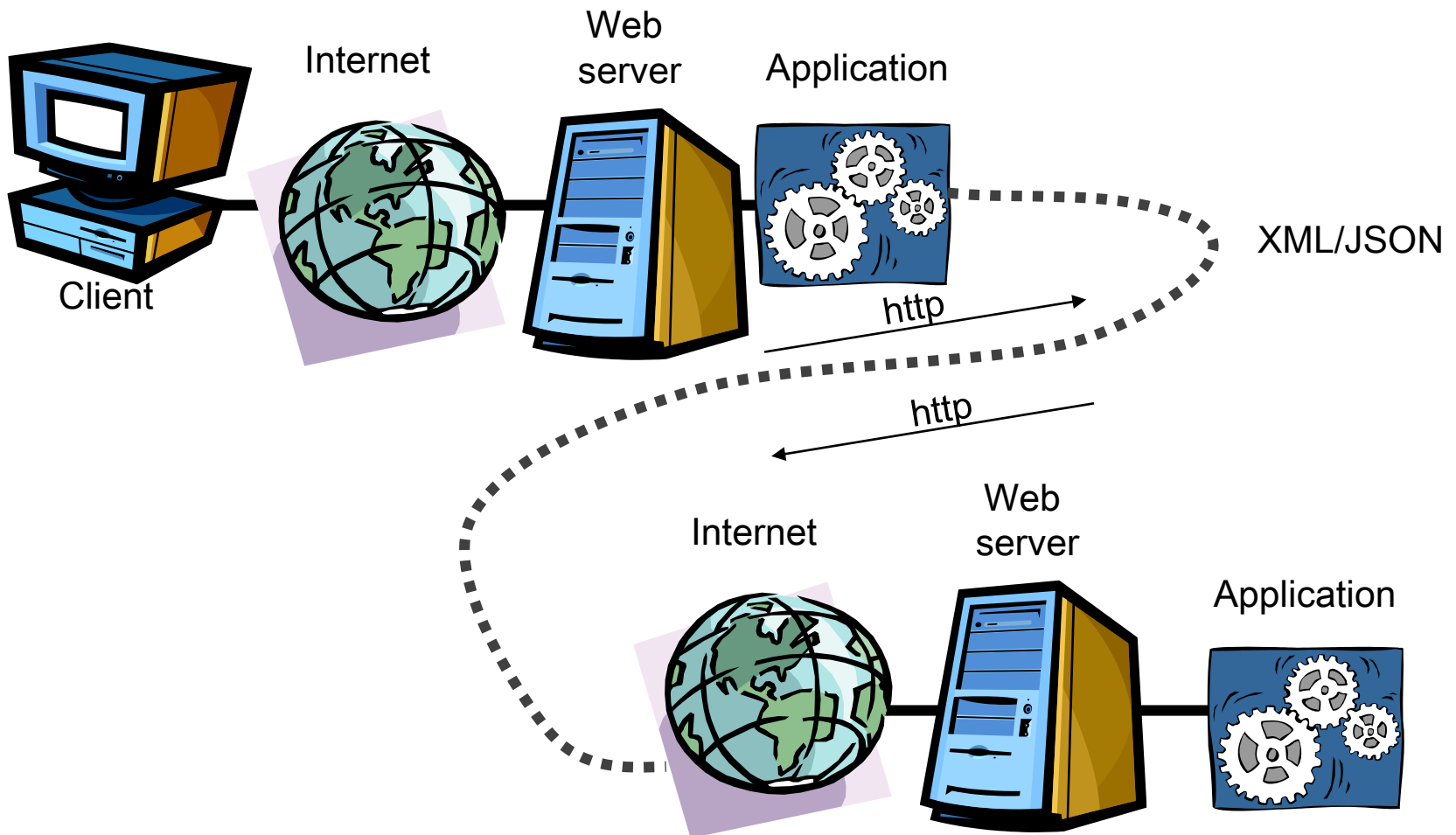
Rich-client asynchronous transactions



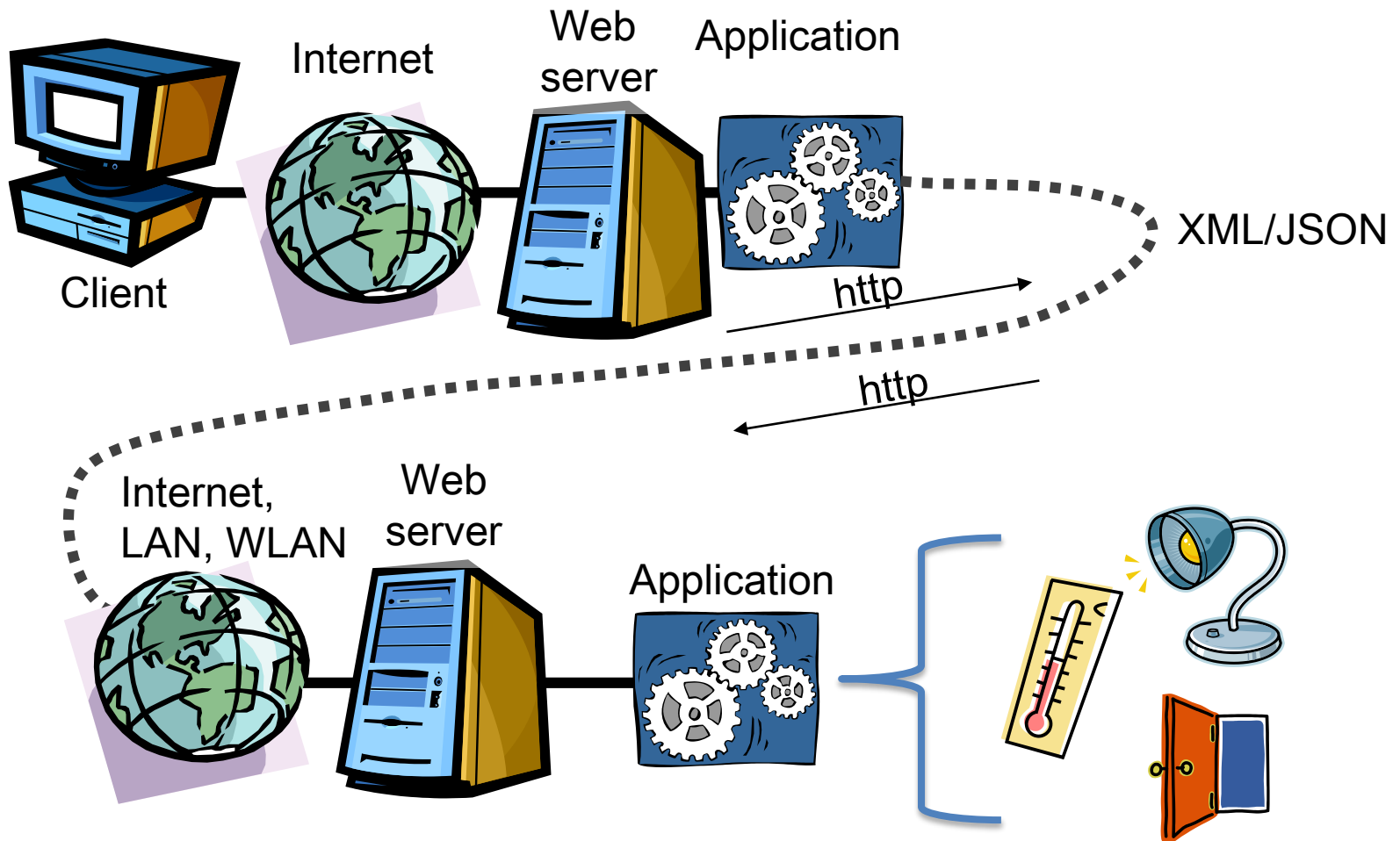
Rich-client asynchronous transactions



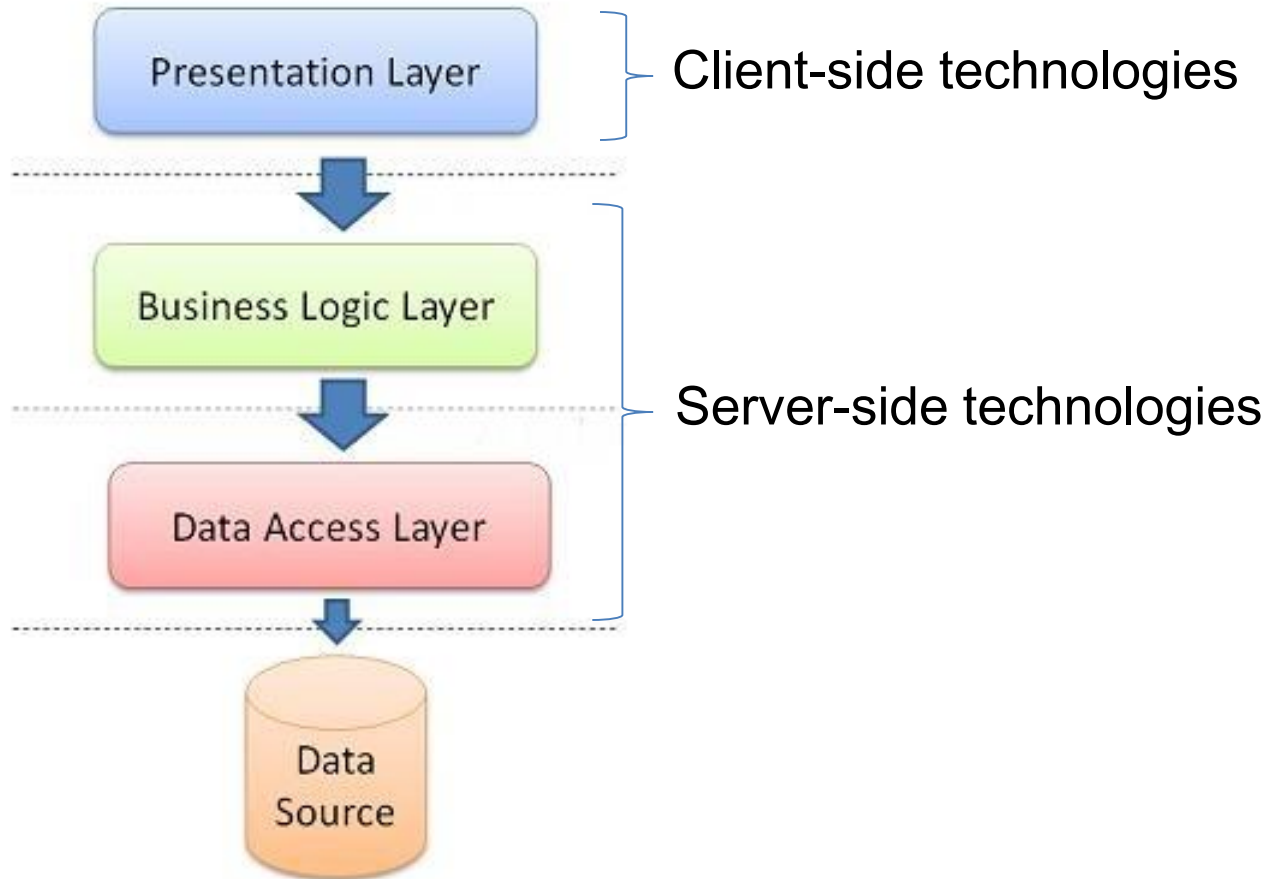
Distributed transactions



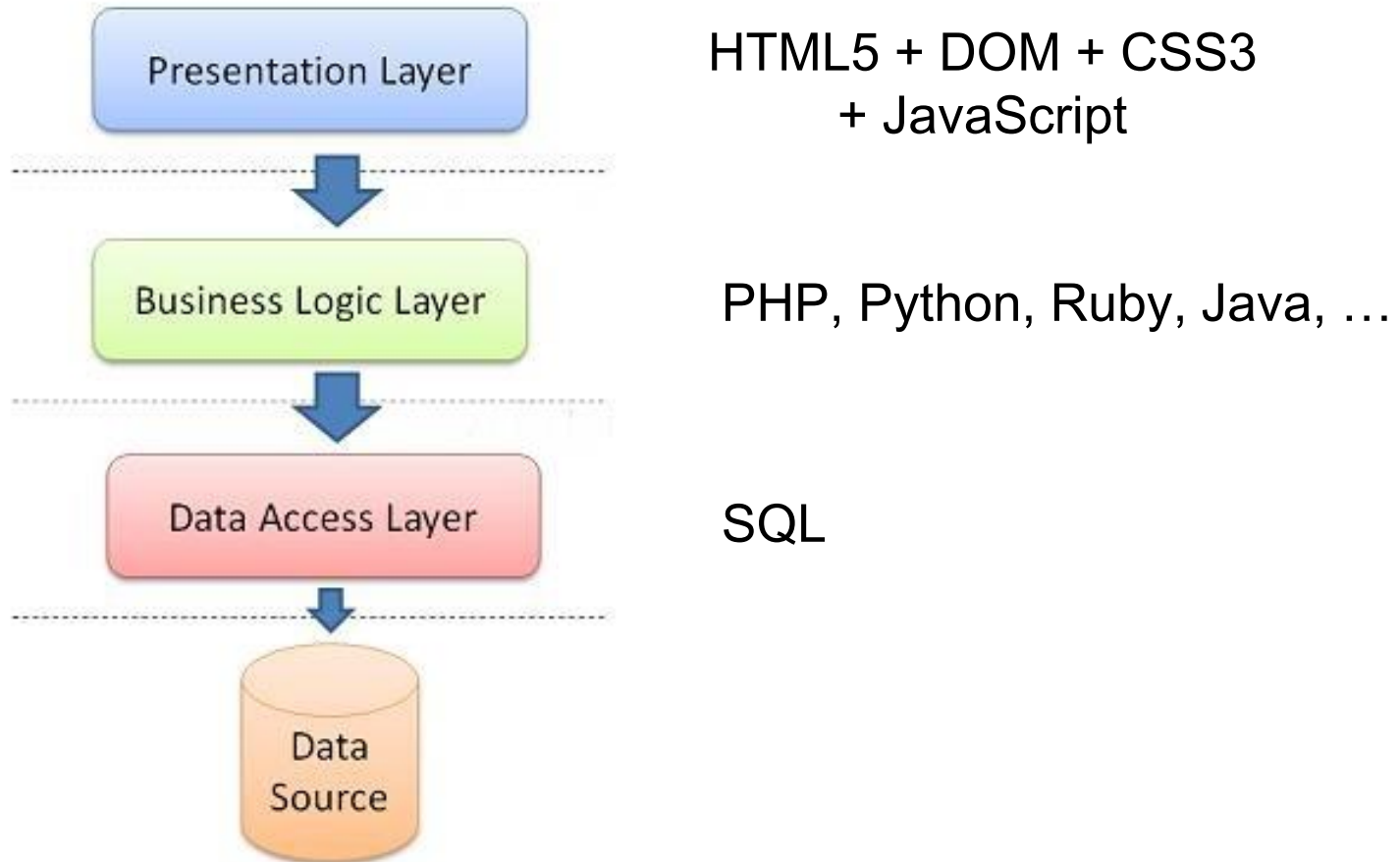
Ambient control



Web technologies and languages



Web technologies and languages



License

- This work is licensed under the Creative Commons “Attribution-NonCommercial-ShareAlike Unported (CC BY-NC-SA 3,0)” License.
- You are free:
 - to Share - to copy, distribute and transmit the work
 - to Remix - to adapt the work
- Under the following conditions:
 - Attribution - You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work).
 - Noncommercial - You may not use this work for commercial purposes.
 - Share Alike - If you alter, transform, or build upon this work, you may distribute the resulting work only under the same or similar license to this one.
- To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/>