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# Client server communication

- Clients and servers exchange messages in a request response messaging pattern. The client sends a request, and the server returns a response. This exchange of messages is an example of inter-process communication.
- To communicate, the computers must have a common language, and they must follow rules so that both the client and the server know what to expect. The language and rules of communication are defined in a communication.
- All client-server protocols operate in the application layer. The application-layer protocol defines the basic patterns of the dialogue.
- To formalize the data exchange even further, the server may implement an API(such as a web service). The API is an abstraction layer for such resources as databases and custom software. By restricting communication to a specific content format. By abstracting access, it facilitate cross platform data exchange.
- A server may receive requests from many different clients in a very short period of time. Because the computer can perform a limited number of tasks at any moment, it relies on a scheduling system to prioritize incoming requests from clients in order to accommodate them all in turn.
- To prevent abuse and maximize uptime, the server's software limits how a client can use the server's resources. Even so, a server is not immune from abuse.
- A denial of service attack exploits a server's obligation to process requests by

bombarding it with requests incessantly. This inhibits the server's ability to respond to legitimate requests that can make the communication of web easier.



Client-server model of computing is a distributed application structure that partitions tasks or workloads between service providers, called servers, and service requesters, called clients.

Often clients and servers communicate over a computer network on separate hardware, but both client and server may reside in the same system.

A server machine is a host that is running one or more server programs which share its resources with clients. A client does not share any of its resources, but requests a server's content or service function. Clients therefore initiate communication sessions with servers which await (listen for) incoming requests.

### Example

- 1. When a bank customer accesses online banking services with a web browser (the client), the client initiates a request to the bank's web server.
- 2. The customer's login credentials may be stored in a database, and the web server

accesses the database server as a client.

- 3. An application server interprets the returned data by applying the bank's business logic, and provides the output to the web server.
- 4. Finally, the web server returns the result to the client web browser for display.

In each step of this sequence of client-server message exchanges, a computer processes a request and returns data. This is the request-response messaging pattern. When all the requests are met, the sequence is complete and the web browser presents the data to the customer.

This example illustrates a design pattern applicable to the client-server model: separation of concerns.

### Client-host and server-host

Client-host and server-host have subtly different meanings than client and server.

A host is any computer connected to a network. Whereas the words server and client may refer either to a computer or to a computer program, server-host and user-host always refer to computers. The host is a versatile, multifunction computer; clients and servers are just programs that run on a host. In the client-server model, a server is more likely to be devoted to the task of serving.

## Issues in client server communication

- Addressing
- Blocking versus non blocking
- buffered versus unbuffered

Client server communication

- reliable versus unreliable
- server architecture concurrent versus sequential scalability