

Systems Design Fundamentals

The foundational knowledge you need to ace the systems design interviews.

Course Progress



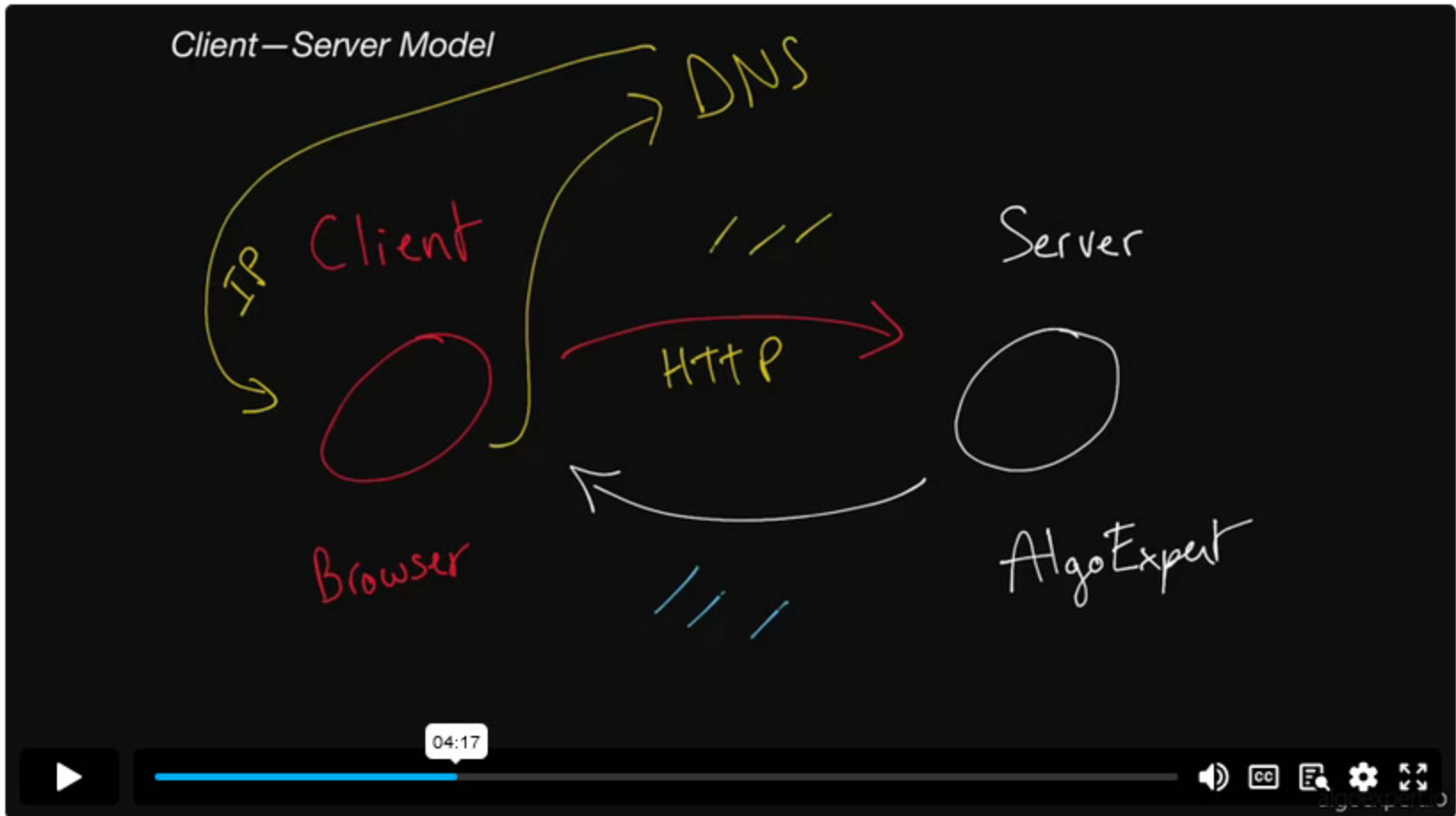
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3 - Client—Server Model

🕒 15 min

A client is a thing that talks to servers. A server is a thing that talks to clients. The client—server model is a thing made up of a bunch of clients and servers talking to one another.

And that, kids, is how the Internet works!



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Key Terms

Client

A machine or process that requests data or service from a server.

Note that a single machine or piece of software can be both a client and a server at the same time. For instance, a single machine could act as a server for end users and as a client for a database.

Server

A machine or process that provides data or service for a client, usually by listening for incoming network calls.

Note that a single machine or piece of software can be both a client and a server at the same time. For instance, a single machine could act as a server for end users and as a client for a database.

Client—Server Model

The paradigm by which modern systems are designed, which consists of clients requesting data or service from servers and servers providing data or service to clients.

IP Address

An address given to each machine connected to the public internet. IPv4 addresses consist of four numbers separated by dots: **a.b.c.d** where all four numbers are between 0 and 255. Special values include:

- **127.0.0.1**: Your own local machine. Also referred to as **localhost**.
- **192.168.x.y**: Your private network. For instance, your machine and all machines on your private wifi network will usually have the **192.168** prefix.

Port

In order for multiple programs to listen for new network connections on the same machine without colliding, they pick a **port** to listen on. A port is an integer between 0 and 65,535 (2^{16} ports total).

Typically, ports 0-1023 are reserved for *system ports* (also called *well-known* ports) and shouldn't be used by user-level processes. Certain ports have pre-defined uses, and although you usually won't be required to have them memorized, they can sometimes come in handy. Below are some examples:

- 22: Secure Shell
- 53: DNS lookup
- 80: HTTP
- 443: HTTPS

DNS

Short for Domain Name System, it describes the entities and protocols involved in the translation from domain names to IP Addresses. Typically, machines make a DNS query to a well known entity which is responsible for returning the IP address (or multiple ones) of the requested domain name in the response.

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What Are Design Fundamentals?

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Network Protocols