



General Knowledge

**General
Knowledge**

NodeJS

ExpressJS

**Data &
Database**

MySQL

MongoDB

**Advanced
Node**

Deployments

OS

Today's Topics

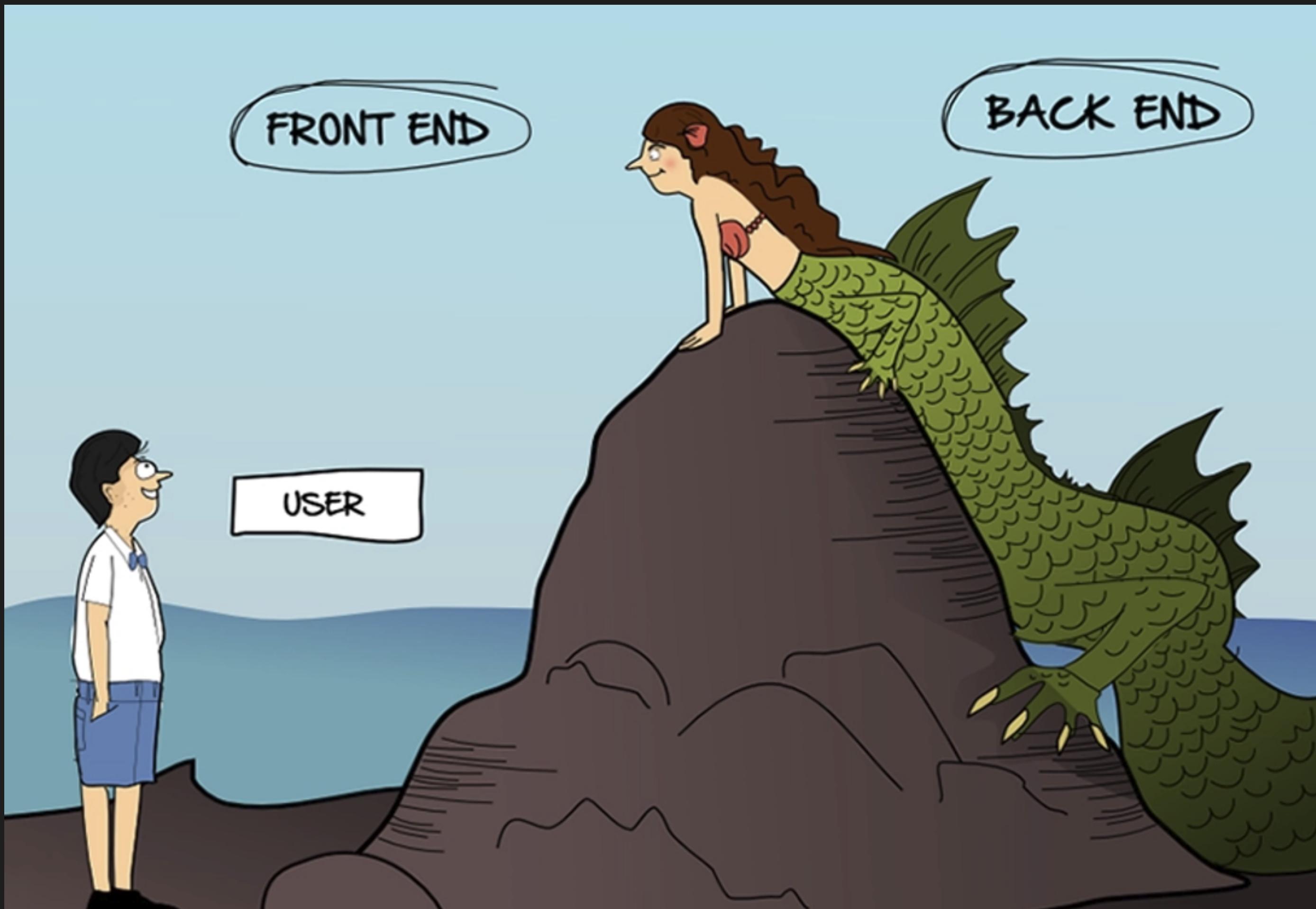
- 1. What is Back-End Development?**
- 2. Computer Network Architecture**

What is back-end development?

Difference between back-end and front-end development

Which one get better salary?

Front-end
and
Back-End



Design
UX
Understandable



Architecture
Database
Server
Security

Front-End

FRONT END DEVELOPMENT



JAVASCRIPT
CSS HTML

Back-End

BACK END DEVELOPMENT



PYTHON PHP
RUBY JAVA GO

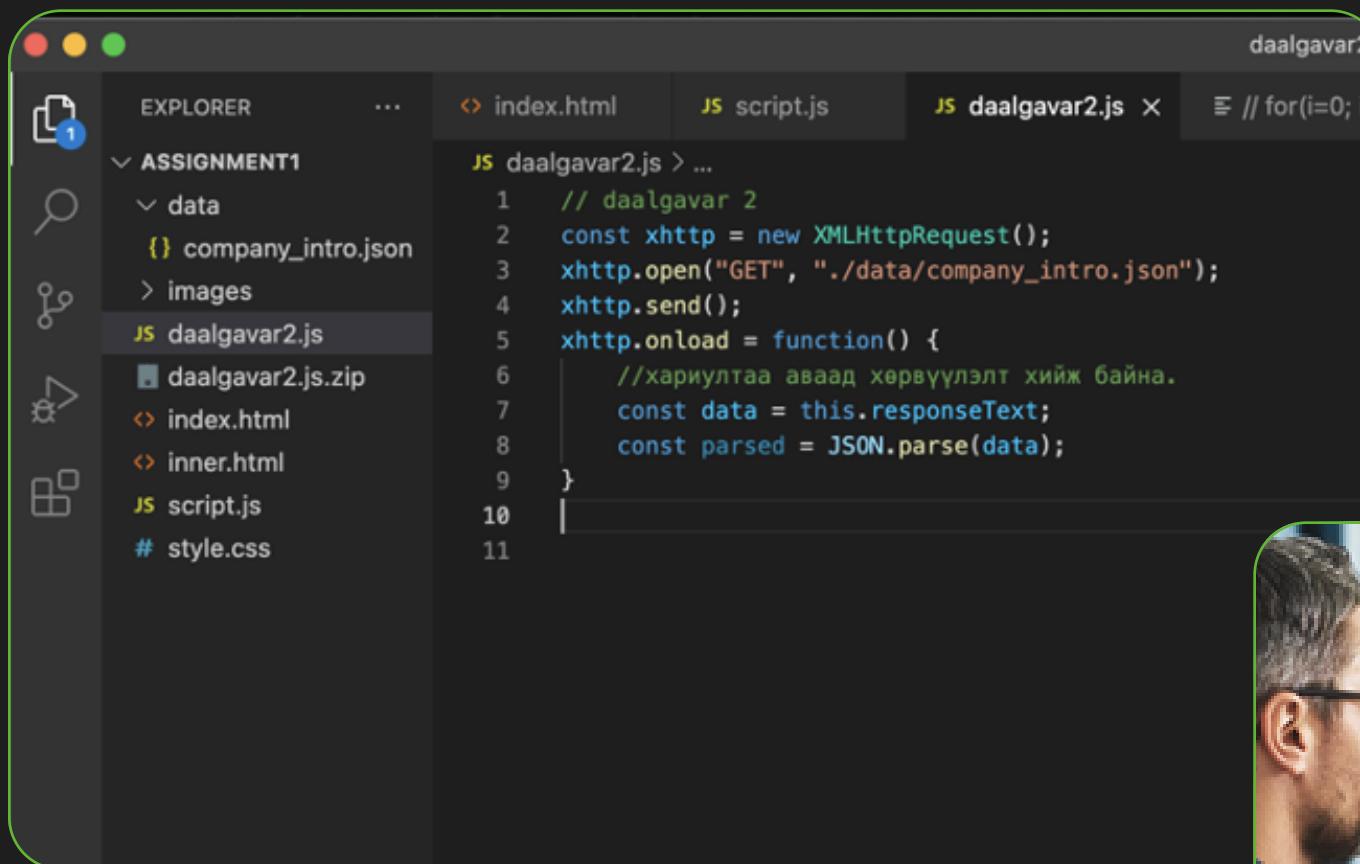
1. Answer Front-End request
2. Calculate main logic
3. Manage data. (Save, Security, Analysis)
4. Server maintenance
5. Security
6. Performance
7. Availability
8. Architecture
9. Create Front-End tool /admin template/

Back-End Majors

Back-End Developer
Java Developer
.NET Deveoper
Fullstack Developer
Solution Architect
Data Scientist
Data Analyst
ML
IOT
AI



Environment



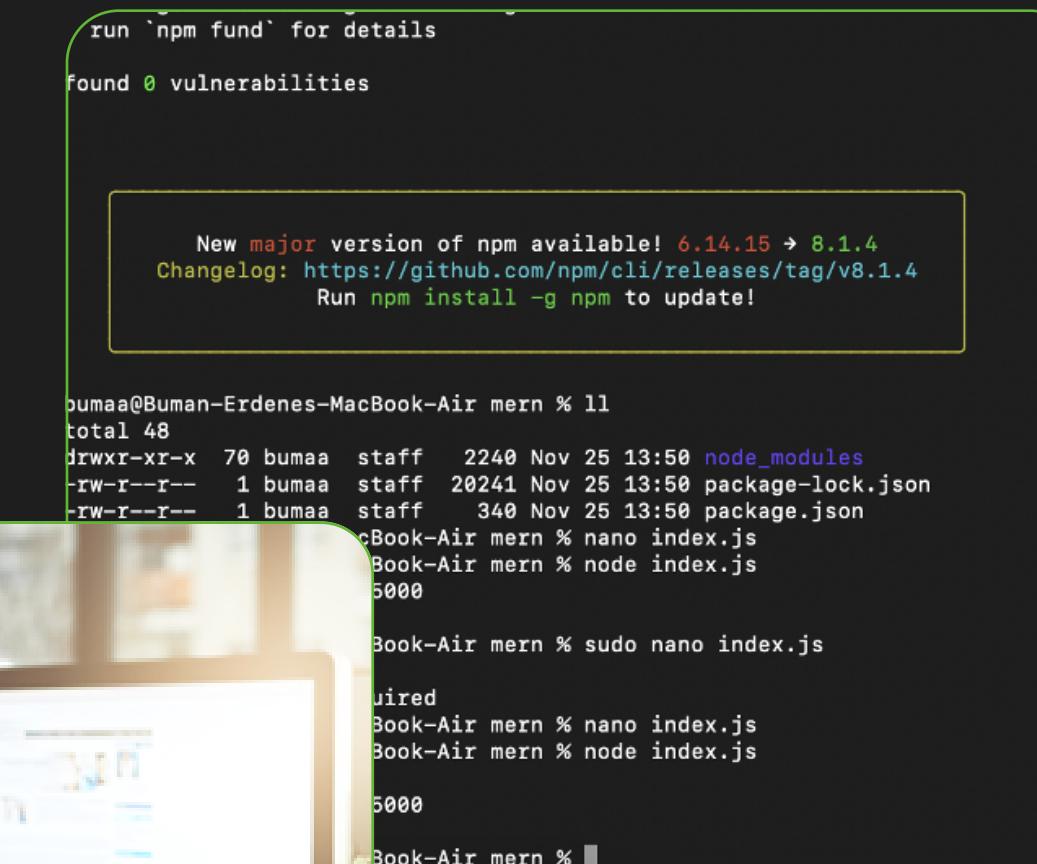
```
// daalgavar 2
const xhttp = new XMLHttpRequest();
xhttp.open("GET", "./data/company_intro.json");
xhttp.send();
xhttp.onload = function() {
    //хариултаа аваад хөрвүүлэлт хийж байна.
    const data = this.responseText;
    const parsed = JSON.parse(data);
}
```

Editor



Office

Terminal

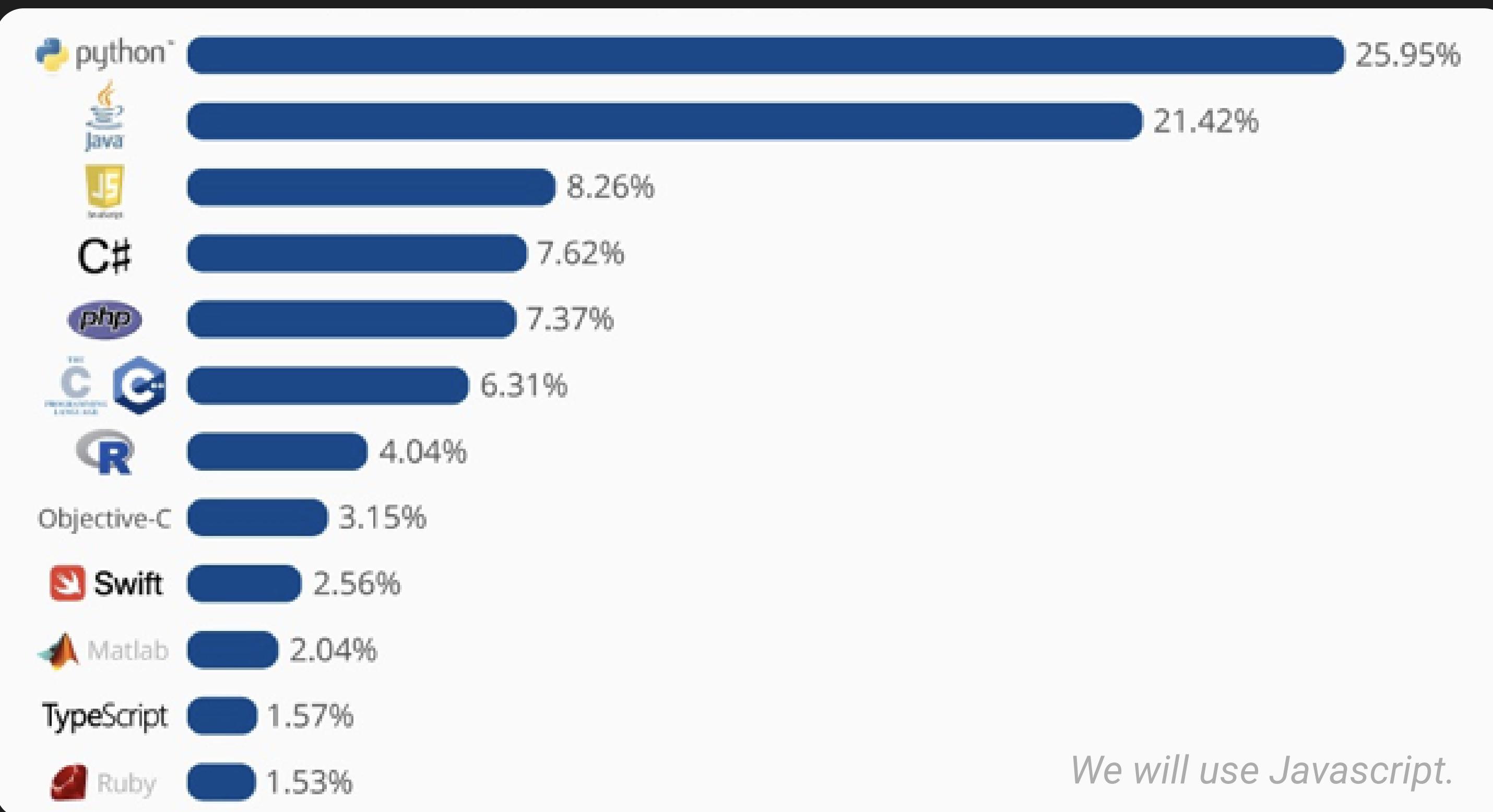


```
run `npm fund` for details
found 0 vulnerabilities

New major version of npm available! 6.14.15 > 8.1.4
Changelog: https://github.com/npm/cli/releases/tag/v8.1.4
Run npm install -g npm to update!

bumaa@Buman-Erdenes-MacBook-Air mern % ll
total 48
drwxr-xr-x  70 bumaa  staff   2240 Nov 25 13:50 node_modules
-rw-r--r--  1 bumaa  staff  20241 Nov 25 13:50 package-lock.json
-rw-r--r--  1 bumaa  staff   340 Nov 25 13:50 package.json
Book-Air mern % nano index.js
Book-Air mern % node index.js
5000
Book-Air mern % sudo nano index.js
quired
Book-Air mern % nano index.js
Book-Air mern % node index.js
5000
Book-Air mern %
```

The Most Popular Back-End Programming Language





Computer Network Architecture

What is a Network?

A network consists of two or more computers that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.

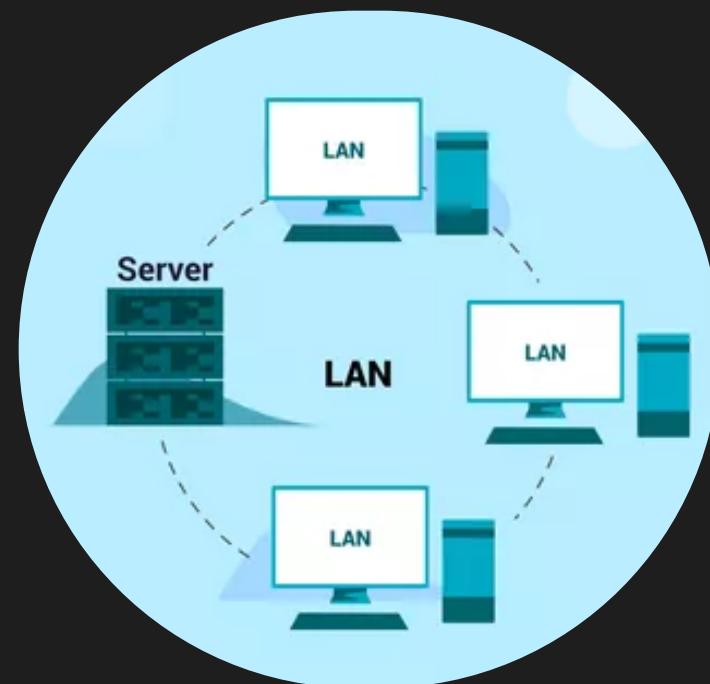
Two very common types of networks include:

- Local Area Network (LAN)
- Wide Area Network (WAN)

What is a Network?

Local Area Network (LAN)

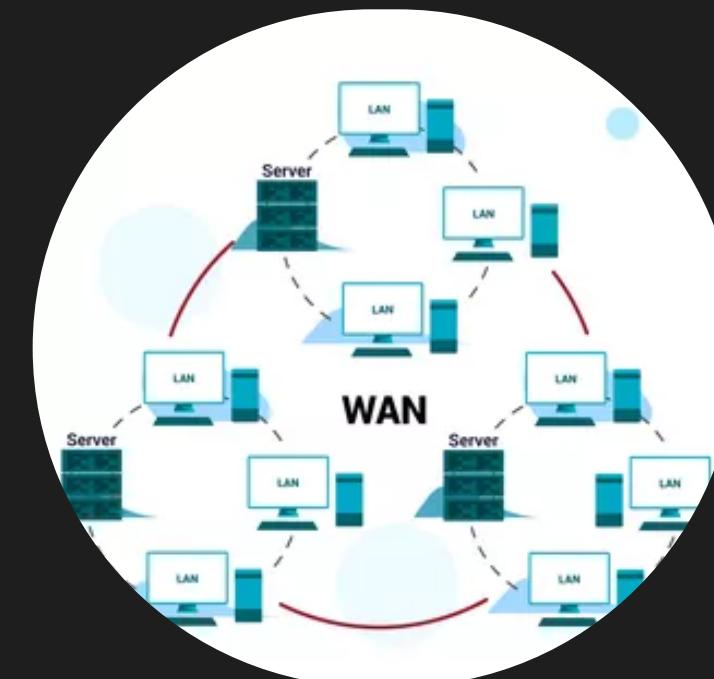
A Local Area Network (LAN) is a network that is confined to a relatively small area. It is generally limited to a geographic area such as a writing lab, school, or building.



Wide Area Network (WAN)

A WAN spans a large physical distance. The internet is the largest WAN, spanning the Earth.

A WAN is a geographically-dispersed collection of LANs. A network device called a router connects LANs to a WAN.



Computer Network Architecture

Computer Network Architecture is defined as the physical and logical design of the software, hardware, protocols, and media of the transmission of data. Simply we can say that how computers are organized and how tasks are allocated to the computer.

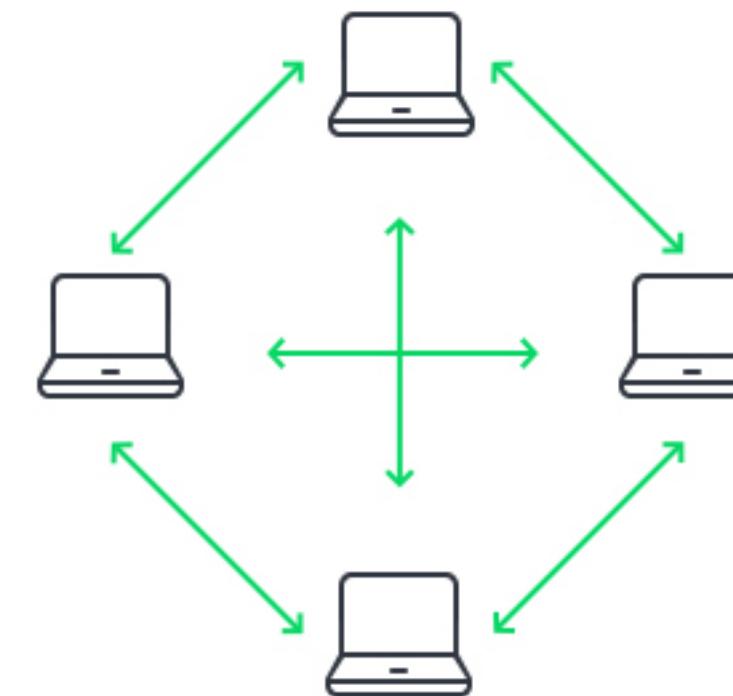
The two types of network architectures are used:

- Peer to Peer
- Client Server

Computer Network Architecture

Peer to Peer

- Peer-To-Peer network is a network in which all the computers are linked together with equal privilege and responsibilities for processing the data.
- Peer-To-Peer network is useful for small environments, usually up to 10 computers.
- Peer-To-Peer network has no dedicated server.
- Special permissions are assigned to each computer for sharing the resources, but this can lead to a problem if the computer with the resource is down.



Computer Network Architecture

Peer to Peer

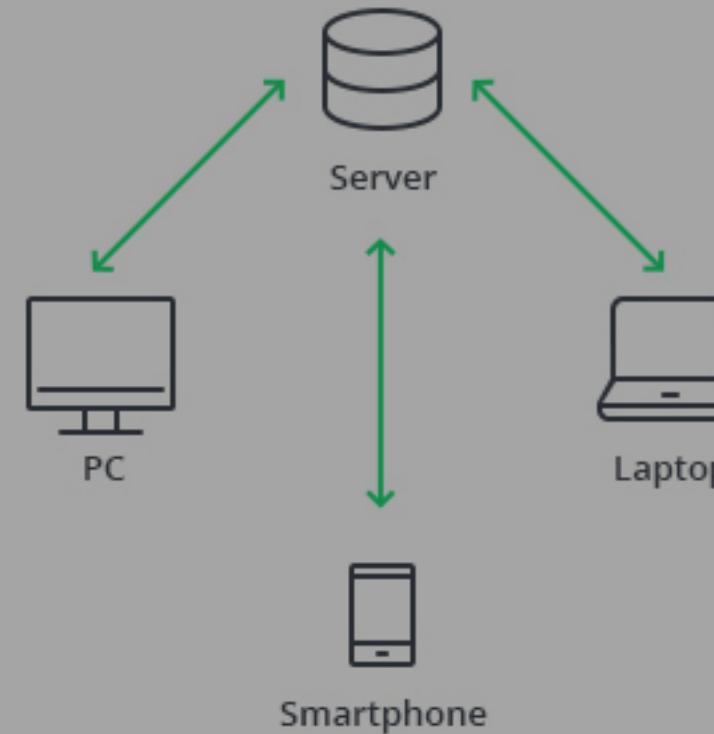
Advantages

- It is less costly as it does not contain any dedicated server.
- If one computer stops working but, other computers will not stop working.
- It is easy to set up and maintain as each computer manages itself.

Disadvantages

- In the case of Peer-To-Peer network, it does not contain the centralized system . Therefore, it cannot back up the data as the data is different in different locations.
- It has a security issue as the device is managed itself.

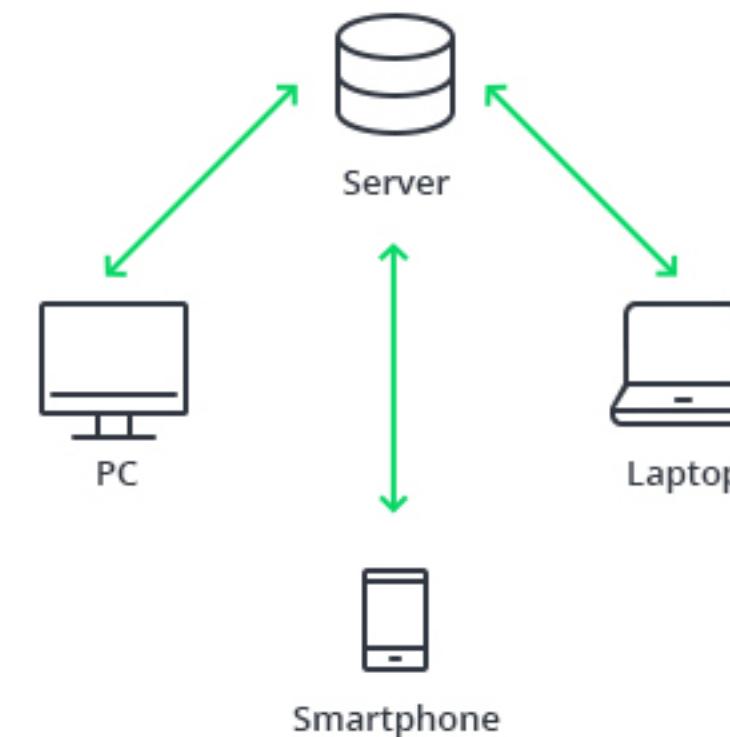
**We choose Client-Server architecture.
Why?**



Computer Network Architecture

Client-Server - 1

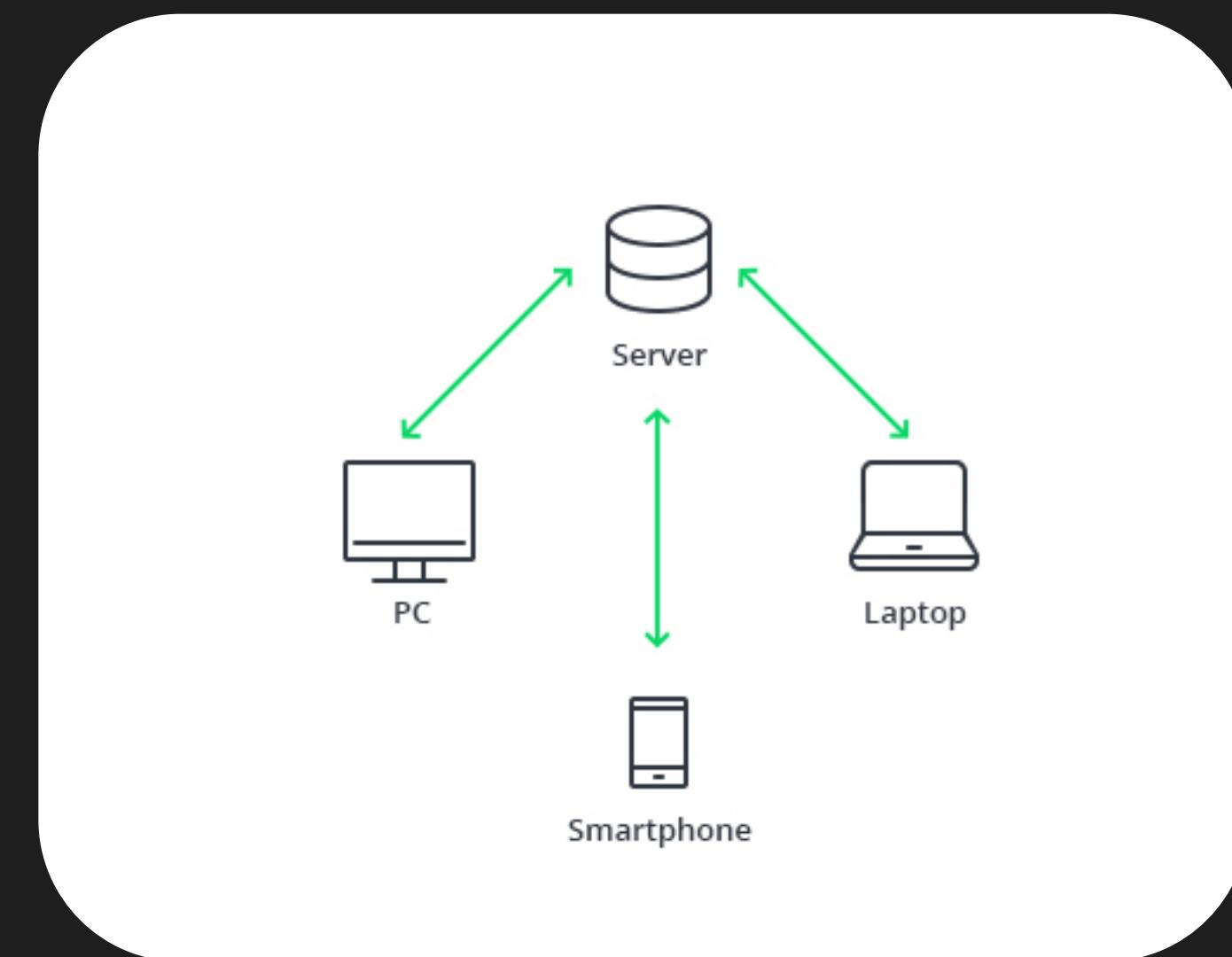
- Client/Server network is a network model designed for the end users called clients, to access the resources such as songs, video, etc. from a central computer known as Server.
- The central controller is known as a server while all other computers in the network are called clients.
- A server performs all the major operations such as security and network management.



Computer Network Architecture

Client-Server - 2

- A server is responsible for managing all the resources such as files, directories, printer, etc.
- All the clients communicate with each other through a server. For example, if client1 wants to send some data to client 2, then it first sends the request to the server for the permission. The server sends the response to the client 1 to initiate its communication with the client 2.



Computer Network Architecture

Client-Server

Advantages

- A Client/Server network contains the centralized system. Therefore we can back up the data easily.
- A Client/Server network has a dedicated server that improves the overall performance of the whole system.
- Security is better in Client/Server network as a single server administers the shared resources.
- It also increases the speed of the sharing resources.

Disadvantages

- Client/Server network is expensive as it requires the server with large memory.
- A server has a Network Operating System(NOS) to provide the resources to the clients, but the cost of NOS is very high.
- It requires a dedicated network administrator to manage all the resources.

Peer to peer

A distributed application architecture that partitions tasks or workloads between peers

Each node can request for services and provide services

A decentralized network

Reliable as there are multiple service providing nodes

Service requesting node does not need to wait long

Expensive to implement

Comparatively less stable

A distributed application structure based on resource or service providers called servers and service requesters called clients

Client requests for service and server responds with a service

A centralized network

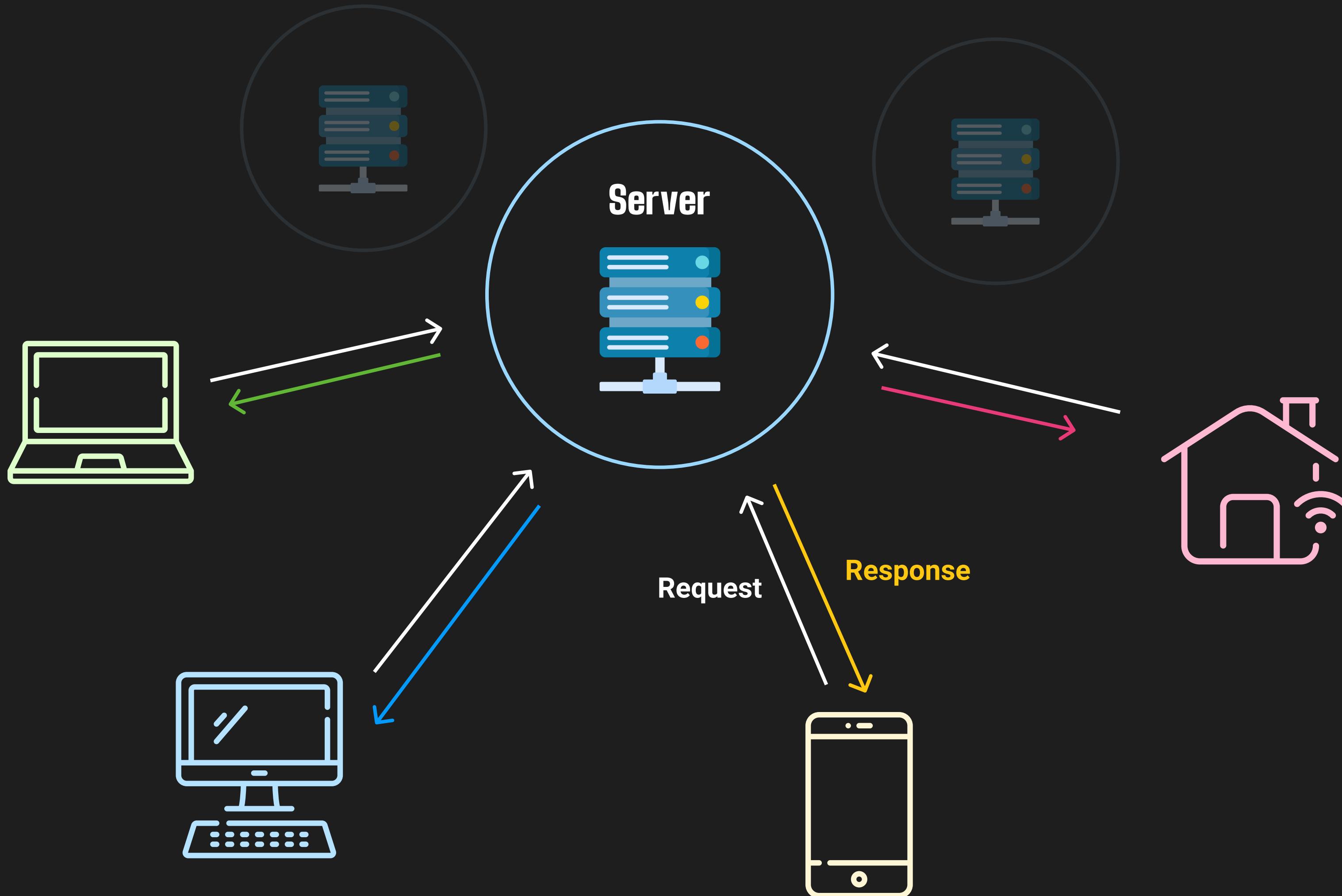
Clients depend on the server - failure in the server will disrupt the functioning of all clients

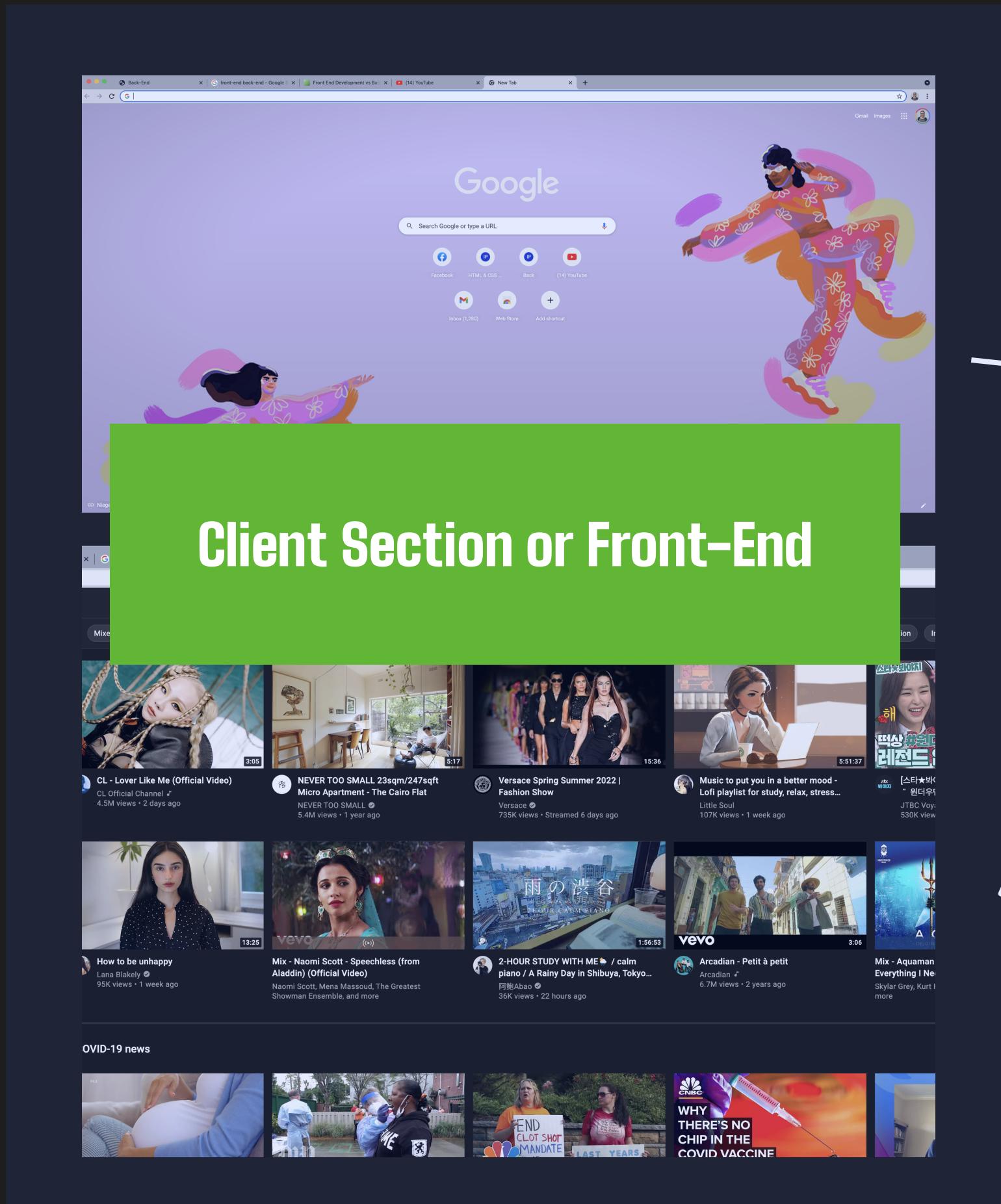
Access time for a service is higher

Does not require extensive hardware to set up the network

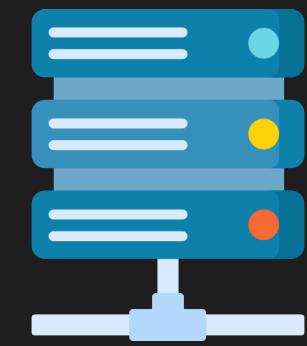
More stable and secure

Client Server





Request



Server

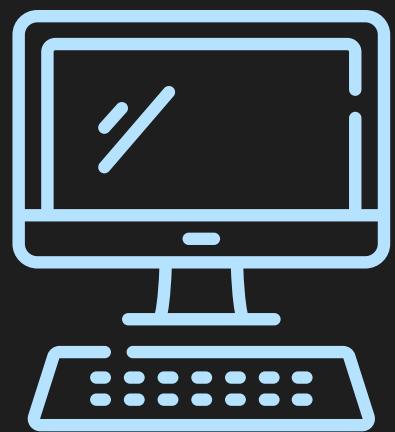
Response

1. Recieving
2. Processing
3. Responding

1. Client-Server Architecture Request-Response

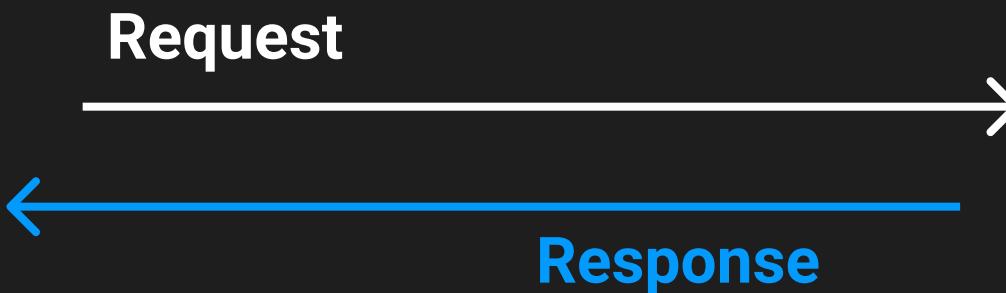
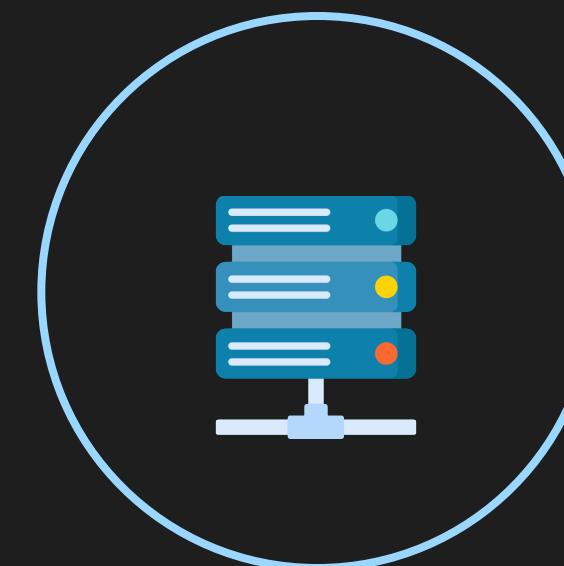
Client:

The digital world a Client is a computer (Host) i.e. capable of receiving information or using a particular service from the service providers (Servers).



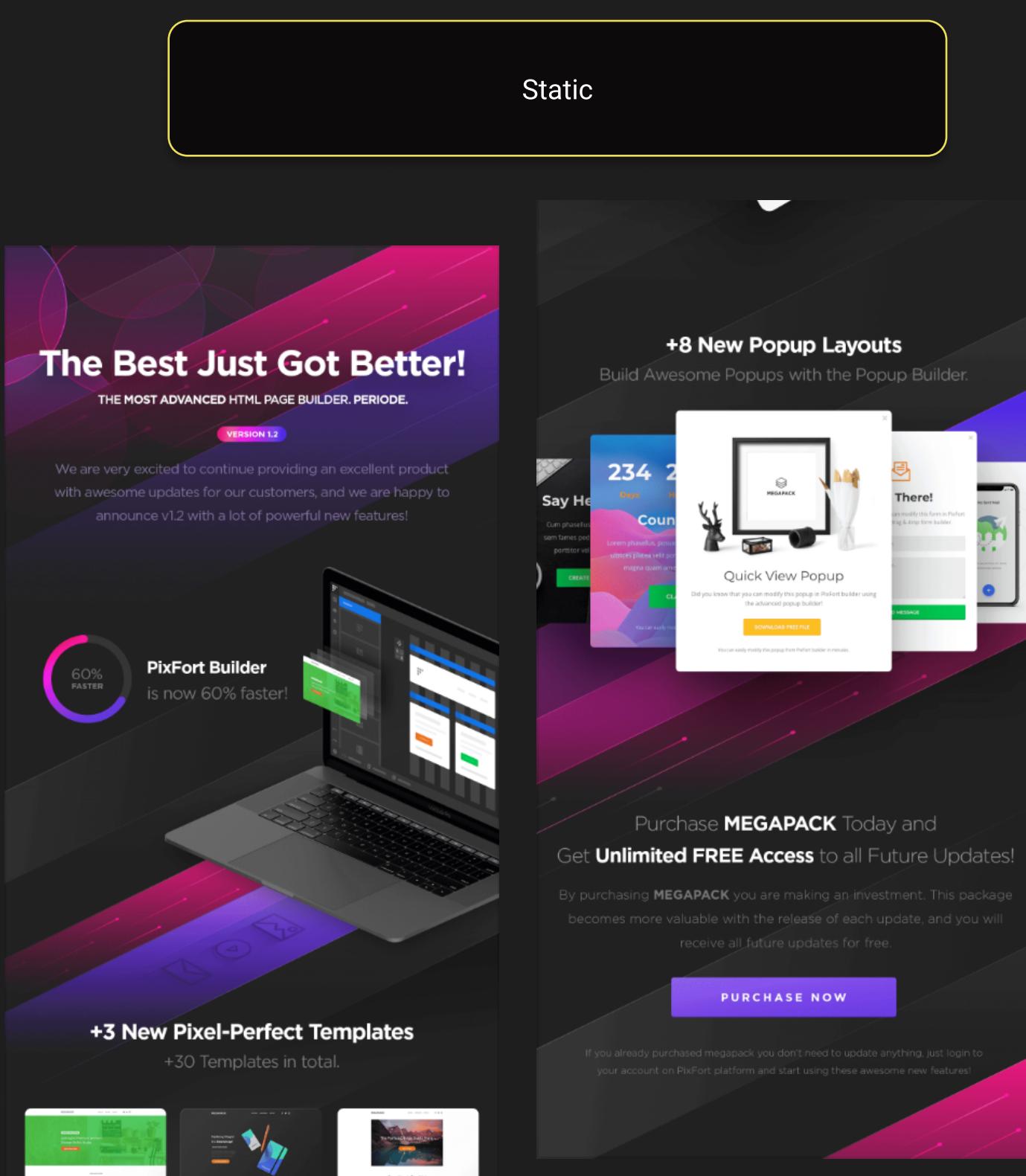
Servers:

This digital world a Server is a remote computer which provides information (data) or access to particular services.



1. Client-Server Architecture Request-Response

Dynamic or Static web

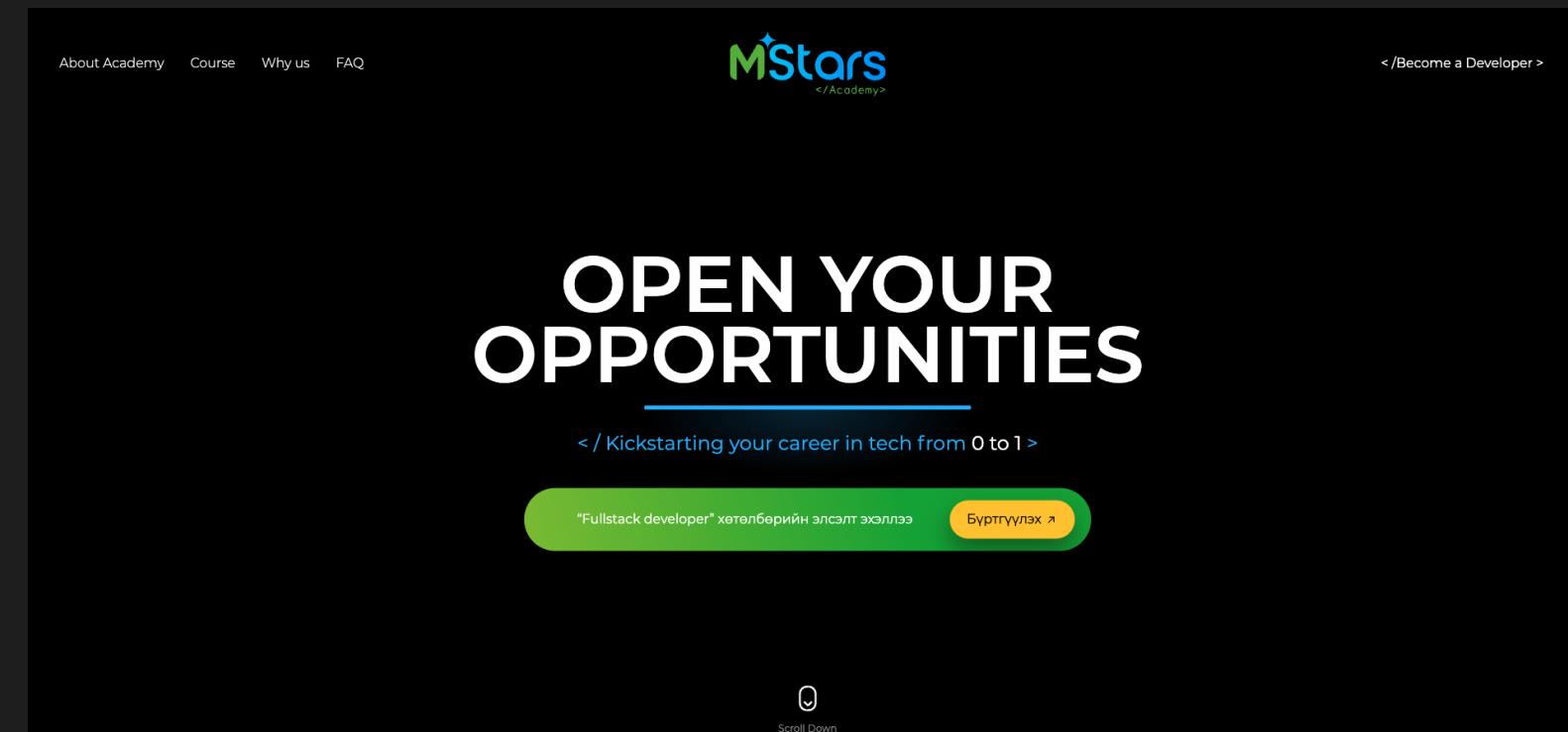


Dynamic

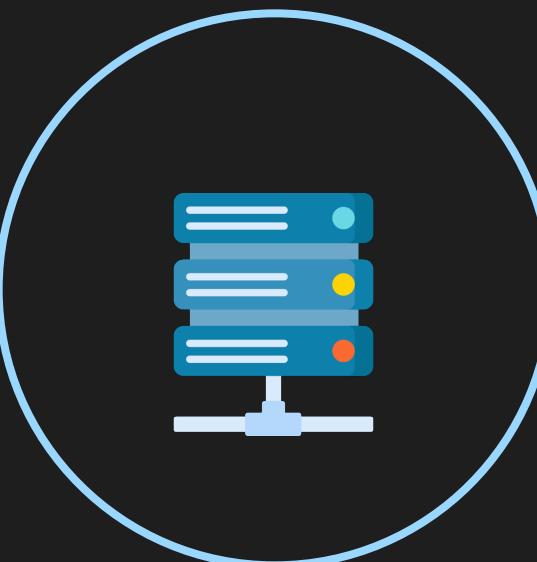
The image shows a dynamic website interface from Medium. At the top, there's a navigation bar with 'Our story', 'Membership', 'Write', 'Sign In', and a green 'Get started' button. The main content area displays several articles with titles like 'Chernobyl's Blown Up Reactor 4 Just Woke Up', '3 lessons an entrepreneur learned from his dad that helped him retire at 36', and '10 Hilarious Cartoons That Depict Real-Life Problems'. To the right, there's a sidebar with categories like 'Self', 'Relationships', 'Data Science', 'Programming', 'Productivity', 'Javascript', 'Machine Learning', 'Politics', and 'Health'. Below the articles, there's a news feed with various posts, including one about a figure skater and another about a digital bank award.

1. Client-Server Architecture Request-Response

Static web

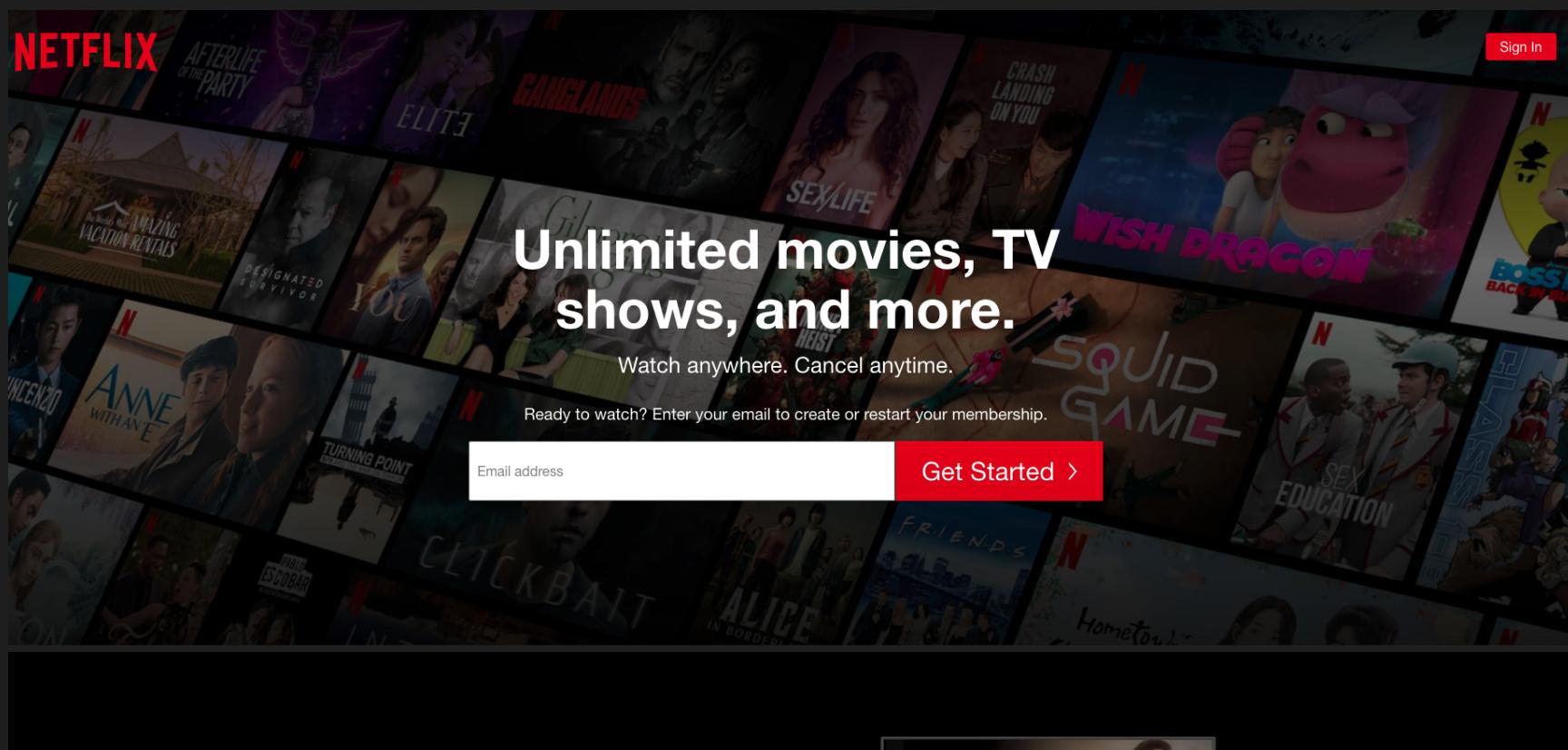


Manually update
Same data for all users
No database
But fast.



1. Client-Server Architecture Request-Response

Dynamic web

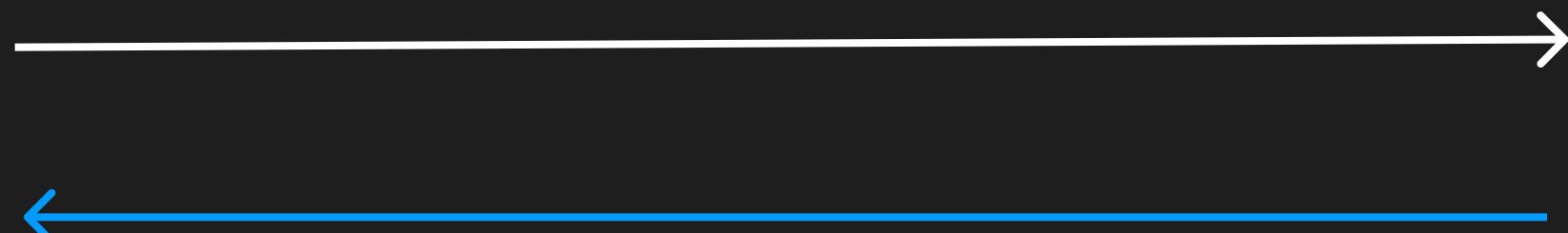


Automatic update section
Different data for every user
Database
But complicated.

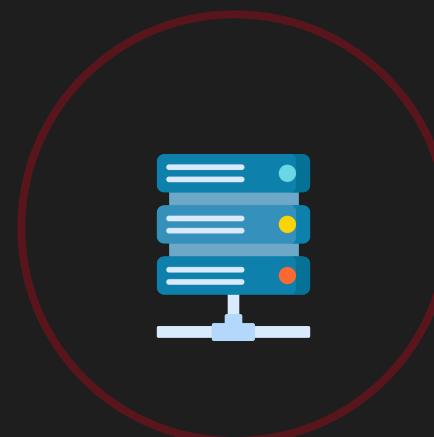
What's new?



Request(I want to see latest movies.)



Response(Squad games,
Crown, The Witch S02)



Listening
Receiving
Searching
Responding

Өөрсдөө нэг бодоод үзэх үү?

1. Дурын нэг сайт сонгох
2. Browser дээрээ очиж,
тухайн сайт руугаа хандах
3. Статик, Динамик эсэхийг
тодорхойлох
4. Динамик бол: ямар датаг
сервэрээс авч байна вэ?
5. Статик бол яагаад статик
хэлбэрийг ашиглах болсон
бэ? Өөрийн таамаг
6. Тус бүрийн давуу болон сул
талыг бичих



5-10мин

Static

Front-End

FRONT END DEVELOPMENT



JAVASCRIPT
CSS HTML

Back-End

Dynamic

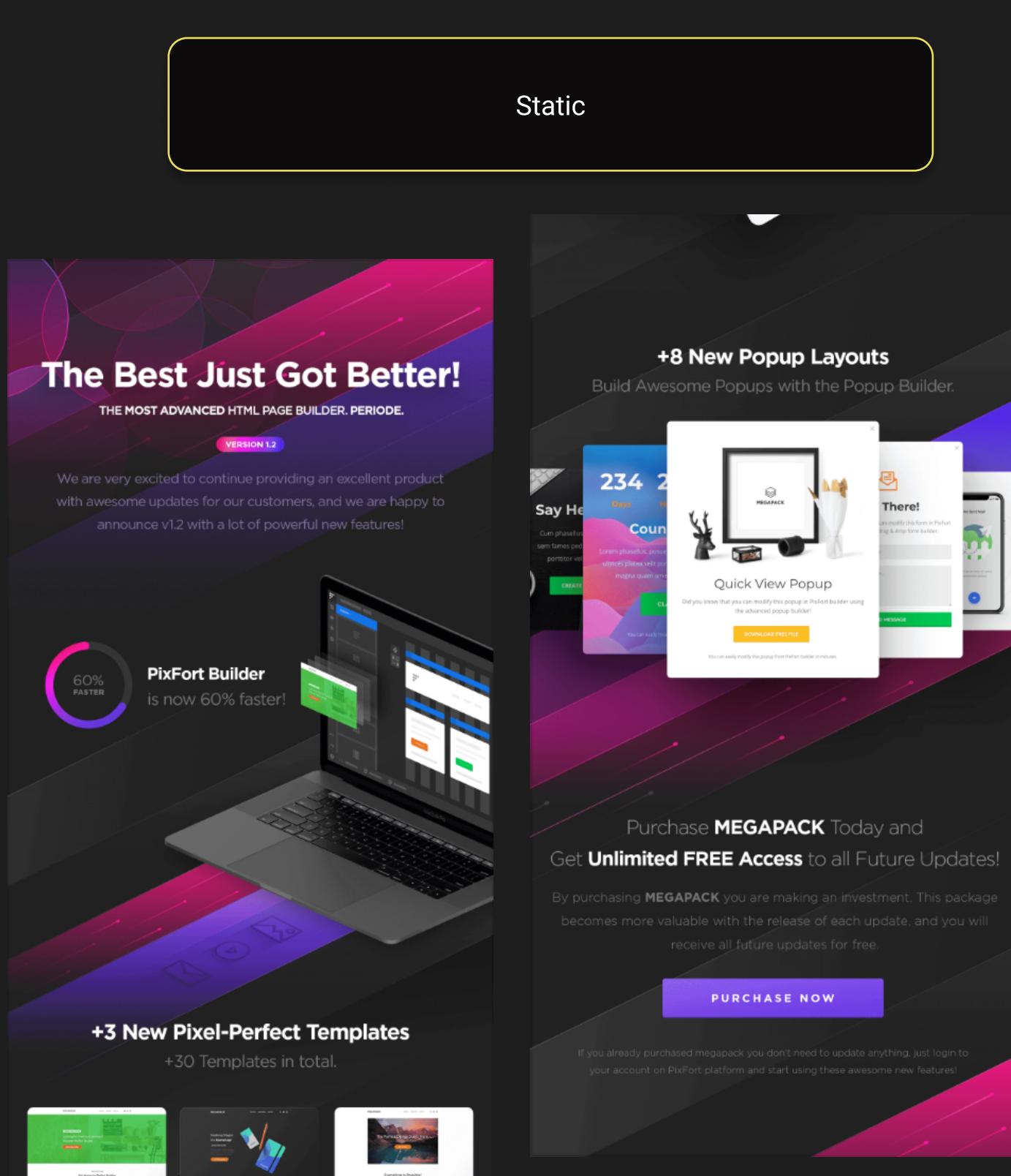
BACK END DEVELOPMENT



PYTHON PHP
RUBY JAVA GO

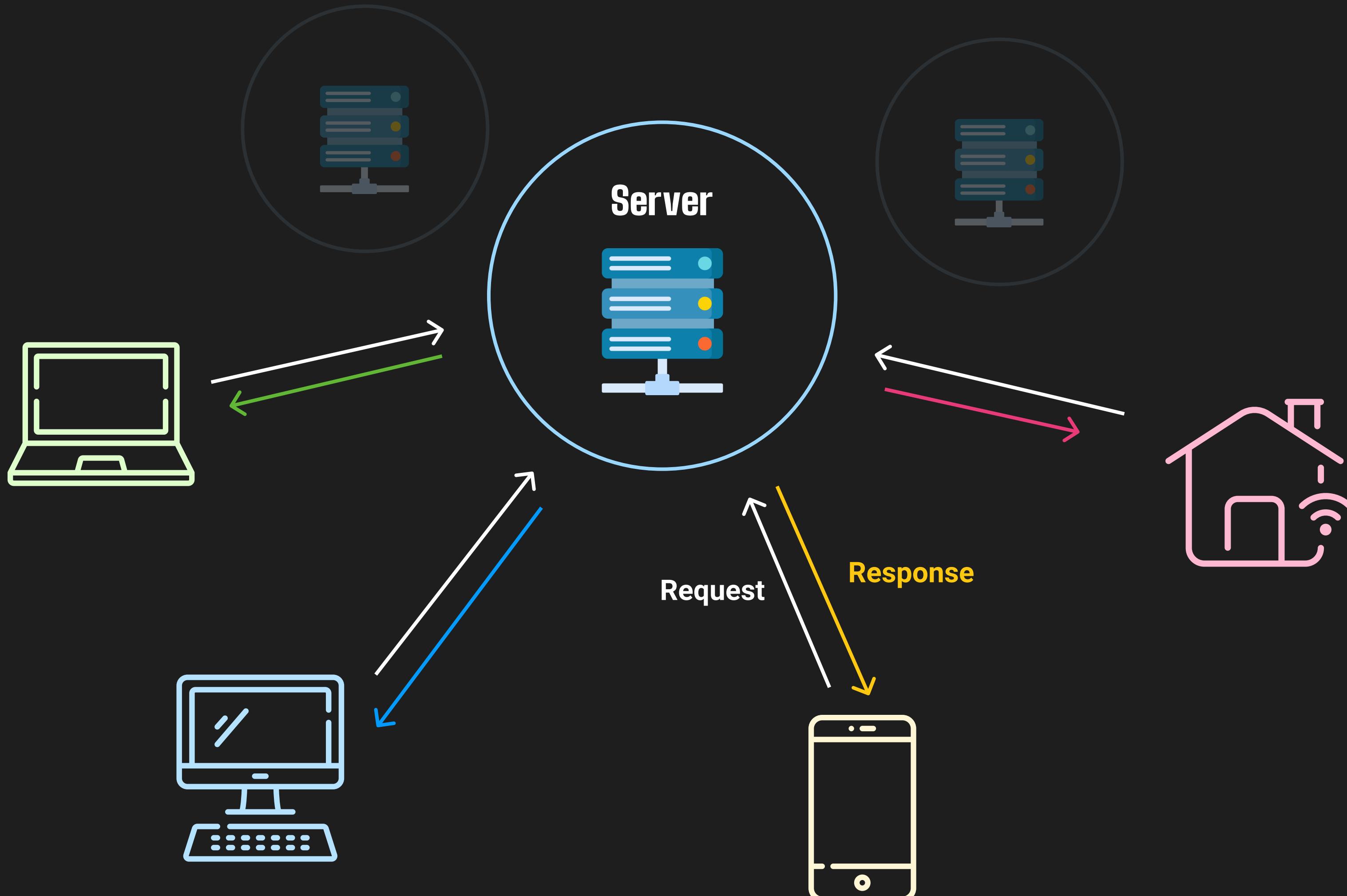
1. Client-Server Architecture Request-Response

Dynamic or Static web



Dynamic

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Type & Talk: client server architecture

Any question?
-/Academy-

Additional Research

Ip address
subnet mask гэж юу вэ?



10-15мин