A screenshot of a cell phone

Description automatically generated

* “A patchy” server because it was built as a patch to httpd (http daemon).
* Apache is an open-source and free web server software that powers around 46% of websites around the world.

**What is a Web Server?**

* File servers, database servers, mail servers, and web servers use different kinds of server software. Each of these applications can access files stored on a physical server and use them for different purposes.
* The job of a web server is to serve websites on the internet. To achieve that goal, it acts as a middleman between the server and client machines. It pulls content from the server on each user request and delivers it to the web.
* The biggest challenge of a web server is to serve many different web users at the same time — each of whom is requesting different pages.
* Web servers process files written in different programming languages such as PHP, Python, Java, and others. They turn them to static HTML files and serve these files in the browser of web users.
* When you hear the word web server, think of it as the tool responsible for the proper server-client communication.

**How Does Apache Web Server Work?**

* Although we call Apache a web server, it is **not a physical server**, but rather **a software that runs on a server**. Its job is to establish a connection between a server and the browsers of website visitors (Firefox, Google Chrome, Safari, etc.) while delivering files back and forth between them (client-server structure).
* Apache is a **cross-platform** software; therefore, it works on both Unix and Windows servers.
* When a visitor wants to load a page on your website, for instance, the homepage or your “About Us” page, their browser sends a request to your server and Apache returns a response with all the requested files (text, images, etc.). The server and the client communicate through the HTTP protocol and Apache is responsible for the smooth and secure communication between the two machines.
* A web server delivers web content to the users (usually on their web browsers).
* Apache server is designed to create Web servers that can host one more HTTP-based websites.

**Features:**

* Ability to support multiple programming languages
* Server-side scripting
* Authentication Mechanism
* Database support
* .htaccess
* IPv6
* FTP
* HTTP/2
* Perl, LUA and PHP
* Bandwidth Throttling
* WebDAV
* Load Balancing
* URL Rewriting
* Session Tracking
* Geolocation based on IP address

Apache is highly customizable, as it has a module-based structure. Modules allow server administrators to turn additional functionalities on and off. Apache has modules for security, caching, URL rewriting, password authentication, and more. You can also set up your own server configurations through a file called .htaccess**,** which is an Apache configuration file.

**Functionality (? I guess)**

Apache uses a system of 3 files for managing its configuration data.

All 3 of these files (almost always) appear in Apache’s ./conf directory and are design to be edited by system administrators:

1. httpd.conf for general settings. It is the master configuration file.
2. srm.conf for resource settings.
3. access.conf for security settings.

The Apache server is configured via config files in which modules are used to control its behavior. By default, Apache listens to the IP addresses configured in its config files that are being requested.

With the Listen directive, Apache can accept and route specific traffic to certain ports and domains based on specific address-port combination requests. By default, Listen runs on port 80 but Apache can be bound to different ports for different domains, allowing for many different websites and domains to be hosted and a single server.

Once a message reaches its destination or recipient, it sends a notice, or ACK message, basically giving acknowledgment to the original sender that their data has successfully arrived. If there’s an error in receiving data, or some packets were lost in transit, the destination host or client sends a Not Acknowledged, or NAK message, to inform the sender that the data needs to be retransmitted.

**Apache Pros and Cons**

An Apache web server can be an excellent choice to run your website on a stable and versatile platform. However, it also comes with some disadvantages you need to pay attention to.

**Pros**:

1. Open-source and free, even for commercial use.
2. Reliable, stable software.
3. Frequently updated, regular security patches.
4. Flexible due to its module-based structure.
5. Easy to configure, beginner friendly.
6. Cross-platform (works on both Unix and Windows servers).
7. Works out of the box with WordPress sites.
8. Huge community and easily available support in case of any problem.

**Cons**:

1. Performance problems on extremely traffic-heavy websites.
2. Too many configuration options can lead to security vulnerabilities.