



Network Diagram

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1 Network Diagram

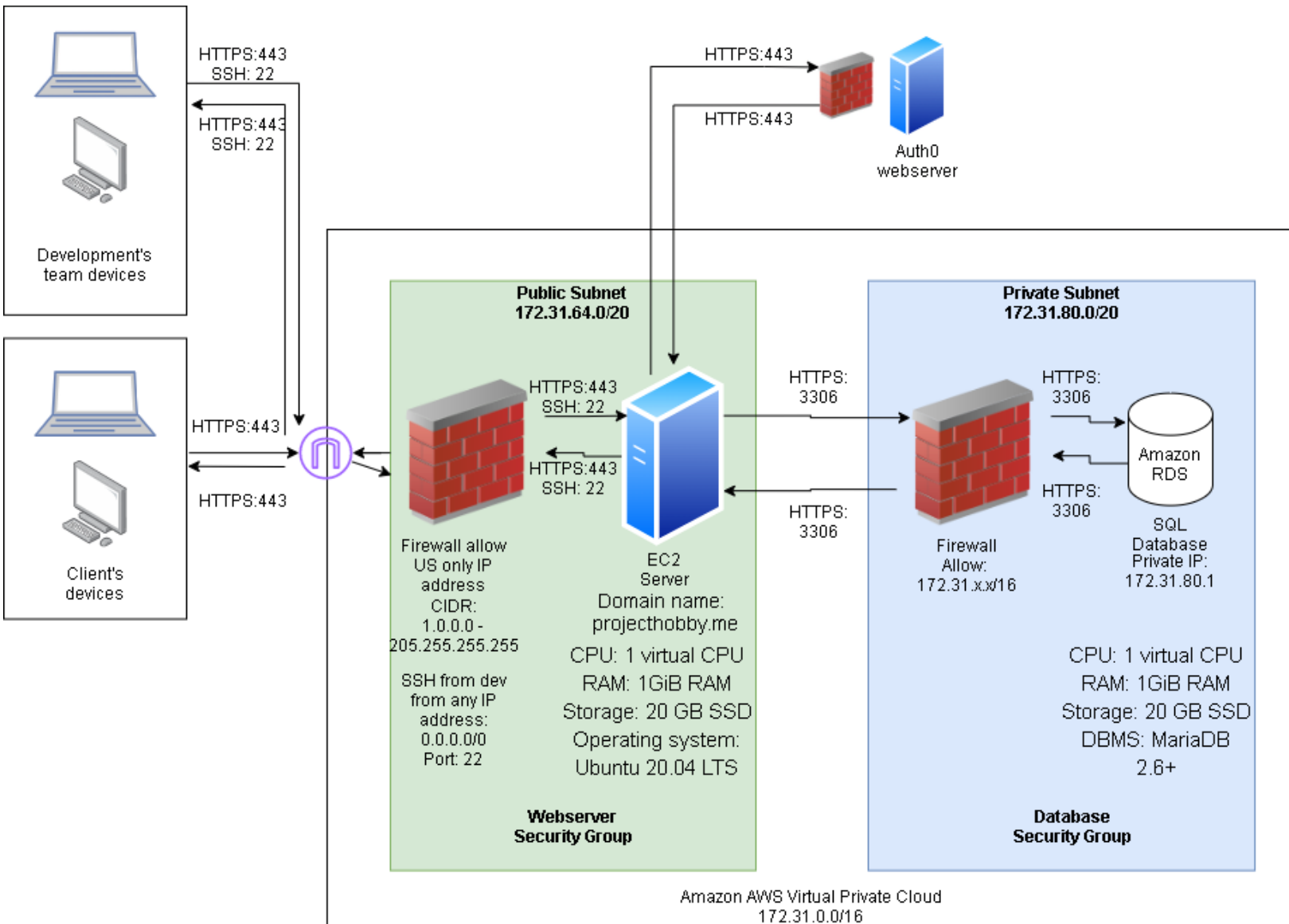


Figure 1: Hobby Project generator Network Diagram

2 Protocol

2.1 HTTPS:

Hypertext transfer protocol secure which is HTTP but uses SSL/TLS protocol with certification verification to increase security by preventing man-in-the-middle attacks.

2.2 SSL/TLS:

Uses certificate exchange similar to asymmetric encryption to verify identities of 2 points connections to prevent eavesdropping.

2.3 TCP/IP:

the protocol that is used to communicate between different computers including servers. TCP/IP layers include application, transport, internet, and network with the application being the highest level.

3 Technical Specifications

3.1 EC2 Server:

3.1.1 Hardware specification:

CPU: 1 virtual CPU
RAM: 1GiB RAM
Storage: 20 GB SSD

3.1.2 Operating systems:

Operating system: Ubuntu 20.04 LTS

3.2 Amazon RDS database:

3.2.1 Hardware specification:

CPU: 1 virtual CPU
RAM: 1GB
Storage: 20 GB SSD
DBMS: MariaDB 2.6+

4 Connection description

Clients will be limited to only United States of America region. HTTPS requests coming from client devices will be passed through a firewall that will only allow United States of America IP addresses from 1.0.0.0 - 205.255.255.255 ranges. The clients will have to pass through their ISP providers first before being able to access the internet and then to our webserver at the domain **youbuildit.me** .

We will be using the EC2 service to host our server provided by Amazon AWS. The EC2 server will be processing client HTTPS requests on port 443 which implements SSL/TLS to ensure security. In addition, SSL/TLS connection will prevent man-in-the-middle attacks using certificate verification. Communication between the backend server and the SQL Database using Amazon RDS service will be using TCP/IP protocol on port 3306. This connection will be further protected by implementing SSL/TLS protocol to ensure data is stored and accessed securely.

The server will then send responses to the clients using HTTPS protocol through port 443. Our backend server will be using Apache HTTP 2.4+.

The webserver will send HTTPS requests to other third-party services that we will be using such as Auth0 for authentication and authorization service on port 443.

5 Virtual Private Cloud

Both the webserver and the database will be residing in the same virtual private cloud. However, they will be in different subnets with the web server which will be hosting our application being on the public subnet (172.31.64.0/20) to handle HTTPS requests from clients with access through the internet gateway. In other words, the webserver will be using a Webserver security group that will allow IP address and connection as displayed in Figure 1.

On the other hand, the relational database will be on a private subnet (172.31.80.0/20) with IP addresses ranging from 172.31.80.1 - 172.31.95.254 with no access to the internet gateway (not available publicly). Connection to the database for querying data will be limited to the private IP address range of 172.31.x.x/16 within the Virtual Private Cloud. A Database security group policy will be implemented to limit access to the relational database.

5 References

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