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# CLOUD SERVER PROJECT DOCUMENTATION

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**Domain Name:** <https://naifsballgame.online>

**Public IP Address:** 13.48.121.106

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## Project Overview

The aim of this project is to deploy a simple browser based ping pong game on a cloud server using Amazon AWS EC2 infrastructure. The goal was to create a website with a custom domain name and HTTPS support in a server, which can be setup, configured and secured. The game showcases real-time interactivity using JavaScript canvas drawing, simulating paddle-ball dynamics and basic AI opponent behavior.

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## Server Setup

### ➤ EC2 Instance Configuration:

- **Cloud Provider:** Amazon AWS
- **Instance Type:** t2.micro (Free Tier)
- **Operating System:** Ubuntu Server 22.04 LTS
- **Web Server:** Apache2

### ➤ **Steps to Launch EC2 and Configure Apache**

# Update packages

```
sudo apt update && sudo apt upgrade -y
```

# Install Apache

```
sudo apt install apache2 -y
```

# Enable Apache to start on boot

```
sudo systemctl enable apache2
```

# Start Apache

```
sudo systemctl start apache2
```

### ➤ **Uploading Game Files**

The HTML, CSS, and JavaScript files were transferred to the EC2 instance by:

```
scp -i "C:\Users\Maham\Downloads\PASSKNIFE.pem" ballgame.html ec2-ubuntu@13.48.121.106 :/var/www/html/
```

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## ➤ Domain and DNS Configuration

- **Domain Name:**

The domain **naifsballgame.online** was purchased via Godaddy

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## ➤ 4. Enabling HTTPS

### **Certbot Installation**

```
sudo apt install certbot python3-certbot-apache -y
```

### **SSL Certificate Setup**

```
sudo certbot --apache
```

Certbot automatically edited the Apache configuration to redirect HTTP traffic to HTTPS and installed the certificate.

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## ➤ Firewall and Security Group Settings

- Port 80 (HTTP) and 443 (HTTPS) were opened in the AWS EC2 Security Group.
  - SSH (port 22) was restricted to my IP address for security.
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## ➤ Code Snippet and Explanation

HTML + JavaScript Snippet:

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head>
```

```
<meta charset="UTF-8">
```

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

```
<title>Ping Pong Game</title>
```

```
<style>
  body { text-align: center; background: #222; color: white; }
  canvas { background: black; display: block; margin: auto; }
</style>
</head>
<body>
  <h1>Ping Pong Game</h1>
  <canvas id="gameCanvas" width="800" height="400"></canvas>
  <script>
    const canvas = document.getElementById("gameCanvas");
    const ctx = canvas.getContext("2d");

    const paddleWidth = 10, paddleHeight = 80;
    let playerY = canvas.height / 2 - paddleHeight / 2;
    let aiY = canvas.height / 2 - paddleHeight / 2;
    let ballX = canvas.width / 2, ballY = canvas.height / 2;
    let ballSpeedX = 5, ballSpeedY = 3;
    let gamePaused = false;

    function drawRect(x, y, width, height, color) {
      ctx.fillStyle = color;
      ctx.fillRect(x, y, width, height);
    }

    function drawCircle(x, y, radius, color) {
      ctx.fillStyle = color;
      ctx.beginPath();
      ctx.arc(x, y, radius, 0, Math.PI * 2);
```

```
ctx.fill();
```

```
}
```

```
function draw() {
```

```
drawRect(0, 0, canvas.width, canvas.height, "black");
```

```
drawRect(0, playerY, paddleWidth, paddleHeight, "white");
```

```
drawRect(canvas.width - paddleWidth, aiY, paddleWidth, paddleHeight, "white");
```

```
drawCircle(ballX, ballY, 8, "white");
```

```
}
```

```
function update() {
```

```
if (gamePaused) return;
```

```
ballX += ballSpeedX;
```

```
ballY += ballSpeedY;
```

```
if (ballY < 0 || ballY > canvas.height) ballSpeedY *= -1;
```

```
if (ballX < paddleWidth && ballY > playerY && ballY < playerY + paddleHeight) {
```

```
ballSpeedX *= -1;
```

```
}
```

```
if (ballX > canvas.width - paddleWidth && ballY > aiY && ballY < aiY + paddleHeight) {
```

```
ballSpeedX *= -1;
```

```
}
```

```
if (ballX < 0 || ballX > canvas.width) {
```

```
gamePaused = true;
```

```
}
```

```
aiY += (ballY - (aiY + paddleHeight / 2)) * 0.1;
```

```
}
```

```
canvas.addEventListener("mousemove", (event) => {
```

```
const rect = canvas.getBoundingClientRect();
```

```
playerY = event.clientY - rect.top - paddleHeight / 2;
```

```
});
```

```
document.addEventListener("keydown", (event) => {
```

```
if (event.code === "Space" && gamePaused) {
```

```
ballX = canvas.width / 2;
```

```
ballY = canvas.height / 2;
```

```
ballSpeedX = 5 * (Math.random() > 0.5 ? 1 : -1);
```

```
ballSpeedY = 3 * (Math.random() > 0.5 ? 1 : -1);
```

```
gamePaused = false;
```

```
}
```

```
});
```

```
function gameLoop() {
```

```
update();
```

```
draw();
```

```
requestAnimationFrame(gameLoop);
```

```
}
```

```
gameLoop();
```

```
</script>
```

```
</body>
```

</html>

### Explanation:

This code creates a basic ping pong game in which the player controls a paddle on the left side with their mouse, and the computer controls the paddle on the right using simple AI logic. The ball bounces off the paddles and top/bottom boundaries, and the game pauses when a point is scored. Pressing the spacebar restarts the game.

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### Rebuild Instructions

If the EC2 server is deleted, follow these steps:

1. Launch a new EC2 instance (Ubuntu)
  2. SSH into the instance
  3. Install Apache
  4. Upload the HTML file to /var/www/html/
  5. Reconfigure DNS A record if IP has changed
  6. Reinstall Certbot and run certbot --apache
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### Additional Info

- **GitHub Repo:** <https://github.com/naiftonse/BallGame>
- **Video Explainer Link:** [https://imagekit.io/tools/asset-public-link?detail=%7B%22name%22%3A%22VideoExplainer\\_35473548\\_NaifTons%22%2C%22type%22%3A%22video%2Fmp4%22%2C%22signedurl\\_expire%22%3A%222028-04-09T20%3A49%3A06.217Z%22%2C%22signedUrl%22%3A%22https%3A%2F%2Fmedia-](https://imagekit.io/tools/asset-public-link?detail=%7B%22name%22%3A%22VideoExplainer_35473548_NaifTons%22%2C%22type%22%3A%22video%2Fmp4%22%2C%22signedurl_expire%22%3A%222028-04-09T20%3A49%3A06.217Z%22%2C%22signedUrl%22%3A%22https%3A%2F%2Fmedia-)

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v7p2VSG3cgB~GeMhAlN2CJdCJ5Lcf~1bNwYyMyDrR6z-  
nb8qcnPrt~WYyVSxWWXrxUtnISF4WOMAYv8UcxEepte2tB6ymsaCTe8jhQQ  
okKF8ADg7lsw8BevAlPZKVv0La36qF1g\_\_%22%7D

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