# CYPHER Dashboard Windows Server 2019 Deployment Guide

## Overview

This guide provides step-by-step instructions for deploying the CYPHER Dashboard application on your Windows Server 2019 EC2 instance.

## Prerequisites

* Windows Server 2019 EC2 instance
* Administrator access to the server
* AWS CLI configured (or will be installed by script)
* Internet connectivity
* Security groups configured for ports 3000 and 3001

## Quick Deployment Steps

### Step 1: Connect to Your Windows Server

Use **Remote Desktop Protocol (RDP)** to connect to your Windows Server 2019 EC2 instance:

1. **Get RDP credentials** from AWS EC2 Console
2. **Connect via RDP** using Windows Remote Desktop Connection
3. **Log in as Administrator**

### Step 2: Open PowerShell as Administrator

1. **Right-click** on Start button
2. Select **“Windows PowerShell (Admin)”**
3. Click **“Yes”** when prompted by UAC

### Step 3: Download and Run Deployment Script

# Download the deployment script from S3  
aws s3 cp s3://cypher-deployment-20250806/Deploy-CYPHER-WindowsServer.ps1 C:\Deploy-CYPHER-WindowsServer.ps1  
  
# Run the deployment script  
.\C:\Deploy-CYPHER-WindowsServer.ps1

## What the Deployment Script Does

### 1. **Installs Prerequisites**

* **Chocolatey** - Windows package manager
* **Node.js** - JavaScript runtime (latest LTS version)
* **AWS CLI** - For S3 access
* **PM2** - Process manager for Node.js applications

### 2. **Downloads Application**

* Downloads CYPHER source code from S3
* Extracts to C:\CYPHER-Dashboard\
* Creates backup of existing installation (if any)

### 3. **Configures Application**

* Installs npm dependencies for API and Client
* Creates environment configuration files
* Builds client application for production
* Configures database connection to your PostgreSQL

### 4. **Sets Up Services**

* Configures PM2 process manager
* Starts API server on port 3001
* Starts client server on port 3000
* Sets up auto-start on Windows boot

### 5. **Configures Security**

* Opens Windows Firewall ports 3000 and 3001
* Sets up proper file permissions

## Application Structure on Windows

### Main Directory:

C:\CYPHER-Dashboard\  
├── api\  
│ ├── src\ # API source code  
│ ├── package.json # API dependencies  
│ └── .env # API configuration  
├── client\  
│ ├── src\ # Client source code  
│ ├── dist\ # Built client files  
│ ├── package.json # Client dependencies  
│ └── .env # Client configuration  
└── ecosystem.config.js # PM2 configuration

### Log Files:

C:\CYPHER-logs\  
├── cypher-api.log # API application logs  
├── cypher-api-error.log # API error logs  
├── cypher-client.log # Client application logs  
└── cypher-client-error.log # Client error logs  
  
C:\CYPHER-deployment.log # Deployment script log

## Post-Deployment Verification

### Step 1: Check PM2 Status

# Check if services are running  
pm2 status  
  
# View logs  
pm2 logs  
  
# Monitor services  
pm2 monit

### Step 2: Test API

# Test API health endpoint  
Invoke-WebRequest -Uri "http://localhost:3001/health"  
  
# Or open in browser  
Start-Process "http://localhost:3001/health"

### Step 3: Test Client Application

# Test client application  
Invoke-WebRequest -Uri "http://localhost:3000"  
  
# Or open in browser  
Start-Process "http://localhost:3000"

## Accessing Your CYPHER Dashboard

Once deployed successfully: - **CYPHER Dashboard**: http://your-windows-server-ip:3000 - **API Endpoints**: http://your-windows-server-ip:3001 - **Health Check**: http://your-windows-server-ip:3001/health

## Service Management Commands

### PM2 Commands (in PowerShell):

# Check service status  
pm2 status  
  
# View logs  
pm2 logs  
  
# Restart all services  
pm2 restart all  
  
# Stop all services  
pm2 stop all  
  
# Start services  
pm2 start ecosystem.config.js  
  
# Delete all services  
pm2 delete all  
  
# Save PM2 configuration  
pm2 save  
  
# Monitor services in real-time  
pm2 monit

### Windows Service Management:

# Check if PM2 Windows service is running  
Get-Service -Name "PM2\*"  
  
# Start PM2 Windows service  
Start-Service -Name "PM2 cypher-api"

## Security Groups Configuration

Ensure your EC2 security group allows: - **Port 3000** (Client) - Inbound TCP from 0.0.0.0/0 - **Port 3001** (API) - Inbound TCP from 0.0.0.0/0 - **Port 3389** (RDP) - For remote desktop access - **Port 80/443** (HTTP/HTTPS) - If using reverse proxy

## Troubleshooting

### Common Issues:

1. **PowerShell Execution Policy**

* Set-ExecutionPolicy -ExecutionPolicy RemoteSigned -Scope CurrentUser -Force

1. **Node.js Installation Issues**

* # Manually install Node.js  
  choco install nodejs -y  
    
  # Refresh environment variables  
  refreshenv

1. **Port Already in Use**

* # Check what's using the port  
  netstat -ano | findstr :3001  
  netstat -ano | findstr :3000  
    
  # Kill process if needed  
  taskkill /PID <PID> /F

1. **Database Connection Issues**
   * Check if EC2 security group allows outbound connections
   * Verify database credentials in .env files
   * Test database connectivity from Windows
2. **PM2 Service Issues**

* # Reinstall PM2 Windows startup  
  npm install -g pm2-windows-startup  
  pm2-startup install

### Log Locations:

* **Deployment Log**: C:\CYPHER-deployment.log
* **Application Logs**: C:\CYPHER-logs\
* **PM2 Logs**: %USERPROFILE%\.pm2\logs\

## Updates and Maintenance

### To Update the Application:

1. Upload new files to S3 bucket
2. Re-run the deployment script
3. The script will automatically backup existing installation

### Regular Maintenance:

* Monitor PM2 processes: pm2 status
* Check logs regularly: pm2 logs
* Monitor Windows Event Logs
* Keep Node.js and npm updated
* Monitor disk space and memory usage

## Backup Strategy

The deployment script automatically creates backups: - **Location**: C:\CYPHER-Dashboard-Backup-YYYYMMDD-HHMMSS\ - **Restore**: Copy backup folder back to C:\CYPHER-Dashboard\

## Optional: IIS Reverse Proxy

For production use, consider setting up IIS as a reverse proxy:

1. **Install IIS** with Application Request Routing
2. **Configure reverse proxy** rules
3. **Setup SSL certificates**
4. **Configure domain routing**

**Deployment Package**: cypher-deployment-20250806 **Target Platform**: Windows Server 2019 EC2 **Ports**: 3000 (Client), 3001 (API)

Your CYPHER Dashboard is ready for Windows deployment! 🚀