

Here's a **step-by-step detailed guide** to help you execute the entire process from creating a Node.js app to pushing the Docker image to Docker Hub. It includes all required commands and explanations.

✅ A) Create an EC2 Instance

- Launch an **Ubuntu** EC2 instance on AWS.
 - Select appropriate key pair and security group (allow port 22, 80, and 3000).
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✅ B) Install Required Packages

SSH into your EC2 instance:

```
ssh -i your-key.pem ubuntu@your-ec2-public-ip
```

Update and install packages:

```
sudo apt update -y
sudo apt install nginx -y
sudo apt install nodejs -y
sudo apt install npm -y
sudo npm install -g pm2
```

✅ C) Create a Node.js App

1. Create your app directory and file:

```
cd /home/ubuntu
nano hello.js
```

Paste this code:

```
const http = require('http');
const hostname = '0.0.0.0';
const port = 3000;
const server = http.createServer((req, res) => {
  res.statusCode = 200;
  res.setHeader('Content-Type', 'text/plain');
  res.end('Hello World!\n');
});
server.listen(port, hostname, () => {
  console.log(`Server running at http://${hostname}:${port}/`);
});
```

Save with **Ctrl+O**, then **Enter**, then **Ctrl+X**.

2. Run the app with PM2:

```
pm2 start hello.js --name app
```

D) Set Up Nginx as Reverse Proxy

Edit Nginx config:

```
sudo nano /etc/nginx/sites-available/example.com
```

Paste this (replace with your EC2 public IP):

```
server {
    listen 80;
    server_name YOUR_EC2_PUBLIC_IP;

    location / {
        proxy_pass http://localhost:3000;
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }
}
```

Create a symlink:

```
sudo ln -s /etc/nginx/sites-available/example.com /etc/nginx/sites-enabled/
```

Restart Nginx:

```
sudo systemctl restart nginx
```

Test your app in a browser: `http://YOUR_EC2_PUBLIC_IP`
You should see: **Hello World!**

E) Set Up Docker

1. Install Docker and Docker Compose:

```
sudo apt install -y docker.io
sudo apt install -y docker-compose
```

2. Prepare app directory for Docker:

```
mkdir -p /home/ubuntu/node
cd /home/ubuntu/node
```

Move your `hello.js` file:

```
cp /home/ubuntu/hello.js .
```

3. Create Dockerfile:

```
nano Dockerfile
```

Paste this:

```
FROM node:12
WORKDIR /app
COPY . .
RUN npm install
EXPOSE 3000
CMD ["node", "hello.js"]
```

Save and exit.

4. Create .dockerignore:

```
nano .dockerignore
```

Paste:

```
node_modules
npm-debug.log
```

F) Build and Push Docker Image

1. Build Docker image:

```
sudo docker build -t your_dockerhub_username/node-app:latest .
```

Replace `your_dockerhub_username` with your real Docker Hub username.

2. Check image is built:

```
sudo docker images
```

3. Log in to Docker Hub:

```
sudo docker login
```

Enter your Docker Hub username and password.

4. Push the image:

```
sudo docker push your_dockerhub_username/node-app:latest
```

5. Verify on Docker Hub:

Go to: <https://hub.docker.com/repositories>

Check if your image `node-app` is listed under your username.

Let me know if you'd like a sample GitHub repo or a shell script to automate these steps.