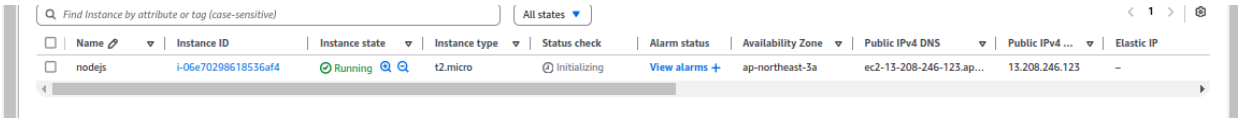
Create a docker image for any application using Docker file and push it to Docker hub

A) Create a Instance

—----------



Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
nodejs	i-06e70298618536af4	Running	t2.micro	Initializing	View alarms +	ap-northeast-3a	ec2-13-208-246-123.ap...	13.208.246.123	–

B) Install nginx, Nodejs, Npm, Pm2

—----------

→ Login in EC2

apt update -y

→ Install Nginx webserver

apt install nginx -y

```
root@ip-172-31-33-75:~# systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
     Loaded: loaded (/lib/systemd/system/nginx.service; enabled; vendor preset: enabled)
     Active: active (running) since Sat 2024-12-28 06:25:30 UTC; 9s ago
       Docs: man:nginx(8)
    Process: 2914 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
    Process: 2915 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Main PID: 3008 (nginx)
      Tasks: 2 (limit: 1130)
     Memory: 4.6M
        CPU: 19ms
     CGroup: /system.slice/nginx.service
             ├─3008 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─3011 "nginx: worker process" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "" "

Dec 28 06:25:30 ip-172-31-33-75 systemd[1]: Starting A high performance web server and a reverse proxy server...
```

→ Install Nodejs

apt install nodejs -y

```
root@ip-172-31-33-75:~# nodejs --version
v12.22.9
```

→ Install NPM (node package manager)

apt install npm -y

```
root@ip-172-31-33-75:~# npm --version
8.5.1
root@ip-172-31-33-75:~#
```

→ Install Pm2 (process manager)

npm install -g pm2

```
[PM2] PM2 Successfully daemonized
5.4.3
```

c) Creating a Nodejs Application

→ First, using `nano` or your favorite text editor, create a sample application called `hello.js` inside the home directory

→ Go to the home directory

cd /home

→open a hello.js file and paste the code

nano hello.js

```
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}/`);
});

```
const http = require('http');

const hostname = 'localhost';
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 the file and exit from the editor

Ctrl + o = saving
Ctrl + x = exit

→ This Node.js application listens on the specified address **(0.0.0.0)** and **port (3000)**, and returns **"Hello World!"** with a **200 HTTP** success code. Since we're listening on localhost, remote clients won't be able to connect to our application.

To test your application, type:

node hello.js

```
root@ip-172-31-33-75:/home# node hello.js
Server running at http://localhost:3000/
```

→ Going to start node application in pm2

pm2 start hello.js --name app

```
root@ip-172-31-33-75:/home# pm2 start hello.js --name app
[PM2] Starting /home/hello.js in fork_mode (1 instance)
[PM2] Done.
```

id	name	mode	↺	status	cpu	memory
0	app	fork	0	online	0%	11.5mb

→ Setting up node application in nginx as a reverse proxy

To let Your application is **running and listening on localhost**, but you need to set up a way for your users to access it. We will set up the **Nginx web server as a reverse proxy** for this purpose.

In the prerequisite tutorial, you set up your **Nginx** configuration in the **/etc/nginx/sites-available/example.com** file. Open this file for editing

```
server {
    listen 80;
    server_name 13.208.246.123;

    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;
    }

}
```

```
server {
   listen 80;
   server_name 13.208.246.123;

   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;
    }

}
```

(replace with your server ip)

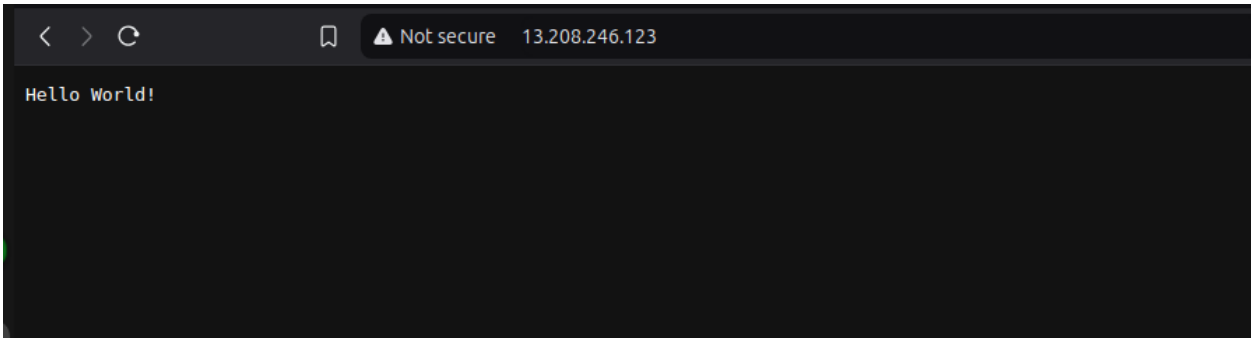
→ Create a symink for this example.com

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

→ Restart your nginx webserver

systemctl restart nginx

→ Check your application in browser using IP



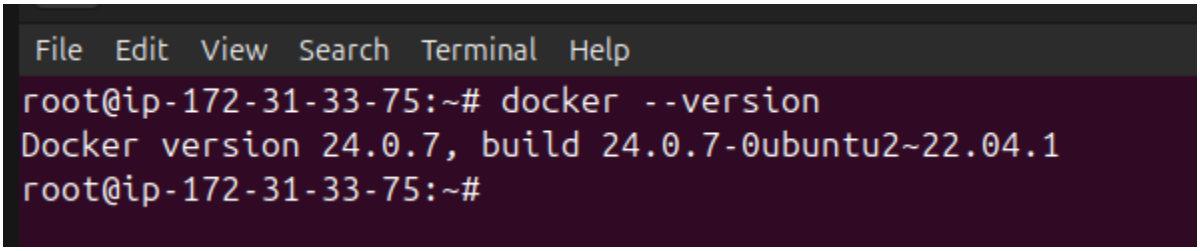
Nodejs application is Running on Ec2 instance

D) Settting up in Docker

—----------

→ Install docker

apt install -y docker.io



→ Install Docker Compose

apt install -y docker-compose

```
root@ip-172-31-33-75:~# docker-compose --version
docker-compose version 1.29.2, build unknown
root@ip-172-31-33-75:~#
```

→ Navigate to the application directory

cd /home/node

→ Create a Dockerfile in the /home/node directory

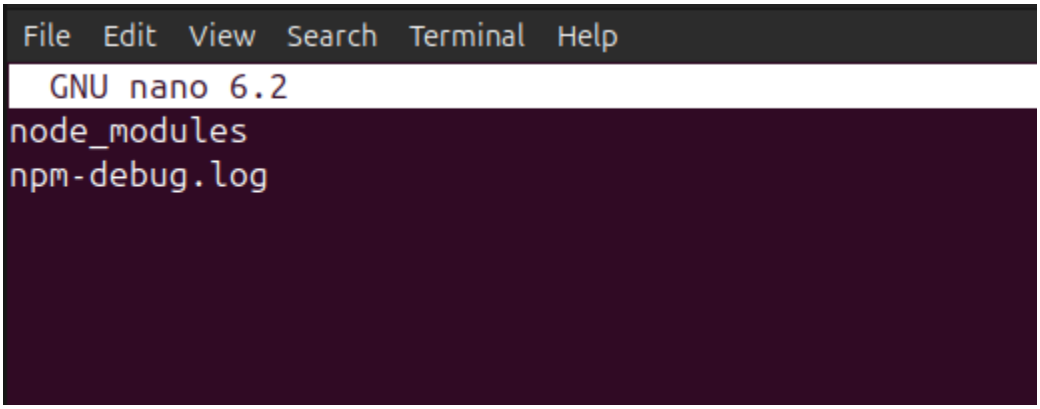
```
# Use Node.js base image
FROM node:12

# Set the working directory inside the contain
WORKDIR /app


# Install dependencies
RUN npm install

# Copy the application code
COPY . .

# Expose port 3000
[ Terminal 000

# Run the application
CMD ["node", "hello.js"]
```

```
# Use Node.js base image
FROM node:12

# Set the working directory inside the container
WORKDIR /app

# Install dependencies
RUN npm install

# Copy the application code
COPY . .

# Expose port 3000
EXPOSE 3000

# Run the application
CMD ["node", "hello.js"]
```

Save it and exit from editor

→ Create a .dockerignore File
Create a .dockerignore file to exclude unnecessary files from the image

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



Save it and exit from editor

→ Build the docker image

docker build -t arunhub01/node-app:latest .

(Here arunhub01 is my dockerhub username. Replace with your dockerhub username)

```
root@ip-172-31-33-75:/home/node# docker build -t arunhub01/node-app:latest .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
            Install the buildx component to build images with BuildKit:
            https://docs.docker.com/go/buildx/

Sending build context to Docker daemon  4.096kB
Step 1/7 : FROM node:12
12: Pulling from library/node
f5196cdf2518: Pull complete
9bed1e86f01e: Pull complete
f44e4bdb3a6c: Pull complete
2f75d131f406: Pull complete
07dff4ad21eb: Pull complete
e0ac4f13b766: Pull complete
df2c3b2eb7cc: Pull complete
efe636eac583: Pull complete
fe17849545bb: Pull complete
Digest: sha256:01627afeb110b3054ba4a1405541ca095c8bfca1cb6f2be9479c767a2711879e
Status: Downloaded newer image for node:12
 ---> 6c8de432fc7f
Step 2/7 : WORKDIR /app
 ---> Running in 86ae60c28fde
Removing intermediate container 86ae60c28fde
 ---> 16d9690918a5
Step 3/7 : COPY package*.json ./
COPY failed: no source files were specified
```

Docker build the image is completed

→ Verify the image is build or not

docker images

```
Successfully built 321bd5bc4878
Successfully tagged arunhub01/node-app:latest
root@ip-172-31-33-75:/home/node# docker images
REPOSITORY          TAG       IMAGE ID       CREATED         SIZE
arunhub01/node-app  latest    321bd5bc4878   6 seconds ago   918MB
node                12        6c8de432fc7f   2 years ago     918MB
root@ip-172-31-33-75:/home/node#
```

E) Push the image to Docker Hub

→ Log in to Docker Hub

docker login

```
root@ip-172-31-33-75:/home/node# docker login
Log in with your Docker ID or email address to push and pull images from Docker Hub. If you don't have a Dock
 https://hub.docker.com/ to create one.
You can log in with your password or a Personal Access Token (PAT). Using a limited-scope PAT grants better s
ired for organizations using SSO. Learn more at https://docs.docker.com/go/access-tokens/

Username: arunhub01
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@ip-172-31-33-75:/home/node#
```

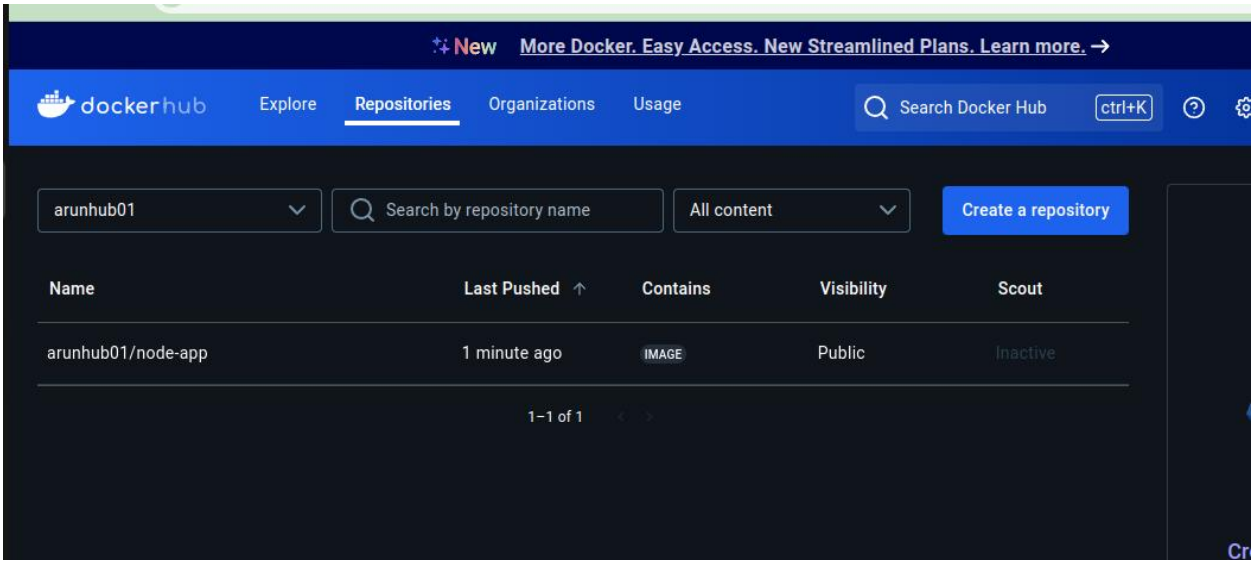
When you use docker login command, you were asked by username and password. Please enter correct username and password of your dockerhub.

→ Push the image to docker hub

docker push arunhub01/node-app:latest

```
root@ip-172-31-33-75:/home/node# docker push arunhub01/node-app:latest
The push refers to repository [docker.io/arunhub01/node-app]
bf5b153cc95f: Pushed
c6d9246fb892: Pushed
47df0936ac6a: Pushed
586c0b414da7: Mounted from library/node
0bfd290f2c17: Mounted from library/node
6d75cd01c26c: Mounted from library/node
95904c181913: Mounted from library/node
df69bfa94785: Mounted from library/node
f35deb8d96fc: Mounted from library/node
f6c2459e2059: Mounted from library/node
f8323fb3a55c: Mounted from library/node
2f4dc9775f33: Mounted from library/node
latest: digest: sha256:414e7d55f202c3cb4117af826ebf47a7c4844e88cbc2cfa3bdd7134108aef603 size: 2835
root@ip-172-31-33-75:/home/node#
```

→ Go to the Docker hub and check repo is there or not


New
More Docker. Easy Access. New Streamlined Plans. Learn more. →
dockerhub
Explore
Repositories
Organizations
Usage
Search Docker Hub
ctrl+K
arunhub01
Search by repository name
All content
Create a repository
Name
Last Pushed
Contains
Visibility
Scout
arunhub01/node-app
1 minute ago
IMAGE
Public
Inactive
1–1 of 1

Completed

—----------