

* why do we use AWS/GCP/Azure ?
→ because they give us a public IP for sharing our hosted apps url. whenever we want to show the world our apps.

* steps to create an EC2 instance on AWS.

① Search for EC2 on the AWS console. in the searchbar.

What are EC2's ?, EC2s are compute machines on the internet provided by AWS to deploy apps.

* Give name to your ec2 instance.

② Select from the "AMI's" or Amazon Machine Images like macOS, Ubuntu, Windows etc.

* It is preferred to use Ubuntu as an AMI.

③ Select Your Instance type from t3.micro upto c5n.metal as per your requirements.

④ Then create a Key pair which is a private & public key pair required to SSH into your server. it is in .cer or .pem format.

So give it a unique name & store it carefully.

If you lose it you could never SSH into your instance / get access to your instance.

⑤ Click Launch instance btn.

Now go to the instances dashboard on console & see

- ① Public IPv4 DNS
- ② Public IPv4 address

Below are all the steps required to "dumb" deploy your code/server to internet.

- ① Choosing a cloud provider (AWS/GCP/Azure) ✓
- ② Creating an instance. ✓
- ③ Getting an ssh key. ✓
- ④ Opening firewalls on the machine on port 80/443/22 (3000/3001?)
- ⑤ Cloning your code to the machine.
- ⑥ Installing node/npm (why docker is useful?)
- ⑦ Building & running your code (pm2?)
- ⑧ Pointing your domain to the server.
- ⑨ Using nginx to setup a reverse proxy.
- ⑩ Certificate management.

In computer networks :-

when we open <https://www.google.com> in our browser google's server automatically sets the port to be "443" which is mandatory for https servers.

http → runs on port "80"

https → runs on port "443".

Basic,



Inbound rules.

- ① click on instance ID on instances page
- ② Scroll down to Details | Security | Networking options tab.
- ③ Select security.
- ④ Click on security groups. link with some gibish ID.
- ⑤ Over there you can see Inbound rules.

★★★ When you create an instance on Aws EC2 it only has port "22" SSH one open for us to ssh into the server. But for deploying our servers we need port "443" open for https & port "80" open for http server.

★ To Open ports by editing inbound rules.

- ① click on "Edit Inbound Rules" btn , over there only port 22 would be open.
 - ② Click Add rule button and add four rules as given below.
 - (i) port=80 & source = Anywhere - IPv4
 - (ii) port=80 & source = Anywhere - IPv6
 - (iii) port=443 & source = Anywhere - IPv4
 - (iv) port=443 & source = Anywhere - IPv6.
- Add for testing
- (v) port=3000 & source = Anywhere - IPv4.
 - (vi) port=3000 & source = Anywhere - IPv6.

Inbound rules - Info

Security group rule ID	Type	Protocol	Port range	Info	Source	Description - optional	Info
sgr-0376f50618f04e471	SSH	TCP	22	Custom	0.0.0.0/0		Delete
-	Custom TCP	TCP	80	Anywhere...	0.0.0.0/0		Delete
-	Custom TCP	TCP	80	Anywhere...	-/0		Delete
-	Custom TCP	TCP	443	Anywhere...	0.0.0.0/0		Delete
-	Custom TCP	TCP	443	Anywhere...	-/0		Delete
-	Custom TCP	TCP	3000	Anywhere...	0.0.0.0/0		Delete
-	Custom TCP	TCP	3000	Anywhere...	-/0		Delete

Add rule

adnansdeofficial@gmail.com
+919545843469

Canceled Preview changes Save rules

CloudShell Feedback Language

todo-app-class.cer

Mute Stop Video Participants Chat Q&A Polls New Share Pause Share Annotate Apps More Show all

Step 5 :- Cloning our code to the aws machine (our ec2 instance)

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
~/Downloads/week-9-master/part-3-ci-cd > on master ssh -i todo-app-100xdevs.pem ubuntu@https://ec2-13-53-207-20.eu-north-1.amazonaws.com
Warning: Identity file todo-app-100xdevs.pem not accessible: No such file or directory.
ssh: Could not resolve hostname https://ec2-13-53-207-20.eu-north-1.compute.amazonaws.com/: nodename nor servname provided, or not known
255 x

~/Dow/week-9-master/part-3-ci-cd > on master ?! ls
cd-easy.yaml cd-final.yaml scan-command.txt
255 x

~/Downloads/week-9-master/part-3-ci-cd > on master ?! cd ..
255 x

~/Downloads/week-9-master > on master ?! ls
part-1-nginx part-2-scripts part-3-ci-cd server todo-app-100xdevs.pem
255 x

~/Downloads/week-9-master > on master ?! ssh -i todo-app-100xdevs.pem ubuntu@https://ec2-13-53-207-20.eu-north-1.compute.amazonaws.com
Warning: Identity file todo-app-100xdevs.pem not accessible: No such file or directory.
ssh: Could not resolve hostname https://ec2-13-53-207-20.eu-north-1.compute.amazonaws.com/: nodename nor servname provided, or not known
255 x

~/Downloads/week-9-master > on master ?! ssh -i todo-app-100xdevs.pem ubuntu@ec2-13-53-207-20.eu-north-1.compute.amazonaws.com
Warning: Permanently added 'ec2-13-53-207-20.eu-north-1.compute.amazonaws.com' (ED25519) to the list of known hosts.
@WARNING: UNPROTECTED PRIVATE KEY FILE!
Permissions 644 for 'todo-app-100xdevs.pem' are too open.
It is required that your private key files are NOT accessible by others.
This private key will be ignored.
Load key "todo-app-100xdevs.pem": bad permissions
ubuntu@ec2-13-53-207-20.eu-north-1.compute.amazonaws.com: Permission denied (publickey).
255 x < took 34s

```

The authenticity of host 'ec2-13-53-207-20.eu-north-1.compute.amazonaws.com (13.53.207.20)' can't be established.

ED25519 key fingerprint is SHA256:9yKjDs7j5TqNJN++4rM9TX4EP7W5Sc+vBwQ.

This key is not known by any other name.

Are you sure you want to continue [yes/no] (fingerprint)? yes

Warning: Permanently added 'ec2-13-53-207-20.eu-north-1.compute.amazonaws.com' (ED25519) to the list of known hosts.

@WARNING: UNPROTECTED PRIVATE KEY FILE!

Permissions 644 for 'todo-app-100xdevs.pem' are too open.

It is required that your private key files are NOT accessible by others.

This private key will be ignored.

Load key "todo-app-100xdevs.pem": bad permissions

ubuntu@ec2-13-53-207-20.eu-north-1.compute.amazonaws.com: Permission denied (publickey).

255 x < took 34s



In the above image aws is saying that our certificate (.cer/.pem) file is too open to be used for sshing into aws's ec2 instance so there's one small thing which must be done before sshing into the aws machine.

```
~/Dow/week-9-master > on master ?1 ls -ltr todo-app-100xdevs.pem  
-rw-r--r--@ 1 adnankhan staff 1674 Dec 12 08:37 todo-app-100xdevs.pem
```

255 x took 34s

↑↑↑

These 2 read access are causing issues

* So this issue can be faced everytime we use a new .cer/.pem file for sshing into our aws machine, so the command to help us in sshing into aws with ease is given below.

```
~/Dow/week-9-master > on master ?1 ls -ltr todo-app-100xdevs.pem  
-rw-r--r--@ 1 adnankhan staff 1674 Dec 12 08:37 todo-app-100xdevs.pem
```

255 x took 34s

```
~/Downloads/week-9-master > on master ?1 chmod 600 ./todo-app-100xdevs.pem
```

```
~/Downloads/week-9-master > on master ?1 ls -ltr todo-app-100xdevs.pem  
-rw-----@ 1 adnankhan staff 1674 Dec 12 08:37 todo-app-100xdevs.pem
```

This command makes the .pem/.cer files more secure & acceptable to aws.

& Now we will run the ssh -i command & we will get into aws wala ec2 machine so that we can host our backend. These

You can see the command below



```
~/Dow/week-9-master > on master ?1 ls -ltr todo-app-100xdevs.pem  
-rw-r--r--@1 adnankhan staff 1674 Dec 12 08:37 todo-app-100xdevs.pem
```

255 ✘ took 34s

```
~/Downloads/week-9-master > on master ?1 chmod 600 ./todo-app-100xdevs.pem
```

```
~/Downloads/week-9-master > on master ?1 ls -ltr todo-app-100xdevs.pem  
-rw-----@1 adnankhan staff 1674 Dec 12 08:37 todo-app-100xdevs.pem
```

```
~/Downloads/week-9-master > on master ?1 ssh -i todo-app-100xdevs.pem ubuntu@ec2-13-53-207-20.eu-north-1.compute.amazonaws.com
```

Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-1012-aws x86_64)

- * Documentation: <https://help.ubuntu.com>
- * Management: <https://landscape.canonical.com>
- * Support: <https://ubuntu.com/advantage>

System information as of Sat Dec 16 17:53:28 UTC 2023

System load:	0.0	Processes:	101
Usage of /:	30.1% of 7.57GB	Users logged in:	0
Memory usage:	27%	IPv4 address for ens5:	172.31.19.52
Swap usage:	0%		

* Ubuntu Pro delivers the most comprehensive open source security and compliance features.

<https://ubuntu.com/aws/pro>

Expanded Security Maintenance for Applications is not enabled.

35 updates can be applied immediately.

To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.

See <https://ubuntu.com/esm> or run: sudo pro status

*** System restart required ***

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

```
ubuntu@ip-172-31-19-52:~$
```

So now we are into aws ec2 instance.

So now what ever commands we run are running on the aws machine.

So now lets bring our git repos code to the ec2 machine.

① Run git clone -url- of repo

② install node & npm to the aws ec2 ubuntu machine. So search of google & follow digitalocean website & follow the npm way of installing.

```

ubuntu@ip-172-31-19-52:~/github-cicd/server$ curl -o- https://raw.githubusercontent.com/nvm-sh/nvm/v0.39.3/install.sh | bash
% Total    % Received % Xferd  Average Speed   Time   Time  Current
          Dload Upload   Total Spent  Left Speed
100 15916  100 15916     0      0  153k    0 --:--:--:--:--:--:--:--:-- 153k
=> Downloading nvm from git to '/home/ubuntu/.nvm'
=> Cloning into '/home/ubuntu/.nvm'...
remote: Enumerating objects: 365, done.
remote: Counting objects: 100% (365/365), done.
remote: Compressing objects: 100% (314/314), done.
remote: Total 365 (delta 43), reused 159 (delta 25), pack-reused 0
Receiving objects: 100% (365/365), 364.78 KiB | 3.92 MiB/s, done.
Resolving deltas: 100% (43/43), done.
* (HEAD detached at FETCH_HEAD)
  master
=> Compressing and cleaning up git repository

=> Appending nvm source string to /home/ubuntu/.bashrc
=> Appending bash_completion source string to /home/ubuntu/.bashrc
=> Close and reopen your terminal to start using nvm or run the following to use it now:

export NVM_DIR="$HOME/.nvm"
[ ! -s "$NVM_DIR/nvm.sh" ] && \. "$NVM_DIR/nvm.sh" # This loads nvm
[ ! -s "$NVM_DIR/bash_completion" ] && \. "$NVM_DIR/bash_completion" # This loads nvm bash_completion
ubuntu@ip-172-31-19-52:~/github-cicd/server$ nvm
Command 'nvm' not found, did you mean:
  command 'nsm' from snap nift (3.0.2)
  command 'gvm' from snap gvm (1.1.0)
  command 'nvim' from snap nvim (v0.9.4)
  command 'nvm' from deb neovim (0.6.1-3)
  command 'lvm' from deb mgetty-voice (1.2.1-1.1)
  command 'num' from deb quickcal (2.4-1)
  command 'npm' from deb npm (8.5.1~ds-1)
  command 'nam' from deb nam (1.15-5.2)
  command 'nvi' from deb nvi (1.81.6-17)
  command 'nvme' from deb nvme-cli (1.16-3ubuntu0.1)
  command 'pvm' from deb lvm (3.4.6-3.2)
  command 'lvm' from deb lvm2 (2.03.11-2.1ubuntu4)
  command 'kvm' from deb qemu-system-x86 (1:6.2+dfsg-2ubuntu6.15)
  command 'nsm' from deb linuxptp (3.1.1-3)
  command 'nm' from deb binutils (2.38-4ubuntu2.3)
See 'snap info <snapshotname>' for additional versions.
ubuntu@ip-172-31-19-52:~/github-cicd/server$ export NVM_DIR="$HOME/.nvm"
[ ! -s "$NVM_DIR/nvm.sh" ] && \. "$NVM_DIR/nvm.sh" # This loads nvm
[ ! -s "$NVM_DIR/bash_completion" ] && \. "$NVM_DIR/bash_completion" # This loads nvm bash_completion
ubuntu@ip-172-31-19-52:~/github-cicd/server$ nvm

```

These 3 commands are imp to make nvm available to use for us on ubuntu.

Node Version Manager (v0.39.3)

Now install node! - using below cmd.

```

ubuntu@ip-172-31-19-52:~/github-cicd/server$ nvm install node
Downloading and installing node v21.4.0...
Downloaded https://nodejs.org/dist/v21.4.0/node-v21.4.0-linux-x64.tar.xz...
#####
Computing checksum with sha256sum
Checksums matched!
Now using node v21.4.0 (npm v10.2.4)
Creating default alias: default -> node (> v21.4.0)
ubuntu@ip-172-31-19-52:~/github-cicd/server$ 

```

Our server gets on getting down so we will use pm2 process manager on our aws ec2 machine.

Command:
 "npm i -g pm2" ← command to install pm2 on ec2
 "pm2 start index.js" ← command to start our server.
 you can do "pm2 list" to list down all the running processes on your machine.

} ran the 3 commands &
 nvm is available now.

