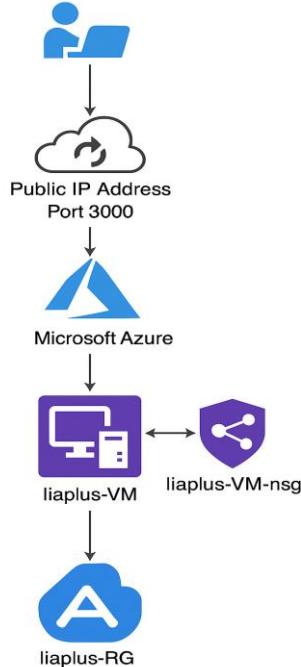


Task1: Set up a simple web application (Node.js/Python) and deploy it on Azure App Service or an Azure Virtual Machine. Ensure that the application is accessible via a public URL.



## Steps to Deploy Node.js Application on Azure Virtual Machine

### ◆ 1. Create a Resource Group

Name	Type	Location
liaplus-VM	Virtual machine	Central India
liaplus-VM-ip	Public IP address	Central India
liaplus-VM-nsg	Network security group	Central India
liaplus-VM-vnet	Virtual network	Central India
liaplus-vm852_z1	Network Interface	Central India
liaplus-VM_key	SSH key	Central India
liaplus-VM_OsDisk_1	Disk	Central India

### ◆ 2. Create a Virtual Machine

**liaplus-VM** Virtual machine

**Essentials**

- Resource group: liaplus-RG
- Status: Running
- Location: Central India (Zone 1)
- Subscription: Azure for Students
- Subscription ID: ab8d3da72-e640-4374-a575-e767bf45e754
- Availability zone: 1
- Operating system: Linux (ubuntu 24.04)
- Size: Standard D2s v3 (2 vcpus, 8 GiB memory)
- Public IP address: 135.235.136.65
- Virtual network/subnet: liaplus-VM-vnet/default
- DNS name: Not configured
- Health state: -
- Time created: 4/15/2025, 6:33 AM UTC

**Properties** Monitoring Capabilities (7) Recommendations Tutorials

**Virtual machine**

Computer name	liaplus-VM	Public IP address	135.235.136.65 (Network interface liaplus-vm852_e1)
Operating system	Linux (ubuntu 24.04)	Public IP address (IPv6)	-
VM generation	V2	Private IP address	10.0.0.4

### ◆ 3. Configure Network Security Group (NSG)

**liaplus-VM-nsg** Network security group

**Overview**

**Essentials**

- Resource group: liaplus-RG
- Location: Central India
- Subscription: Azure for Students
- Subscription ID: ab8d3da72-e640-4374-a575-e767bf45e754
- Tags: (edit) Add tags

**Inbound Security Rules**

Priority ↑	Name ↑	Port ↑	Protocol ↑	Source ↑	Destination ↑	Action ↑
300	SSH	22	TCP	14.97.132.203	135.235.136.65,10.0.0.4	Allow
320	HTTP	80	TCP	Any	Any	Allow
330	AllowAnyCustom3000Inbound	3000	TCP	Any	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInbound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInbound	Any	Any	Any	Any	Deny

**Outbound Security Rules**

### ◆ 4. Connect to the VM And Install Required Packages

```
azureuser@liaplus-VM: ~  
7rc10@LAPTOP-SV67L1UT MINGW64 ~/Downloads  
$ ssh -i liaplus-VM_key.pem azureuser@135.235.136.65  
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.8.0-1021-azure x86_64)  
  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/pro  
  
System information as of Tue Apr 15 08:57:45 UTC 2025  
  
System load: 0.0 Processes: 134  
Usage of /: 9.4% of 28.02GB Users logged in: 0  
Memory usage: 6% IPv4 address for eth0: 10.0.0.4  
Swap usage: 0%  
  
Expanded Security Maintenance for Applications is not enabled.  
106 updates can be applied immediately.  
51 of these updates are standard security updates.  
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  
  
Last login: Tue Apr 15 08:23:55 2025 from 223.225.58.148  
azureuser@liaplus-VM:~$ sudo apt update  
sudo apt install nodejs npm git -y  
Hit:1 http://azure.archive.ubuntu.com/ubuntu noble InRelease  
Get:2 http://azure.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]  
Hit:3 http://azure.archive.ubuntu.com/ubuntu noble-backports InRelease  
Hit:4 http://azure.archive.ubuntu.com/ubuntu noble-security InRelease  
Fetched 126 kB in 0s (270 kB/s)  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
98 packages can be upgraded. Run 'apt list --upgradable' to see them.  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
nodejs is already the newest version (18.19.1+dfsg-6ubuntu5).  
npm is already the newest version (9.2.0~ds1-2).  
git is already the newest version (1:2.43.0-1ubuntu7.2).  
0 upgraded, 0 newly installed, 0 to remove and 98 not upgraded.  
azureuser@liaplus-VM:~$
```

#### ◆ 5. Clone Your Node.js Project

```
azureuser@liaplus-VM: ~/simple-nodejs-app
azureuser@liaplus-VM:~$ git clone https://github.com/GaganPal27/simple-nodejs-app.git
Cloning into 'simple-nodejs-app'...
remote: Enumerating objects: 2107, done.
remote: Counting objects: 100% (97/97), done.
remote: Compressing objects: 100% (72/72), done.
remote: Total 2107 (delta 87), reused 25 (delta 25), pack-reused 2010 (from 1)
Receiving objects: 100% (2107/2107), 2.28 MiB | 22.04 MiB/s, done.
Resolving deltas: 100% (420/420), done.
azureuser@liaplus-VM:~$ 
azureuser@liaplus-VM:~$ 
azureuser@liaplus-VM:~$ 
azureuser@liaplus-VM:~$ ls
simple-nodejs-app
azureuser@liaplus-VM:~$ 
azureuser@liaplus-VM:~$ 
azureuser@liaplus-VM:~$ cd simple-nodejs-app/
azureuser@liaplus-VM:~/simple-nodejs-app$ |
```

## ◆ 6. Install Project Dependencies

```
azureuser@liaplus-VM: ~/simple-nodejs-app
azureuser@liaplus-VM:~/simple-nodejs-app$ npm install
npm WARN lockfilev1: The package-lock.json file was created with an old version of npm.
npm WARN lockfilev1: so supplemental metadata must be fetched from the registry.
npm WARN lockfilev1: This is a one-time fix-up, please be patient...
npm WARN lockfilev1: This is a one-time fix-up, please be patient...
npm WARN deprecated har-validator@5.1.3: this library is no longer supported
npm WARN deprecated uid@3.4.0: Please upgrade to version 7 or higher. Older versions may use Math.random() in certain circumstances, which is known to be problematic. See https://v8.dev/blog/math-random for details
npm WARN deprecated request@2.88.2: request has been deprecated, see https://github.com/request/request/issues/3142
added 153 packages, and audited 154 packages in 6s
8 packages are looking for funding
  run 'npm fund' for details
12 vulnerabilities (3 low, 3 moderate, 6 high)
To address issues that do not require attention, run:
  npm audit fix
To address all issues possible (including breaking changes), run:
  npm audit fix --force
Some issues need review, and may require choosing
a different dependency.
Run 'npm audit' for details.
azureuser@liaplus-VM:~/simple-nodejs-app$ |
```

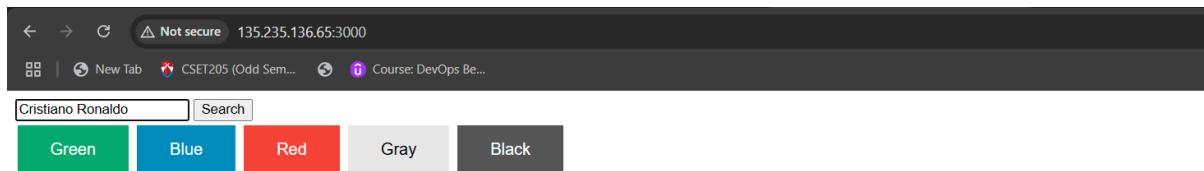
## ◆ 7. Start the Application

```
azureuser@liaplus-VM: ~/simple-nodejs-app
azureuser@liaplus-VM:~/simple-nodejs-app$ npm start
> simple-nodejs-app@1.0.0 start
> node index.js

Listening at port 3000...
```

#### ◆ 8. Access the Application

<http://135.235.136.65:3000/>



← → ⚖ Not secure 135.235.136.65:3000/index?person=Cristiano+Ronaldo

New Tab CSE7205 (Odd Sem... Course DevOps Be... All Bookmarks

```
{"name": "Cristiano Ronaldo", "nobold": [{"post-nominals": "GOIH ComM"}]}, "image": "Cristiano Ronaldo playing for Al Nassr FC against Persepolis, September 2023 (cropped).jpg", "caption": "Ronaldo with Al-Nassr in 2023", "full_name": "Cristiano Ronaldo dos Santos Aveiro", "birth_date": "[birth date and age]1985[2]/5(df-y)]", "birth_place": "Funchal, Madeira, Portugal", "height": "1.87 m", "position": "Forward", "currentclub": "Al-Nassr", "clubnumber": "7", "youthyears1": "1992\u20131995", "youthclubs1": "Andorinha", "youthyears2": "1995\u20131997", "youthclubs2": "Nacional", "youthyears3": "1997\u20132002", "youthclubs3": "Sporting CP", "years1": "2002\u20132003", "clubs1": "Sporting CP B", "caps1": "2", "goals1": "0", "years2": "2002\u20132003", "clubs2": "Sporting CP", "caps2": "25", "goals2": "3", "years3": "2003\u20132009", "clubs3": "Manchester United", "caps3": "196", "goals3": "84", "years4": "2009\u20132018", "clubs4": "Real Madrid", "caps4": "292", "goals4": "311", "years5": "2018\u20132021", "clubs5": "Juventus", "caps5": "98", "goals5": "81", "years6": "2021\u20132022", "clubs6": "Manchester United", "caps6": "40", "goals6": "19", "years7": "2023", "clubs7": "Al-Nassr", "caps7": "73", "goals7": "72", "nationalyears1": "2001", "nationalteam1": "Portugal U15", "nationalcaps1": "9", "nationalgoals1": "7", "nationalyears2": "2001\u20132002", "nationalteam2": "Portugal U17", "nationalcaps2": "5", "nationalgoals2": "5", "nationalyears3": "2003", "nationalteam3": "Portugal U20", "nationalcaps3": "5", "nationalgoals3": "1", "nationalyears4": "2002\u20132003", "nationalteam4": "Portugal U21", "nationalcaps4": "10", "nationalgoals4": "3", "nationalyears5": "2004", "nationalteams5": "Portugal U23", "nationalcaps5": "3", "nationalgoals5": "2", "nationalyears6": "2003", "nationalteam6": "Portugal", "nationalcaps6": "219", "nationalgoals6": "136", "club-update": "22:05, 12 April 2025 (UTC)", "nationalteam-update": "23:30, 23 March 2025 (UTC)", "medatemplates": "{MedalSport[Men's football]}", "module": "{Infobox person|embed=yes|signature='Cristiano Ronaldo Signature.svg'|signature_alt='Cristiano Ronaldo signature'}"}
```