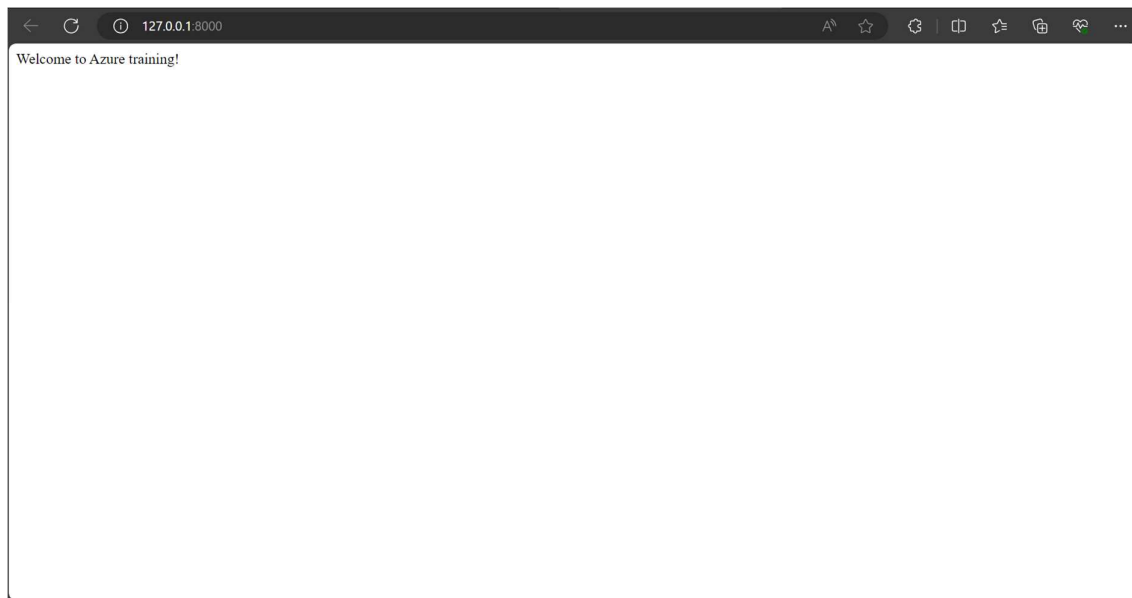


# Efficient Django Deployment : Dockerized Application on Azure vm

Submitted by – Gaurav Kulmethe

## 1. Django Sample Application azure\_training run in local environment:



## 2. Creating Resource Group

```
gaurav [ ~ ]$ az group create --name rg6febgaaurav --location eastus
{
  "id": "/subscriptions/63c2b25c-a0a4-4b82-bdb6-49a530715edd/resourceGroups/rg6febgaaurav",
  "location": "eastus",
  "managedBy": null,
  "name": "rg6febgaaurav",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
```

## 3. Creating Vnet Network

```

gaurav [ ~ ]$ az network vnet create \
--name Vnet1gaurav \
--resource-group rg6febgaaurav \
--address-prefixes 10.0.0.0/16 \
--subnet-name Subnet1 \
--subnet-prefix 10.0.0.0/24
Command group 'az network' is in preview and under development. Reference and support levels: https://aka.ms/CLI_refstatus
{
  "newVNet": {
    "addressSpace": {
      "addressPrefixes": [
        "10.0.0.0/16"
      ]
    },
    "enableDdosProtection": false,
    "etag": "W/\"0d7bbb2e-0c34-43c9-ab72-2811d8a542ed\"",
    "id": "/subscriptions/63c2b25c-a0a4-4b82-bdb6-49a530715edd/resourceGroups/rg6febgaaurav/providers/Microsoft.Network/virtualNetworks/Vnet1gaurav",
    "location": "eastus",
    "name": "Vnet1gaurav",
    "provisioningState": "Succeeded",
    "resourceGroup": "rg6febgaaurav",
    "resourceGuid": "faaeca0b-74f5-4dd5-8b39-f3a423273eb4",
    "subnets": [

```

## 4. Creating VM on Azure

```

gaurav [ ~ ]$ az vm create \
--resource-group rg6febgaaurav \
--name gauravVm1 \
--image Ubuntu2204 \
--public-ip-sku Standard \
--vnet-name Vnet1gaurav \
--subnet Subnet1 \
--ssh-key-value ~/.ssh/gaurav_lock.pub
{
  "fqdns": "",
  "id": "/subscriptions/63c2b25c-a0a4-4b82-bdb6-49a530715edd/resourceGroups/rg6febgaaurav/providers/Microsoft.Compute/virtualMachines/gauravVm1",
  "location": "eastus",
  "macAddress": "00-22-48-2D-72-B5",
  "powerState": "VM running",
  "privateIpAddress": "10.0.0.4",
  "publicIpAddress": "20.172.194.123",
  "resourceGroup": "rg6febgaaurav",
  "zones": ""
}

```

```

gaurav [ ~ ]$ ssh -i ~/.ssh/gaurav_lock gaurav@20.172.194.123
The authenticity of host '20.172.194.123 (20.172.194.123)' can't be established.
ED25519 key fingerprint is SHA256:/012I9yKZ8AoKHtAZkz4eRfivi5g3Cm+hJvy9A0tEg.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '20.172.194.123' (ED25519) to the list of known hosts.
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-1019-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Tue Feb  6 04:59:52 UTC 2024

System load:  0.01513671875   Processes:            103
Usage of /:   5.1% of 28.89GB   Users logged in:      0
Memory usage: 8%              IPv4 address for eth0: 10.0.0.4
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.

```

## 5. Installing Docker on Azure VM:

- sudo apt-get update
- sudo apt-get install apt-transport-https ca-certificates curl software-properties-common
- curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
- sudo apt-key fingerprint 0EBFCD88

- e. `sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable"`
- f. `sudo apt-get update`
- g. `sudo apt-get install docker-ce docker-ce-cli containerd.io`
- h. `sudo usermod -aG docker $USER`
- i. `sudo docker run hello-world`

```

gaaurav@gaauravVm1:~$ sudo apt-get update
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://azure.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:6 http://azure.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1326 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [268 kB]
Get:13 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1043 kB]
Get:14 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [235 kB]
Get:15 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [22.1 kB]
Get:16 http://azure.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [42.1 kB]
Get:17 http://azure.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [10.1 kB]
Get:18 http://azure.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [472 B]
Get:19 http://azure.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [41.7 kB]
Get:20 http://azure.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [10.5 kB]
Get:21 http://azure.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:22 http://azure.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:23 http://azure.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [24.2 kB]

```

```

gaaurav@gaauravVm1:~$ sudo apt-get install apt-transport-https ca-certificates curl software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20230311ubuntu0.22.04.1).
ca-certificates set to manually installed.
curl is already the newest version (7.81.0-1ubuntu1.15).
curl set to manually installed.
software-properties-common is already the newest version (0.99.22.9).
software-properties-common set to manually installed.
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 1510 B of archives.
After this operation, 170 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 apt-transport-https all 2.4.11 [1510 B]
Fetched 1510 B in 0s (13.7 kB/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 61596 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.4.11_all.deb ...
Unpacking apt-transport-https (2.4.11) ...
Setting up apt-transport-https (2.4.11) ...
Scanning processes...

```

```

No VM guests are running outdated hypervisor (qemu) binaries on this host.
gaaurav@gaauravVm1:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
gaaurav@gaauravVm1:~$ sudo apt-key fingerprint 0EBFCD88
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
pub  rsa4096 2017-02-22 [SCEA]
    9DC8 5822 9FC7 DD38 854A  E2D8 8D81 803C 0EBF CD88
uid      [ unknown] Docker Release (CE deb) <docker@docker.com>
sub  rsa4096 2017-02-22 [S]

gaaurav@gaauravVm1:~$ sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable"
Repository: 'deb [arch=amd64] https://download.docker.com/linux/ubuntu jammy stable'
Description:
Archive for codename: jammy components: stable
More info: https://download.docker.com/linux/ubuntu
Adding repository.
Press [ENTER] to continue or Ctrl-c to cancel.
Adding deb entry to /etc/apt/sources.list.d/archive_uri-https_download_docker_com_linux_ubuntu-jammy.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/archive_uri-https_download_docker_com_linux_ubuntu-jammy.list
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease

```

```

gaurav@gauravVm1:~$ sudo apt-get update
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease
Hit:5 https://download.docker.com/linux/ubuntu jammy InRelease
Reading package lists... Done
W: https://download.docker.com/linux/ubuntu/dists/jammy/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the t
PRECATION section in apt-key(8) for details.
gaurav@gauravVm1:~$ sudo apt-get install docker-ce docker-ce-cli containerd.io
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  docker-buildx-plugin docker-ce-rootless-extras docker-compose-plugin libltdl7 libsllrp0 pigz sllrp4netns
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
The following NEW packages will be installed:
  containerd.io docker-buildx-plugin docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin libltdl7 libsllrp0 pigz
  sllrp4netns
0 upgraded, 10 newly installed, 0 to remove and 2 not upgraded.
Need to get 117 MB of archives.
After this operation, 420 MB of additional disk space will be used.

```

```

gaurav@gauravVm1:~$ sudo usermod -aG docker $USER
gaurav@gauravVm1:~$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:4bd78111b6914a99dbbc560e6a20eab57ff6655aea4a80c50b0c5491968cbc2e6
Status: Downloaded newer image for hello-world:latest

```

Hello from Docker!  
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:

1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.  
(amd64)
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:  
\$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:

## 6. Resource Group

[Home](#) >





### Resource groups ...

Incedo Technology Solutions Ltd. (incedo.onmicrosoft.com)

[+ Create](#) [Manage view](#) [Refresh](#) [Export to CSV](#) [Open query](#) [Assign tags](#)

[Subscription equals all](#) [Location equals all](#) [Add filter](#)

Showing 1 to 4 of 4 records. No grouping List view

<input type="checkbox"/> Name ↑↓	<input type="checkbox"/> Subscription ↑↓	<input type="checkbox"/> Location ↑↓
<input type="checkbox"/>  cloud-shell-storage-centralindia	Incedo Azure Training	Central India ...
<input type="checkbox"/>  NetworkWatcherRG	Incedo Azure Training	East US ...
<input type="checkbox"/>  rg4febgaaurav	Incedo Azure Training	East US ...
<input type="checkbox"/>  rg6febgaaurav	Incedo Azure Training	East US ...

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Home > Resource groups >

## Resource groups

Incedo Technology Solutions Ltd. (incedoin.onmicr...

+ Create Manage view ...

Filter for any field...

Name ↑

- cloud-shell-storage-centralindia ...
- NetworkWatcherRG ...
- rg4febgaaurav ...
- rg6febgaaurav ...

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---

### rg6febgaaurav

Resource group

+ Create Manage view ... Delete resource group Refresh Export to CSV Open query Assign tags ...

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 6 of 6 records. Show hidden types No grouping List view

Name ↑	Type ↑	Location ↑
gauravVm1	Virtual machine	East US
gauravVm1_disk1_fef80a618f64715b55b9fe57249d902	Disk	East US
gauravVm1NSG	Network security group	East US
gauravVm1PublicIP	Public IP address	East US
gauravVm1VMNic	Network Interface	East US
Vnet1gaurav	Virtual network	East US

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## 7. Django Application Dockerization using Dockerplayground:

- Git clone [https://github.com/Kgaurav729/MsAzureActivity\\_Gaurav.git](https://github.com/Kgaurav729/MsAzureActivity_Gaurav.git)
- Cd MsAzureActivity\_Gaurav
- Cd azure\_training
- Docker build -t sampleimage .
- Docker run -p 8000:8000 sampleimage

## 8. Docker Image

03:43:58  
CLOSE SESSION  
Instances  
+ ADD NEW INSTANCE  
192.168.0.18  
node1

cn16ujkv\_cn174is7vdo000cvo700

IP: 192.168.0.18 OPEN PORT

Memory: 9.14% (365.5MiB / 3.906GiB) CPU: 62.27%

SSH: ssh ip172-18-0-70-cn16ujkvmr1000d8permg@direct.labs.pla

DELETE EDITOR

```

=> extracting sha256:1b97fe7de19b6f8a10c0b0e1d11ae421f08b2c37a40e3c437e69b8930cb1672 49.4s
=> extracting sha256:09966a9040d3b3b594959a6df2a2f0d693e0ce78a3c37484bb2e0a995f01a7 1.5s
=> extracting sha256:0ef33db8e9b06bd0535db75106e242127302a67ce36c75f45996351582af2 2.2s
=> extracting sha256:12598e745e6b4eeaf1fa994bbd2f3edbd4b734a9f46842598450dbb026bfb94 0.0s
=> extracting sha256:d93394337709931044380dfac1850ceff5db773142f704f5ecffe03d0162f342 1.0s
=> [internal] load build context 0.0s
=> transferring context: 11.04kB 0.0s
=> [2/5] WORKDIR /usr/src/app 0.1s
=> [3/5] COPY requirements.txt /usr/src/app/ 0.2s
=> [4/5] RUN pip install --no-cache-dir -r requirements.txt 21.2s
=> [5/5] COPY . /usr/src/app/ 0.3s
=> exporting to image 1.9s
=> exporting layers 1.9s
=> writing image sha256:iae0966be28bcd2e0935268c2e5e7e3594a672034d83f6fc5f5a0edbc482a635 0.0s
=> saving to docker.io/library/sampleimage 0.0s
[node1] (local) root@192.168.0.18 ~/MsAzureActivity_Gaurav/azure_training
$ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
sampleimage latest ae0966be28bc 10 seconds ago 1.02GB
[node1] (local) root@192.168.0.18 ~/MsAzureActivity_Gaurav/azure_training
$

```

03:41:35

CLOSE SESSION

Instances

+ ADD NEW INSTANCE

192.168.0.18  
node1

cn16ujkv\_cn174is7vdo000cvo700

IP

192.168.0.18

OPEN PORT

8000

Memory

6.16% (246.4MiB / 3.906GiB)

CPU

0.91%

SSH

ssh ip172-18-0-70-cn16ujkvmr1000d8pemg@direct.labs.pla

DELETE

EDITOR

```

Performing system checks...

System check identified no issues (0 silenced).

You have 18 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): admin, auth, conte
nttypes, sessions.
Run 'python manage.py migrate' to apply them.
February 06, 2024 - 17:58:54
Django version 3.2.24, using settings 'azure_training.settings'
Starting development server at http://0.0.0.0:8000/
Quit the server with CONTROL-C.
[06/Feb/2024 17:59:00] code 400, message Bad request version ('0kFG\x00')
[06/Feb/2024 17:59:00] You're accessing the development server over HTTPS, but it only supports HTTP.
[06/Feb/2024 17:59:01] code 400, message Bad request version ('@@x00\x00\x00')
[06/Feb/2024 17:59:01] You're accessing the development server over HTTPS, but it only supports HTTP.
[06/Feb/2024 17:59:01] "GET / HTTP/1.1" 200 26
Not Found: /favicon.ico
[06/Feb/2024 17:59:02] "GET /favicon.ico HTTP/1.1" 404 2339

```

## 9. Output

< > ↺

🔒

Not secure | ip172-18-0-70-cn16ujkvmr1000d8pemg-8000.direct.labs.play-with-docker.com

Welcome to Azure training!