

## Assignment: Deploy a .NET API on Azure Virtual Machine Using Docker

### Objective:

Provision an Azure Virtual Machine, install Docker, deploy a .NET Web API in a container, and expose it publicly using the VM's IP address.

### Shape

### Instructions

Create a Virtual Machine on Azure

Sign in to the Azure Portal.

Provision a Linux Virtual Machine (Ubuntu 20.04 LTS).

Configuration:

Public IP Address: Static

Inbound Ports: Allow SSH (port 22) and HTTP (port 80)

Size: B1s or larger

Download the SSH key or note your login credentials.

Install Docker

Connect to your VM using SSH:

```
ssh azureuser@<public-ip>
```

Install Docker:

```
sudo apt-get update
```

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

Start Docker and enable it on boot:

```
sudo systemctl start docker
```

```
sudo systemctl enable docker
```

Verify Docker installation:

```
docker --version
```

Create a Simple .NET Web API

On your local machine, create a new .NET Web API project:

```
dotnet new webapi -o MyApiApp
```

```
cd MyApiApp
```

Test locally with:

```
dotnet run
```

Create a Dockerfile in the project root:

```
FROM mcr.microsoft.com/dotnet/aspnet:8.0 AS base
```

```
WORKDIR /app
```

```
EXPOSE 80
```

```
FROM mcr.microsoft.com/dotnet/sdk:8.0 AS build
```

```
WORKDIR /src
```

```
COPY . .
```

```
RUN dotnet publish -c Release -o /app/publish
```

```
FROM base AS final
```

```
WORKDIR /app
```

```
COPY --from=build /app/publish .
```

```
ENTRYPOINT ["dotnet", "MyApiApp.dll"]
```

Build the Docker image locally:

```
docker build -t my-dotnet-api .
```

Push the image to Docker Hub (create a free account if needed):

```
docker login
```

```
docker tag my-dotnet-api <your-dockerhub-username>/my-dotnet-api:latest
```

```
docker push <your-dockerhub-username>/my-dotnet-api:latest
```

Pull and Run the API on Azure VM

Back in your SSH session:

Pull the Docker image:

```
sudo docker pull <your-dockerhub-username>/my-dotnet-api:latest
```

Run the container exposing port 80:

```
sudo docker run -d -p 80:80 <your-dockerhub-username>/my-dotnet-api:latest
```

Verify the container is running:

```
sudo docker ps
```

Test the API

From your browser or Postman:

```
http://<your-vm-public-ip>/weatherforecast
```

You should see the default .NET WeatherForecast JSON response.

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## Deliverables

A document or presentation including:

Screenshots of:

Azure VM creation

Docker installation verification

Docker container running

API response in the browser


The commands you used to:

Build and push the Docker image

Run the container on Azure

The public URL to access your API.

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 Bonus Challenge (Optional):

Create an Azure Resource Group and automate deployment using Azure CLI.

Configure a custom domain with Azure DNS to point to your VM.

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If you'd like, I can provide sample code, Dockerfile, or Azure CLI scripts. Just let me know!