



Dot Net Cloud Microservices Lab Book





Document Revision History

Date	Revision No.	Author	Summary of Changes
3-Oct-2018	1.0	Meganadha Reddy K	Initial Version



Table of Contents

Document Revision History.....	3
1. Setup checklist for Micro Services	5
2. Computer settings to be done to enable docker support	6
a. Enable Hyper-V in your computer:	6
b. Enable “Virtualization” in your computer.....	7
3. “Hello, World” Microservice:	8
a. Check Docker Status	8
b. Create a simple microservice	10
c. Enable Docker Support for solution.....	11
d. Service changes.....	12
4. Lab Task.....	15



1. Setup checklist for Micro Services

Operating System	Windows 10 Pro 64 bit
Processor	Core i3 or Above [Preferred: i5 or above]
Memory	8 GB or more recommended
Software	Visual Studio 2017
	Docker and create account in docker website
	SQL Server 2014 or above

Note:

RAM size of min. 8 GB is required otherwise running docker will make the system slow. So, 8 GB or more is recommended.

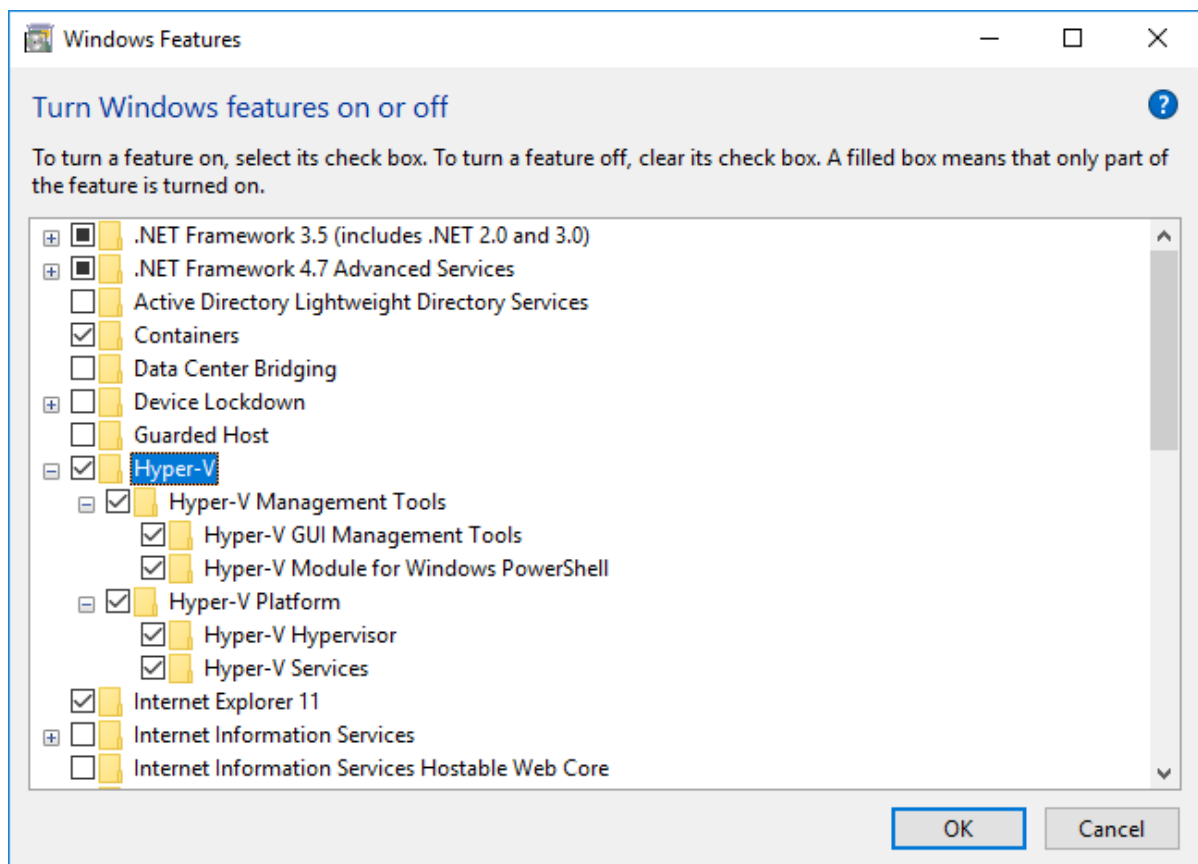


2. Computer settings to be done to enable docker support

a. Enable Hyper-V in your computer:

Open Control Panel → Programs → Turn Windows features on or off

Select all the check boxes related to **Hyper-V** as shown in the below screen shot
click "OK"



Re-start will be required once you complete the above step.

This will complete enabling "Hyper-V" in your computer.



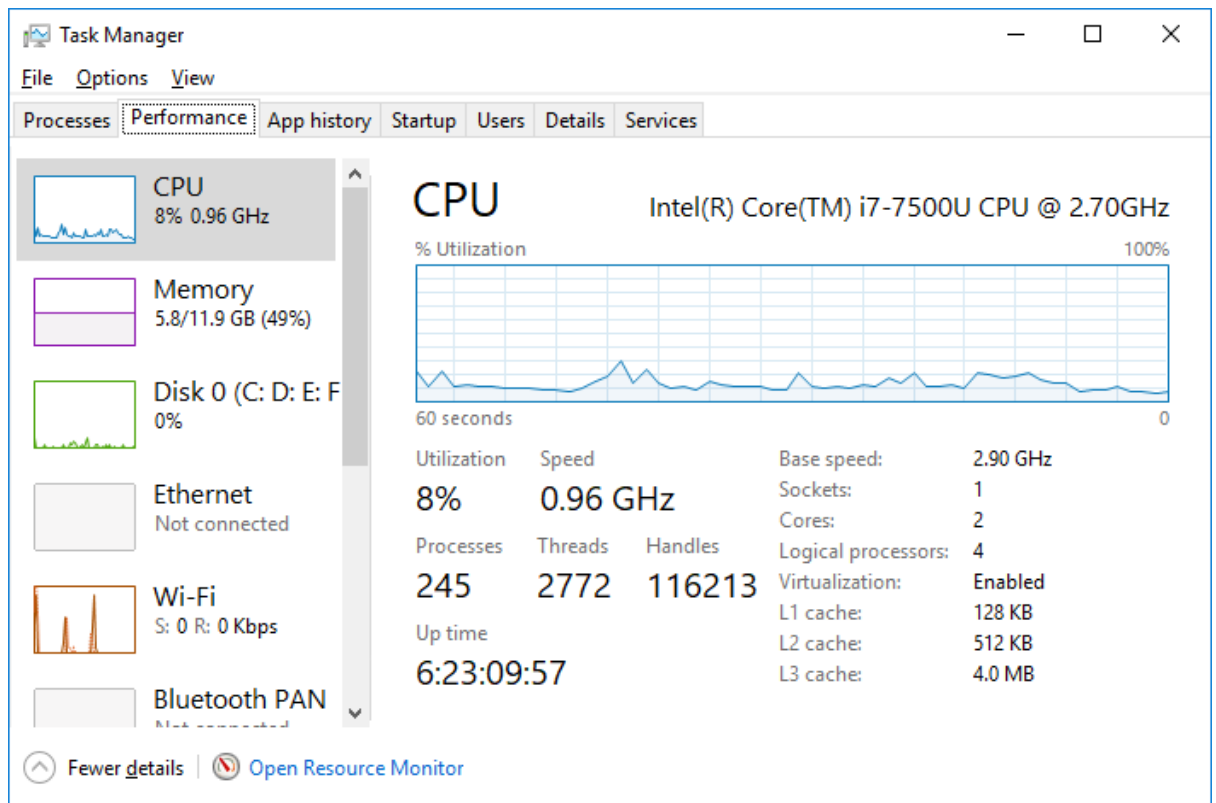
b. Enable “Virtualization” in your computer

(Note that this requires administrator access):

To check if Virtualization is enabled or not:

Open “Task Manager” → Click on “Performance” Tab → Check if “Virtualization” is enabled or not.

[Refer below screen shot]



To enable Virtualization, you need have admin access or raise ticket for the same.

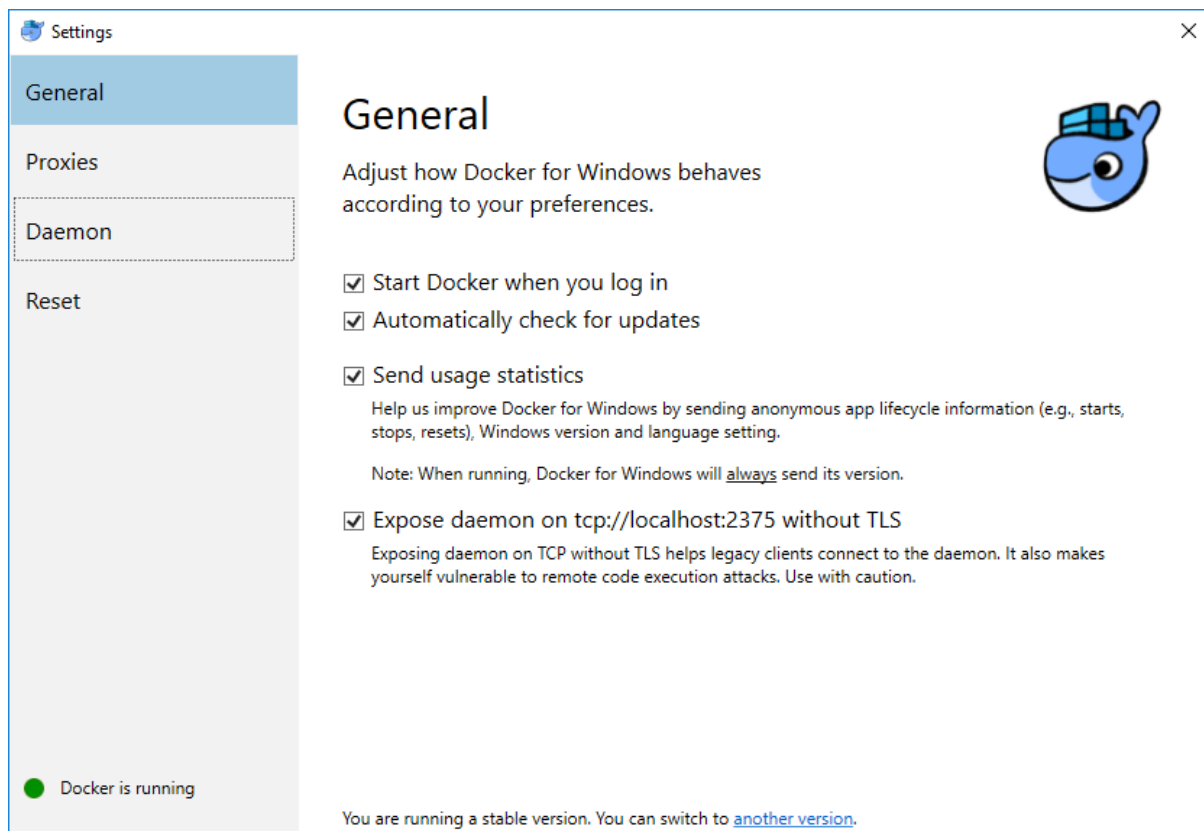


3. “Hello, World” Microservice:

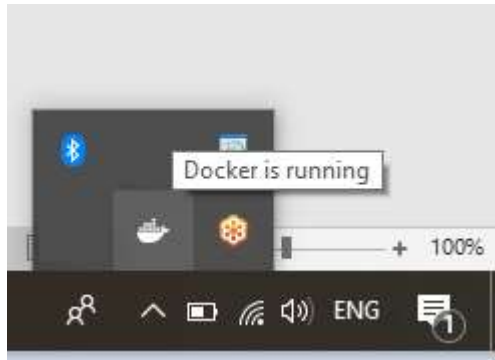
a. Check Docker Status

Open Docker Settings and verify if docker is running in computer or not.

Make sure that docker is running in the computer as shown below:



You can also see in the task bar for docker running status as shown below:



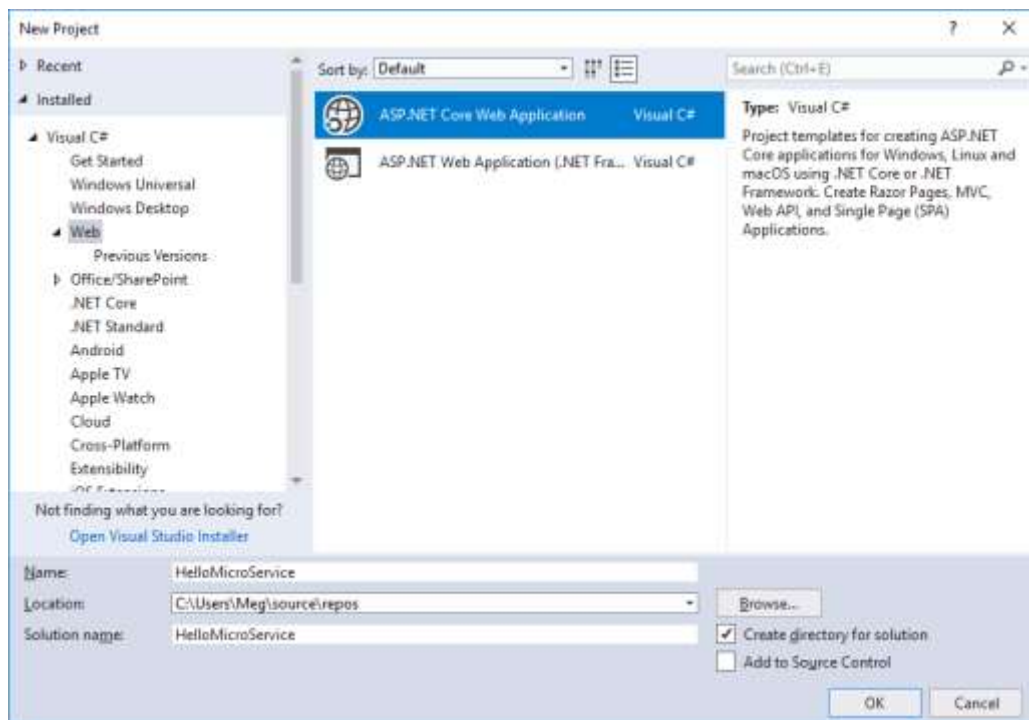


b. Create a simple microservice

Open Visual Studio →

File → New → Project

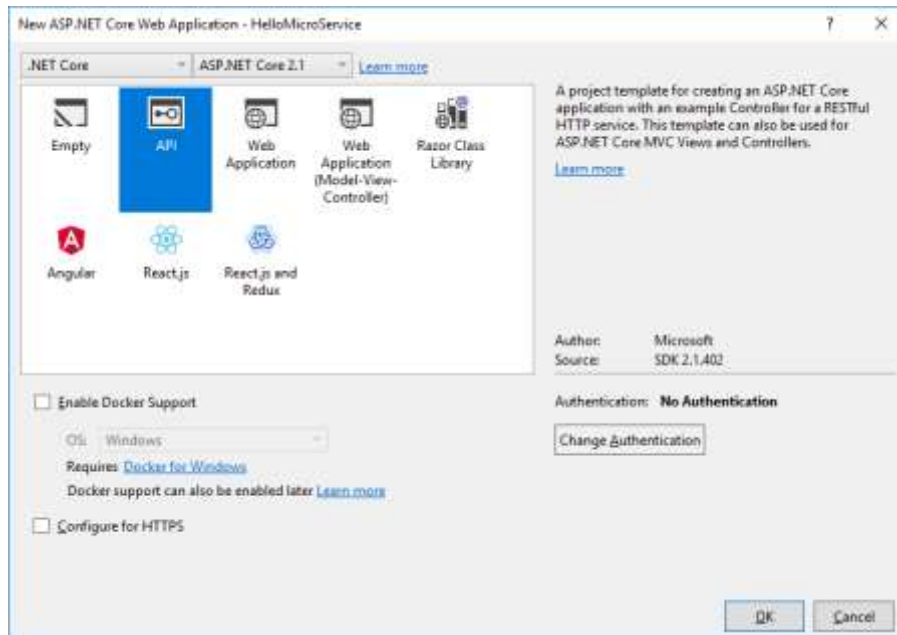
Visual C# → Web → ASP.NET Core Web Application



Give the name as “HelloMicroService” (as shown above)

Click “OK”

Select “API” as shown below, and click on “OK”

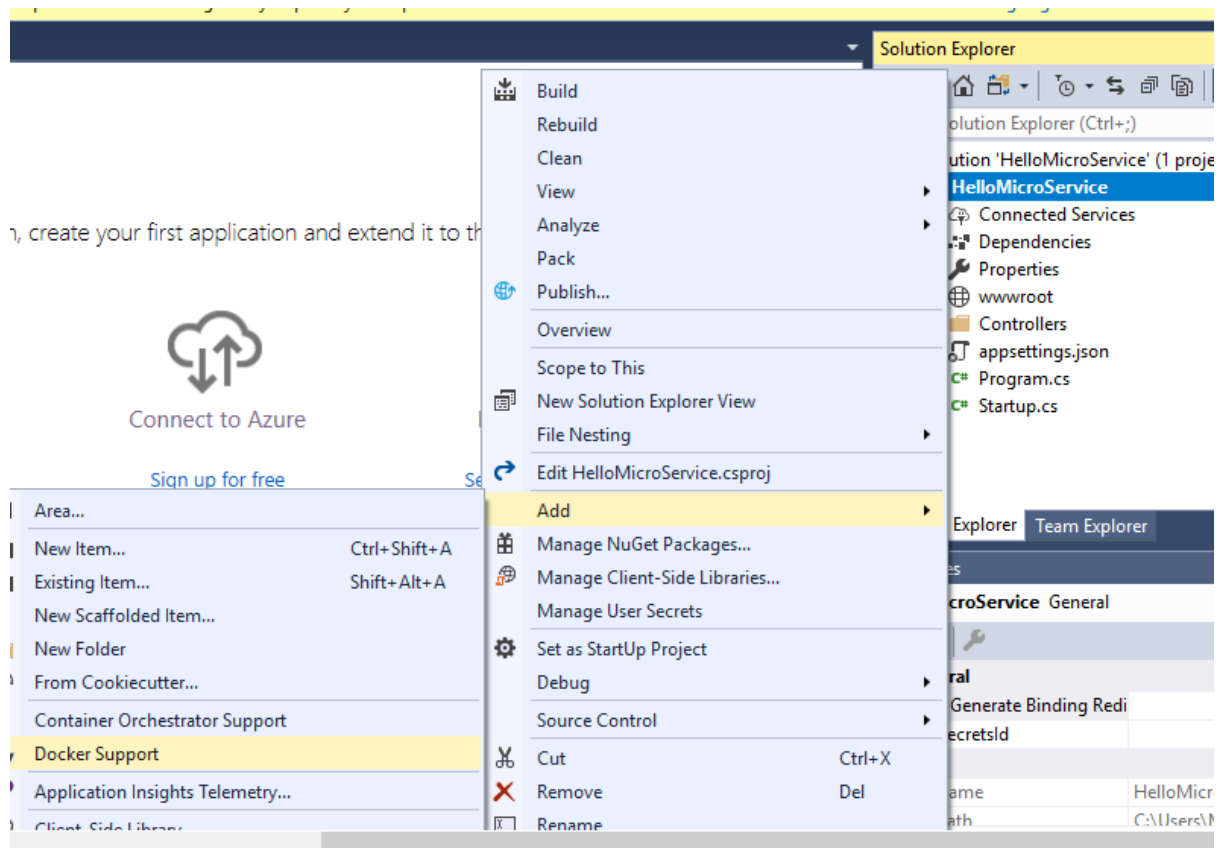


c. Enable Docker Support for solution

Note that we can enable docker support while creating the service itself. Now we are doing it after creating service.

Right click on "HelloMicroService" Project in solution explorer.

Click on "Add" → Docker Support → Select OS as "Windows"



d. Service changes

Change the method in **ValuesController.cs** as shown below:

```
[Route("api/[controller]")]
[ApiController]
public class ValuesController : ControllerBase
{
    // GET api/values
    [HttpGet]
    public ActionResult<IEnumerable<string>> Get()
    {
        return new string[] { "Hello Micro Service", "From Capgemini" };
    }

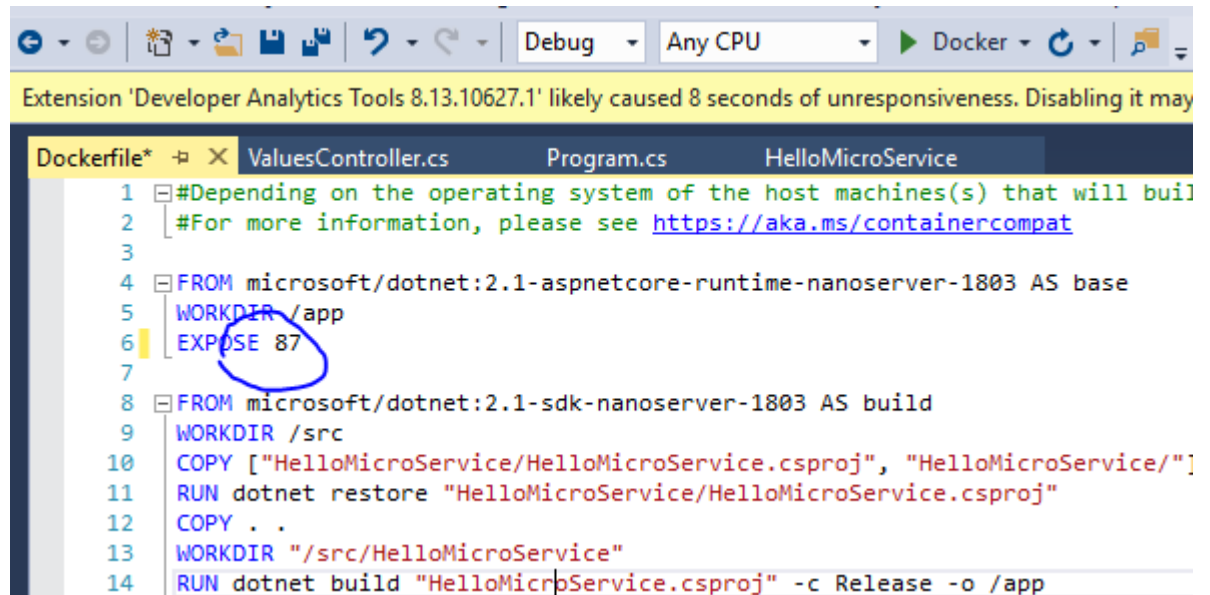
    // GET api/values/5
    [HttpGet("{id}")]
    public ActionResult<string> Get(int id)
    {
        return "value";
    }

    // POST api/values
```

Open "Dockerfile" from solution explorer and change the port number to 87 (initially it will be default 80)



Normally 80 will be used by other applications so we are changing to 87.

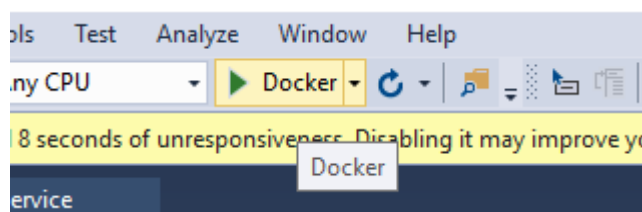


```
1 #Depending on the operating system of the host machines(s) that will build
2 #For more information, please see https://aka.ms/containercompat
3
4 FROM microsoft/dotnet:2.1-aspnetcore-runtime-nanoserver-1803 AS base
5 WORKDIR /app
6 EXPOSE 87
7
8 FROM microsoft/dotnet:2.1-sdk-nanoserver-1803 AS build
9 WORKDIR /src
10 COPY ["HelloMicroService/HelloMicroService.csproj", "HelloMicroService/"]
11 RUN dotnet restore "HelloMicroService/HelloMicroService.csproj"
12 COPY . .
13 WORKDIR "/src/HelloMicroService"
14 RUN dotnet build "HelloMicroService.csproj" -c Release -o /app
```

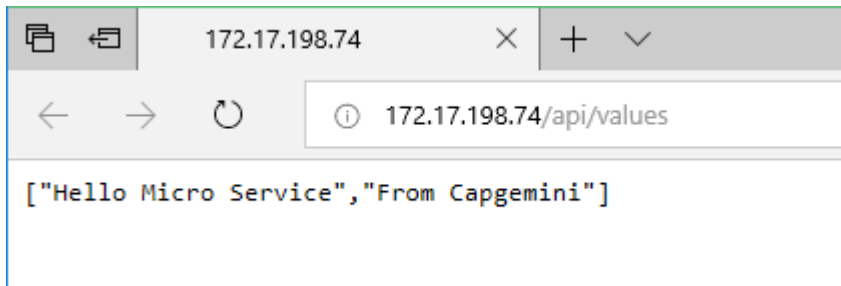
“Rebuild” the Solution

This might take few minutes for first time.

Execute the code using “Docker” as shown below:



You will the output as shown below:



Check existing images running in your computer:

Open Command prompt as administrator from your application folder

Type the below command:

➤ Docker Images

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.17134.285]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Meg\source\repos\HelloMicroService\HelloMicroService\Controllers>docker images
REPOSITORY          TAG                 IMAGE ID            CREATED
hellomicroservice   dev                5a2cb32f76d3       6 minutes ago
webapplication5     dev                d982c85d80b9       About an hour ago
webapplication4     dev                d41372345c8f       5 hours ago
webapplication3     dev                8837d838b4ff       5 hours ago
microsoft/dotnet    2.1-aspnetcore-runtime-nanoserver-1803  6045d03976f5       12 days ago
```

Check existing containers running in docker

➤ Docker PS

```
C:\Users\Meg\source\repos\HelloMicroService\HelloMicroService\Controllers>docker ps
CONTAINER ID        IMAGE               CREATED             STATUS              PORTS
70f1ea3d825b       hellomicroservice:dev  9 minutes ago      Up 9 minutes       0.0.0.0:64314->87/tcp
c11d60db92ac       webapplication5:dev   2 hours ago        Up 2 hours         0.0.0.0:63705->80/tcp
0ea4ba79c9c4       webapplication4:dev   5 hours ago        Up 5 hours         0.0.0.0:63548->78/tcp
c21833e17004       webapplication3:dev   5 hours ago        Up 5 hours         0.0.0.0:63166->88/tcp
```

You can notice above that our service

“hellomicroservice:dev” is up from last 9 mins.

Port number is 87



4. Lab Task

- Create a Table **Employee** with four columns Id, Name, Age, Salary.
- Create a simple .Net Microservice for performing CRUD operations
- Host the Service in Docker container