How to deploy .NET8 CRUD WebAPI Azure CosmosDB Microservice to Azure Container Instance (ACI)

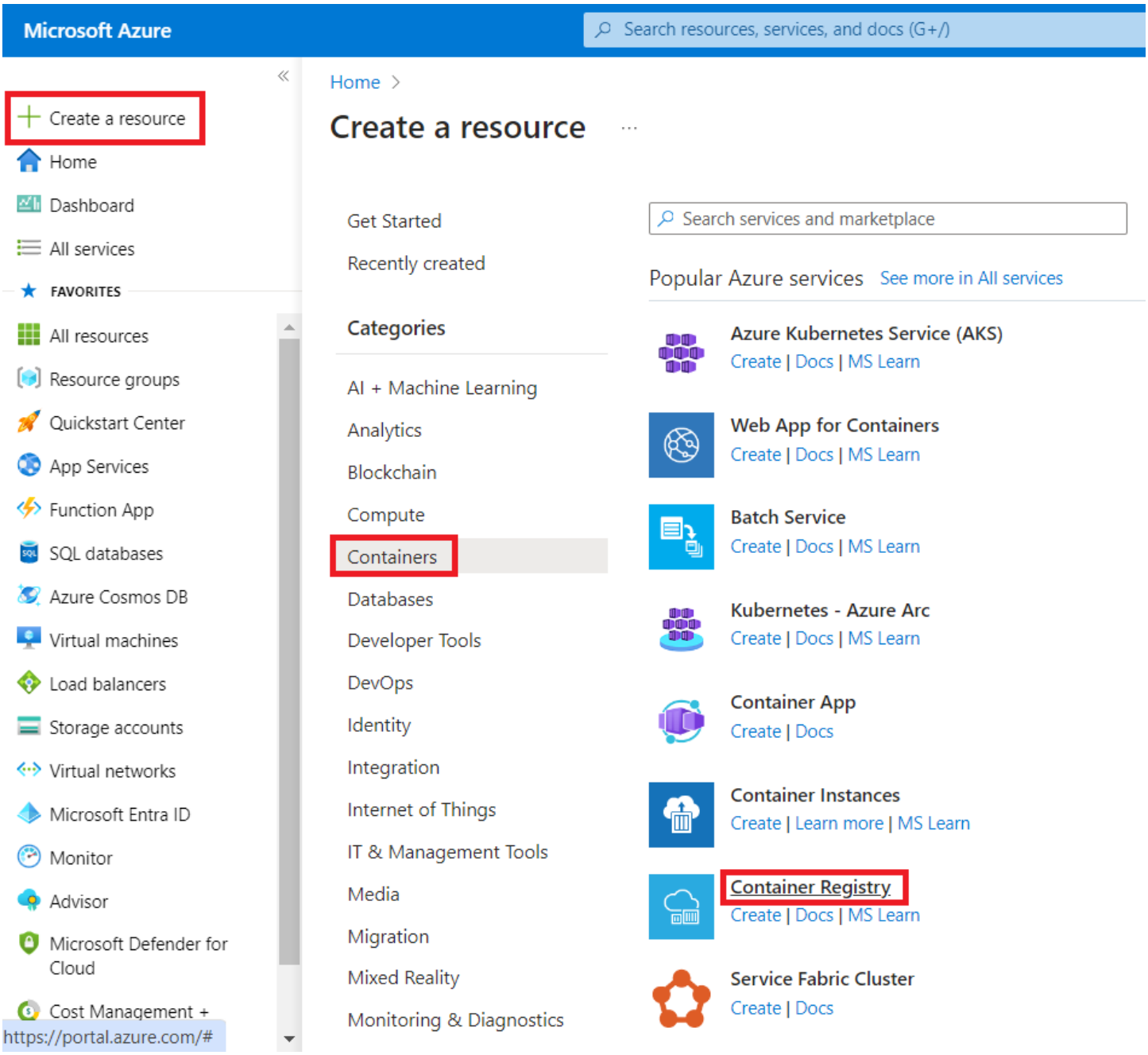
0. Prerequisite create .NET8 CRUD WebAPI connected to Azure CosmosDB

See the code in this repo: https://github.com/luiscoco/MicroServices_dotNET8_CRUD_WebAPI-CosmosDB-deployed_to_Azure_Container_Instance

Also see this repo: https://github.com/luiscoco/MicroServices_dotNET8_CRUD_WebAPI-AzureCosmosDB

1. Create an Azure Container Registry

We create Azure Container Registry service for uploading the .NET CRUD WebAPI docker image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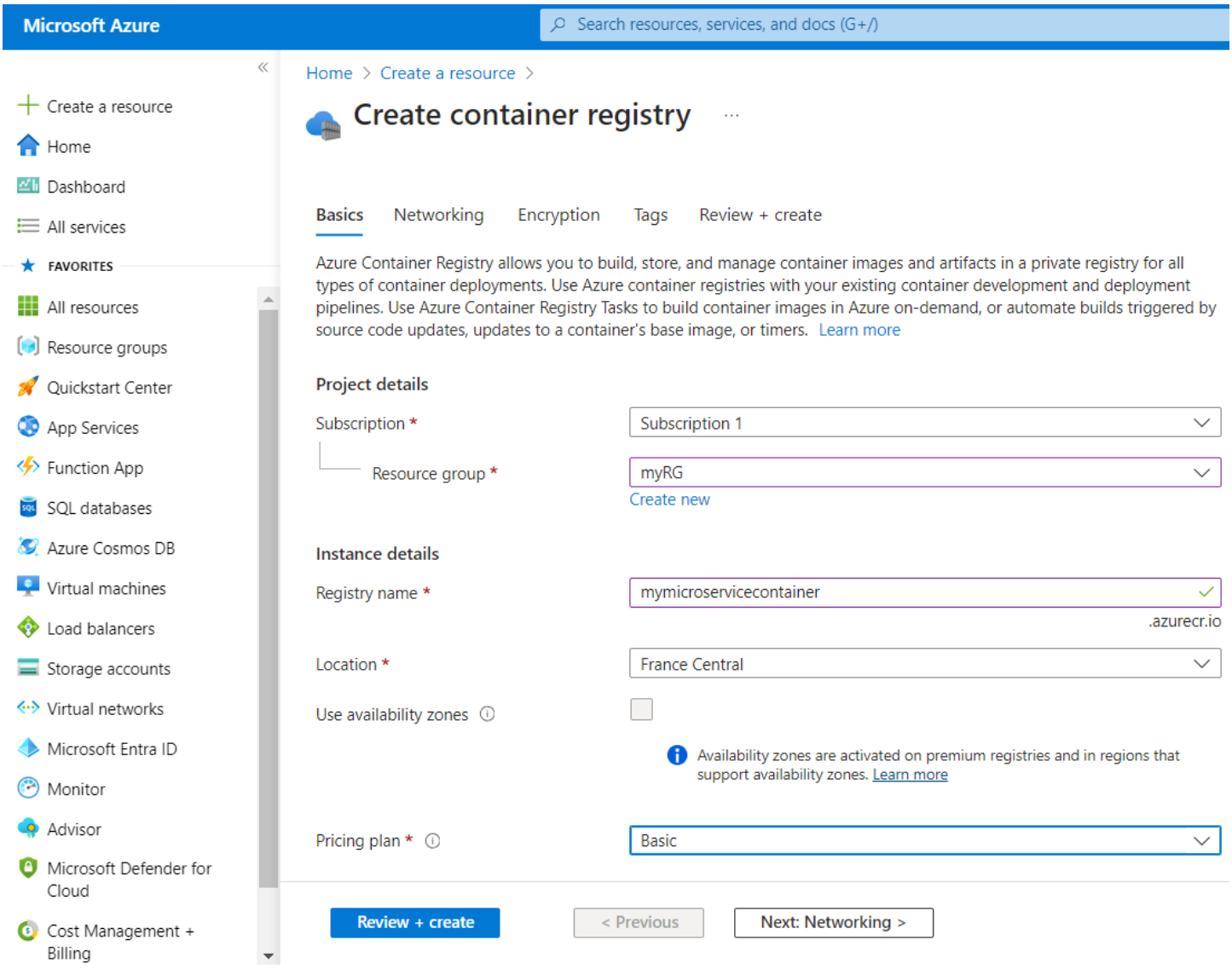
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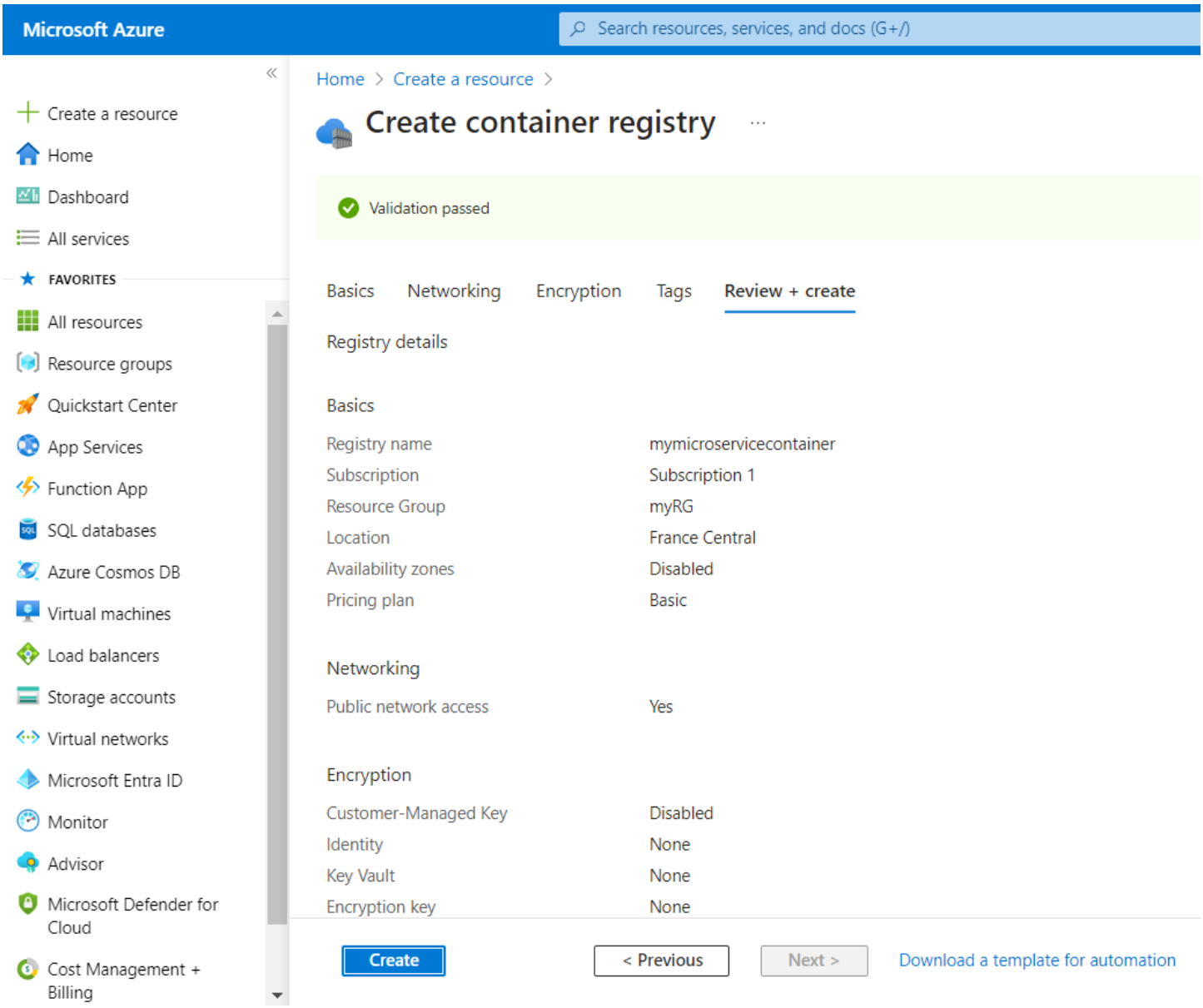
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Registry name mymicroservicecontainer
Subscription Subscription 1
Resource Group myRG
Location France Central
Availability zones Disabled
Pricing plan Basic
Networking
Public network access Yes
Encryption
Customer-Managed Key Disabled
Identity None
Key Vault None
Encryption key None
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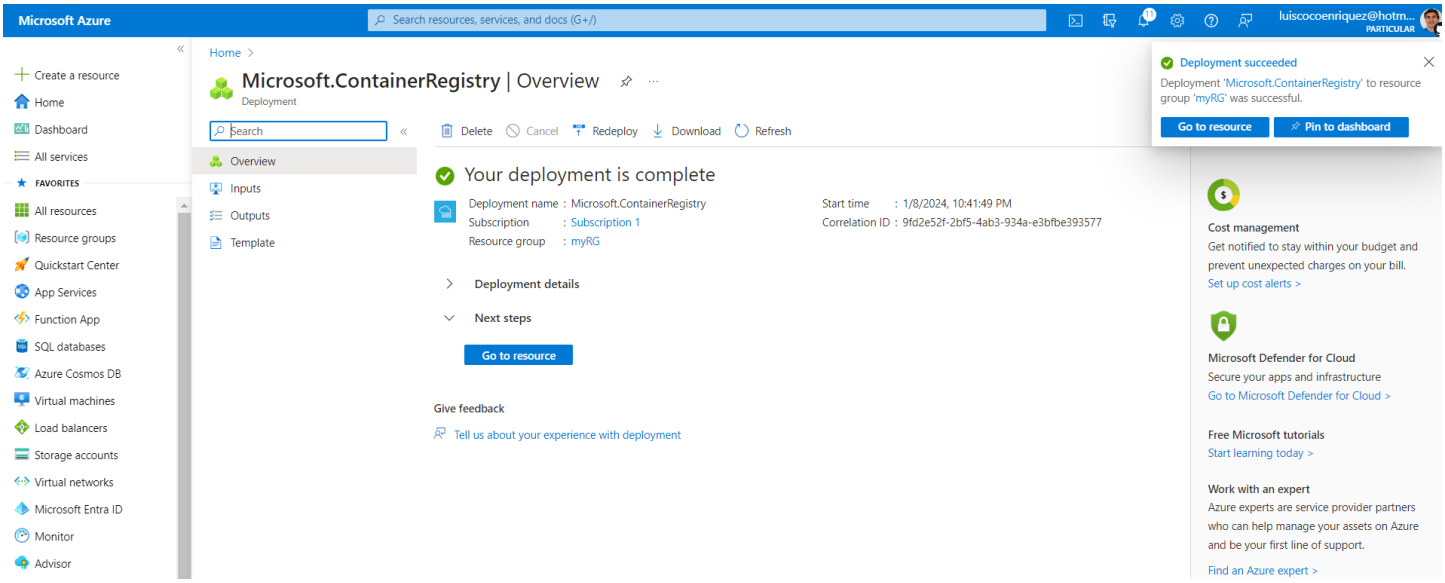
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Deployment name : Microsoft.ContainerRegistry
Subscription : Subscription 1
Resource group : myRG
Start time : 1/8/2024, 10:41:49 PM
Correlation ID : 9fd2e52f-2bf5-4ab3-934a-e3bfbe393577
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Next steps
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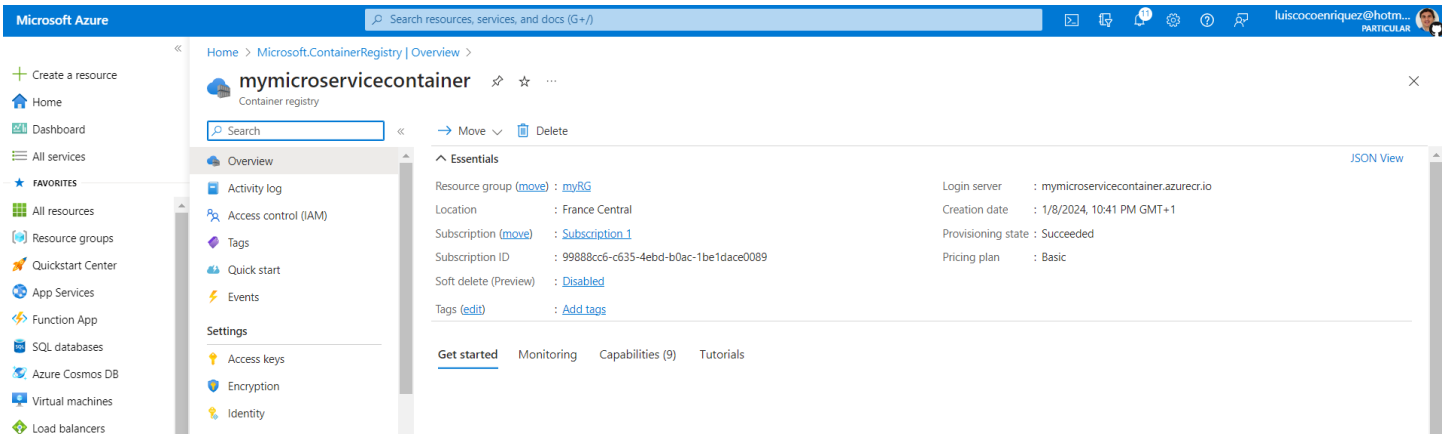
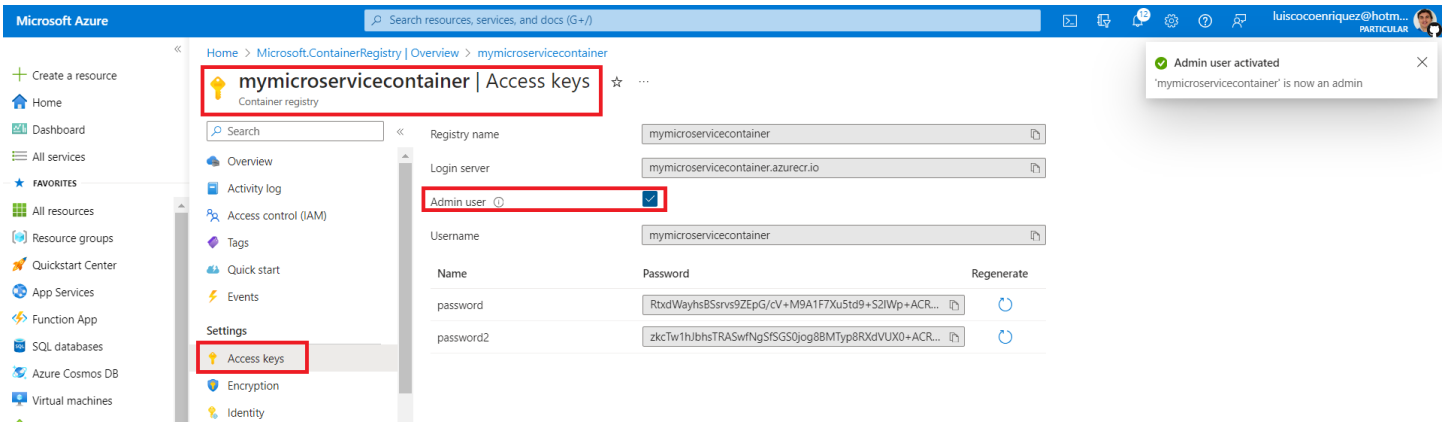


2. Set the Admin User

We can enable the Admin User in the Azure Portal



Or we can enable the Admin User programmatically with Azure CLI

```
az acr update --name mymicroservicecontainer --resource-group myRG --admin-enabled true
```

Log in to Azure ACR

```
az acr login --name mymicroservicecontainer
```

3. Create a Dockerfile

With Visual Studio 2022 Community Edition we can automatically create the Dockerfile.

After creating automatically the Dockerfile we **expose the port 80**

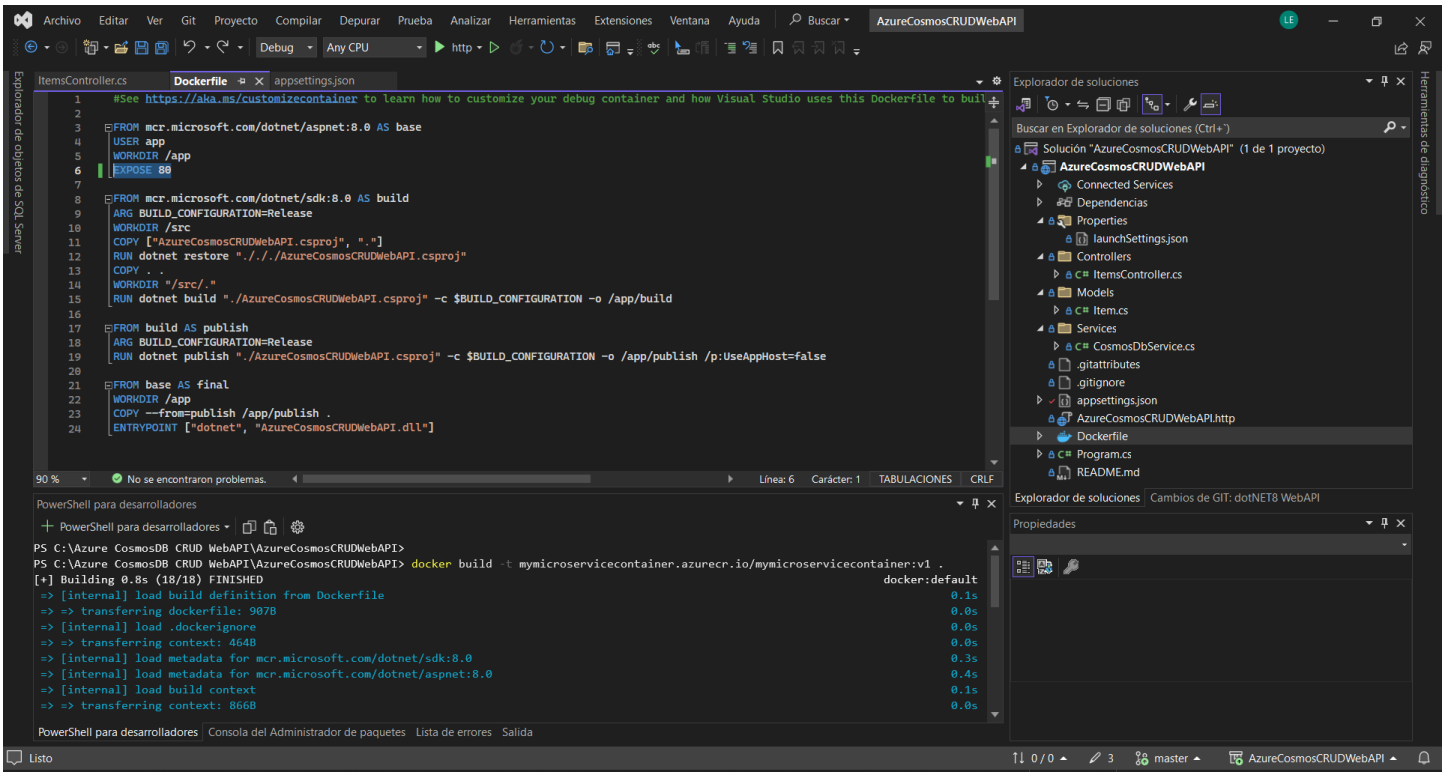
This is the Dockerfile source code

```
#See https://aka.ms/customizecontainer to learn how to customize your debug container and how

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

```
USER app
WORKDIR /app
EXPOSE 80

FROM mcr.microsoft.com/dotnet/sdk:8.0 AS build
ARG BUILD_CONFIGURATION=Release
WORKDIR /src
COPY ["AzureCosmosCRUDWebAPI.csproj", "."]
RUN dotnet restore "./././AzureCosmosCRUDWebAPI.csproj"
COPY . .
WORKDIR "/src/."
RUN dotnet build "./AzureCosmosCRUDWebAPI.csproj" -c $BUILD_CONFIGURATION -o /app/build

FROM build AS publish
ARG BUILD_CONFIGURATION=Release
RUN dotnet publish "./AzureCosmosCRUDWebAPI.csproj" -c $BUILD_CONFIGURATION -o /app/publish /p

FROM base AS final
WORKDIR /app
COPY --from=publish /app/publish .
ENTRYPOINT ["dotnet", "AzureCosmosCRUDWebAPI.dll"]
```

4. Create the Docker image

```
docker build -t mymicroservicecontainer.azurecr.io/mymicroservicecontainer:v1 .
```



5. Push the Docker image

Log in to Azure ACR

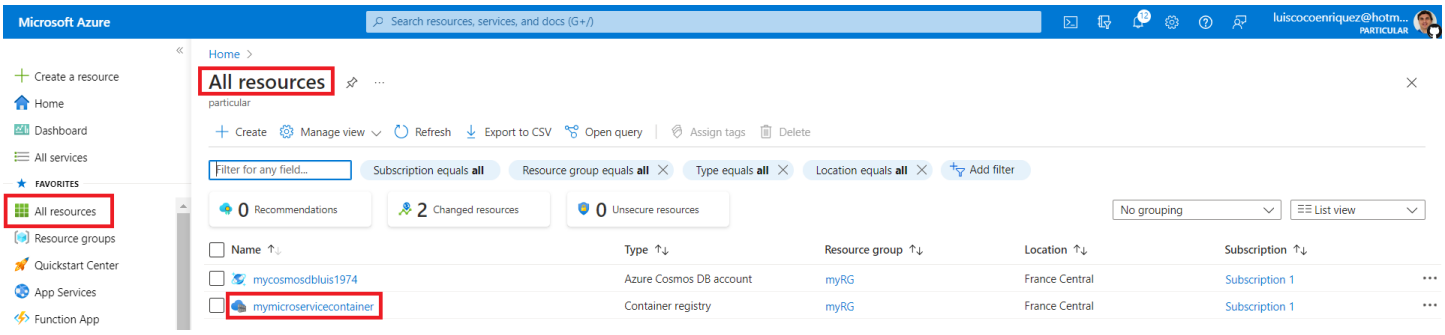
```
az acr login --name mymicroservicecontainer
```

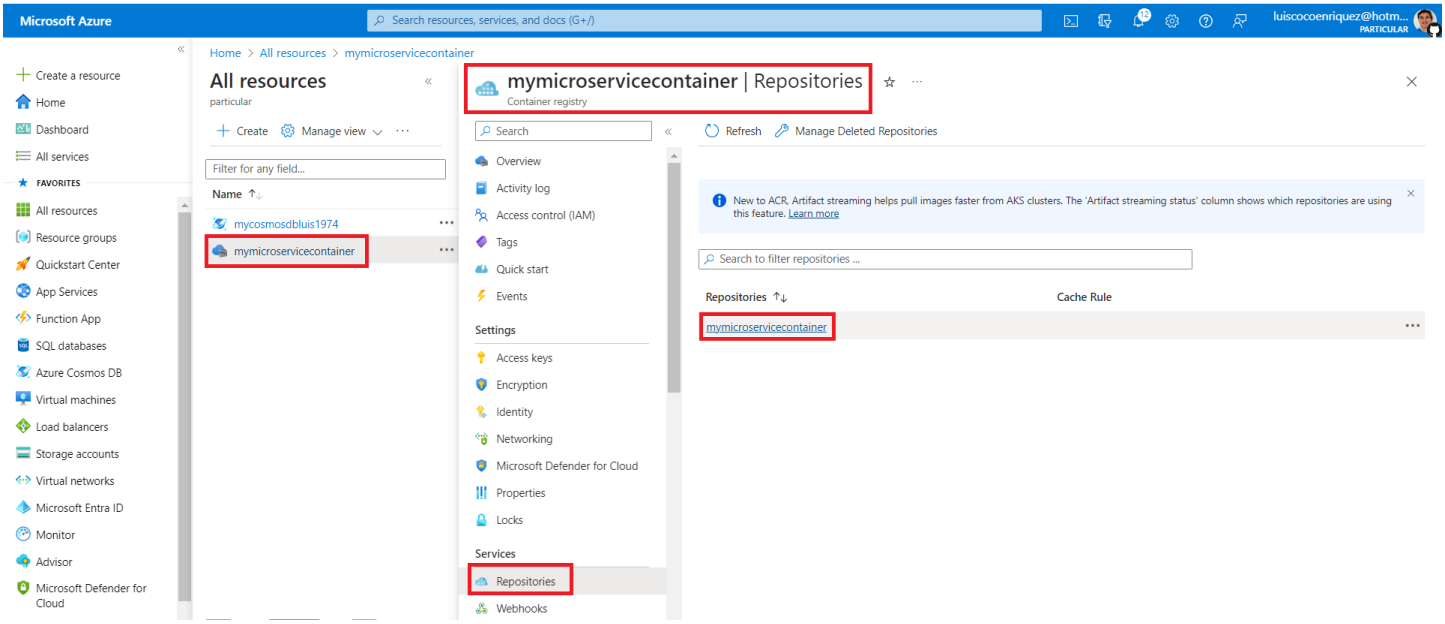
And we push the docker image to Azure ACR

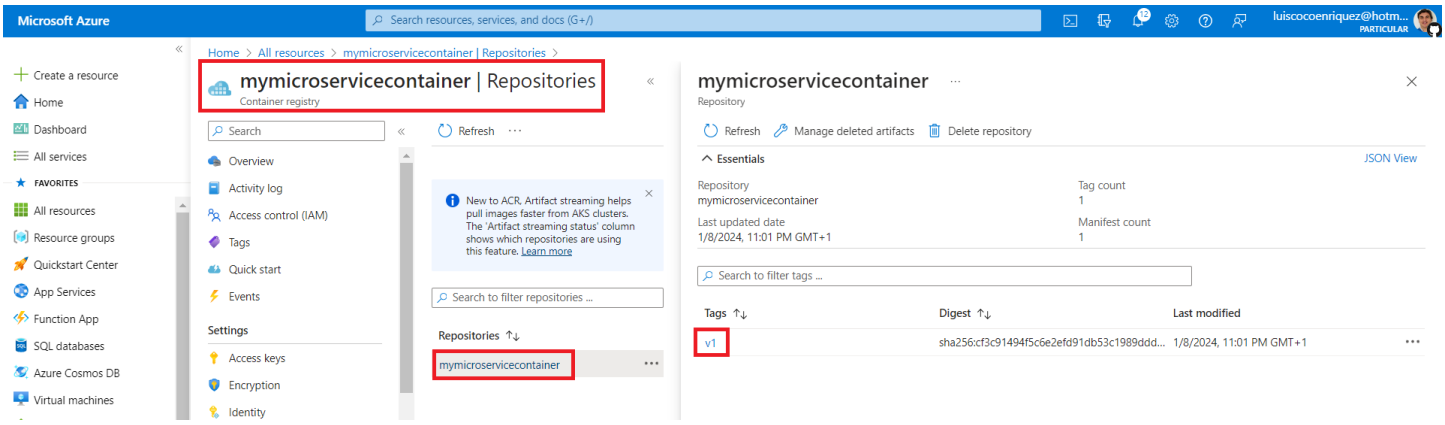
```
docker push mymicroservicecontainer.azurecr.io/mymicroservicecontainer:v1
```

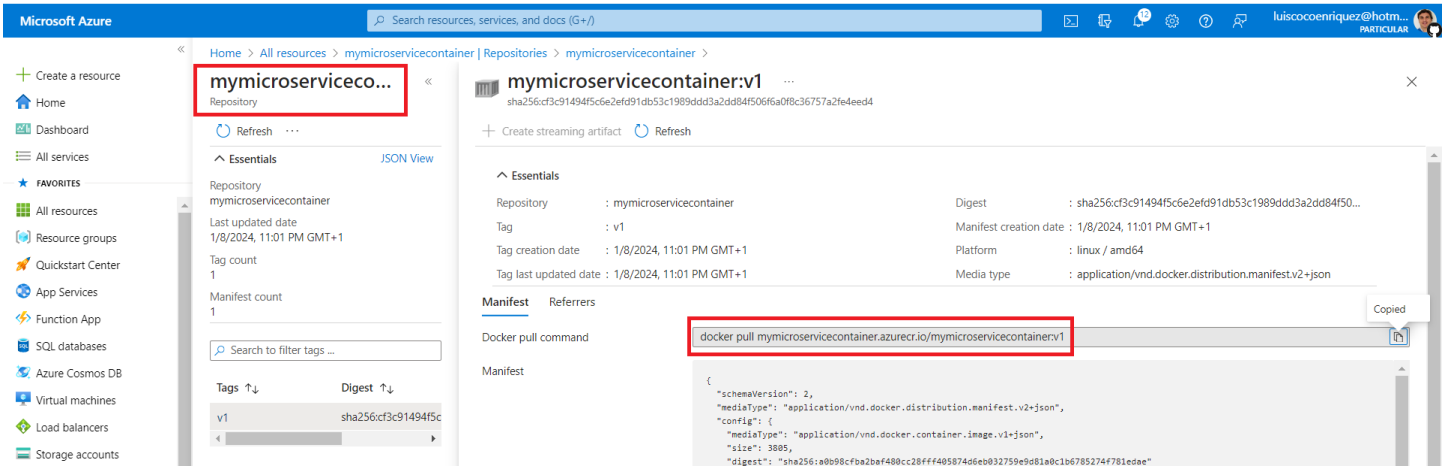
6. Verify the Docker image in Azure ACR

We navigate to the Azure ACR









We first pull the Azure Docker image to our local laptop with this command

```
docker pull mymicroservicecontainer.azurecr.io/mymicroservicecontainer:v1
```

And then we run the docker image

```
docker run -p 80:8080 mymicroservicecontainer.azurecr.io/mymicroservicecontainer:v1
```

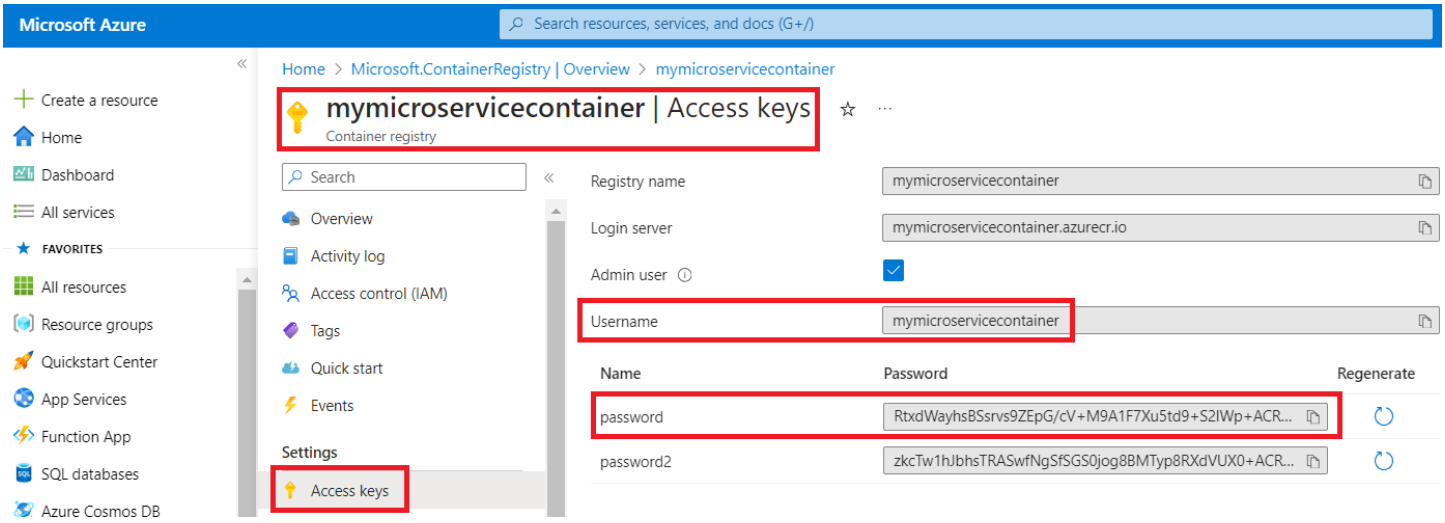
We can access the application endpoint

http://localhost/api/family


```
[
    {
        "id": "1",
        "partitionKey": "pk001",
        "lastName": "Smith",
        "parents": [
            {
                "familyName": "Smith",
                "firstName": "John"
            },
            {
                "familyName": "Smith",
                "firstName": "Jane"
            }
        ],
        "children": [
            {
                "familyName": "Smith",
                "firstName": "Emma",
                "gender": "Female",
                "grade": 5,
                "pets": [
                    {
                        "givenName": "Buddy"
                    }
                ]
            },
            {
                "familyName": "Smith",
                "firstName": "Mike",
                "gender": "Male",
                "grade": 8,
                "pets": []
            }
        ],
        "address": {
            "state": "California",
            "county": "Orange",
            "city": "Irvine"
        },
        "isRegistered": true
    }
]
```

7. Create the Azure Container Instance (ACI)

We copy the ACR username and password:



ACR username: mymicroservicecontainer

ACR password: RtxdWayhsBSsrvs9ZEpG/cV+M9A1F7Xu5td9+S2lWp+ACRDRt6Dk

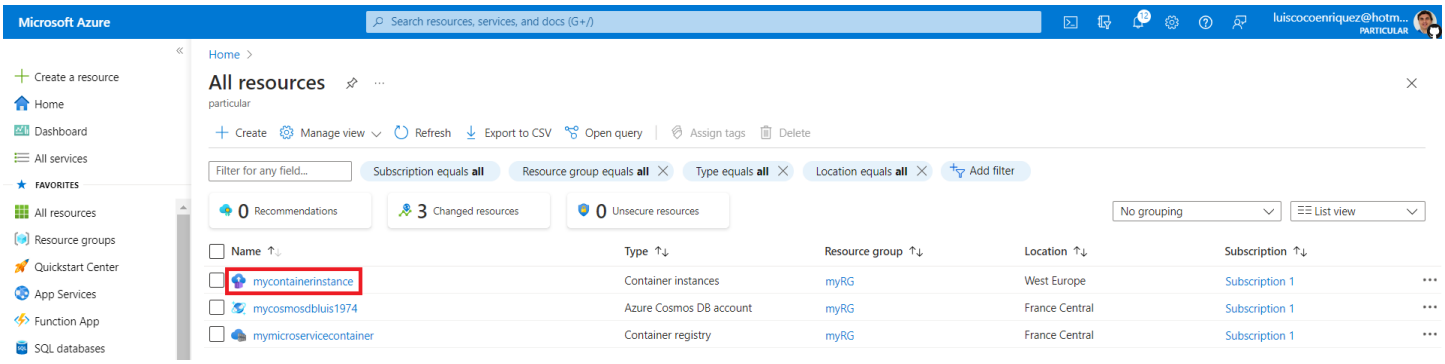
```
az container create --resource-group myRG --name mycontainerinstance --image mymicroservicecon
```

Also we can input the command in multiline

```
az container create --resource-group myRG ^
--name mycontainerinstance ^
--image mymicroservicecontainer.azurecr.io/mymicroservicecontainer:v1 ^
--cpu 1 ^
--memory 1.5 ^
--registry-login-server mymicroservicecontainer.azurecr.io ^
--registry-username mymicroservicecontainer ^
--registry-password RtxdWayhsBSsrvs9ZEpG/cV+M9A1F7Xu5td9+S2lWp+ACRDRt6Dk ^
--dns-name-label mymicroservicedns007 ^
--ports 8080 ^
--location westeurope
```

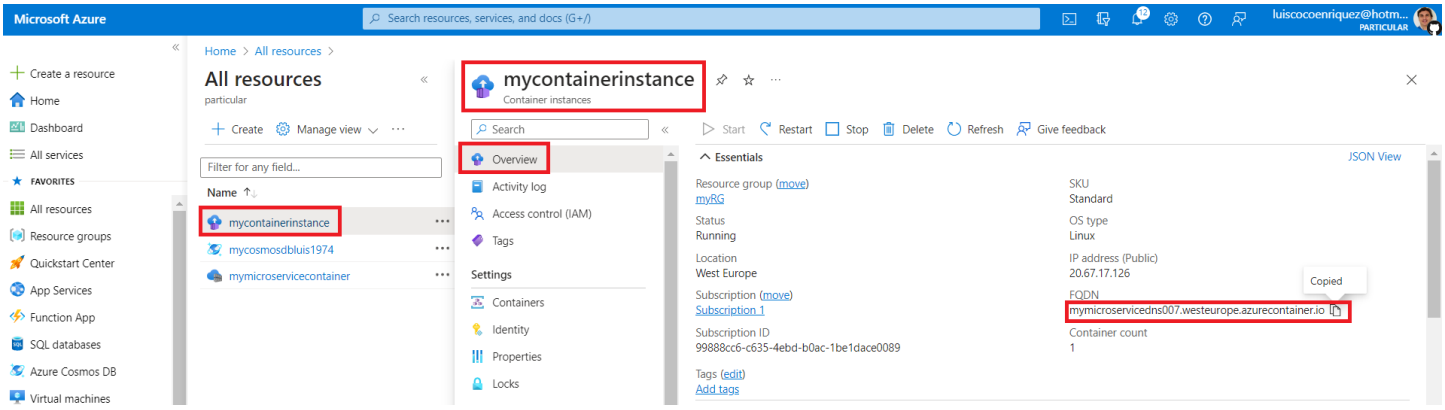
8. Verify the application running in the Azure Container Instance (ACI)

We navigate to the Azure ACI service



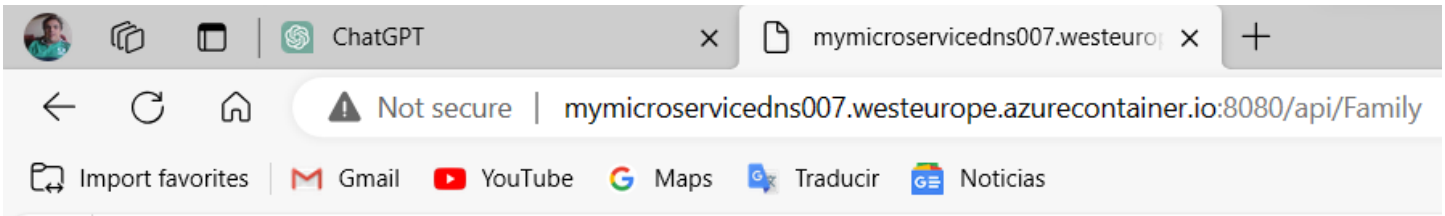
We press in the Azure ACI link

We copy the FQDN



We input the Azure ACI endpoint in the internet web browser

http://mymicroservicedns007.westeurope.azurecontainer.io:8080/api/Family




```
[
    {
        "id": "1",
        "partitionKey": "pk001",
        "lastName": "Smith",
        "parents": [
            {
                "familyName": "Smith",
                "firstName": "John"
            },
            {
                "familyName": "Smith",
                "firstName": "Jane"
            }
        ],
        "children": [
            {
                "familyName": "Smith",
                "firstName": "Emma",
                "gender": "Female",
                "grade": 5,
                "pets": [
                    {
                        "givenName": "Buddy"
                    }
                ]
            },
            {
                "familyName": "Smith",
                "firstName": "Mike",
                "gender": "Male",
                "grade": 8,
                "pets": []
            }
        ],
        "address": {
            "state": "California",
            "county": "Orange",
            "city": "Irvine"
        },
        "isRegistered": true
    }
]
```