Publishing to Azure

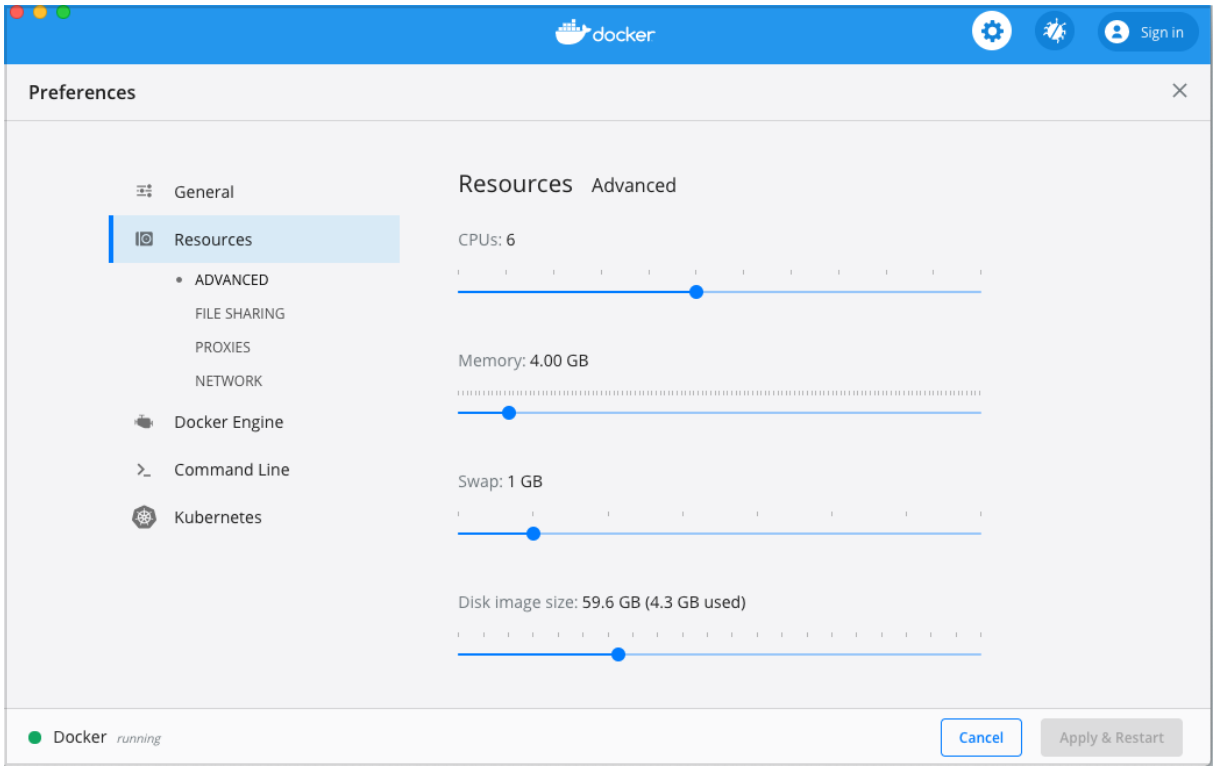
First of all we want to make sure our app runs without issue on Sql Server 2019. For windows you can just install this directly, but for Mac/Linux then you can get a docker image of SQL as Microsoft now has a Linux version of SQL. If you are on Windows but do not have SQL installed then so long as you have Docker then you can go ahead and do the same as me.

Setting up Sql Server for Development

Since SQL is a bit of a big install I'm going to download the files to my computer by running the following command:

```
docker pull microsoft/mssql-server-linux:latest
```

SQL Server requires a bit more memory than other DBs so I am also going to increase the memory for Docker in the preferences to 4GB:

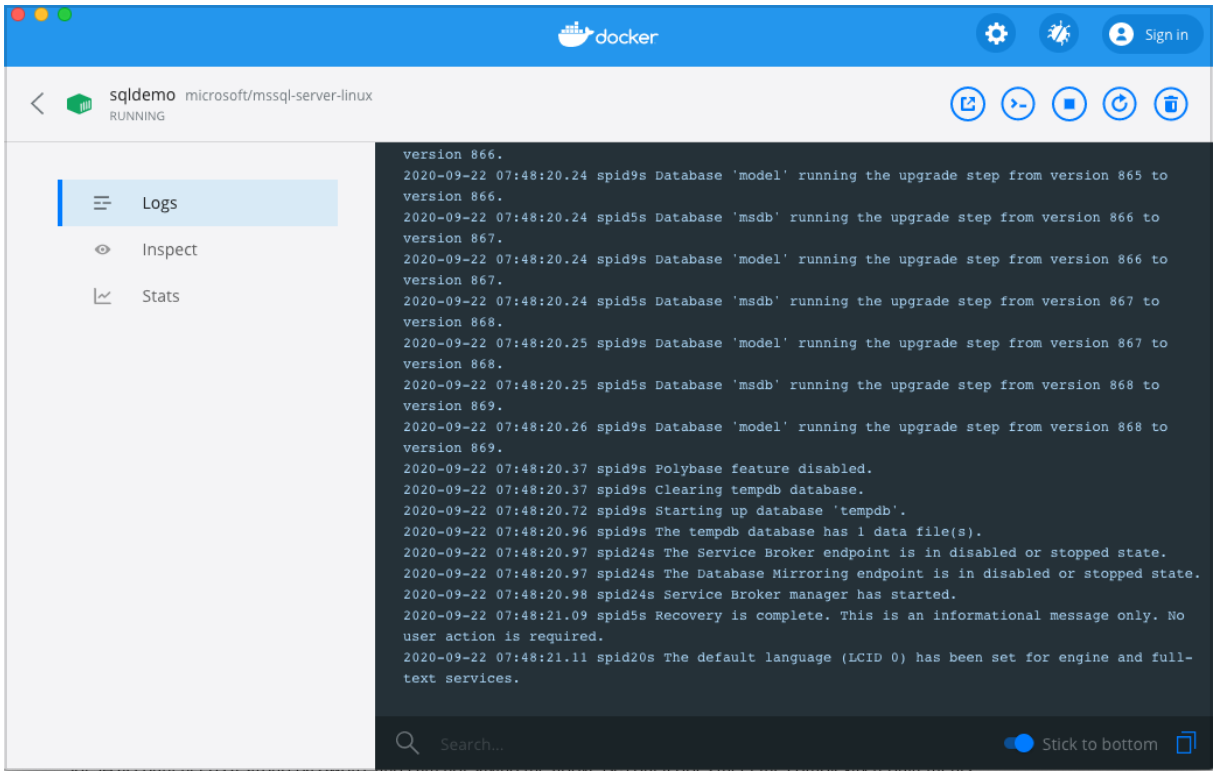


Then we can run the following command to run the SQL Server:

```
docker run -d --name sqldemo -e 'ACCEPT_EULA=Y' -e 'SA_PASSWORD=Password1!' -p
1433:1433 microsoft/mssql-server-linux
```

Sql SA account needs a strong password, and I am not saying the above is(!) but it does meet the complexity requirements.

Should see this now in the docker dashboard:



Switching to use SQL Server for dev.

I'm going to create a new branch so that I do not interfere with the master branch. Run the following:

```
git checkout -b AzurePublish
```

Add the following Sql Server provider via Nuget:

Microsoft.EntityFrameworkCore.SqlServer

You can remove the package for Sqlite and Postgres if you still have them installed - we only need SqlServer for this

Ensure you pick the same version as your runtime.

Open the **appsettings.development.json** and change the default connection string to the following:

```
"ConnectionStrings" : {
    "DefaultConnection": "Server=localhost; User Id=sa; Password=Password1!;
Database=datingappdb"
  },
```

Update the ApplicationServiceExtensions to use this:

```
            services.AddDbContext<DataContext>(options =>
            {

options.UseSqlServer(config.GetConnectionString("DefaultConnection"));
            });
```

Delete the migrations folder from Data/Migrations and create a new migration for the Sql Server provider:

```
dotnet ef migrations add SqlInitial -o Data/Migrations
```

Check the migration and ensure you can see Sql server specific annotations in there:

```
migrationBuilder.CreateTable(
    name: "AspNetRoles",
    columns: table => new
    {
        Id = table.Column<int>(type: "int", nullable: false)
            .Annotation("SqlServer:Identity", "1, 1"),
        Name = table.Column<string>(type: "nvarchar(256)", maxLength: 256, nullable: tru
        NormalizedName = table.Column<string>(type: "nvarchar(256)", maxLength: 256, nul
        ConcurrencyStamp = table.Column<string>(type: "nvarchar(max)", nullable: true)
    },
```

Restart the app and make sure everything works!

Well, it doesn't because Sql server is special:

```
fail: API.Program[0]
      An error occurred during migration
      Microsoft.Data.SqlClient.SqlException (0x80131904): Introducing FOREIGN KEY constraint 'FK_Likes_AspNetUsers_Sour
ceUserId' on table 'Likes' may cause cycles or multiple cascade paths. Specify ON DELETE NO ACTION or ON UPDATE NO ACTI
ON, or modify other FOREIGN KEY constraints.
      Could not create constraint or index. See previous errors.
         at Microsoft.Data.SqlClient.SqlConnection.OnError(SqlException exception, Boolean breakConnection, Action`1 wr
apCloseInAction)
         at Microsoft.Data.SqlClient.SqlInternalConnection.OnError(SqlException exception, Boolean breakConnection, Act
ion`1 wrapCloseInAction)
         at Microsoft.Data.SqlClient.TdsParser.ThrowExceptionAndWarning(TdsParserStateObject stateObj, Boolean callerHa
sConnectionLock, Boolean asyncClose)
         at Microsoft.Data.SqlClient.TdsParser.TryRun(RunBehavior runBehavior, SqlCommand cmdHandler, SqlDataReader dat
aStream, BulkCopySimpleResultSet bulkCopyHandler, TdsParserStateObject stateObj, Boolean& dataReady)
         at Microsoft.Data.SqlClient.SqlCommand.InternalEndExecuteNonQuery(IAsyncResult asyncResult, Boolean isInternal
  String endMethod)
```

So we need to add an extra bit of configuration here to the DataContext.cs class and make sure one of the 'UserLike' specifies no action for the delete behaviour:

```
            builder.Entity<UserLike>()
                .HasOne(s => s.SourceUser)
                .WithMany(l => l.LikedUsers)
                .HasForeignKey(s => s.SourceUserId)
                .OnDelete(DeleteBehavior.NoAction);

            builder.Entity<UserLike>()
                .HasOne(s => s.LikedUser)
                .WithMany(l => l.LikedByUsers)
                .HasForeignKey(s => s.LikedUserId)
                .OnDelete(DeleteBehavior.Cascade);
```

Delete the migrations folder and recreate the migration

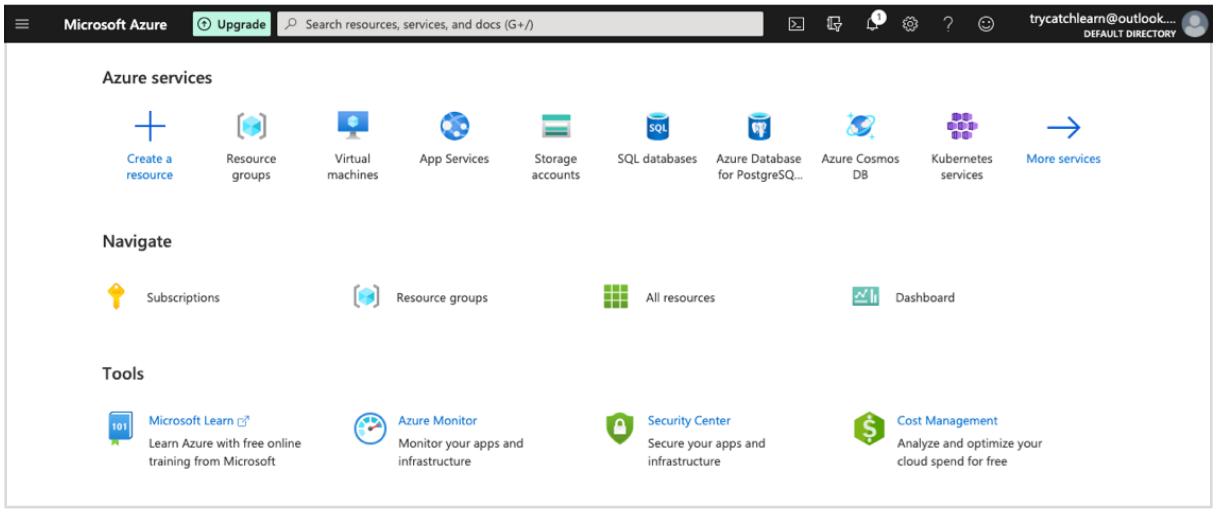
```
dotnet ef migrations add SqlInitial -o Data/Migrations
```

Restart the app again and make sure we have success!

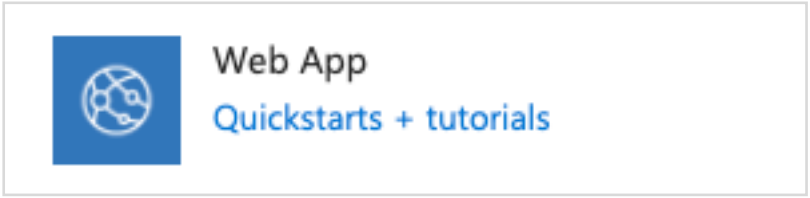
This time everything goes smoothly. Restart the angular app and ensure we can operate the application without any errors on localhost 4200. It should work fine.

Creating an app service in Azure

Now is time to go and create an app in Azure. If you have never used Azure before then you will be able to use $150 worth of resources for the first 12 months. You will still need to provide credit card info though which is why this is not part of the main course. Once you are in you should see something like this:



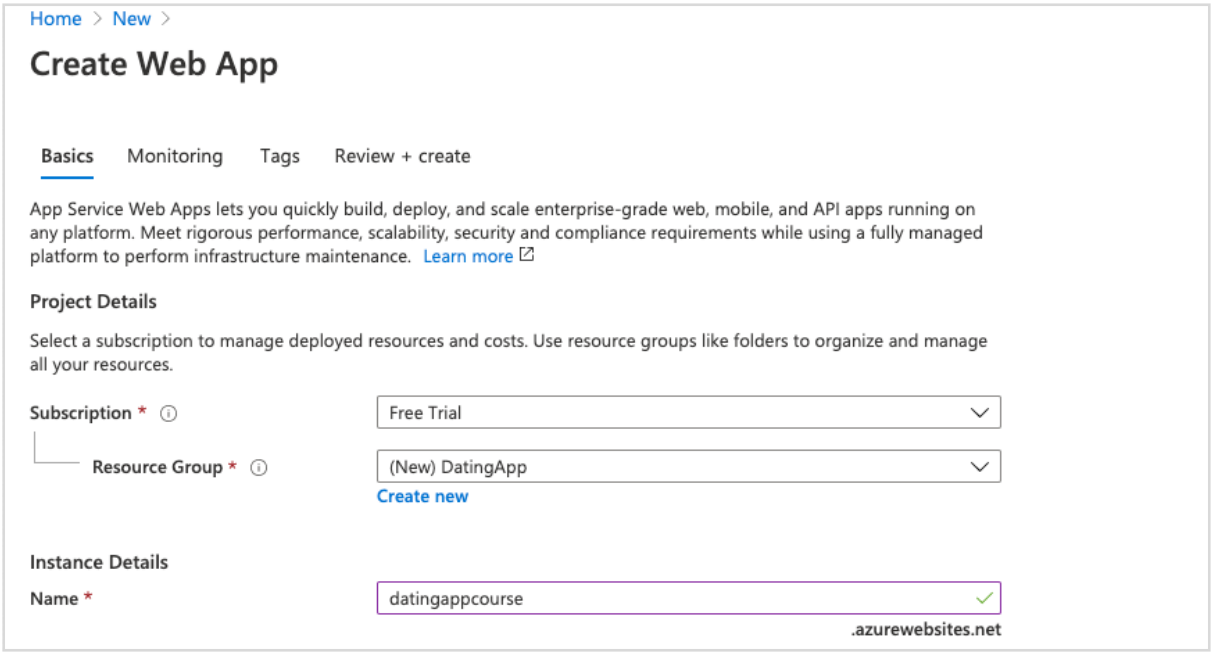
From here we want to create a new resource, so hit the 'Create resource' button, then select 'Web App' from the list:

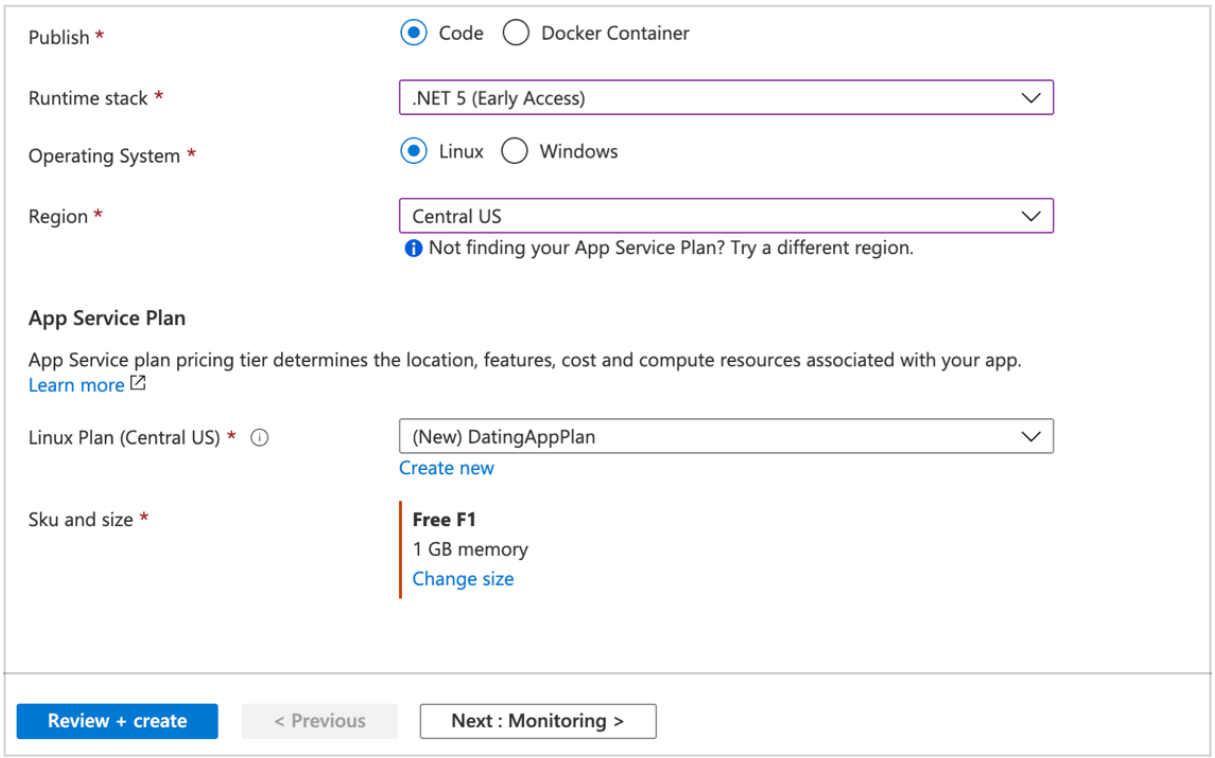


We then need to complete a form (yay!). You will need to create a resource group which is just a container for… resources.

These are the options I've selected - the goal here is to select the absolute cheapest or

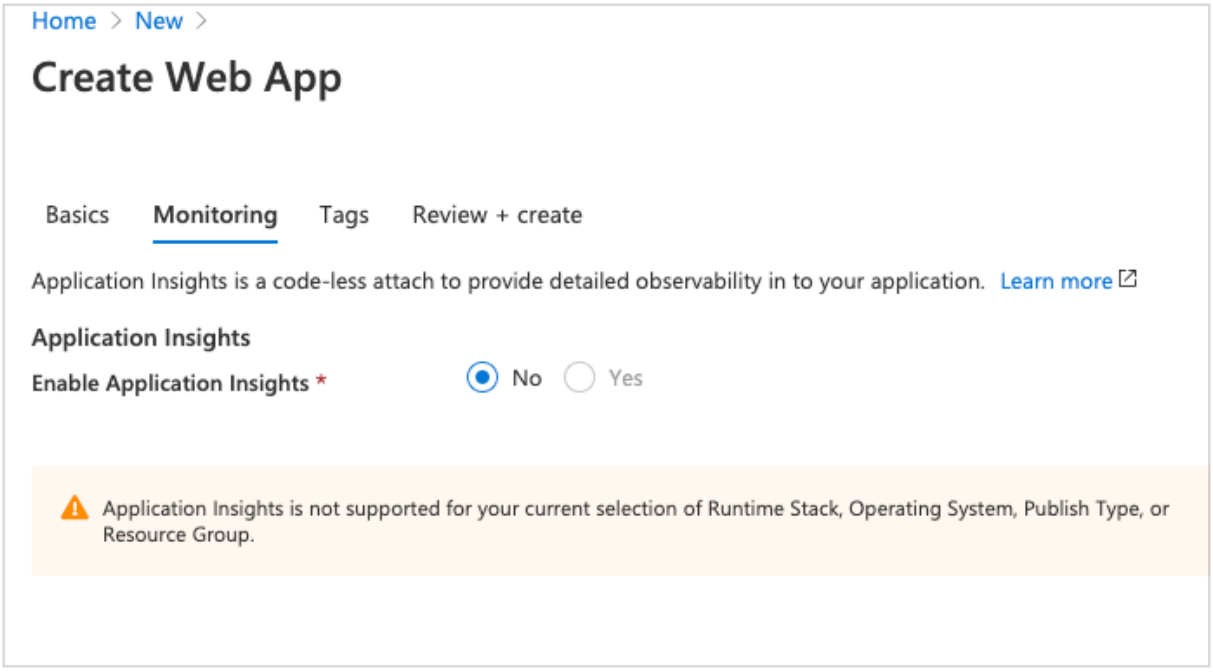
free options available so you will need to be careful as obviously Microsoft will select some expensive defaults for you if you just accept them without changing.



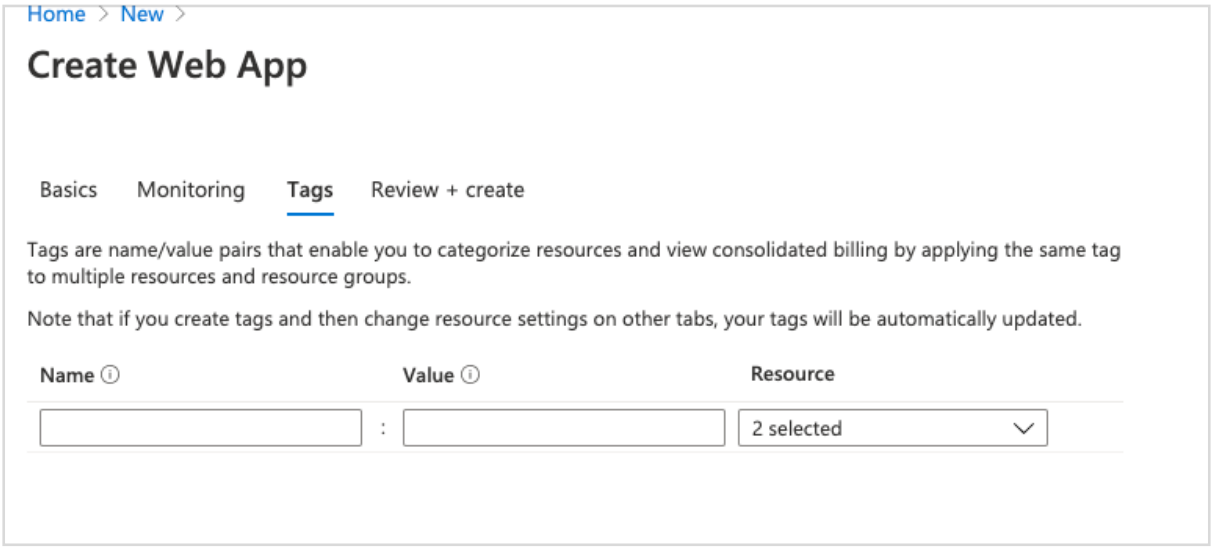


Note that .Net 5 is still in “Early Access”, but this is what we are looking for.

Click the next button… Monitoring:

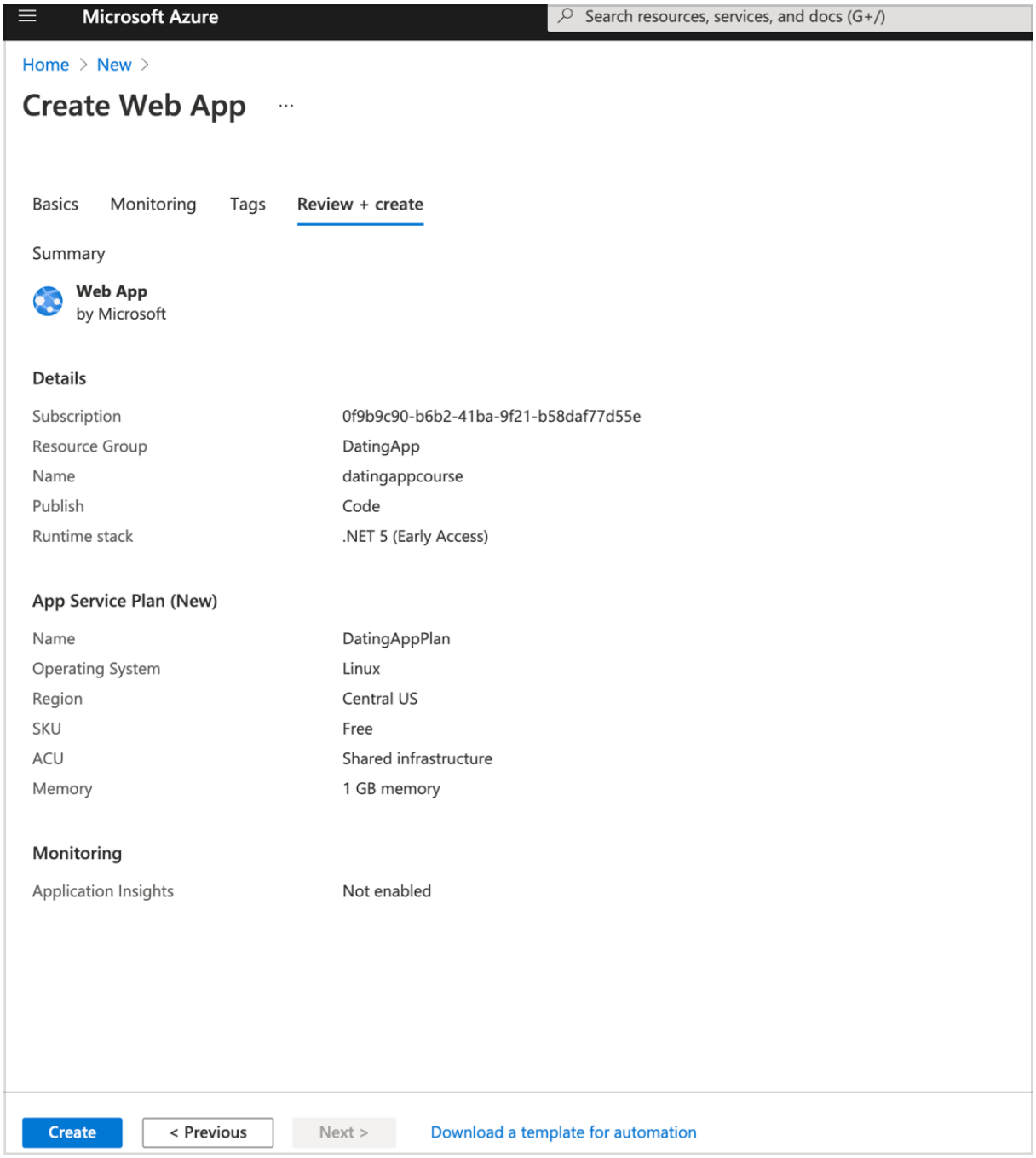


Not much choice here. So either the Linux config does not allow this or (more likely) this is not available for freebies. Click Next: tags

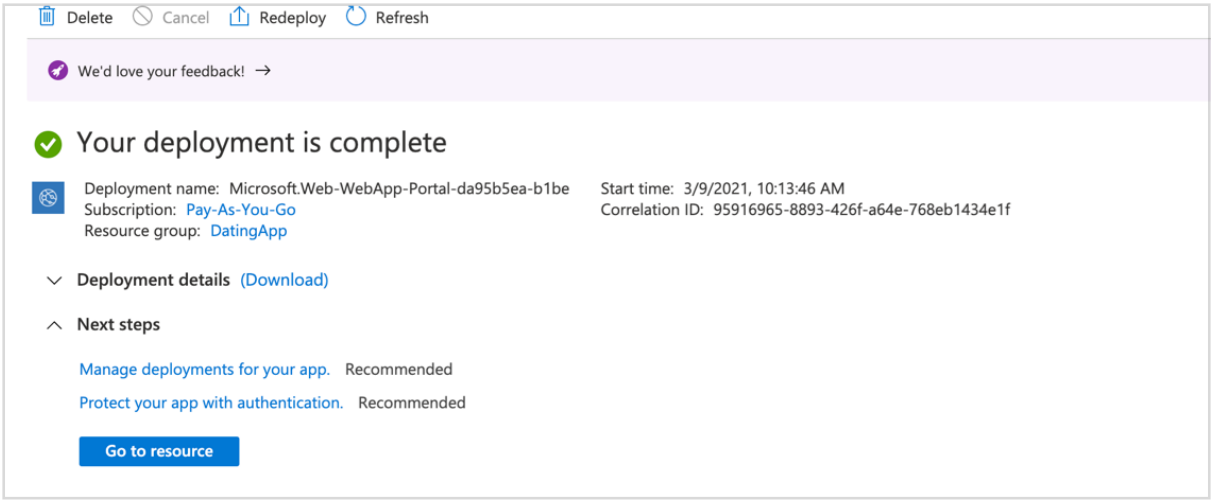


I'm leaving this blank. Next: Review + Create (finally!)

Then we get to review our selections:

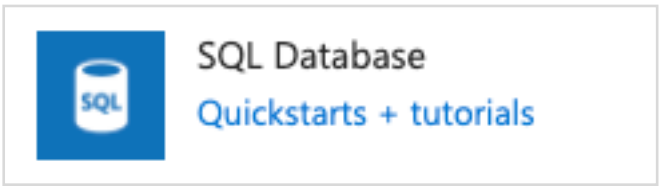


Then we get to hit the Create button and go make a coffee whilst it does its thing, it will probably take a few minutes. Once its done we should see this:



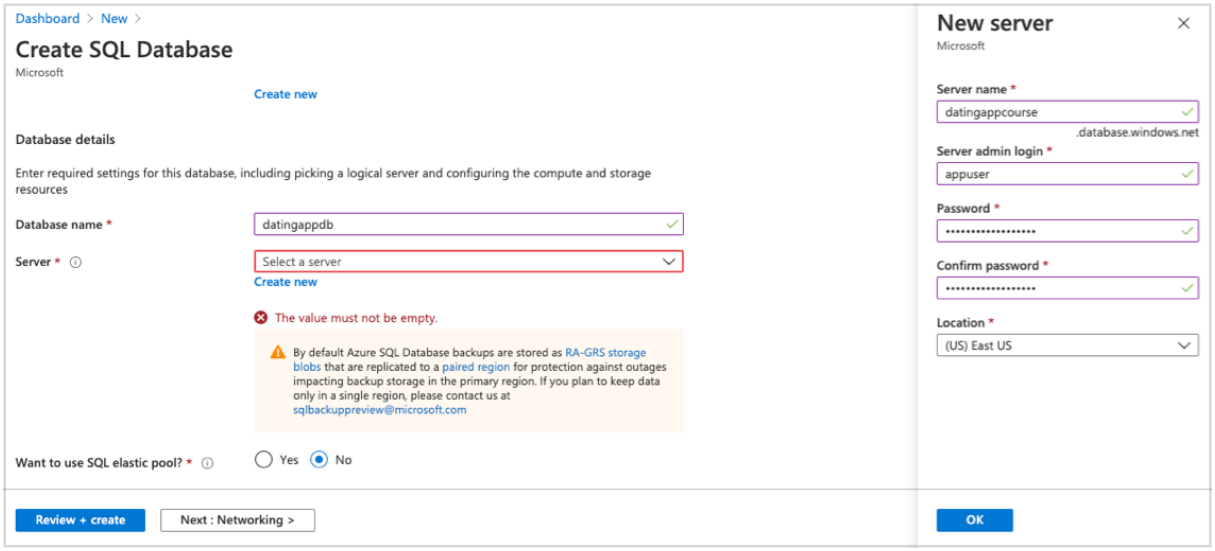
Now we need a Database server. Click the hamburger icon in the top left and hit the 'Create a resource' link.

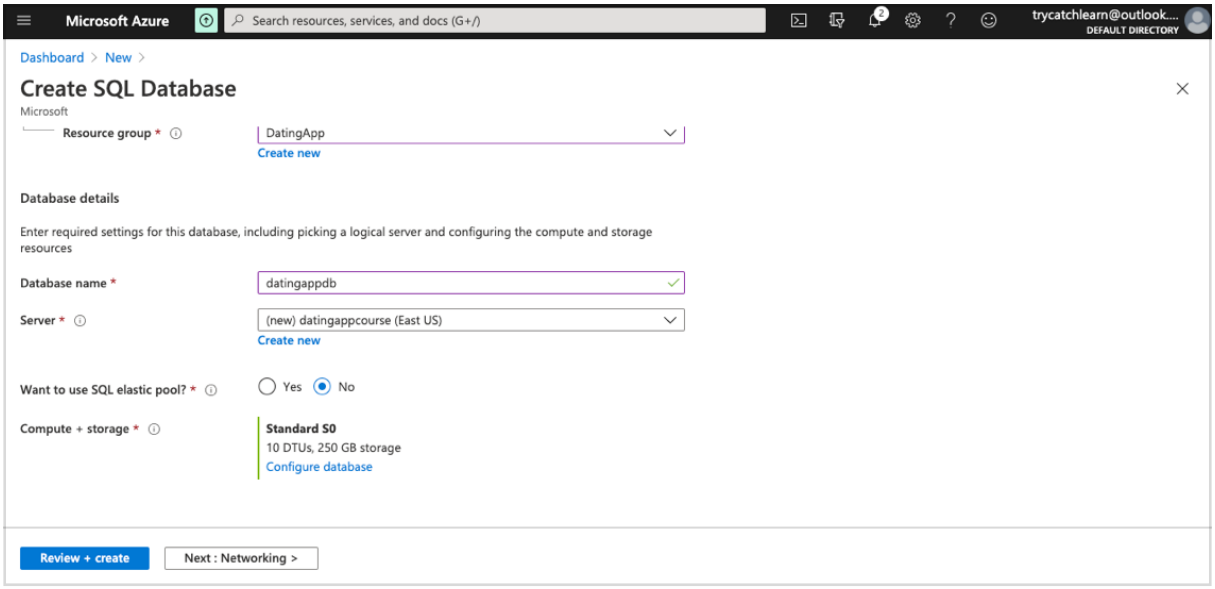
Select the SQL Database:



We now have another form to fill out (yay!). Once again the goal here is not to accept the defaults but seek out the cheapest (or free) option available. The options here will be different depending on what your subscription here is so proceed with utmost caution unless you have more money than you know what to do with in which case the defaults will be fine.

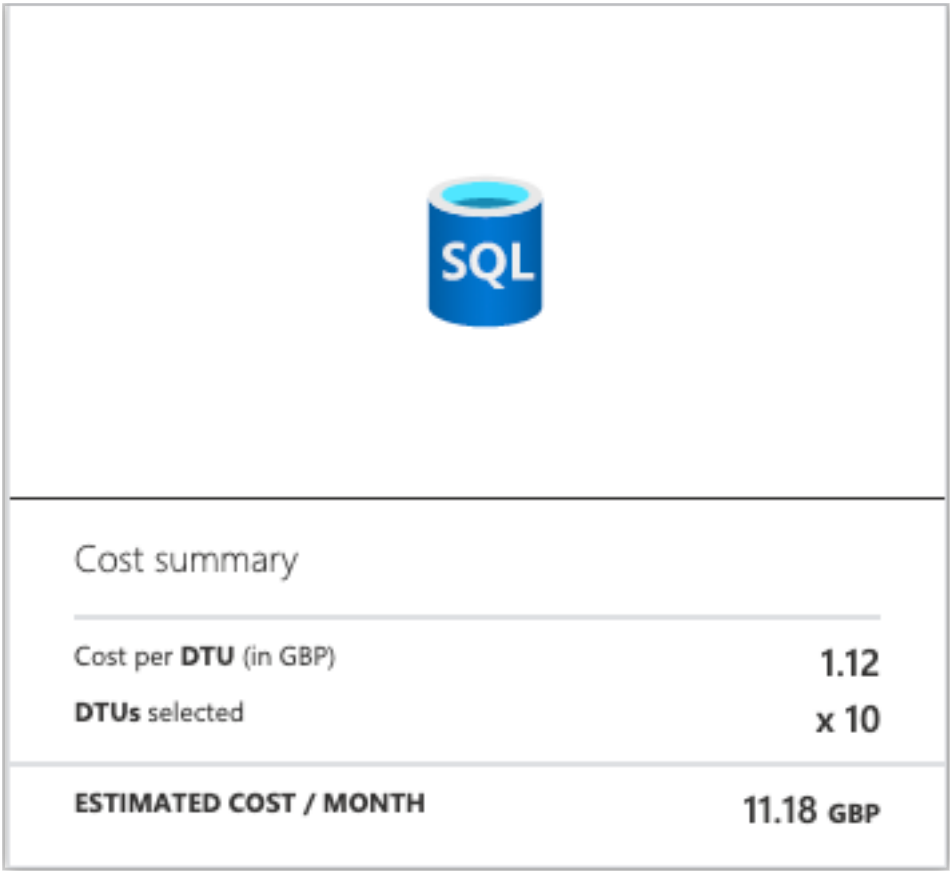
We need to create a server here for our Database that has a unique name on Azure, as well as an admin account that cannot use the name 'admin' so I've gone for appuser as my admin account:





Microsoft have kindly selected Standard S0 as the Database server that doesn't have any pricing info associated with it. I wonder how much this costs….

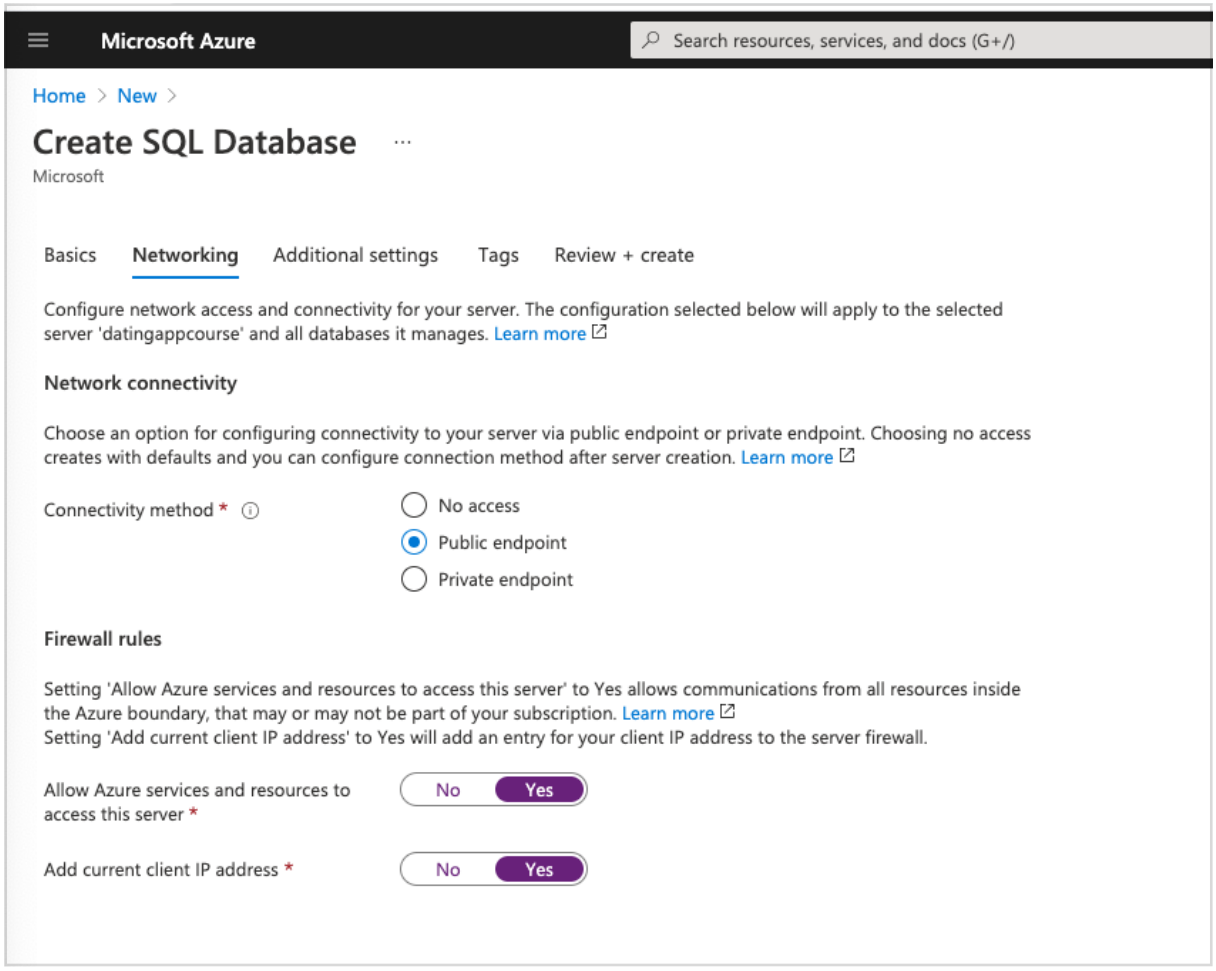
Click the configure database link to take a look:



Ok not as much as I thought it was going to be but let's see if we can get a freebie.

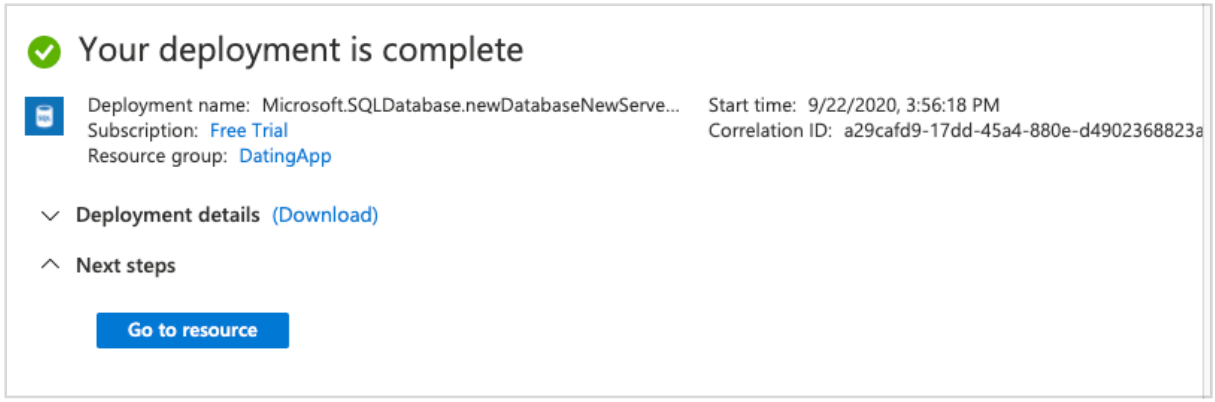
This is the cheapest option I can see on mine. No freebies :(Looks like I'll be eating into that $150 they have provided for my new account.

Click next ➜ Networking and set the following options:

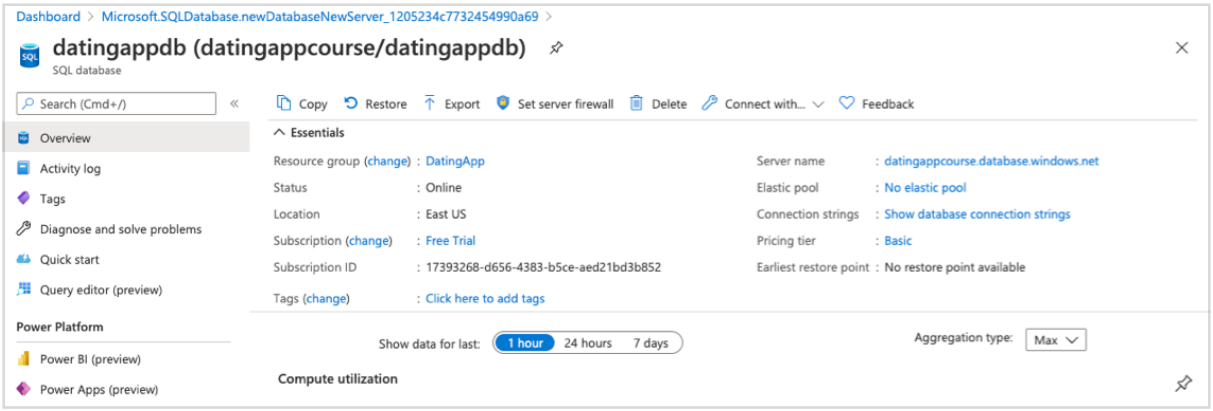


You can take a look at the other options here but I'm going with this and will select create. Azure will now do its thing so time for another coffee.

Once this has complete you should see the following:



We now need to tell our Web app about our new Database server, but we will need to get the connection string info so click the 'Go to resource' button and you should see the following:

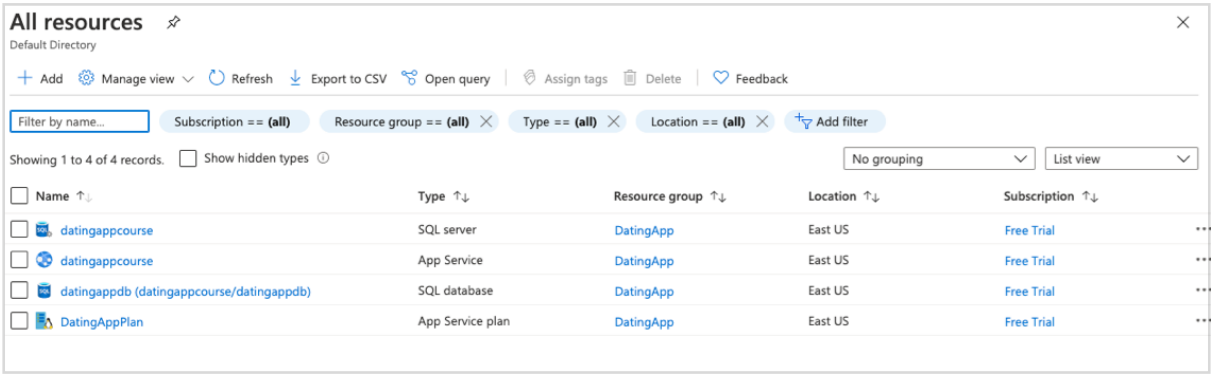


Click on the Show database connection strings and copy/paste them somewhere.

```
Server=tcp:datingappcourse.database.windows.net,1433;Initial
Catalog=datingappdb;Persist Security Info=False;User
ID=appuser;Password={your_password};MultipleActiveResultSets=False;Encrypt=True
;TrustServerCertificate=False;Connection Timeout=30;
```

Make a note to yourself you need to update the password as I am pretty sure I didn't set the password to {your_password}

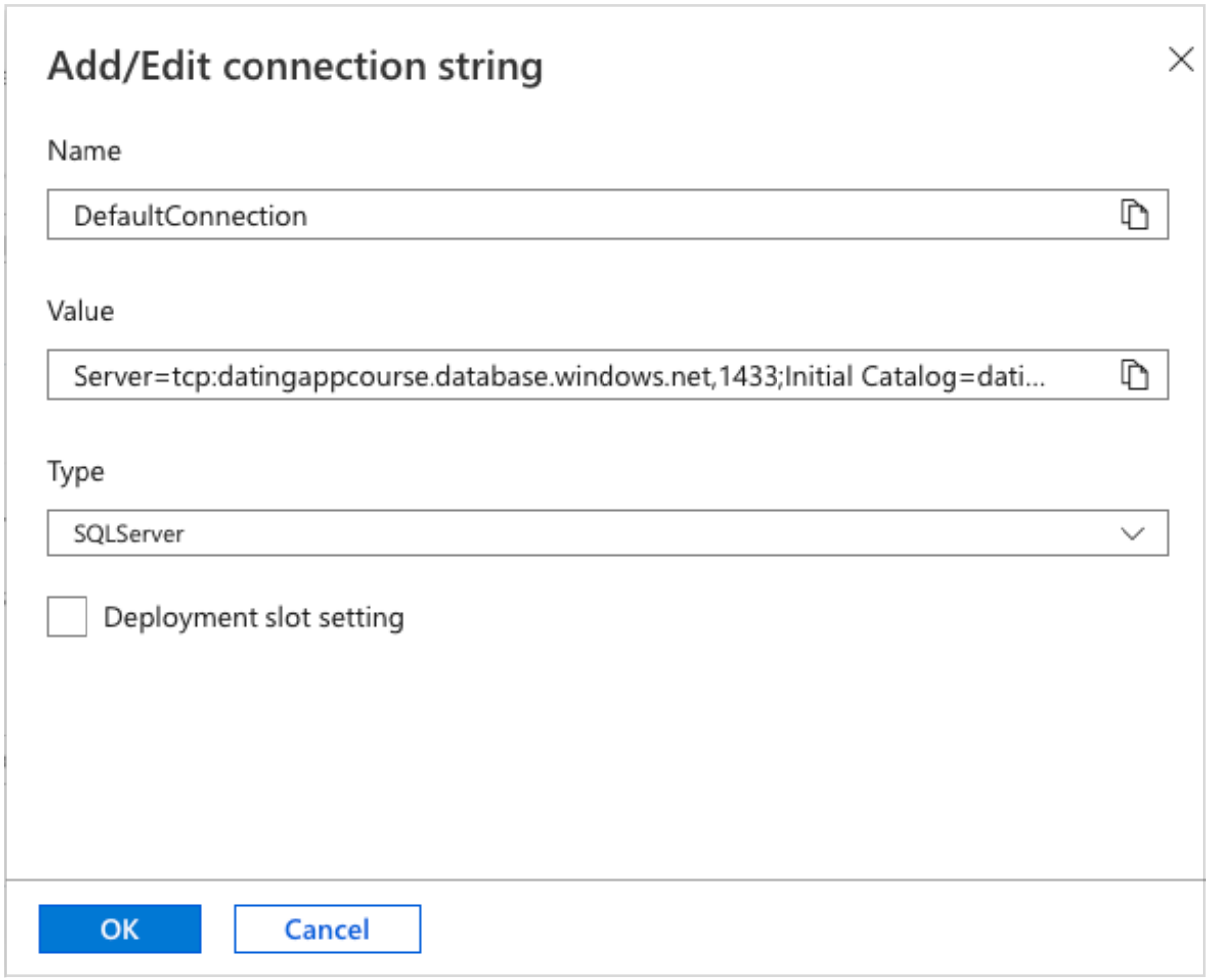
Click on the hamburger icon and select 'All resources' to get to the list of resources we have created. Should see something like this:



We need to provide environment variables to our app so it knows the following:

1. TokenKey
2. CloudinarySettings
3. ConnectionString

Click on the App Service, then once here select 'Configuration' from the list on the left. Click on the button to add a new Connection String:



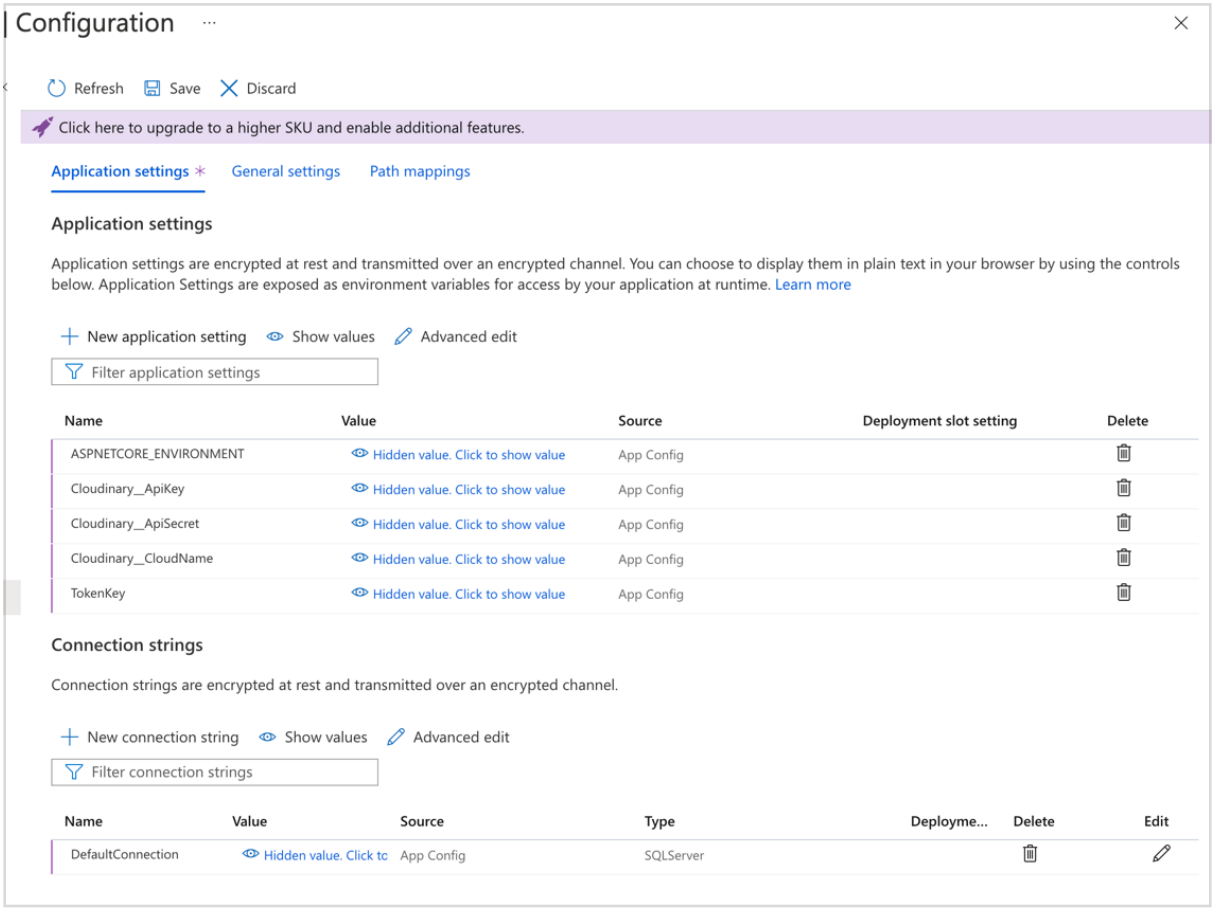
Make sure you call it "DefaultConnection" as this is what we called this connection in our app.

Don't forget to change {your_password} to your password. Not literally 'your password' but the password you created earlier!

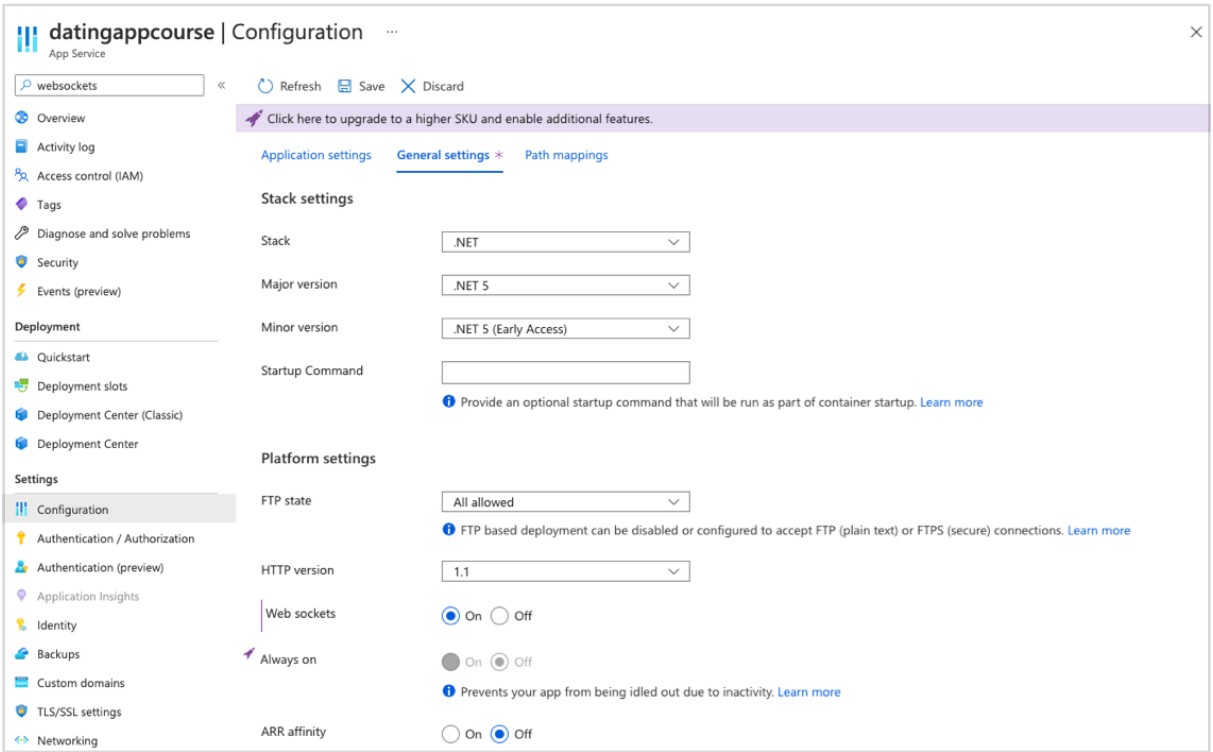
We can then add the application settings for the TokenKey and cloudinary. Make sure your token key is a strong key so use a password generator and go for at least 32 characters.

Also, add a key for the environment as well so set ASPNETCORE_ENVIRONMENT to Production

Should see something like this once you are done:

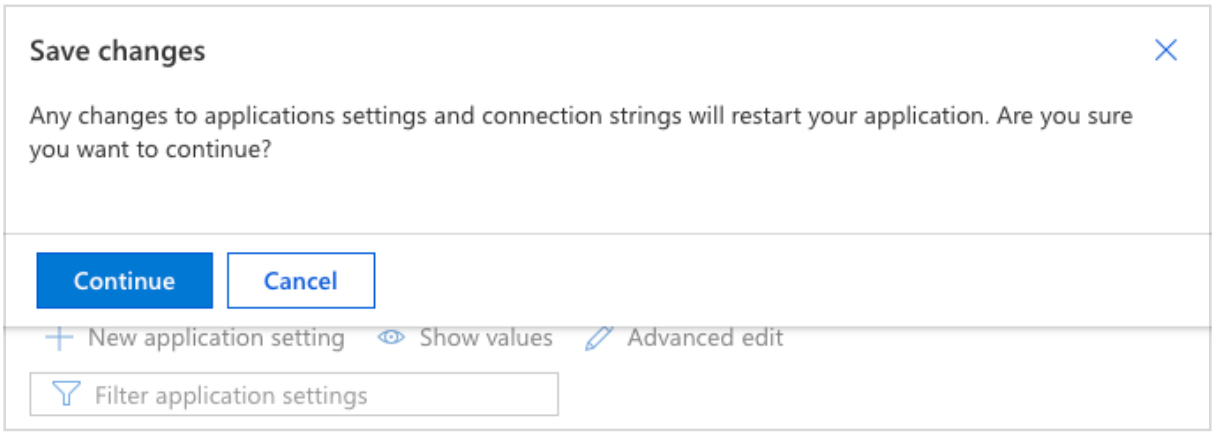


We also need to enable WebSockets so on the General Settings tab enable this:



Note that we cannot use a : for nested keys as we chose a linux container earlier. When specifying a nested key we have to use a double underscore

Also, don't forget to hit the Save changes button when you are done and continue which will restart our app.

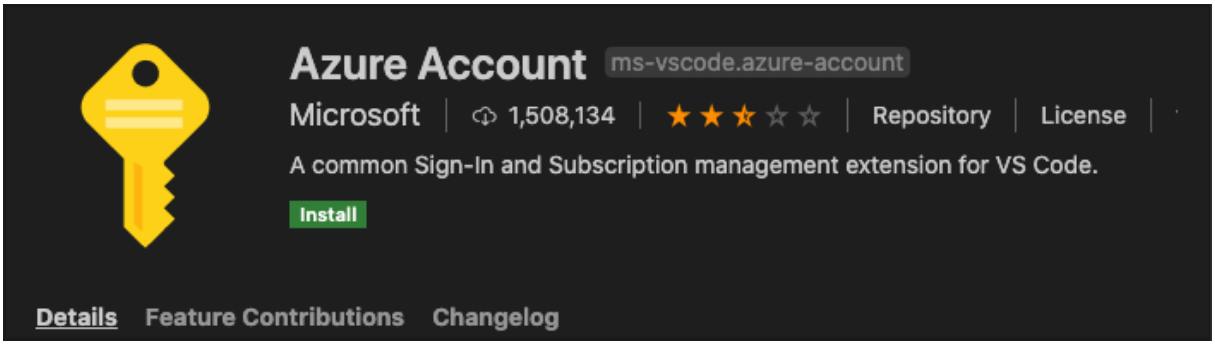


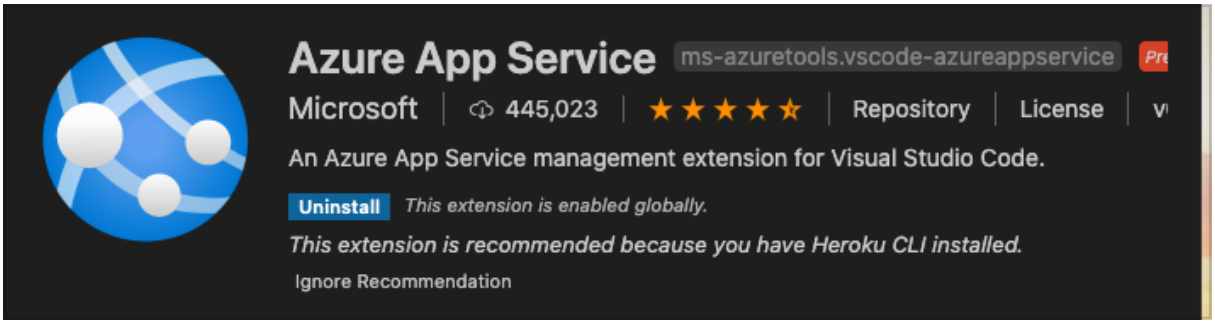
Deploying the app.

Our next task is to get our app from our Dev machine over to Azure.

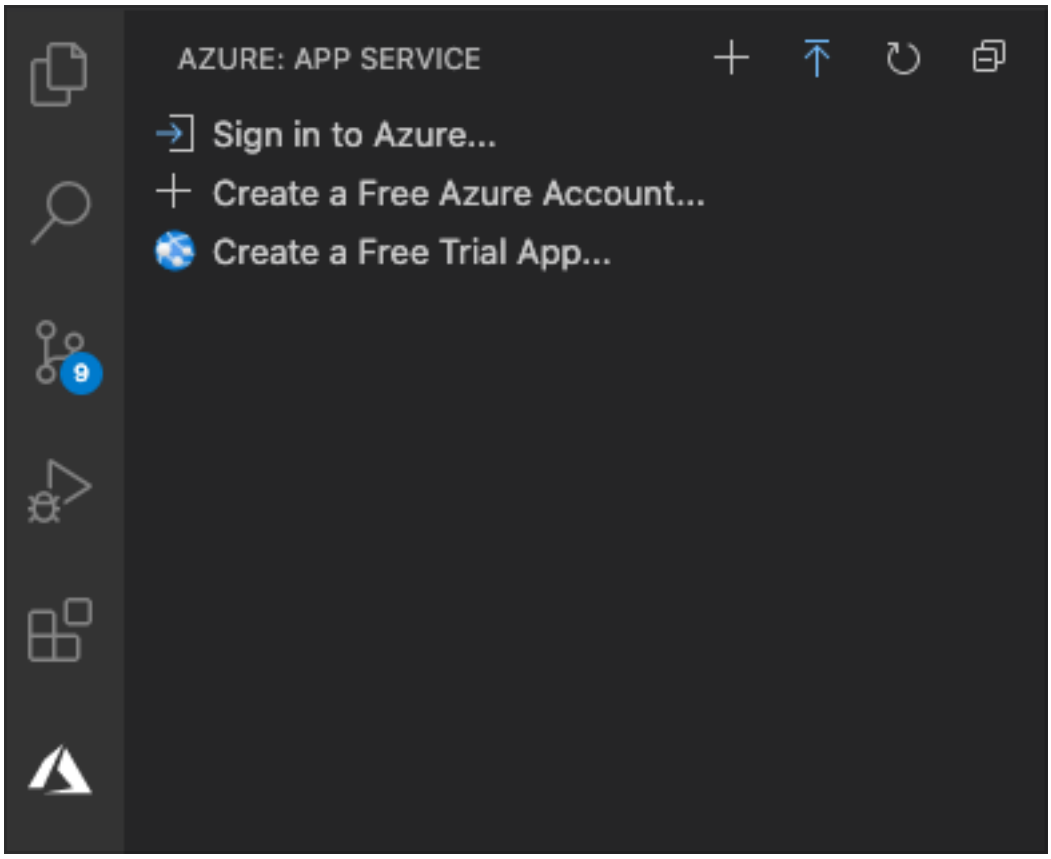
To do this we will need to add 2 new extensions to VS Code to make our life a bit easier.

Azure Account extension and Azure App Service.

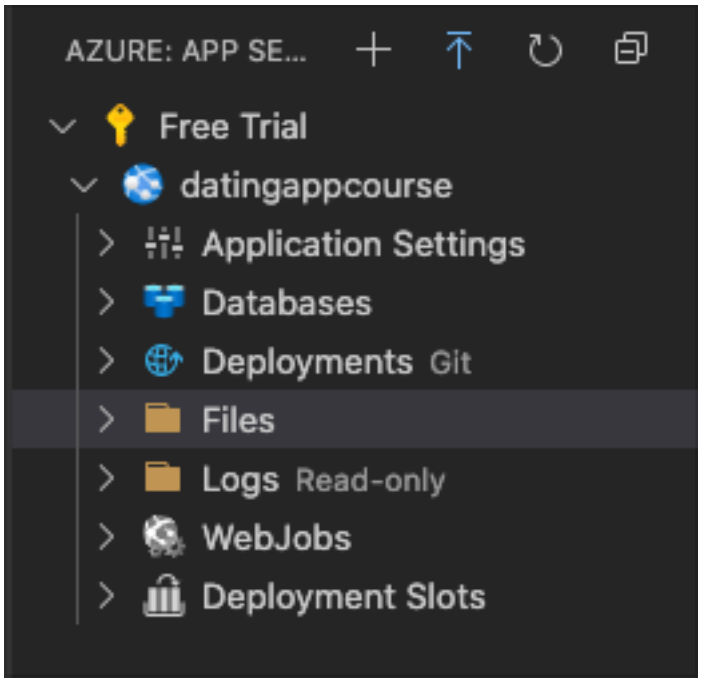




Click on the shiny new Azure Icon in VS Code and sign in with your account:

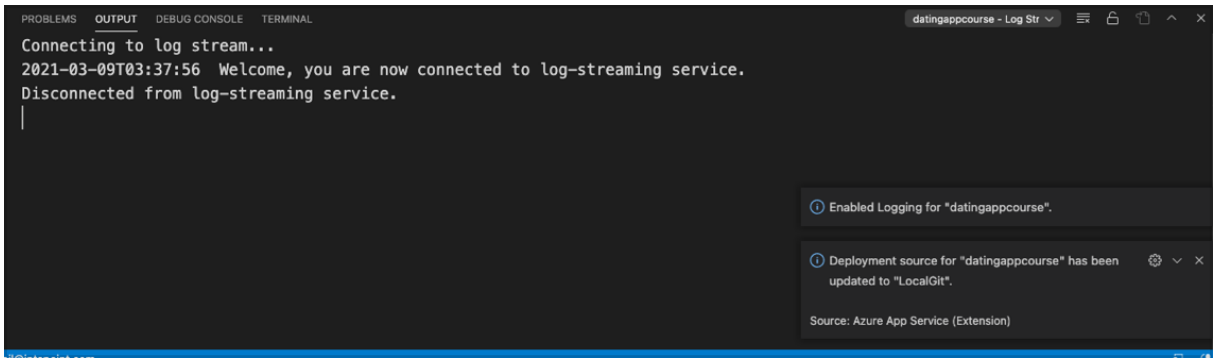


Should see the following:



Right click the app and select “start streaming logs” so that we get logging information

from Azure.



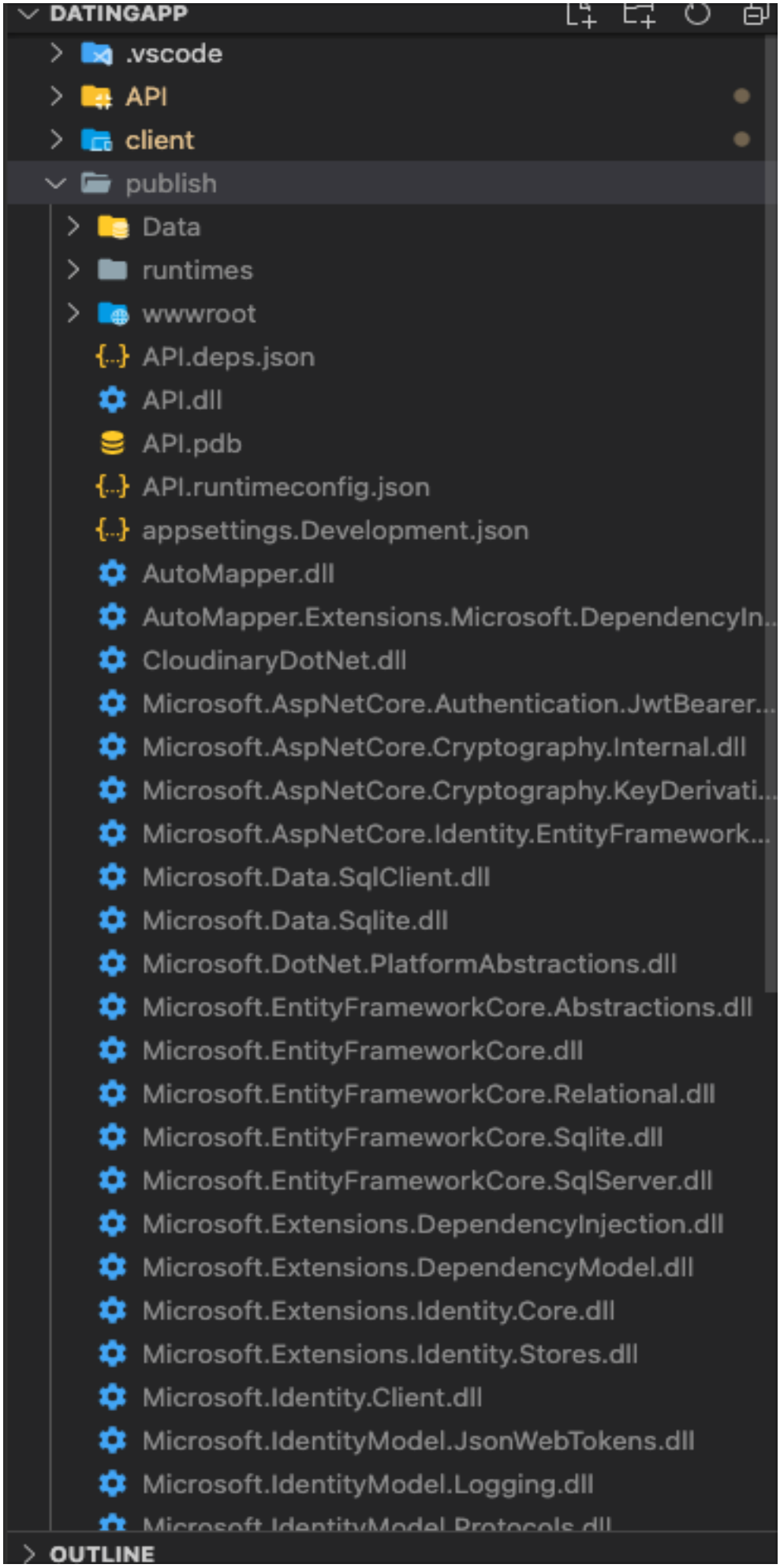
If you need to republish your Angular app for any reason now is a good time to do so.

```
ng build --prod
```

Now we will create a publish folder that we will use for deployment for the .Net application. In the solution folder run the following:

```
dotnet publish -c Release -o publish
```

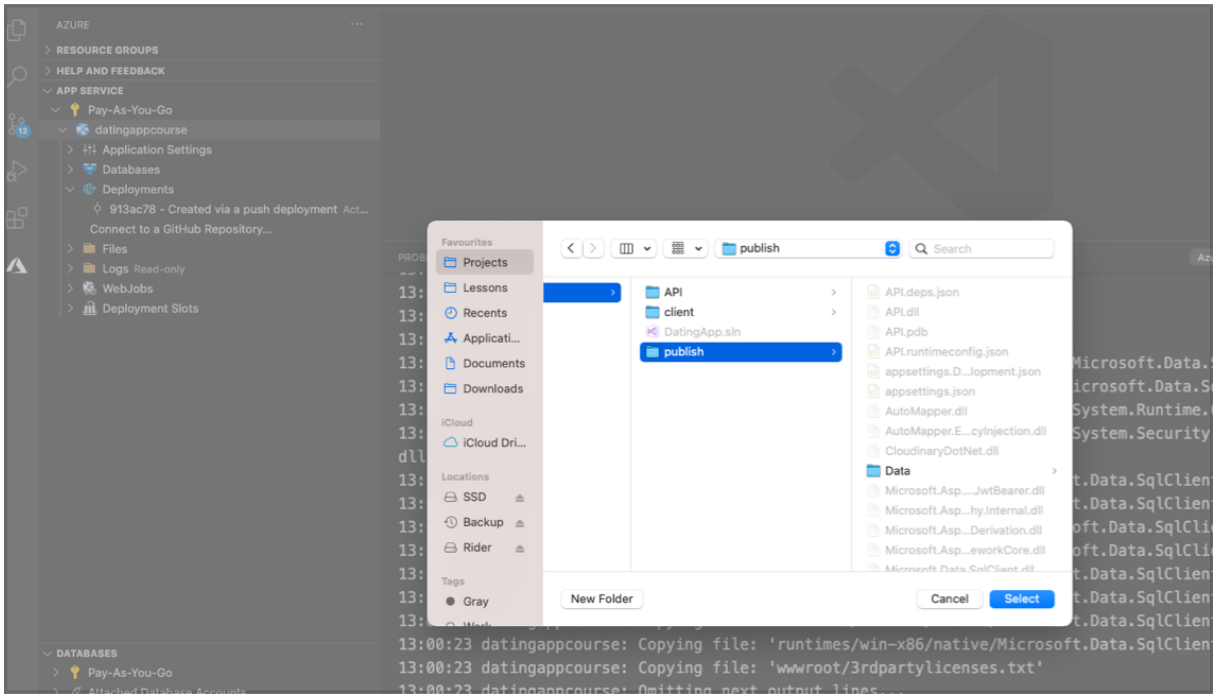
In your solution folder you should see:


DATINGAPP
.vscode
API
client
publish
Data
runtimes
wwwroot
API.deps.json
API.dll
API.pdb
API.runtimeconfig.json
appsettings.Development.json
AutoMapper.dll
AutoMapper.Extensions.Microsoft.DependencyIn...
CloudinaryDotNet.dll
Microsoft.AspNetCore.Authentication.JwtBearer...
Microsoft.AspNetCore.Cryptography.Internal.dll
Microsoft.AspNetCore.Cryptography.KeyDerivati...
Microsoft.AspNetCore.Identity.EntityFramework...
Microsoft.Data.SqlClient.dll
Microsoft.Data.Sqlite.dll
Microsoft.DotNet.PlatformAbstractions.dll
Microsoft.EntityFrameworkCore.Abstractions.dll
Microsoft.EntityFrameworkCore.dll
Microsoft.EntityFrameworkCore.Relational.dll
Microsoft.EntityFrameworkCore.Sqlite.dll
Microsoft.EntityFrameworkCore.SqlServer.dll
Microsoft.Extensions.DependencyInjection.dll
Microsoft.Extensions.DependencyModel.dll
Microsoft.Extensions.Identity.Core.dll
Microsoft.Extensions.Identity.Stores.dll
Microsoft.Identity.Client.dll
Microsoft.IdentityModel.JsonWebTokens.dll
Microsoft.IdentityModel.Logging.dll
OUTLINE

Now we are ready to publish!

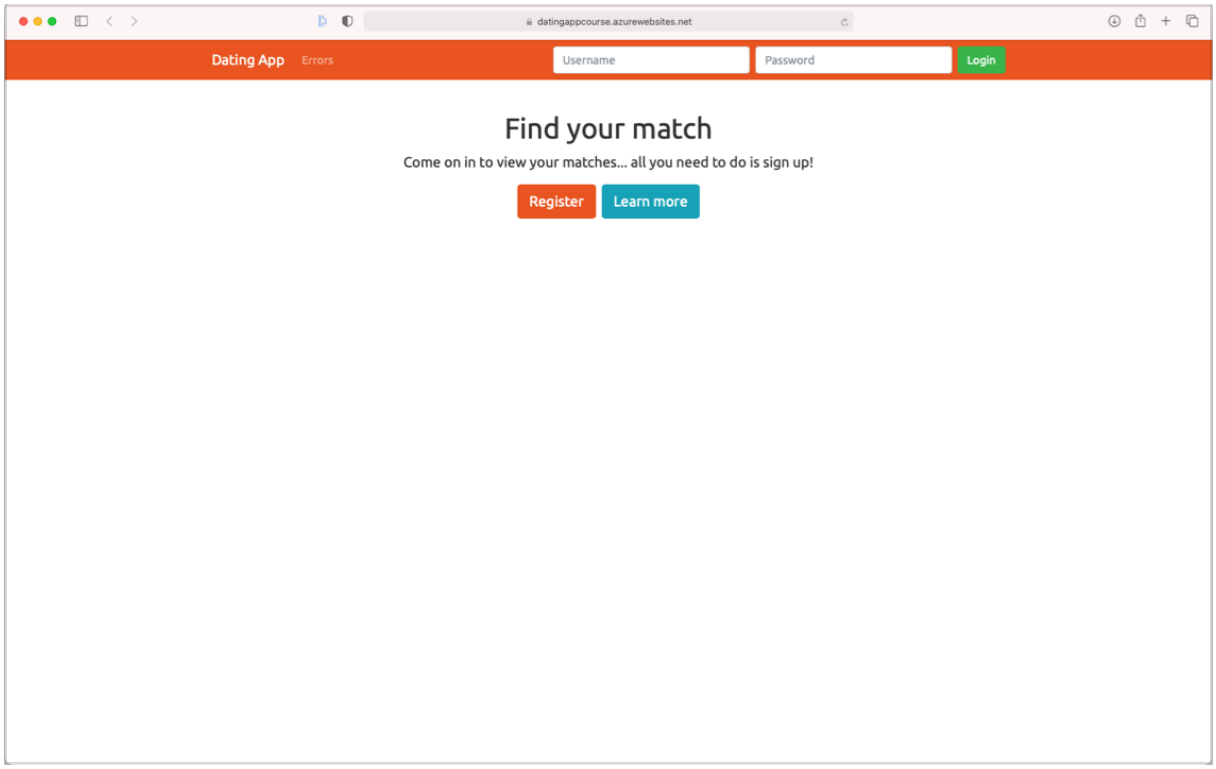
Right-click the app service in the Azure extension and select deploy to web app…

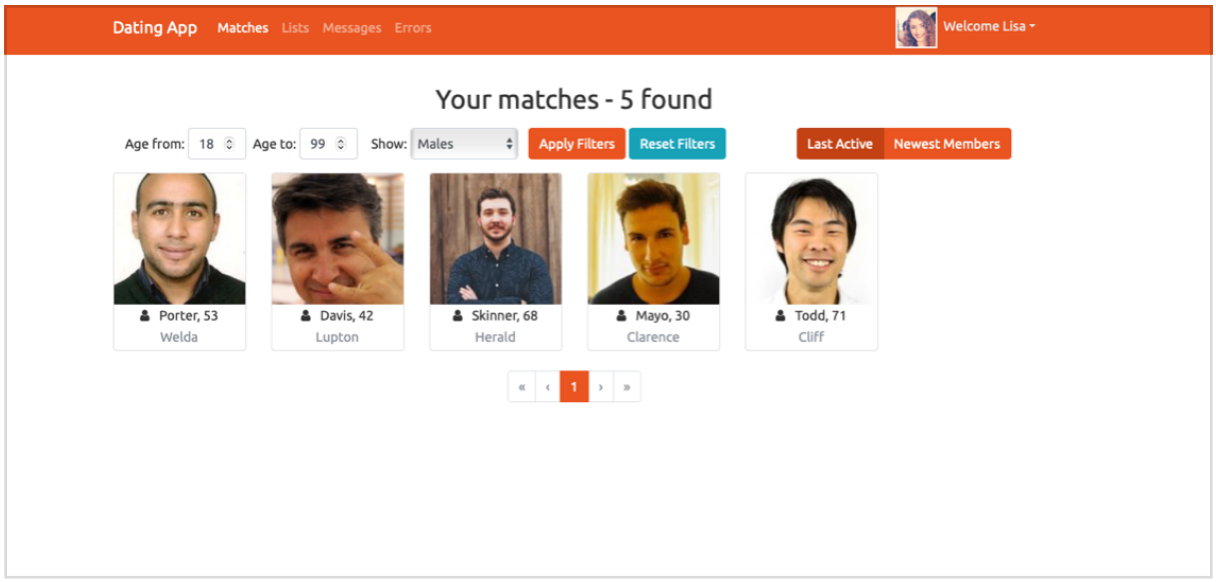
Browse to the publish folder and select it.

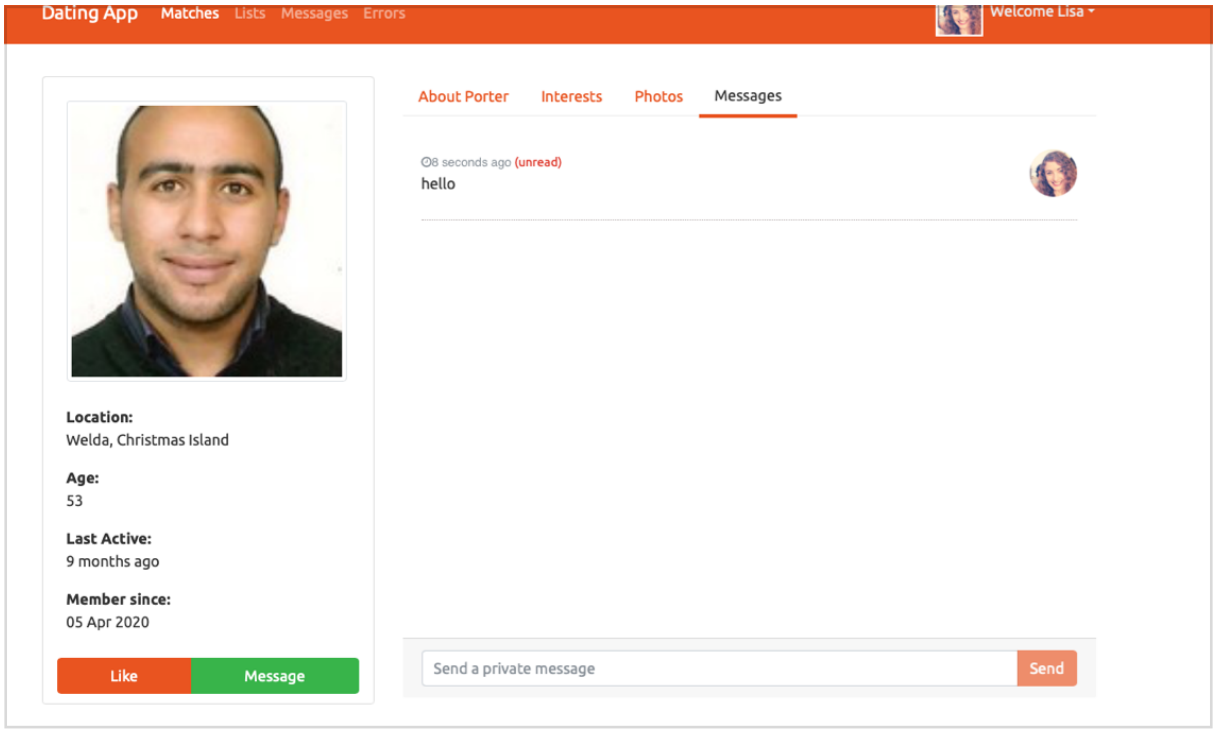


```
13:00:22 datingappcourse: Copying file: 'web.config'
13:00:22 datingappcourse: Deleting file: 'hostingstart.html'
13:00:22 datingappcourse: Copying file: 'Data/UserSeedData.json'
13:00:22 datingappcourse: Copying file: 'runtimes/unix/lib/netcoreapp3.1/M
13:00:22 datingappcourse: Copying file: 'runtimes/win/lib/netcoreapp3.1/Mi
13:00:23 datingappcourse: Copying file: 'runtimes/win/lib/netstandard2.0/S
13:00:23 datingappcourse: Copying file: 'runtimes/win/lib/netstandard2.0/S
dll'
13:00:23 datingappcourse: Copying file: 'runtimes/win-arm/native/Microsoft
13:00:23 datingappcourse: Copying file: 'runtimes/win-arm/native/Microsoft
13:00:23 datingappcourse: Copying file: 'runtimes/win-arm64/native/Microso
13:00:23 datingappcourse: Copying file: 'runtimes/win-arm64/native/Microso
13:00:23 datingappcourse: Copying file: 'runtimes/win-x64/native/Microsoft
13:00:23 datingappcourse: Copying file: 'runtimes/win-x64/native/Microsoft
13:00:23 datingappcourse: Copying file: 'runtimes/win-x86/native/Microsoft
13:00:23 datingappcourse: Copying file: 'runtimes/win-x86/native/Microsoft
13:00:23 datingappcourse: Copying file: 'wwwroot/3rdpartylicenses.txt'
13:00:23 datingappcourse: Omitting next output lines...
13:00:23 datingappcourse: Finished successfully.
13:00:24 datingappcourse: Running post deployment command(s)...
13:00:24 datingappcourse: Triggering recycle (preview mode disabled).
13:00:24 datingappcourse: Deployment successful.
13:00:39: Deployment to "datingappcourse" completed.
```

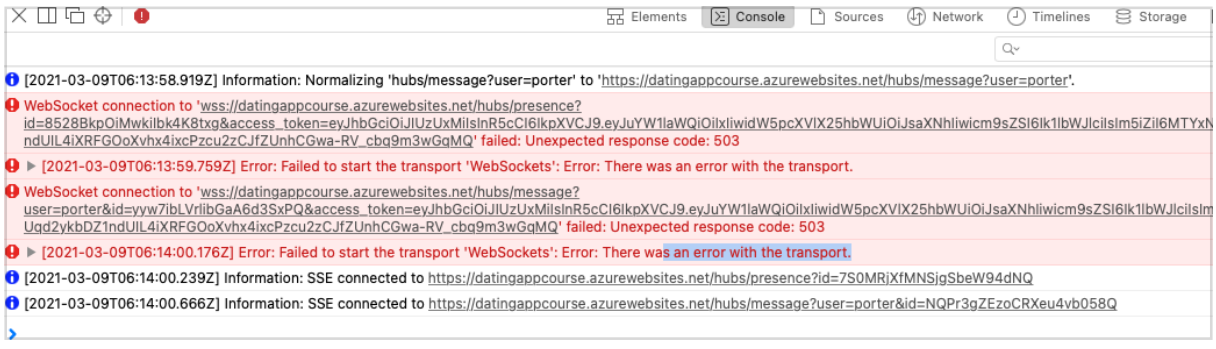
It will pop up with an option to browse the site and you can say yes and hey presto! The site is live and published in Azure.







Note: At time of writing there is an issue with Azure web sockets so it is defaulting to Server Side Events. You may see errors in the logs like follows:



This just means that Websockets is not available. The chat/presence still works but just using a different protocol. The fact that .Net is still in “Early access” and not released probably has something to do with this.

#datingapp-final/section19