Boxer Product Management System

This document is intended to for anyone who might be required to have a technical understanding of to the implemented solution by outlining high level design and requirements specification.

Summary

The documents outlines the high-level design and specification for the implemented system. The current system is for managing products offered by the business. The system is developed following the Microservice pattern currently with three microservices, Gateway, Security and Product management. The code was developed using c# dotnet core version 9, angular version 25 and ionic 8. The application makes use of two SQL databases and entity core for all interactions. There is a database stored procedure used for filtering the products grid performing SQL custom select query.

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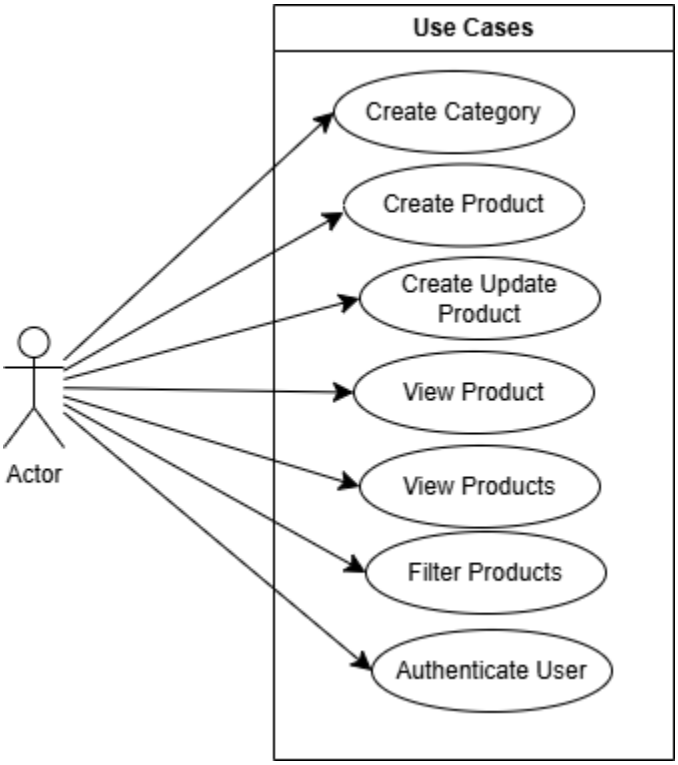
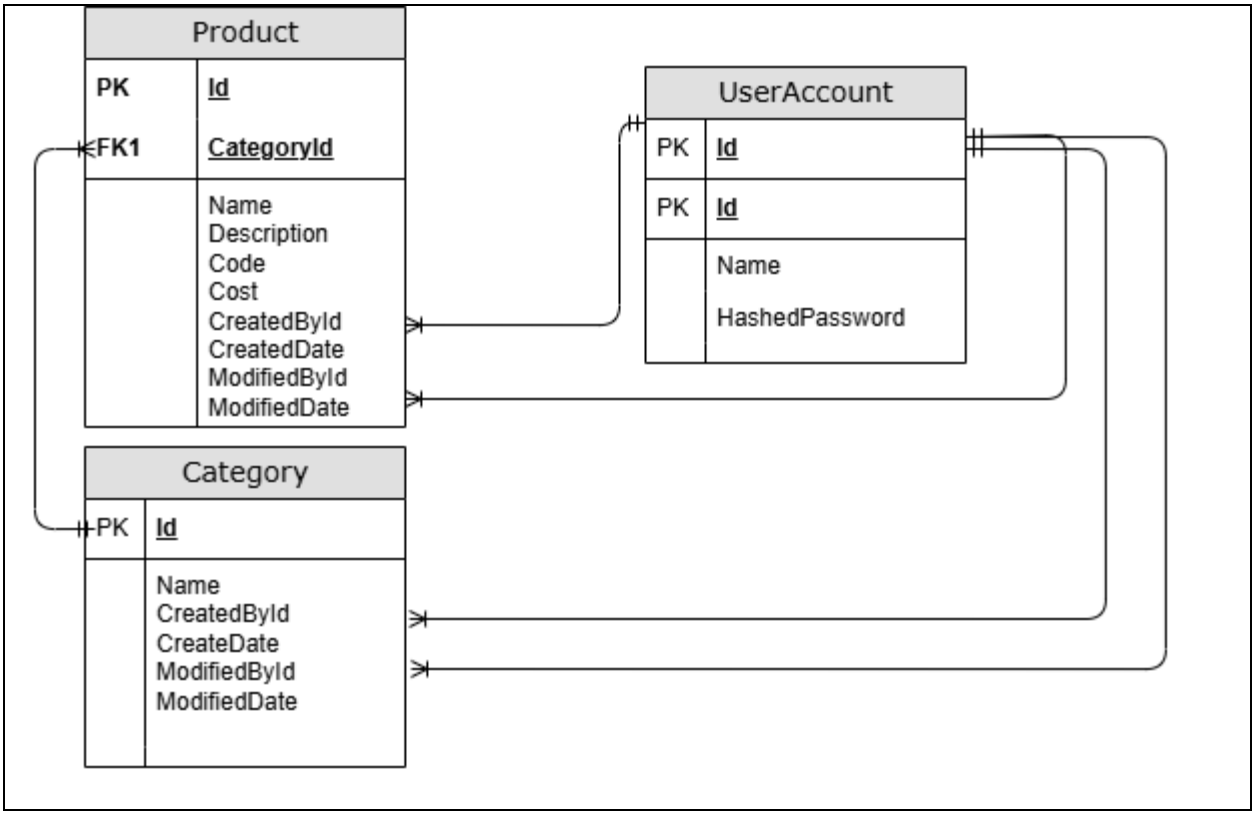
Use Cases



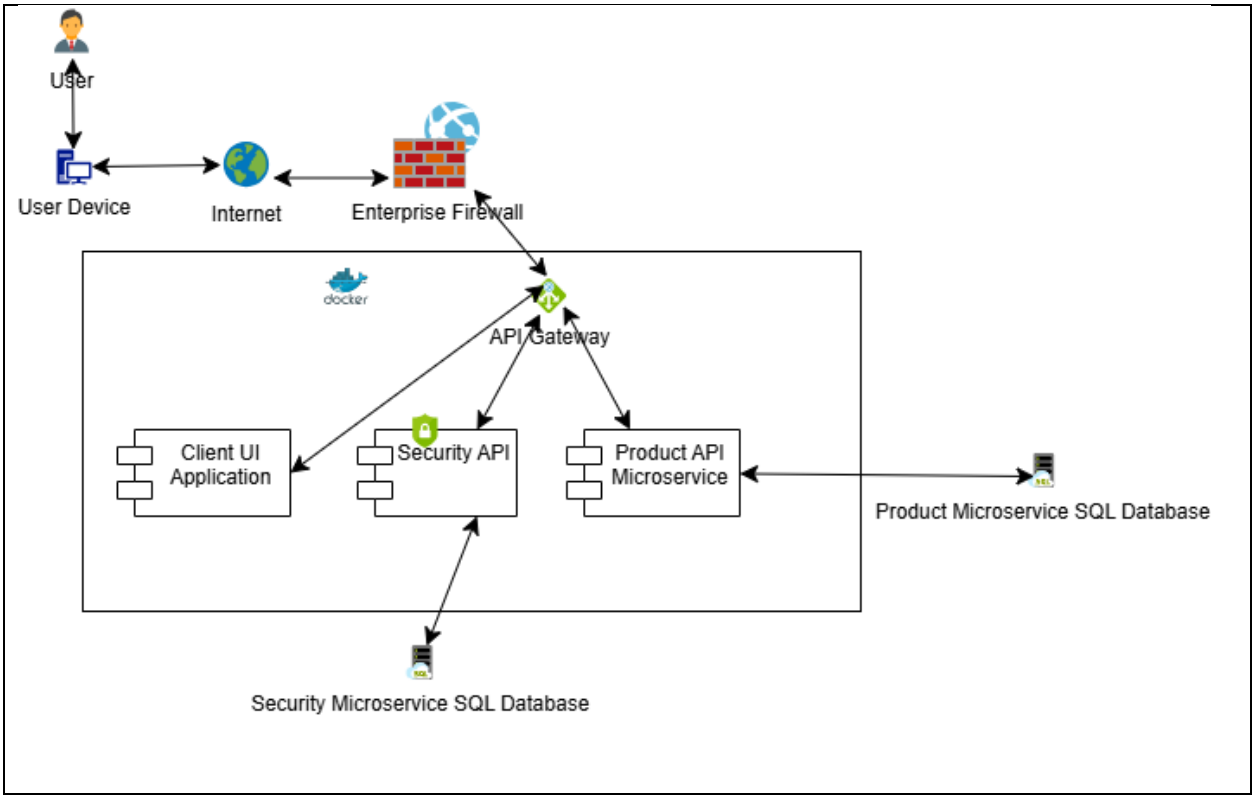
The application allows the user to perform functions shown in the use cases above.

Database Model



The model above shows the current application tables. Though the model depicts as a single model. The tables are portioned onto different database instances for Security and Product management APIs. The tables provided by dotnet core identity are excluded from model though present on the schema as they are scaffolded by framework.

Operational Architecture View



The application is currently made up of three microservices, Gateway API, Security API and Product API.

The gateway API applies required Authentication checks for token and restricts downstream traffic where the required valid token is not provided.

The routing to different Microservices is handled in the Gateway.

There are two separate databases for Security and Product APIs.

The microservices components

The microservices have and not limited to components listed and briefly described below.

Data

Provides a Database configuration and access

Service

Interacts with Data and process any required logic for the controller classes.

Model

Entity definition for data and data/view objects

API

The integrating component with controller classes. Dependencies are injected via class constructors. Http requests are terminated in the API classes to process client requests.

Setting up development Environment

The Project was implemented on a Windows 11 Pro operating system, i7 64bit, 16Gb RAM.

Microsoft SQL Server 2022

Visual Studio 2022

Asp.net Core Web API 9, Windows Docker enabled

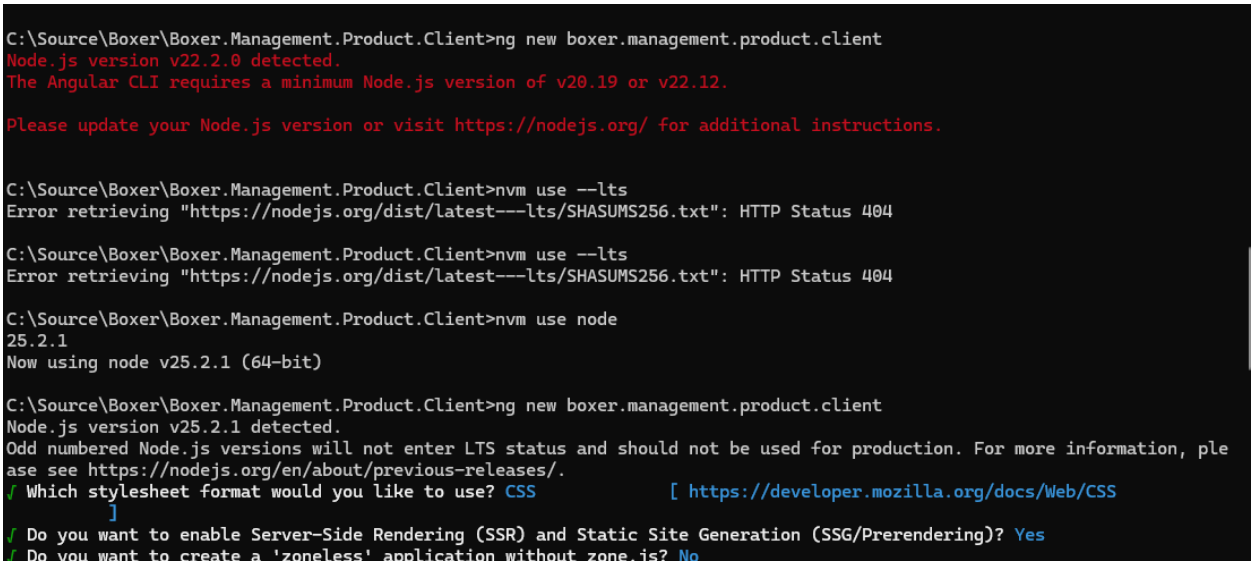
Uses Entity Framework Core

NVM

Please use Node version manager(NVM) to install node.js which is required for Angular client application. NMV will enable the User to target multiple node version and update using script commands.

nvm install node - will install the latest node.js version.

Note the error below when installing angular with latest version node.js “nvm use node” for latest node version.



Angular

After installing Node and NVM can run command below to install latest version of angular

npm install -g @angular/cli

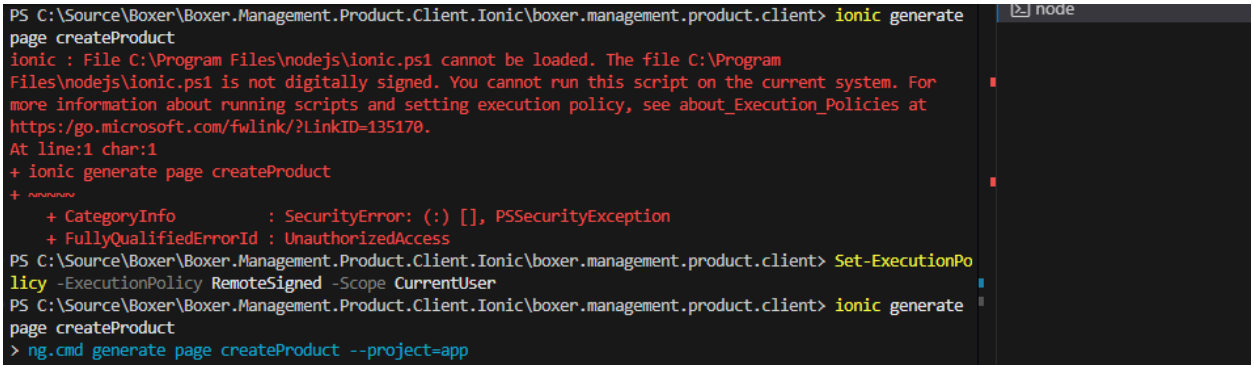
Ionic Framework

Run command below to install Ionic Framework which works with Angular for client UI development.

npm install -g @ionic/cli

ionic start boxer.management.product.client blank --type angular

Please note of insert below with possible exceptions and commands to resolve.



Database migration

Please Install from nuget package manager

Microsoft.EntityFrameworkCore,

Microsoft.EntityFrameworkCore.SqlServer,

Microsoft.EntityFrameworkCore.Tools

- Add Database configuration context definition file to root folder inheriting from IdentityDbContext for Default Identity Framework
- Add Database configuration context definition file to root folder inheriting from DbContext
- Add Database connection settings to appsettings file
- Define UserAccount that Inherits from Microsoft.AspNetCore.Identity Identity User

- Run commands to create migrations, update the database and remove used migrations.

  dotnet ef migrations add InitialCreate

  dotnet ef database update

  dotnet ef migrations remove

Examples commands below for database update on the Root API folders.

dotnet ef database update --context Boxer.Management.Product.Data.DatabaseContext

dotnet ef migrations add InitialCreate --context Boxer.Management.Product.Data.DatabaseContext

Database backup files

Two back files will be made available as part of the solution and can be restored for application to run.

Login validation

The application uses dotnet core signinmanage and usermanager for creating users and authentication.

SignInManager by default validates password minimum length, checks for number, special character and upper case letter.

The UserManager hashes password and validates provided credentials.

User credentials

Username:user002 or user001

Password: A1!iousafesdd

Scala Documentation

Please navigate to

https://localhost:7117/scalar/v1 Product API

Scalar API Reference Security API

Docker

Docker desktop for localhost can be downloaded and installed the docker website.

The commands for docker build are as follows,

Security API

```
docker build -t boxer.management:7168/security.authentication:0.0.1 .
```

Product API

```
docker build -t boxer.management: 7168/product:0.0.1 .
```

Gateway API

```
docker build -t boxer.management: 7168/security.gateway:0.0.1 .
```

Further Exploration and up-skilling

URL links are listed below under references for articles that may be useful in providing a technical foundation of the implemented solution?

References

https://codewithmukesh.com/blog/aspnet-core-webapi-crud-with-entity-framework-core-full-course/

https://medium.com/@v4sooraj/building-a-minimal-api-in-net-core-9-0-for-product-management-43ee1b984196

https://learn.microsoft.com/en-us/aspnet/core/fundamentals/dependency-injection?view=aspnetcore-10.0

https://learn.microsoft.com/en-us/ef/core/miscellaneous/connection-strings?tabs=dotnet-core-cli

https://www.telerik.com/blogs/new-net-8-aspnet-core-identity-how-implement

https://learn.microsoft.com/en-us/azure/architecture/web-apps/guides/enterprise-app-patterns/modern-web-app/dotnet/guidance

https://medium.com/@v4sooraj/building-a-minimal-api-in-net-core-9-0-for-product-management-43ee1b984196

https://github.com/zangassis/publish-cms/blob/main/Content.ApiGateway/ocelot.json

https://learn.microsoft.com/en-us/dotnet/core/compatibility/aspnet-core/8.0/securitytoken-events

Write custom ASP.NET Core middleware | Microsoft Learn

https://github.com/bezkoder/angular-17-pagination-example

https://learn.microsoft.com/en-us/aspnet/core/security/authentication/identity?view=aspnetcore-10.0&tabs=visual-studio