Buffer Overflow documentation

Preface

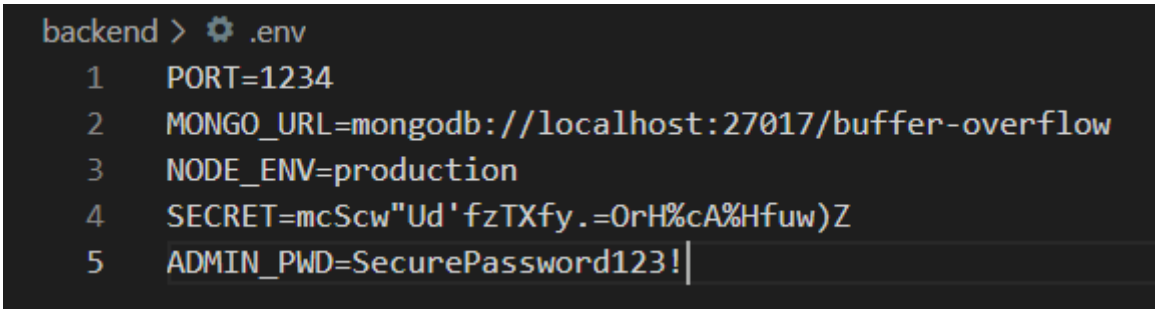
What is Buffer Overflow? Buffer Overflow is a full stack web application built using the MERN (MongoDB, Express, React, Node) stack. It is similar to Stack Overflow (see: https://stackoverflow.com/) which might be easy to deduce from the application's name. In short, the application is a forum-based platform, where authenticated users can create new posts which include a header, description, and a code snippet. Other authenticated users may leave comments to the posts for other people to see. Non-authenticated users may only see the content posted by other users.

How to install?

Installing the application is straight-forward but it has some prerequisites. You need to have access to a MongoDB database (you may host the database locally using MongoDB's community server, available at: https://www.mongodb.com/try/download/community). You also need to have Node and NPM (Node Package Manager) installed. The application has been tested on versions Node v12.22.6 and NPM v6.14.15 on x64 Microsoft Windows 10 Home version 10.0.19043 build 19043.

After meeting the prerequisites proceed as follows

1. Create a new folder in a path of your choosing and name it buffer-overflow.
2. Clone this Git -repository's contents inside of it.
3. Create a file ".env" inside the backend folder and open it with a text editor.
4. Add the following variables (PORT, MONGO_URL, NODE_ENV, SECRET, ADMIN_PWD) and fill them with values of your choosing. PORT is the port on which the Express server will run on, MONGO_URL is the connection string to the MongoDB, NODE_ENV indicates whether you want to run the development or production version (see more at the "for developers" -section), SECRET is used for signing the JWT tokens for authentication and ADMIN_PWD is the admin account's password.



Example of the ./backend/.env

5. Open your operating system's default shell (bash on Linux Ubuntu and on Windows 10 cmd).

6. Run the command “npm install”. This will install all of the required node package dependencies.
7. To start the application if you set the backend’s NODE_ENV to production
    a. Run the command “npm run buildFrontend”
    b. Run the command “npm run startServerProd”
8. To start the application if you set the backend’s NODE_ENV to development
    a. Run the command “npm run startServerDev”
    b. Run the command “npm run startReactDevServer”

Technologies used

Technology	Description	Justification
MongoDB	MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.	Data had to be saved to a database. We used MongoDB as our primary database during the course.
Express	Express.js, or simply Express, is a backend web application framework for Node.js	Used for creating the backend’s REST API.
React	React is a free and open-source front-end JavaScript library for building user interfaces based on UI components.	Used to create the frontend.
Node	Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser.	Mandatory requirement of the course.
Mongoose	Mongoose a straight-forward, schema-based solution to model your application data.	ODM (object document mapping) for the MongoDB database.
JWTs (NPM packages used jsonwebtoken, passport, passport-jwt)	JSON Web Token is a proposed Internet standard for creating data with optional signature and/or optional encryption whose	Used for authenticating and authorizing users with the backend

	payload holds JSON that asserts some number of claims. The tokens are signed either using a private secret or a public/private key.	
bcryptjs	bcrypt is a password-hashing function.	Used for hashing and salting passwords before persisting them to the database.
Express-validator	express-validator is a set of express.js middlewares that wraps validator.js validator and sanitizer functions.	Used for validating and sanitizing requests to the backend.
Dotenv	Dotenv is a zero-dependency module that loads environment variables from a .env file into process.env	Used to load in secrets from a file into process.env
Password-validator	NPM package used for validating passwords.	Used to validate and enforce strong passwords.
React-bootstrap	React-Bootstrap replaces the Bootstrap JavaScript. Each component has been built from scratch as a true React component, without unneeded dependencies like jQuery.	Used as a foundation for the user interface.
React-highlight	React component for syntax highlighting using highlight.js	Used to highlight the code snippets in the posts.
React-router-dom	React Router DOM enables you to implement dynamic routing in a react web app.	Used for dynamic routing.
Luxon	Luxon is a library for dealing with dates and times in JavaScript.	Used for parsing timestamps coming from the backend.

Features implemented

Feature	Points	Justification
Basic features with well written documentation	25	Mentioned in the project description.
Users can edit their own comments/posts	4	Mentioned in the project description.
Utilization of a frontside framework, such as React	5	Mentioned in the project description.
Use some highlight library for the code snippet	2	Mentioned in the project description.
Admin account with rights to edit and delete all comments and posts. Removing posts removes its comments as well.	3	Mentioned in the project description.
Provide a search that can filter out only those messages that have the searched keyword	2	Mentioned in the project description.
User can click username and see user profile page where name, register date, (user picture) and user bio is listed	2	Mentioned in the project description.
Last edited timestamp is stored and shown with posts/comments	2	Mentioned in the project description.
Users can edit their profile, passwords hashed and salted before storing	3	Own features, complexity comparable to editing own comments/posts.

Total points: $25 + 5 + 4 + 2 + 3 + 2 + 2 + 2 + 3 = 48$.

User manual

How to login/register?

Navigate to the main page of the application with your browser. Open the side navigation menu by clicking the hamburger menu icon on the top right corner of the website. Click Login/Register. Enter your credentials and click login. If you have not created an account yet, you can create one by clicking the register button in the login/register page.

How to create a new post?

Navigate to the main page of the application with your browser. Open the side navigation menu by clicking the hamburger menu icon on the top right corner of the website. Click new post. Fill the form data and click publish new post.

How to edit/delete a post?

If you are an admin or have created the post yourself, you can see and click the “delete post” and “edit post” buttons on the top right corner of the posts in the main feed.

How to search for posts?

You can search posts by their headers by entering a search word in the main feed’s search box. Click the search button after you have entered your search words. You can reset the main feed by either reloading the page or entering an empty string in the search box.

How to create comments?

Navigate to the main page of the application with your browser. Make sure you are logged in. Choose any post by clicking the “show more” button in the post’s bottom left corner. Scroll to the bottom of the post and you will see a create a comment component. Enter your comment in the “comment” field and click publish comment.

How to edit/delete comments?

Navigate to the main page of the application with your browser. Make sure you are logged in. Choose any post by clicking the “show more” button in the post’s bottom left corner. Scroll to the bottom of the post and you will see all comments. If you are authorized, you can see the edit comment and delete comment buttons.

How to view a public profile?

Navigate to the main page of the application with your browser. You can see anyone’s public profile by clicking their username on the top left corner of the post.

How to edit my profile?

Navigate to the main page of the application with your browser. Make sure you are logged in. Open the side navigation menu by clicking the hamburger menu icon on the top right corner of the website. Click my profile. Modify the fields you want and click update profile.

For developers

If you wish to continue developing this project, you should set the backend's NODE_ENV to development and run the command "npm run startReactDevServer". This will allow react to start its' development server on port 3000. It will proxy all requests to the backend server and allows hot reloading when developing.