

# ONLINE LAUNDRY SERVICE PLATFORM

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## 1. Project Overview

This is a full-stack web application designed to connect users with laundry service providers. The system allows users to book services, while providers can manage their offerings and orders through a secure dashboard.

## 2. Technology Stack

**Frontend:** HTML5, CSS3, JavaScript (Vanilla)

**Backend:** Node.js with Express.js framework

**Database:** MongoDB Atlas (Cloud Database)

**Authentication:** JSON Web Tokens (JWT)

**File Handling:** Multer (for image uploads)

## 3. Security Features

**Password Encryption:** Using bcryptjs to hash passwords before storing them.

**Secure Authentication:** JWT-based login system for session management.

**Role-Based Access Control (RBAC):** Different permissions for 'User', 'Service Provider', and 'Admin'.

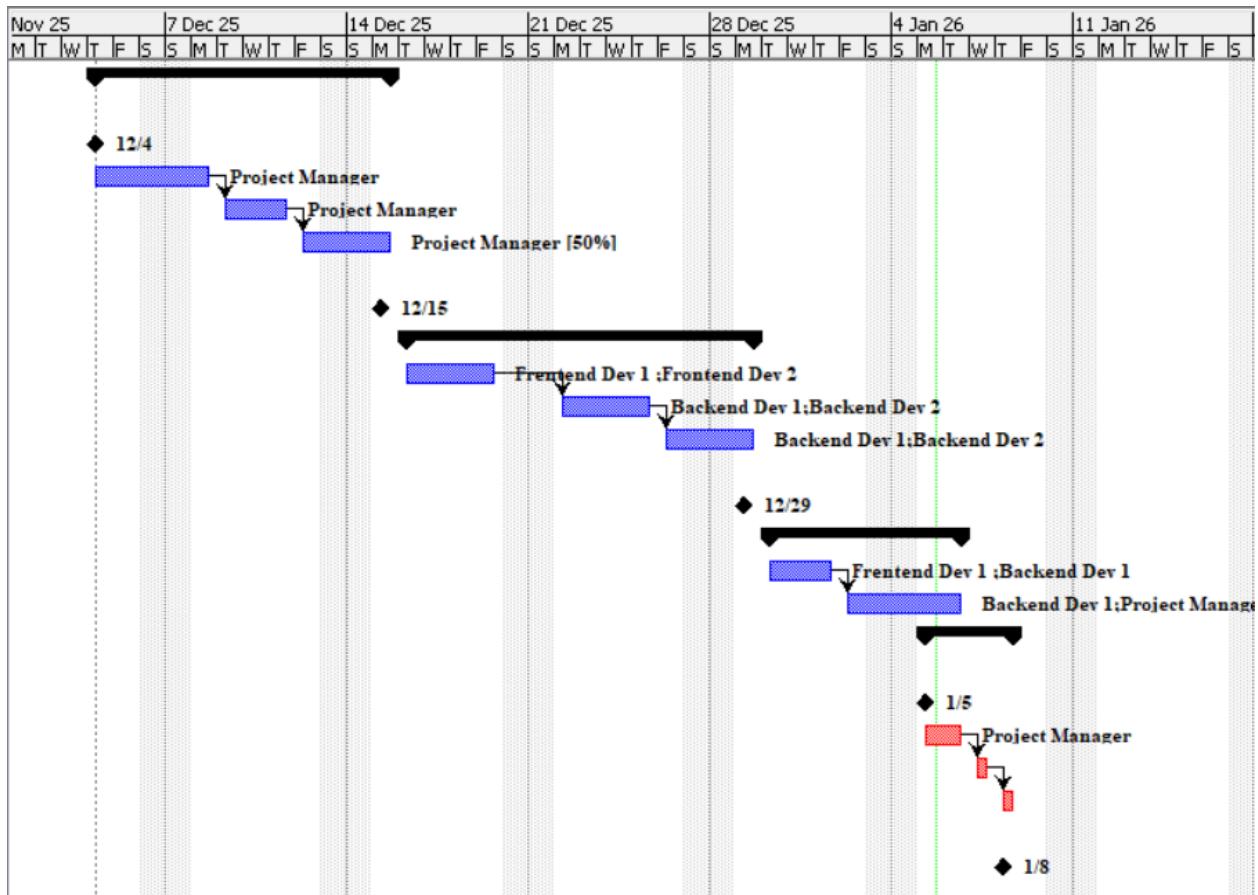
**Environment Protection:** Sensitive keys (API URLs, Secrets) are stored in .env files.

**Protected Routes:** Only authorized users can access specific actions like adding or deleting services.

## 4. Project Management Structure

The project followed a structured project management approach to ensure clear task allocation, timeline control, and coordination between development and security activities.

The structure defines leadership roles, development responsibilities, and security oversight to ensure smooth collaboration throughout the project lifecycle.



## 5. Setup & Installation Instructions

- Clone/Copy Project:** Transfer the project folder to the local machine.
- Install Dependencies:** Run npm install to download all required libraries.
- Environment Setup:** Configure the .env file with MongoDB URI and JWT Secret.
- Create Folders:** Ensure an uploads/ folder exists for image storage.
- Run Server:** Execute npm start or nodemon server.js to begin.

The project source code is hosted on GitHub to support version control, collaboration, and transparency.

The repository contains:

- Frontend and backend source code
- Middleware, models, and routes
- Security-related implementations
- README file with setup and usage instructions

GitHub commits were used to track progress and manage updates efficiently<sup>16</sup>:

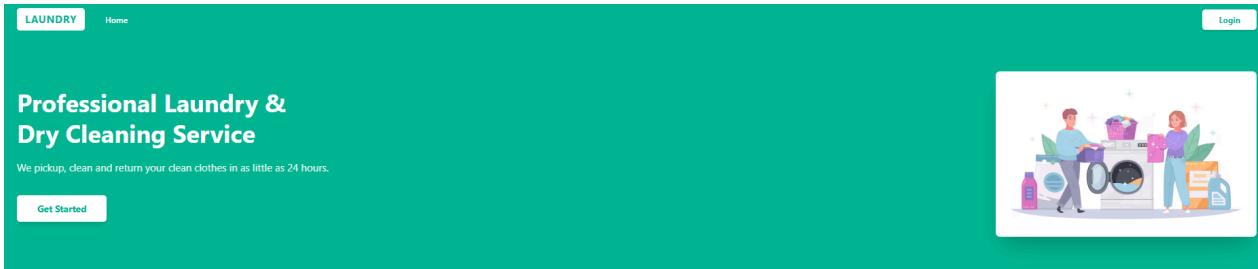
<https://github.com/babar123123/Smart-Laundry-Platform.git>

The screenshot shows a GitHub repository page for 'babar123123/Smart-Laundry-Platform'. The top navigation bar indicates 1 branch and 0 tags. The main content area displays a list of 12 commits, each with a file path, message, and timestamp. The commits are as follows:

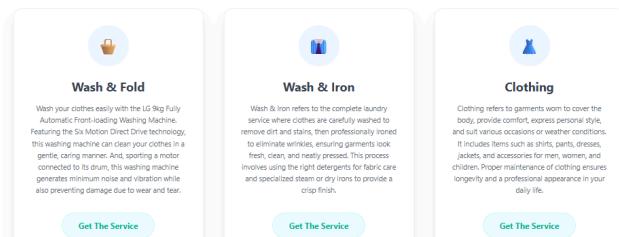
File Path	Commit Message	Timestamp
frontend	Update app.js	yesterday
middleware	Initial commit	2 days ago
models	Initial commit	2 days ago
routes	final	yesterday
uploads	Initial commit	2 days ago
.gitattributes	Initial commit	2 days ago
.gitignore	Initial commit	2 days ago
.replit	Allow server to be accessible on any network interface	yesterday
Group_Members.md	Initial commit	2 days ago
README.md	Create README.md	2 days ago
exploit_poc.js	Implemented Security Fixes	yesterday
package.json	Initial commit	2 days ago
requirements.txt	Initial commit	2 days ago
server.js	Update server.js	yesterday

On the right side, there is an 'About' section with a detailed description of the application: 'A complete full-stack laundry service application featuring role-based dashboards (Admin, User, Provider), real-time order tracking, and automated workflow management.' Below this are sections for 'Readme', 'Activity', 'Stars', 'Watching', 'Forks', and a link to 'Report repository'. Further down are sections for 'Releases' (No releases published) and 'Packages' (No packages published). The 'Languages' section at the bottom shows Python as the primary language (97.3%) followed by C (1.9%), JavaScript (0.4%), HTML (0.3%), Roff (0.1%), and PowerShell (0.0%).

## 6. Frontend:



### Our Services



## 7. Login / Register

A comparison of two user interface components: 'Login' and 'Register'. Both are set against a light gray background. The 'Login' component on the left has a white background and features fields for 'Email' and 'Password', followed by a large blue 'Login' button. Below the button is a link 'Don't have an account? [Register](#)'. The 'Register' component on the right also has a white background and features fields for 'Name', 'Email', 'Password', and a dropdown menu set to 'User'. Below these is a large green 'Register' button. Above the button is a link 'Already have an account? [Login](#)'.

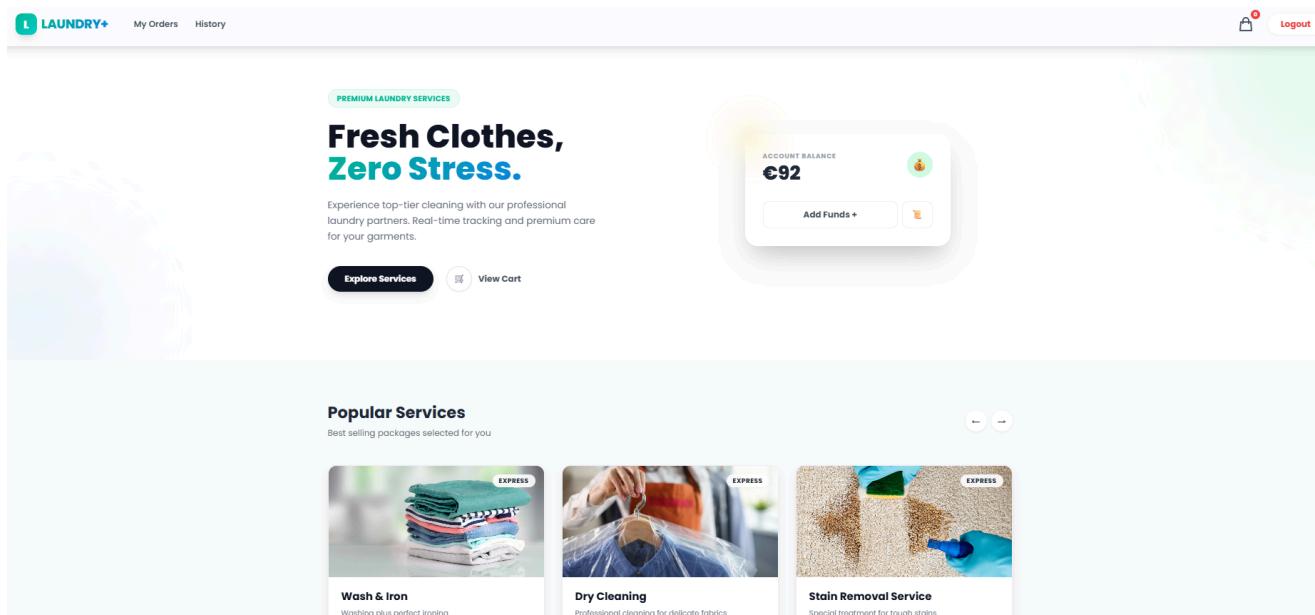
## 8. Team Roles and Responsibilities

Each team member had a clearly defined role combining development, management, and security responsibilities.

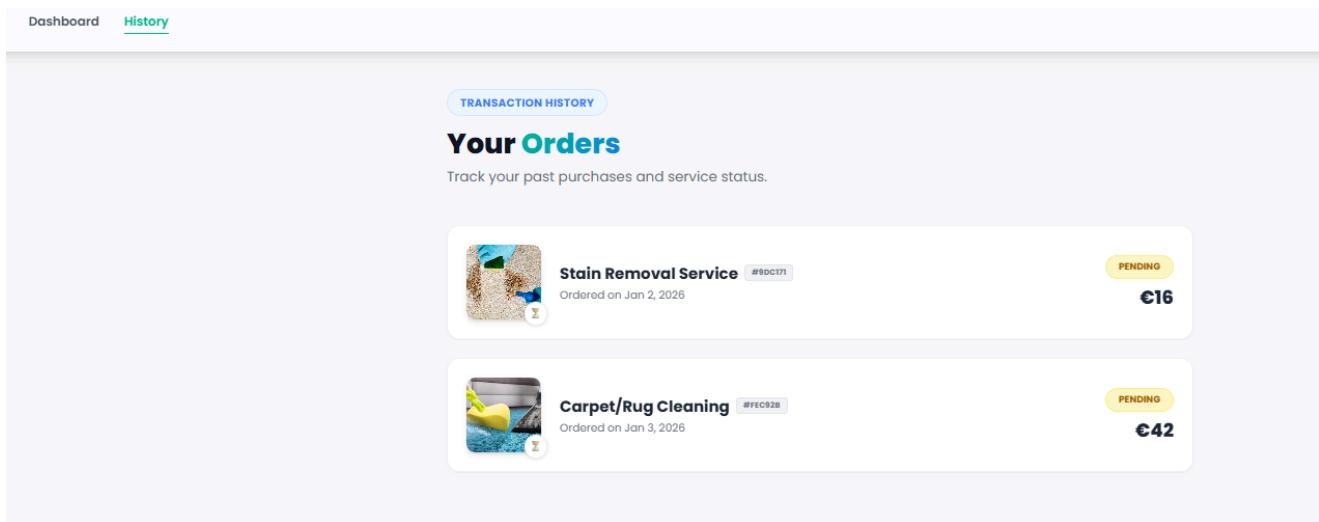
- **EGHAGHE Edoseghe George** – Project Manager & Security
- **BABAR Muhammad** – Development Lead & Security
- **FIFEN MENEGUEM Idiatou** – Project Management Structure Designer & Security
- **YOUMBI NJANDA Steven Alan** – Backend Developer & Security
- **Anas TAGUI** – Frontend Developer & Security
- **FNGUELIEBOU NGUEUKAM Flavien Briator** – Frontend Developer & Security

This role distribution ensured accountability, efficient development, and continuous security integration.

## 9. User Interface:



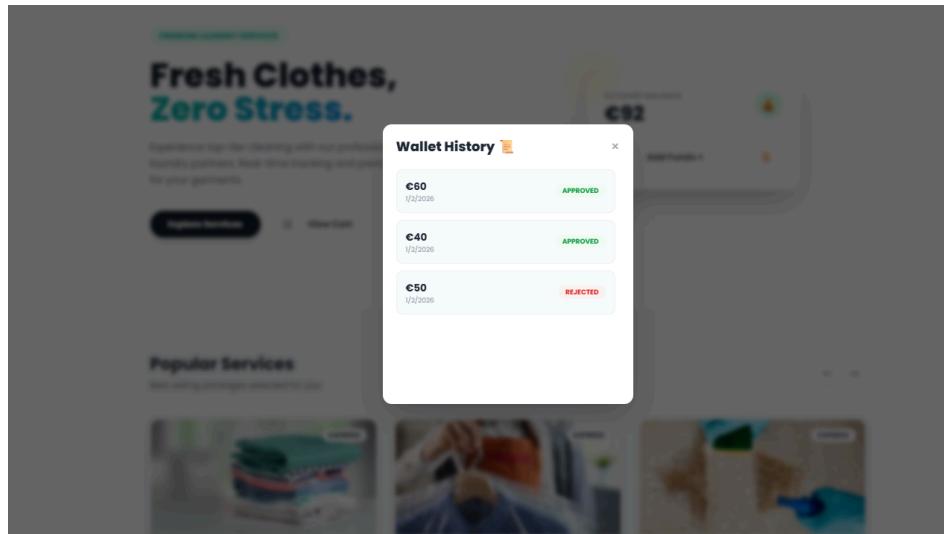
## 10. Order History:



The screenshot shows the 'Your Orders' section of the app. At the top, it says 'TRANSACTION HISTORY' and 'Your Orders'. Below that, it says 'Track your past purchases and service status.' There are two service requests listed:

- Stain Removal Service** #8DC171  
Ordered on Jan 2, 2026  
**PENDING** €16
- Carpet/Rug Cleaning** #FEC92B  
Ordered on Jan 3, 2026  
**PENDING** €42

## 11. Balance Tracking:



The screenshot shows the 'Wallet History' section of the app. It displays three transactions:

Amount	Date	Status
€60	1/2/2026	APPROVED
€40	1/2/2026	APPROVED
€50	1/2/2026	REJECTED

## 12. Admin Panel:

The Admin Panel Dashboard displays the following summary statistics:

- TOTAL ORDERS:** 5 (View Details →)
- PENDING REQUESTS:** 0 (View Details →)
- TOTAL USERS:** 3 (View Details →)
- SERVICES:** 4 (View Details →)

## 13. All User Data:

The Admin Panel Dashboard displays the following summary statistics:

- TOTAL ORDERS:** 5 (View Details →)
- PENDING REQUESTS:** 1 (View Details →)
- TOTAL USERS:** 3 (View Details →)
- SERVICES:** 4 (View Details →)

**Registered Users:**

User Type	Username	Email	Balance	Action
ADMIN	admin	admin@gmail.com	€50	
SERVICE_PROVIDER	provider	provider@gmail.com	€50	
USER	user	user@gmail.com	€92	

## 14. Pending Request:

The Admin Panel Dashboard displays the following summary statistics:

- TOTAL ORDERS:** 5 (View Details →)
- PENDING REQUESTS:** 1 (View Details →)
- TOTAL USERS:** 3 (View Details →)
- SERVICES:** 4 (View Details →)

**Pending Fund Requests:**

User Type	User Name	Email	Requested Amount	Action
FUND REQUESTER	user	user@gmail.com	€30	<b>APPROVE</b> <b>REJECT</b>

## 15. All Services:

The screenshot shows the Admin Panel Dashboard. On the left is a dark sidebar with a navigation menu:

- Dashboard
- MANAGEMENT
  - Fund Requests
  - Orders
  - Users
  - Services
  - Services
  - Security

The main area is titled "Dashboard" and features four colored cards:

- TOTAL ORDERS 5** (blue card) with a shopping bag icon. Below it: "View Details →".
- PENDING REQUESTS 1** (yellow card) with a dollar sign icon. Below it: "View Details →".
- TOTAL USERS 3** (green card) with a user icon. Below it: "View Details →".
- SERVICES 4** (red card) with a bell icon. Below it: "View Details →".

Below these cards is a section titled "Services Catalog" containing three service cards:

- Wash & Iron** (€29): Washing plus perfect ironing. Includes a stack of folded laundry thumbnail and a "DELETE SERVICE" button.
- Dry Cleaning** (€25): Professional cleaning for delicate fabrics. Includes a person drying clothes thumbnail and a "DELETE SERVICE" button.
- Stain Removal Service** (€16): Special treatment for tough stains. Includes a carpet being cleaned thumbnail and a "DELETE SERVICE" button.

## 16. All Orders:

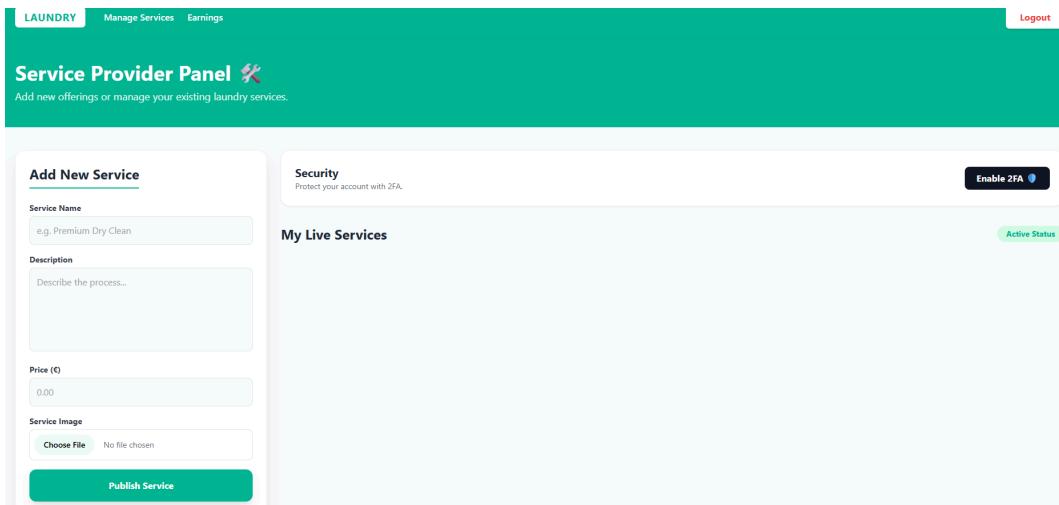
The screenshot shows the Admin Panel Dashboard. The sidebar and top navigation are identical to the previous screenshot.

The main area is titled "Dashboard" and features the same four colored cards as before.

Below these cards is a section titled "Global Orders" containing three order cards:

- ORDER #7403D2** (**COMPLETED**): Wash & Iron. By Deleted User. Includes "Edit Status" and "Delete" buttons.
- ORDER #7403D5** (**PROCESSING**): Stain Removal Service. By Deleted User. Includes "Edit Status" and "Delete" buttons.
- ORDER #2B020A** (**COMPLETED**): Dry Cleaning. By Deleted User. Includes "Edit Status" and "Delete" buttons.

## 17. Service Provider Interface:



## 18. Security Implementation Report

The Laundry Platform is designed with a Security-First approach. Security is applied at every stage of the Software Development Life Cycle (SDLC).

The system includes:

- Multi-Factor Authentication (MFA)
- Role-Based Access Control (RBAC)
- Strong input validation

These controls help protect against the major security risks listed in the OWASP Top 10.

### 18.1 Authentication and Authorization

#### Secure Authentication

- **JSON Web Tokens (JWT)**

Used for secure login sessions.

Tokens are signed using a secret key stored in environment variables.

```
// Generating signed JWT token
const token = jwt.sign({ id: user._id }, process.env.JWT_SECRET, { expiresIn: '1d' });
});
```

- **Password Hashing (bcrypt)**

User passwords are salted and hashed before storage.

This protects against brute-force and rainbow-table attacks.

```
// Hashing password before saving
const salt = await bcrypt.genSalt(10);
const hashedPassword = await bcrypt.hash(password, salt);
const user = new User({ name, email, password: hashedPassword, role });
await user.save();
```

- **Multi-Factor Authentication (MFA)**

Time-based One-Time Password (TOTP) is implemented.

Users can connect Google Authenticator for extra login security.

```
const verified = speakeasy.totp.verify({
  secret: user.mfaSecret.base32,
  encoding: 'base32',
  token: token
});

if (verified) {
  // Grant access
} else {
  res.status(400).json({ msg: "Invalid MFA Code" });
}
```

## 18.2 Role-Based Access Control (RBAC)

### System roles:

- o User
- o Service Provider
- o Admin

Access is enforced using middleware:

- o auth
- o adminAuth

These ensure users only access features they are allowed to use.

```

const auth = async (req, res, next) => {
  try {
    const token = req.header('Authorization')?.replace('Bearer ', '');
    if(!token) return res.status(401).json({ msg: "No token" });

    const decoded = jwt.verify(token, process.env.JWT_SECRET);
    req.user = await User.findById(decoded.id).select('-password');
    next();
  } catch (err) {
    res.status(401).json({ msg: "Token is not valid" });
  }
}

const adminAuth = (req, res, next) => {
  if(req.user.role !== 'admin') return res.status(403).json({ msg: "Admin access denied" });
  next();
}

```

## 18.3 Application Security Controls

### **Input Validation and Sanitization**

express-validator validates user inputs  
(registration and login forms)

#### **Prevents:**

- o malformed data
- o injection attacks

Mongoose schema enforces correct data types

```

router.post('/register', [
  check('name', 'Name is required').not().isEmpty(),
  check('email', 'Please include a valid email').isEmail(),
  check('password', 'Password must be 6 or more characters').isLength({ min: 6 })
], async (req, res) => {
  const errors = validationResult(req);
  if (!errors.isEmpty()) return res.status(400).json({ errors: errors.array() });
  // ... proceed
});

```

### **Security Headers (Helmet.js)**

Helmet is used to set secure HTTP headers:

- prevents clickjacking
- reduces XSS risk

- adds protocol-level protections

Content Security Policy (CSP) allows only trusted CDNs such as Tailwind CSS.

```
const helmet = require('helmet');
// Secure headers with CSP configured for Tailwind CDN
app.use(helmet({
  contentSecurityPolicy: false,
}));
```

## Rate Limiting

express-rate-limit is configured

- Maximum: 100 requests per 15 minutes per IP
- Protects against:
  - brute force login attempts
  - DoS attacks

```
const rateLimit = require('express-rate-limit');

// Rate Limiting (100 requests per 15 mins)
const limiter = rateLimit({
  windowMs: 15 * 60 * 1000,
  max: 100
});
app.use(limiter);
```

## 18.4 Data Protection and Infrastructure

### Secret Management

- Sensitive data (DB URI, JWT secrets, API keys) stored in:
  - .env file
- No secrets are written in source code
- A past hard-coded secret was fixed and moved to environment variables

### Secure Communication

- Application runs over HTTPS/TLS
- Encryption protects data during transfer

- Prevents Man-in-the-Middle attacks

## Database Security

- MongoDB connection strings are stored securely
- Mongoose is used for queries
- Parameterized queries help prevent NoSQL injection

```
// Loading secrets from .env file
require('dotenv').config();

// Using the secret (never hardcoded)
mongoose.connect(process.env.MONGO_URI);
const decoded = jwt.verify(token, process.env.JWT_SECRET);
```

## 19. Segmentation Analysis

In network security, the term micro-segmentation is commonly used in Zero Trust architectures, especially in cloud and distributed environments. Since the Laundry Platform is currently deployed in a monolithic architecture on a single server, traditional network micro-segmentation does not directly apply.

However, the application implements strong logical segmentation at the application level, which effectively separates users, roles, and data. This provides many of the same security benefits.

### 19.1 Role-Based Segmentation (RBAC)

The platform strictly separates users based on roles:

- **Admin Segment** – can manage users and view global orders
- **Service Provider Segment** – can add and manage services
- **User Segment** – can place orders and view only their own history

Access control is enforced using middleware such as:

- auth
- adminAuth

These ensure that ordinary users cannot access admin-level routes (for example, /api/admin).

## 19.2 Data Segmentation (Isolation)

Data in the database is logically isolated:

- When a user calls /api/orders/my, the backend checks that:
  - The user can only access their own orders
  - A user cannot access another user's data, even if they guess an order ID

This is enforced using the authenticated user ID (req.user.\_id) in database queries.

## 19.3 Modular Code Segmentation

The codebase is separated into logical modules to reduce risk and improve maintainability:

- routes/userRoutes.js
- routes/serviceRoutes.js
- routes/orderRoutes.js

If one module encounters an error, the rest of the system remains unaffected conceptually, supporting fault isolation and maintainability.

# 20. Conclusion

The Laundry Platform has been developed with a strong focus on security at every level of the system. By implementing secure authentication, role-based access control, encrypted communication, secure coding practices, and strict data protection controls, the platform is well-protected against common cyber threats.

Continuous monitoring, regular security audits, and timely updates will further ensure that the platform remains secure, reliable, and trustworthy for all users and service providers.