## System Components and Design

### Purpose

*What is the purpose of this project? Who is the client and what do they want their system to be able to do?*

* Client Name: Driver Pass
* DriverPass wants to offer students access to driver education resources such as practice exams and in-person driving lessons.
* DriverPass has identified a need for better driver training.
* System can generate downloadable reports for business administrators and analysts.
* Drivers can make reservations online by choosing a date and time
* Details about reservations are available via downloadable reports.
* Varying levels of user access should exist for users, owners, and administrators.
* The system should keep records of lesson history and the driver each customer is assigned to for any lesson the customer has scheduled or completed.

### System Background

* DriverPass will offer various packages that include different amounts of lesson time.
* Packages may include access to online exams, and materials.
* Many drivers fail DMV exams due to lack of resources and driver training.
* DriverPass wants to make resources available via the web and on mobile devices.
* In person lessons are available and reservations can be entered online.
* Customers can access the system via the website or mobile application.
* The system should exist in a cloud environment where the business does not need to handle security and backup.

### Objectives and Goals

* When completed the system should be on a locally hosted Linux server.
* The final system should implement all the features including the ability for users to make reservations, view and take exams, and reset their password if needed.
* There should be a web interface and mobile applications.
* Models of the system will lay out the design and logic of the system
* After the models are completed and approved, the system should be constructed and deployed on the cloud provider’s network.
* After the system has been implemented, the system should be tested completely prior to entering production.

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

* The system shall be a web-based application that is accessible from mobile and desktop devices.
* The system shall not take longer than 3 seconds to display any web content.
* The application should be updated as soon as any new information emerges or changes. Laws and other factors can change at any time and the application should be able to be updated quickly.

#### Platform Constraints

* The application shall be web based and compatible with Windows, Linux, and Mac OSX via a web interface.
* The web interface should be accessible from Android and IOS based mobile devices via mobile web browsers.
* The back end should be hosted on a Linux machine. Arch Linux and Ubuntu are cost effective and flexible choices to host the server.
  + Ubuntu is easy to get up and running while Arch offers a very flexible system that can be built using only the components needed to host the server.
* The back end will require a database to store details about user's accounts, including login information for authentication purposes.
* The back end should have the ability to send notifications to users in the event of any changes to driving laws that affect customers in a specific state or region.
* To facilitate notifications, the user database shall contain contact information for all users and administrators of the system.

#### Accuracy and Precision

* Every user shall have a unique user account.
* Usernames are not case sensitive.
* Usernames must be unique
* User accounts will be secured by a password.
* Passwords are case sensitive.
* An administrator should be notified in the case that a user is unable to log in or reset their password using the automated password reset (details about the password reset feature are listed under the security section of this document)

#### Adaptability

* System administrators should have the ability to add, remove, and modify any information associated with a user account.
* Customers should have the ability to update their personal information such as updating their home address via the web interface.
* Updating users should not require any new code to be written. Administrators shall have access to a web interface that allows user database entries to be added, deleted, and modified.
* Operating system and dependency application updates should be applied during the overnight hours by system administrators. Backups of the server and the data it contains should be created daily in case something goes wrong with an operating system or dependency update.
* Administrators should have root access to the server.

#### Security

* A username and password are required to log in.
* All connections will be made using SSL/TLS.
* Attempting to use an unsecured connection should result in a message letting the user know their connection is not secure and block any login attempts.
* User accounts shall be locked upon 5 failed login attempts to prevent anyone from attempting to crack a user’s password.
* In the event the user forgets their password, an option to reset the password should appear on the login page.

### Functional Requirements

* They system shall validate user credentials when logging in.
* The system shall show any relevant notifications to users when they log in.
* They system shall have the ability to send emails and text messages to users to inform them of any new or essential information such as changes to driving laws in a user’s state or municipality.
* The system shall have the ability to display information and lessons that include text, audio, and video.
* The system shall allow users to register, update, and cancel appointments for driving lessons.

### User Interface

* The system should have a user interface for customers.
  + The customer interface should allow customers to schedule, modify, or cancel appointments.
  + The customer interface should be a web page displayed by a browser on a desktop or mobile device.
  + The customer interface should be able to display content associated with driving lessons, including text, audio, and video material.
  + The customer user interface should allow users to update their personal information such as mailing address or phone number.
* The system should have an interface for administrators
  + The administrator interface should have the ability to add, remove, or modify user accounts and user account information.
  + The administrator interface should include the ability for administrators to send notifications to specific users and/or specific groups of users (including the ability to send notifications to all users if necessary)
  + The administrator interface should notify administrators of any security issues such as attempts to break into the server or crack user passwords.

### Assumptions

* It is assumed that users are a modern device with a modern web-browser installed.
* It is assumed that users have a fast and reliable internet connection.
* It is assumed that the server has power and internet access 24/7.
* It is assumed that users web-browsers support SSL/TLS for secure connections.
* It is assumed that the user's device’s clock is set to the correct time as this is important for SSL/TLS connections to the server.

### Limitations

* The system built should be within the budget allocated for the project.
* The system will not support older devices that lack a modern web browser that includes the ability to connect securely to the server.
* They system should be completed by May 8th as the sign off meeting with the client will occur on May 10th as discussed in the scheduling interview transcript.

### Gantt Chart

