



# **EGE UNIVERSITY**

## **COMPUTER ENGINEERING**

- **Public Transport Route Finder System (PTRFS)**
  - **ARCHITECTURAL MODEL REPORT**  
**(07.12.2018)**

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## INTRODUCTION

According to previous reports, we divide the system into subsystems. Also, we chose our architecture model. In addition to that, we made its block and class diagram.

## SUBSYSTEMS

### 1. Account Database:

It keeps the information regarding accounts such as user id, password, email, account type.

### 2. Account Management System:

It's responsible for registration process. If a client tries to create an account and if that account does not exist already, it creates the account by committing the information given by the user into Account Database.

### 3. Authentication System:

It checks the authentication of the client.

### 4. Authorization System:

It checks the authorization of the client.

### 5. Backup Database:

The system needs to be backed up on a regular interval. Because there can be hardware failures, natural disasters, cyber attacks etc. This database keeps the backup of all other databases.

### 6. Feedback Database:

It keeps the feedback given by users.

### 7. Feedback Management System:

It's responsible for retrieving feedback from Feedback Database. It's also responsible for committing the feedback users give into Feedback Database.

**8. Google API:**

It provides needed maps and information regarding traffic and roads. It uses GPS (or Internet) in order to pinpoint the location of user.

**9. GPS:**

It finds the current location of the user.

**10. Log Database:**

It keeps logs for every action taken by System Management System.

**11. Notification Management System:**

It notifies the users about updates or about any changes about transports that are used by their favorite routes. To see users favorited routes, it uses Account Database.

**12. Route Finder System:**

It finds the optimum route(s) for the given locations with the selected algorithm. It uses Transport Database in order to retrieve the information regarding transports and uses Google API to show the optimum route on map and give directions for walking.

**13. System Management System:**

It's the system that is used solely by admins/moderators. This allows any system admin to add/delete/update any information regarding transports. It also allows a backup of the system to be taken. Every action done by this system will be logged into Log Database.

**14. Transport Database:**

It keeps the information regarding transports. Such as transport modes, transport types, special rules.

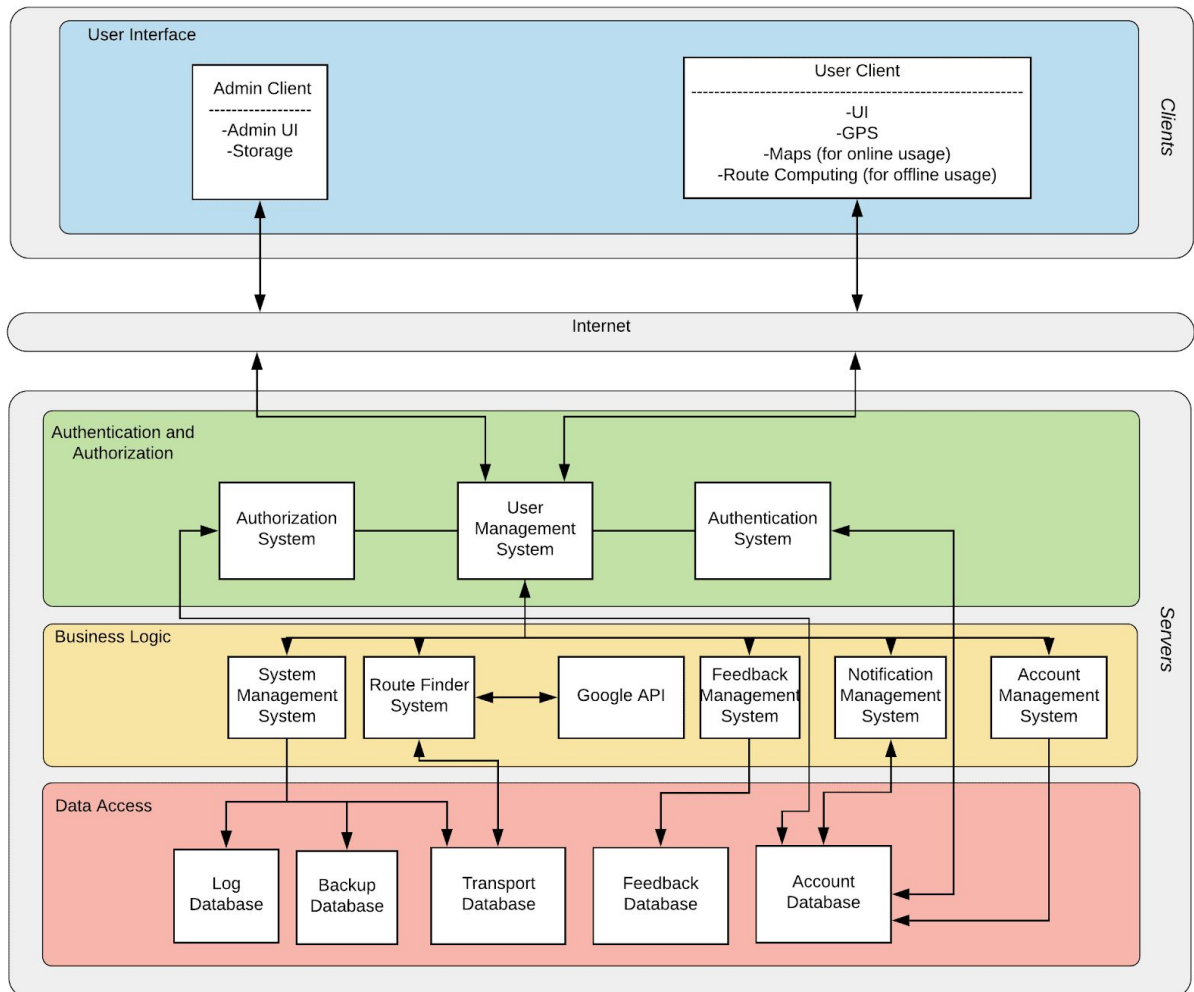
**15. User Management System:**

It uses authorization service and authentication service to decide which services a client can access. If the client has the right privileges, it redirects user's request to the appropriate server and returns that server's response to the client.

## ARCHITECTURAL MODEL

We have chosen to use a hybrid of Client-Server Architecture and Layered Architecture. Our system needs to be distributed around the globe and workload of any given country may differ greatly. Since client-server architecture model is good for distributed systems and it lets us do scaling comparatively easily, choosing the client-server model seemed logical. On the other hand, we wanted additional security. Since layered architecture divides system into logical categories (ie. layers) managing the security of the system becomes easier and it lets us have a more flexible development phase. Because of all the aforementioned reasons, we have chosen to use a hybrid System.

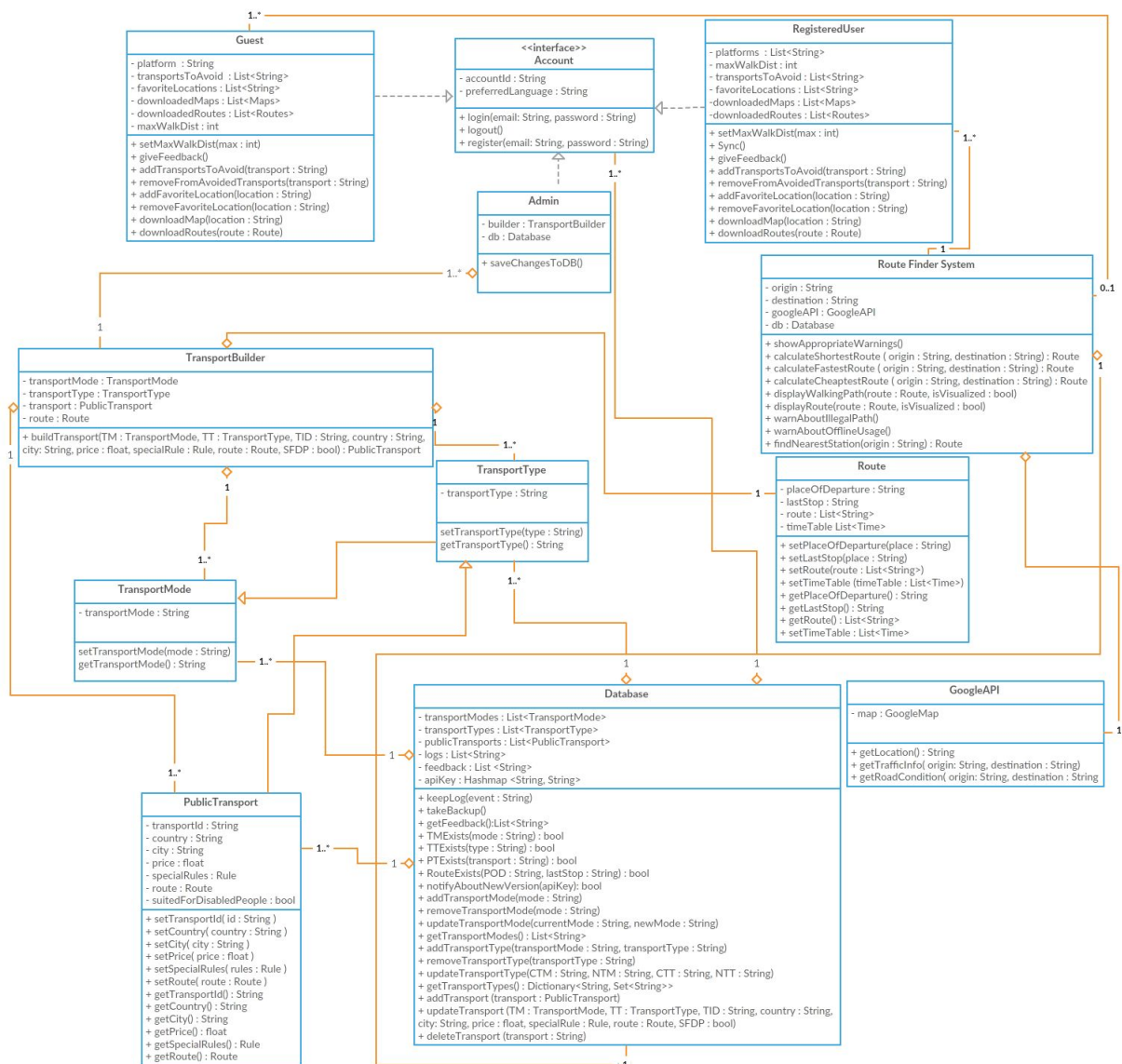
## BLOCK DIAGRAM



Servers are distributed around the globe. So there can be multiple servers for any given server type.

Our system offers offline usage as well (provided that user has already downloaded the necessary packages beforehand). In case of offline usage, everything can be done within client-side. But offline usage itself has downsides such as possible out-of-date data, not being able to take traffic into calculation and so on.

# CLASS DIAGRAM



For simplicity's sake; Log Database, Transport Database, Feedback Database and Account Database is shown by a single "Database" class.

## DICTIONARY

- **Account:** The tool used by users who are reserved for authority classes to connect to the system.
- **Authentication:** The process or action of verifying the identity of a user or process.
- **Authorization:** Function of specifying access rights/privileges to resources related to information security and computer security in general and to access control in particular.
- **Backup:** A copy of a file or other item of data made in case the original is lost or damaged.
- **Feedback:** A process in which a system regulates itself by monitoring its own output.
- **GPS:** The Global Positioning System (GPS) is a satellite-based navigation system made up of at least 24 satellites.
- **Notification:** Notification is a message that pops up on a device.
- **Route:** A way or course taken in getting from a starting point to a destination.
- **System Logs:** Records the operations of the software.
- **Transport:** A system of vehicles such as buses and trains that operate at regular times on fixed routes and are used by the public.
- **Transport Mode:** Mode of transport. (i.e. air, water, land transport...)
- **Transport Type:** Type of the transport. (i.e. bus, train...)