COMP 6231- Distributed System Design

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Distributed Movie Ticket Booking System Using Java RMI - Assignment 1

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CONTENTS

1. Overview

Distributed Movie Ticket Booking Systems have 2 types of users:

- Admin - Actions:
  - Create Movie Slots
  - Update Movie Slots
  - Delete Movie Slots
  - Do Actions on behalf of customer
  - Get a list of movie slots for a particular movie.
- Customer - Actions:
  - Book a movie Slot
  - Cancel a movie slot (Completely/Partially)
  - Get their booking details.

There are 3 servers for movie theatres:

- ATW- Atwater
- VER- Verdun
- OUT- Outremont

There are 3 timing slots for a movie:

- A- Afternoon
- M- Morning
- E- Evening

A Client ID Consist of SERVER ID+A(for Admin)/C(for Customer)+4 unique digits.

A movie ID Consists of SERVER ID+Timing Slot(A/M/E)+Date (in DDMMYY format).

The task was to create an RMI-enabled Distributed System for movie booking.

- Implementations:

  MovieModel.java: POJO for Movie Servers (getters, setters and other methods).

  ClienModel.java: POJO for Client Servers (getters, setters and other methods)..

  Server.java: Creating Server instances.

  Client.java: Interacting with User, displaying all options for a client, sending details that forward a UDP request to the server for actions.

  ServerInst.java: Interface for Server Actions.

  MovieManager.java: Middleware between Server and Client, sends UDP requests.

  Logger.java: Logs actions to a text file.

  Data is stored in nested map structures as shown in (3).

- UDP Server Ports Used:

  ATWATER: 7878
  VERDUN: 8989
  OUTREMONT: 9090

- RMI Server Ports Used:

  ATWATER: 2964
  VERDUN: 2965
  OUTREMONT: 2966

- Logs: Logs are saved for every client and every server.

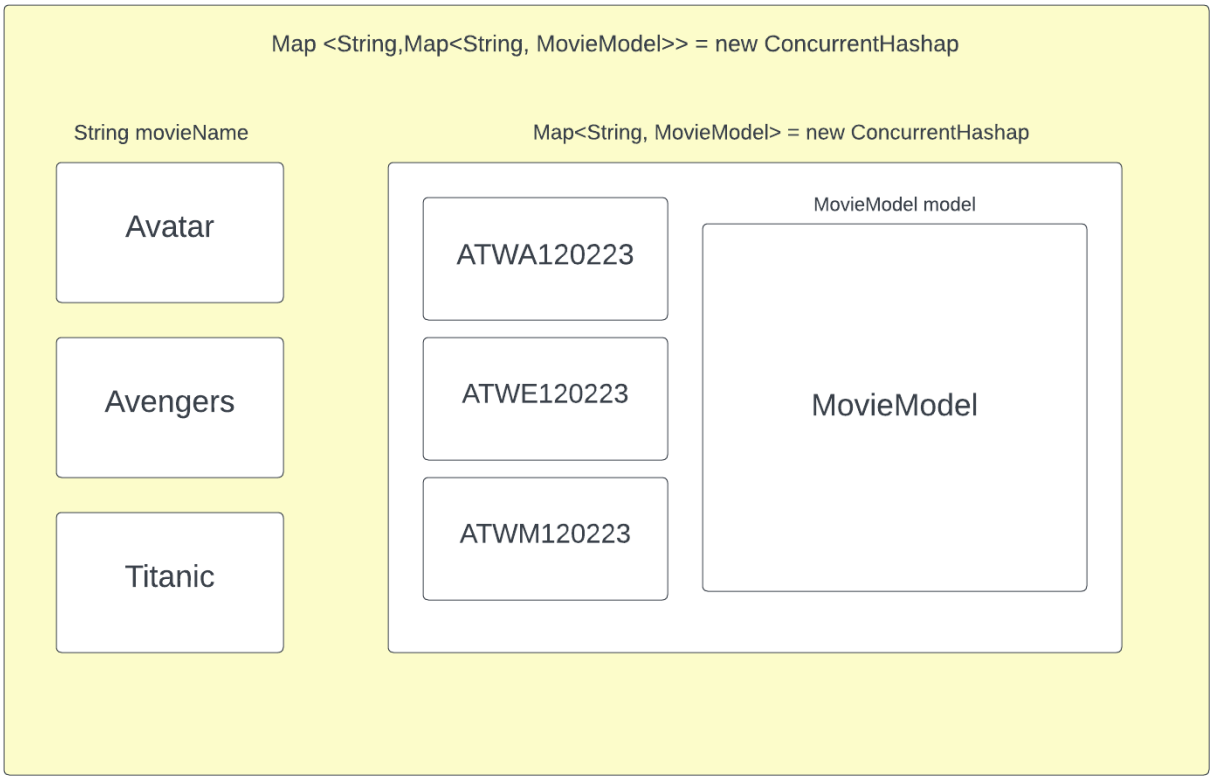
  Path for SERVER Logs: /src/Logs/Server/ServerName.txt
  Path for CLIENT Logs: /src/Logs/Client/ClientId.txt

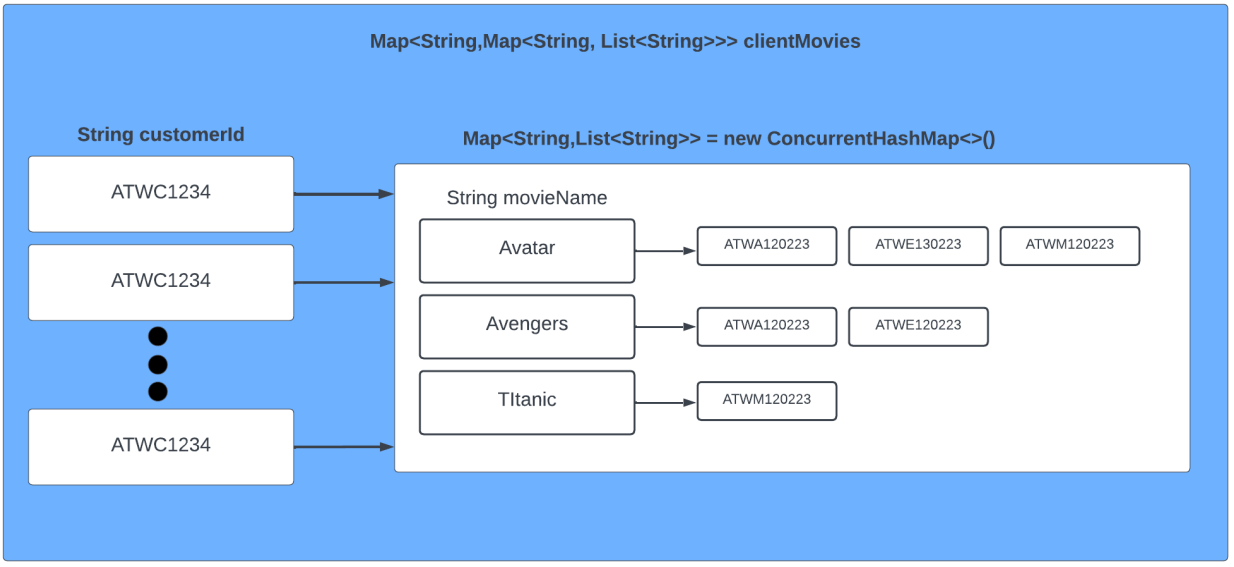
- Concurrent hashmaps were used to ensure maximum efficiency.

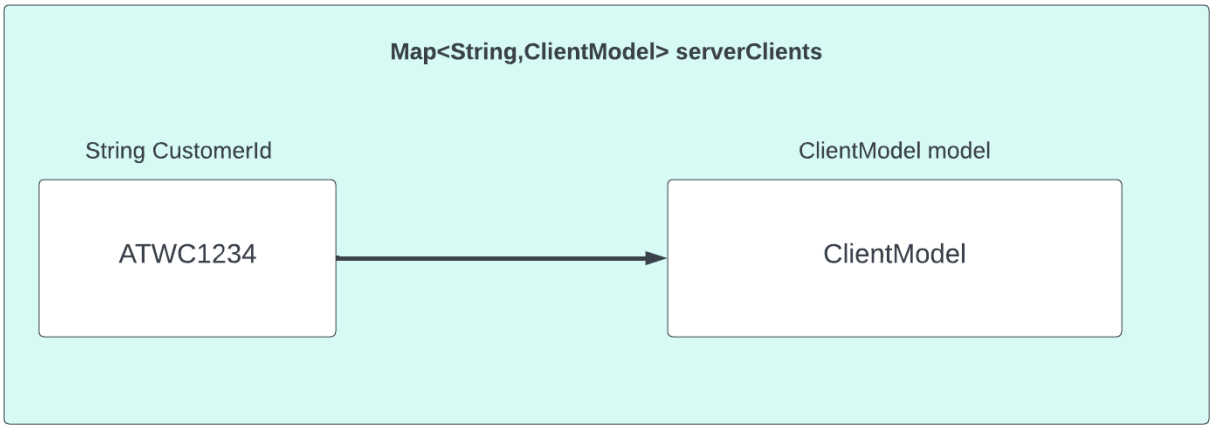
- Hardest Part of the assignment was to implement Book Movies and Cancel movies while keeping the track of the number of movie tickets the user need to book, for that I used a Concurrent hashmap with a unique id that consists of customerId+movieid+movieName. This was also the most important part according to my understanding.

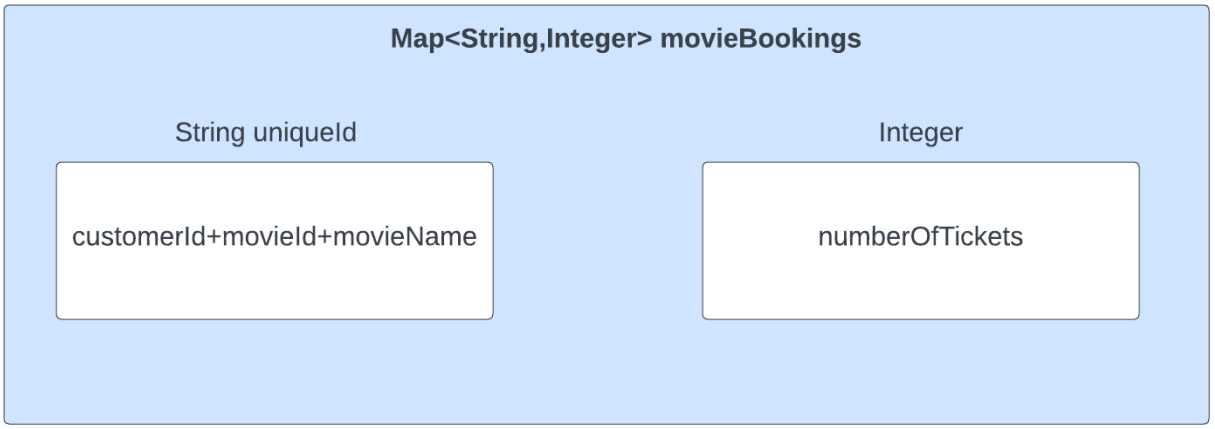
2. Class Diagram

3. Data Structure






Map<String,ClientModel> serverClients
String CustomerId
ClientModel model
ATWC1234
ClientModel


Map<String,Integer> movieBookings
String uniqueId
Integer
customerId+movieId+movieName
numberOfTickets

4. Test Cases

Scenario No.	Requirement name	Test Scenario	Test Case
1.	Login	username	• Validate username for Admin and Customer • Validate Server Access
2.	Admin Actions, User Action	logout	• Logout current client and prompt for user id.
3.	Admin Actions	Add movie	• Validate movie id. • validate movie capacity. • Either adding a new movie slot or updating the capacity of existing movie slots • Movie adding only allowed for a week's range from the current date
4.	Admin Actions	Remove movie	• Validate movie id • Validate movie slot capacity
5.	Admin Actions	List movie shows available	• show the movie slots created in the current server.
6.	Admin Action, User Action	menu selection	• select menu options
7.	User Actions	Book movie	• validate movie id • book movie tickets for a movie id from the same server with a valid capacity • Constrain to 3 movie tickets from other servers. • validate booking multiple movies
8.	User Actions	Cancel movie	• Cancel all or a partial number of movie tickets from the server • Booking movie on next available slot
9.	User Actions	Get Booking Schedule	• Validate all movies booked by the customer
10.	Admin Actions	Do user actions on behalf of customer	• Booking movie • Cancelling movie • Get movie schedule