National College of Ireland

Distributed Systems
March 2023

Erica de Almeida Pereira
x21185999

Contents

1 Introduction

The Smart HR Office is dedicated to providing employees (clients) with efficient services by utilizing remote procedure call (RPC) methods. This software communication protocol allows programs running on different machines on a network to request services without having to understand the network's technicalities. The goal is to use this technology to provide our employees with a seamless experience and high-quality services such as employee scheduling, onboarding, and temperature control services.

2 Service: Smart Schedule Meeting

Meeting Schedule This service manages HR and employee scheduling, such as organizing training and other activities and providing feedback as needed.

2.1 Methods

2.1.1 RPC Create Meeting

It is a method for scheduling a new meeting with a start and end time and a list of attendees. It returns a response that includes the unique identifier for the session. This service uses Client Streaming RPC, allowing efficient data transmission between the client and the server during the meeting creation process.

2.1.2 RPC Modify Meeting

This method allows for modifying an existing meeting by using its unique identifier. The employee can send multiple update messages to the server through the stream, and the server can respond with numerous responses indicating the status of each update message. And return a message indicating whether or not the modification was successful. This service is known as bidirectional streaming RPC.

2.1.3 RPC Cancel Meeting

This method uses Server streaming RPC to cancel a scheduled meeting by using its unique identifier. After the cancellation process is completed, the server will return a success or error message indicating whether the meeting was successfully canceled.

3 Service: Smart Temperature control

Smart Room Temperature is an innovative service that displays the current temperature of a specific room in an office building. With this service, multiple employees can adjust and set their preferred temperature for the room, resulting in a more comfortable working environment.

3.1 Methods

3.1.1 RPC Show Room Temperature

As a unary RPC, obtaining the current temperature of a specific room in a building is possible. The client sends the room number to the server as a parameter, and the server responds with the temperature.

3.1.2 RPC Set Room Temperature

The client can use this method to set the desired temperature for a specific room in a building. The client sends the server the initial room number and chooses temperature as a parameter, and the server adjusts the temperature accordingly. The server sends updates back to the client in a stream as the temperature changes, allowing the client to keep track of the current temperature in real time. This is referred to as Server Streaming RPC.

3.1.3 RPC Method 3 Adjust Room Temperature

This method adjusts the temperature of a specific room within a structure. As parameters, the client would specify the room number or name and the adjustment amount, and the server would adjust the temperature accordingly. This service is known as bidirectional streaming because after receiving the response message, the client can continue sending requests to adjust the temperature of other rooms within the structure.

4 Service: Smart Onboarding

An onboarding service is an essential component of any modern HR department. It is concerned with the process of bringing a new employee into an organization and acquainting them with their role and responsibilities. This server's proposal will enable

interaction between the new employee and HR, such as a web-based portal where new employees can enter personal and employment information, electronically sign documents, and access.

4.1 RPC Create New Employee

This method creates a new user account based on input parameters such as username, password, and other relevant information. After receiving client input, this method sends a request to the server to create a new user account. The server then processes the request and returns a response indicating whether the operation was successful or not. It uses Unary RPC, a simple request-response model.

4.1.1 RPC Onboarding Status

This client streaming RPC method allows the client to send the server a stream of employee status requests. The server processes each request, and a message is returned indicating whether or not the employee is still on the team. It can be used when the client needs to check the status of multiple employees simultaneously.

4.1.2 RPC Onboard Employee

In this case, use bidirectional streaming. It is designed to manage a stream of Employee messages. The client sends a stream of Employee messages to the server, and the server responds with a stream indicating whether the onboarding process is complete. This method is helpful in situations where the client needs to onboard multiple employees at once and wants to receive status updates in real time.