CHAPTER 1
INTRODUCTION

1.1   Background

Communication services are actions taken by humans using a communication system that transmits and receives information between two or more communication points. Each point must be able to transmit and receive information if the communication process is taking place. The term 'Communication service' includes the process of receiving information in the form of voice data, printed materials, images, and data encoded in a programming language. In a communication service system that uses computer technology, a protocol is needed that can be used to provide a communication mechanism between processes that can permit a program that is being run by a computer without making the code execution process on the system feel directly.

Remote Procedure Call is a communication protocol software that can be used in communication service activities to receive services from one program location to another program on the same network without having to understand the details of the network itself. Remote Procedure Call or RPC is used to call another process on a remote system such as a local system, where the procedure is also known as a function call or subroutine call.

Remote Procedure Call or RPC is a form of the protocol used for communication service activities where PRC assumes the existence of transport protocols such as TCP and UDH at low-level levels to carry data or information in the communication process that occurs in computer programs. Two technologies that are often used in the communication service process are gRPC and REST API.

Rest API has been a pillar technology in web programming for quite a long time, but recently gRPC developed by one of the world's tech giants Google has started to find its market territory. One of the biggest differences between gRPC and the REST API is in the payload format, wherein the REST API most messages usually contain JSON, and there are very few exceptions in the REST API for receiving and returning information outside of JSON. In contrast to gRPC, where most of the messages returned using Protobuf are efficient and packaged. Not only that, many other aspects are the material for comparison of the two technologies.

The difference between these protocols is that they are run in the Go programming language, the Go programming language is a programming language created by Google by Ken Thompson, Robert Griesemer, and Rob Pike in 2009. Golang can be typed statically and can generate binary code while the engine is being compiled. Golang is also a set of C programming languages in the 21st century. This language is known for its efficiency so it is favored by many people for making software and applications.

we will compare the performance between the two gRPC protocols with the REST API in terms of service transaction communication using the Go programming language with different scenarios for each service. To test its efficiency, load test and stress test methods are applied to both services, where the framework used is Echo from the Go programming language. So to see the results of this research, which one is more efficient to use in transaction service communication.

1.2. Problem Formulation

1. How to compare data transfer performance between gRPC and REST API using the Golang programming language in the application transaction service?
2. Which one is more efficient in terms of data transfer using the Golang programming language between gRPC and REST API in the application transaction service?

1.3. Objective

1. Find results that compare the performance of data transfer using the Golang programming language between gRPC and the REST API with the load and stress test method on the application transaction service
2. Find out which result is more efficient to use in terms of data transfer by using the Golang programming language between gRPC and REST API on the application transaction service.

1.4. Scope

1. This research was only carried out on two types of protocols, namely gRPC and REST API and using the Golang programming language in the application transaction service
2. This research only focuses on the data transfer performance of gRPC technology and REST API using the Golang programming language on the application transaction service with the load and stress test method and using JMeter to test these methods, not on other aspects of observation.