Distributed System
Final Report: HTTP over RPC

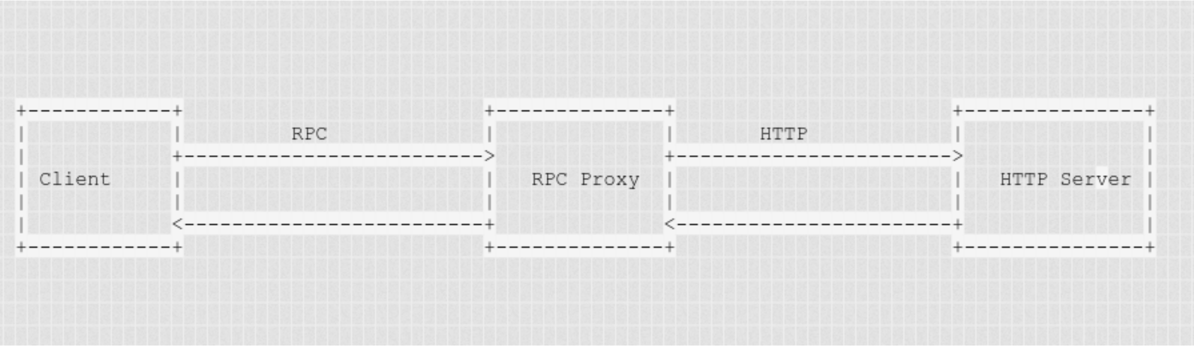
Le Nhu Chu Hiep   Pham Thi Ngoc Mai   Pham Phan Bach
Doan Lien Huong   Vu Khanh Huyen

April 19, 2020

Contents

1 Introduction

HTTP over RPC is quite a interesting topic. In here, we try to build the proxy servers that sit between client and its destination.



In this project, our requirement is that the client and the proxy will communicate through RPC protocol. There are 2 ways to understand it:

Firstly, the proxy can provide severial HTTP generate function so that the client can use to send request to the destination host (Of course the function call in here is remote - RPC function). But I think it is not preference way for 2 reason. It is not productive and the general user can not used. And the other way will be providing the data transfer proxy as normal proxy and applying the RPC as the protocol. In other other word, the client give proxy poorly HTTP as data and we help them transfer it to destinate. And in the middle of the line, the RPC protocol will be used.

Developing from second idea, the proxy can split out or we can say it is distributed proxy. Basicaly, there are 2 parts in the proxy system, the bunch of servers will get the client HTTP request and the other server send request HTTP to the destination host. The RPC is used as main protocol between 2 type server of system.

Why do we run this project ?
Obviously, this is our final and the sub reason is the knowledge that I can gain about proxy. And it sound very cool also.

2 Objective

My purpose in this project is understand the proxy definition and use it to develope the runable proxy between the real browser (in this case is the firefox) and any destination HTTP and HTTPS host. During building idea time, I decide to implement 2 type server:

- The client proxy server which stand in the same region as the client and can have multi-server across each geography space. It will sit in demo computer for convenient reason. This server type handle the client request send in as poor HTTP or HTTPS. Parse the client request to get IP and port of destinate host, talk to other type server (RPC protocol) to open tunnel between client and destination.

- Other type server in here is the server proxy server. It is a bad name (I know). But it is the important part in my proxy system. It run outside of the censored region. Waiting for incomming request of the client server (in RPC protocol). Creating TCP socket to destination host, then open tunnel between client and host website. It keep the role as end user in the website point of view.

Note that my browser is firefox 74 so the communication with client will follow standard of firefox 74 in proxy mode.

3 State of the art

Unfortunately, we could not found any the proxy server apply RPC protocol into the commnucation. It can be explained because most of the proxy system work as a single station. That mean the user will send the request to a server and that server itself sends request to the destination host. That is a simple and easy implemented method.

However, it is lack of security protection when the single location of the proxy server can be found. Then the middle-man can track out the client IP to identify the user location. But if the proxy system are distributed as my idea, even if the part connect to the website be found, it is still be hard to keep tracking the user IP because the user dont connect directly to tracked server. Moreover, it is easier to scale up sysetm. Basicaly, the server proxy part do 1 job only is transfer data the host website. And the hard part which is handle request from the user (include multiple of proxy communicate protocol depending on the browser type and version) stay in the client proxy server part. Then when the proxy implement some new feature, instead of closing the wholw system to update, the new client proxy part will be deployed then connect to on-running server proxy part. I call it dynamic update

4 Method

5 Evaluation

6 Conclusion