CSCI 5105: Introduction to Distributed Computing

Programming Assignment 0: A simple Thrift client & server

Due: *Feb / 19* (will not be graded but 1% credit)

1. Overview

In this programming assignment, you will implement a simple Thrift client and server on CSE machines. The goal of this assignment is to make you learn how to use Thrift and implement a client and a server using it. **You will work alone and get 1% credit for your submission,** but project will not be graded. We strongly recommend you to do if you are not familiar with Thrift (RPC) since you may need to use Thrift for the rest of project assignments.

2. Project Details

The Thrift server will be a simple key-value storage in which all data is stored in memory and thus not persistent. For simplicity, you may want to use *Map* data type to store key-value pairs. The server will expose two APIs Get/Put to the client.

    a. get (string key): retrieve a value associated with a key.
    b. put (string key, string value): insert a key-value pair.

The client will use these two APIs to insert a key-value pair to server and retrieve values associated with keys from the server.

In this project, you need to use Thrift to implement a client and a server. The programming steps are:

    a. Define interfaces in IDL (Interface Definition Language) file.
    b. Compile the IDL file with Thrift code generator: > thrift --gen java (or cpp) xxx.thrift
    c. Implement a client that send get/put requests to a server. (You may want to make a simple UI to send requests).
    d. Implement interfaces (in server side) generated codes by thrift (in step b).
    e. Implement a server which includes the implementation of interfaces (in step d) and manages the key-value pair in memory as requested.
    f. Compile and run in the same or separate machines.

You will use CSELabs for this class. The client and the server can run in the same machine or separate machines. If you want to run them on different machines, you need to use appropriate hostname (instead of 'localhost') in the client program to connect the server. You can use either C/C++ or Java.

3. Project Group

All students should work alone.

4. Grading

This project will not be graded. But it is highly recommended to do this project to help yourself prepare to do the project assignments in this class.

5. References

- Thrift White paper
  - https://thrift.apache.org/static/files/thrift-20070401.pdf
- How to setup Thrift in your own machine (Ubuntu)
  - Packages for compiling Thrift
    https://thrift.apache.org/docs/install/debian
  - Building Thrift from source codes
    https://thrift.apache.org/docs/BuildingFromSource
- Tutorial by Examples
  - Java
    https://thrift.apache.org/tutorial/java
    http://thrift-tutorial.readthedocs.org/en/latest/usage-example.html
  - C/C++
    https://thrift.apache.org/tutorial/cpp