

Computer Systems Engineering Lab2

Simple Distributed File System Part 2

Release: Oct 31, 2018

Deadline: Nov 14 24:00, 2018

Interview: Nov 17-18, 2018

Introduction

In the lab1, you have already finished a part of SDFS. Now, we want to make it an actually C/S architecture program.

Target

You need just to finish following part:

- **RPC**

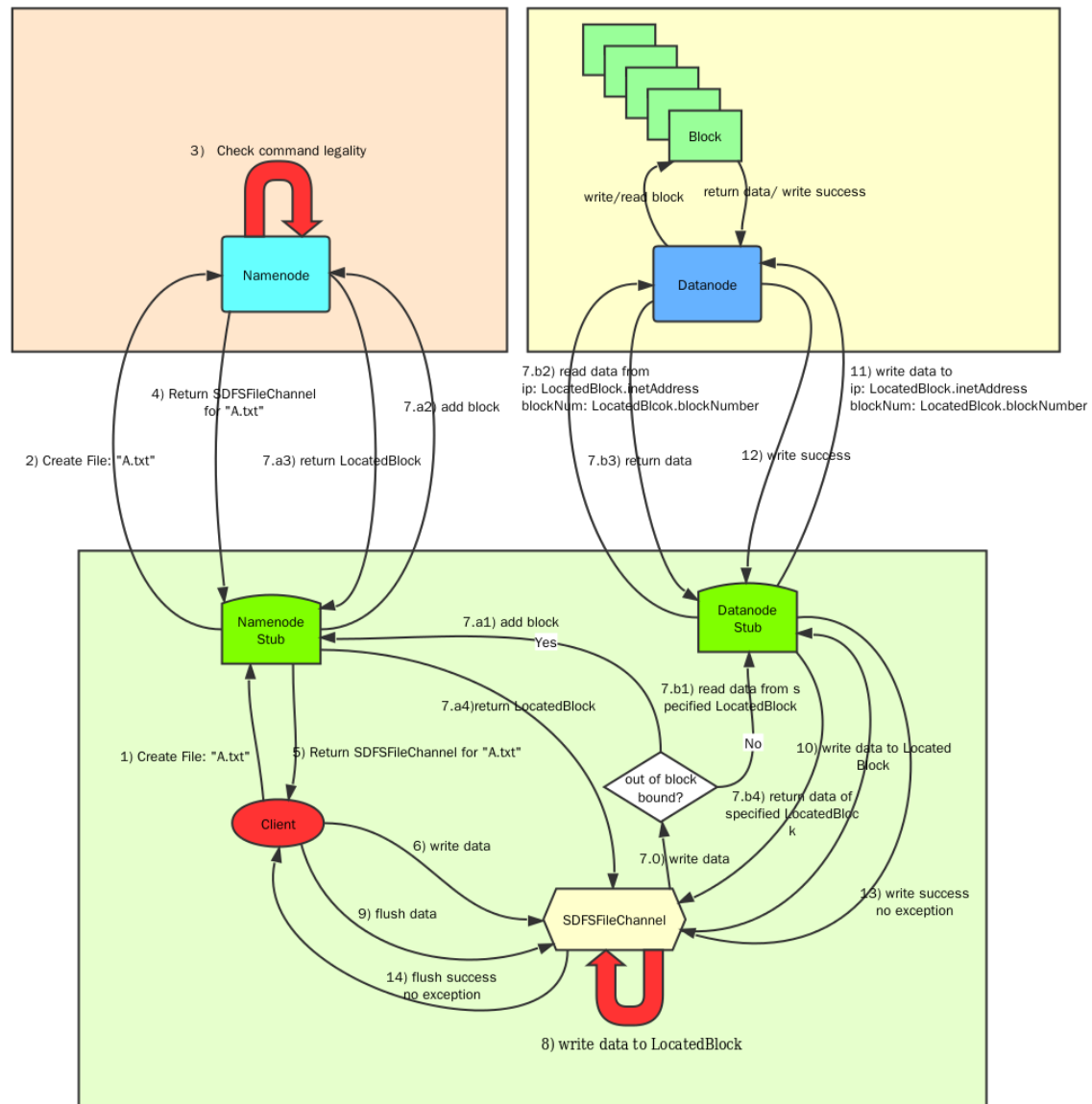
In this lab, you are required to implement a simple RPC framework by yourself.

RPC frameworks, including RMI, gRPC, Thrift, etc. are **NOT** allowed in this lab.

You should implement client stub and RPC server by yourself. Any kind of implements without code copy and without any framework are acceptable.

Suggestion: Use Socket, and send/receive custom serializable class to communication between stub and remote server.

[java socket](#)



Client->create

NameNodeStub->create

NameNode->onRpcReceive

NameNode->create return SDFSFileChannel with readwrite permission

NameNodeStub receive and return SDFSFileChannel

SDFSFileChannel->write block not enough

NameNodeStub->addBlock

NameNodeServer->onRpcReceive

NameNode->addBlock return LocatedBlock

NameNodeStub receive and return LocatedBlock

SDFSFileChannel continue to write data

SDFSFileChannel->close

SDFSFileChannel->flush

DataNodeStub->write

DataNode->onRpcReceive

DataNode->write to disk and return result

DataNodeStub receive and return result

SDFSFileChannel close successful

Other tips

Since you are familiar with inode, from this lab, you are allowed to store the DirNode directly to the disk. That is to say, you could serialize the entire file tree to disk by implementing *java.io.Serializable*. It depends on you to use the old design or the new design.

Also, you can use *java.io.Serializable* to serialize message between client and server.

Document

Basically, your document should include following:

1. Your design of RPC.
2. Describe the problem you met during developing and how you solve it.
3. Describe the change of the architecture of yours (if possible).
4. Extra work you have done.

HandIn

Please pack all the code, document, and possible supplementing materials in a zip file with name *[STUDENT_ID].zip* and upload it to the *WORK_UPLOAD/lab1/* folder on FTP server.

Grading

Document: 35%. A clear and detailed document is expected. Both Chinese and English will do.

Implementation: 55%. Any failed test will cause a loss of 20%.

Code Style: 10%. Well-commented and maintainable code is expected.

Bonus: 20%. Hard to get all of them but easy to take a sip. Be sure to mention extra work in the document.