Distributed Systems Programming

A.Y. 2021/22

Exam Assignment for Exam Call on 06/05/2022

Deadline for submission: 04/05/2022 EOD

Modify your solution of Laboratory 4, by changing the protocol implemented by your client and server, according to the following specifications, which allows files of arbitrary length to be transferred:

1. The protocol works as in Laboratory 4, the main difference being that the file to be transferred by the client or by the server is encoded in a different way on the connection: before sending the file, the sender divides the file into blocks. Each block is 65535 bytes long, except the last one, which is **less than** 65535 bytes long (in the special case of a file whose total length is a multiple of 65535 bytes, the last block contains 0 bytes). Then, according to this new protocol, the sender encodes each block as the concatenation of the block length, encoded as a 2's complement integer represented over 2 bytes, and the block contents:

B	Contents (B bytes)

   Of course, if the last block is a zero-length block, its encoding contains only the two bytes of the length B=0. The sender sends the file on the connection by sending the sequence of its blocks. The receiver recognizes the end of the file by detecting its last block (which is the only one having a length less than 65535).

Test your new Java client and server together as you did for the original client and server, including robustness tests.

Submit the updated solution, including all the following items:

- The code of the modified client and server
- README.md files that specify the contents of folders and instructions on how to compile and run the code from scratch

Important:

- The solution must work within the Labinf VMs, with the software already installed in those machines.
- The solution must be uploaded to a git repository for which you will get the credentials.

Useful tip

In the specifications of Laboratory 4, it was required to send the length in bytes of the image file that must be converted, as a 4-byte 2's complement integer number in network byte order. In the solution that you must develop for this exam call, you must not send that information anymore. In fact, the new encoding described in this exam assignment allows transferring files of arbitrary size because there is no longer the need to encode the overall length over 4 bytes (which would limit that length to 2^31 bytes).