ITMO UNIVERSITY

National Research University ITMO

Faculty of Software Engineering and Computer Systems

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# SYSTEM SOFTWARE FUNDAMENTALS

**Lab Work #6 (4)**

TCP/IP Communication

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# Assignment

## Part I

Implement client-server communication over TCP/IP in C and Perl.

The client should:

1. Accept *host name* and *directory paths* as command line arguments;
2. Establish a TCP/IP connection and request file listings for the specified directories;
3. Output the listing to `stdout`.

The server should:

1. Use a text protocol;
2. Handle multiple simultaneous connections;
3. Create a new thread (using `pthreads`) for each connection.

In addition to this, the following diagrams should be provided:

- a BPMN diagram;
- UML sequence, class, activity, use case, deployment, state, and component diagrams, written using the PlantUML notation.

# Code Listing

`.c`, `.pl`, and `.plantuml` files are available at

`https://github.com/timlathy/itmo-third-year/tree/master/System-Programming-Fundamentals-5th-Term/Lab6-TCP`

# Communication Protocol

The following text protocol was implemented:

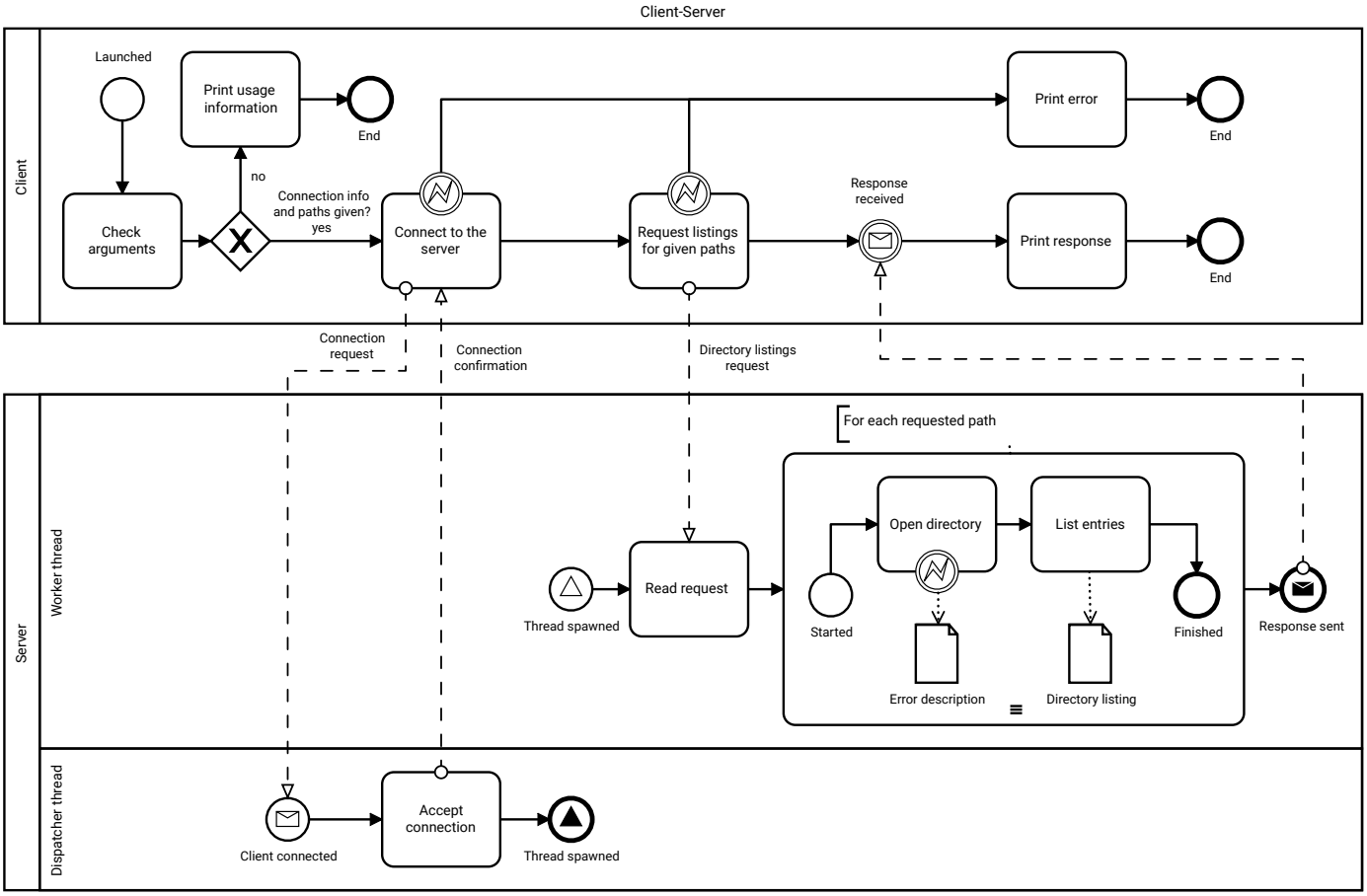
```
<request> ::= <path> { <path> } CR LF
<path> ::= <non-empty string not including NUL or CR or LF> CR LF
```

# Example Telnet Interaction

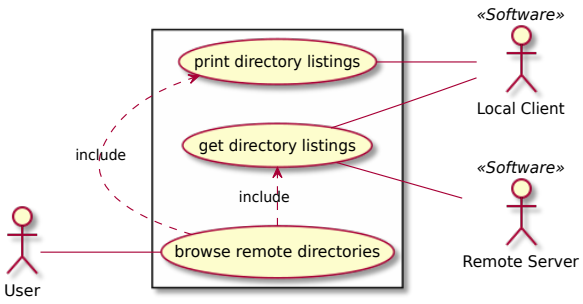
```
Trying 127.0.0.1...
Connected to 127.0.0.1.
Escape character is '^]'.
test
test-protected
.

Contents of test:
.
h
..
abc

Failed to open test-protected: Permission denied

Contents of .:
test-protected
.
test
..


Connection closed by foreign host.
```

# Diagrams

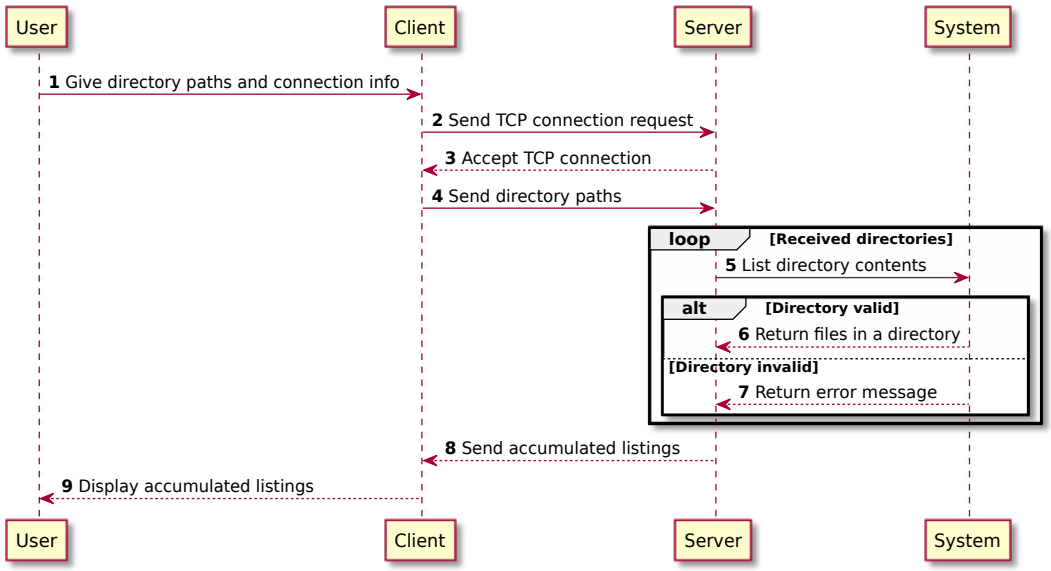
## BPMN



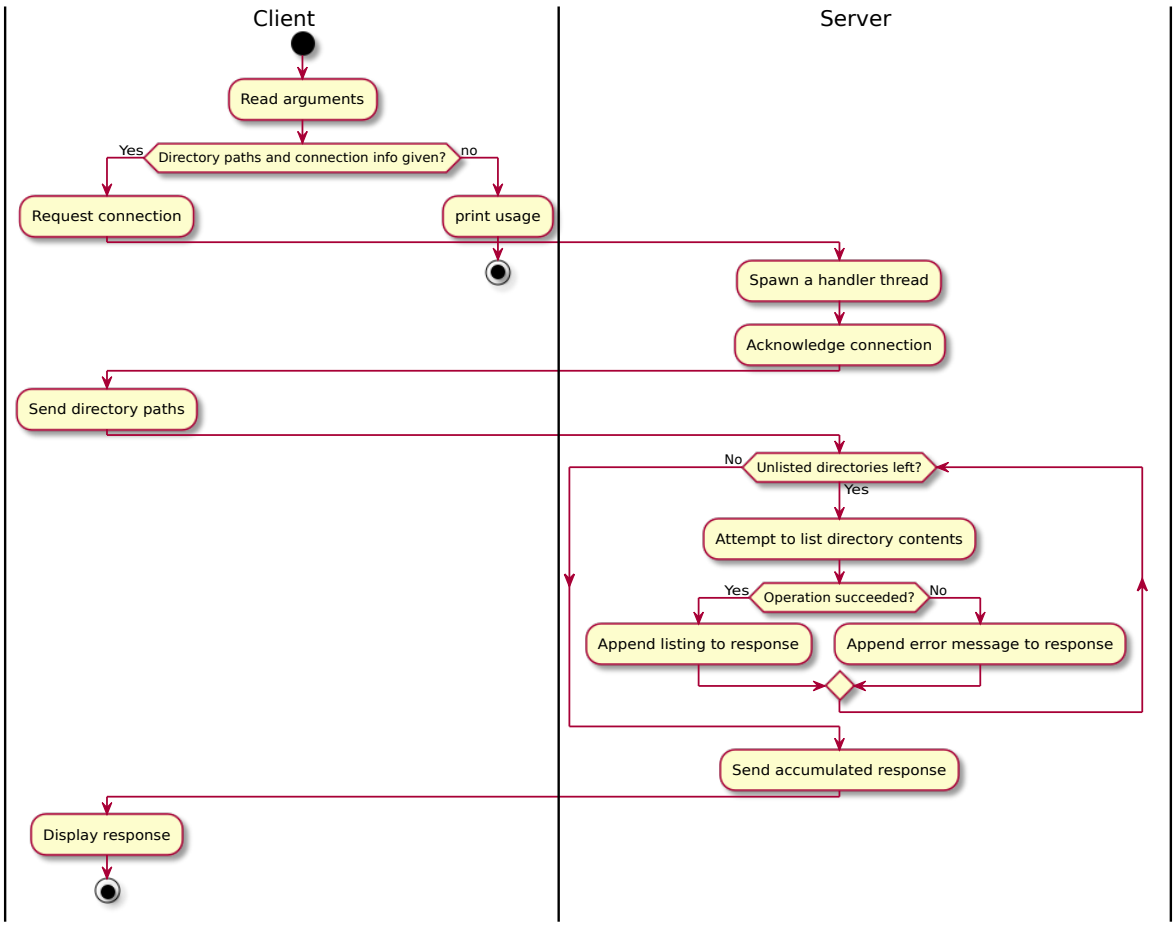

## UML Use Case



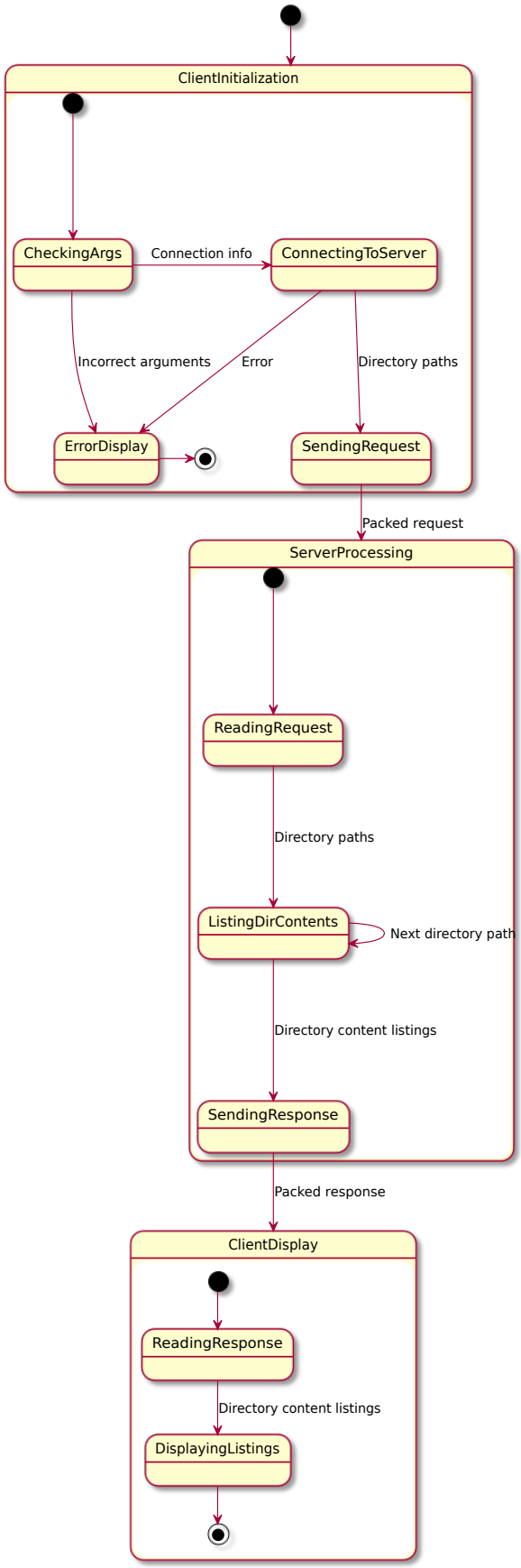
## UML Sequence



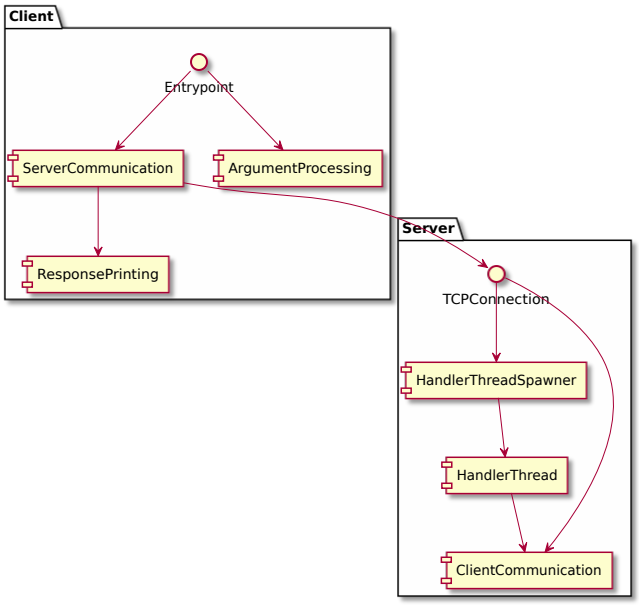

## UML Activity



## UML State




## UML Component



# UML Deployment