JAVACHAT

Simple Chatting Program

자바타요

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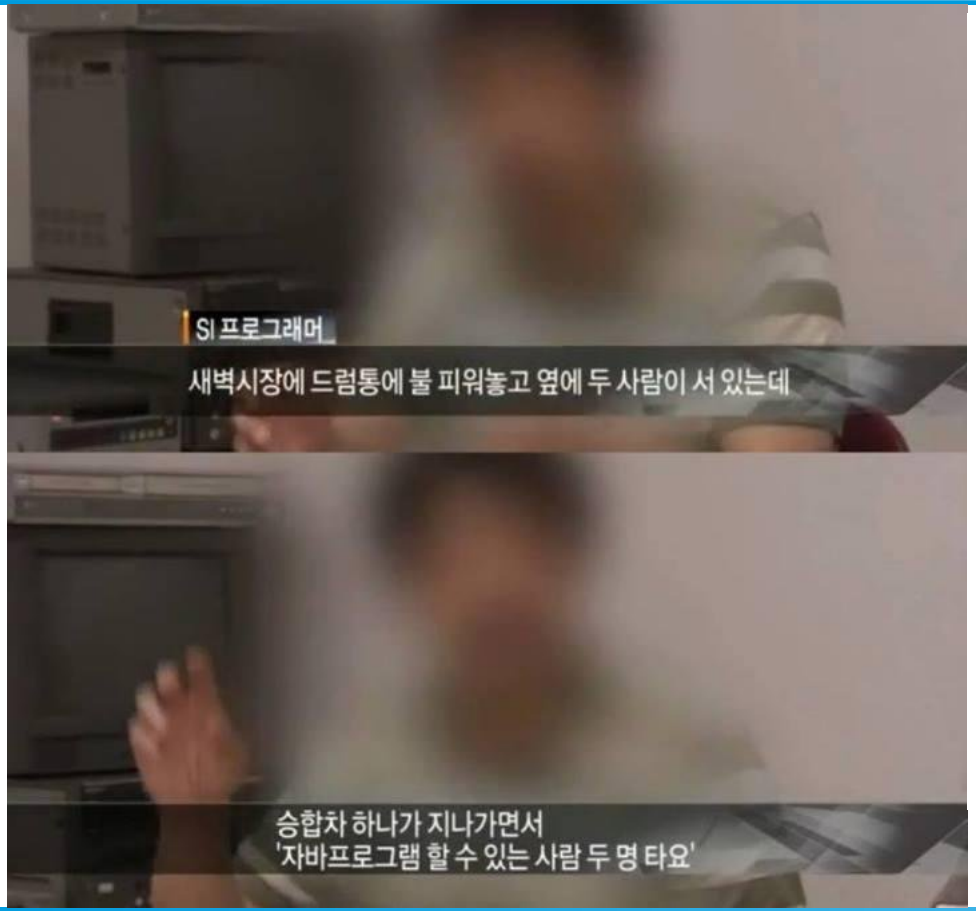
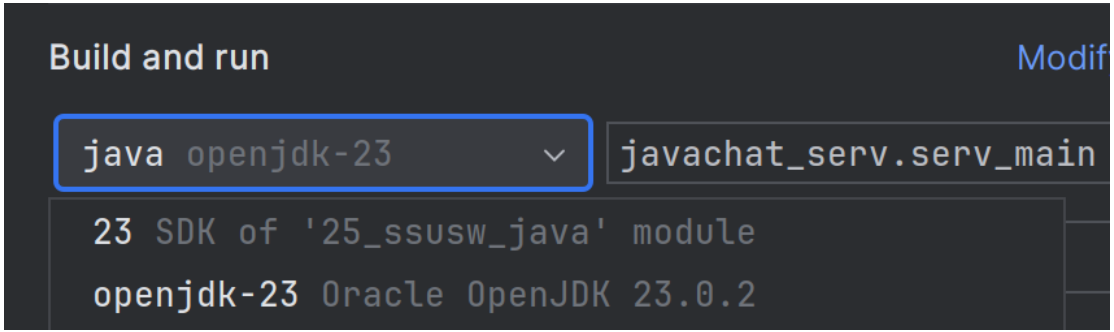
자바타요?

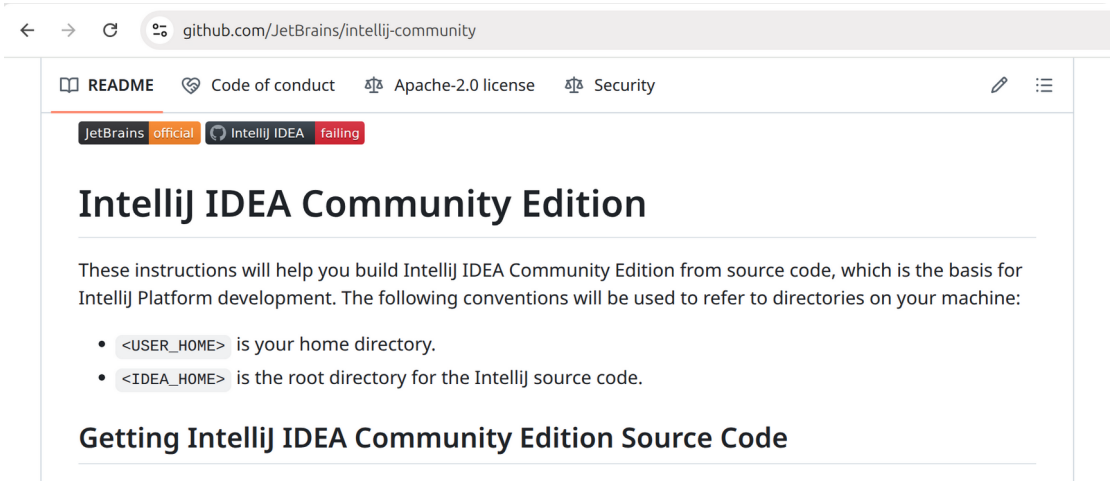

SI 프로그래머
새벽시장에 드럼통에 불 피워놓고 옆에 두 사람이 서 있는데
승합차 하나가 지나가면서
'자바프로그램 할 수 있는 사람 두 명 타요'


Java 두명
타요...

Development Environment

- **Various Host OS (Windows, Linux, macOS)**
  … Because of WORA,
  different OS does not matter!
- **OpenJDK 23**
- **Jetbrains Intellij 2025.1.1 Community edition**
  It's Free and Open Source!





What We Focused

- **Implement of Simple Protocol**

  Protocols: Rules promised to send and receive data

  - Syntax, Semantics, Timing

- **Socket Programming**

  Socket : Endpoint of IPC(Inter-Process Communication)

  Process : Unit of resource allocation at program execution

Berkeley Socket

- Developed for API of BSD 4.2, in 1983 at UC Berkeley
- Located between Layer 5 (Application) and Layer 4 (Transport) of TCP/IP 5 Layer
- Using the Internet to send and receive data
  → Considering the network topology, this is IPC!

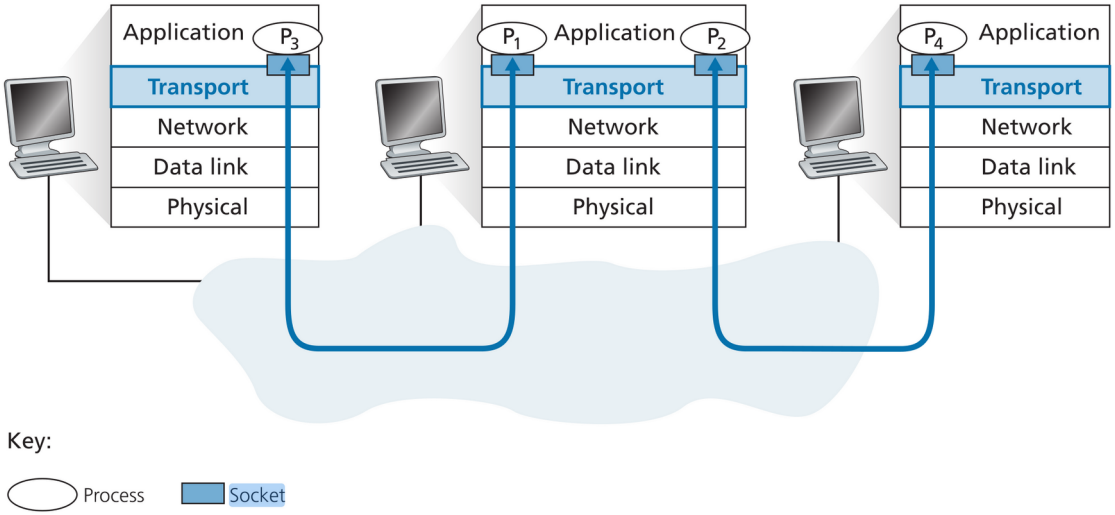
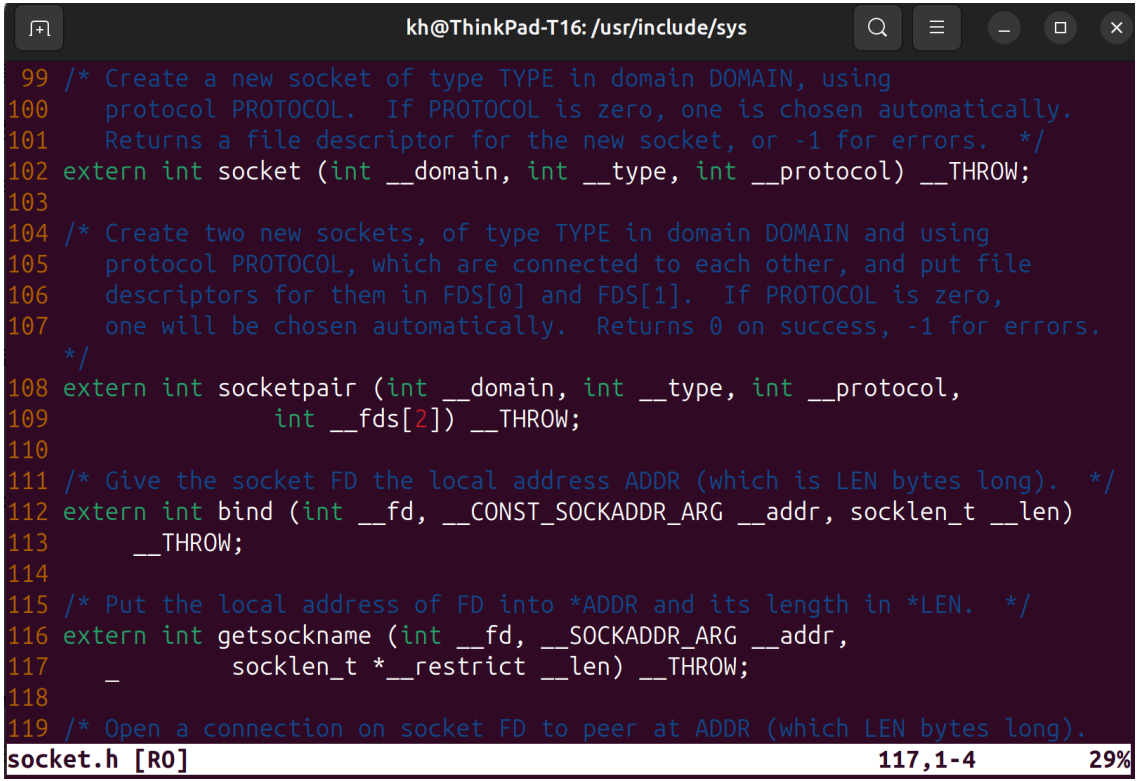


Figure 3.2 ♦ Transport-layer multiplexing and demultiplexing

Socket in Java

- A wrapper built into Java, not a Berkeley Socket
- Runs the same on all host JVMs
  → Actual implementation uses system calls, which provided by each host OS

  UNIX - <sys/socket.h>
  Windows - <Winsock2.h>
- Java.net.Socket
  Java.net.ServerSocket
  → **TCP Communication**



TCP

- Protocol used in Layer 4 of TCP/IP
- Connection-Oritented

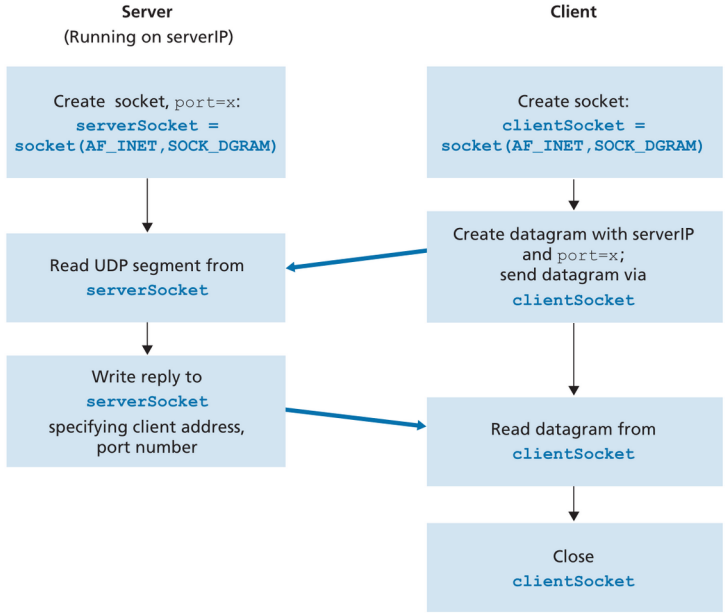


Figure 2.27 ♦ The client-server application using UDP

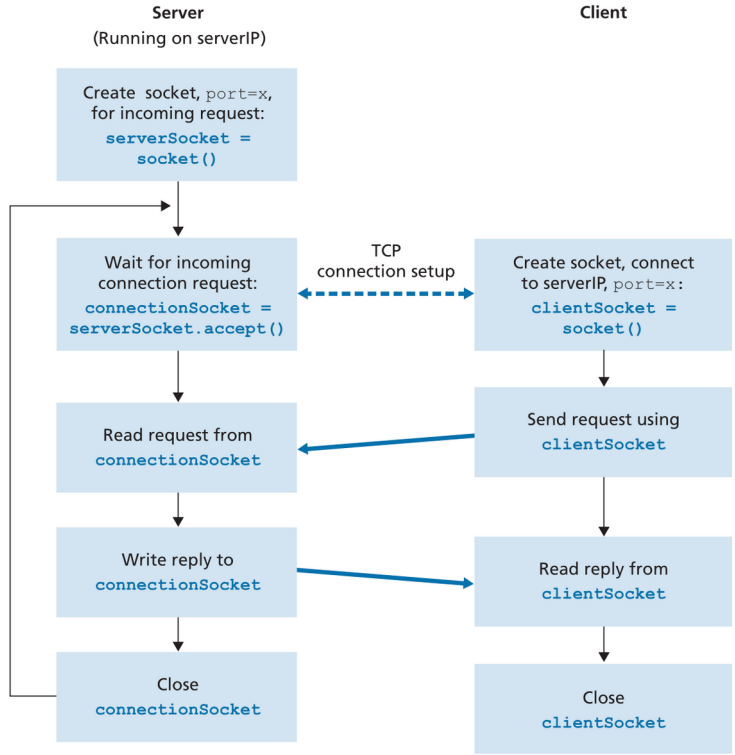


Figure 2.29 ♦ The client-server application using TCP

Basic Syntax

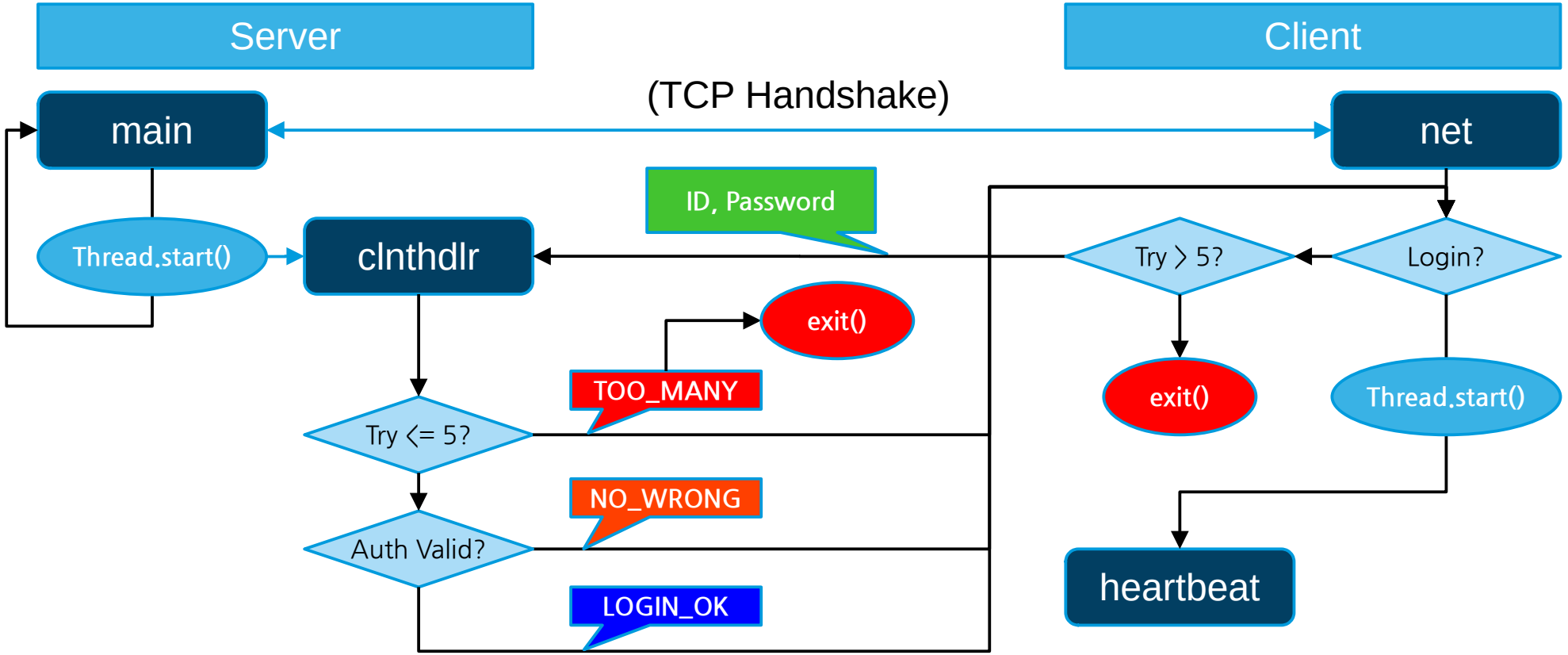
- **Every line ends with '₩n'**

  BufferedReader's readline() method reads everything before '₩n'

- **< Exactly Once >, { None or More }, [None or Once]**

  Backus-Naur Form

(1) Login - Timing



(1) Login - Syntax & Semantics

- **Client.net → Server.clnthdlr**

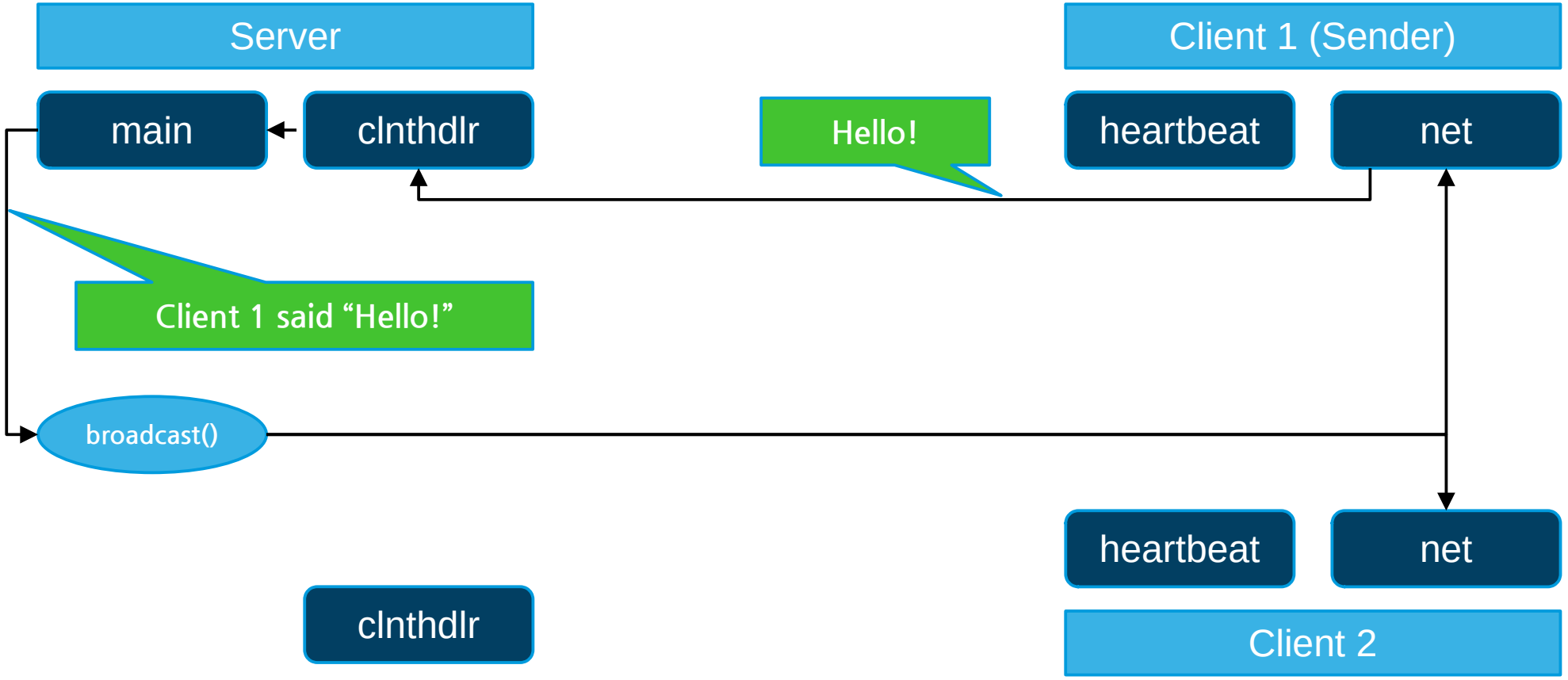
  <String> <String> : id, password

- **Server.clnthdlr → Client.net**

  <Int> : response

100 - LOGIN_OK
200 - NO_WRONG
300 - TOO_MANY

(2) Plain Messsage - Timing



(2) Plain Message - Syntax & Semantics

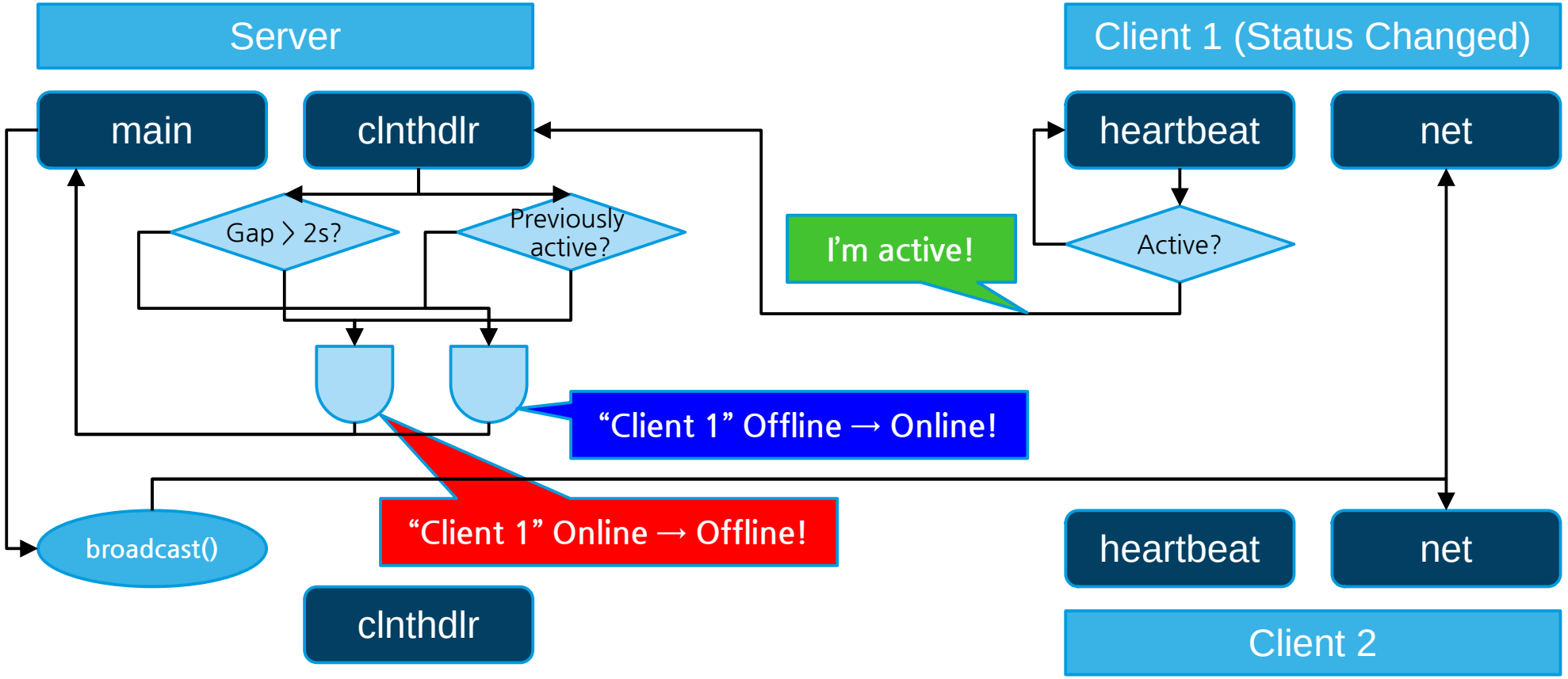
- **(Some) Client.net → Server.clnthdlr**
- **Broadcast (Server.main → (All) Client.net)**

  〈Int〉 [String] : Type, Message

0 : Plain Message

What user want to send
(Empty Message Allowed)

(3) Heartbeat - Timing



(3) Heartbeat - Syntax & Semantics

- **(Some) Client.net → Server.clnthdlr**

  〈Int〉 “true” : Type, No meaning

- **Broadcast (Server.main → (All) Client.net)**

  〈Int〉 〈String〉 〈Boolean〉 : Type, Client Name, Active

1 : Heartbeat

Demonstration

Significance and Limitations

[Significance]

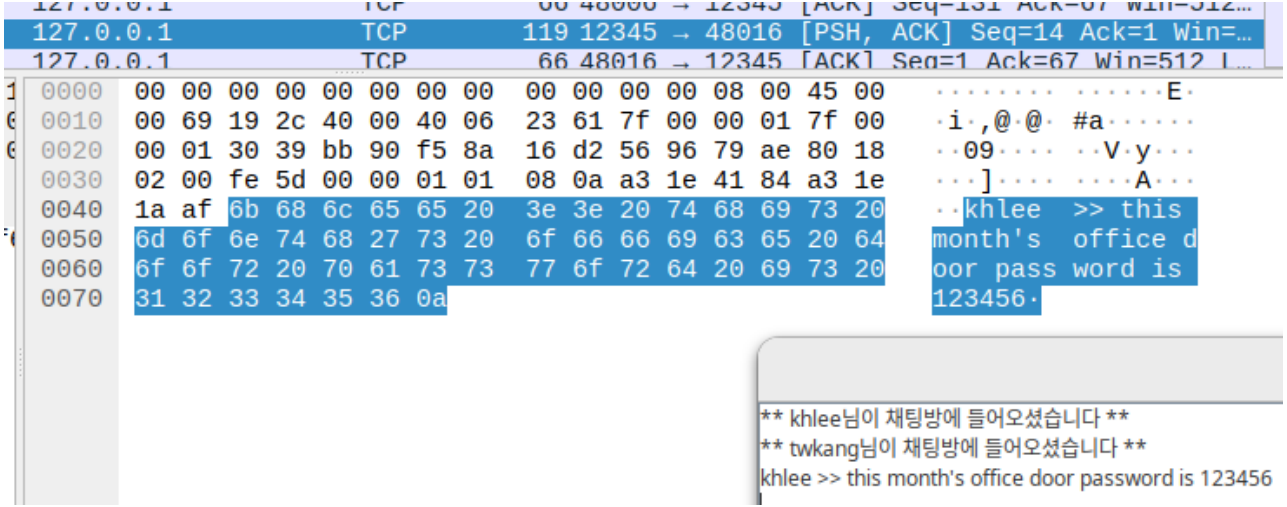
- No usage of external things other than Java

  → **Valuable experience to make thought about fundamental of framework**

[Limitations]

- **All packets are plain text**
- **Implement without JAAS**

  JAAS : Java Authentication and Authorization Service



Any Questions?

Thank you!

[Reference]

Computer Networking: A Top Down Approach 8th, James F. Kurose, Pearson, 2021