Java Sockets

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Agenda

- What are sockets
- Client/Server interaction
- Single client/server example
- Synchronized data objects
- Multi-threaded servers
- Multi-threaded clients
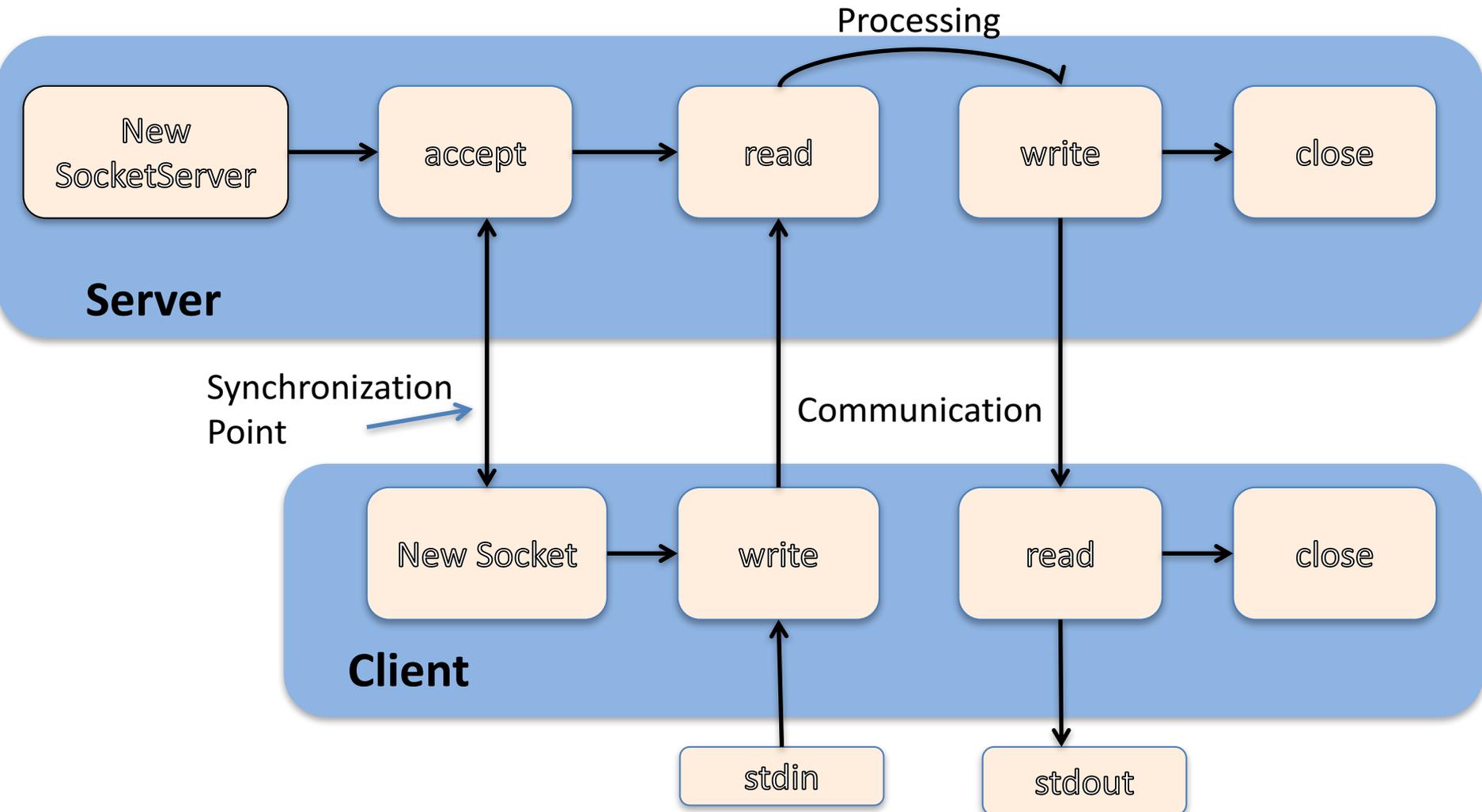- Detecting client/server shutdown

Socket

- One end-point of a two-way communication link between two programs running on the network
  - Typically one process is called the *server*
  - Typically one process is called the *client*
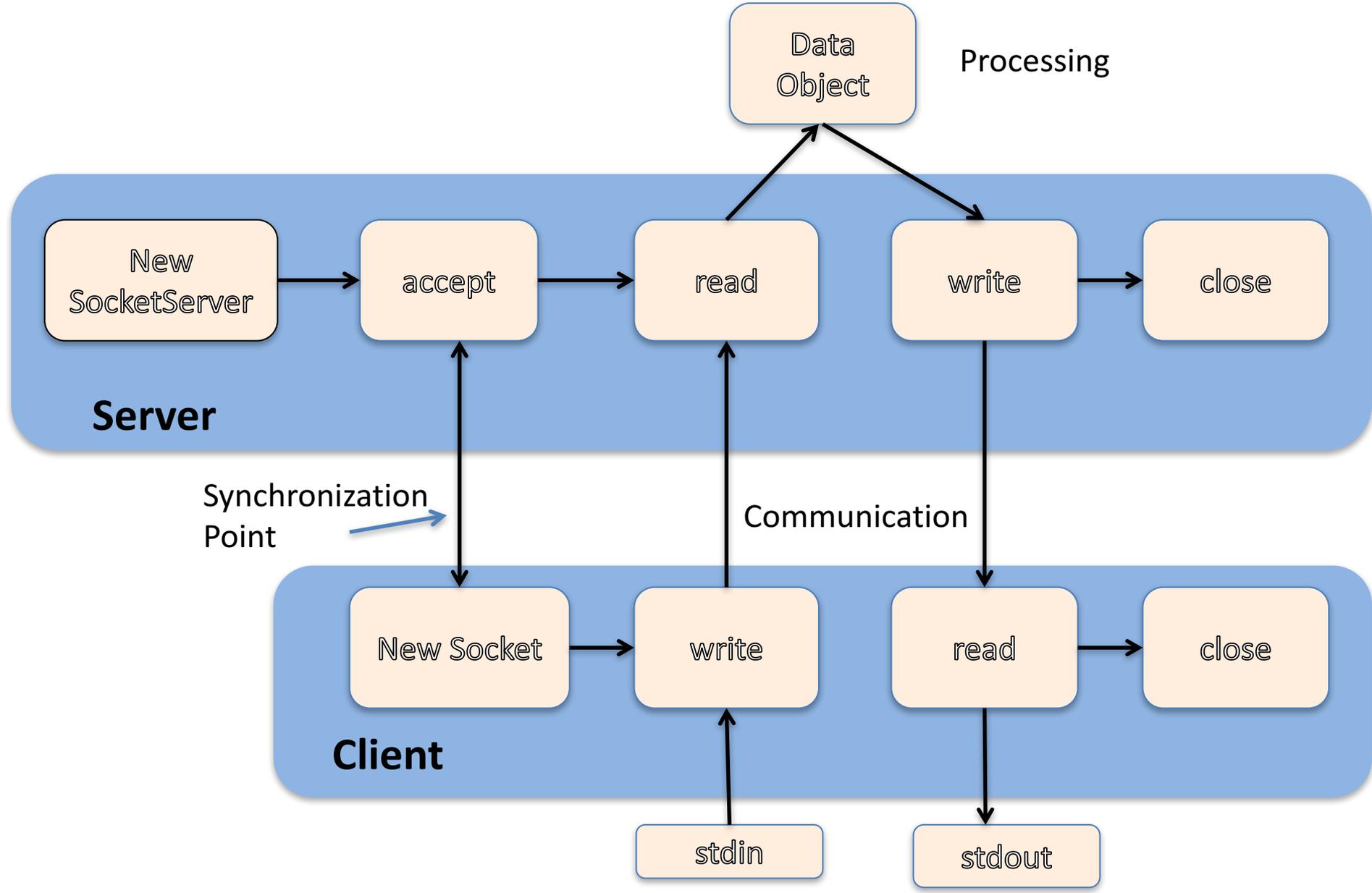
Server/Client Interaction

(from Jonathan Engelsma's Java Sockets Tutorial--
https://www.youtube.com/watch?v=aEDV0WlwXTs)
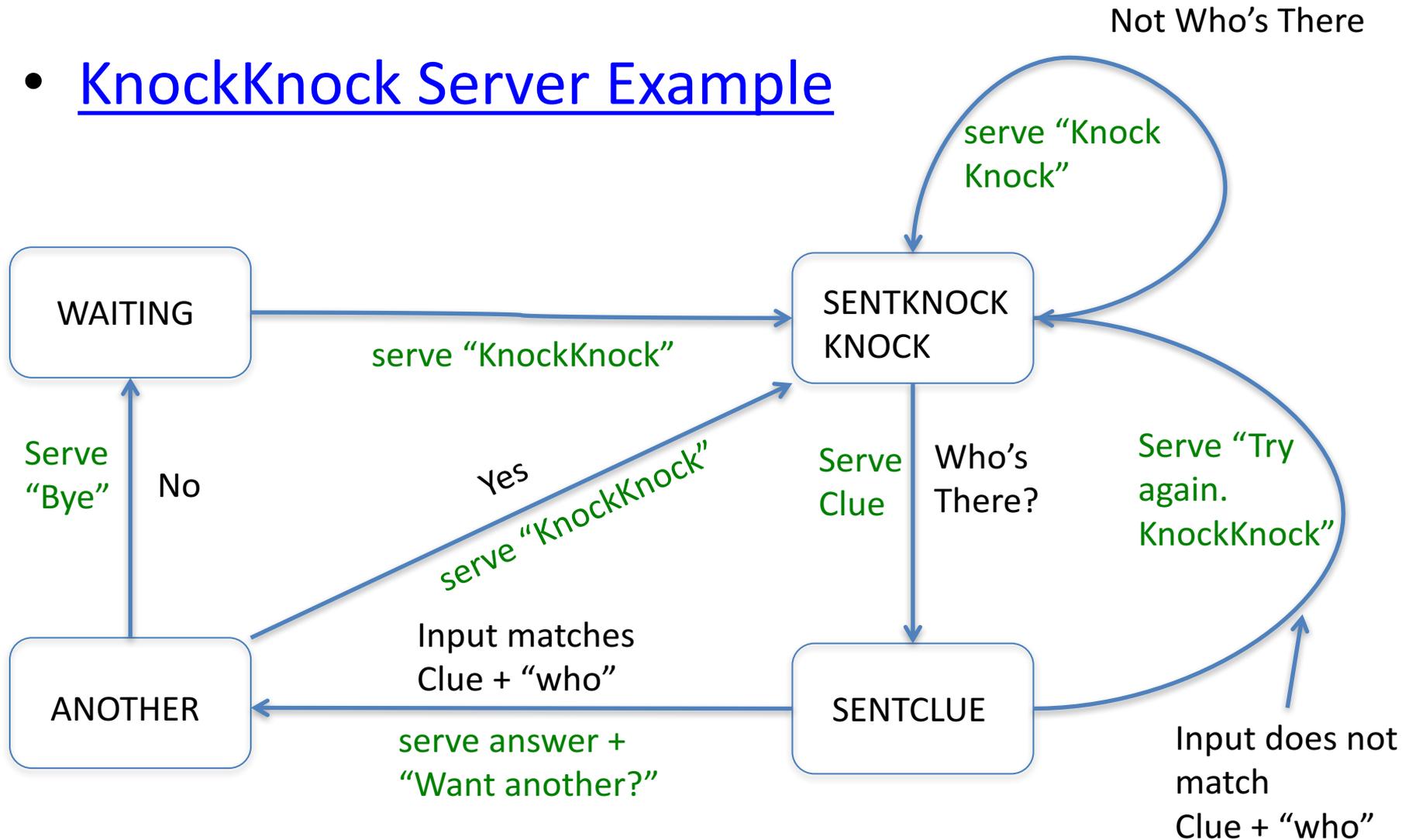
Single Client/Server Example

- [echo client](echo-client)
  - try with resources only works for Java 1.7 or later
  - hydra machines have Java 1.6 (4/2014)

Synchronized Data Objects

Synchronized Data Objects
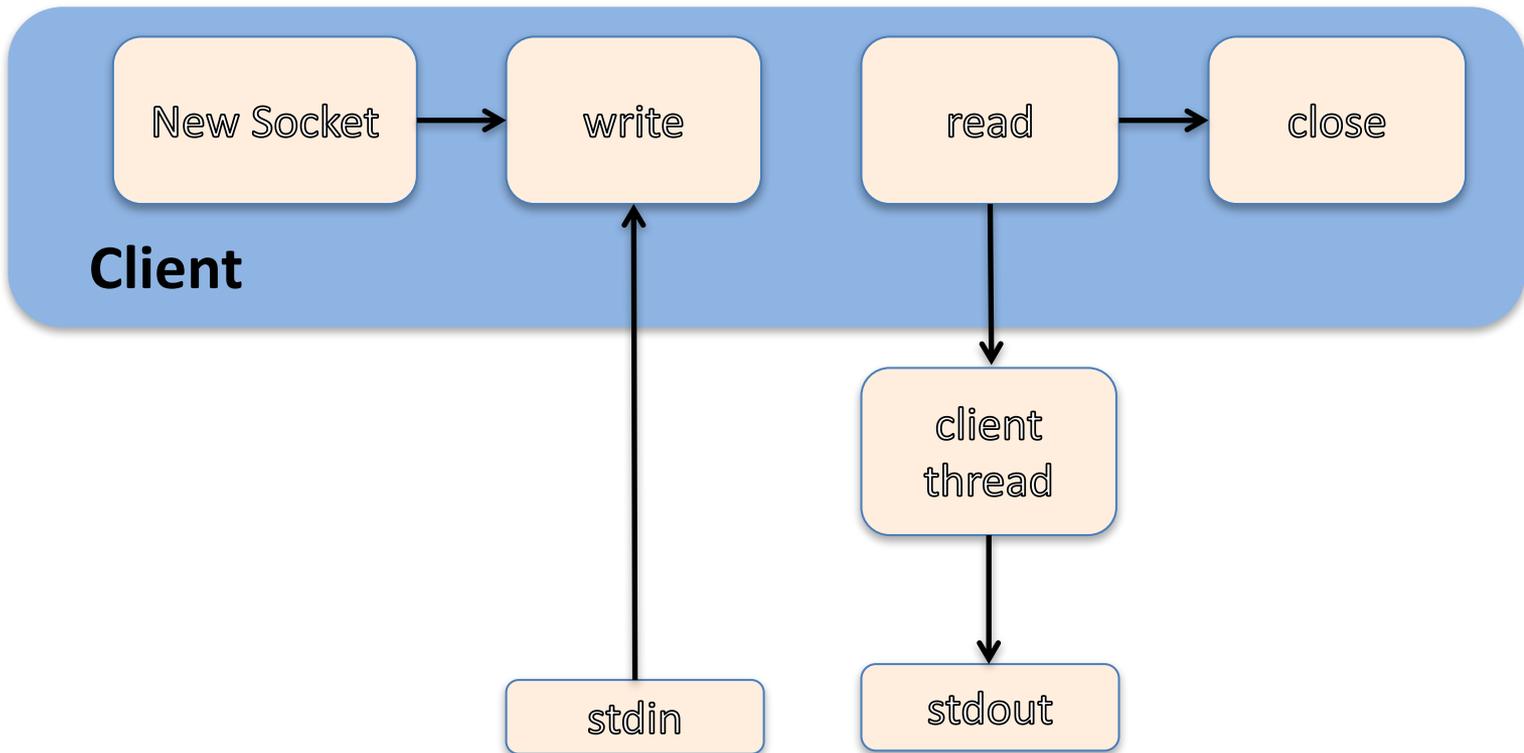
- ## [KnockKnock Server Example](#)

Multi-Threaded Servers

- [Multi-Threaded KnockKnock Example](#)

Multi-Threaded Client

- Chat Example

Multi-Threaded Client
(Pseudo Code)

Main Thread

New Socket

Get SocketRead and

   SocketWrite objects

Create WriteConsoleThread

  w/ SocketRead obj

While (more Stdin)

    Process/Write to

    SocketWrite Obj

WriteConsoleThread

While (more Socket Read Obj)

    Process line

    Write to console

Detecting client/server shutdown

- Occurs when socket read object returns null
  - Socket.close() on other end does not signal other process of termination
- Server thread: Exit while loop, wrap up processing, and terminate

Multi-Threaded Client
(Detecting Shutdown)

Main Thread
New Socket
interrupted = false
Get SocketRead and
  SocketWrite objects
Create WriteConsoleThread
  w/ SocketRead obj
While (more Stdin)
    if (interrupted) break
    Process/Write to
    SocketWrite Obj

WriteConsoleThread
While (more Socket Read Obj)
    Process line
    Write to console
Notify Main thread of
    server shutdown by setting
    interrupted to true