

Trial Project SYSC 3010

Design document

SeyedSaeed Alavinia	100764724
Volodymyr sharovar	100772017
Chimere Mbah	100823820
Riyath alsegier	100814815
Raditya Budianto	100836539

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Objective:

The objective of this project is to build a remotely controlled 8-bit binary counter where the counter value is represented as LED lights on a piface board integrated with a Raspberry pi (flasher device). The remote control capabilities are provided using a TCP java server at the core and using a Raspberry pi integrated with a Gertboard as controller (invoker device).

System Architecture:

The system implements a client-server architecture where a PC functions as a threaded java server while the clients are two "Raspberry pi" devices; one with a Gertboard (invoker) and the other with a piface board attached (flasher). After a successful connection from each client, the server instantiates and runs specific threads to handle the connected clients. the "invokerThread", which is in charge of handling switch clicks received from invoker, invokes the "flasherThread" which is waiting for click commands. The "flasherThread" maps the received command to appropriate output command and forwards it to the flasher device.

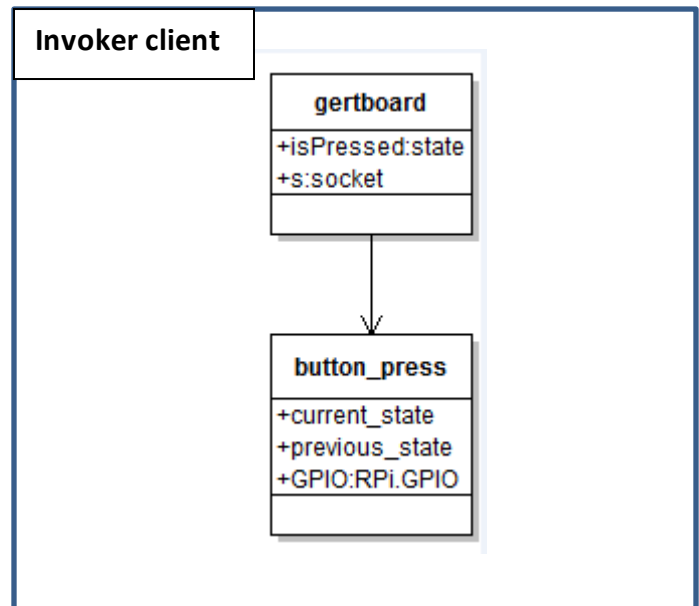
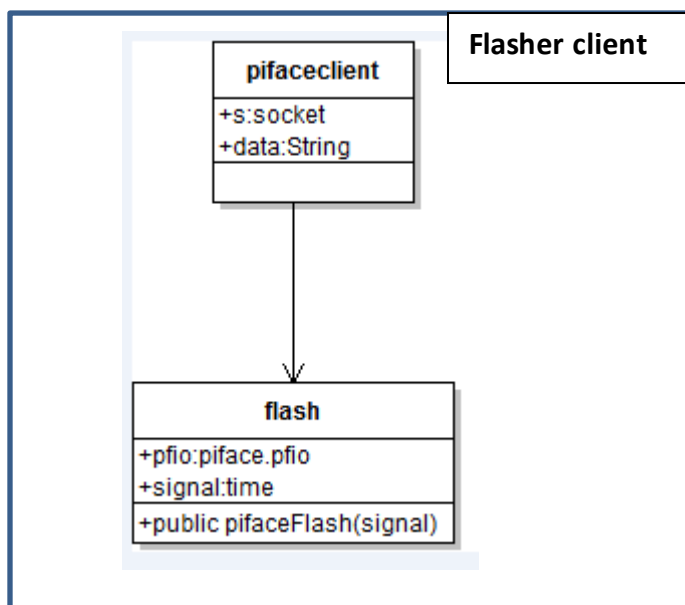
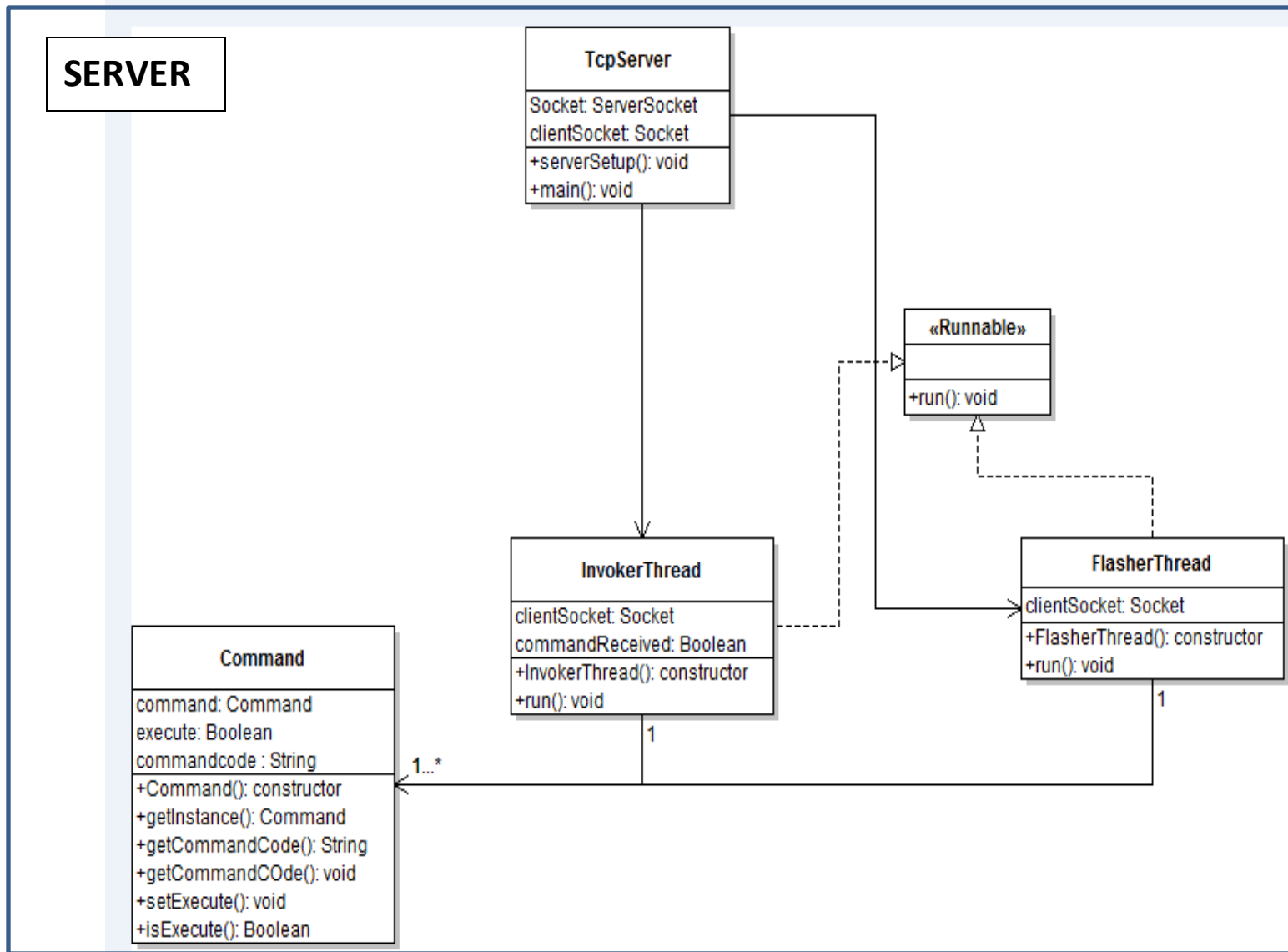
The flasher device takes the appropriate action based on received and updates the counter state and the updated state is reflected on the piface LEDs.

The following describes the association between each input on the invoker device and the expected output on the flasher device.

Input on Gertboard	Output on Piface
Press S1 switch	Add 1 to counter
Press S2 switch	Subtract one from counter
Press S3 switch	Reset the counter to 0

Implementation and Design:

The following figure illustrates the UML class diagram representation of the described remotely controlled 8bit binary counter.



The following represents the component diagram of the described system:

