

FCST

THAT IS, HOW TO MEASURE HOW MANY ACTUAL DATA
CAN YOU SEND USING ETHERNET (AND UDP DATAGRAMS)

PROJECT OUTLINE

- APPLICATION FOR TESTING CONNECTION WITH FPGA DEVICE THROUGH ETHERNET AND UDP PACKETS
- MEASURES SPEED OF RAW DATA SENT BY FPGA
- CONNECTION PARAMETERS LIKE IP ADDRESSES, PORTS AND SETUP DATAGRAMS ARE CONFIGURED THROUGH JSON FILE.

TWO MAIN COMPONENTS

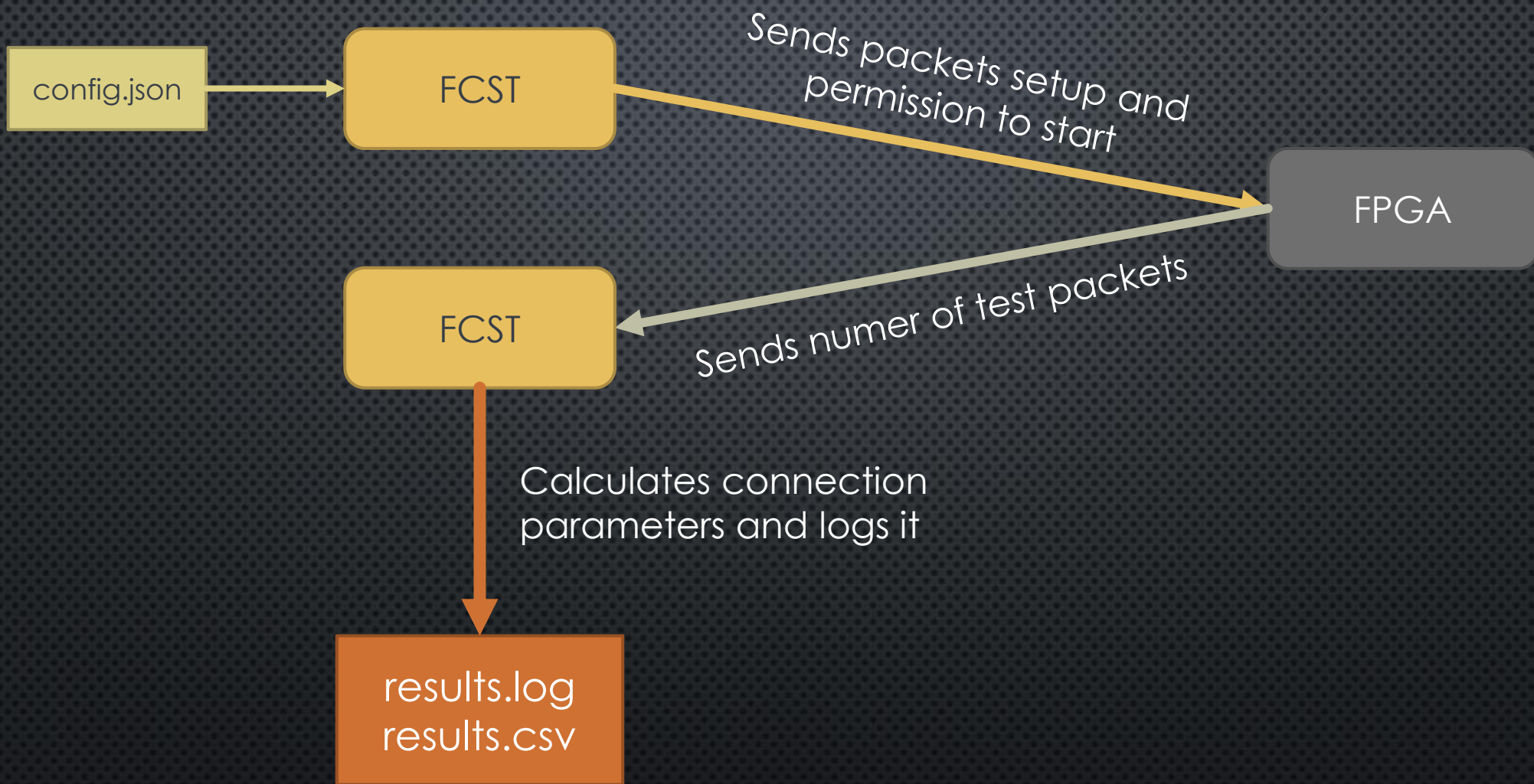
FCST

- RESPONSIBLE FOR
 - SETUP OF FPGA TEST PACKETS
 - RECEIVING AND MEASURING CONNECTION PARAMETERS
- CUSTOMISABLE THROUGH JSON CONFIG FILE

FPGA MOCKUP

- IMITATES REAL FPGA RESPONSES
- RESPONSIBLE FOR SENDING TEST PACKETS

HOW IT WORKS



MOCKUP

```
Listening on 12666...
Listening on 14666...
Listening on 15666...
Finished Listening on 14666.
Finished Listening on 15666.
Finished Listening on 12666.
Received setup on port 14666, setup message: b'\xff'
Received setup on port 15666, setup message: b'\x01\x86\xa0'Received setup on port 12666, setup message: b'\x00\x01\x80'

Set padding to 255
Mode set to: 1
Set number of packets to 100000
Start sending = 1
Sending 100000 packets
Finished sending.

Process finished with exit code 0
```


RECEIVING PACKETS

```
2020-09-09 12:12:33,220 [INFO] Delta time: 0.026139259338378906; Current counter: 5000
2020-09-09 12:12:33,242 [INFO] Delta time: 0.04808402061462402; Current counter: 10000
2020-09-09 12:12:33,263 [INFO] Delta time: 0.06885981559753418; Current counter: 15000
2020-09-09 12:12:33,283 [INFO] Delta time: 0.08906340599060059; Current counter: 20000
2020-09-09 12:12:33,303 [INFO] Delta time: 0.10867071151733398; Current counter: 25000
2020-09-09 12:12:33,322 [INFO] Delta time: 0.12800097465515137; Current counter: 30000
2020-09-09 12:12:33,341 [INFO] Delta time: 0.14680004119873047; Current counter: 35000
2020-09-09 12:12:33,360 [INFO] Delta time: 0.16547894477844238; Current counter: 40000
2020-09-09 12:12:33,379 [INFO] Delta time: 0.18500757217407227; Current counter: 45000
2020-09-09 12:12:33,401 [INFO] Delta time: 0.2066805362701416; Current counter: 50000
2020-09-09 12:12:33,422 [INFO] Delta time: 0.22752070426940918; Current counter: 55000
2020-09-09 12:12:33,441 [INFO] Delta time: 0.24680423736572266; Current counter: 60000
2020-09-09 12:12:33,460 [INFO] Delta time: 0.2658710479736328; Current counter: 65000
2020-09-09 12:12:33,478 [INFO] Delta time: 0.2843315601348877; Current counter: 70000
2020-09-09 12:12:33,496 [INFO] Delta time: 0.3023102283477783; Current counter: 75000
2020-09-09 12:12:33,514 [INFO] Delta time: 0.32022929191589355; Current counter: 80000
2020-09-09 12:12:33,532 [INFO] Delta time: 0.33757972717285156; Current counter: 85000
2020-09-09 12:12:33,549 [INFO] Delta time: 0.35536789894104004; Current counter: 90000
2020-09-09 12:12:33,567 [INFO] Delta time: 0.37304234504699707; Current counter: 95000
2020-09-09 12:12:33,585 [INFO] Delta time: 0.39052891731262207; Current counter: 100000
2020-09-09 12:12:34,586 [INFO] Successfully ended test
Transmitted 100000 packets
Received 100000 packets in 0.39052891731262207 seconds
Raw UDP packet data length: 1408 bytes
Raw UDP packet throughput: 2884.2646115711714 Mbps
```

SOMETIMES THINGS GO WRONG

```
Setup complete
Starting test...
[Error] No packets were received.

Process finished with exit code 1
```

```
2020-09-13 16:20:17,740 [INFO] Delta time: 1.625209093093872; Current counter: 2500
2020-09-13 16:20:18,947 [INFO] Delta time: 2.832361936569214; Current counter: 5022
2020-09-13 16:20:20,143 [INFO] Delta time: 4.02858829498291; Current counter: 7522
2020-09-13 16:20:31,375 [INFO] Successfully ended test
Transmitted 9617 packets
Received 19956 packets in 5.253500699996948 seconds
Raw UDP packet data length: 3 bytes
Raw UDP packet throughput: 0.04392956490900135 Mbps
```


OBSTACLES

- WE DIDN'T KNOW HOW TO USE PYTHON SOCKETS
- WE DIDN'T EVEN KNOW WHAT SOCKET IS
- NOT TO MENTION SENDING PACKETS THROUGH ETHERNET...

FUTURE PLANS

- SWITCH TO ETHERNET FRAMES (IN PROGRESS)
- MAKE IT WORK EVERY TIME (UNIT TESTS PROBABLY)
- ADD GUI
- ADD SOME FANCY PLOTS AND OTHER STATISTICS

THANK YOU FOR YOUR ATTENTION

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