

# Heartbeats Testing

Gary Khodayari 27th, Feb 2022

[Github Link](#)

***Some of the examples are from the Debug Mode since the debug mode displays the process of the program a lot better and more verbosely. For a look at the non debug mode version of the code, Please either run the code in normal operation mode or watch the accompanied video.***

***Thank you,  
Gary***

**[JUMP TO CLIENT](#)**

**[JUMP TO SERVER](#)**

## Client

<b>Function</b>	<b>Description</b>	<b>Status</b>	<b>Example</b>
Import Libraries	Program imports required libraries	Passed	
Logging Implemented	Instead of printing, I will use logging for cleaner look and timestamps	Passed	
Debug Mode	There is a debug mode implemented that displays usefull information for debugging	Passed	<a href="#">Example</a>
BR Filter	Program correctly detects its own IP and creates a BPF filter isolating correct packets	Passed	
Welcome Page	A welcome intro is displayed when the program is first opened	Passed	<a href="#">Example</a>
Local IP	Local IP is displayed once when time the program has started	Passed	<a href="#">Example</a>
Thread Maker	The thread maker function is implement	Passed	
UI	There is a comprehensive user interface display	Passed	<a href="#">Example</a>
Messenger	One thread is responsible for grabing user input from UI and sending the message to the server	Passed	<a href="#">Example</a>
Termination	Termination option correctly terminates heartbeat sessions	Passed	<a href="#">Example</a>
Pulse Receiving and Responding	Pulse messages are correctly received and responded to	Passed	<a href="#">Example</a>
Incorrect Input handling	Incorrect inputs dont break the program	Passed	<a href="#">Example</a>

## Examples

Debug Mode

```
2022-03-02 05:24:27,900 : Thread-2 -- <Unanswered: TCP:0 UDP:0 ICMP:0 Other:0>
<Results: TCP:1 UDP:0 ICMP:0 Other:0>

2022-03-02 05:24:27,901 : Thread-2 -- Responded back to the PULSE from 10.0.0.231

2022-03-02 05:25:27,893 : Thread-2 -- looking_for_pulse is starting ...

2022-03-02 05:25:27,893 : Thread-2 -- Ether / IP / TCP 10.0.0.231:17665 >
10.0.0.232:11415 S

2022-03-02 05:25:27,930 : Thread-2 -- looking_for_pulse is starting ...

2022-03-02 05:25:27,930 : Thread-2 -- Ether / IP / TCP 10.0.0.231:17665 >
10.0.0.232:11415 A

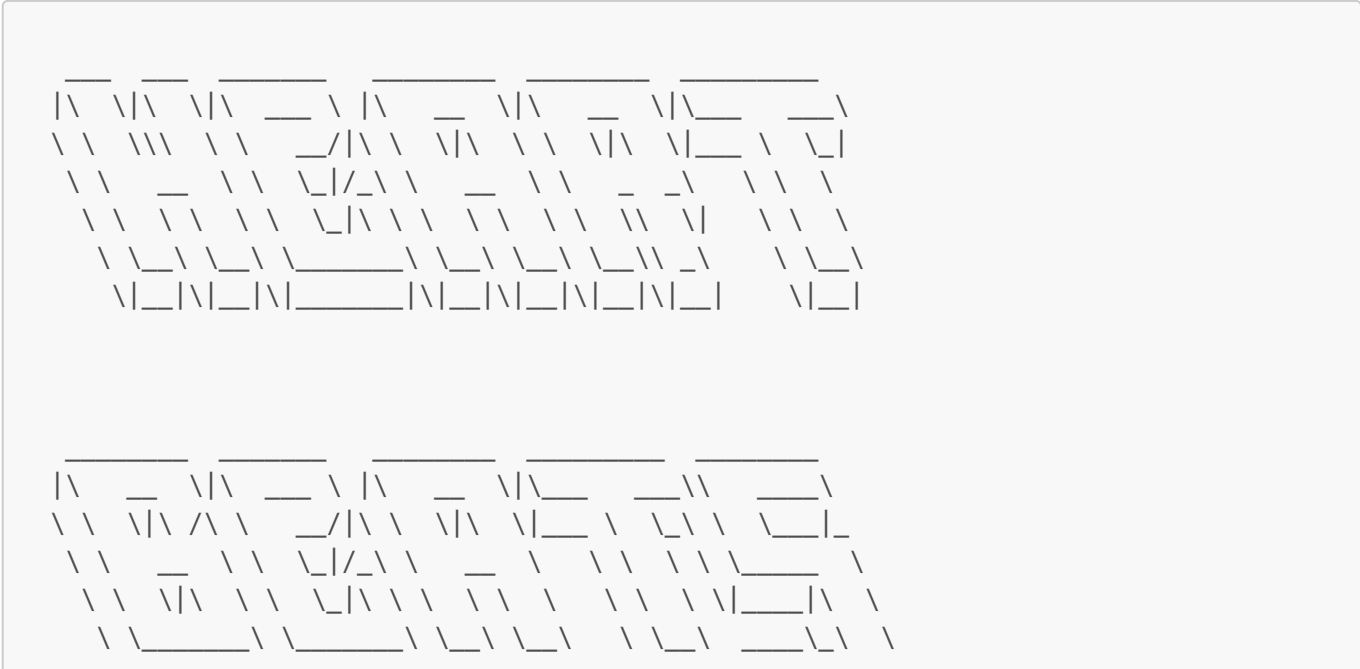
2022-03-02 05:25:27,962 : Thread-2 -- looking_for_pulse is starting ...

2022-03-02 05:25:27,962 : Thread-2 -- Ether / IP / TCP 10.0.0.231:17665 >
10.0.0.232:11415 A / Raw

2022-03-02 05:25:27,962 : Thread-2 -- Recieved a Pulse from 10.0.0.231

2022-03-02 05:25:27,962 : Thread-2 -- send_msg is starting ...
```

Welcome Page



```
\|_____| \|_____| \|_| \|_|   \|_| \|_____| \|_____|
\|_____|
```

Welcome to the Heartbeats Client!

Before sending messages, make sure the heartbeats server is already running and reachable.

You can Access the most up-to-date version on:

<https://github.com/d0ntblink/heartbeats>

## Local IP

```
2022-03-02 05:13:17,173 : MainThread -- local ip : 10.0.0.232
```

## UI

Please input the ip address of the server you are trying to connect to: 10.0.0.231

What would like to do:

S) Send a customized message ->

Q) Terminate session and change server IP ->

E) Exit the program (REMOVED. DO NOT USE) ->

S

What is your message : Whats up Doc?

## Messenger

What is your message : hello

Begin emission:

Finished sending 1 packets.

\*

Received 1 packets, got 1 answers, remaining 0 packets

.

Sent 1 packets.

Begin emission:

Finished sending 1 packets.

\*.....

Received 25 packets, got 1 answers, remaining 0 packets

```
2022-03-02 05:26:20,785 : Thread-1 -- Message Sent!
```

## Termination

q

```
Begin emission:
Finished sending 1 packets.
.*
Received 2 packets, got 1 answers, remaining 0 packets
.
Sent 1 packets.
Begin emission:
Finished sending 1 packets.
*.....
Received 23 packets, got 1 answers, remaining 0 packets

2022-03-02 05:26:58,017 : Thread-1 -- sent a terminate command
```

## Pulse Receiving and Responding

```
2022-03-02 05:21:23,214 : Thread-2 -- Recieved a Pulse from 10.0.0.231

2022-03-02 05:21:24,309 : Thread-2 -- Responded back to the PULSE from 10.0.0.231
```

## Incorrect Input handling

```
What would like to do:
S) Send a customized message ->
Q) Terminate session and change server IP ->
E) Exit the program (REMOVED. DO NOT USE) ->

11

2022-03-02 05:20:43,287 : Thread-1 -- Unknown Input, Please try again!
```

## Server

<i><b>Function</b></i>	<i><b>Description</b></i>	<i><b>Status</b></i>	<i><b>Example</b></i>
Import Libraries	Program imports required liberaries	<i>Passed</i>	
Logging Implemented	Instead of printing, I will use logging for cleaner look and timestamps	<i>Passed</i>	
Debug Mode	There is a debug mode implemented that displays usefull information for debugging	<i>Passed</i>	<a href="#">Example</a>
BR Filter	Program correctly detects its own IP and creates a BPF filter isolating correct packets	<i>Passed</i>	
Welcome Page	A welcome intro is displayed when the program is first opened	<i>Passed</i>	<a href="#">Example</a>

<b>Function</b>	<b>Description</b>	<b>Status</b>	<b>Example</b>
Local IP	Local IP is displayed once when time the program has started	<i>Passed</i>	<a href="#">Example</a>
Thread Maker	The thread maker function is implement	<i>Passed</i>	
User Chosen Timeout	Server users asks for its heartbeat session timeout limit and uses it	<i>Passed</i>	<a href="#">Example</a>
Accepting Messages	The server accepts messages and displays to the terminal	<i>Passed</i>	<a href="#">Example</a>
Heartbeat Counter	Program correctly keeps count of the time passed the last time it received a message from every of its heartbeat session companions	<i>Passed</i>	<a href="#">Example</a>
Termination	When Server Receives a terminate command it will close active heartbeat session for the soruce ip	<i>Passed</i>	<a href="#">Example</a>
Pulse Sending	Server sends a Pulse everytime a heartbeat session is timedout	<i>Passed</i>	<a href="#">Example</a>
Incorrect Input handling	Incorrect inputs dont break the program	<i>Passed</i>	<a href="#">Example</a>
Multiple Clients	Accept messages From multiple Sources and keep heartbeat countdown for all	<i>Passed</i>	<a href="#">Example</a>

## Examples

### Server Debug Mode

```

How long should the server wait before sending a PULSE? (in seconds) 4

Listening for messages ....

2022-03-02 05:31:06,564 : MainThread -- timeout limit is 4.

2022-03-02 05:31:06,564 : MainThread -- start_a_thread is starting ...

2022-03-02 05:31:06,564 : Thread-1 -- listening_for_pkts starting ...

2022-03-02 05:31:06,564 : MainThread -- created thread <Thread(Thread-1, started
140323487831616)>.

2022-03-02 05:31:06,564 : MainThread -- start_a_thread is starting ...

2022-03-02 05:31:06,566 : Thread-2 -- heartbeat is starting ...

```

## Accepting Messages

2022-03-02 05:15:27,874 : Thread-1 -- heartbeat session with 10.0.0.232 has been opened

2022-03-02 05:15:27,946 : Thread-1 -- 10.0.0.232 said Whats up Doc?

## Heartbeat Counter

2022-03-02 05:19:30,175 : Thread-1 -- 10.0.0.232 said Whats up Doc?

2022-03-02 05:19:30,175 : Thread-1 --  
-- Ether INFO --  
ip proto : 2048  
-- IP INFO --  
dst ip : 10.0.0.231  
src ip : 10.0.0.232  
ip ver : 4  
pkt size : 53  
-- TCP INFO --  
tcp flag: A  
src port : 42063  
dest port : 11414  
data : b'Whats up Doc?'

2022-03-02 05:19:30,936 : Thread-2 -- 10.0.0.232 hasnt replied for 1 seconds

2022-03-02 05:19:31,937 : Thread-2 -- 10.0.0.232 hasnt replied for 2 seconds

2022-03-02 05:19:32,938 : Thread-2 -- 10.0.0.232 hasnt replied for 3 seconds

2022-03-02 05:19:33,939 : Thread-2 -- 10.0.0.232 hasnt replied for 4 seconds

2022-03-02 05:19:34,940 : Thread-2 -- 10.0.0.232 hasnt replied for 5 seconds

2022-03-02 05:19:35,942 : Thread-2 -- 10.0.0.232 hasnt replied for 6 seconds

## Server Termination

2022-03-02 05:26:57,002 : Thread-1 -- heartbeat session with 10.0.0.232 has been closed

## Pulse Sending

```
2022-03-02 05:25:27,845 : Thread-2 -- Session with 10.0.0.232 timedout.
```

```
Begin emission:
```

```
Finished sending 1 packets.
```

```
..*
```

```
Received 3 packets, got 1 answers, remaining 0 packets
```

```
.
```

```
Sent 1 packets.
```

```
Begin emission:
```

```
Finished sending 1 packets.
```

```
*..
```

```
2022-03-02 05:25:28,981 : Thread-2 -- Sent a pulse to 10.0.0.232.
```

```
2022-03-02 05:25:28,054 : Thread-1 -- 10.0.0.232 said STILL D.R.E
```

## Server Incorrect Input handling

```
How long should the server wait before sending a PULSE? (in seconds) jfjjfjffj
```

```
2022-03-02 05:30:51,249 : MainThread -- Something went wrong, try again.
```

```
How long should the server wait before sending a PULSE? (in seconds) 4
```

```
Listening for messages ....
```

## Multiple Clients

```
2022-03-02 05:33:30,936 : Thread-2 -- 10.0.0.232 hasnt replied for 5 seconds
```

```
2022-03-02 05:33:30,937 : Thread-2 -- 10.0.0.233 hasnt replied for 11 seconds
```

```
2022-03-02 05:33:31,938 : Thread-2 -- 10.0.0.232 hasnt replied for 6 seconds
```

```
2022-03-02 05:33:31,939 : Thread-2 -- 10.0.0.233 hasnt replied for 12 seconds
```

```
2022-03-02 05:33:32,940 : Thread-2 -- 10.0.0.232 hasnt replied for 7 seconds
```

```
2022-03-02 05:33:32,942 : Thread-2 -- 10.0.0.233 hasnt replied for 13 seconds
```