

Heartbeats Testing

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[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

Function	Description	Status	Example
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	Example
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	Example
Local IP	Local IP is displayed once when time the program has started	Passed	Example
Thread Maker	The thread maker function is implement	Passed	
UI	There is a comprehensive user interface display	Passed	Example
Messenger	One thread is responsible for grabing user input from UI and sending the message to the server	Passed	Example
Termination	Termination option correctly terminates heartbeat sessions	Passed	Example
Pulse Receiving and Responding	Pulse messages are correctly received and responded to	Passed	Example
Incorrect Input handling	Incorrect inputs dont break the program	Passed	Example

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

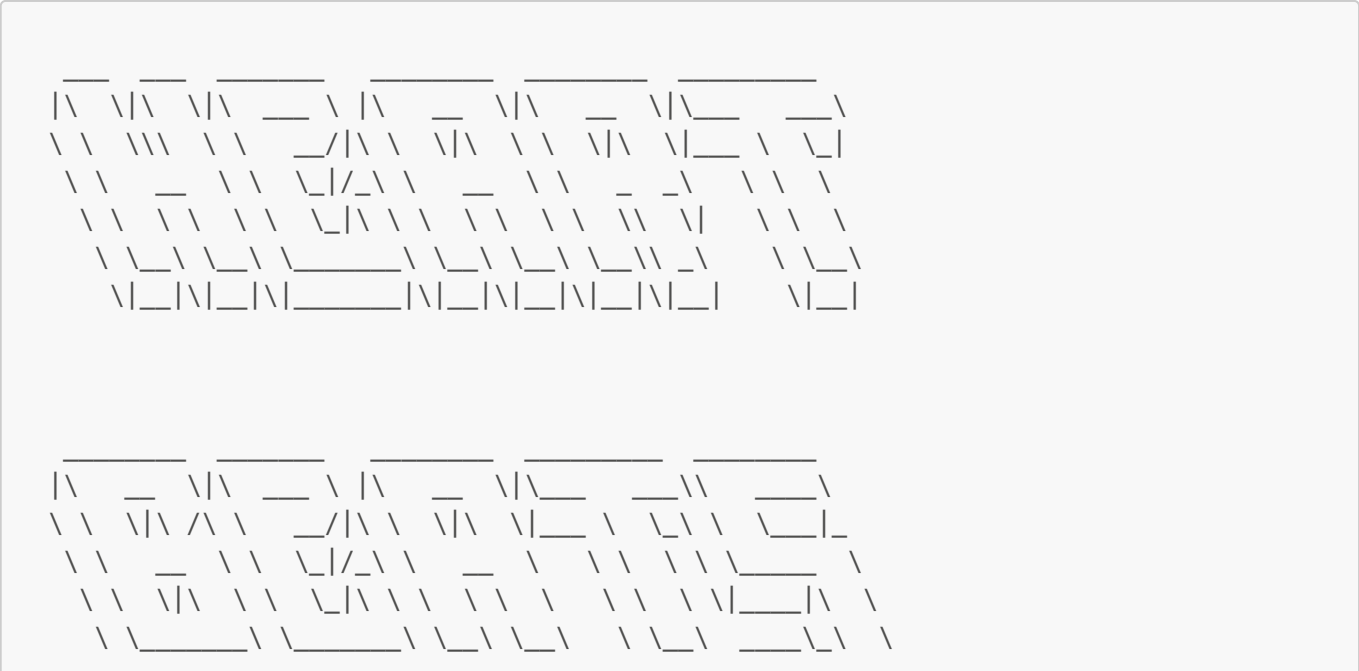
2022-03-02 05:25:27,962 : Thread-2 -- looking_for_pulse is starting ...

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) ->

ll

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

Server

Function	Description	Status	Example
Import Libraries	Program imports required liberaries	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	Example
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	Example

Function	Description	Status	Example
Local IP	Local IP is displayed once when time the program has started	<i>Passed</i>	Example
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>	Example
Accepting Messages	The server accepts messages and displays to the terminal	<i>Passed</i>	Example
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>	Example
Heartbeat Retry	The server tries to contact the client for a user chosen amount.	<i>Passed</i>	Example
Heartbeat Give Up	After the user chose amount of Pulse have been sent, server will give up and close the session.	<i>Passed</i>	Example
Termination	When Server Receives a terminate command it will close active heartbeat session for the soruce ip	<i>Passed</i>	Example
Pulse Sending	Server sends a Pulse everytime a heartbeat session is timedout	<i>Passed</i>	Example
Incorrect Input handling	Incorrect inputs dont break the program	<i>Passed</i>	Example
Multiple Clients	Accept messages From multiple Sources and keep heartbeat countdown for all	<i>Passed</i>	Example

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 ...
```

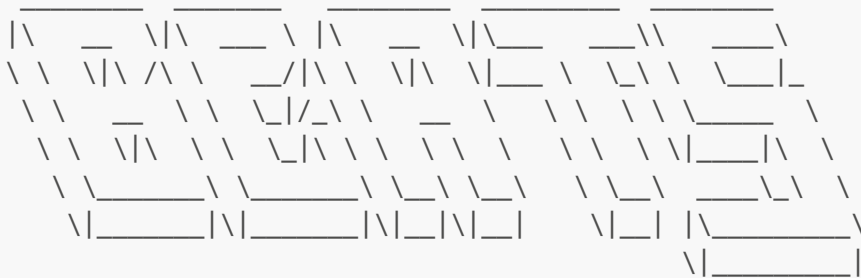
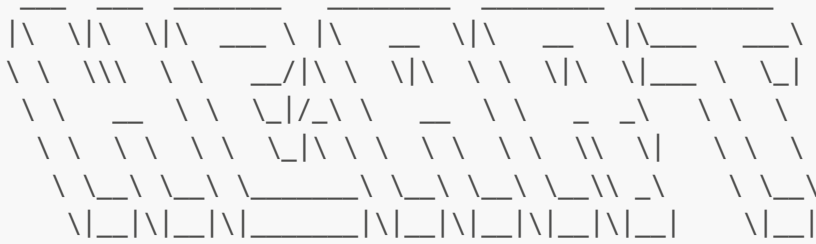
```
2022-03-02 05:31:06,564 : MainThread -- created thread <Thread(Thread-1, started 140323487831616)>.
```

```
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 ...

2022-03-02 05:31:06,566 : MainThread -- created thread <Thread(Thread-2, started
140323479438912)>.
```

```
2022-03-02 05:31:06,566 : MainThread -- created thread <Thread(Thread-2, started
140323479438912)>.
```



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

How many PULSES should the server send before giving up? 15

Listening for messages

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

Heartbeat Retry

```
2022-03-02 06:44:51,299 : Thread-2 -- Session with 10.0.0.232 timedout.
```

```
2022-03-02 06:44:52,405 : Thread-2 -- Sent a pulse to 10.0.0.232.
```

```
2022-03-02 06:45:03,517 : Thread-2 -- Sent a pulse to 10.0.0.232.
```

```
2022-03-02 06:45:14,653 : Thread-2 -- Sent a pulse to 10.0.0.232.
```

```
2022-03-02 06:45:16,756 : Thread-2 -- Sent a pulse to 10.0.0.232.
```

Heartbeat Give Up

```
2022-03-02 06:45:20,948 : Thread-2 -- Sent a pulse to 10.0.0.232.
```

```
2022-03-02 06:45:21,950 : Thread-2 -- giving up on 10.0.0.232.
```

```
2022-03-02 06:45:21,950 : Thread-2 -- heartbeat session with 10.0.0.232 has been closed
```

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
```