

Ping CLI Application

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Problem Statement

Features

The Ping CLI Application covers various features like:-

- Accepting as a positional terminal argument a hostname or IP address.
- Showcases equivalent IP Address for the hostname argument
- Showcases the resolved reverse lookup domain value, i.e., converts dot notation IP address to hostname.
- Emitting requests with a periodic delay as long as the program is running.
- Report of packets sent lost and received as well as RTT times and total time.
- Features like TTL as argument and **time exceeded** alert if the TTL value of a packet is greater than the specified value and prints information about that packet (At least information about one packet is always printed). Many more features are present.

Folder Contents

- **Ping_Cli_Application.c** - This file contains the source code of the Ping Application developed using C language.
- **makefile** - This file is used to compile the code and produce an executable file.
- **.gitignore** - To ignore the executable file generated during compilation.

How to run this program-

The program can be run either using *makefile* or by compiling *Ping_Cli_Application.c*

Install essential packages using Linux terminal or WSL on windows.

```
$ sudo apt-get install build-essential
```

- **By Compiling-** Compile the program by typing the following commands into the terminal:-

```
$ gcc Ping_Application_CLI.c -o pingcli
```

```
$ sudo ./pingcli <argument1> <argument2>
```

- **Using make file-** `cd` into the directory containing the makefile. Now type following commands into the terminal:-

```
$ make
```

```
$ sudo ./pingcli <argument1> <argument2>
```

Arguments- It accepts 2 different arguments as follows:-

- **Hostname/IP Address-** The first argument consists of a Hostname (google.com) or an IP Address (216.58.203.46) and is **compulsory** to be provided.
- **TTL value-** The second argument is **optional** in nature and is an integer value in the range -32,768 to 32,767 (Supported by 2-bit 'int' datatype in C). Any value which is not an integer in nature will result in "Not an Integer" alert.

If number of arguments is less than 2 or more than 3 it will result in an alert.

Output-

```
$ sudo ./pingcli google.com

Resolving DNS..

Trying to connect to 'google.com' IP: 216.58.221.46

Reverse Lookup domain: kul01s10-in-f46.1e100.net
Socket file descriptor 3 received

Socket set to TTL..
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=1
ttl=64 rtt = 8.841000 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=2
ttl=64 rtt = 1.047400 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=3
ttl=64 rtt = 0.805400 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=4
ttl=64 rtt = 1.067700 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=5
ttl=64 rtt = 0.882100 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=6
ttl=64 rtt = 2.336300 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=7
ttl=64 rtt = 1.048900 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=8
ttl=64 rtt = 1.138800 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=9
ttl=64 rtt = 0.807300 ms.
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=10
ttl=64 rtt = 1.163600 ms.
```

```
===216.58.221.46 ping statistics===  
  
10 packets sent, 10 packets received, 0 packets lost. Total time: 10033.491700 ms.  
  
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=11  
ttl=64 rtt = 1.059800 ms.  
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=12  
ttl=64 rtt = 0.950600 ms.  
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=13  
ttl=64 rtt = 1.130000 ms.  
64 bytes from kul01s10-in-f46.1e100.net (h: google.com) (216.58.221.46) icmp_seq=14  
ttl=64 rtt = 0.759600 ms.
```

Output1- Showcasing a successful Ping run with one argument

```
$ sudo ./pingcli google.com 64  
  
Resolving DNS..  
  
Trying to connect to 'google.com' IP: 172.217.27.206  
  
Reverse Lookup domain: bom07s15-in-f14.1e100.net  
Socket file descriptor 3 received  
  
Socket set to TTL..  
64 bytes from bom07s15-in-f14.1e100.net (h: google.com) (172.217.27.206) icmp_seq=1 ttl=64  
rtt = 22.283900 ms.  
  
===TIME EXCEEDED===  
  
===172.217.27.206 ping statistics===  
1 packets sent, 1 packets received, 0 packets lost. Total time: 1025.021900 ms.
```

Output2- Showcasing a successful Ping run with optional TTL argument