ft_ping

Summary: *This project is about recoding the ping command.*

Version: 5.1

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Chapter I

Forewords

Ettore Majorana (born on 5 August 1906 – possibly dying after 1959) was an Italian theoretical physicist. He is best known for his work in particle physics, with particular applications of neutrino theory. His sudden and mysterious loss, in the spring of 1938, gave rise to many speculations on a possible suicide in the Tyrrhenian Sea, or on a voluntary disappearance.

« There are several categories of scientists in the world; those of second or third rank do their best but never get very far. Then there is the first rank, those who make important discoveries, fundamental to scientific progress. But then there are the geniuses, like Galilei and Newton. Majorana was one of these. »

In 1926, Professor Corbino, eager to promote modern physics in Rome, appointed Enrico Fermi to the chair of theoretical physics; Edoardo Amaldi and Emilio Segrè joined the group in the fall of 1927. Segrè succeeded in convincing Majorana that physics matched his aspirations and abilities, and in getting him to join the physics faculty as well. This transfer is made in January 1928, after a meeting with Fermi.

The meeting gave rise to a significant anecdote: Majorana asked about current research at the Institute. Fermi was working on the statistical model of the atom: he hypothesized that the electrostatic potential to which an electron is subjected is approximately equal to the average potential created by the nucleus and the other electrons, which makes it possible to determine an approximate value of the energy level of the electron. Fermi exposes to Majorana the general lines of this "universal potential of Fermi" - which will take later the name of model of Thomas-Fermi -, then shows him a table where he gathered some of the numerical values of this average potential, that he had calculated in one week with the help of a mechanical calculating machine. Majorana listens with interest, and after having asked for some precisions, leaves. The following day, at the end of the morning, Majorana returns to the institute, enters the office of Fermi and without preamble asks to re-examine the table which he saw the day before. Drawing then from his pocket a paper on which in one night he makes a similar table, but complete, he concludes that the results of Fermi are right. Then he leaves the office.

Source.

Chapter II

Introduction

Ping is the name of a command that allows you to test the accessibility of another machine through the IP network. The command also measures the time taken to receive a response, called the round-trip time.

Chapter III

General Instructions

- Your project must be realized in a virtual machine running on Debian ($>= 7.0$).

- Your virtual machine must have all the necessary software to complete your project. These softwares must be configured and installed.

- You must be able to use your virtual machine from a cluster computer.

- This project will be corrected by humans only. You're allowed to organise and name your files as you see fit, but you must follow the following rules

- You must use C and submit a Makefile

- Your Makefile must compile the project and must contain the usual rules. It must recompile and re-link the program only if necessary.

- You have to handle errors carefully. In no way can your program quit in an unexpected manner (Segmentation fault, bus error, double free, etc).

- You are authorised to use the libc functions to complete this project.

> ⚠ ATTENTION: Program in C, all libC is authorised, using the system ping or the sources of a standard ping in any way is forbidden.

Chapter IV

Mandatory Part

- The executable must be named ft_ping.
- You will take as reference the ping implementation from inetutils-2.0 (ping -V).
- You have to manage the -v -? options.

> ⚠ The -v option here will also allow us to see the results in case of a problem or an error linked to the packets, which logically shouldn't force the program to stop (the modification of the TTL value can help to force an error).

- You will have to manage a simple IPv4 (address/hostname) as parameters.
- You will have to manage FQDN without doing the DNS resolution in the packet return

> 💡 You are allowed to use all the functions of the printf family.

> ⚠ For the smarty pants (or not)... Obviously you are NOT allowed to call a real ping.

Chapter V

Bonus Part

Find below a few ideas of interesting bonuses:

- Additional -f -l -n -w -W -p -r -s -T --ttl --ip-timestamp flags...

> 💡 the flags -V, -usage, -echo are not considered as bonus

> 💡 Of course two flags corresponding to the same feature (eg: -t and -type) are not considered as two bonuses

> ⚠️ The bonus part will only be assessed if the mandatory part is PERFECT. Perfect means the mandatory part has been integrally done and works without malfunctioning. If you have not passed ALL the mandatory requirements, your bonus part will not be evaluated at all.

Chapter VI

Submission and peer-evaluation

Turn in your assignment in your `Git` repository as usual. Only the work inside your repository will be evaluated during the defense. Don't hesitate to double check the names of your folders and files to ensure they are correct.

- You have to be in a VM with a Linux kernel > 3.14. Note that grading was designed on a Debian 7.0 stable.

- Except for the RTT line and the reverse DNS resolution, the result must have an indentation identical to the implementation from inetutils-2.0.

> 💡 A delay of +/- 30ms is tolerated on the reception of a packet.