**Ping&watchdog - programming in C**

Authors:

Maor Saadon 318532421

Duvi Amiram 305677494

**Contents**

**1 System Characterization 2**

1.1 System Overview

1.1.1 About the System………………………………………………………..…………..3  
1.1.2 How to Install and Run the Program………………………….……..……..7

1.2 System Functionality

1.2.1 Code Description……………………………………………………..…………8-19  
1.2.2 Output…………………………………………………………………………………..21  
1.2.3 Functions………………………………………………………………………….22-31

**2 Research findings 34**

2.1 Wireshark

Part A…………………………………………………………….……………….34-36  
Part B……………………………………………………………………………37-39

2.2 Bibliography………………………………………………………………………..……………..48

**1 System Characterization**

**1.1 System Overview**

**1.1.1 About the System**

Part A:

The ping command is used to check the connection between 2 machines. In part A, we will implement the “ping” command.

we will write a program called “ping.c” which will get an argument indicating which host to ping.

ICMP ECHO REQUEST AND ICMP-ECHOREPLY - The ICMP echo request and the ICMP echo reply messages are commonly known as ping messages. Ping is a troubleshooting tool used by system administrators to manually test for connectivity between network devices, and also to test for network delay and packet loss.

The program will send an ICMP ECHO REQUEST to the host, and when receiving ICMP-ECHOREPLY, the program will send the next ICMP ECHO REQUEST (no need to stop).

Part B:

Watchdog is a timer to detect and recover your computer dis-functions or hardware fails. It’s a chip whose sole purpose is to receive a signal every millisecond from the CPU.

It will reboot the system if it hasn’t received any signal for 10 seconds (mostly when hardware fails).

We will modify the ping program and write a watchdog that will hold a timer (TCP connection on port 3000) to ensure that if we don’t receive an ICMP-ECHO-REPLY after sending an ICMP-REQUEST for 10 seconds, it will exit.

We will modify the ping.c program so that it will execute the watchdog.c program as well using fork + exec.

Every time better\_ping.c sends a packet, we will update watchdog.c timer.

**1.1.2 How to Install and Run the Program**

To test the system for yourself, you would need a Linux based operating system.

Instructions:

1. Download the following files:
   1. ping.c
   2. better\_ping.c
   3. watchdog
   4. Makefile
2. Put all of the above files in a single directory.
3. Open said directory in your Linux terminal.
4. Run the following commands:
   1. sudo apt install build-essential
   2. Make
   3. sudo ./parta <IP> - for part A
   4. sudo ./partb <IP> - for part B
5. When you want to close Part A you need to press on Ctrl+c

**1.2 System Functionality  
1.2.1 Code Description**

**1.2.2 Output**

Part a:

Part b:

**1.2.3 Functions**

**2 Research findings**

**2.1 Wireshark**

**2.5 Bibliography**

Cubic and Reno CC – Algorithm  
<https://squidarth.com/rc/programming/networking/2018/08/01/congestion-cubic.html>

How to calculate time  
<https://www.youtube.com/watch?v=cunJcNgtxMk&feature=youtu.be>

About the functions  
‘man’ command on vs terminal

For many things

[ChatGPT: Optimizing Language Models for Dialogue (openai.com)](https://openai.com/blog/chatgpt/)

https://www.google.com/search?gs\_ssp=eJzj4tTP1TcwMU02T1JgNGB0YPBiS8\_PT89JBQBASQXT&q=google&oq=googlr&aqs=chrome.1.69i57j46i10i131i199i433i465i512j0i10i131i433i512l4j69i60j69i65.3825j0j4&sourceid=chrome&ie=UTF-8