

# COMP 7003

## Assignment 2

### User Guide

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# Purpose

- A program that captures one packet each for the following protocols from a connected network:
  - IPv4
  - TCP
  - UDP
  - ARP

# Installing

## Obtaining

git clone <https://github.com/GursidhSandhu/Comp-7003-Assign-2>

## Building

Ensure python3 is installed in the OS by using the following command:  
- python3 --version

Use either of the following commands to obtain your OS's network interface:

- ifconfig
- ipconfig

## Running

**Change the interface argument according to your OS**

**Also may need to run program using sudo according to user permissions**

```
cd source/src/  
python3 scanner.py en0
```

## Environment Variables

No environmental variables alter the program's execution.

## Configuration

No configurations need to be set in the program.

## Command Line Arguments

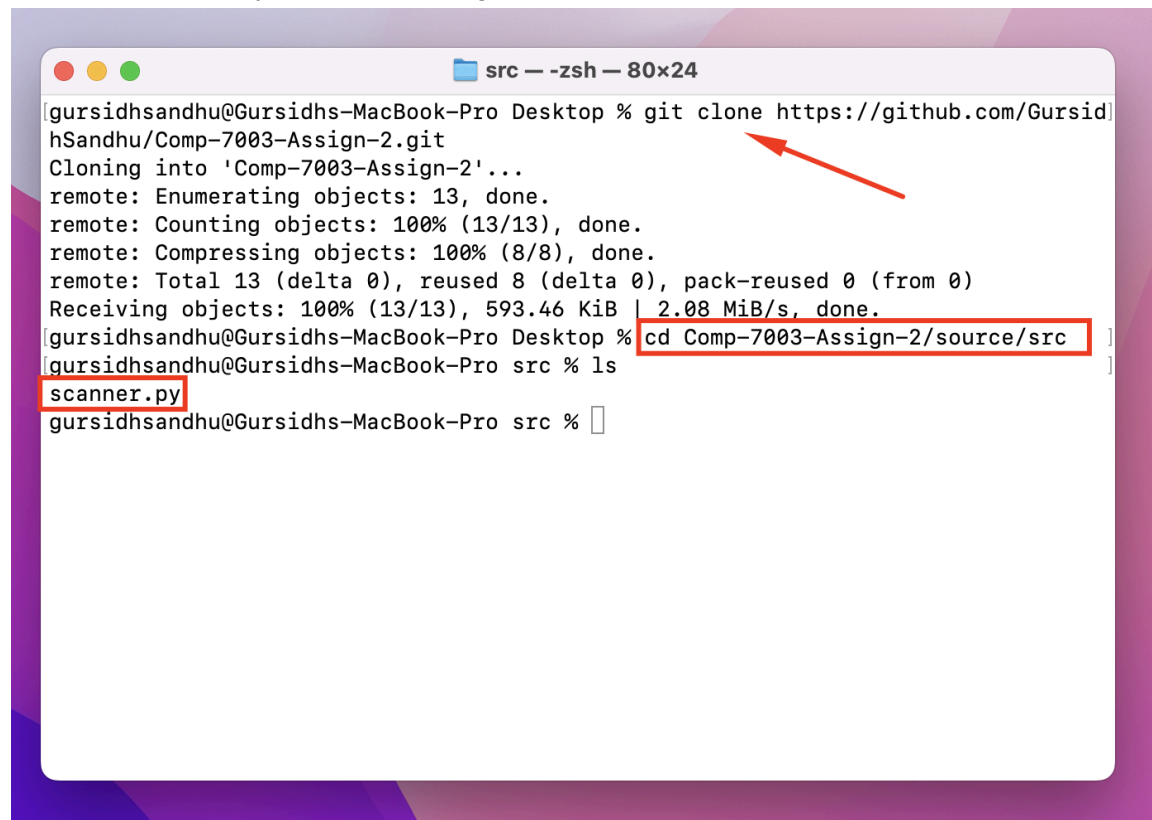
The following configuration values can be set in the command line:

Variable	Purpose
interface	The interface used for that certain OS to capture packets

## Examples

### 1) Obtaining

Clone the repository and ensure program file is available.

A screenshot of a macOS terminal window titled 'src — -zsh — 80x24'. The terminal shows the following commands and output:

```
gursidhsandhu@Gursidhs-MacBook-Pro Desktop % git clone https://github.com/GursidhSandhu/Comp-7003-Assign-2.git
Cloning into 'Comp-7003-Assign-2'...
remote: Enumerating objects: 13, done.
remote: Counting objects: 100% (13/13), done.
remote: Compressing objects: 100% (8/8), done.
remote: Total 13 (delta 0), reused 8 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (13/13), 593.46 KiB | 2.08 MiB/s, done.
gursidhsandhu@Gursidhs-MacBook-Pro Desktop % cd Comp-7003-Assign-2/source/src
gursidhsandhu@Gursidhs-MacBook-Pro src % ls
scanner.py
gursidhsandhu@Gursidhs-MacBook-Pro src %
```

An arrow points to the URL in the first command. The directory path 'Comp-7003-Assign-2/source/src' and the file 'scanner.py' are highlighted with red boxes.

## 2) Building

Ensure python3 is installed and find one valid network interface to use.

```
src — -zsh — 80x24
gursidhsandhu@Gursidhs-MacBook-Pro src % python3 --version
Python 3.11.3
gursidhsandhu@Gursidhs-MacBook-Pro src % ifconfig
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
    options=1203<RXCSUM, TXCSUM, TXSTATUS, SW_TIMESTAMP>
    inet 127.0.0.1 netmask 0xff000000
    inet6 ::1 prefixlen 128
    inet6 fe80::1%lo0 prefixlen 64 scopeid 0x1
    nd6 options=201<PERFORMNUD,DAD>
gif0: flags=8010<POINTOPOINT,MULTICAST> mtu 1280
stf0: flags=0<> mtu 1280
anpi1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 96:06:ac:81:42:0c
    inet6 fe80::9406:acff:fe81:420c%anpi1 prefixlen 64 scopeid 0x4
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
anpi0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 96:06:ac:81:42:0b
    inet6 fe80::9406:acff:fe81:420b%anpi0 prefixlen 64 scopeid 0x5
    nd6 options=201<PERFORMNUD,DAD>
    media: none
```

multiple  
interfaces

## 3) Running

```
src — -zsh — 80x24
gursidhsandhu@Gursidhs-MacBook-Pro src % python3 scanner.py en0
Starting packet capture on en0 with filter: ip and tcp
Captured Packet (Hex): d007ca53d6a09c3e539083cd080045000028a6870000400668ed0a416
e648efa63bcd39146cf717aeb9c305b1795010080032820000
Destination MAC: d0:07:ca:53:d6:a0
Source MAC: 9c:3e:53:90:83:cd
EtherType: 0800
Version (Hex): 4 -> Human Readable Value: 4
Header Length (Hex): 5 -> Human Readable Value: 5
TOS (Hex): 00 -> Human Readable Value: 0
Total Length (Hex): 0028 -> Human Readable Value: 40
IP Identification (Hex): a687 -> Human Readable Value: 42631
Flags + Offset (Hex): 0000 / 0000 0000 0000 0000 -> Human Readable Value: 0
    - Reserved: 0
    - Don't Fragment: 0
    - More Fragments: 0
    - Offset: 000 / 0 0000 0000 0000
Time To Live (Hex): 40 -> Human Readable Value: 64
Protocol (Hex): 06 -> Human Readable Value: 6
Checksum (Hex): 68ed -> Human Readable Value: 26861
Source Address (Hex): 0a416e64 -> Human Readable Value: 10.65.110.100
Destination Address (Hex): 8efa63bc -> Human Readable Value: 142.250.99.188
TCP Packet:
Source Port (Hex): db39 -> Human Readable Value: 56121
```

program starts