Report by Swathi: Snort with IDS

What is snort: A free open-source intrusion detection system is sniff. It is a widely used and effective multi-packet tool that is used by several individuals and organizations. It is one of the intrusion detection and prevention systems that use signatures. The creation of rules is where this tool's beauty lies. Rules can be written or configured to send alerts, stop traffic, or all three. Alerts can be sent to the console, the screen, or a log file. They can be set up to log events in a database or to send an email to a specific recipient. Rules can be created using a variety of methods. Sniffer mode, Packet logger mode, and NIDS mode are basically how Snort operates. It is possible to use the command line to run it in packet sniffer mode, which merely examines header data and prints the results on the screen. It is also possible to use it as a packet logger mode, which records every packet in the root directory's log files.

Snort with IDS

I worked on the Snort with IDS Snort is an open-source network that uses specified rules, the widely used free and open-source IDS/IPS system Snort can identify and stop many types of attacks by doing traffic/protocol analysis, content matching, and other tasks. The development of Snort has been vigorous, and thousands of users and volunteers have created rules to keep Snort current with the most recent assaults. For this creating snort IDS we have used some commands in the command and we have created the snort IDS. I will attach the images of the commands below.

STEPS TO CREATE IDS WITH SNORT LINKS:

You can download snort from this link:
https://www.snort.org/downloads#

You can download WinPcap from this Link:
https://www.winpcap.org/install/

Snort has 3 basic working modes

1. Packet Sniffing - Collects and shows network traffic as Wireshark does.
2. Network traffic is gathered and logged into a file using packet logging.
3. Network intrusion detection: method three packet analysis and signature matching.

What attacks can Snort detect?

- **DoS/DDoS attacks**
- **Buffer overflow attacks**
- **Semantic URL attacks**
- **Common Gateway Interface(CGI) attacks**
- **Stealth port scans**
- **Routing attacks**
- **Spoofing attacks**
- **Server message block probes**
- **Efforts to get an operating system's fingerprint.**

Introduction about Snort in IDS

Snort detects malicious traffic or attacks by leveraging pattern matching.
When active, Snort captures packets, reassembles them, analyzes them, and determines what needs to be done to the packet based on predefined rules.

Snort rules are very similar to typical firewall rules, whereby, they are used to match network activity against specific patterns or signatures and consequently make a decision as to whether to send an alert or drop the traffic (in the case of IPS).

Snort has a large number of rule sets created by the community that is very useful.

Snort versions:

Snort was initially developed in 1998 and has been continuously improved since then.

There are currently 2 versions of Snort available: • Snort 2. X - De facto version of snort.

1. Snort 3.0 - Latest version of Snort that features improved efficiency, performance, scalability, and usability over Snort 2.
2. In this video, we will be using Snort 2. as it is the most widely implemented version and has extensive support, documentation & rule sets.

Snort Rules

Community rules - Free rule sets created by the Snort community. Registered rules - Free rule sets created. In order to use them, you must register for an account.

Subscription-only rules - These rule sets require an active paid subscription in order to be accessed and used.

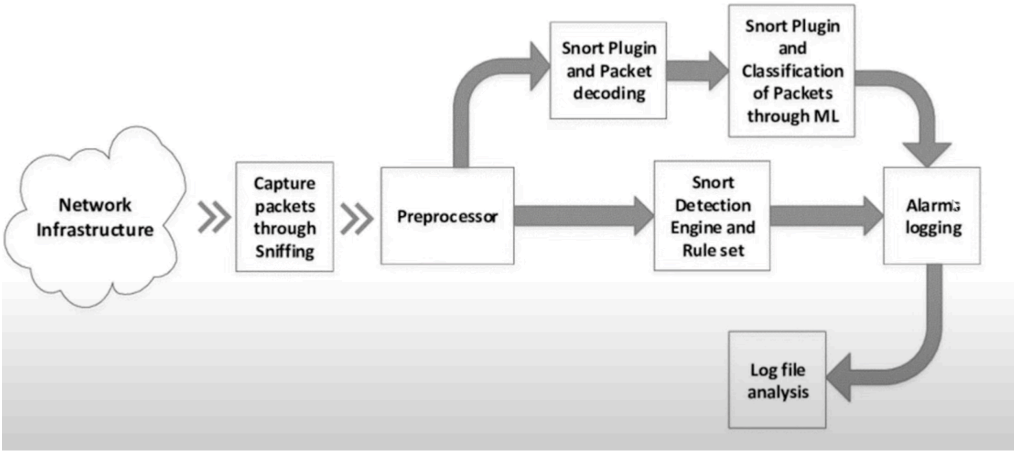
Benefits of Using Snort:

High Accuracy: Since Snort is an open-source project, there is always a push to enhance it and change a few of its features to make them more accurate. The program is improved by a number of security teams through the worldwide scattered Snort Community.

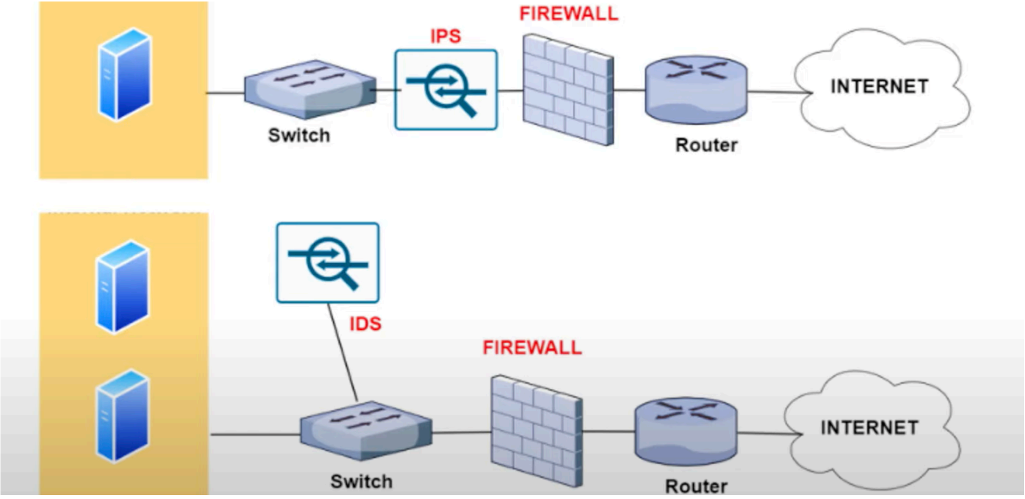
High adaptability: The ability to add additional functions to Snort by accessing its source code offers Snort a substantial advantage over its competitors. This strategy might enable Snort to administer any network security system.

Quick Response: Snort can defend the system from any fresh threats or malicious software thanks to its real-time protection mechanisms.

How snort works flow chart :

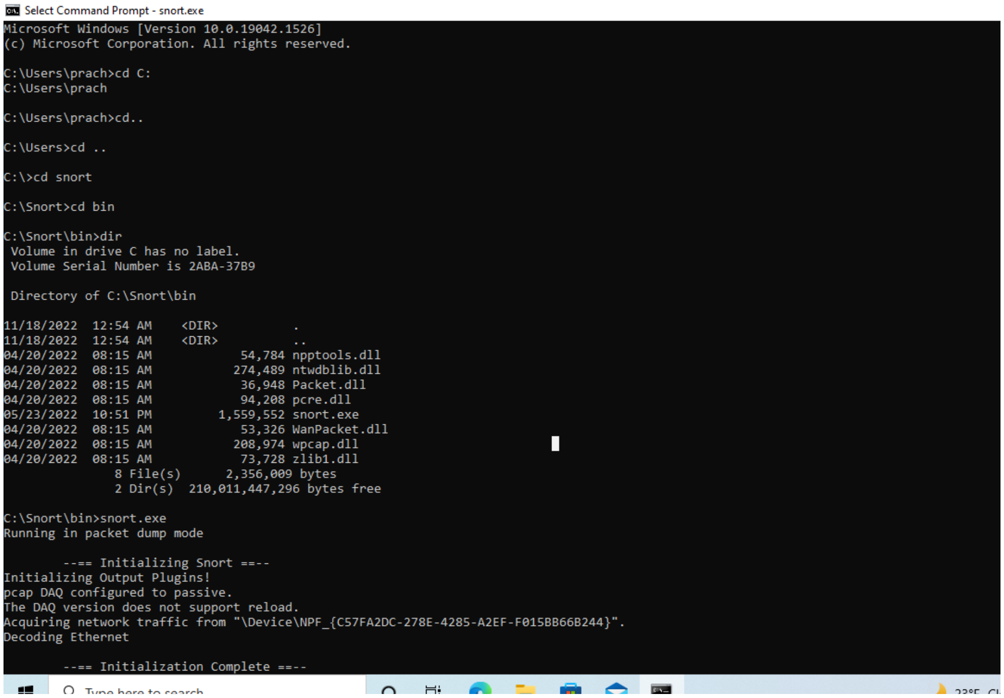

Network Infrastructure
Capture packets through Sniffing
Preprocessor
Snort Plugin and Packet decoding
Snort Plugin and Classification of Packets through ML
Snort Detection Engine and Rule set
Alarms logging
Log file analysis

Snort IDS network placement

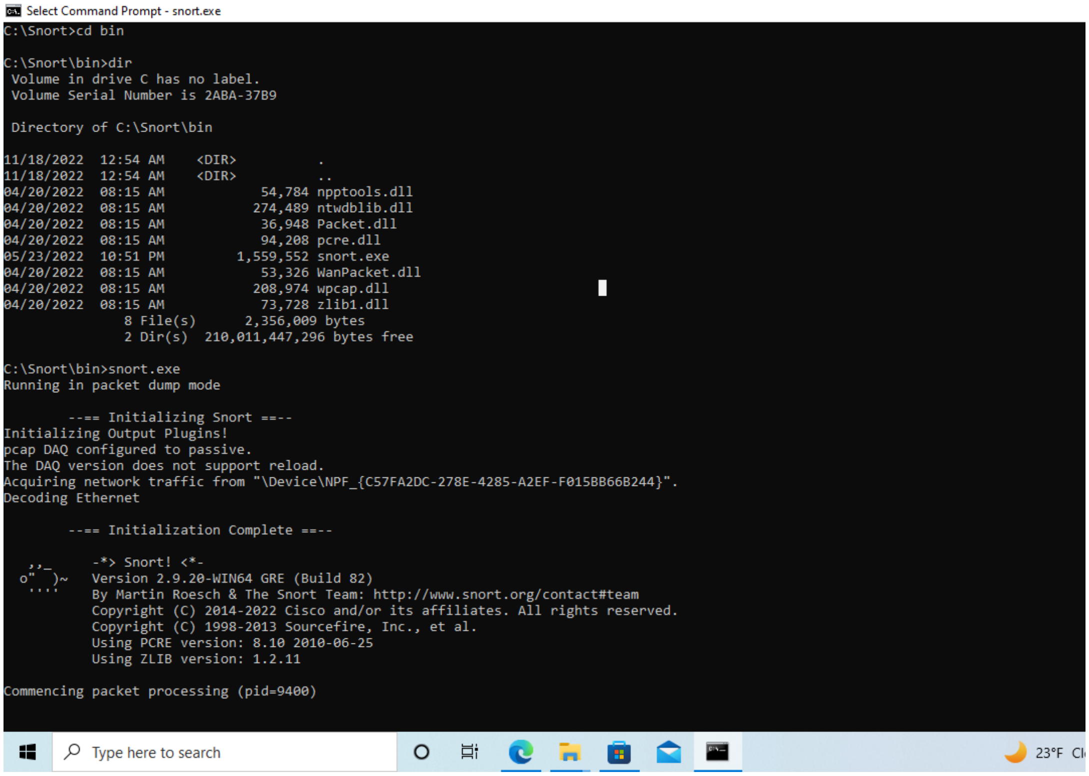


Commands for IDS with Snort:

These all are the commands I have used in this snort IDS.



```
Microsoft Windows [Version 10.0.19042.1526]
(c) Microsoft Corporation. All rights reserved.

C:\Users\prach>cd C:
C:\Users\prach

C:\Users\prach>cd..

C:\Users>cd ..

C:\>cd snort

C:\Snort>cd bin

C:\Snort\bin>dir
 Volume in drive C has no label.
 Volume Serial Number is 2ABA-37B9

 Directory of C:\Snort\bin

11/18/2022  12:54 AM    <DIR>          .
11/18/2022  12:54 AM    <DIR>          ..
04/20/2022  08:15 AM            54,784 npptools.dll
04/20/2022  08:15 AM           274,489 ntwdblib.dll
04/20/2022  08:15 AM            36,948 Packet.dll
04/20/2022  08:15 AM            94,208 pcre.dll
05/23/2022  10:51 PM         1,559,552 snort.exe
04/20/2022  08:15 AM            53,326 WanPacket.dll
04/20/2022  08:15 AM           208,974 wpcap.dll
04/20/2022  08:15 AM            73,728 zlib1.dll
               8 File(s)      2,356,009 bytes
               2 Dir(s)  210,011,447,296 bytes free

C:\Snort\bin>snort.exe
Running in packet dump mode

        --== Initializing Snort ==--
Initializing Output Plugins!
pcap DAQ configured to passive.
The DAQ version does not support reload.
Acquiring network traffic from "\Device\NPF_{C57FA2DC-278E-4285-A2EF-F015BB66B244}".
Decoding Ethernet

        --== Initialization Complete ==--
```



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11/18/2022  12:54 AM    <DIR>          ..
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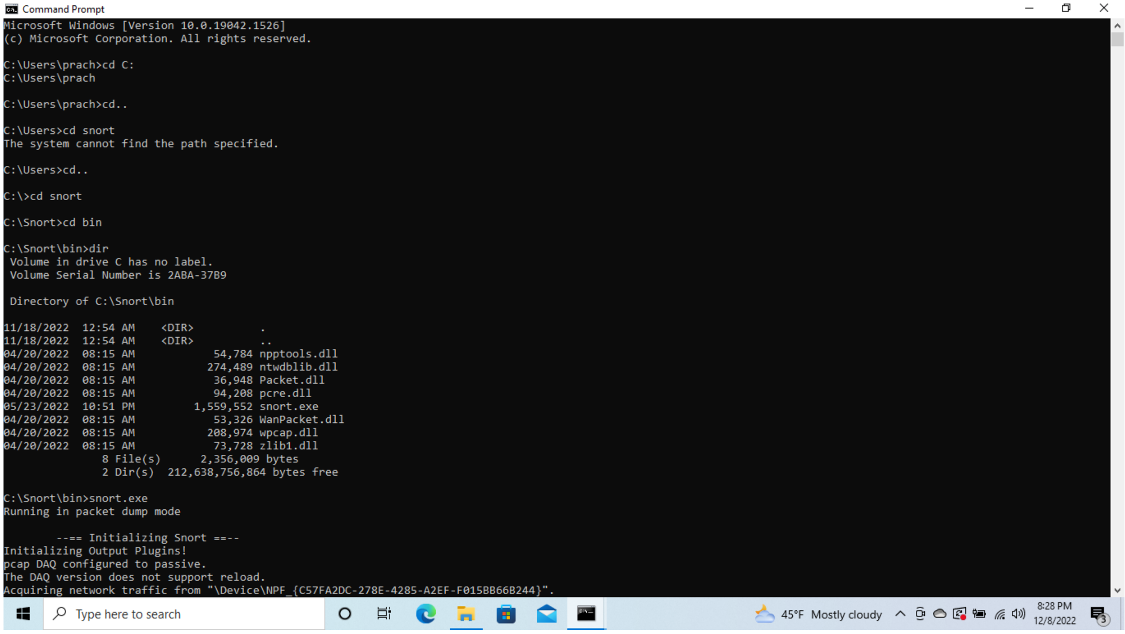
Decoding Ethernet

        --== Initialization Complete ==--

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

Commencing packet processing (pid=9400)
```



```
Microsoft Windows [Version 10.0.19042.1526]
(c) Microsoft Corporation. All rights reserved.

C:\Users\prach>cd C:
C:\Users\prach

C:\Users\prach>cd..

C:\Users>cd snort
The system cannot find the path specified.

C:\Users>cd..

C:\>cd snort

C:\Snort>cd bin

C:\Snort\bin>dir
 Volume in drive C has no label.
 Volume Serial Number is 2ABA-37B9

 Directory of C:\Snort\bin

11/18/2022  12:54 AM    <DIR>          .
11/18/2022  12:54 AM    <DIR>          ..
04/20/2022  08:15 AM            54,784 npptools.dll
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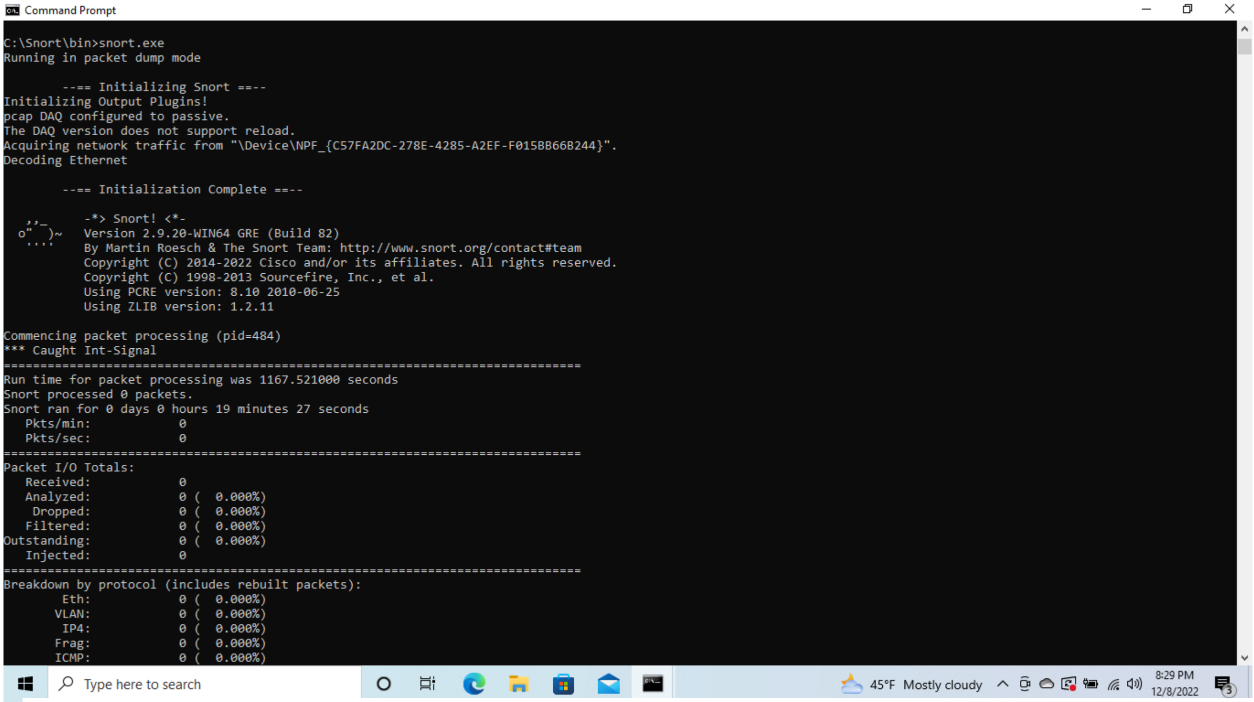
04/20/2022  08:15 AM            36,948 Packet.dll
04/20/2022  08:15 AM            94,208 pcre.dll
05/23/2022  10:51 PM         1,559,552 snort.exe
04/20/2022  08:15 AM            53,326 WanPacket.dll
04/20/2022  08:15 AM           208,974 wpcap.dll
04/20/2022  08:15 AM            73,728 zlib1.dll
               8 File(s)      2,356,009 bytes
               2 Dir(s)  212,638,756,864 bytes free

C:\Snort\bin>snort.exe
Running in packet dump mode

        --== Initializing Snort ==--
Initializing Output Plugins!
pcap DAQ configured to passive.
The DAQ version does not support reload.
Acquiring network traffic from "\Device\NPF_{C57FA2DC-278E-4285-A2EF-F015BB66B244}".
```



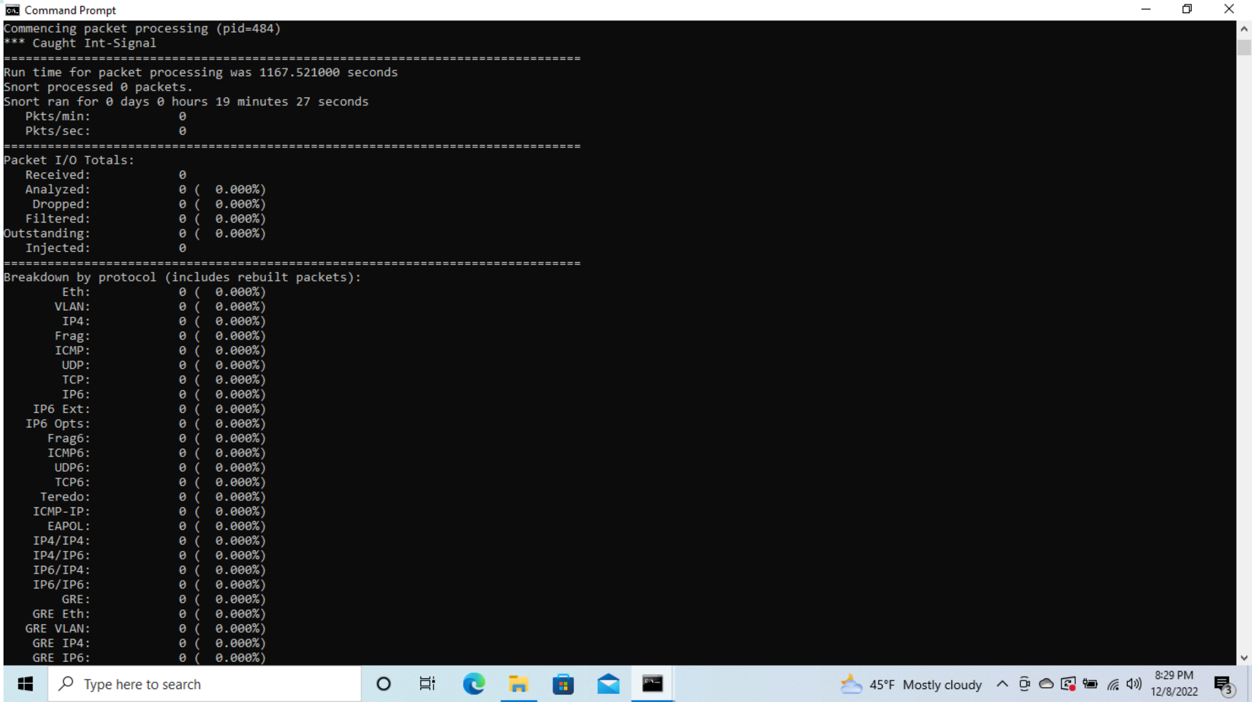
```
C:\Snort\bin>snort.exe
Running in packet dump mode

        --== Initializing Snort ==--
Initializing Output Plugins!
pcap DAQ configured to passive.
The DAQ version does not support reload.
Acquiring network traffic from "\Device\NPF_{C57FA2DC-278E-4285-A2EF-F015BB66B244}".
Decoding Ethernet

        --== Initialization Complete ==--

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

Commencing packet processing (pid=484)
*** Caught Int-Signal
===============================================================================
Run time for packet processing was 1167.521000 seconds
Snort processed 0 packets.
Snort ran for 0 days 0 hours 19 minutes 27 seconds
   Pkts/min:            0
   Pkts/sec:            0
===============================================================================
Packet I/O Totals:
   Received:            0
   Analyzed:            0 (  0.000%)
    Dropped:            0 (  0.000%)
   Filtered:            0 (  0.000%)
Outstanding:            0 (  0.000%)
   Injected:            0
===============================================================================
Breakdown by protocol (includes rebuilt packets):
        Eth:            0 (  0.000%)
       VLAN:            0 (  0.000%)
        IP4:            0 (  0.000%)
       Frag:            0 (  0.000%)
       ICMP:            0 (  0.000%)
```



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===============================================================================
Packet I/O Totals:
   Received:            0
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    Dropped:            0 (  0.000%)
   Filtered:            0 (  0.000%)
Outstanding:            0 (  0.000%)
   Injected:            0
===============================================================================
Breakdown by protocol (includes rebuilt packets):
        Eth:            0 (  0.000%)
       VLAN:            0 (  0.000%)
        IP4:            0 (  0.000%)
       Frag:            0 (  0.000%)
       ICMP:            0 (  0.000%)
        UDP:            0 (  0.000%)
        TCP:            0 (  0.000%)
        IP6:            0 (  0.000%)
    IP6 Ext:            0 (  0.000%)
   IP6 Opts:            0 (  0.000%)
      Frag6:            0 (  0.000%)
      ICMP6:            0 (  0.000%)
       UDP6:            0 (  0.000%)
       TCP6:            0 (  0.000%)
     Teredo:            0 (  0.000%)
    ICMP-IP:            0 (  0.000%)
      EAPOL:            0 (  0.000%)
    IP4/IP4:            0 (  0.000%)
    IP4/IP6:            0 (  0.000%)
    IP6/IP4:            0 (  0.000%)
    IP6/IP6:            0 (  0.000%)
        GRE:            0 (  0.000%)
    GRE Eth:            0 (  0.000%)
   GRE VLAN:            0 (  0.000%)
    GRE IP4:            0 (  0.000%)
    GRE IP6:            0 (  0.000%)
```

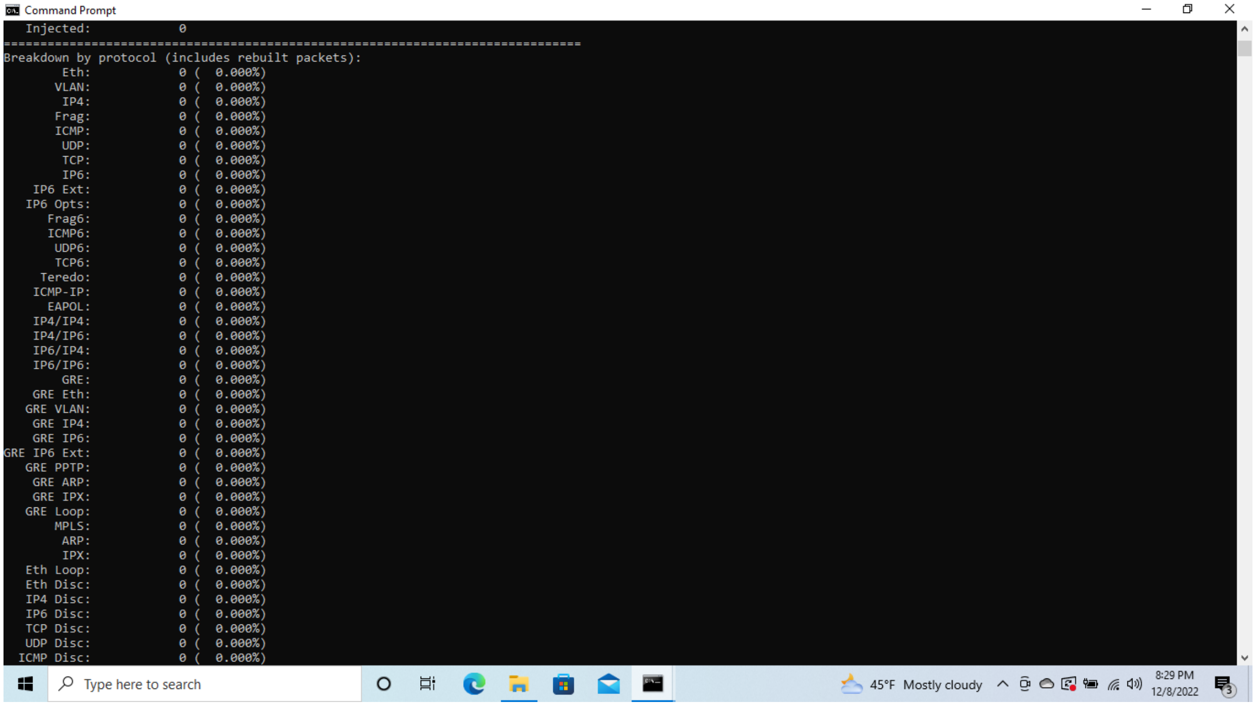

```
   Injected:            0
===============================================================================
Breakdown by protocol (includes rebuilt packets):
        Eth:            0 (  0.000%)
       VLAN:            0 (  0.000%)
        IP4:            0 (  0.000%)
       Frag:            0 (  0.000%)
       ICMP:            0 (  0.000%)
        UDP:            0 (  0.000%)
        TCP:            0 (  0.000%)
        IP6:            0 (  0.000%)
    IP6 Ext:            0 (  0.000%)
   IP6 Opts:            0 (  0.000%)
      Frag6:            0 (  0.000%)
      ICMP6:            0 (  0.000%)
       UDP6:            0 (  0.000%)
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     Teredo:            0 (  0.000%)
    ICMP-IP:            0 (  0.000%)
      EAPOL:            0 (  0.000%)
    IP4/IP4:            0 (  0.000%)
    IP4/IP6:            0 (  0.000%)
    IP6/IP4:            0 (  0.000%)
    IP6/IP6:            0 (  0.000%)
        GRE:            0 (  0.000%)
    GRE Eth:            0 (  0.000%)
   GRE VLAN:            0 (  0.000%)
    GRE IP4:            0 (  0.000%)
    GRE IP6:            0 (  0.000%)
GRE IP6 Ext:            0 (  0.000%)
   GRE PPTP:            0 (  0.000%)
    GRE ARP:            0 (  0.000%)
    GRE IPX:            0 (  0.000%)
   GRE Loop:            0 (  0.000%)
       MPLS:            0 (  0.000%)
        ARP:            0 (  0.000%)
        IPX:            0 (  0.000%)
   Eth Loop:            0 (  0.000%)
   Eth Disc:            0 (  0.000%)
   IP4 Disc:            0 (  0.000%)
   IP6 Disc:            0 (  0.000%)
   TCP Disc:            0 (  0.000%)
   UDP Disc:            0 (  0.000%)
  ICMP Disc:            0 (  0.000%)
```
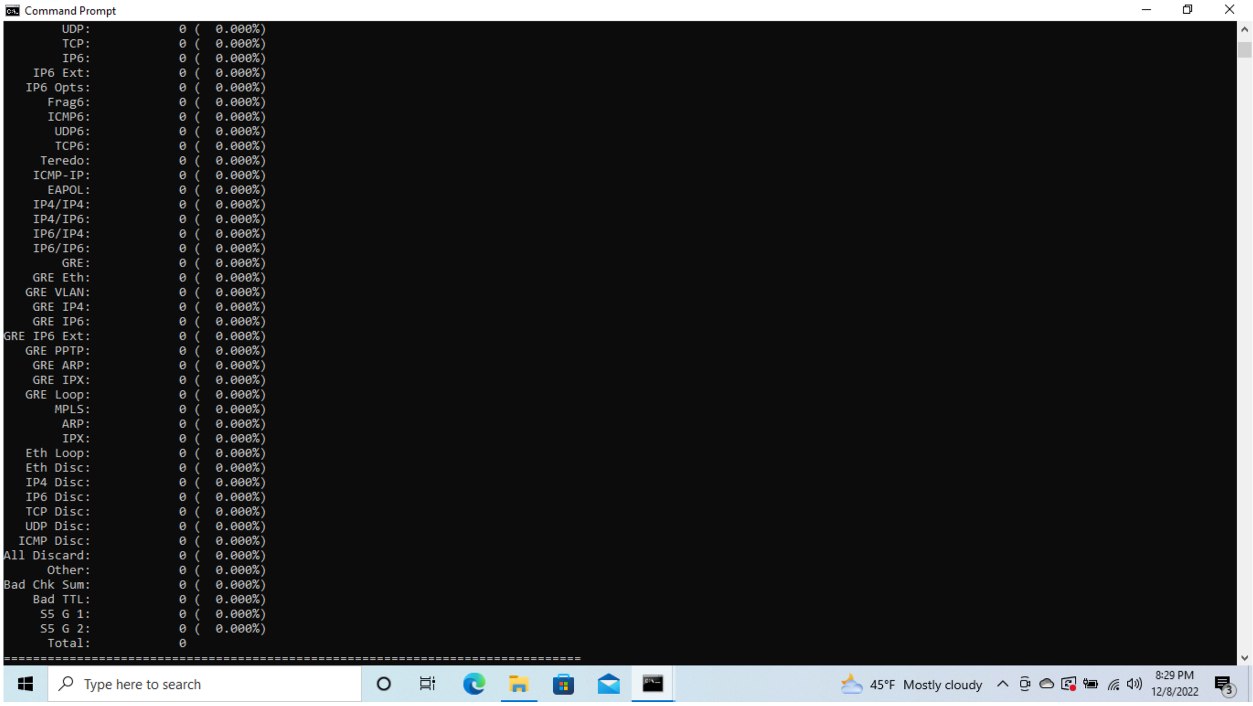
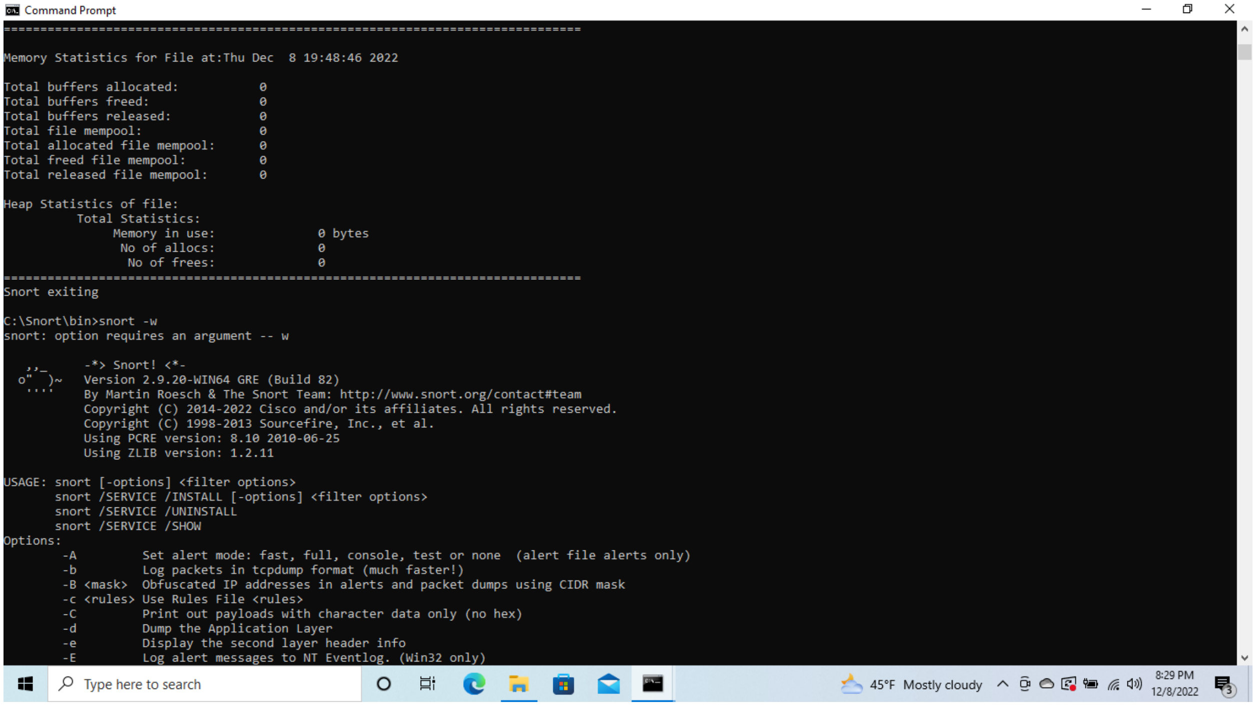
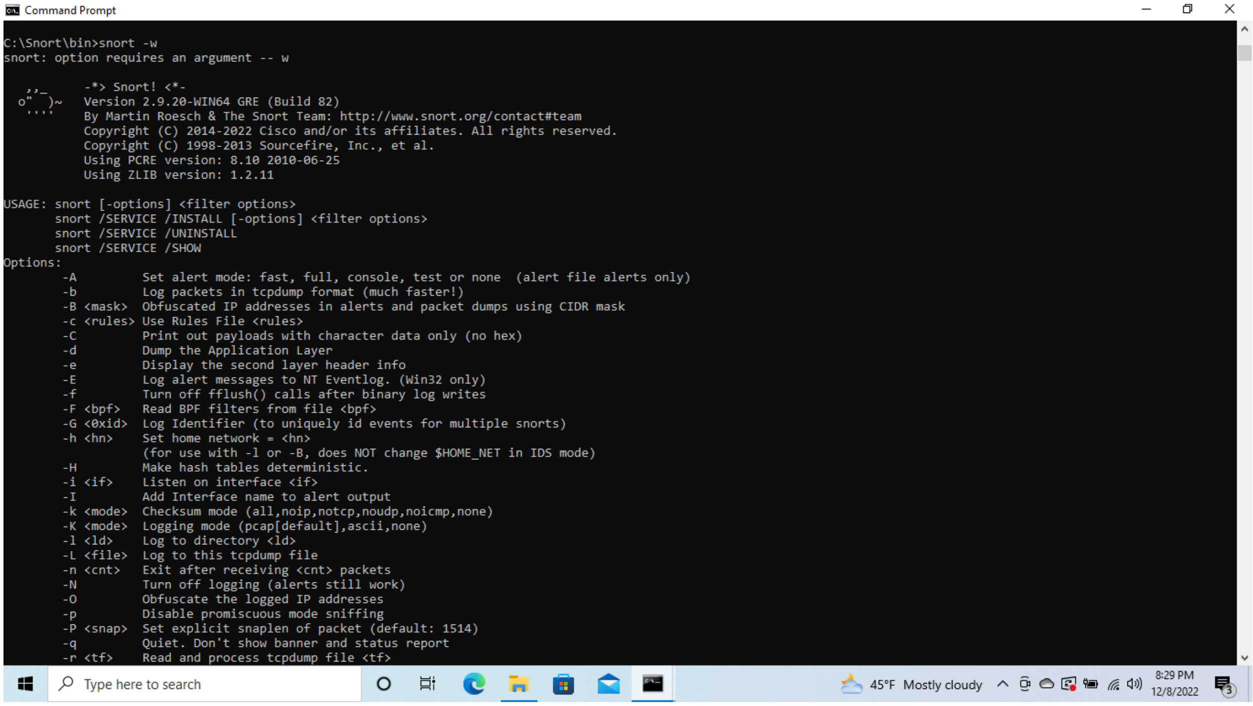



```
        UDP:            0 (  0.000%)
        TCP:            0 (  0.000%)
        IP6:            0 (  0.000%)
    IP6 Ext:            0 (  0.000%)
   IP6 Opts:            0 (  0.000%)
      Frag6:            0 (  0.000%)
      ICMP6:            0 (  0.000%)
       UDP6:            0 (  0.000%)
       TCP6:            0 (  0.000%)
     Teredo:            0 (  0.000%)
    ICMP-IP:            0 (  0.000%)
      EAPOL:            0 (  0.000%)
    IP4/IP4:            0 (  0.000%)
    IP4/IP6:            0 (  0.000%)
    IP6/IP4:            0 (  0.000%)
    IP6/IP6:            0 (  0.000%)
        GRE:            0 (  0.000%)
    GRE Eth:            0 (  0.000%)
   GRE VLAN:            0 (  0.000%)
    GRE IP4:            0 (  0.000%)
    GRE IP6:            0 (  0.000%)
GRE IP6 Ext:            0 (  0.000%)
   GRE PPTP:            0 (  0.000%)
    GRE ARP:            0 (  0.000%)
    GRE IPX:            0 (  0.000%)
   GRE Loop:            0 (  0.000%)
       MPLS:            0 (  0.000%)
        ARP:            0 (  0.000%)
        IPX:            0 (  0.000%)
   Eth Loop:            0 (  0.000%)
   Eth Disc:            0 (  0.000%)
   IP4 Disc:            0 (  0.000%)
   IP6 Disc:            0 (  0.000%)
   TCP Disc:            0 (  0.000%)
   UDP Disc:            0 (  0.000%)
  ICMP Disc:            0 (  0.000%)
All Discard:            0 (  0.000%)
      Other:            0 (  0.000%)
Bad Chk Sum:            0 (  0.000%)
    Bad TTL:            0 (  0.000%)
     S5 G 1:            0 (  0.000%)
     S5 G 2:            0 (  0.000%)
      Total:            0
===============================================================================
```



```
===============================================================================

Memory Statistics for File at:Thu Dec  8 19:48:46 2022

Total buffers allocated:           0
Total buffers freed:               0
Total buffers released:            0
Total file mempool:                0
Total allocated file mempool:      0
Total freed file mempool:          0
Total released file mempool:       0

Heap Statistics of file:
          Total Statistics:
               Memory in use:             0 bytes
                No of allocs:             0
                 No of frees:             0
===============================================================================
Snort exiting

C:\Snort\bin>snort -w
snort: option requires an argument -- w

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

USAGE: snort [-options] <filter options>
       snort /SERVICE /INSTALL [-options] <filter options>
       snort /SERVICE /UNINSTALL
       snort /SERVICE /SHOW
Options:
        -A         Set alert mode: fast, full, console, test or none  (alert file alerts only)
        -b         Log packets in tcpdump format (much faster!)
        -B <mask>  Obfuscated IP addresses in alerts and packet dumps using CIDR mask
        -c <rules> Use Rules File <rules>
        -C         Print out payloads with character data only (no hex)
        -d         Dump the Application Layer
        -e         Display the second layer header info
        -E         Log alert messages to NT Eventlog. (Win32 only)
```



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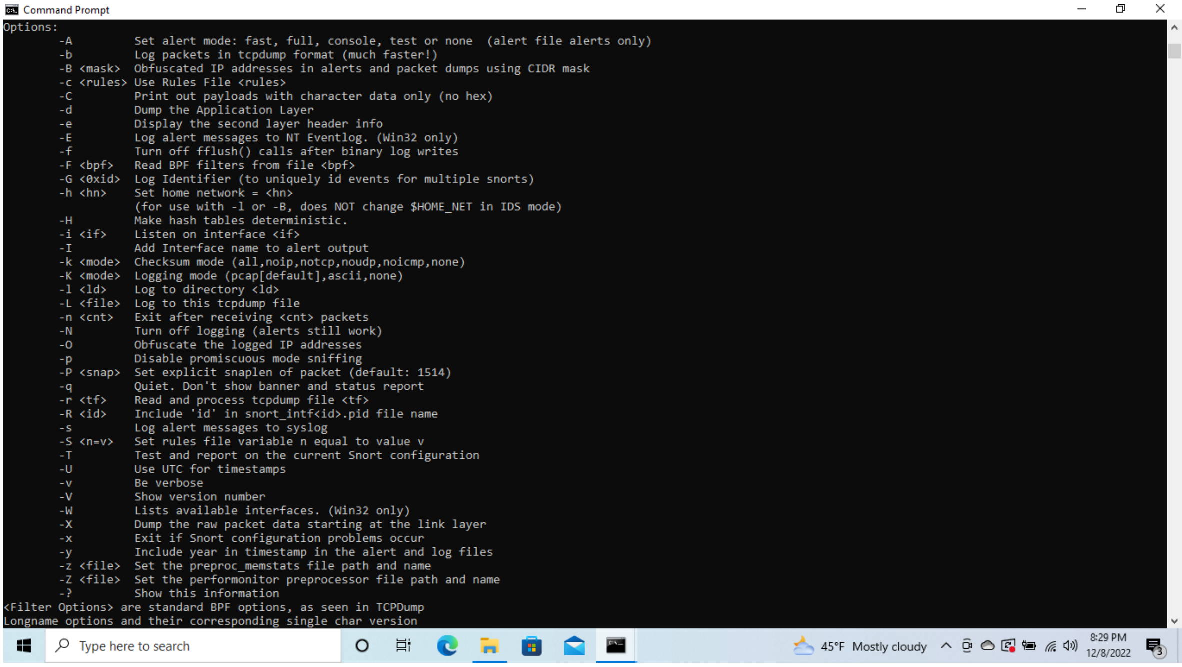
```

```
        -f         Turn off fflush() calls after binary log writes
        -F <bpf>   Read BPF filters from file <bpf>
        -G <0xid>  Log Identifier (to uniquely id events for multiple snorts)
        -h <hn>    Set home network = <hn>
                   (for use with -l or -B, does NOT change $HOME_NET in IDS mode)
        -H         Make hash tables deterministic.
        -i <if>    Listen on interface <if>
        -I         Add Interface name to alert output
        -k <mode>  Checksum mode (all,noip,notcp,noudp,noicmp,none)
        -K <mode>  Logging mode (pcap[default],ascii,none)
        -l <ld>    Log to directory <ld>
        -L <file>  Log to this tcpdump file
        -n <cnt>   Exit after receiving <cnt> packets
        -N         Turn off logging (alerts still work)
        -O         Obfuscate the logged IP addresses
        -p         Disable promiscuous mode sniffing
        -P <snap>  Set explicit snaplen of packet (default: 1514)
        -q         Quiet. Don't show banner and status report
        -r <tf>    Read and process tcpdump file <tf>
```



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        -P <snap>  Set explicit snaplen of packet (default: 1514)
        -q         Quiet. Don't show banner and status report
        -r <tf>    Read and process tcpdump file <tf>
        -R <id>    Include 'id' in snort_intf<id>.pid file name
        -s         Log alert messages to syslog
        -S <n=v>   Set rules file variable n equal to value v
        -T         Test and report on the current Snort configuration
        -U         Use UTC for timestamps
        -v         Be verbose
        -V         Show version number
        -W         Lists available interfaces. (Win32 only)
        -X         Dump the raw packet data starting at the link layer
        -x         Exit if Snort configuration problems occur
        -y         Include year in timestamp in the alert and log files
        -z <file>  Set the preproc_memstats file path and name
        -Z <file>  Set the performonitor preprocessor file path and name
        -?         Show this information
<Filter Options> are standard BPF options, as seen in TCPDump
Longname options and their corresponding single char version
```

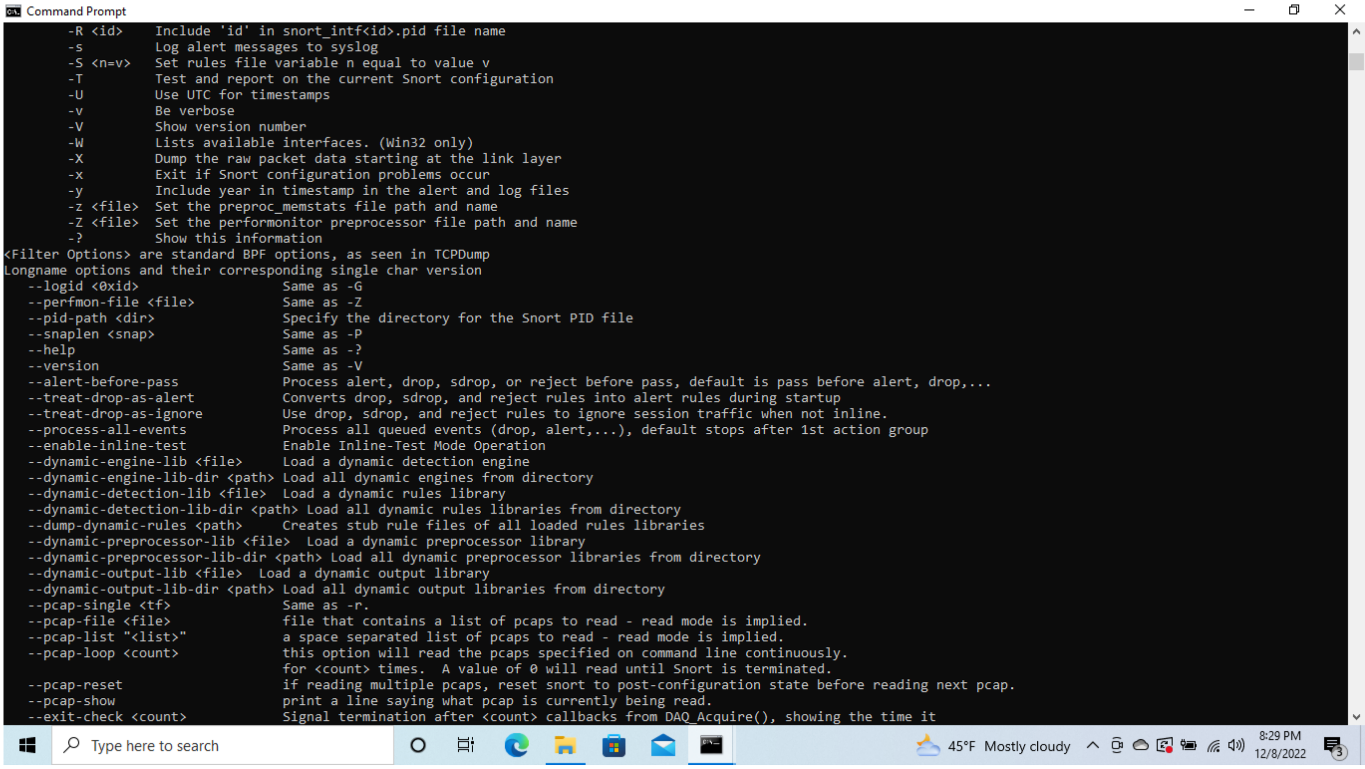

```
        -R <id>    Include 'id' in snort_intf<id>.pid file name
        -s         Log alert messages to syslog
        -S <n=v>   Set rules file variable n equal to value v
        -T         Test and report on the current Snort configuration
        -U         Use UTC for timestamps
        -v         Be verbose
        -V         Show version number
        -W         Lists available interfaces. (Win32 only)
        -X         Dump the raw packet data starting at the link layer
        -x         Exit if Snort configuration problems occur
        -y         Include year in timestamp in the alert and log files
        -z <file>  Set the preproc_memstats file path and name
        -Z <file>  Set the performonitor preprocessor file path and name
        -?         Show this information
<Filter Options> are standard BPF options, as seen in TCPDump
Longname options and their corresponding single char version
   --logid <0xid>                  Same as -G
   --perfmon-file <file>           Same as -Z
   --pid-path <dir>                Specify the directory for the Snort PID file
   --snaplen <snap>                Same as -P
   --help                          Same as -?
   --version                       Same as -V
   --alert-before-pass             Process alert, drop, sdrop, or reject before pass, default is pass before alert, drop,...
   --treat-drop-as-alert           Converts drop, sdrop, and reject rules into alert rules during startup
   --treat-drop-as-ignore          Use drop, sdrop, and reject rules to ignore session traffic when not inline.
   --process-all-events            Process all queued events (drop, alert,...), default stops after 1st action group
   --enable-inline-test            Enable Inline-Test Mode Operation
   --dynamic-engine-lib <file>     Load a dynamic detection engine
   --dynamic-engine-lib-dir <path> Load all dynamic engines from directory
   --dynamic-detection-lib <file>  Load a dynamic rules library
   --dynamic-detection-lib-dir <path> Load all dynamic rules libraries from directory
   --dump-dynamic-rules <path>     Creates stub rule files of all loaded rules libraries
   --dynamic-preprocessor-lib <file>  Load a dynamic preprocessor library
   --dynamic-preprocessor-lib-dir <path> Load all dynamic preprocessor libraries from directory
   --dynamic-output-lib <file>  Load a dynamic output library
   --dynamic-output-lib-dir <path> Load all dynamic output libraries from directory
   --pcap-single <tf>              Same as -r.
   --pcap-file <file>              file that contains a list of pcaps to read - read mode is implied.
   --pcap-list "<list>"            a space separated list of pcaps to read - read mode is implied.
   --pcap-loop <count>             this option will read the pcaps specified on command line continuously.
                                   for <count> times.  A value of 0 will read until Snort is terminated.
   --pcap-reset                    if reading multiple pcaps, reset snort to post-configuration state before reading next pcap.
   --pcap-show                     print a line saying what pcap is currently being read.
   --exit-check <count>            Signal termination after <count> callbacks from DAQ_Acquire(), showing the time it
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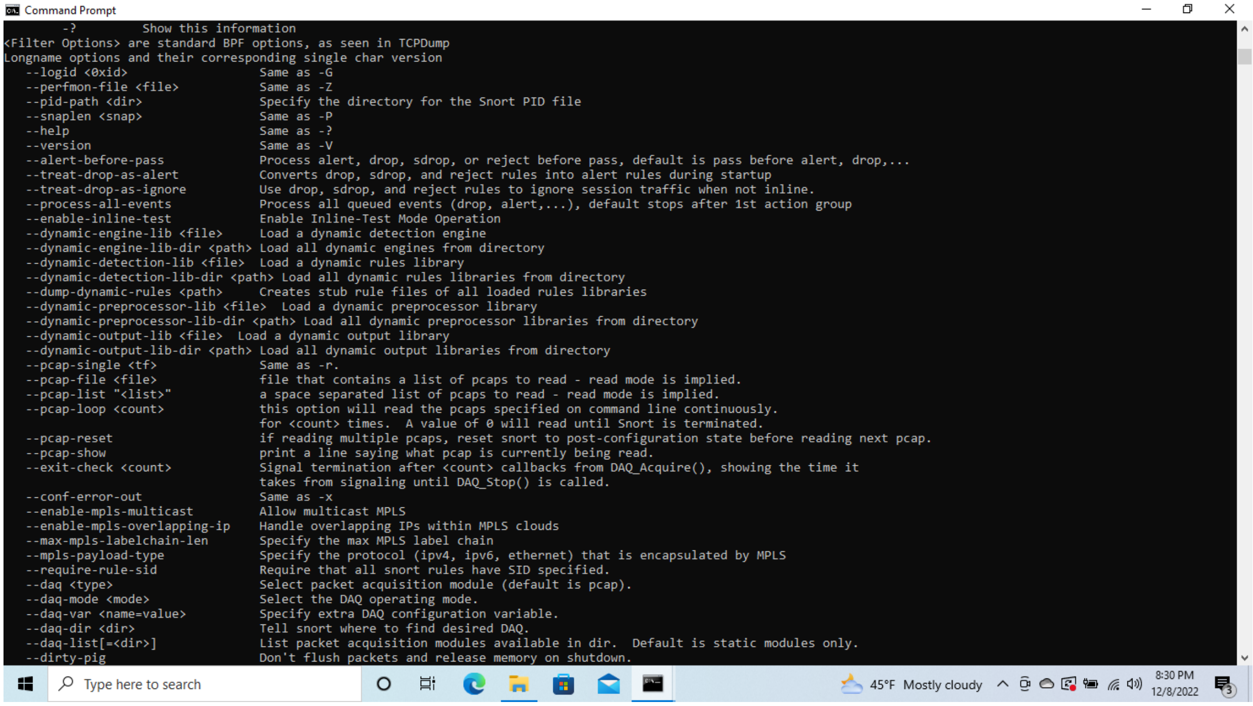

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        -?         Show this information
<Filter Options> are standard BPF options, as seen in TCPDump
Longname options and their corresponding single char version
   --logid <0xid>                  Same as -G
   --perfmon-file <file>           Same as -Z
   --pid-path <dir>                Specify the directory for the Snort PID file
   --snaplen <snap>                Same as -P
   --help                          Same as -?
   --version                       Same as -V
   --alert-before-pass             Process alert, drop, sdrop, or reject before pass, default is pass before alert, drop,...
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   --pcap-loop <count>             this option will read the pcaps specified on command line continuously.
                                   for <count> times.  A value of 0 will read until Snort is terminated.
   --pcap-reset                    if reading multiple pcaps, reset snort to post-configuration state before reading next pcap.
   --pcap-show                     print a line saying what pcap is currently being read.
   --exit-check <count>            Signal termination after <count> callbacks from DAQ_Acquire(), showing the time it
                                   takes from signaling until DAQ_Stop() is called.
   --conf-error-out                Same as -x
   --enable-mpls-multicast         Allow multicast MPLS
   --enable-mpls-overlapping-ip    Handle overlapping IPs within MPLS clouds
   --max-mpls-labelchain-len       Specify the max MPLS label chain
   --mpls-payload-type             Specify the protocol (ipv4, ipv6, ethernet) that is encapsulated by MPLS
   --require-rule-sid              Require that all snort rules have SID specified.
   --daq <type>                    Select packet acquisition module (default is pcap).
   --daq-mode <mode>               Select the DAQ operating mode.
   --daq-var <name=value>          Specify extra DAQ configuration variable.
   --daq-dir <dir>                 Tell snort where to find desired DAQ.
   --daq-list[=<dir>]              List packet acquisition modules available in dir.  Default is static modules only.
   --dirty-pig                     Don't flush packets and release memory on shutdown.
```

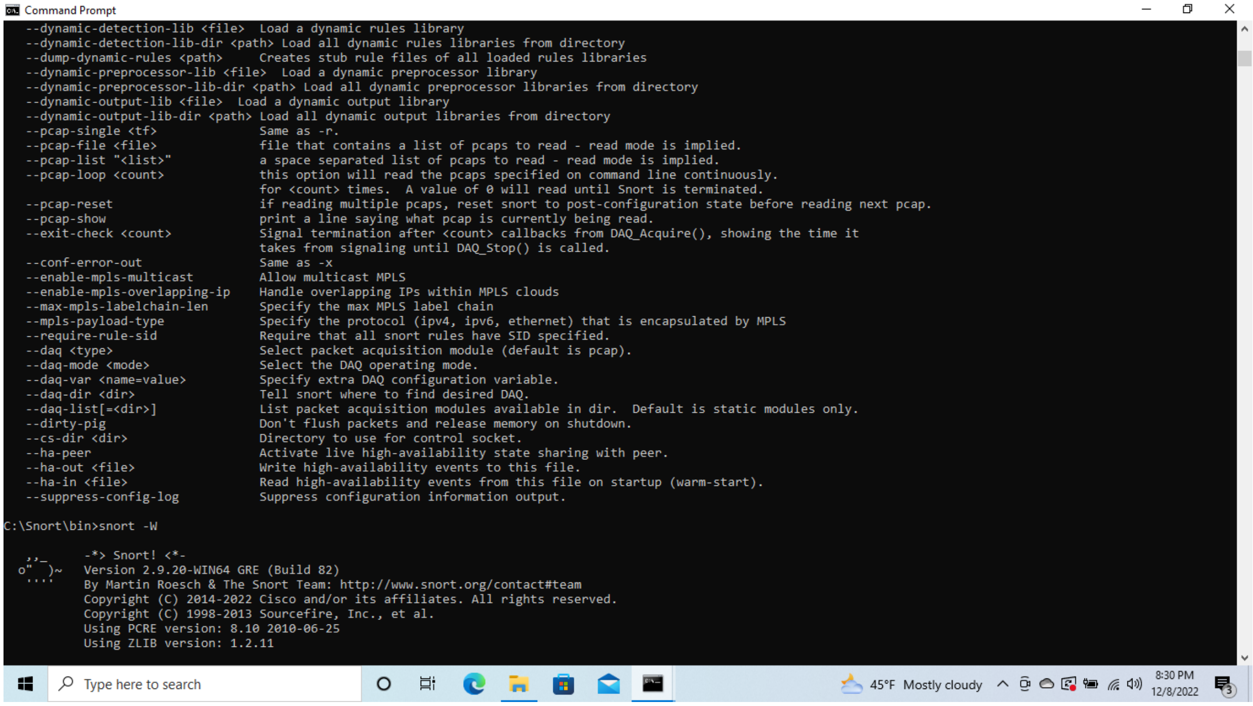

```
   --dynamic-detection-lib <file>  Load a dynamic rules library
   --dynamic-detection-lib-dir <path> Load all dynamic rules libraries from directory
   --dump-dynamic-rules <path>     Creates stub rule files of all loaded rules libraries
   --dynamic-preprocessor-lib <file>  Load a dynamic preprocessor library
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   --max-mpls-labelchain-len       Specify the max MPLS label chain
   --mpls-payload-type             Specify the protocol (ipv4, ipv6, ethernet) that is encapsulated by MPLS
   --require-rule-sid              Require that all snort rules have SID specified.
   --daq <type>                    Select packet acquisition module (default is pcap).
   --daq-mode <mode>               Select the DAQ operating mode.
   --daq-var <name=value>          Specify extra DAQ configuration variable.
   --daq-dir <dir>                 Tell snort where to find desired DAQ.
   --daq-list[=<dir>]              List packet acquisition modules available in dir.  Default is static modules only.
   --dirty-pig                     Don't flush packets and release memory on shutdown.
```
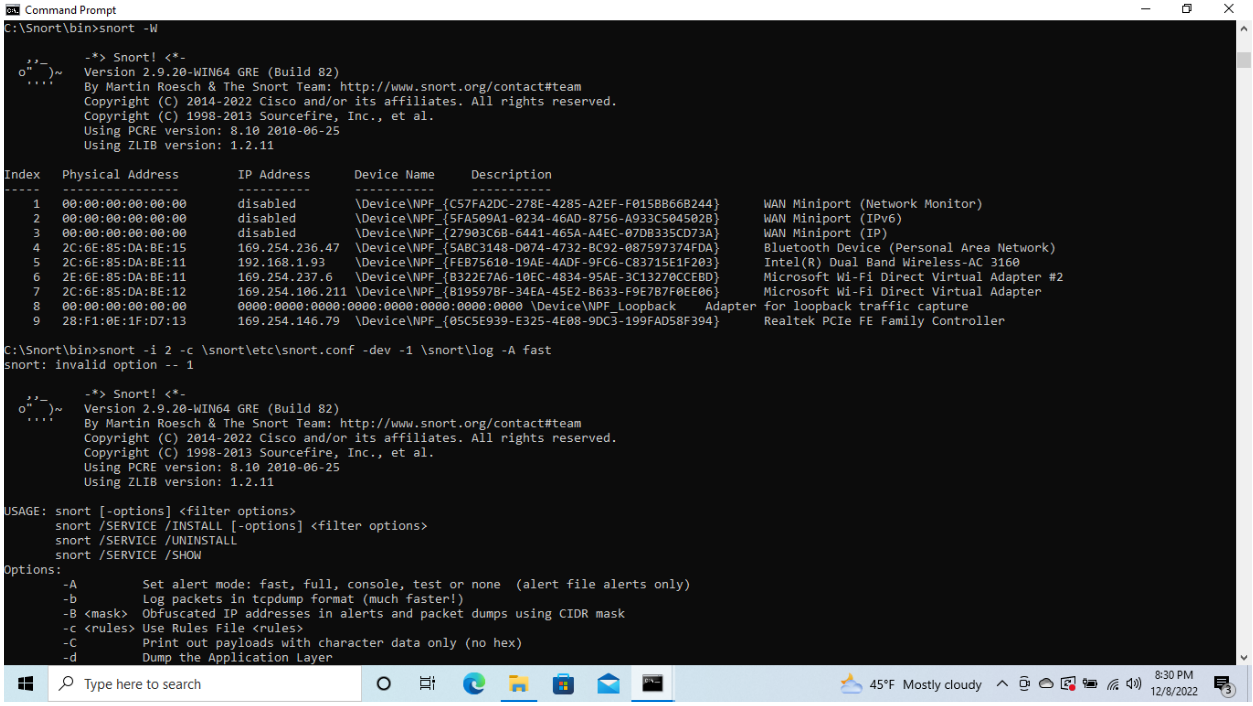

```
   --cs-dir <dir>                  Directory to use for control socket.
   --ha-peer                       Activate live high-availability state sharing with peer.
   --ha-out <file>                 Write high-availability events to this file.
   --ha-in <file>                  Read high-availability events from this file on startup (warm-start).
   --suppress-config-log           Suppress configuration information output.

C:\Snort\bin>snort -W

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11
```



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   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
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           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

Index   Physical Address        IP Address      Device Name     Description
-----   ----------------        ----------      -----------     -----------
    1   00:00:00:00:00:00       disabled        \Device\NPF_{C57FA2DC-278E-4285-A2EF-F015BB66B244}      WAN Miniport (Network Monitor)
    2   00:00:00:00:00:00       disabled        \Device\NPF_{5FA509A1-0234-46AD-8756-A933C504502B}      WAN Miniport (IPv6)
    3   00:00:00:00:00:00       disabled        \Device\NPF_{27903C6B-6441-465A-A4EC-07DB335CD73A}      WAN Miniport (IP)
    4   2C:6E:85:DA:BE:15       169.254.236.47  \Device\NPF_{5ABC3148-D074-4732-BC92-087597374FDA}      Bluetooth Device (Personal Area Network)
    5   2C:6E:85:DA:BE:11       192.168.1.93    \Device\NPF_{FEB75610-19AE-4ADF-9FC6-C83715E1F203}      Intel(R) Dual Band Wireless-AC 3160
    6   2E:6E:85:DA:BE:11       169.254.237.6   \Device\NPF_{B322E7A6-10EC-4834-95AE-3C13270CCEBD}      Microsoft Wi-Fi Direct Virtual Adapter #2
    7   2C:6E:85:DA:BE:12       169.254.106.211 \Device\NPF_{B19597BF-34EA-45E2-B633-F9E7B7F0EE06}      Microsoft Wi-Fi Direct Virtual Adapter
    8   00:00:00:00:00:00       0000:0000:0000:0000:0000:0000:0000:0000 \Device\NPF_Loopback    Adapter for loopback traffic capture
    9   28:F1:0E:1F:D7:13       169.254.146.79  \Device\NPF_{05C5E939-E325-4E08-9DC3-199FAD58F394}      Realtek PCIe FE Family Controller

C:\Snort\bin>snort -i 2 -c \snort\etc\snort.conf -dev -1 \snort\log -A fast
snort: invalid option -- 1

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
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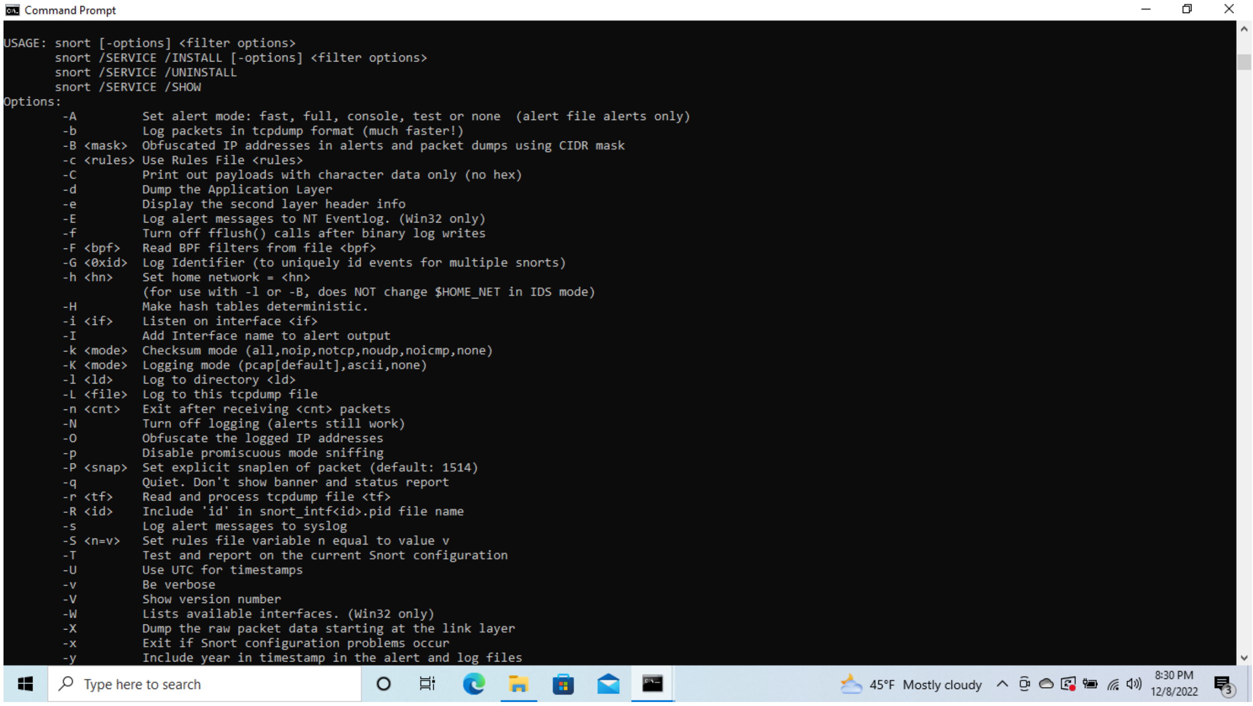
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

USAGE: snort [-options] <filter options>
       snort /SERVICE /INSTALL [-options] <filter options>
       snort /SERVICE /UNINSTALL
       snort /SERVICE /SHOW
Options:
        -A         Set alert mode: fast, full, console, test or none  (alert file alerts only)
        -b         Log packets in tcpdump format (much faster!)
        -B <mask>  Obfuscated IP addresses in alerts and packet dumps using CIDR mask
        -c <rules> Use Rules File <rules>
        -C         Print out payloads with character data only (no hex)
        -d         Dump the Application Layer
```



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USAGE: snort [-options] <filter options>
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       snort /SERVICE /UNINSTALL
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        -b         Log packets in tcpdump format (much faster!)
        -B <mask>  Obfuscated IP addresses in alerts and packet dumps using CIDR mask
        -c <rules> Use Rules File <rules>
        -C         Print out payloads with character data only (no hex)
        -d         Dump the Application Layer
        -e         Display the second layer header info
        -E         Log alert messages to NT Eventlog. (Win32 only)
        -f         Turn off fflush() calls after binary log writes
        -F <bpf>   Read BPF filters from file <bpf>
        -G <0xid>  Log Identifier (to uniquely id events for multiple snorts)
        -h <hn>    Set home network = <hn>
                   (for use with -l or -B, does NOT change $HOME_NET in IDS mode)
        -H         Make hash tables deterministic.
        -i <if>    Listen on interface <if>
        -I         Add Interface name to alert output
        -k <mode>  Checksum mode (all,noip,notcp,noudp,noicmp,none)
        -K <mode>  Logging mode (pcap[default],ascii,none)
        -l <ld>    Log to directory <ld>
        -L <file>  Log to this tcpdump file
        -n <cnt>   Exit after receiving <cnt> packets
        -N         Turn off logging (alerts still work)
        -O         Obfuscate the logged IP addresses
        -p         Disable promiscuous mode sniffing
        -P <snap>  Set explicit snaplen of packet (default: 1514)
        -q         Quiet. Don't show banner and status report
        -r <tf>    Read and process tcpdump file <tf>
        -R <id>    Include 'id' in snort_intf<id>.pid file name
        -s         Log alert messages to syslog
        -S <n=v>   Set rules file variable n equal to value v
        -T         Test and report on the current Snort configuration
        -U         Use UTC for timestamps
        -v         Be verbose
        -V         Show version number
        -W         Lists available interfaces. (Win32 only)
        -X         Dump the raw packet data starting at the link layer
        -x         Exit if Snort configuration problems occur
        -y         Include year in timestamp in the alert and log files
```

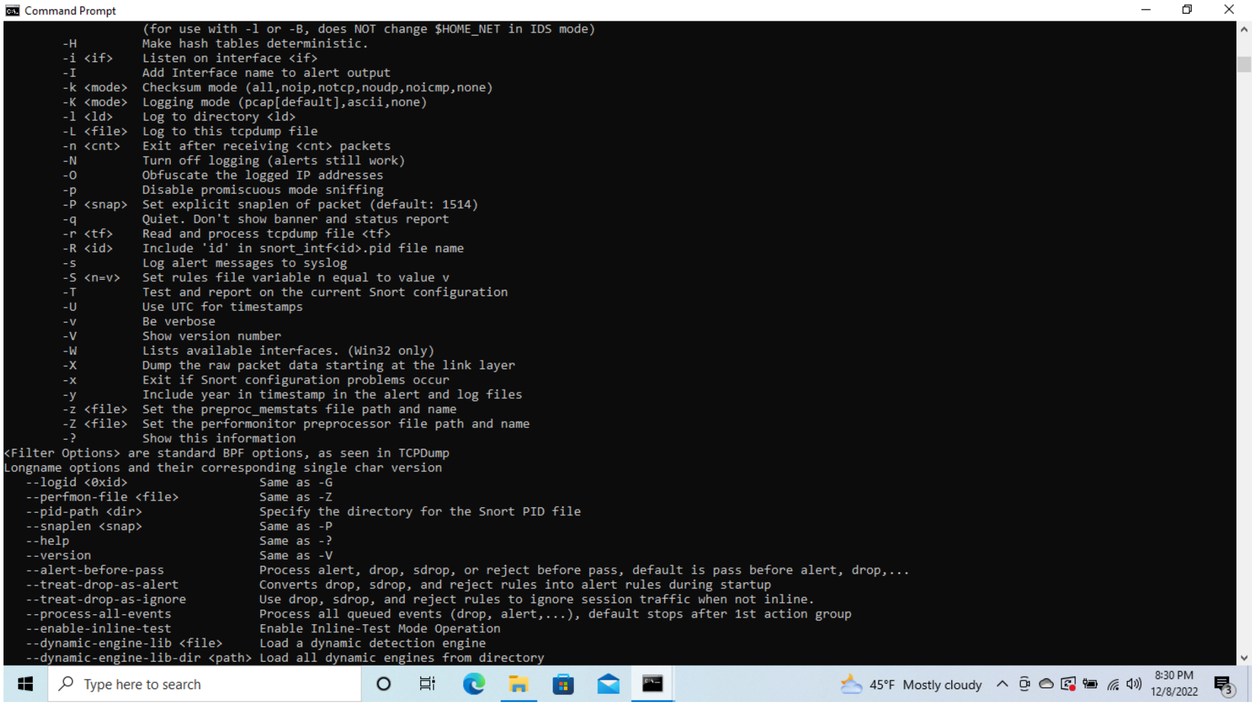

```
                   (for use with -l or -B, does NOT change $HOME_NET in IDS mode)
        -H         Make hash tables deterministic.
        -i <if>    Listen on interface <if>
        -I         Add Interface name to alert output
        -k <mode>  Checksum mode (all,noip,notcp,noudp,noicmp,none)
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        -z <file>  Set the preproc_memstats file path and name
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        -?         Show this information
<Filter Options> are standard BPF options, as seen in TCPDump
Longname options and their corresponding single char version
   --logid <0xid>                  Same as -G
   --perfmon-file <file>           Same as -Z
   --pid-path <dir>                Specify the directory for the Snort PID file
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   --help                          Same as -?
   --version                       Same as -V
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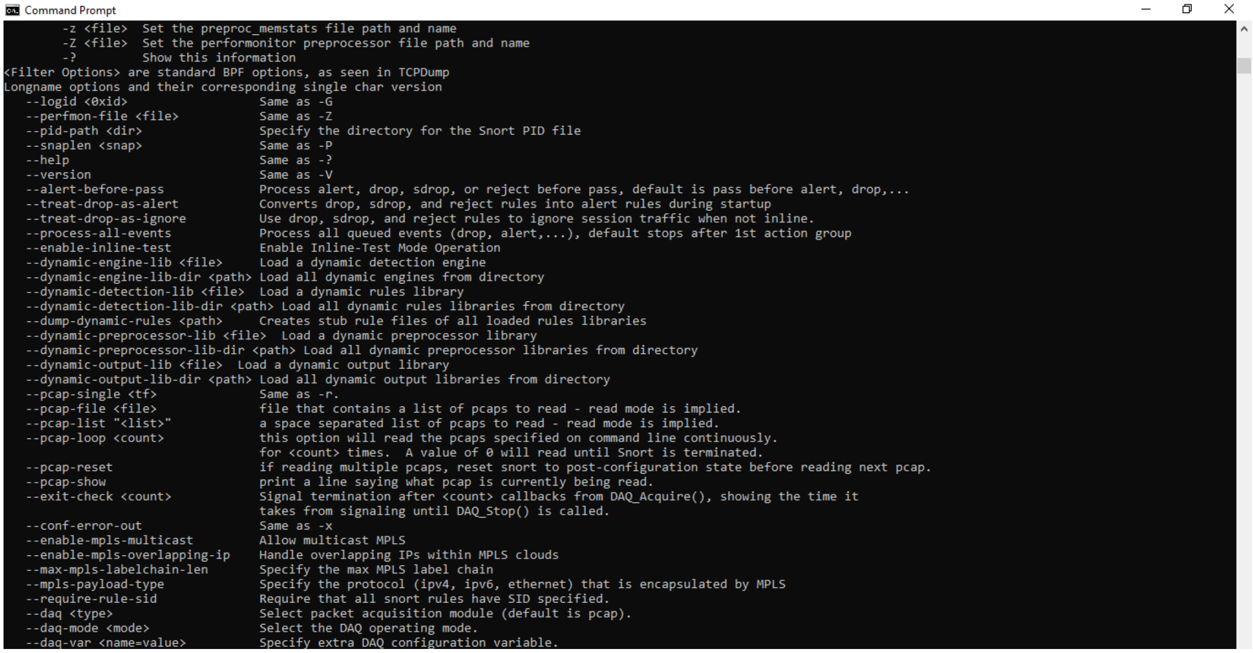

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   --pcap-reset                    if reading multiple pcaps, reset snort to post-configuration state before reading next pcap.
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   --exit-check <count>            Signal termination after <count> callbacks from DAQ_Acquire(), showing the time it
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   --conf-error-out                Same as -x
   --enable-mpls-multicast         Allow multicast MPLS
   --enable-mpls-overlapping-ip    Handle overlapping IPs within MPLS clouds
   --max-mpls-labelchain-len       Specify the max MPLS label chain
   --mpls-payload-type             Specify the protocol (ipv4, ipv6, ethernet) that is encapsulated by MPLS
   --require-rule-sid              Require that all snort rules have SID specified.
   --daq <type>                    Select packet acquisition module (default is pcap).
   --daq-mode <mode>               Select the DAQ operating mode.
   --daq-var <name=value>          Specify extra DAQ configuration variable.
```

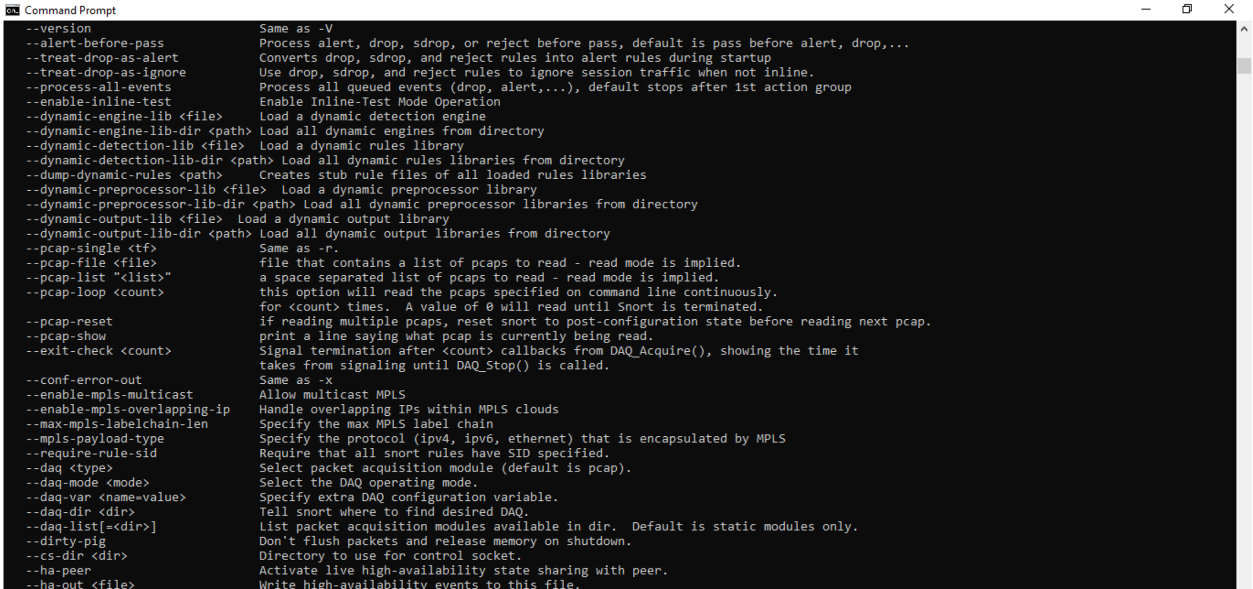

```
   --version                       Same as -V
   --alert-before-pass             Process alert, drop, sdrop, or reject before pass, default is pass before alert, drop,...
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   --daq-list[=<dir>]              List packet acquisition modules available in dir.  Default is static modules only.
   --dirty-pig                     Don't flush packets and release memory on shutdown.
   --cs-dir <dir>                  Directory to use for control socket.
   --ha-peer                       Activate live high-availability state sharing with peer.
   --ha-out <file>                 Write high-availability events to this file.
```

GITBUB LINK: https://github.com/prachi24s/Intrusion_Detection_System

REFERENCES: https://www.youtube.com/watch?v=RzF5-fVz7Oc

Images are also from this reference link.
I have referred to the online website.