

CA169 Assignment 1 Lab Report

Submit these pages onwards.

Date:	16 th March 2018
STUDENT NAME:	Tomas Baltrunas
STUDENT NUMBER:	17350793
PROJECT NUMBER:	1
MODULE CODE:	CA169
DEGREE: [CA EC ECSA PSSD]	CA
LECTURER:	Brian Stone

Declaration

In submitting this project, I declare that the project material, which I now submit, is my own work. Any assistance received by way of borrowing from the work of others has been cited and acknowledged within the work. I make this declaration in the knowledge that a breach of the rules pertaining to project submission may carry serious consequences.

Answer Sheets

Ipconfig exercise

IP address of the machine	136.206.18.141
MAC address	50-9A-4C-3D-6E-2F

Ping exercise 1

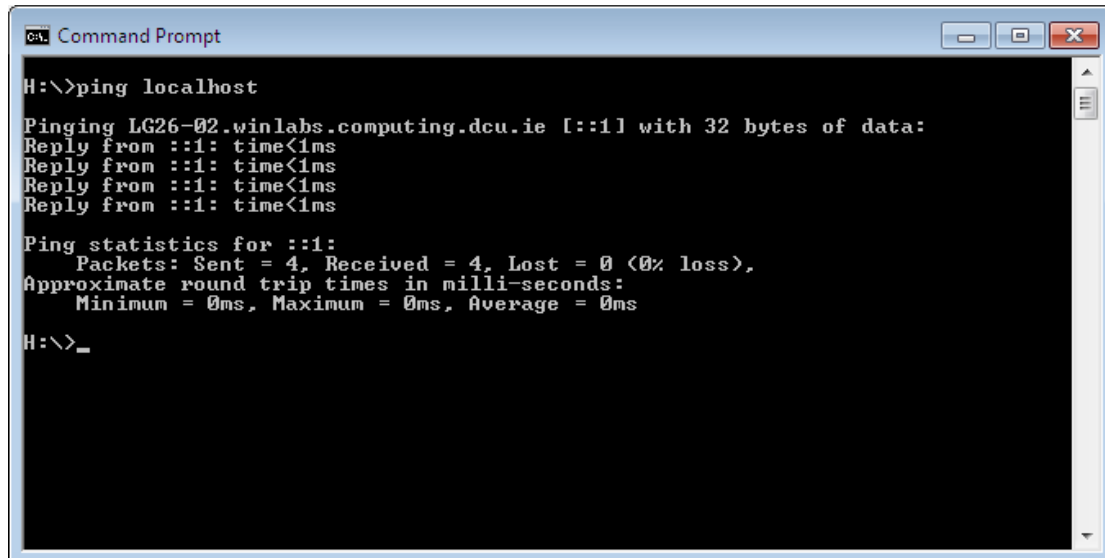
What is displayed?

Structure of the command's syntax and explanation of its options is displayed. For example, '-t' and '-n' control the number of ping requests, '-a' translates a numeric IP address into a human-readable form, and so on. Other arguments relate to IPv4 and IPv6, routing, sent and received packets, information about the sender, and more.

Ping exercise 2

Ping localhost

Paste window here.



```
Ca. Command Prompt
H:\>ping localhost

Pinging LG26-02.winlabs.computing.dcu.ie [::1] with 32 bytes of data:
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms

Ping statistics for ::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

H:\>_
```

1. What information is returned?
2. What is the localhost?

Answer 1

Details about the packets sent to the target and received from it are returned. Statistics on the packet exchanges and their “speed” are included. This indicates the target’s status.

Answer 2

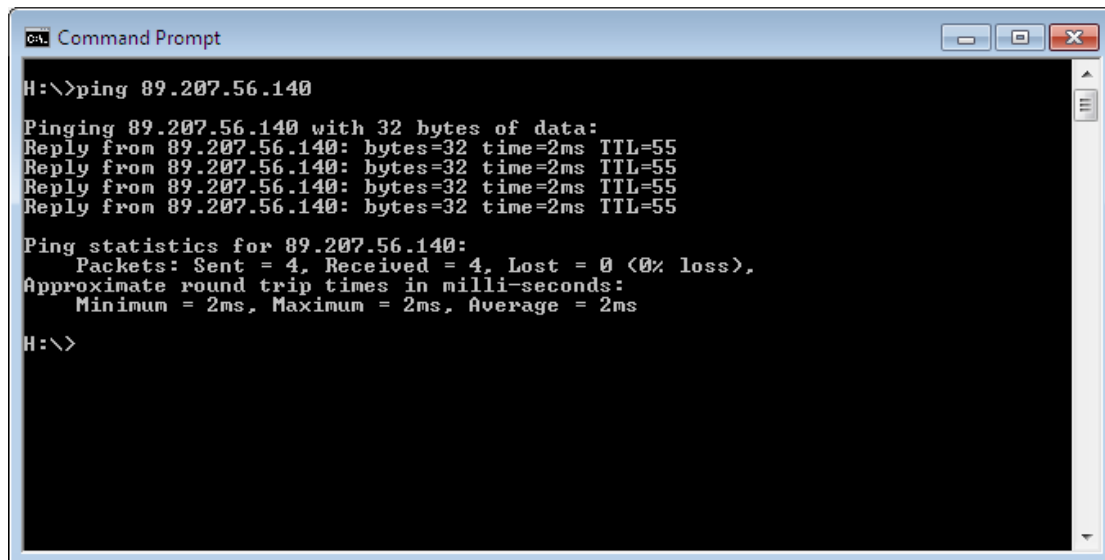
Own computer that the user is on, “self”.

Additional marks

‘89.207.56.140’ represents www.rte.ie, owned by ‘Raidió Teilifís Éireann’, phone no. ‘+353 1 208 3111’, post address ‘RTÉ, Donnybrook, Dublin 4’, email ‘info@rte.ie’. ‘216.58.211.163’ (spec) represents www.google.ie, of ‘Google LLC’, address ‘Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043 USA’. I found the URL’s by entering the IP addresses into my browser’s address bar.

Ping the IP address 89.207.56.140 **or the address** 173.194.34.120

Paste window here



```
ca. Command Prompt
H:\>ping 89.207.56.140

Pinging 89.207.56.140 with 32 bytes of data:
Reply from 89.207.56.140: bytes=32 time=2ms TTL=55
Reply from 89.207.56.140: bytes=32 time=2ms TTL=55
Reply from 89.207.56.140: bytes=32 time=2ms TTL=55
Reply from 89.207.56.140: bytes=32 time=2ms TTL=55

Ping statistics for 89.207.56.140:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 2ms, Average = 2ms

H:\>
```

Explain output here, item by item.

Line 1: Shows the target's address/name and how much data will be sent to it.
Next 4: Target's reply to each packet - the target's address(IPv4), packet sizes, time taken to reach the host and get back from it (round trip time in milliseconds), and time-to-live (maximum time in ms by which the packet must reach its target).
Last 4: The number of packets sent out, successfully accepted, and lost. The overall shortest, longest, and the average of the times taken by packets.

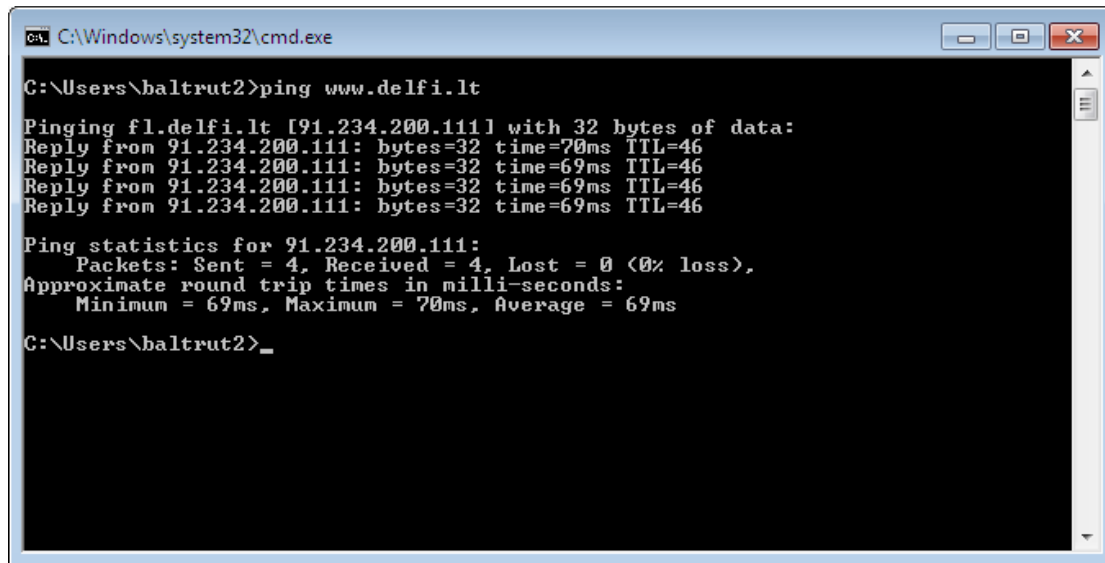
(References:

https://en.wikipedia.org/wiki/Time_to_live

[https://en.wikipedia.org/wiki/Ping_\(networking_utility\)](https://en.wikipedia.org/wiki/Ping_(networking_utility)))

Exercise 3

Paste window 1



```
C:\Windows\system32\cmd.exe

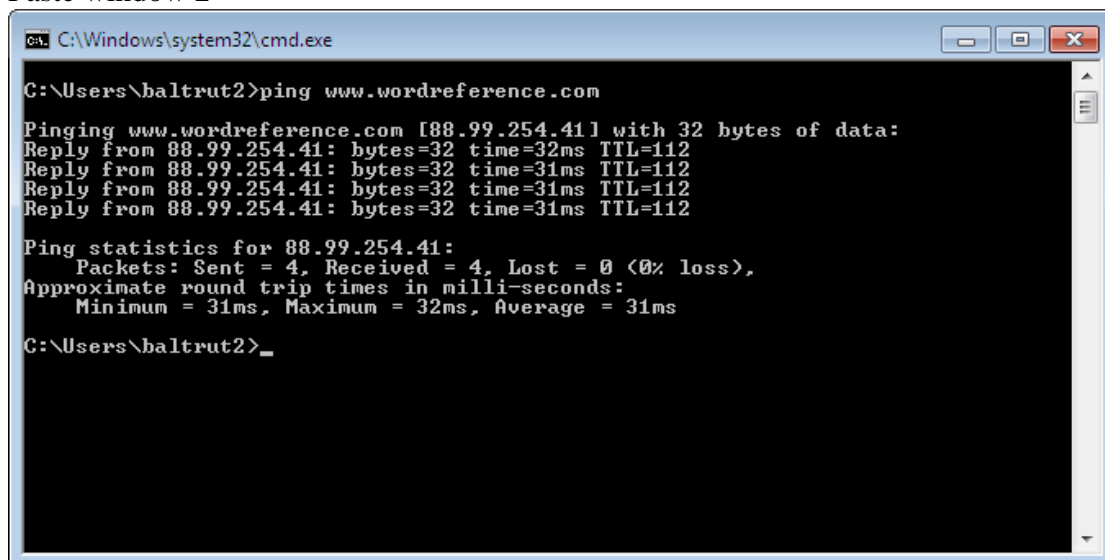
C:\Users\baltrut2>ping www.delfi.lt

Pinging fl.delfi.lt [91.234.200.111] with 32 bytes of data:
Reply from 91.234.200.111: bytes=32 time=70ms TTL=46
Reply from 91.234.200.111: bytes=32 time=69ms TTL=46
Reply from 91.234.200.111: bytes=32 time=69ms TTL=46
Reply from 91.234.200.111: bytes=32 time=69ms TTL=46

Ping statistics for 91.234.200.111:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 69ms, Maximum = 70ms, Average = 69ms

C:\Users\baltrut2>_
```

Paste window 2



```
C:\Windows\system32\cmd.exe

C:\Users\baltrut2>ping www.wordreference.com

Pinging www.wordreference.com [88.99.254.41] with 32 bytes of data:
Reply from 88.99.254.41: bytes=32 time=32ms TTL=112
Reply from 88.99.254.41: bytes=32 time=31ms TTL=112
Reply from 88.99.254.41: bytes=32 time=31ms TTL=112
Reply from 88.99.254.41: bytes=32 time=31ms TTL=112

Ping statistics for 88.99.254.41:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 31ms, Maximum = 32ms, Average = 31ms

C:\Users\baltrut2>_
```

	Website 1	Website 2
Name of the website pinged	delfi.lt	wordreference.com
What is the IP address returned?	91.234.200.111	88.99.254.41
What is the TTL figure?	46	112
Average round trip time	69 milliseconds	31 milliseconds

Your comments on **administrative information** that you found by searching on the Internet about the websites from experiment 3. Things like, who owns it, phone numbers, email addresses, registered addresses etc, anything at all that tells us about the website and its administration.

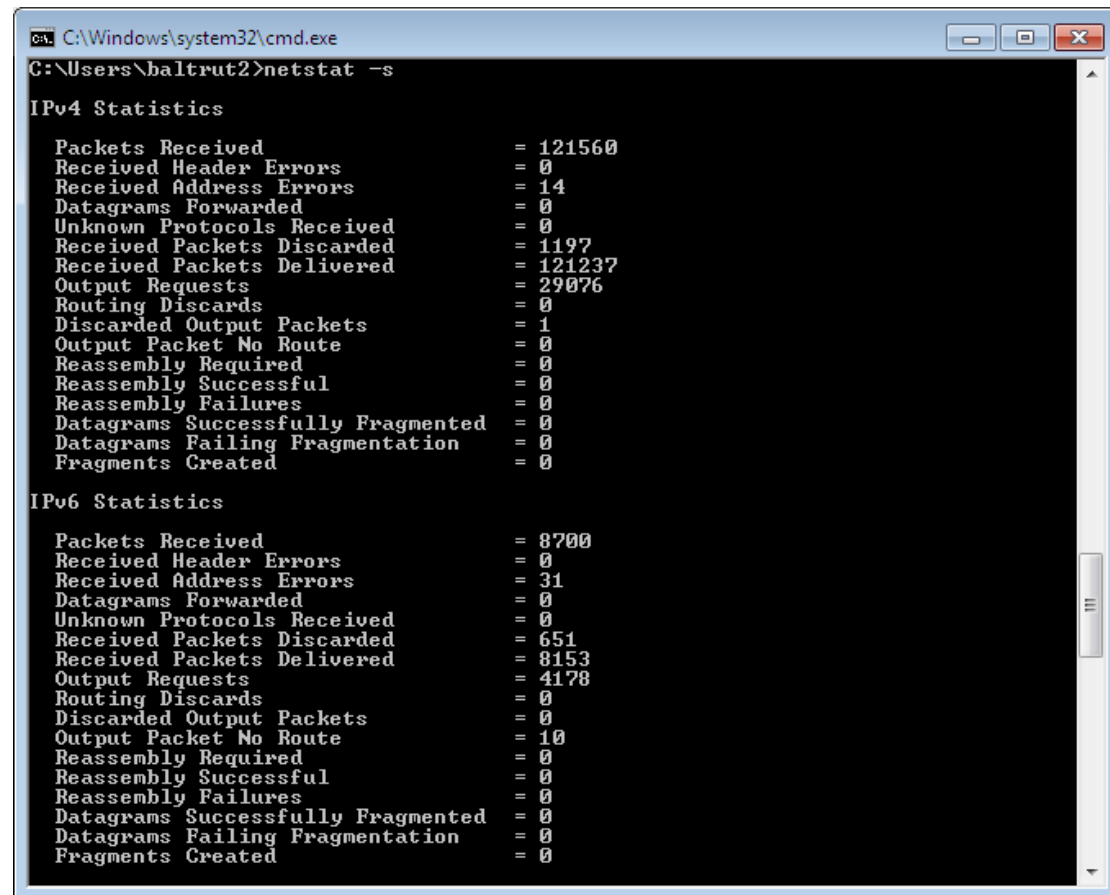
‘delfi.lt’, is a Lithuanian online news portal. The domain name ‘.lt’ indicates that the website is Lithuanian. The footer on the homepage shows that it is owned by ‘UAB DELFI’(Lithuanian company), with address ‘Gynėjų g. 16, 01109 Vilnius’(capital of Lithuania), phone number ‘+37052045400’(‘+370’ is the Lithuanian phone number prefix), and email ‘info@delfi.lt’. The longest packet time is 70ms.

‘wordreference.com’, is a dictionary and translation reference. The About Us page tells that the website is owned by Michael Kellogg, with the postal address Weston, Florida, USA, and one email ‘advertising@ our website’. The website’s domain name ‘.com’, and a maximum packet round-trip time of 32ms give the impression that the website is hosted in the United States.

Exercise 4: Netstat exercise

Number of packets received by workstation: 130260(121560+8700)

Window here.



```
C:\Windows\system32\cmd.exe
C:\Users\haltrut2>netstat -s

IPv4 Statistics

Packets Received                = 121560
Received Header Errors          = 0
Received Address Errors         = 14
Datagrams Forwarded             = 0
Unknown Protocols Received      = 0
Received Packets Discarded      = 1197
Received Packets Delivered      = 121237
Output Requests                 = 29076
Routing Discards                = 0
Discarded Output Packets        = 1
Output Packet No Route          = 0
Reassembly Required             = 0
Reassembly Successful           = 0
Reassembly Failures             = 0
Datagrams Successfully Fragmented = 0
Datagrams Failing Fragmentation = 0
Fragments Created               = 0

IPv6 Statistics

Packets Received                = 8700
Received Header Errors          = 0
Received Address Errors         = 31
Datagrams Forwarded             = 0
Unknown Protocols Received      = 0
Received Packets Discarded      = 651
Received Packets Delivered      = 8153
Output Requests                 = 4178
Routing Discards                = 0
Discarded Output Packets        = 0
Output Packet No Route          = 10
Reassembly Required             = 0
Reassembly Successful           = 0
Reassembly Failures             = 0
Datagrams Successfully Fragmented = 0
Datagrams Failing Fragmentation = 0
Fragments Created               = 0
```

ICMPv4 Statistics

	Received	Sent
Messages	14	15
Errors	0	0
Destination Unreachable	0	1
Time Exceeded	0	0
Parameter Problems	0	0
Source Quench	0	0
Redirects	0	0
Echo Replies	14	0
Echos	0	14
Timestamps	0	0
Timestamp Replies	0	0
Address Masks	0	0
Address Mask Replies	0	0
Router Solicitations	0	0
Router Advertisements	0	0

ICMPv6 Statistics

	Received	Sent
Messages	84	84
Errors	0	0
Destination Unreachable	0	0
Packet Too Big	0	0
Time Exceeded	0	0
Parameter Problems	0	0
Echos	0	64
Echo Replies	0	0
MLD Queries	0	0
MLD Reports	0	0
MLD Dones	0	0
Router Solicitations	0	12
Router Advertisements	0	0
Neighbor Solicitations	0	4
Neighbor Advertisements	84	4
Redirects	0	0
Router Renumberings	0	0

ICMP packets explained:

Received message types(v4 and v6): echo replies (response to a 'ping' packet)
neighbor advertisements (response to a neighbour solicitation, which determines
neighbour (close data link) addresses or checks reachability of a neighbour).

(References:

https://en.wikipedia.org/wiki/Internet_Control_Message_Protocol

https://en.wikipedia.org/wiki/Neighbor_Discovery_Protocol)

Discuss the connections opened by visiting the DCU website here.

One connection was opened by visiting DCU. The connection's protocol was TCP. Its state was 'ESTABLISHED'. The connection's local address was

136.206.18.153:49350, and the foreign address in numerical form was 52.31.60.123:443 (which is DCU's IP address as seen from 'ping dcu.ie'). The foreign address' port number was 443, which is the HTTPS port, used for secure communication with a website.

Also, grab the window, showing connections opened as a result of visiting the DCU website.

```
C:\Windows\system32\cmd.exe

C:\Users\baltrut2>ping dcu.ie

Pinging dcu.ie [52.31.60.123] with 32 bytes of data:
Reply from 52.31.60.123: bytes=32 time=1ms TTL=46
Reply from 52.31.60.123: bytes=32 time=1ms TTL=46
Reply from 52.31.60.123: bytes=32 time=1ms TTL=46
Reply from 52.31.60.123: bytes=32 time=1ms TTL=46

Ping statistics for 52.31.60.123:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\Users\baltrut2>netstat -n

Active Connections

    Proto Local Address          Foreign Address         State
    TCP    136.206.18.153:49312    104.244.43.49:443      ESTABLISHED
    TCP    136.206.18.153:49314    104.244.42.136:443      ESTABLISHED
    TCP    136.206.18.153:49315    104.244.46.231:443      ESTABLISHED
    TCP    136.206.18.153:49330    216.58.211.163:443      ESTABLISHED
    TCP    136.206.18.153:49350    52.31.60.123:443        ESTABLISHED
    TCP    136.206.18.153:49352    162.247.242.21:443      ESTABLISHED
    TCP    136.206.18.153:49353    216.58.211.174:443      ESTABLISHED
    TCP    136.206.18.153:49354    216.58.211.168:443      ESTABLISHED
    TCP    136.206.18.153:49356    209.85.203.154:443      ESTABLISHED
    TCP    136.206.18.153:49357    151.101.18.110:443      ESTABLISHED
    TCP    136.206.18.153:49360    136.206.217.50:8000      TIME_WAIT
    TCP    136.206.18.153:49366    216.58.211.170:443      ESTABLISHED
    TCP    136.206.18.153:49367    216.58.211.174:443      ESTABLISHED
    TCP    136.206.18.153:49368    216.58.211.163:443      ESTABLISHED
    TCP    136.206.18.153:49369    216.58.211.163:443      ESTABLISHED
    TCP    136.206.18.153:49370    216.58.211.174:443      ESTABLISHED
    TCP    136.206.18.153:49371    209.85.202.94:443       ESTABLISHED
    TCP    136.206.18.153:49372    216.58.211.164:443      ESTABLISHED
    TCP    136.206.18.153:49373    216.58.211.162:443      ESTABLISHED
    TCP    136.206.18.153:49374    109.169.87.88:443       TIME_WAIT
    TCP    136.206.18.153:49375    109.169.87.88:443       TIME_WAIT
    TCP    136.206.18.153:49376    109.169.87.88:443       TIME_WAIT
    TCP    136.206.18.153:49380    216.58.211.163:443      ESTABLISHED
    TCP    136.206.18.153:49381    136.206.217.50:8000      ESTABLISHED
    TCP    136.206.18.153:49383    109.169.87.88:443       TIME_WAIT
    TCP    136.206.18.153:49384    109.169.87.88:443       TIME_WAIT
    TCP    136.206.18.153:49385    216.58.211.174:443      ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49271 [2002:88ce:d93d::88ce:d93d]:445 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49273 [2002:88ce:d93d::88ce:d93d]:135 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49274 [2002:88ce:d93d::88ce:d93d]:135 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49275 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49277 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49278 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49279 [2002:88ce:d93d::88ce:d93d]:135 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49280 [2002:88ce:d93d::88ce:d93d]:135 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49281 [2002:88ce:d93d::88ce:d93d]:135 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49282 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49283 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49285 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49286 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49287 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED
    TCP    [2002:88ce:1299::88ce:1299]:49288 [2002:88ce:d93d::88ce:d93d]:49158 ESTABLISHED

C:\Users\baltrut2>
```

Netstat -r explained

It shows the IPv4 and IPv6 routing tables, which help data reach its target destination by hopping through intermediate devices. The command shows the computer's interfaces such as physical network interface cards, abstract virtual network interfaces, and various network drivers.

A list of active (current, dynamic) and persistent (user-set, static) routes is given.

Each route is given the address of its destination (network and subnet IP's), the address of the next destination through which to go to reach the final destination (gateway), the interface the route is connected to, and a metric number that helps the router make decisions on where to send the data next.

```

C:\Windows\system32\cmd.exe

C:\Users\baltrut2>netstat -r
=====
Interface List
13...50 2a 4c 3d 69 f6 .....Intel(R) Ethernet Connection (5) I219-U
15...0a 00 27 00 00 0f .....VirtualBox Host-Only Ethernet Adapter
17...00 50 56 c0 00 01 .....VMware Virtual Ethernet Adapter for VMnet1
19...00 50 56 c0 00 08 .....VMware Virtual Ethernet Adapter for VMnet8
1.....Software Loopback Interface 1
14...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter
11...00 00 00 00 00 00 00 e0 Microsoft 6to4 Adapter
12...00 00 00 00 00 00 00 e0 Microsoft Teredo Tunneling Adapter
16...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #2
18...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #3
20...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #4
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
0.0.0.0                    0.0.0.0          136.206.18.254    136.206.18.153    10
127.0.0.0                  255.0.0.0        On-link           127.0.0.1         306
127.0.0.1                  255.255.255.255 On-link           127.0.0.1         306
127.255.255.255           255.255.255.255 On-link           127.0.0.1         306
136.206.18.0               255.255.255.0    On-link           136.206.18.153    266
136.206.18.153             255.255.255.255 On-link           136.206.18.153    266
136.206.18.255             255.255.255.255 On-link           136.206.18.153    266
192.168.56.0               255.255.255.0    On-link           192.168.56.1      266
192.168.56.1               255.255.255.255 On-link           192.168.56.1      266
192.168.56.255             255.255.255.255 On-link           192.168.56.1      266
192.168.152.0              255.255.255.0    On-link           192.168.152.1     276
192.168.152.1              255.255.255.255 On-link           192.168.152.1     276
192.168.152.255            255.255.255.255 On-link           192.168.152.1     276
192.168.178.0              255.255.255.0    On-link           192.168.178.1     276
192.168.178.1              255.255.255.255 On-link           192.168.178.1     276
192.168.178.255            255.255.255.255 On-link           192.168.178.1     276
224.0.0.0                  240.0.0.0        On-link           127.0.0.1         306
224.0.0.0                  240.0.0.0        On-link           136.206.18.153    266
224.0.0.0                  240.0.0.0        On-link           192.168.56.1      266
224.0.0.0                  240.0.0.0        On-link           192.168.178.1     276
224.0.0.0                  240.0.0.0        On-link           192.168.152.1     276
255.255.255.255           255.255.255.255 On-link           127.0.0.1         306
255.255.255.255           255.255.255.255 On-link           136.206.18.153    266
255.255.255.255           255.255.255.255 On-link           192.168.56.1      266
255.255.255.255           255.255.255.255 On-link           192.168.178.1     276
255.255.255.255           255.255.255.255 On-link           192.168.152.1     276
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1 306 ::1/128 On-link
11 1010 2002::/16 On-link
11 266 2002::88ce:1299::88ce:1299/128 On-link
13 266 fe80::/64 On-link
15 266 fe80::/64 On-link
17 276 fe80::/64 On-link
19 276 fe80::/64 On-link
19 276 fe80::2d39:384b:a7b4:e424/128 On-link
13 266 fe80::4d30:ce62:6143:b688/128 On-link
15 266 fe80::94aa:9061:ec61:1fed/128 On-link
17 276 fe80::f5b4:f8f1:d63b:15d2/128 On-link
1 306 ff00::/8 On-link
13 266 ff00::/8 On-link
15 266 ff00::/8 On-link
17 276 ff00::/8 On-link
19 276 ff00::/8 On-link
=====
Persistent Routes:
None

```

(References:
https://en.wikipedia.org/wiki/Routing_table)