

Όνοματεπώνυμο: Άγγελος Μητροκώτσας		Ομάδα: 6
Όνομα PC/ΛΣ: DESKTOP-91G20CF/ Windows 10 Pro 20H2		Ημερομηνία: 15/11/2021
Διεύθυνση IP: 192.168.1.12 (Διευθυνση IP του VPN: 147.102.131.54)	Διεύθυνση MAC: F8-63-3F-59-24-C8	

Εργαστηριακή Άσκηση 5

Εξερεύνηση του Διαδικτύου

Απαντήστε στα ερωτήματα στον χώρο που σας δίνεται παρακάτω και στην πίσω σελίδα εάν δεν επαρκεί. Το φυλλάδιο αυτό θα παραδοθεί στον επιβλέποντα.

1

1.1 Διευθυνση IP του VPN: 147.102.131.54

```

Windows PowerShell
PS C:\Users\User> ipconfig /all

Windows IP Configuration

Host Name . . . . . : DESKTOP-91G20CF
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : home

Wireless LAN adapter Τηλεφωνική σύνδεση* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : F8-63-3F-59-24-C8
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Τηλεφωνική σύνδεση* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : F8-63-3F-59-24-C8
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . . . . . : TAP-Windows Adapter V9
Description . . . . . : TAP-Windows Adapter V9
Physical Address. . . . . : 00-FF-50-A5-B8-09
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::ad13:6797:197f:3a0%43(Preferred)
IPv4 Address. . . . . : 147.102.131.54(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Κυριακή, 14 Νοεμβρίου 2021 2:48:42 μμ
Lease Expires . . . . . : Δευτέρα, 14 Νοεμβρίου 2022 2:48:42 μμ
Default Gateway . . . . . :
DHCP Server . . . . . : 147.102.131.254
DHCPv6 IAID . . . . . : 721485648

```

```

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . . . . . : TAP-Windows Adapter V9
Description . . . . . : TAP-Windows Adapter V9
Physical Address. . . . . : 00-FF-50-A5-B8-09
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::ad13:6797:197f:3a0%43(Preferred)
IPv4 Address. . . . . : 147.102.131.54(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Κυριακή, 14 Νοεμβρίου 2021 2:48:42 μμ
Lease Expires . . . . . : Δευτέρα, 14 Νοεμβρίου 2022 2:48:42 μμ
Default Gateway . . . . . :
DHCP Server . . . . . : 147.102.131.254
DHCPv6 IAID . . . . . : 721485648
DHCPv6 Client DUID. . . . . : 00-01-00-01-27-47-6E-E2-F8-63-3F-59-24-C8
DNS Servers . . . . . : 147.102.222.210
147.102.222.220
147.102.222.230
NetBIOS over Tcpip. . . . . : Enabled

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . . . . . : home
Description . . . . . : Intel(R) Dual Band Wireless-AC 8265
Physical Address. . . . . : F8-63-3F-59-24-C8
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
IPv4 Address. . . . . : 192.168.1.12(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Δευτέρα, 15 Νοεμβρίου 2021 12:07:30 μμ
Lease Expires . . . . . : Δευτέρα, 15 Νοεμβρίου 2021 12:07:30 μμ
Default Gateway . . . . . : fe80::1X3
192.168.1.1
DHCP Server . . . . . : 192.168.1.1
DHCPv6 IAID . . . . . : 66609983
DHCPv6 Client DUID. . . . . : 00-01-00-01-27-47-6E-E2-F8-63-3F-59-24-C8
DNS Servers . . . . . : fe80::1X3
192.168.1.1
192.168.1.1
NetBIOS over Tcpip. . . . . : Enabled

```

1.2 Subnet Mask : 255.255.255.0

1.3 ping -c 1 -i <TTL> <IP addr>

1.4 To 3

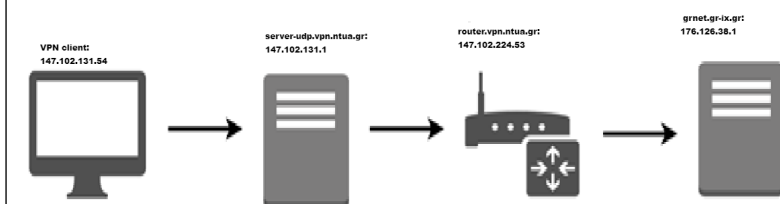
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

icmp

No.	Time	Source	Protocol	Length	Destination	Info
295	0.000000	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=321/16641, ttl=1 (
296	0.024966	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
346	0.994929	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=322/16897, ttl=1 (
349	0.081324	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
441	0.941122	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=323/17153, ttl=1 (
442	0.018137	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
528	0.990955	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=324/17409, ttl=1 (
530	0.073534	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
756	2.361193	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=325/17665, ttl=2 (
760	0.016692	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
868	0.996748	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=326/17921, ttl=2 (
872	0.027167	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
979	0.985833	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=327/18177, ttl=2 (
989	0.037001	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
1104	0.976662	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=328/18433, ttl=2 (
1146	0.049465	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
1477	2.446827	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=329/18689, ttl=3 (
1483	0.039982	176.126.38.1	ICMP	74	147.102.131.54	Echo (ping) reply id=0x0001, seq=329/18689, ttl=62
1577	0.965713	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=330/18945, ttl=3 (
1593	0.073850	176.126.38.1	ICMP	74	147.102.131.54	Echo (ping) reply id=0x0001, seq=330/18945, ttl=62
1733	0.951739	147.102.131.54	ICMP	74	176.126.38.1	Echo (ping) request id=0x0001, seq=331/19201, ttl=3 (

Internet Control Message Protocol: Protocol | Packets: 2302 · Displayed: 24 (1.0%) · Dropped: 0 (0.0%) | Profile: Default

1.5

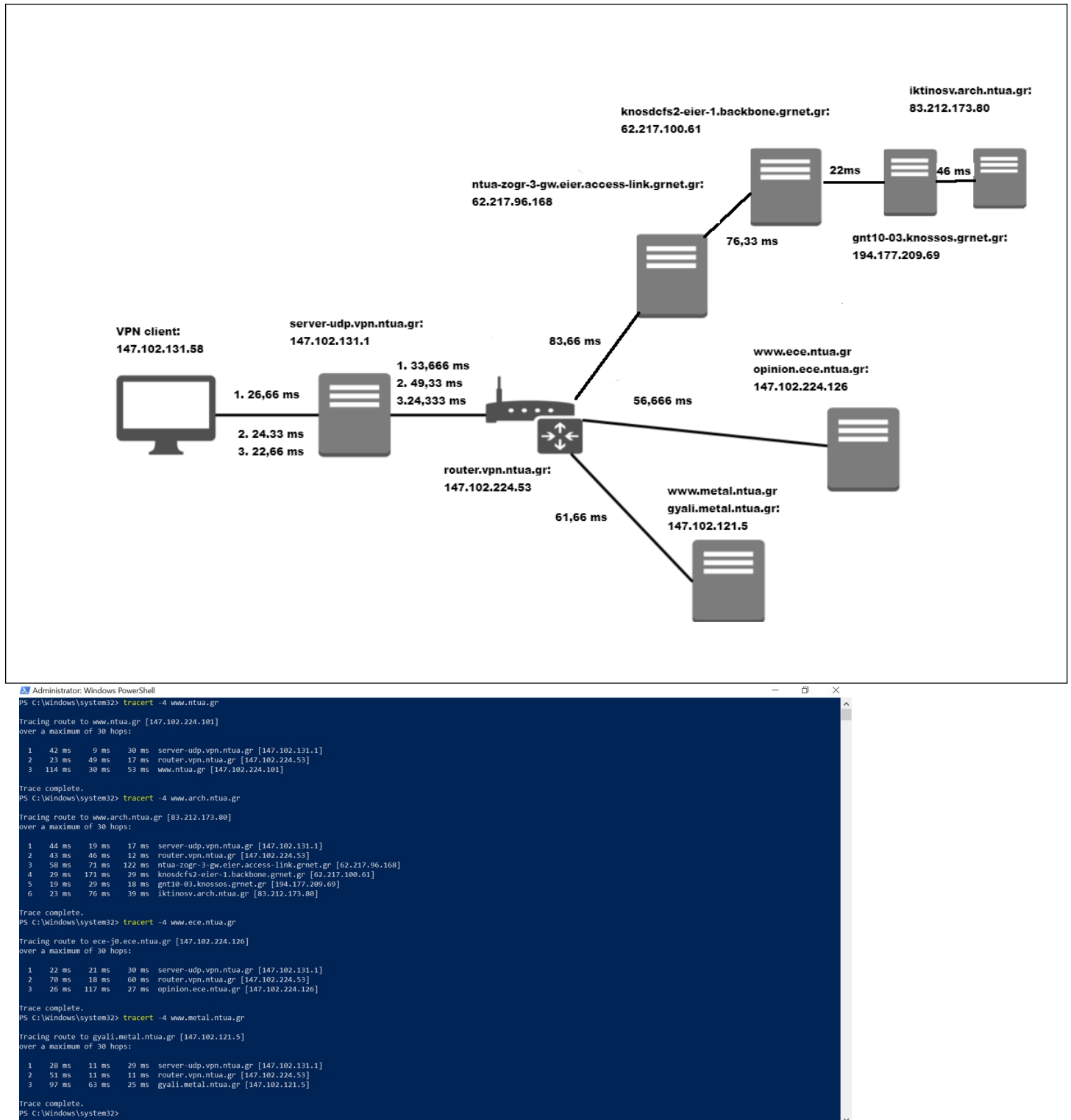


2

2.1 (η IP του vpn client μου άλλαξε σε 147.102.131.58 επειδή βγήκα και ξαναμπήκα)

Η καταγραφή τις διαδρομής κάποιες φορές επιτυγχάνει ενώ άλλες, θεωρητικά, πέφτει πάνω σε κάποιο firewall, επίσης η διαδρομή που θα ακολουθηθεί θα είναι διαφορετική (συντομεύει όταν έχω ανοικτό το OpenVpn) (Η εντολή φαίνεται στο στιγμιότυπο οθόνης στο 2.2).

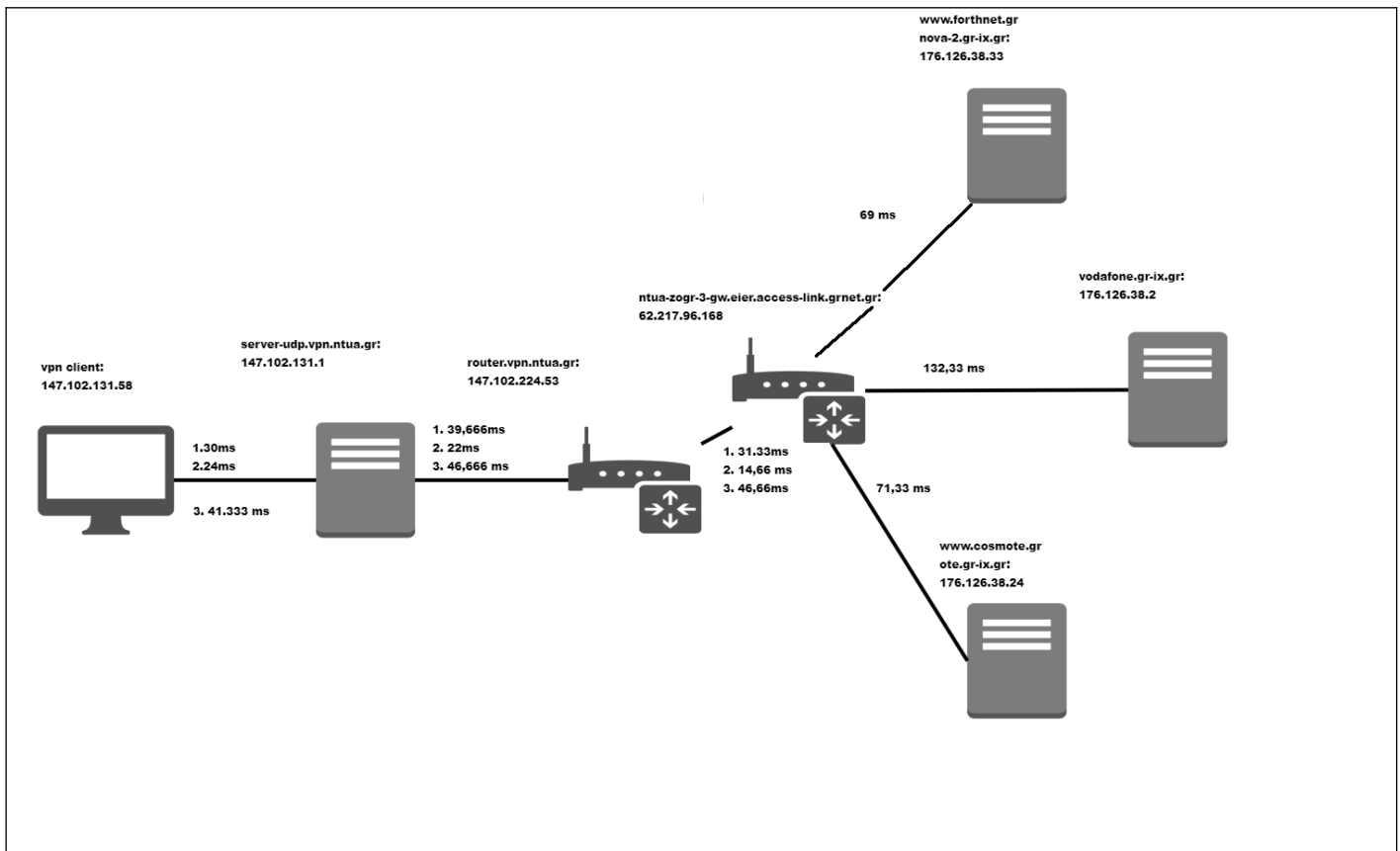
2.2



2.3 Ναι, συμφωνεί (δεν μπορώ να εντοπίσω τα Hubs)

2.4 `tracert -4 -h 4 <IPv4 Address>`

2.5



```

Administrator: Windows PowerShell

Tracing route to www.forthnet.gr [62.1.46.80]
over a maximum of 4 hops:

  1  15 ms  27 ms  48 ms  server-udp.vpn.ntua.gr [147.102.131.1]
  2  44 ms  25 ms  50 ms  router.vpn.ntua.gr [147.102.224.53]
  3  67 ms  12 ms  15 ms  ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
  4  25 ms  80 ms  102 ms  nova-2.gr-ix.gr [176.126.38.33]

Trace complete.
PS C:\Windows\system32> tracert -4 -h 4 www.vodafone.gr

Tracing route to www.vodafone.gr [213.249.26.56]
over a maximum of 4 hops:

  1  25 ms  27 ms  20 ms  server-udp.vpn.ntua.gr [147.102.131.1]
  2  41 ms  12 ms  13 ms  router.vpn.ntua.gr [147.102.224.53]
  3  14 ms  16 ms  14 ms  ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
  4  284 ms  28 ms  85 ms  vodafone.gr-ix.gr [176.126.38.2]

Trace complete.
PS C:\Windows\system32> tracert -4 -h 4 www.cosmote.gr

Tracing route to www.cosmote.gr [195.167.99.18]
over a maximum of 4 hops:

  1  60 ms  41 ms  23 ms  server-udp.vpn.ntua.gr [147.102.131.1]
  2  24 ms  46 ms  21 ms  router.vpn.ntua.gr [147.102.224.53]
  3  12 ms  52 ms  76 ms  ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
  4  149 ms  21 ms  44 ms  ote.gr-ix.gr [176.126.38.24]

Trace complete.

```

2.6 Ναι, συμφωνεί

2.7 176.126.38.1

2.8 tracert -4 -d gnet.gr-ix.gr

2.9 icmp or udp

2.10 Η τιμή του πεδίου Protocol είναι ίση με 0x01, που δηλώνει ότι το πρόκειται για πακέτο πρωτοκόλλου ICMP

The image shows a Wireshark packet capture window titled "*Ethernet (icmp)". The filter bar at the top is set to "icmp or udp". The packet list pane shows several packets, with packet 10 selected. The packet details pane shows the structure of the selected packet, and the packet bytes pane shows the raw data.

No.	Time	Source	Protocol	Length	Destination	Info
10	0.013837	147.102.224.53	ICMP	110	147.102.131.58	Time-
11	0.004437	147.102.131.58	ICMP	106	176.126.38.1	Echo
12	0.115145	147.102.224.53	ICMP	110	147.102.131.58	Time-
13	0.914596	147.102.131.58	ICMP	106	176.126.38.1	Echo
14	0.067855	176.126.38.1	ICMP	106	147.102.131.58	Echo
15	0.004580	147.102.131.58	ICMP	106	176.126.38.1	Echo
16	0.047450	176.126.38.1	ICMP	106	147.102.131.58	Echo
17	0.005388	147.102.131.58	ICMP	106	176.126.38.1	Echo

Packet 10 details:

- Total Length: 92
- Identification: 0x4aa2 (19106)
- Flags: 0x00
- Fragment Offset: 0
- Time to Live: 62
- Protocol: ICMP (1)
- Header Checksum: 0x44df [validation disabled]
- [Header checksum status: Unverified]

Packet 10 bytes (hex):

```

0010  00 5c 4a a2 00 00 3e 01 44 df b0 7e 26 01 93 66  ·\J...>·D...~&...f
0020  83 3a 00 00 fc fd 00 01 03 01 00 00 00 00 00 00  ·.:.....
0030  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0040  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....

```

2.11 Μεταφέρει 64 bytes.

2.12 Αποστέλλονται και λαμβάνονται 3 τριάδες μηνυμάτων

2.13 Παραλήπτης του μηνύματος για κάθε 3δα που στείλαμε: Και στις 3 είναι η 176.126.38.1

No.	Time	Source	Protocol	Length	Destination	Info
1	0.000000	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=763/64258, ttl=1 (no response)
2	0.068306	147.102.131.1	ICMP	70	147.102.131.58	Time-to-live exceeded (Time to live exceeded in transit)
3	0.004513	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=764/64514, ttl=1 (no response)
4	0.013808	147.102.131.1	ICMP	70	147.102.131.58	Time-to-live exceeded (Time to live exceeded in transit)
5	0.004360	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=765/64770, ttl=1 (no response)
6	0.012241	147.102.131.1	ICMP	70	147.102.131.58	Time-to-live exceeded (Time to live exceeded in transit)
7	1.011344	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=766/65026, ttl=2 (no response)
8	0.013774	147.102.224.53	ICMP	110	147.102.131.58	Time-to-live exceeded (Time to live exceeded in transit)
9	0.004357	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=767/65282, ttl=2 (no response)
10	0.013837	147.102.224.53	ICMP	110	147.102.131.58	Time-to-live exceeded (Time to live exceeded in transit)
11	0.004437	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=768/3, ttl=2 (no response)
12	0.115145	147.102.224.53	ICMP	110	147.102.131.58	Time-to-live exceeded (Time to live exceeded in transit)
13	0.914596	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=769/259, ttl=3 (reply in transit)
14	0.067855	176.126.38.1	ICMP	106	147.102.131.58	Echo (ping) reply id=0x0001, seq=769/259, ttl=62 (request received)
15	0.004580	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=770/515, ttl=3 (reply in transit)
16	0.047450	176.126.38.1	ICMP	106	147.102.131.58	Echo (ping) reply id=0x0001, seq=770/515, ttl=62 (request received)
17	0.005388	147.102.131.58	ICMP	106	176.126.38.1	Echo (ping) request id=0x0001, seq=771/771, ttl=3 (reply in transit)
18	0.013000	176.126.38.1	ICMP	106	147.102.131.58	Echo (ping) reply id=0x0001, seq=771/771, ttl=62 (request received)

Οι πηγές των απαντήσεων για κάθε 3δα είναι:

1. 147.102.131.1

2. 147.102.224.53

3. 176.126.38.1

2.14 Ναι, είναι

2.15 Για τις τριάδες μηνυμάτων που στείλαμε:

1. 1ms

2. 2ms

3. 3ms

2.16 Για τις τριάδες απαντήσεων που λάβαμε:

1. 64 ms

2. 254 ms

3. 62 ms

2.17 Ξεκινούν τα πρώτα πακέτα με μικρή τιμή TTL (άρα μηδενίζεται γρήγορα) και ο κόμβος στον οποίο φτάνουν δεν αποτελεί τελικός προορισμός, συνεπώς ο κόμβος αυτός δεν μπορεί να προωθήσει

το πακέτο στον επόμενο κόμβο και έτσι, στέλνει τα μηνύματα ICMP Time-to-live exceeded πίσω στην πηγή, πληροφορώντας έτσι για την ανάγκη για επέκταση του TTL.

2.18 Με Echo (ping) reply μηνύματα

3

3.1 tracert -4 nic.gr-ix.gr (VPN client: 147.102.131.54)

```

Administrator: Windows PowerShell
PS C:\Windows\system32> tracert -4 nic.gr-ix.gr

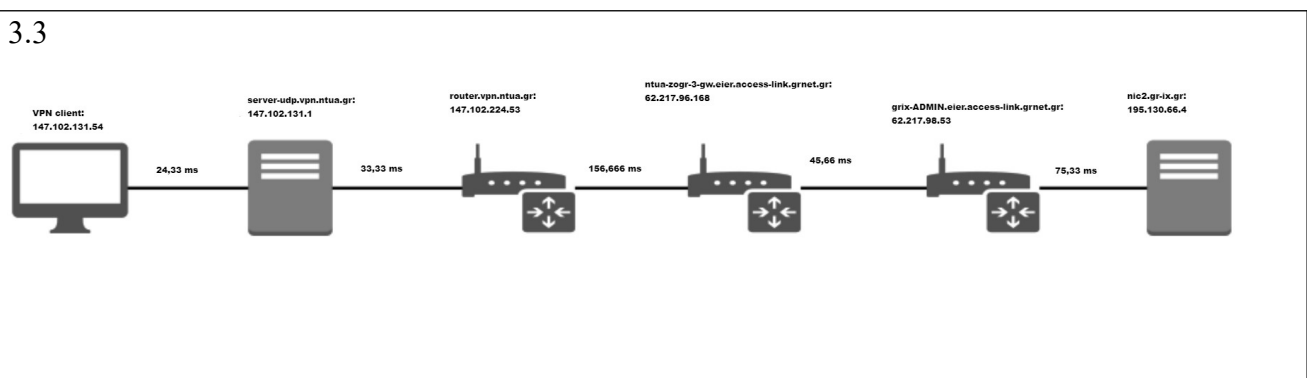
Tracing route to nic2.gr-ix.gr [195.130.66.4]
over a maximum of 30 hops:
  0  34 ms  12 ms  27 ms  server-udp.vpn.ntua.gr [147.102.131.1]
  1  53 ms  23 ms  24 ms  router.vpn.ntua.gr [147.102.224.53]
  2  67 ms  27 ms  376 ms  ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
  3  56 ms  16 ms  65 ms  grix-ADMIN.eier.access-link.grnet.gr [62.217.98.53]
  4  30 ms  104 ms  92 ms  nic2.gr-ix.gr [195.130.66.4]

Trace complete.
PS C:\Windows\system32>

```

3.2 icmp

3.3



3.4 Τα Identification, TTL, Header Checksum

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Protocol	Length	Destination	Info
2	0.034366	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
4	0.011994	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
6	0.027461	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
1	0.000000	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=387/33537, ttl=1 (
3	0.002413	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=388/33793, ttl=1 (
5	0.001637	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=389/34049, ttl=1 (

Internet Protocol Version 4, Src: 147.102.131.1, Dst: 147.102.131.54

- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 56
- Identification: 0xefe2 (61410)
- > Flags: 0x00
- Fragment Offset: 0
- Time to Live: 64
- Protocol: ICMP (1)
- Header Checksum: 0x5dde [validation disabled]
- [Header checksum status: Unverified]
- Source Address: 147.102.131.1
- Destination Address: 147.102.131.54
- > Internet Control Message Protocol

wireshark_EthernetQEK6C1.pcapng

Packets: 30 · Displayed: 30 (100.0%) · Dropped: 0 (0.0%) Profile: Default

Wireshark capture showing ICMP Echo (ping) requests. The first two packets are successful, but the next three show 'Time-to-live exceeded'.

No.	Time	Source	Protocol	Length	Destination	Info
27	0.004007	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=400/36865, ttl=5 (
29	0.005363	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=401/37121, ttl=5 (
8	0.052719	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
10	0.023319	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
12	0.023886	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
26	0.020898	195.130.66.4	ICMP	106	147.102.131.54	Echo (ping) reply id=0x0001, seq=399/36600, ttl=60

Internet Protocol Version 4, Src: 147.102.224.53, Dst: 147.102.131.54

- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 96
- Identification: 0xcfad (53165)
- > Flags: 0x00
- Fragment Offset: 0
- Time to Live: 254
- Protocol: ICMP (1)
- Header Checksum: 0x62b6 [validation disabled]
- [Header checksum status: Unverified]
- Source Address: 147.102.224.53
- Destination Address: 147.102.131.54

3.5 Τα υπόλοιπα

3.6 Το version , αφού κάναμε κλήση της IPv4 έκδοσης του tracerf,

Το Total Length, αφού δεν έχουμε διευκρινίσει συγκεκριμένο μέγεθος για τα πακέτα icmp, άρα στέλνονται με default μέγεθος (64 bytes)

Το Protocol, αφού βάλαμε το -4 στην εντολή

Τα source και destination, αφού ορίστηκαν από εμάς

3.7 Το Identification, αλλιώς θα μιλούσαμε για κομμάτια του ίδιου πακέτου

Το TTL, για να μπορούμε να κάνουμε trace

Το Header Checksum, αφού αλλάζουν τα 2 παραπάνω

3.8 64ms

Wireshark capture showing ICMP Echo (ping) requests. The first three packets show 'Time-to-live exceeded' and the next three are successful.

No.	Time	Source	Protocol	Length	Destination	Info
2	0.034366	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
4	0.011994	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
6	0.027461	147.102.131.1	ICMP	70	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
1	0.000000	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=387/33537, ttl=1 (
3	0.002413	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=388/33793, ttl=1 (
5	0.001637	147.102.131.54	ICMP	106	195.130.66.4	Echo (ping) request id=0x0001, seq=389/34049, ttl=1 (

Internet Protocol Version 4, Src: 147.102.131.1, Dst: 147.102.131.54

- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 56
- Identification: 0xef2 (61410)
- > Flags: 0x00
- Fragment Offset: 0
- Time to Live: 64
- Protocol: ICMP (1)

3.9 Ναι, καθώς είναι η απάντηση (reply) σε τρία πακέτα ICMP που στάληκαν με την ίδια κλήση της εντολής (τους δόθηκε ο ίδιος TTL).

3.10 Στα αμέσως επόμενα 3 πακέτα ICMP time exceeded έχουν τιμή 254 ms (στα επόμενα 3 μετά από αυτά είναι 253, στα αμέσως επόμενα 3 252)

3.11 60ms

The image shows a Wireshark packet capture window titled '*Ethernet (icmp)'. The packet list pane shows several ICMP packets. The first three are 'Time-to-live exceeded' messages from 147.102.224.53 to 147.102.131.54. The next three are 'Echo (ping) reply' messages from 195.130.66.4 to 147.102.131.54. The selected packet is the first echo reply (No. 26, Time 0.029898). The packet details pane shows the Internet Protocol Version 4 header with Source Address: 195.130.66.4 and Destination Address: 147.102.131.54. The ICMP section shows 'Echo (ping) reply' with id=0x0001, seq=399/36609, and ttl=60.

No.	Time	Source	Protocol	Length	Destination	Info
8	0.052719	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
10	0.023319	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
12	0.023886	147.102.224.53	ICMP	110	147.102.131.54	Time-to-live exceeded (Time to live exceeded in transi
26	0.029898	195.130.66.4	ICMP	106	147.102.131.54	Echo (ping) reply id=0x0001, seq=399/36609, ttl=60
28	0.103998	195.130.66.4	ICMP	106	147.102.131.54	Echo (ping) reply id=0x0001, seq=400/36865, ttl=60
30	0.092705	195.130.66.4	ICMP	106	147.102.131.54	Echo (ping) reply id=0x0001, seq=401/37121, ttl=60

Internet Protocol Version 4, Src: 195.130.66.4, Dst: 147.102.131.54

- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
 - Total Length: 92
 - Identification: 0x9482 (38018)
- > Flags: 0x00
 - Fragment Offset: 0
 - Time to Live: 60
 - Protocol: ICMP (1)
 - Header Checksum: 0xcdfb [validation disabled]
 - [Header checksum status: Unverified]
 - Source Address: 195.130.66.4
 - Destination Address: 147.102.131.54

3.12 64ms (έκανα 4 hops, 16ms ανά hop)

4

(η IP του vrn client μου άλλαξε σε 147.102.131.57 επειδή βγήκα και ξαναμπήκα)

4.1 ping -n 1 -r 9 www.ntua.gr

4.2 100 bytes

Wireshark capture showing a successful ping from 147.102.131.57 to 147.102.224.101. The packet list shows an ICMP Echo request (No. 1) and an Echo reply (No. 2). The packet details for the request show an IP header with source 147.102.131.57 and destination 147.102.224.101, and an ICMP header with type 8 and sequence 492/60417. The packet bytes show the raw data of the ICMP request.

4.3 100 bytes

Wireshark capture showing a successful ping from 147.102.224.101 to 147.102.131.57. The packet list shows an ICMP Echo request (No. 1) and an Echo reply (No. 2). The packet details for the request show an IP header with source 147.102.224.101 and destination 147.102.131.57, and an ICMP header with type 8 and sequence 492/60417. The packet bytes show the raw data of the ICMP request.

4.4 Ευθύνεται το πεδίο Options, επειδή καταγράφει τη διαδρομή για τον προορισμό σε κάθε βήμα (η διαδρομή καταγράφεται βήμα βήμα).

Ethernet (icmp)

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

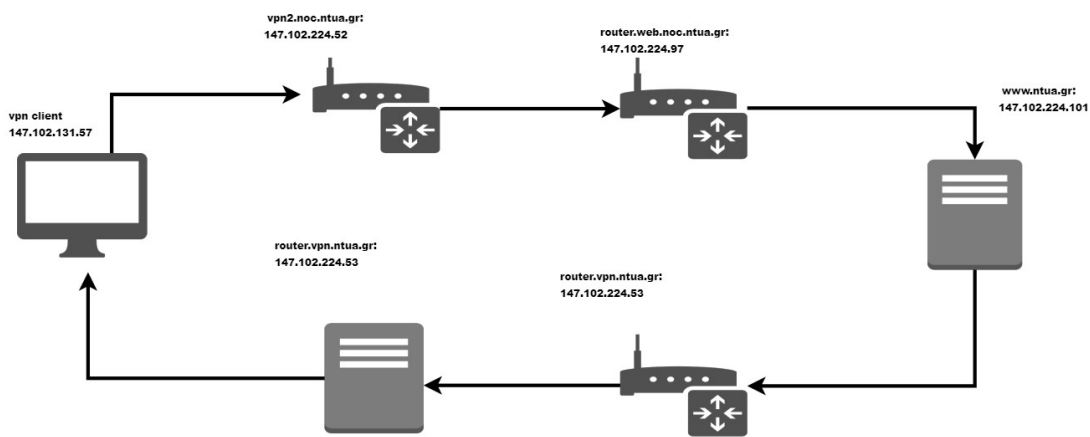
Apply a display filter ... <Ctrl-/>

No.	Time	Source	Protocol	Length	Destination	Info
1	0.000000	147.102.131.57	ICMP	114	147.102.224.101	Echo (ping) request id=0x0001, seq=492/60417, ttl=128 (req
2	0.011795	147.102.224.101	ICMP	114	147.102.131.57	Echo (ping) reply id=0x0001, seq=492/60417, ttl=62 (requ

Protocol: ICMP (1)
 Header Checksum: 0x4c60 [validation disabled]
 [Header checksum status: Unverified]
 Source Address: 147.102.224.101
 Destination Address: 147.102.131.57
 > Options: (40 bytes), Record Route
 > Internet Control Message Protocol

0010 00 64 47 c1 00 00 3e 01 4c 60 93 66 e0 65 93 66 ·dG·>·L·f·e·f
 0020 83 39 07 27 18 93 66 e0 34 93 66 e0 61 93 66 e0 ·9·'·f·4·f·a·f·
 0030 65 93 66 e0 35 93 66 83 01 00 00 00 00 00 00 00 ·e·f·5·f· ······
 0040 00 00 00 00 00 00 00 00 00 00 00 00 53 6f 00 01 ······ ····So·
 0050 01 ec 61 62 63 64 65 66 67 68 69 6a 6b 6c 6d 6e ··abcdef ghijklmn
 0060 6f 70 71 72 73 74 75 76 77 61 62 63 64 65 66 67 ·opqrstuv wabdefg

4.5



(για να βρω τα ονόματα έκανα tracert με τις ip που έδειξε η εντολή ping στο 4.1)

```

Administrator: Windows PowerShell
PS C:\Windows\system32> ping -n 1 -i 9 www.ntua.gr
Pinging www.ntua.gr [147.102.224.101] with 32 bytes of data:
Reply from 147.102.224.101: bytes=32 time=12ms TTL=62
Route: 147.102.224.52 ->
147.102.224.97 ->
147.102.224.101 ->
147.102.224.53 ->
147.102.131.1

Ping statistics for 147.102.224.101:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 12ms, Average = 12ms
PS C:\Windows\system32> tracert -4 147.102.224.52
Tracing route to vpn2.ntua.gr [147.102.224.52]
over a maximum of 30 hops:
  0  5 ms  4 ms  5 ms speedport.ip [102.168.1.1]
  1  43 ms  8 ms  14 ms 80.106.125.100
  2  9 ms  14 ms  11 ms 79.128.234.192
  3  8 ms  7 ms  7 ms 79.128.250.170
  4  14 ms  10 ms  7 ms gnet-2.gr-ix.gr [176.126.38.31]
  5  9 ms  9 ms  11 ms eier-kolottir-AE.backbone.grnet.gr [62.217.100.63]
  6  9 ms  10 ms  12 ms ntua-zogr-3.eier.access-link.grnet.gr [62.217.96.169]
  7  11 ms  9 ms  10 ms vpn2.ntua.gr [147.102.224.52]

Trace complete.
PS C:\Windows\system32> tracert -4 147.102.224.97
Tracing route to router.web.noc.ntua.gr [147.102.224.97]
over a maximum of 30 hops:
  0  17 ms  10 ms  9 ms server-udp.vpn.ntua.gr [147.102.131.1]
  1  10 ms  10 ms  13 ms router.web.noc.ntua.gr [147.102.224.97]

Trace complete.
PS C:\Windows\system32> 147.102.131.1
PS C:\Windows\system32> tracert -4 147.102.131.1
Tracing route to server-udp.vpn.ntua.gr [147.102.131.1]
over a maximum of 30 hops:
  
```

4.6 194.177.210.210, 5 βήματα μακριά

```

Administrator: Windows PowerShell
PS C:\Windows\system32> tracert nic.grnet.gr

Tracing route to pdns1.grnet.gr [194.177.210.210]
over a maximum of 30 hops:

  0  11 ms  11 ms  9 ms  server-udp.vpn.ntua.gr [147.102.131.1]
  1  10 ms  73 ms  133 ms  router.vpn.ntua.gr [147.102.224.53]
  2  13 ms  18 ms  13 ms  ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
  3  11 ms  16 ms  12 ms  kolettir-eier-AE.backbone.grnet.gr [62.217.100.62]
  4  14 ms  15 ms  11 ms  pdns1.grnet.gr [194.177.210.210]

Trace complete.
PS C:\Windows\system32>

```

4.7

- server-udp.vpn.ntua.gr [147.102.131.1]
- router.vpn.ntua.gr [147.102.224.53]
- ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
- kolettir-eier-AE.backbone.grnet.gr [62.217.100.62]
- pdns1.grnet.gr [194.177.210.210]

4.8

- vpn2.noc.ntua.gr [147.102.224.52]
- ntua-zogr-3.eier.access-link.grnet.gr [62.217.96.169]
- eier-kolettir-ae.backbone.grnet.gr [62.217.100.63]
- koletti-serverlan-gw.grnet.gr [194.177.210.193]
- pdns1.grnet.gr [194.177.210.210]

(Τα βρήκα με `tracert <IPv4 addr>`, και έβαζα τις διευθύνσεις που μου έβγαλε η ping

```

Administrator: Windows PowerShell
PS C:\Windows\system32> tracert nic.grnet.gr

Tracing route to pdns1.grnet.gr [194.177.210.210]
over a maximum of 30 hops:

  0  65 ms  11 ms  12 ms  server-udp.vpn.ntua.gr [147.102.131.1]
  1  12 ms  12 ms  12 ms  router.vpn.ntua.gr [147.102.224.53]
  2  12 ms  14 ms  14 ms  ntua-zogr-3-gw.eier.access-link.grnet.gr [62.217.96.168]
  3  12 ms  12 ms  11 ms  kolettir-eier-AE.backbone.grnet.gr [62.217.100.62]
  4  14 ms  11 ms  12 ms  pdns1.grnet.gr [194.177.210.210]

Trace complete.
PS C:\Windows\system32> ping -n 1 -r 5 nic.grnet.gr

Pinging pdns1.grnet.gr [194.177.210.210] with 32 bytes of data:
Reply from 194.177.210.210: bytes=32 time=18ms TTL=60
    Route: 147.102.224.52 ->
            62.217.96.169 ->
            62.217.100.63 ->
            194.177.210.193 ->
            194.177.210.210

Ping statistics for 194.177.210.210:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 18ms, Average = 18ms
PS C:\Windows\system32> tracert 147.102.224.52

Tracing route to vpn2.noc.ntua.gr [147.102.224.52]
over a maximum of 30 hops:

  0  2 ms  2 ms  2 ms  speedport.ip [192.168.1.1]
  1  8 ms  8 ms  7 ms  80.106.125.100
  2  14 ms  8 ms  8 ms  79.128.234.192
  3  22 ms  11 ms  8 ms  79.128.250.179
  4  11 ms  8 ms  9 ms  grnet-2-gr-ix.gr [176.126.38.31]
  5  9 ms  15 ms  11 ms  eier-kolettir-AE.backbone.grnet.gr [62.217.100.63]
  6  12 ms  16 ms  12 ms  ntua-zogr-3.eier.access-link.grnet.gr [62.217.96.169]
  7  34 ms  49 ms  25 ms  vpn2.noc.ntua.gr [147.102.224.52]

Trace complete.
PS C:\Windows\system32> tracert 62.217.96.169

Tracing route to ntua-zogr-3.eier.access-link.grnet.gr [62.217.96.169]

```

)

4.9

