

Results of Deep Packet Analysis VPNs

**VPN Spyglass: VPN Traffic Analyzer**

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# Steps

1. Open Wireshark and access a website without any VPN activated.
2. Identify the packets and looking into characteristics.
3. These characteristics involves:
   1. Packet Size
   2. Packet Length
   3. Response Time
   4. Average Response Time
   5. Average Length
   6. Source and Destination Port Number of both the flows
   7. Source and Destination IP of both the flows
   8. Any other Characteristic that can help us identity the packet.
4. Now, turn on the VPN and repeat the same steps.
5. Save and compare the values of both types of traffics.

# Without VPN

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sr. | Packet Length  D-S | Packet Length  S-D | Payload Size |  | Src. Port No. | Des. Port No. | Src. IP | Des. IP |
| 1. | **1292** – 69 – 64 – 855 – 235 – 66 – 1288 | 1292 – 119 – 1288 – 813 – **74** – **73** – **65** | 42 bits for header |  | 64530 | 443 | 10.7.80.11 | 172.217.17.42 |
| 2. | **1292** – 71 – 67 – 75 – | 1292 – **74 – 75** – **73** – **65** | 42 bits for header |  | 64915 | 443 | 10.7.80.11 | 172.217.21.36 |
| 3. |  |  |  |  |  |  |  |  |
| 4. |  |  |  |  |  |  |  |  |

QUIC Handshake from Google = 1292

QUIC Handshake from end device = 81

TCP Handshake from Google = 56

TCP Handshake from end device = 54

|  |
| --- |
| MOST Used Lengths in the Packets |
| 1292 – 128x |
| 74-75-73-71-65 |

# Proton VPN

## WireGuard

### Netherlands

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr. | Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 1. | 122 – 138 – 154 – 1354 – 1482 | 122 – 138 – 154 – 1482 | 190.2.130.161  (190.2.130.167) | 1224 | 49898 |
| 2. | 1354 – 138 – 266 – 1402 – 1482 – 1306 | 122 – 138 – 154 | 190.2.130.161  (190.2.130.177) | 1224 | 61373 |
| 3. | 1354 – 138 – 266 – 1402 – 1482 – 1306 | 122 – 138 – 154 | 190.2.130.161  (190.2.130.168) | 51820 | 61090 |
| 4. | 1354 – 1482 – 1306 | 122 – 138 | 185.107.56.236  (185.107.56.239) | 1224 | 55548 |
| 5. | 1354 – 1482 – 1306 | 122 – 138 – 154 | 185.107.56.236  (185.107.56.251) | 1224 | 63813 |
| 6. | 1354 – 1482 – 1306 – 1432 – 1402 | 122 – 138 – 154 | 185.107.56.236  (185.107.56.238) | 88 | 56827 |
| 7. | 1354 – 1482 – 1306 | 122 – 138 – 154 | 185.107.56.30  (185.107.56.30) | 4500 | 49202 |
| 8. | 1354 – 1482 – 1306 | 122 – 138 – 154 | 185.107.56.30  (185.107.56.42) | 51820 | 51847 |
| 9. | 1354 – 1482 – 1306 | 122 – 138 – 154 | 185.107.56.30  (185.107.56.35) | 1224 | 63302 |
| 10. | 1354 – 1482 – 1306 | 122 – 138 – 154 | 185.107.56.30  (185.107.56.40) | 1224 | 58262 |
| 11. | 1354 – 1482 – 1306 | 122 – 138 – 154 | 149.34.244.164  (149.34.244.166) | 1224 | 54294 |
| 12 |  |  | 149.34.244.164  (149.34.244.167) | 1224 | 56999 |
| 13 |  |  | 149.34.244.164  (149.34.244.166) | 88 | 52469 |
|  |  |  | 149.34.244.139  (149.34.244.143) | 443 | 58435 |
|  |  |  | 149.34.244.139  (149.34.244.140) | 88 | 64950 |
|  |  |  | 149.34.244.139  (149.34.244.141) | 88 | 58126 |
|  |  |  | 149.34.244.139  (149.34.244.142) | 1224 | 50523 |
|  |  |  | 149.34.244.174  (149.34.244.175) | 1224 | 59903 |
|  |  |  | 149.34.244.174  (149.34.244.178) | 443 | 52974 |
|  |  |  | 149.34.244.174  (149.34.244.176) | 51820 | 54959 |
|  |  |  | 149.34.244.174  (149.34.244.177) | 500 | 59415 |
|  |  |  | 138.199.7.251  (169.150.196.141) | 443 | 62409 |
|  |  |  | 138.199.7.251  (169.150.196.144) | 51820 | 57782 |
|  |  |  | 138.199.7.251  (169.150.196.143) | 51820 | 60141 |
|  |  |  | 138.199.7.251  (169.150.196.142) | 88 | 51036 |
|  |  |  | 138.199.7.159  (138.199.7.163) | 443 | 57800 |
|  |  |  | 138.199.7.159  (138.199.7.160) | 88 | 57948 |
|  |  |  | 138.199.7.159  (138.199.7.161) | 443 | 61661 |
|  |  |  | 190.2.133.223  (190.2.133.229) | 1224 | 59648 |
|  |  |  | 190.2.133.223  (190.2.133.224) | 443 | 57914 |
|  |  |  | 190.2.133.223  (190.2.133.229) | 500 | 57435 |
|  |  |  | 190.2.133.223  (190.2.133.230) | 443 | 55272 |
|  |  |  | 138.199.7.181  (138.199.7.184) | 443 | 54518 |
|  |  |  | 138.199.7.181  (138.199.7.183) | 51820 | 59220 |
|  |  |  | 138.199.7.181  (138.199.7.182) | 443 | 57827 |
|  |  |  | 217.23.3.76  (217.23.3.96) | 88 | 62282 |
|  |  |  | 217.23.3.76  (217.23.3.91) | 1224 | 65031 |
|  |  |  | 185.107.56.98  (185.107.56.104) | 88 | 60630 |
|  |  |  | 185.107.56.98  (185.107.56.98) | 443 | 57474 |
|  |  |  | 185.107.56.98  (185.107.56.105) | 1224 | 51160 |
|  |  |  | 169.150.218.21  (169.150.218.22) | 4500 | 59383 |
|  |  |  | 169.150.218.21  (169.150.218.22) | 51820 | 50752 |
|  |  |  | 169.150.218.21  (169.150.218.23) | 1224 | 59050 |
|  |  |  | 185.107.56.117  (185.107.56.128) | 500 |  |
|  |  |  | 185.107.56.117  (185.107.56.129) | 4500 |  |
|  |  |  | 185.107.56.117  (185.107.56.120) | 88 |  |
|  |  |  | 89.39.107.109  (89.39.107.198) | 1224 |  |
|  |  |  | 169.150.218.36  (169.150.218.40) | 51820 |  |
|  |  |  | 169.150.218.36  (169.150.218.37) | 4500 |  |
|  |  |  | 185.107.56.148  (185.107.56.152) | 51820 |  |
|  |  |  | 185.107.56.148  (185.107.56.150) | 443 |  |
|  |  |  | 169.150.196.100  (138.199.7.233) | 1224 |  |
|  |  |  | 169.150.218.31  (169.150.218.35) | 51820 |  |
|  |  |  | 93.190.140.103  (93.190.140.122) | 51820 |  |
|  |  |  | 185.107.56.134  (185.107.56.136) | 1224 |  |
|  |  |  | 212.8.250.217  (212.8.250.219) | 443 |  |
|  |  |  | 190.2.133.15  (190.2.133.16) | 1224 |  |
|  |  |  | 190.2.133.15  (190.2.133.14) | 1224 |  |
|  |  |  | 190.2.133.200  (190.2.133.202) | 1224 |  |
|  |  |  | 185.183.33.218  (185.183.33.221) | 1224 |  |
|  |  |  | 185.183.34.149  (185.183.34.145) | 1224 |  |
|  |  |  | 212.102.35.225  (212.102.35.229) | 1224 |  |
|  |  |  | 138.199.7.250  (169.150.196.139) | 443 |  |
|  |  |  | 185.107.56.76  (185.107.56.83) | 443 |  |
|  |  |  | 169.150.218.75  (169.150.218.77) | 88 |  |
|  |  |  | 93.190.138.166  (93.190.138.188) | 443 |  |
|  |  |  | 169.150.218.16  (169.150.218.20) | 443 |  |
|  |  |  | 169.150.218.85  (169.150.218.87) | 88 |  |
|  |  |  | 138.199.7.233  (169.150.196.130) | 443 |  |
|  |  |  | 212.8.253.155  (212.8.253.163) | 88 |  |
|  |  |  | 185.107.57.7  (185.107.57.8) | 51820 |  |
|  |  |  | 192.2.132.198  (192.2.132.214) | 51820 |  |
|  |  |  | 169.150.218.1  (169.150.218.4) | 88 |  |
|  |  |  | 89.39.107.157  (89.39.107.157) | 51820 |  |
|  |  |  | 212.8.243.68  (212.8.243.74) | 500 |  |
|  |  |  | 138.199.7.225  (138.199.7.227) | 1224 |  |
|  |  |  | 149.34.244.169  (149.34.244.170) | 88 |  |
|  |  |  | 185.177.126.133  (185.177.126.133) |  |  |
|  |  |  | 89.38.97.196  (89.38.97.206) |  |  |
|  |  |  | 212.8.250.234  (212.38.97.238) |  |  |
|  |  |  | 185.177.124.190  (185.177.124.194) |  |  |
|  |  |  | 185.182.193.32  (185.182.193.75) |  |  |
|  |  |  | 46.166.182.31  (46.166.182.57) |  |  |
|  |  |  | 185.107.56.123  (185.107.56.126) |  |  |
|  |  |  | 89.38.99.138  (89.38.99.93) | 4569 |  |
|  |  |  | 89.38.99.188  (89.38.99.172) |  |  |
|  |  |  | 169.150.218.70  (169.150.218.73) |  |  |
|  |  |  | 149.34.224.159  (149.34.224.162) |  |  |
|  |  |  | 89.39.107.185  (89.39.107.193) |  |  |
|  |  |  | 89.39.106.102  (89.39.106.102) |  |  |
|  |  |  | 185.177.125.177  (185.177.125.174) |  |  |
|  |  |  | 169.150.218.55  (169.150.218.57) |  |  |
|  |  |  | 169.150.196.65  (169.150.196.66) |  |  |
|  |  |  | 185.177.126.71  (185.177.126.127) |  |  |
|  |  |  | 165.150.169.71  (165.150.169.72) |  |  |
|  |  |  | 149.34.244.149  (149.34.244.152) |  |  |
|  |  |  | 169.150.196.145  (169.150.196.147) |  |  |
|  |  |  | 138.199.7.243  (169.150.196.136) |  |  |
|  |  |  | 185.107.56.69  (185.107.56.71) |  |  |
|  |  |  | 89.38.97.139  (89.38.97.174) |  |  |
|  |  |  | 185.107.56.154  (185.107.56.157) |  |  |
|  |  |  | 185.107.56.45  (185.107.56.45) |  |  |
|  |  |  | 185.177.124.219  (185.177.124.225) |  |  |
|  |  |  | 169.150.196.89  (169.150.196.93) |  |  |
|  |  |  | 185.107.56.212  (185.107.56.212) |  |  |
|  |  |  | 169.150.196.77  (169.150.196.78) |  |  |
|  |  |  | 77.247.178.122  (77.247.178.126) |  |  |
|  |  |  | 149.34.244.154  (149.34.244.156) |  |  |
|  |  |  | 169.150.218.80  (169.150.218.84) |  |  |
|  |  |  | 185.177.125.201  (185.177.125.211) |  |  |
|  |  |  | 185.177.124.84  (185.177.124.88) |  |  |
|  |  |  | 149.34.244.179  (149.34.244.181) |  |  |
|  |  |  | 109.236.81.160  (109.236.81.188) |  |  |
|  |  |  | 138.199.7.235  (138.199.7.237) |  |  |
|  |  |  | 149.34.244.129  (149.34.244.132) |  |  |
|  |  |  | 169.150.169.99  (169.150.169.114) |  |  |
|  |  |  | 185.182.193.108  (185.182.193.108) |  |  |
|  |  |  | 169.150.218.65  (169.150.218.67) |  |  |
|  |  |  | 169.150.196.98  (169.150.196.110) |  |  |
|  |  |  | 169.150.218.26  (169.150.218.27) |  |  |
|  |  |  | 169.150.218.91  (169.150.218.135) |  |  |
|  |  |  | 212.102.35.244  (212.102.35.246) |  |  |
|  |  |  | 169.150.218.6  (169.150.218.9) |  |  |
|  |  |  | 185.107.56.162  (185.107.56.165) |  |  |
|  |  |  | 185.177.126.144  (185.177.126.144) |  |  |
|  |  |  | 185.107.56.50  (185.107.56.65) |  |  |
|  |  |  | 185.107.56.143  (185.107.56.147) |  |  |
|  |  |  | 89.39.107.113  (89.39.107.196) |  |  |
|  |  |  | 89.39.104.173  (89.39.104.173) |  |  |
|  |  |  | 212.8.253.138  (212.8.253.139) |  |  |
|  |  |  | 89.39.107.188  (89.39.107.202) |  |  |
|  |  |  | 185.107.80.190  (185.107.80.190) |  |  |
|  |  |  | 185.159.158.139  (37.120.217.162) |  |  |

### Japan

|  |  |  |  |
| --- | --- | --- | --- |
| Src. Port No. | Src. IP | Src. Port No. | Src. IP |
| 1194 443 | 37.19.205.150  (37.19.205.150) |  | 138.199.21.206  (138.199.21.207) |
| 51820  5060 | 138.199.21.216  (212.102.51.246) |  | 138.199.21.193  (138.199.21.194) |
| 51820 | 212.102.51.241  (212.102.51.245) |  | 37.19.205.145  (37.19.205.147) |
|  | 45.14.71.5  (45.14.71.11) |  | 212.102.51.247  (212.102.51.249) |
|  | 138.199.22.103  (138.199.22.107) |  | 138.199.22.102  (138.199.22.196) |
|  | 138.199.21.198  (138.199.21.201) |  | 103.125.235.18  (103.125.235.23) |
|  | 138.199.22.97  (138.199.22.100) |  | 185.159.156.87  (79.110.55.2) |
|  | 37.19.205.155  (37.19.205.155) |  | 45.14.71.7  (45.14.71.23) |

### USA

|  |  |  |  |
| --- | --- | --- | --- |
| Src. Port No. | Src. IP | Src. Port No. | Src. IP |
| 433,88 | 146.70.202.114  (146.70.202.115) | 51820 | 146.70.174.66 (146.70.174.68) |
| 500 (malformed packets) | 195.181.163.1  (195.181.163.29) | 51820 | 37.19.199.139  (37.19.199.141) |
| 443 | 195.181.162.163  (195.181.162.179) | 1224 | 38.132.103.146  (38.132.103.148) |
| 500 (malformed packets) | 89.187.177.71  (89.187.177.73) | 500(malformed packets) | 37.19.200.22  (37.19.200.23) |
| 88 | 37.19.199.129  (37.19.199.133) | 443 | 37.19.200.1  (37.19.200.3) |
| 88 | 37.19.221.194  (37.19.221.232) | 4500 ESP | 37.19.201.195  (37.19.201.248) |
| 443 | 37.19.199.144  (37.19.199.148) | 5060 | 37.19.221.195  (146.70.147.99) |
| 51820 | 37.19.199.149  (37.19.199.153) | 1194 | 89.187.185.161  (89.187.185.171) |
| 1224 | 185.236.200.242  (185.236.200.244) | 51820 | 45.87.214.114  (45.87.214.117) |
| 1224 | 143.244.44.171  (143.244.44.174) | 500  (malformed Packet) | 156.146.51.129  (156.146.51.131) |
| 443 | 89.187.180.55  (89.187.180.57) | ESP 4500 | 146.70.202.82  (146.70.202.85) |
| 80 | 89.187.180.54  (87.249.134.130) | ESP 4500 | 217.138.206.82  (217.138.206.84) |
| 443 | 185.236.126.2  (185.236.126.4) | Malformed packets | 143.244.44.161  (143.244.44.164) |
| 443 | 143.244.44.166  (143.244.44.169) | 88 | 89.187.180.1  (89.187.180.3) |
| 1224 | 37.19.221.199  (37.19.221.237) | ESP | 193.148.18.74  (193.148.18.78) |
| ESP port: 4500 | 37.19.200.17  (37.19.200.18) | 1224 | 89.187.170.159  (89.187.170.165) |
| 443 | 143.244.44.181  (143.244.44.184) | 88 | 146.70.202.2  (146.70.202.6) |
| 88 | 37.19.199.134  (37.19.199.135) | 1224 | 138.199.52.193  (138.199.52.197) |
| 500(malformed packet) | 37.19.221.198  (37.19.221.244) |  | 146.70.45.82  (146.70.45.83) |
| 51820 | 138.199.50.98  (138.199.50.102) |  | 45.89.173.194  (45.89.173.198) |
| 1224 | 193.148.18.58  (198.148.18.59) |  | 37.19.221.196  (37.19.221.233) |
| 443 | 89.187.179.55  (89.187.179.58) |  | 143.244.44.176  (143.244.44.177) |
| 1194 | 37.19.221.197  (37.19.221.227) |  | 37.19.221.193  (37.19.221.201) |
| 443 | 146.70.202.34  (146.70.202.35) |  | 89.45.4.2  (89.45.4.2) |
| 443 | 156.146.54.81  (156.146.54.85) |  | 37.120.244.154  (37.120.244.154) |
|  | 146.70.202.114  (146.70.202.116) |  | 37.19.221.197  (37.19.221.225) |
|  | 156.146.54.81  (156.146.54.84) |  | 156.146.51.129  (156.146.51.132) |
|  | 37.19.221.196  (37.19.221.236) |  | 45.87.214.114  (45.87.214.116) |
|  | 146.70.202.82  (146.70.202.85) |  | 146.70.202.34  (146.70.202.37) |
|  | 146.70.174.66  (146.70.174.66) |  | 37.19.199.144  (37.19.199.146) |
|  | 217.138.206.82  (217.138.206.86) |  | 45.89.173.194  (45.89.173.198) |
|  | 37.19.199.129  (37.19.199.129) |  | 89.187.177.71  (89.187.177.73) |
|  | 37.19.200.1  (37.19.200.4) |  | 185.230.126.2  (185.230.126.6) |
|  | 89.187.185.161  (89.187.185.184) |  | 37.19.199.134  (37.19.199.135) |
|  | 89.187.185.161  (89.187.180.56) |  | 138.199.52.193  (138.199.52.194) |
|  | 193.148.18.74  (193.148.18.75) |  | 89.187.179.55  (89.187.179.58) |
|  | 146.70.202.2  (146.70.202.5) |  | 37.19.221.195  (37.19.221.246) |
|  | 37.19.200.23  (37.19.200.23) |  | 185.236.200.242  (185.236.200.245) |
|  | 146.70.147.98  (146.70.147.100) |  | 146.70.45.82  (146.70.45.83) |
|  | 143.244.44.181  (143.244.44.184) |  | 38.132.103.146  (38.132.103.150) |
|  | 143.244.44.166  (143.244.44.168) |  | 195.181.162.163  (195.181.162.186) |
|  | 37.19.221.199  (37.19.221.237) |  | 37.19.221.198  (37.19.221.242) |
|  | 143.244.44.161  (143.244.44.164) |  | 37.19.200.17  (37.19.200.18) |
|  | 89.187.170.159  (89.187.170.167) |  | 195.181.163.1  (195.181.163.32) |
|  | 37.19.199.149  (37.19.199.153) |  | 37.19.221.193  (37.19.221.202) |
|  | 143.244.44.176  (143.244.44.178) |  | 89.187.180.1  (89.187.180.2) |

## Open-VPN UDP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 107 – 177 – 182 – 409 – 619 – 1282 – 1344 – 1395 – 1414 – 1423 – 1428 – 1433 - | 107 – 119 – 127 -135 – 143 – 1121 - 1433 | 4569 | 51122 | 146.70.202.114 |
| 107 - 177 – 181– 1282 – 1344 – 1395 – 1414 – 1423 – 1428 – 1433 | 107 – 119 – 127 -146– 181- 205 – 265 – 624 - 1433 | 1194 | 57241 | 185.107.56.45 |
| 107 – 119 - 177 – 181– 227 - 1282 – 1357 – 1345 -1344 – 1395 -1414 -1423 – 1428 - 1433 | 107 – 119 – 127 – 138 - 146– 171– 624 - 1433 | 5060 | 59894 | 89.187.180.1 |
| 107 - 177 – 181– 1282 – 1344 – 1395 – 1414 – 1423 – 1428 – 1433 | 107 – 119 – 127 – 135 – 138 – 143 – 146 – 181 – 1121 – 1433 | 80 | 62340 | 37.19.199.149 |
|  | 1344-1460 |  |  |  |
| 127, 126, 128, |  |  |  |  |

## Open – VPN TCP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 60 – 66- 89 – 124 – 161 – 184 – 208 – 1295 – 1296 – 1370 – 1405 – 1440 – 1445 – 1459 - | 54 – 74 -82 – 90 – 121 – 133 - 1514 | 7770 | 60810 | 103.125.235.18 |
| 60 – 121 – 133 – 161 – 1295 – 1296 – 1370 – 1407 – 1426-1435 – 1440- 1445 – 1459 - 1486 – 1500 – 1507 | 54 – 121 – 133 – 152 = 160 – 195 | 443 | 65112 | 149.34.244.129 |
| 60 – 121 – 133 –188– 1295 – 1370-1373 – 1407 – 1426– 1440- 1445 – 1486 – 1500 – 1507 - | 54 – 66 - 121 – 133 – 152 = 160 – 195 – 1514 | 443 | 60949 | 37.10.200.4 |
|  |  | 8443 |  |  |
|  | 1448-1354-1358 |  |  |  |
|  |  |  |  |  |

## After Subnetting

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 103.125.235.**xx** | 146.70.202**.xxx** | 185.107.80.**xxx** | 185.236.200**.xxx** | 212.38.97.**xxx** | 37.19.221.**xxx** | 89.187.177.**50-100** | 93.190.138.**150-200** | 93.190.138.**150-200** |
| 109.236.81.**xxx** | 146.70.45.**xxx** | 185.159.156.**xxx** | 190.2.130**.xxx** | 212.8.243.**xxx** | 38.132.103.**xxx** | 89.187.179**.xxx** | 93.190.140.**xxx** | 93.190.140.**xxx** |
| 138.199.21.**xxx** | 149.34.244.**xxx** | 185.159.158.**xxx** | 190.2.133.**xxx** | 212.8.253.**xxx** | 45.14.71.**xxx** | 89.187.180.**xxx** | 93.190.138.**xxx** |  |
| 138.199.22.**xxx** | 156.146.51.**xxx** | 185.177.124.**xxx** | 193.148.18**.xxx** | 217.138.206.**xxx** | 45.87.214.**xxx** | 89.187.185.**xxx** | 93.190.140.**xxx** |  |
| 138.199.50.**xxx** | 156.146.54.**xxx** | 185.177.125.**xxx** | 192.2.132.**xxx** | 217.23.3**.xxx** | 45.89.173.**xxx** | 89.38.97.**xxx** | 93.190.138.**xxx** |  |
| 138.199.52.**xxx** | 165.150.169.**xxx** | 185.177.126.**xxx** | 195.181.162.**xxx** | 37.120.217.**xxx** | 46.166.182.**xxx** | 89.38.99.**xxx** | 93.190.140.**xxx** |  |
| 138.199.7.**xxx** | 169.150.196.**xxx** | 185.182.193.**xxx** | 195.181.163.**xxx** | 37.120.244.**xxx** | 77.247.178.**xxx** | 89.39.104.**xxx** | 93.190.138.**xxx** |  |
| 143.244.44.**xxx** | 169.150.218.**xxx** | 185.183.33.**xxx** | 198.148.18.**xxx** | 37.19.200.**xxx** | 79.110.55.**xxx** | 89.39.106.xxx | 93.190.140.**xxx** |  |
| 146.70.147.**xxx** | 185.107.56.**xxx** | 185.183.34**.xxx** | 212.102.35.**xxx** | 37.19.201.**xxx** | 87.249.134.**xxx** | 89.39.107.**xxx** | 93.190.138.**xxx** |  |
| 146.70.174.**xxx** | 185.107.57.xxx | 185.230.126.**xx** | 212.102.51.**xxx** | 37.19.205.**xxx** | 89.187.170.**xxx** | 89.45.4.**xxx** | 93.190.140.**xxx** |  |

# Windscribe

## WireGuard

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 1494 – 1352 – 114 – 124 == 137 | 122 – 138 – 154 – 1354 | 155.94.217.4 | 59531 | 443 |
| 114 – 123 == 137 – 1352 – 1494 | 122 – 138 == 145 – 154 – 1354 | 107.7.60.188 | 56990 | 443 |
| 114 – 123 == 134 - 145 – 1352 -1382 - 1494 | 122 – 138 – 154 – 218 – 1354 | **155.94.216.68**  **155.94.216.122** | 57272 | 443 |
| 114 – 123 == 137 – 145 – 1352 - 1494 | 122 – 138 - 154 – 186 – 218 - 1354 | **161.129.70.132**  **161.129.70.135** | 51097 | 443 |
| 114 – 123 == 137 – 145 – 188 == 202 -1352 – 1382 - 1494 | 122 – 138 – 154 – 186 - 202 – 218 - 1354 | 104.129.18.196  104.129.18.214 | 49716 | 443 |
| 114 – 123 == 137 – 145 – 188 == 202 -1352 – 1382 - 1494 | 122 – 138 – 154 – 186 – 218 – 1354 - 1494 | 162.222.198.4  162.222.198.23 | 49834 | 443 |
| 114 – 123 == 137 – 145 – 188 == 202 -1352 – 1382 - 1494 | 122 – 138 – 154 – 186 – 218 – 1354 - 1494 | 69.174.103.196  69.174.103.248 | 54517 | 443 |
| 114 – 123 == 137 – 165 == 166 – 206 == 224 -1352 - 1494 | 122 – 138 – 154 – 186 – 282 - 1494 | 107.150.22.196  107.150.22.246 | 61209 | 443 |
|  |  | 107.150.30.132  107.150.30.166 | 56498 | 443 |
|  |  | 155.97.217.xxx |  |  |
|  |  | 107.150.23.196  107.150.23.233 | 57368 | 443 |
|  |  | 104.233.93.196  104.233.93.236 | 50723 | 443 |
|  |  | 162.222.198.68  162.222.198.114 | 64071 | 443 |
|  |  | 155.94.250.68  155.94.250.101 | 59004 | 443 |
|  |  | 104.233.103.68  104.233.103.117 | 65070 | 443 |
|  |  | 198.96.95.132  198.96.95.189 | 55985 | 443 |
|  |  | 107.161.86.132  107.161.86.145 | 63632 | 443 |
|  |  | 155.94.250.4  155.94.250.10 | 50299 | 443 |
|  |  | 104.223.98.132  104.223.98.138 | 58521 | 443 |
|  |  | 104.223.102.4  104.223.102.52 | 49485 | 443 |
|  |  | 104.223.100.132  104.223.100.142 | 54555 | 443 |
|  |  | 155.94.251.68  155.94.251.102 | 58554 | 443 |
|  |  | 155.94.247.196  155.94.247.243 | 62563 | 443 |
|  |  | 204.44.122.4  204.44.122.19 | 57659 | 443 |
|  |  | 68.235.35.181  68.235.33.98 | 57448 | 443 |
|  |  | 68.235.43.187  68.235.32.229 | 59552 | 443 |
|  |  | 208.77.22.205  68.235.38.38 | 52209 | 443 |
|  |  | 68.235.35.173  68.235.33.131 | 63652 | 443 |
|  |  | 68.235.43.197  68.235.32.227 | 58268 | 443 |
|  |  | 68.235.39.125  68.235.38.187 | 52788 | 443 |
|  | MIAMI  Snow | 173.44.36.132  173.44.36.178 | 62673 | 443 |
|  |  | 155.94.218.68  155.94.218.113 | 65284 | 443 |
|  |  | 96.47.239.196  96.47.239.236 | 62459 | 443 |
|  | MIAMI  Vice | 86.106.87.100  86.106.87.103 | 62328 | 443 |
|  |  | 45.87.214.68  45.87.214.83 | 56384 | 443 |
|  |  | 37.120.215.164  37.120.215.168 | 58456 | 443 |
|  | NEW YORK  Empire | 217.138.255.196  217.138.255.202 | 62346 | 443 |
|  |  | 77.81.136.68  77.81.136.85 | 49922 | 443 |
|  |  | 92.119.177.84  92.119.177.90 | 53648 | 443 |
|  |  | 212.103.48.84  212.103.48.92 | 63361 | 443 |
|  |  |  |  |  |
|  | NEW YORK  Grand Central | 143.244.44.211  154.47.26.242 | 59669 | 443 |
|  | Washington DC  Precedent | 23.105.190.162  23.105.190.167 | 58573 | 443 |
|  |  | 207.244.91.155  207.244.91.174 | 65260 | 443 |
|  |  | 23.105.186.146  23.105.186.145 | 49606 | 443 |
|  | Los Angeles  Dogg | 89.41.26.52  89.41.26.62 | 52988 | 443 |
|  |  | 91.219.212.84  91.219.212.91 | 60854 | 443 |
|  |  | 185.236.200.20  185.236.200.28 | 61104 | 443 |
|  | Dallas | 198.55.126.224  198.55.126.196 | 63605 | 443 |
|  | Seattle  Cobain | 104.129.57.132  104.129.57.158 | 54666 | 443 |
|  |  | 104.129.56.164  104.129.56.167 | 55951 | 443 |
|  | Montreal  Expo 67 | 198.8.85.241  198.8.85.247 | 65240 | 443 |
|  |  | 172.98.68.164  172.98.68.164 | 62556 | 443 |
|  | Toronto  Comfort Zone | 149.57.28.194  149.57.28.211 | 59653 | 443 |
|  | Toronto  The 6 | 104.245.146.76  104.245.146.54 | 63034 | 443 |
|  | Vancouver  Granville | 71.19.251.141  71.19.251.147 | 58234 | 443 |
|  |  | 71.19.252.153  71.19.252.158 | 52089 | `443 |
|  | Vancouver  Vansterdam | 208.78.41.148  208.78.41.155 | 52155 | 443 |
|  | Hong Kong  Victoria | 27.122.12.228  27.122.12.235 | 58080 | 443 |
|  |  | 103.10.197.4  27.122.14.68 | 52617 | 443 |
|  |  | 27.122.14.36  27.122.14.44 | 65354 | 443 |
|  |  | 223.123.88.96 |  | 443 |
|  | Paris  Jardin | 84.17.43.227  84.17.43.239 | 63128 | 443 |
|  |  | 139.199.47.195  139.199.47.209 | 56843 | 443 |
|  |  | 138.199.47.222  138.199.47.224 | 63008 | 443 |
|  | Paris  Seine | 146.70.18.100  146.70.18.125 | 64554 | 443 |
|  |  | 146.70.68.228  146.70.68.236 | 58113 | 443 |
|  |  | 146.70.105.4  146.70.105.16 | 63006 | 443 |
|  |  | 194.59.249.244  194.59.249.203 | 59295 | 443 |
|  |  | 185.156.173.180  185.189.113.62 | 49880 | 443 |
|  | Frankfurt  Castle | 146.70.107.68  146.70.107.82 | 62173 | 443 |
|  |  | 193.27.14.180  193.27.14.182 | 53544 | 443 |
|  |  | 45.87.212.68  45.87.212.71 | 63598 | 443 |
|  | Frankfurt  Wurstchen | 149.36.50.213  149.36.50.230 | 63031 | 443 |
|  |  | 149.36.50.159  149.36.50.173 | 50976 | 443 |
|  | Amsterdam  Canal | 146.70.108.68  146.70.108.60 | 60660 | 443 |
|  |  | 146.70.108.164  146.70.108.171 | 62187 | 443 |
|  |  | 2.58.44.244  2.58.44.252 | 64291 | 443 |
|  | Amsterdam  Red Light | 104.223.81.196  104.223.81.196 | 58460 | 433 |
|  |  | 155.94.209.132  155.94.209.188 | 56629 | 443 |
|  | Amsterdam  Tulip | 169.150.196.195  169.150.196.199 | 65303 | 443 |
|  |  | 149.36.51.131  149.36.51.139 | 52989 | 443 |
|  | Oslo  Fjord | 185.253.97.132  185.253.97.141 | 52188 | 443 |
|  |  | 146.70.103.4  146.70.103.9 | 51240 | 443 |
|  |  | 146.70.103.36  146.70.103.45 | 59001 | 443 |
|  |  | 37.120.203.228  37.120.203.252 | 51643 | 443 |
|  | Bucharest  No Vampires | 185.120.147.4  185.120.147.5 | 55006 | 443 |
|  |  | 185.217.68.132  185.217.68.136 | 62049 | 443 |
|  |  | 91.207.103.196  91.207.103.205 | 54647 | 443 |
|  |  | 146.70.97.228  146.70.97.245 | 50731 | 443 |
|  | Zurich  Alphorn | 146.70.99.228  146.70.99.246 | 57175 | 443 |
|  |  | 146.70.99.164  146.70.99.187 | 60550 | 443 |
|  | Zurich  Lindenhof | 169.150.197.163  169.150.197.185 | 50499 | 443 |
|  |  | 169.150.197.195  169.150.197.214 | 58502 | 443 |
|  | London  Crumpets | 89.47.62.100  89.47.62.110 | 56946 | 443 |
|  |  | 217.138.254.68  217.138.254.70 | 57410 | 443 |
|  |  | 146.70.104.4  146.70.104.9 | 55558 | 443 |
|  |  | 146.70.95.148  146.70.95.148 | 64528 | 443 |
|  |  | 146.70.95.132  146.70.95.138 | 63084 | 443 |
|  | London  Custard | 138.199.31.131  138.199.31.141 | 64458 | 443 |
|  |  | 212.102.63.3  212.102.63.30 | 54069 | 443 |
|  |  | 84.17.50.195  84.17.50.208 | 62492 | 443 |
|  | Istanbul  Lygos | 149.102.229.227  149.102.229.247 | 49345 | 443 |
|  |  | 149.50.208.99  149.50.208.100 | 50534 | 443 |
|  |  |  |  |  |

## IKEv2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 118 – 130 – 146 – 1354 – 1478 | 118 – 130 – 138 – 142 – 146 | 107.150.30.66  107.150.30.109 | 4500 | 4500 |
| 118 – 126 – 130 – 1354 – 1478 | 118 – 138 – 146 | 89.41.26.50  89.41.26.59 | 4500 | 4500 |
| 118 – 130 – 134 – 1354 – 1478 | 118 – 130 – 138 – 1354 | 172.98.68.162  172.98.68.171 | 4500 | 4500 |
| 1. – 130 – 158 – 1354 – 1478 | 118 – 138 – 158 – 1354 | 71.19.252.151  71.19.252.161 | 4500 | 4500 |
|  |  |  |  |  |
|  |  |  |  |  |

## Stealth

TCP Whole

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 56 – 142 – 154 – 1514 – 4250 | 54 – 142 – 154 – 1514 | 89.41.26.52 | 58004 | 443 |
| 56 – 142 – 154 – 1224 – 1514 – 4250 – 1380 – 4284 | 54 – 142 – 154 – 1380 – 1514 | 149.57.28.41 | 59804 | 443 |
| 56 – 142 – 154 – 1224 – 1514 – 4250 – 1380 – 4284 | 54 – 142 – 154 – 1380 – 1514 | 198.55.126.196  198.55.126.245 | 49701 | 443 |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

## TCP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 60 – 1514 | 54 – 120 – 140 = 180 – 1527 – 2809 | 155.94.250.3 | 52896 | 443 |
| 60 – 1514 | 54 – 120 – 140 = 180 – 1527 – 2754 + | 198.96.95.182 | 57442 | 443 |
| 60 – 1514 | 54 – 120 – 140 = 180 – 1527 – 2754 + | 27.122.12.122 | 54940 | 443 |
| 60 – 1514 | 54 – 120 – 140 = 180 – 1527 – 2809 | 104.129.56.164  104.129.56.167 | 55951 | 443 |

## WStunnel

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 56 – 60 – 84 – 144 – 158 – 1238 – 1376 – 1384 – 1514 | 54 – 66 – 148 – 90 – 1514 – 1573+ | 27.122.12.111 | 63847 | 443 |
| 56 – 60 – 84 – 144 – 158 – 1238 – 1376 – 1384 – 1514 | 167==177 – 54 – 66 – 148 – 90 – 1514 – 1573+ | 149.57.28.7 | 63957 | 443 |
| 56 – 60 – 84 – 144 – 158 – 1238 – 1376 – 1384 – 1514 | 167==177 – 54 – 66 – 148 – 90 – 1514 – 1573+ | 104.129.56.162 | 54135 | 443 |
| 56 – 60 – 84 – 144 – 158 – 1238 – 1376 – 1384 – 1514 | 54 – 66 – 148 – 167==177 – 90 – 1514 – 1573+ | 71.19.252.153 | 52089 | 443 |

## UDP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 106 – 120 == 124 – 1294 – 1344 – 1392 | 106 – 126 == 131 | 104.129.56.163 | 55509 | 443 |
| 106 – 118 – 120 – 1294 – 1326 – 1344 – 1392 | 106 – 118 – 125 == 131 – 142 – 1344 – 1392 | 155.94.218.67 | 50226 | 443 |
| 106 – 117 – 118 – 119 == 122 – 1294 – 1344 – 1392 | 106 – 118 – 1344 – 1392 | 198.8.85.225 | 55348 | 443 |
| 106 – 118 – 120 – 1294 – 1326 – 1344 – 1392 | 106 – 118 – 125 == 131 – 142 – 1344 – 1392 | 84.17.43.226 | 49891 | 443 |

## IP

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 103.10.197.xxx | 143.244.44.xxx | 162.222.198.xxx | 193.27.14.xxx | 212.102.xxx.xxx | 68.174.103.xxx |
| 104.129.xxx.xxx | 146.70.xxx.xxx | 169.150.19x.xxx | 194.59.249.xxx | 212.103.xxx.xxx | 71.19.25x.xxx |
| 104.223.xxx.xxx | 149.102.229.xxx | 172.98.68.xxx | 198.55.126.xxx | 217.138.25x.xxx | 77.81.136.xxx |
| 104.233.xxx.xxx | 149.36.xx.xxx | 173.44.36.xxx | 198.8.85.xxx | 223.123.88.xxx | 84.17.43.xxx |
| 104.245.146.xxx | 149.50.208.xxx | 185.120.147.xxx | 198.96.95.xxx | 23.105.1xx.xxx | 84.17.50.xxx |
| 107.150.xx.xxx | 149.57.xx.xxx | 185.156.173.xxx | 2.58.44.xxx | 27.122.1x.xxx | 86.106.87.xxx |
| 107.161.86.xxx | 154.47.26.xxx | 185.189.113.xxx | 204.44.122.xxx | 37.120.2xx.xxx | 89.41.26.xxx |
| 107.7.60.xxx | 155.94.xxx.xxx | 185.217.68.xxx | 207.244.91.xxx | 45.87.21x.xxx | 89.47.62.xxx |
| 138.199.xx.xxx | 155.97.217.xxx | 185.236.200.xxx | 208.77.22.xxx | 68.235.3x.xxx | 91.2xx.xxx.xxx |
| 139.199.47.xxx | 161.129.70.xxx | 185.253.97.xxx | 208.78.41.xxx | 68.235.4x.xxx | 92.119.117.xxx |
|  |  |  |  |  | 96.47.239.xxx |

# Tunnel-Bear

## WireGuard

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 114 – 123==127 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 159.223.123.80 | 51820 | 51820 |
| 114 – 123==131 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 159.89.229.4 | 51820 | 51820 |
| 114 – 123==137 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 146.190.221.237 | 51820 | 51820 |
| 114 – 123==137 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 67.205.185.125 | 51820 | 51820 |
| 124==137 – 1352 | 138 – 154 – 186 – 1354 | 146.190.78.14 | 51820 | 51820 |
| 114 – 123==137 – 1348 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 174.138.95.205 | 51820 | 51820 |
| 114 – 123==137 – 1348 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 165.227.190.147 | 51820 | 51820 |
| 114 – 123==137 – 1348 – 1352 – 1494 | 122 – 138 – 154 – 186 – 1354 | 165.227.65.21 | 51820 | 51820 |
|  |  | 192.241.150.52 | 51820 | 51820 |
|  |  | 159.203.110.178 | 51820 | 51820 |
|  |  | 146.190.221.234 | 51820 | 51820 |
|  |  | 134.209.119.87 | 51820 | 51820 |
|  |  | 157.245.124.236 | 51820 | 51820 |
|  |  | 165.227.223.156 | 51820 | 51820 |
|  |  | 159.65.40.36 | 51820 | 51820 |
|  |  | 45.55.192.185 | 51820 | 51820 |
|  |  | 65.225.56.109 | 51820 | 51820 |
|  |  | 134.209.115.236 | 51820 | 51820 |
|  |  | 104.131.70.103 | 51820 | 51820 |
|  |  | 45.55.67.132 | 51820 | 51820 |
|  |  | 107.170.62.18 | 51820 | 51820 |
|  |  | 143.198.26.17 | 51820 | 51820 |
|  |  | 138.197.76.54 | 51820 | 51820 |
|  |  | 165.227.124.162 | 51820 | 51820 |
|  |  | 162.243.55.20 | 51820 | 51820 |
|  |  | 162.243.48.13 | 51820 | 51820 |
|  |  | 104.131.68.172 | 51820 | 51820 |
|  |  | 159.203.85.23 | 51820 | 51820 |
|  |  | 137.184.23.75 | 51820 | 51820 |
|  |  | 167.172.232.90 | 51820 | 51820 |
|  |  | 45.55.195.206 | 51820 | 51820 |
|  |  | 165.227.93.214 | 51820 | 51820 |
|  |  | 68.183.58.206 | 51820 | 51820 |
|  |  | 159.223.113.42 | 51820 | 51820 |
|  |  | 104.131.69.74 | 51820 | 51820 |
|  |  | 192.241.251.33 | 51820 | 51820 |
|  |  | 162.243.96.11 | 51820 | 51820 |
|  |  | 167.71.188.198 | 51820 | 51820 |
|  |  | 157.230.11.141 | 51820 | 51820 |
|  |  | 167.172.226.245 | 51820 | 51820 |
|  |  | 165.227.82.126 | 51820 | 51820 |
|  |  | 159.203.132.89 | 51820 | 51820 |
|  |  | 162.243.199.14 | 51820 | 51820 |
|  |  | 159.203.136.230 | 51820 | 51820 |
|  |  | 206.189.200.246 | 51820 | 51820 |
|  |  | 192.81.211.144 | 51820 | 51820 |
|  |  | 159.65.186.240 | 51820 | 51820 |
|  |  | 138.197.110.128 | 51820 | 51820 |
|  |  | 165.227.87.40 | 51820 | 51820 |
|  | UK | 188.166.147.145 | 51820 | 51820 |
|  |  | 139.59.163.167 | 51820 | 51820 |
|  |  | 104.248.162.7 | 51820 | 51820 |
|  |  | 104.248.167.56 | 51820 | 51820 |
|  |  | 46.101.91.228 | 51820 | 51820 |
|  |  | 206.189.18.182 | 51820 | 51820 |
|  |  | 209.97.190.70 | 51820 | 51820 |
|  |  | 159.65.49.170 | 51820 | 51820 |
|  |  | 161.35.162.126 | 51820 | 51820 |
|  |  | 165.232.33.198 | 51820 | 51820 |
|  |  | 134.122.106.102 | 51820 | 51820 |
|  |  | 161.35.163.141 | 51820 | 51820 |
|  |  | 159.65.81.12 | 51820 | 51820 |
|  |  | 143.110.166.130 | 51820 | 51820 |
|  |  | 143.110.162.42 | 51820 | 51820 |
|  |  | 134.122.101.51 | 51820 | 51820 |
|  |  | 165.232.41.8 | 51820 | 51820 |
|  | Argentina | 103.50.33.223 | 51820 | 51820 |
|  |  | 200.25.50.23 | 51820 | 51820 |
|  | Australia | 139.180.178.70 | 51820 | 51820 |
|  |  | 149.28.164.197 | 51820 | 51820 |
|  |  | 37.120.234.211 | 51820 | 51820 |
|  |  |  |  |  |

## IKEv2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 126 – 142 – 158 – 174 – 190 – 1358 – 1486 | 126 – 142 – 158 – 174 – 190 – 1358 – 1486 | 178.175.135.35 | 4500 | 4500 |
| 126 - 142 - 158 - 174 - 1358 - 1374 – 1486 | 126 - 142 - 158 - 174 - 1358 | 37.120.145.42 | 4500 | 4500 |
| 126 - 142 - 158 - 174 - 1358 - 1374 - 1486 | 126 - 142 - 158 - 174 - 1358 | 134.122.101.51 | 4500 | 4500 |
|  |  |  |  |  |

## IP Addr

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 103.50.33.xxx | 134.209.xx.xxx | 143.110.1xx.xxx | 159.2xx.xxx.xxx | 165.2xx.xxx.xxx | 192.241.xxx.xxx | 45.55.xxx.xxx |
| 104.131.xx.xxx | 137.184.xx.xxx | 143.198.26.xxx | 159.65.xxx.xxx | 167.172.xxx.xxx | 200.25.50.xxx | 46.101.xxx.xxx |
| 104.248.162.xxx | 138.197.xxx.xxx | 146.190.xxx.xxx | 159.89.xxx.xxx | 167.71.xxx.xxx | 106.189.xx.xxx | 65.225.56.xxx |
| 107.170.xx.xxx | 139.180.xxx.xxx | 149.28.164.xxx | 161.35.16x.xxx | 174.138.xxx.xxx | 209.97.xxx.xxx | 67.205.185.xxx |
| 134.122.xx.xxx | 139.59.xxx.xxx | 157.2xx.xxx.xxx | 162.243.xxx.xxx | 188.166.xxx.xxx | 37.120.234.xxx | 68.183.58.xxx |

# Hide.me

## WireGuard

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length  Response | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 346 – 138 – 1354 – 1050 – 1466 – 986 – 154 | 138 – 122 – 170 – 154 – 186 | 217.138.208.82 |  | 432 |
| 202 – 186 – 1345 – 794 – 250 – 234 – 138 – 154 – 1050 – 1210 – 1466 | 1354 – **170** – 186 – 266 – **154** – **138 – 122** | 217.138.194.230 | 64314 | 432 |
| 202 – 186 – 1050 – 138 – 1354 – 1322 – 650 | 1354 – 346 – **154** – 634 – **138** – **170** – 618 – 298 – **186** | 217.138.195.132 | 57399 | 432 |
| 698 – 410 -138 – 1354 – 282 – 218 – 202 – 186 – 1210 | **170** – **154** – 666 – 202 – 234 – 794 – **138** – 186 | 217.138.195.131 | 63517 | 432 |
| 122 – 138 – 1354 - 1466 | 122 – 138 – **154 – 170 – 186** | 31.13.189.5 | 49211 | 432 |
| 122 – 138 – 154 – 1354 - 1466 | **170** – **186** – 122 – **138** – **154** – 1354 | 72.10.162.6 | 49657 | 432 |
| 138 – 170 – 1354 – 1466 | **138 – 154 – 170 – 186** | 72.10.160.132 | 63674 | 432 |
| 122 – 138 – 170 – 1354 – 1466 | 122 – **138** – **154** – **170** – 186 - | 31.13.189.2 | 51979 | 432 |
| 122 – 138 – 170 – 1354 – 1466 | 122 – **138** – **154** – **170** – 186 - | 72.10.162.2 | 57457 | 432 |
| 122 – 138 – 170 – 1354 – 1466 | 122 – **138** – **154** – **170** – 186 - | 146.70.128.2 | 51273 | 432 |
|  |  | 217.138.208.85 | 61012 | 432 |
|  |  | 37.120.192.90 | 55777 | 432 |
|  |  | 146.70.118.52 | 58276 | 432 |
|  |  | 146.70.106.110 | 62811 | 432 |
|  |  | 146.70.128.3 | 60279 | 432 |
|  |  | 45.152.181.69 | 55246 | 432 |
|  |  | 146.70.106.29 | 60494 | 432 |
|  |  | 185.216.33.148 | 53869 | 432 |
|  |  | 141.98.102.219 | 59761 | 432 |
|  |  | 217.138.194.90 | 53523 | 432 |
|  |  | 45.152.182.92 | 50578 | 432 |
|  |  | 217.138.215.156 | 60213 | 432 |
|  |  | 45.141.152.146 | 53929 | 432 |
|  |  | 45.152.182.91 | 53722 | 432 |
|  |  |  |  |  |

## IkeV2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 126 – 142 – 158 – 206 – 1358 – 1374 | 126 – 142 – **158** – **174** – **190** – **206** - | 31.13.189.4 | 62675 | 443 |
| 126 – 142 – 158 – 190 – 1358 | 126 – 142 – **158** – 174 – **190** – 1358 | 217.138.194.90 | 62863 | 443 |
| 126 – 142 – 158 – 174 – 1358 – 1486 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 45.152.182.90 | 62952 | 443 |
| 126 – 142 – 158 – 174 – 1358 – 1486 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 146.70.128.2 | 63067 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 72.10.162.5 | 63126 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 45.152.181.70 | 63256 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 217.138.194.222 | 63461 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 217.138.208.84 | 63672 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 146.70.118.51 | 63857 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 37.120.192.134 | 51059 | 443 |
| 126 – 142 – 158 – 174 – 1358 | 126 – 142 – **158** – **190** – **174** – 1358 – **1486** | 95.174.67.37 | 51222 | 443 |
|  |  |  |  |  |
|  |  |  |  |  |

## OpenVPN

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 1344 – 1458 | 127 - | 45.152.181.68 | 49553 | 3011 |
| 106 – 123 – 126 – 1344 – 1458 | 106 – 125 – **126** – 1340 – 1344 | 45.152.182.94 | 61502 | 3002 |
| 126 – 1344 – 1346 – 1458 | 125 – **126** – 127 – 129 | 31.13.189.3 | 61837 | 3003 |
| 121 – 123 – 124 – 126 – 1344 – 1346 | 125 – **126** – 127 – 128 – 129 | 146.70.118.38 | 62986 | 3041 |
| 121 – 123 – 124 – 126 – 1344 – 1346 | 125 – **126** – 127 – 128 – 129 | 217.138.194.219 | 62940 | 3063 |
| 121 – 123 – 124 – 126 – 1344 – 1346 | 125 – **126** – 127 – 128 – 129 | 95.174.67.34 | 54309 | 3005 |
|  |  | 45.141.152.147 | 59672 | 3023 |
|  |  | 37.120.192.90 | 51165 | 3040 |
|  |  | 146.70.106.30 | 63738 | 3009 |
|  |  | 72.10.162.3 | 63503 | 3056 |
|  |  | 146.70.118.43 | 50796 | 3037 |
|  |  | 217.138.195.130 | 53543 | 3084 |
|  |  | 146.70.106.99 | 62182 | 3025 |
|  |  | 146.70.128.5 | 50234 | 3009 |
|  |  | 217.138.215.156 | 56494 | 3086 |
|  |  | 217.138.208.84 | 55925 | 3063 |
|  |  |  |  |  |

## SoftEtherVPN

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 56 = TCP  1417+ | 54 = TCP  Any range | 95.174.67.37 | 52784 | 40000 - 444 |
| 56 = TCP  1499 max – 1514 = TCP | 54 = TCP  Any Range | 45.152.182.93 | 64629 | 40000 - 444 |
| 56 = TCP  1499 max – 1514 = TCP | 54 = TCP  Any Range | 45.152.181.66 | 59450 | 40003 - 444 |
| 56 = TCP  1417+ | 54 = TCP  Any range | 146.70.128.2 | 50751 | 40000 - 444 |
| 56 = TCP  1499 max – 1514 = TCP | 54 = TCP  Any Range | 217.138.195.130 | 56561 | 40000 - 444 |
| 56 = TCP  1499 max – 1514 = TCP | 54 = TCP  Any Range | 146.70.118.44 | 63457 | 40000 - 444 |
|  |  |  |  |  |

## SSTP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 56 – 1296 – 1362 – 1406 – 1514 | 54 – 66 | 45.152.182.93 | 52906 | 443 |
| 56 – 1296 – 1362 – 1406 – 1514 | 54 – 66 | 72.10.162.4 | 60394 | 443 |
| 56 – 1296 – 1362 – 1406 – 1514 | 54 – 66 | 217.138.208.85 | 53288 | 443 |
| 56 – 1296 – 1362 – 1406 – 1514 | 54 – 66 | 146.70.118.34 | 53378 | 443 |
| 56 – 1296 – 1362 – 1406 – 1514 | 54 – 66 | 217.138.215.146 |  |  |
|  |  |  |  |  |

## IPS

|  |  |
| --- | --- |
| 146.70.106.xx | 31.13.189.xxx |
| 146.70.118.xx | 37.120.192.xxx |
| 146.70.128.xx | 45.141.152.xxx |
| 185.216.33.xxx | 45.152.18x.xxx |
| 217.138.194.xxx | 72.10.160.xxx |
| 217.138.195.xxx | 72.10.162.xxx |
| 217.138.208.xxx | 95.174.67.xxx |
| 217.138.215.xxx |  |

# Turbo VPN

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 51.79.240.225 | 51199 | 443 |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 139.99.90.122 | 59749 | 443 |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 165.227.110.161 | 53559 | 8080 |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 159.89.180.216 | 54074 | 443 |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 162.243.5.152 | 62866 | 8080 |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 157.245.218.82 | 46423 | 443 |
| 56 – 66 – 1514 | 54 – 66 – 1514 | 162.243.6.223 | 49248 | 8080 |
|  |  | 162.243.5.116 | 49570 | 8080 |
|  |  | 162.243.3.11 | 50404 | 8080 |
|  |  | 134.209.212.4 | 55206 | 8080 |
|  |  |  |  |  |

## IP Addr

|  |
| --- |
| 134.209.212.xxx |
| 139.99.90.xxx |
| 157.245.218.xxx |
| 159.89.180.xxx |
| 162.243.x.xxx |
| 165.227.xxx.xxx |
| 51.79.xxx.xxx |

# Hotspot Shield

## WireGuard

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| Los Angles | 114-126-145-153-1450-1494 | 122-138-154-186-202-218-282-1354-1494 | 89.117.102.228  104.232.37.113 | 61474 | 5000 |
|  | 114-126-145-152-153-183-456-1450-1494 | 122-138-154-186-202-218-234-282-634-714-1354-1494 | 89.117.101.204  104.232.37.150 | 60734 | 5000 |
|  | 114-126-145-153-1318=1354-1450-1494 | **122-138-154-186-202-218-282-634-890-1494** | 146.70.143.218  192.119.160.27 | 58567 | 5000 |
|  | 114-126-145-153-850-1150-1318-1450-1494 | **122-138-154-186-634-1354** | 146.70.195.250  198.145.226.250 | 56619 | 5000 |
|  | 114-126-145-153-156=185-978-1150-1322-1450-1494 | **122-138-154-186-202-218-634-874-1354** | 89.116.253.28  89.116.253.29 | 58198 | 5000 |
| New York |  |  | 107.182.231.203  204.14.73.41 | 60713 | 5000 |
|  |  |  | 173.244.217.159  45.56.198.49 | 59073 | 5000 |
|  |  |  | 107.182.231.198  45.56.197.19 | 63624 | 5000 |
|  |  |  | 173.244.217.159  63.141.48.127 | 63677 | 5000 |
| Singapore |  |  | 92.119.178.186  103.105.164.40 | 52465 | 5000 |
| United Kingdom |  |  | 217.151.98.10  198.145.233.227 | 62909 | 5000 |
|  |  |  | 146.70.121.242  103.216.198.196 | 59880 | 5000 |
|  |  |  | 146.70.121.242  185.208.152.106 | 65354 | 5000 |
|  |  |  | 146.70.133.250  185.208.152.253 | 53153 | 5000 |

## IKEv2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| Los Angles | 126-142-398-1486 | 126-142-158-190-222-1358-1494 | 104.243.215.42  23.249.172.204 | 4500 | 4500 |
|  | 126-142-398-1486 | 126-142-158-190-222-1358-1494 | 104.243.215.42  23.249.172.204 | 4500 | 4500 |
|  | 126-142-398-1486 | 126-142-158-190-222-1358-1494 | 104.243.215.42  23.249.172.204 | 4500 | 4500 |
|  | 126-142-398-1486 | 126-142-158-190-222-1358-1494 | 104.243.215.42  23.249.172.204 | 4500 | 4500 |
|  |  |  |  |  |  |

## Hydra

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Server | Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| Los Angles | 60-102=107-142-154-157-511=520-1044-1279-1328-1514- | 54-103-134-152-172=190-261-310=326-343-620-669-1389- | 146.70.143.221  192.119.160.27 | 64500 | 443 |
|  | 60-102=107-142-154-157-511=520-1044-1279-1328-1514- | 54-103-134-152-172=190-261-310=326-343-620-669-1389- | 146.70.143.221  192.119.160.27 | 64500 | 443 |
|  | 60-102=107-142-154-157-511=520-1044-1279-1328-1514- | 54-103-134-152-172=190-261-310=326-343-620-669-1389- | 146.70.143.221  192.119.160.27 | 64500 | 443 |
|  | 60-102=107-142-154-157-511=520-1044-1279-1328-1514- | 54-103-134-152-172=190-261-310=326-343-620-669-1389- | 146.70.143.221  192.119.160.27 | 64500 | 443 |
|  | 60-102=107-142-154-157-511=520-1044-1279-1328-1514- | 54-103-134-152-172=190-261-310=326-343-620-669-1389- | 146.70.143.221  192.119.160.27 | 64500 | 443 |

## IP Addr

|  |  |
| --- | --- |
| 103.105.164.xxx | 198.145.2xx.xxx |
| 103.216.198.xxx | 204.14.xx.xxx |
| 104.232.xxx.xxx | 217.151.xxx.xxx |
| 107.182.231.xxx | 23.249.xxx.xxx |
| 146.70.1xx.xxx | 45.56.1xx.xxx |
| 173.244.217.xxx | 64.141.xx.xxx |
| 185.208.152.xxx | 89.11x.xxx.xxx |
| 192.119.160.xxx | 92.119.xxx |
| 20.190.147.xxx | 13.38.12x.xxx |
| 63.141.48.xx | 51.44.41.xxx |

# Cloudflare WARP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Packet Length | Request Packet Length | Src. IP | Dest Port | Src. Port No. |
| 74 – 114 – 1352 – 1354 | 74 – 114 – 126 – 155 – 161 – 651 | 162.159.192.2 | 59655 | 2408 |
| 74 – 114 – 1352 – 1354 | 74 – 114 – 126 – 155 – 161 – 651 | 162.159.192.2 | 64918 | 2408 |
| 74 – 114 – 1352 – 1354 | 74 – 114 – 126 – 155 – 161 – 651 | 162.159.192.2 | 55093 | 2408 |
| 74 – 114 – 1352 – 1354 | 74 – 114 – 126 – 155 – 161 – 651 | 162.159.192.2 | 52692 | 2408 |
| 74 – 114 – 1352 – 1354 | 74 – 114 – 126 – 155 – 161 – 651 | 162.159.192.2 | 61583 | 2408 |
|  |  |  |  |  |

# Identifying VPN

## Proton VPN

1. Packets are in length for request is 122 – 186 – 138 – 1514. And response 1482 – 122 – 1248 – 1306 – 1354 – 1402
2. Ports are always from 51820- 1224 – 88 – 433 – 4500 – 500 only.
3. No matter which website you access the packet size is always 1354 and some packets are 1482. Moreover, requests are majority 122 even on YouTube.
4. The Ips are always in the above-mentioned classes. We can program by subnetting.

## Hide.me

1. Port = 432 - 443 - 30xx - 4000x - 444
2. Packet size of requests is as 138 – 122 – 170 – 154 – 186 - 158 - 174 - 190 - 1486 - 126 - 54 - 66 and responses are as 138 – 1354 – 1466 - 1358 - 1344 - 1346 - 1458 - 56 - 1499 -1406 - 1362 - 1514

## Windscribe

1. Port = 443 – 80 – 53 – 123 – 1194 – 65142 – 54784 – 587 – 21 – 22 – 3306 – 8080 – 54783 – 1194 – 8443 and request are as 4500
2. Packet size of requests is as 122 - 1354 - 154 -138 -218 - 1494 - 118 - 130 - 1354 - 1514 - 1380 - 54 - 120 - 2809 + - 1527 - 66 - 148 - 90 - 1573 + - 106 and responses are as 1494 - 1352 - 1382 - 114 - 202 - 158 - 1354 - 1478 - 1514 - 4250 - 1380 - 4284 - 60 - 1384 - 1376 - 1238 - 1392 - 1344 - 1294 - 106

## Tunnel - Bear

1. Port = 51820 and requests are as 51820
2. The packet size of requests is as 122 - 138 - 154 - 186 -1354 and responses are as 114 - 123 - 1348 - 1352 - 1494.
3. There are many more IPs, but we can use just ports to identify the VPN.

## Turbo VPN

1. Port = **443** **- 8080**
2. Packet size of requests is as 56 - 66 - 1514 and responses are as 54 - 66 - 1514.

## Hotspot Shield

1. Port = 5000 - 4500 - 443
2. The packet size of requests is as 122 - 138 - 154 - 186 - 1354 - 1358 - 1494 - 669 - 1389 -54 - 103 and responses are as 114 - 126 - 145 - 1318 - 1450 - 1494 - 1486 - 398 -1044 - 1279 - 1328 - 1514.

## Cloudflare WARP

1. Port = 2408
2. IP = 162.159.192.2
3. The packet size of requests is 74 – 114 – 126 – 155 – 161 – 651 and responses are as 74 – 114 – 1352 – 1354.

# Testing of Results

## TEST 1

**0 – 25 Seconds**

Ip = 104.232.37.114 - 134

Port = 443

Request = 54 - 1490

Response = 60 - 215 - 1148 - 1279 - 1514

So, VPN is = Hotspot Shield

**25 – 75 Seconds**

Ip = 138.199.47.222

Port = 443

Request = 122 - 138 - 154 - 1354

Response = 114 - 126 - 1352 - 1450 - 1494

So, VPN is = Windscribe

**75 – 112 Seconds**

Ip = 51.79.240.230

Port = 443

Request = 54 - 66 - 1514

Response = 52 - 56 - 66 - 79 - 1514

So, VPN is = Turbo

**112 – 180 Seconds**

Ip = 45.77.238.74

Port = 51820 - 51820

Request = 122 - 138 - 154 - 186 - 202 -

Response = 114 -126 - 1352 - 1494

Sot, VPN is = Tunnel Bear

**193 – 375 Seconds**

Ip = 190.2.130.161

Port = 88

Request = 54 - 122 - 138 - 154 -

Response = 56 - 122 - 138 - 154 - 1306 - 1354 - 1402 - 1434 - 1482

So, VPN is = Proton VPN

**348 – 387 Seconds**

Ip = 72.10.160.130

Port = 443

Request = 54 - 124 - 144 - 145 - 160 - 1514

Response = 56 - 124 - 144 - 1296 - 1362 - 1364 - 1406

So, VPN is = Hide.me

## Test 2

**0 – 46 Seconds**

Ip = 185.191.206.51

Port = 4500 - 4500

Request = 126 - 142 - 158 - 206 - 1358

Response = 126 - 142 - 158 - 206- 1358 - 1374 - 1486

So, VPN is = Tunnel Bear

**46 – 89**

Ip = 84.17.43.227

Port = 443

Request = 122 - 138 - 154 - 186 - 1494

Response = 114 - 124 == 137 - 1352 - 1450 - 1494

So, VPN is = Windscribe

**89 – 115**

Ip = 146.70.25.221

Port = 443

Request = 54 - 74 - 66 - 1389 -

Response = 56 - 60 - 1514 - 1360 - 1328

So VPN is = Hotspot Shield

## TEST 3

**0 – 46 Seconds**

Ip = 84.17.43.227

Port = 443

Request = 122 - 138 - 154 - 186 - 1494

Response = 114 - 124 == 137 - 1352 - 1450 - 1494

So, VPN is = Windscribe

**46 – 75 Seconds**

Ip = 190.2.130.161

Port = 88

Request = 54 - 122 - 138 - 154 -

Response = 56 - 122 - 138 - 154 - 1306 - 1354 - 1402 - 1434 - 1482

So, VPN is = Proton VPN

**75 – 112 Seconds**

Ip = 84.17.43.227

Port = 443

Request = 122 - 138 - 154 - 186 - 1494

Response = 114 - 124 == 137 - 1352 - 1450 - 1494

So, VPN is = Windscribe