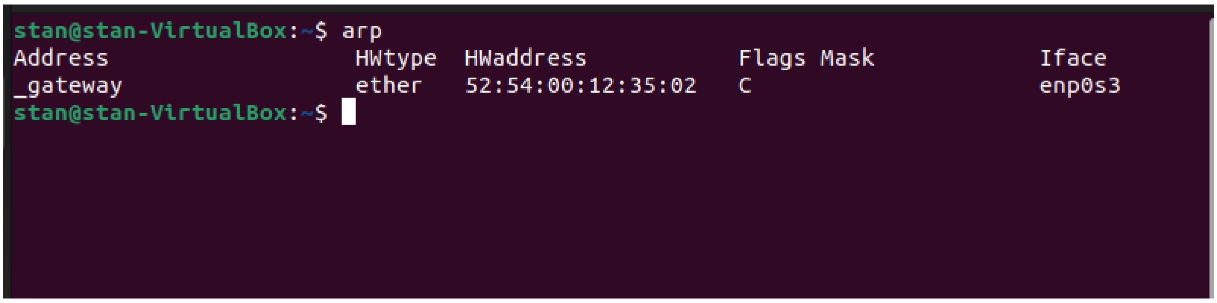
HOMEWORK FOR NETWORKING

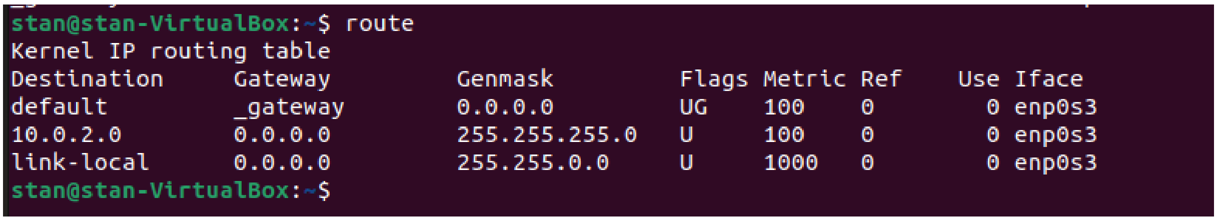
Exercise 1 – Basic network stuff.

Use the arp command and paste the output from the arp table on your system:



```
stan@stan-VirtualBox:~$ arp
Address                  HWtype  HWaddress           Flags Mask            Iface
_gateway                 ether   52:54:00:12:35:02   C                     enp0s3
stan@stan-VirtualBox:~$ 
```

Use the route command and paste the output from the routing table on your system:

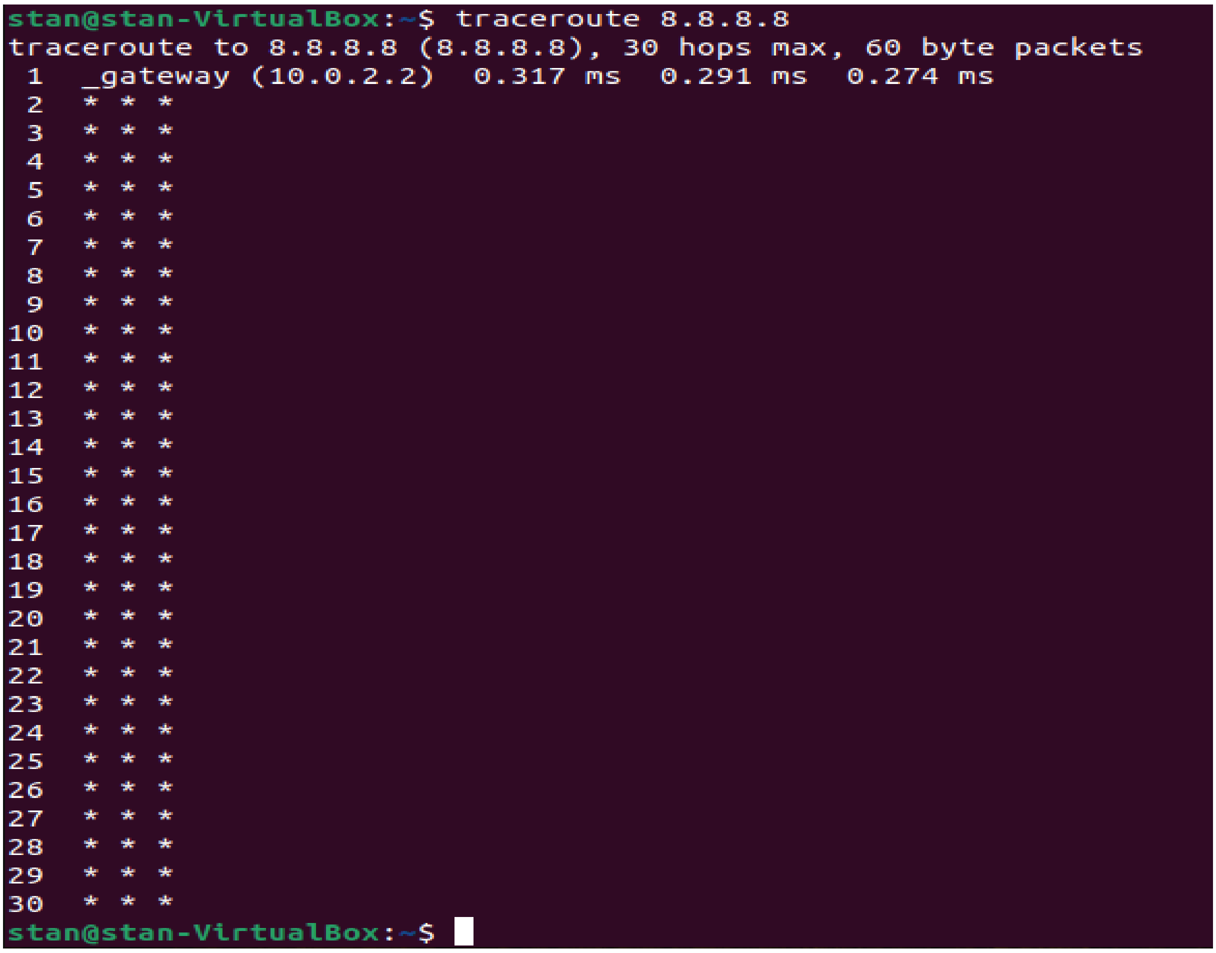


```
stan@stan-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         _gateway        0.0.0.0         UG    100    0        0 enp0s3
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 enp0s3
link-local      0.0.0.0         255.255.0.0     U     1000   0        0 enp0s3
stan@stan-VirtualBox:~$
```

Use the traceroute command on your system and observe the hops to Google’s DNS, 8.8.8.8.

The traceroute command is used to trace the path that packets take from your system to a destination IP address.

Paste the full output from the command bellow showing all the hops from your system to 8.8.8.8.



```
stan@stan-VirtualBox:~$ traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  0.317 ms  0.291 ms  0.274 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
stan@stan-VirtualBox:~$ 
```

Why would you need to use the ping command? Answer:

The ping command is used to test connectivity between your system and another device on the network. It sends packets to the specified device and measures the time it takes to receive a response. The ping command is useful for troubleshooting network connectivity issues and verifying that a device is reachable on the network.

Write down the TCP/UDP ports of the most commonly used services bellow in the form of TCP[PORT] or UDP[PORT].

- HTTP - TCP80
- SNMP - UDP161
- HTTPS - TCP443
- DNS client - UDP53
- DNS zone transfer - TCP53
- SMTP - TCP25
- SSH - TCP22
- FTP - TCP21
- Telnet - TCP23
- MSSQL - TCP1433
- MySQL - TCP3306
- PostgreSQL - TCP5432
- RDP (Remote Desktop Protocol) - TCP3389
- NTP - UDP123
- NFS - TCP2049 (UDP can also be used for NFS)

Exercise 2 – TCP/IP Basics.

For each of the packet locations shown, 1 to 4 write down the source and

destination MAC addresses of the packet as it travels across the network interfaces.

1. The laptop initiates communication with the web server and prepares a packet. What would the package look like at this stage?

- SRC IP : 100.20.30.10/24
- DST IP : 80.70.60.100/24
- SRC MAC : AA-AA-AA:33:33:33
- DST MAC : BB:BB:BB:11:11:01

2. RTR1 receives the packet on its IF-LAN interface, prepares it accordingly and forwards it out its IFWAN. What would the packet look like at this stage?

- SRC IP : 100.20.30.10/24

- DST IP : 80.70.60.100/24
- SRC MAC : BB:BB:BB:11:11:01
- DST MAC : BB:BB:BB:11:11:02

3. RTR2 receives the packet on its IF-WAN interface, prepares it accordingly and forwards it out via IFLAN. What would the packet look like at this stage?

- SRC IP : 100.20.30.10/24
- DST IP : 80.70.60.100/24
- SRC MAC : CC:CC:CC:22:22:02
- DST MAC : CC:CC:CC:22:22:01

4. The web server receives the packet and prepares a response packet back. What would the packet

look like at this stage?

- SRC IP : 80.70.60.100/24
- DST IP : 100.20.30.10/24:
- SRC MAC : DD:DD:DD:77:77:77
- DST MAC : CC:CC:CC:22:22:02

The most probable transport layer protocol to be used is TCP.

Since we are talking about web traffic (www), the most probable transport layer protocol that will be used is TCP.

When the laptop sends the packet, we can expect to see a random high-numbered source port

50000 and destination port 80 (HTTP) or 443(HTTPS).

When the web server sends a response packet back, we can expect to see source port 80 (HTTP) or 443(HTTPS) and a random high-numbered destination port.

There are four broadcast domains in the exhibit shown: one for RTR1's IF-LAN interface and one for RTR2's IF-LAN interface and in between the routers.

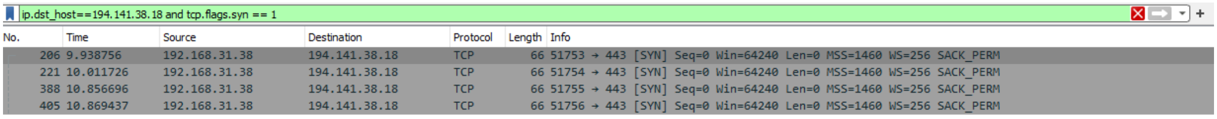
Exercise 3 – Traffic analysis and identifying the OSI layers of the network packets.

Analyze the TCP's three-way handshake and using screenshots from the Wireshark window answer the questions bellow:

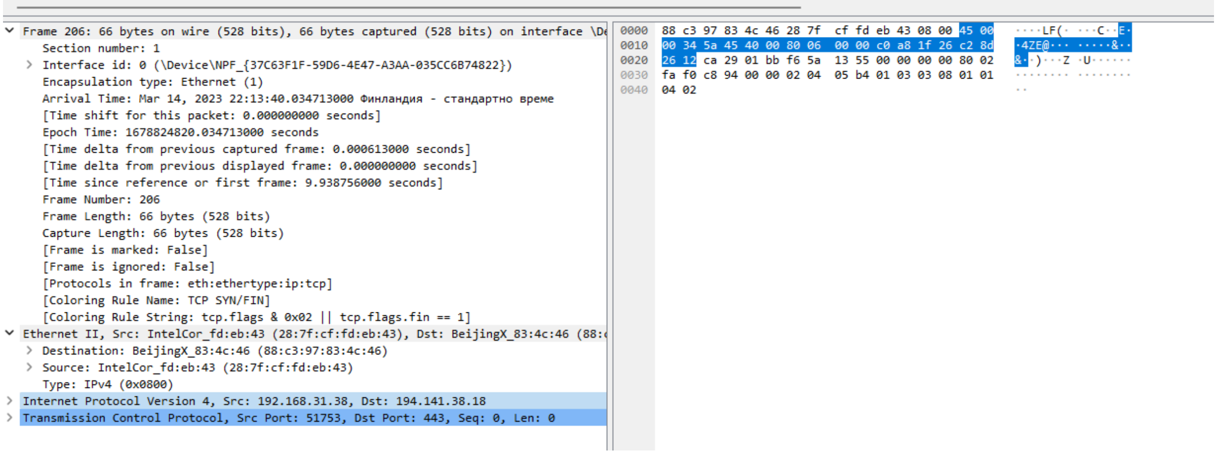
1. What is the source IP (of the initiating host): 192.168.31.38

2. What is the destination IP? (target website): 194.141.38.18

Identify the Network Interface (Layer 1 & 2) section of the SYN packet and paste a screenshot from it:



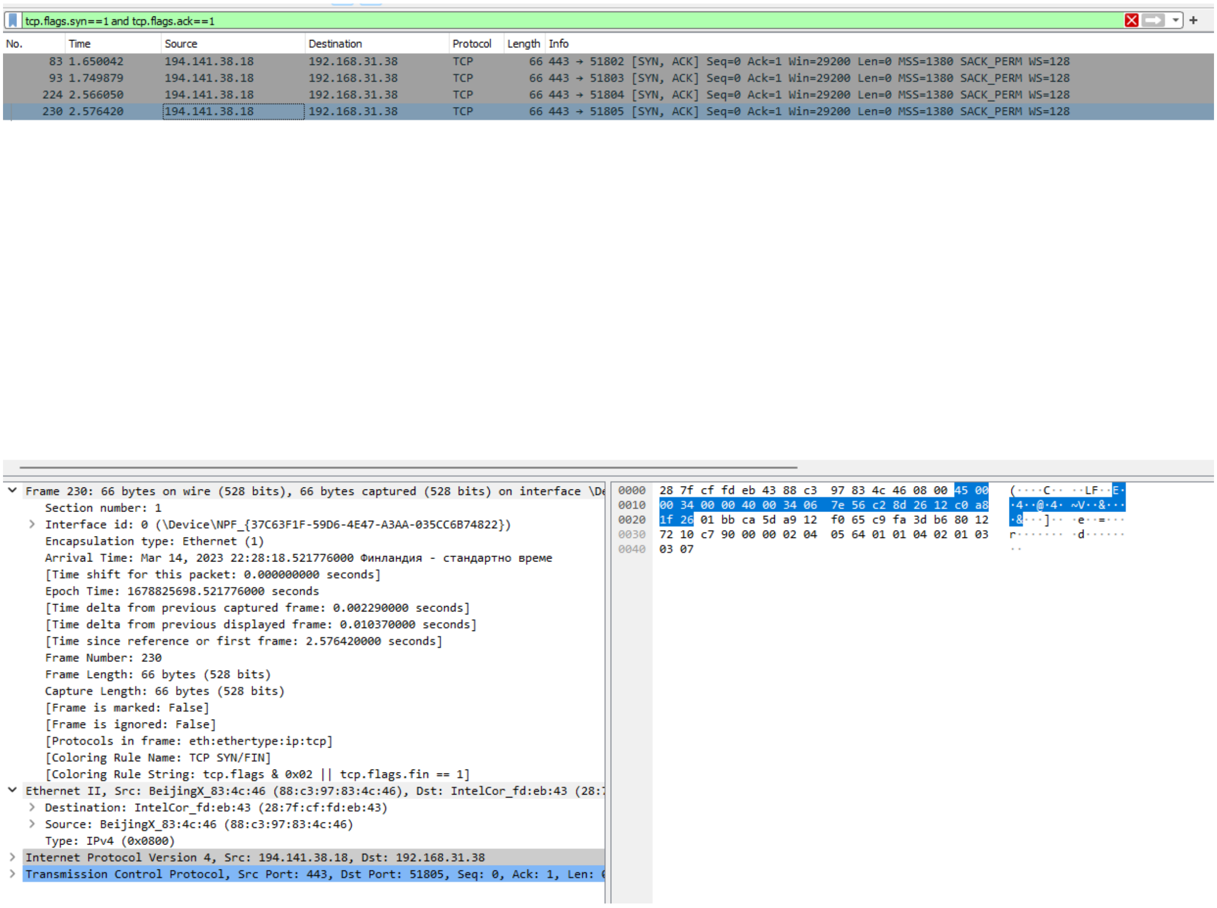
```
ip.dst_host==194.141.38.18 and tcp.flags.syn == 1

No.       Time          Source            Destination       Protocol  Length Info
    206 9.938756       192.168.31.38     194.141.38.18     TCP          66 51753 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
    221 10.011726      192.168.31.38     194.141.38.18     TCP          66 51754 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
    388 10.856696      192.168.31.38     194.141.38.18     TCP          66 51755 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
    405 10.869437      192.168.31.38     194.141.38.18     TCP          66 51756 → 443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
```



```
v Frame 206: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface \De
    Section number: 1
  > Interface id: 0 (\Device\NPF_{37C63F1F-59D6-4E47-A3AA-035CC6B74822})
    Encapsulation type: Ethernet (1)
    Arrival Time: Mar 14, 2023 22:13:40.034713000 Финландия - стандартно време
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1678824820.034713000 seconds
    [Time delta from previous captured frame: 0.000613000 seconds]
    [Time delta from previous displayed frame: 0.000000000 seconds]
    [Time since reference or first frame: 9.938756000 seconds]
    Frame Number: 206
    Frame Length: 66 bytes (528 bits)
    Capture Length: 66 bytes (528 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ethertype:ip:tcp]
    [Coloring Rule Name: TCP SYN/FIN]
    [Coloring Rule String: tcp.flags & 0x02 || tcp.flags.fin == 1]
v Ethernet II, Src: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43), Dst: BeijingX_83:4c:46 (88:
  > Destination: BeijingX_83:4c:46 (88:c3:97:83:4c:46)
  > Source: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43)
    Type: IPv4 (0x0800)
> Internet Protocol Version 4, Src: 192.168.31.38, Dst: 194.141.38.18
> Transmission Control Protocol, Src Port: 51753, Dst Port: 443, Seq: 0, Len: 0
```

```
0000  88 c3 97 83 4c 46 28 7f  cf fd eb 43 08 00 45 00   ····LF(· ···C··E·
0010  00 34 5a 45 40 00 80 06  00 00 c0 a8 1f 26 c2 8d   ·4ZE@··· ·····&··
0020  26 12 ca 29 01 bb f6 5a  13 55 00 00 00 00 80 02   &··)···Z ·U······
0030  fa f0 c8 94 00 00 02 04  05 b4 01 03 03 08 01 01   ········ ········
0040  04 02                                              ··
```

Identify the Network Layer 3 section of the SYN/ACK packet and paste a screenshot from it:



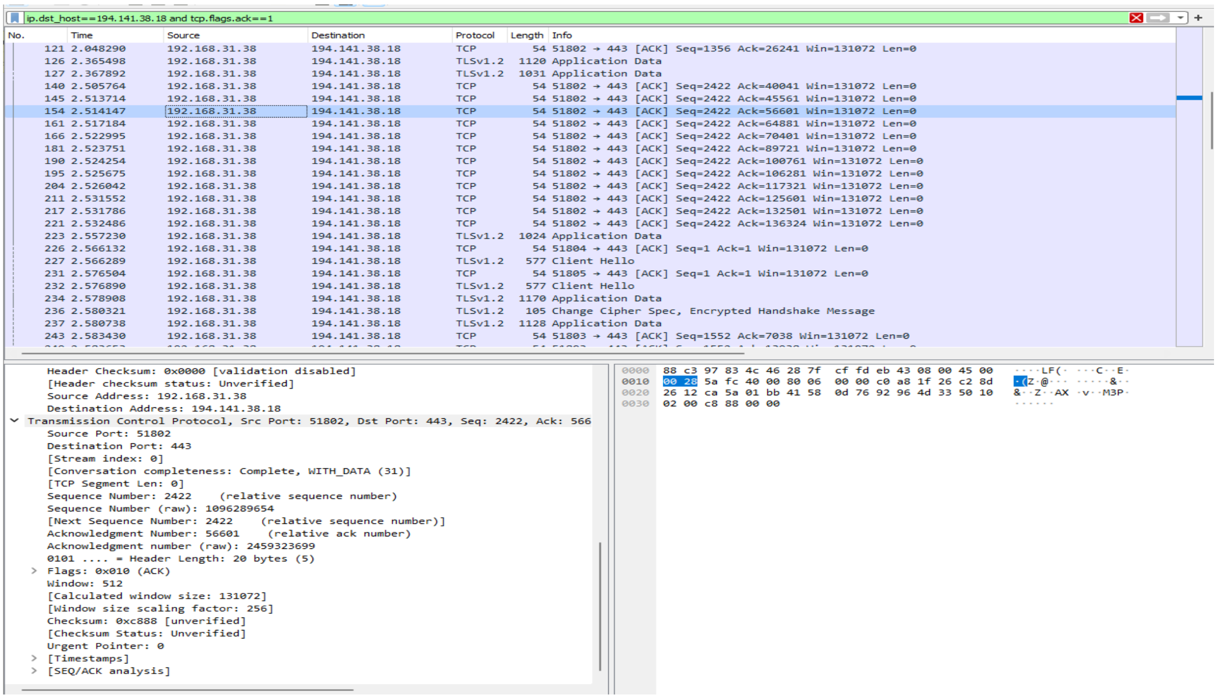
```
tcp.flags.syn==1 and tcp.flags.ack==1
```

```
No.   Time       Source          Destination     Protocol  Length Info
   83 1.650042   194.141.38.18   192.168.31.38   TCP         66 443 → 51802 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1380 SACK_PERM WS=128
   93 1.749879   194.141.38.18   192.168.31.38   TCP         66 443 → 51803 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1380 SACK_PERM WS=128
  224 2.566050   194.141.38.18   192.168.31.38   TCP         66 443 → 51804 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1380 SACK_PERM WS=128
  230 2.576420   194.141.38.18   192.168.31.38   TCP         66 443 → 51805 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1380 SACK_PERM WS=128
```

```
Frame 230: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface \De
    Section number: 1
  > Interface id: 0 (\Device\NPF_{37C63F1F-59D6-4E47-A3AA-035CC6B74822})
    Encapsulation type: Ethernet (1)
    Arrival Time: Mar 14, 2023 22:28:18.521776000 Финландия - стандартно време
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1678825698.521776000 seconds
    [Time delta from previous captured frame: 0.002290000 seconds]
    [Time delta from previous displayed frame: 0.010370000 seconds]
    [Time since reference or first frame: 2.576420000 seconds]
    Frame Number: 230
    Frame Length: 66 bytes (528 bits)
    Capture Length: 66 bytes (528 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:ethertype:ip:tcp]
    [Coloring Rule Name: TCP SYN/FIN]
    [Coloring Rule String: tcp.flags & 0x02 || tcp.flags.fin == 1]
Ethernet II, Src: BeijingX_83:4c:46 (88:c3:97:83:4c:46), Dst: IntelCor_fd:eb:43 (28:
  > Destination: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43)
  > Source: BeijingX_83:4c:46 (88:c3:97:83:4c:46)
    Type: IPv4 (0x0800)
> Internet Protocol Version 4, Src: 194.141.38.18, Dst: 192.168.31.38
> Transmission Control Protocol, Src Port: 443, Dst Port: 51805, Seq: 0, Ack: 1, Len:
```

```
0000  28 7f cf fd eb 43 88 c3  97 83 4c 46 08 00 45 00   (····C·· ··LF··E·
0010  00 34 00 00 40 00 34 06  7e 56 c2 8d 26 12 c0 a8   ·4··@·4· ~V··&···
0020  1f 26 01 bb ca 5d a9 12  f0 65 c9 fa 3d b6 80 12   ·&···]·· ·e··=···
0030  72 10 c7 90 00 00 02 04  05 64 01 01 04 02 01 03   r······· ·d······
0040  03 07                                              ··
```

Identify the Transport Layer 4 section of the ACK packet and paste a screenshot from it bellow:



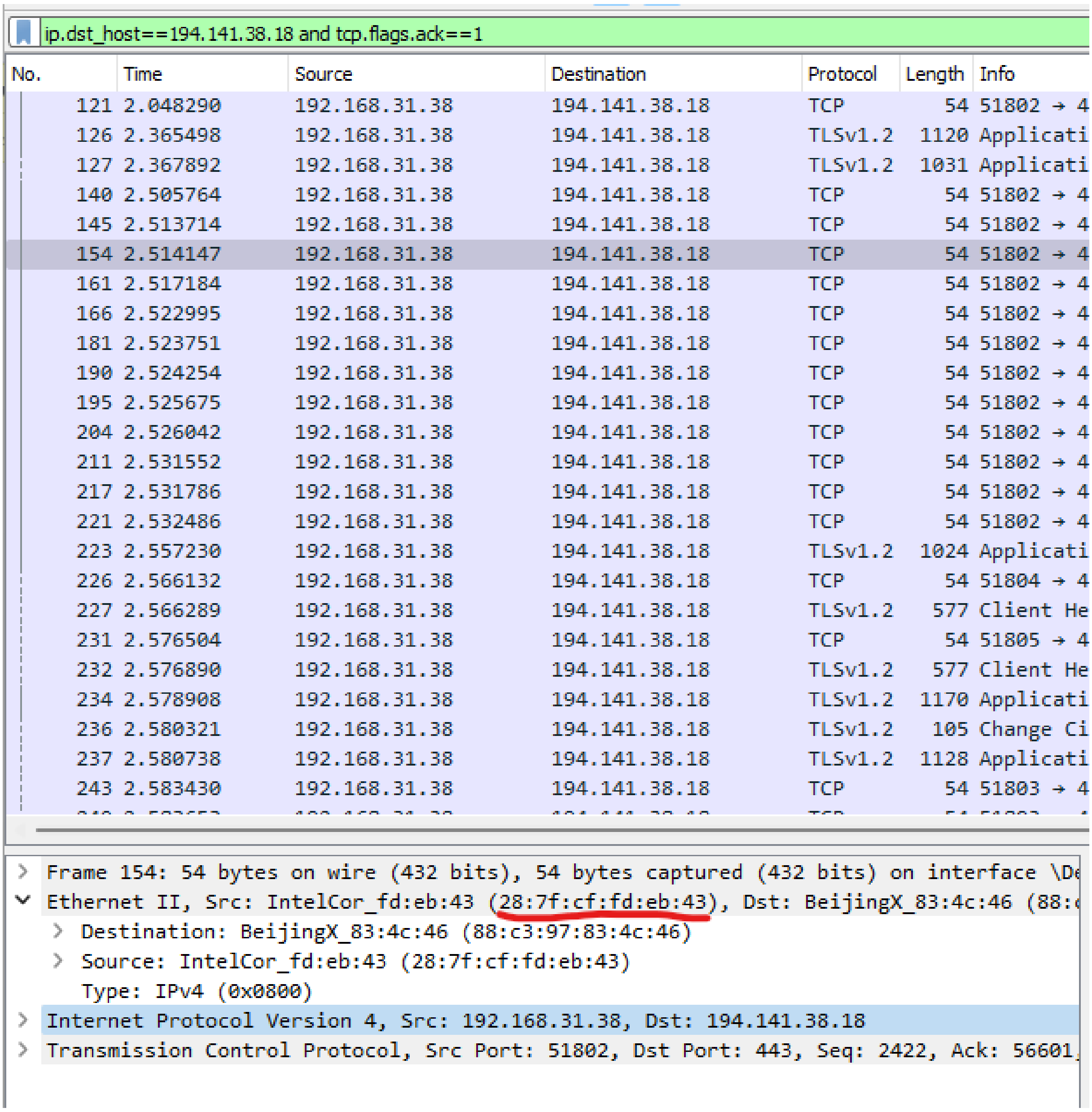
```
ip.dst_host==194.141.38.18 and tcp.flags.ack==1
```

```
No.   Time       Source          Destination     Protocol  Length Info
  121 2.048290   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=1356 Ack=26241 Win=131072 Len=0
  126 2.365498   192.168.31.38   194.141.38.18   TLSv1.2   1120 Application Data
  127 2.367892   192.168.31.38   194.141.38.18   TLSv1.2   1031 Application Data
  140 2.505764   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=40041 Win=131072 Len=0
  145 2.513714   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=45561 Win=131072 Len=0
  154 2.514147   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=56601 Win=131072 Len=0
  161 2.517184   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=64881 Win=131072 Len=0
  166 2.522995   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=70401 Win=131072 Len=0
  181 2.523751   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=89721 Win=131072 Len=0
  190 2.524254   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=100761 Win=131072 Len=0
  195 2.525675   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=106281 Win=131072 Len=0
  204 2.526042   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=117321 Win=131072 Len=0
  211 2.531552   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=125601 Win=131072 Len=0
  217 2.531786   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=132501 Win=131072 Len=0
  221 2.532486   192.168.31.38   194.141.38.18   TCP         54 51802 → 443 [ACK] Seq=2422 Ack=136324 Win=131072 Len=0
  223 2.557230   192.168.31.38   194.141.38.18   TLSv1.2   1024 Application Data
  226 2.566132   192.168.31.38   194.141.38.18   TCP         54 51804 → 443 [ACK] Seq=1 Ack=1 Win=131072 Len=0
  227 2.566289   192.168.31.38   194.141.38.18   TLSv1.2    577 Client Hello
  231 2.576504   192.168.31.38   194.141.38.18   TCP         54 51805 → 443 [ACK] Seq=1 Ack=1 Win=131072 Len=0
  232 2.576890   192.168.31.38   194.141.38.18   TLSv1.2    577 Client Hello
  234 2.578908   192.168.31.38   194.141.38.18   TLSv1.2   1170 Application Data
  236 2.580321   192.168.31.38   194.141.38.18   TLSv1.2    105 Change Cipher Spec, Encrypted Handshake Message
  237 2.580738   192.168.31.38   194.141.38.18   TLSv1.2   1128 Application Data
  243 2.583430   192.168.31.38   194.141.38.18   TCP         54 51803 → 443 [ACK] Seq=1552 Ack=7038 Win=131072 Len=0
```

```
    Header Checksum: 0x0000 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 192.168.31.38
    Destination Address: 194.141.38.18
Transmission Control Protocol, Src Port: 51802, Dst Port: 443, Seq: 2422, Ack: 566
    Source Port: 51802
    Destination Port: 443
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 0]
    Sequence Number: 2422    (relative sequence number)
    Sequence Number (raw): 1096289654
    [Next Sequence Number: 2422    (relative sequence number)]
    Acknowledgment Number: 56601    (relative ack number)
    Acknowledgment number (raw): 2459323699
    0101 .... = Header Length: 20 bytes (5)
  > Flags: 0x010 (ACK)
    Window: 512
    [Calculated window size: 131072]
    [Window size scaling factor: 256]
    Checksum: 0xc888 [unverified]
    [Checksum Status: Unverified]
    Urgent Pointer: 0
  > [Timestamps]
  > [SEQ/ACK analysis]
```

```
0000  88 c3 97 83 4c 46 28 7f  cf fd eb 43 08 00 45 00   ····LF(· ···C··E·
0010  00 28 5a fc 40 00 80 06  00 00 c0 a8 1f 26 c2 8d   ·(Z·@··· ·····&··
0020  26 12 ca 5a 01 bb 41 58  0d 76 92 96 4d 33 50 10   &··Z··AX ·v··M3P·
0030  02 00 c8 88 00 00                                  ······
```

Look closely at the L2 section of the three-way handshake packet details. Each of them shows the source and destination MAC address of the packets.

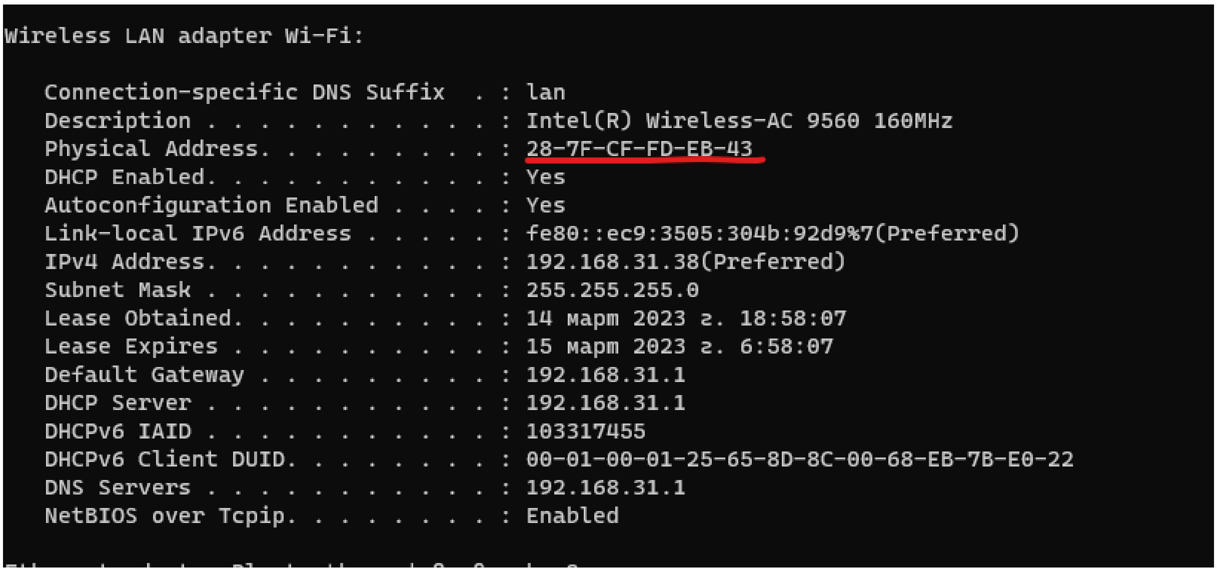


ip.dst_host==194.141.38.18 and tcp.flags.ack==1

No.	Time	Source	Destination	Protocol	Length	Info
121	2.048290	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
126	2.365498	192.168.31.38	194.141.38.18	TLSv1.2	1120	Applicati
127	2.367892	192.168.31.38	194.141.38.18	TLSv1.2	1031	Applicati
140	2.505764	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
145	2.513714	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
154	2.514147	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
161	2.517184	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
166	2.522995	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
181	2.523751	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
190	2.524254	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
195	2.525675	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
204	2.526042	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
211	2.531552	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
217	2.531786	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
221	2.532486	192.168.31.38	194.141.38.18	TCP	54	51802 → 4
223	2.557230	192.168.31.38	194.141.38.18	TLSv1.2	1024	Applicati
226	2.566132	192.168.31.38	194.141.38.18	TCP	54	51804 → 4
227	2.566289	192.168.31.38	194.141.38.18	TLSv1.2	577	Client He
231	2.576504	192.168.31.38	194.141.38.18	TCP	54	51805 → 4
232	2.576890	192.168.31.38	194.141.38.18	TLSv1.2	577	Client He
234	2.578908	192.168.31.38	194.141.38.18	TLSv1.2	1170	Applicati
236	2.580321	192.168.31.38	194.141.38.18	TLSv1.2	105	Change Ci
237	2.580738	192.168.31.38	194.141.38.18	TLSv1.2	1128	Applicati
243	2.583430	192.168.31.38	194.141.38.18	TCP	54	51803 → 4

```
> Frame 154: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \De
v Ethernet II, Src: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43), Dst: BeijingX_83:4c:46 (88:c
   > Destination: BeijingX_83:4c:46 (88:c3:97:83:4c:46)
   > Source: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43)
     Type: IPv4 (0x0800)
> Internet Protocol Version 4, Src: 192.168.31.38, Dst: 194.141.38.18
> Transmission Control Protocol, Src Port: 51802, Dst Port: 443, Seq: 2422, Ack: 56601,
```

Who is the owner of the destination MAC address of the SYN packet?



```
Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : lan
   Description . . . . . . . . . . . : Intel(R) Wireless-AC 9560 160MHz
   Physical Address. . . . . . . . . : 28-7F-CF-FD-EB-43
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::ec9:3505:304b:92d9%7(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.31.38(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : 14 мapm 2023 г. 18:58:07
   Lease Expires . . . . . . . . . . : 15 мapm 2023 г. 6:58:07
   Default Gateway . . . . . . . . . : 192.168.31.1
   DHCP Server . . . . . . . . . . . : 192.168.31.1
   DHCPv6 IAID . . . . . . . . . . . : 103317455
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-25-65-8D-8C-00-68-EB-7B-E0-22
   DNS Servers . . . . . . . . . . . : 192.168.31.1
   NetBIOS over Tcpip. . . . . . . . : Enabled
```

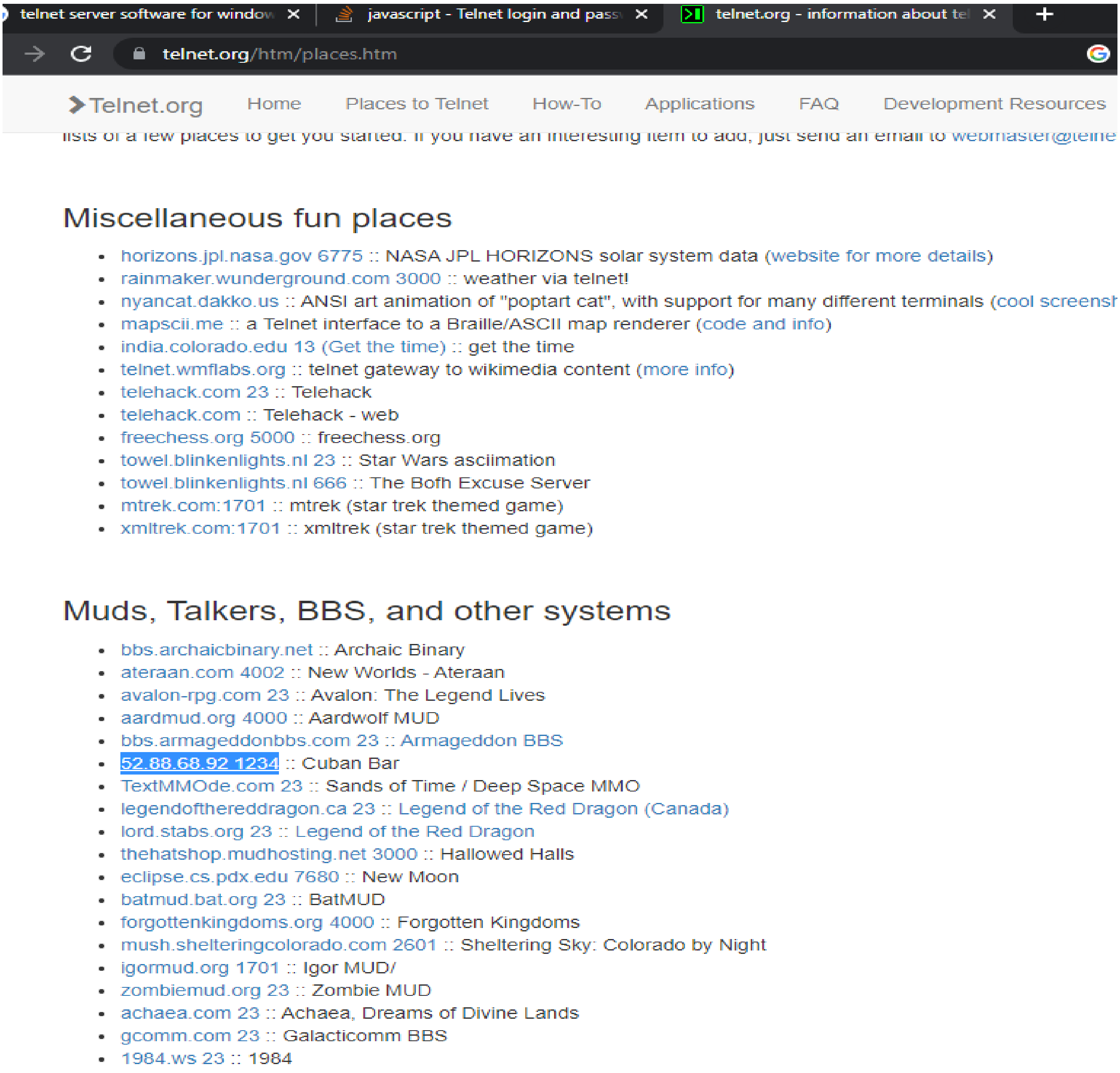
Exercise 4 – Hacking mockup (for Bonus points).

Use Wireshark to capture the packet's application layer data and discover the implications

of using unencrypted communication over a network.

As a proof of competition for this exercise paste in bellow a screenshot of the application layer data containing visible username and password.

Using TELNET:



telnet server software for window ✕
javascript - Telnet login and pass ✕
telnet.org - information about tel ✕
telnet.org/htm/places.htm
Telnet.org
Home
Places to Telnet
How-To
Applications
FAQ
Development Resources

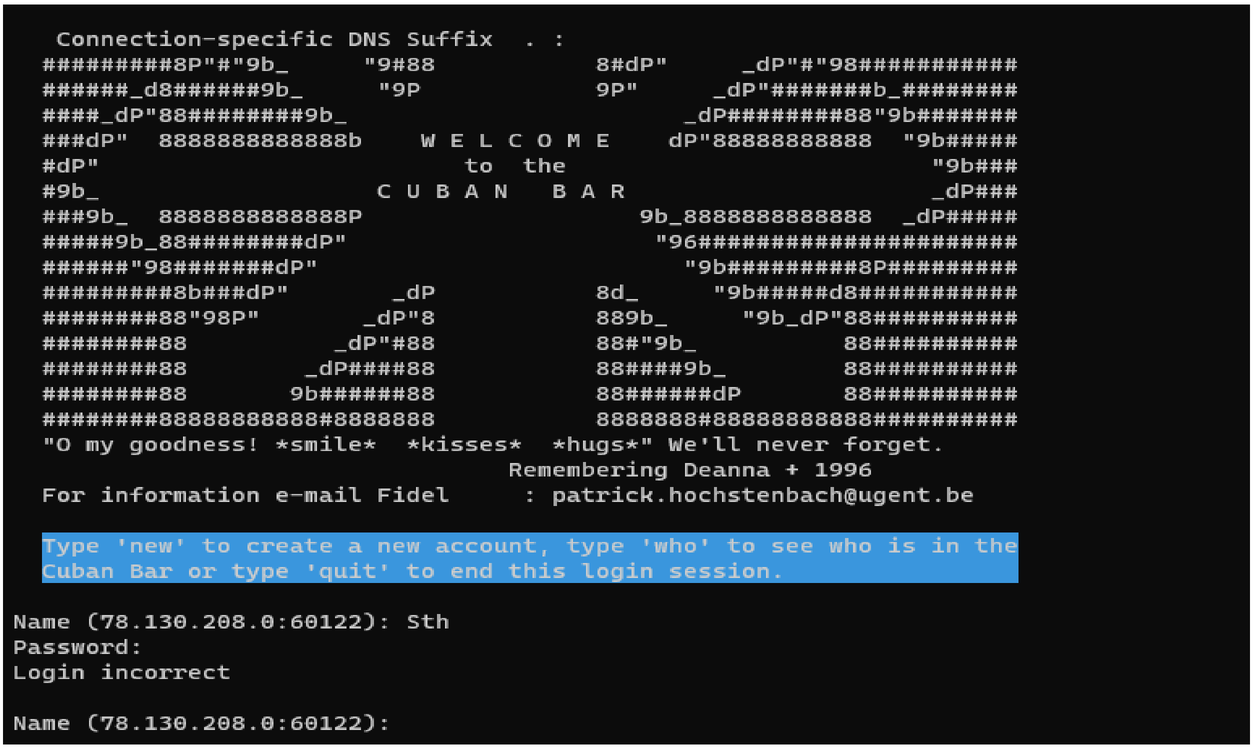
lists of a few places to get you started. If you have an interesting item to add, just send an email to webmaster@telne

Miscellaneous fun places

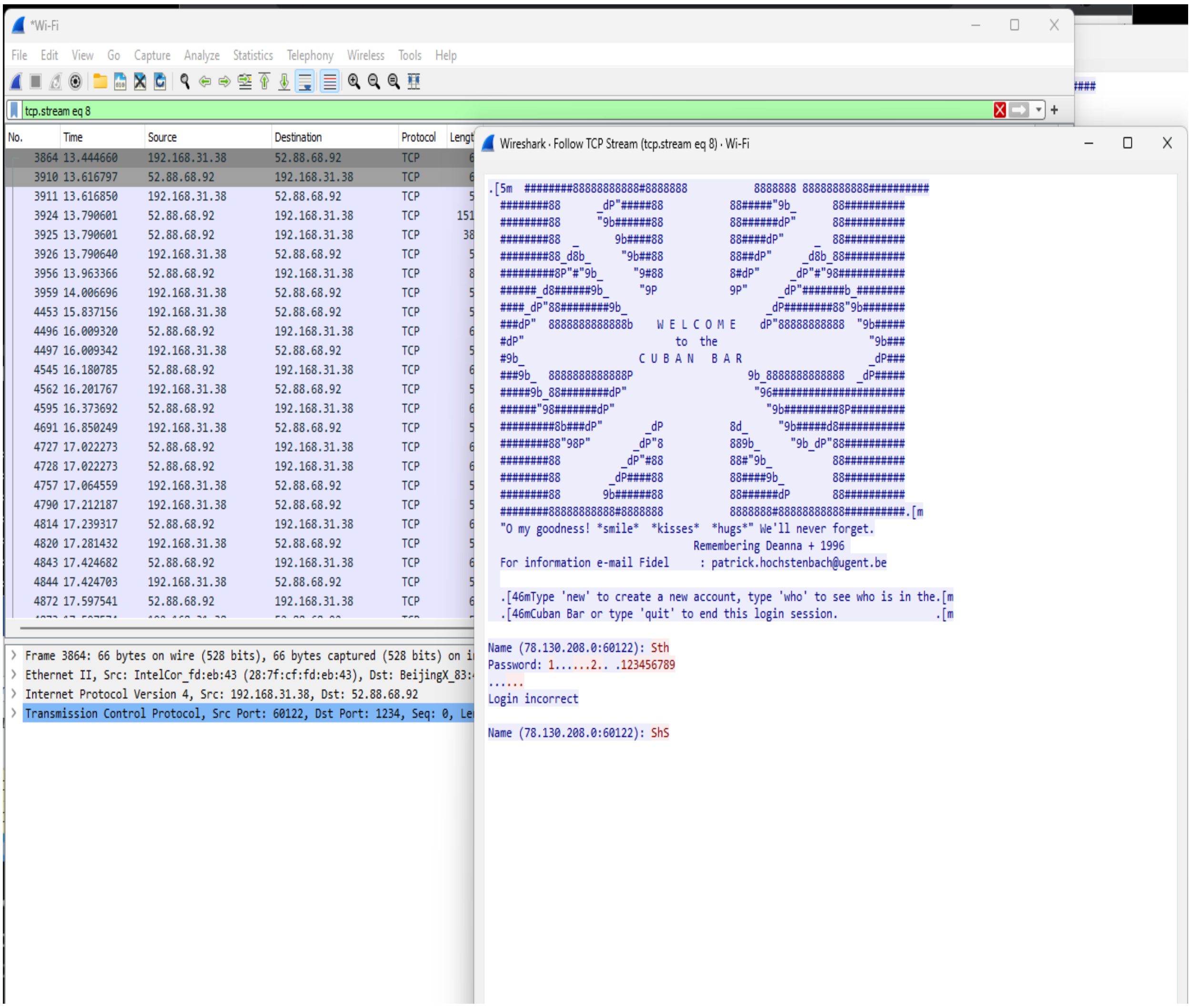
- horizons.jpl.nasa.gov 6775 :: NASA JPL HORIZONS solar system data (website for more details)
- rainmaker.wunderground.com 3000 :: weather via telnet!
- nyancat.dakko.us :: ANSI art animation of "poptart cat", with support for many different terminals (cool screensh
- mapscii.me :: a Telnet interface to a Braille/ASCII map renderer (code and info)
- india.colorado.edu 13 (Get the time) :: get the time
- telnet.wmflabs.org :: telnet gateway to wikimedia content (more info)
- telehack.com 23 :: Telehack
- telehack.com :: Telehack - web
- freechess.org 5000 :: freechess.org
- towel.blinkenlights.nl 23 :: Star Wars asciimation
- towel.blinkenlights.nl 666 :: The Bofh Excuse Server
- mtrek.com:1701 :: mtrek (star trek themed game)
- xmltrek.com:1701 :: xmltrek (star trek themed game)

Muds, Talkers, BBS, and other systems

- bbs.archaicbinary.net :: Archaic Binary
- ateraan.com 4002 :: New Worlds - Ateraan
- avalon-rpg.com 23 :: Avalon: The Legend Lives
- aardmud.org 4000 :: Aardwolf MUD
- bbs.armageddonbbs.com 23 :: Armageddon BBS
- 52.88.68.92 1234 :: Cuban Bar
- TextMMOde.com 23 :: Sands of Time / Deep Space MMO
- legendofthereddragon.ca 23 :: Legend of the Red Dragon (Canada)
- lord.stabs.org 23 :: Legend of the Red Dragon
- thehatshop.mudhosting.net 3000 :: Hallowed Halls
- eclipse.cs.pdx.edu 7680 :: New Moon
- batmud.bat.org 23 :: BatMUD
- forgottenkingdoms.org 4000 :: Forgotten Kingdoms
- mush.shelteringcolorado.com 2601 :: Sheltering Sky: Colorado by Night
- igormud.org 1701 :: Igor MUD/
- zombiemud.org 23 :: Zombie MUD
- achaea.com 23 :: Achaea, Dreams of Divine Lands
- gcomm.com 23 :: Galacticomm BBS
- 1984.ws 23 :: 1984



```
   Connection-specific DNS Suffix  . :
  #########8P"#"9b_     "9#88          8#dP"      _dP"#"98###########
  ######_d8######9b_     "9P           9P"      _dP"#######b_########
  ####_dP"88########9b_                       _dP########88"9b#######
  ###dP"  888888888888b    W E L C O M E    dP"8888888888  "9b#####
  #dP"                        to  the                         "9b###
  #9b_                   C U B A N   B A R                    _dP###
  ###9b_  888888888888P                    9b_888888888888  _dP#####
  #####9b_88########dP"                     "96####################
  ######"98#######dP"                         "9b########8P#########
  #########8b###dP"        _dP          8d_     "9b#####d8##########
  ########88"98P"        _dP"8          889b_     "9b_dP"88#########
  #########88          _dP"#88          88#"9b_          88#########
  #########88        _dP####88          88####9b_        88#########
  #########88       9b######88          88######dP       88#########
  #######88888888888#8888888          8888888#888888888888#########
  "O my goodness! *smile*  *kisses*  *hugs*" We'll never forget.
                                Remembering Deanna + 1996
  For information e-mail Fidel     : patrick.hochstenbach@ugent.be

  Type 'new' to create a new account, type 'who' to see who is in the
  Cuban Bar or type 'quit' to end this login session.

Name (78.130.208.0:60122): Sth
Password:
Login incorrect

Name (78.130.208.0:60122):
```



*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

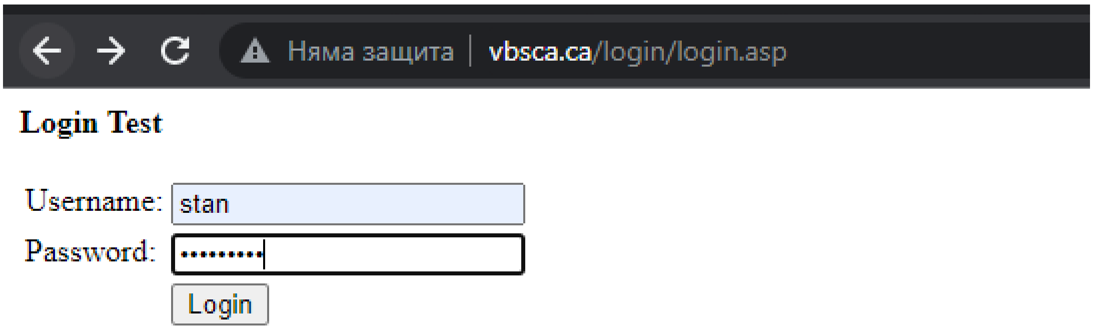
tcp.stream eq 8

```
No.   Time       Source          Destination     Protocol Lengt
 3864 13.444660  192.168.31.38   52.88.68.92     TCP      6
 3910 13.616797  52.88.68.92     192.168.31.38   TCP      6
 3911 13.616850  192.168.31.38   52.88.68.92     TCP      5
 3924 13.790601  52.88.68.92     192.168.31.38   TCP      151
 3925 13.790601  52.88.68.92     192.168.31.38   TCP      38
 3926 13.790640  192.168.31.38   52.88.68.92     TCP      5
 3956 13.963366  52.88.68.92     192.168.31.38   TCP      8
 3959 14.006696  192.168.31.38   52.88.68.92     TCP      5
 4453 15.837156  192.168.31.38   52.88.68.92     TCP      5
 4496 16.009320  52.88.68.92     192.168.31.38   TCP      6
 4497 16.009342  192.168.31.38   52.88.68.92     TCP      5
 4545 16.180785  52.88.68.92     192.168.31.38   TCP      6
 4562 16.201767  192.168.31.38   52.88.68.92     TCP      5
 4595 16.373692  52.88.68.92     192.168.31.38   TCP      6
 4691 16.850249  192.168.31.38   52.88.68.92     TCP      5
 4727 17.022273  52.88.68.92     192.168.31.38   TCP      6
 4728 17.022273  52.88.68.92     192.168.31.38   TCP      6
 4757 17.064559  192.168.31.38   52.88.68.92     TCP      5
 4790 17.212187  192.168.31.38   52.88.68.92     TCP      5
 4814 17.239317  52.88.68.92     192.168.31.38   TCP      6
 4820 17.281432  192.168.31.38   52.88.68.92     TCP      5
 4843 17.424682  52.88.68.92     192.168.31.38   TCP      6
 4844 17.424703  192.168.31.38   52.88.68.92     TCP      5
 4872 17.597541  52.88.68.92     192.168.31.38   TCP      6

> Frame 3864: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on i
> Ethernet II, Src: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43), Dst: BeijingX_83:
> Internet Protocol Version 4, Src: 192.168.31.38, Dst: 52.88.68.92
> Transmission Control Protocol, Src Port: 60122, Dst Port: 1234, Seq: 0, Le
```

Wireshark · Follow TCP Stream (tcp.stream eq 8) · Wi-Fi

```
.[5m  #######8888888888#8888888          8888888 8888888888##########
  #########88      _dP"#####88          88#####"9b_      88#########
  #########88      "9b######88          88######dP"      88#########
  #########88  _      9b####88          88####dP"    _   88#########
  #########88_d8b_     "9b##88          88##dP"     _d8b_88#########
  #########8P"#"9b_     "9#88          8#dP"      _dP"#"98###########
  ######_d8######9b_     "9P           9P"      _dP"#######b_########
  ####_dP"88########9b_                       _dP########88"9b#######
  ###dP"  888888888888b    W E L C O M E    dP"8888888888  "9b#####
  #dP"                        to  the                         "9b###
  #9b_                   C U B A N   B A R                    _dP###
  ###9b_  888888888888P                    9b_888888888888  _dP#####
  #####9b_88########dP"                     "96####################
  ######"98#######dP"                         "9b########8P#########
  #########8b###dP"        _dP          8d_     "9b#####d8##########
  ########88"98P"        _dP"8          889b_     "9b_dP"88#########
  #########88          _dP"#88          88#"9b_          88#########
  #########88        _dP####88          88####9b_        88#########
  #########88       9b######88          88######dP       88#########
  #######8888888888#8888888          8888888#8888888888##########.[m
  "O my goodness! *smile*  *kisses*  *hugs*" We'll never forget.
                                Remembering Deanna + 1996
  For information e-mail Fidel     : patrick.hochstenbach@ugent.be

  .[46mType 'new' to create a new account, type 'who' to see who is in the.[m
  .[46mCuban Bar or type 'quit' to end this login session.               .[m

Name (78.130.208.0:60122): Sth
Password: 1......2.. .123456789
......
Login incorrect

Name (78.130.208.0:60122): ShS
```

Using HTTP:

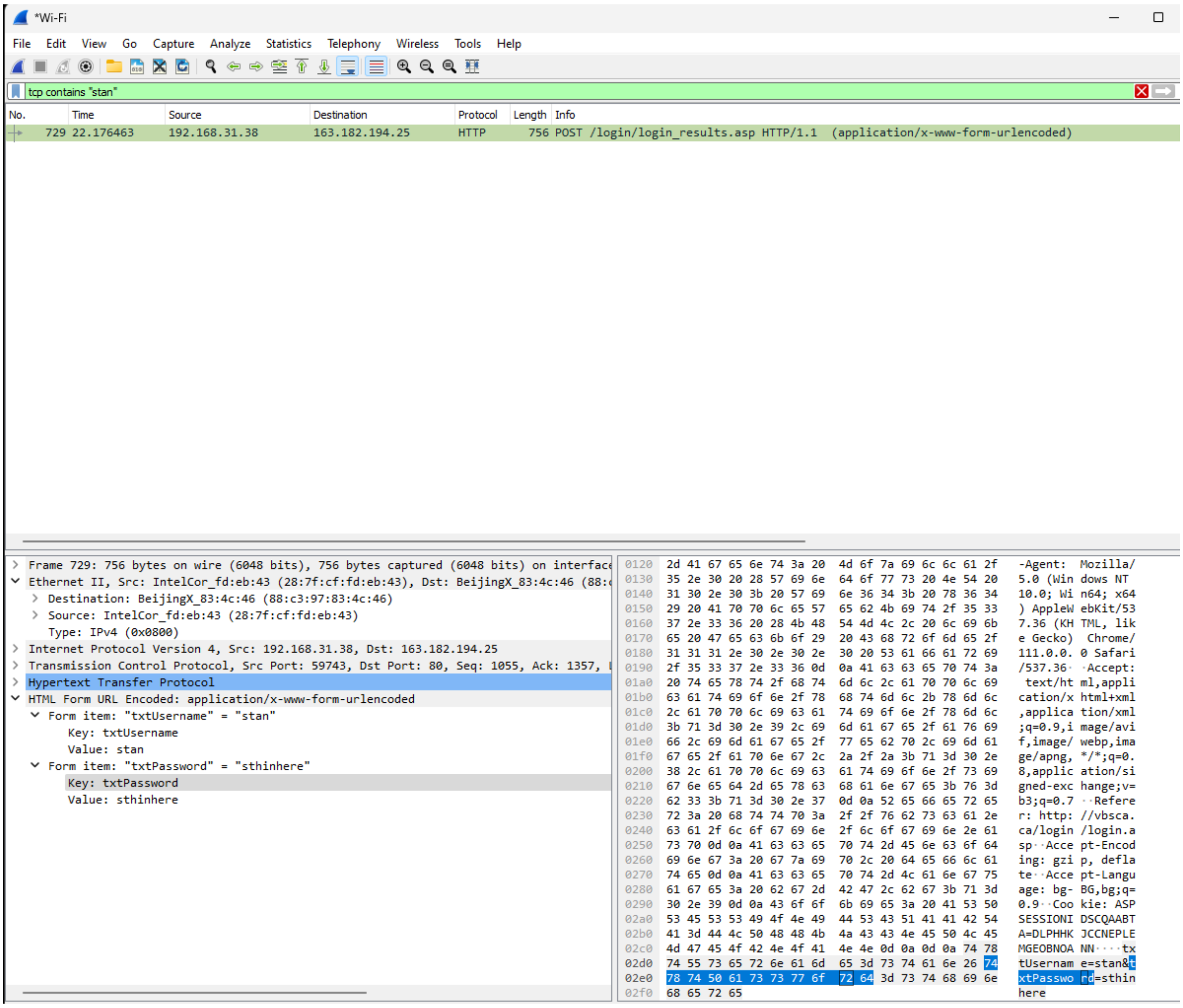


vbsca.ca/login/login.asp

Login Test

Username: stan

Password: •••••••••



*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

tcp contains "stan"

```
No.    Time          Source           Destination      Protocol  Length  Info
   729 22.176463     192.168.31.38    163.182.194.25   HTTP         756  POST /login/login_results.asp HTTP/1.1  (application/x-www-form-urlencoded)
```

```
> Frame 729: 756 bytes on wire (6048 bits), 756 bytes captured (6048 bits) on interface
v Ethernet II, Src: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43), Dst: BeijingX_83:4c:46 (88:c
   > Destination: BeijingX_83:4c:46 (88:c3:97:83:4c:46)
   > Source: IntelCor_fd:eb:43 (28:7f:cf:fd:eb:43)
     Type: IPv4 (0x0800)
> Internet Protocol Version 4, Src: 192.168.31.38, Dst: 163.182.194.25
> Transmission Control Protocol, Src Port: 59743, Dst Port: 80, Seq: 1055, Ack: 1357, L
> Hypertext Transfer Protocol
v HTML Form URL Encoded: application/x-www-form-urlencoded
   v Form item: "txtUsername" = "stan"
        Key: txtUsername
        Value: stan
   v Form item: "txtPassword" = "sthinhere"
        Key: txtPassword
        Value: sthinhere
```

```
0120  2d 41 67 65 6e 74 3a 20  4d 6f 7a 69 6c 6c 61 2f   -Agent:  Mozilla/
0130  35 2e 30 20 28 57 69 6e  64 6f 77 73 20 4e 54 20   5.0 (Win dows NT 
0140  31 30 2e 30 3b 20 57 69  6e 36 34 3b 20 78 36 34   10.0; Wi n64; x64
0150  29 20 41 70 70 6c 65 57  65 62 4b 69 74 2f 35 33   ) AppleW ebKit/53
0160  37 2e 33 36 20 28 4b 48  54 4d 4c 2c 20 6c 69 6b   7.36 (KH TML, lik
0170  65 20 47 65 63 6b 6f 29  20 43 68 72 6f 6d 65 2f   e Gecko)  Chrome/
0180  31 31 31 2e 30 2e 30 2e  30 20 53 61 66 61 72 69   111.0.0. 0 Safari
0190  2f 35 33 37 2e 33 36 0d  0a 41 63 63 65 70 74 3a   /537.36· ·Accept:
01a0  20 74 65 78 74 2f 68 74  6d 6c 2c 61 70 70 6c 69    text/ht ml,appli
01b0  63 61 74 69 6f 6e 2f 78  68 74 6d 6c 2b 78 6d 6c   cation/x html+xml
01c0  2c 61 70 70 6c 69 63 61  74 69 6f 6e 2f 78 6d 6c   ,applica tion/xml
01d0  3b 71 3d 30 2e 39 2c 69  6d 61 67 65 2f 61 76 69   ;q=0.9,i mage/avi
01e0  66 2c 69 6d 61 67 65 2f  77 65 62 70 2c 69 6d 61   f,image/ webp,ima
01f0  67 65 2f 61 70 6e 67 2c  2a 2f 2a 3b 71 3d 30 2e   ge/apng, */*;q=0.
0200  38 2c 61 70 70 6c 69 63  61 74 69 6f 6e 2f 73 69   8,applic ation/si
0210  67 6e 65 64 2d 65 78 63  68 61 6e 67 65 3b 76 3d   gned-exc hange;v=
0220  62 33 3b 71 3d 30 2e 37  0d 0a 52 65 66 65 72 65   b3;q=0.7 ··Refere
0230  72 3a 20 68 74 74 70 3a  2f 2f 76 62 73 63 61 2e   r: http: //vbsca.
0240  63 61 2f 6c 6f 67 69 6e  2f 6c 6f 67 69 6e 2e 61   ca/login /login.a
0250  73 70 0d 0a 41 63 63 65  70 74 2d 45 6e 63 6f 64   sp··Acce pt-Encod
0260  69 6e 67 3a 20 67 7a 69  70 2c 20 64 65 66 6c 61   ing: gzi p, defla
0270  74 65 0d 0a 41 63 63 65  70 74 2d 4c 61 6e 67 75   te··Acce pt-Langu
0280  61 67 65 3a 20 62 67 2d  42 47 2c 62 67 3b 71 3d   age: bg- BG,bg;q=
0290  30 2e 39 0d 0a 43 6f 6f  6b 69 65 3a 20 41 53 50   0.9··Coo kie: ASP
02a0  53 45 53 53 49 4f 4e 49  44 53 43 51 41 41 42 54   SESSIONI DSCQAABT
02b0  41 3d 44 4c 50 48 48 4b  4a 43 43 4e 45 50 4c 45   A=DLPHHK JCCNEPLE
02c0  4d 47 45 4f 42 4e 4f 41  4e 4e 0d 0a 0d 0a 74 78   MGEOBNOA NN····tx
02d0  74 55 73 65 72 6e 61 6d  65 3d 73 74 61 6e 26 74   tUsernam e=stan&t
02e0  78 74 50 61 73 73 77 6f  72 64 3d 73 74 68 69 6e   xtPasswo rd=sthin
02f0  68 65 72 65                                        here
```