

My IP terminal address is 192.168.200.8

```
Select Command Prompt
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : TAP-Windows Adapter V9
Physical Address. . . . . : 00-FF-6F-9E-8B-F8
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : AC-ED-5C-47-B8-33
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : AE-ED-5C-47-B8-32
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Dual Band Wireless-AC 3165
Physical Address. . . . . : AC-ED-5C-47-B8-32
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . : fe80::b087:a5f0:8826:6b52%13(Preferred)
IPv4 Address. . . . . : 192.168.200.8(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Tuesday, April 23, 2019 12:34:45 PM
Lease Expires . . . . . : Tuesday, April 23, 2019 2:34:46 PM
Default Gateway . . . . . : 192.168.200.1
DHCP Server . . . . . : 192.168.200.1
DHCPv6 IAID . . . . . : 78441820
DHCPv6 Client DUID. . . . . : 00-01-00-01-22-3E-67-C6-AC-ED-5C-47-B8-32
DNS Servers . . . . . : 192.168.200.1
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter Bluetooth Network Connection 2:
```

1. TLS version of the client hello frame is TLS 1.0

Wi-Fi

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No.	Time	Source	Destination	Protocol	Length	Info
1907	2019-04-23 13:07:03.465118	52.223.224.48	192.168.200.8	TLSv1.2	1514	Application Data [TCP segment of a reassembled PDU]
1923	2019-04-23 13:07:03.467921	52.223.224.48	192.168.200.8	TLSv1.2	1514	Application Data [TCP segment of a reassembled PDU]
1939	2019-04-23 13:07:03.469076	52.223.224.48	192.168.200.8	TLSv1.2	255	Application Data
1943	2019-04-23 13:07:03.813048	192.168.200.8	99.84.106.149	TLSv1.2	186	Application Data
1944	2019-04-23 13:07:03.824287	99.84.106.149	192.168.200.8	TLSv1.2	453	Application Data
1947	2019-04-23 13:07:03.908325	192.168.200.8	52.94.232.195	TLSv1.2	634	Application Data
1948	2019-04-23 13:07:03.908450	192.168.200.8	52.94.232.195	TLSv1.2	644	Application Data
1949	2019-04-23 13:07:03.910048	192.168.200.8	52.54.16.161	TLSv1.2	143	Application Data
1951	2019-04-23 13:07:03.910177	192.168.200.8	52.54.16.161	TLSv1.2	241	Application Data
1956	2019-04-23 13:07:03.927453	52.54.16.161	192.168.200.8	TLSv1.2	248	Application Data
1961	2019-04-23 13:07:03.930653	52.94.232.195	192.168.200.8	TLSv1.2	588	Application Data
1964	2019-04-23 13:07:03.937520	192.168.200.8	99.84.109.115	TLSv1.2	571	Client Hello
1975	2019-04-23 13:07:03.947793	99.84.109.115	192.168.200.8	TLSv1.2	1514	Server Hello
1980	2019-04-23 13:07:03.948857	99.84.109.115	192.168.200.8	TLSv1.2	953	Certificate, Certificate Status, Server Key Exchange, Server Hello Done
1983	2019-04-23 13:07:03.949904	192.168.200.8	99.84.109.115	TLSv1.2	180	Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
1984	2019-04-23 13:07:03.950073	192.168.200.8	99.84.109.115	TLSv1.2	147	Application Data
1985	2019-04-23 13:07:03.950204	192.168.200.8	99.84.109.115	TLSv1.2	200	Application Data

> Frame 1964: 571 bytes on wire (4568 bits), 571 bytes captured (4568 bits) on interface 0

> Ethernet II, Src: IntelCor_47:b8:32 (ac:ed:5c:47:b8:32), Dst: Verizon_d0:13:e4 (20:c0:47:d0:13:e4)

> Internet Protocol Version 4, Src: 192.168.200.8, Dst: 99.84.109.115

> Transmission Control Protocol, Src Port: 64435, Dst Port: 443, Seq: 1, Ack: 1, Len: 517

Secure Sockets Layer

- TLsv1.2 Record Layer: Handshake Protocol: Client Hello
 - Content Type: Handshake (22)
 - Version: TLS 1.0 (0x0301)
 - Length: 512
 - Handshake Protocol: Client Hello

```
0000 20 c0 47 d0 13 e4 ac ed 5c 47 b8 32 08 00 45 00  -G....\G.2..E-
0010 02 2d 36 e9 40 00 80 06 68 69 c0 a8 c8 08 63 54  --6.@...hi...cT
0020 6d 73 fb b3 01 bb 18 c0 88 e3 42 81 47 aa 50 18  ms.....-B-G-
0030 00 44 ee 15 00 00 16 03 01 02 00 01 00 01 fc 03  -D.....
0040 03 a8 54 c1 ec 01 81 d8 89 fc 69 80 9b 5c c6 e5  -T.....-i-..
0050 6a 56 53 c3 a5 eb a0 2f ca 6d 2a ec 00 06 64 5c  jVS..../-m*...d\
0060 c9 20 5e ab a4 02 55 73 87 0e 18 52 3c 2b a4 08  -^...Us...R<...
0070 8c 1b f9 ac a3 cc 55 4a 11 e4 14 49 47 a4 e6 08  ....UJ...IG<...
0080 f9 13 00 22 ea ea 13 01 13 02 13 03 c0 2b c0 2f  ...".....+..
```

wireshark_87882E4A-EB88-48D4-BDFB-137D7C3D83D8_20190423130700_a03456.pcapng

Packets: 4062 · Displayed: 911 (22.4%) · Dropped: 0 (0.0%)

Profile: Default

1:09 PM
4/23/2019

2. Value of the Content Type is 22 for handshake message and with a handshake type of 1 in Client hello.

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No.	Time	Source	Destination	Protocol	Length	Info
1907	2019-04-23 13:07:03.465118	52.223.224.48	192.168.200.8	TLSv1.2	1514	Application Data [TCP segment of a reassembled PDU]
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1947	2019-04-23 13:07:03.908325	192.168.200.8	52.94.232.195	TLSv1.2	634	Application Data
1948	2019-04-23 13:07:03.908450	192.168.200.8	52.94.232.195	TLSv1.2	644	Application Data
1949	2019-04-23 13:07:03.910048	192.168.200.8	52.54.16.161	TLSv1.2	143	Application Data
1951	2019-04-23 13:07:03.910177	192.168.200.8	52.54.16.161	TLSv1.2	241	Application Data
1956	2019-04-23 13:07:03.927453	52.54.16.161	192.168.200.8	TLSv1.2	248	Application Data
1961	2019-04-23 13:07:03.930653	52.94.232.195	192.168.200.8	TLSv1.2	588	Application Data
1964	2019-04-23 13:07:03.937520	192.168.200.8	99.84.109.115	TLSv1.2	571	Client Hello
1975	2019-04-23 13:07:03.947793	99.84.109.115	192.168.200.8	TLSv1.2	1514	Server Hello
1980	2019-04-23 13:07:03.948857	99.84.109.115	192.168.200.8	TLSv1.2	953	Certificate, Certificate Status, Server Key Exchange, Server Hello Done
1983	2019-04-23 13:07:03.949904	192.168.200.8	99.84.109.115	TLSv1.2	180	Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
1984	2019-04-23 13:07:03.950073	192.168.200.8	99.84.109.115	TLSv1.2	147	Application Data
1985	2019-04-23 13:07:03.950104	192.168.200.8	99.84.109.115	TLSv1.2	208	Application Data

> Transmission Control Protocol, Src Port: 64435, Dst Port: 443, Seq: 1, Ack: 1, Len: 517

Secure Sockets Layer

✓ TLSv1.2 Record Layer: Handshake Protocol: Client Hello

Content Type: Handshake (22)

Version: TLS 1.0 (0x0301)

Length: 512

✓ Handshake Protocol: Client Hello

Handshake Type: Client Hello (1)

Length: 508

Version: TLS 1.2 (0x0303)

> Random: a854c1ec0181d889fc69809b5cc6e56a5653c3a5eba02fca...

Session ID Length: 32

0000 20 c0 47 d0 13 e4 ac ed 5c 47 b8 32 08 00 45 00 -G-... \G-2-...

0010 02 2d 36 e9 40 00 80 06 68 69 c0 a8 c8 08 63 54 --6-@... hi...cT

0020 6d 73 fb b3 01 bb 18 c0 88 e3 42 81 47 aa 50 18 ms-... -B-G-P-

0030 00 44 ee 15 00 00 16 03 01 02 00 01 00 01 fc 03 -D-... ..

0040 03 a8 54 c1 ec 01 81 d8 89 fc 69 80 9b 5c c6 e5 ..T-... -i-.\..

0050 6a 56 53 c3 a5 eb a0 2f ca 6d 2a ec 00 06 64 5c jVS-... / -m*-...d\

0060 c9 20 5e ab a4 02 55 73 87 0e 18 52 3c 2b a4 08 -^...Us -R<+...

0070 8c 1b f9 ac a3 cc 55 4a 11 e4 14 49 47 a4 e6 08UJ -IG...

0080 f9 13 00 22 ea ea 13 01 13 02 13 03 c0 2b c0 2f ..."-... ..+/-

wireshark_B7882E4A-EB88-48D4-BDFB-137D7C3083D8_20190423130700_a03456.pcapng

Packets: 4062 · Displayed: 911 (22.4%) · Dropped: 0 (0.0%)

Profile: Default

1:36 PM 4/23/2019

3. I couldn't find anything that was labelled challenge or nonce. However, the Random Bytes is highlighted in the screenshot.

The screenshot shows a Wireshark capture of a TLSv1.2 handshake. The packet list on the left shows several packets, with packet 1964 (13:07:03.937520) being the 'Client Hello' packet. The packet details pane on the right shows the structure of this packet, including the 'Random' field. The 'Random Bytes' field is highlighted in blue, and a green arrow points to it. The packet bytes pane at the bottom shows the raw data of the packet, with the 'Random Bytes' field highlighted in blue.

Wireshark interface showing a TLSv1.2 handshake. The packet list on the left shows several packets, with packet 1964 (13:07:03.937520) being the 'Client Hello' packet. The packet details pane on the right shows the structure of this packet, including the 'Random' field. The 'Random Bytes' field is highlighted in blue, and a green arrow points to it. The packet bytes pane at the bottom shows the raw data of the packet, with the 'Random Bytes' field highlighted in blue.

Random values used for deriving keys (ssl.handshake.random_bytes), 28 bytes

Packets: 4062 · Displayed: 911 (22.4%) · Dropped: 0 (0.0%)

Profile: Default

2:07 PM 4/23/2019

4. Yes it advertises the cyber suites it supports. The public key algorithm is AES, symmetric key algorithm is GCM and hash algorithm is SHA.

*Wi-Fi

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No.	Time	Source	Destination	Protocol	Length	Info
1961	2019-04-23 13:07:03.930653	52.94.232.195	192.168.200.8	TLSv1.2	588	Application Data
1964	2019-04-23 13:07:03.937520	192.168.200.8	99.84.109.115	TLSv1.2	571	Client Hello
1975	2019-04-23 13:07:03.947793	99.84.109.115	192.168.200.8	TLSv1.2	1514	Server Hello
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1984	2019-04-23 13:07:03.950073	192.168.200.8	99.84.109.115	TLSv1.2	147	Application Data
1986	2019-04-23 13:07:03.950284	192.168.200.8	99.84.109.115	TLSv1.2	308	Application Data
1989	2019-04-23 13:07:03.955517	192.168.200.8	204.154.111.113	TLSv1.2	571	Client Hello
1999	2019-04-23 13:07:03.957662	192.168.200.8	104.244.36.20	TLSv1.2	571	Client Hello
2000	2019-04-23 13:07:03.957871	192.168.200.8	104.244.36.20	TLSv1.2	571	Client Hello
2001	2019-04-23 13:07:03.958058	192.168.200.8	99.84.101.143	TLSv1.2	574	Client Hello
2002	2019-04-23 13:07:03.958274	192.168.200.8	99.84.101.143	TLSv1.2	571	Client Hello
2004	2019-04-23 13:07:03.958285	99.84.109.115	192.168.200.8	TLSv1.2	296	New Session Ticket, Change Cipher Spec, Encrypted Handshake Message
2005	2019-04-23 13:07:03.958286	99.84.109.115	192.168.200.8	TLSv1.2	132	Application Data
2008	2019-04-23 13:07:03.958622	192.168.200.8	204.154.111.113	TLSv1.2	571	Client Hello
2009	2019-04-23 13:07:03.958785	192.168.200.8	99.84.109.115	TLSv1.2	92	Application Data
2014	2019-04-23 13:07:03.971701	99.84.101.143	192.168.200.8	TLSv1.2	1514	Server Hello

Version: TLS 1.2 (0x0303)
Random: a854c1ec0181d889fc69809b5cc6e56a5653c3a5eba02fca...
GMT Unix Time: Jun 29, 2059 11:42:36.000000000 Eastern Daylight Time
Random Bytes: 0181d889fc69809b5cc6e56a5653c3a5eba02fca6d2aec00...
Session ID Length: 32
Session ID: 5eaba4025573870e18523c2ba4088c1bf9aca3cc554a11e4...
Cipher Suites Length: 34
Cipher Suites (17 suites)
Cipher Suite: Reserved (GREASE) (0xaeaa)
Cipher Suite: TLS_AES_128_GCM_SHA256 (0x1301)
Cipher Suite: TLS_AES_256_GCM_SHA384 (0x1302)
Cipher Suite: TLS_CHACHA20_POLY1305_SHA256 (0x1303)
Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b)
Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)
Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 (0xc02c)
Cipher Suite: TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 (0xc030)

0080 f9 13 00 22 ea ea 13 01 13 02 13 03 c0 2b c0 2f+./
0090 c0 2c c0 30 cc a9 cc a8 c0 13 c0 14 00 9c 00 9d .,0.....
00a0 00 2f 00 35 00 0a 01 00 01 91 0a 0a 00 00 00 00 ./5.....
00b0 00 13 00 11 00 00 0e 77 77 77 2e 61 6d 61 7a 6fw ww.amazo
00c0 6e 2e 63 6f 6d 00 17 00 00 ff 01 00 01 00 00 0a n.com... ..

Cipher Suite (ssl.handshake.ciphersuite), 2 bytes

Packets: 4062 · Displayed: 911 (22.4%) · Dropped: 0 (0.0%)

Profile: Default

2:07 PM
4/23/2019

Server Hello Record

1. Yes, it specifies a chosen cypher suite. The cypher suite algorithms are RSA AES GCM SHA.

The image shows a Wireshark network capture of a TLS Server Hello record. The top pane displays a list of packets, with packet 1975 (1514 bytes) selected, showing a TLSv1.2 Server Hello from 192.168.200.8 to 99.84.109.115. The middle pane shows the details of this packet, highlighting the 'Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)' field. The bottom pane shows the raw packet data in hexadecimal and ASCII.

Wireshark Interface: *Wi-Fi

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No.	Time	Source	Destination	Protocol	Length	Info
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2009	2019-04-23 13:07:03.958785	192.168.200.8	99.84.109.115	TLSv1.2	92	Application Data

Version: TLS 1.2 (0x0303)
Length: 78
Handshake Protocol: Server Hello
Handshake Type: Server Hello (2)
Length: 74
Version: TLS 1.2 (0x0303)
Random: 8cd7a23345f02df822192773440315c1babe6961563e7b32...
GMT Unix Time: Nov 16, 2044 15:46:43.000000000 Eastern Standard Time
Random Bytes: 45f02df822192773440315c1babe6961563e7b329ac6ae1f...
Session ID Length: 0
Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)
Compression Method: null (0)
Extensions Length: 34
Extension: server_name (len=0)
Extension: renegotiation_info (len=1)
Extension: ec_point_formats (len=4)

0000 ac ed 5c 47 b8 32 20 c0 47 d0 13 ed 08 00 45 20 ..\G.2..G...E
0010 05 dc 46 1f 40 00 f3 06 e2 63 63 54 6d 73 c0 a8 ..F.@...ccTms..
0020 c8 08 01 bb fb b3 42 81 47 aa 18 c0 8a e8 50 10B..G....P..
0030 00 77 de f9 00 00 16 03 03 00 4e 02 00 00 4a 03 .w.....N...J..
0040 03 8c d7 a2 33 45 f0 2d f8 22 19 27 73 44 03 153E-..".sD..

wireshark_B7882E4A-E8B8-4804-BDFB-13707C3D83D8_20190423130700_a03456.pcapng

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