



VIT[®]

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Information Security Analysis and Audit

Course Code: CSE3501

Slot: L47-48

Faculty: Anil Kumar K

18BCI0247

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Exercise 1:

Experiments in Wireshark software.

What is Wireshark:

Wireshark is the world's foremost and widely-used network protocol analyser. It lets you see what's happening on your network at a microscopic level and is the de facto (and often de jure) standard across many commercial and non-profit enterprises, government agencies, and educational institutions.

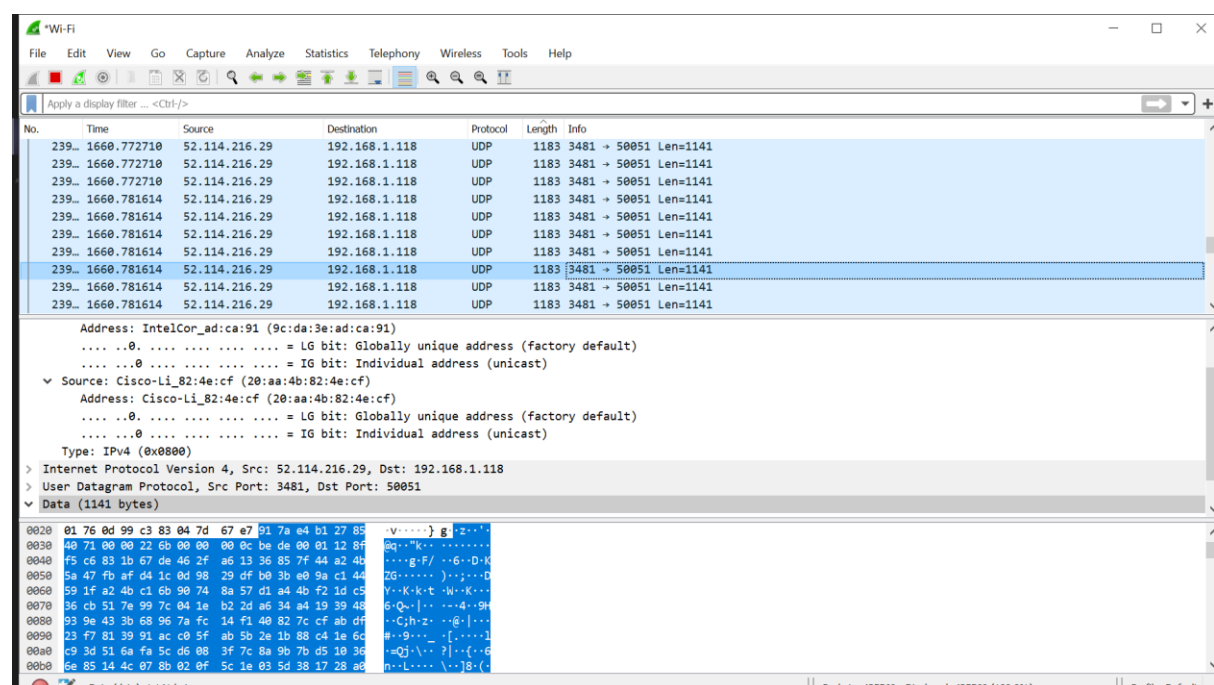
Wireshark has a rich feature set which includes the following:

- Deep inspection of hundreds of protocols, with more being added all the time
- Live capture and offline analysis
- Standard three-pane packet browser
- Multi-platform: Runs on Windows, Linux, macOS, Solaris, etc.

Shows all the general packet information on my WIFI Network and the protocols it uses.

Source and destination IP addresses of the packets are also mentioned

Other info like packet length, additional information is also present.



Filtering only icmp protocol packets:

The screenshot shows the Wireshark interface with the 'icmp' filter applied to the packet list. The packet list displays several ICMP 'Destination unreachable' messages. The packet details pane shows the structure of an ICMP Echo (ping) request, including the source and destination IP addresses and the type of message.

No.	Time	Source	Destination	Protocol	Length	Info
203...	195.102131	95.32.196.188	192.168.1.118	ICMP	173	Destination unreachable (Host unreachable)
223...	223.694460	188.19.42.215	192.168.1.118	ICMP	173	Destination unreachable (Host unreachable)
373...	354.641194	78.139.78.178	192.168.1.118	ICMP	173	Destination unreachable (Port unreachable)
137...	1019.466702	119.152.149.119	192.168.1.118	ICMP	173	Destination unreachable (Port unreachable)
154...	1141.678766	95.32.196.188	192.168.1.118	ICMP	173	Destination unreachable (Host unreachable)
155...	1148.729751	197.52.186.110	192.168.1.118	ICMP	173	Destination unreachable (Host unreachable)
173...	1278.731173	111.251.218.35	192.168.1.118	ICMP	173	Destination unreachable (Port unreachable)
231...	1610.638545	68.43.158.150	192.168.1.118	ICMP	173	Destination unreachable (Host unreachable)
233...	1624.665441	188.179.234.215	192.168.1.118	ICMP	173	Destination unreachable (Host unreachable)
254...	1748.667846	45.58.55.80	192.168.1.118	ICMP	173	Destination unreachable (Host administratively prohibited)

Frame 233449: 173 bytes on wire (1384 bits), 173 bytes captured (1384 bits) on interface \Device\NPF_{FA258B46-1EB1-4FB1-BA43-76A438C8952B}, id 0
Ethernet II, Src: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf), Dst: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)
Destination: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)
Address: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)
.....0..... = LG bit: Globally unique address (factory default)
.....0..... = IG bit: Individual address (unicast)
Source: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)
Address: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)
.....0..... = LG bit: Globally unique address (factory default)
.....0..... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)

0000 9c da 3e ad ca 91 20 aa 4b 82 4e cf 08 00 45 00 -->... K·N...E
0010 00 9f f3 8c 00 00 39 01 24 28 bc b3 ea d7 c0 a8 -->...9 \${.....
0020 01 76 83 01 67 29 00 00 00 00 45 00 00 83 de 4f -->...g) ...E...Q
0030 00 00 77 11 fb 70 c0 a8 01 76 bc b3 ea d7 b2 8f -->...p ...v.....
0040 bc 7e 00 ff 12 2d 64 31 3a 61 64 32 3a 69 64 32 -->...o·dl :ad2:ld2
0050 30 3a 32 2a d9 7e f4 14 a2 dc 6d 2c 09 cf 5b 54 -->0:2*~...m,·[T
0060 fe f0 3b 23 85 6e 3e 3a 74 61 72 67 65 74 32 30 -->·;#n6: target20
0070 3a 32 2a d5 16 00 00 62 1e 00 00 08 ba 00 00 3e -->2*...b>
0080 e8 00 00 53 ac 65 31 3a 71 39 3a 66 69 6e 64 5f -->...S·el: q9:find_

Filtering only http protocol packets:

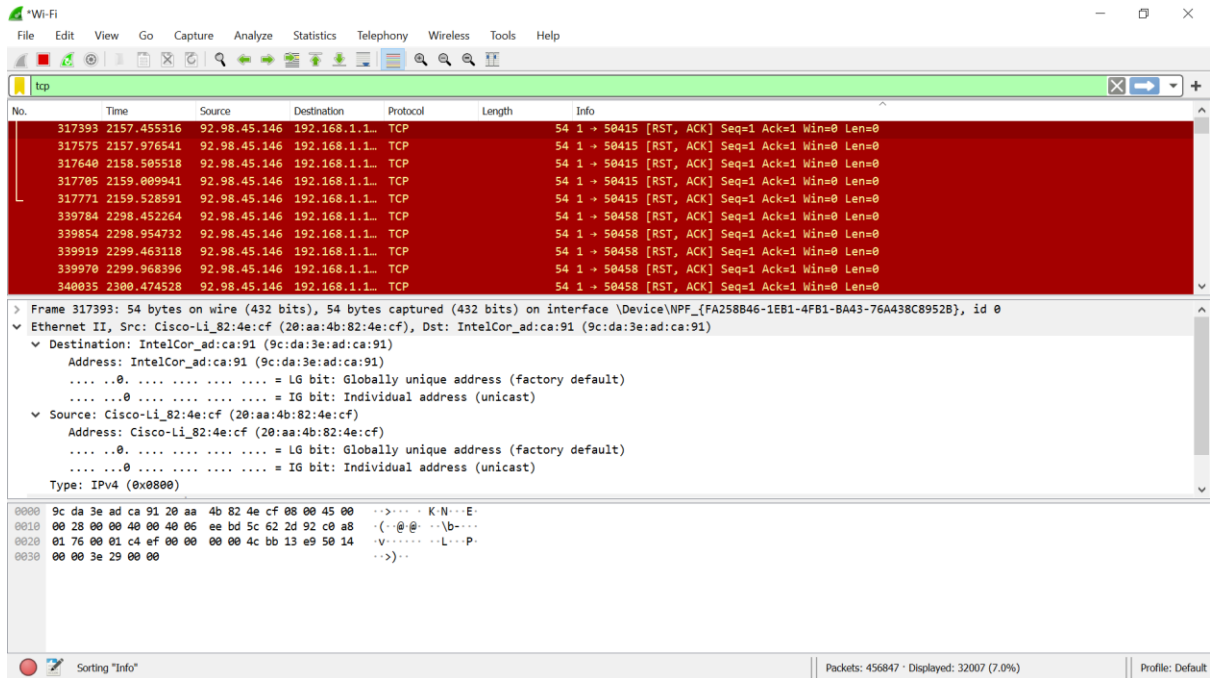
The screenshot shows the Wireshark interface with the 'http' filter applied to the packet list. The packet list displays several HTTP GET requests and continuations. The packet details pane shows the structure of an HTTP GET request, including the source and destination IP addresses and the type of message.

No.	Time	Source	Destination	Protocol	Length	Info
20325	193.948359	192.168.1.2	192.168.1.1	HTTP	1514	Continuation
20332	193.991431	192.168.1.2	192.168.1.1	HTTP	1206	Continuation
64280	554.138953	192.168.1.2	192.168.1.1	HTTP	1514	Continuation
64283	554.157453	192.168.1.2	192.168.1.1	HTTP	1206	Continuation
368207	2472.620694	192.168.1.2	192.168.1.1	HTTP	1514	Continuation
368208	2472.620694	192.168.1.2	192.168.1.1	HTTP	1206	Continuation
169	1.953945	192.168.1.1	192.168.1.2	HTTP	256	GET /IGDdevicedesc.xml HTTP/1.1
1673	11.977817	192.168.1.1	192.168.1.2	HTTP	256	GET /IGDdevicedesc.xml HTTP/1.1
3364	21.971294	192.168.1.1	192.168.1.2	HTTP	256	GET /IGDdevicedesc.xml HTTP/1.1
4524	31.967673	192.168.1.1	192.168.1.2	HTTP	256	GET /IGDdevicedesc.xml HTTP/1.1

Frame 20325: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface \Device\NPF_{FA258B46-1EB1-4FB1-BA43-76A438C8952B}, id 0
Ethernet II, Src: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf), Dst: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)
Destination: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)
Address: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)
.....0..... = LG bit: Globally unique address (factory default)
.....0..... = IG bit: Individual address (unicast)
Source: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)
Address: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)
.....0..... = LG bit: Globally unique address (factory default)
.....0..... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)

0000 9c da 3e ad ca 91 20 aa 4b 82 4e cf 08 00 45 00 -->... K·N...E
0010 05 dc bb 3c 40 00 40 06 f6 16 c0 a8 01 02 c0 a8 -->...<@·
0020 01 76 c0 00 d6 74 e5 9f 32 e3 78 1a 20 cc 50 10 -->·v·t·- 2·x· ·P·
0030 19 20 cc f0 00 00 6f 64 65 6c 4e 61 6d 65 3e 45 -->...od elName>E
0040 41 33 35 30 30 3c 2f 6d 6f 64 65 6c 4e 61 6d 65 -->A3500</m odelName
0050 3e 0a 20 20 20 20 20 20 20 20 3c 6d 6f 64 65 6c -->·> ·<model
0060 4e 75 6d 62 65 72 3e 45 41 33 35 30 30 3c 2f 6d -->Number>E A3500</m
0070 6f 64 65 6c 4e 75 6d 62 65 72 3e 0a 20 20 20 20 -->odelNumb er> ·
0080 20 20 20 20 3c 6d 6f 64 65 6c 55 52 4c 3e 68 74 -->·<mod elURL>ht

Filtering only tcp protocol packets:



The Wireshark interface shows a packet list filtered for TCP protocol. The filter bar at the top contains the text "tcp". The packet list displays several TCP packets, including RST, ACK, and Seq=1 packets. The packet details pane shows the structure of a TCP segment, including the source and destination IP addresses and ports. The packet bytes pane shows the raw data of the packet.

No.	Time	Source	Destination	Protocol	Length	Info
317393	2157.455316	92.98.45.146	192.168.1.1	TCP	54	1 → 50415 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
317575	2157.976541	92.98.45.146	192.168.1.1	TCP	54	1 → 50415 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
317640	2158.505518	92.98.45.146	192.168.1.1	TCP	54	1 → 50415 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
317705	2159.009941	92.98.45.146	192.168.1.1	TCP	54	1 → 50415 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
317771	2159.528591	92.98.45.146	192.168.1.1	TCP	54	1 → 50415 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
339784	2298.452264	92.98.45.146	192.168.1.1	TCP	54	1 → 50458 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
339854	2298.954732	92.98.45.146	192.168.1.1	TCP	54	1 → 50458 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
339919	2299.463118	92.98.45.146	192.168.1.1	TCP	54	1 → 50458 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
339970	2299.968396	92.98.45.146	192.168.1.1	TCP	54	1 → 50458 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
340035	2300.474528	92.98.45.146	192.168.1.1	TCP	54	1 → 50458 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0

Frame 317393: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF_{FA258B46-1EB1-4FB1-BA43-76A438C8952B}, id 0

Ethernet II, Src: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf), Dst: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)

Destination: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)

Address: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)

.....0..... = LG bit: Globally unique address (factory default)

.....0..... = IG bit: Individual address (unicast)

Source: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)

Address: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)

.....0..... = LG bit: Globally unique address (factory default)

.....0..... = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

0000 9c da 3e ad ca 91 20 aa 4b 82 4e cf 08 00 45 00 -->... K N ... E

0010 00 28 00 00 40 00 40 06 ee bd 5c 62 2d 92 c0 a8 : (: @ @ : : b ...

0020 01 76 00 01 c4 ef 00 00 00 4c bb 13 e9 50 14 : v ... M ... s _ & P

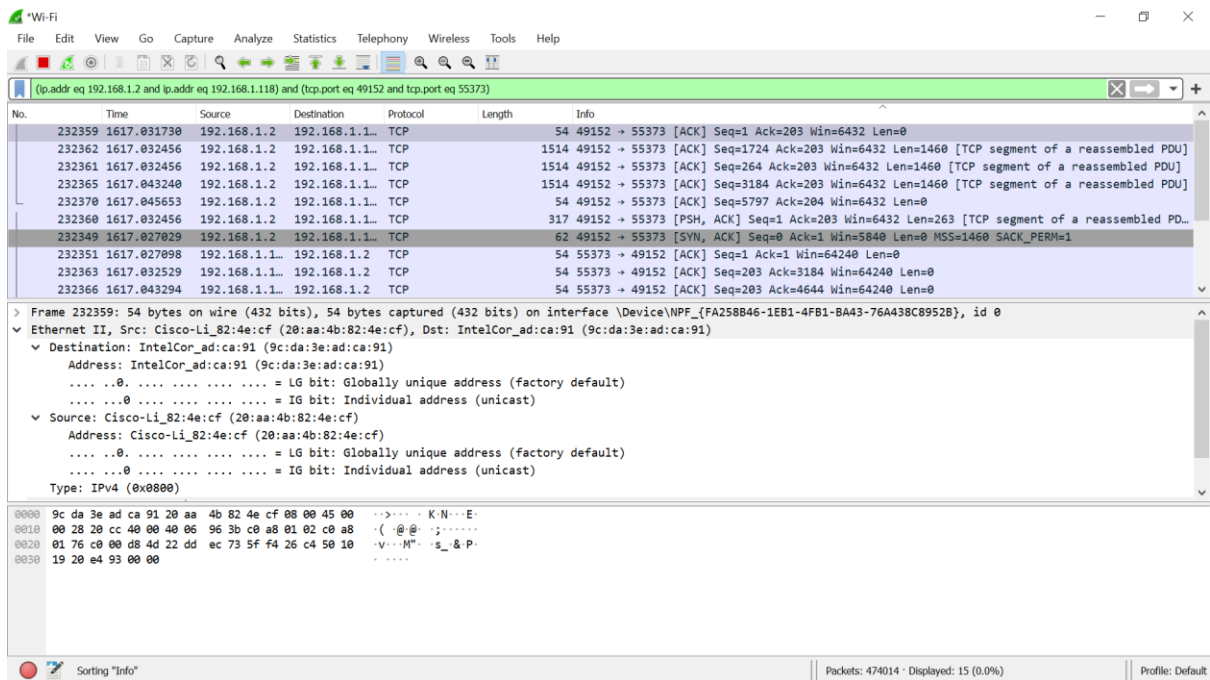
0030 00 00 3e 29 00 00 -->):

Sorting "Info"

Packets: 456847 · Displayed: 32007 (7.0%)

Profile: Default

Conversation filter:



The Wireshark interface shows a packet list filtered for a specific conversation. The filter bar at the top contains the text "(ip.addr eq 192.168.1.2 and ip.addr eq 192.168.1.118) and (tcp.port eq 49152 and tcp.port eq 55373)". The packet list displays several TCP packets, including ACK, Seq=1, and Seq=203 packets. The packet details pane shows the structure of a TCP segment, including the source and destination IP addresses and ports. The packet bytes pane shows the raw data of the packet.

No.	Time	Source	Destination	Protocol	Length	Info
232359	1617.031730	192.168.1.2	192.168.1.1	TCP	54	49152 → 55373 [ACK] Seq=1 Ack=203 Win=6432 Len=0
232362	1617.032456	192.168.1.2	192.168.1.1	TCP	1514	49152 → 55373 [ACK] Seq=1724 Ack=203 Win=6432 Len=1460 [TCP segment of a reassembled PDU]
232361	1617.032456	192.168.1.2	192.168.1.1	TCP	1514	49152 → 55373 [ACK] Seq=264 Ack=203 Win=6432 Len=1460 [TCP segment of a reassembled PDU]
232365	1617.043240	192.168.1.2	192.168.1.1	TCP	1514	49152 → 55373 [ACK] Seq=3184 Ack=203 Win=6432 Len=1460 [TCP segment of a reassembled PDU]
232370	1617.045653	192.168.1.2	192.168.1.1	TCP	54	49152 → 55373 [ACK] Seq=5797 Ack=204 Win=6432 Len=0
232360	1617.032456	192.168.1.2	192.168.1.1	TCP	317	49152 → 55373 [PSH, ACK] Seq=1 Ack=203 Win=6432 Len=263 [TCP segment of a reassembled PD...
232349	1617.027029	192.168.1.2	192.168.1.1	TCP	62	49152 → 55373 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 SACK_PERM=1
232351	1617.027098	192.168.1.1	192.168.1.2	TCP	54	55373 → 49152 [ACK] Seq=1 Ack=1 Win=64240 Len=0
232363	1617.032529	192.168.1.1	192.168.1.2	TCP	54	55373 → 49152 [ACK] Seq=203 Ack=3184 Win=64240 Len=0
232366	1617.043294	192.168.1.1	192.168.1.2	TCP	54	55373 → 49152 [ACK] Seq=203 Ack=4644 Win=64240 Len=0

Frame 232359: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF_{FA258B46-1EB1-4FB1-BA43-76A438C8952B}, id 0

Ethernet II, Src: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf), Dst: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)

Destination: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)

Address: IntelCor_ad:ca:91 (9c:da:3e:ad:ca:91)

.....0..... = LG bit: Globally unique address (factory default)

.....0..... = IG bit: Individual address (unicast)

Source: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)

Address: Cisco-Li_82:4e:cf (20:aa:4b:82:4e:cf)

.....0..... = LG bit: Globally unique address (factory default)

.....0..... = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

0000 9c da 3e ad ca 91 20 aa 4b 82 4e cf 08 00 45 00 -->... K N ... E

0010 00 28 00 cc 40 00 40 06 96 3b c0 a8 01 02 c0 a8 : (: @ @ : : b ...

0020 01 76 c0 00 d8 4d 22 dd ec 73 5f f4 26 c4 50 10 : v ... M ... s _ & P

0030 19 20 e4 93 00 00 -->):

Sorting "Info"

Packets: 474014 · Displayed: 15 (0.0%)

Profile: Default

Detailed information about all the packets in my WIFI Network:

Wireshark · Expert Information · Wi-Fi

Severity	Summary	Group	Protocol	Count
> Error	Malformed Packet (Exception occurred)	Malformed	mDNS	2
> Error	Malformed Packet (Exception occurred)	Malformed	SABP	1
> Error	New fragment overlaps old data (retransmission?)	Malformed	TCP	55
> Error	Malformed Packet (Exception occurred)	Malformed	STUN	933
> Warning	Size constraint: value too big: 3 (0 - 2)	Protocol	SABP	1
> Warning	something unknown here [unknown extension root index in...	Undecoded	SABP	1
> Warning	ACKed segment that wasn't captured (common at capture s...	Sequence	TCP	21
> Warning	TCP window specified by the receiver is now completely full	Sequence	TCP	4
> Warning	Ignored Unknown Record	Protocol	TLS	225
> Warning	DNS response retransmission. Original response in frame 19...	Protocol	DNS	27
> Warning	DNS query retransmission. Original request in frame 19565	Protocol	DNS	50
> Warning	This frame is a (suspected) out-of-order segment	Sequence	TCP	231
> Warning	Previous segment(s) not captured (common at capture start)	Sequence	TCP	109
> Warning	DNS query retransmission. Original request in frame 9574	Protocol	mDNS	159
> Warning	Connection reset (RST)	Sequence	TCP	213
> Warning	TCP Zero Window segment	Sequence	TCP	124
> Note	This frame is a (suspected) fast retransmission	Sequence	TCP	5
> Note	The acknowledgment number field is nonzero while the AC...	Protocol	TCP	8
> Note	A new tcp session is started with the same ports as an earlie...	Sequence	TCP	6
> Note	This session reuses previously negotiated keys (Session resu...	Sequence	TLS	9
> Note	"Time To Live" != 255 for a packet sent to the Local Networ...	Sequence	IPv4	47
> Note	Duplicate ACK (#1)	Sequence	TCP	1125
> Note	This frame is a (suspected) spurious retransmission	Sequence	TCP	119
> Note	ACK to a TCP keep-alive segment	Sequence	TCP	245
> Note	TCP keep-alive segment	Sequence	TCP	269
> Note	This frame is a (suspected) retransmission	Sequence	TCP	1083
> Chat	Possible traceroute: hop #6, attempt #2	Sequence	UDP	3
> Chat	TCP window update	Sequence	TCP	9
> Chat	Connection finish (FIN)	Sequence	TCP	2019
> Chat	GET /IGDdevicedesc.xml HTTP/1.1\n/n	Sequence	HTTP	1413
> Chat	Connection establish acknowledgement (SYN+ACK): server port ...	Sequence	TCP	1014

Display filter: "ip.addr eq 192.168.1.2 and ip.addr eq 192.168.1.118 and (tcp.port eq 40152 and tcp.port eq 55372)"

☐ Limit to Display Filter ☒ Group by summary Search:

All the IP Address info about all the packets in my WIFI Network:

Wireshark · All Addresses · Wi-Fi

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
▼ All Addresses	521452				0.1541	100%	1.0300	3360.776
99.76.189.124	1				0.0000	0.00%	0.0100	1050.412
99.248.210.253	2				0.0000	0.00%	0.0200	814.126
99.244.164.136	2				0.0000	0.00%	0.0200	1632.815
99.241.42.147	2				0.0000	0.00%	0.0100	2755.412
99.240.182.86	4				0.0000	0.00%	0.0200	53.097
99.235.189.40	4				0.0000	0.00%	0.0200	1725.212
99.234.65.216	2				0.0000	0.00%	0.0100	830.417
99.228.198.77	2				0.0000	0.00%	0.0200	516.126
98.251.141.154	2				0.0000	0.00%	0.0100	186.672
98.239.145.169	1				0.0000	0.00%	0.0100	1236.431
98.201.227.152	4				0.0000	0.00%	0.0200	601.224
98.156.166.244	2				0.0000	0.00%	0.0200	72.155
98.10.10.223	7				0.0000	0.00%	0.0200	726.407
96.44.147.66	2				0.0000	0.00%	0.0200	495.079
96.44.147.114	2				0.0000	0.00%	0.0200	557.879
96.27.163.195	2				0.0000	0.00%	0.0200	1595.114
96.242.37.83	2				0.0000	0.00%	0.0200	1770.867
96.241.36.93	4				0.0000	0.00%	0.0200	473.043
96.241.149.22	4				0.0000	0.00%	0.0200	1736.494
96.241.142.33	2				0.0000	0.00%	0.0100	2727.432
96.23.172.71	2				0.0000	0.00%	0.0200	430.874
96.20.192.118	2				0.0000	0.00%	0.0200	697.198
96.126.98.53	1				0.0000	0.00%	0.0100	3105.430
95.91.227.118	2				0.0000	0.00%	0.0100	3091.413
95.84.150.168	2				0.0000	0.00%	0.0100	711.419
95.54.224.174	16				0.0000	0.00%	0.0200	70.616
95.45.132.235	2				0.0000	0.00%	0.0200	188.708
95.43.75.142	2				0.0000	0.00%	0.0200	1992.794
95.43.32.99	2				0.0000	0.00%	0.0200	1111.145
95.43.232.85	2				0.0000	0.00%	0.0200	1381.468
95.42.78.247	2				0.0000	0.00%	0.0200	973.715

Display filter:

Filtering IP Addresses based on IP Protocol:

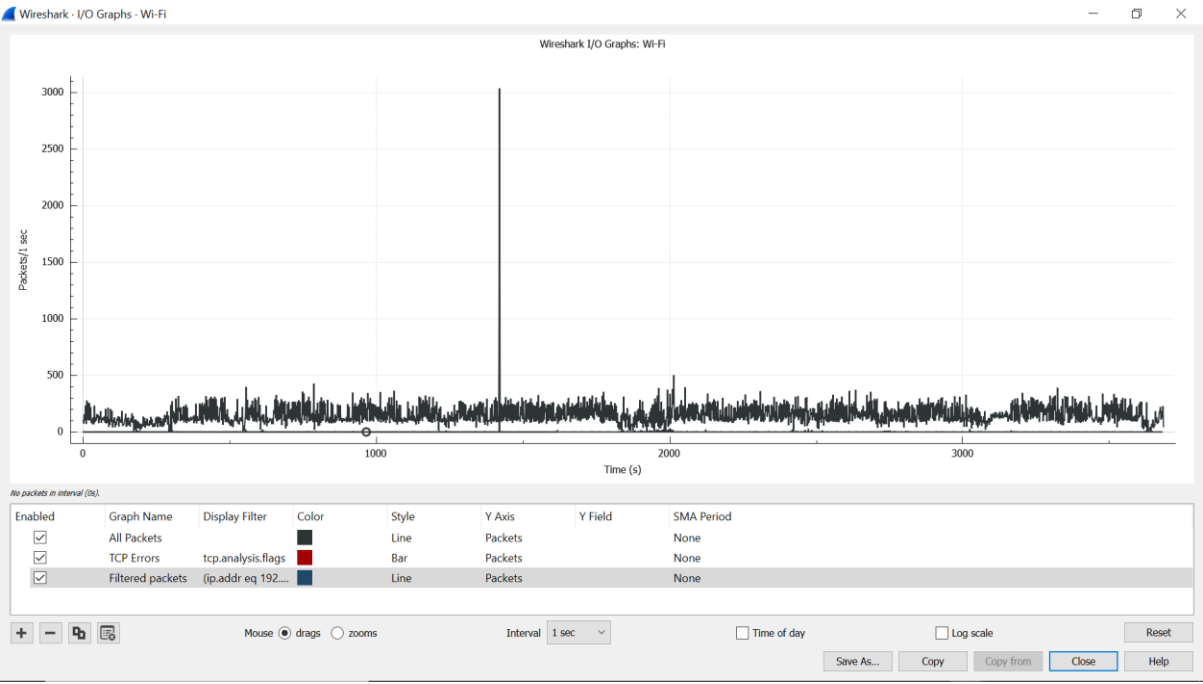
Wireshark - All Addresses - Wi-Fi

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
▼ All Addresses	556809				0.1545	100%	1.0600	3567.500
99.76.189.124	1				0.0000	0.00%	0.0100	1050.412
99.248.210.253	2				0.0000	0.00%	0.0200	814.126
99.244.164.136	2				0.0000	0.00%	0.0200	1632.815
99.241.42.147	2				0.0000	0.00%	0.0100	2755.412
99.240.182.86	4				0.0000	0.00%	0.0200	53.097
99.235.189.40	4				0.0000	0.00%	0.0200	1725.212
99.234.65.216	2				0.0000	0.00%	0.0100	830.417
99.228.198.77	2				0.0000	0.00%	0.0200	516.126
98.251.141.154	6				0.0000	0.00%	0.0200	3588.680
98.239.145.169	1				0.0000	0.00%	0.0100	1236.431
98.201.227.152	4				0.0000	0.00%	0.0200	601.224
98.156.166.244	2				0.0000	0.00%	0.0200	72.155
98.10.10.223	7				0.0000	0.00%	0.0200	726.407
96.44.147.66	2				0.0000	0.00%	0.0200	495.079
96.44.147.114	2				0.0000	0.00%	0.0200	557.879
96.27.163.195	2				0.0000	0.00%	0.0200	1595.114
96.242.37.83	2				0.0000	0.00%	0.0200	1770.867
96.241.36.93	4				0.0000	0.00%	0.0200	473.043
96.241.149.22	4				0.0000	0.00%	0.0200	1736.494
96.241.142.33	2				0.0000	0.00%	0.0100	2727.432
96.23.172.71	2				0.0000	0.00%	0.0200	430.874
96.20.192.118	2				0.0000	0.00%	0.0200	697.198
96.126.98.53	1				0.0000	0.00%	0.0100	3105.430
95.91.227.118	2				0.0000	0.00%	0.0100	3091.413
95.84.150.168	2				0.0000	0.00%	0.0100	711.419
95.55.67.95	4				0.0000	0.00%	0.0400	3575.311
95.54.224.174	20				0.0000	0.00%	0.0200	70.616
95.45.132.235	2				0.0000	0.00%	0.0200	188.708
95.43.75.142	2				0.0000	0.00%	0.0200	1992.794
95.43.32.99	2				0.0000	0.00%	0.0200	1111.145
95.43.232.85	2				0.0000	0.00%	0.0200	1381.468

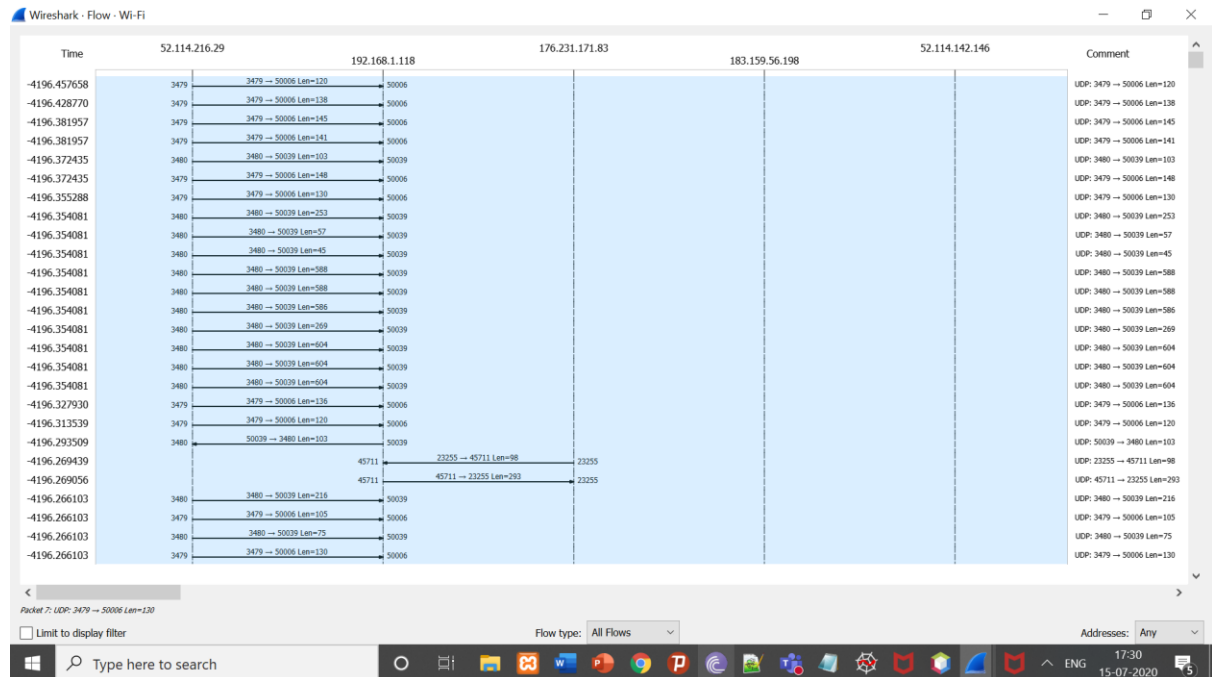
Display filter: ip

Copy Save as... Close

I/O Graph showing all the packets and how fast they are transferred/delivered in units of time(seconds)



FlowChart showing all Protocols:



FlowChart showing only TCP Protocol:



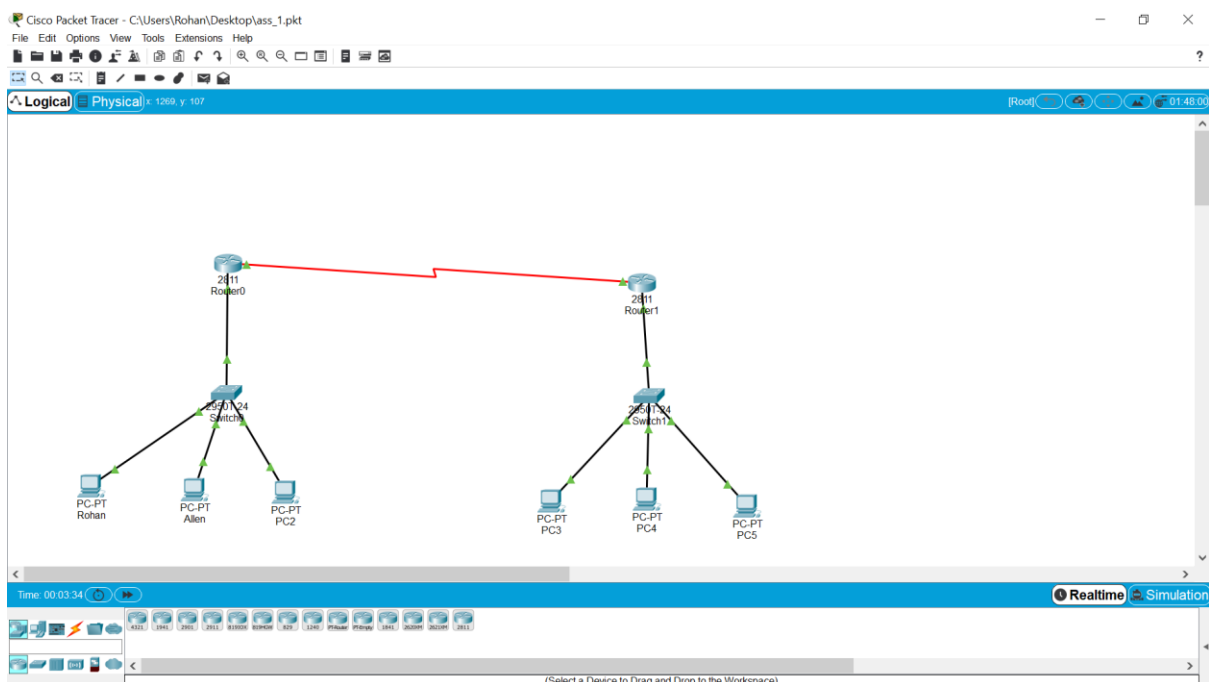
Exercise 2:

Experiments in Cisco Packet Tracer software.

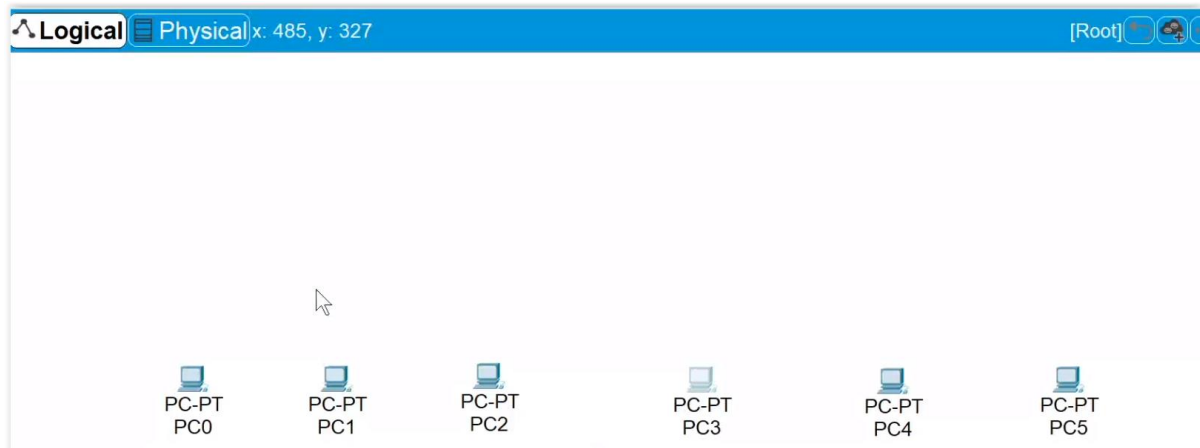
Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface.

Aim:

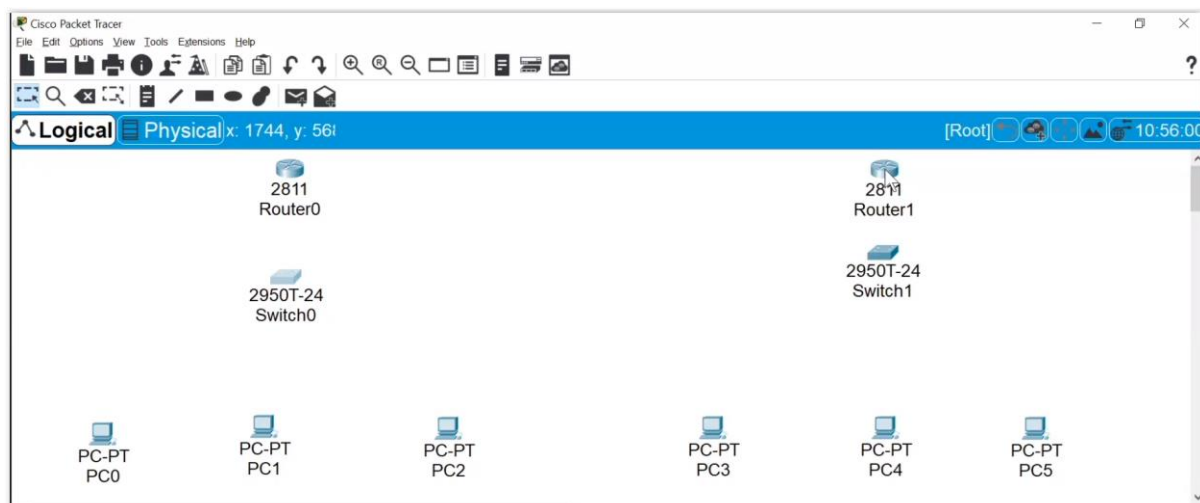
To get this network topology:



First Get 6 PC devices:

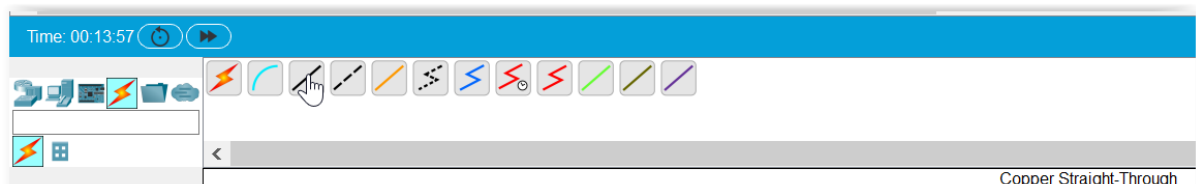


Then get 2 2950T-24 switches and two 2811 routers:



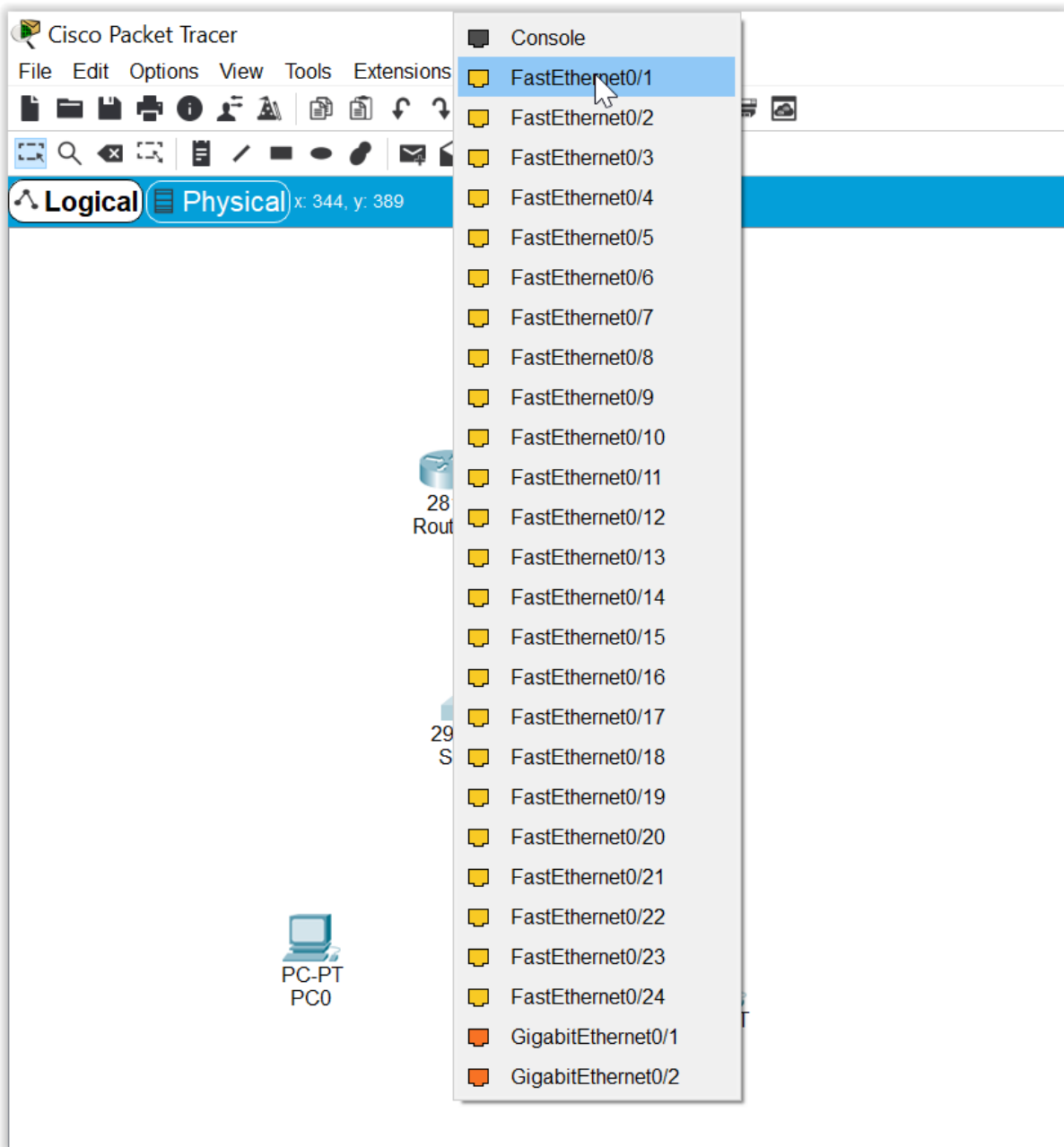
Now we have to configure these devices to get the required network topology.

We choose the copper straight through wires to make the connections.

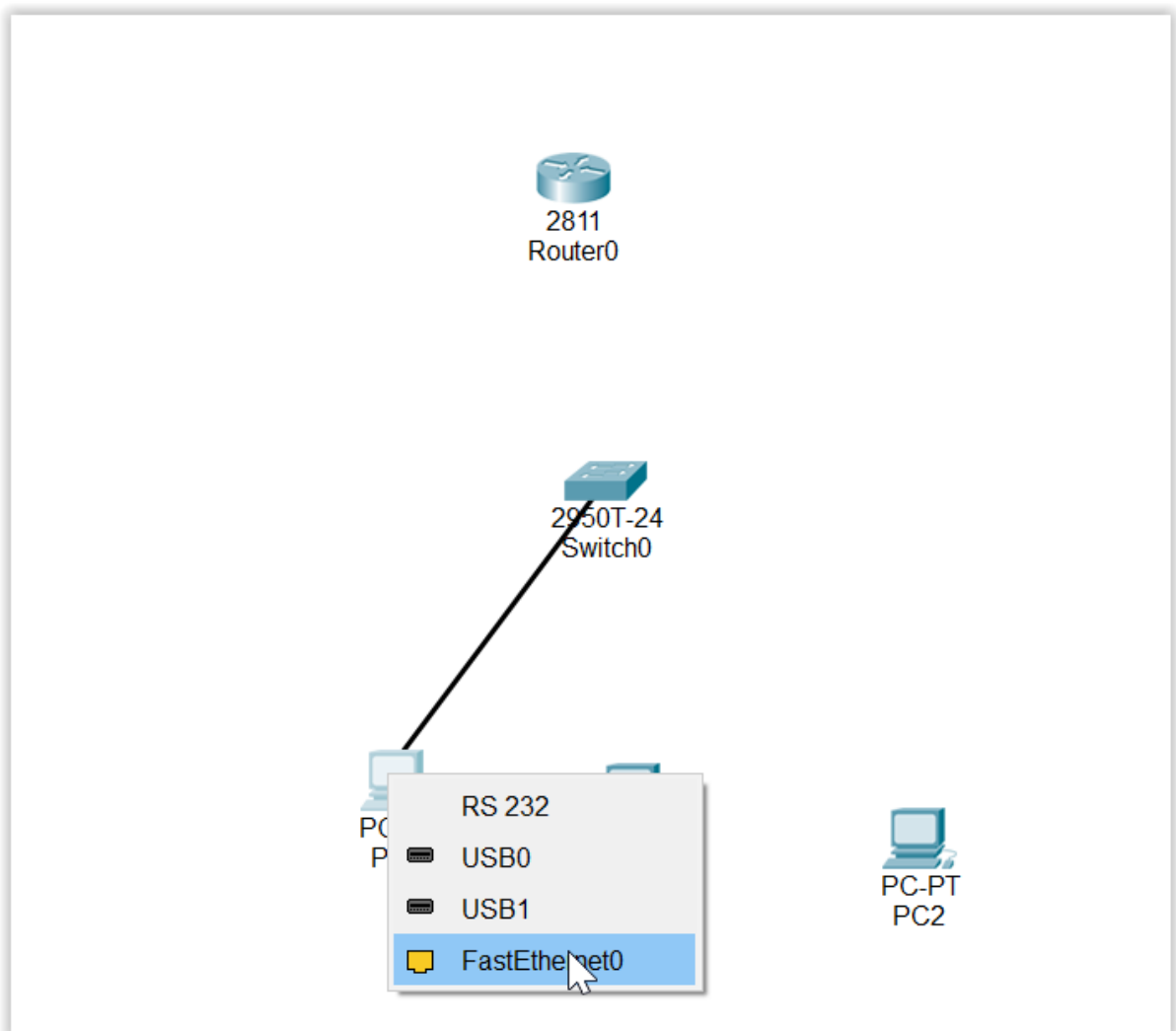


Click on the switch:

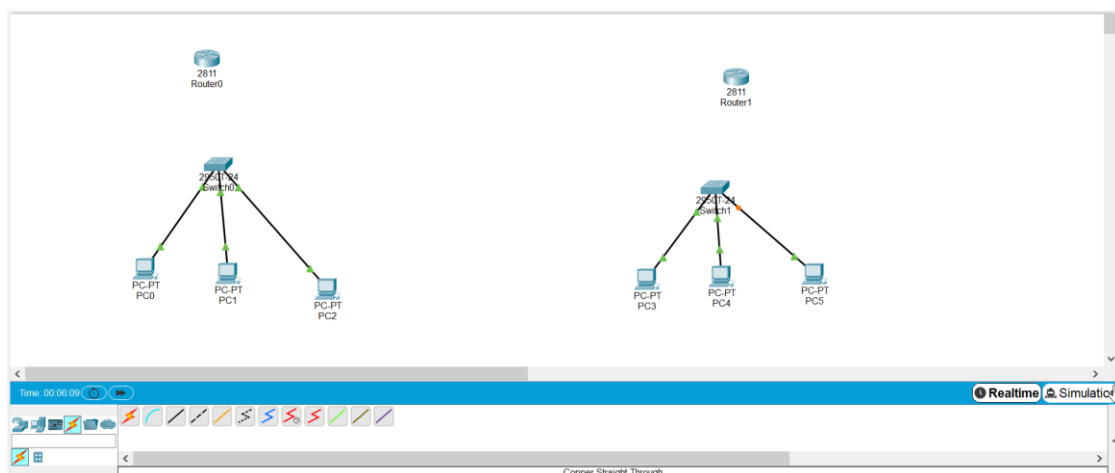
Then select the highlighted option



Click on PC0 Now and select the below highlighted option



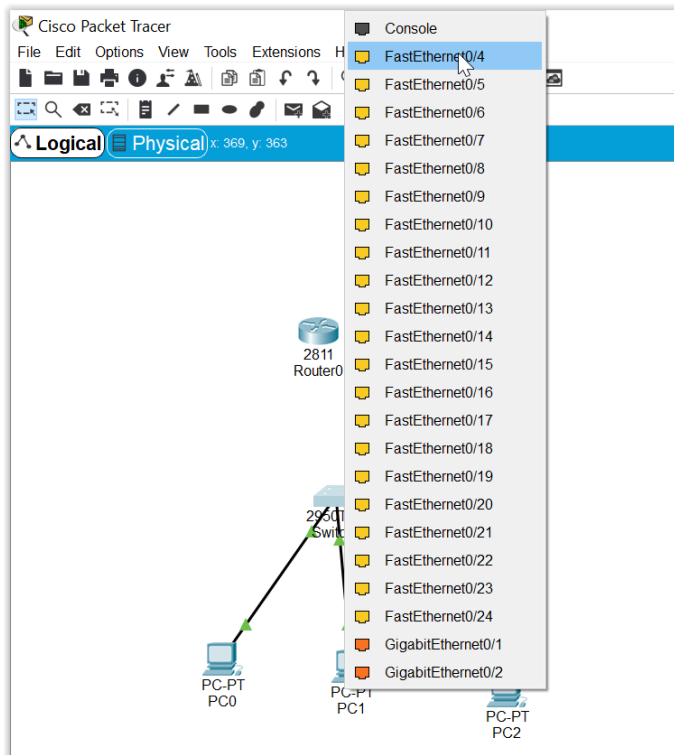
Now to the same connections for all the PCs and switches.



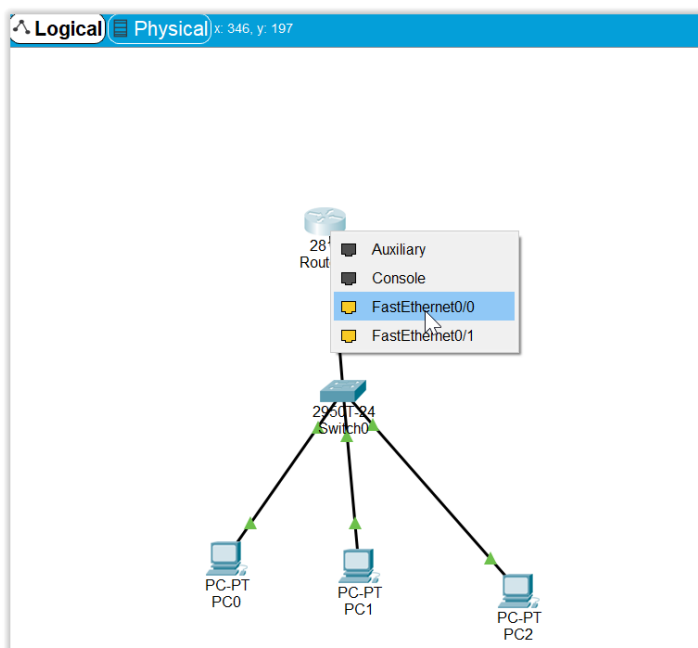
Now for router to switch connection:

Click on switch after choosing appropriate cable

select the below highlighted option

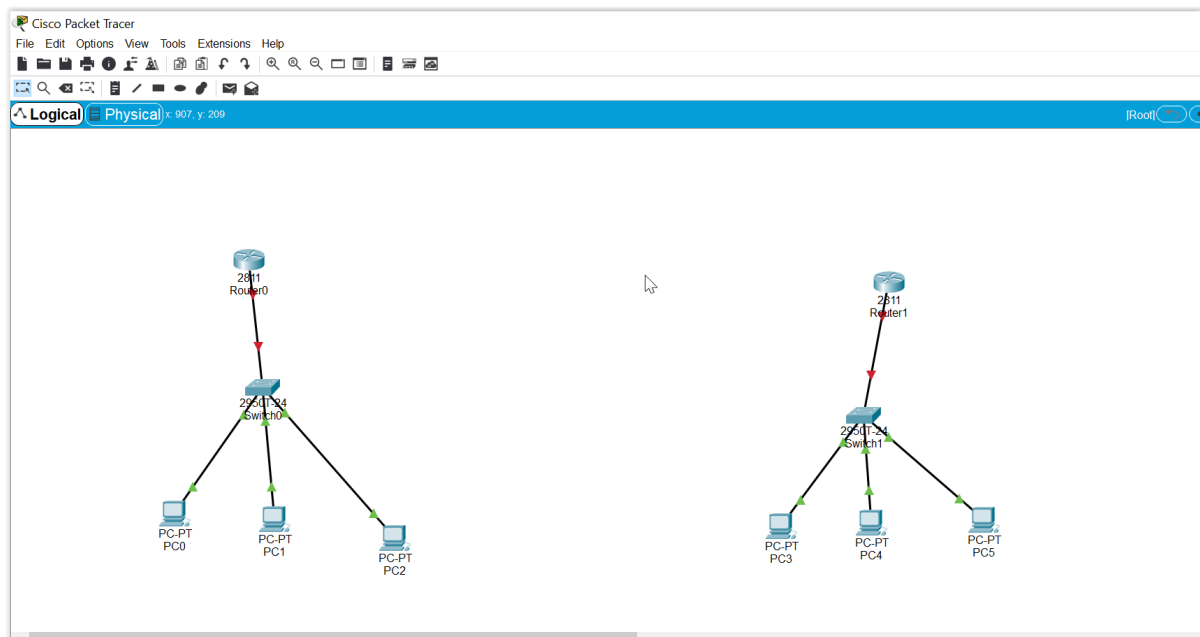


Now click on router and select the below highlighted option



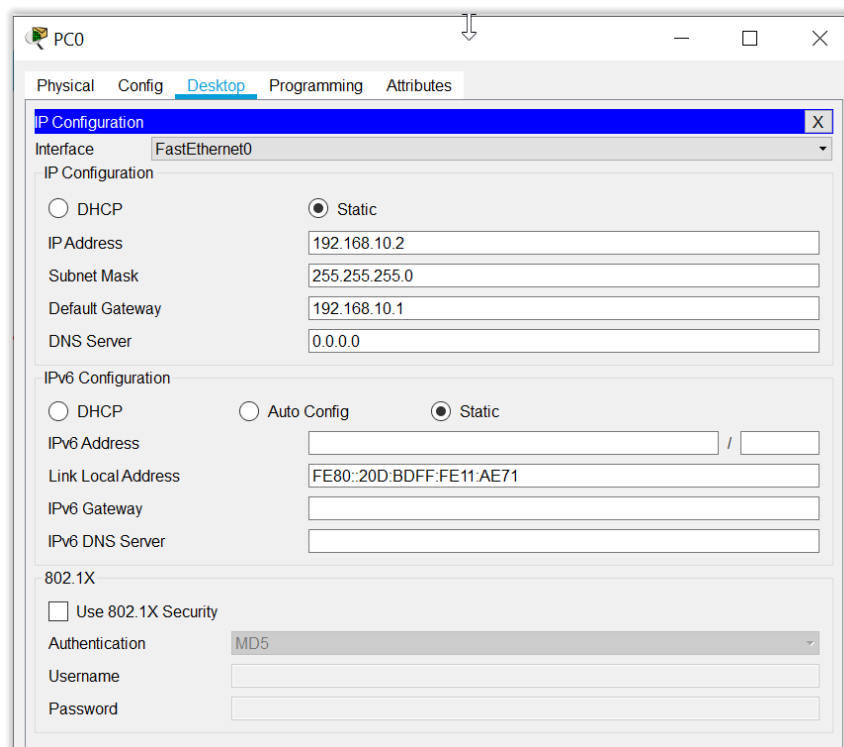
Do this for all routers

Finally, we get



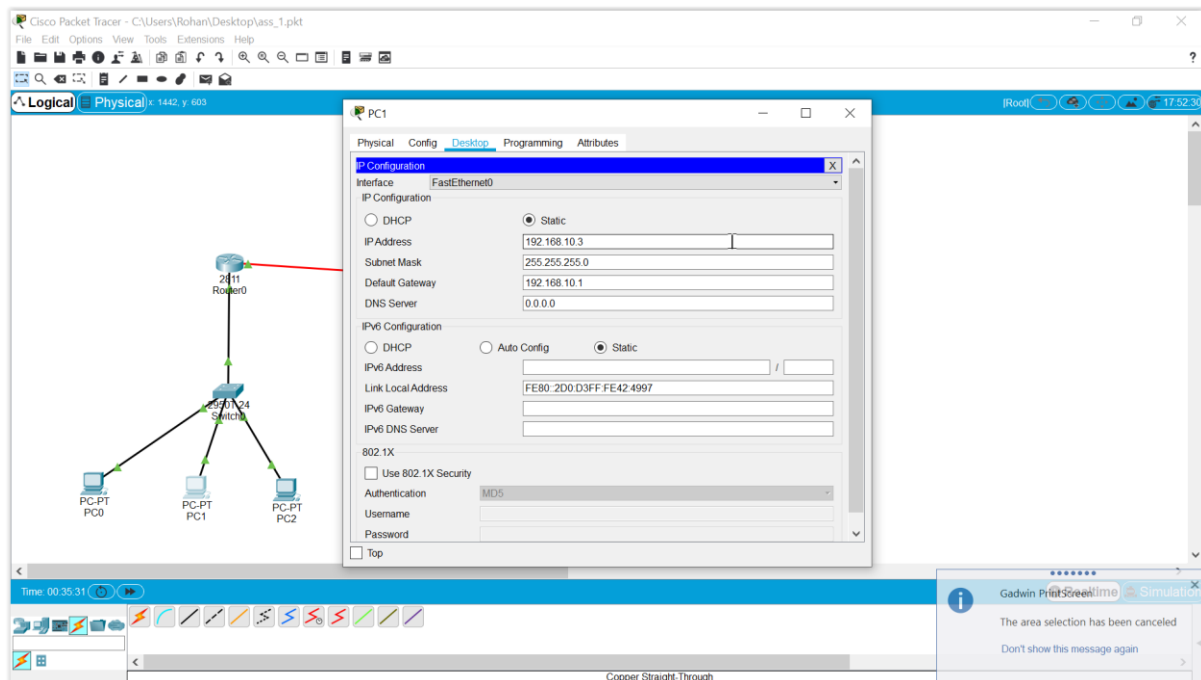
Now we have to configure all the PCs

Double click on PC0 and apply this IP Address and default gateway

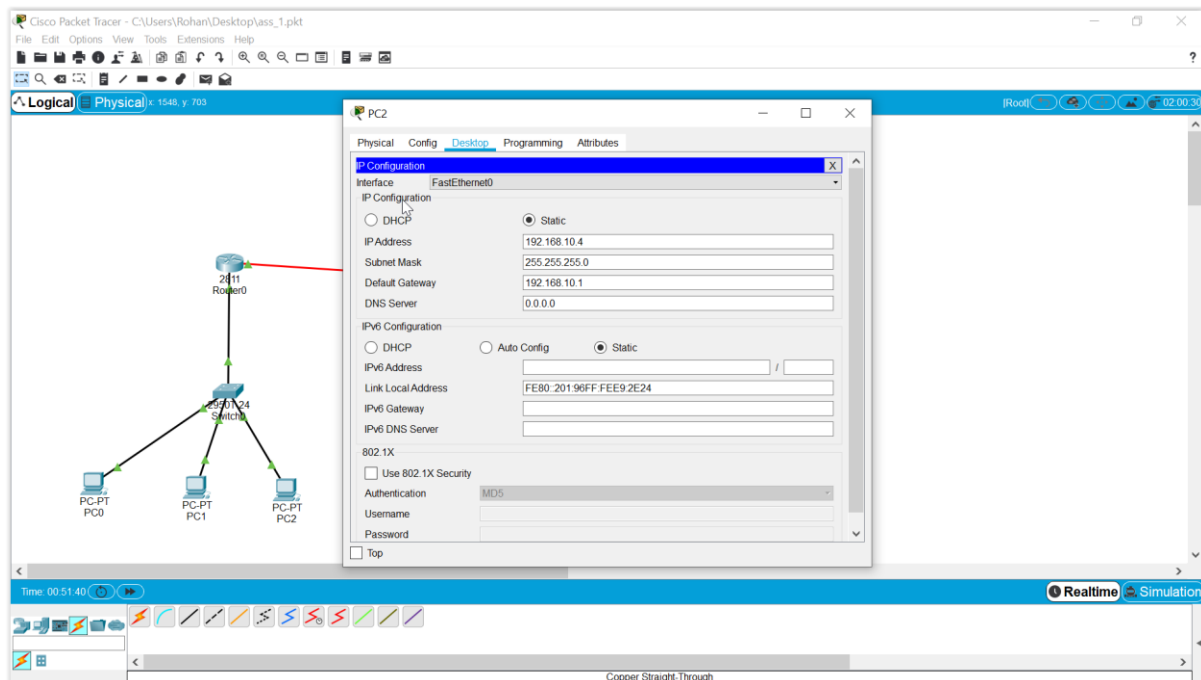


Similarly do for all PCs:

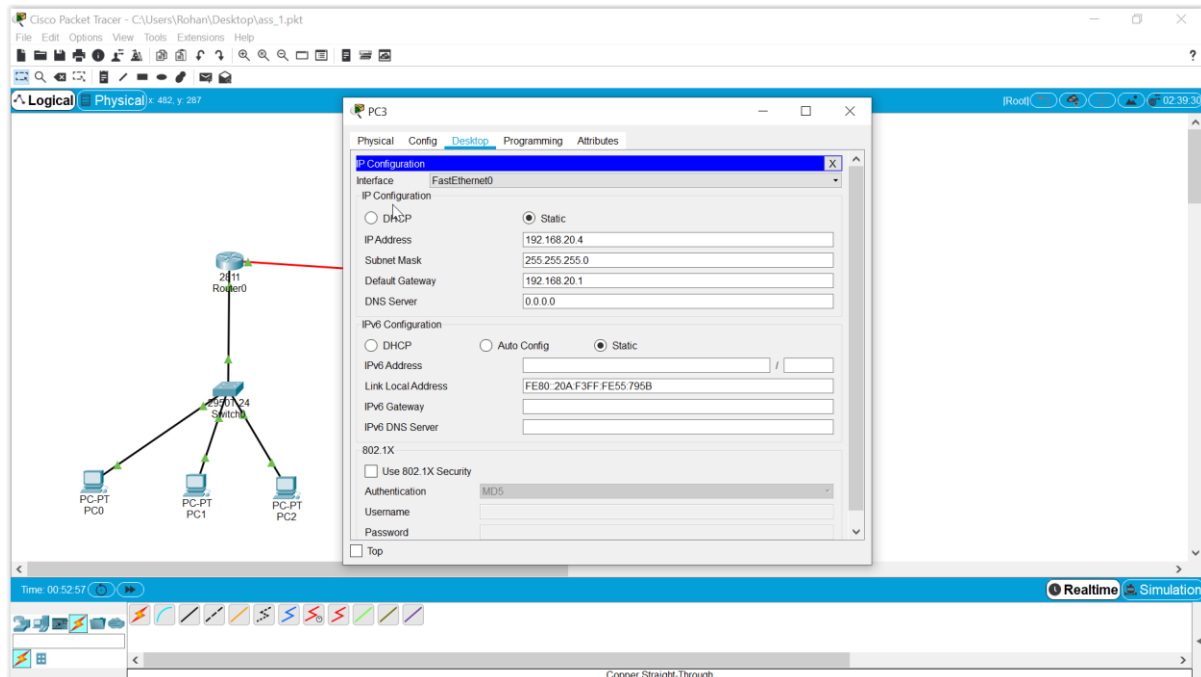
PC1



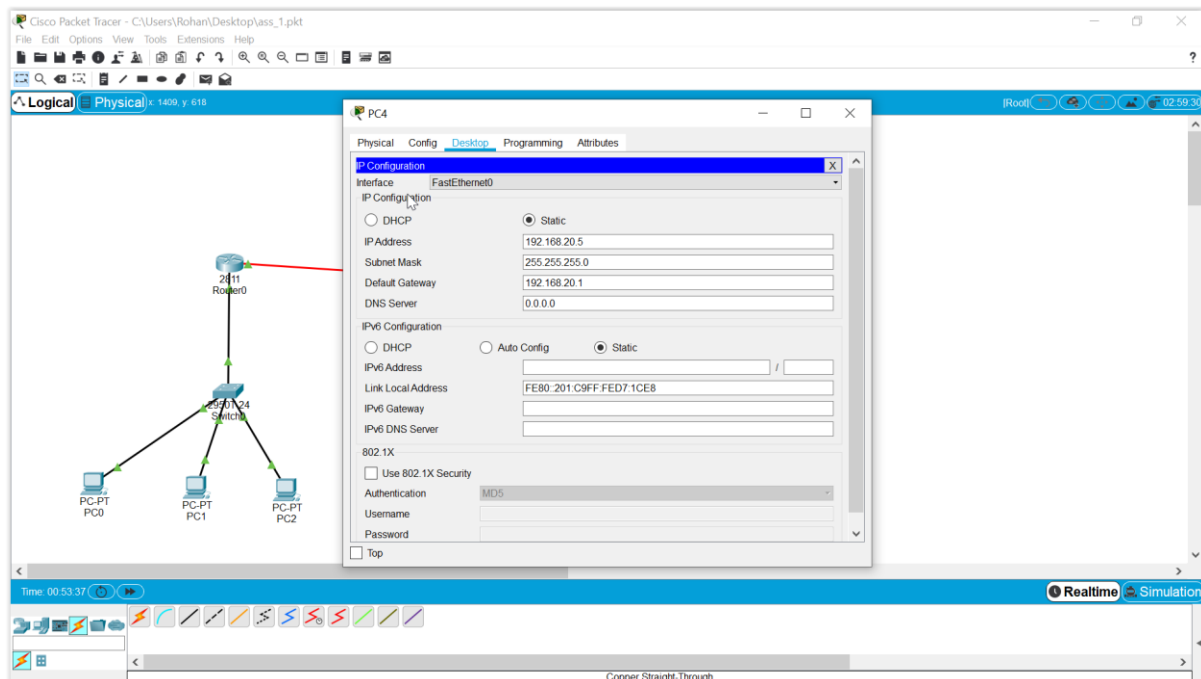
PC2



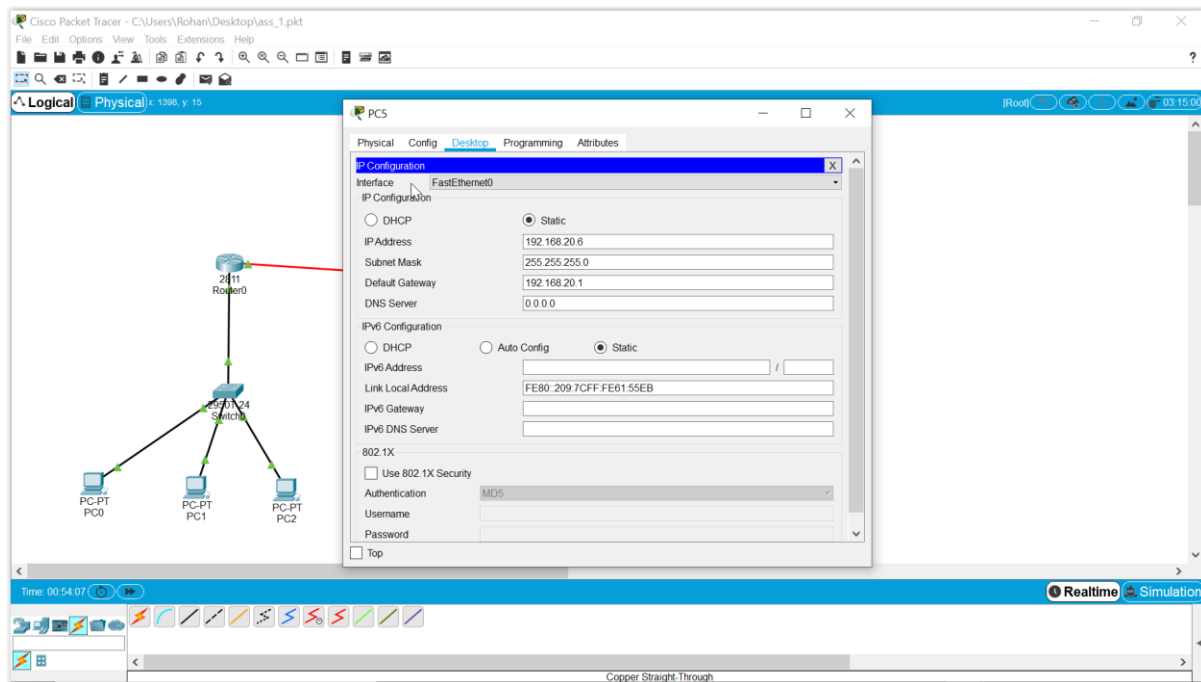
PC3



PC4



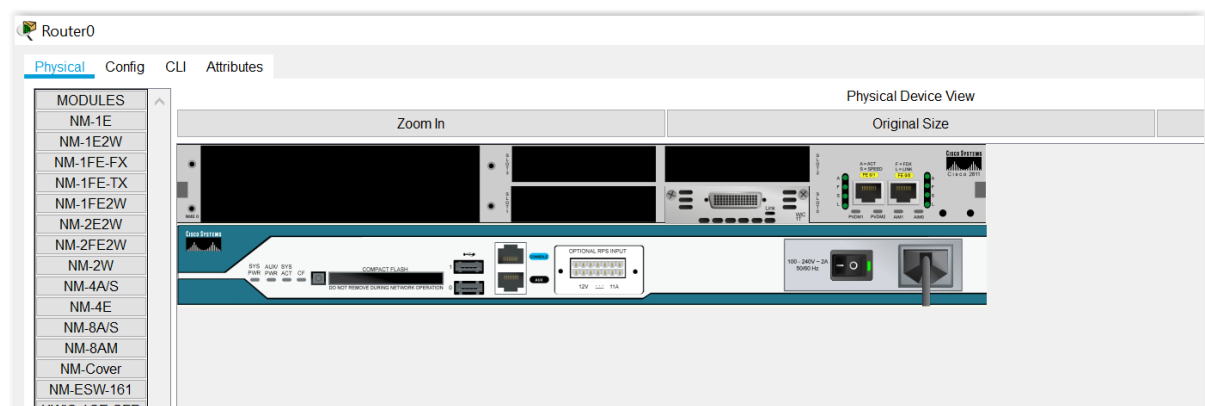
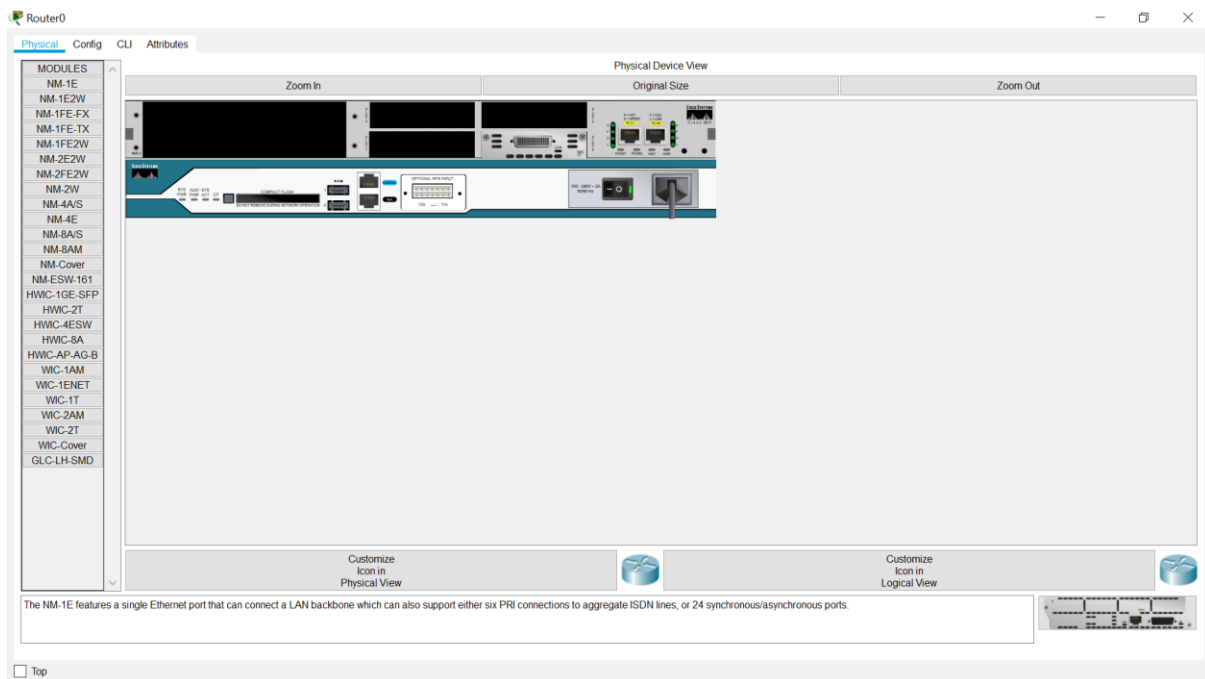
PC5



Now we will configure the routers:

Double click the router and add module WIC-1T. Turn on switch

The WIC-1T provides a single port serial connection to remote sites or legacy serial network devices such as Synchronous Data Link Control (SDLC) concentrators, alarm systems, and packet over SONET (POS) devices.



Similarly do for the other router

Apply this config for router0:

The screenshot shows the configuration window for Router0. The 'Config' tab is active, and the 'FastEthernet0/0' interface is selected. The settings are as follows:

FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0009.7CCA.5301
IP Configuration	
IP Address	192.168.10.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

Equivalent IOS Commands

```
Technical Support: http://www.cisco.com/techsupport  
Copyright (c) 1986-2007 by Cisco Systems, Inc.  
Compiled Wed 18-Jul-07 06:21 by pt_rel_team  
Press RETURN to get started!
```

Router1:

The screenshot shows the configuration window for Router1. The 'Config' tab is active, and the 'FastEthernet0/0' interface is selected. The settings are as follows:

FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0060.478B.1701
IP Configuration	
IP Address	192.168.20.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

Equivalent IOS Commands

```
Router#  
Router#configure terminal  
Enter configuration commands, one per line. End with  
CNTL/Z.  
Router(config)#interface FastEthernet0/0  
Router(config-if)#
```

Select Serial DCE cable to connect the routers:



Therefore, finally we get:

