Name : Rajat Minekar
Roll : 31448, M4

Page No.
Date

Assignment - I

Title :-

setup a wired LAN using layer switch & then IP switch of minimum four computers. It includes preparation of cable, testing of cable using line tests configuration machine using IP addresses, testing using PING utility & demonstration of the PING packets captured using wireshark packet analyz tool.

Objectives :-

1) To understand the structure & working of various networks including interconnecting devices used in them.
2) To get hands on experience of making testing cables.

Types of networks :-

1] LAN :- (Local Area Network)

A LAN connects network devices over a relatively short dista A networked office building, school, or home usually contains single LAN, though sometimes one building will contain a few small LANS (

and occassionally a LAN will span a group of buildings.

2] MAN :- (Metropolitan Area Network)

A network spanning a physical area larger than a LAN but smaller than WAN, such as a city. A MAN is typically owned & operated by single entity such as a goverment body or large corporation.

3] WAN :- (Wide Area Network)

As the term implies a WAN spans a large physical distance. The Internet is the largest WAN, spanning the Earth.

Types of Cables :-

1] Unshielded Twisted Pair (UTP) cable :-

Twisted pair cable comes into two vesties ① Shielded ② Unshielded

UTP is the most popular & is generally the best option for school networks.

Category	Speed	Use
①	1 Mbps	Voice Only (Telephone wire)
②	4 Mbps	Local Talk & Telephone
③	16 Mbps	10 Base Ethernet
④	20 Mbps	Token Ring
⑤	100 Mbps	100 Base Ethernet
	1000 Mbps	Gigabit Ethernet
⑤e	1000 Mbps	Gigabit Ethernet
⑥	10,000 Mbps	Gigabit Ethernet

2] Coaxial cable :-

It has a single copper conductor at it's center. A plastic layer provides insulation between the center conductor & braided metal shield. The metal shield helps to block any outside interference from

Although, it is difficult to install, it is highly resistant to signal interference.

Network Topology :-

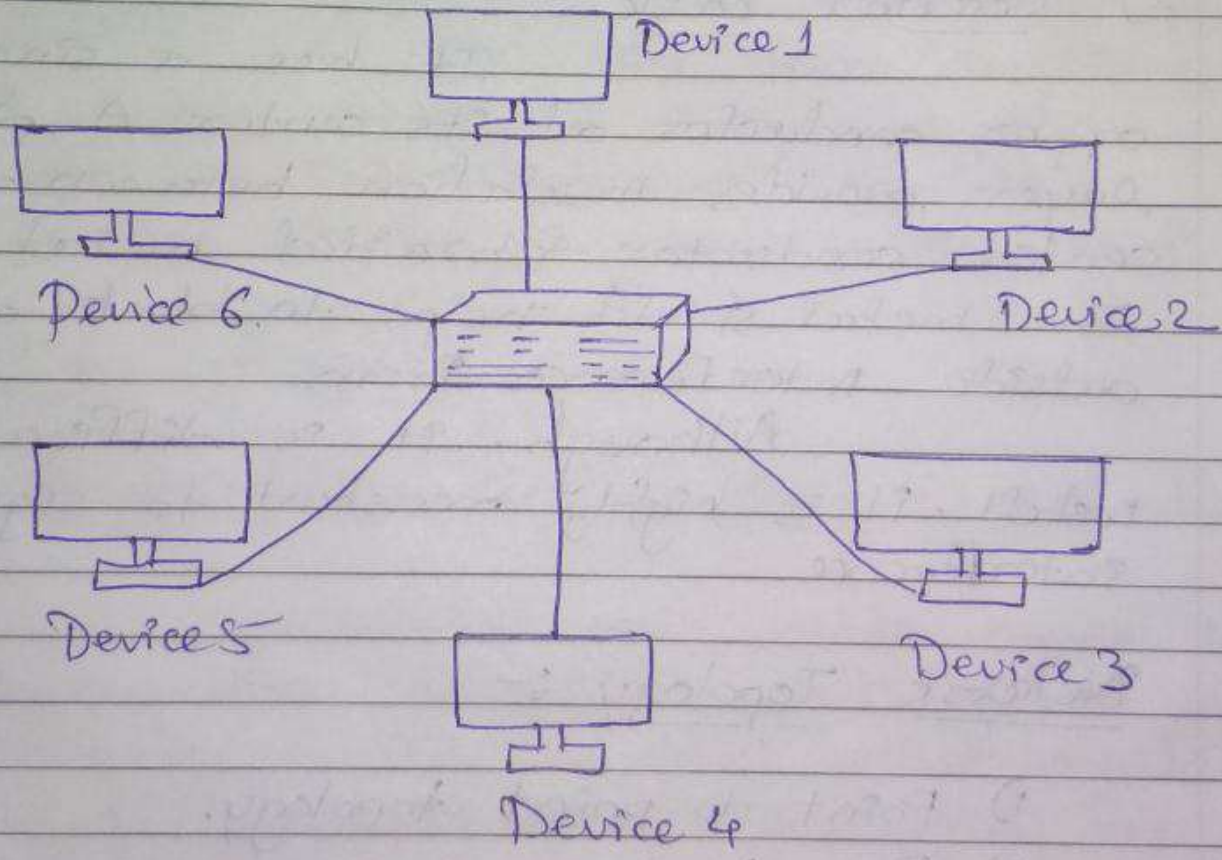
1) Point to point topology.
2) Bus topology.
3) Star topology.
4) Ring topology.
5) Tree topology.
6) Mesh topology.
7) Hybrid topology.

Page No.
Date / /

Star Topology :-

A star topology is designed with each node connected directly to a central network hub, switch or concentrator.

Data on a star network passes through the hub, switch or concentrator before continuing to its destination. The hub, switch or concentrator manages & controls all function of network.



Page No.
Date

Advantages :-

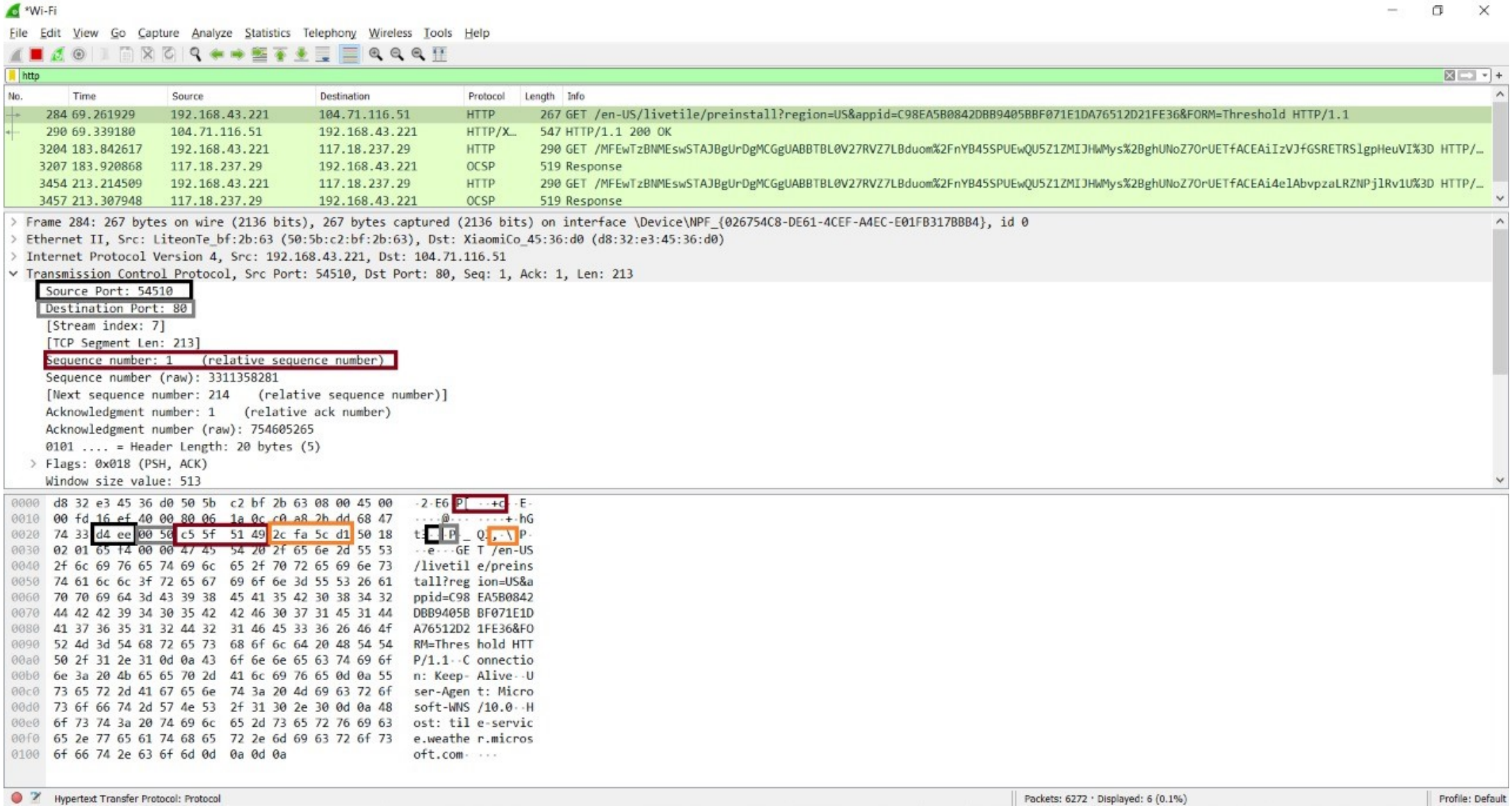
1) Easy to install & wire.
2) No distruptions to the network when connecting or removing devices.
3) Easy to detect faults & to remove parts.

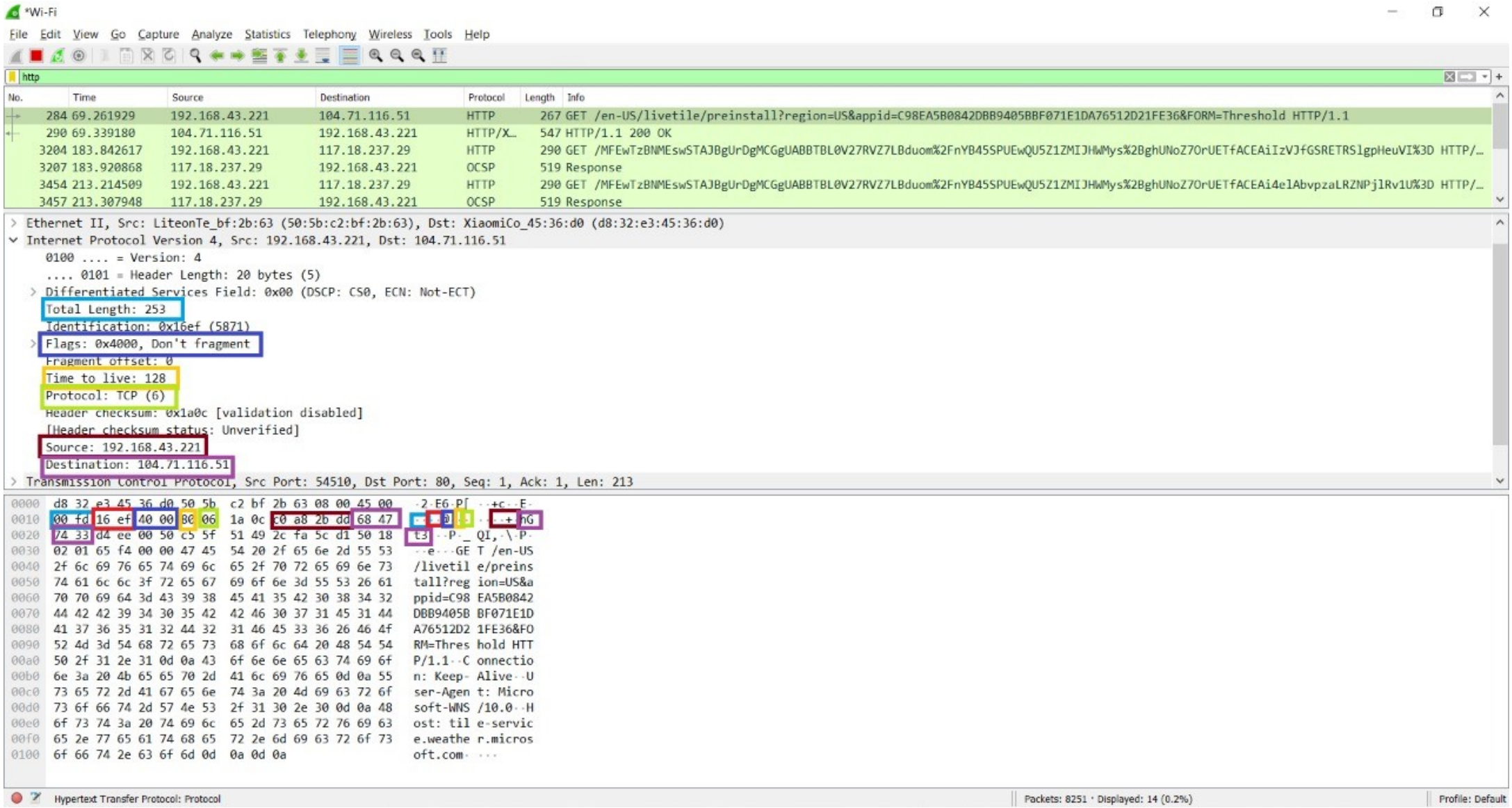
Disadvantages :-

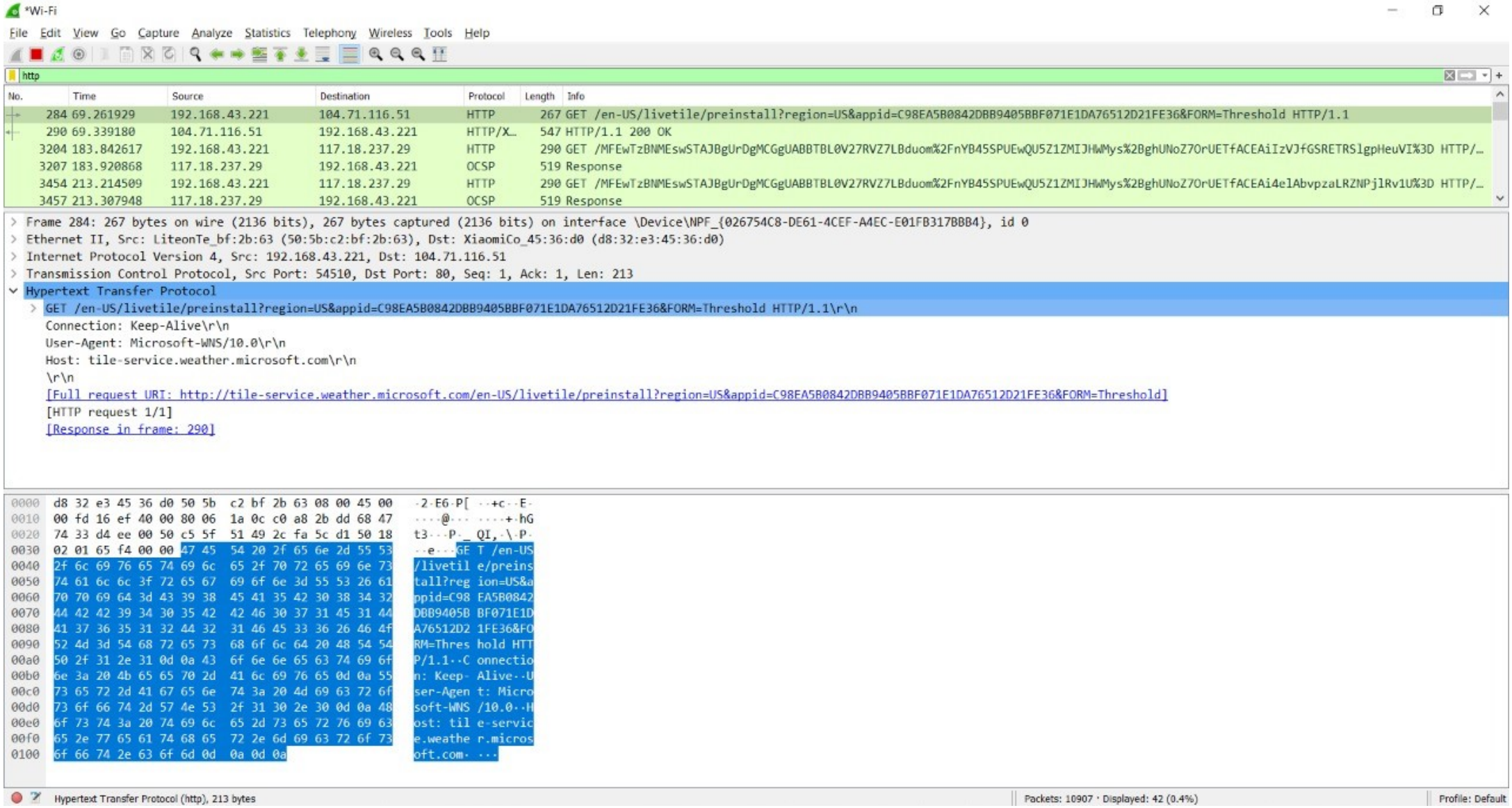
1) Requires more cable length than a linear topology.
2) If the hub, switch or concentrator fails, nodes ~~add~~ immediately are disabled.
3) More expensive than linear bus.

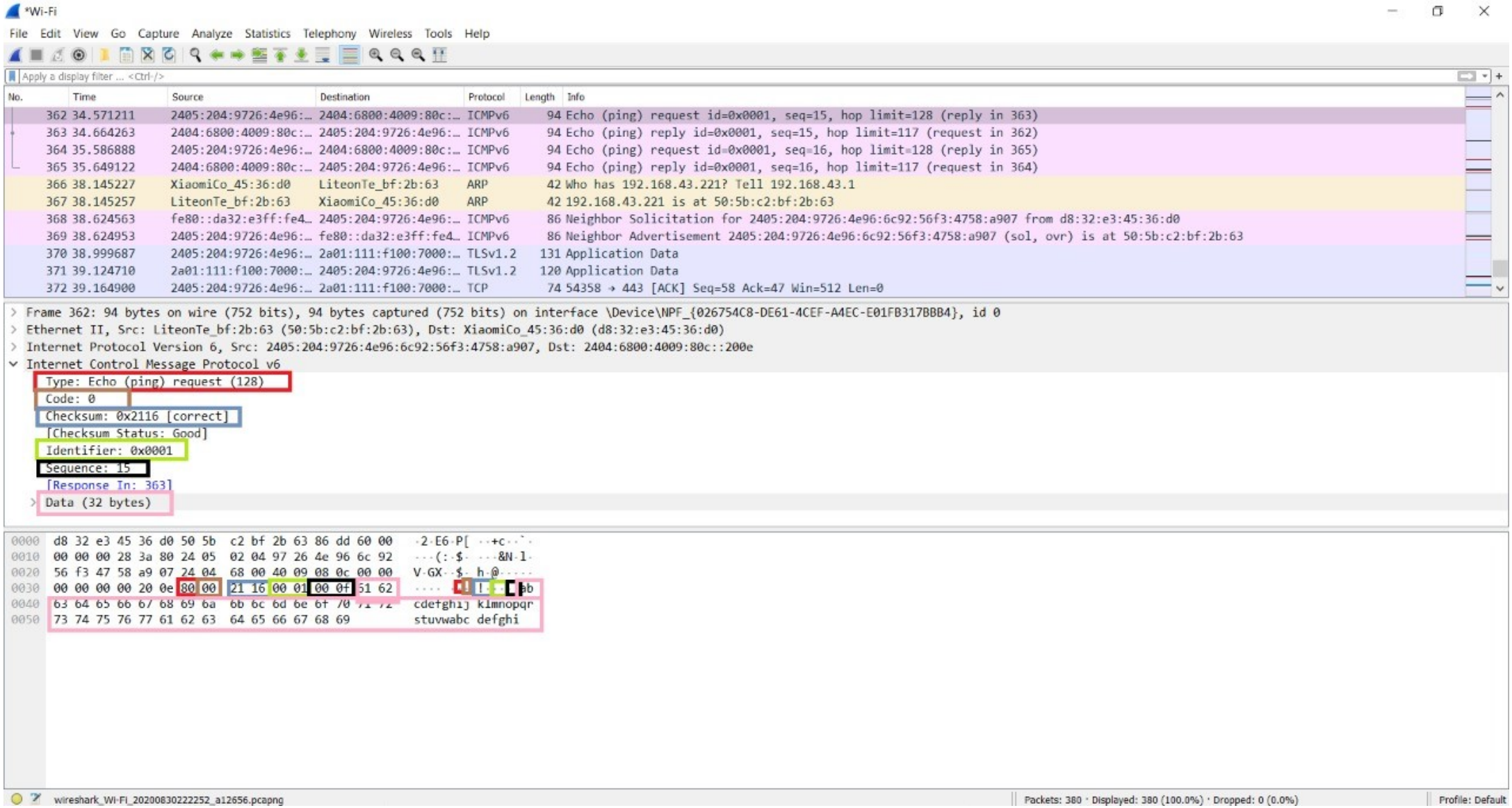
Conclusion :-

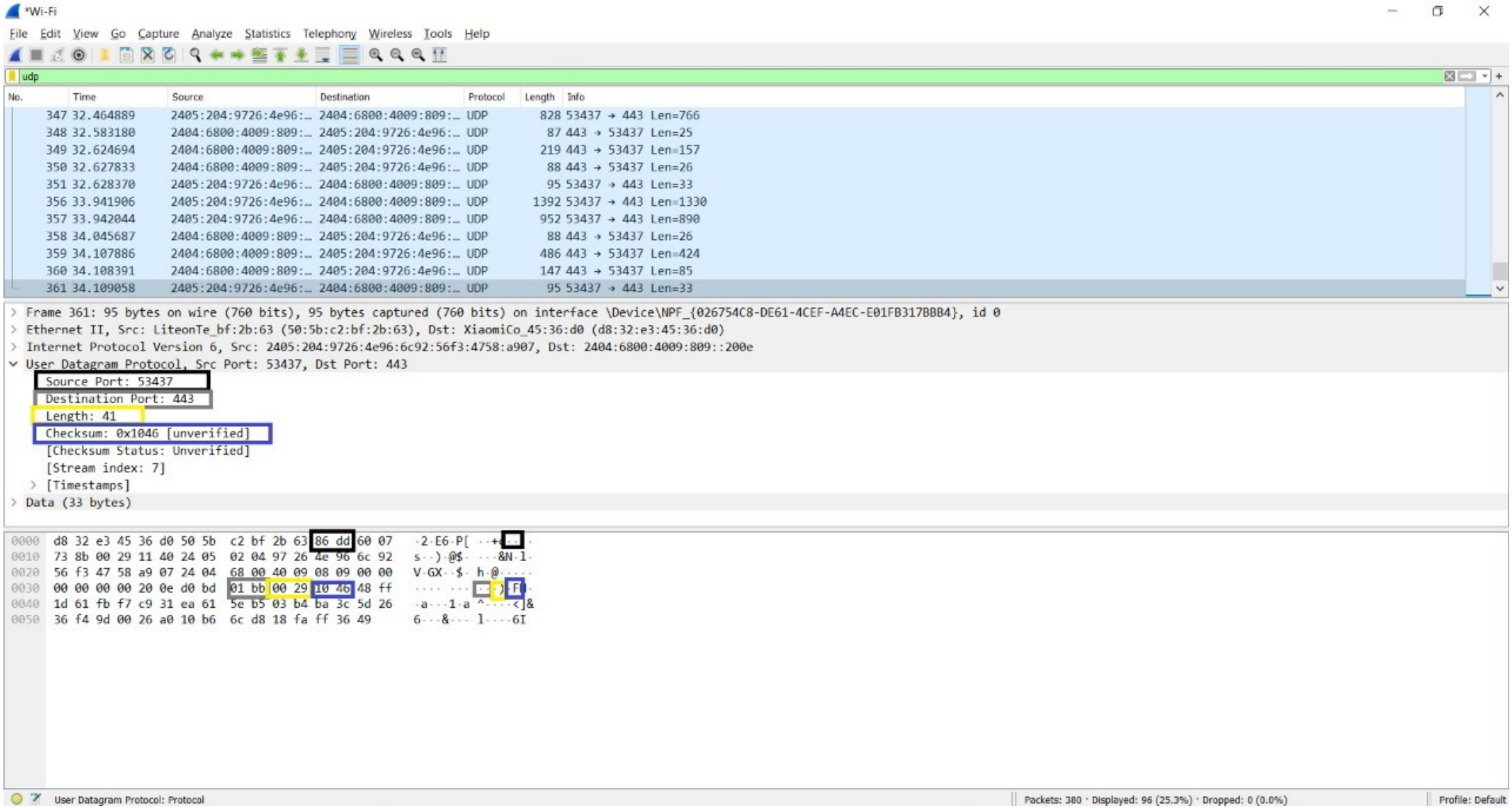
We successfully learn the various networks & study of existing LAN.


*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
http
No. Time Source Destination Protocol Length Info
284 69.261929 192.168.43.221 104.71.116.51 HTTP 267 GET /en-US/livetile/preinstall?region=US&appid=C98EA5B0842DBB9405BBF071E1DA76512D21FE36&FORM=Threshold HTTP/1.1
290 69.339180 104.71.116.51 192.168.43.221 HTTP/X… 547 HTTP/1.1 200 OK
3204 183.842617 192.168.43.221 117.18.237.29 HTTP 290 GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTBL0V27RVZ7LBduom%2FnYB45SPUEwQU5Z1ZMIJHWMys%2BghUNoZ7OrUETfACEAiIzVJfGSRETRSlgpHeuVI%3D HTTP/…
3207 183.920868 117.18.237.29 192.168.43.221 OCSP 519 Response
3454 213.214509 192.168.43.221 117.18.237.29 HTTP 290 GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTBL0V27RVZ7LBduom%2FnYB45SPUEwQU5Z1ZMIJHWMys%2BghUNoZ7OrUETfACEAi4elAbvpzaLRZNPjlRv1U%3D HTTP/…
3457 213.307948 117.18.237.29 192.168.43.221 OCSP 519 Response
Frame 284: 267 bytes on wire (2136 bits), 267 bytes captured (2136 bits) on interface \Device\NPF_{026754C8-DE61-4CEF-A4EC-E01FB317BBB4}, id 0
Ethernet II, Src: LiteonTe_bf:2b:63 (50:5b:c2:bf:2b:63), Dst: XiaomiCo_45:36:d0 (d8:32:e3:45:36:d0)
Internet Protocol Version 4, Src: 192.168.43.221, Dst: 104.71.116.51
Transmission Control Protocol, Src Port: 54510, Dst Port: 80, Seq: 1, Ack: 1, Len: 213
Source Port: 54510
Destination Port: 80
[Stream index: 7]
[TCP Segment Len: 213]
Sequence number: 1 (relative sequence number)
Sequence number (raw): 3311358281
[Next sequence number: 214 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)
Acknowledgment number (raw): 754605265
0101 .... = Header Length: 20 bytes (5)
Flags: 0x018 (PSH, ACK)
Window size value: 513
0000 d8 32 e3 45 36 d0 50 5b c2 bf 2b 63 08 00 45 00
0010 00 fd 16 ef 40 00 80 06 1a 0c c0 a8 2b dd 68 47
0020 74 33 d4 ee 00 50 c5 5f 51 49 2c fa 5c d1 50 18
0030 02 01 65 f4 00 00 47 45 54 20 2f 65 6e 2d 55 53
0040 2f 6c 69 76 65 74 69 6c 65 2f 70 72 65 69 6e 73
0050 74 61 6c 6c 3f 72 65 67 69 6f 6e 3d 55 53 26 61
0060 70 70 69 64 3d 43 39 38 45 41 35 42 30 38 34 32
0070 44 42 42 39 34 30 35 42 42 46 30 37 31 45 31 44
0080 41 37 36 35 31 32 44 32 31 46 45 33 36 26 46 4f
0090 52 4d 3d 54 68 72 65 73 68 6f 6c 64 20 48 54 54
00a0 50 2f 31 2e 31 0d 0a 43 6f 6e 6e 65 63 74 69 6f
00b0 6e 3a 20 4b 65 65 70 2d 41 6c 69 76 65 0d 0a 55
00c0 73 65 72 2d 41 67 65 6e 74 3a 20 4d 69 63 72 6f
00d0 73 6f 66 74 2d 57 4e 53 2f 31 30 2e 30 0d 0a 48
00e0 6f 73 74 3a 20 74 69 6c 65 2d 73 65 72 76 69 63
00f0 65 2e 77 65 61 74 68 65 72 2e 6d 69 63 72 6f 73
0100 6f 66 74 2e 63 6f 6d 0d 0a 0d 0a
Hypertext Transfer Protocol: Protocol
Packets: 6272 · Displayed: 6 (0.1%)
Profile: Default


*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
http
No. Time Source Destination Protocol Length Info
284 69.261929 192.168.43.221 104.71.116.51 HTTP 267 GET /en-US/livetile/preinstall?region=US&appid=C98EA5B0842DBB9405BBF071E1DA76512D21FE36&FORM=Threshold HTTP/1.1
290 69.339180 104.71.116.51 192.168.43.221 HTTP/X… 547 HTTP/1.1 200 OK
3204 183.842617 192.168.43.221 117.18.237.29 HTTP 290 GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTBL0V27RVZ7LBduom%2FnYB45SPUEwQU5Z1ZMIJHWMys%2BghUNoZ7OrUETfACEAiIzVJfGSRETRSlgpHeuVI%3D HTTP/…
3207 183.920868 117.18.237.29 192.168.43.221 OCSP 519 Response
3454 213.214509 192.168.43.221 117.18.237.29 HTTP 290 GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTBL0V27RVZ7LBduom%2FnYB45SPUEwQU5Z1ZMIJHWMys%2BghUNoZ7OrUETfACEAi4elAbvpzaLRZNPjlRv1U%3D HTTP/…
3457 213.307948 117.18.237.29 192.168.43.221 OCSP 519 Response
Ethernet II, Src: LiteonTe_bf:2b:63 (50:5b:c2:bf:2b:63), Dst: XiaomiCo_45:36:d0 (d8:32:e3:45:36:d0)
Internet Protocol Version 4, Src: 192.168.43.221, Dst: 104.71.116.51
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 253
Identification: 0x16ef (5871)
Flags: 0x4000, Don't fragment
Fragment offset: 0
Time to live: 128
Protocol: TCP (6)
Header checksum: 0x1a0c [validation disabled]
[Header checksum status: Unverified]
Source: 192.168.43.221
Destination: 104.71.116.51
Transmission Control Protocol, Src Port: 54510, Dst Port: 80, Seq: 1, Ack: 1, Len: 213
0000 d8 32 e3 45 36 d0 50 5b c2 bf 2b 63 08 00 45 00
0010 00 fd 16 ef 40 00 80 06 1a 0c c0 a8 2b dd 68 47
0020 74 33 d4 ee 00 50 c5 5f 51 49 2c fa 5c d1 50 18
0030 02 01 65 f4 00 00 47 45 54 20 2f 65 6e 2d 55 53
0040 2f 6c 69 76 65 74 69 6c 65 2f 70 72 65 69 6e 73
0050 74 61 6c 6c 3f 72 65 67 69 6f 6e 3d 55 53 26 61
0060 70 70 69 64 3d 43 39 38 45 41 35 42 30 38 34 32
0070 44 42 42 39 34 30 35 42 42 46 30 37 31 45 31 44
0080 41 37 36 35 31 32 44 32 31 46 45 33 36 26 46 4f
0090 52 4d 3d 54 68 72 65 73 68 6f 6c 64 20 48 54 54
00a0 50 2f 31 2e 31 0d 0a 43 6f 6e 6e 65 63 74 69 6f
00b0 6e 3a 20 4b 65 65 70 2d 41 6c 69 76 65 0d 0a 55
00c0 73 65 72 2d 41 67 65 6e 74 3a 20 4d 69 63 72 6f
00d0 73 6f 66 74 2d 57 4e 53 2f 31 30 2e 30 0d 0a 48
00e0 6f 73 74 3a 20 74 69 6c 65 2d 73 65 72 76 69 63
00f0 65 2e 77 65 61 74 68 65 72 2e 6d 69 63 72 6f 73
0100 6f 66 74 2e 63 6f 6d 0d 0a 0d 0a
Hypertext Transfer Protocol: Protocol
Packets: 8251 · Displayed: 14 (0.2%)
Profile: Default


*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
http
No. Time Source Destination Protocol Length Info
284 69.261929 192.168.43.221 104.71.116.51 HTTP 267 GET /en-US/livetile/preinstall?region=US&appid=C98EA5B0842DBB9405BBF071E1DA76512D21FE36&FORM=Threshold HTTP/1.1
290 69.339180 104.71.116.51 192.168.43.221 HTTP/X… 547 HTTP/1.1 200 OK
3204 183.842617 192.168.43.221 117.18.237.29 HTTP 290 GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTBL0V27RVZ7LBduom%2FnYB45SPUEwQU5Z1ZMIJHWMys%2BghUNoZ7OrUETfACEAiIzVJfGSRETRSlgpHeuVI%3D HTTP/…
3207 183.920868 117.18.237.29 192.168.43.221 OCSP 519 Response
3454 213.214509 192.168.43.221 117.18.237.29 HTTP 290 GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTBL0V27RVZ7LBduom%2FnYB45SPUEwQU5Z1ZMIJHWMys%2BghUNoZ7OrUETfACEAi4elAbvpzaLRZNPjlRv1U%3D HTTP/…
3457 213.307948 117.18.237.29 192.168.43.221 OCSP 519 Response
Frame 284: 267 bytes on wire (2136 bits), 267 bytes captured (2136 bits) on interface \Device\NPF_{026754C8-DE61-4CEF-A4EC-E01FB317BBB4}, id 0
Ethernet II, Src: LiteonTe_bf:2b:63 (50:5b:c2:bf:2b:63), Dst: XiaomiCo_45:36:d0 (d8:32:e3:45:36:d0)
Internet Protocol Version 4, Src: 192.168.43.221, Dst: 104.71.116.51
Transmission Control Protocol, Src Port: 54510, Dst Port: 80, Seq: 1, Ack: 1, Len: 213
Hypertext Transfer Protocol
GET /en-US/livetile/preinstall?region=US&appid=C98EA5B0842DBB9405BBF071E1DA76512D21FE36&FORM=Threshold HTTP/1.1\r\n
Connection: Keep-Alive\r\n
User-Agent: Microsoft-WNS/10.0\r\n
Host: tile-service.weather.microsoft.com\r\n
\r\n
[Full request URI: http://tile-service.weather.microsoft.com/en-US/livetile/preinstall?region=US&appid=C98EA5B0842DBB9405BBF071E1DA76512D21FE36&FORM=Threshold]
[HTTP request 1/1]
[Response in frame: 290]
0000 d8 32 e3 45 36 d0 50 5b c2 bf 2b 63 08 00 45 00 ·2·E6·P[··+c··E·
0010 00 fd 16 ef 40 00 80 06 1a 0c c0 a8 2b dd 68 47 ····@··· ····+·hG
0020 74 33 d4 ee 00 50 c5 5f 51 49 2c fa 5c d1 50 18 t3···P·_ QI,·\·P·
0030 02 01 65 f4 00 00 47 45 54 20 2f 65 6e 2d 55 53 ··e···GE T /en-US
0040 2f 6c 69 76 65 74 69 6c 65 2f 70 72 65 69 6e 73 /livetil e/preins
0050 74 61 6c 6c 3f 72 65 67 69 6f 6e 3d 55 53 26 61 tall?reg ion=US&a
0060 70 70 69 64 3d 43 39 38 45 41 35 42 30 38 34 32 ppid=C98 EA5B0842
0070 44 42 42 39 34 30 35 42 42 46 30 37 31 45 31 44 DBB9405B BF071E1D
0080 41 37 36 35 31 32 44 32 31 46 45 33 36 26 46 4f A76512D2 1FE36&FO
0090 52 4d 3d 54 68 72 65 73 68 6f 6c 64 20 48 54 54 RM=Thres hold HTT
00a0 50 2f 31 2e 31 0d 0a 43 6f 6e 6e 65 63 74 69 6f P/1.1··C onnectio
00b0 6e 3a 20 4b 65 65 70 2d 41 6c 69 76 65 0d 0a 55 n: Keep- Alive··U
00c0 73 65 72 2d 41 67 65 6e 74 3a 20 4d 69 63 72 6f ser-Agen t: Micro
00d0 73 6f 66 74 2d 57 4e 53 2f 31 30 2e 30 0d 0a 48 soft-WNS /10.0··H
00e0 6f 73 74 3a 20 74 69 6c 65 2d 73 65 72 76 69 63 ost: til e-servic
00f0 65 2e 77 65 61 74 68 65 72 2e 6d 69 63 72 6f 73 e.weathe r.micros
0100 6f 66 74 2e 63 6f 6d 0d 0a 0d 0a oft.com· ···
Hypertext Transfer Protocol (http), 213 bytes
Packets: 10907 · Displayed: 42 (0.4%)
Profile: Default


*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
362 34.571211 2405:204:9726:4e96:... 2404:6800:4009:80c:... ICMPv6 94 Echo (ping) request id=0x0001, seq=15, hop limit=128 (reply in 363)
363 34.664263 2404:6800:4009:80c:... 2405:204:9726:4e96:... ICMPv6 94 Echo (ping) reply id=0x0001, seq=15, hop limit=117 (request in 362)
364 35.586888 2405:204:9726:4e96:... 2404:6800:4009:80c:... ICMPv6 94 Echo (ping) request id=0x0001, seq=16, hop limit=128 (reply in 365)
365 35.649122 2404:6800:4009:80c:... 2405:204:9726:4e96:... ICMPv6 94 Echo (ping) reply id=0x0001, seq=16, hop limit=117 (request in 364)
366 38.145227 XiaomiCo_45:36:d0 LiteonTe_bf:2b:63 ARP 42 Who has 192.168.43.221? Tell 192.168.43.1
367 38.145257 LiteonTe_bf:2b:63 XiaomiCo_45:36:d0 ARP 42 192.168.43.221 is at 50:5b:c2:bf:2b:63
368 38.624563 fe80::da32:e3ff:fe4... 2405:204:9726:4e96:... ICMPv6 86 Neighbor Solicitation for 2405:204:9726:4e96:6c92:56f3:4758:a907 from d8:32:e3:45:36:d0
369 38.624953 2405:204:9726:4e96:... fe80::da32:e3ff:fe4... ICMPv6 86 Neighbor Advertisement 2405:204:9726:4e96:6c92:56f3:4758:a907 (sol, ovr) is at 50:5b:c2:bf:2b:63
370 38.999687 2405:204:9726:4e96:... 2a01:111:f100:7000:... TLSv1.2 131 Application Data
371 39.124710 2a01:111:f100:7000:... 2405:204:9726:4e96:... TLSv1.2 120 Application Data
372 39.164900 2405:204:9726:4e96:... 2a01:111:f100:7000:... TCP 74 54358 → 443 [ACK] Seq=58 Ack=47 Win=512 Len=0
Frame 362: 94 bytes on wire (752 bits), 94 bytes captured (752 bits) on interface \Device\NPF_{026754C8-DE61-4CEF-A4EC-E01FB317BBB4}, id 0
Ethernet II, Src: LiteonTe_bf:2b:63 (50:5b:c2:bf:2b:63), Dst: XiaomiCo_45:36:d0 (d8:32:e3:45:36:d0)
Internet Protocol Version 6, Src: 2405:204:9726:4e96:6c92:56f3:4758:a907, Dst: 2404:6800:4009:80c::200e
Internet Control Message Protocol v6
Type: Echo (ping) request (128)
Code: 0
Checksum: 0x2116 [correct]
[Checksum Status: Good]
Identifier: 0x0001
Sequence: 15
[Response In: 363]
Data (32 bytes)
0000 d8 32 e3 45 36 d0 50 5b c2 bf 2b 63 86 dd 60 00
0010 00 00 00 28 3a 80 24 05 02 04 97 26 4e 96 6c 92
0020 56 f3 47 58 a9 07 24 04 68 00 40 09 08 0c 00 00
0030 00 00 00 00 20 0e 80 00 21 16 00 01 00 0f 61 62
0040 63 64 65 66 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72
0050 73 74 75 76 77 61 62 63 64 65 66 67 68 69
wireshark_Wi-Fi_20200830222252_a12656.pcapng
Packets: 380 · Displayed: 380 (100.0%) · Dropped: 0 (0.0%)
Profile: Default


*Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
udp
No. Time Source Destination Protocol Length Info
347 32.464889 2405:204:9726:4e96:… 2404:6800:4009:809:… UDP 828 53437 → 443 Len=766
348 32.583180 2404:6800:4009:809:… 2405:204:9726:4e96:… UDP 87 443 → 53437 Len=25
349 32.624694 2404:6800:4009:809:… 2405:204:9726:4e96:… UDP 219 443 → 53437 Len=157
350 32.627833 2404:6800:4009:809:… 2405:204:9726:4e96:… UDP 88 443 → 53437 Len=26
351 32.628370 2405:204:9726:4e96:… 2404:6800:4009:809:… UDP 95 53437 → 443 Len=33
356 33.941906 2405:204:9726:4e96:… 2404:6800:4009:809:… UDP 1392 53437 → 443 Len=1330
357 33.942044 2405:204:9726:4e96:… 2404:6800:4009:809:… UDP 952 53437 → 443 Len=890
358 34.045687 2404:6800:4009:809:… 2405:204:9726:4e96:… UDP 88 443 → 53437 Len=26
359 34.107886 2404:6800:4009:809:… 2405:204:9726:4e96:… UDP 486 443 → 53437 Len=424
360 34.108391 2404:6800:4009:809:… 2405:204:9726:4e96:… UDP 147 443 → 53437 Len=85
361 34.109058 2405:204:9726:4e96:… 2404:6800:4009:809:… UDP 95 53437 → 443 Len=33
Frame 361: 95 bytes on wire (760 bits), 95 bytes captured (760 bits) on interface \Device\NPF_{026754C8-DE61-4CEF-A4EC-E01FB317BBB4}, id 0
Ethernet II, Src: LiteonTe_bf:2b:63 (50:5b:c2:bf:2b:63), Dst: XiaomiCo_45:36:d0 (d8:32:e3:45:36:d0)
Internet Protocol Version 6, Src: 2405:204:9726:4e96:6c92:56f3:4758:a907, Dst: 2404:6800:4009:809::200e
User Datagram Protocol, Src Port: 53437, Dst Port: 443
Source Port: 53437
Destination Port: 443
Length: 41
Checksum: 0x1046 [unverified]
[Checksum Status: Unverified]
[Stream index: 7]
[Timestamps]
Data (33 bytes)
0000 d8 32 e3 45 36 d0 50 5b c2 bf 2b 63 86 dd 60 07
0010 73 8b 00 29 11 40 24 05 02 04 97 26 4e 96 6c 92
0020 56 f3 47 58 a9 07 24 04 68 00 40 09 08 09 00 00
0030 00 00 00 00 20 0e d0 bd 01 bb 00 29 10 46 48 ff
0040 1d 61 fb f7 c9 31 ea 61 5e b5 03 b4 ba 3c 5d 26
0050 36 f4 9d 00 26 a0 10 b6 6c d8 18 fa ff 36 49
User Datagram Protocol: Protocol
Packets: 380 · Displayed: 96 (25.3%) · Dropped: 0 (0.0%)
Profile: Default