

Gabriel Emerson
 ELEC 5220 - Lab 8
 11/29/21

Exercise 1

Host 1

```
Ping statistics for 128.238.66.102:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\WINDOWS\system32>arp -a

Interface: 128.238.66.101 --- 0xf
    Internet Address          Physical Address      Type
    128.238.66.1              2c-5a-0f-12-5b-8c  dynamic
    128.238.66.102            98-ee-cb-57-51-06  dynamic
    128.238.66.255            ff-ff-ff-ff-ff-ff  static
    224.0.0.22                01-00-5e-00-00-16  static
    224.0.0.252               01-00-5e-00-00-fc  static
    239.255.255.250           01-00-5e-7f-ff-fa  static
    255.255.255.255           ff-ff-ff-ff-ff-ff  static

C:\WINDOWS\system32>
```

| | | | | |
|-------------|-------------------|--------------------------------|------|-----------------------------------------------------------------------------|
| 8 2.847685 | Cisco_12:5b:8c | spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8001 |
| 9 3.990245 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x9887 A api.apexnw.com |
| 10 3.991147 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 11 4.228417 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=283/6913, ttl=128 (reply in 12) |
| 12 4.229984 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=283/6913, ttl=128 (request in 11) |
| 13 4.848799 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8001 |
| 14 5.240438 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=284/7169, ttl=128 (reply in 13) |
| 15 5.241311 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=284/7169, ttl=128 (request in 14) |
| 16 6.244608 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=285/7425, ttl=128 (no response in 15) |
| 17 6.245498 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=285/7425, ttl=128 (request in 16) |
| 18 6.847649 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8001 |
| 19 7.260395 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=286/7681, ttl=128 (reply in 17) |
| 20 7.261288 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=286/7681, ttl=128 (request in 19) |
| 21 7.994783 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x9887 A api.apexnw.com |
| 22 7.995712 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 23 8.647110 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8001 |
| 24 8.950375 | WistronI_57:51:06 | WistronI_57:52:98 | ARP | 60 Who has 128.238.66.101? Tell 128.238.66.102 |
| 25 8.953089 | WistronI_57:52:98 | WistronI_57:51:06 | ARP | 42 Who has 128.238.66.101? Tell 98:ee:cb:57:52:98 |
| 26 8.979440 | WistronI_57:52:98 | WistronI_57:51:06 | ARP | 42 Who has 128.238.66.102? Tell 128.238.66.101 |
| 27 8.980310 | WistronI_57:51:06 | WistronI_57:52:98 | ARP | 60 128.238.66.102 is at 98:ee:cb:57:51:06 |

Host 2

| No. | Time | Source | Destination | Protocol | Length Info |
|--------------|-------------------|--------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------|-------------|
| 1 0.000000 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 2 1.559063 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 3 4.000052 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 4 5.999569 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 5 7.999421 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 6 9.999221 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 7 11.999125 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 8 13.963379 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=279/5889, ttl=128 (reply in 9) | |
| 9 13.963439 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=279/5889, ttl=128 (request in 8) | |
| 10 14.000052 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 11 14.971303 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=280/6145, ttl=128 (reply in 12) | |
| 12 14.971347 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=280/6145, ttl=128 (request in 11) | |
| 13 15.987354 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=281/6401, ttl=128 (no response found!) | |
| 14 15.987399 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=281/6401, ttl=128 (request in 13) | |
| 15 15.998840 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 16 17.002993 | 128.238.66.101 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=282/6657, ttl=128 (reply in 17) | |
| 17 17.003043 | 128.238.66.102 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=282/6657, ttl=128 (request in 16) | |
| 18 17.008670 | Cisco_12:5b:8c | Spanning-tree-(for-~ STP | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 | | |
| 19 18.602129 | WistronI_57:51:06 | WistronI_57:52:98 | ARP | 42 Who has 128.238.66.101? Tell 128.238.66.102 | |
| 20 18.602835 | WistronI_57:52:98 | WistronI_57:51:06 | ARP | 60 128.238.66.101 is at 98:ee:cb:57:52:98 | |
| 21 18.631201 | WistronI_57:52:98 | WistronI_57:51:06 | ARP | 60 Who has 128.238.66.102? Tell 128.238.66.101 | |
| 22 18.631206 | WistronI_57:51:06 | WistronI_57:52:98 | ARP | 42 128.238.66.102 is at 98:ee:cb:57:51:06 | |

| Administrator: Command Prompt | | | | | |
|------------------------------------------------------|--|--|--|--|--|
| C:\WINDOWS\system32>arp -a | | | | | |
| Interface: 128.238.66.102 --- 0x11 | | | | | |
| Internet Address Physical Address Type | | | | | |
| 128.238.66.1 2c-5a-0f-12-5b-8c dynamic | | | | | |
| 128.238.66.10 98-ee-cb-57-52-98 dynamic | | | | | |
| 128.238.66.101 98-ee-cb-57-52-98 dynamic | | | | | |
| 128.238.66.255 ff-ff-ff-ff-ff-ff static | | | | | |
| 224.0.0.22 01-00-5e-00-00-16 static | | | | | |
| 239.255.255.250 01-00-5e-7f-ff-fa static | | | | | |

Q1: Is there any new entries in the ARP tables from after Ping process? If yes, which network interfaces are they for?

Yes. There are the IP's that the host sent a ping request to.

Q2: Is ARP request sent before or after the Ping request? Who sends the ARP request and whose MAC address is queried? Who is supposed to receive the ARP request?

Ping is sent first followed by ARP request. The ARP then asks itself who is at the location and then answers.

Q3: Who sends the ARP reply as a respond to the ARP request in Q2? Who is supposed to receive the ARP reply?

After asking for ARP location of other. It then will ask itself to establish the ARP on the other side as well.

Q4: List the source IP address, destination IP address, source MAC address, and destination MAC address of the ping request packet.

Source IP: 128.238.66.101

Destination IP: 128.238.66.102

Source MAC: 98-ee-cb-57-52-98

Destination MAC: 98-ee-cb-57-51-06

Q5: List the source IP address, destination IP address, source MAC address, and destination MAC address of the ping reply packet.

Source IP: 128.238.66.102

Destination IP: 128.238.66.101

Source MAC: 98-ee-cb-57-51-06

Destination MAC: 98-ee-cb-57-52-98

Exercise 2

Host 1

```
C:\WINDOWS\system32>ping 128.238.66.120
Pinging 128.238.66.120 with 32 bytes of data:
Reply from 128.238.66.120: bytes=32 time=1ms TTL=127

Ping statistics for 128.238.66.120:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\WINDOWS\system32>arp -a

Interface: 128.238.66.101 --- 0xf
      Internet Address          Physical Address      Type
        128.238.66.1           2c-5a-0f-12-5b-8c dynamic
        128.238.66.120          98-e6-cb-57-51-06 dynamic
        128.238.66.255          ff-ff-ff-ff-ff-ff static
        224.0.0.22              01-00-5e-00-00-16 static
        224.0.0.252             01-00-5e-00-00-fc static
        239.255.255.250         01-00-5e-7f-f7-fa static
        255.255.255.255         ff-ff-ff-ff-ff-ff static

C:\WINDOWS\system32>
```

| | | | | |
|-----------------|-------------------|--------------------------------|------|--------------------------------------------------------------------------|
| 1 0.000000 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 2 0.166001 | 128.238.66.101 | 192.168.127.2 | DNS | 86 Standard query 0x6d6f A win1710.ipv6.microsoft.com |
| 3 0.187530 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 4 1.999792 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 5 2.737044 | Wistron1_57:52:98 | Broadcast | ARP | 42 Who has 128.238.66.120? Tell 128.238.66.101 |
| 6 2.737705 | Wistron1_57:51:06 | Wistron1_57:52:98 | ARP | 60 128.238.66.120 is at 98:e6:cb:57:51:06 |
| 7 2.737745 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=287/7937, ttl=128 (reply -) |
| 8 2.739216 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=287/7937, ttl=127 (request -) |
| 9 3.752504 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=288/8193, ttl=128 (no response -) |
| 10 3.753711 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=288/8193, ttl=127 (request -) |
| 11 3.999772 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 12 4.190058 | 128.238.66.101 | 128.238.66.120 | DNS | 86 Standard query 0x6d6f A win1710.ipv6.microsoft.com |
| 13 4.190058 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 14 4.766281 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=289/8449, ttl=128 (reply -) |
| 15 4.769938 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=289/8449, ttl=127 (request -) |
| 16 5.784304 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=290/8705, ttl=128 (reply -) |
| 17 5.785272 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 Echo (ping) reply id=0x0001, seq=290/8705, ttl=127 (request -) |
| 18 5.785272 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 19 7.280487 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x50b5 A ap1.apppexnw.com |
| 20 7.281186 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 21 8.190276 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x50b5 A ap1.apppexnw.com |
| 22 8.191909 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 23 9.144437 | Wistron1_57:52:98 | Cisco_12:5b:8c | ARP | 42 Who has 128.238.66.1? Tell 128.238.66.101 |
| 24 9.145219 | Cisco_12:5b:8c | Wistron1_57:52:98 | ARP | 60 128.238.66.1 is at 98:e6:cb:57:51:06 |
| 25 9.196564 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x50b5 A ap1.apppexnw.com |
| 26 9.197368 | 128.238.66.101 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 27 9.197368 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 28 9.999709 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 29 11.210948 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x50b5 A ap1.apppexnw.com |
| 30 11.211824 | 128.238.66.101 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 31 11.295181 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 32 12.242528 | Wistron1_57:51:06 | Broadcast | ARP | 60 Who has 128.238.66.1? Tell 128.238.66.101 |
| 33 13.999023 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 34 15.213054 | 128.238.66.101 | 192.168.127.2 | DNS | 75 Standard query 0x50b5 A ap1.apppexnw.com |
| 35 15.213977 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 36 16.004889 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 37 18.002728 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 38 19.855006 | 128.238.66.101 | 192.168.127.2 | DNS | 76 Standard query 0x50b5 A ap1.apppexnw.com |
| 39 19.855023 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 40 60.327076 | 128.238.66.101 | 192.168.127.2 | DNS | 91 Standard query 0x50d8 A settings-win.data.microsoft.com |
| 41 61.399110 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 42 63.990414 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 43 64.335335 | 128.238.66.101 | 192.168.127.2 | DNS | 91 Standard query 0x2d0f A settings-win.data.microsoft.com |
| 44 64.336201 | 128.238.66.101 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 45 65.346442 | 128.238.66.101 | 192.168.127.2 | DNS | 91 Standard query 0x2d0f A settings-win.data.microsoft.com |
| 46 65.347274 | 128.238.66.101 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 47 65.399750 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 48 66.346739 | 128.238.66.101 | 192.168.127.2 | DNS | 91 Standard query 0x2d0f A settings-win.data.microsoft.com |
| 49 66.347469 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 50 67.999142 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 51 67.362622 | 128.238.66.101 | 192.168.127.2 | DNS | 91 Standard query 0x2d0f A settings-win.data.microsoft.com |
| 52 68.363592 | 128.238.66.101 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 53 69.398894 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 54 70.71.567447 | 128.238.66.101 | 128.238.66.101 | ICMP | 74 Echo (ping) request id=0x0001, seq=203/62983, ttl=127 (reply -) |
| 55 71.567494 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) reply id=0x0001, seq=203/62983, ttl=128 (request -) |
| 56 71.71.998793 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 57 72.23.363748 | 128.238.66.101 | 192.168.127.2 | DNS | 91 Standard query 0x2d0f A settings-win.data.microsoft.com |
| 58 72.23.364643 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 59 72.27.577749 | 128.238.66.101 | 128.238.66.101 | ICMP | 74 Echo (ping) request id=0x0001, seq=203/63239, ttl=127 (no response -) |
| 60 72.27.577794 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) reply id=0x0001, seq=203/63239, ttl=128 (request -) |
| 61 73.593585 | 128.238.66.101 | 128.238.66.101 | ICMP | 74 Echo (ping) request id=0x0001, seq=204/63495, ttl=127 (reply -) |
| 62 73.593630 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) reply id=0x0001, seq=204/63495, ttl=128 (request -) |
| 63 73.998648 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 64 74.609317 | 128.238.66.101 | 128.238.66.101 | ICMP | 74 Echo (ping) request id=0x0001, seq=204/63751, ttl=127 (no response -) |
| 65 74.74.609381 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 Echo (ping) reply id=0x0001, seq=204/63751, ttl=128 (request -) |
| 66 76.004585 | Cisco_12:5b:8c | Spanning-tree-(for-bridges)_00 | STP | 60 Conf. Root = 32768/0/2:c5a:0f:12:5b:8c Cost = 0 Port = 0x80.. |
| 67 76.145666 | Wistron1_57:51:06 | Wistron1_57:51:06 | ARP | 42 Who has 128.238.66.120? Tell 128.238.66.101 |
| 68 76.146525 | 128.238.66.101 | 192.168.127.2 | DNS | 86 Standard query 0x6890 A win1710.ipv6.microsoft.com |
| 69 88.461860 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |
| 70 88.461860 | 128.238.66.101 | 128.238.66.120 | ICMP | 86 Standard query 0x6890 A win1710.ipv6.microsoft.com |
| 71 88.461860 | 128.238.66.101 | 192.168.127.2 | DNS | 86 Standard query 0x6890 A win1710.ipv6.microsoft.com |
| 72 88.461860 | 128.238.66.1 | 128.238.66.101 | ICMP | 70 Destination unreachable (Host unreachable) |

Host 2

| No. | Time | Source | Description | Protocol | Length | Info |
|-----|-----------|------------------|--------------------------|----------|--------|----------------------------------------------------------------------------|
| 7 | 11.999095 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | STP | 60 | Conf. Root = 32768/0/2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 |
| 8 | 13.998937 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | STP | 60 | Conf. Root = 32768/0/2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 |
| 9 | 14.173958 | 128.238.66.101 | 128.238.66.255 | BROWSER | 252 | Domain\Workgroup Announcement WORKGROUP, NT Workstation, Domain Enum |
| 10 | 14.173959 | 128.238.66.101 | 128.238.66.101 | ICMP | 60 | Echo (ping) request id=0x0001, seq=299/11009, ttl=128 (request in 10) |
| 11 | 17.674236 | Wistron_57:51:08 | Broadcast | ARP | 60 | I who has 128.238.66.100? Tell 128.238.66.101 |
| 12 | 17.674239 | Wistron_57:51:06 | Wistron_57:51:08 | ARP | 42 | 128.238.66.100 is at 08:ec:cb:57:51:06 |
| 13 | 17.674889 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 | Echo (ping) request id=0x0001, seq=299/11009, ttl=128 (reply in 14) |
| 14 | 17.674952 | 128.238.66.101 | 128.238.66.101 | ICMP | 74 | Echo (ping) reply id=0x0001, seq=299/11009, ttl=128 (request in 13) |
| 15 | 17.676239 | 128.238.66.101 | 128.238.66.120 | ICMP | 70 | Redirect (Redirect for host) |
| 16 | 17.676242 | 128.238.66.101 | 128.238.66.101 | ICMP | 60 | Conn. to 127.0.0.1/0x00000000 Cost = 0 Port = 0x8003 |
| 17 | 18.689562 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 | Echo (ping) request id=0x0001, seq=300/11265, ttl=128 (no response found!) |
| 18 | 18.689613 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 | Echo (ping) reply id=0x0001, seq=300/11265, ttl=128 (request in 17) |
| 19 | 18.690414 | 128.238.66.1 | 128.238.66.120 | ICMP | 70 | Redirect (Redirect for host) |
| 20 | 19.696319 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 | Echo (ping) request id=0x0001, seq=301/11521, ttl=128 (reply in 21) |
| 21 | 19.696363 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 | Echo (ping) reply id=0x0001, seq=301/11521, ttl=128 (request in 20) |
| 22 | 19.697151 | 128.238.66.1 | 128.238.66.120 | ICMP | 70 | Redirect (Redirect for host) |
| 23 | 19.698492 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | STP | 60 | Conf. Root = 32768/0/2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 |
| 24 | 20.713633 | 128.238.66.101 | 128.238.66.120 | ICMP | 74 | Echo (ping) request id=0x0001, seq=302/11777, ttl=128 (no response found!) |
| 25 | 20.713684 | 128.238.66.120 | 128.238.66.101 | ICMP | 74 | Echo (ping) reply id=0x0001, seq=302/11777, ttl=128 (request in 24) |
| 26 | 20.714456 | 128.238.66.1 | 128.238.66.120 | ICMP | 70 | Redirect (Redirect for host) |
| 27 | 20.714459 | 128.238.66.1 | 128.238.66.101 | ICMP | 60 | Conn. to 127.0.0.1/0x00000000 Cost = 0 Port = 0x8003 |
| 28 | 22.520064 | Wistron_57:51:06 | Cisco_12:5b:8c | ARP | 42 | I who has 128.238.66.1? Tell 128.238.66.120 |
| 29 | 22.520032 | Cisco_12:5b:8c | Wistron_57:51:06 | ARP | 60 | 128.238.66.1 is at 2c:5a:0f:12:5b:8c |
| 30 | 23.558256 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | STP | 60 | Conf. Root = 32768/0/2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 |
| 31 | 25.980839 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | STP | 60 | Conf. Root = 32768/0/2c:5a:0f:12:5b:8c Cost = 0 Port = 0x8003 |
| | | | | | | C:\WINDOWS\system32> |

Q6: When host 1 pings host 2, is the Ping process successful? Do you observe any ARP packets and what is the purpose of them? Explain what has happened.

Yes. I do see ARP packets because the subnet ID is correct for Host 1. This means Host 1 can see Host 2 and can successfully ping the Host.

Q7: When host 2 pings host 1, is the Ping process successful? Do you observe any ARP packets and what is the purpose of them? Explain what has happened.

No. The ping is unsuccessful due to a bad Subnet ID.

Exercise 3

Host 1

```
Ping statistics for 128.238.66.102:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\WINDOWS\system32>arp -a

Interface: 192.168.10.20 --- 0xf
Internet Address      Physical Address      Type
192.168.10.1           2c:5a:0f:12:5b:90   dynamic
192.168.10.255         ff:ff:ff:ff:ff:ff   static
224.0.0.22              01:00:5e:00:00:16   static
224.0.0.252             01:00:5e:00:00:fc   static
239.255.255.250        01:00:5e:7f:ff:fa   static
255.255.255.255        ff:ff:ff:ff:ff:ff   static

C:\WINDOWS\system32>
```

| | | | | | |
|-----|------------|-------------------|-------------------|---------|--------------------------------------------------------------------------|
| 79 | 72.019392 | 192.168.10.20 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=291/8961, ttl=128 (no respons... |
| 80 | 75.958954 | 192.168.10.20 | 192.168.127.2 | DNS | 84 Standard query 0x3d52 A ans-c1710.cloud.acer.com |
| 81 | 75.959864 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 82 | 76.770901 | 192.168.10.20 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=292/9217, ttl=128 (no respons... |
| 83 | 76.912060 | 192.168.10.20 | 192.168.10.255 | BROWSER | 252 Domain/Workgroup Announcement WORKGROUP, NT Workstation, Domain E... |
| 84 | 76.958416 | 192.168.10.20 | 192.168.127.2 | DNS | 84 Standard query 0x3d52 A ans-c1710.cloud.acer.com |
| 85 | 76.959303 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 86 | 77.958533 | 192.168.10.20 | 192.168.127.2 | DNS | 84 Standard query 0x3d52 A ans-c1710.cloud.acer.com |
| 87 | 77.959418 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 88 | 79.125894 | Cisco_12:5b:90 | Cisco_12:5b:90 | LOOP | 60 Reply |
| 89 | 79.958715 | 192.168.10.20 | 192.168.127.2 | DNS | 84 Standard query 0x3d52 A ans-c1710.cloud.acer.com |
| 90 | 79.959605 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 91 | 81.771494 | 192.168.10.20 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=293/9473, ttl=128 (no respons... |
| 92 | 83.959130 | 192.168.10.20 | 192.168.127.2 | DNS | 84 Standard query 0x3d52 A ans-c1710.cloud.acer.com |
| 93 | 83.960040 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 94 | 84.756030 | WistronI_57:52:98 | Cisco_12:5b:90 | ARP | 42 Who has 192.168.10.1? Tell 192.168.10.20 |
| 95 | 84.756942 | Cisco_12:5b:90 | WistronI_57:52:98 | ARP | 60 192.168.10.1 is at 2c:5a:0f:12:5b:90 |
| 96 | 86.772652 | 192.168.10.20 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=294/9729, ttl=128 (no respons... |
| 97 | 89.125182 | Cisco_12:5b:90 | Cisco_12:5b:90 | LOOP | 60 Reply |
| 98 | 95.018427 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=295/9985, ttl=128 (reply in 9... |
| 99 | 95.020827 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=295/9985, ttl=127 (request in ... |
| 100 | 96.030937 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=296/10241, ttl=128 (reply in - |
| 101 | 96.032230 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=296/10241, ttl=127 (request in ... |
| 102 | 97.046684 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=297/10497, ttl=128 (reply in - |
| 103 | 97.047957 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=297/10497, ttl=127 (request in ... |
| 104 | 98.062467 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=298/10753, ttl=128 (reply in - |
| 105 | 98.063748 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=298/10753, ttl=127 (request in ... |
| 106 | 99.124721 | Cisco_12:5b:90 | Cisco_12:5b:90 | LOOP | 60 Reply |
| 107 | 109.123770 | Cisco_12:5b:90 | Cisco_12:5b:90 | LOOP | 60 Reply |
| 108 | 119.122997 | Cisco_12:5b:90 | Cisco_12:5b:90 | LOOP | 60 Reply |
| 109 | 121.515054 | 192.168.10.20 | 192.168.127.2 | DNS | 86 Standard query 0x6325 A win1710.ipv6.microsoft.com |
| 110 | 121.515852 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 111 | 122.516970 | 192.168.10.20 | 192.168.127.2 | DNS | 86 Standard query 0x6325 A win1710.ipv6.microsoft.com |
| 112 | 122.517793 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 113 | 123.519457 | 192.168.10.20 | 192.168.127.2 | DNS | 86 Standard query 0x6325 A win1710.ipv6.microsoft.com |
| 114 | 123.520413 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 115 | 125.519951 | 192.168.10.20 | 192.168.127.2 | DNS | 86 Standard query 0x6325 A win1710.ipv6.microsoft.com |
| 116 | 125.520851 | 192.168.10.1 | 192.168.10.20 | ICMP | 70 Destination unreachable (Host unreachable) |
| 117 | 129.127142 | Cisco_12:5b:90 | Cisco_12:5b:90 | LOOP | 60 Reply |
| 118 | 130.522889 | 192.168.10.20 | 192.168.127.2 | DNS | 86 Standard query 0x6325 A win1710.ipv6.microsoft.com |

Host 2

| No. | Time | Source | Destination | Protocol | Length | Info |
|-----|------------|-------------------|--------------------------|----------|-------------------------------------------------------------------------------|------|
| 46 | 83.997829 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 47 | 85.0646435 | 192.168.10.20 | 128.238.66.120 | ICMP | 74 Echo (ping) request id=0x0001, seq=294/9729, ttl=127 (no response found!) | |
| 48 | 85.997708 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 49 | 87.998572 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 50 | 89.997410 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 51 | 91.997281 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 52 | 93.892159 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=295/9985, ttl=127 (reply in 55) | |
| 53 | 93.892243 | WistronI_57:51:06 | Broadcast | ARP | 42 Who has 128.238.66.1? Tell 128.238.66.128 | |
| 54 | 93.893454 | Cisco_12:5b:8c | WistronI_57:51:06 | ARP | 60 128.238.66.1 is at 2c:5a:0f:12:5b:8c | |
| 55 | 93.893454 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=295/9985, ttl=128 (request in 52) | |
| 56 | 93.897059 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 57 | 94.904688 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=296/10241, ttl=127 (reply in 58) | |
| 58 | 94.904733 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=296/10241, ttl=128 (request in 57) | |
| 59 | 95.902083 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=297/10497, ttl=127 (reply in 60) | |
| 60 | 95.9020442 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=297/10497, ttl=128 (request in 59) | |
| 61 | 95.906079 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 62 | 96.936199 | 192.168.10.20 | 128.238.66.102 | ICMP | 74 Echo (ping) request id=0x0001, seq=298/10753, ttl=127 (no response found!) | |
| 63 | 96.936252 | 128.238.66.102 | 192.168.10.20 | ICMP | 74 Echo (ping) reply id=0x0001, seq=298/10753, ttl=128 (request in 62) | |
| 64 | 97.998049 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |
| 65 | 99.996673 | Cisco_12:5b:8e | Spanning-tree-(for-> STP | 60 | 60 Conf. Root = 32768/0:2c:5a:0f:12:5b:8c Cost = 0 Port = 0x0003 | |

```

Administrator: Command Prompt
C:\Windows\system32>arp -a
Interface: 128.238.66.102 --- 0x11
Internet Address      Physical Address          Type
128.238.66.1           2c:5a:0f:12:5b:8c      dynamic
128.238.66.10          08:ee:cb:57:52:98      dynamic
128.238.66.101         08:ee:cb:57:52:98      dynamic
128.238.66.255         ff:ff:ff:ff:ff:ff      static
224.0.0.22              01:00:5e:00:00:16      static
239.255.255.250        01:00:5e:7f:ff:fa      static

C:\Windows\system32>arp -d 128.238.66.1
C:\Windows\system32>arp -d 128.238.66.10
C:\Windows\system32>arp -d 128.238.66.101

C:\Windows\system32>arp -a
Interface: 128.238.66.102 --- 0x11
Internet Address      Physical Address          Type
128.238.66.1           2c:5a:0f:12:5b:8c      dynamic
128.238.66.255         ff:ff:ff:ff:ff:ff      static
224.0.0.22              01:00:5e:00:00:16      static
239.255.255.250        01:00:5e:7f:ff:fa      static

C:\Windows\system32>

```

Q8: A new entry appeared in host 1's ARP table after the ping process. Which network interface is it for?

It is used in the ARP and is type dynamic. This is used to successfully connect the two hosts. This is in the ICMP protocols.

Q9: A new entry appeared in host 2's ARP table after the ping process. Which network interface is it for?

It is used in the ARP and is type dynamic. This is used to successfully connect the two hosts. This is in the ICMP protocols.

Q10: Whose MAC address is queried in the ARP Request from host 1? Which network interface sends the ARP Reply to host 1?

Host 1 is connected to the WAN port so it is communicating with that interface.

Q11: List the source IP address, destination IP address, source MAC address, and destination MAC address of

- (1) the Ping Request packet captured on host 1
- (2) the Ping Reply packet captured on host 1

Request

Source IP: 192.168.10.1

Destination IP: 128.238.66.120

Source MAC: 2c-5a-0f-12-5b-90

Destination MAC: 2c-5a-0f-12-5b-8c

Reply

Source IP: 128.238.66.120

Destination IP: 192.168.10.1

Source MAC: 2c-5a-0f-12-5b-8c

Destination MAC: 2c-5a-0f-12-5b-90

Q12: List the source IP address, destination IP address, source MAC address, and destination MAC address of

- (1) the Ping Request packet captured on host 2
- (2) the Ping Reply packet captured on host 2

Request

Source IP: 128.238.66.1

Destination IP: 192.168.10.20

Source MAC: 2c-5a-0f-12-5b-90

Destination MAC: 2c-5a-0f-12-5b-8c

Reply

Source IP: 192.168.10.20

Destination IP: 128.238.66.1

Source MAC: 2c-5a-0f-12-5b-8c

Destination MAC: 2c-5a-0f-12-5b-90

Q13: Do you get the same MAC address results for Q11 and Q12? Explain why it happens.

Yes. Since they are going through a router, they simply see the directions as ‘go to the router’ and the router does its own routing from there.