

ELEC-5220

Info. Networks

FROM: Jacob Howard

TO: Dr. Yihan Li & Chao Yang,

DUE DATE: 11/2/21

Lab 5

Introduction

In this lab, we worked with a partner with IP addressing and subnetting. Below shows the ipconfig command screenshot. There's also a client setup screenshot below.

```
Command Prompt
Microsoft Windows [Version 10.0.16299.19]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\Authorized User>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::9cae:d1a0:fe00:f0a2%13
    IPv4 Address. . . . . : 128.238.66.102
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

C:\Users\Authorized User>
```

Ipconfig

The screenshot shows the 'General' tab of the Network Adapter Properties dialog box. It contains instructions on how to obtain IP settings and radio buttons for 'Obtain an IP address automatically' and 'Use the following IP address:'. The 'Use the following IP address' option is selected, and the IP address field is filled with '128 . 238 . 66 . 101'. The Subnet mask field is filled with '255 . 255 . 255 . 0'. The Default gateway field is empty. Below these, there are radio buttons for 'Obtain DNS server address automatically' and 'Use the following DNS server addresses:'. The 'Use the following DNS server addresses' option is selected, and the Preferred DNS server and Alternate DNS server fields are empty. At the bottom, there is a checkbox for 'Validate settings upon exit' and an 'Advanced...' button. The 'OK' and 'Cancel' buttons are at the bottom right.

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 128 . 238 . 66 . 101

Subnet mask: 255 . 255 . 255 . 0

Default gateway:

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

☐ Validate settings upon exit

Advanced...

OK Cancel

Client setup

Ex 2.1 : Q1-Q6

1	12:26:09.285607	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
2	12:26:11.285231	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
3	12:26:13.285304	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
4	12:26:15.285206	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
5	12:26:17.285842	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
6	12:26:18.978745	128.238.66.101	128.238.66.102	ICMP	74	Echo (ping) request	id=0x0001, seq=2761/51466, ttl=128	(reply in 7)
7	12:26:18.978803	128.238.66.102	128.238.66.101	ICMP	74	Echo (ping) reply	id=0x0001, seq=2761/51466, ttl=128	(request in 6)
8	12:26:19.284676	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
9	12:26:19.985867	128.238.66.101	128.238.66.102	ICMP	74	Echo (ping) request	id=0x0001, seq=2762/51722, ttl=128	(reply in 10)
10	12:26:19.985925	128.238.66.102	128.238.66.101	ICMP	74	Echo (ping) reply	id=0x0001, seq=2762/51722, ttl=128	(request in 9)
11	12:26:21.002043	128.238.66.101	128.238.66.102	ICMP	74	Echo (ping) request	id=0x0001, seq=2763/51978, ttl=128	(reply in 12)
12	12:26:21.002086	128.238.66.102	128.238.66.101	ICMP	74	Echo (ping) reply	id=0x0001, seq=2763/51978, ttl=128	(request in 11)
13	12:26:21.284801	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
14	12:26:22.005953	128.238.66.101	128.238.66.102	ICMP	74	Echo (ping) request	id=0x0001, seq=2764/52234, ttl=128	(reply in 15)
15	12:26:22.005998	128.238.66.102	128.238.66.101	ICMP	74	Echo (ping) reply	id=0x0001, seq=2764/52234, ttl=128	(request in 14)
16	12:26:23.284625	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
17	12:26:23.584027	WistronI_57:54:1c	WistronI_57:54:1c	ARP	60	Who has 128.238.66.102? Tell 128.238.66.101		
18	12:26:23.584040	WistronI_57:54:1c	WistronI_57:54:1c	ARP	42	128.238.66.102 is at 98:ee:cb:57:51:09		
19	12:26:23.858850	WistronI_57:54:1c	WistronI_57:54:1c	ARP	42	Who has 128.238.66.101? Tell 128.238.66.102		
20	12:26:23.859708	WistronI_57:54:1c	WistronI_57:54:1c	ARP	60	128.238.66.101 is at 98:ee:cb:57:54:1c		
21	12:26:25.284528	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
22	12:26:27.290449	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
23	12:26:29.288162	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
24	12:26:31.288081	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
25	12:26:33.287754	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
26	12:26:35.287832	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001
27	12:26:37.288420	Cisco_F6:a7:b8	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8	Cost = 0	Port = 0x8001

Wireshark Screenshot

Q1: Are the two “ping” processes successful?

Yes both pings are successful, as you can see below in the screenshot.

```

C:\Users\Authorized User>ping 128.238.66.101

Pinging 128.238.66.101 with 32 bytes of data:
Reply from 128.238.66.101: bytes=32 time<1ms TTL=128
Reply from 128.238.66.101: bytes=32 time<1ms TTL=128
Reply from 128.238.66.101: bytes=32 time<1ms TTL=128
Reply from 128.238.66.101: bytes=32 time<1ms TTL=128

Ping statistics for 128.238.66.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Authorized User>

```

Figure 1

Q2: In the ping request packet, what is the source IP address? What is the destination IP address?

Source IP was 128.238.66.101

Q3: In the reply packet, what is the source IP address? What is the destination IP address?

Source IP was 128.238.66.102 and Destination IP was 128.238.66.101.

Q4: List all IP header fields in the request and reply to packets (or take a screenshot of them).

Figure 2 shows request and Figure 3 shows the reply.

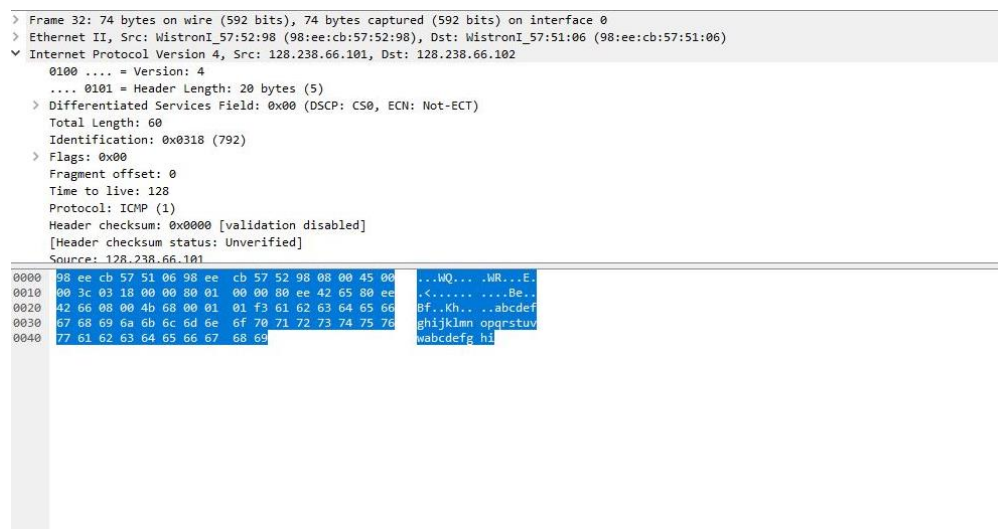


Figure 2

```

> Frame 33: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0
> Ethernet II, Src: WistronI_57:51:06 (98:ee:cb:57:51:06), Dst: WistronI_57:52:98 (98:ee:cb:57:52:98)
▼ Internet Protocol Version 4, Src: 128.238.66.102, Dst: 128.238.66.101
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
    > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 60
    Identification: 0x0c45 (3141)
    > Flags: 0x00
    Fragment offset: 0
    Time to live: 128
    Protocol: ICMP (1)
    Header checksum: 0xa7d4 [validation disabled]
    [Header checksum status: Unverified]
    Source: 128.238.66.102

```

0000	98 ee cb 57 52 98 98 ee	cb 57 51 06 08 00 45 00	...wR... .wQ...E.
0010	00 3c 0c 45 00 00 80 01	a7 d4 80 ee 42 66 80 ee	..<.E.... ..Bf..
0020	42 65 00 00 53 68 00 01	01 f3 61 62 63 64 65 66	Be..Sh.. ..abcdef
0030	67 68 69 6a 6b 6c 6d 6e	6f 70 71 72 73 74 75 76	ghijklmn opqrstuv
0040	77 61 62 63 64 65 66 67	68 69	wabcdefg hi

Figure 3

Q5: What is the subnet ID for host 1?

It is 128.238.66.0

Q6: What is the subnet ID for host 2?

It is 128.238.66.0

Ex 2.2 : Q7-Q8

```

C:\Users\Authorized User>ping 128.238.66.101

Reply from 128.238.66.101: bytes=32 time<1ms TTL=128

Ping statistics for 128.238.66.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Authorized User>ping 128.238.66.101

Pinging 128.238.66.101 with 32 bytes of data:
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.

Ping statistics for 128.238.66.101:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Authorized User>ping 128.238.66.101

Pinging 128.238.66.101 with 32 bytes of data:
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.
PING: transmit failed. General failure.

Ping statistics for 128.238.66.101:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Authorized User>

```

Ping

1 12:31:11.560406 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
2 12:31:11.876910 128.238.66.120	128.238.66.127	BROWSER	252 Domain/Workgroup Announcement WORKGROUP, NT Workstation, Domain Enum
3 12:31:11.877731 Cisco_F6:a7:b8	Broadcast	ARP	60 Who has 128.238.66.127? Tell 128.238.66.1
4 12:31:11.902615 128.238.66.101	128.238.66.111	BROWSER	243 Local Master Announcement BRN312-03, Workstation, Server, NT Workstation, Potential Browser, Master Browser
5 12:31:11.903370 Cisco_F6:a7:b8	Broadcast	ARP	60 Who has 128.238.66.111? Tell 128.238.66.1
6 12:31:13.560232 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
7 12:31:15.560062 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
8 12:31:17.566007 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
9 12:31:19.563757 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
10 12:31:21.563623 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
11 12:31:23.563418 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
12 12:31:25.563368 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
13 12:31:27.563986 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
14 12:31:29.563065 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
15 12:31:31.562918 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
16 12:31:33.562604 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
17 12:31:35.562624 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
18 12:31:37.563305 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
19 12:31:39.562102 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
20 12:31:41.562100 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003
21 12:31:43.561985 Cisco_F6:a7:ba	Spanning-tree (for...	STP	60 Conf. Root = 32768/0/2c:5a:0f:f6:a7:b8 Cost = 0 Port = 0x8003

Wireshark Screenshot

Q7: What is the subnet ID for each computer?

Host 1's subnet was 128.238.66.96 and Host 2's subnet was 128.238.66.112

Q8: Are the two ping processes successful?

No, as we can see from the ping screenshot above for my ping, it was not successful. My partners ping was also not successful. This is due to change in Network ID.

Ex 2.3 : Q9-Q11

```
C:\Users\Authorized User>ping 128.238.66.101
```

```
Pinging 128.238.66.101 with 32 bytes of data:  
PING: transmit failed. General failure.  
PING: transmit failed. General failure.  
PING: transmit failed. General failure.  
PING: transmit failed. General failure.
```

```
Ping statistics for 128.238.66.101:  
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
C:\Users\Authorized User>
```

Ping (failure)

```
C:\Users\Authorized User>ping 128.238.66.120
```

```
Pinging 128.238.66.120 with 32 bytes of data:  
Request timed out.  
Request timed out.  
Request timed out.  
Request timed out.
```

```
Ping statistics for 128.238.66.120:  
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
C:\Users\Authorized User>
```

Ping (timeout)

Q9: What is the subnet ID for each computer?

Host 1's ID is 128.238.66.0 and Host 2's ID is 128.238.66.112

Q10: Can host 1 send the ping request? Is the "ping" process successful? Why?

Yes, it can send a ping request, but there is a timeout. So, the request is not successful.

Q11: Can host 2 send the ping request? Is the “ping” process successful? Why?

No. No request is sent at all and the pinging process is unsuccessful. There was a general failure.