

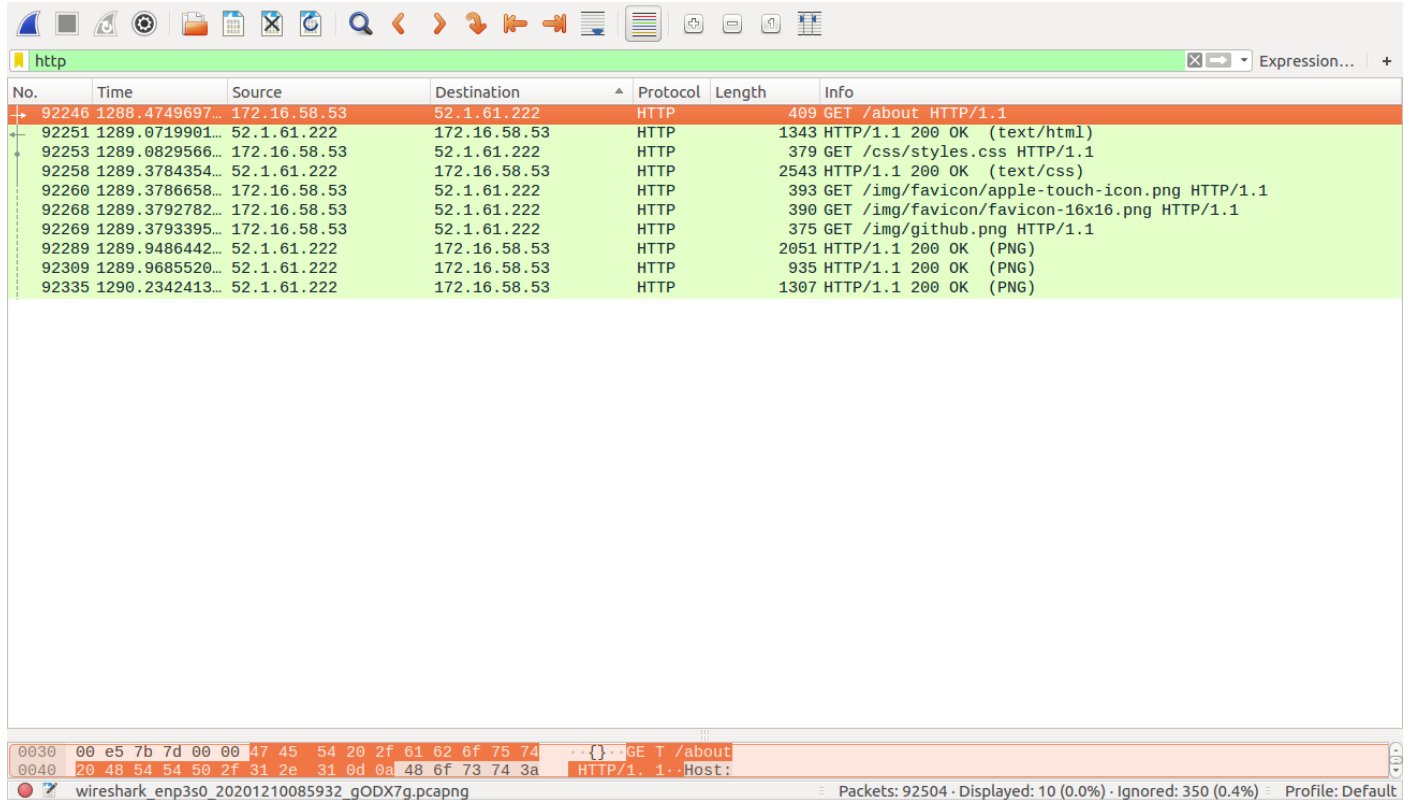
Lab Session 2

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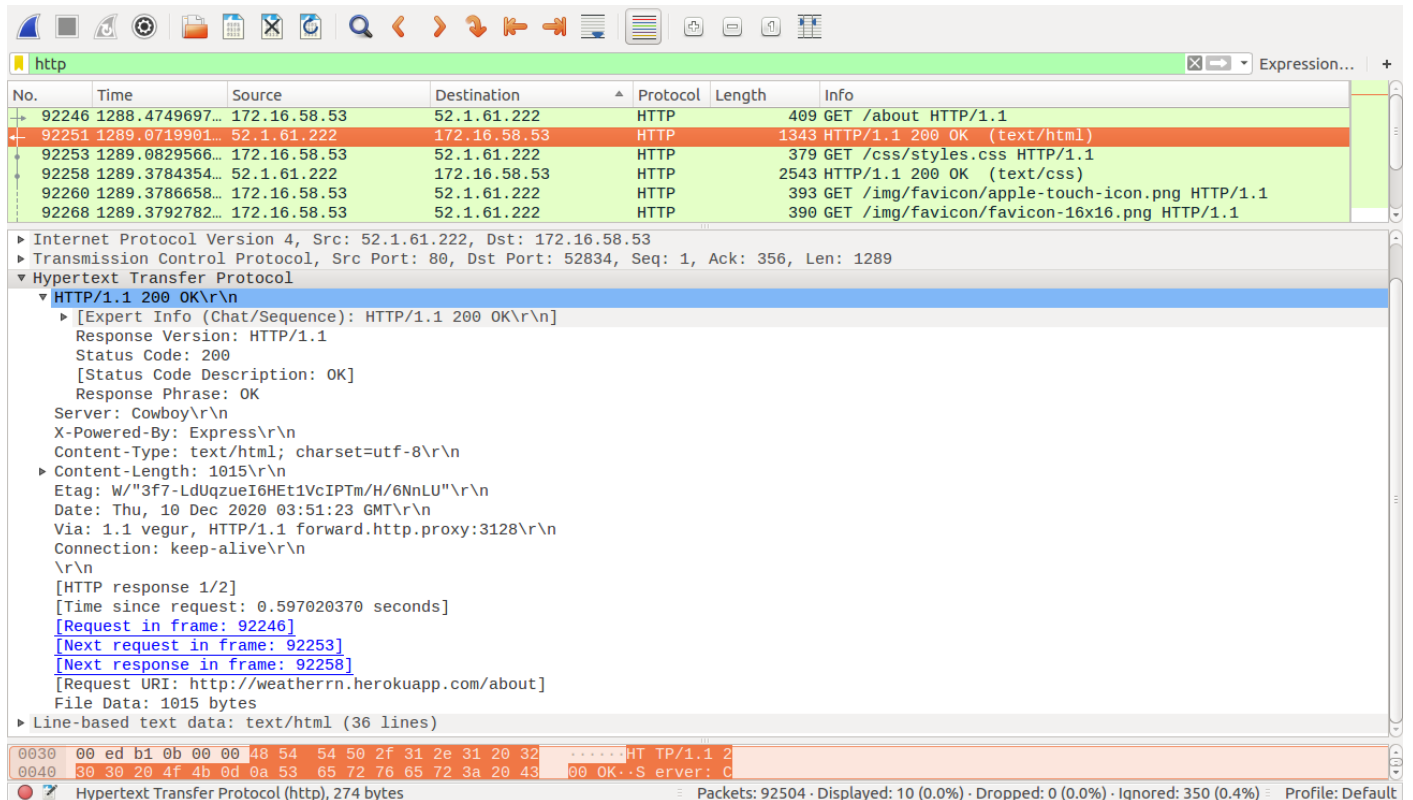
Q3.1 HTTP Wireshark



Wireshark packet capture showing HTTP traffic. The packet list displays the following details:

No.	Time	Source	Destination	Protocol	Length	Info
92246	1288.4749697...	172.16.58.53	52.1.61.222	HTTP	409	GET /about HTTP/1.1
92251	1289.0719901...	52.1.61.222	172.16.58.53	HTTP	1343	HTTP/1.1 200 OK (text/html)
92253	1289.0829566...	172.16.58.53	52.1.61.222	HTTP	379	GET /css/styles.css HTTP/1.1
92258	1289.3784354...	52.1.61.222	172.16.58.53	HTTP	2543	HTTP/1.1 200 OK (text/css)
92260	1289.3786658...	172.16.58.53	52.1.61.222	HTTP	393	GET /img/favicon/apple-touch-icon.png HTTP/1.1
92268	1289.3792782...	172.16.58.53	52.1.61.222	HTTP	390	GET /img/favicon/favicon-16x16.png HTTP/1.1
92269	1289.3793395...	172.16.58.53	52.1.61.222	HTTP	375	GET /img/github.png HTTP/1.1
92289	1289.9486442...	52.1.61.222	172.16.58.53	HTTP	2051	HTTP/1.1 200 OK (PNG)
92309	1289.9685520...	52.1.61.222	172.16.58.53	HTTP	935	HTTP/1.1 200 OK (PNG)
92335	1290.2342413...	52.1.61.222	172.16.58.53	HTTP	1307	HTTP/1.1 200 OK (PNG)

The packet details pane shows the selected packet (92246) as a GET request for /about. The packet bytes pane shows the raw data in hexadecimal and ASCII.



Wireshark packet capture showing the details of the HTTP 200 OK response for the /about page. The packet details pane displays the following information:

- Internet Protocol Version 4, Src: 52.1.61.222, Dst: 172.16.58.53
- Transmission Control Protocol, Src Port: 80, Dst Port: 52834, Seq: 1, Ack: 356, Len: 1289
- Hypertext Transfer Protocol
 - HTTP/1.1 200 OK\r\n
 - [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
 - Response Version: HTTP/1.1
 - Status Code: 200
 - [Status Code Description: OK]
 - Response Phrase: OK
 - Server: Cowboy\r\n
 - X-Powered-By: Express\r\n
 - Content-Type: text/html; charset=utf-8\r\n
 - Content-Length: 1015\r\n
 - Etag: W/"3f7-LdUqzueI6HEt1VcIPTm/H/6NnLU"\r\n
 - Date: Thu, 10 Dec 2020 03:51:23 GMT\r\n
 - Via: 1.1 vegur, HTTP/1.1 forward.http.proxy:3128\r\n
 - Connection: keep-alive\r\n
 - \r\n
 - [HTTP response 1/2]
 - [Time since request: 0.597020370 seconds]
 - [Request in frame: 92246]
 - [Next request in frame: 92253]
 - [Next response in frame: 92258]
 - [Request URI: http://weather.n.herokuapp.com/about]
 - File Data: 1015 bytes
 - Line-based text data: text/html (36 lines)

The packet bytes pane shows the raw data in hexadecimal and ASCII.

Q3.2 FTP

Terminal

tcp.port == 21

No.	Time	Source	Destination	Protocol	Length	Info
3574	226.647584276	172.16.58.53	172.16.57.152	TCP	74	36890 → 21 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=1369183 T...
3575	226.647865406	172.16.57.152	172.16.58.53	TCP	74	21 → 36890 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK_PERM=1 TSva...
3576	226.647904815	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=1 Ack=1 Win=29312 Len=0 TSval=1369183 TSecr=1662217360
3577	226.651311195	172.16.57.152	172.16.58.53	FTP	126	Response: 220 Welcome to DEPARTMENT OF CSE, MIT MANIPAL FTP service.
3578	226.651362210	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=1 Ack=61 Win=29312 Len=0 TSval=1369184 TSecr=1662217361

```
Ssem@dmlab-hp-07: ~  
Ssem@dmlab-hp-07:~$ ftp 172.16.57.152  
Connected to 172.16.57.152.  
220 Welcome to DEPARTMENT OF CSE, MIT MANIPAL FTP service.  
Name (172.16.57.152:Ssem):
```

0000 00 00 0c 07 ac 3a 8c dc d4 48 eb 2e 08 00 45 00H...E.
0010 00 3c 63 3d 40 00 40 06 0b 91 ac 10 3a 35 ac 10 -<c=@.@...:5..

wireshark_enp3s0_20201210093430_vj73vA.pcapng

Packets: 3800 · Displayed: 5 (0.1%) · Ignored: 29 (0.8%) · Profile: Default

Terminal

tcp.port == 21

No.	Time	Source	Destination	Protocol	Length	Info
3574	226.647584276	172.16.58.53	172.16.57.152	TCP	74	36890 → 21 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=1369183 T...
3575	226.647865406	172.16.57.152	172.16.58.53	TCP	74	21 → 36890 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK_PERM=1 TSva...
3576	226.647904815	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=1 Ack=1 Win=29312 Len=0 TSval=1369183 TSecr=1662217360
3577	226.651311195	172.16.57.152	172.16.58.53	FTP	126	Response: 220 Welcome to DEPARTMENT OF CSE, MIT MANIPAL FTP service.
3578	226.651362210	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=1 Ack=61 Win=29312 Len=0 TSval=1369184 TSecr=1662217361
4086	257.991410010	172.16.58.53	172.16.57.152	FTP	82	Request: USER anonymous
4087	257.991701176	172.16.57.152	172.16.58.53	TCP	66	21 → 36890 [ACK] Seq=61 Ack=17 Win=29056 Len=0 TSval=1662225196 TSecr=13770...
4088	257.991736176	172.16.57.152	172.16.58.53	FTP	100	Response: 331 Please specify the password.
4089	257.991784199	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=17 Ack=95 Win=29312 Len=0 TSval=1377019 TSecr=16622251...
4114	262.719495327	172.16.58.53	172.16.57.152	FTP	79	Request: PASS paawan
4115	262.760719255	172.16.57.152	172.16.58.53	TCP	66	21 → 36890 [ACK] Seq=95 Ack=30 Win=29056 Len=0 TSval=1662226388 TSecr=13782...
4116	262.775560160	172.16.57.152	172.16.58.53	FTP	89	Response: 230 Login successful.
4117	262.775620231	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=30 Ack=118 Win=29312 Len=0 TSval=1378215 TSecr=1662226...
4118	262.775660651	172.16.58.53	172.16.57.152	FTP	72	Request: SYST
4119	262.775895744	172.16.57.152	172.16.58.53	TCP	66	21 → 36890 [ACK] Seq=118 Ack=36 Win=29056 Len=0 TSval=1662226392 TSecr=1378...
4120	262.775912396	172.16.57.152	172.16.58.53	FTP	85	Response: 215 UNIX Type: L8
4121	262.812694218	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=36 Ack=137 Win=29312 Len=0 TSval=1378225 TSecr=1662226...

```
Ssem@dmlab-hp-07: ~  
Ssem@dmlab-hp-07:~$ ftp 172.16.57.152  
Connected to 172.16.57.152.  
220 Welcome to DEPARTMENT OF CSE, MIT MANIPAL FTP service.  
Name (172.16.57.152:Ssem): anonymous  
331 Please specify the password.  
Password:  
230 Login successful.  
Remote system type is UNIX.  
Using binary mode to transfer files.  
ftp>
```

0000 00 00 0c 07 ac 3a 8c dc d4 48 eb 2e 08 00 45 00H...E.
0010 00 3c 63 3d 40 00 40 06 0b 91 ac 10 3a 35 ac 10 -<c=@.@...:5..

wireshark_enp3s0_20201210093430_vj73vA.pcapng

Packets: 4317 · Displayed: 17 (0.4%) · Ignored: 29 (0.7%) · Profile: Default

Terminal

tcp.port == 21

No.	Time	Source	Destination	Protocol	Length	Info
3574	226.647584276	172.16.58.53	172.16.57.152	TCP	74	36890 → 21 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=1369183 T...
3575	226.647865406	172.16.57.152	172.16.58.53	TCP	74	21 → 36890 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK_PERM=1 TSva...
3576	226.647904815	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=1 Ack=1 Win=29312 Len=0 TSval=1369183 TSecr=1662217360
3577	226.651311195	172.16.57.152	172.16.58.53	FTP	126	Response: 220 Welcome to DEPARTMENT OF CSE, MIT MANIPAL FTP service.
3578	226.651362210	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=1 Ack=61 Win=29312 Len=0 TSval=1369184 TSecr=1662217361
4086	257.991410010	172.16.58.53	172.16.57.152	FTP	82	Request: USER anonymous
4087	257.991701176	172.16.57.152	172.16.58.53	TCP	66	21 → 36890 [ACK] Seq=61 Ack=17 Win=29056 Len=0 TSval=1662225196 TSecr=13770...
4088	257.991736176	172.16.57.152	172.16.58.53	FTP	100	Response: 331 Please specify the password.
4089	257.991784199	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=17 Ack=95 Win=29312 Len=0 TSval=1377019 TSecr=16622251...
4114	262.719495327	172.16.58.53	172.16.57.152	FTP	79	Request: PASS paawan
4115	262.760719255	172.16.57.152	172.16.58.53	TCP	66	21 → 36890 [ACK] Seq=95 Ack=30 Win=29056 Len=0 TSval=1662226388 TSecr=13782...
4116	262.775560160	172.16.57.152	172.16.58.53	FTP	89	Response: 230 Login successful.
4117	262.775620231	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=30 Ack=118 Win=29312 Len=0 TSval=1378215 TSecr=1662226...
4118	262.775660651	172.16.58.53	172.16.57.152	FTP	72	Request: SYST
4119	262.775895744	172.16.57.152	172.16.58.53	TCP	66	21 → 36890 [ACK] Seq=118 Ack=36 Win=29056 Len=0 TSval=1662226392 TSecr=1378...
4120	262.775912396	172.16.57.152	172.16.58.53	FTP	85	Response: 215 UNIX Type: L8
4121	262.812694218	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=36 Ack=137 Win=29312 Len=0 TSval=1378225 TSecr=1662226...
4512	294.221121565	172.16.58.53	172.16.57.152	FTP	93	Request: PORT 172,16,58,53,151,139
4513	294.221609625	172.16.57.152	172.16.58.53	FTP	117	Response: 200 PORT command successful. Consider using PASV.
4514	294.221633192	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=63 Ack=188 Win=29312 Len=0 TSval=1386077 TSecr=1662234...
4515	294.221649048	172.16.58.53	172.16.57.152	FTP	72	Request: LIST
4519	294.223141551	172.16.57.152	172.16.58.53	FTP	105	Response: 150 Here comes the directory listing.
4523	294.223711120	172.16.57.152	172.16.58.53	FTP	90	Response: 226 Directory send OK.
4524	294.223739706	172.16.58.53	172.16.57.152	TCP	66	36890 → 21 [ACK] Seq=69 Ack=251 Win=29312 Len=0 TSval=1386077 TSecr=1662234...

ssem@dblab-hp-07: ~

Name (172.16.57.152:ssem): anonymous

331 Please specify the password.

Password:

230 Login successful.

Remote system type is UNIX.

Using binary mode to transfer files.

ftp> ls

200 PORT command successful. Consider using PASV.

150 Here comes the directory listing.

226 Directory send OK.

0000 00 00 0c 07 ac

0010 00 3c 63 3d 40

wireshark_enp3s0

ftp>

Displayed: 24 (0.4%) · Ignored: 29 (0.5%) · Profile: Default

Q3.7 DNS

dns.qry.name == "nyu.edu"

No.	Time	Source	Destination	Protocol	Length	Info
1061	12.223484966	172.16.58.53	172.16.19.203	DNS	67	Standard query 0x5030 A nyu.edu
1062	12.223524870	172.16.58.53	172.16.19.203	DNS	67	Standard query 0x6cd6 AAAA nyu.edu
1101	12.459318827	172.16.19.203	172.16.58.53	DNS	83	Standard query response 0x5030 A nyu.edu A 216.165.47.10
1233	15.160788585	172.16.19.203	172.16.58.53	DNS	125	Standard query response 0x6cd6 AAAA nyu.edu SOA ns1.nyu.net

0040 01 00 01 c0 0c 00 01 00 01 00 00 00 3c 00 04 d8 ...<...
0050 a5 2f 0a .../...

Response Address (dns.a), 4 bytes

Packets: 3772 · Displayed: 4 (0.1%)

Profile: Default

Wireshark · Packet 1101 · enp3s0

▶ Frame 1101: 83 bytes on wire (664 bits), 83 bytes captured (664 bits) on interface 0

▶ Ethernet II, Src: cc:7f:76:13:3a:ff (cc:7f:76:13:3a:ff), Dst: HewlettP_48:eb:2e (8c:dc:d4:48:eb:2e)

▶ Internet Protocol Version 4, Src: 172.16.19.203, Dst: 172.16.58.53

▶ User Datagram Protocol, Src Port: 53, Dst Port: 35862

▼ Domain Name System (response)

Transaction ID: 0x5030

▶ Flags: 0x8180 Standard query response, No error

Questions: 1

Answer RRs: 1

Authority RRs: 0

Additional RRs: 0

▼ Queries

▶ nyu.edu: type A, class IN

▼ Answers

▼ nyu.edu: type A, class IN, addr 216.165.47.10

Name: nyu.edu

Type: A (Host Address) (1)

Class: IN (0x0001)

Time to live: 60

Data length: 4

Address: 216.165.47.10

[\[Request In: 1061\]](#)

[Time: 0.235833861 seconds]

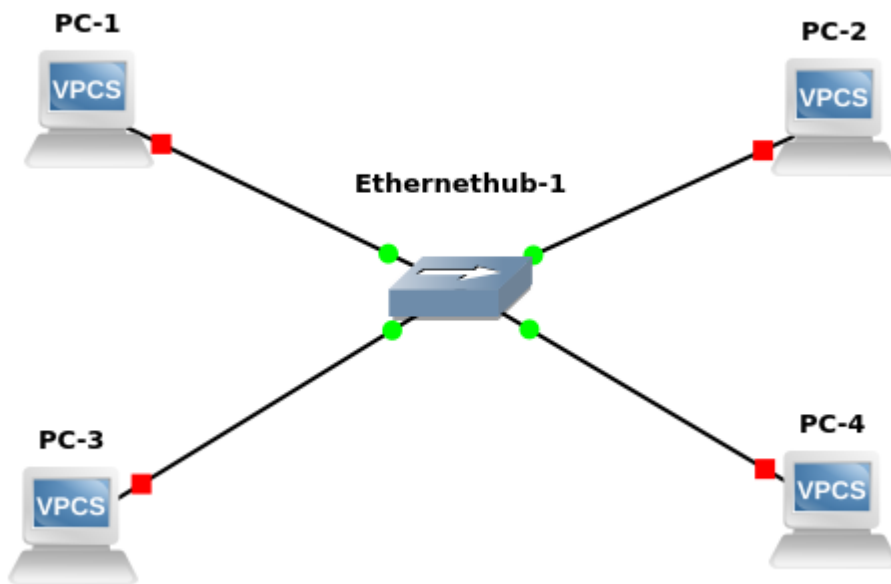
0000 8c dc d4 48 eb 2e cc 7f 76 13 3a ff 08 00 45 00 ...H...v...E...
0010 00 45 53 44 00 00 7f 11 42 43 ac 10 13 cb ac 10 ...ESD...BC...
0020 3a 35 00 35 8c 16 00 31 15 e7 50 30 81 80 00 01 ...:5.5...1..P0...
0030 00 01 00 00 00 00 03 6e 79 75 03 65 64 75 00 00n yu.edu..
0040 01 00 01 c0 0c 00 01 00 01 00 00 00 3c 00 04 d8 ...<...

Help

Close

4.1 Hub

Network:



The screenshot shows a terminal window with a dark background and white text. The terminal output is as follows:

```
licence.  
Source code and license can be found at vpcs.sf.net.  
For more information, please visit wiki.freecode.com.cn.  
  
Press '?' to get help.  
  
Executing the startup file  
  
PC-1> ip 10.0.1.11/24  
Checking for duplicate address...  
PC1 : 10.0.1.11 255.255.255.0  
PC-1>   
  
PC-2> ip 10.0.1.12/24  
Checking for duplicate address...  
PC2 : 10.0.1.12 255.255.255.0  
PC-2>   
  
PC-3> ip 10.0.1.13/24  
Checking for duplicate address...  
PC3 : 10.0.1.13 255.255.255.0  
PC-3>   
  
PC-4> ip 10.0.1.14/24  
Checking for duplicate address...  
PC4 : 10.0.1.14 255.255.255.0  
PC-4>   
  
Source NIO listener thread for VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528 has started  
Destination NIO listener thread for VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528 has started
```

The terminal window also shows a "Topology Summary" tab on the right side, which displays a diagram of the network topology. The diagram shows four PCs connected to a central hub, matching the diagram above.

```
Terminal
Press '?' to get help.

Executing the startup file

PC-1> ip 10.0.1.11/24
Checking for duplicate address...
PC1 : 10.0.1.11 255.255.255.0

PC-1> show arp

arp table is empty

PC-1> 
```

```
Terminal

PC-1> ip 10.0.1.11/24
Checking for duplicate address...
PC1 : 10.0.1.11 255.255.255.0

PC-1> show arp

arp table is empty

PC-1> ping 10.0.1.12
84 bytes from 10.0.1.12 icmp_seq=1 ttl=64 time=0.146 ms
84 bytes from 10.0.1.12 icmp_seq=2 ttl=64 time=0.191 ms
84 bytes from 10.0.1.12 icmp_seq=3 ttl=64 time=0.174 ms
84 bytes from 10.0.1.12 icmp_seq=4 ttl=64 time=0.227 ms
```

Wireshark interface showing a packet capture of an ARP request and ping responses.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	Private_66:68:00	Broadcast	ARP	64	Who has 10.0.1.12? Tell 10.0.1.11 [ETHERNET FRAME CHECK SEQUENCE INCORR...]
2	0.000122	Private_66:68:01	Private_66:68:00	ARP	64	10.0.1.12 is at 00:50:79:66:68:01 [ETHERNET FRAME CHECK SEQUENCE INCORR...]
3	0.001010	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x36ac, seq=1/256, ttl=64 (reply in 4)
4	0.001100	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x36ac, seq=1/256, ttl=64 (request in 3)
5	1.002176	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x37ac, seq=2/512, ttl=64 (reply in 6)
6	1.002288	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x37ac, seq=2/512, ttl=64 (request in 5)
7	2.003341	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x38ac, seq=3/768, ttl=64 (reply in 8)
8	2.003432	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x38ac, seq=3/768, ttl=64 (request in 7)
9	3.004428	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x39ac, seq=4/1024, ttl=64 (reply in 10)
10	3.004549	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x39ac, seq=4/1024, ttl=64 (request in 9)

Frame 1: 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface 0

Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

Destination: Broadcast (ff:ff:ff:ff:ff:ff)

Address: Broadcast (ff:ff:ff:ff:ff:ff)

...1. = LG bit: Locally administered address (this is NOT the factory default)

...1. = IG bit: Group address (multicast/broadcast)

Source: Private_66:68:00 (00:50:79:66:68:00)

Type: ARP (0x0806)

Padding: 00000000000000000000000000000000

Frame check sequence: 0x00000000 incorrect, should be 0x37da1eb9

[FCS Status: Bad]

Address Resolution Protocol (request)

0000 ff ff ff ff ff ff 00 50 79 66 68 00 08 06 00 01P yfh....

0010 08 00 06 04 00 01 00 50 79 66 68 00 0a 00 01 0bP yfh....

Destination Hardware Address (eth.dst), 6 bytes

Packets: 10 · Displayed: 10 (100.0%)

Profile: Default

ip.addr == 10.0.1.12

No.	Time	Source	Destination	Protocol	Length	Info
3	0.001010	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x36ac, seq=1/256, ttl=64 (reply in 4)
4	0.001100	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x36ac, seq=1/256, ttl=64 (request in 3)
5	1.002176	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x37ac, seq=2/512, ttl=64 (reply in 6)
6	1.002288	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x37ac, seq=2/512, ttl=64 (request in 5)
7	2.003341	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x38ac, seq=3/768, ttl=64 (reply in 8)
8	2.003432	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x38ac, seq=3/768, ttl=64 (request in 7)
9	3.004428	10.0.1.11	10.0.1.12	ICMP	98	Echo (ping) request id=0x39ac, seq=4/1024, ttl=64 (reply in 10)
10	3.004549	10.0.1.12	10.0.1.11	ICMP	98	Echo (ping) reply id=0x39ac, seq=4/1024, ttl=64 (request in 9)

▶ Frame 3: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface 0
 ▶ Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Private_66:68:01 (00:50:79:66:68:01)
 ▶ Internet Protocol Version 4, Src: 10.0.1.11, Dst: 10.0.1.12
 ▶ Internet Control Message Protocol

0000 00 50 79 66 68 01 00 50 79 66 68 00 08 00 45 00 ..Pyfh..P yfh...E.
 0010 00 54 ac 36 00 00 40 01 b8 5c 0a 00 01 0b 0a 00 ..T.6..@. \.....

wireshark - 20201210103351_hoj7fX.pcapng Packets: 10 · Displayed: 8 (80.0%) Profile: Default

Terminal

```

arp table is empty
PC-1> ping 10.0.1.12
84 bytes from 10.0.1.12 icmp_seq=1 ttl=64 time=0.146 ms
84 bytes from 10.0.1.12 icmp_seq=2 ttl=64 time=0.191 ms
84 bytes from 10.0.1.12 icmp_seq=3 ttl=64 time=0.174 ms
84 bytes from 10.0.1.12 icmp_seq=4 ttl=64 time=0.227 ms
^C
PC-1> show arp
00:50:79:66:68:01 10.0.1.12 expires in 1 seconds
PC-1>
  
```

Terminal

```

Press '?' to get help.
Executing the startup file
PC-2> ip 10.0.1.12/24
Checking for duplicate address...
PC1 : 10.0.1.12 255.255.255.0
PC-2> show arp
00:50:79:66:68:00 10.0.1.11 expires in 5 seconds
PC-2>
  
```

Console

```

Destination NIO listener thread for VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528 has started
Error while sending command 'bridge create VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528': bridge 'VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528' already exists
Hypervisor TCP control server started (IP 127.0.0.1 port 36891).
UDP tunnel connecting from local port 10013 to IPv4 address 127.0.0.1 on port 10012
Source NIO listener thread for VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528 has started
Destination NIO listener thread for VPCS-09e6ff1e-0488-4fe4-96c3-62a393fcf528 has started
  
```

2 errors 6 warnings

Wireshark · Packet 1 · Standard Input

▶ Frame 1: 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface 0

▼ Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

▼ Destination: Broadcast (ff:ff:ff:ff:ff:ff)

Address: Broadcast (ff:ff:ff:ff:ff:ff)

.... ..1. = LG bit: Locally administered address (this is NOT the factory default)

.... ..1. = IG bit: Group address (multicast/broadcast)

▼ Source: Private_66:68:00 (00:50:79:66:68:00)

Address: Private_66:68:00 (00:50:79:66:68:00)

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

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

Type: ARP (0x0806)

Padding: 00000000000000000000000000000000

▼ Frame check sequence: 0x00000000 incorrect, should be 0x37da1eb9

▼ [Expert Info (Error/Checksum): Bad checksum [should be 0x37da1eb9]]

[Bad checksum [should be 0x37da1eb9]]

[Severity level: Error]

[Group: Checksum]

[FCS Status: Bad]

▶ Address Resolution Protocol (request)

0000 ff ff ff ff ff ff 00 50 79 66 68 00 08 06 00 01 ...P yfh....

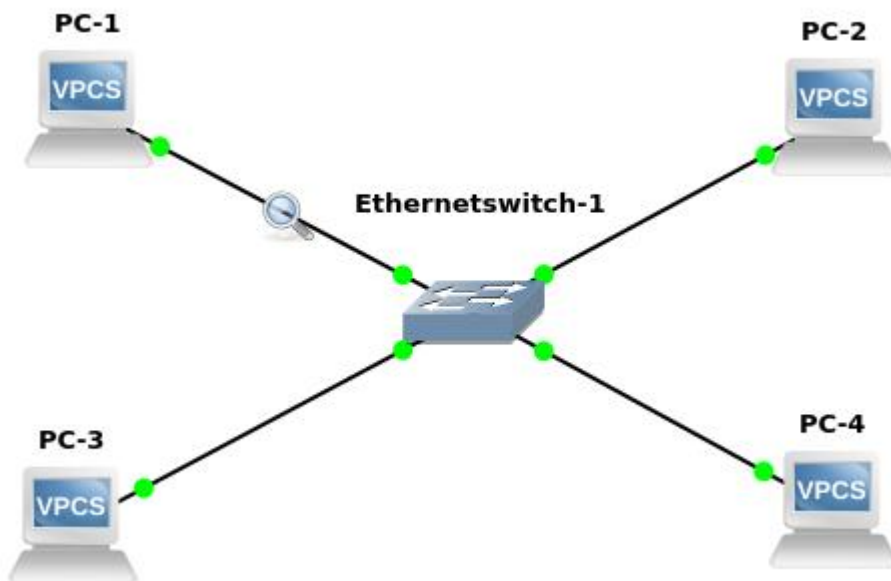
0010 08 00 06 04 00 01 00 50 79 66 68 00 0a 00 01 0bP yfh....

Help

Close

4.2 Switch

Network:



```
Terminal Terminal File Edit View Search Terminal Help
84 bytes from 10.0.1.12 icmp_seq=1 ttl=64 time=0.146 ms
84 bytes from 10.0.1.12 icmp_seq=2 ttl=64 time=0.191 ms
84 bytes from 10.0.1.12 icmp_seq=3 ttl=64 time=0.174 ms
84 bytes from 10.0.1.12 icmp_seq=4 ttl=64 time=0.227 ms
^C
PC-1> show arp
00:50:79:66:68:01 10.0.1.12 expires in 1 seconds
PC-1> ip 10.0.1.100/24
Checking for duplicate address...
PC1 : 10.0.1.100 255.255.255.0
PC-1>

Press '?' to get help.
Executing the startup file
PC-3> ip 10.0.1.13/24
Checking for duplicate address...
PC1 : 10.0.1.13 255.255.255.0
PC-3> ip 10.0.1.120/24
Checking for duplicate address...
PC1 : 10.0.1.120 255.255.255.0
PC-3>

PC-2> ip 10.0.1.12/24
Checking for duplicate address...
PC1 : 10.0.1.12 255.255.255.0
PC-2> show arp
00:50:79:66:68:00 10.0.1.11 expires in 5 seconds
PC-2> ip 10.0.1.101/28
Checking for duplicate address...
PC1 : 10.0.1.101 255.255.255.240
PC-2>

PC-4> ip 10.0.1.14/24
Checking for duplicate address...
PC1 : 10.0.1.14 255.255.255.0
PC-4> ip 10.0.1.121/28
Checking for duplicate address...
PC1 : 10.0.1.121 255.255.255.240
PC-4>
```

```
Terminal
Checking for duplicate address...
PC1 : 10.0.1.100 255.255.255.0

PC-1> ping 10.0.1.120
84 bytes from 10.0.1.120 icmp_seq=1 ttl=64 time=0.152 ms
84 bytes from 10.0.1.120 icmp_seq=2 ttl=64 time=0.178 ms
84 bytes from 10.0.1.120 icmp_seq=3 ttl=64 time=0.203 ms
^C
PC-1> ping 10.0.1.101 -c 1
84 bytes from 10.0.1.101 icmp_seq=1 ttl=64 time=0.099 ms

PC-1> ping 10.0.1.121 -c 1
10.0.1.121 icmp_seq=1 timeout
```

```
Terminal
Executing the startup file

PC-4> ip 10.0.1.14/24
Checking for duplicate address...
PC1 : 10.0.1.14 255.255.255.0

PC-4> ip 10.0.1.121/28
Checking for duplicate address...
PC1 : 10.0.1.121 255.255.255.240

PC-4> ping 10.0.1.100
No gateway found

PC-4> 
```

```
Terminal
00:50:79:66:68:00 10.0.1.11 expires in 5 seconds

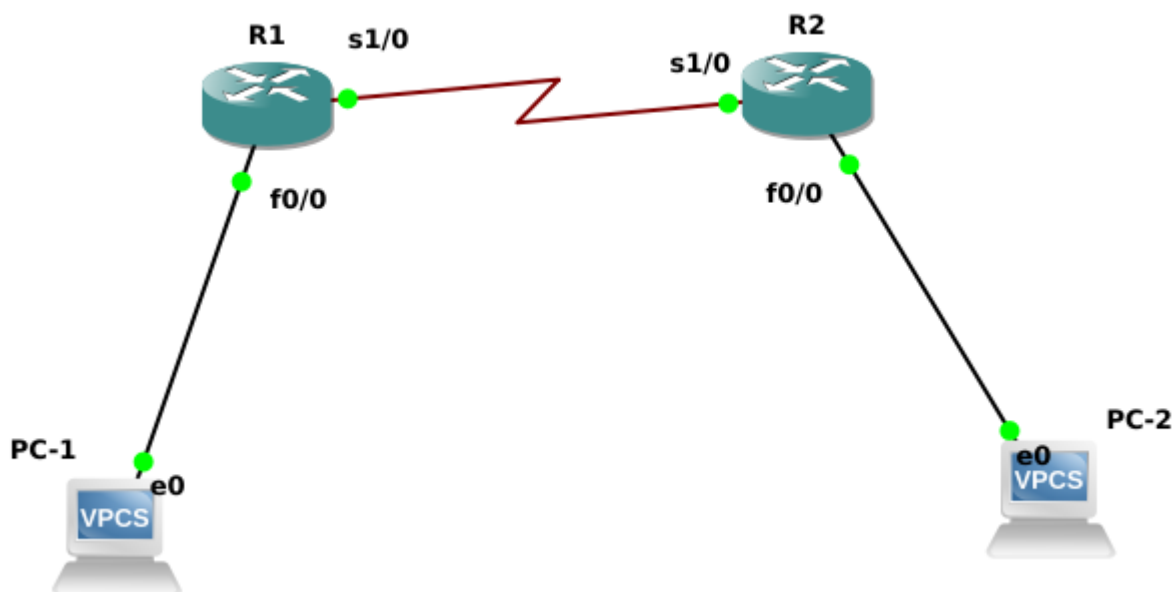
PC-2> ip 10.0.1.101/28
Checking for duplicate address...
PC1 : 10.0.1.101 255.255.255.240

PC-2> ping 10.0.1.100
84 bytes from 10.0.1.100 icmp_seq=1 ttl=64 time=0.101 ms
84 bytes from 10.0.1.100 icmp_seq=2 ttl=64 time=0.296 ms
^C
PC-2> ping 10.0.1.120 -c 1
No gateway found

PC-2> 
```

4.6 Routers

Network:



```
Terminal
-p port      Destination port
-s port      Source port
-T ttl       Set ttl, default 64
-t           Send packets until interrupted by Ctrl+C
-w ms       Wait ms milliseconds to receive the response

Notes: 1. Using names requires DNS to be set.
       2. Use Ctrl+C to stop the command.

PC-1> ping 30.0.0.10
30.0.0.10 icmp_seq=1 timeout
84 bytes from 30.0.0.10 icmp_seq=2 ttl=62 time=21.948 ms
84 bytes from 30.0.0.10 icmp_seq=3 ttl=62 time=56.594 ms
84 bytes from 30.0.0.10 icmp_seq=4 ttl=62 time=27.271 ms
84 bytes from 30.0.0.10 icmp_seq=5 ttl=62 time=56.339 ms
^C
PC-1> ping 30.0.0.10 -c 5
84 bytes from 30.0.0.10 icmp_seq=1 ttl=62 time=56.670 ms
84 bytes from 30.0.0.10 icmp_seq=2 ttl=62 time=56.330 ms
84 bytes from 30.0.0.10 icmp_seq=3 ttl=62 time=27.070 ms
84 bytes from 30.0.0.10 icmp_seq=4 ttl=62 time=26.276 ms
84 bytes from 30.0.0.10 icmp_seq=5 ttl=62 time=26.656 ms

PC-1> 
```