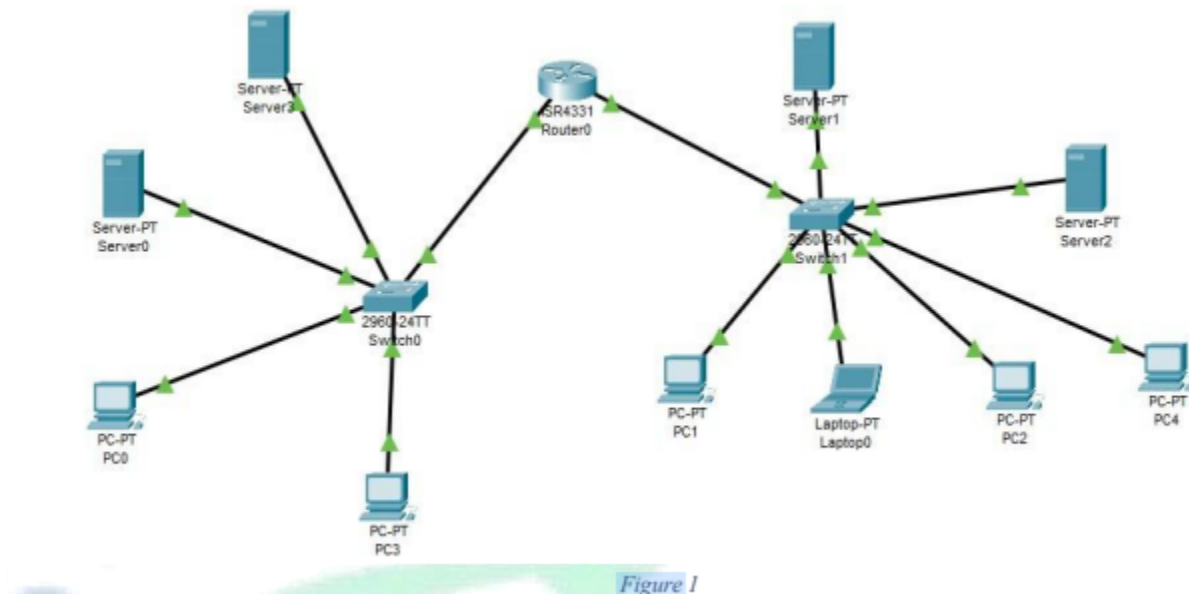


### Lab Exercise SMTP and FTP:

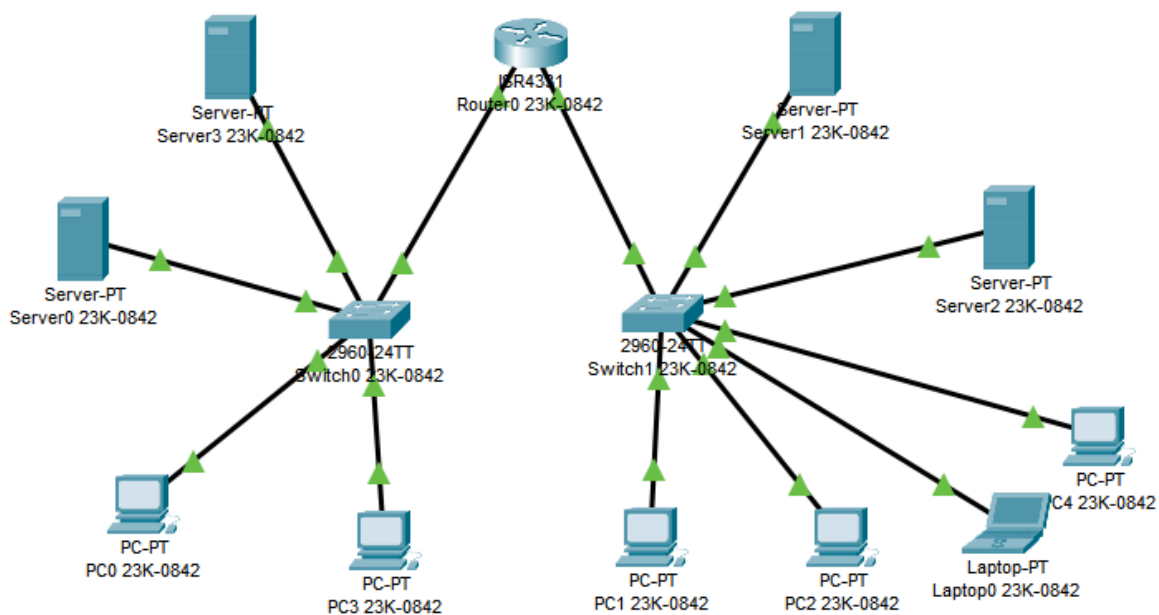
1. Let's suppose your organization needs to create its small server (to provide some services) based network. With below mentioned topology and instructions:

Attach a screenshot of each step. Also, Submit a .pkt file.

- Configure SMTP (create an account with your last name along with the last 3 digits roll number) and send mail from PC 0 to PC 1, PC1 to PC 2 and PC0 to PC3.
- Configure the FTP server to create an account with your first name, password with your roll number, and filename with your last name (.bin extension) to show all connection results. The FTP Server should be established on Server 0, Server 1 and Server 3.



### REAL TIME:



PC0 23K-0842

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

PC3 23K-0842

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

Server0 23K-0842

Physical Config Services **Desktop** Programming Attributes

IP Configuration X

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.4

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

Physical Config Services **Desktop** Programming Attributes

**IP Configuration** X

IP Configuration

☐ DHCP ☒ Static

IPv4 Address

Subnet Mask

Default Gateway

DNS Server

Physical Config **Services** Desktop Programming Attributes

**SERVICES** ^

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL**
- FTP
- IoT
- VM Management
- Radius EAP

EMAIL

SMTP Service ☒ ON ☐ OFF

POP3 Service ☒ ON ☐ OFF

Domain Name:

User Setup

User  Password

PC0 23K-0842

Physical Config **Desktop** Programming Attributes

**Configure Mail** X

User Information

Your Name: afzal842

Email Address: afzal842@kinza.com

Server Information

Incoming Mail Server: 192.168.1.4

Outgoing Mail Server: 192.168.1.4

Logon Information

User Name: afzal842

Password: ●●●

Save Remove Clear Reset

PC3 23K-0842

Physical Config **Desktop** Programming Attributes

**Configure Mail** X

User Information

Your Name: 1afzal842

Email Address: 1afzal842@kinza.com

Server Information

Incoming Mail Server: 192.168.1.4

Outgoing Mail Server: 192.168.1.4

Logon Information

User Name: 1afzal842

Password: ●●●

Save Remove Clear Reset

PC1 23K-0842



Physical Config **Desktop** Programming Attributes

**Configure Mail** [X]

User Information

Your Name: 2afzal842

Email Address: 2afzal842@kinza.com

Server Information

Incoming Mail Server: 192.168.1.4

Outgoing Mail Server: 192.168.2.6

Logon Information

User Name: 2afzal842

Password: ...

Save Remove Clear Reset

PC2 23K-0842



Physical Config **Desktop** Programming Attributes

**Configure Mail** [X]

User Information

Your Name: 3afzal842

Email Address: 3afzal842@kinza.com

Server Information

Incoming Mail Server: 192.168.2.6

Outgoing Mail Server: 192.168.2.6

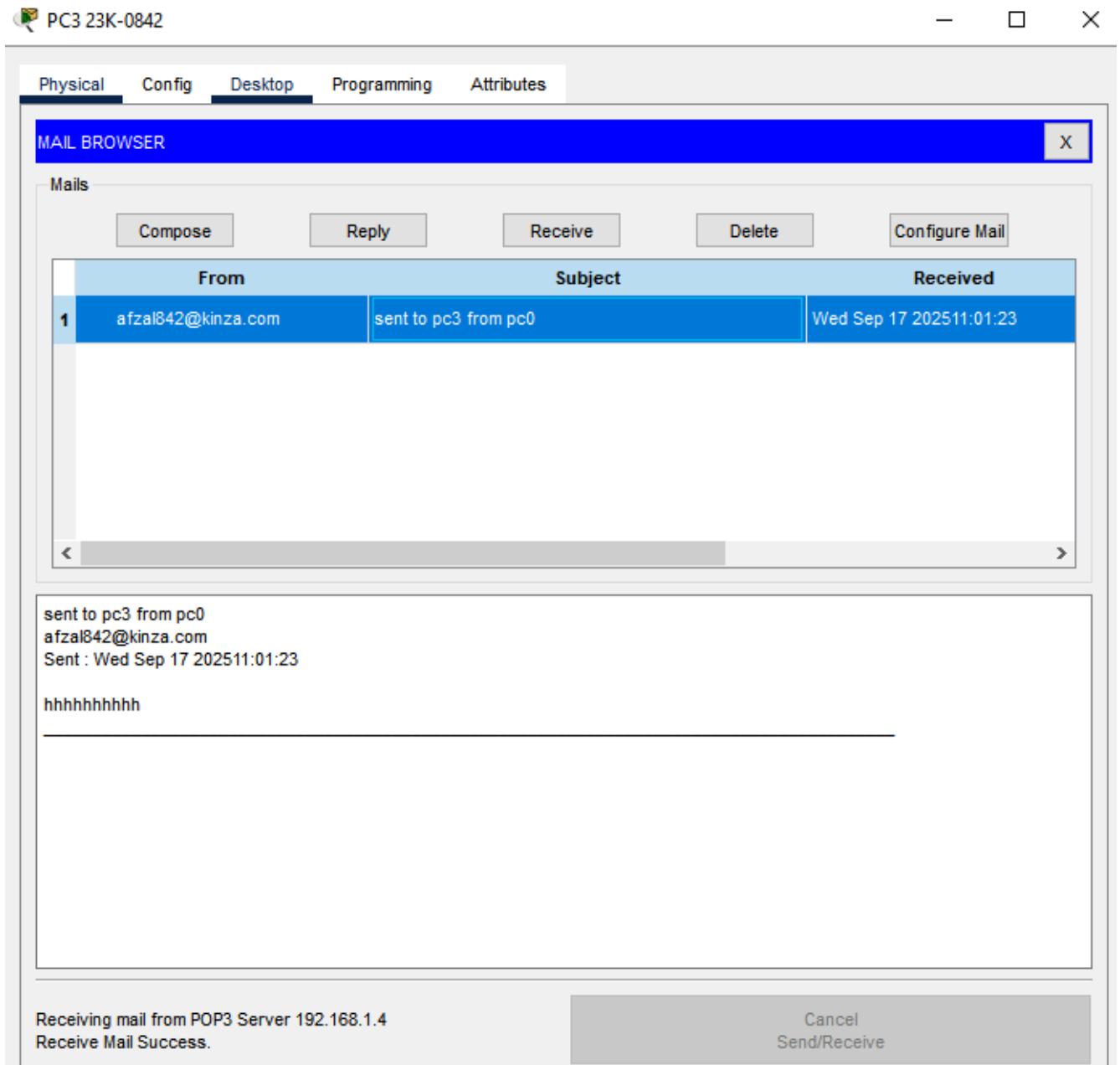
Logon Information

User Name: 3afzal842

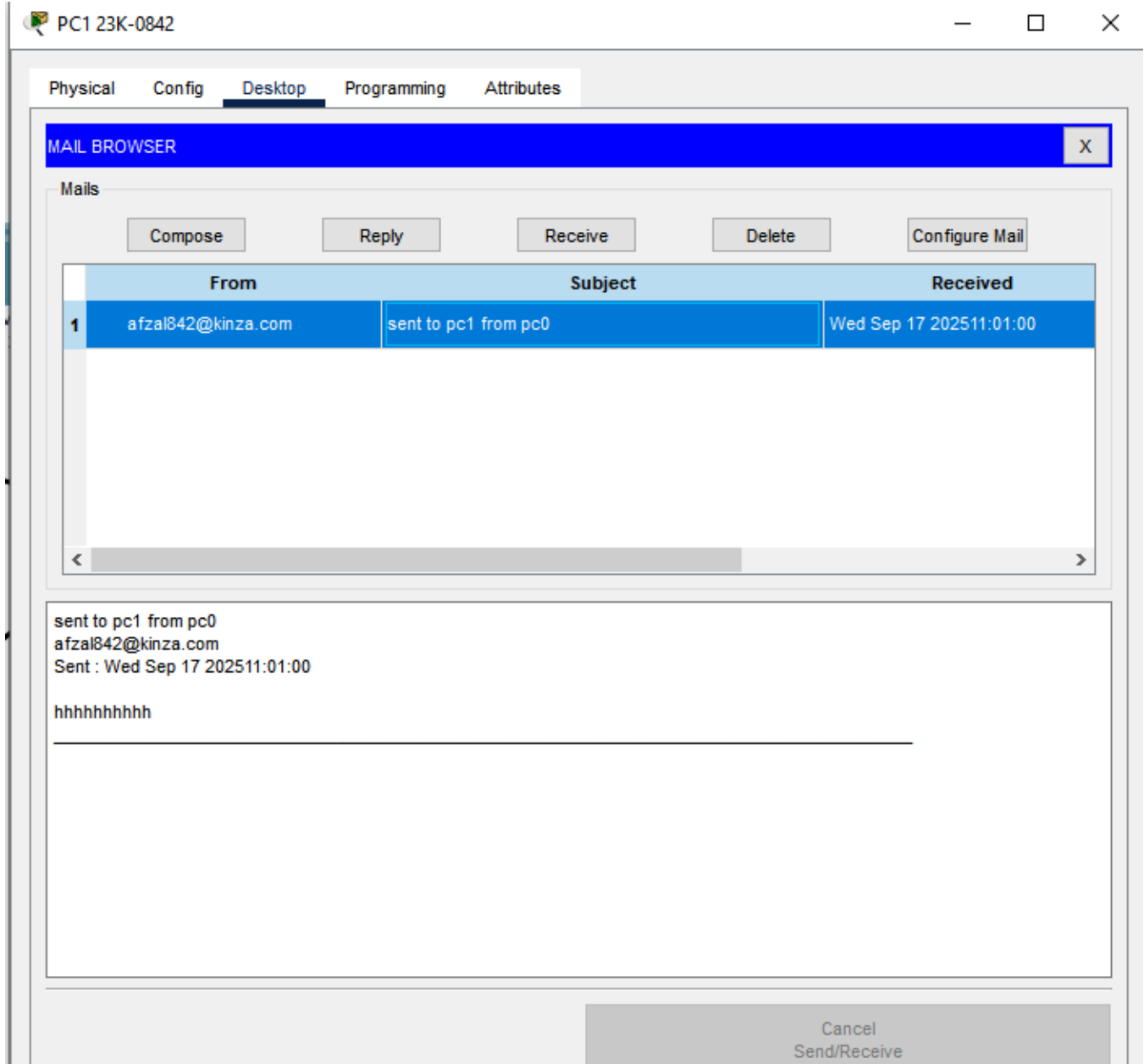
Password: ...

Save Remove Clear Reset

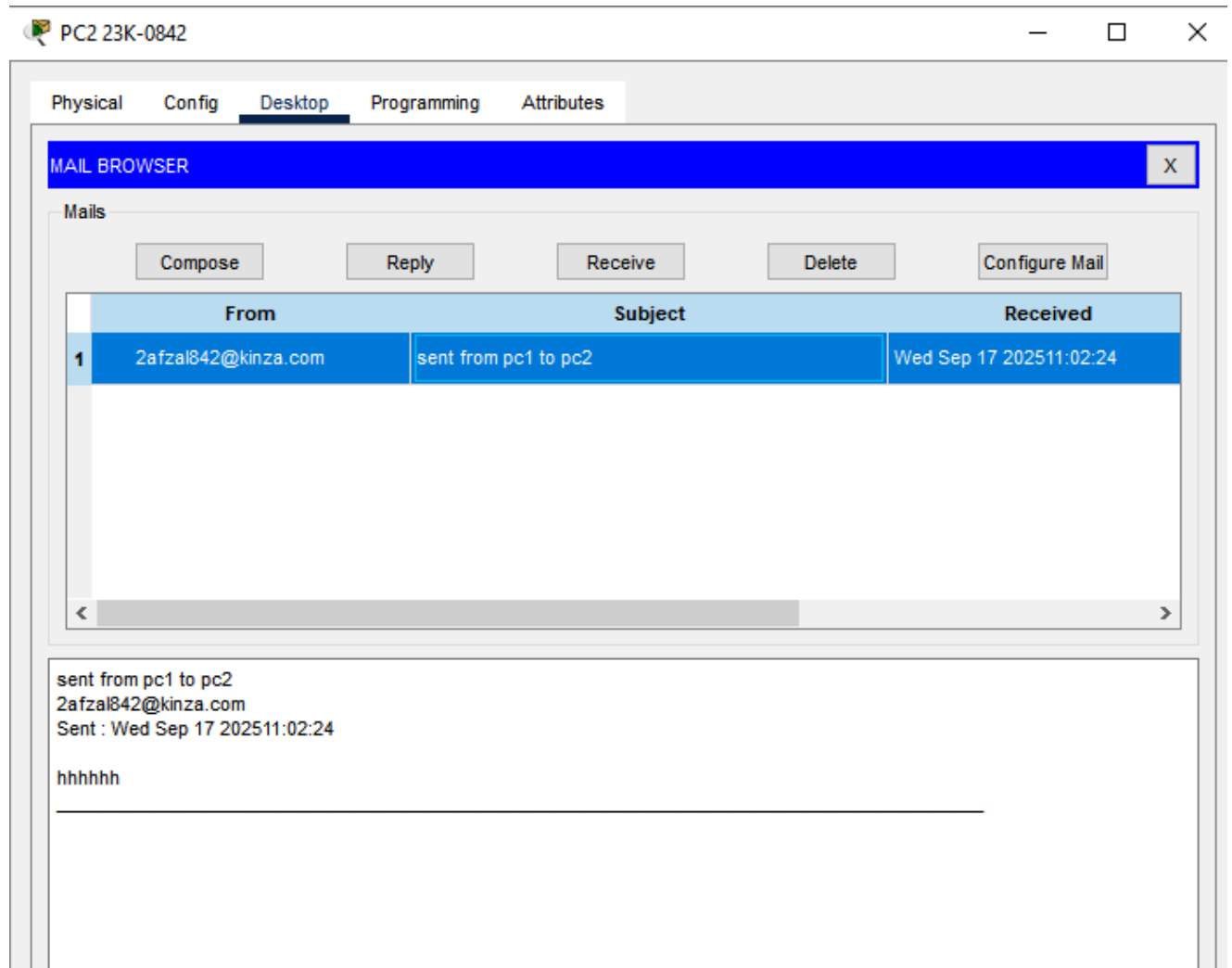
## Sending mail from PC0 TO PC3:



## Sending mail from PC0 TO PC1:

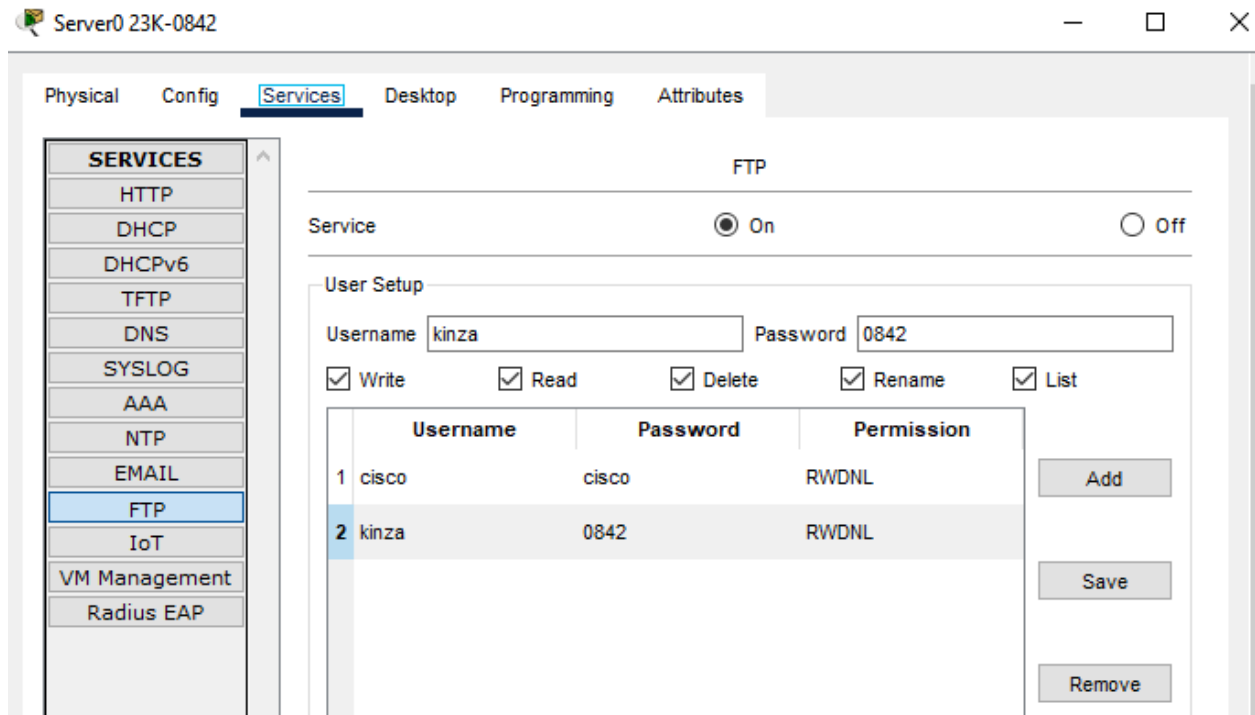


## Sending mail from PC1 TO PC2:

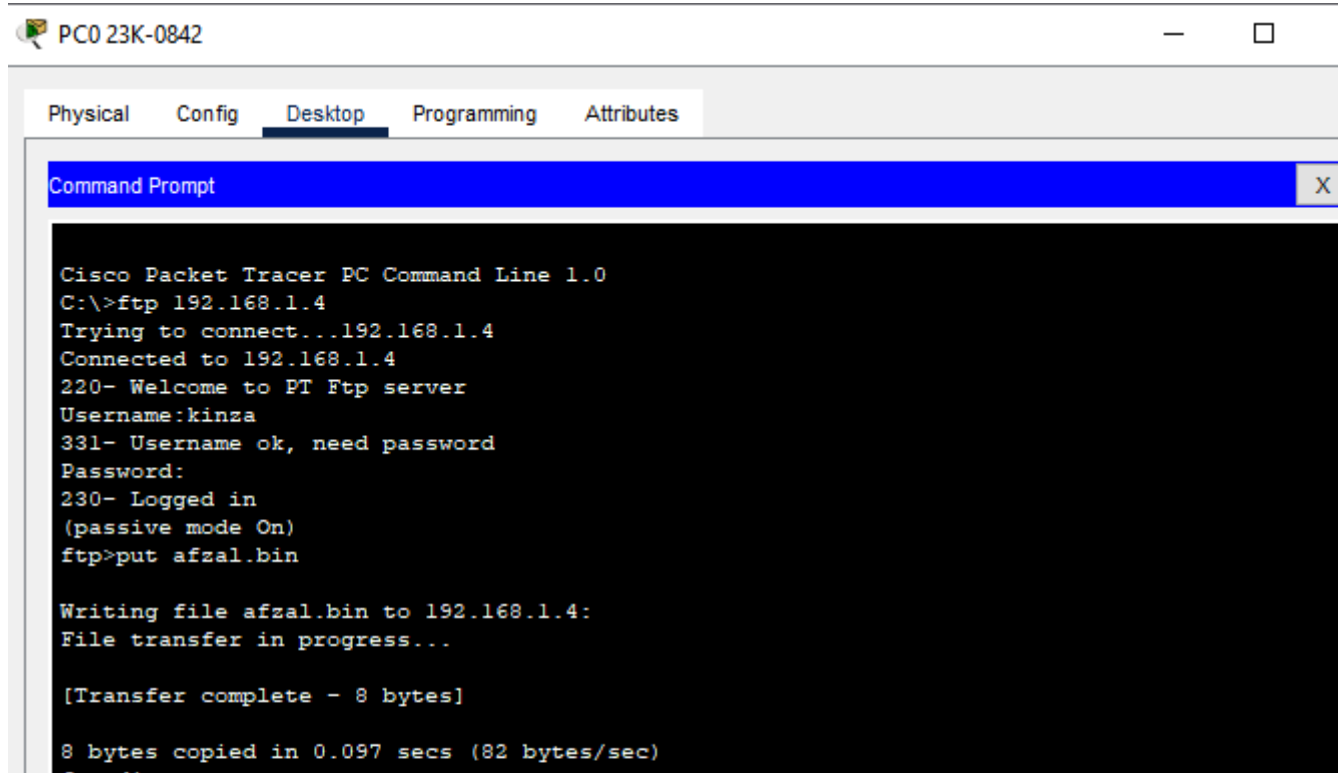




## b) FTP:



Created file afzal.bin in PC0



```
ftp>dir

Listing /ftp directory from 192.168.1.4:
0   : afzal.bin                8
1   : asa842-k8.bin           5571584
2   : asa923-k8.bin           30468096
```

### Ftp server0 ip

```
C:\>ftp 192.168.1.5
Trying to connect...192.168.1.5
Connected to 192.168.1.5
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

Writing file afzal.bin to 192.168.1.5:
File transfer in progress...

[Transfer complete - 8 bytes]

8 bytes copied in 0.096 secs (83 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.1.5:
0   : afzal.bin                8
1   : asa842-k8.bin           5571584
```

### Ftp server3 ip

```
C:\>ftp 192.168.2.7
Trying to connect...192.168.2.7
Connected to 192.168.2.7
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

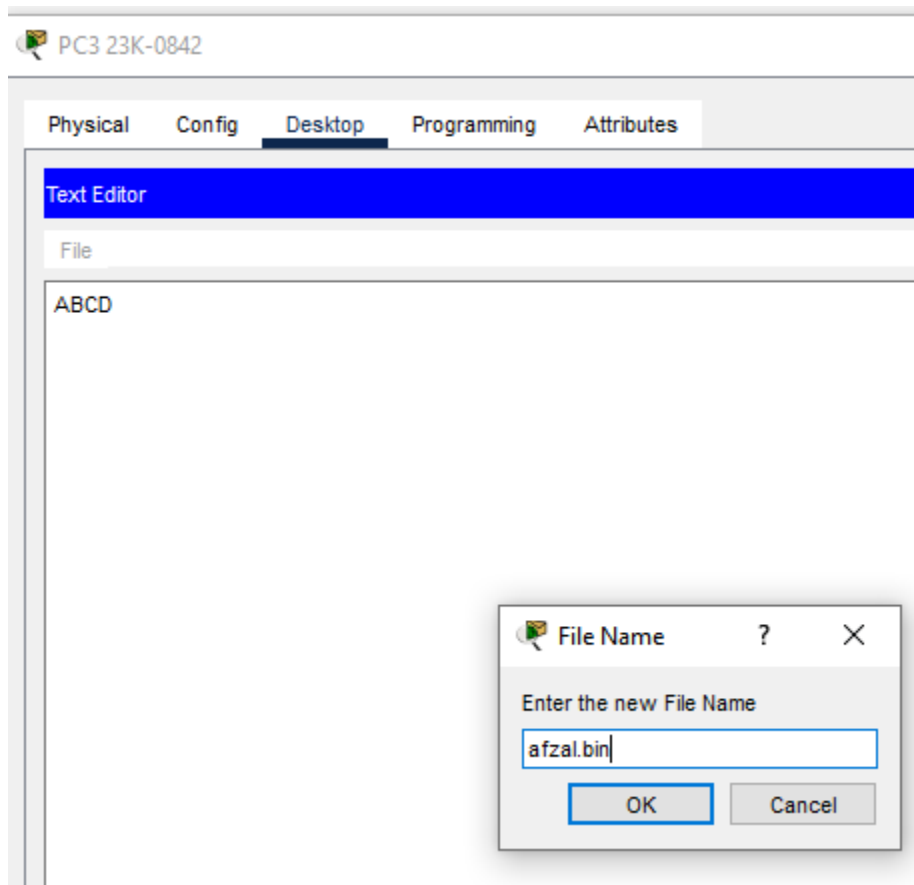
Writing file afzal.bin to 192.168.2.7:
File transfer in progress...

[Transfer complete - 5 bytes]

5 bytes copied in 0.077 secs (64 bytes/sec)
```

### Ftp server1 ip

### Checking on PC3:



```
C:\>ftp 192.168.1.4
Trying to connect...192.168.1.4
Connected to 192.168.1.4
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

Writing file afzal.bin to 192.168.1.4:
File transfer in progress...

[Transfer complete - 4 bytes]

4 bytes copied in 0.094 secs (42 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.1.4:
0   : afzal.bin                               4
1   : 33a842-k8 bin                          557158
```

### Ftp server0 ip

```
C:\>ftp 192.168.1.5
Trying to connect...192.168.1.5
Connected to 192.168.1.5
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

Writing file afzal.bin to 192.168.1.5:
File transfer in progress...

[Transfer complete - 5 bytes]

5 bytes copied in 0.082 secs (60 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.1.5:
0   : afzal.bin                               5
1   : asa842-k8.bin                          5571584
```

### ftp server 3 ip

```
C:\>ftp 192.168.2.7
Trying to connect...192.168.2.7
Connected to 192.168.2.7
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin


Writing file afzal.bin to 192.168.2.7:
File transfer in progress...

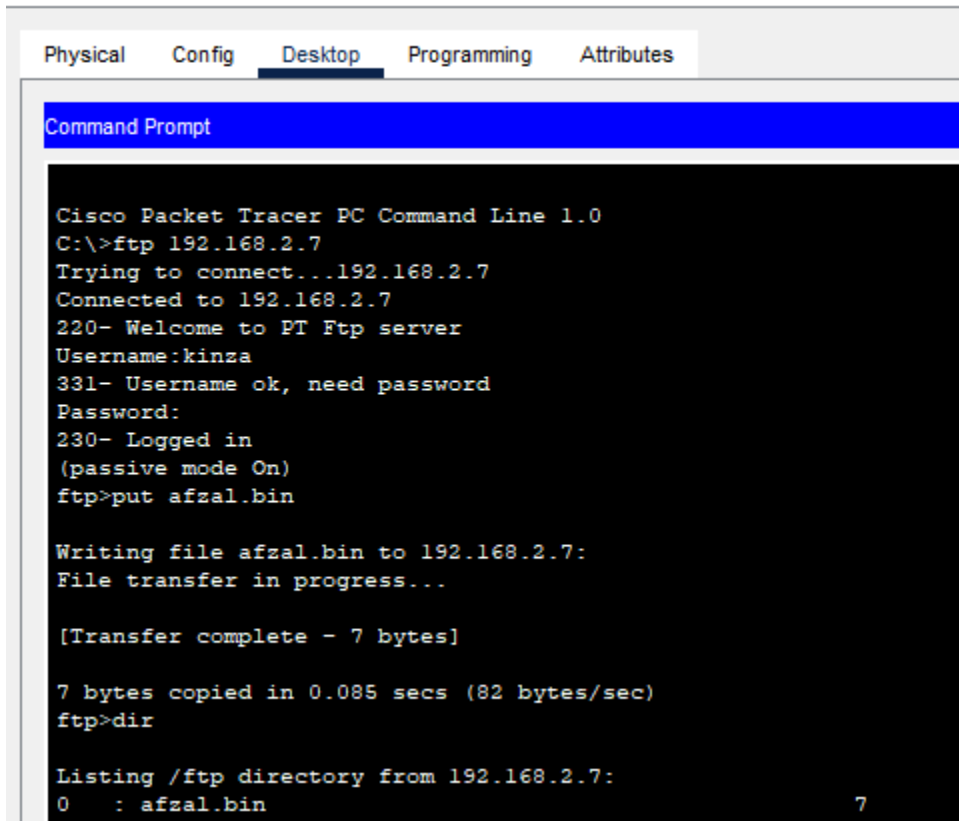
[Transfer complete - 5 bytes]

5 bytes copied in 0.077 secs (64 bytes/sec)
```

### Ftp server 1 ip

## Checking on PC1

 PC1 23K-0842



The image shows a screenshot of the Cisco Packet Tracer Desktop tab. A Command Prompt window is open, displaying the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ftp 192.168.2.7
Trying to connect...192.168.2.7
Connected to 192.168.2.7
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

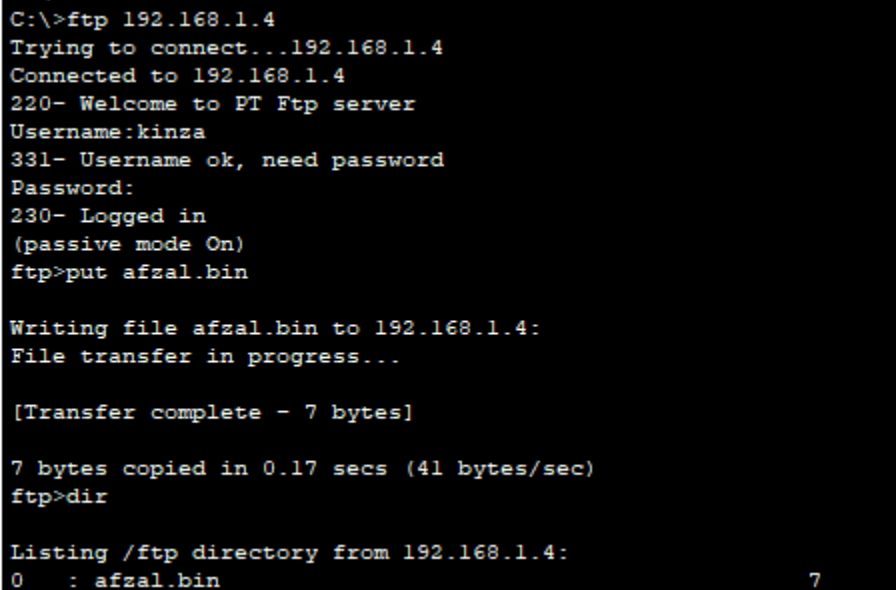
Writing file afzal.bin to 192.168.2.7:
File transfer in progress...

[Transfer complete - 7 bytes]

7 bytes copied in 0.085 secs (82 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.2.7:
0      : afzal.bin
```

## Ftp server1 ip



The image shows a screenshot of a Command Prompt window with the following text:

```
C:\>ftp 192.168.1.4
Trying to connect...192.168.1.4
Connected to 192.168.1.4
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

Writing file afzal.bin to 192.168.1.4:
File transfer in progress...

[Transfer complete - 7 bytes]

7 bytes copied in 0.17 secs (41 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.1.4:
0      : afzal.bin
```

## Ftp server0 ip

```
C:\>ftp 192.168.1.5
Trying to connect...192.168.1.5
Connected to 192.168.1.5
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

Writing file afzal.bin to 192.168.1.5:
File transfer in progress...

[Transfer complete - 7 bytes]

7 bytes copied in 0.164 secs (42 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.1.5:
0      : afzal.bin                                7
1      : afzal.txt                                5581584
```

### Ftp server 3 ip

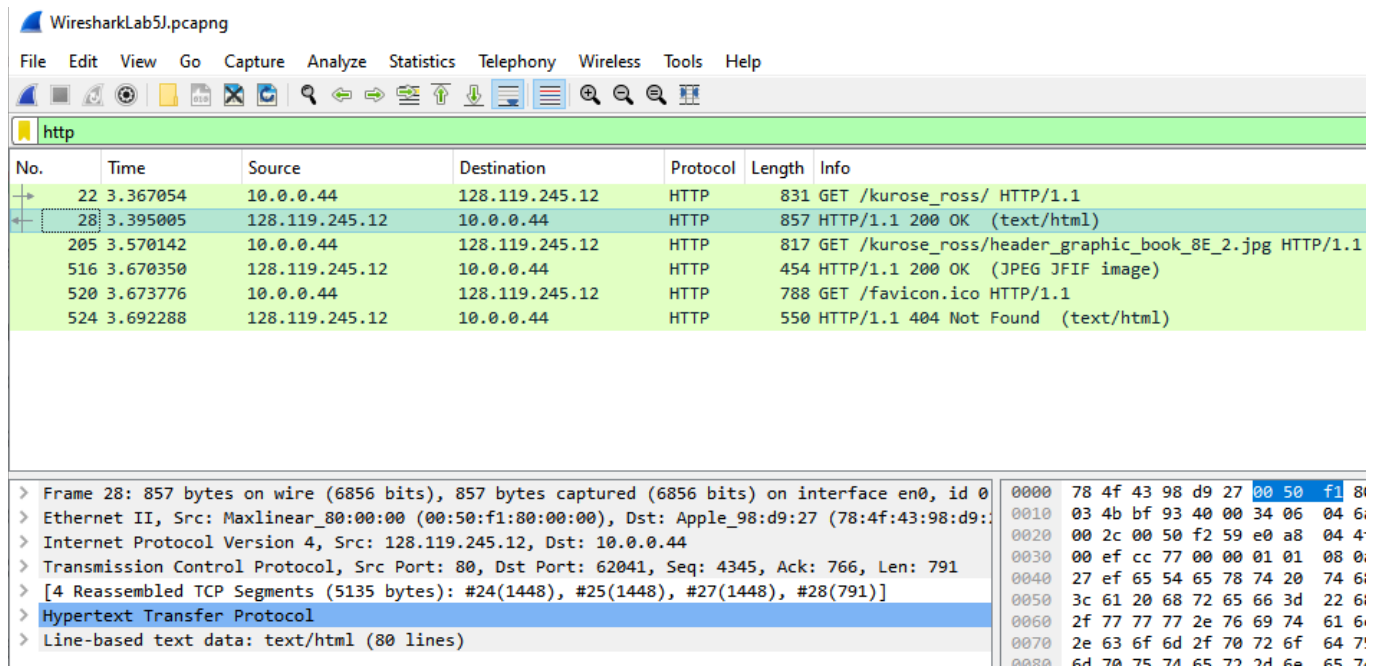
## Lab Exercise Wireshark:

Open the WiresharkLab5J.pcap file on Wireshark. Apply a HTTP filter and select the packet having

serial no. 28 and answer the following questions:

1. What is the status code returned from the server to your browser?
2. When was the HTML file that you are retrieving last modified at the server?
3. What is the destination and source port no?
4. What is the destination and source ip address of the packet?
5. How many data-containing TCP segments were needed to carry the single HTTP response?

1.



WiresharkLab5J.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

http

No.	Time	Source	Destination	Protocol	Length	Info
22	3.367054	10.0.0.44	128.119.245.12	HTTP	831	GET /kurose_ross/ HTTP/1.1
28	3.395005	128.119.245.12	10.0.0.44	HTTP	857	HTTP/1.1 200 OK (text/html)
205	3.570142	10.0.0.44	128.119.245.12	HTTP	817	GET /kurose_ross/header_graphic_book_8E_2.jpg HTTP/1.1
516	3.670350	128.119.245.12	10.0.0.44	HTTP	454	HTTP/1.1 200 OK (JPEG JFIF image)
520	3.673776	10.0.0.44	128.119.245.12	HTTP	788	GET /favicon.ico HTTP/1.1
524	3.692288	128.119.245.12	10.0.0.44	HTTP	550	HTTP/1.1 404 Not Found (text/html)

> Frame 28: 857 bytes on wire (6856 bits), 857 bytes captured (6856 bits) on interface en0, id 0

> Ethernet II, Src: Maxlinear\_80:00:00 (00:50:f1:80:00:00), Dst: Apple\_98:d9:27 (78:4f:43:98:d9:27)

> Internet Protocol Version 4, Src: 128.119.245.12, Dst: 10.0.0.44

> Transmission Control Protocol, Src Port: 80, Dst Port: 62041, Seq: 4345, Ack: 766, Len: 791

> [4 Reassembled TCP Segments (5135 bytes): #24(1448), #25(1448), #27(1448), #28(791)]

> Hypertext Transfer Protocol

> Line-based text data: text/html (80 lines)

0000 78 4f 43 98 d9 27 00 50 f1 80  
0010 03 4b bf 93 40 00 34 06 04 61  
0020 00 2c 00 50 f2 59 e0 a8 04 41  
0030 00 ef cc 77 00 00 01 01 08 00  
0040 27 ef 65 54 65 78 74 20 74 61  
0050 3c 61 20 68 72 65 66 3d 22 61  
0060 2f 77 77 77 2e 76 69 74 61 61  
0070 2e 63 6f 6d 2f 70 72 6f 64 71  
0080 6d 70 75 74 65 72 7d 6a 65 71

**HTTP/1.1 200 OK**

**Status code: 200**

2.

http			
No.	Time	Source	Destination
22	3.367054	10.0.0.44	128.119.245.12
28	3.395005	128.119.245.12	10.0.0.44
205	3.570142	10.0.0.44	128.119.245.12
516	3.670350	128.119.245.12	10.0.0.44
520	3.673776	10.0.0.44	128.119.245.12
524	3.692288	128.119.245.12	10.0.0.44

>	HTTP/1.1 200 OK\r\n
	Date: Sun, 31 Jan 2021 20:34:40 GMT\r\n
	Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips
	Last-Modified: Mon, 31 Aug 2020 15:24:21 GMT\r\n

3.

http						
No.	Time	Source	Destination	Protocol	Length	Info
22	3.367054	10.0.0.44	128.119.245.12	HTTP	831	GET /kuro
28	3.395005	128.119.245.12	10.0.0.44	HTTP	857	HTTP/1.1
205	3.570142	10.0.0.44	128.119.245.12	HTTP	817	GET /kuro
516	3.670350	128.119.245.12	10.0.0.44	HTTP	454	HTTP/1.1
520	3.673776	10.0.0.44	128.119.245.12	HTTP	788	GET /favi
524	3.692288	128.119.245.12	10.0.0.44	HTTP	550	HTTP/1.1

>	Frame 28: 857 bytes on wire (6856 bits), 857 bytes captured (6856 bits) on interface e
>	Ethernet II, Src: Maxlinear_80:00:00 (00:50:f1:80:00:00), Dst: Apple_98:d9:27 (78:4f:4
>	Internet Protocol Version 4, Src: 128.119.245.12, Dst: 10.0.0.44
▼	Transmission Control Protocol, Src Port: 80, Dst Port: 62041, Seq: 4345, Ack: 766, Len
	Source Port: 80
	Destination Port: 62041

**Source Port: 80**

**Destination Port: 62041**



4.

http						
No.	Time	Source	Destination	Protocol	Length	Info
22	3.367054	10.0.0.44	128.119.245.12	HTTP	831	GET
28	3.395005	128.119.245.12	10.0.0.44	HTTP	857	HTT
205	3.570142	10.0.0.44	128.119.245.12	HTTP	817	GET
516	3.670350	128.119.245.12	10.0.0.44	HTTP	454	HTT
520	3.673776	10.0.0.44	128.119.245.12	HTTP	788	GET

> Frame 28: 857 bytes on wire (6856 bits), 857 bytes captured (6856 bits) on inter

> Ethernet II, Src: Maxlinear\_80:00:00 (00:50:f1:80:00:00), Dst: Apple\_98:d9:27 (7

✓ Internet Protocol Version 4, Src: 128.119.245.12, Dst: 10.0.0.44

0100 .... = Version: 4

.... 0101 = Header Length: 20 bytes (5)

> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

Total Length: 843

Identification: 0xbf93 (49043)

> 010. .... = Flags: 0x2, Don't fragment

...0 0000 0000 0000 = Fragment Offset: 0

Time to Live: 52

Protocol: TCP (6)

Header Checksum: 0x046a [validation disabled]

[Header checksum status: Unverified]

Source Address: 128.119.245.12

Destination Address: 10.0.0.44

Source Address: 128.119.245.12

Destination Address: 10.0.0.44

5.

tcp.stream eq 0						
No.	Time	Source	Destination	Protocol	Length	Info
14	3.323466	10.0.0.44	128.119.245.12	TCP	78	6204
18	3.366349	128.119.245.12	10.0.0.44	TCP	76	80 -
20	3.366509	10.0.0.44	128.119.245.12	TCP	66	6204
22	3.367054	10.0.0.44	128.119.245.12	HTTP	831	GET
23	3.392444	128.119.245.12	10.0.0.44	TCP	68	80 -
24	3.392449	128.119.245.12	10.0.0.44	TCP	1514	80 -
25	3.393632	128.119.245.12	10.0.0.44	TCP	1514	80 -
26	3.393709	10.0.0.44	128.119.245.12	TCP	66	6204
27	3.394783	128.119.245.12	10.0.0.44	TCP	1514	80 -
28	3.395005	128.119.245.12	10.0.0.44	HTTP	857	HTT
29	3.395072	10.0.0.44	128.119.245.12	TCP	66	6204

Count: 6

### Steps I followed to count the TCP segments carrying the HTTP response

1. Open capture & filter for HTTP

I opened the WiresharkLab5J.pcap file in Wireshark and typed http in the display-filter bar.

Then I scrolled to packet No. 28, which contains the HTTP response.

### Follow the TCP stream

I right-clicked on packet 28 → Follow → TCP Stream.

After closing the text window, Wireshark automatically applied the filter tcp.stream eq 0

2. so only the packets for this single connection were visible.

3. Identify server-to-client packets

In the Packet List I looked at the Source and Destination columns.

The server IP is 128.119.245.12 and my client IP is 10.0.0.44, so I focused only on packets where the Source is 128.119.245.12.

4. Count data-carrying segments

I checked those server-to-client packets and counted every one with a non-zero TCP length (these are the packets that actually carry the HTTP data).

The packets are 18, 23, 24, 25, 27, and 28.

5. Result

Total data-containing TCP segments for the single HTTP response = 6.