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.

a) 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.

b) 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.

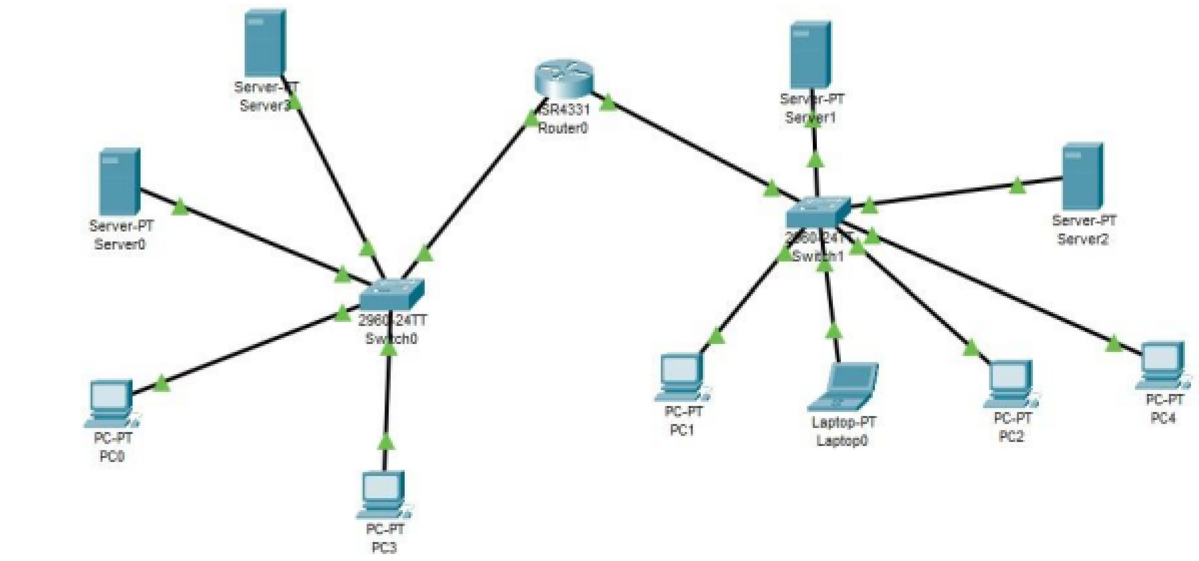
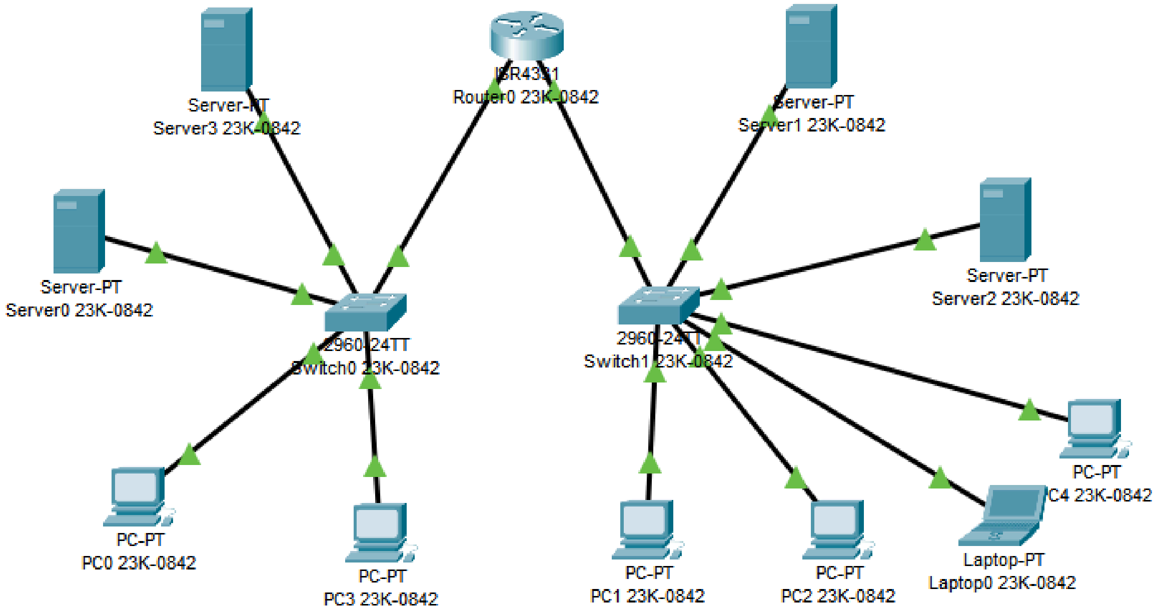
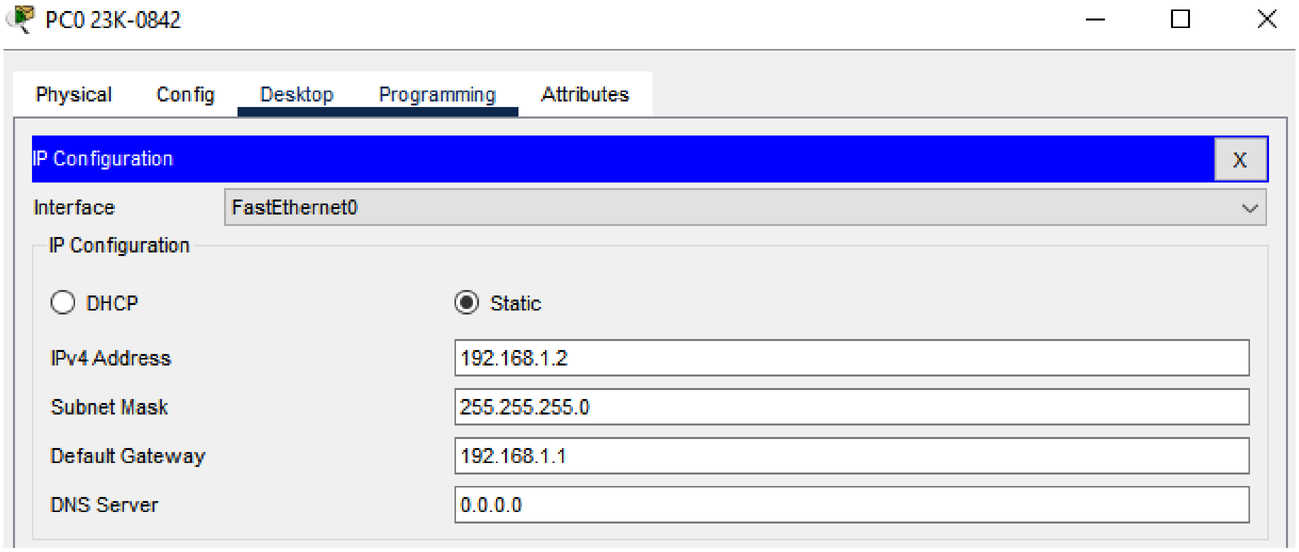


Figure 1

REAL TIME:





IP Configuration

Interface: FastEthernet0

IP Configuration

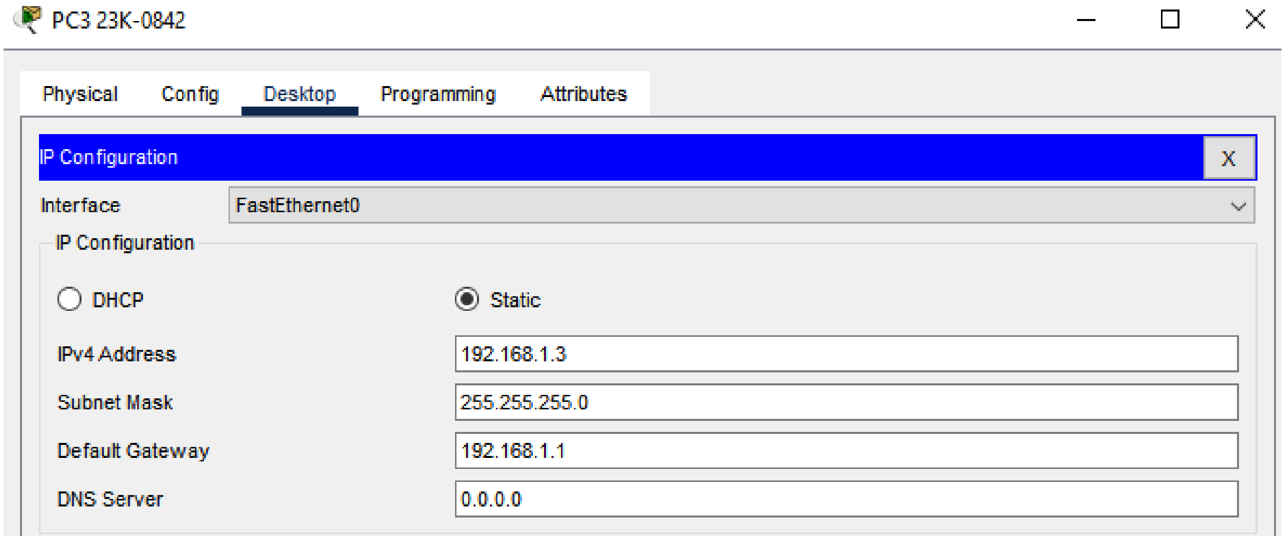
○ DHCP ● Static

IPv4 Address: 192.168.1.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0



IP Configuration

Interface: FastEthernet0

IP Configuration

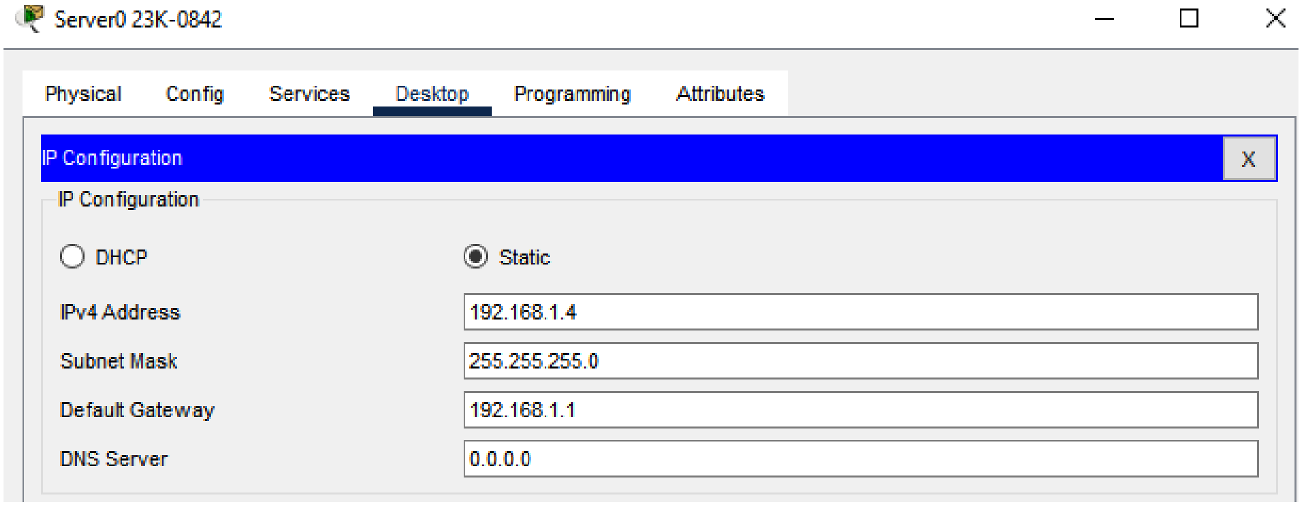
○ DHCP ● Static

IPv4 Address: 192.168.1.3

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0



IP Configuration

IP Configuration

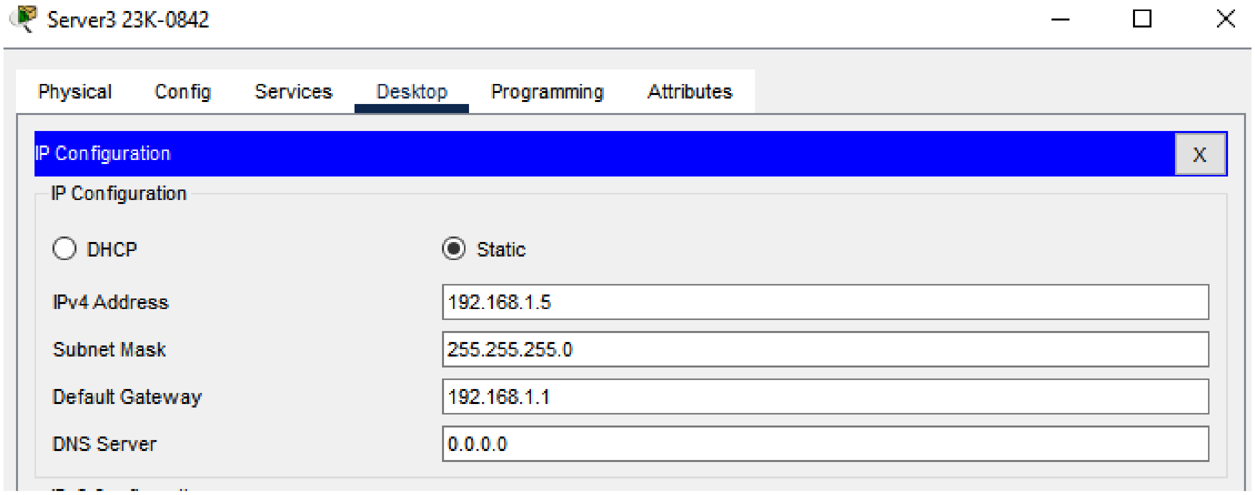
○ DHCP ● Static

IPv4 Address: 192.168.1.4

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0



IP Configuration

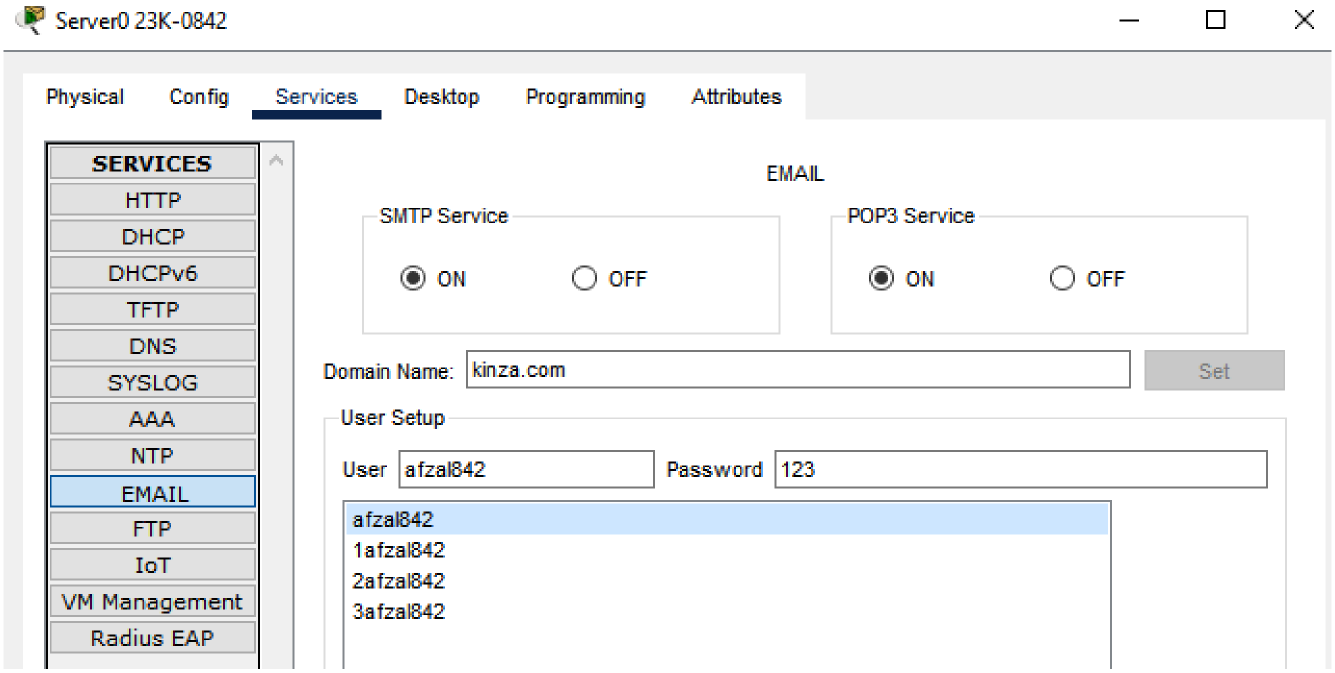
○ DHCP ● Static

IPv4 Address: 192.168.1.5

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0



EMAIL

SMTP Service: ● ON ○ OFF

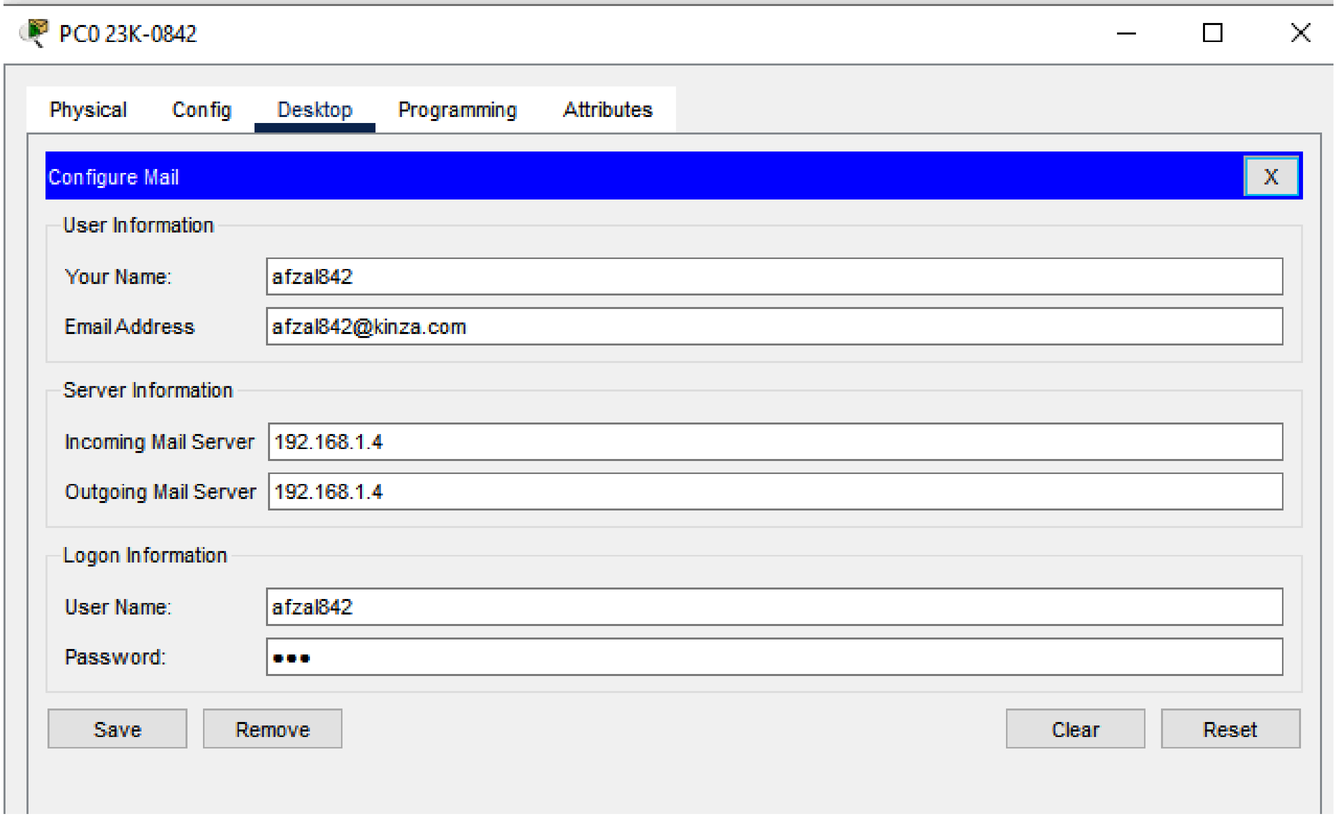
POP3 Service: ● ON ○ OFF

Domain Name: kinza.com

User Setup

User: afzal842 Password: 123

afzal842
1afzal842
2afzal842
3afzal842



Configure Mail

User Information

Your Name: afzal842

Email Address afzal842@kinza.com

Server Information

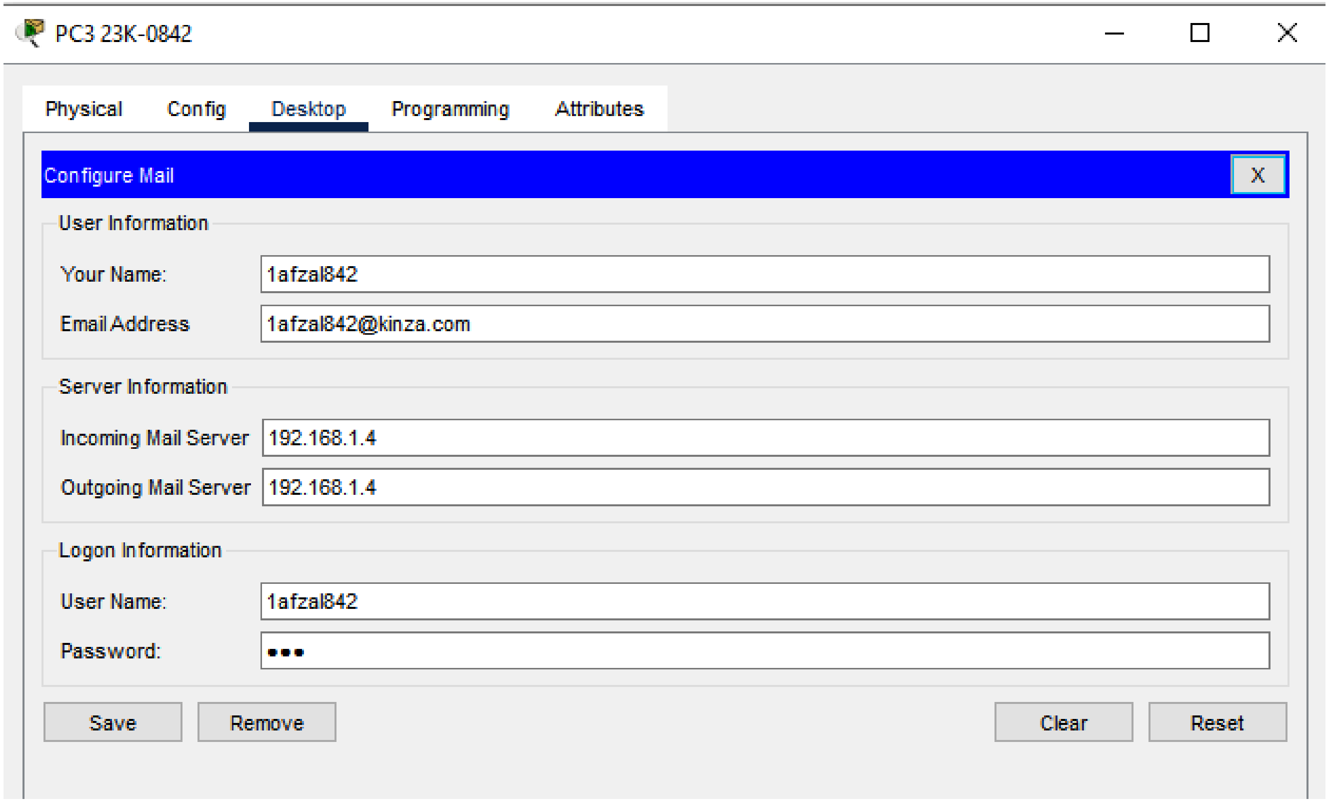
Incoming Mail Server 192.168.1.4

Outgoing Mail Server 192.168.1.4

Logon Information

User Name: afzal842

Password: •••



Configure Mail

User Information

Your Name: 1afzal842

Email Address 1afzal842@kinza.com

Server Information

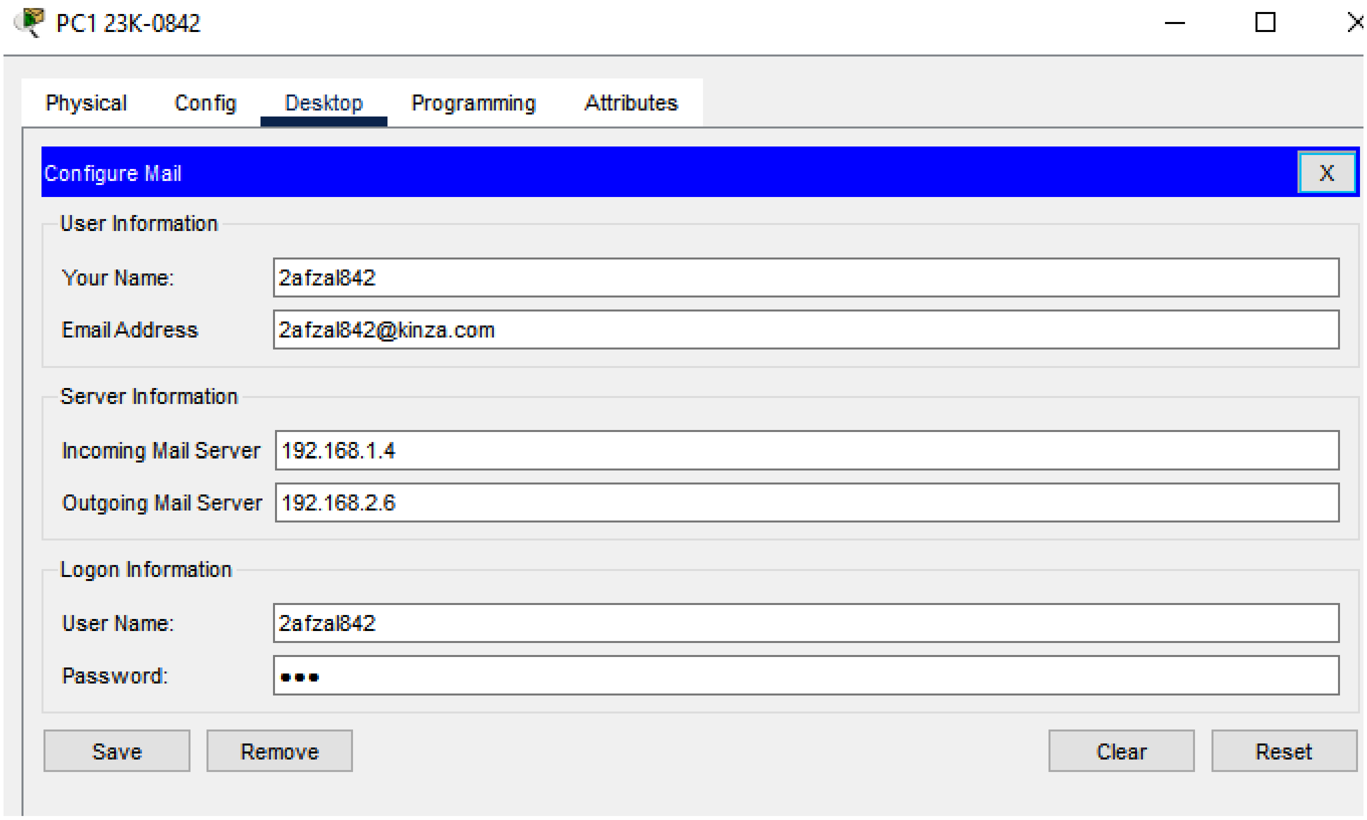
Incoming Mail Server 192.168.1.4

Outgoing Mail Server 192.168.1.4

Logon Information

User Name: 1afzal842

Password: •••



PC1 23K-0842

Configure Mail

User Information

Your Name: 2afzal842

Email Address 2afzal842@kinza.com

Server Information

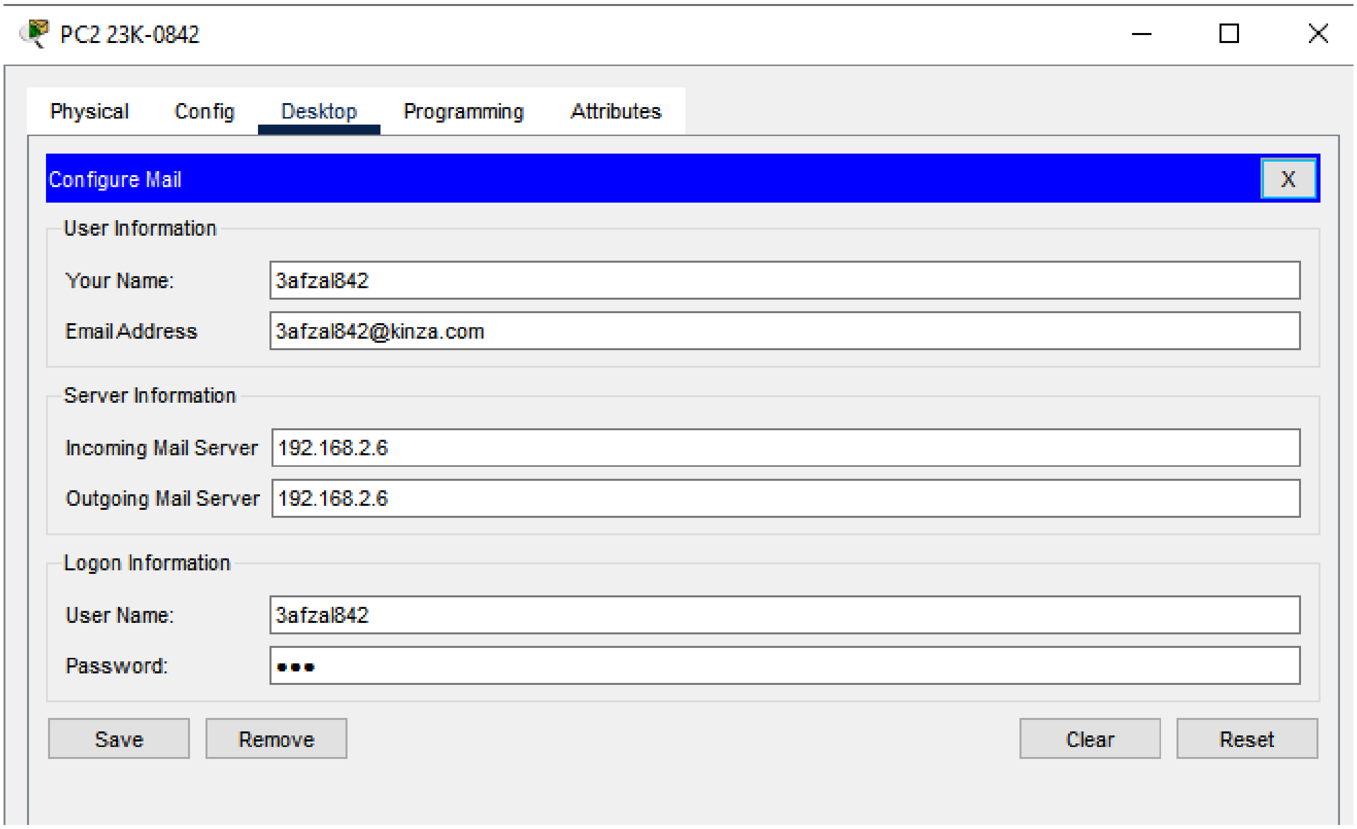
Incoming Mail Server 192.168.1.4

Outgoing Mail Server 192.168.2.6

Logon Information

User Name: 2afzal842

Password: •••



PC2 23K-0842

Configure Mail

User Information

Your Name: 3afzal842

Email Address 3afzal842@kinza.com

Server Information

Incoming Mail Server 192.168.2.6

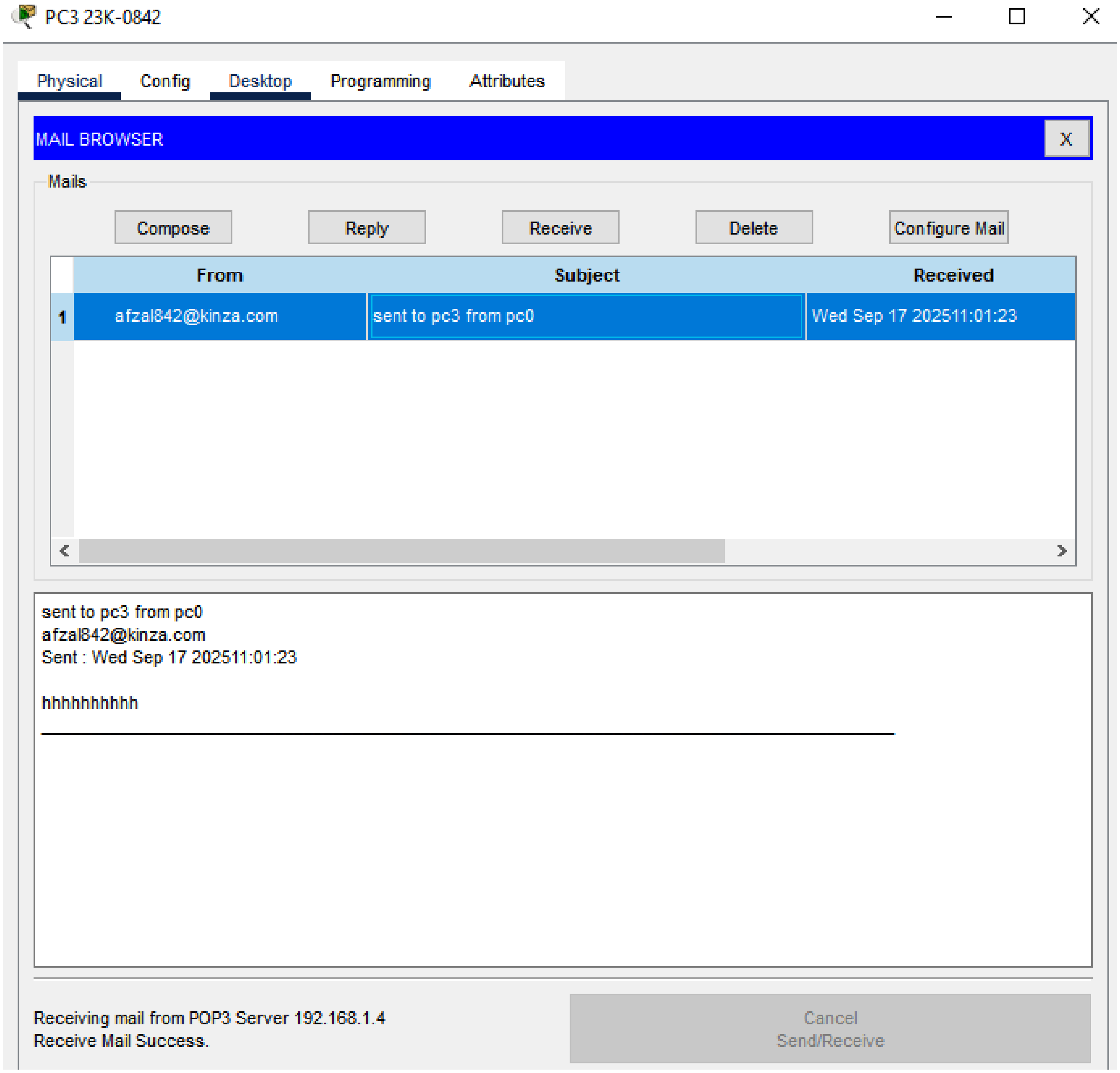
Outgoing Mail Server 192.168.2.6

Logon Information

User Name: 3afzal842

Password: •••

Sending mail from PC0 TO PC3:



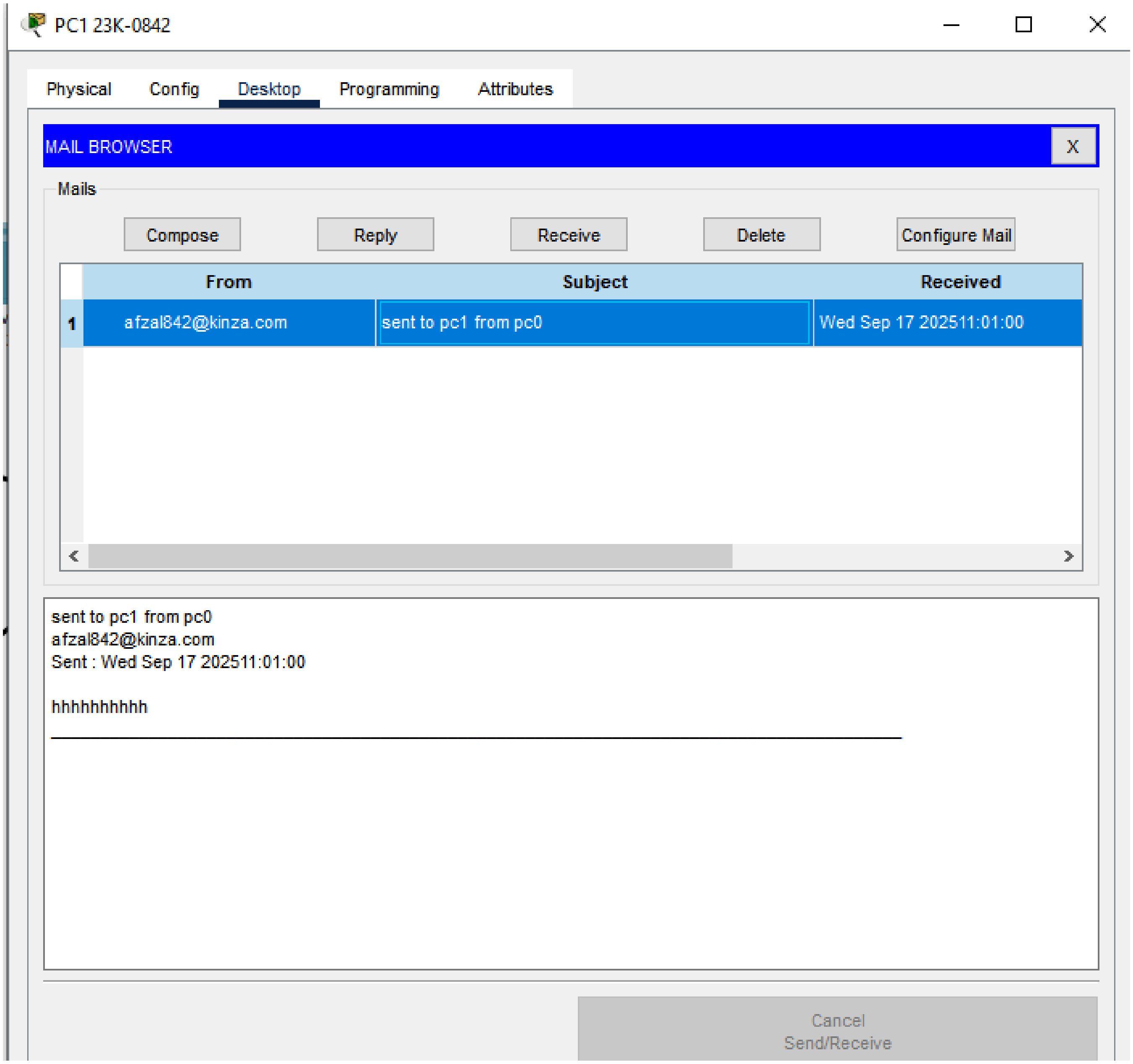
	From	Subject	Received
1	afzal842@kinza.com	sent to pc3 from pc0	Wed Sep 17 202511:01:23

sent to pc3 from pc0
afzal842@kinza.com
Sent : Wed Sep 17 202511:01:23

hhhhhhhhhh

Receiving mail from POP3 Server 192.168.1.4
Receive Mail Success.

Sending mail from PC0 TO PC1:

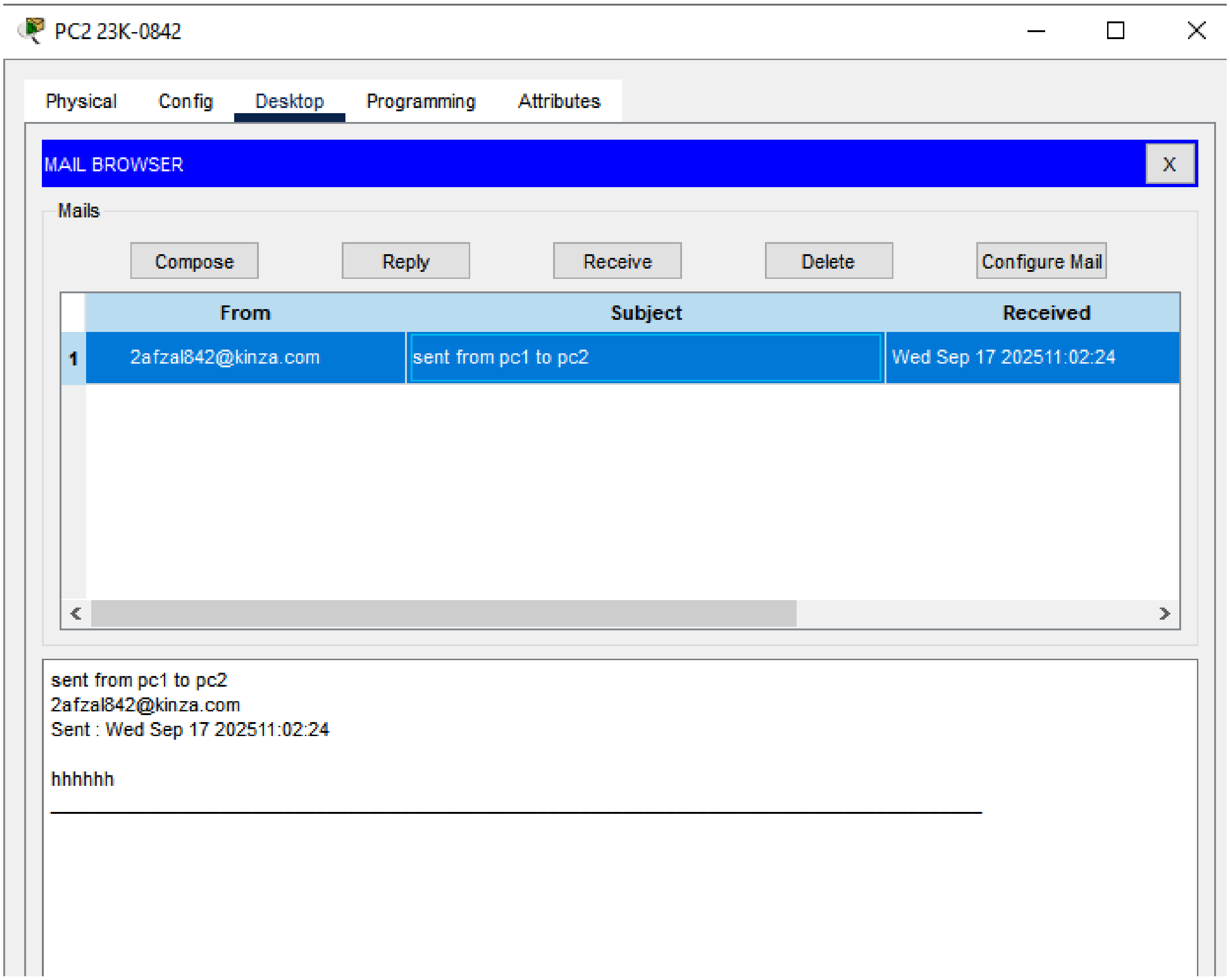


	From	Subject	Received
1	afzal842@kinza.com	sent to pc1 from pc0	Wed Sep 17 202511:01:00

sent to pc1 from pc0
afzal842@kinza.com
Sent : Wed Sep 17 202511:01:00

hhhhhhhhhh

Sending mail from PC1 TO PC2:

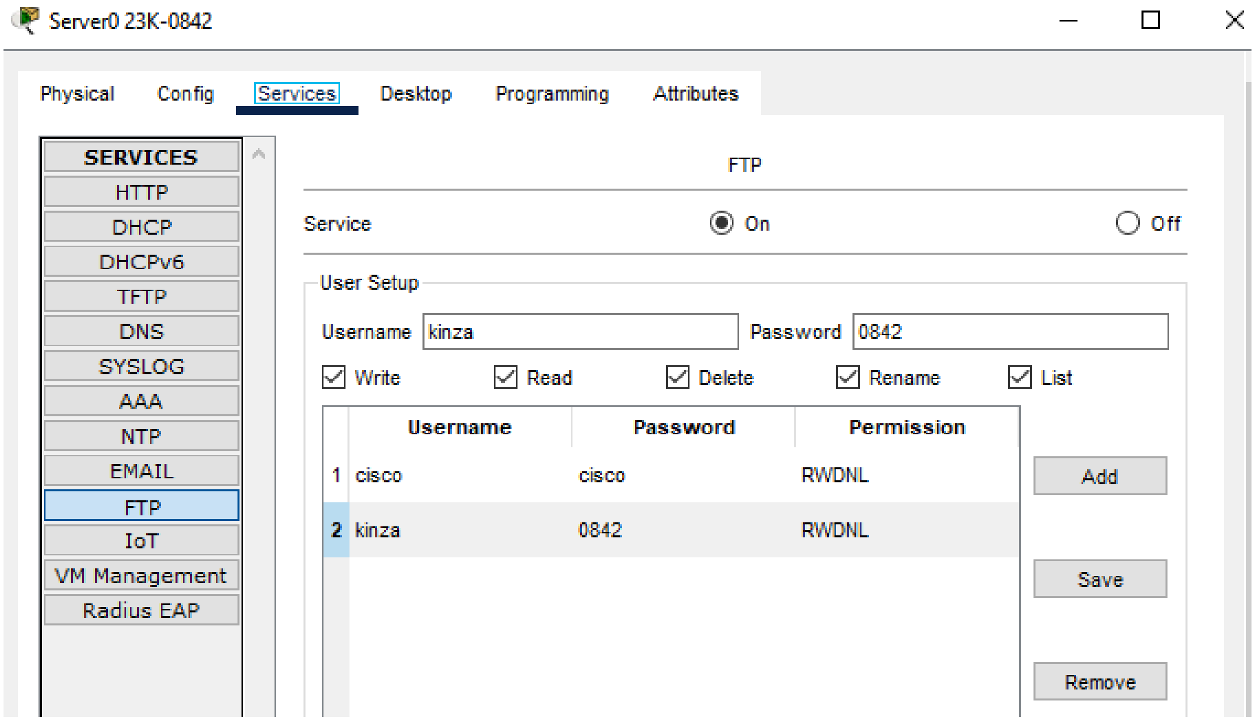


	From	Subject	Received
1	2afzal842@kinza.com	sent from pc1 to pc2	Wed Sep 17 202511:02:24

sent from pc1 to pc2
2afzal842@kinza.com
Sent : Wed Sep 17 202511:02:24

hhhhhh

b) FTP:



FTP

Service ● On ○ Off

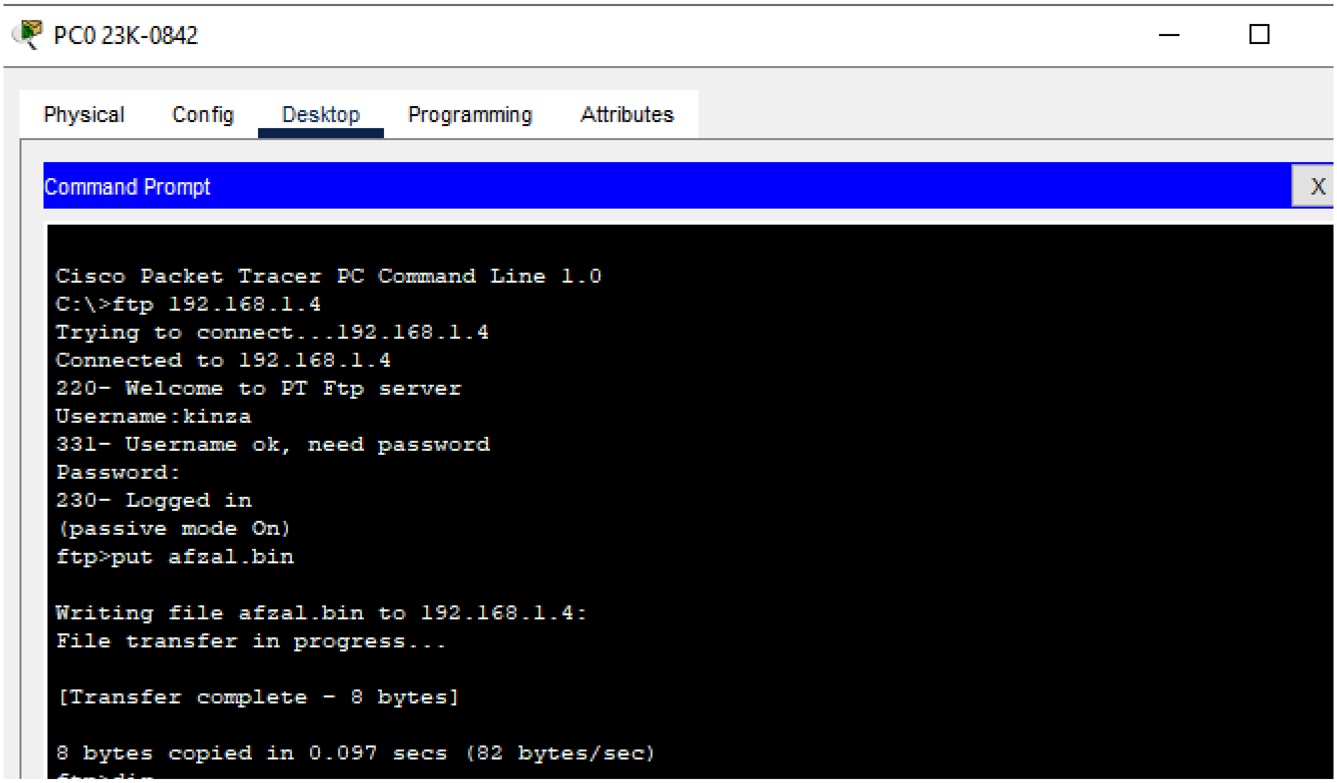
User Setup

Username kinza Password 0842

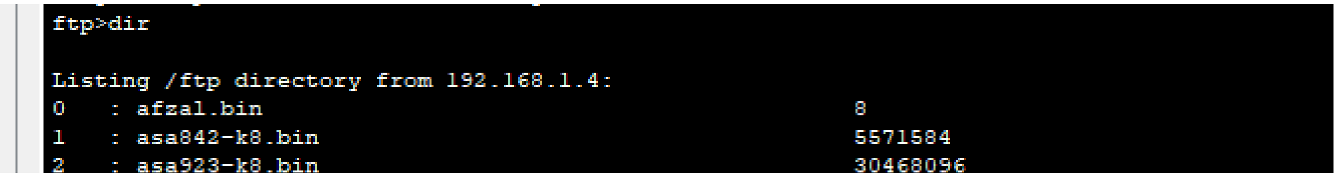
☑ Write ☑ Read ☑ Delete ☑ Rename ☑ List

	Username	Password	Permission
1	cisco	cisco	RWDNL
2	kinza	0842	RWDNL

Created file afzal.bin in PC0

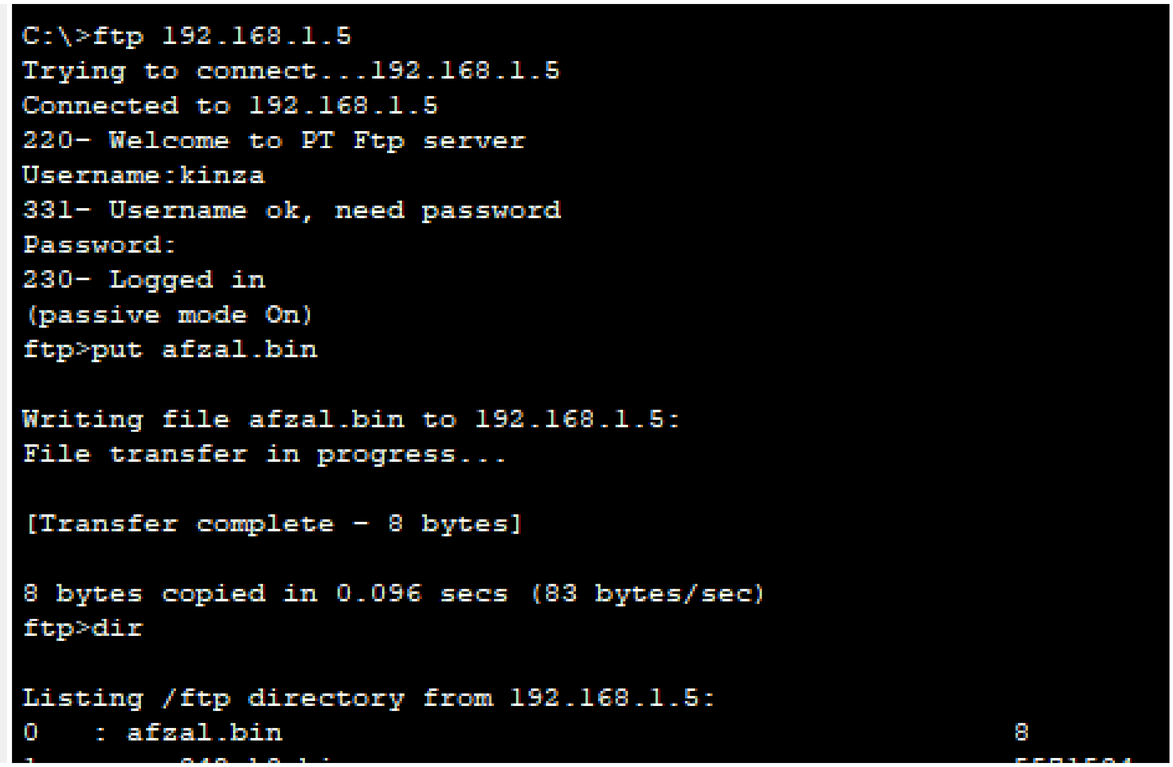


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ftp 192.168.1.4
Trying to connect...192.168.1.4
Connected to 192.168.1.4
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

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

[Transfer complete - 8 bytes]

8 bytes copied in 0.097 secs (82 bytes/sec)
ftp>dir
```



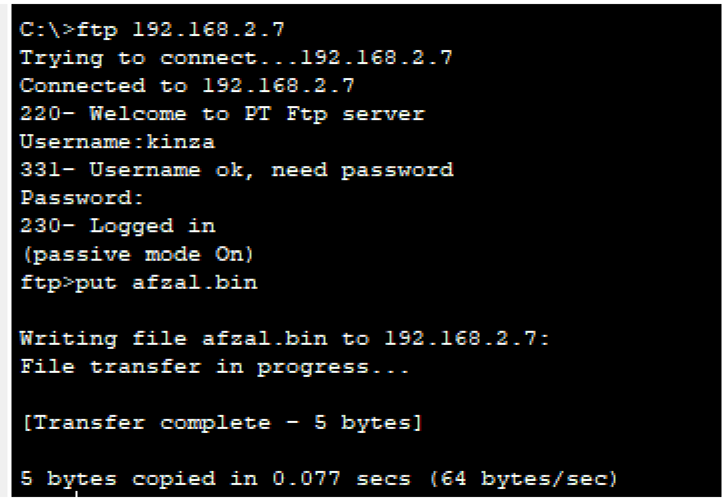
```
ftp>dir

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
```

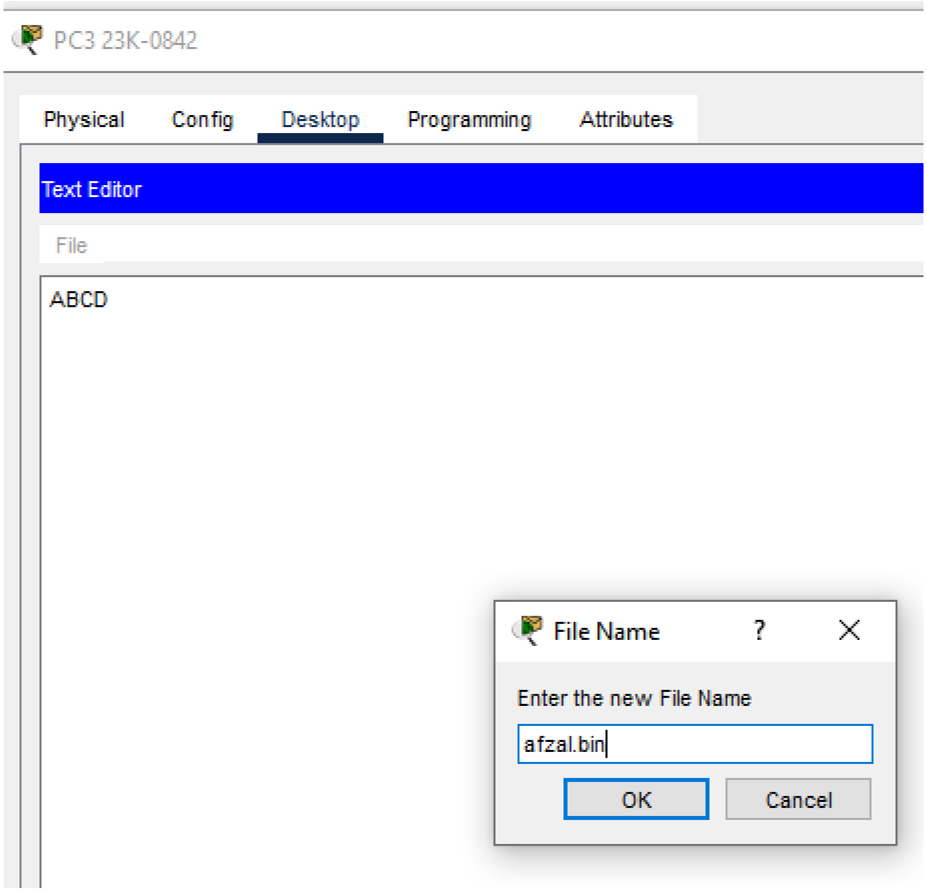
Ftp server3 ip



```
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

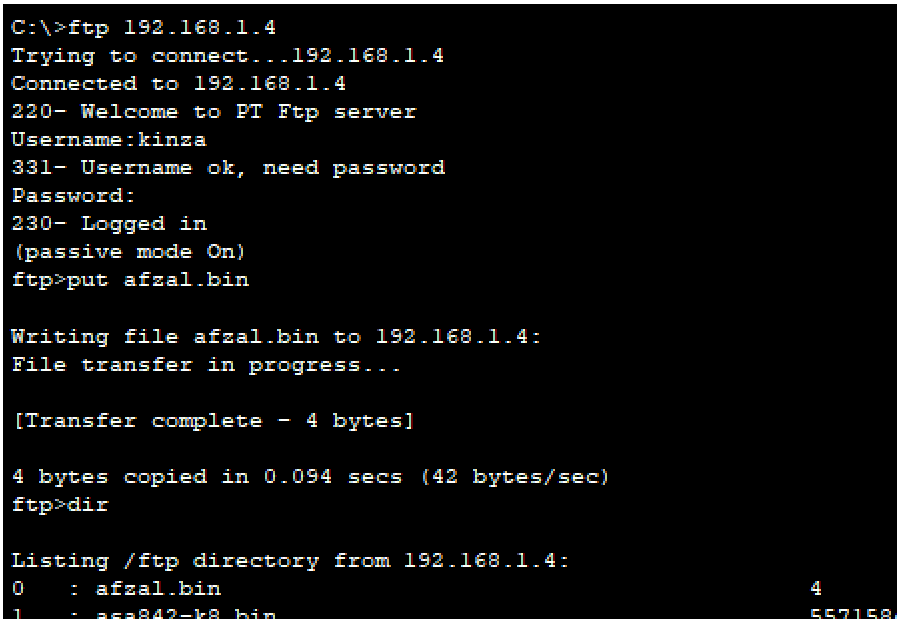
Checking on PC3:



ABCD

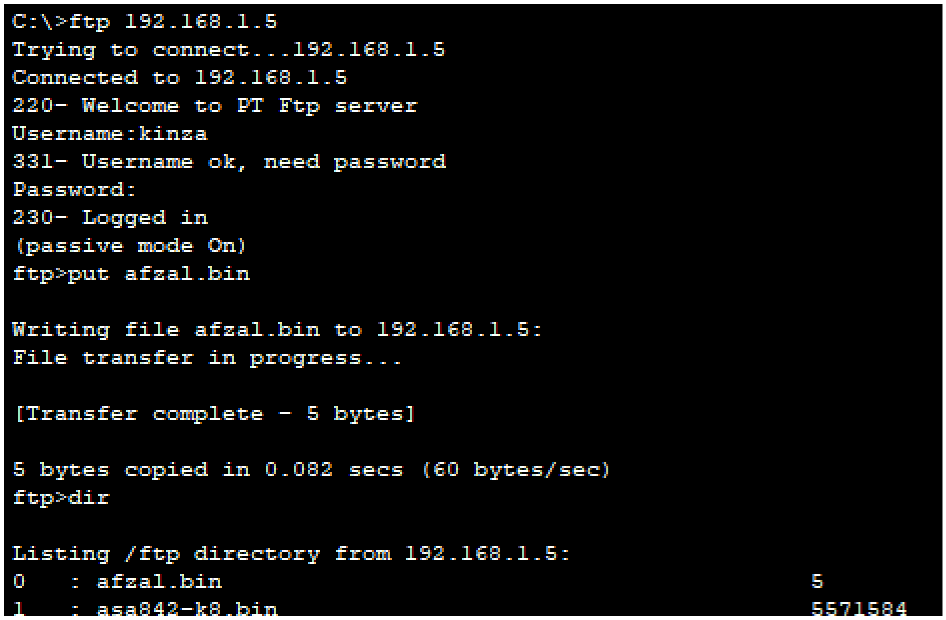
Enter the new File Name

afzal.bin



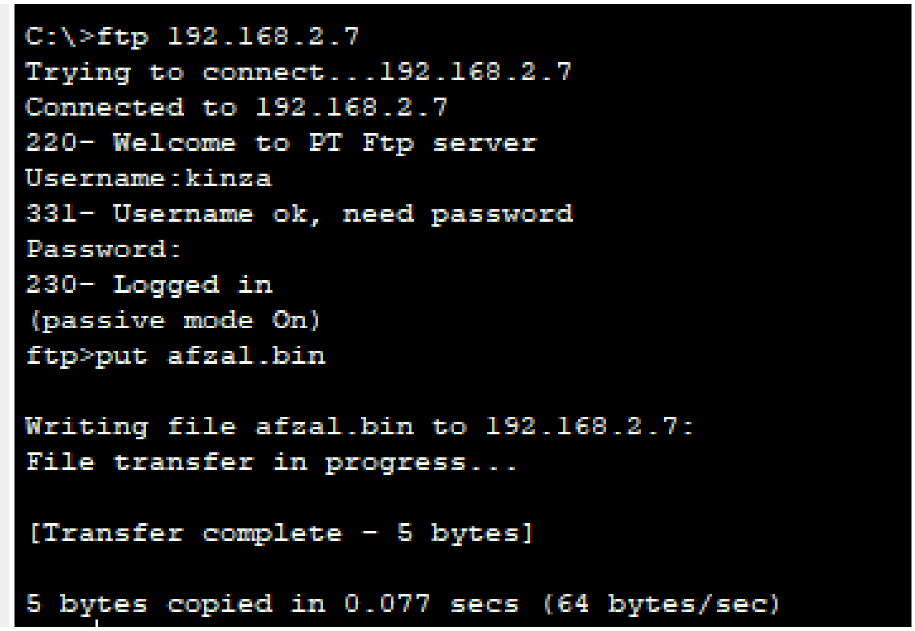
```
C:\>ftp 192.168.1.4
Trying to connect...192.168.1.4
Connected to 192.168.1.4
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

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    : asa842-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
```

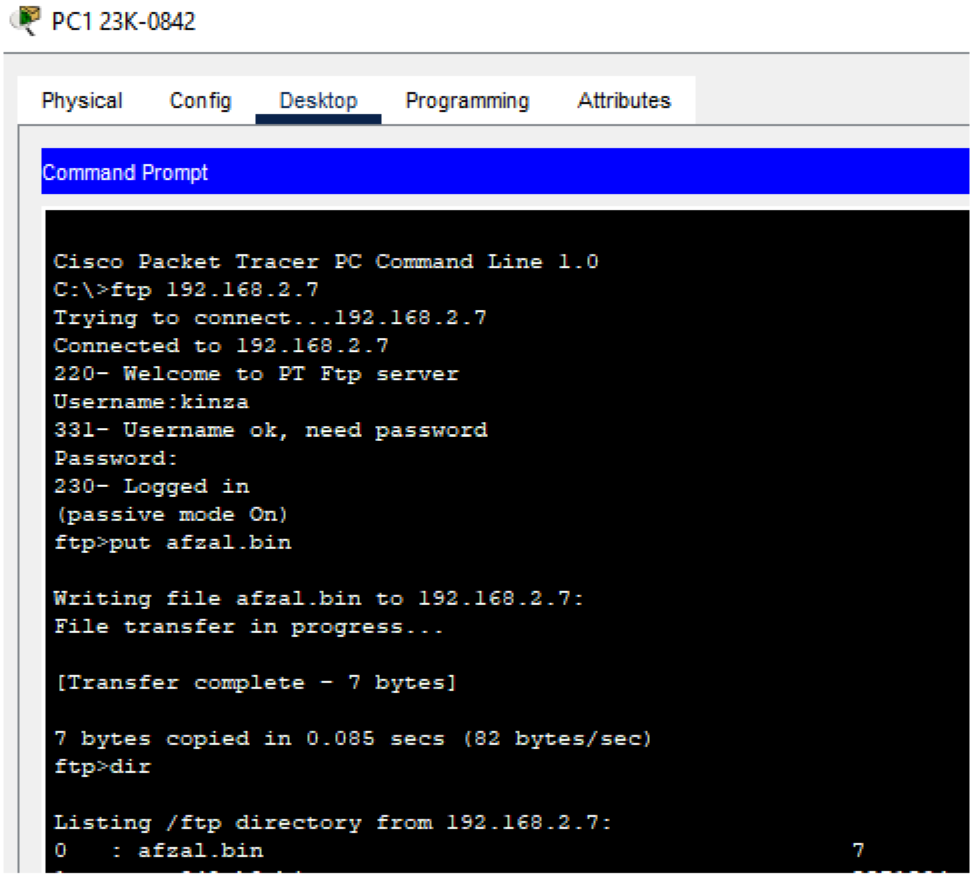
ftp server 3 ip



```
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)
```

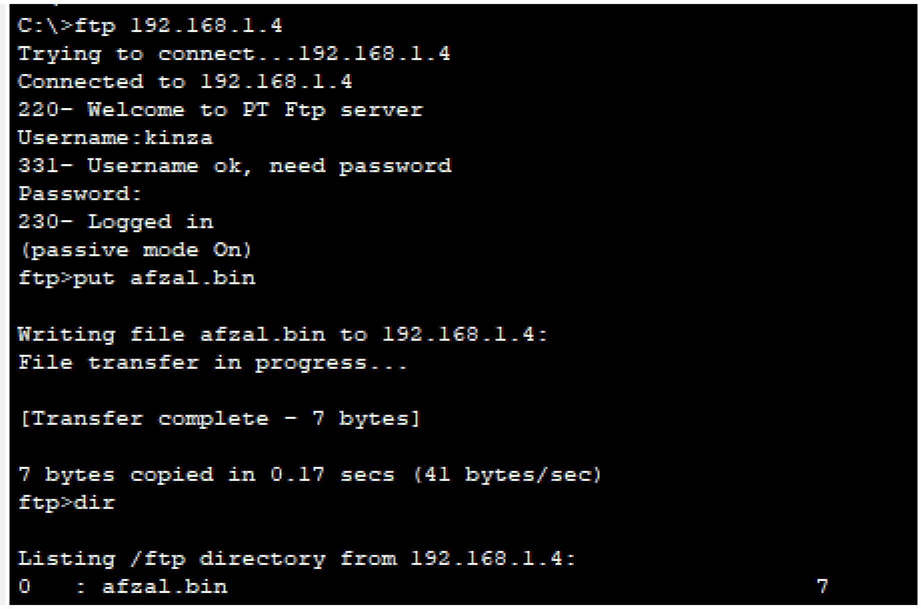
Ftp server 1 ip

Checking on PC1



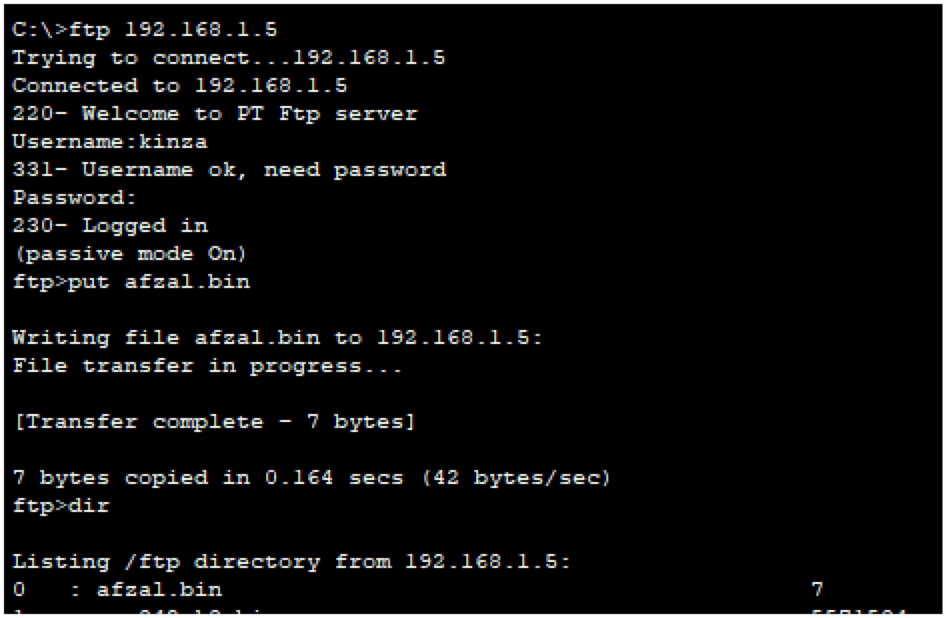
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ftp 192.168.2.7
Trying to connect...192.168.2.7
Connected to 192.168.2.7
220- Welcome to PT Ftp server
Username:kinza
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put afzal.bin

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                                                   7
```

Ftp server1 ip



```
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                                                   7
```

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
```

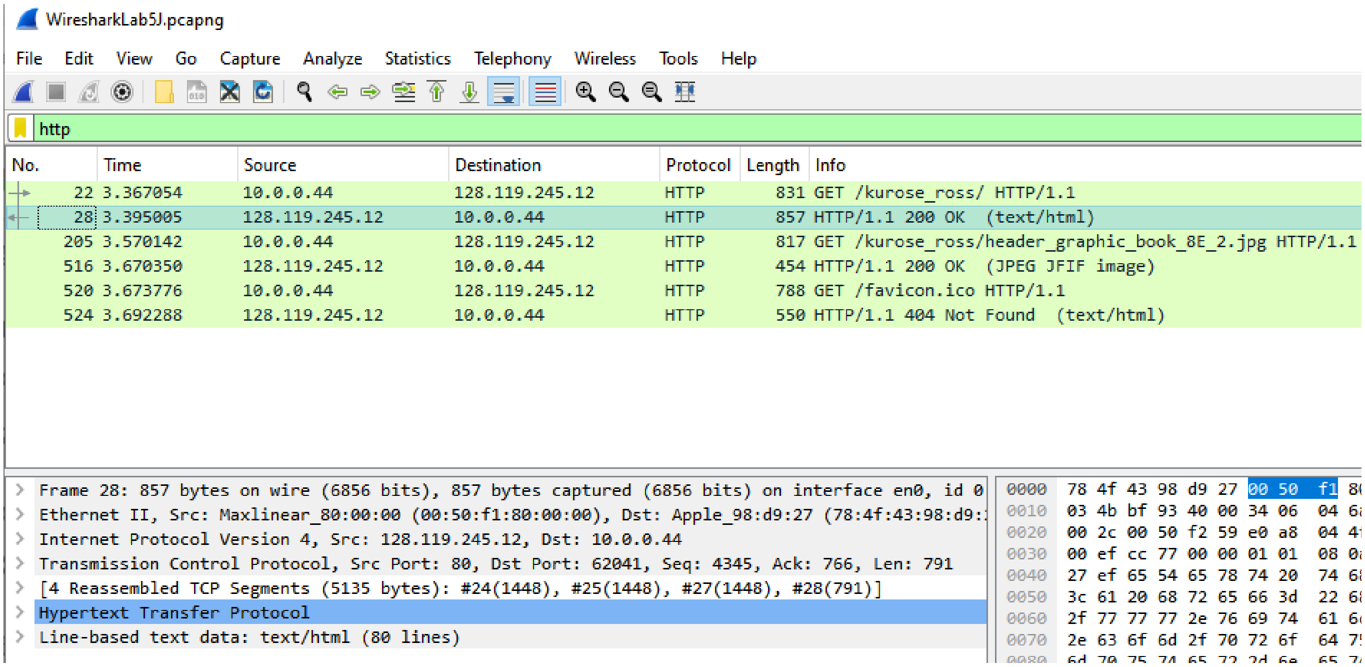
Ftp server 3 ip

<u>Lab Exercise Wireshark:</u>

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.



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)
```

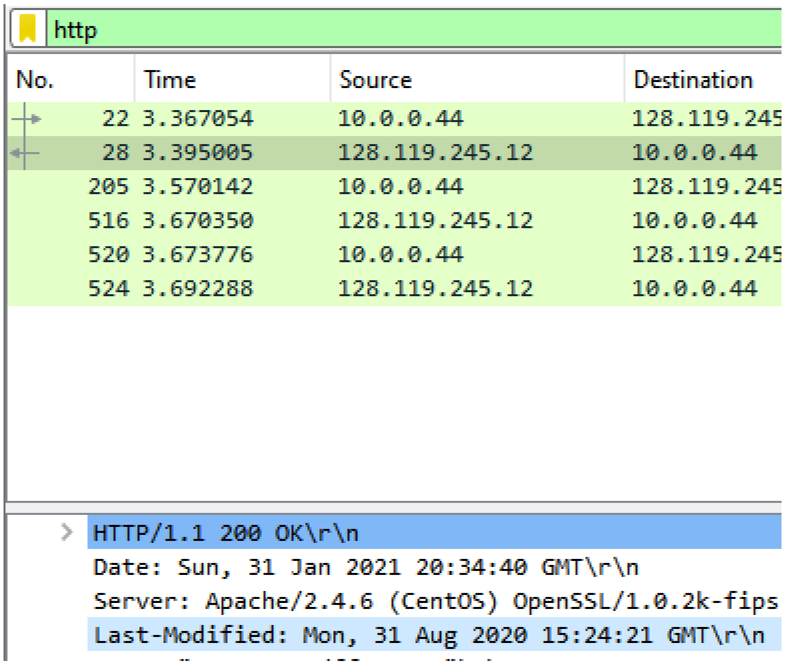
```
> Frame 28: 857 bytes on wire (6856 bits), 857 bytes captured (6856 bits) on interface en0, id 0
> Ethernet II, Src: Maxlinear_80:00:00 (00:50:f1:80:00:00), Dst: Apple_98:d9:27 (78:4f:43:98:d9:
> Internet Protocol Version 4, Src: 128.119.245.12, Dst: 10.0.0.44
> Transmission Control Protocol, Src 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 8
0010  03 4b bf 93 40 00 34 06  04 6
0020  00 2c 00 50 f2 59 e0 a8  04 4
0030  00 ef cc 77 00 00 01 01  08 0
0040  27 ef 65 54 65 78 74 20  74 6
0050  3c 61 20 68 72 65 66 3d  22 6
0060  2f 77 77 77 2e 76 69 74  61 6
0070  2e 63 6f 6d 2f 70 72 6f  64 7
0080  6d 70 75 74 65 72 2d 6e  65 7
```

HTTP/1.1 200 OK

Status code: 200

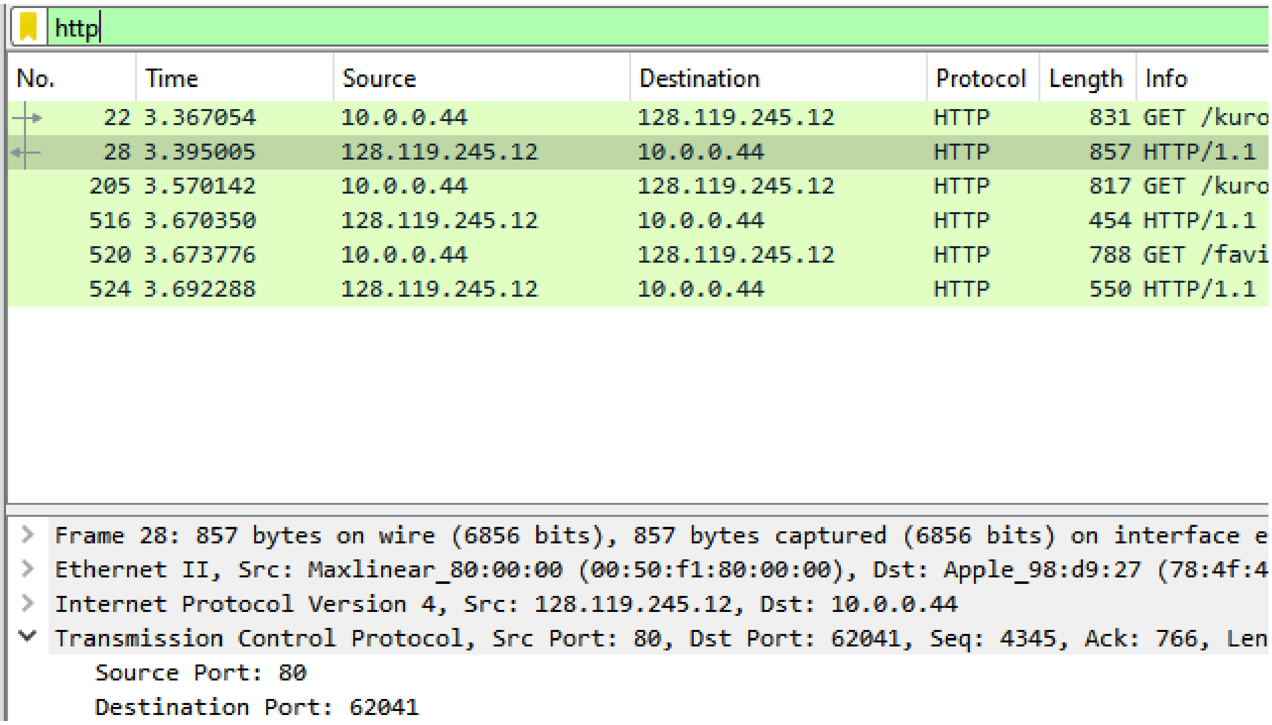
2.



```
No.     Time        Source          Destination
   22 3.367054    10.0.0.44       128.119.245
   28 3.395005    128.119.245.12  10.0.0.44
  205 3.570142    10.0.0.44       128.119.245
  516 3.670350    128.119.245.12  10.0.0.44
  520 3.673776    10.0.0.44       128.119.245
  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.

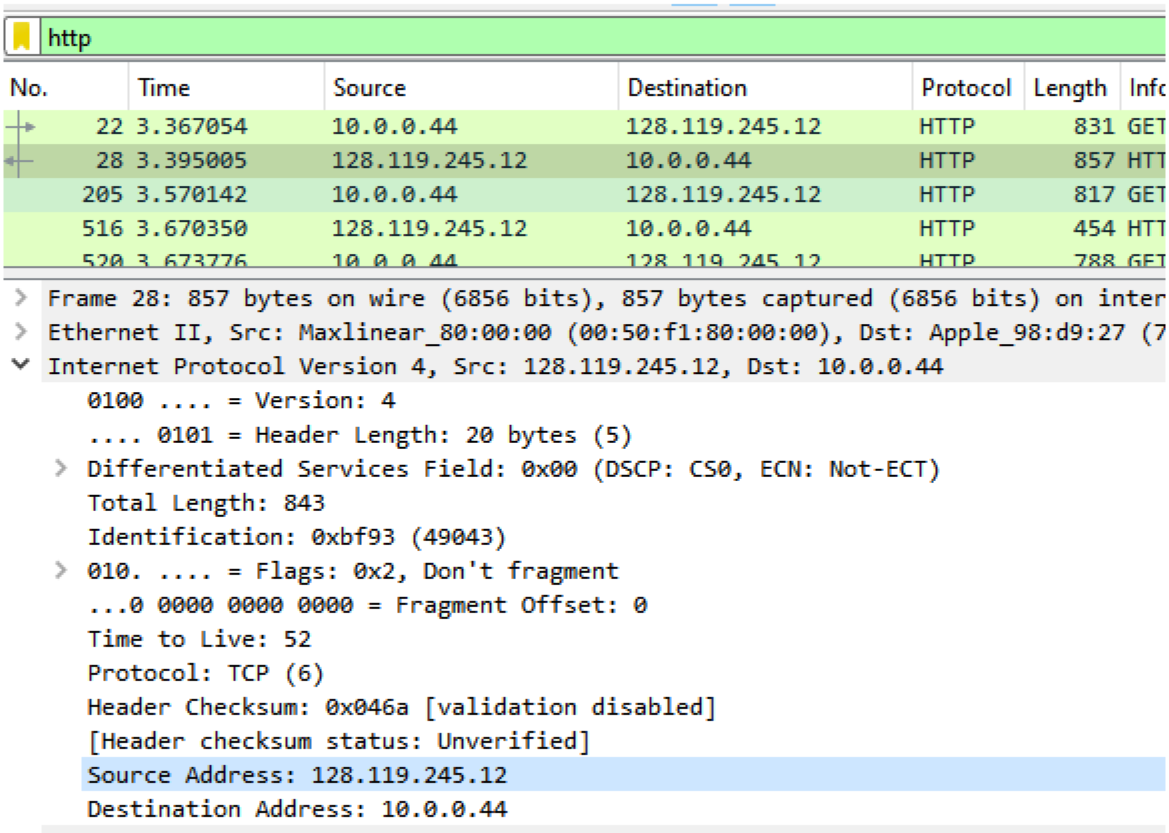


```
No.     Time        Source          Destination     Protocol  Length Info
   22 3.367054    10.0.0.44       128.119.245.12  HTTP         831 GET /kuro
   28 3.395005    128.119.245.12  10.0.0.44       HTTP         857 HTTP/1.1
  205 3.570142    10.0.0.44       128.119.245.12  HTTP         817 GET /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
v 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

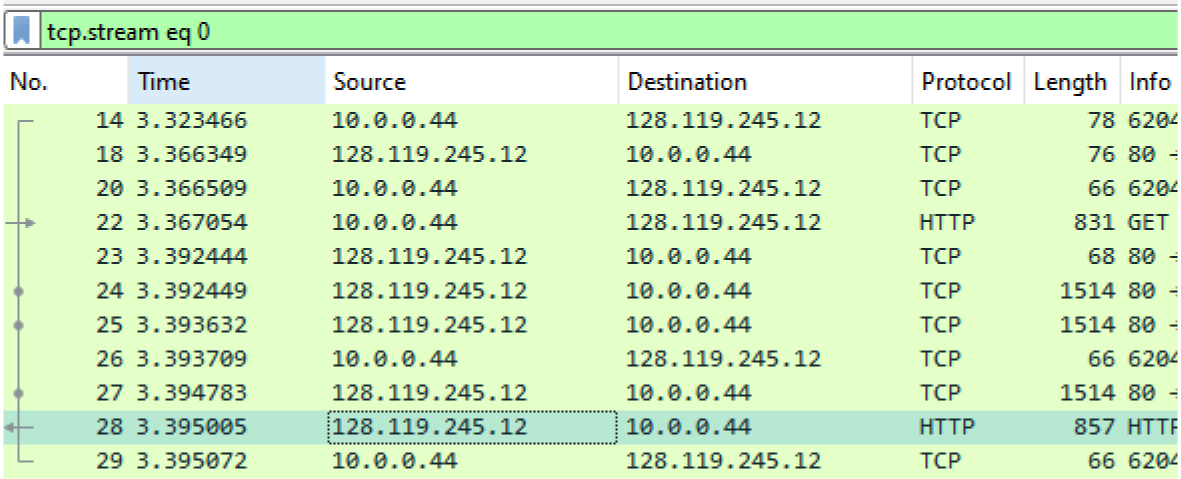
4.



```
http
No.     Time        Source            Destination       Protocol  Length  Infc
     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
v 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  HTTF
     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.