	COLLEGE OF COMPUTING AND INFORMATION SCIENCES		
	Lab Assessment Summer 2020 Semester		
Class Id	104645	Course Title	Data Communication & Networks
Program	BSCS	Campus / Shift	Main Campus / Morning
Date	31-07-2020	Total Marks	20
Duration	03 hours	Faculty Name	Ali Babar
Student Id	9827	Student Name	Hassan Noor Soomro

**Instructions:**

- Fill out your Student ID and Student Name in above header.
  - Do not remove or change any part question paper.
  - Write down your answers with title "Answer for Question# 00".
  - Handwritten text or image should be on A4 size page with clear visibility of contents.
  - In case of CHEATING, COPIED material or any unfair means would result in negative marking or ZERO.
  - **Caution:** Duration to perform LAB Assessment is **03 hours only including submission. Therefore, if you failed to upload answer sheet on LMS (in PDF format) within 3 hours limit, you would be considered as ABSENT/FAILED.**
-

Q1) Design a mesh network which consists of 4 routers (Router sequence number hint is given below). Use serial cable between routers. Attach 3 PCs with each router with the help of switch. Also attach an Email Server & DNS Server with router 2 switch and FTP Server with router 3 switch.

**The requirements are as follows.**

- 1- All the attached devices should be on your name. (Tag all the devices on network diagram) **[1 Marks]**
- 2- Assign IP addresses on each device. Use given public & private IPs and apply where each can be suitable and the tagging of IP address is mandatory on network diagram with subnet mask. You have to apply VLSM on complete network. **[3 Marks]**
- 3- Attached users of router 2 (ANY TWO) should be able to send & receive email to each other. All three user details should be mentioned while configuring the services of Email Server. Email address should be on your full name with your day of birth (Like, **AliBabar02Nov** will be a sender & **BabarAli02Nov** will be a receiver). Email domain will be the name of your Cell Phone Model, so you will make a domain like this (**AliBabar02Nov@HuaweiY5II.com** and vice versa) **[5 Marks]**
- 4- Configure FTP Services for the users of router 3 so that all the attached devices of router 3 should be able to upload, rename and download file from FTP Server. You should make a User name on FTP Server from ONLY your first name along with your obtained marks from 80 in DCN Lab. Like **the user will be Ali75** who will be able to login onto the FTP Server with this particular name. (75 are your obtained marks). The password on FTP Server should be of your 4 digit SID. The uploaded text file should be from the name of your favorite dish with your full name while the renamed file should be the dish (with your full name) from which you will be satisfied if your favorite dish is not available for some reasons. (Like **Ali\_Babar\_likes\_Beef Biryani will be the uploaded file and Ali\_Babar\_likes\_Chicken Biryani will be the downloaded file**). At last, you all have to show these files in your PC directory by downloading this from FTP Server. **[5 Marks]**
- 5- Configure Static Routing Technique on all routers for all possible destinations. **[6 Marks]**

### Public Networks:

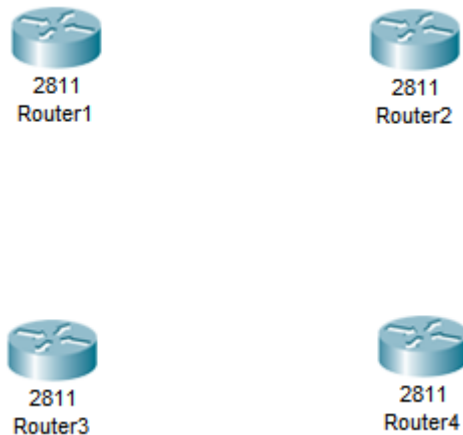
90.90.90.32, 95.95.95.64, 100.100.100.48, 40.40.40.96, 60.60.60.128

20.20.20.192, 30.30.30.16, 70.70.70.88

### Private Networks:

10.10.10.176, 10.10.10.80, 10.10.10.104, 192.168.2.240, 192.168.3.200, 192.168.4.120

Routers sequence number should be like this.



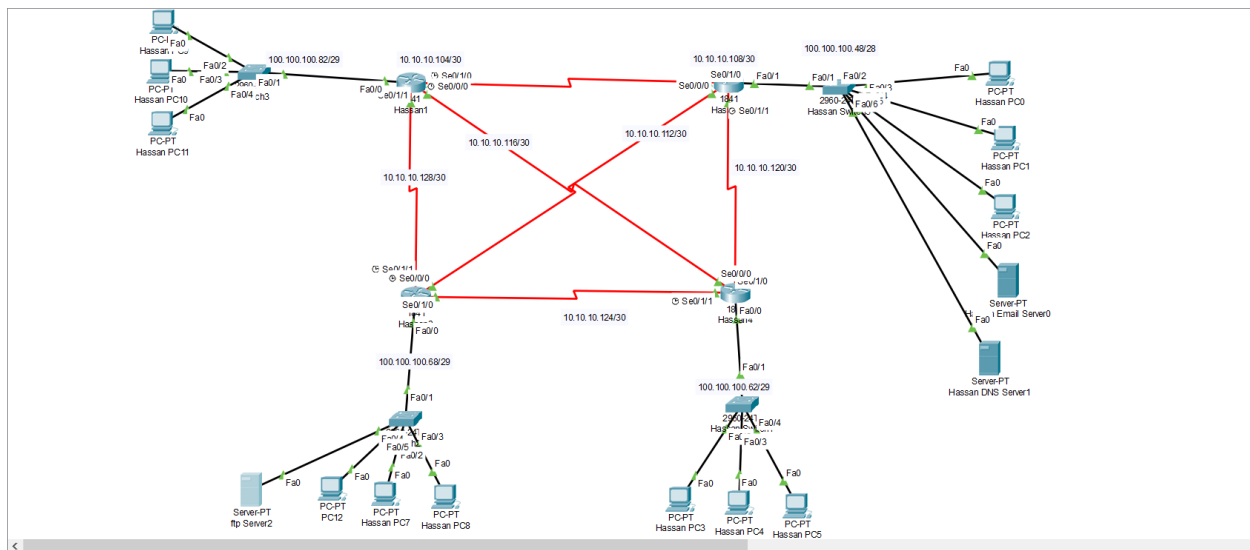
## Solution:

You all have to take snaps in sequence as mentioned.

- 1- Network Diagram with complete tagging.
- 2- IP address of each router with specific router name. (Like router 1 then all IPs of this router, router 2 then all IPs of this router and so on). In your case, all the routers are on your names. Host name should be mentioned along with IP address. **{Like Final-lab (config-if)# ip address 10.0.0.1 255.255.255.252}**  
(Take snaps of this configuration). Final -lab is the host name which must be on your name.  
(Don't close your file until you didn't take the configuration snaps otherwise host name will not be appeared) So take snaps immediately after completing every single activity.
- 3- ONLY One PC IP address from each router. Just take the snap of PC window name, IP, subnet mask & gateway.
- 4- Email Server Services snap, Configure Email for both users snap & Email send & receive snap.
- 5- DNS Server Services snap.
- 6- FTP Server Services Snap, ANY 1 user login snap to the FTP Server, FTP & PC directory snaps both at the uploading time & downloading time.
- 7- Static Routing complete code of all routers along with the host name on your name.

**Note: All the snaps should be clearly visible & don't use the Copy and Paste Option which is available in Router CLI. Take Snap of CLI.**

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Hassan DNS Server1

Physical

Config

Services

Desktop

Programming

Attributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DNS

DNS Service

On

Off

Resource Records

Name

Type

A Record

Address

Add

Save

Remove

No.	Name	Type	Detail
0	huawei9.com	A Record	100.100.100.53

DNS Cache

Top

Hassan PC0

Physical

Config

Desktop

Programming

Attributes

MAIL BROWSER

Mails

Compose

Reply

Receive

Delete

Configure Mail

	From	Subject	Received
1	NoorHassan01july@huawei9.c...	Hello	Fri Jul 31 2020 10:49:06

Hello

NoorHassan01july@huawei9.com

Sent : Fri Jul 31 2020 10:49:06

asdasdasdasd

Receiving mail from POP3 Server huawei9.com

DNS resolving. Resolving name: huawei9.com by querying to DNS Server: 255.255.255.255. DNS resolved ip address: 100.100.100.53

Receive Mail Success.

Cancel

Send/Receive

Hassan PC1

Physical

Config

Desktop

Programming

Attributes

Compose Mail

Send

To:

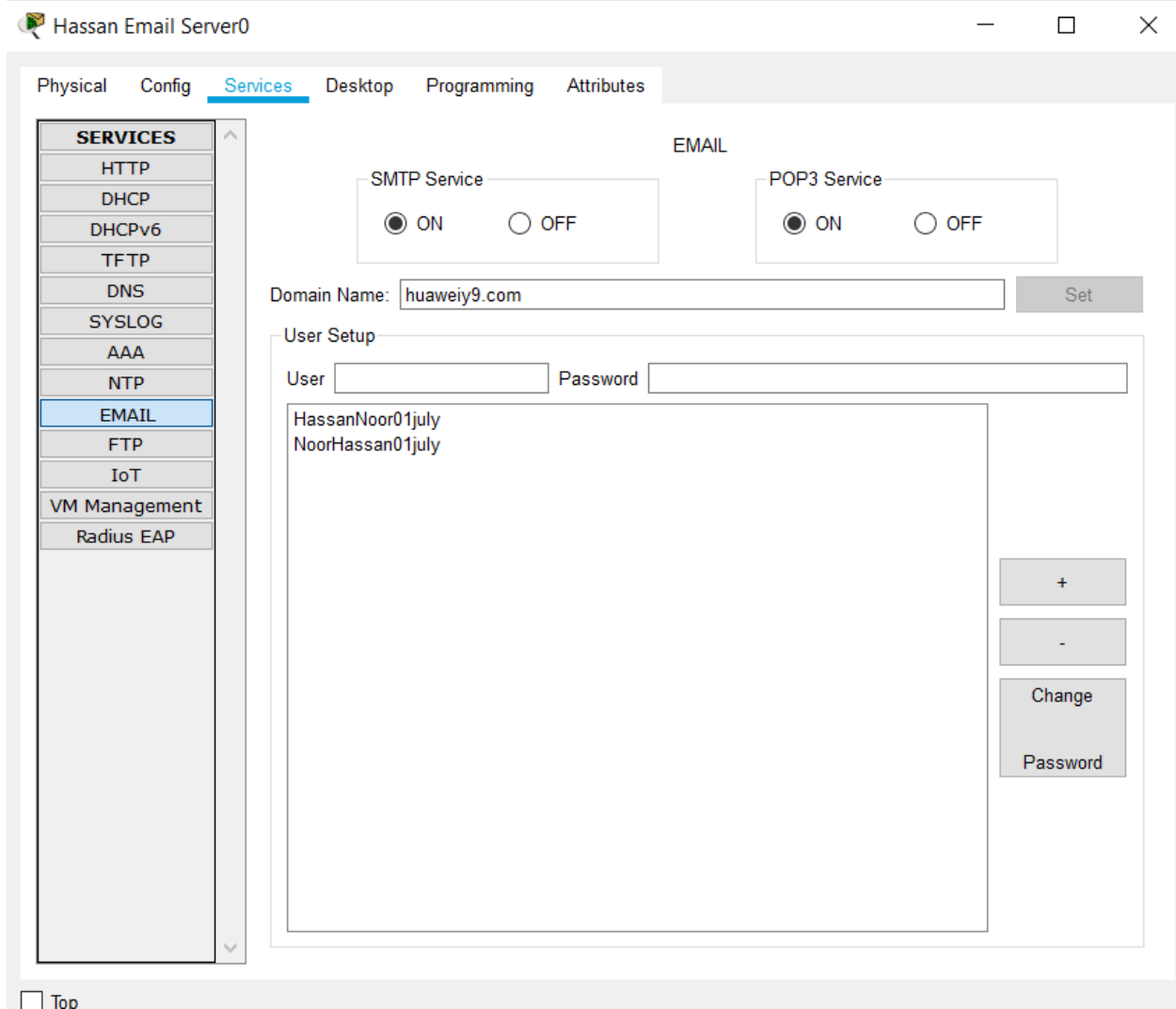
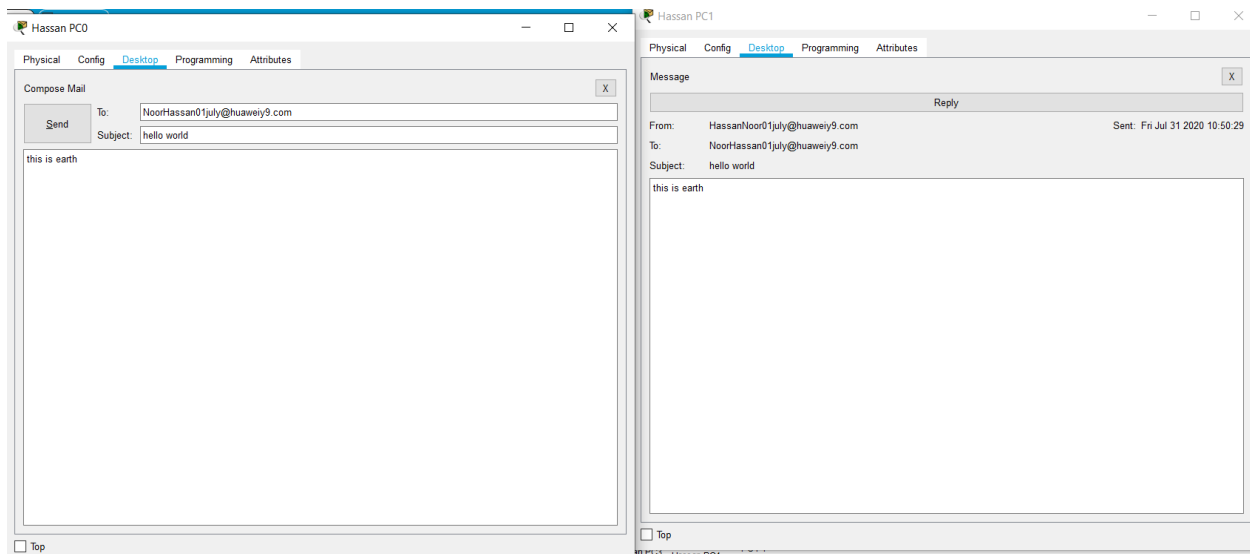
HassanNoor01july@huawei9.com

Subject:

Hello

asdasdasdasd

Top





## Command Prompt

```

13 : c2900-universalk9-mz.SPA.155-3.M4a.bin          33591768
14 : c2950-i6q4l2-mz.121-22.EA4.bin                 3058048
15 : c2950-i6q4l2-mz.121-22.EA8.bin                 3117390
16 : c2960-lanbase-mz.122-25.FX.bin                 4414921
17 : c2960-lanbase-mz.122-25.SEE1.bin                4670455
18 : c2960-lanbasek9-mz.150-2.SE4.bin                4670455
19 : c3560-advipservicesk9-mz.122-37.SE1.bin         8662192
20 : c3560-advipservicesk9-mz.122-46.SE.bin          10713279
21 : c800-universalk9-mz.SPA.152-4.M4.bin            33591768
22 : c800-universalk9-mz.SPA.154-3.M6a.bin           83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin          505532849
24 : cgr1000-universalk9-mz.SPA.154-2.CG             159487552
25 : cgr1000-universalk9-mz.SPA.156-3.CG             184530138
26 : hassanlikestea                                  0
27 : ir800-universalk9-bundle.SPA.156-3.M.bin        160968869
28 : ir800-universalk9-mz.SPA.155-3.M                61750062
29 : ir800-universalk9-mz.SPA.156-3.M                63753767
30 : ir800_yocto-1.7.2.tar                           2877440
31 : ir800_yocto-1.7.2_python-2.7.3.tar             6912000
32 : pt1000-i-mz.122-28.bin                          5571584
33 : pt3000-i6q4l2-mz.121-22.EA4.bin                3117390
ftp>get hassanlikestea

Reading file hassanlikestea from 100.100.100.73:
File transfer in progress...

[Transfer complete - 0 bytes]

0 bytes copied in 0 secs
ftp>

C:\>dir

Volume in drive C has no label.
Volume Serial Number is 5E12-4AF3
Directory of C:\

1/1/1970    5:0 PM           0          HassanNoorBeefPulao.txt
1/1/1970    5:0 PM           0          Hassan_Noor_likes_Beef_Pulao .txt
1/1/1970    5:0 PM           0          hassanlikestea
1/1/1970    5:0 PM          26          sampleFile.txt
                26 bytes              4 File(s)

C:\>

```



## Text Editor

File

File Na... ? X

Enter the new File Name

Hassan\_Noor\_likes\_Beef Pulao

OK Cancel

☐ Top

Hassan1

```
Enter configuration commands, one per line. End with Ctrl-Z.
Router(config)#hostname Hassan1
Hassan1(config)#interface fa 100.100.100.82 255.255.255.248
^
% Invalid input detected at '^' marker.

Hassan1(config)#interface fa 0/0
Hassan1(config-if)#ip address 100.100.100.82 255.255.255.248
Hassan1(config-if)#no shutdown

Hassan1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Hassan1(config-if)#exit
Hassan1(config)#interface se 0/1/0
Hassan1(config-if)#ip address 10.10.10.105 255.255.255.252
^
% Invalid input detected at '^' marker.

Hassan1(config-if)#ip address 10.10.10.105 255.255.255.252
Hassan1(config-if)#clock rate 64000
Hassan1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Hassan1(config-if)#
Hassan1(config-if)#interface se 0/0/0
Hassan1(config-if)#ip address 10.10.10.117 255.255.255.252
Hassan1(config-if)#clock rate 64000
Hassan1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Hassan1(config-if)#interface se 0/1/1
Hassan1(config-if)#ip address 10.10.10.129 255.255.255.252
Hassan1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Hassan1(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
```

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Hassan2
Hassan2(config)#interface se 0/1/0
Hassan2(config-if)#ip address 10.10.106 255.255.255.252
Hassan2(config-if)#no shutdown
^
% Invalid input detected at '^' marker.

Hassan2(config-if)#no shutdown

Hassan2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Hassan2(config-if)#i
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
Hassan2(config-if)#interface fa 0/1
Hassan2(config-if)#ip address 100.100.100.49 255.255.255.240
Hassan2(config-if)#no shutdown

Hassan2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Hassan2(config-if)#exit
Hassan2(config)#interface se 0/1/1
Hassan2(config-if)#ip address 10.10.122 255.255.255.252
Hassan2(config-if)#clock rate 64000
Hassan2(config-if)#no shutdown

Hassan2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

Hassan2(config-if)#exit
Hassan2(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

Hassan2(config)#interface se 0/0/0
Hassan2(config)#
Hassan2(config)#interface se 0/1/1
Hassan2(config-if)#ip address 10.10.122 255.255.255.252
Hassan2(config-if)#clock rate 64000
Hassan2(config-if)#no shutdown

Hassan2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

Hassan2(config-if)#exit
Hassan2(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

Hassan2(config)#interface se 0/0/0
Hassan2(config-if)#ip address 10.10.113 255.255.255.252
Hassan2(config-if)#no shutdown

Hassan2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Hassan2(config-if)#exit
Hassan2(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Hassan2(config)#

Hassan2 con0 is now available
```

```
Router>en
Router#congifure terminal
      ^
% Invalid input detected at '^' marker.

Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Hassan3
Hassan3(config)#interface se 0/0
%Invalid interface type and number
Hassan3(config)#interface fa 0/0
Hassan3(config-if)#ip address 100.100.100.63 255.255.255.248
Bad mask /29 for address 100.100.100.63
Hassan3(config-if)#no shutdown

Hassan3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Hassan3(config-if)#interface se 0/1/0
Hassan3(config-if)#ip address 10.10.10.121 255.255.255.252
Hassan3(config-if)#no shutdown

Hassan3(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Hassan3(config-if)#exit
Hassan3(config)#interface s
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
e
% Incomplete command.
Hassan3(config)#
Hassan3(config)#interface se 0/0/0
Hassan3(config-if)#ip address 10.10.10.118 255.255.255.252
Hassan3(config-if)#no shutdown
```

```
Hassan3(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Hassan3(config-if)#exit
Hassan3(config)#interface s
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
e
% Incomplete command.
Hassan3(config)#
Hassan3(config)#interface se 0/0/0
Hassan3(config-if)#ip address 10.10.10.118 255.255.255.252
Hassan3(config-if)#no shutdown

Hassan3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Hassan3(config-if)#ecit
^
% Invalid input detected at '^' marker.

Hassan3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Hassan3(config-if)#exit
Hassan3(config)#interface se 0/1/1
Hassan3(config-if)#ip address 10.10.10.125 255.255.255.252
Hassan3(config-if)#clock rate 64000
Hassan3(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Hassan3(config-if)#exit
Hassan3(config)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

%LINK-3-UPDOWN: Interface Serial0/1/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to down
```

```
Router>en
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Hassan4
Hassan4(config)#interface fa 0/0
Hassan4(config-if)#ip address 100.100.100.69
% Incomplete command.
Hassan4(config-if)#ip address 100.100.100.69 255.255.255.248
Hassan4(config-if)#no shutdown

Hassan4(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Hassan4(config-if)#exit
Hassan4(config)#interface se 0/1/0
Hassan4(config-if)#ip address 10.10.10.124 255.255.255.252
Bad mask /30 for address 10.10.10.124
Hassan4(config-if)#ip address 10.10.10.126 255.255.255.252
Hassan4(config-if)#no shutdown

Hassan4(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Hassan4(config-if)#exit
Hassan4(config)#interface se
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
Hassan4(config)#interface se 0/0/0
Hassan4(config-if)#ip address 10.10.10.114 255.255.255.252
Hassan4(config-if)#clock rate 64000
Hassan4(config-if)#no shutdown

Hassan4(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Hassan4(config-if)#exit
Hassan4(config)#interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed st
Hassan4(config)#interface se 0/1/1
Hassan4(config-if)#ip address 10.10.10.130 255.255.255.252

Hassan4(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Hassan4(config-if)#exit
Hassan4(config)#interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed st
Hassan4(config)#interface se 0/1/1
Hassan4(config-if)#ip address 10.10.10.130 255.255.255.252
Hassan4(config-if)#no shutdown

Hassan4(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

Hassan4(config-if)#exit
Hassan4(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

%LINK-3-UPDOWN: Interface Serial0/0/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to down

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

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

**FTP**  
Service ☒ On ☐ Off

User Setup

Username  Password

☒ Write ☒ Read ☒ Delete ☒ Rename ☒ List

	Username	Password	Permission	
1	Hassan70.85	9827	RWDNL	Add
2	cisco	cisco	RWDNL	Save
				Remove

File  
1 asa842-k8.bin  
2 asa923-k8.bin  
3 c1841-advipservicesk9-mz.124-15.T1.bin  
4 c1841-ipbase-mz.123-14.T7.bin  
Remove

## IP Configuration

Interface FastEthernet0

## IP Configuration

☐ DHCP☒ Static

IP Address

100.100.100.70

Subnet Mask

255.255.255.248

Default Gateway

100.100.100.69

DNS Server

0.0.0.0

## IPv6 Configuration

☐ DHCP☐ Auto Config☒ Static

IPv6 Address

Link Local Address

FE80::201:64FF:FECE:85A1

IPv6 Gateway

IPv6 DNS Server

## 802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

Physical Config **Desktop** Programming Attributes

## IP Configuration X

Interface FastEthernet0 ▾

## IP Configuration

☐ DHCP☒ Static

IP Address

100.100.100.84

Subnet Mask

255.255.255.248

Default Gateway

0.0.0.0

DNS Server

100.100.100.83

## IPv6 Configuration

☐ DHCP☐ Auto Config☒ Static

IPv6 Address

Link Local Address

FE80::240:BFF:FEA3:4AB6

IPv6 Gateway

IPv6 DNS Server

## 802.1X

☐ Use 802.1X Security

Authentication

MD5 ▾

Username

Password

☐ Top



## Command Prompt

```
Volume Serial Number is 5E12-4AF3
Directory of C:\

1/1/1970    5:0 PM                0          HassanLikesicecream.txt
1/1/1970    5:0 PM                0          Hassan_Noor_likes_Beef Pulao .txt
1/1/1970    5:0 PM            26          sampleFile.txt
                26 bytes                3 File(s)

C:\>ftp 100.100.100.73
Trying to connect...100.100.100.73
Connected to 100.100.100.73
220- Welcome to PT Ftp server
Username:Hassan70.85
331- Username ok, need password
Password:

%Error ftp://100.100.100.73/ (No such Account)
332- Need account for login

ftp 100.100.100.73
Trying to connect...100.100.100.73
Connected to 100.100.100.73
220- Welcome to PT Ftp server
Username:Hassan70.85
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put HassanLikesicecream.txt

Writing file HassanLikesicecream.txt to 100.100.100.73:
File transfer in progress...

[Transfer complete - 0 bytes]

0 bytes copied in 0.019 secs (0 bytes/sec)
ftp>rename HassanLikesicecream.txt hassanlikestea

Renaming HassanLikesicecream.txt
ftp>
[OK Renamed file successfully from HassanLikesicecream.txt to hassanlikestea]
ftp>
```