



TSN2201 Computer Networks

Trimester 2110

Lab Assignment Report

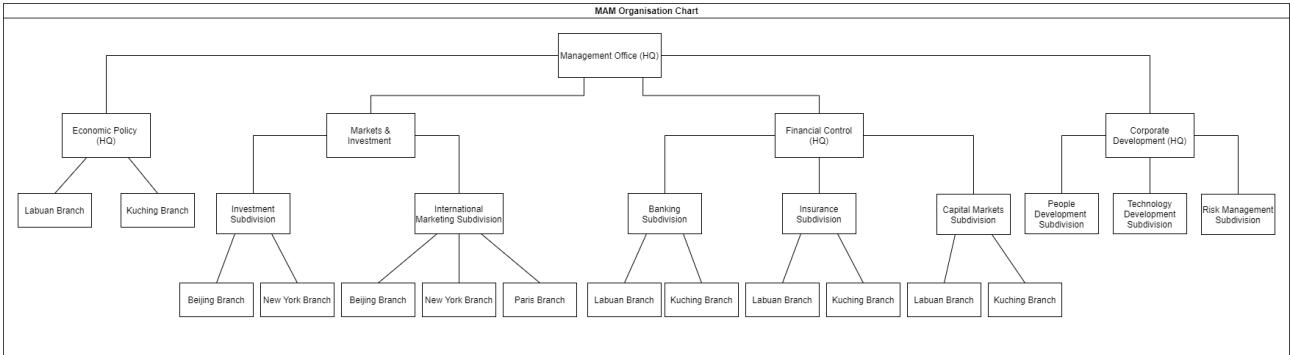
Tutorial Session: TT3V

Lecturer: Dr Kannan Ramakrishnan

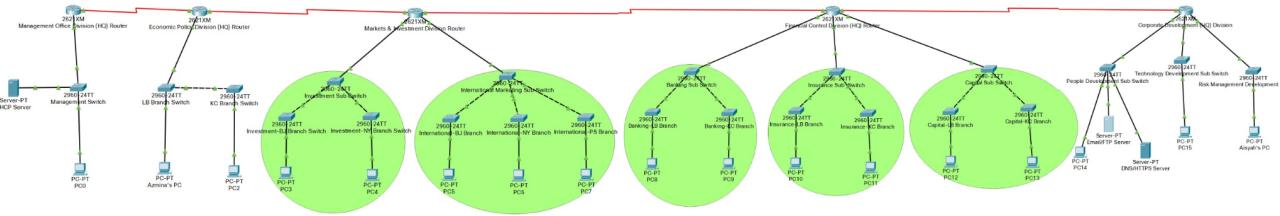
Group 4

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Student Name 3	-	Student ID 3	-
Question number	2		
IP address block	200.150.144.0/20		

Organisation Chart



Logical Network Design



VLSM Design

1. VLSM Table

Subnet	Requirements	No. of HID	Subnet Address	Subnet Mask	Directed Broadcast Address	First Usable Address	Last Usable Address
Financial Control - Banking	93	7	200.150.144 .0/25	255.255.255 .128	200.150.144.127/25	200.150.144.1/25	200.150.144.126/25
Financial Control - Capital Market	33	5	200.150.144 .128/26	255.255.255 .192	200.150.144.191/26	200.150.144.129/26	200.150.144.190/26
Management Office	32	5	200.150.144 .192/27	255.255.255 .224	200.150.144.223/27	200.150.144.193/27	200.150.144.222/27
Markets & Investment - Investment	31	5	200.150.144 .224/27	255.255.255 .224	200.150.144.255/27	200.150.144.225/27	200.150.144.254/27
Financial Control - Insurance	30	5	200.150.145 .0/27	255.255.255 .224	200.150.145.31/27	200.150.145.1/27	200.150.145.30/27
Economic Policy	27	5	200.150.145 .32/27	255.255.255 .224	200.150.145.63/27	200.150.145.33/27	200.150.145.62/27
Markets & Investment - International Marketing	27	5	200.150.145 .64/27	255.255.255 .224	200.150.145.95/27	200.150.145.65/27	200.150.145.94/27
Corporate Development - Risk Management	23	5	200.150.145 .96/27	255.255.255 .224	200.150.145.127/27	200.150.145.97/27	200.150.145.126/27
Corporate Development - People Development	22	5	200.150.145 .128/27	255.255.255 .224	200.150.145.159/27	200.150.145.129/27	200.150.145.158/27
Corporate Development - Technology	12	4	200.150.145 .160/28	255.255.255 .240	200.150.145.175/28	200.150.145.161/28	200.150.145.174/28
Management Office to Economic Policy WAN	2	2	200.150.145 .176/30	255.255.255 .252	200.150.145.179/30	200.150.145.177/30	200.150.145.178/30

Economic Policy to Markets & Investment WAN	2	2	200.150.145.180/30	255.255.255.252	200.150.145.183/30	200.150.145.181/30	200.150.145.182/30
Markets & Investment to Financial Control WAN	2	2	200.150.145.184/30	255.255.255.252	200.150.145.187/30	200.150.145.185/30	200.150.145.186/30
Financial Control to Corporate Development WAN	2	2	200.150.145.188/30	255.255.255.252	200.150.145.191/30	200.150.145.189/30	200.150.145.190/30

2. VLSM Binary Calculations

1. Financial Control - Banking

Requirements: 93

No. of H10: $2^7 = 128$

$$2^6 = 64$$

$$= 7*$$

NID	SID	H10
20 bits	5 bits	7 bits
200.150.1001 00000	00000	0000000

$$20+5 = 25 - \text{subnet}$$

Subnet mask = 255.255.255.128

IP address range:

200.150.10010000 00000000 → 200.150.144.0 / 25

to

200.150.10010000 01111111 → 200.150.144.127 / 25

Subnet add = 200.150.144.0 / 25

First usable = 200.150.144.1 / 25

Directed broadcast address = 200.150.144.127 / 25 Last usable = 200.150.144.126 / 2

2. Financial Control - Capital Market

Requirements: 33

No. of H10: $2^6 = 64$

$$2^5 = 32$$

$$= 6*$$

NID	SID	H10
20 bits	6 bits	6 bits
200.150.1001 000010	000010	000000

$$20+6 = 26 - \text{subnet}$$

$$\begin{array}{r} 00000 \\ + 00001 \\ \hline 000010 \end{array}$$

Subnet mask = 255.255.255.192

IP address range:

200.150.10010000 10000000 → 200.150.144.128 / 26

to

200.150.10010000 10111111 → 200.150.144.191 / 26

Subnet add = 200.150.144.128 / 26

First usable = 200.150.144.129 / 26

Directed broadcast add = 200.150.144.191 / 26

Last usable = 200.150.144.190 / 26

3. Management office

Requirements: 32

$$\begin{aligned} \text{No. of HID: } 2^5 &= 32 \\ &= 5 \times \end{aligned}$$

NID	SID	HID	$2^{17} = 2^7 \text{ bits - subnet}$
			$ \begin{array}{r} 000010 \\ + 1 \\ \hline 0000110 \end{array} $

Subnet mask: 255.255.255.224

IP address range:

$$200.150.1001\ 0000 \quad 1100\ 0000 \rightarrow 200.150.144.192/27$$

to

$$200.150.1001\ 0000 \quad 1101\ 1111 \rightarrow 200.150.144.223/27$$

Subnet add: 200.150.144.192/27

First usable: 200.150.144.193/27

Directed broadcast add: 200.150.144.223/27 Last usable: 200.150.144.222/27

4. Markets & Investment - Investment

Requirements: 31

$$\begin{aligned} \text{No. of HID: } 2^5 &= 32 \\ 2^4 &= 16 \\ &= 5 \times \end{aligned}$$

NID	SID	HID	$2^{17} = 2^7 \text{ - subnet}$
			$ \begin{array}{r} 0000110 \\ + 1 \\ \hline 0000\ 111 \end{array} $

Subnet mask: 255.255.255.224

IP address range:

$$200.150.1001\ 0000 \quad 1110\ 0000 \rightarrow 200.150.144.224/27$$

to

$$200.150.1001\ 0000 \quad 1111\ 1111 \rightarrow 200.150.144.255/27$$

Subnet add: 200.150.144.224/27

First usable: 200.150.144.225/27

Directed broadcast add: 200.150.144.255/27 Last usable: 200.150.144.254/27

3. Financial Control - Insurance

Requirements: 30

No. of HIDs: $2^5 = 32$

$$2^4 = 16$$

= 5

NID	SID	HID
20 bits	7 bits	5 bits

200.150.1001 0001000 00000

$2^{0+7} = 2^7$ = subnet

$$\begin{array}{r}
 0000111 \\
 + \quad \quad \quad 1 \\
 \hline
 0001000
 \end{array}$$

Subnet mask: 255.255.255.224

IP address range:

200.150.10010001 00000000 → 200.150.145.0 /27
to

200.150.10010001 00011111 → 200.150.145.31 /27

Subnet add: 200.150.145.0 /27

First usable: 200.150.145.1 /27

Directed broadcast add: 200.150.145.31 /27 Last usable: 200.150.145.30 /27

4. Economic Policy

Requirements: 27

No. of HIDs: $2^5 = 32$

$$2^4 = 16$$

= 5

NID	SID	HID
20 bits	7 bits	5 bits

200.150.1001 0001001 00000

2^7 = subnet

$$\begin{array}{r}
 0001000 \\
 + \quad \quad \quad 1 \\
 \hline
 0001001
 \end{array}$$

Subnet mask: 255.255.255.224

IP address range:

200.150.10010001 00100000 → 200.150.145.32 /27
to

200.150.10010001 00111111 → 200.150.145.63 /27

Subnet add: 200.150.145.32 /27

First usable: 200.150.145.33 /27

Directed broadcast: 200.150.145.63 /27 Last usable: 200.150.145.62 /27

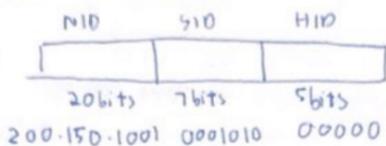
7. Markets & Investment - International Marketing

Requirements: 27

$$\text{No. of H10: } 2^{15} = 32$$

$$2^{14} = 16$$

$$= 5_{\text{X}}$$



200.150.1001 0001010 00000

27 bits - subnet

$$\begin{array}{r} 0001001 \\ + \quad \quad \quad 1 \\ \hline 0001010 \end{array}$$

Subnet mask - 255.255.255.224

IP address range:

200.150.10010001 01000000 → 200.150.145.64/27

to

200.150.1001001 01011111 → 200.150.145.95/27

Subnet add: 200.150.145.64/27

First usable: 200.150.145.65/27

Directed broadcast: 200.150.145.95/27 Last usable: 200.150.145.94/27

8.

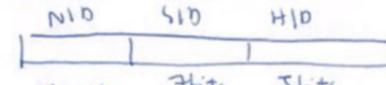
Corporate Development - Risk Management

Requirements: 23

$$\text{No. of H10: } 2^{15} = 32$$

$$2^{14} = 16$$

$$= 5_{\text{X}}$$



200.150.1001 0001011 00000

$$\begin{array}{r} 0001010 \\ + \quad \quad \quad 1 \\ \hline 0001011 \end{array}$$

Subnet mask - 255.255.255.224

IP address range:

200.150.10010001 01100000 → 200.150.145.96/27

to

200.150.10010001 01111111 → 200.150.145.127/27

Subnet add: 200.150.145.96/27

First usable: 200.150.145.97/27

Directed broadcast: 200.150.145.127/27

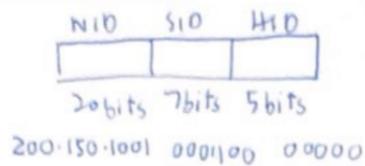
Last usable: 200.150.145.126/27

19 Corporate Development - People Development

Requirements = 22

$$\text{No. of H1D} = 2^7.5 = 25$$

$$2^{14} = 16 \\ = 5 \text{ bits}$$



200.150.1001 0001100 00000

$$\begin{array}{r} & & 1 & 1 \\ & 0 & 0 & 1 & 0 & 1 & 1 \\ + & & & & & & 1 \\ \hline 0 & 0 & 0 & 1 & 1 & 0 & 0 \end{array}$$

Subnet mask: 255.255.255.224

IP address range:

$$200.150.10010001 10000000 \rightarrow 200.150.145.128/27$$

$$200.150.10010001 10011111 \rightarrow 200.150.145.189/27$$

Subnet add: 200.150.145.128/27

First usable: 200.150.145.129/27

Directed broadcast: 200.150.145.159/27 Last usable: 200.150.145.158/27

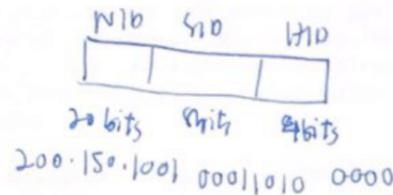
10.

10 Corporate development - Technology

Requirements = 12

$$\text{No. of H1D} = 2^{14} = 16$$

$$2^{13} = 8 \\ = 4 \text{ bits}$$



200.150.1001 00011010 0000

$$\begin{array}{r} & & & 1 \\ & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ + & & & & & & 1 \\ \hline 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 \end{array}$$

Subnet mask: 255.255.255.240

IP address range:

$$200.150.10010001 10100000 \rightarrow 200.150.145.160/28$$

to

$$200.150.10010001 10101111 \rightarrow 200.150.145.175/28$$

Subnet add: 200.150.145.160/28

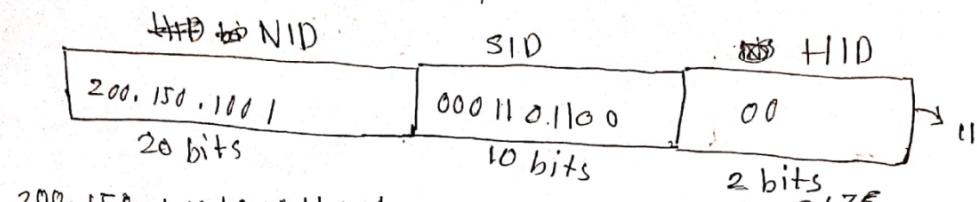
First usable: 200.150.145.161/28

Directed broadcast: 200.150.145.175/28

Last usable: 200.150.145.179/28.

Management Office - Economic Policy WAN

IP Address requirements : 4



200.150.145.176/30

+ 0
200.150.145.176/30

200.150.145.176/30

200.150.145.176/30

Subnet Address = 200.150.145.176/30

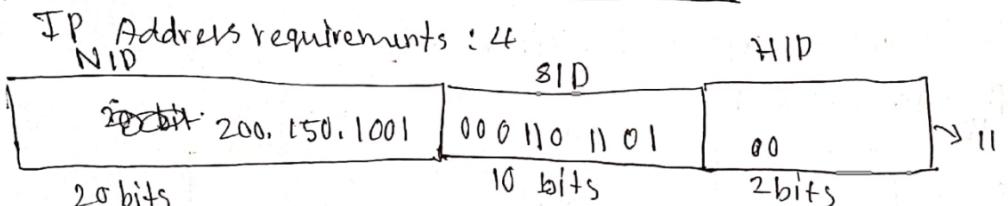
Directed Broadcast Address = 200.150.145.179/30

First Usable Address = 200.150.145.177/30 Subnet Mask Address = 255.255.255.255

Last Usable Address = 200.150.145.178/30 252

Economic Policy - Markets & Investment WAN

IP Address requirements : 4



200.150.145.180/30

+ 0
200.150.145.180/30

0001101100
+ 1
0001101101

+ 0
200.150.145.180/30

Subnet Address = 200.150.145.180/30

Directed Broadcast Address = 200.150.145.183/30

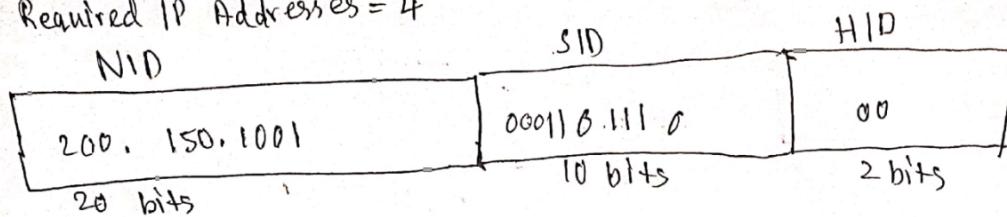
First Usable Address = 200.150.145.181/30

Last Usable Address = 200.150.145.182/30

Subnet Mask Address = 255.255.255.252

Markets & Investment → Financial Control WAN

Required IP Addresses = 4



200.150.10010001.10110.0.0 200.150.145.184/30

+0

+0

200.150.10010001.10110.11 200.150.145.187/30

0001101101
+ 1

0001101110

Subnet Address = 200.150.145.184/30

Direct Broadcast Address = 200.150.145.187/30

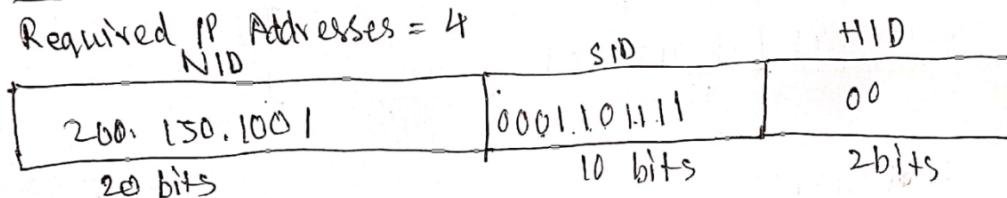
First Usable Address = 200.150.145.185/30

Last Usable Address = 200.150.145.186/30

Subnet Mask Address = 255.255.255.252

Financial Control WAN ← Corporate Development WAN

Required IP Addresses = 4



200.150.10010001.101110.0 200.150.145.188/30

+0

0001101110
+ 1
0001101111

200.150.10010001.1011111 200.150.145.191/30

Subnet Address = 200.150.145.188/30

Direct Broadcast Address = 200.150.145.191/30

First Usable Address = 200.150.145.189/30

Last Usable Address = 200.150.145.190/30

Subnet Mask Address = 255.255.255.252

Verification of Configuration

1. All devices can ping

All devices can ping before Standard Access Control was implemented.

After the Standard Access Control has been implemented, PC1 and PC2 cannot be pinged outside of the subnet.

Fire	Last Status	Source	Destination	Type	Color	Time(s)	Period	Num	Edit	Delete
●	Successful	Azmi...	PC2	ICMP	■	0.000	N	0	(edit)	
●	Successful	PC3	PC4	ICMP	■	0.000	N	1	(edit)	
●	Successful	PC5	PC6	ICMP	■	0.000	N	2	(edit)	
●	Successful	PC6	PC7	ICMP	■	0.000	N	3	(edit)	
●	Successful	PC8	PC9	ICMP	■	0.000	N	4	(edit)	
●	Successful	PC10	PC11	ICMP	■	0.000	N	5	(edit)	
●	Successful	PC12	PC13	ICMP	■	0.000	N	6	(edit)	
●	Successful	PC14	PC15	ICMP	■	0.000	N	7	(edit)	

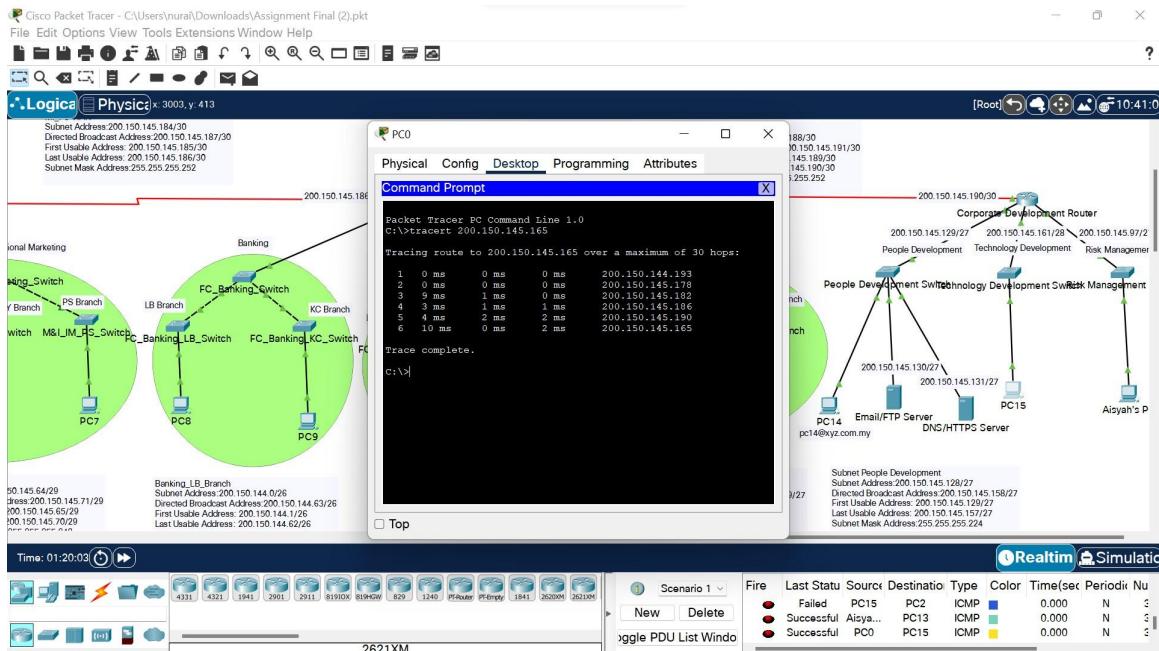
PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(s)	Period	Num	Edit	Delete
●	Successful	PC12	PC13	ICMP	■	0.000	N	6	(edit)	
●	Successful	PC14	PC15	ICMP	■	0.000	N	7	(edit)	
●	Successful	PC15	Aisyah's PC	ICMP	■	0.000	N	8	(edit)	
●	Successful	PC3	PC5	ICMP	■	0.000	N	9	(edit)	
●	Successful	PC4	PC7	ICMP	■	0.000	N	10	(edit)	
●	Successful	PC6	PC8	ICMP	■	0.000	N	11	(edit)	
●	Successful	PC9	PC11	ICMP	■	0.000	N	12	(edit)	
●	Successful	PC10	PC12	ICMP	■	0.000	N	13	(edit)	

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(s)	Period	Num	Edit	Delete
●	Successful	PC6	PC8	ICMP	■	0.000	N	11	(edit)	
●	Successful	PC9	PC11	ICMP	■	0.000	N	12	(edit)	
●	Successful	PC10	PC12	ICMP	■	0.000	N	13	(edit)	
●	Successful	PC11	PC13	ICMP	■	0.000	N	14	(edit)	
●	Successful	PC12	PC14	ICMP	■	0.000	N	15	(edit)	
●	Successful	PC11	PC15	ICMP	■	0.000	N	16	(edit)	
●	Successful	PC9	Aisyah's PC	ICMP	■	0.000	N	17	(edit)	

2. Traceroute



Traceroute output from PC0 to PC15

3. Routing configuration



Economic Policy Router

Physical Config CLI Attributes

IOS Command Line Interface

```
Welcome to Economic Policy router

Economic_Policy>sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

  200.150.144.0/24 is variably subnetted, 7 subnets, 3 masks
o  200.150.144.0/26 [110/129] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.144.64/26 [110/129] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.144.128/27 [110/129] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.144.160/27 [110/129] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.144.192/27 [110/65] via 200.150.145.177, 01:49:03, Serial0/0
o  200.150.144.224/28 [110/65] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.144.240/28 [110/65] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.0/24 is variably subnetted, 13 subnets, 4 masks
o  200.150.145.0/28 [110/129] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.16/28 [110/129] via 200.150.145.182, 00:57:34, Serial0/1
c  200.150.145.32/27 is directly connected, FastEthernet0/0
o  200.150.145.64/29 [110/65] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.72/29 [110/65] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.80/29 [110/65] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.96/27 [110/193] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.128/27 [110/193] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.160/28 [110/193] via 200.150.145.182, 00:57:34, Serial0/1
c  200.150.145.176/30 is directly connected, Serial0/0
c  200.150.145.180/30 is directly connected, Serial0/0
o  200.150.145.184/30 [110/128] via 200.150.145.182, 00:57:34, Serial0/1
o  200.150.145.188/30 [110/192] via 200.150.145.182, 00:57:34, Serial0/1

Economic_Policy>
```

Ctrl+F6 to exit CLI focus Copy Paste

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Financial Control Router

Physical Config CLI Attributes

IOS Command Line Interface

```
Financial_Control>sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

  200.150.144.0/24 is variably subnetted, 7 subnets, 3 masks
c  200.150.144.0/26 is directly connected, FastEthernet0/0.60
c  200.150.144.64/26 is directly connected, FastEthernet0/0.70
c  200.150.144.128/27 is directly connected, FastEthernet1/0.100
c  200.150.144.160/27 is directly connected, FastEthernet1/0.110
o  200.150.144.192/27 [110/193] via 200.150.145.185, 00:56:10, Serial0/0
o  200.150.144.224/28 [110/65] via 200.150.145.185, 01:47:43, Serial0/0
o  200.150.144.240/28 [110/65] via 200.150.145.185, 01:47:43, Serial0/0
  200.150.145.0/24 is variably subnetted, 13 subnets, 4 masks
c  200.150.145.0/28 is directly connected, FastEthernet0/1.80
c  200.150.145.16/28 is directly connected, FastEthernet0/1.90
o  200.150.145.32/27 [110/129] via 200.150.145.185, 00:56:10, Serial0/0
o  200.150.145.64/29 [110/65] via 200.150.145.185, 01:47:43, Serial0/0
o  200.150.145.72/29 [110/65] via 200.150.145.185, 01:47:43, Serial0/0
o  200.150.145.80/29 [110/65] via 200.150.145.185, 01:47:43, Serial0/0
o  200.150.145.96/27 [110/65] via 200.150.145.190, 00:56:10, Serial0/1
o  200.150.145.128/27 [110/65] via 200.150.145.190, 00:56:10, Serial0/1
o  200.150.145.160/28 [110/65] via 200.150.145.190, 00:56:10, Serial0/1
o  200.150.145.176/30 [110/192] via 200.150.145.185, 00:56:10, Serial0/0
c  200.150.145.180/30 [110/128] via 200.150.145.185, 01:47:43, Serial0/0
c  200.150.145.184/30 is directly connected, Serial0/0
c  200.150.145.188/30 is directly connected, Serial0/1

Financial_Control>
```

Ctrl+F6 to exit CLI focus Copy Paste

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Markets & Investment Router

Physical Config CLI Attributes

IOS Command Line Interface

```
Welcome to Markets & Investment router

Markets_&_Investment>sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

 200.150.144.0/24 is variably subnetted, 7 subnets, 3 masks
o 200.150.144.0/26 [110/65] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.144.64/26 [110/65] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.144.128/27 [110/65] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.144.160/27 [110/65] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.144.192/27 [110/129] via 200.150.145.181, 01:45:49, Serial0/0
c 200.150.144.224/28 is directly connected, FastEthernet0/0.1
c 200.150.144.240/28 is directly connected, FastEthernet0/0.20
 200.150.145.0/24 is variably subnetted, 13 subnets, 4 masks
o 200.150.145.0/28 [110/65] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.145.16/28 [110/65] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.145.32/27 [110/65] via 200.150.145.181, 01:45:49, Serial0/0
c 200.150.145.64/29 is directly connected, FastEthernet0/1.30
c 200.150.145.72/29 is directly connected, FastEthernet0/1.40
c 200.150.145.80/29 is directly connected, FastEthernet0/1.50
o 200.150.145.96/27 [110/129] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.145.128/27 [110/129] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.145.160/28 [110/129] via 200.150.145.186, 01:45:49, Serial0/1
o 200.150.145.176/30 [110/128] via 200.150.145.181, 01:45:49, Serial0/0
c 200.150.145.180/30 is directly connected, Serial0/0
c 200.150.145.184/30 is directly connected, Serial0/1
o 200.150.145.188/30 [110/128] via 200.150.145.186, 01:45:49, Serial0/1

Markets_&_Investment>
```

Ctrl+F6 to exit CLI focus

Top

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Corporate Development Router

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
00:51:44: %OSPF-5-ADJCHG: Process 1, Nbr 200.150.145.189 on Serial0/0 from LOADING to FULL, Loading Done
Welcome to Corporate Development router

Corporate_Development>
Corporate_Development>sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
      * - candidate default, U - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

 200.150.144.0/24 is variably subnetted, 7 subnets, 3 masks
o 200.150.144.0/26 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.144.64/26 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.144.128/27 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.144.160/27 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.144.192/27 [110/257] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.144.224/28 [110/129] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.144.240/28 [110/129] via 200.150.145.189, 01:01:05, Serial0/0
 200.150.145.0/24 is variably subnetted, 13 subnets, 4 masks
o 200.150.145.0/28 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.16/28 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.32/27 [110/65] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.64/29 [110/129] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.72/29 [110/129] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.80/29 [110/129] via 200.150.145.189, 01:01:05, Serial0/0
c 200.150.145.96/27 is directly connected, FastEthernet0/0
c 200.150.145.128/27 is directly connected, FastEthernet0/0
o 200.150.145.160/28 [110/257] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.180/30 [110/128] via 200.150.145.189, 01:01:05, Serial0/0
o 200.150.145.184/30 [110/128] via 200.150.145.189, 01:01:05, Serial0/0
c 200.150.145.188/30 is directly connected, Serial0/0

Corporate_Development>
```

Ctrl+F6 to exit CLI focus

Top

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4. VLAN

M&I_Investment_Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

Switch>sh vlan

VLAN Name          Status      Ports
-----  -----
1    default        active      Fa0/4, Fa0/5, Fa0/6, Fa0/7
                           Fa0/8, Fa0/9, Fa0/10, Fa0/11
                           Fa0/12, Fa0/13, Fa0/14, Fa0/15
                           Fa0/16, Fa0/17, Fa0/18, Fa0/19
                           Fa0/20, Fa0/21, Fa0/22, Fa0/23
                           Fa0/24, Gig0/1, Gig0/2

10   Investment_BJ_Branch  active
20   Investment_NY_Branch  active
1002 fddi-default        active
1003 token-ring-default  active
1004 fddinet-default     active
1005 trnet-default       active

VLAN Type SAID      MTU      Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
1    enet  100001    1500     -       -       -       -       0       0
10  enet  100010    1500     -       -       -       -       0       0
20  enet  100020    1500     -       -       -       -       0       0
1002 fddi 101002    1500     -       -       -       -       0       0
1003 tr  101003    1500     -       -       -       -       0       0
1004 fdnet 101004   1500     -       -       ieee   -       0       0
1005 trnet 101005   1500     -       -       ibm   -       0       0

VLAN Type SAID      MTU      Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
Remote SPAN VLANs
-----  -----
```

Primary	Secondary	Type	Ports
			Switch>

Ctrl+F6 to exit CLI focus

Top

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M&I_International_Marketing_Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch>sh vlan

VLAN Name          Status      Ports
-----  -----
1    default        active      Fa0/5, Fa0/6, Fa0/7, Fa0/8
                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
                           Gig0/1, Gig0/2

30   Marketing_BJ_Branch  active
40   Marketing_NY_Branch  active
50   Marketing_PS_Branch  active
1002 fddi-default        active
1003 token-ring-default  active
1004 fddinet-default     active
1005 trnet-default       active

VLAN Type SAID      MTU      Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
1    enet  100001    1500     -       -       -       -       0       0
30  enet  100030    1500     -       -       -       -       0       0
40  enet  100040    1500     -       -       -       -       0       0
50  enet  100050    1500     -       -       -       -       0       0
1002 fddi 101002    1500     -       -       -       -       0       0
1003 tr  101003    1500     -       -       -       -       0       0
1004 fdnet 101004   1500     -       -       ieee   -       0       0
1005 trnet 101005   1500     -       -       ibm   -       0       0

VLAN Type SAID      MTU      Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
Remote SPAN VLANs
-----  -----
```

Primary	Secondary	Type	Ports
			Switch>

Ctrl+F6 to exit CLI focus

Top

Copy Paste

FC_Banking_Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

Switch>sh vlan

VLAN Name          Status     Ports
-----  -----
1    default        active     Fa0/4, Fa0/5, Fa0/6, Fa0/7
                           Fa0/8, Fa0/9, Fa0/10, Fa0/11
                           Fa0/12, Fa0/13, Fa0/14, Fa0/15
                           Fa0/16, Fa0/17, Fa0/18, Fa0/19
                           Fa0/20, Fa0/21, Fa0/22, Fa0/23
                           Fa0/24, Gig0/1, Gig0/2

60   Banking_LB_Branch  active
70   Banking_KC_Branch  active
1002 fddi-default      active
1003 token-ring-default active
1004 fddinet-default   active
1005 trnet-default     active

VLAN Type SAID      MTU     Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
1    enet 100001    1500    -       -       -       -       0       0
60  enet 100060    1500    -       -       -       -       0       0
70  enet 100070    1500    -       -       -       -       0       0
1002 fddi 101002   1500    -       -       -       -       0       0
1003 tr  101003   1500    -       -       -       -       0       0
1004 fdnet 101004  1500    -       -       ieee   -       0       0
1005 trnet 101005  1500    -       -       ibm   -       0       0

VLAN Type SAID      MTU     Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
Remote SPAN VLANs
-----  -----
```

Primary	Secondary	Type	Ports

Switch>

Ctrl+F6 to exit CLI focus

Top

FC_CapitalMarkets_Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>
Switch>sh vlan

VLAN Name          Status     Ports
-----  -----
1    default        active     Fa0/4, Fa0/5, Fa0/6, Fa0/7
                           Fa0/8, Fa0/9, Fa0/10, Fa0/11
                           Fa0/12, Fa0/13, Fa0/14, Fa0/15
                           Fa0/16, Fa0/17, Fa0/18, Fa0/19
                           Fa0/20, Fa0/21, Fa0/22, Fa0/23
                           Fa0/24, Gig0/1, Gig0/2

100 CapitalMarketing_LB_Branch  active
110 CapitalMarketing_KC_Branch  active
1002 fddi-default              active
1003 token-ring-default        active
1004 fddinet-default           active
1005 trnet-default             active

VLAN Type SAID      MTU     Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----  -----
1    enet 100001    1500    -       -       -       -       0       0
100  enet 100100   1500    -       -       -       -       0       0
110  enet 100110   1500    -       -       -       -       0       0
1002 fddi 101002   1500    -       -       -       -       0       0
1003 tr  101003   1500    -       -       -       -       0       0
1004 fdnet 101004  1500    -       -       ieee   -       0       0

Switch>
Switch>
```

Ctrl+F6 to exit CLI focus

Top

FC_Insurance_Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

Switch>sh vlan

VLAN Name          Status    Ports
---- --
1     default      active    Fa0/4, Fa0/5, Fa0/6, Fa0/7
                      Fa0/8, Fa0/9, Fa0/10, Fa0/11
                      Fa0/12, Fa0/13, Fa0/14, Fa0/15
                      Fa0/16, Fa0/17, Fa0/18, Fa0/19
                      Fa0/20, Fa0/21, Fa0/22, Fa0/23
                      Fa0/24, Gig0/1, Gig0/2

80   Insurance_LB_Branch  active
90   Insurance_KC_Branch  active
1002 fddi-default        active
1003 token-ring-default  active
1004 fddinet-default     active
1005 trnet-default       active

VLAN Type  SAID      MTU    Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- --
1   enet  100001    1500   -     -     -     -     0     0
80  enet  100008    1500   -     -     -     -     0     0
90  enet  100090    1500   -     -     -     -     0     0
1002 fddi  101002    1500   -     -     -     -     0     0
1003 tr   101003    1500   -     -     -     -     0     0
1004 fddnet 101004    1500   -     -     ieee -   0     0
1005 trnet 101005    1500   -     -     ibm  -   0     0

VLAN Type  SAID      MTU    Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2

Remote SPAN VLANS
-----
```

Primary	Secondary	Type	Ports
Switch>	Switch>		

Ctrl+F6 to exit CLI focus

Top

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5. DNS

DNS/HTTPS Server

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

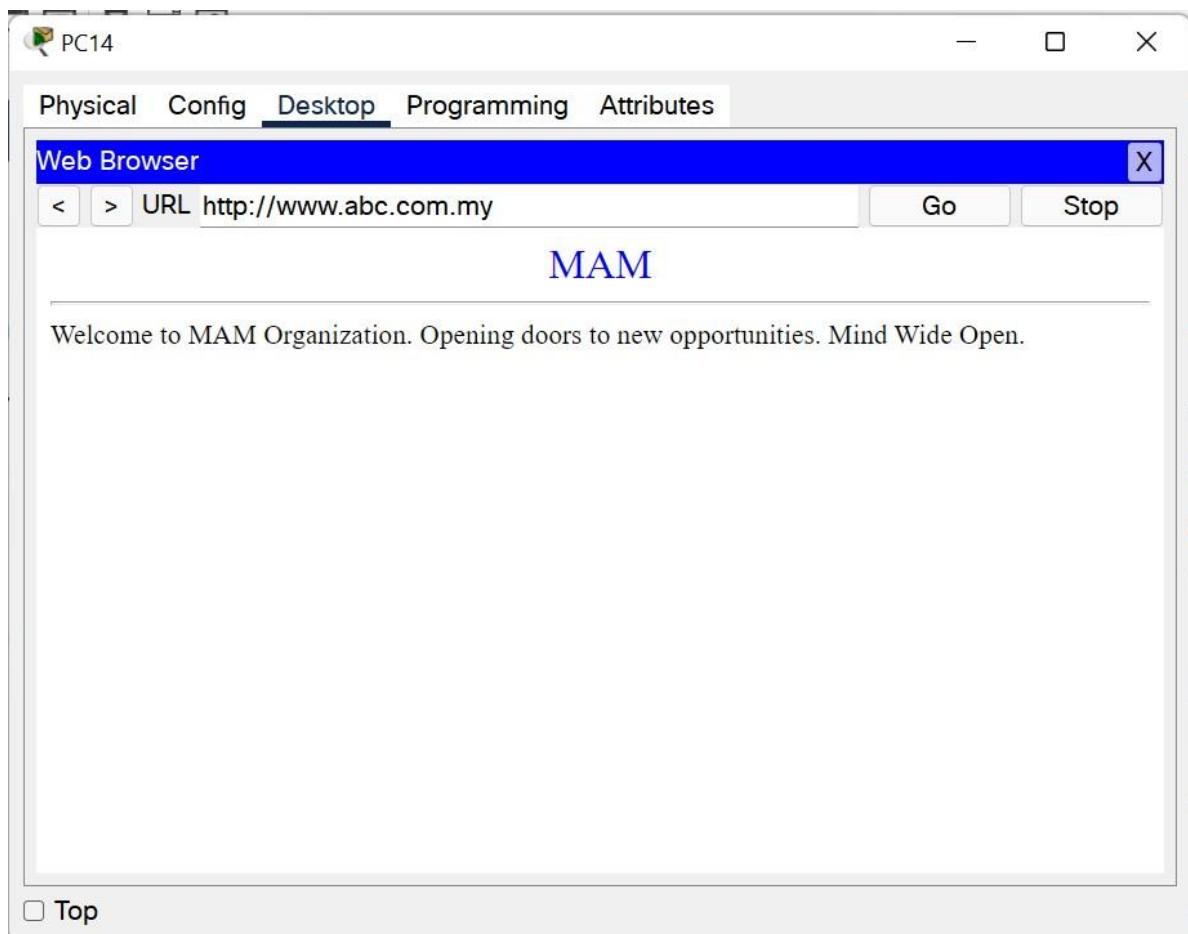
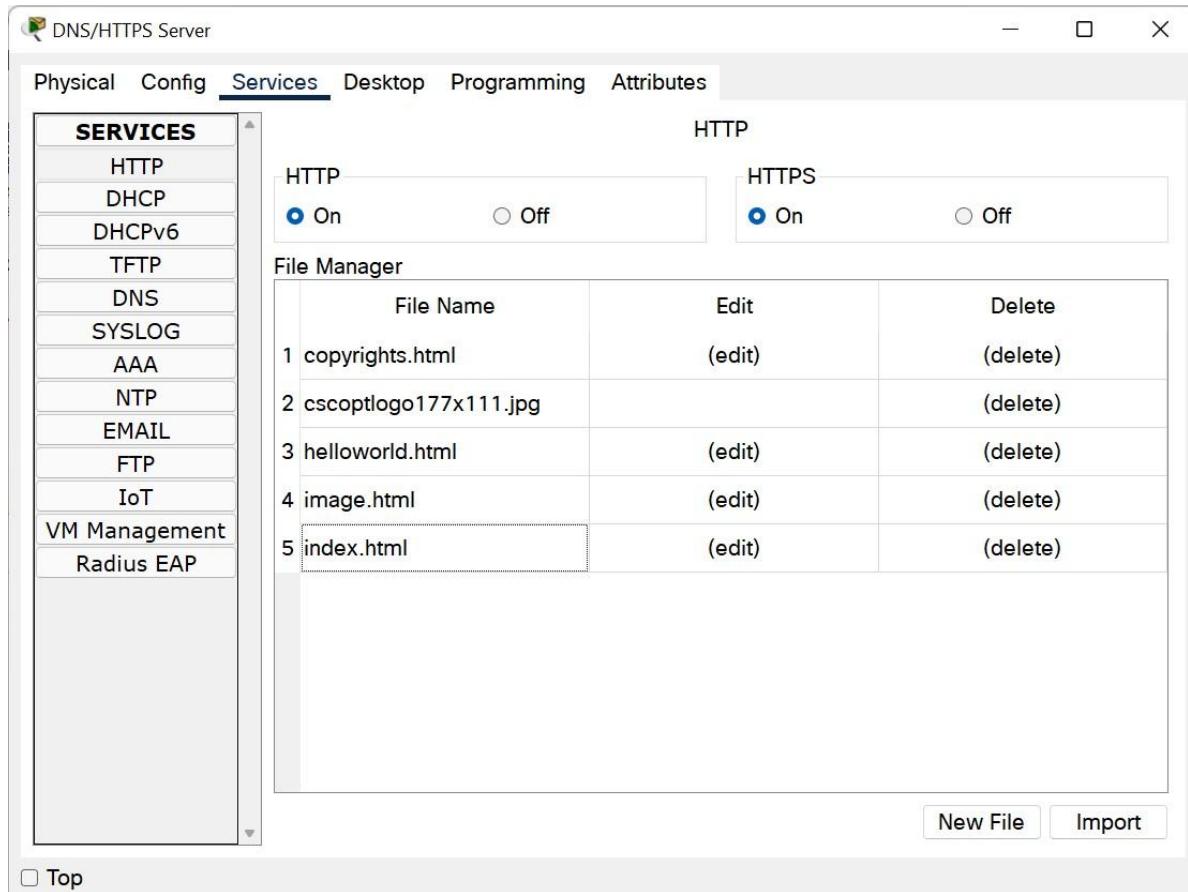
Address

Add	Save	Remove	
No.	Name	Type	Detail
0	abc.com.my	A Record	200.150.145.131
1	dhcp.abc.com.my	A Record	200.150.144.194
2	ftp.abc.com.my	A Record	200.150.145.130
3	mail.abc.com.my	A Record	200.150.145.130
4	pc0@abc.com.my	A Record	200.150.144.195
5	pc14@xyz.com.my	A Record	200.150.145.140
6	www.abc.com.my	CNAME	abc.com.my

DNS Cache

Top

6. Web server



7. DHCP server

DHCP Server

Physical Config **Services** Desktop Programming Attributes

DHCP							
Interface	FastEthernet0	Service	<input checked="" type="radio"/> On	<input type="radio"/> Off			
Pool Name	serverPool						
Default Gateway	0.0.0.0						
DNS Server	0.0.0.0						
Start IP Address :	200	150	144	192			
Subnet Mask:	255	255	255	224			
Maximum Number of Users :	31						
TFTP Server:	0.0.0.0						
WLC Address:	0.0.0.0						
Add		Save			Remove		
Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
CapitalMarketing_KC_Branch	200.150.144.1	200.150.145.1	200.150.144.1	255.255.255.1	30	0.0.0.0	0.0.0.0
CapitalMarketing_LB_Branch	200.150.144.1	200.150.145.1	200.150.144.1	255.255.255.1	30	0.0.0.0	0.0.0.0
Insurance_KC_Branch	200.150.145.17	200.150.145.17	200.150.145.18	255.255.255.1	14	0.0.0.0	0.0.0.0
Insurance_LB_Branch	200.150.145.1	200.150.145.1	200.150.145.2	255.255.255.1	14	0.0.0.0	0.0.0.0
Banking_KC_Branch	200.150.144.65	200.150.145.65	200.150.144.66	255.255.255.1	62	0.0.0.0	0.0.0.0
Banking_LB_Branch	200.150.144.1	200.150.145.1	200.150.144.2	255.255.255.1	62	0.0.0.0	0.0.0.0
Marketing_PS_Branch	200.150.145.81	200.150.145.81	200.150.145.82	255.255.255.1	6	0.0.0.0	0.0.0.0
Marketing_NY_Branch	200.150.145.73	200.150.145.73	200.150.145.74	255.255.255.1	6	0.0.0.0	0.0.0.0

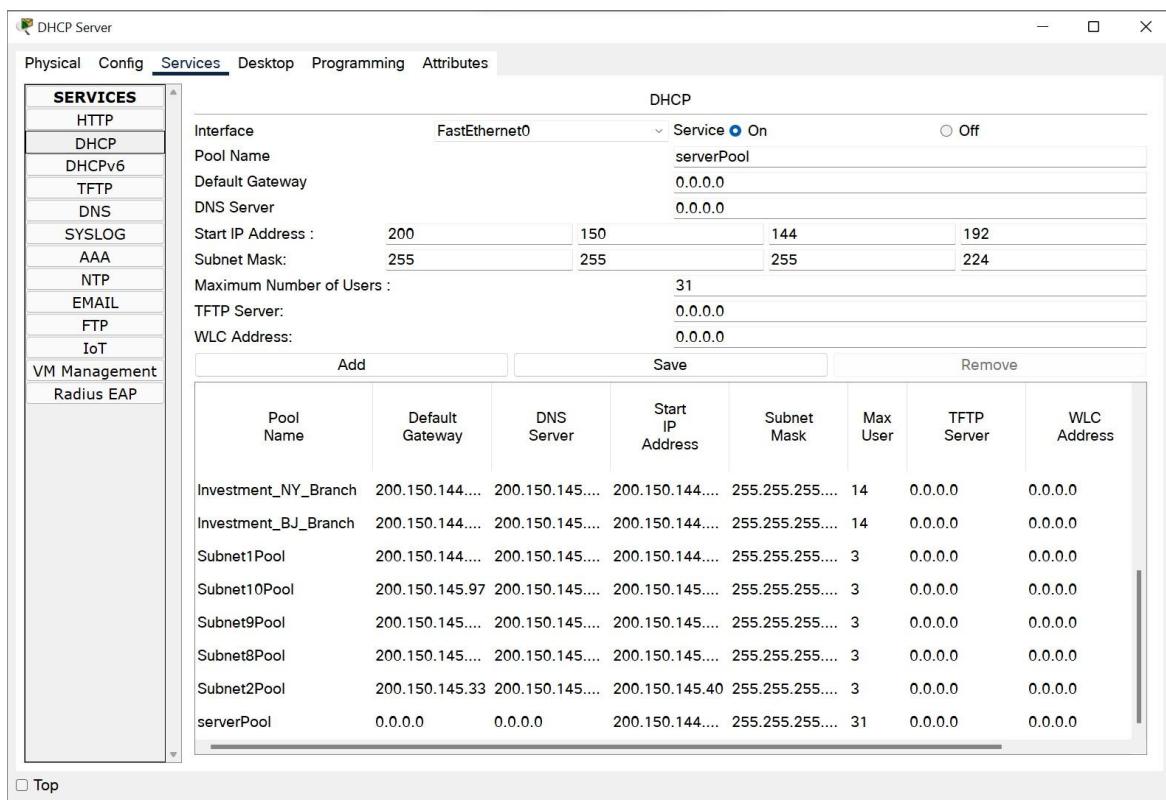
Top

DHCP Server

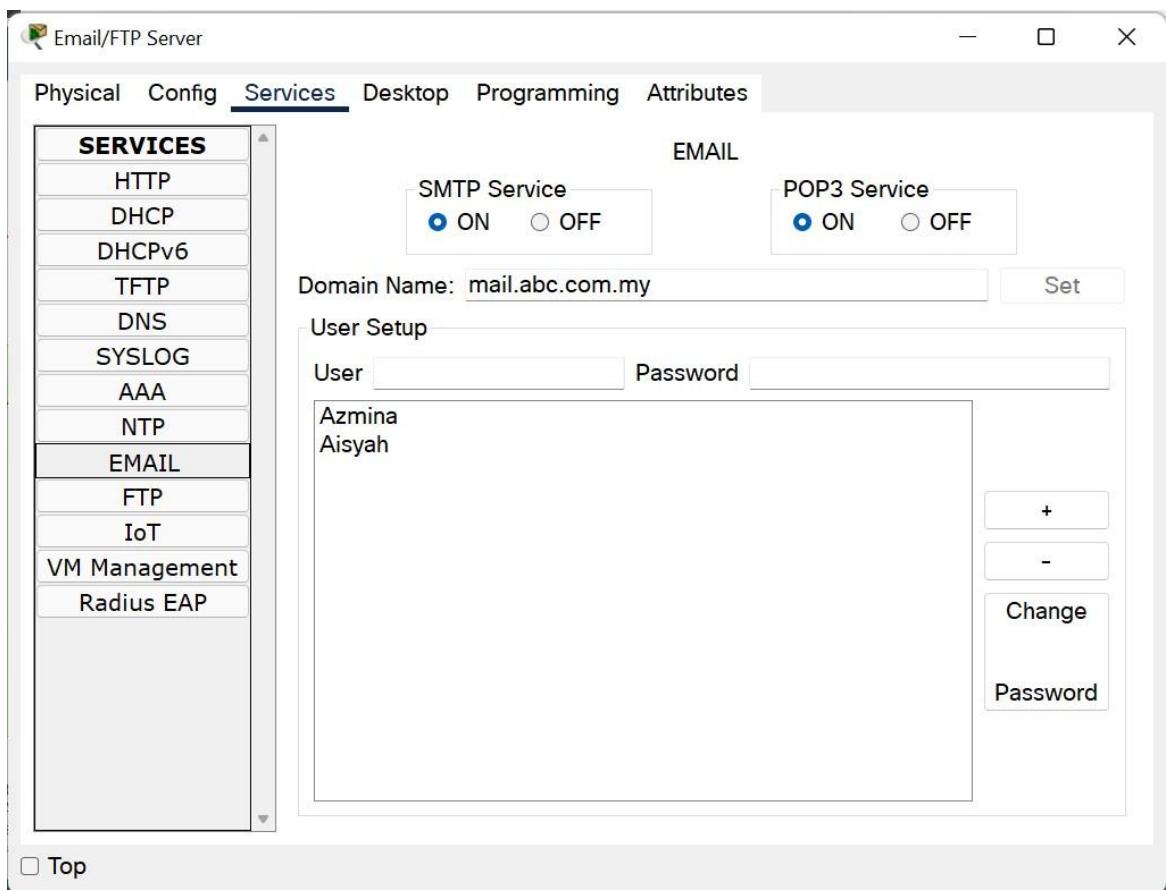
Physical Config **Services** Desktop Programming Attributes

DHCP							
Interface	FastEthernet0	Service	<input checked="" type="radio"/> On	<input type="radio"/> Off			
Pool Name	serverPool						
Default Gateway	0.0.0.0						
DNS Server	0.0.0.0						
Start IP Address :	200	150	144	192			
Subnet Mask:	255	255	255	224			
Maximum Number of Users :	31						
TFTP Server:	0.0.0.0						
WLC Address:	0.0.0.0						
Add		Save			Remove		
Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
Marketing_NY_Branch	200.150.145.73	200.150.145.73	200.150.145.74	255.255.255.1	6	0.0.0.0	0.0.0.0
Marketing_BJ_Branch	200.150.145.65	200.150.145.65	200.150.145.66	255.255.255.1	6	0.0.0.0	0.0.0.0
Investment_NY_Branch	200.150.144.1	200.150.145.1	200.150.144.1	255.255.255.1	14	0.0.0.0	0.0.0.0
Investment_BJ_Branch	200.150.144.1	200.150.145.1	200.150.144.1	255.255.255.1	14	0.0.0.0	0.0.0.0
Subnet1Pool	200.150.144.1	200.150.145.1	200.150.144.1	255.255.255.1	3	0.0.0.0	0.0.0.0
Subnet10Pool	200.150.145.97	200.150.145.97	200.150.145.98	255.255.255.1	3	0.0.0.0	0.0.0.0
Subnet9Pool	200.150.145.1	200.150.145.1	200.150.145.1	255.255.255.1	3	0.0.0.0	0.0.0.0
Subnet8Pool	200.150.145.1	200.150.145.1	200.150.145.1	255.255.255.1	3	0.0.0.0	0.0.0.0

Top



8. E-mail server





Azmina's PC

— □ ×

Physical Config Desktop Programming Attributes

Compose

Reply

Receive

Delete

Configure Ma

	From	Subject	Received
1	Aisyah@mai...	Testing	Tue Nov 9 ...
2	Aisyah@mai...	Try testing	Tue Nov 9 ...
3	Aisyah@mai...	hi azmina	Tue Nov 9 ...

Receiving mail from POP3 Server
200.150.145.130
Receive Mail Success.

Top

Physical Config Desktop Programming Attributes

ivans

Compose Reply Receive Delete Configure Ma

	From	Subject	Received
1	Azmina@m...	hi again	Mon Nov 8 ...
2	Azmina@m...	hi	Mon Nov 8 ...
3	Aisyah@mai...	hi	Mon Nov 8 ...

Cancel
Send/Receive

Top

9. FTP Server

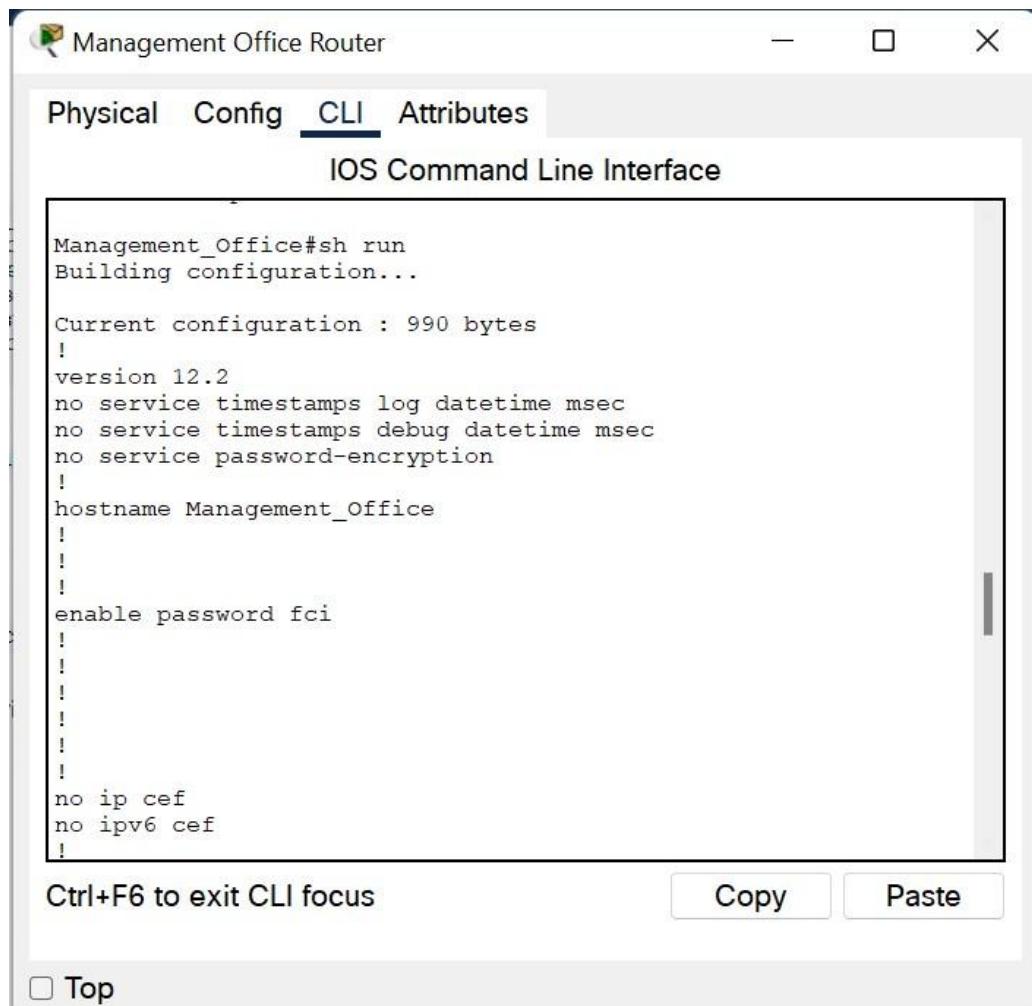
The screenshot shows the 'Email/FTP Server' application window with the 'Services' tab selected. On the left, a sidebar lists various services: HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, **FTP**, IoT, VM Management, and Radius EAP. The 'FTP' service is currently configured with 'On' checked. Under 'User Setup', there are two entries: 'cisco' with password 'cisco' and permission 'RWDNL', and 'manager' with password 'work' and permission 'RWDNL'. Below this is a 'File' section containing three files: 'asa842-k8.bin', 'asa923-k8.bin', and 'c1841-advipservicesk9-mz....'. Buttons for 'Add', 'Save', 'Remove', and 'Top' are visible.

Username	Password	Permission
1 cisco	cisco	RWDNL
2 manager	work	RWDNL

File
1 asa842-k8.bin
2 asa923-k8.bin
3 c1841-advipservicesk9-mz....

10. Network Security

Password



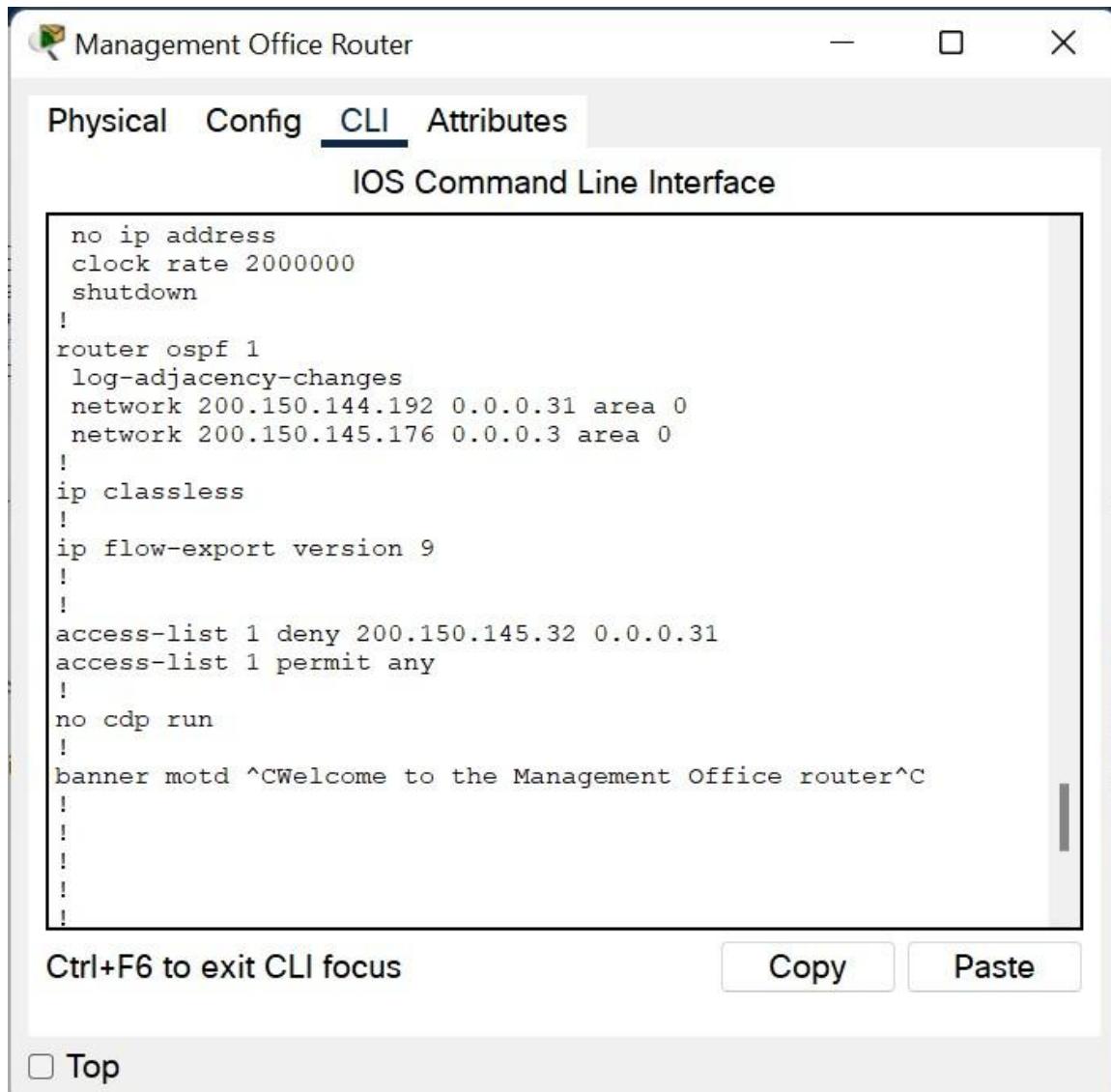
The screenshot shows a window titled "Management Office Router" with a tab bar containing "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tab bar is the title "IOS Command Line Interface". The main area displays the following configuration text:

```
Management_Office#sh run
Building configuration...

Current configuration : 990 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Management_Office
!
!
!
enable password fci
!
!
!
!
!
no ip cef
no ipv6 cef
!
```

At the bottom left of the window, there is a message: "Ctrl+F6 to exit CLI focus". At the bottom right, there are "Copy" and "Paste" buttons. A checkbox labeled "Top" is located at the very bottom left of the window frame.

Access Control



The image shows a software interface titled "Management Office Router" with a window titled "IOS Command Line Interface". The window contains the following configuration commands:

```
no ip address
clock rate 2000000
shutdown
!
router ospf 1
log-adjacency-changes
network 200.150.144.192 0.0.0.31 area 0
network 200.150.145.176 0.0.0.3 area 0
!
ip classless
!
ip flow-export version 9
!
!
access-list 1 deny 200.150.145.32 0.0.0.31
access-list 1 permit any
!
no cdp run
!
banner motd ^CWELCOME TO THE MANAGEMENT OFFICE ROUTER^C
!
!
```

At the bottom of the window, there are buttons for "Copy" and "Paste". Below the window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and a checkbox labeled "Top".

Denies PC1 and PC2