

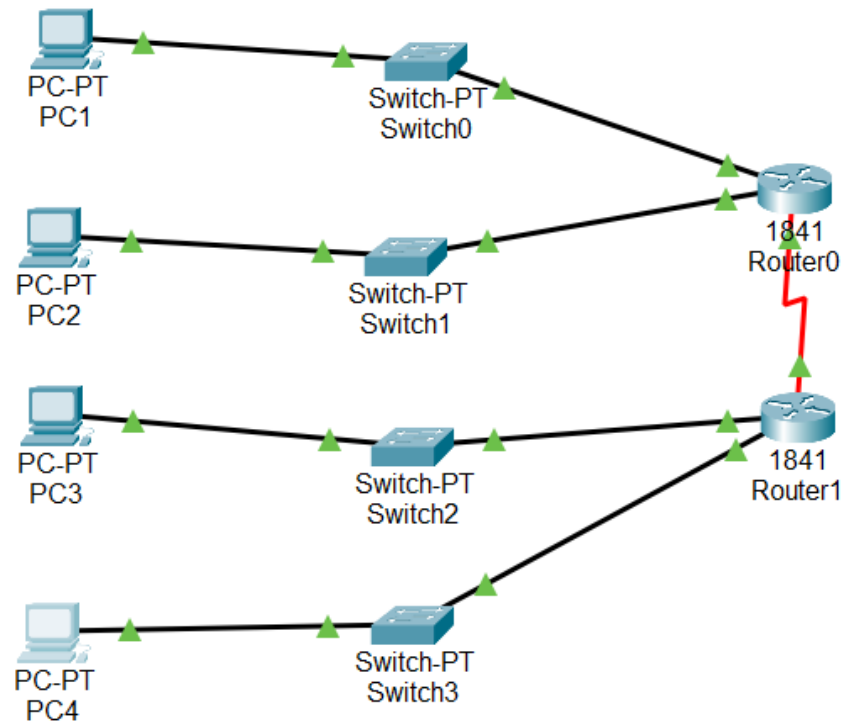
COMPUTER NETWORKS(CS-307)

LAB-11

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BSSE-5A

Topology A:



Q5: Calculate the binary value for the first five subnets. The first two subnets have been done for you.

Subnet	Network Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	192.168.100.0	0	0	0	0	0	0	0	0
1	192.168.100.0	0	0	1	0	0	0	0	0
2	192.168.100.0	0	1	0	0	0	0	0	0
3	192.168.100.0	0	1	1	0	0	0	0	0
4	192.168.100.0	1	0	0	0	0	0	0	0

Q6: Calculate the binary and decimal value of the new subnet mask.

First octet	Second Octet	Third Octet	Mask Bit 7	Mask Bit 6	Mask Bit 5	Mask Bit 4	Mask Bit 3	Mask Bit 2	Mask Bit 1	Mask Bit 0
11111111	11111111	11111111	1	1	1	1	0	0	0	0

First decimal Octet	Second decimal Octet	Third decimal Octet	Formal Decimal Octet
255.	255.	255	224

Q7. Fill in the Subnet Table, listing the decimal value of all available subnets, the first and last usable host address, and the broadcast address. Repeat until all addresses are listed.

Note: You may not need to use all rows.

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.10.0	192.168.10.1	192.168.10.30	192.168.10.31
1	192.168.10.32	192.168.10.33	192.168.10.62	192.168.10.63
2	192.168.10.64	192.168.10.65	192.168.10.94	192.168.10.95
3	192.168.10.96	192.168.10.97	192.168.10.126	192.168.10.127
4	192.168.10.128	192.168.10.129	192.168.10.158	192.168.10.159
5	192.168.10.160	192.168.10.161	192.168.10.190	192.168.10.191
6	192.168.10.192	192.168.10.193	192.168.10.222	192.168.10.223
7	192.168.10.224	192.168.10.225	192.168.10.254	192.168.10.255

Step 2: Assign the subnets to the network shown in the topology.

a) Assign Subnet 0 to the LAN connected to the GigabitEthernet 0/0 interface of R1:
192.168.100.0/27

b) Assign Subnet 1 to the LAN connected to the GigabitEthernet 0/1 interface of R1:
192.168.100.32/27

c) Assign Subnet 2 to the LAN connected to the GigabitEthernet 0/0 interface of R2:
192.168.100.64/27

d) Assign Subnet 3 to the LAN connected to the GigabitEthernet 0/1 interface of R2:
192.168.100.96/27

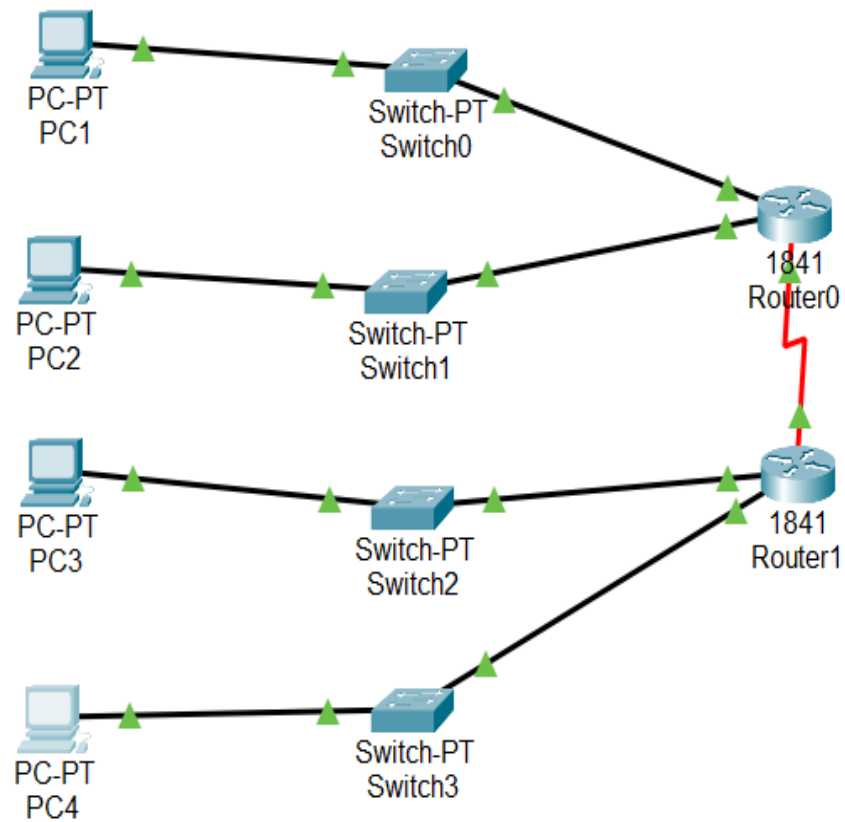
e) Assign Subnet 4 to the WAN link between R1 to R2:
192.168.100.128/27

Step 3: Document the addressing scheme.


Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.100.1	255.255.255.224	-
	G0/1	192.168.100.33	255.255.255.224	-
	S0/0/0	192.168.100.129	255.255.255.224	-
R2	G0/0	192.168.100.65	255.255.255.224	-
	G0/1	192.168.100.97	255.255.255.224	-
	S0/0/0	192.168.100.158	255.255.255.224	-
S1	VLAN 1	-	-	-
S2	VLAN 1	-	-	-
S3	VLAN 1	-	-	-
S4	VLAN 1	-	-	-
PC1	NIC	192.168.100.30	255.255.255.224	192.168.100.1
PC2	NIC	192.168.100.62	255.255.255.224	192.168.100.33
PC3	NIC	192.168.100.94	255.255.255.224	192.168.100.65
PC4	NIC	192.168.100.126	255.255.255.224	192.168.100.97

Part 2: Implement given topology in Packet Tracer and Assign IP Addresses to Network Devices and Verify Connectivity.

Step 1: Draw topology



Step 2: Assign IP Address & Serial IP address on Router 0

 Router0—□×

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/1/0

Serial0/1/1

FastEthernet0/0

FastEthernet0/1

Serial0/1/0

Serial0/1/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address 0002.16D6.C601

IP Configuration

IPv4 Address 192.168.100.1

Subnet Mask 255.255.255.224

Tx Ring Limit 10

Equivalent IOS Commands

up

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

ip address 192.168.100.1 255.255.255.0

Router(config-if)#ip address 192.168.100.1 255.255.255.224

Router(config-if)#

☐ Top

Physical Config CLI Attributes

GLOBAL	FastEthernet0/1
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Bandwidth <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
ROUTING	Duplex <input checked="" type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
Static	MAC Address <input type="text" value="0002.16D6.C602"/>
RIP	IP Configuration
SWITCHING	IPv4 Address <input type="text" value="192.168.100.33"/>
VLAN Database	Subnet Mask <input type="text" value="255.255.255.224"/>
INTERFACE	Tx Ring Limit <input type="text" value="10"/>
FastEthernet0/0	
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/1, changed state to up
no ip address
Router(config-if)#ip address 192.168.100.33 255.255.255.224
Router(config-if)#ip address 192.168.100.33 255.255.255.224
Router(config-if)#
```


Physical Config CLI Attributes

GLOBAL	Serial0/1/0
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Duplex <input type="radio"/> Full Duplex
ROUTING	Clock Rate 2000000
Static	IP Configuration
RIP	IPv4 Address 192.168.100.129
SWITCHING	Subnet Mask 255.255.255.224
VLAN Database	Tx Ring Limit 10
INTERFACE	
FastEthernet0/0	
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
Router(config-if)#ip address 192.168.100.33 255.255.255.224
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#ip address 192.168.100.129 255.255.255.224
Router(config-if)#ip address 192.168.100.129 255.255.255.224
Router(config-if)#
```

Step 3: Assign IP Address & Serial IP address on Router 1

Router1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/1/0

Serial0/1/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address 00D0.BAAA.0A01

IP Configuration

IPv4 Address 192.168.100.65

Subnet Mask 255.255.255.224

Tx Ring Limit 10

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/0, changed state to up
ip address 192.168.100.65 255.255.255.0
Router(config-if)#ip address 192.168.100.65 255.255.255.0
Router(config-if)#ip address 192.168.100.65 255.255.255.224
Router(config-if)#
```

☐ Top

Physical Config CLI Attributes

GLOBAL	FastEthernet0/1
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Bandwidth <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
ROUTING	Duplex <input checked="" type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
Static	MAC Address <input type="text" value="00D0.BAAA.0A02"/>
RIP	IP Configuration
SWITCHING	IPv4 Address <input type="text" value="192.168.100.97"/>
VLAN Database	Subnet Mask <input type="text" value="255.255.255.224"/>
INTERFACE	Tx Ring Limit <input type="text" value="10"/>
FastEthernet0/0	
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/1, changed state to up
ip address 192.168.100.97 255.255.255.224
Router(config-if)#ip address 192.168.100.97 255.255.255.224
Router(config-if)#
```

Physical Config CLI Attributes

GLOBAL	Serial0/1/0
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Duplex <input type="radio"/> Full Duplex
ROUTING	Clock Rate 2000000
Static	IP Configuration
RIP	IPv4 Address 192.168.100.158
SWITCHING	Subnet Mask 255.255.255.224
VLAN Database	
INTERFACE	
FastEthernet0/0	Tx Ring Limit 10
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
no ip address
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0,
changed state to up
ip address 192.168.100.158 255.255.255.224
Router(config-if)#ip address 192.168.100.158 255.255.255.224
Router(config-if)#
```

Step 4: Assign IP Address on PC1:

PC1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.100.30

Subnet Mask 255.255.255.224

Default Gateway 192.168.100.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::20A:F3FF:FE3D:67E2

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

Step 5: Assign IP Address on PC2:

PC2

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.100.62

Subnet Mask 255.255.255.224

Default Gateway 192.168.100.33

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::204:9AFF:FE10:288E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

Step 6: Assign IP Address on PC3:

PC3

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.100.94

Subnet Mask: 255.255.255.224

Default Gateway: 192.168.100.65

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::201:97FF:FE88:5766

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

☐ Top

Step 7: Assign IP Address on PC4:

PC4

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.100.126

Subnet Mask: 255.255.255.224

Default Gateway: 192.168.100.97

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::230:F2FF:FE1D:DB78

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

☐ Top

Step 8: Verify Connectivity by passing packets between routers

Scenario 0

New Delete

Toggle PDU List Window

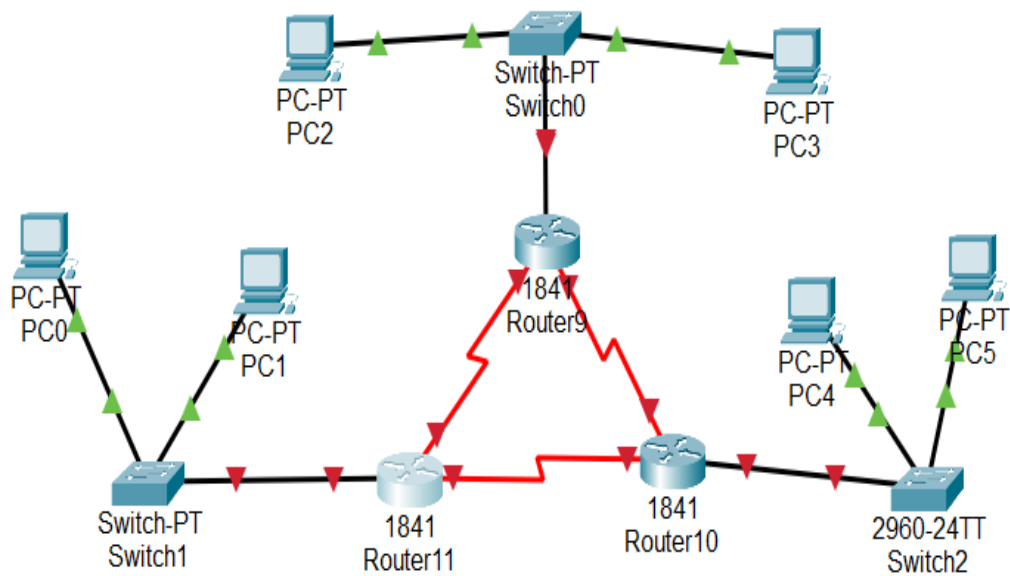
Realtime Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	Router0	ICMP	Green	0.000	N	0	(edit)	(delete)
	Successful	PC2	Router0	ICMP	Pink	0.000	N	1	(edit)	(delete)
	Successful	PC3	Router1	ICMP	Light Blue	0.000	N	2	(edit)	(delete)
	Successful	PC4	Router1	ICMP	Light Green	0.000	N	3	(edit)	(delete)


Topology B:

Implement Task 4 (Lab 10) in Packet Tracer and Assign IP Addresses to Network Devices and Verify Connectivity.

Step 1: Draw topology



Step 2: Assign IP Address & Serial IP address on Router 11

 Router11

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/1/0

Serial0/1/1

FastEthernet0/1

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

100 Mbps

10 Mbps

Half Duplex

Full Duplex

000D.BD5A.7B02

192.168.10.1

255.255.255.0

10

☒ On

☒ Auto

☒ Auto

Equivalent IOS Commands

Router(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

☐ Top

Physical Config CLI Attributes

GLOBAL	Serial0/1/0
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Duplex <input type="radio"/> Full Duplex
ROUTING	Clock Rate 2000000
Static	IP Configuration
RIP	IPv4 Address 192.168.10.33
SWITCHING	Subnet Mask 255.255.255.224
VLAN Database	Tx Ring Limit 10
INTERFACE	
FastEthernet0/0	
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
Router(config-if)#ip address 192.168.10.1 255.255.255.224
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#no shutdown
Router(config-if)#ip address 192.168.10.33 255.255.255.224
Router(config-if)#
```

☐ Top


Physical Config CLI Attributes

GLOBAL	Serial0/1/1
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Duplex <input type="radio"/> Full Duplex
ROUTING	Clock Rate 2000000
Static	IP Configuration
RIP	IPv4 Address 192.168.10.65
SWITCHING	Subnet Mask 255.255.255.224
VLAN Database	Tx Ring Limit 10
INTERFACE	
FastEthernet0/0	
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#no shutdown
Router(config-if)#ip address 192.168.10.65 255.255.255.224
Router(config-if)#ip address 192.168.10.65 255.255.255.224
Router(config-if)#
```

Step 3: Assign IP Address & Serial IP address on Router 9

 Router9

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/1/0

Serial0/1/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☒ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address 000D.BD49.D702

IP Configuration

IPv4 Address 192.168.10.97

Subnet Mask 255.255.255.224

Tx Ring Limit 10

Equivalent IOS Commands

```
up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/1, changed state to up
ip address 192.168.10.97 255.255.255.0
Router(config-if)#ip address 192.168.10.97 255.255.255.224
Router(config-if)#
```

☐ Top

Physical Config CLI Attributes

Serial0/1/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	2000000 ▾
IP Configuration	
IPv4 Address	192.168.10.34
Subnet Mask	255.255.255.224
Tx Ring Limit	10

Equivalent IOS Commands

```
%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
ip address 192.168.10.34 255.255.255.224
Router(config-if)#ip address 192.168.10.34 255.255.255.224
Router(config-if)#
```

Physical Config CLI Attributes

Serial0/1/1	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	192.168.10.129
Subnet Mask	255.255.255.224
Tx Ring Limit	10

Equivalent IOS Commands

```
Router(config-if) #
Router(config-if) #exit
Router(config) #interface Serial0/1/1
Router(config-if) #no shutdown
Router(config-if) #ip address 192.168.10.129 255.255.255.224
Router(config-if) #ip address 192.168.10.129 255.255.255.224
Router(config-if) #
```

Step 4: Assign IP Address & Serial IP address on Router 10

Router10

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/1/0

Serial0/1/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address 0004.9A2A.9E02

IP Configuration

IPv4 Address 192.168.10.161

Subnet Mask 255.255.255.224

Tx Ring Limit 10

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/1, changed state to up
ip address 192.168.10.66 255.255.255.0
Router(config-if)#ip address 192.168.10.66 255.255.255.224
Router(config-if)#ip address 192.168.10.161 255.255.255.224
Router(config-if)#
```

☐ Top

Physical Config CLI Attributes

GLOBAL	Serial0/1/0
Settings	Port Status <input checked="" type="checkbox"/> On
Algorithm Settings	Duplex <input type="radio"/> Full Duplex
ROUTING	Clock Rate 2000000
Static	IP Configuration
RIP	IPv4 Address 192.168.10.66
SWITCHING	Subnet Mask 255.255.255.224
VLAN Database	Tx Ring Limit 10
INTERFACE	
FastEthernet0/0	
FastEthernet0/1	
Serial0/1/0	
Serial0/1/1	

Equivalent IOS Commands

```
%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
ip address 192.168.10.66 255.255.255.224
Router(config-if)#ip address 192.168.10.66 255.255.255.224
Router(config-if)#
```

☐ Top

Router10

Physical
 Config
 CLI
 Attributes

GLOBAL
 Settings
 Algorithm Settings
 ROUTING
 Static
 RIP
 SWITCHING
 VLAN Database
 INTERFACE
 FastEthernet0/0
 FastEthernet0/1
 Serial0/1/0
 Serial0/1/1

Serial0/1/1

Port Status ☒ On

Duplex ☐ Full Duplex

Clock Rate 1200

IP Configuration

IPv4 Address 192.168.10.130
 Subnet Mask 255.255.255.224

Tx Ring Limit 10

Equivalent IOS Commands


```

ip address 192.168.10.66 255.255.255.224
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#ip address 192.168.10.130 255.255.255.224
Router(config-if)#ip address 192.168.10.130 255.255.255.224
Router(config-if)#
    
```

☐ Top

Step 5 : Verify Connectivity by passing packets between routers

Scenario 0

New
 Delete

 Toggle PDU List Window

Realtime

Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Route...	Router10	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Router9	Router10	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Route...	Router9	ICMP		0.000	N	2	(edit)	(delete)