

## Lab Exercise:

### Note:

One VLAN number according to your roll no.

E.g: VLAN49(Your Rollno:22k4649)

Create four VLANs(CS, DS, EE, and AI), and assign PCs to those VLANs.

Connect the switches together using a **trunk port**.

Use a **router** (Router-on-a-Stick) to allow communication between different VLANs.

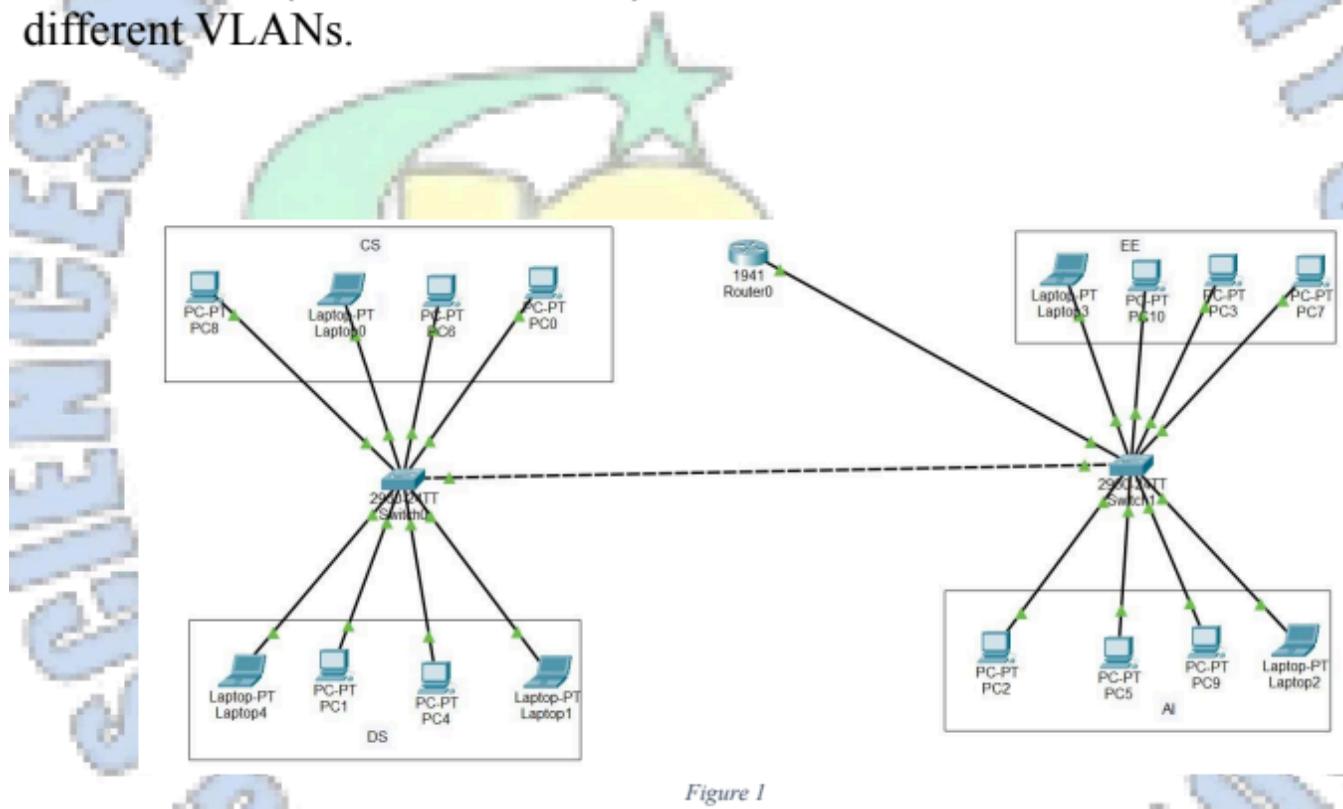
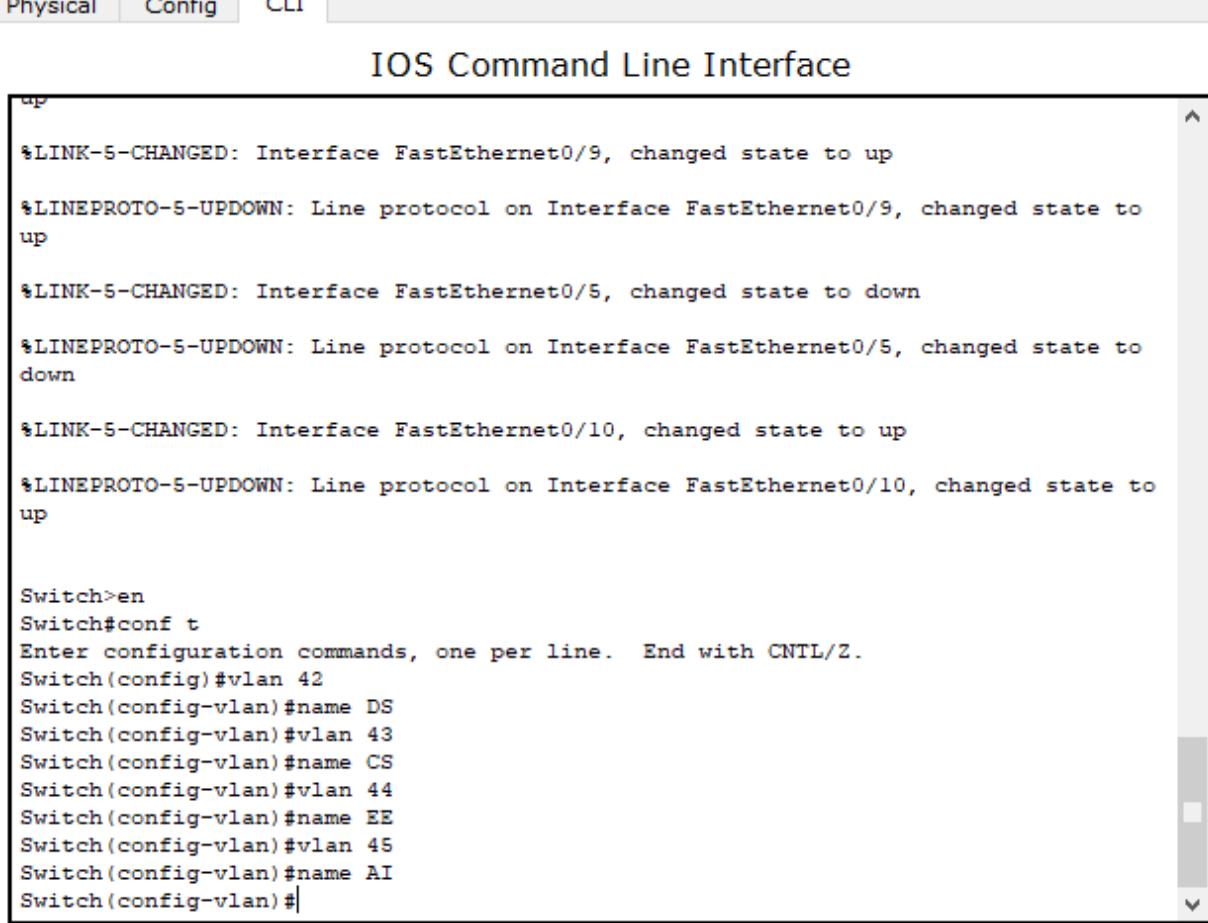


Figure 1



The screenshot shows a window titled "IOS Command Line Interface" for a device named "23K-0842 Switch0". The window has tabs for "Physical", "Config", and "CLI", with "CLI" selected. The main area displays the following text:

```
up
*LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
*LINK-5-CHANGED: Interface FastEthernet0/5, changed state to down
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to down
*LINK-5-CHANGED: Interface FastEthernet0/10, changed state to up
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 42
Switch(config-vlan)#name DS
Switch(config-vlan)#vlan 43
Switch(config-vlan)#name CS
Switch(config-vlan)#vlan 44
Switch(config-vlan)#name EE
Switch(config-vlan)#vlan 45
Switch(config-vlan)#name AI
Switch(config-vlan)#

```

At the bottom right of the window are "Copy" and "Paste" buttons.

```
Switch(config)#vlan 42
Switch(config-vlan)#name DS
Switch(config-vlan)#vlan 43
Switch(config-vlan)#name CS
Switch(config-vlan)#vlan 44
Switch(config-vlan)#name EE
Switch(config-vlan)#vlan 45
Switch(config-vlan)#name AI
```

42 comes in my roll no.

23K-0842 Switch0

Physical Config CLI

### IOS Command Line Interface

```
Switch(config-vlan)#vlan 43
Switch(config-vlan)#name CS
Switch(config-vlan)#vlan 44
Switch(config-vlan)#name EE
Switch(config-vlan)#vlan 45
Switch(config-vlan)#name AI
Switch(config-vlan)#
Switch#
*SYS-5-CONFIG_I: Configured from console by console

Switch#en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int fa0/10
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 42
Switch(config-if)#int fa0/6
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 42
Switch(config-if)#int fa0/7
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 42
Switch(config-if)#int fa0/8
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 42
Switch(config-if)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 43
Switch(config-if)#int fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 43
Switch(config-if)#int fa0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 43
Switch(config-if)#int fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 43
Switch(config-if)#int fa0/24
Switch(config-if)#switchport mode trunk
```

23K-0842 Switch1

[Physical](#) [Config](#) [CLI](#)

### IOS Command Line

```
Switch(config)#vlan 42
Switch(config-vlan)#name DS
Switch(config-vlan)#vlan 43
Switch(config-vlan)#name CS
Switch(config-vlan)#vlan 44
Switch(config-vlan)#name EE
Switch(config-vlan)#vlan 45
Switch(config-vlan)#name AI
Switch(config-vlan)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan45
```

23K-0842 Switch1

[Physical](#) [Config](#) [CLI](#)

### IOS Command Line Interface

```
Switch(config-vlan)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan45
^
% Invalid input detected at '^' marker.

Switch(config-if)#switchport access vlan 45
Switch(config-if)#int fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 45
Switch(config-if)#int fa0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 45
Switch(config-if)#int fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 45
```

23K-0842 Switch1

[Physical](#) [Config](#) [CLI](#)

### IOS Command Line Inte

```
Switch(config)#int fa0/5
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 44
Switch(config-if)#int fa0/6
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 44
Switch(config-if)#int fa0/7
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 44
Switch(config-if)#int fa0/8
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 44
Switch(config-if)#int fa0/24
Switch(config-if)#switchport mode access
Switch(config-if)#switchport mode trunk
```

23K-0842 Switch0

Physical Config CLI

IOS Command Line Interface

```
Switch>show vlan brief

VLAN Name          Status      Ports
---- -----
1     default      active      Fa0/5, Fa0/9, 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
42    DS           active      Fa0/6, Fa0/7, Fa0/8, Fa0/10
43    CS           active      Fa0/1, Fa0/2, Fa0/3, Fa0/4
44    EE           active
45    AI           active
1002  fddi-default active
1003  token-ring-default active
1004  fddinet-default active
1005  trnet-default active
Switch>
```

Copy Paste

Switch>show vlan brief

VLAN Name Status Ports

```
-----  
1 default active Fa0/5, Fa0/9, 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  
42 DS active Fa0/6, Fa0/7, Fa0/8, Fa0/10  
43 CS active Fa0/1, Fa0/2, Fa0/3, Fa0/4  
44 EE active  
45 AI active  
1002 fddi-default active  
1003 token-ring-default active  
1004 fddinet-default active  
1005 trnet-default active
```

23K-0842 Switch1

Physical Config CLI

### IOS Command Line Interface

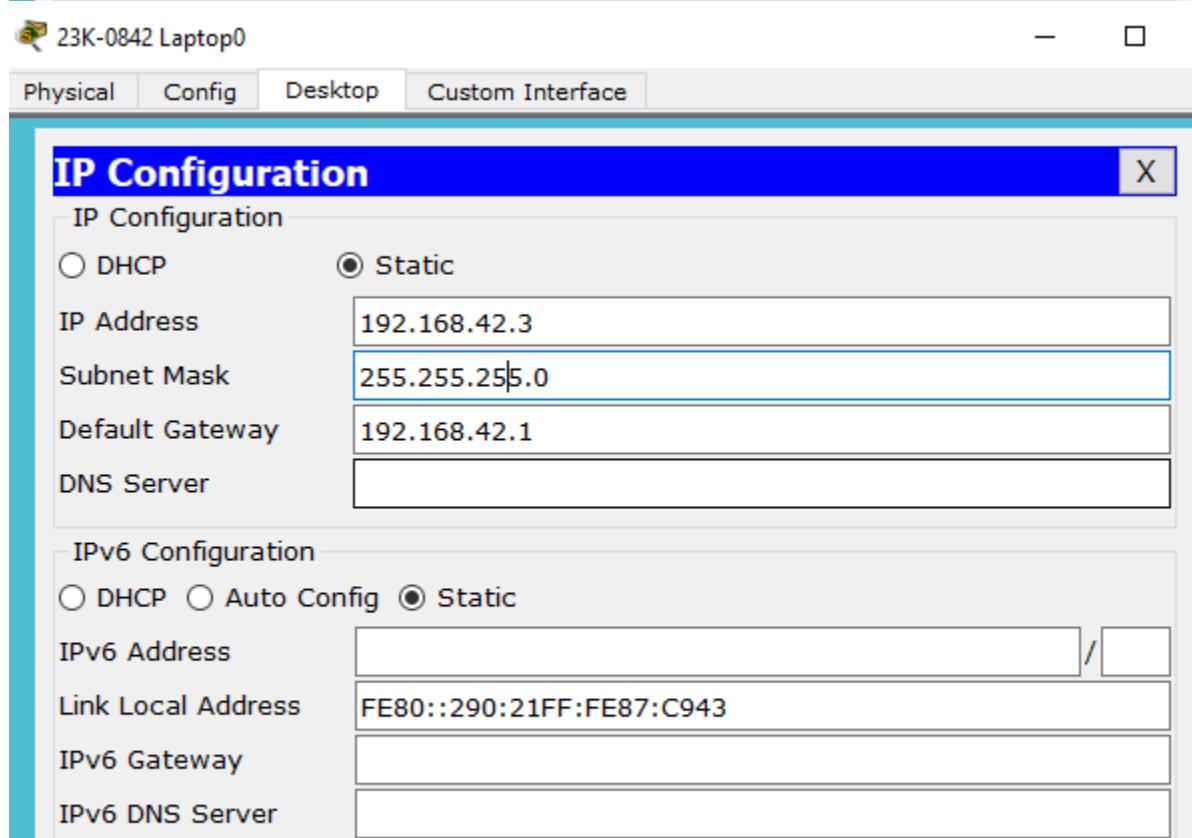
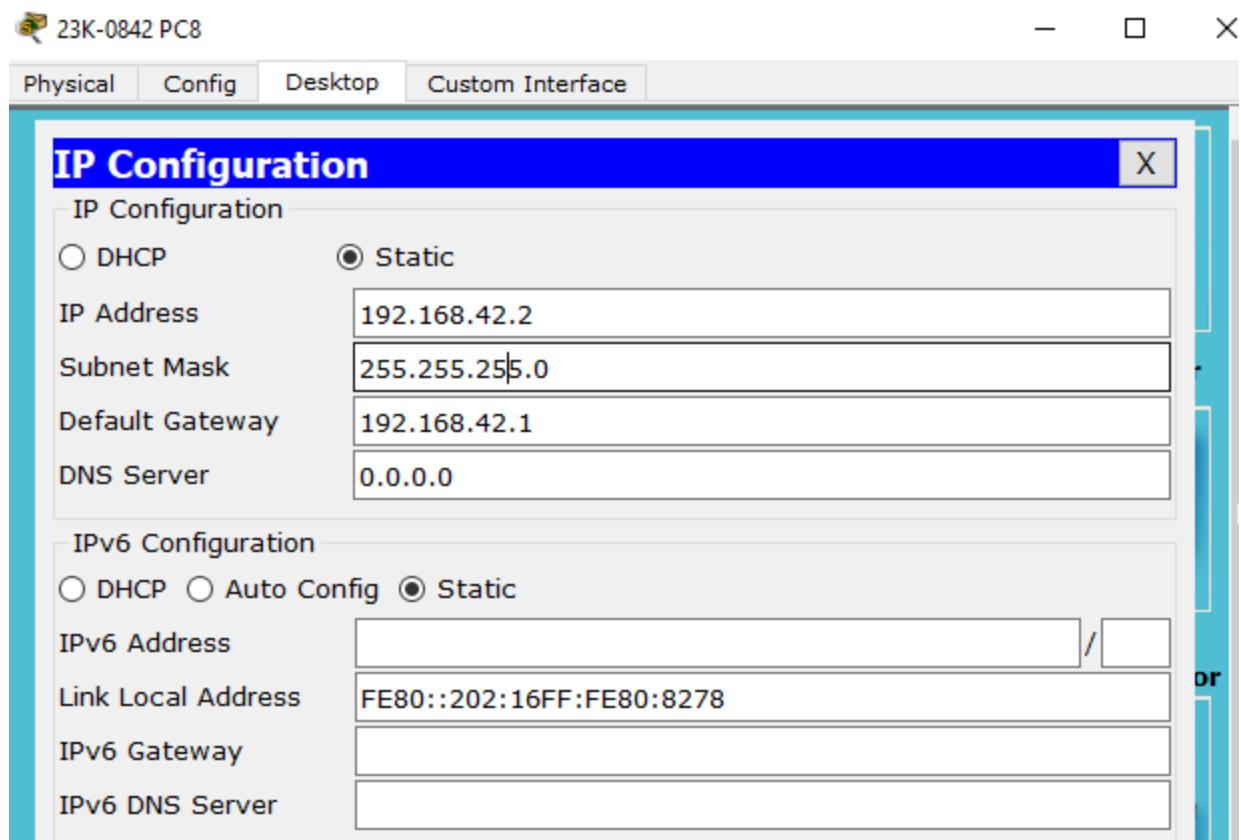
```
Switch(config-if)#ex
Switch(config)#ex
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan brief

VLAN Name Status Ports
-----
1   default      active  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
42  DS          active
43  CS          active
44  EE          active  Fa0/5, Fa0/6, Fa0/7, Fa0/8
45  AI          active  Fa0/1, Fa0/2, Fa0/3, Fa0/4
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
Switch#
```

Copy Paste

```
Switch#show vlan brief
VLAN Name Status Ports
-----
1 default active 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
42 DS active
43 CS active
44 EE active Fa0/5, Fa0/6, Fa0/7, Fa0/8
45 AI active Fa0/1, Fa0/2, Fa0/3, Fa0/4
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
Switch#
```



The image displays three separate windows, each titled "IP Configuration", showing network settings for different hosts. All three hosts are configured with static IP addresses in the 192.168.42.x range, using a subnet mask of 255.255.255.0 and a default gateway of 192.168.42.1. The DNS server field is empty in all cases.

**23K-0842 PC6 Configuration:**

Setting	Value
IP Configuration	Static
IP Address	192.168.42.4
Subnet Mask	255.255.255.0
Default Gateway	192.168.42.1
DNS Server	

**23K-0842 PC0 Configuration:**

Setting	Value
IP Configuration	Static
IP Address	192.168.42.5
Subnet Mask	255.255.255.0
Default Gateway	192.168.42.1
DNS Server	

**23K-0842 Laptop4 Configuration:**

Setting	Value
IP Configuration	Static
IP Address	192.168.43.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.43.1
DNS Server	

23K-0842 PC4

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

DHCP  Static

IP Address: 192.168.43.3  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.43.1  
DNS Server:

23K-0842 PC1

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

DHCP  Static

IP Address: 192.168.43.4  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.43.1  
DNS Server: 0.0.0.0

23K-0842 Laptop1

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

DHCP  Static

IP Address: 192.168.43.5  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.43.1  
DNS Server:

The image displays three separate windows, each titled "IP Configuration", showing network settings for different devices. All three windows have a blue header bar with the title and a close button (X) in the top right corner. Below the header is a toolbar with four tabs: "Physical", "Config", "Desktop", and "Custom Interface". The "Config" tab is selected in all three windows.

**23K-0842 Laptop3 (Top Window):**

IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IP Address	192.168.44.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.44.1
DNS Server	

**23K-0842 PC10 (Middle Window):**

IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IP Address	192.168.44.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.44.1
DNS Server	

**23K-0842 PC3 (Bottom Window):**

IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IP Address	192.168.44.4
Subnet Mask	255.255.255.0
Default Gateway	192.168.44.1
DNS Server	

23K-0842 PC7

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

DHCP  Static

IP Address: 192.168.44.5  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.44.1  
DNS Server:

23K-0842 PC2

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

DHCP  Static

IP Address: 192.168.45.2  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.45.1  
DNS Server:

23K-0842 PC5

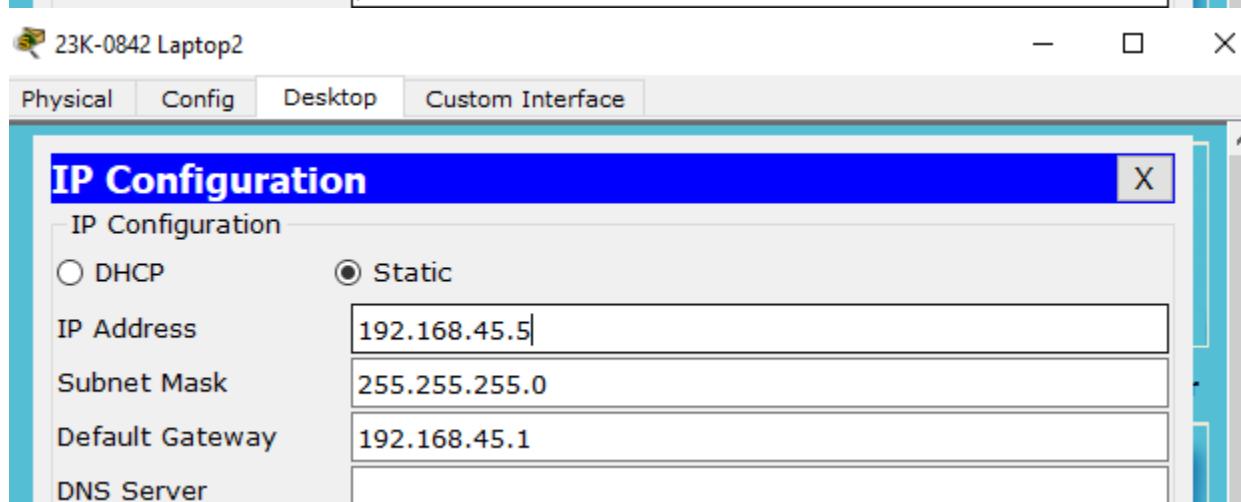
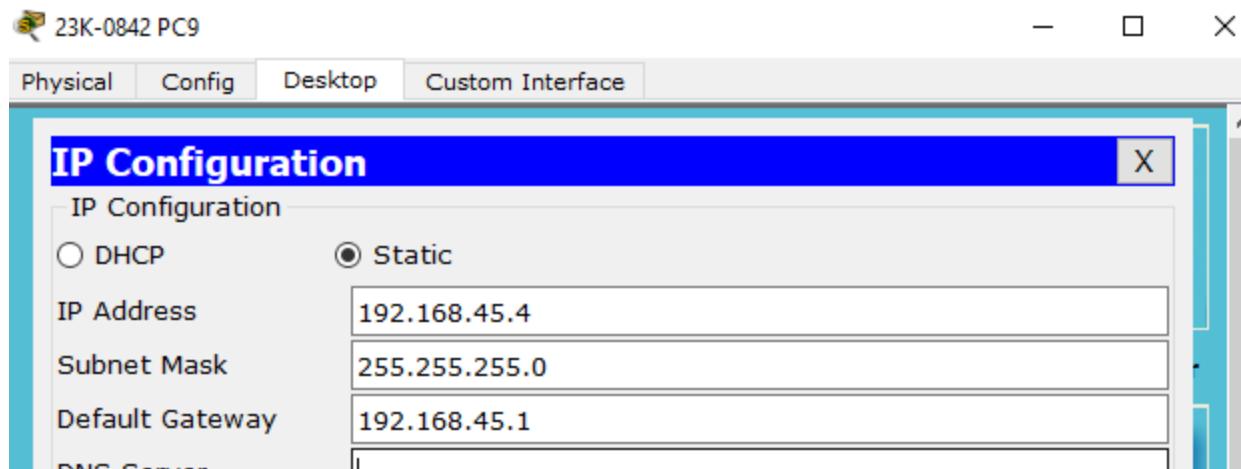
Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

DHCP  Static

IP Address: 192.168.45.3  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.45.1  
DNS Server:



23K-0842 Switch1

Physical Config CLI

### IOS Command Line Interface

```
Switch#en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int fa0/10
Switch(config-if)#switchport mode trunk

Switch(config-if)#
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to
down

*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to
up

Switch(config-if)#
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to
down

*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to
up
```

23K-0842 Switch0

Physical Config CLI

### IOS Command Line Interface

```
Switch(config)#int fa0/9
Switch(config-if)#switchport5 mode trunk
^
* Invalid input detected at '^' marker.

Switch(config-if)#switchport mode trunk

Switch(config-if)#
*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to
down

*LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to
up
```

23K-0842 PC2

Physical Config Desktop Custom Interface

### Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.44.1

Pinging 192.168.44.1 with 32 bytes of data:

Reply from 192.168.44.1: bytes=32 time=2ms TTL=255
Reply from 192.168.44.1: bytes=32 time=1ms TTL=255
Reply from 192.168.44.1: bytes=32 time=0ms TTL=255
Reply from 192.168.44.1: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.44.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 1ms

PC>ping 192.168.44.2

Pinging 192.168.44.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.44.2: bytes=32 time=0ms TTL=127
Reply from 192.168.44.2: bytes=32 time=1ms TTL=127
Reply from 192.168.44.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.44.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.44.3

Pinging 192.168.44.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.44.3: bytes=32 time=0ms TTL=127
Reply from 192.168.44.3: bytes=32 time=0ms TTL=127
Reply from 192.168.44.3: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.44.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

The screenshot shows a software interface for managing network interfaces. At the top, there are tabs for "Physical", "Config", "Desktop", and "Custom Interface". Below the tabs, there are icons representing different interface types. A central window is titled "Command Prompt" and contains the following text output from ping commands:

```
PC>ping 192.168.42.2

Pinging 192.168.42.2 with 32 bytes of data:

Reply from 192.168.42.2: bytes=32 time=0ms TTL=127
Reply from 192.168.42.2: bytes=32 time=0ms TTL=127
Reply from 192.168.42.2: bytes=32 time=15ms TTL=127
Reply from 192.168.42.2: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.42.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 15ms, Average = 4ms

PC>ping 192.168.42.3

Pinging 192.168.42.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.42.3: bytes=32 time=9ms TTL=127
Reply from 192.168.42.3: bytes=32 time=0ms TTL=127
Reply from 192.168.42.3: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.42.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 9ms, Average = 3ms

PC>
```

The screenshot shows a Cisco Network Simulator interface titled "23K-0842 Laptop0". The "Command Prompt" window is open, displaying ping results for three hosts:

```
PC>ping 192.168.43.5
Pinging 192.168.43.5 with 32 bytes of data:
Request timed out.
Reply from 192.168.43.5: bytes=32 time=0ms TTL=127
Reply from 192.168.43.5: bytes=32 time=1ms TTL=127
Reply from 192.168.43.5: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.43.5:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.45.3
Pinging 192.168.45.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.45.3: bytes=32 time=0ms TTL=127
Reply from 192.168.45.3: bytes=32 time=0ms TTL=127
Reply from 192.168.45.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.45.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 192.168.44.2
Pinging 192.168.44.2 with 32 bytes of data:
Reply from 192.168.44.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.44.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```

The screenshot shows a Cisco Packet Tracer interface titled "Command Prompt". The window displays the output of several ping commands sent from a PC to hosts with IP addresses 192.168.44.2, 192.168.42.2, and 192.168.43.2. The results show 100% packet delivery with zero loss and very low round-trip times (0ms to 1ms).

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.44.2

Pinging 192.168.44.2 with 32 bytes of data:

Reply from 192.168.44.2: bytes=32 time=1ms TTL=128
Reply from 192.168.44.2: bytes=32 time=0ms TTL=128
Reply from 192.168.44.2: bytes=32 time=0ms TTL=128
Reply from 192.168.44.2: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.44.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.42.2

Pinging 192.168.42.2 with 32 bytes of data:

Reply from 192.168.42.2: bytes=32 time=0ms TTL=127

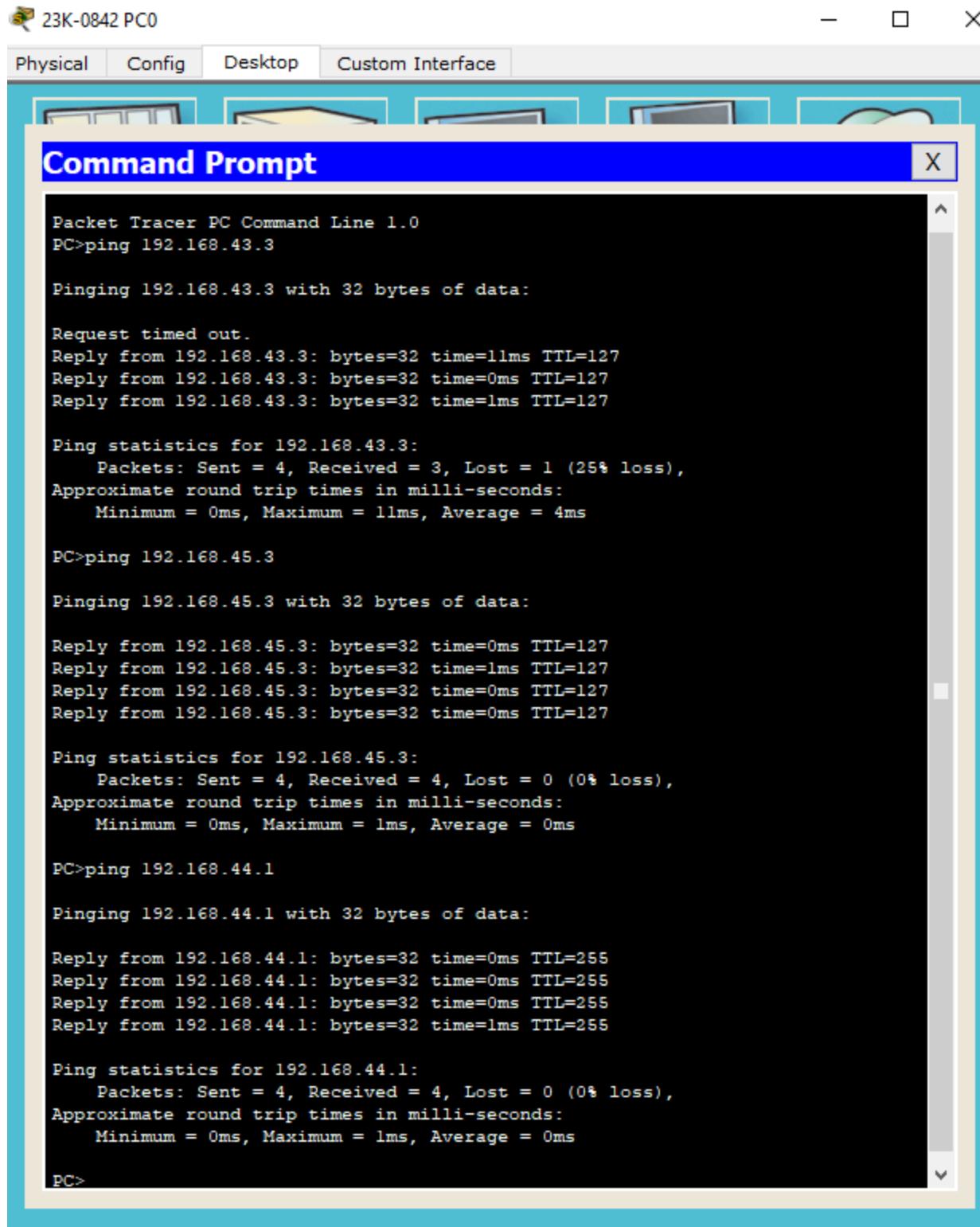
Ping statistics for 192.168.42.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 192.168.43.2

Pinging 192.168.43.2 with 32 bytes of data:

Reply from 192.168.43.2: bytes=32 time=1ms TTL=127
Reply from 192.168.43.2: bytes=32 time=0ms TTL=127
Reply from 192.168.43.2: bytes=32 time=0ms TTL=127
Reply from 192.168.43.2: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.43.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```



23K-0842 PC0

Physical Config Desktop Custom Interface

**Command Prompt**

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.43.3

Pinging 192.168.43.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.43.3: bytes=32 time=11ms TTL=127
Reply from 192.168.43.3: bytes=32 time=0ms TTL=127
Reply from 192.168.43.3: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.43.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 4ms

PC>ping 192.168.45.3

Pinging 192.168.45.3 with 32 bytes of data:

Reply from 192.168.45.3: bytes=32 time=0ms TTL=127
Reply from 192.168.45.3: bytes=32 time=1ms TTL=127
Reply from 192.168.45.3: bytes=32 time=0ms TTL=127
Reply from 192.168.45.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.45.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.44.1

Pinging 192.168.44.1 with 32 bytes of data:

Reply from 192.168.44.1: bytes=32 time=0ms TTL=255
Reply from 192.168.44.1: bytes=32 time=0ms TTL=255
Reply from 192.168.44.1: bytes=32 time=0ms TTL=255
Reply from 192.168.44.1: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.44.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PDU List Window										
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	
●	Successful	23K-0842 PC7	23K-0842 Laptop2	ICMP	#FF0000	0.000	N	1	(edit)	
●	Successful	23K-0842 PC3	23K-0842 Laptop2	ICMP	#E64A19	0.000	N	2	(edit)	
●	Successful	23K-0842 PC0	23K-0842 PC5	ICMP	#00FFFF	0.000	N	3	(edit)	
●	Successful	23K-0842 Laptop1	23K-0842 PC2	ICMP	#3CB371	0.000	N	4	(edit)	
●	Successful	23K-0842 PC1	23K-0842 PC10	ICMP	#FF00FF	0.000	N	5	(edit)	
●	Successful	23K-0842 PC0	23K-0842 Laptop4	ICMP	#D2B48C	0.000	N	6	(edit)	
●	Successful	23K-0842 PC3	23K-0842 Laptop0	ICMP	#A0A0FA	0.000	N	7	(edit)	
●	Successful	23K-0842 PC9	23K-0842 Laptop3	ICMP	#800080	0.000	N	8	(edit)	
●	Successful	23K-0842 Laptop3	23K-0842 PC8	ICMP	#400080	0.000	N	9	(edit)	

