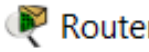
1. Implement the example give in lab 9 on cisco packet tracer but use network address as 30.20.0.0/24 using RIP.




```
%SYS-5-CONFIG_I: Configured from console by console

Router#enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#ip address 30.20.0.1 255.255.255.240
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface se2/0
Router(config-if)#ip address 30.20.0.33 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 30.20.0.0
Router(config-router)#no auto-summary
Router(config-router)#exit
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#
```

Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#ip address 30.20.0.17 255.255.255.240
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface se2/0
Router(config-if)#ip address 30.20.0.34 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 30.20.0.0
Router(config-router)#no auto-summary
Router(config-router)#exit
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write
Building configuration...
[OK]
Router#
```

Router0

Physical Config CLI Attributes

GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0

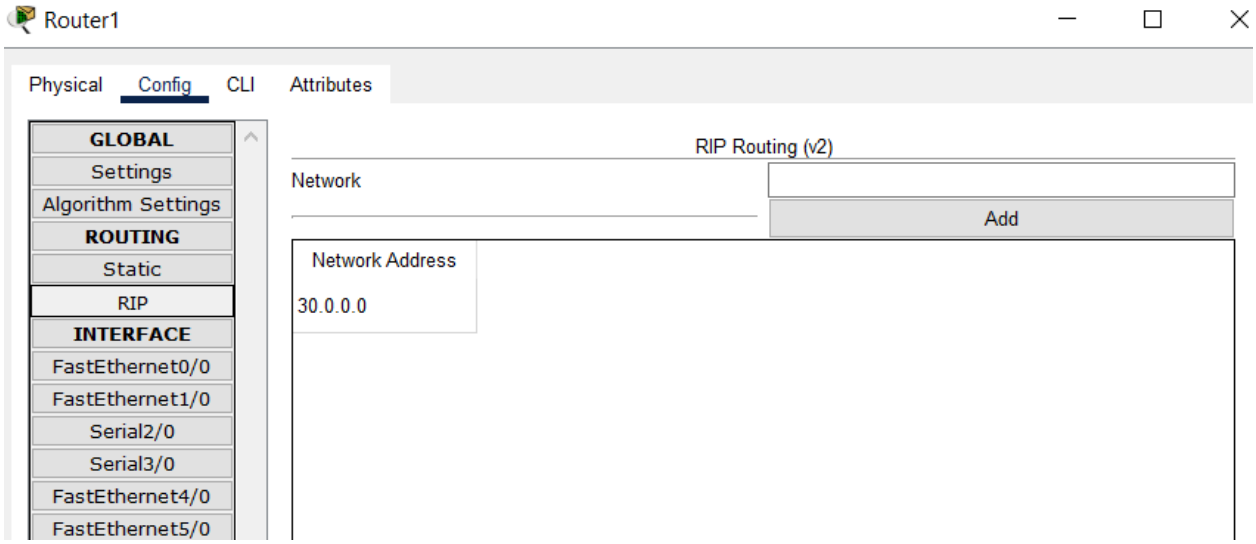
RIP Routing (v2)

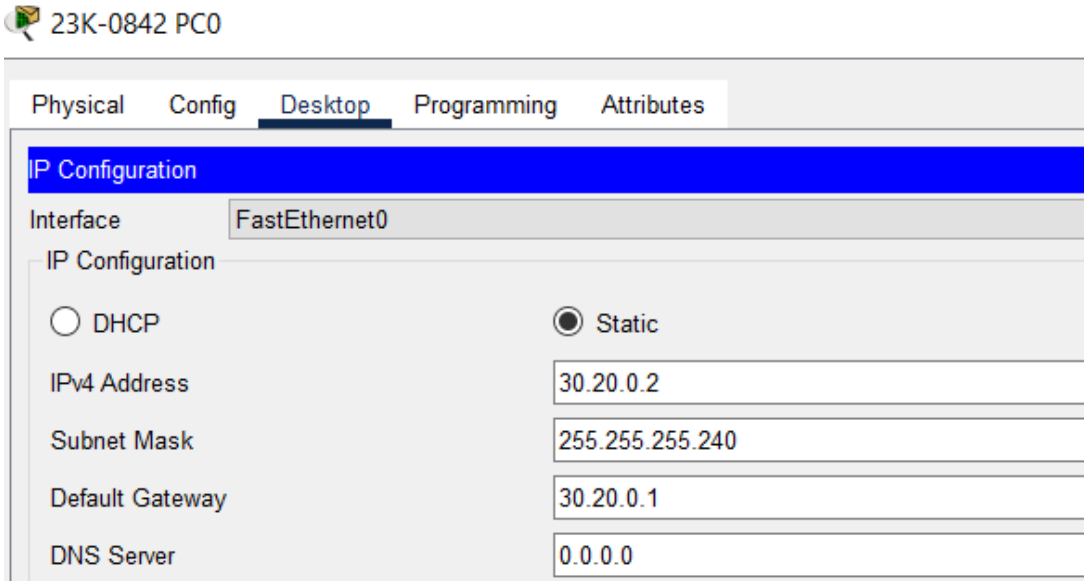
Network

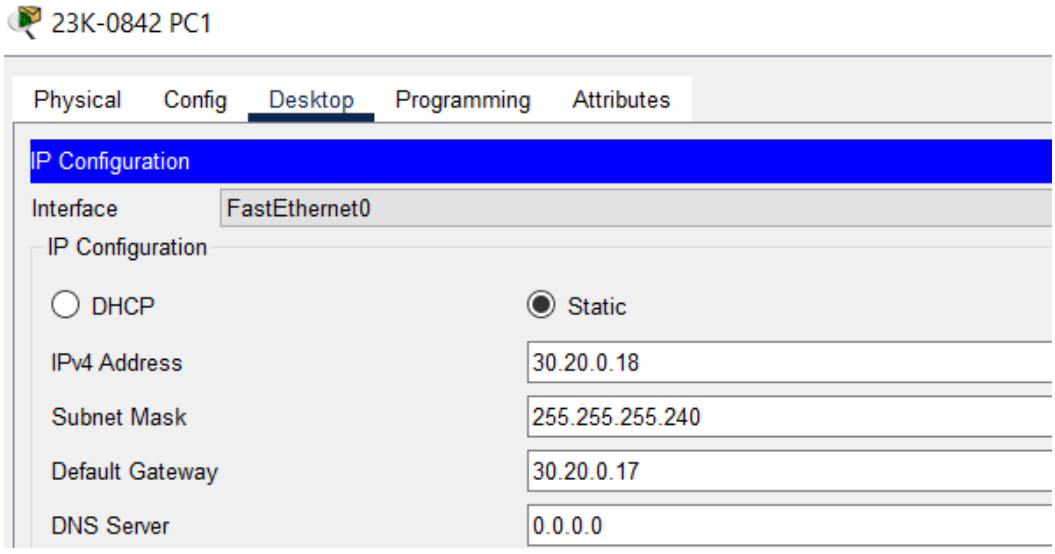
Add

Network Address

30.0.0.0


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
Serial2/0
Serial3/0
FastEthernet4/0
FastEthernet5/0
RIP Routing (v2)
Network
Add
Network Address
30.0.0.0


23K-0842 PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
30.20.0.2
Subnet Mask
255.255.255.240
Default Gateway
30.20.0.1
DNS Server
0.0.0.0


23K-0842 PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
30.20.0.18
Subnet Mask
255.255.255.240
Default Gateway
30.20.0.17
DNS Server
0.0.0.0

Testing ping:

23K-0842 PC0

Physical Config Desktop Programming Attributes

Command Prompt

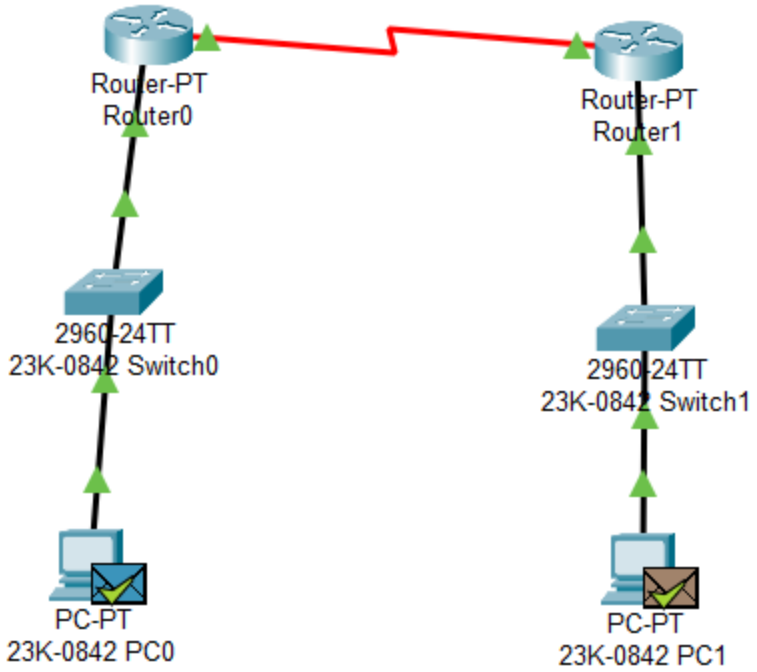
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 30.20.0.18

Pinging 30.20.0.18 with 32 bytes of data:

Reply from 30.20.0.18: bytes=32 time=1ms TTL=126
Reply from 30.20.0.18: bytes=32 time=1ms TTL=126

Ping statistics for 30.20.0.18:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 11ms, Average = 4ms

C:\>
```

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	23K-0...	23K-0842 ...	ICMP		0.000	N	0	(edit)	(delete)
	Successful	23K-0...	23K-0842 ...	ICMP		0.000	N	1	(edit)	(delete)

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	23K-0842 PC0	ICMP
	0.000	--	23K-0842 PC1	ICMP
	0.001	23K-0842 PC0	23K-0842 Switch0	ICMP
	0.001	23K-0842 PC1	23K-0842 Switch1	ICMP
	0.002	23K-0842 Switch0	Router0	ICMP
	0.002	23K-0842 Switch1	Router1	ICMP
	0.003	Router0	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router1	23K-0842 Switch1	ICMP
	0.004	Router0	23K-0842 Switch0	ICMP
	0.005	23K-0842 Switch1	23K-0842 PC1	ICMP
	0.005	23K-0842 Switch0	23K-0842 PC0	ICMP
	0.006	23K-0842 PC1	23K-0842 Switch1	ICMP
	0.006	23K-0842 PC0	23K-0842 Switch0	ICMP
	0.007	23K-0842 Switch1	Router1	ICMP
	0.007	23K-0842 Switch0	Router0	ICMP
	0.008	Router1	Router0	ICMP



Router0

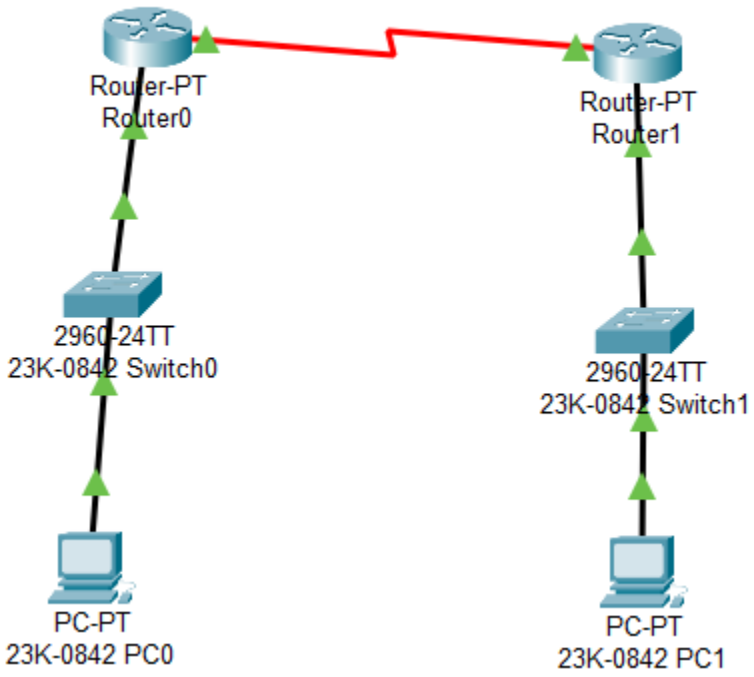
```
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#exit
Router#show 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

     30.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C       30.20.0.0/28 is directly connected, FastEthernet0/0
R       30.20.0.16/28 [120/1] via 30.20.0.34, 00:00:18, Serial2/0
C       30.20.0.32/30 is directly connected, Serial2/0

Router#
```

Router1

```
                    ^
% Invalid input detected at '^' marker.

Router#show 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

     30.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
R       30.20.0.0/28 [120/1] via 30.20.0.33, 00:00:26, Serial2/0
C       30.20.0.16/28 is directly connected, FastEthernet0/0
C       30.20.0.32/30 is directly connected, Serial2/0

Router#
```

Copy Paste

We see routes learned via RIP to the other LAN.



2. Let`s consider an example of subnetting for ABC Company. There are 3 departments i.e. Acco Academics and Development.
   You have to perform subnetting for the allocation of the given requirement:
   120 PCs for Academics
   35 PCs for Development
   10 PCs for Accounts

   The network address for the given scenario is 192.168.50.0/24. Only show calculation.
   Note: Do it on paper and paste Snap of it.

Department	Req. hosts	Subnet	Mask	Network Addr	Usable Hosts	Broadcast Addr
Academics	120	192.168.50.0 /25	255.255.255.128	192.168.50.0	192.168.50.1 – 192.168.50.126	192.168.50.127
Development	35	192.168.50.128/26	255.255.255.192	192.168.50.128	192.168.50.129 – 192.168.50.190	192.168.50.191
Accounts	10	192.168.50.192/28	255.255.255.240	192.168.50.192	192.168.50.193 – 192.168.50.206	192.168.50.207

Scanned paper attached.

3. Let`s consider an example of subnetting for FAST NUCES. There are 3 departments i.e. CS, AI and DS
   You have to perform subnetting for the allocation of the given requirement:
   90 PCs for DS
   50 PCs for CS
   20 PCs for AI

   The network address for the given scenario is 195.178.100.0/24. Implement it on Cisco Packet Tracer and Apply RIPv2.

Department	**Required PCs**
DS	90
CS	50
AI	20

Main network: **195.178.100.0/24**

Dept	**Required PCs**	**Total (2^n)**	**Usable**	**Prefix**	**Block Size**
DS	90	128	126	**/25**	128
CS	50	64	62	**/26**	64
AI	20	32	30	**/27**	32

LAN	**Network**	**Prefix**	**Gateway (Router Interface)**
DS LAN	195.178.100.0/25	255.255.255.128	195.178.100.1
AI LAN	195.178.100.128/26	255.255.255.192	195.178.100.129
CS LAN	195.178.100.192/27	255.255.255.224	195.178.100.193

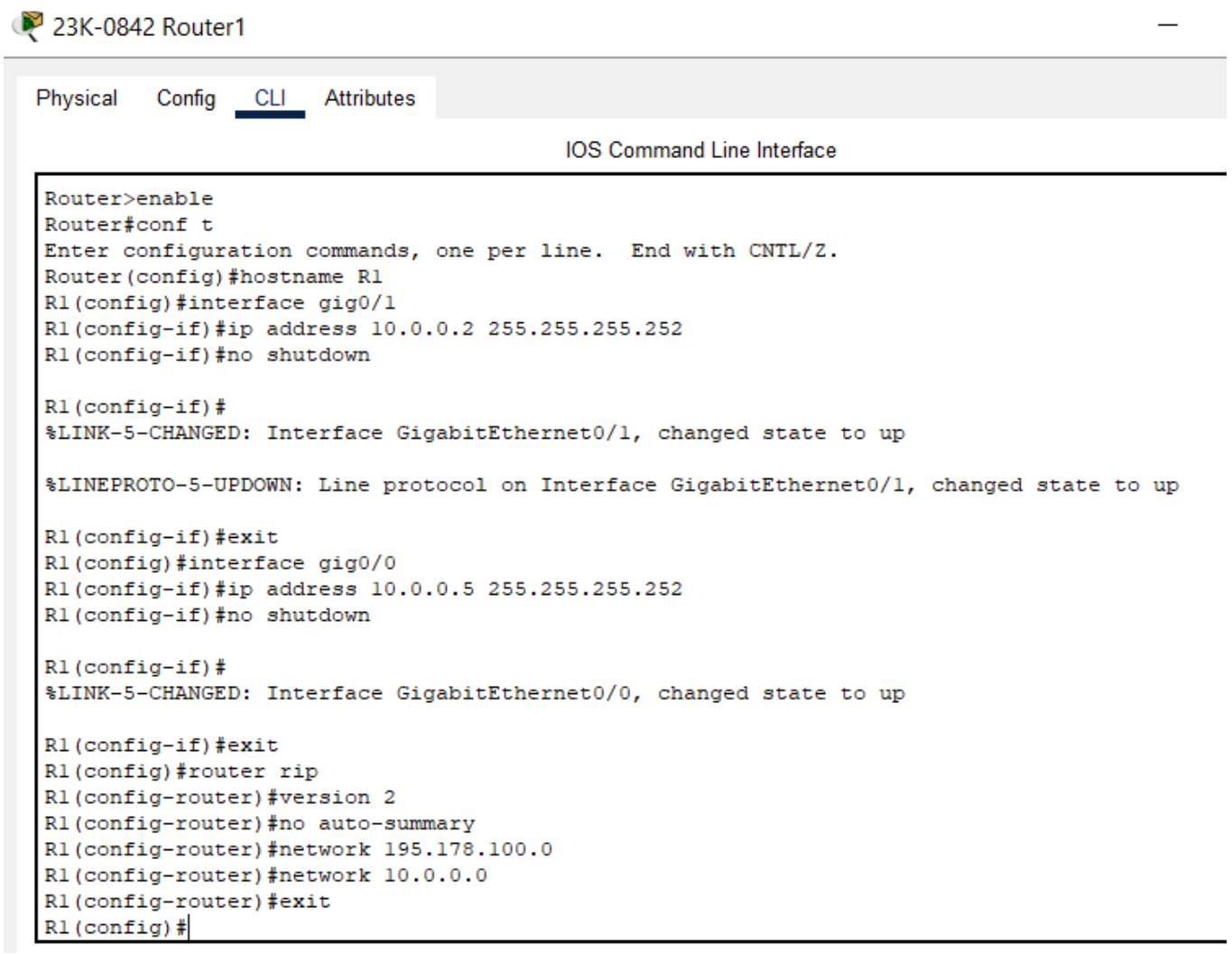
Router Link	**Network**	**Prefix**	**Subnet Mask**
R0 ↔ R1	10.0.0.0/30	/30	255.255.255.252
R1 ↔ R2	10.0.0.4/30	/30	255.255.255.252
R0 ↔ R2	10.0.0.8/30	/30	255.255.255.252

23K-0842 Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Press RETURN to get started!


Press RETURN to get started!


Router>enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface gig0/2
Router(config-if)#ip address 10.0.0.1 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

Router(config-if)#exit
Router(config)#interface gig0/1
Router(config-if)#ip address 10.0.0.9 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#network 195.178.100.0
Router(config-router)#network 10.0.0.0
Router(config-router)#exit
Router(config)#
```


23K-0842 Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#interface gig0/1
R1(config-if)#ip address 10.0.0.2 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
R1(config-if)#exit
R1(config)#interface gig0/0
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
R1(config-if)#exit
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#no auto-summary
R1(config-router)#network 195.178.100.0
R1(config-router)#network 10.0.0.0
R1(config-router)#exit
R1(config)#

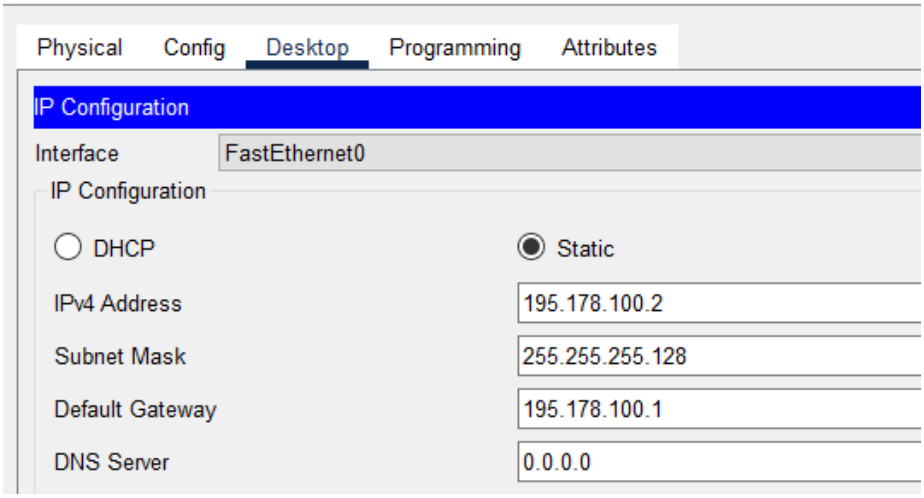
23K-0842 Router2

Physical Config CLI Attributes

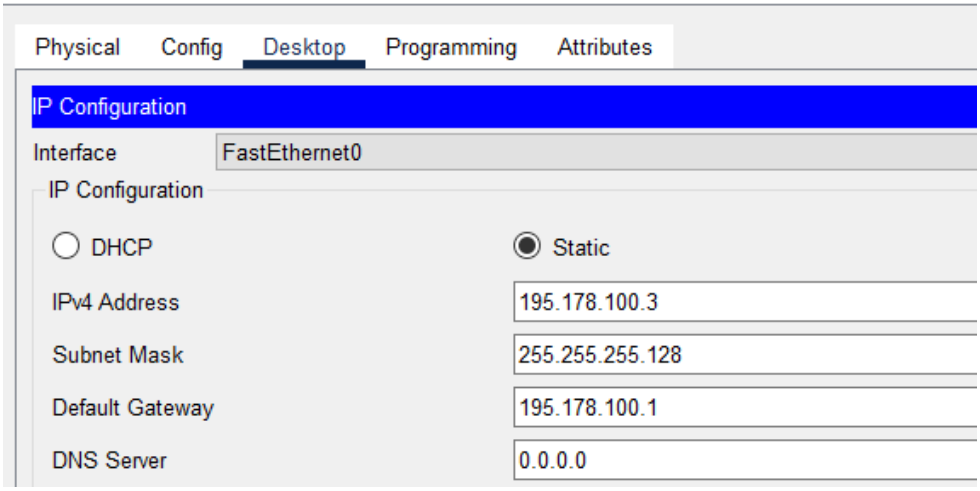
IOS Command Line Interface

```
Press RETURN to get started!



Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface gig0/0
R2(config-if)#ip address 10.0.0.10 255.255.255.252
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

R2(config-if)#exit
R2(config)#interface gig0/2
R2(config-if)#ip address 10.0.0.6 255.255.255.252
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

R2(config-if)#exit
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#no auto-summary
R2(config-router)#network 195.178.100.0
R2(config-router)#network 10.0.0.0
R2(config-router)#exit
R2(config)#
```

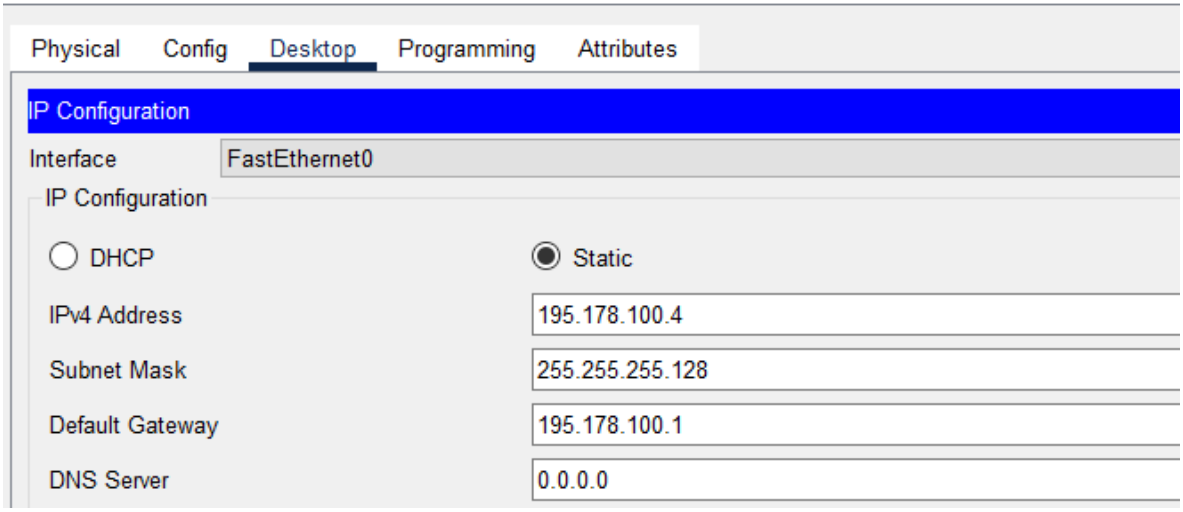
23K-0842 PC6



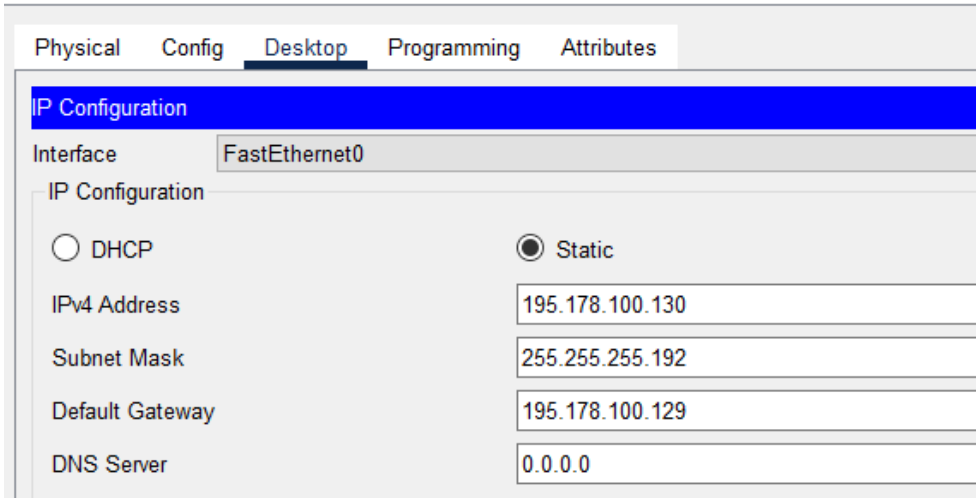
23K-0842 PC7



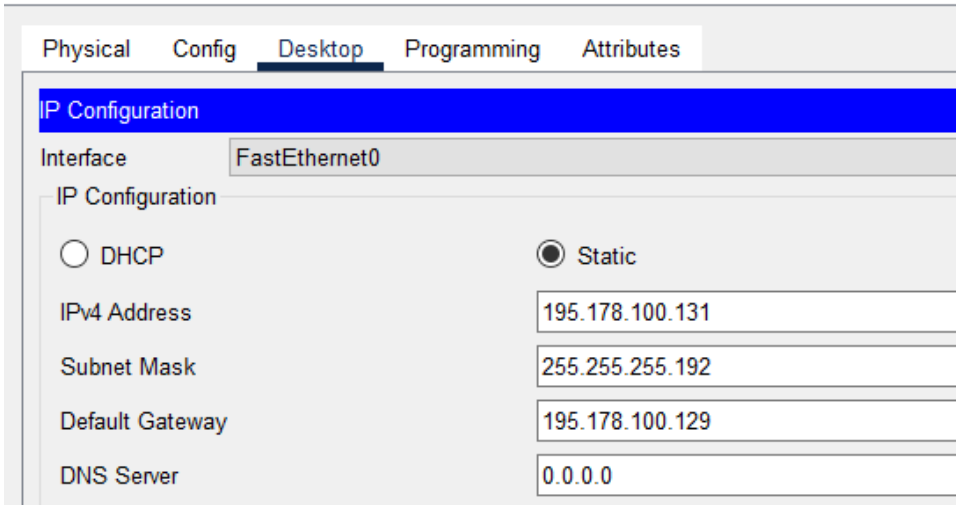
23K-0842 PC8



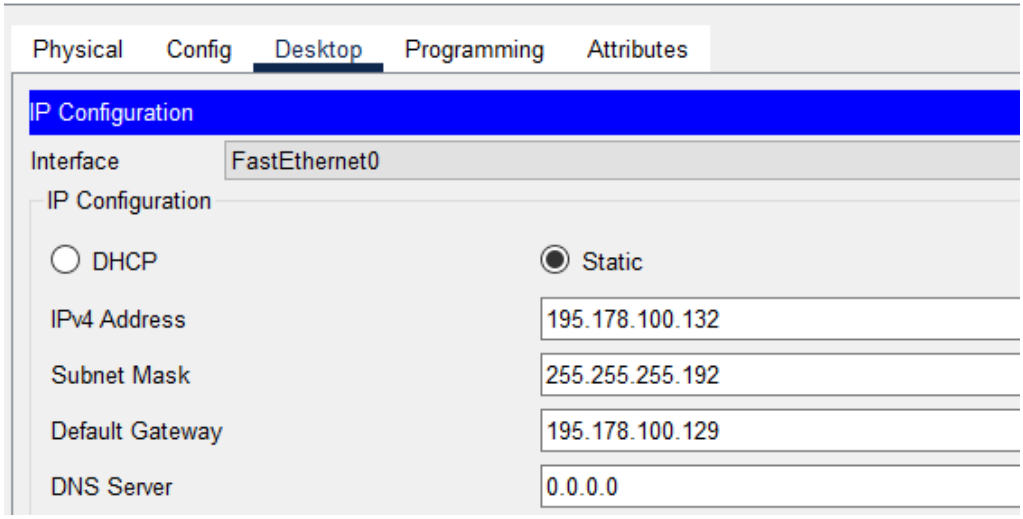
23K-0842 PC12



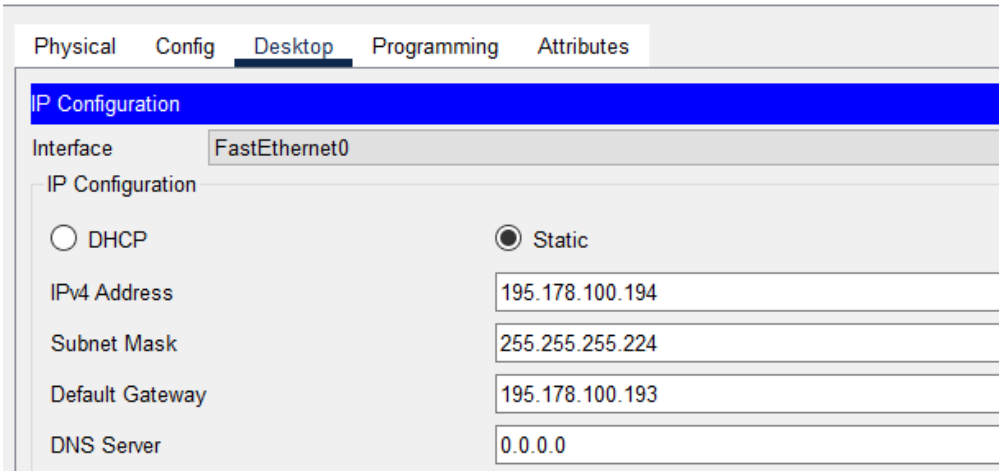
23K-0842 PC13



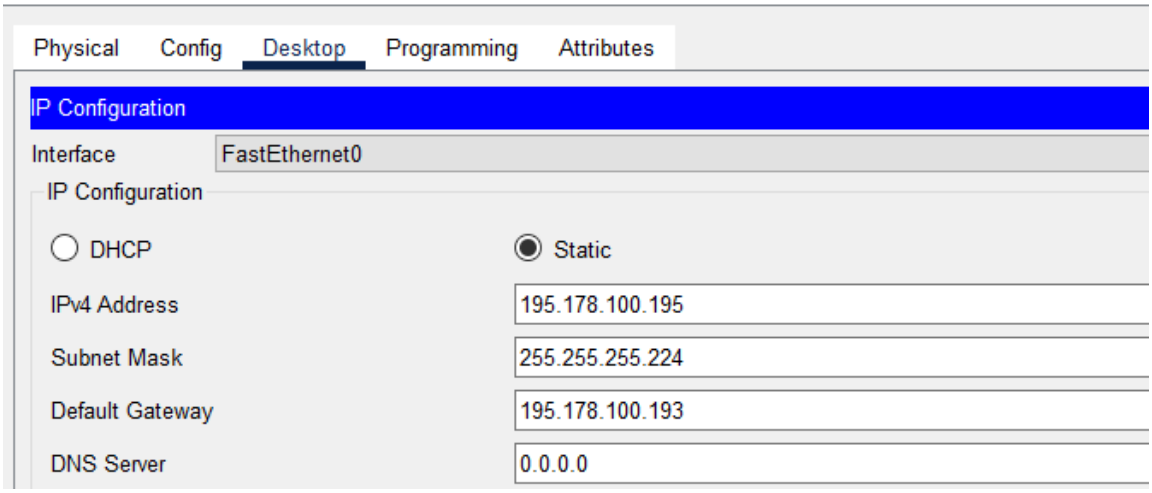
23K-0842 PC14



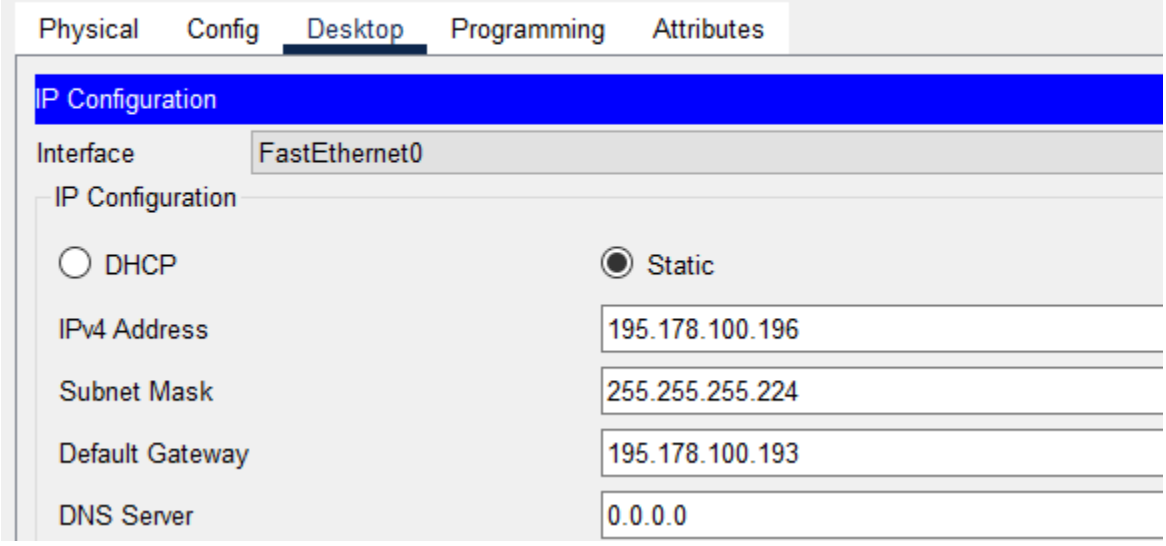
23K-0842 PC9



23K-0842 PC10



23K-0842 PC11



23K-0842 PC7

Physical | Config | Desktop | Programming | Attributes

Command Prompt

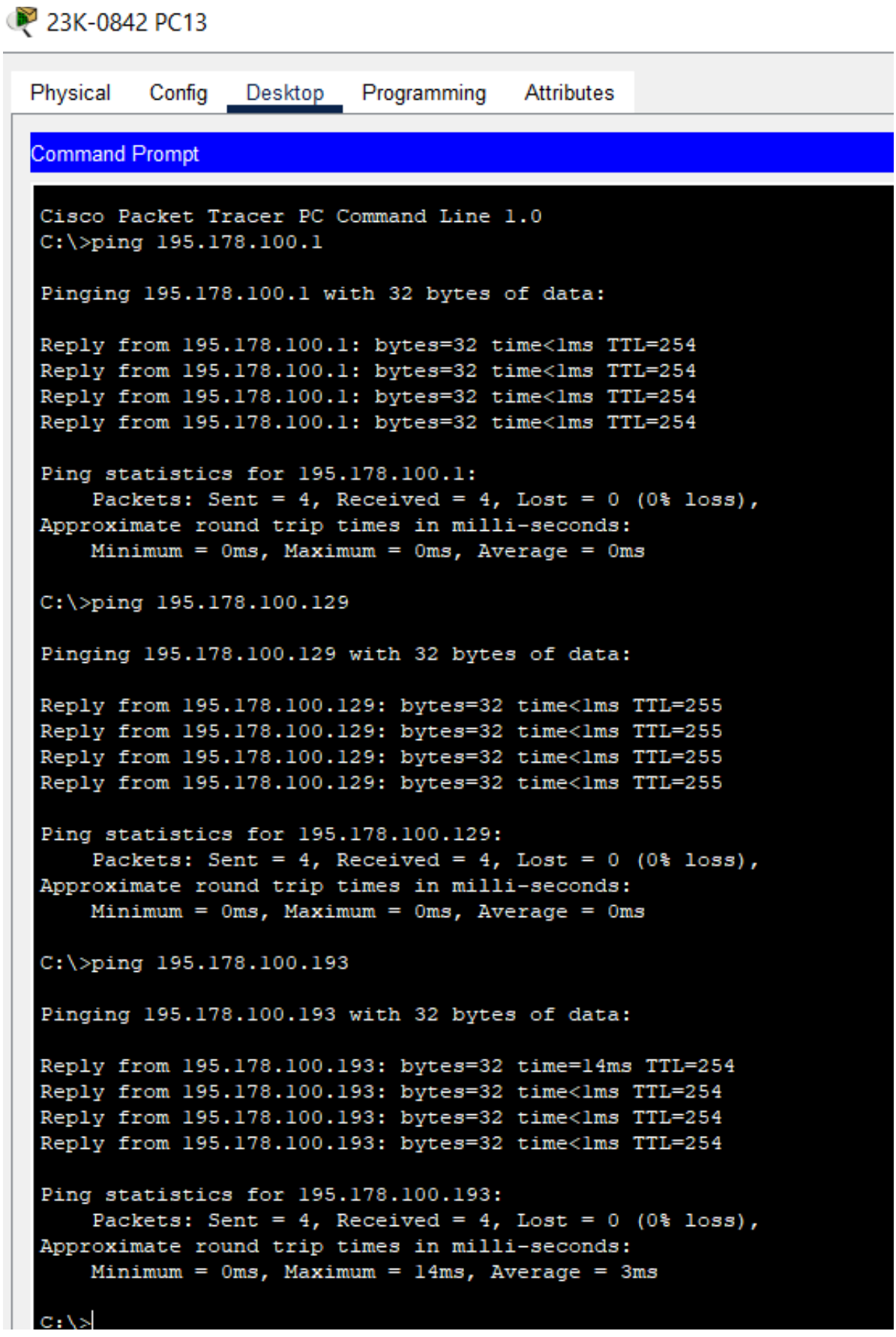
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 195.178.100.1

Pinging 195.178.100.1 with 32 bytes of data:

Reply from 195.178.100.1: bytes=32 time<1ms TTL=255
Reply from 195.178.100.1: bytes=32 time<1ms TTL=255
Reply from 195.178.100.1: bytes=32 time<1ms TTL=255
Reply from 195.178.100.1: bytes=32 time<1ms TTL=255

Ping statistics for 195.178.100.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 195.178.100.129

Pinging 195.178.100.129 with 32 bytes of data:

Reply from 195.178.100.129: bytes=32 time<1ms TTL=254
Reply from 195.178.100.129: bytes=32 time<1ms TTL=254
Reply from 195.178.100.129: bytes=32 time<1ms TTL=254
Reply from 195.178.100.129: bytes=32 time=1ms TTL=254

Ping statistics for 195.178.100.129:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 195.178.100.193

Pinging 195.178.100.193 with 32 bytes of data:

Reply from 195.178.100.193: bytes=32 time<1ms TTL=254
Reply from 195.178.100.193: bytes=32 time<1ms TTL=254
Reply from 195.178.100.193: bytes=32 time<1ms TTL=254
Reply from 195.178.100.193: bytes=32 time<1ms TTL=254

Ping statistics for 195.178.100.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

23K-0842 PC10

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 195.178.100.1

Pinging 195.178.100.1 with 32 bytes of data:

Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254

Ping statistics for 195.178.100.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 195.178.100.129

Pinging 195.178.100.129 with 32 bytes of data:

Reply from 195.178.100.129: bytes=32 time<1ms TTL=254
Reply from 195.178.100.129: bytes=32 time<1ms TTL=254
Reply from 195.178.100.129: bytes=32 time<1ms TTL=254
Reply from 195.178.100.129: bytes=32 time<1ms TTL=254

Ping statistics for 195.178.100.129:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 195.178.100.193

Pinging 195.178.100.193 with 32 bytes of data:

Reply from 195.178.100.193: bytes=32 time=14ms TTL=255
Reply from 195.178.100.193: bytes=32 time<1ms TTL=255
Reply from 195.178.100.193: bytes=32 time<1ms TTL=255
Reply from 195.178.100.193: bytes=32 time<1ms TTL=255

Ping statistics for 195.178.100.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 14ms, Average = 3ms
```


23K-0842 PC13
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 195.178.100.1
Pinging 195.178.100.1 with 32 bytes of data:
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Reply from 195.178.100.1: bytes=32 time<1ms TTL=254
Ping statistics for 195.178.100.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 195.178.100.129
Pinging 195.178.100.129 with 32 bytes of data:
Reply from 195.178.100.129: bytes=32 time<1ms TTL=255
Reply from 195.178.100.129: bytes=32 time<1ms TTL=255
Reply from 195.178.100.129: bytes=32 time<1ms TTL=255
Reply from 195.178.100.129: bytes=32 time<1ms TTL=255
Ping statistics for 195.178.100.129:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 195.178.100.193
Pinging 195.178.100.193 with 32 bytes of data:
Reply from 195.178.100.193: bytes=32 time=14ms TTL=254
Reply from 195.178.100.193: bytes=32 time<1ms TTL=254
Reply from 195.178.100.193: bytes=32 time<1ms TTL=254
Reply from 195.178.100.193: bytes=32 time<1ms TTL=254
Ping statistics for 195.178.100.193:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 14ms, Average = 3ms
C:\>

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	23K-0842 PC8	23K-0842 PC11	ICMP		0.000	N	0	(edit)	
	Successful	23K-0842 PC7	23K-0842 PC13	ICMP		0.000	N	1	(edit)	
	Successful	23K-0842 PC7	23K-0842 PC10	ICMP		0.000	N	2	(edit)	
	Successful	23K-0842 PC8	23K-0842 PC14	ICMP		0.000	N	5	(edit)	
	Successful	23K-0842 PC11	23K-0842 PC13	ICMP		0.000	N	6	(edit)	
	Successful	23K-0842 PC10	23K-0842 PC13	ICMP		0.000	N	7	(edit)	
	Successful	23K-0842 PC9	23K-0842 PC14	ICMP		0.000	N	8	(edit)