

1 Project Overview

The network is built around a single Wireless Router which acts as the Gateway, Firewall, and DHCP Server for the entire 192.168.10.0/24 subnet. A Cisco Switch is used to expand the number of wired ports available.

2 Router & Network Services Configuration

Setting	Value	Functions
Router (Gateway) IP	192.168.10.1	The local access IP for the router and the gateway for the network.
Subnet Mask	255.255.255.0	Standard Class C subnet mask.
DHCP Server	Enabled	Automatically assigns IP addresses to all connected devices (wired and wireless).
Start IP Address	192.168.10.50	The first IP address handed out by DHCP.
Maximum DHCP Users	20	The maximum number of devices that can connect to the network.
DNS Server 1	8.8.8.8	Public DNS server (Google DNS) for name resolution.

Setup		Wireless-N Broadband			
Setup	Wireless	Security	Access Restrictions	Applications & Gaming	Administration
Basic Setup		DDNS		MAC Address Clone	

Internet Setup	
Internet Connection type	Automatic Configuration - DHCP ▾
Optional Settings (required by some internet service providers)	Host Name: <input type="text"/>
	Domain Name: <input type="text"/>
	MTU: <input type="text"/> Size: 1500

Network Setup	
Router IP	IP Address: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="10"/> . <input type="text" value="1"/> Subnet Mask: <input type="text" value="255.255.255.0"/>
DHCP Server Settings	DHCP Server: <input checked="" type="radio"/> Enabled <input type="radio"/> Disabled DHCP Reservation
	Start IP Address: 192.168.10. <input type="text" value="50"/>
	Maximum number of Users: <input type="text" value="20"/>
	IP Address Range: 192.168.10. 50 - 69
	Client Lease Time: <input type="text" value="0"/> minutes (0 means one day)
	Static DNS 1: <input type="text" value="8"/> . <input type="text" value="8"/> . <input type="text" value="8"/> . <input type="text" value="8"/>
Static DNS 2: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/>	
Static DNS 3: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/>	
WINS: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/>	

3 Wireless Configuration(Wi-Fi)

These settings apply to all wireless devices (Laptops, PCs, Tablet, Smartphones).

Setting	Value	Security Level
SSID (Network Name)	KhadgaOrg_WAN	Unique name for the wireless network.
Security Mode	WPA2 Personal	Industry standard encryption for secure communication.
Passphrase (Password)	Khadga123	The key required to connect to the Wi-Fi network. (NOTE: Must be changed in a real-world environment).

Network Mode:

Mixed

Network Name (SSID):

KhadgaOrg_WAN

Radio Band:

Auto

Wide Channel:

Auto

Standard Channel:

1 - 2.412GHz

SSID Broadcast:

☒ Enabled

☐ Disabled

Security Mode:

WPA2 Personal

Encryption:

AES

Passphrase:

Khadga123

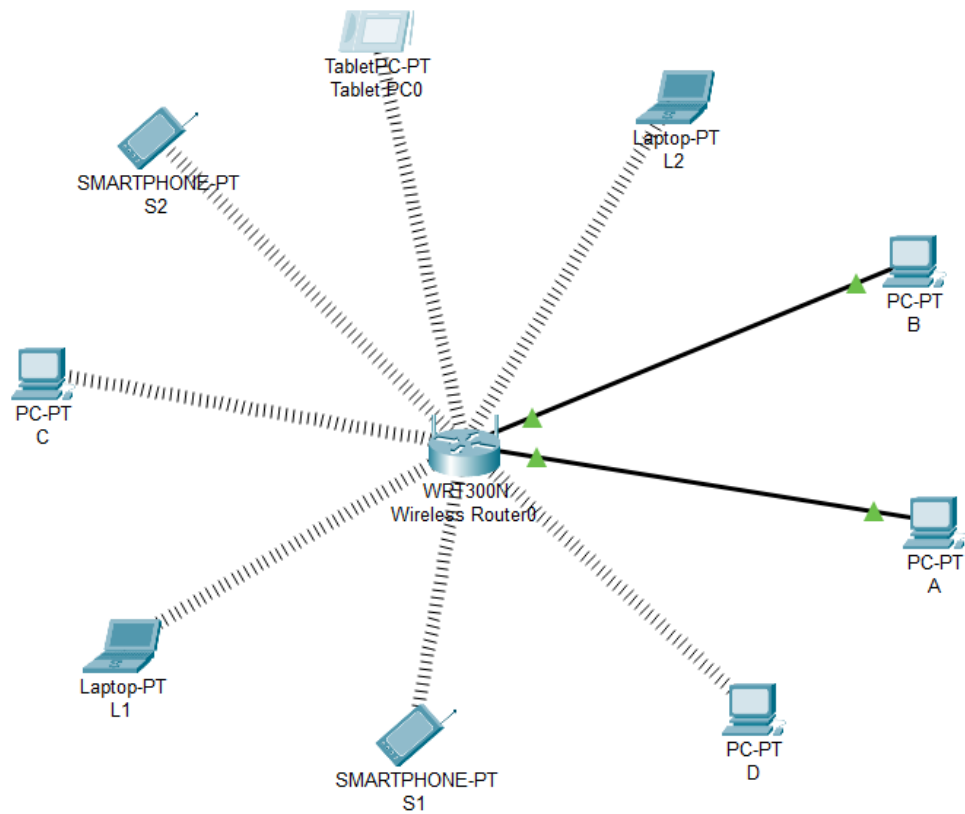
Key Renewal:

3600

seconds

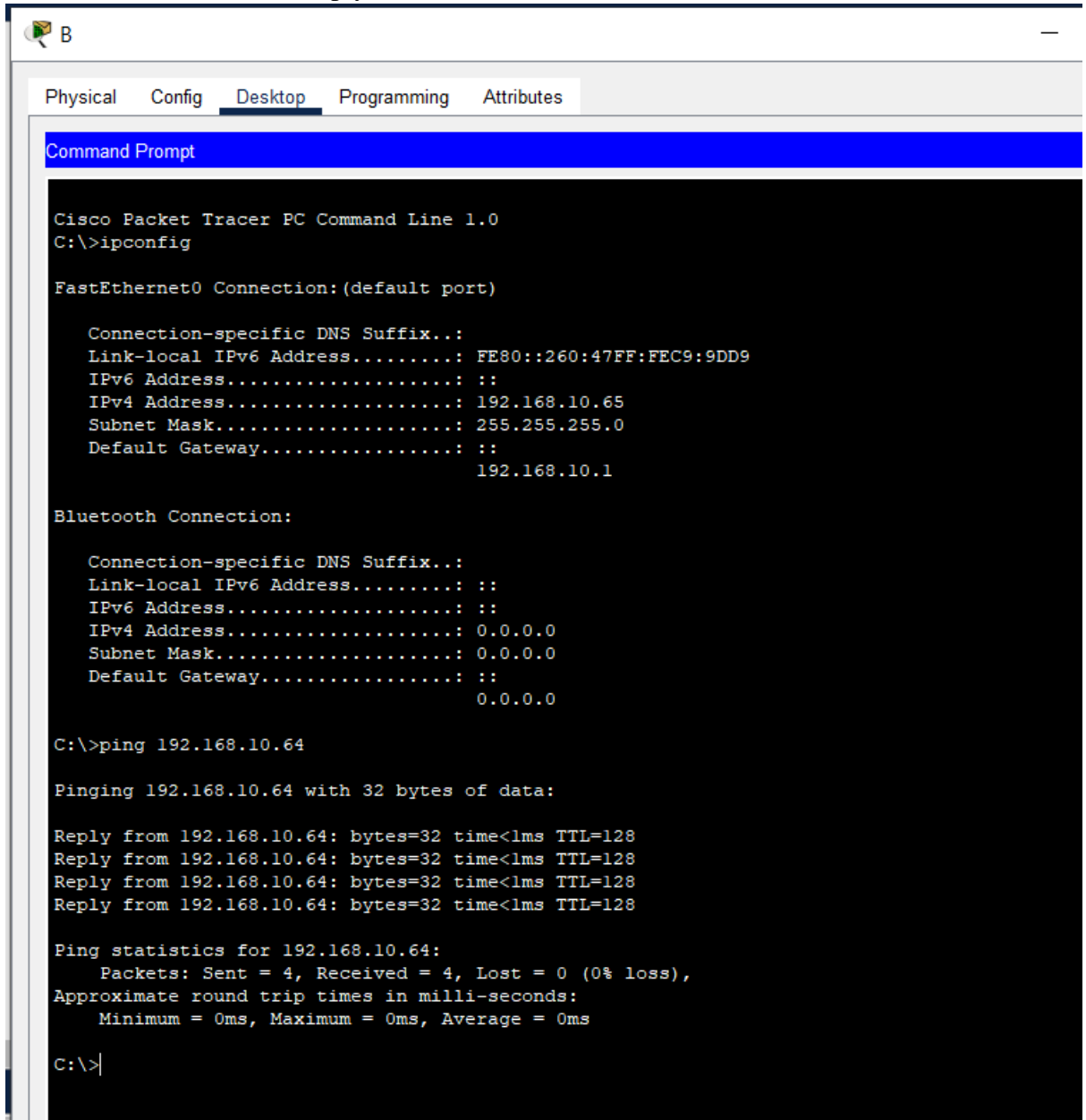
4 Device Configuration Summary

Device Type	Connection Type	Interface Card/Module	IP Configuration
PC-A,B	Wired (to Wireless Router)	FastEthernet0 (Built-in)	DHCP (Auto)
PC-C,D	Wireless	WPC300N (Module Added)	DHCP (Auto)
Laptop	Wireless	WPC300N (Module Added)	DHCP (Auto)
Smartphones/Tablet	Wireless	Wireless0 (Built-in)	DHCP (Auto)



5 Verification and Testing

- Test 1: Wired to Wired
Action: Ping from PC-A(192.168.10.64) to PC-B(192.168.10.65)
Result: Successful reply

A screenshot of the Cisco Packet Tracer PC Command Line interface for PC-B. The window has tabs for Physical, Config, Desktop (selected), Programming, and Attributes. The Desktop tab shows a Command Prompt window with a black background and white text. The text shows the configuration of FastEthernet0, including IPv4 and IPv6 addresses, subnet masks, and default gateways. It also shows the execution of a ping command from 192.168.10.64 to 192.168.10.65, which was successful, and the resulting ping statistics.

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

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::260:47FF:FEC9:9DD9
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 192.168.10.65
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                   192.168.10.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                   0.0.0.0

C:\>ping 192.168.10.64

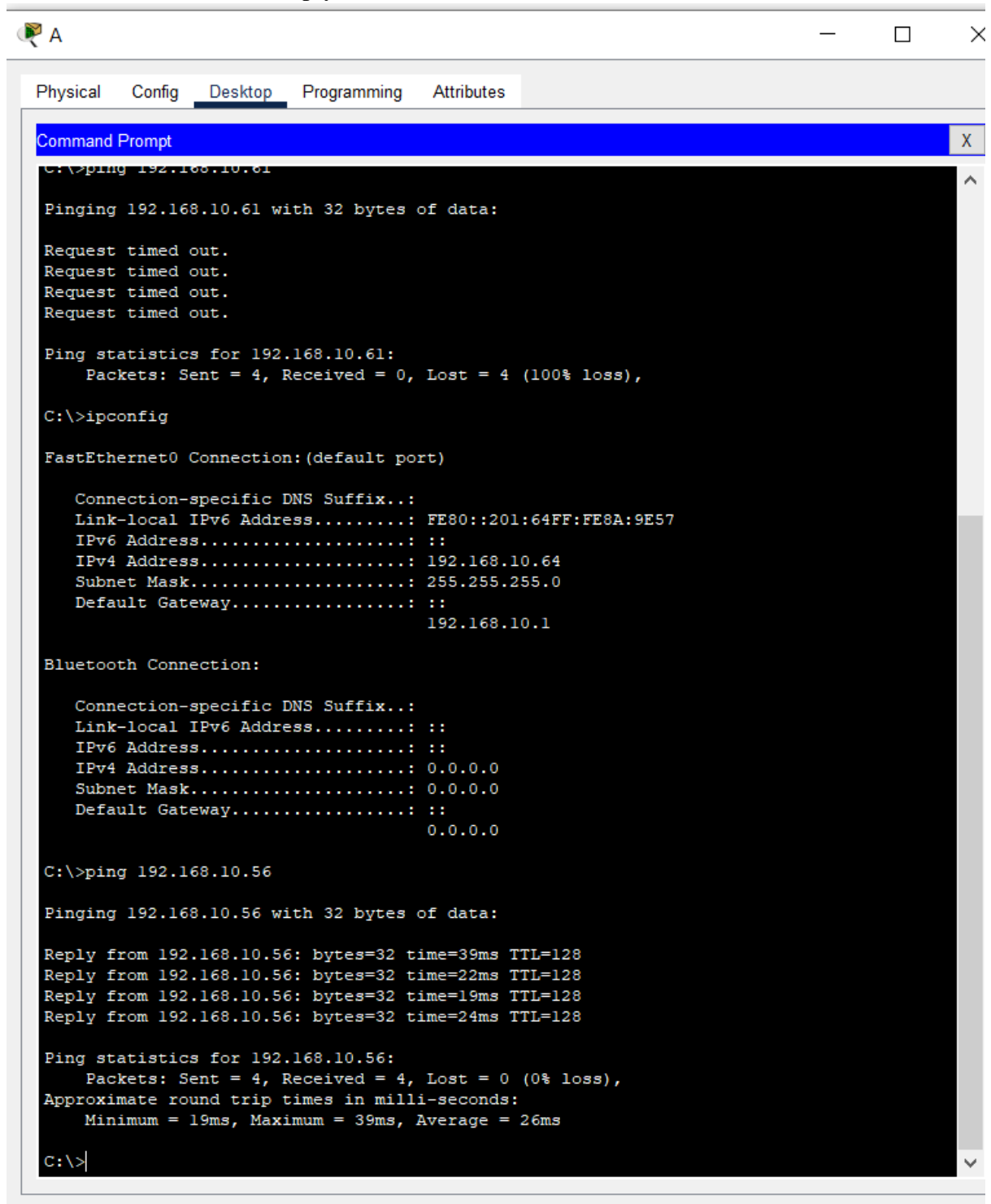
Pinging 192.168.10.64 with 32 bytes of data:

Reply from 192.168.10.64: bytes=32 time<lms TTL=128
Reply from 192.168.10.64: bytes=32 time<lms TTL=128
Reply from 192.168.10.64: bytes=32 time<lms TTL=128
Reply from 192.168.10.64: bytes=32 time<lms TTL=128

Ping statistics for 192.168.10.64:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```

- Test 2: Wired to Wireless
Action: Ping from PC-A(192.168.10.64) to the laptop-L1(192.168.10.56)
Result: Successful reply



```
C:\>ping 192.168.10.61

Pinging 192.168.10.61 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.61:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::201:64FF:FE8A:9E57
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 192.168.10.64
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                   192.168.10.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                   0.0.0.0

C:\>ping 192.168.10.56

Pinging 192.168.10.56 with 32 bytes of data:

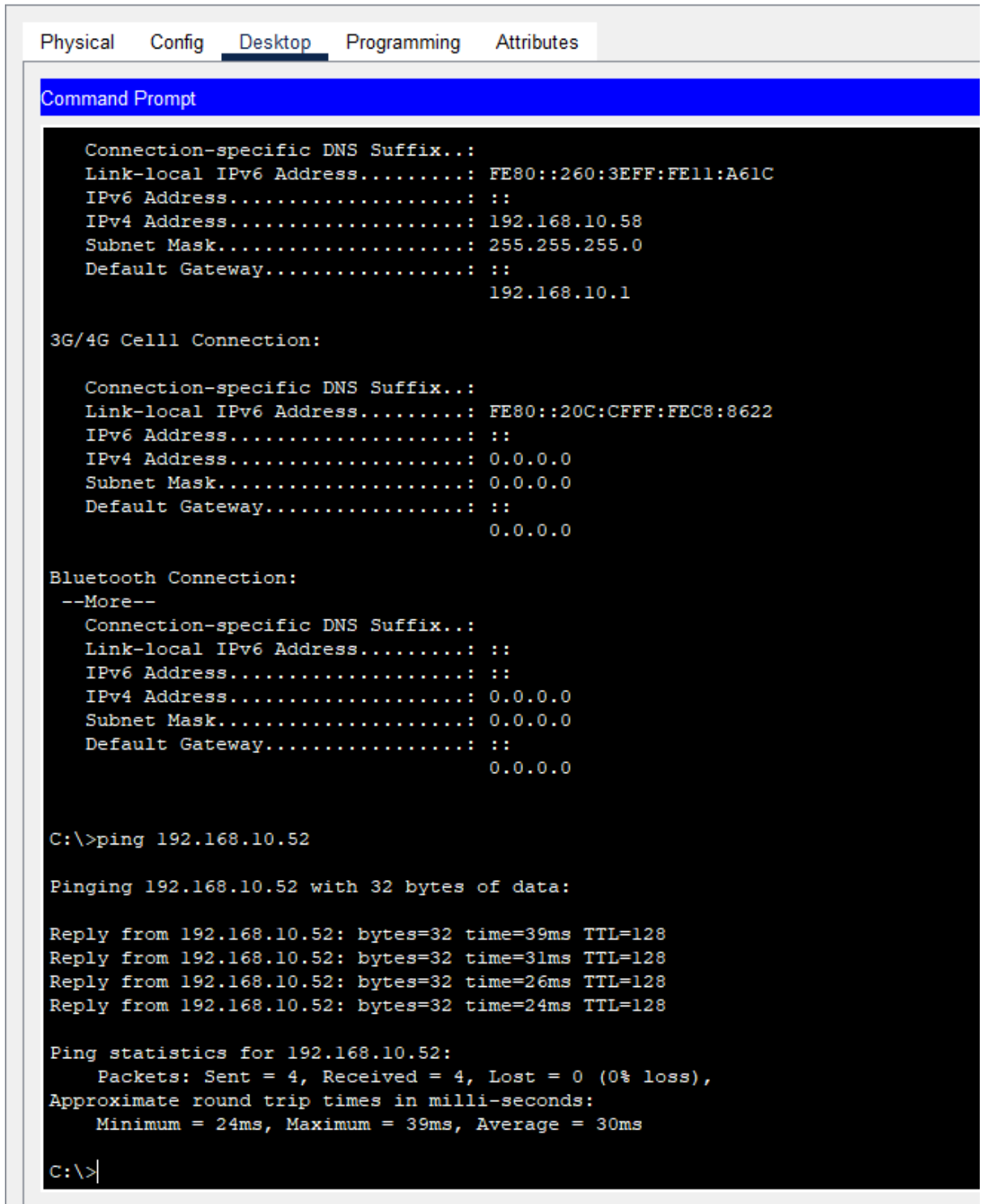
Reply from 192.168.10.56: bytes=32 time=39ms TTL=128
Reply from 192.168.10.56: bytes=32 time=22ms TTL=128
Reply from 192.168.10.56: bytes=32 time=19ms TTL=128
Reply from 192.168.10.56: bytes=32 time=24ms TTL=128

Ping statistics for 192.168.10.56:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 19ms, Maximum = 39ms, Average = 26ms

C:\>
```

- Test 3: Wireless to Wireless
Action: Ping from Smartphone-S2(192.168.10.58) to Tablet(192.168.10.52)
Result: Successful Reply

 S2



The screenshot shows a virtual device interface with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a Command Prompt window. The Command Prompt shows network configuration for a 3G/4G cellular connection and a Bluetooth connection. The 3G/4G connection is configured with a Link-local IPv6 Address of FE80::260:3EFF:FE11:A61C, an IPv4 Address of 192.168.10.58, a Subnet Mask of 255.255.255.0, and a Default Gateway of 192.168.10.1. The Bluetooth connection is configured with a Link-local IPv6 Address of FE80::20C:CFFF:FEC8:8622, an IPv4 Address of 0.0.0.0, a Subnet Mask of 0.0.0.0, and a Default Gateway of 0.0.0.0. The Command Prompt shows the execution of a ping command to 192.168.10.52, which is successful, with a round trip time of 30ms.

```
Physical  Config  Desktop  Programming  Attributes

Command Prompt

Connection-specific DNS Suffix...:
Link-local IPv6 Address.....: FE80::260:3EFF:FE11:A61C
IPv6 Address.....: ::
IPv4 Address.....: 192.168.10.58
Subnet Mask.....: 255.255.255.0
Default Gateway.....: ::
                        192.168.10.1

3G/4G Celll Connection:

Connection-specific DNS Suffix...:
Link-local IPv6 Address.....: FE80::20C:CFFF:FEC8:8622
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
                        0.0.0.0

Bluetooth Connection:
--More--
Connection-specific DNS Suffix...:
Link-local IPv6 Address.....: ::
IPv6 Address.....: ::
IPv4 Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: ::
                        0.0.0.0

C:\>ping 192.168.10.52

Pinging 192.168.10.52 with 32 bytes of data:

Reply from 192.168.10.52: bytes=32 time=39ms TTL=128
Reply from 192.168.10.52: bytes=32 time=31ms TTL=128
Reply from 192.168.10.52: bytes=32 time=26ms TTL=128
Reply from 192.168.10.52: bytes=32 time=24ms TTL=128

Ping statistics for 192.168.10.52:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 24ms, Maximum = 39ms, Average = 30ms

C:\>
```