

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	Setup	Wireless	Security	Access Restrictions	Applications & Gaming	Wireless-N Broadband	
Internet Setup	Basic Setup	DHCP			MAC Address Clone	Ad	
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: <input type="text"/>						
Network Setup	Router IP						
DHCP Server Settings	IP Address: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> Subnet Mask: <input type="text"/> DHCP Server: <input checked="" type="radio"/> Enabled <input type="radio"/> Disabled Start IP Address: 192.168.10. <input type="text"/> Maximum number of Users: <input type="text"/> IP Address Range: 192.168.10. 50 - 69 Client Lease Time: <input type="text"/> minutes (0 means one day) Static DNS 1: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> Static DNS 2: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> Static DNS 3: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> WINS: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	DHCP Reservation					

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

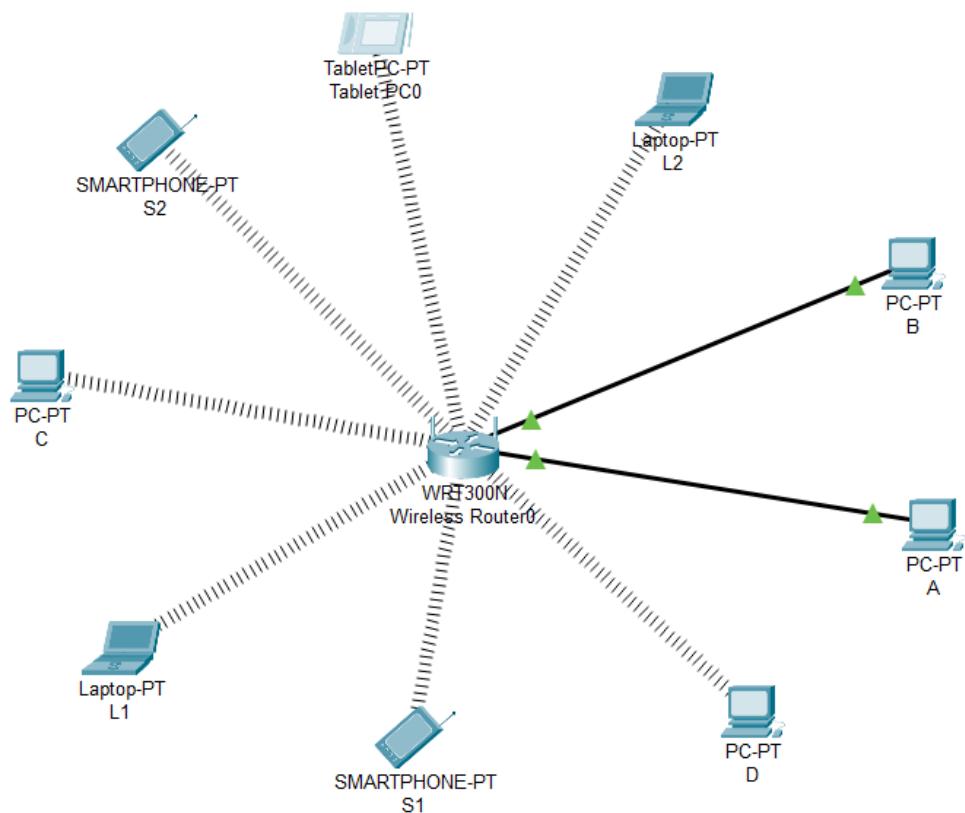
Encryption: AES

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)

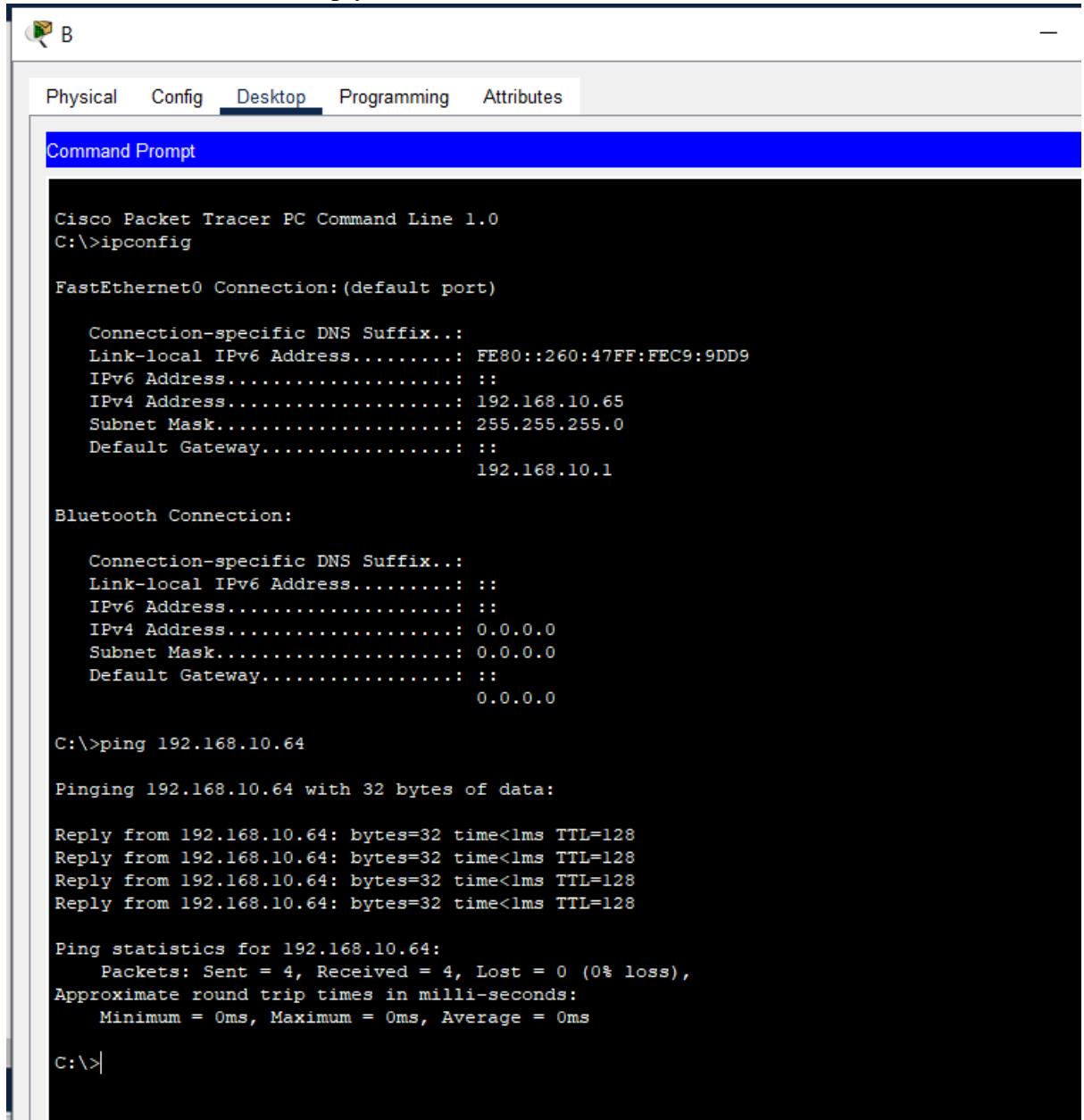


5 Verification and Testing

- Test 1: Wired to Wired

Action: Ping from PC-A(192.168.10.64) to PC-B(192.168.10.65)

Result: Successful reply



The screenshot shows a Cisco Packet Tracer interface with a terminal window. The window title is "Command Prompt". The tab bar at the top includes "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". The terminal output displays the results of an "ipconfig" command and a "ping" command.

```
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<1ms TTL=128

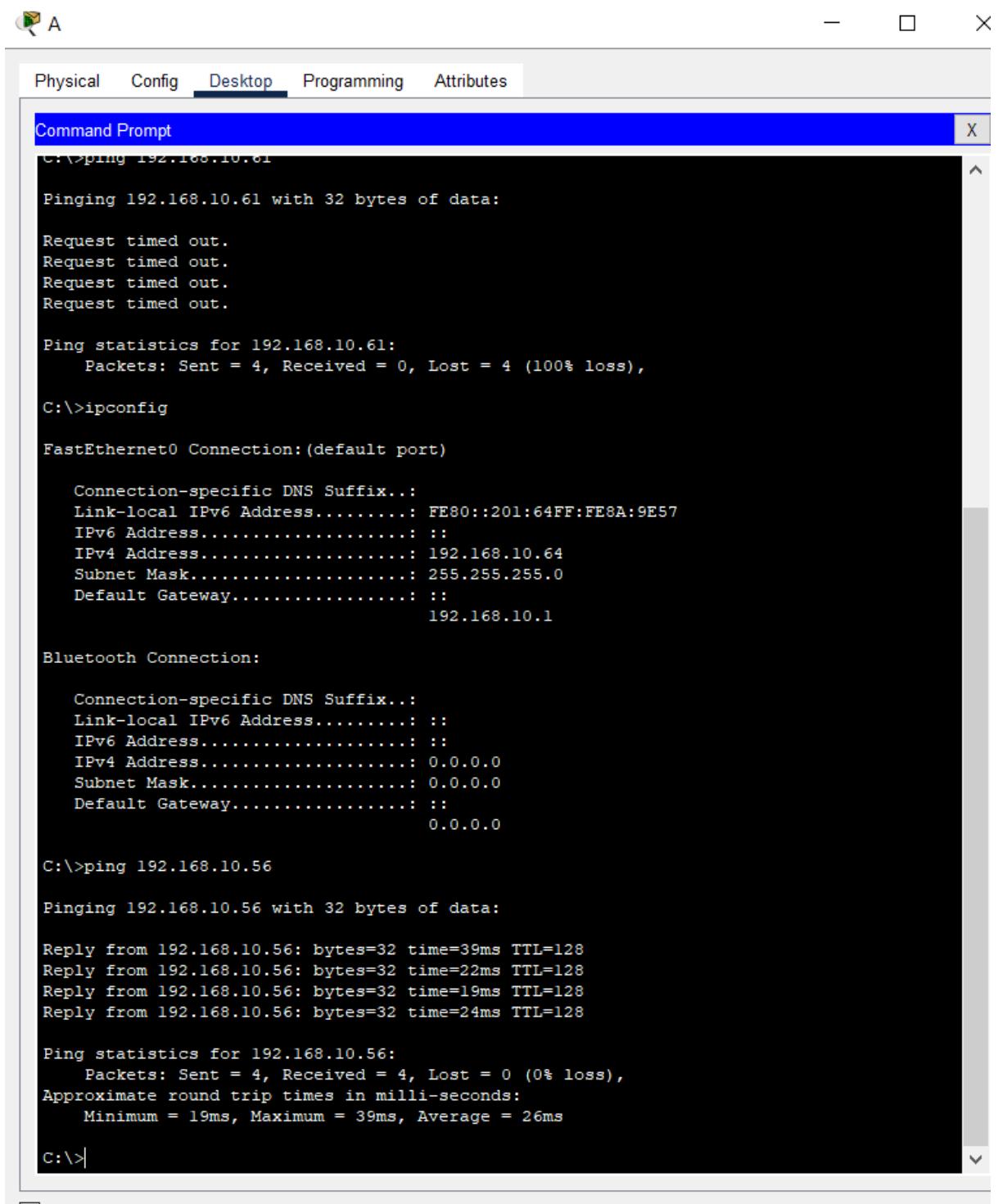
Ping statistics for 192.168.10.64:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

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



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The window has tabs at the top: Physical, Config, Desktop (which is selected), Programming, and Attributes. The title bar also has icons for minimize, maximize, and close.

```
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

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 Cell 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:\>
```