

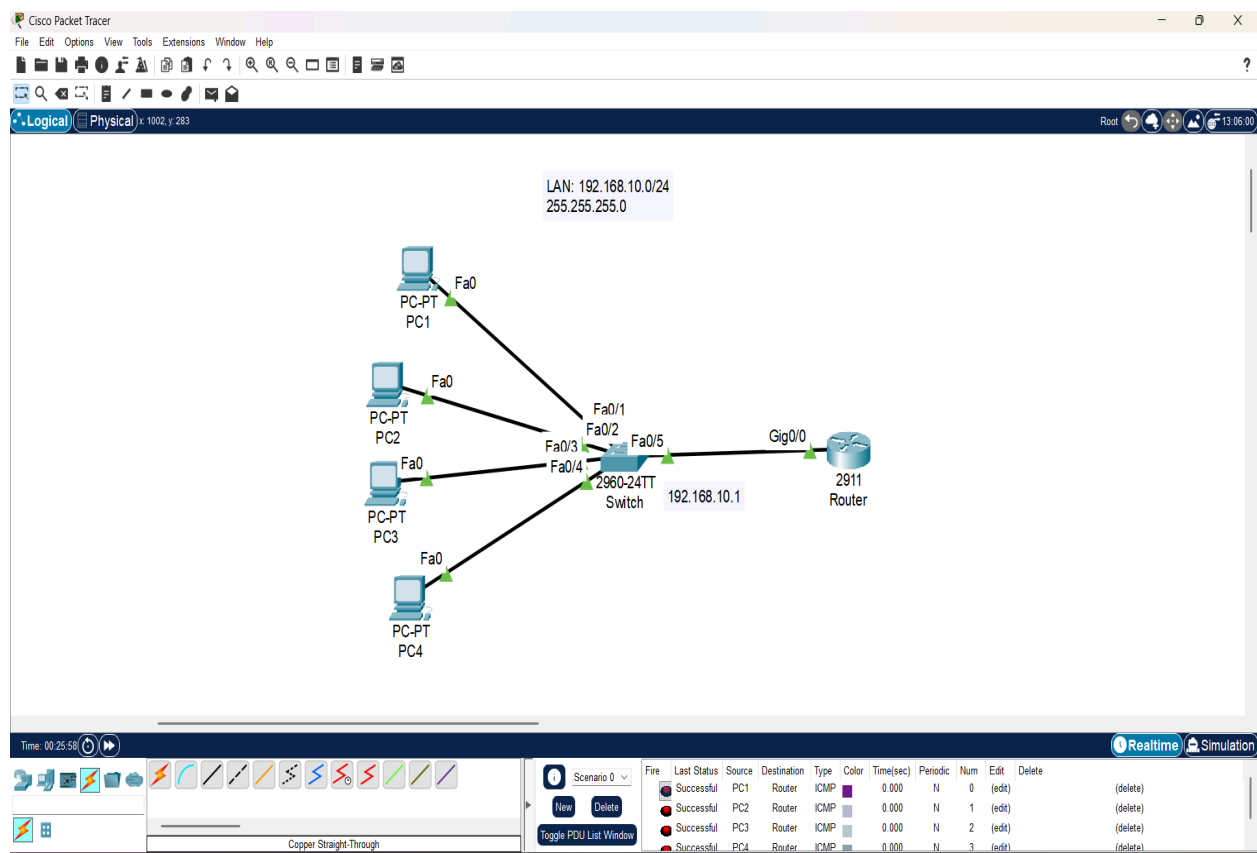
Lab 05 – DHCP on a Router

Objective:

To configure a router as a DHCP server that automatically assigns IP addresses to hosts in a LAN.

Topology Description

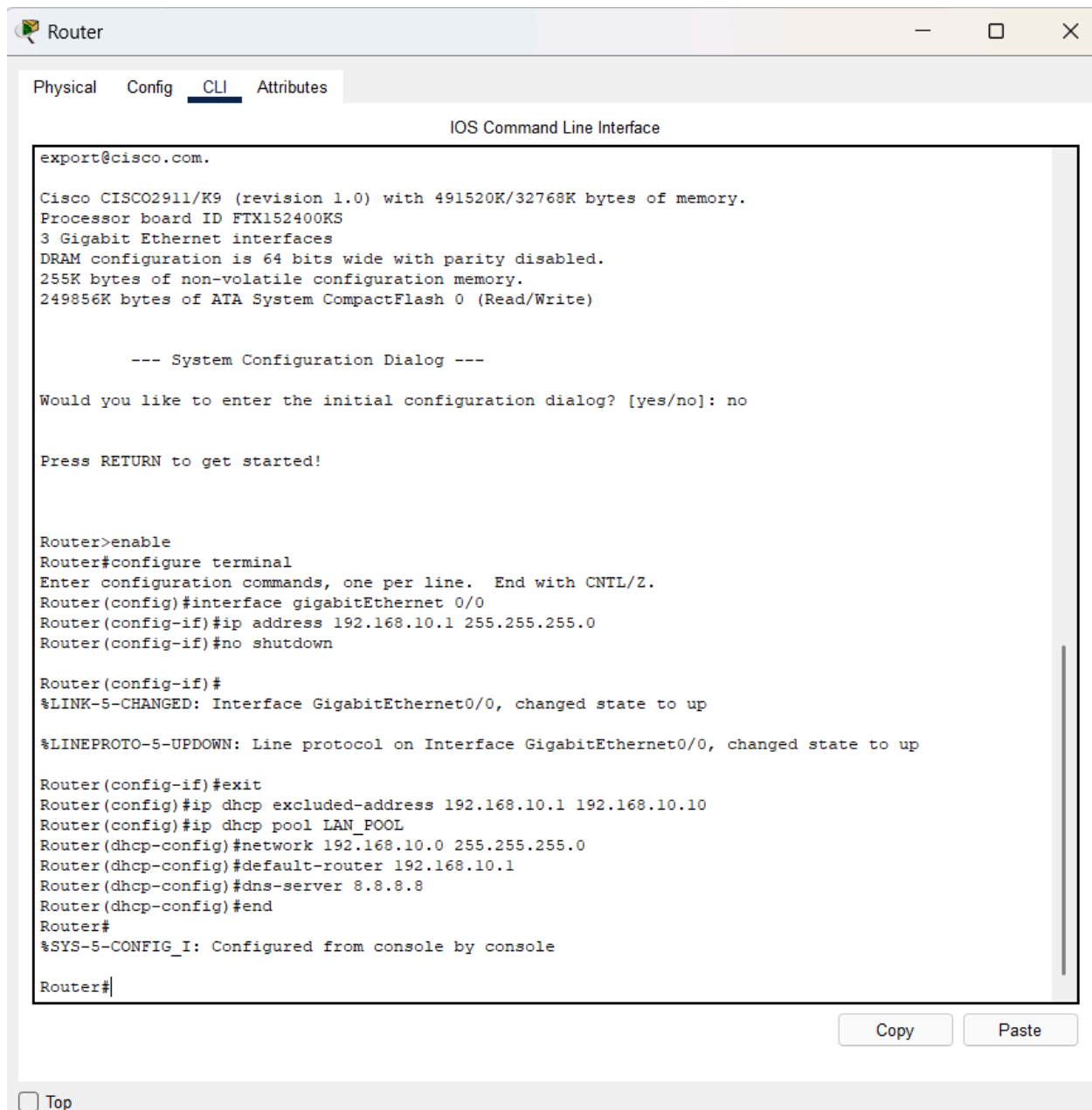
A single LAN consisting of one router, one switch, and multiple PCs. The router provides IP addressing information using DHCP.



Network Information

- Network: 192.168.10.0/24
- Router (Default Gateway): 192.168.10.1

Router Configuration Summary



The screenshot shows a web-based interface for a Cisco router. The top bar has tabs for 'Physical', 'Config', 'CLI' (selected), and 'Attributes'. The main area is titled 'IOS Command Line Interface' and displays a terminal session. The session starts with the user 'export@cisco.com.' and shows the router's hardware details. It then prompts for a system configuration dialog, which is skipped. The user enters 'enable' to enter privileged mode, then 'configure terminal' to enter configuration mode. The configuration includes setting the interface 'GigabitEthernet 0/0' to 'ip address 192.168.10.1 255.255.255.0' and 'no shutdown'. The interface is then brought up. The user exits configuration mode and enters DHCP settings: 'ip dhcp excluded-address 192.168.10.1 192.168.10.10', 'ip dhcp pool LAN_POOL', 'network 192.168.10.0 255.255.255.0', 'default-router 192.168.10.1', and 'dns-server 8.8.8.8'. The session ends with the user at the 'Router#' prompt.

```
export@cisco.com.  
  
Cisco CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.  
Processor board ID FTX152400KS  
3 Gigabit Ethernet interfaces  
DRAM configuration is 64 bits wide with parity disabled.  
255K bytes of non-volatile configuration memory.  
249856K bytes of ATA System CompactFlash 0 (Read/Write)  
  
--- System Configuration Dialog ---  
  
Would you like to enter the initial configuration dialog? [yes/no]: no  
  
Press RETURN to get started!  
  
Router>enable  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface gigabitEthernet 0/0  
Router(config-if)#ip address 192.168.10.1 255.255.255.0  
Router(config-if)#no shutdown  
  
Router(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  
  
Router(config-if)#exit  
Router(config)#ip dhcp excluded-address 192.168.10.1 192.168.10.10  
Router(config)#ip dhcp pool LAN_POOL  
Router(dhcp-config)#network 192.168.10.0 255.255.255.0  
Router(dhcp-config)#default-router 192.168.10.1  
Router(dhcp-config)#dns-server 8.8.8.8  
Router(dhcp-config)#end  
Router#  
%SYS-5-CONFIG_I: Configured from console by console  
Router#
```

Interface Configuration

- G0/0: 192.168.10.1/24

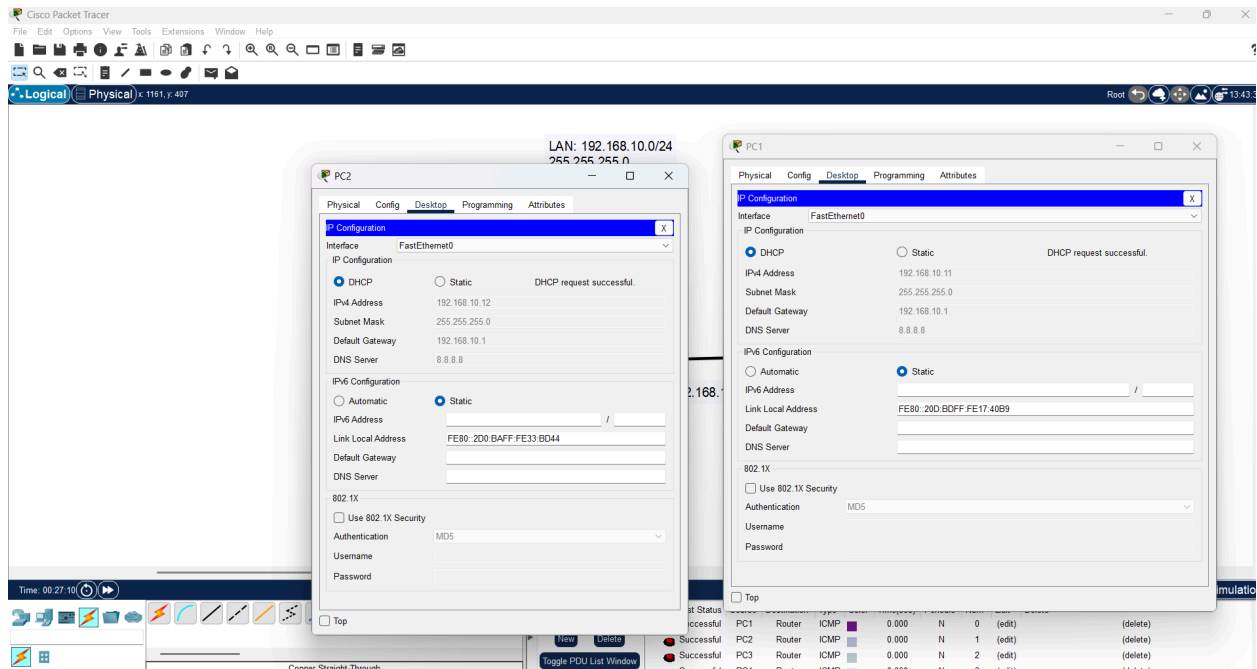
DHCP Configuration

- Excluded Addresses: 192.168.10.1 – 192.168.10.10
- DHCP Pool Name: LAN_POOL

```
ip dhcp pool LAN_POOL
network 192.168.10.0 255.255.255.0
default-router 192.168.10.1
dns-server 8.8.8.8
```

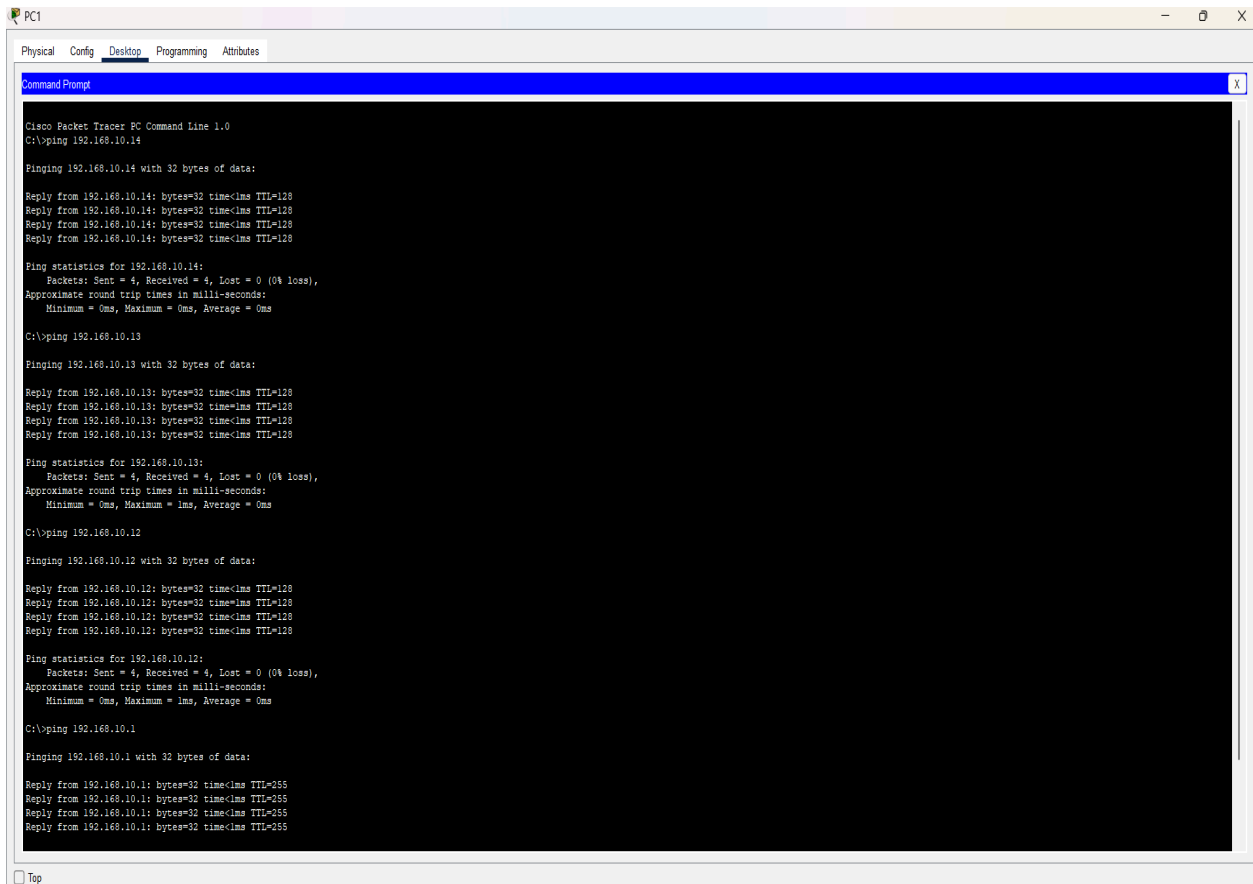
PC Configuration

- All PCs set to obtain IP addresses automatically via DHCP



Verification

- PCs received IP addresses dynamically
- Successful ping from PCs to the router
- Successful communication between PCs



The screenshot shows a Cisco Packet Tracer PC Command Line window for PC1. The window has tabs for Physical, Config, Desktop, Programming, and Attributes, with Desktop selected. The Command Prompt shows the following output:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.14

Pinging 192.168.10.14 with 32 bytes of data:

Reply from 192.168.10.14: bytes=32 time<1ms TTL=128
Reply from 192.168.10.14: bytes=32 time<1ms TTL=128
Reply from 192.168.10.14: bytes=32 time<1ms TTL=128
Reply from 192.168.10.14: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.13

Pinging 192.168.10.13 with 32 bytes of data:

Reply from 192.168.10.13: bytes=32 time<1ms TTL=128
Reply from 192.168.10.13: bytes=32 time<1ms TTL=128
Reply from 192.168.10.13: bytes=32 time<1ms TTL=128
Reply from 192.168.10.13: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.12

Pinging 192.168.10.12 with 32 bytes of data:

Reply from 192.168.10.12: bytes=32 time<1ms TTL=128
Reply from 192.168.10.12: bytes=32 time<1ms TTL=128
Reply from 192.168.10.12: bytes=32 time<1ms TTL=128
Reply from 192.168.10.12: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
```

At the bottom left of the window, there is a checkbox labeled "Top" which is currently unchecked.

Lessons Learned

- DHCP automates IP address assignment
- Excluded addresses prevent IP conflicts
- Routers can function as DHCP servers