

NETSEC

Capstone By Adhiraj Saharan



01. A SINGLE ROUTER AND SWITCH

02. 3 PCS, 3 PRINTERS, 3 ACCESSPOINTS

03. 2 LAPTOPS

04. 2 SMARTPHONES



**DEVICES ON
THE
NETWORK**





METHOD OF CONNECTION TO THE LAN

All Devices are connected via wireless connection encrypted with WPA2-PSK.

Ethernet cables are avoided to ensure host devices can freely move around when required and guests or interns with laptops or mobiles can be easily accommodated.



**A SINGLE SWITCH AND
ROUTER WILL SEPARATE THE
NETWORK CONFIGURED
USING A DHCP SERVER**



**TO ENSURE EASE OF
ADMINISTRATION AND
REDUCED NETWORK
TRAFFIC, EACH SECTOR WILL
BE ON A DIFFERENT VLAN**

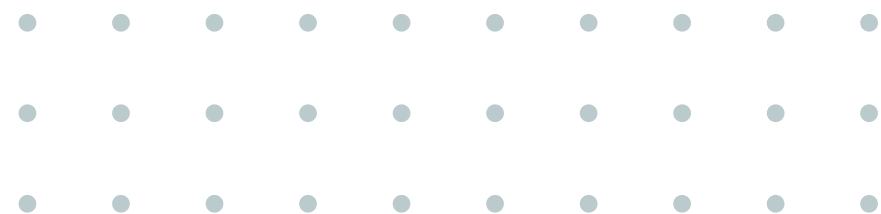


IT IS ENSURED THAT ALL
DEVICES IN DIFFERENT
SECTORS CAN COMMUNICATE
WITH EACH OTHER AND
AUTOMATICALLY OBTAIN IP
ADDRESSES



IP ADDRESSING SCHEME AND SUBNETTING OVERVIEW

- The base network uses the 192.168.1.0 private address.
- 3 Subnets for the Financial, Admin and Customer Service sectors respectively.
- Number of borrowed bits: 2^n , so 2^n should equal 3 and $n = 2$.
- Class C Network Subnet mask used (255.255.255.0) since it is ideal for small networks with fewer than 250 hosts.
- To satisfy the network requirements for 3 subnets, we have to borrow 2 bits:
 - The new binary subnet mask after borrowing: 11111111.11111111.11111111.11000000
 - Converting back to decimal gives the new subnet mask 255.255.255.192
- The block size on IPV4 will be 64 bits.



1ST SUBNET CONFIGURATION (ADMIN SECTOR)

Network ID: 192.168.1.0

Broadcast ID: 192.168.1.63 (they act like a loop that point to the next subnet)

Host range: 192.168.1.1 – 192.168.1.62 (lies between the network ID and Host ID)



2ND SUBNET CONFIGURATION (FINANCIAL SECTOR)

Network ID: 192.168.1.64 (first ID + block size)

Broadcast ID: 192.168.1.127 (they act like a loop that point to the next subnet)

Host range: 192.168.1.65 – 192.168.1.127 (lies between the network ID and Host ID)



3RD SUBNET CONFIGURATION (CUSTOMER SERVICE SECTOR)

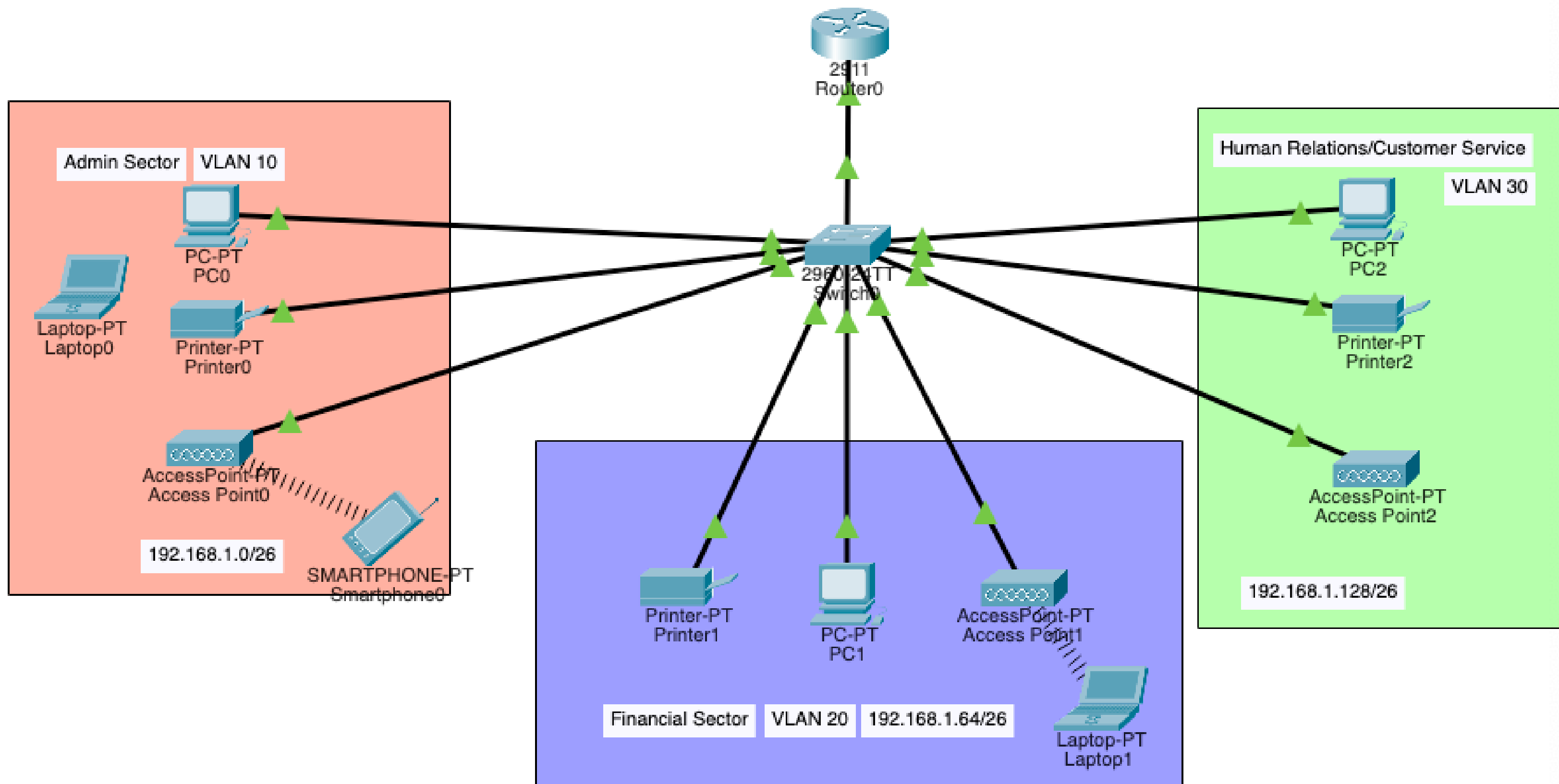
Network ID: 192.168.1.128 (second ID + block size)

Broadcast ID: 192.168.1.192 (they act like a loop that point to the next subnet)

Host range: 192.168.1.129 – 192.168.1.190 (lies between the network ID and Host ID)



SCREENSHOT



ADMIN SECTOR (VLAN 10) PC0 CONFIG

Global Settings

Display Name

Interfaces 

Gateway/DNS IPv4

☒ DHCP
☐ Static

Default Gateway

DNS Server

Gateway/DNS IPv6

☐ Automatic
☒ Static

Default Gateway

DNS Server

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☒ DHCP
☐ Static

IPv4 Address

Subnet Mask

IPv6 Configuration

☐ Automatic
☒ Static

IPv6 Address

Link Local Address:



ADMIN SECTOR (VLAN 10) PRINTER0 CONFIG

Global Settings

Display Name

Gateway/DNS IPv4

☒ DHCP
☐ Static

Default Gateway

DNS Server

Gateway/DNS IPv6

☐ Automatic
☒ Static

Default Gateway

DNS Server

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☒ DHCP
☐ Static

IPv4 Address

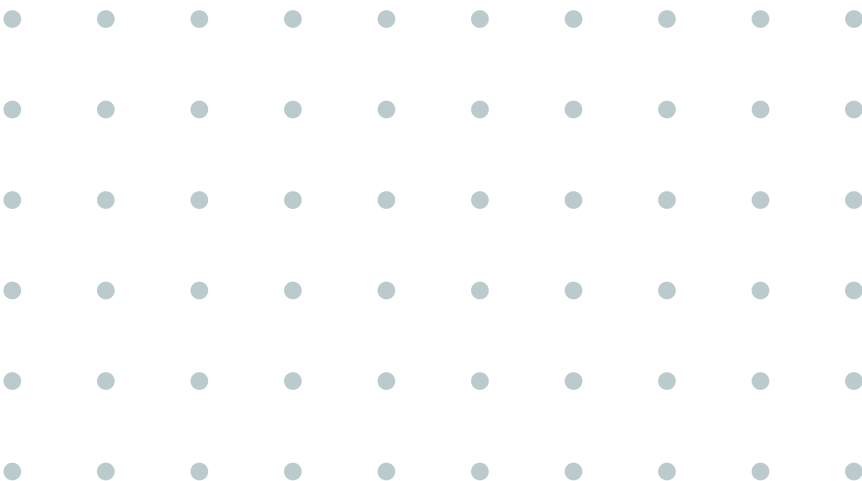
Subnet Mask

IPv6 Configuration

☐ Automatic
☒ Static

IPv6 Address

Link Local Address:



ADMIN SECTOR (VLAN 10) ACCESSPOINT CONFIG

Port 1

Port Status

☒ On

SSID

Admin-WIFI

2.4 GHz Channel

6

Coverage Range (meters)

140.00

Authentication

☐ Disabled

☐ WEP

☐ WPA-PSK

☒ WPA2-PSK

WEP Key

PSK Pass Phrase

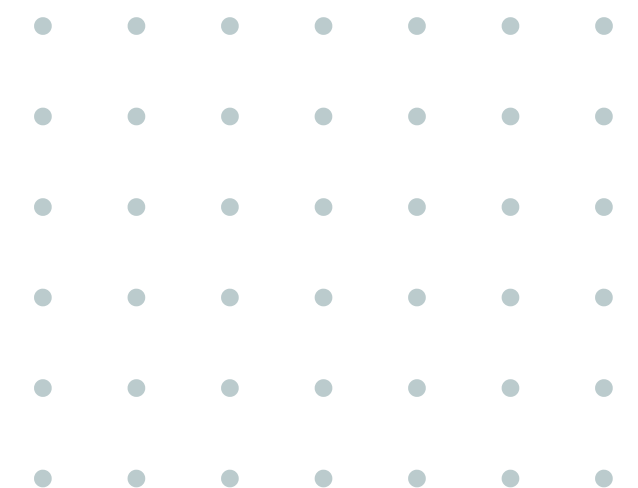
Admin@123

User ID

Password

Encryption Type

AES



ADMIN SECTOR(VLAN 10) SMARTPHONEO CONFIG

Wireless0

Port Status

☒ On

Bandwidth

54 Mbps

MAC Address

0050.0F9E.3ED1

SSID

Admin-WIFI

Authentication

☐ Disabled

☐ WEP

WEP Key

☐ WPA-PSK

☒ WPA2-PSK

PSK Pass Phrase

Admin@123

☐ WPA

☐ WPA2

User ID

☐ 802.1X

Method:

MD5

User Name

Password

Encryption Type

AES

IP Configuration

☒ DHCP

☐ Static

IPv4 Address

192.168.1.4

Subnet Mask

255.255.255.192

IPv6 Configuration

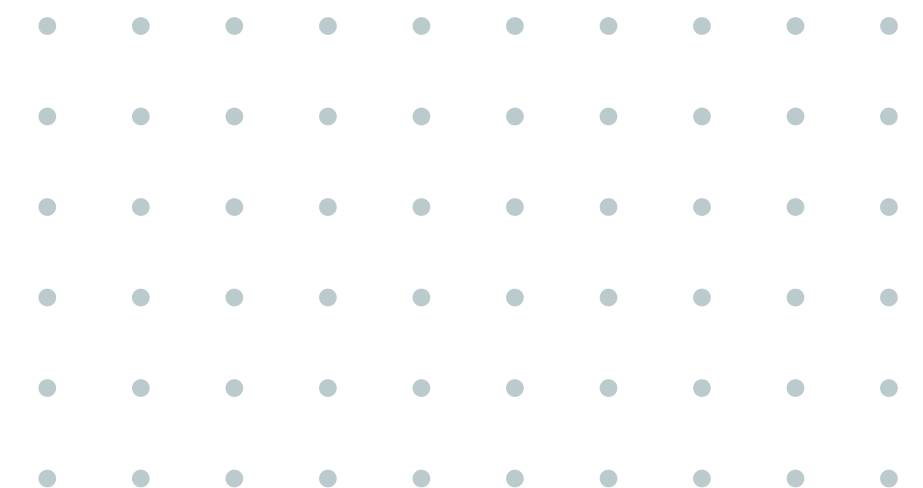
☒ Automatic

☐ Static

IPv6 Address

/

Link Local Address: FE80::250:FFF:FE9E:3ED1

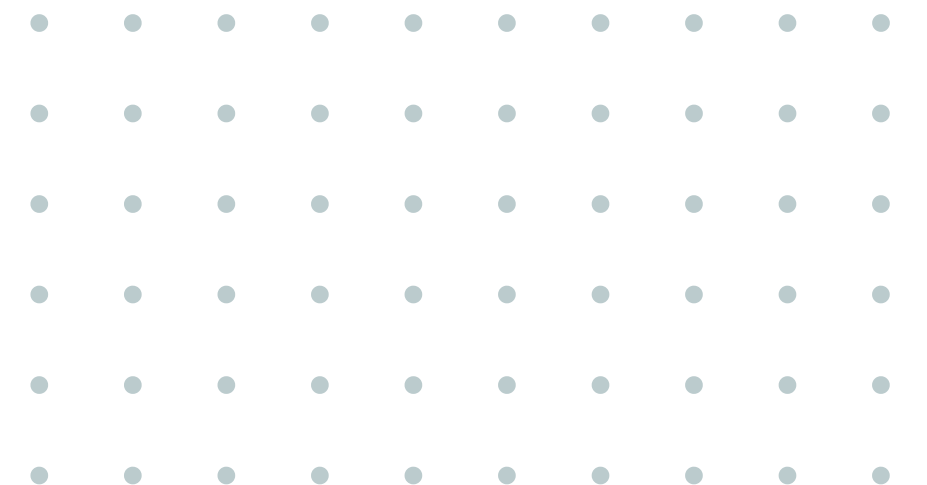


**THE REMAINING DEVICES ARE
SIMILARLY CONNECTED TO
THE ACCESS POINTS IN THE
OTHER SECTORS**





**THE ROUTER CONFIG AND SWITCH CONFIG CAN
BE BETTER REVIEWED IN THE PACKET TRACER
FILE**



**THE FOLLOWING
SCREENSHOTS ARE PROOF
THAT HOST DEVICES CAN
COMMUNICATE ACROSS
SECTORS AND THE DHCP
SERVER IS WORKING**



SMARTPHONE IN ADMIN CAN PING CUSTOMER SERVICE SECTOR

Smartphone0

PhysicalConfigDesktopProgrammingAttributes

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.131

Pinging 192.168.1.131 with 32 bytes of data:

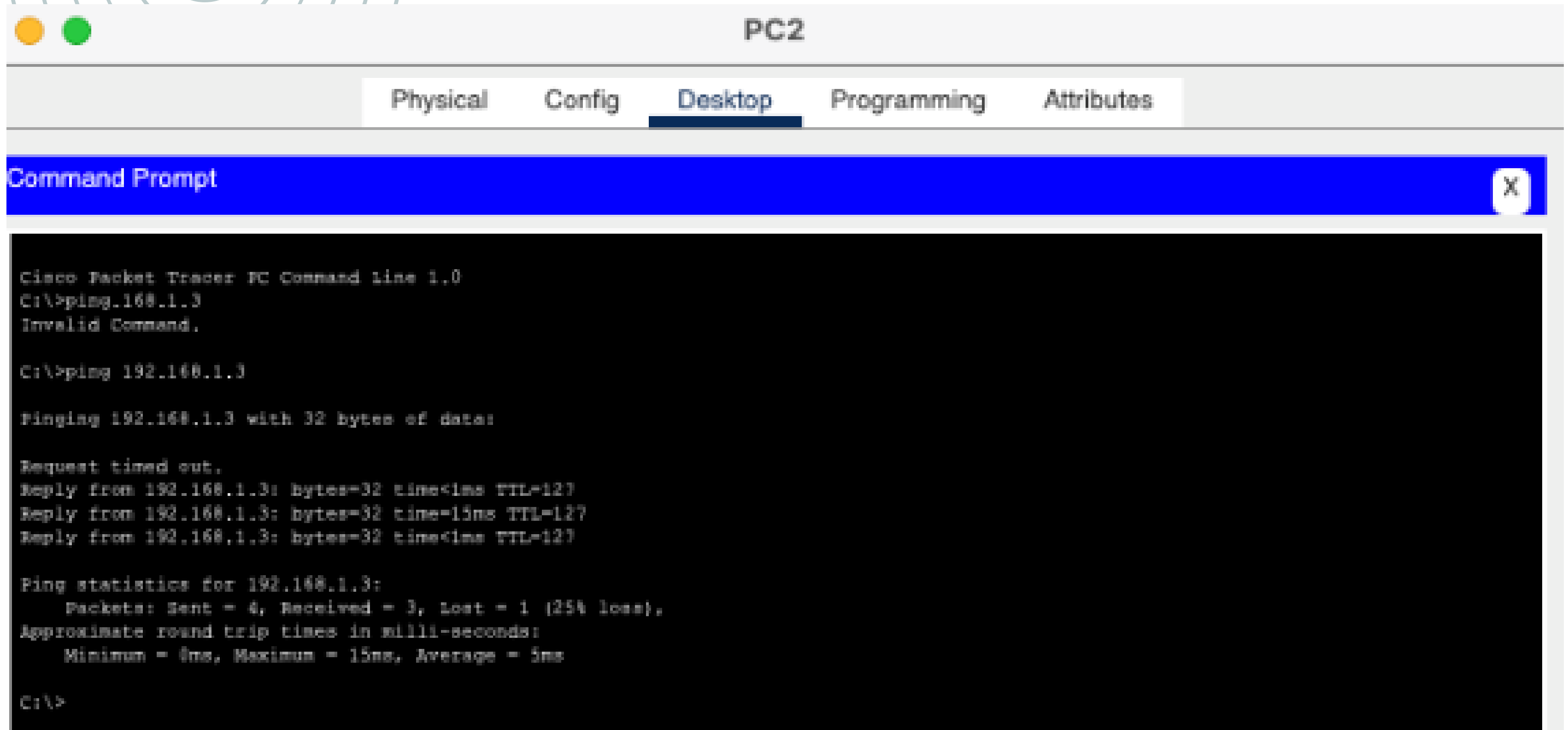
Request timed out.
Reply from 192.168.1.131: bytes=32 time=23ms TTL=127
Reply from 192.168.1.131: bytes=32 time=23ms TTL=127
Reply from 192.168.1.131: bytes=32 time=26ms TTL=127

Ping statistics for 192.168.1.131:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 23ms, Maximum = 26ms, Average = 23ms

C:\>



PC IN CUSTOMER SERVICE CAN PING DEVICES IN FINANCE



The screenshot shows a window titled "PC2" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a Command Prompt window. The Command Prompt shows the following text:

```
Cisco Packet Tracer PC Command line 1.0
C:\>ping.168.1.3
Invalid Command.

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.3: bytes=32 time<1ms TTL=127
Reply from 192.168.1.3: bytes=32 time=15ms TTL=127
Reply from 192.168.1.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 15ms, Average = 5ms

C:\>
```

PC IN ADMIN CAN PING DEVICES IN FINANCE

Command Prompt



Packet Tracer PC Command Line 1.0

C:\>

ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.

Reply from 192.168.1.2: bytes=32 time=60ms TTL=127

Reply from 192.168.1.2: bytes=32 time=57ms TTL=127

Reply from 192.168.1.2: bytes=32 time=34ms TTL=127

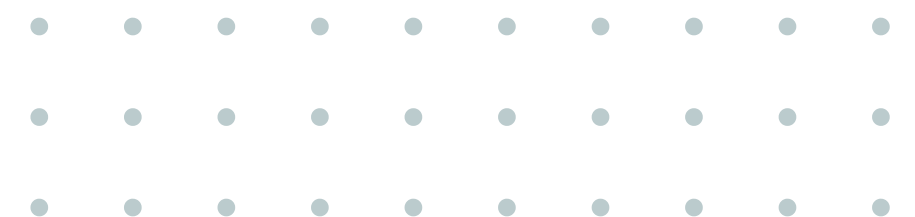
Ping statistics for 192.168.1.2:

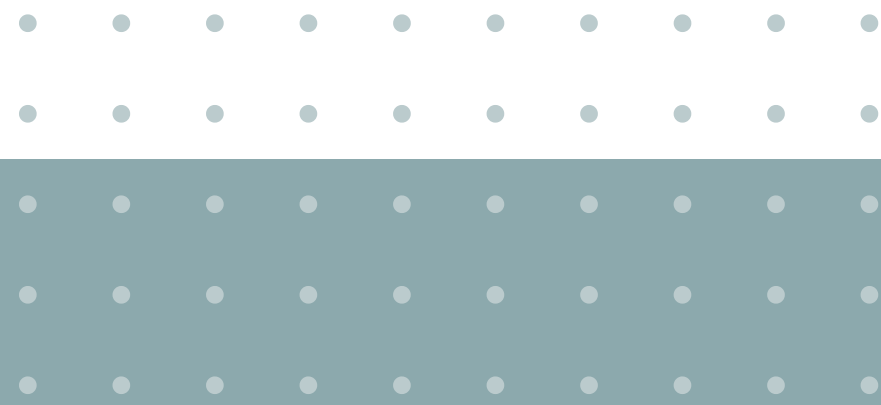
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 34ms, Maximum = 60ms, Average = 50ms

C:\>





THANK YOU

