NETSEC

Capstone By Adhiraj Saharan

DEVICES ON THE NETWORK

01. A SINGLE ROUTER AND SWITCH

02. 3 PCS, 3 PRINTERS, 3 ACCESSPOINTS

03. 2 LAPTOPS

04. 2 SMARPHONES

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 SWICH 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 OPTAIN 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)

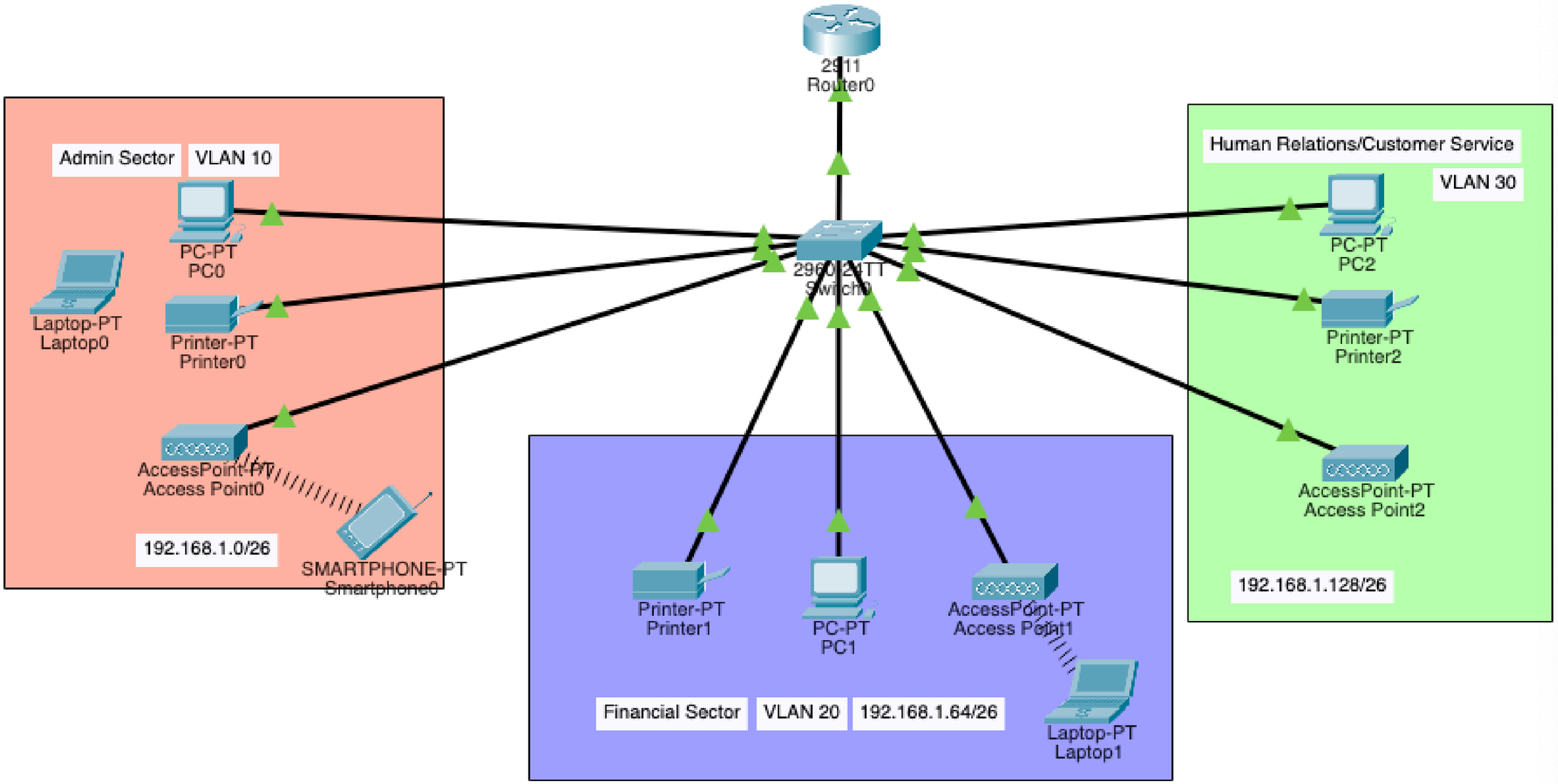
3RD SUBNET CONFIGURATION (CUSTOMER SERVICE SECTOR)

Network ID: 192.168.1.128 (second ID + block size)

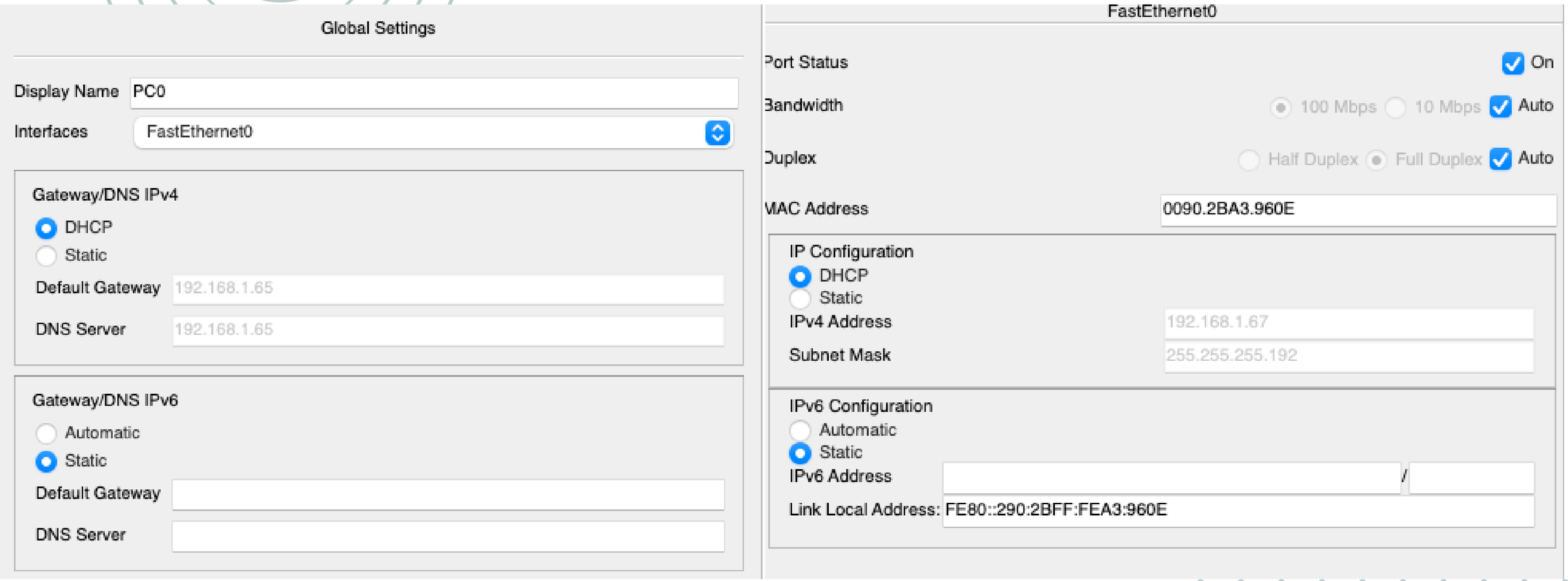
Broadcast ID: 192.168.1.192 (they act like a loop that point to the next subnet)

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

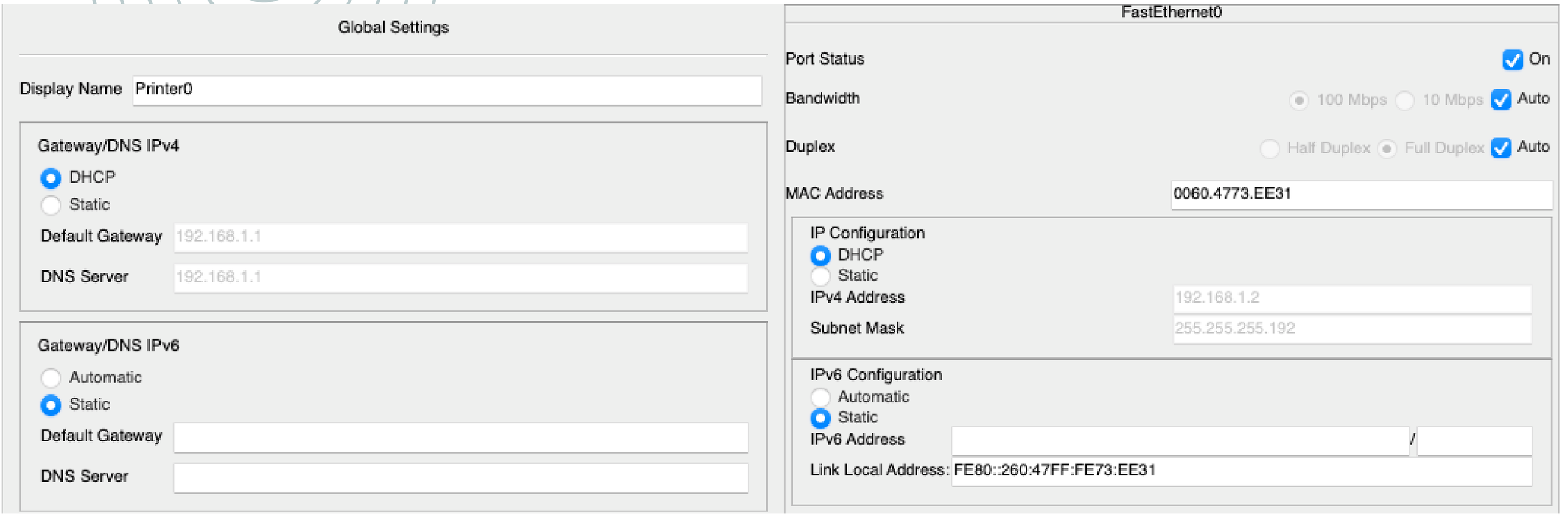
SCREENSHOT


2911
Router0
Admin Sector
VLAN 10
PC-PT
PC0
Laptop-PT
Laptop0
Printer-PT
Printer0
AccessPoint-PT
Access Point0
192.168.1.0/26
SMARTPHONE-PT
Smartphone0
2960-24TT
Switch0
Printer-PT
Printer1
PC-PT
PC1
AccessPoint-PT
Access Point1
Financial Sector
VLAN 20
192.168.1.64/26
Laptop-PT
Laptop1
Human Relations/Customer Service
VLAN 30
PC-PT
PC2
Printer-PT
Printer2
AccessPoint-PT
Access Point2
192.168.1.128/26

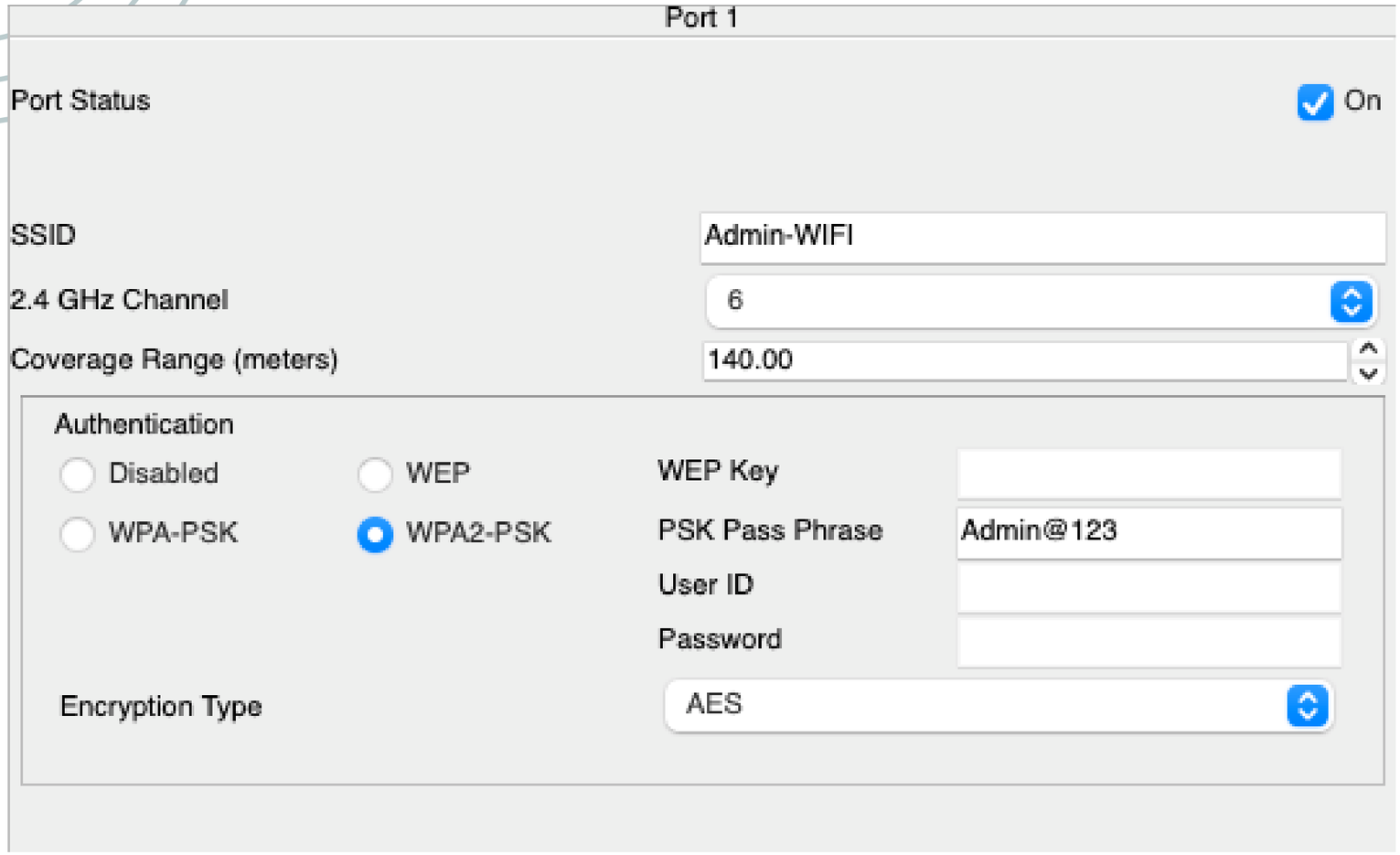
ADMIN SECTOR (VLAN 10) PC0 CONFIG



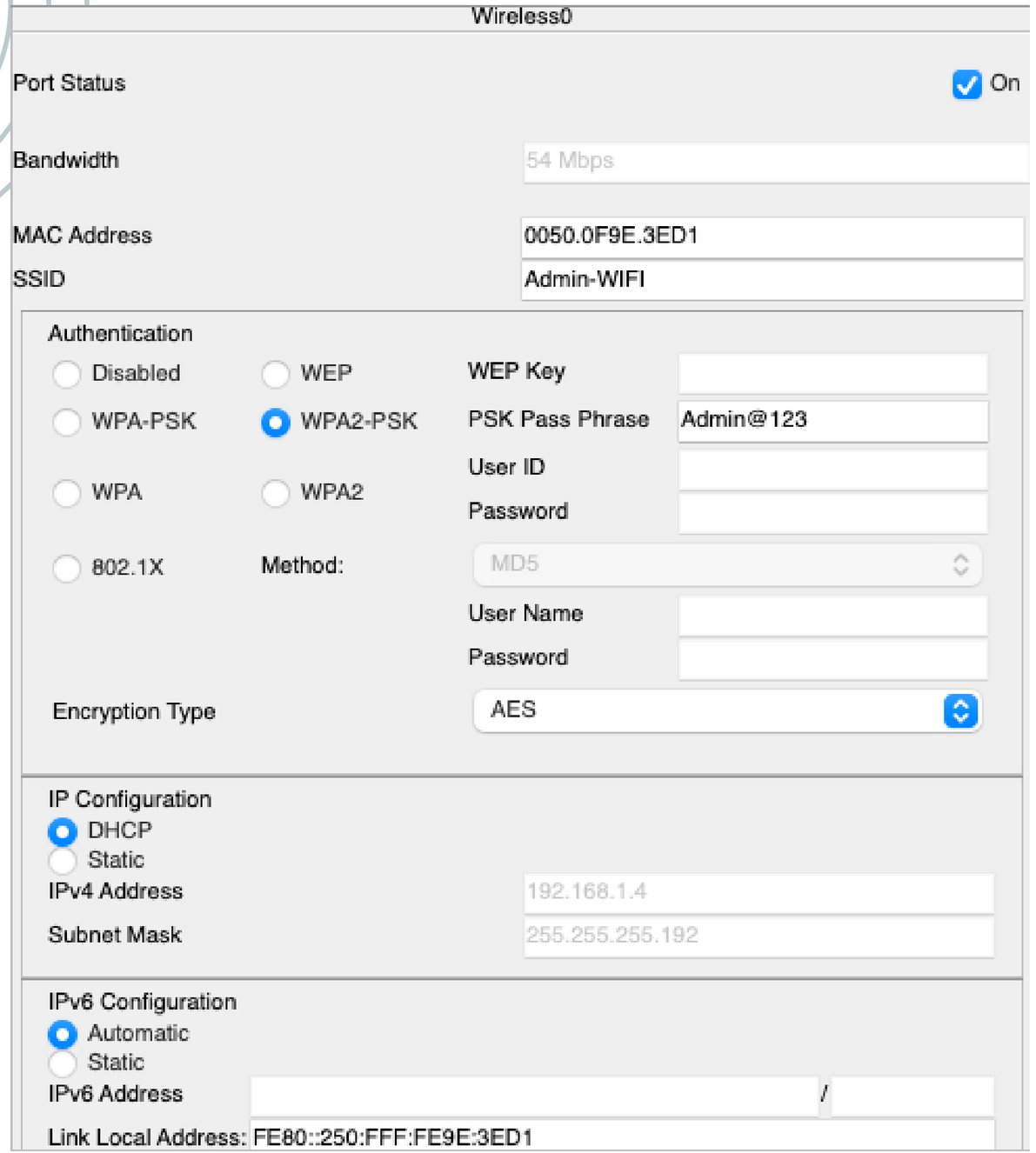
ADMIN SECTOR (VLAN 10) PRINTERO CONFIG



ADMIN SECTOR (VLAN 10) ACCESSPOINT CONFIG



ADMIN SECTOR(VLAN 10) SMARTPHONE0 CONFIG

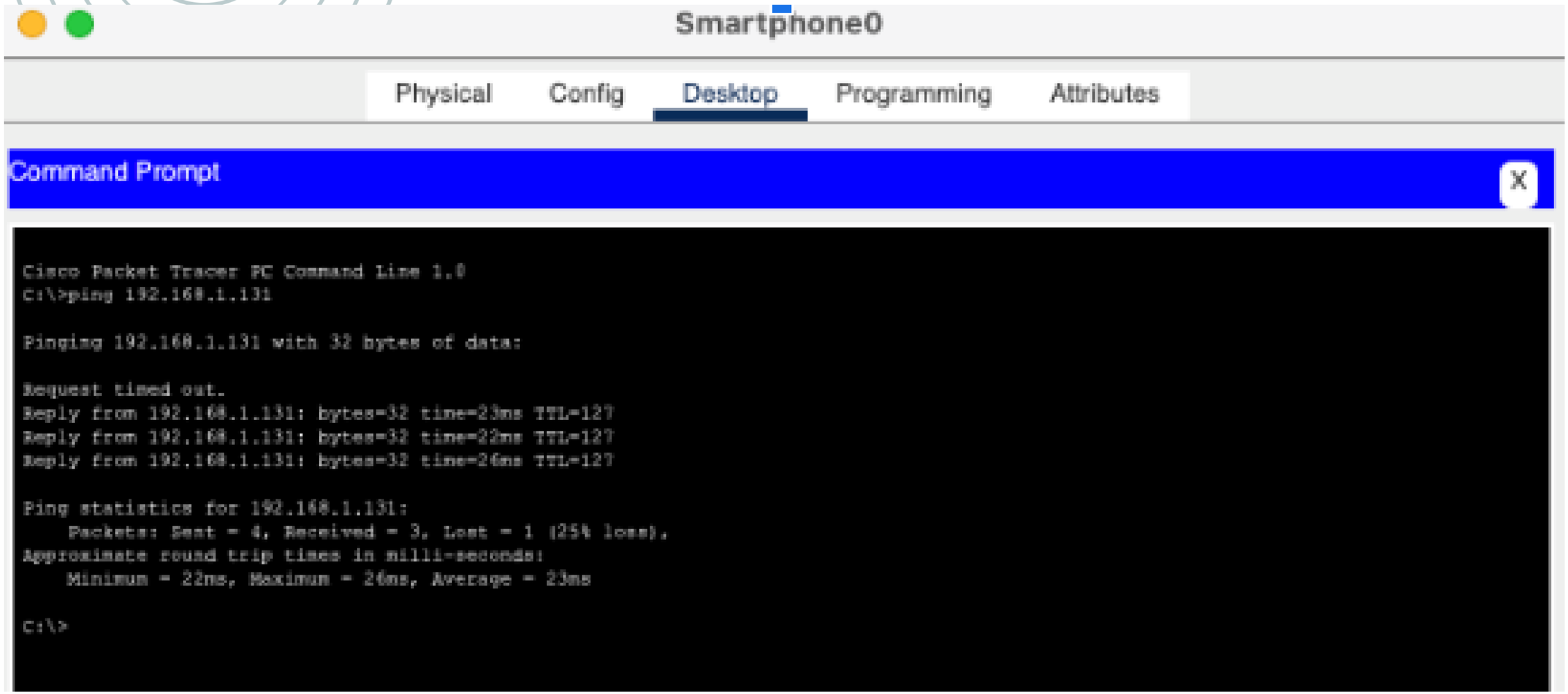


THE REMAINING DEVICES ARE SIMILARLTY CONNECTED TO THE ACCESS POINTS IN THE OTHER SECTORS

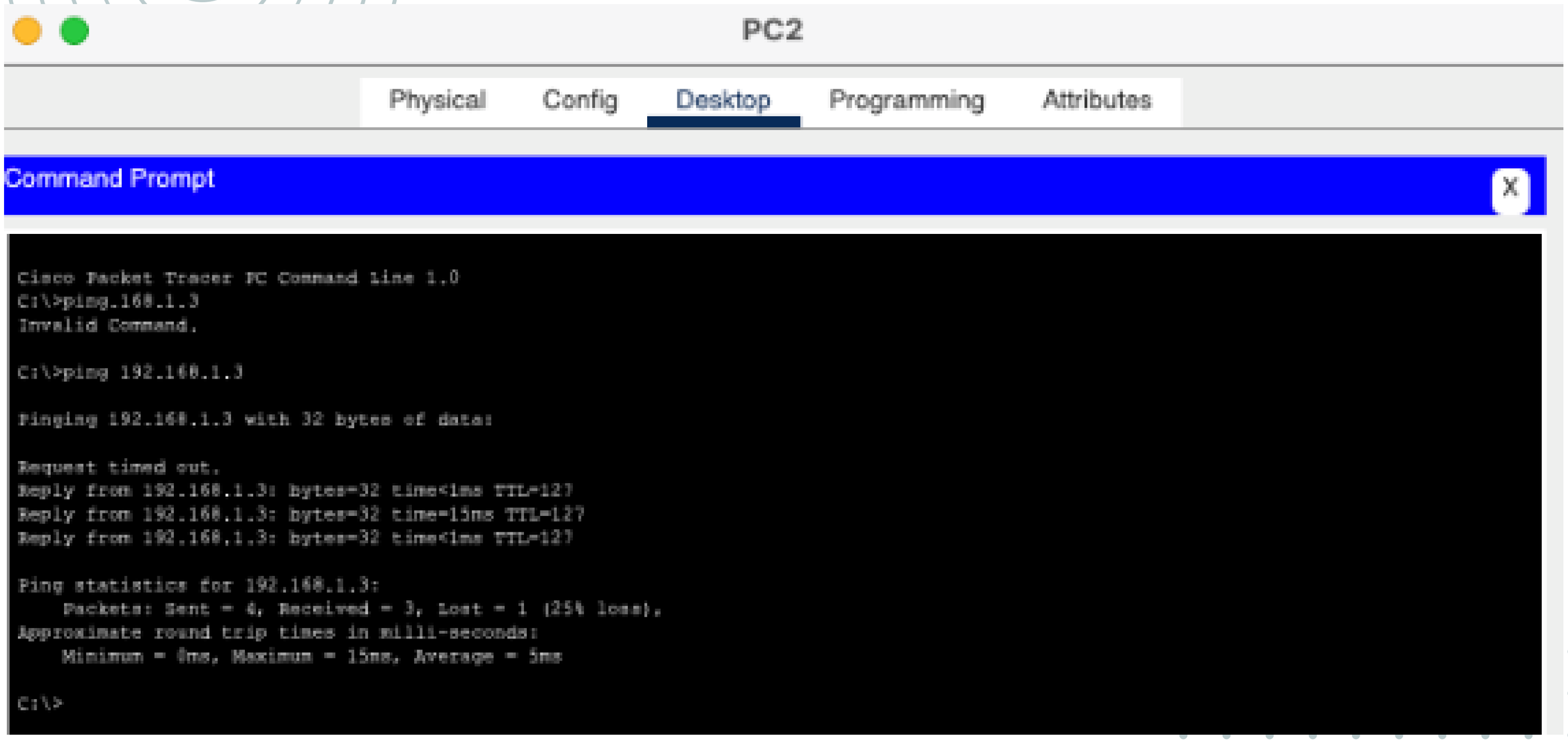
THE ROUTER CONFIG AND SWITCH CONFIG CAN BE BETTER REVIEWED IN THE PACKET TRACER FILE

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

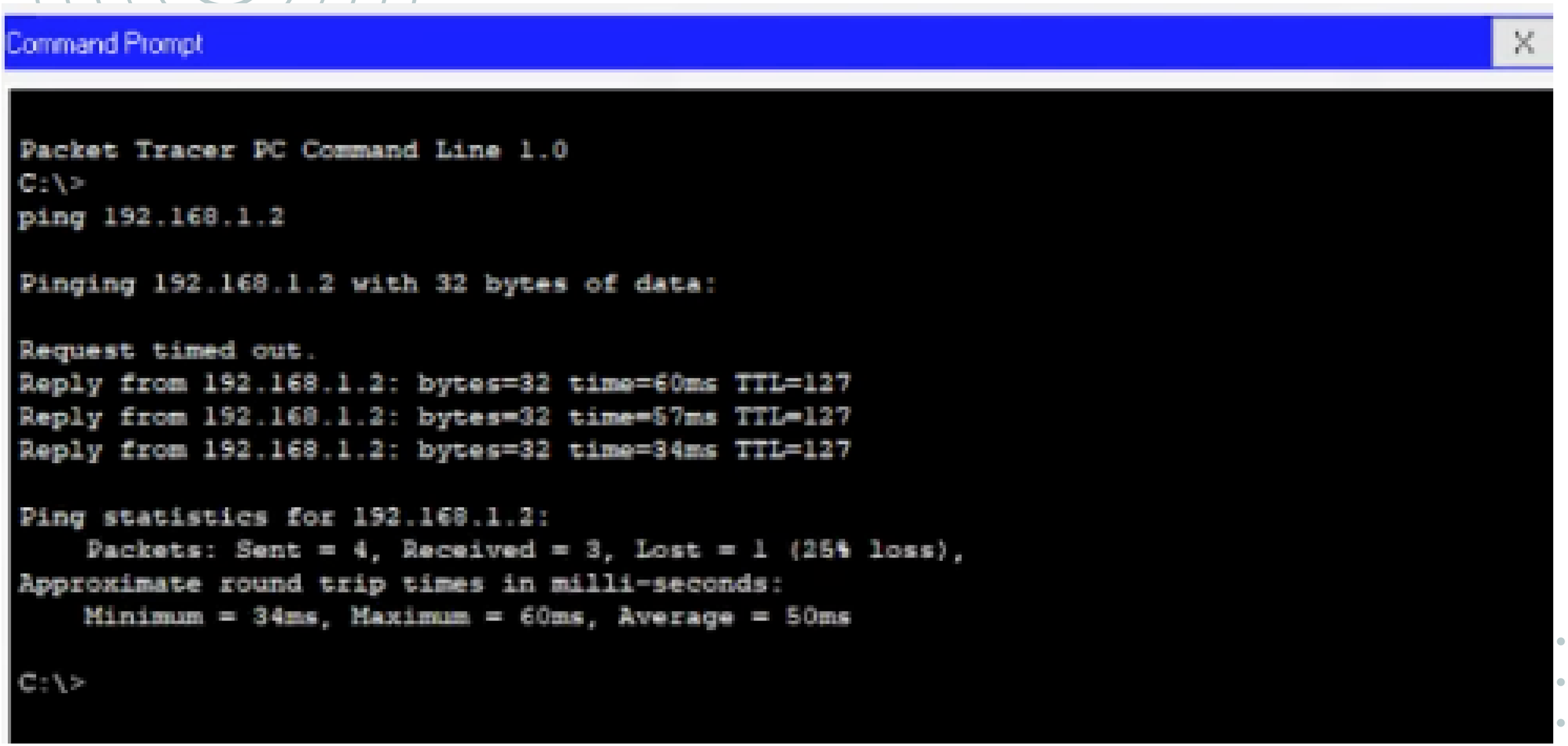
SMARTPHONE IN ADMIN CAN PING CUSTOMER SERVICE SECTOR



PC IN CUSTOMER SERVICE CAN PING DEVICES IN FINANCE



PC IN ADMIN CAN PING DEVICES IN FINANCE



THANK YOU