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Introduction:

Importance of Cybersecurity in Barbershops:

Barbershops just like many other businesses are now increasingly getting reliant on digital technology in various operations which is including customer management, their scheduling and inventory control management. This integration of the digital system brings about significant benefits which are also for efficiency and customer service. However it now also exposes barbershops to potential risks of cyber threats that can jeopardize sensitive customers data and disrupt ongoing business operations.

- One of key challenges that is faced by barbershops is the need to safeguard customer information, their financial transactions and network infrastructure from cyber attacks which include data breaches, ransomware and phishing attempts. Given that the interconnected nature of digital system within the barbershop, a breach in its security can have very far reaching consequences that may including loss of customer trust, financial liabilities and complete operational disruptions.
- With the emergence of Internet of Thing (IoT) devices in barbershops such as those smart mirrors and automated appointment systems these add another layer of complexity to the cybersecurity. These devices with offering conveniences and innovation also do pose many security risks if they are not properly secured. Therefore, ensuring of robust cybersecurity measures in barbershops is now a paramount need to protect both customer data and business operations.
- An effective efficient strategy to enhance cybersecurity for barbershops involves implementation of Access Control Lists (ACLs). By configure ACLs to segregate weak and vulnerable devices such as IoT devices onto separate access control lists, barbershops can mitigate the risk of a single point of failure compromise the entire network. This approach enables the enforcement of access restriction ensure that even if one ACL is compromise and rest of network remains secure and thereby limit the impact of potential security breaches.

Overview of some Cyber Threats Faced by Barbershops:

Barbershops are just like many other businesses in today's digital age which are increasingly vulnerable to wide range of cyber threats. These threats poses great risks to both the security of customer data and the smooth functioning of businesses operations. It is to understand the nature of these threats which is essential for implementing effective cybersecurity measures. (Brogan et al., 2023)

Data Breaches: One of the most riskier and dangerous threats faced by barbershops is the risk of the data breaches. Barbershops often collect the data and store sensitive customer information which is also including contact details, payment information and appointment schedules. In the case of data breach this information can be leaked leading to financial loss also reputational damage and potential legal liabilities.

Ransomware Attacks: Ransomware attacks involves malicious encryption of data by cybercriminals which then demand payment (a ransom) in return for decrypting of the data. Barbershops are also not immune to such attacks and the consequences can be severe to them. Successfully done ransomware attack can disrupt business operations which may lead to data loss and may result in financial losses due to downtime of the service and ransom payments.

Phishing Attempts: Phishing is also a really common tactic used by cybercriminals in order to trick individuals into giving sensitive information such as login credentials and financial details. Barbershops may be targeted by any phishing attempt by fraud emails or messages which are posing as legitimate entities. If these employees fall victim to any of these phishing scams then it can compromise the security of the entire business.

Compromised IoT Devices: The including of Internet of Things (IoT) devices in barbershops introduce many new security challenges. With the use of devices like Smart mirrors, automated appointment systems and other IoT devices may get vulnerabilities which can be exploited by cybercriminals to get unauthorized access to network. Compromised IoT devices can serve to be entry points for attackers for launch further attacks or to steal sensitive information. (Wylde et al., 2022)

Operational Disruptions: It is the direct impact on data security, cyber threats can also disrupt the day-to-day operations of barbershops. Downtime resulting from a cyber attack can lead to appointment cancellations, loss of revenue, and damage to the business's reputation. Moreover, the time and resources required to recover from an attack can place a significant burden on the business. (Badotra et al., 2021)

Objectives of the report:

Smart Barber Shop Cybersecurity Initiative with countering cyber security measures

The primary objective of this business plan is to outline a comprehensive cybersecurity strategy tailored to unique needs of a **Smart Barber Shop** which is implemented on cisco packet tracer. Firstly, the prototype of this topology was made on lucid chart and then the working topology is made to represent the communication across of Smart barber shop between all the devices. Specifically, the plan aims to achieve the following objectives:

1. Highlight the Importance of Cybersecurity: Plan will emphasize critical significance of cybersecurity within context of a Smart Barber Shop. It will shed light on the potential risk associated to cyber threats such as data breaches, ransomware attacks, phishing attempts and compromised IoT devices. By raise awareness of threat and plan seeks to cultivate a proactive approach towards cybersecurity among barber shop owners and stakeholder. (Eliyan et al., 2021)

2. Examine Existing Cybersecurity Practices: Through utilization of a simple network topology diagram and plan will examine current cybersecurity practices implement in Smart Barber Shop. Analysis will encompass areas such as data and network security, encryption technologies, firewalls, intrusion detection system (IDS), patch management and software upgrade.

3. Explore Innovative Solutions: In addition to assess current cybersecurity measures plan would explore innovative solutions and best practice for enhance cybersecurity in Smart Barber Shop. This may include implementation of VLANs (Virtual Local Area Networks) to segregate network traffic and protect sensitive information and as well as adoption of advanced authentication and encryption technology to safeguard against cyber threats.

4. Provide Practical Recommendations: Based on findings of analysis and plan will offer practical recommendation for improved cybersecurity posture of Smart Barber Shop. These recommendations will be tailored to specific need and constraints of barber shop environment and taking into account factors such as budget, resources and technical expertise.

5. Promote Compliance with Regulations: Finally, plan will emphasize importance of compliance with relevant regulations and industry standards such as General Data Protection Regulation (GDPR) and other legal frameworks govern data privacy and security. By adhere these regulations Smart Barber Shop can mitigate legal risk and demonstrate a commitment to protect customer information. (Ahuja & Singh, 2019)

Cyber Security Measures in Barbershops:

Data and Network Security:

Barbershops like many modern businesses rely on interconnected network and digital systems to manage operations, store customer data and facilitate transactions. However with this reliance comes the inherent risk of cyber threats targeting sensitive information and network infrastructure. To mitigate the risk and ensure the integrity and confidentiality of data and barbershops must prioritize robust data and network security measures. (Gardner, 2020)

Importance of Protecting Network Infrastructure:

The network infrastructure of barbershop serves as the backbone of its operations and facilitating communication between devices and storage of data and access to essential services. Given the interconnected nature of modern networks, a breach in security at any point can have cascade effects and potentially compromising sensitive information and disrupting business operation. Therefore safeguard network infrastructure against cyber threats a paramount. (Kotey et al., 2019)

Utilization of Digital Technology in Barbershops:

In recent years barbershops have embraced digital technology with streamline operation and enhance customer experience. From online booking system and digital payment platforms to smart mirrors and IoT devices and integration of digital tools has become commonplace of barbershop environments. While these technologies offer numerous benefits and they also introduce new security challenges and necessitate proactive measure to protect against cyber threats.

Case Study: Maliks Barbershop (S Cutz):

To illustrate importance of data and network security in a real-world context lets consider case of Maliks Barbershop, also known as S Cutz. As a thriving barbershop in digital age and S Cutz relies on robust network infrastructure to manage appointment and process payments and store customer records. However increasing prevalence of cyber threats pose significant risk to the security of S Cutzs operations.

Implement comprehensive data and network security measures is essential to safeguard S Cutz against potential cyber threats. This may include deploy firewalls and intrusion detection systems (IDS) to monitor network traffic and encrypt sensitive data to prevent unauthorize access and implement stringent access control measures to limit the exposure of confidential information.

By prioritize data and network security, S Cutz can protect its customer sensitive information and maintain the trust of its client and safeguard the continuity of its business operations. Moreover investing in robust security measures demonstrates S Cutzs commitment to prioritize customer privacy and maintain the integrity of its operation in a increasingly digital landscape. (Klein et al., 2023)

ACL (Access Control List) for Enhanced Security:

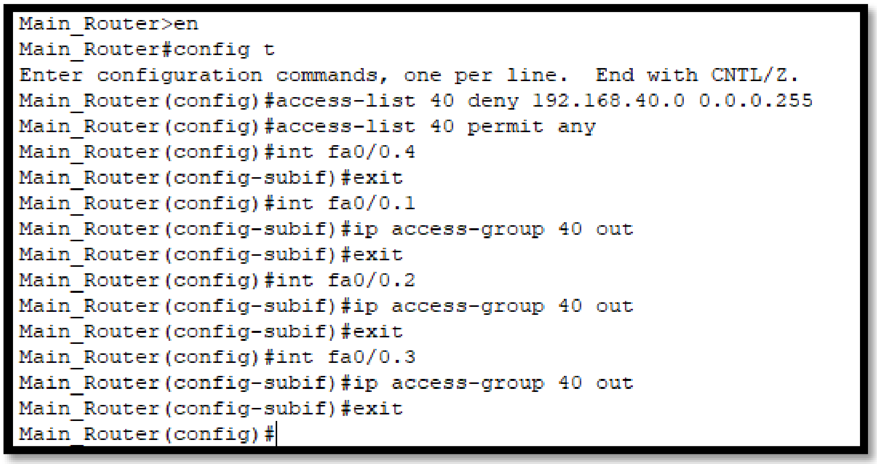
In the digital age characterized as ubiquitous interconnection Access Control Lists (ACLs) emerge as strategic fortification network security and especially in environment like barbershops with diverse device ecosystem. ACLs involve create list specify permit or deny access of different users or groups and devices. Segment a single network into multiple small subnetwork each with its own ACL configuration and enhanced control over resource access achieved. This segmenting not only facilitate efficient network management and performance optimization also plays a pivotal role for bolster cybersecurity measures.

Concept of ACL:

ACL (Access Control List) is security mechanism used for computing of regulate access to resources like files and directories or network devices. It consists of lists of entry specify users groups or system entities along with their permitted or denied action on the resource. These permissions can include read, write and execute etc. ACLs is of two main types: Discretionary Access Control (DAC) and Mandatory Access Control (MAC). DAC allows resource owners to manage access while MAC imposes centrally administered policies. When a user attempt access to system evaluates the ACL to determine if access should be granted or denied, ensure security and integrity. (Garcia et al., 2021)

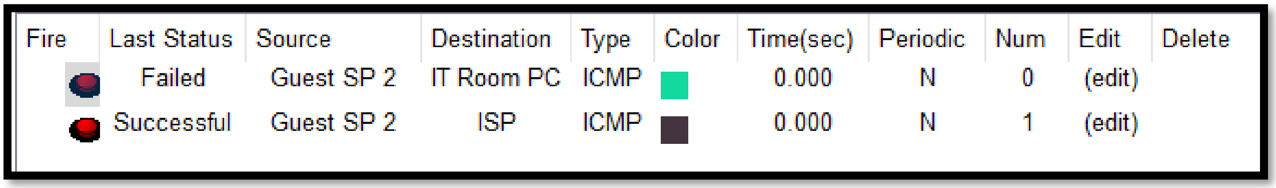
Implementation of ACL in Barbershops:

In barbershop implementing ACL in a way to secure the network is possible. Fort this network the ACL is applied on the guest network in order to stop the device at that network to access the other devices. But still, it can access the internet. This can be done by making an ACL list of denying 192.168.40.0 255.255.255.0 and applied it on the etheranet sub interfaces except the sub-interface of guest VLAN and Internet service provider (ISP). This is done as:



```
Main_Router>en
Main_Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Main_Router(config)#access-list 40 deny 192.168.40.0 0.0.0.255
Main_Router(config)#access-list 40 permit any
Main_Router(config)#int fa0/0.4
Main_Router(config-subif)#exit
Main_Router(config)#int fa0/0.1
Main_Router(config-subif)#ip access-group 40 out
Main_Router(config-subif)#exit
Main_Router(config)#int fa0/0.2
Main_Router(config-subif)#ip access-group 40 out
Main_Router(config-subif)#exit
Main_Router(config)#int fa0/0.3
Main_Router(config-subif)#ip access-group 40 out
Main_Router(config-subif)#exit
Main_Router(config)#
```

Thus, when sending the packet from guest to any other network the message packet is failed except the packet send to the ISP as:



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Failed	Guest SP 2	IT Room PC	ICMP	🟩	0.000	N	0	(edit)	
●	Successful	Guest SP 2	ISP	ICMP	■	0.000	N	1	(edit)	

Benefits of ACLs for Cybersecurity in Barbershops:

The implementing Access Control Lists (ACLs) offer several cybersecurity advantages:

1. **Isolation of Vulnerable Devices:** ACLs allow barbershop segregate IoT devices and potentially vulnerable endpoints onto separate networks reduce the risk of compromising the entire network. By enforce access restriction through ACL

configuration scope of potential security breaches is limited and thereby bolster network resilience.

2. **Granular Access Control:** ACLs empower barbershop to enforce granular access control policies tailor to specific requirement of each network. For example, these ACLs can be configured restrict unauthorized access with sensitive data and services ensure only authorized personnel can access critical system and information. The fine-grained control enhances security posture.
3. **Improved Network Performance:** Utilize ACLs aid optimize network performance by minimize broadcast traffic and segment network traffic into small and more manageable segment. This segment facilitates better resource allocation, leads to enhanced network efficiency, reduced latency, and improve overall reliability.

VLAN and Inter-VLAN Routing with DHCP for Enhanced Security

In the realm of network security VLANs (Virtual Local Area Networks) and inter-VLAN routing play pivotal roles for enhancing the protection in network resources and data integrity. By segment network into a distinct VLANs and enable communication between them through inter-VLAN routing, organizations that include barbershops can bolster their cybersecurity posture and mitigate potential threat.

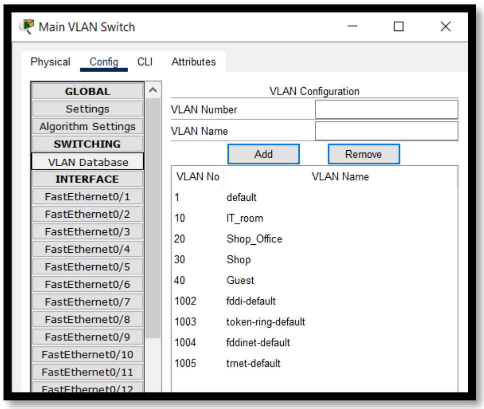
Concept of VLAN and Inter-VLAN:

VLANs is logical segmenting mechanisms that divide a single physical network into multiple isolated broadcast domains and each behaving as if it was a separate network. Inter-VLAN routing, on the other hand, facilitates communication between devices resides in different VLANs by routing traffic through a layer 3 device of which as router or layer 3 switch. This enables seamless connectivity while maintained network for segmentation and security. (Patel et al., 2023)

Implementation of VLAN and Inter-VLAN in Barbershops:

In barbershops, VLANs can be implemented to segregate network traffic based on functional areas or user groups. For instance, VLAN 10 can be designated for IT room devices, VLAN 20 for office devices, VLAN 30 for shop devices (including reception and staff members), and VLAN 40 for guest devices (such as customer smartphones or tablets). Inter-VLAN routing allows these VLANs to communicate securely, facilitating essential functions like data sharing and resource access while preventing unauthorized access to sensitive information.

The VLAN is firstly made on the switch and each port that connect al the devices to the switch were assigned the VLAN but 1 port is shifted in trunk mode so that inter VLAN routing is possible because this port at other end is connected to the router. The VLAN database in switch is as:



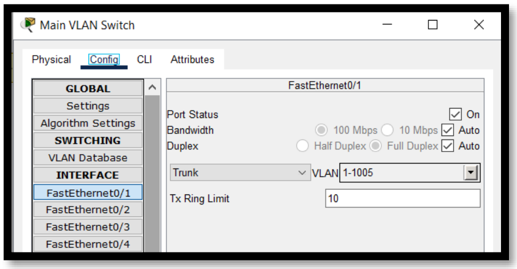
VLAN Configuration

VLAN Number

VLAN Name

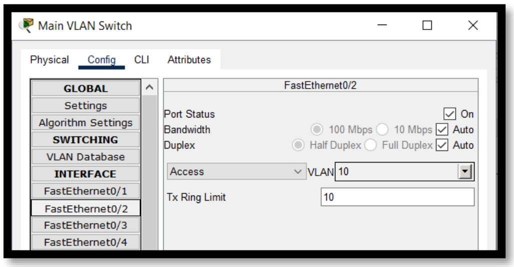
VLAN No	VLAN Name
1	default
10	IT_room
20	Shop_Office
30	Shop
40	Guest
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Then all the ports were switch to the access mode and given their respective port:



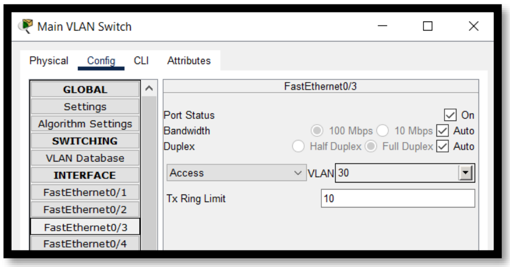
FastEthernet0/1

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Trunk VLAN 1-1005
Tx Ring Limit 10



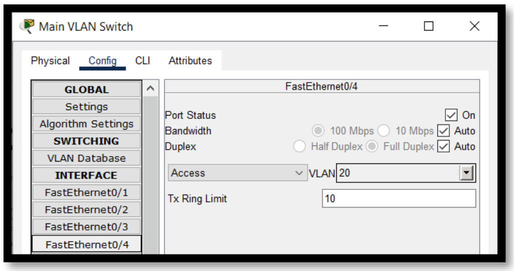
FastEthernet0/2

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 10
Tx Ring Limit 10



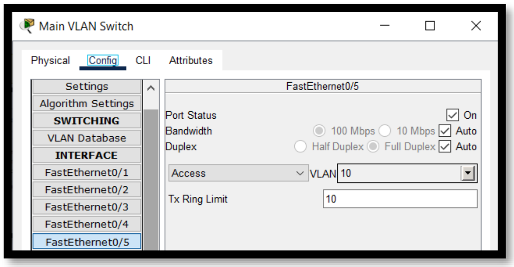
FastEthernet0/3

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 30
Tx Ring Limit 10



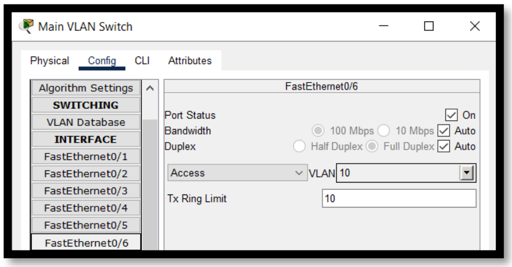
FastEthernet0/4

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 20
Tx Ring Limit 10



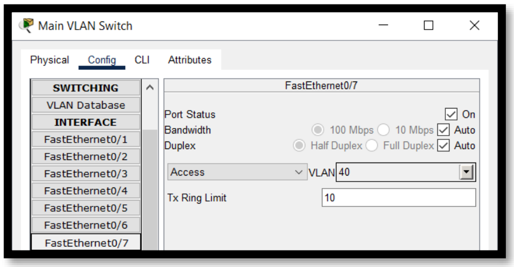
FastEthernet0/5

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 10
Tx Ring Limit 10



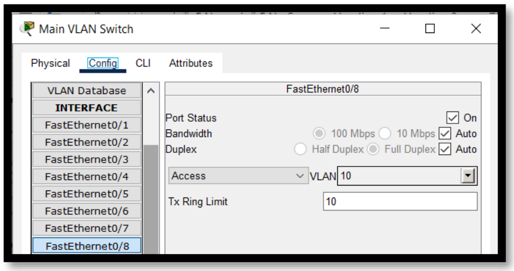
FastEthernet0/6

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 10
Tx Ring Limit 10



FastEthernet0/7

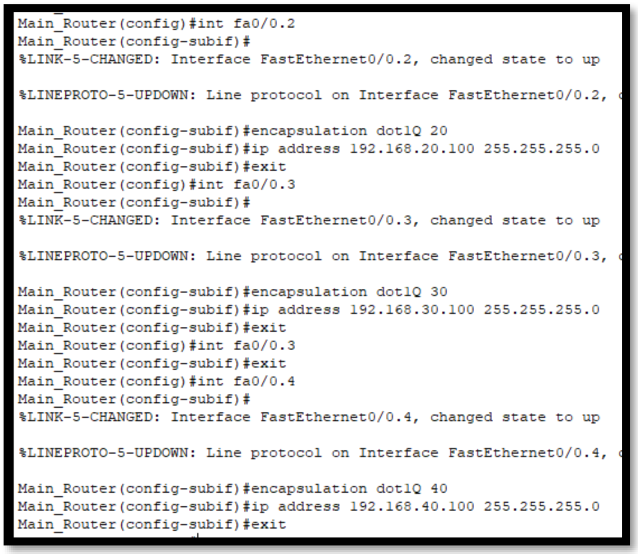
Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 40
Tx Ring Limit 10



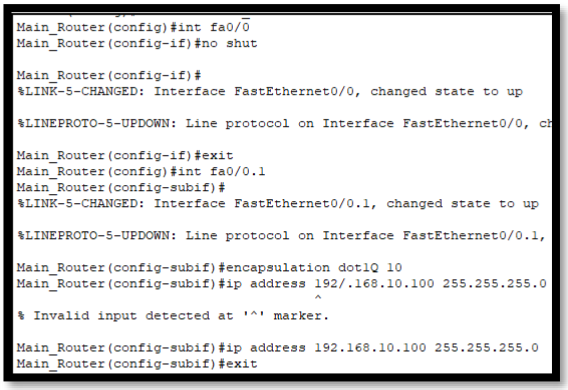
FastEthernet0/8

Port Status ☑ On
Bandwidth ○ 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ○ Half Duplex ○ Full Duplex ☑ Auto
Access VLAN 10
Tx Ring Limit 10

These VLANs were successfully configured after doing these steps the communication is done only in between these VLANs not across the VLAN. For this we do Inter-VLAN routing using trunking ode in Switch and dot1Q encapsulation in router. The trunk mode is already enabled in the switch now we have to enable the dot1Q encapsulation on router for successful communication across the network as router configuration:

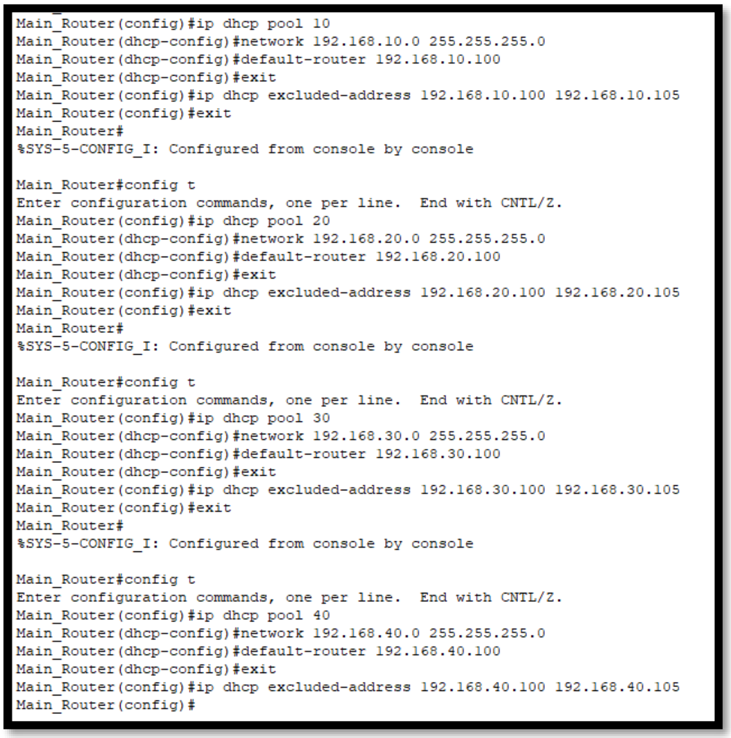


```
Main_Router(config)#int fa0/0.2
Main_Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.2, c

Main_Router(config-subif)#encapsulation dot1Q 20
Main_Router(config-subif)#ip address 192.168.20.100 255.255.255.0
Main_Router(config-subif)#exit
Main_Router(config)#int fa0/0.3
Main_Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.3, c

Main_Router(config-subif)#encapsulation dot1Q 30
Main_Router(config-subif)#ip address 192.168.30.100 255.255.255.0
Main_Router(config-subif)#exit
Main_Router(config)#int fa0/0.3
Main_Router(config-subif)#exit
Main_Router(config)#int fa0/0.4
Main_Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.4, c

Main_Router(config-subif)#encapsulation dot1Q 40
Main_Router(config-subif)#ip address 192.168.40.100 255.255.255.0
Main_Router(config-subif)#exit
```



```
Main_Router(config)#int fa0/0
Main_Router(config-if)#no shut

Main_Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, ch

Main_Router(config-if)#exit
Main_Router(config)#int fa0/0.1
Main_Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1,

Main_Router(config-subif)#encapsulation dot1Q 10
Main_Router(config-subif)#ip address 192/.168.10.100 255.255.255.0
                                     ^
% Invalid input detected at '^' marker.

Main_Router(config-subif)#ip address 192.168.10.100 255.255.255.0
Main_Router(config-subif)#exit
```

Thus, VLAN works properly but we have to give the ip to each device and for doing it efficiently we use DHCP protocol on each of the sub interface of etheranet of router fa0/0 thus each of the devices across all the VLANs get dynamic ip from ip pool. The configuration of this router is as:



```
Main_Router(config)#ip dhcp pool 10
Main_Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Main_Router(dhcp-config)#default-router 192.168.10.100
Main_Router(dhcp-config)#exit
Main_Router(config)#ip dhcp excluded-address 192.168.10.100 192.168.10.105
Main_Router(config)#exit
Main_Router#
%SYS-5-CONFIG_I: Configured from console by console

Main_Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Main_Router(config)#ip dhcp pool 20
Main_Router(dhcp-config)#network 192.168.20.0 255.255.255.0
Main_Router(dhcp-config)#default-router 192.168.20.100
Main_Router(dhcp-config)#exit
Main_Router(config)#ip dhcp excluded-address 192.168.20.100 192.168.20.105
Main_Router(config)#exit
Main_Router#
%SYS-5-CONFIG_I: Configured from console by console

Main_Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Main_Router(config)#ip dhcp pool 30
Main_Router(dhcp-config)#network 192.168.30.0 255.255.255.0
Main_Router(dhcp-config)#default-router 192.168.30.100
Main_Router(dhcp-config)#exit
Main_Router(config)#ip dhcp excluded-address 192.168.30.100 192.168.30.105
Main_Router(config)#exit
Main_Router#
%SYS-5-CONFIG_I: Configured from console by console

Main_Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Main_Router(config)#ip dhcp pool 40
Main_Router(dhcp-config)#network 192.168.40.0 255.255.255.0
Main_Router(dhcp-config)#default-router 192.168.40.100
Main_Router(dhcp-config)#exit
Main_Router(config)#ip dhcp excluded-address 192.168.40.100 192.168.40.105
Main_Router(config)#
```

Benefits of VLANs for Cybersecurity in Barbershops:

- **Enhanced Segmentation:** VLANs provide logical isolation of network segments by reducing scope of potential security breaches. Through separate critical infrastructure such as IT systems, from guest or public-facing networks, barbershops can mitigate the risk of unauthorized access to sensitive data.
- **Access Control:** VLANs enable granular access control policies and allows barbershops to restrict communication between different VLANs based on specific security requirement. This helps prevent lateral movement of threat within network and ensures that only authorized users can access designated resources.
- **Improved Network Performance:** VLANs optimize network performance by reduce broadcast traffic and segment network traffic into smaller and more manageable segments. This optimization leads to enhanced network efficiency and reduce latency and improved overall reliability.
- **Scalability and Flexibility:** VLANs offer scalability and flexibility and allow barbershops to adapt their network architecture to evolved business needs and security requirements. New VLANs can beecreated or existing ones modified to adjust changes in organizational structure or network infrastructure and ensure continued resilience against emerged threats.

Implementation of the Cisco Network topology (SMART BARBER SHOP):

Step 1: Drag and drop all the devices to the main canvas of the cisco packet tracer.

These devices include a list of different devices as IoT Devices, End Devices(Like PC's) and network devices(like routers). The list of devices used is as follows:

IOT Devices	End Devices	Network Devices
SMART Door, window, Ac, Web Cam, Light, Speaker	PC, Smart phone, printer	Router PT, Access Point-PT, 2960 24TT switch, DSL-Modem-PT, Internet Cloud

Step 2: Next step is to highlight all the section so that it could identified that which device is connected in which section and label each device in each section. AS to highlight there are three section as:

1. Shop Main Area

- Reception Desk
- Waiting Area
- Working Area

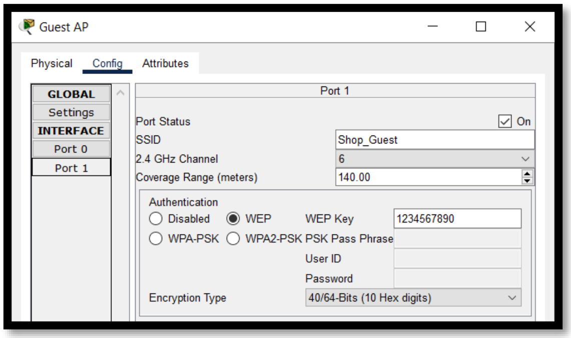
2. IT Room

3. Shop Office

Step 3: In this step all the devices are connected with in or across the network. This connection made using wired and wirelessly using access point.

The wired connection is simply done by connection wires in all of the section of the topology. As switch is connected to the access point and routers. The PCs are connected to the switches. Printer is connected to the switches. Server, modem, cloud is connected to the router.

But for wireless connection a SSID and password foe each section is given to the access point as foe Guest-AP done below:



Port 1

Port Status ☑ On

SSID: Shop_Guest

2.4 GHz Channel: 6

Coverage Range (meters): 140.00

Authentication

○ Disabled ● WEP WEP Key: 1234567890

○ WPA-PSK ○ WPA2-PSK PSK Pass Phrase

User ID

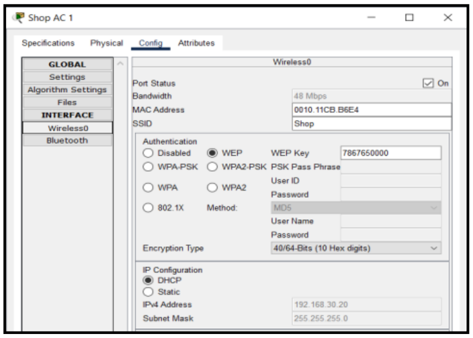
Password

Encryption Type: 40/64-Bits (10 Hex digits)

In this way all other Access point configuration tab is opened and the SSID and password given below is entered as:

Access point	SSID	Password
Guest-AP	Shop_Guest	1234567890
Shop-AP	Shop	7867650000
IT Room-AP	IT_Room	0987654321
Office-AP	Office	6789054321

Now these credentials were entered in the IoT Devices and the Smart Phone and they got connected to the access point as:



Wireless0

Port Status ☑ On

Bandwidth: 48 Mbps

MAC Address: 0010.11CB.B6E4

SSID: Shop

Authentication

○ Disabled ● WEP WEP Key: 7867650000

○ WPA-PSK ○ WPA2-PSK PSK Pass Phrase

○ WPA ○ WPA2 User ID

Password

○ 802.1X Method: MD5

User Name

Password

Encryption Type: 40/64-Bits (10 Hex digits)

IP Configuration

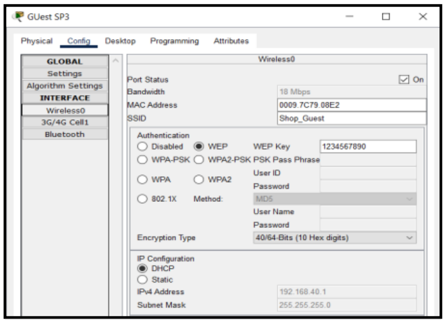
● DHCP

○ Static

IPv4 Address: 192.168.30.20

Subnet Mask: 255.255.255.0

IoT credentials Entered



Wireless0

Port Status ☑ On

Bandwidth: 18 Mbps

MAC Address: 0009.7C79.08E2

SSID: Shop_Guest

Authentication

○ Disabled ● WEP WEP Key: 1234567890

○ WPA-PSK ○ WPA2-PSK PSK Pass Phrase

○ WPA ○ WPA2 User ID

Password

○ 802.1X Method: MD5

User Name

Password

Encryption Type: 40/64-Bits (10 Hex digits)

IP Configuration

● DHCP

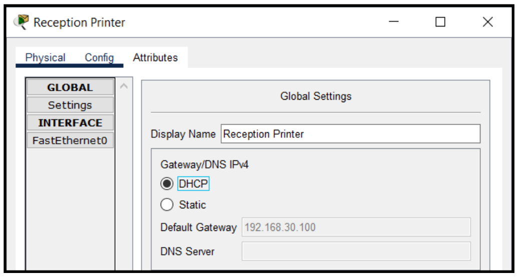
○ Static

IPv4 Address: 192.168.40.1

Subnet Mask: 255.255.255.0

SMART PHONE credentials entered

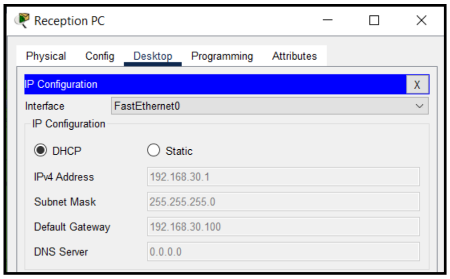
This is done and the wireless devices are connected successfully. Remember that to turn on DHCP for these wireless devices so each device will get its IP. The DHCP also turned on for the wired connected devices as PC or Printer as:



Display Name: Reception Printer

Gateway/DNS IPv4
● DHCP
○ Static
Default Gateway: 192.168.30.100
DNS Server:

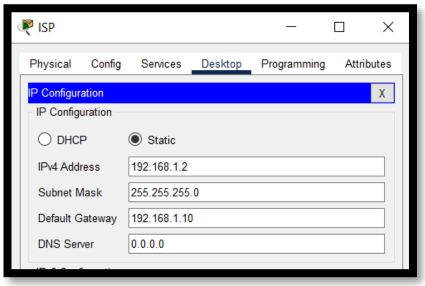
Printer Given Default gateway through DHCP



Interface: FastEthernet0
IP Configuration
● DHCP ○ Static
IPv4 Address: 192.168.30.1
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.30.100
DNS Server: 0.0.0.0

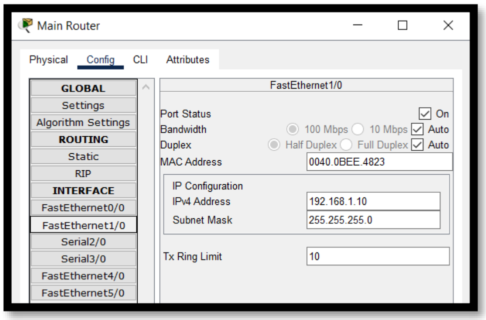
IP Given to PC using DHCP

This step is also repeated for servers except for the ISP the IP 192.168.1.10 is given statically and for its router also given static IP of 192.169.1.100 so that router can access the internet:

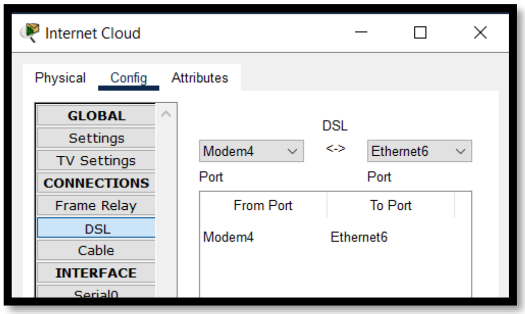


IP Configuration
○ DHCP ● Static
IPv4 Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.10
DNS Server: 0.0.0.0

The router at in fa0/1 is connected to the ISP Internet service provider and for and the cloud the as:



FastEthernet1/0
Port Status ☑ On
Bandwidth ● 100 Mbps ○ 10 Mbps ☑ Auto
Duplex ● Half Duplex ○ Full Duplex ☑ Auto
MAC Address: 0040.0BEE.4823
IP Configuration
IPv4 Address: 192.168.1.10
Subnet Mask: 255.255.255.0
Tx Ring Limit: 10



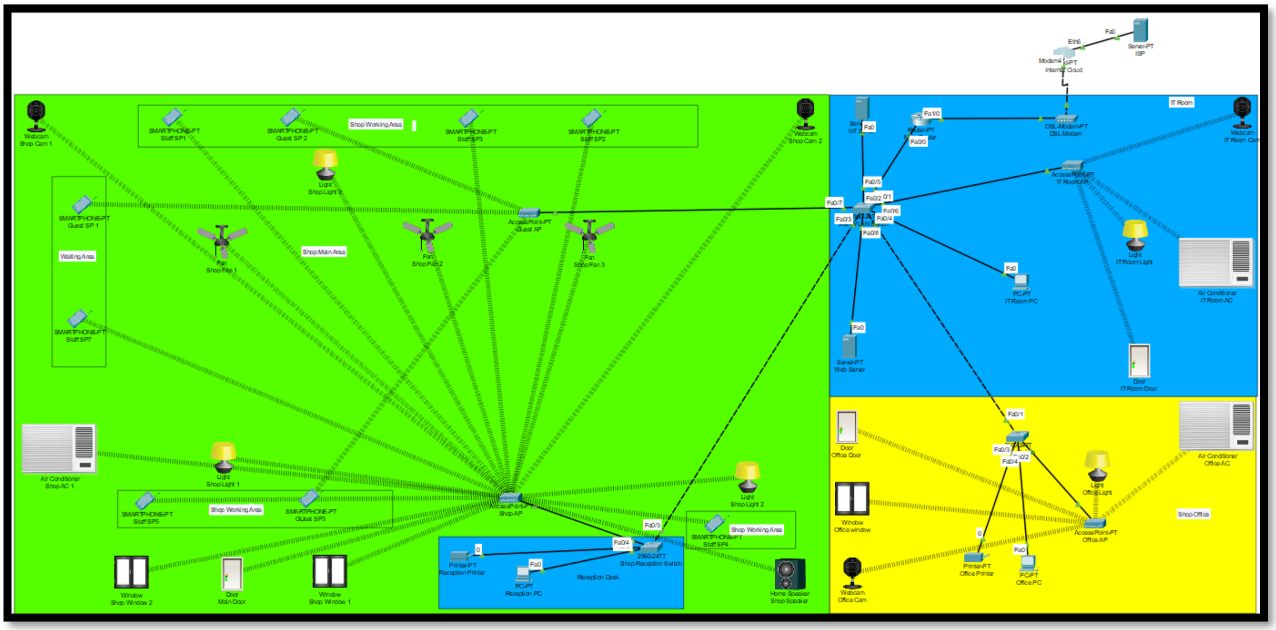
DSL
Modem4 Port <-> Ethernet6 Port

From Port	To Port
Modem4	Ethernet6

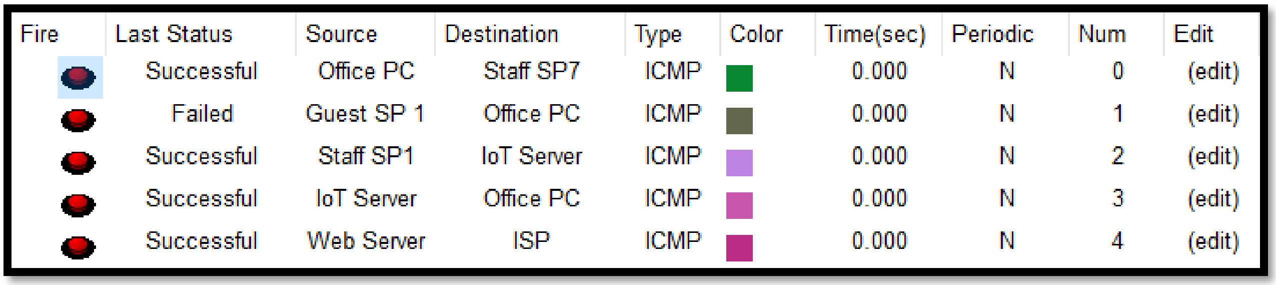
Thus all the devices are connected success fully the step 4 and 5 , 6 of ACL, VLAN and DHCP are already mentioned above. The table ranges for VLAN and DHCP are as:

Section	VLAN (Name, Num)	Sub-interface	DHCP Network	router IP
IT Room	IT_Room,10	Int fa0/0.1	192.168.10.0	192.168.10.100
Office	Office ,20	Int fa0/0.2	192.168.20.0	192.168.20.100
Shop	Shop,30	Int fa0/0.3	192.168.30.0	192.168.30.100
Guest	Guest,40	Int fa0/0.4	192.168.40.0	192.168.40.100

Thus, after doing these steps, we get the complete topology as:



The packet is success fully sent to each section except Guest as:



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
●	Successful	Office PC	Staff SP7	ICMP	🟩	0.000	N	0	(edit)
●	Failed	Guest SP 1	Office PC	ICMP	■	0.000	N	1	(edit)
●	Successful	Staff SP1	IoT Server	ICMP	■	0.000	N	2	(edit)
●	Successful	IoT Server	Office PC	ICMP	■	0.000	N	3	(edit)
●	Successful	Web Server	ISP	ICMP	■	0.000	N	4	(edit)

Conclusion:

In conclusion integration of cybersecurity measures and network topology in barbershop is imperative for safeguard sensitive data and protecting against cyber threats and ensuring uninterrupted business operations. By implement robust cybersecurity protocols such as VLANs, Access Control Lists (ACLs), and DHCP management and barbershops can effectively mitigate risks associated with data breaches and malware attacks, and unauthorized access. Additionally strategic deployment of network segment, inter-VLAN routing, and DHCP scope management enhances network resilience, scalability and performance. As barbershops continue to embrace digital transformation and rely on interconnected smart devices and prioritize cybersecurity and network topology becomes paramount. Adopting a proactive approach towards cybersecurity barbershops can foster customer trust and maintain regulatory compliance and uphold their reputation as secure and reliable service providers in the digital age of technology.

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