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MINI PROJECT
HOTEL NETWORK CONFIGURATION
Sub Code:- 23CAH-753 (NSA)

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Introduction

This project entails the design and configuration of a comprehensive network infrastructure tailored for a hotel environment, utilizing Cisco Packet Tracer. The network setup encompasses various elements including serial router configurations, password security measures and DHCP implementation to streamline IP address management.

Objective

The primary aim of this project is to develop a robust and efficient network infrastructure customized to meet the specific demands of a hotel setting. This involves the creation of segmented VLANs to manage traffic effectively, configuring routers to enable inter-VLAN communication, implementing security measures such as password protection, deploying a web server to facilitate guest services, and integrating DHCP services for simplified IP address allocation.

Description of System:

1st Floor Network Layout and Devices:

a) Reception (Area):

- Reception Desk Computers (used for guest check-in/check-out)
- IP Phones (used for communication between staff and guests)
- Printer (for guest-related documents)

Network Configuration:

- Reception computers and devices are connected to **Floor Switch 1**.
- The **Floor Switch 1** connects to **Router 1**, providing an internet connection and allowing access to the central network system.

b) Store (Area):

- Inventory Computers (for stock management)
- Printer (for generating receipts)

Network Configuration:

- Store systems are connected to Floor Switch 1, enabling seamless data sharing and communication between the store devices and other departments.

c). Logistics (Area):

- Inventory Management System (used for logistics tracking)

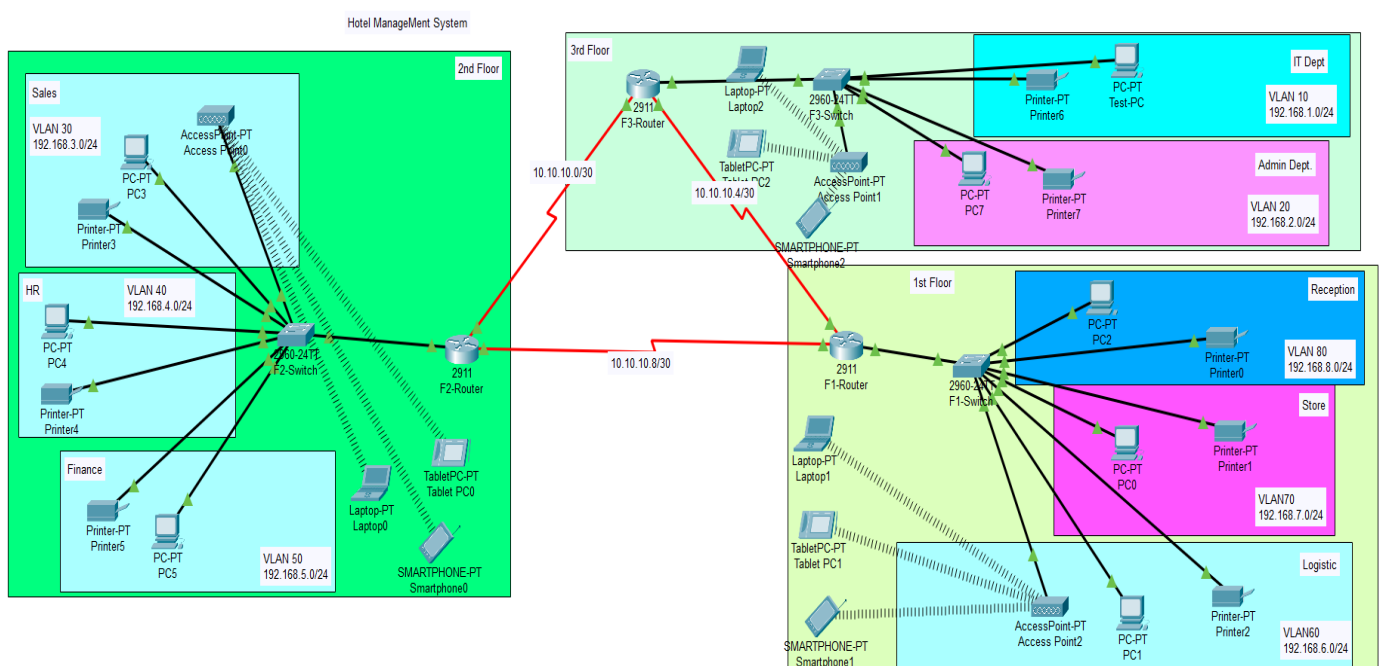
Network Configuration:

- Similar to the Reception and Store, logistics systems are connected to Floor Switch 1. These systems can access centralized services via Router 1.
- Second Floor and Third Floor: These floors follow a similar network setup as the first floor, with routers connecting to the central router (Router 2) for internet access and STICK-VLAN communication.

Network Topology

The network topology comprises the following components:

1. Routers: Facilitate interconnection between VLANs and provide gateway access to the internet.
2. Switches: Serve to connect devices within each VLAN segment.
3. PCs: Representing guest devices including laptops, smartphones.
4. Web Server: Hosts essential services such as guest portal, room service requests, etc.
5. DHCP Server: Facilitates automatic IP address assignment to network devices.



Configuration Details

1. Serial Router Configuration : Router1

Router>en

Router#config t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#int se0/2/0

Router(config-if)#no shut

Router(config-if)#int gig0/0

Router(config-if)#no shut

Router(config-if)#

Router(config-if)#int se0/2/0

Router(config-if)#clock rate 64000

Router(config-if)#int se0/2/1

Router(config-if)#no shutdown

Router(config-if)#int se0/2/1

Router(config-if)#clock rate 64000

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router#

%SYS-5-CONFIG_I: Configured from console by console

Router 2:

Router>en

Router#config t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#int se0/1/0

```
Router(config-if)#no shut
Router(config-if)#int gig0/0
Router(config-if)#no shut
Router(config-if)#
Router(config-if)#int se0/1/0
Router(config-if)#clock rate 64000
Router(config-if)#int se0/1/1
Router(config-if)#no shutdown
Router(config-if)#int se0/1/1
Router(config-if)#clock rate 64000
Router(config-if)#do wr
Building configuration...
```

[OK]

```
Router(config-if)#
```

```
Router#
```

%SYS-5-CONFIG_I: Configured from console by console

Router 3:

```
Router>en
```

```
Router#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#int se0/2/0
```

```
Router(config-if)#no shut
```

```
Router(config-if)#int gig0/0
```

```
Router(config-if)#no shut
```

```
Router(config-if)#
```

```
Router(config-if)#int se0/2/0
```

```
Router(config-if)#clock rate 64000
```

```
Router(config-if)#int se0/2/1
```

Router(config-if)#no shutdown

Router(config-if)#int se0/2/1

Router(config-if)#clock rate 64000

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router#

%SYS-5-CONFIG_I: Configured from console by console

2. Stick VLAN IMPLEMENTATION

Switch

```
Switch>
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/2-3
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 80
% Access VLAN does not exist. Creating vlan 80
Switch(config-if-range)#int range fa0/2-3
%LINK-3-UPDOWN: Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

Switch(config-if-range)#int range fa0/4-5
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 70
% Access VLAN does not exist. Creating vlan 70
Switch(config-if-range)#int range fa0/6-8
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 60
% Access VLAN does not exist. Creating vlan 60
Switch(config-if-range)#int fa0/1
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Switch(config-if)#do wr
Building configuration...
[OK]
Switch(config-if)#
```

Switch#show vlan br

VLAN Name	Status	Ports
1 default	active	Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
60 VLAN0060	active	Fa0/6, Fa0/7, Fa0/8
70 VLAN0070	active	Fa0/4, Fa0/5
80 VLAN0080	active	Fa0/2, Fa0/3
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

Router1:-

```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int gig0/0.30
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30, changed state to up

Router(config-subif)#encapsulation dot1Q 30
Router(config-subif)#ip address 192.168.3.1 255.255.255.0
Router(config-subif)#ex
Router(config)#int gig0/0.40
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up

Router(config-subif)#encapsulation dot1Q 40
Router(config-subif)#ip address 192.168.4.1 255.255.255.0
Router(config-subif)#ex
Router(config)#int gig0/0.50
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.50, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.50, changed state to up

Router(config-subif)#encapsulation dot1Q 50
Router(config-subif)#ip address 192.168.5.1 255.255.255.0
Router(config-subif)#do wr
Building configuration...
[OK]
Router(config-subif)#ex
Router(config)#service dhcp
Router(config)#ip dhcp pool Sales
Router(dhcp-config)#network 192.168.3.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.3.1
Router(dhcp-config)#dns-server 192.168.3.1
Router(dhcp-config)#ex
Router(config)#service dhcp
```

3.Password Setting;

1st Floor

Access Point0

Physical **Config** Attributes

GLOBAL ^

Settings

INTERFACE

Port 0

Port 1

Port 1

Port Status ☒ On

SSID floor1

2.4 GHz Channel 6

Coverage Range (meters) 140.00

Authentication

☐ Disabled ☐ WEP ☒ WPA2-PSK

WEP Key

PSK Pass Phrase floor1@123

User ID

Password

Encryption Type AES

2nd floor

Access Point2

Physical **Config** Attributes

GLOBAL ^

Settings

INTERFACE

Port 0

Port 1

Port 1

Port Status ☒ On

SSID floor2

2.4 GHz Channel 6

Coverage Range (meters) 140.00

Authentication

☐ Disabled ☐ WEP ☒ WPA2-PSK

WEP Key

PSK Pass Phrase floor2@123

User ID

Password

Encryption Type AES

3rd floor

Access Point1

Physical **Config** Attributes

GLOBAL ^

Settings

INTERFACE

Port 0

Port 1

Port 1

Port Status ☒ On

SSID floor3

2.4 GHz Channel 6

Coverage Range (meters) 140.00

Authentication

☐ Disabled ☐ WEP ☒ WPA2-PSK

WEP Key

PSK Pass Phrase floor3@123

User ID

Password

Encryption Type AES

4. DHCP Implementation:-

Router 1:-

```
Router(config)#service dhcp
Router(config)#ip dhcp pool reception
Router(dhcp-config)#network 192.168.8.0 255.255.255.0
Router(dhcp-config)#default ^-router 192.168.8.1
% Invalid input detected at '^' marker.

Router(dhcp-config)#default-router 192.168.8.1
Router(dhcp-config)#dns-server 192.168.8.1
Router(dhcp-config)#ex
Router(config)#service dhcp
Router(config)#ip dhcp pool store
Router(dhcp-config)#network 192.168.7.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.7.1
Router(dhcp-config)#dns-server 192.168.7.1
Router(dhcp-config)#ex
Router(config)#service dhcp
Router(config)#ip dhcp pool Logistic
Router(dhcp-config)#network 192.168.6.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.6.1
Router(dhcp-config)#dns-server 192.168.6.1
Router(dhcp-config)#ex
Router(config)#do wr
Building configuration...
[OK]
Router(config)#
```

Router 2:

```
Router(config)#service dhcp
Router(config)#ip dhcp pool Sales
Router(dhcp-config)#network 192.168.3.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.3.1
Router(dhcp-config)#dns-server 192.168.3.1
Router(dhcp-config)#ex
Router(config)#service dhcp
Router(config)#ip dhcp pool HR
Router(dhcp-config)#network 192.168.4.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.4.1
Router(dhcp-config)#dns-server 192.168.4.1
Router(dhcp-config)#ex
Router(config)#service dhcp
Router(config)#ip dhcp pool Finance
Router(dhcp-config)#network 192.168.5.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.5.1
Router(dhcp-config)#dns-server 192.168.5.1
Router(dhcp-config)#ex
Router(config)#do wr
Building configuration...
[OK]
Router(config)#
```

Router 3:-

```
Router(config)#service dhcp
Router(config)#ip dhcp pool IT
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#dns-server 192.168.1.1
Router(dhcp-config)#ex
Router(config)#service dhcp
Router(config)#ip dhcp pool Admin
Router(dhcp-config)#network 192.168.2.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.2.1
Router(dhcp-config)#dns-server 192.168.2.1
Router(dhcp-config)#ex
Router(config)#do wr
Building configuration...
[OK]
Router(config)#
```

5. Routing Protocol(OSPF) Implementation:-

Router 1

```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 10.10.10.4 255.255.255.252 area 0
Router(config-router)#network 10.10.10.8 255.255.255.252 area 0
Router(config-router)#network 192.168.8.0 255.255.255.255 area 0
Router(config-router)#network 192.168.7.0 255.255.255.255 area 0
Router(config-router)#network 192.168.6.0 255.255.255.255 area 0
Router(config-router)#do wr
Building configuration...
[OK]
Router(config-router)#
04:22:07: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.5.1 on Serial0/2/1 from LOADING to FULL, Loading Done

Router(config-router)#network 192.168.6.0 255.255.255.0 area 0
Router(config-router)#network 192.168.7.0 255.255.255.0 area 0
Router(config-router)#network 192.168.8.0 255.255.255.0 area 0
Router(config-router)#do wr
Building configuration...
[OK]
Router(config-router)#
04:28:20: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.2.1 on Serial0/2/0 from LOADING to FULL, Loading Done
```

Router 2

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 10.10.10.0 255.255.255.252 area 0
Router(config-router)#network 10.10.10.8 255.255.255.252 area 0
Router(config-router)#network 1 255.255.255.252 area 0
04:22:25: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.8.1 on Serial0/1/1 from LOADING to FULL, Loading
Done
92.168
      ^
% Invalid input detected at '^' marker.

Router(config-router)#network 1 255.255.255.252 area 092.168^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 192.168.3.0 255.255.255.0 area 0
Router(config-router)#network 192.168.4.0 255.255.255.0 area 0
Router(config-router)#network 192.168.5.0 255.255.255.0 area 0
Router(config-router)#do wr
Building configuration...
[OK]
```

Router 3

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 10.10.10.0 255.255.255.252 area 0
Router(config-router)#network 10.10.10.0 255.255.255.252 area 0
04:30:03: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.5.1 on Serialrouter ospf 10
Router(config-router)#network 10.10.10.4 255.255.255.252 area 0
Router(config-router)#
04:30:21: %OSPF-5-ADJCHG: Process 10, Nbr 192.168.8.1 on Serial0/2/1 from LOADING to FULL, Loading
Done

Router(config-router)#network 192.168.1.0 255.255.255.0 area 0
Router(config-router)#network 192.168.2.0 255.255.255.0 area 0
Router(config-router)#do wr
Building configuration...
[OK]
Router(config-router)#
```

6.SSH Implementation for Remote Login(Router):

Router 1:

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname F1-Router
F1-Router(config)#ip domain-name NW
F1-Router(config)#username admin password admin@123
F1-Router(config)#crypto key generate rsa
The name for the keys will be: F1-Router.NW
Choose the size of the key modulus in the range of 360 to 4096 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

F1-Router(config)#line vty 0 15
*Mar 1 5:11:24.284: %SSH-5-ENABLED: SSH 1.99 has been enabled
F1-Router(config-line)#login local
F1-Router(config-line)#transport input ssh
F1-Router(config-line)#do wr
Building configuration...
[OK]
F1-Router(config-line)#exit
F1-Router(config)#
```

Router 2:

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname F2
F2(config)#ip domain-name NW
F2(config)#username admin password admin@123
F2(config)#crypto key generate rsa
The name for the keys will be: F2.NW
Choose the size of the key modulus in the range of 360 to 4096 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

F2(config)#line vty 0 15
*Mar 1 5:9:31.262: %SSH-5-ENABLED: SSH 1.99 has been enabled
F2(config-line)#login local
F2(config-line)# transport input ssh
F2(config-line)#do wr
Building configuration...
[OK]
F2(config-line)#ex
% Ambiguous command: "ex"
F2(config-line)#exit
F2(config)#
```

Router 3

```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname F3-Router
F3-Router(config)#ip domain-name NW
F3-Router(config)#username admin password admin@123
F3-Router(config)#crypto key generate rsa
The name for the keys will be: F3-Router.NW
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

F3-Router(config)#line vty 0 15
*Mar 1 5:8:41.985: %SSH-5-ENABLED: SSH 1.99 has been enabled
F3-Router(config-line)#login local
F3-Router(config-line)#transport input ssh
F3-Router(config-line)#do wr
Building configuration...
[OK]
F3-Router(config-line)#exit
F3-Router(config)#
```

Remote Access into Router:-

```
C:\>ssh -l admin 10.10.10.9

Password:

F1-Router>show ip arp
Protocol Address Age (min) Hardware Addr Type Interface
Internet 192.168.6.2 165 0007.EC60.DD7D ARPA GigabitEthernet0/0.60
Internet 192.168.7.2 128 000A.F328.7602 ARPA GigabitEthernet0/0.70
Internet 192.168.8.2 165 0006.2AA2.A7E9 ARPA GigabitEthernet0/0.80
F1-Router>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
O 10.10.10.0/30 [110/128] via 10.10.10.6, 02:10:59, Serial0/2/0
   [110/128] via 10.10.10.10, 02:10:59, Serial0/2/1
C 10.10.10.4/30 is directly connected, Serial0/2/0
L 10.10.10.5/32 is directly connected, Serial0/2/0
C 10.10.10.8/30 is directly connected, Serial0/2/1
L 10.10.10.9/32 is directly connected, Serial0/2/1
O 192.168.1.0/24 [110/65] via 10.10.10.6, 02:10:17, Serial0/2/0
O 192.168.2.0/24 [110/65] via 10.10.10.6, 02:10:07, Serial0/2/0
O 192.168.3.0/24 [110/65] via 10.10.10.10, 02:14:14, Serial0/2/1
O 192.168.4.0/24 [110/65] via 10.10.10.10, 02:13:57, Serial0/2/1
O 192.168.5.0/24 [110/65] via 10.10.10.10, 02:13:47, Serial0/2/1
192.168.6.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.6.0/24 is directly connected, GigabitEthernet0/0.60
L 192.168.6.1/32 is directly connected, GigabitEthernet0/0.60
192.168.7.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.7.0/24 is directly connected, GigabitEthernet0/0.70
L 192.168.7.1/32 is directly connected, GigabitEthernet0/0.70

F1-Router>
```

Testing of reachability of a networked device:

```
C:\>ping 192.168.6.2

Pinging 192.168.6.2 with 32 bytes of data:

Reply from 192.168.6.2: bytes=32 time=37ms TTL=126
Reply from 192.168.6.2: bytes=32 time=1ms TTL=126
Reply from 192.168.6.2: bytes=32 time=1ms TTL=126
Reply from 192.168.6.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.6.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 37ms, Average = 10ms
```

```
C:\>ping 192.168.7.2

Pinging 192.168.7.2 with 32 bytes of data:

Reply from 192.168.7.2: bytes=32 time=1ms TTL=126
Reply from 192.168.7.2: bytes=32 time=1ms TTL=126
Reply from 192.168.7.2: bytes=32 time=1ms TTL=126
Reply from 192.168.7.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.7.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Conclusion

By implementing this network infrastructure, the hotel ensures efficient communication, robust security, and seamless access to essential services for guests and staff. The segmented STICK VLAN, DHCP, Passwords and routing configuration, facilitate smooth operations across different departments while maintaining network integrity and security.