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Module Code: PUSL3129	Module Name: Multimedia Over IP
Coursework Title: Multimedia Over IP Coursework	
Deadline Date: 30.04.2025	Member of staff responsible for coursework: Mr. Harshapriya Rajakaruna
Programme: BSc (Hons) Computer Networks	

I confirm that i have read and understood the Plymouth University regulations relating to Assessment Offences and that I'm aware of the possible penalties for any breach of these regulations. I confirm that this is the independent work.

Use of translation software

We have not used translation software.

Overall mark _____%   Assessors Initials _____   Date_____

Introduction

The objective of this project is the design, implementation, and configuration of an IP Multimedia network for a medium-sized business. The goal is to develop a comprehensive, scalable, and secure network infrastructure to deliver voice and data communication between different departments.

The network is segmented into VLANs for separate voice and data traffic isolation to improve performance, security, and manageability. Cisco routers and switches are configured to deliver inter-VLAN routing, DHCP, DNS, and VoIP capabilities via Cisco IP Phones.

Besides internal communications, the network also supports centralized DNS and HTTP servers, where services and internal web pages are hosted on a domain-by-domain basis. Dynamic IP assignment, secure remote access via SSH, and centralized routing via RIP v2 also are provided to provide connectivity and manageability.

The report takes into consideration the whole configuration, design elements, and testing of the network as per the specification of coursework and more precisely, Question 3, such as VLANs, IP addressing, DHCP, DNS, and network services.

VLAN Design & Configuration

Every department within the network is separated with VLANs to keep voice and data traffic isolated. This provides superior performance, security, and Quality of Service for VoIP.

VLAN ID	Department	Purpose	Subnet
4	All Departments	Voice VLAN	172.28.4.X/27
10	IT	Data VLAN	10.110.4.128/27
20	Accounting	Data VLAN	10.110.4.96/27
30	Marketing	Data VLAN	10.110.4.0/27
40	Sales	Data VLAN	10.110.4.32/27
50	Administration	Data VLAN	10.110.4.64/27

Each trunk port of the switch connects to its associated router and offers VLAN 4 and the associated data VLAN. Access ports are both assigned a data VLAN and voice VLAN for IP phone pass-through deployments.

DHCP Configuration

All routers act as DHCP servers and use separate pools for VOICE and DATA subnets. Each pool assigns:

- IP addresses
- Default gateway
- DNS server (10.110.4.157)
- Option 150 (for IP phones)

DNS Configuration

A primary DNS server is located at IP 10.110.4.157 (in the IT VLAN). It translates internal hostnames such as:

Hostname	Type	IP Address
groupd.com	A Record	10.110.4.158

The DNS service is turned on and available to every device through the use of DHCP configuration. It allows users to access services by using domain names instead of IP addresses.

Web/HTTP Server

The HTTP Server resides at 10.110.4.158, and hosts multiple web pages under:

http://groupd.com

It supports:

- HTTP & HTTPS

Configured with:

- **Default Gateway**: 10.110.4.129

- **DNS Server**: 10.110.4.157

VoIP & Telephony Configuration

Each department router includes:

- Telephony-service settings

- Ephone-DNs and ephones (Cisco IP Phones)

- Dial-peers for interdepartmental calls

IP Addressing

Department	Router Subinterface IPs	Voice VLAN gateway	Data VLAN gateway
Admin	172.28.4.65 / 10.110.4.65	172.28.4.65	10.110.4.65
It	172.28.4.129 / 10.110.4.129	172.28.4.129	10.110.4.129
Accounting	172.28.4.97 / 10.110.4.97	172.28.4.97	10.110.4.97
Marketing	172.28.4.1 / 10.110.4.1	172.28.4.1	10.110.4.1
Sales	172.28.4.33 / 10.110.4.33	172.28.4.33	10.110.4.33

Security & Network Services

- SSH Access enabled on all routers (transport input ssh)
- Login credentials established with encrypted secrets
- Banner MOTD installed on all routers and switches for unauthorized access notice
- Switch security:
    i.   spanning-tree mode pvst
    ii.   switchport voice vlan with access vlan for phones/PCs
    iii. Trunk ports configured to permit some VLANs only

Admin Router Configurations

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l admin 192.168.4.2

% Connection timed out; remote host not responding
C:\>ssh -l admin 192.168.4.2

Password:

Authorized access only! Violators will be prosecuted.

Administration#show run
Building configuration...

Current configuration : 4656 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname Administration
!
!
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
!
ip dhcp pool VOICE
 network 172.28.4.64 255.255.255.224
 default-router 172.28.4.65
 option 150 ip 172.28.4.65
ip dhcp pool DATA
 network 10.110.4.64 255.255.255.224
 default-router 10.110.4.65
 dns-server 10.110.4.157
 domain-name wr
!
!
!
ip cef
no ipv6 cef
!
!
!
username admin privilege 15 secret 5 $1$mERr$JLnNuS6HkTmShN18pfojp.
!
!
license udi pid CISCO2811/K9 sn FTX1017BMO9-
```

```
!
ip domain-name groupd.local
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
interface FastEthernet0/0.4
 encapsulation dot1Q 4
 ip address 172.28.4.65 255.255.255.224
interface FastEthernet0/0.50
 encapsulation dot1Q 50
 ip address 10.110.4.65 255.255.255.224
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial1/0
 ip address 192.168.4.2 255.255.255.252
!
interface Serial1/1
 ip address 192.168.4.6 255.255.255.252
!
interface Serial1/2
 ip address 192.168.4.10 255.255.255.252
!
interface Serial1/3
 ip address 192.168.4.14 255.255.255.252
!
interface Serial1/4
 no ip address
 clock rate 2000000
!
interface Serial1/5
 no ip address
 clock rate 2000000
!
interface Serial1/6
 no ip address
 clock rate 2000000
!
interface Serial1/7
 no ip address
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
```
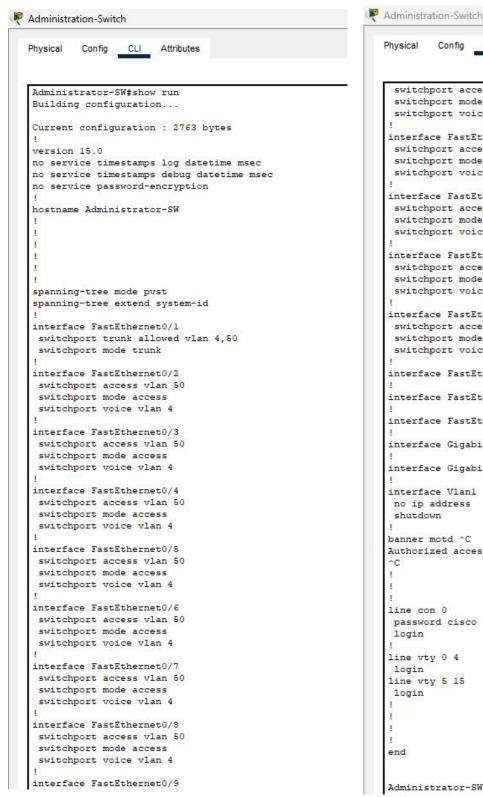
```
router rip
 version 2
 network 10.0.0.0
 network 172.28.0.0
 network 192.168.4.0
!
ip classless
!
ip flow-export version 9
!
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
dial-peer voice 1 voip
 destination-pattern 10..
 session target ipv4:172.28.4.33
!
dial-peer voice 2 voip
 destination-pattern 20..
 session target ipv4:172.28.4.1
!
dial-peer voice 3 voip
 destination-pattern 30..
 session target ipv4:172.28.4.97
!
dial-peer voice 5 voip
 destination-pattern 50..
 session target ipv4:172.28.4.129
!
telephony-service
 max-ephones 20
 max-dn 99
 ip source-address 172.28.4.65 port 2000
 auto assign 1 to 20
!
ephone-dn 1
 number 4001
!
ephone-dn 2
 number 4002
!
ephone-dn 3
 number 4003
!
ephone-dn 4
 number 4004
!
ephone-dn 5
 number 4005
!
ephone-dn 6
 number 4006
```

```
 device-security-mode none
 mac-address 0002.17DE.9C5E
 type 7960
 button 1:13
!
ephone 14
 device-security-mode none
 mac-address 0001.9798.AE88
 type 7960
 button 1:14
!
ephone 15
 device-security-mode none
 mac-address 0001.6349.92EA
 type 7960
 button 1:15
!
ephone 16
 device-security-mode none
 mac-address 000C.8507.3BB9
 type 7960
 button 1:16
!
ephone 17
 device-security-mode none
 mac-address 0060.3E93.7027
 type 7960
 button 1:17
!
ephone 18
 device-security-mode none
 mac-address 0090.2BE5.504B
 type 7960
 button 1:18
!
ephone 19
 device-security-mode none
 mac-address 0004.9A11.E859
 type 7960
 button 1:19
!
ephone 20
 device-security-mode none
 mac-address 0060.474E.7B4B
 type 7960
 button 1:20
!
line con 0
 password 7 0822455D0A16
 login
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
!
!
!
end

Administration#
```

Admin Switch Configurations

```
Administrator-SW#show run
Building configuration...

Current configuration : 2763 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Administrator-SW
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 4,50
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/3
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/4
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/5
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/6
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/7
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/8
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/9
```

```
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/18
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/19
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/20
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/21
 switchport access vlan 50
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end

Administrator-SW#
```

It Router Configurations

```
IT#show run
Building configuration...

Current configuration : 3767 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname IT
!
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
ip dhcp pool VOICE
 network 172.28.4.128 255.255.255.224
 default-router 172.28.4.129
 option 150 ip 172.28.4.129
ip dhcp pool DATA
 network 10.110.4.128 255.255.255.224
 default-router 10.110.4.129
 dns-server 10.110.4.157
!
!
ip cef
no ipv6 cef
!
!
username it privilege 15 secret 5 $1$mERr$XoYaOSG6Mvp31YkHzPSkT1
!
license udi pid CISCO2811/K9 sn FTX1017N7K9-
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name groupd.local
!
spanning-tree mode pvst
!
```

```
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/0.4
 encapsulation dot1Q 4
 ip address 172.28.4.129 255.255.255.224
!
interface FastEthernet0/0.10
 encapsulation dot1Q 10
 ip address 10.110.4.129 255.255.255.224
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/3/0
 ip address 192.168.4.1 255.255.255.252
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 172.28.0.0
 network 192.168.4.0
 no auto-summary
!
ip classless
!
ip flow-export version 9
!
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
dial-peer voice 1 voip
 destination-pattern 10..
 session target ipv4:172.28.4.33
!
dial-peer voice 2 voip
 destination-pattern 20..
!
dial-peer voice 3 voip
 destination-pattern 30..
 session target ipv4:172.28.4.97
!
dial-peer voice 4 voip
 destination-pattern 40..
 session target ipv4:172.28.4.65
```

```
 number 5001
!
ephone-dn 2
 number 5002
!
ephone-dn 3
 number 5003
!
ephone-dn 4
 number 5004
!
ephone-dn 5
 number 5005
!
ephone-dn 6
 number 5006
!
ephone-dn 7
 number 5007
!
ephone-dn 8
 number 5008
!
ephone-dn 9
 number 5009
!
ephone-dn 10
 number 5010
!
ephone-dn 11
 number 5011
!
ephone-dn 12
 number 5012
!
ephone-dn 13
 number 5013
!
ephone-dn 14
 number 5014
!
ephone-dn 15
 number 5015
!
ephone-dn 16
 number 5016
!
ephone 1
 device-security-mode none
 mac-address 000A.4171.3C84
 type 7960
 button 1:3
!
ephone 2
 device-security-mode none
 mac-address 000C.858B.0651
 type 7960
 button 1:1
!
ephone 3
 device-security-mode none
 mac-address 00E0.F902.767D
 type 7960
```

```
 device-security-mode none
 mac-address 000B.BEA6.A330
 type 7960
 button 1:9
!
ephone 10
 device-security-mode none
 mac-address 00E0.A3E5.55BB
 type 7960
 button 1:10
!
ephone 11
 device-security-mode none
 mac-address 0007.EC05.CE61
 type 7960
 button 1:11
!
ephone 12
 device-security-mode none
 mac-address 00E0.F7C3.B687
 type 7960
 button 1:12
!
ephone 13
 device-security-mode none
 mac-address 0060.2FCE.7893
 type 7960
 button 1:13
!
ephone 14
 device-security-mode none
 mac-address 00D0.FF67.7E42
 type 7960
 button 1:14
!
ephone 15
 device-security-mode none
 mac-address 00D0.58CA.2DDA
 type 7960
 button 1:15
!
ephone 16
 device-security-mode none
 mac-address 0030.F2E8.BE72
 type 7960
 button 1:16
!
line con 0
 password 7 0822455D0A16
 login
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
!
!
end


IT#
```

It Switch Configurations

```
IT-SW#show run
Building configuration...

Current configuration : 2600 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname IT-SW
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 4,10
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/5
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/7
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/8
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/9
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
```

```
interface FastEthernet0/17
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/18
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/19
 switchport access vlan 10
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/20
 shutdown
!
interface FastEthernet0/21
 shutdown
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
 shutdown
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end


IT-SW#
```

Accounting Router Configurations

```
C:\>
C:\>ssh -l acc 192.168.4.5

Password:


Authorized access only! Violators will be prosecuted.


Accounting#show run
Building configuration...

Current configuration : 4019 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname Accounting
!
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
ip dhcp pool VOICE
 network 172.28.4.96 255.255.255.224
 default-router 172.28.4.97
 option 150 ip 172.28.4.97
ip dhcp pool DATA
 network 10.110.4.96 255.255.255.224
 default-router 10.110.4.97
 dns-server 10.110.4.157
!
!
!
ip cef
no ipv6 cef
!
!
username acc privilege 15 secret 5 $1$mERr$x5AYZI/LSGRg/kHXhYZFG0
!
license udi pid CISCO2811/K9 sn FTX101760ZG-
!
!
!
!
!
!
!
!
!
ip domain-name groupd.local
!
!
spanning-tree mode pvst
!
!
```

```
interface FastEthernet0/0.4
 encapsulation dot1Q 4
 ip address 172.28.4.97 255.255.255.224
!
interface FastEthernet0/0.20
 encapsulation dot1Q 20
 ip address 10.110.4.97 255.255.255.224
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/3/0
 ip address 192.168.4.5 255.255.255.252
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 172.28.0.0
 network 192.168.4.0
 no auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
!
dial-peer voice 1 voip
 destination-pattern 10..
 session target ipv4:172.28.4.33
!
dial-peer voice 2 voip
 destination-pattern 20..
 session target ipv4:172.28.4.1
!
dial-peer voice 4 voip
 destination-pattern 40..
 session target ipv4:172.28.4.65
!
dial-peer voice 5 voip
 destination-pattern 50..
 session target ipv4:172.28.4.129
!
telephony-service
 max-ephones 18
 max-dn 99
 ip source-address 172.28.4.97 port 2000
```

```
ephone-dn 3
 number 3003
!
ephone-dn 4
 number 3004
!
ephone-dn 5
 number 3005
!
ephone-dn 6
 number 3006
!
ephone-dn 7
 number 3007
!
ephone-dn 8
 number 3008
!
ephone-dn 9
 number 3009
!
ephone-dn 10
 number 3010
!
ephone-dn 11
 number 3011
!
ephone-dn 12
 number 3012
!
ephone-dn 13
 number 3013
!
ephone-dn 14
 number 3014
!
ephone-dn 15
 number 3015
!
ephone-dn 16
 number 3016
!
ephone-dn 17
 number 3017
!
ephone-dn 18
 number 3018
!
ephone 1
 device-security-mode none
 mac-address 0006.2A80.73C5
 type 7960
 button 1:1
!
ephone 2
 device-security-mode none
 mac-address 0004.9A7B.16EC
 type 7960
 button 1:2
!
ephone 3
 device-security-mode none
```

```
 device-security-mode none
 mac-address 0002.16D1.2155
 type 7960
 button 1:18
!
ephone 12
 device-security-mode none
 mac-address 0002.1778.415C
 type 7960
 button 1:11
!
ephone 13
 device-security-mode none
 mac-address 0009.7C20.12E4
 type 7960
 button 1:12
!
ephone 14
 device-security-mode none
 mac-address 0001.43C8.ED33
 type 7960
 button 1:4
!
ephone 15
 device-security-mode none
 mac-address 00E0.F7A8.1B38
 type 7960
 button 1:5
!
ephone 16
 device-security-mode none
 mac-address 0005.5EEB.C515
 type 7960
 button 1:7
!
ephone 17
 device-security-mode none
 mac-address 0001.96E2.959D
 type 7960
 button 1:17
!
ephone 18
 device-security-mode none
 mac-address 00E0.8F89.5178
 type 7960
 button 1:6
line con 0
 password 7 0822456D0A16
 login
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
!
!
end

Accounting#
```

Accounting Switch Configurations

Physical   Config   CLI   Attributes

```
Account-SW>en
Account-SW#show run
Building configuration...

Current configuration : 2939 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Account-SW
!
!
!
no ip domain-lookup
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 4,20
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/3
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/4
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/5
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/6
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/7
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/8
 switchport access vlan 20
 switchport mode access
```

Physical   Config   CLI   Attributes

```
 switchport voice vlan 4
!
interface FastEthernet0/19
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/20
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/21
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/22
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/23
 switchport access vlan 20
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end

Account-SW#
```

Marketing Router Configurations

```
Marketing#show run
Building configuration...

Current configuration : 4682 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname Marketing
!
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
ip dhcp pool VOICE
 network 172.28.4.0 255.255.255.224
 default-router 172.28.4.1
 option 150 ip 172.28.4.1
ip dhcp pool DATA
 network 10.110.4.0 255.255.255.224
 default-router 10.110.4.1
 dns-server 10.110.4.157
!
!
ip cef
no ipv6 cef
!
!
username mar privilege 15 secret 5 $1$mERr$qR8J37UwgaDsaksn9PEUW1
!
license udi pid CISCO2811/K9 sn FTX1017IHMO-
!
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name groupd.local
!
!
spanning-tree mode pvst
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
```

```
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/3/0
 ip address 192.168.4.9 255.255.255.252
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 172.28.0.0
 network 192.168.4.0
 no auto-summary
!
ip classless
!
ip flow-export version 9
!
!
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
!
dial-peer voice 1 voip
 destination-pattern 10..
 session target ipv4:172.28.4.33
!
dial-peer voice 3 voip
 destination-pattern 30..
 session target ipv4:172.28.4.97
!
dial-peer voice 4 voip
 destination-pattern 40..
 session target ipv4:172.28.4.65
!
dial-peer voice 5 voip
 destination-pattern 50..
 session target ipv4:172.28.4.129
!
telephony-service
 max-ephones 25
 max-dn 99
 ip source-address 172.28.4.1 port 2000
 auto assign 1 to 25
!
ephone-dn 1
 number 2001
!
ephone-dn 2
 number 2002
```
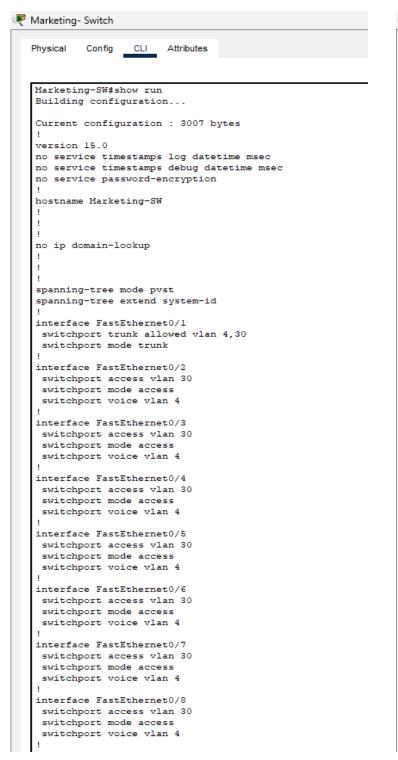
```
 number 2005
!
ephone-dn 6
 number 2006
!
ephone-dn 7
 number 2007
!
ephone-dn 8
 number 2008
!
ephone-dn 9
 number 2009
!
ephone-dn 10
 number 2010
!
ephone-dn 11
 number 2011
!
ephone-dn 12
 number 2012
!
ephone-dn 13
 number 2013
!
ephone-dn 14
 number 2014
!
ephone-dn 15
 number 2015
!
ephone-dn 16
 number 2016
!
ephone-dn 17
 number 2017
!
ephone-dn 18
 number 2018
!
ephone-dn 19
 number 2019
!
ephone-dn 20
 number 2020
!
ephone-dn 21
 number 2021
!
ephone-dn 22
 number 2022
!
ephone-dn 23
 number 2023
!
ephone-dn 24
 number 2024
!
ephone-dn 25
 number 2025
!
ephone 1
```

```
 device-security-mode none
 mac-address 0001.429E.1B0A
 type 7960
 button 1:16
!
ephone 17
 device-security-mode none
 mac-address 000D.BD94.61ED
 type 7960
 button 1:17
!
ephone 18
 device-security-mode none
 mac-address 000C.CF85.4320
 type 7960
 button 1:18
!
ephone 19
 device-security-mode none
 mac-address 0007.EC71.AA25
 type 7960
 button 1:19
!
ephone 20
 device-security-mode none
 mac-address 0040.0B52.8144
 type 7960
 button 1:20
!
ephone 21
 device-security-mode none
 mac-address 0004.9ADB.3D99
 type 7960
 button 1:21
!
ephone 22
 device-security-mode none
 mac-address 0001.97CB.76C0
 type 7960
 button 1:22
!
ephone 23
 device-security-mode none
 mac-address 0090.2BC2.84C3
 type 7960
 button 1:23
!
line con 0
 password 7 0822455D0A16
 login
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
!
!
end

Marketing#
```

Marketing Switch Configurations

Physical   Config   CLI   Attributes

```
Marketing-SW#show run
Building configuration...

Current configuration : 3007 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Marketing-SW
!
!
!
no ip domain-lookup
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 4,30
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/3
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/4
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/5
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/6
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/7
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/8
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
```

Marketing- Switch

Physical   Config   CLI   Attributes

```
interface FastEthernet0/19
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/20
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/21
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/22
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/23
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/24
 switchport access vlan 30
 switchport mode access
 switchport voice vlan 4
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end


Marketing-SW#
```

Sales Router Configurations

```
Sales#show run
Building configuration...

Current configuration : 4273 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname Sales
!
!
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCil
!
!
ip dhcp pool VOICE
 network 172.28.4.32 255.255.255.224
 default-router 172.28.4.33
 option 150 ip 172.28.4.33
ip dhcp pool DATA
 network 10.110.4.32 255.255.255.224
 default-router 10.110.4.33
 dns-server 10.110.4.157
!
!
ip cef
no ipv6 cef
!
!
username sal privilege 15 secret 5 $1$mERr$6UygResABFKs74/LOPqhA0
!
!
license udi pid CISCO2811/K9 sn FTX101746B7-
!
!
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name groupd.local
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
```
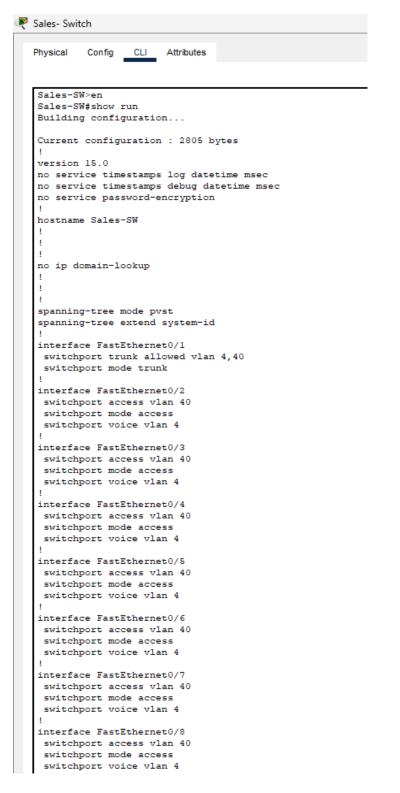
```
 duplex auto
 speed auto
!
interface FastEthernet0/0.4
 encapsulation dot1Q 4
 ip address 172.28.4.33 255.255.255.224
!
interface FastEthernet0/0.40
 encapsulation dot1Q 40
 ip address 10.110.4.33 255.255.255.224
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Serial0/3/0
 ip address 192.168.4.13 255.255.255.252
 clock rate 2000000
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 version 2
 network 10.0.0.0
 network 172.28.0.0
 network 192.168.4.0
 no auto-summary
!
ip classless
!
ip flow-export version 9
!
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
!
dial-peer voice 2 voip
 destination-pattern 20..
 session target ipv4:172.28.4.1
!
dial-peer voice 3 voip
 destination-pattern 30..
 session target ipv4:172.28.4.97
!
dial-peer voice 4 voip
 destination-pattern 40..
 session target ipv4:172.28.4.65
!
dial-peer voice 5 voip
 destination-pattern 50..
 session target ipv4:172.28.4.129
!
telephony-service
 max-ephones 20
```

```
 number 1005
!
ephone-dn 6
 number 1006
!
ephone-dn 7
 number 1007
!
ephone-dn 8
 number 1008
!
ephone-dn 9
 number 1009
!
ephone-dn 10
 number 1010
!
ephone-dn 11
 number 1011
!
ephone-dn 12
 number 1012
!
ephone-dn 13
 number 1013
!
ephone-dn 14
 number 1014
!
ephone-dn 15
 number 1015
!
ephone-dn 16
 number 1016
!
ephone-dn 17
 number 1017
!
ephone-dn 18
 number 1018
!
ephone-dn 19
 number 1019
!
ephone-dn 20
 number 1020
!
ephone 1
 device-security-mode none
 mac-address 0060.5C5E.EC0A
 type 7960
 button 1:1
!
ephone 2
 device-security-mode none
 mac-address 0002.174E.6A1B
 type 7960
 button 1:2
!
ephone 3
 device-security-mode none
 mac-address 00E0.8F77.9123
 type 7960
```

```
 device-security-mode none
 mac-address 00E0.F9BC.AB2A
 type 7960
 button 1:13
!
ephone 14
 device-security-mode none
 mac-address 0090.0C53.0E94
 type 7960
 button 1:14
!
ephone 15
 device-security-mode none
 mac-address 00E0.B0C4.46D8
 type 7960
 button 1:15
!
ephone 16
 device-security-mode none
 mac-address 00D0.FF4C.C42D
 type 7960
 button 1:16
!
ephone 17
 device-security-mode none
 mac-address 0002.1E42.3D5B
 type 7960
 button 1:17
!
ephone 18
 device-security-mode none
 mac-address 00E0.A334.13BA
 type 7960
 button 1:18
!
ephone 19
 device-security-mode none
 mac-address 0001.970B.9EB0
 type 7960
 button 1:19
!
ephone 20
 device-security-mode none
 mac-address 00E0.F9E8.1E2B
 type 7960
 button 1:20
!
line con 0
 password 7 0822455D0A16
 login
!
line aux 0
!
line vty 0 4
 login local
 transport input ssh
!
!
end

Sales#
```

Sales Switch Configurations

```
Sales- Switch

Physical    Config    CLI    Attributes

Sales-SW>en
Sales-SW#show run
Building configuration...

Current configuration : 2805 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Sales-SW
!
!
!
no ip domain-lookup
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 4,40
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/3
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/4
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/5
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/6
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/7
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/8
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
```

```
Sales- Switch

Physical    Config    CLI    Attributes

!
interface FastEthernet0/18
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/19
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/20
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/21
 switchport access vlan 40
 switchport mode access
 switchport voice vlan 4
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
 shutdown
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
banner motd ^C
Authorized access only! Violators will be prosecuted.
^C
!
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end


Sales-SW#
```

Passwords and Info of the Packet Tracer

Device Name	Access Method	Username	Password	Access Notes
Admin Router	SSH Only	admin	admin321	Only SSH allowed. No console login without credentials.
IT Router	SSH Only	it	it321	Secured with SSH login.
Accounting Router	SSH Only	acc	acc321	Secured with SSH login.
Marketing Router	SSH Only	mar	mar321	Secured with SSH login.
Sales Router	SSH Only	sal	sal321	Secured with SSH login.
All Routers	Console	-	cisco	Console line password is universally cisco for all routers.
All Switches	Console/VTY	-	cisco	All switches use the password cisco for console and remote

Note: All **routers** are configured to accept **SSH only** (no Telnet or manual).