

ROUTING AND SWITCHING

LAB EXAM MANUAL

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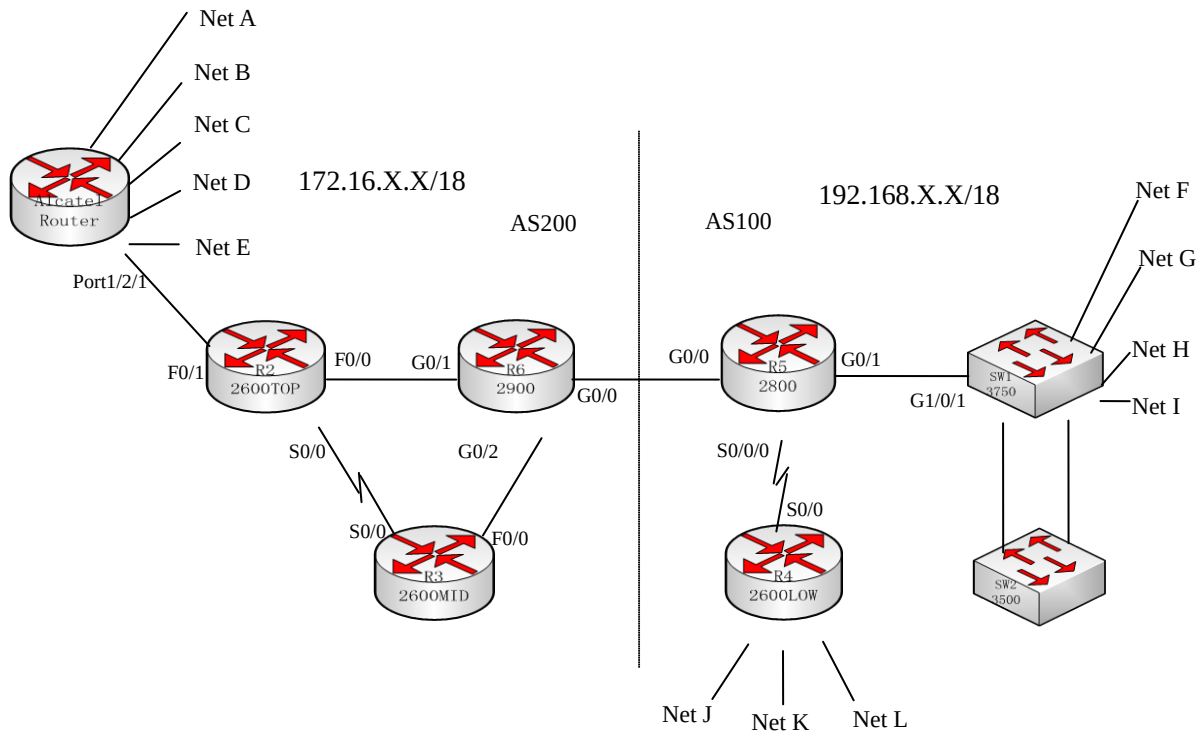
Abstract

Due to rapid networking development of modern world now, we all live in an environment which promise us to share and communicate easily and fast. Such an environment is built on all kinds of terminals and other electronic medium connected with each other. So routing and switching technology and different protocols applications are indispensable to construct this huge communication system.

This project aims to set up a series of MINT 708 Exam labs about routing and switching which include the 7 technologies: virtual LAN, spanning tree protocol, static routing protocol, RIPv2, OSPF, IS-IS, BGP. This project of labs works for testing candidates' theories and practical skills in lab environment and even real world of networking which uses distinguish protocols to communicate among routers and switches in LAN or WAN network. Those labs should be designed to performance the data packets passing through the whole lab network correctly according to requirements under different protocols.

Chapter 1 Routing and switching lab exam 1

1.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Alcatel router, Cisco 3750 and Cisco 2600 according to the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')

2. Configure RIPv2 in Alcatel router(R1) and Cisco 2600(R2) to let them reach each other. (10')

3. Configure OSPF in Cisco 2600(R2), Cisco 2600(R3) and Cisco 2900(R6) within area 0. (10')

4. Configure EBGP in Cisco 2900(R6) and Cisco 2800(R5), don't advertise autonomous system network topology behind R5 and R6. Instead you should be advertising /18 network. (20')

5. Configure ISIS in Cisco 2800(R5) and Cisco 2600(R4). (10')

6. Configure Static routes in Cisco 2800(R5) and Cisco 3750. (10')

7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in

Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')

8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

1.2 what to hand in

1. For the routing tasks, you should ping from Alcatel router to the nets of Cisco 3750 and Cisco 2600(R4) at the the other side of the whole network, and from Cisco 3750 and Cisco 2600(R4) to the nets of Alcatel router. For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2900(R6).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

1.3 lab solution

1.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
Alcatel router	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	Net E:172.16.4.1/24	Port 1/2/1:172.16.5.253/30
R2 Cisco 2600	F0/0:172.16.6.253/30	F0/1:172.16.5.254/30
	S0/0:172.16.6.249/30	
R3 Cisco 2600	F0/0:172.16.7.253/30	S0/0:172.16.6.250/30
R6 Cisco 2900	G0/0:172.16.8.253/30	G0/1:172.16.6.254/30
	G0/2:172.16.7.254/40	
R5 Cisco 2800	G0/0:172.16.8.254/30	G0/1:192.168.8.253/30
	S0/0/0:192.168.7.253/30	
R4 Cisco 2600	Net J:192.168.4.1/24	Net K:192.168.5.1/24
	Net L:192.168.6.1/24	S0/0:192.168.7.254/30
Cisco 3750	Net F:192.168.0.1/24	Net G:192.168.1.1/24
	Net H:192.168.2.1/24	Net I:192.168.3.1/24
	G1/0/1:192.168.8.254/30	

1.3.2 ROUTING TASK

ALCATEL ROUTER:

***A:NS085167006# admin display-config**

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

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Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main

Generated TUE OCT 04 08:14:35 2011 UTC

exit all

configure

#-----

echo "System Configuration"

#-----

system

ccm 1

exit

snmp

shutdown

exit

time

sntp

shutdown

exit

zone UTC

exit

thresholds

rmon

exit

exit

exit

#-----

echo "System Security Configuration"

#-----

system

security

per-peer-queuing

exit

exit

#-----

echo "Log Configuration"

#-----

log

```

        exit
#-----
echo "System Security Cpm Hw Filters Configuration"
#-----
        system
            security
            exit
        exit
#-----
echo "QoS Policy Configuration"
#-----
        qos
        exit
#-----
echo "Card Configuration"
#-----
        card 1
            card-type iom-9g
            mda 2
                mda-type c8-10/100eth-tx
            exit
        exit
#-----
echo "Port Configuration"
#-----
        port 1/2/1
            ethernet
            exit
            no shutdown
        exit
        port 1/2/2
            shutdown
            ethernet
            exit
        exit
        port 1/2/3
            shutdown
            ethernet
            exit
        exit
        port 1/2/4
            shutdown
            ethernet
            exit

```

```

exit
port 1/2/5
    shutdown
    ethernet
    exit
exit
port 1/2/6
    shutdown
    ethernet
    exit
exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit
#-----
echo "System Sync-If-Timing Configuration"
#-----
    system
        sync-if-timing
            begin
            commit
        exit
    exit
#-----
echo "Management Router Configuration"
#-----
    router management
    exit
#-----
echo "Router (Network Side) Configuration"
#-----
    router
        interface "loop1"
            address 172.16.0.1/24
            loopback
        exit
        interface "loop2"

```

```

        address 172.16.1.1/24
        loopback
    exit
    interface "loop3"
        address 172.16.2.1/24
        loopback
    exit
    interface "loop4"
        address 172.16.3.1/24
        loopback
    exit
    interface "loop5"
        address 172.16.4.1/24
        loopback
    exit
    interface "system"
    exit
    interface "to2600top"
        address 172.16.5.253/30
        port 1/2/1
    exit
#-----
echo "RIP Configuration"
#-----
    rip
        export "forrip"
        group "neigh"
            neighbor "loop1"
            exit
            neighbor "loop2"
            exit
            neighbor "loop3"
            exit
            neighbor "loop4"
            exit
            neighbor "loop5"
            exit
            neighbor "to2600top"
            exit
        exit
    exit
exit
#-----
echo "Service Configuration"

```

```

#-----
service
    customer 1 create
        description "Default customer"
    exit
exit
#-----
echo "Router (Service Side) Configuration"
#-----
router
#-----
echo "Policy Configuration"
#-----
    policy-options
        begin
            policy-statement "forrip"
                entry 1
                    from
                        protocol ospf
                    exit
                    action accept
                    exit
                exit
                default-action accept
                exit
            exit
        commit
    exit
exit
exit all

```

Finished TUE OCT 04 08:14:42 2011 UTC

***A:NS091066068# show router route-table**

```

=====
Route Table (Router: Base)
=====

```

Dest Prefix	Type	Proto	Age	Pref	Metric
Next Hop[Interface Name]					
0.0.0.0/0	Remote	RIP	00h14m22s	100	2
172.16.5.254					

172.16.0.0/24 loop1	Local	Local	01h51m55s	0	0
172.16.1.0/24 loop2	Local	Local	01h51m43s	0	0
172.16.2.0/24 loop3	Local	Local	01h51m23s	0	0
172.16.3.0/24 loop4	Local	Local	01h51m07s	0	0
172.16.4.0/24 loop5	Local	Local	01h50m47s	0	0
172.16.5.252/30 to2600top	Local	Local	01h45m41s	0	0
172.16.6.248/30 172.16.5.254	Remote	RIP	01h43m07s	100	2
172.16.6.252/30 172.16.5.254	Remote	RIP	01h41m49s	100	2

No. of Routes: 9
=====

CISCO 2600 TOP

2600top#sh run

```
Building configuration...
Current configuration : 978 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
```

```

!
interface FastEthernet0/0
 ip address 172.16.6.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.6.249 255.255.255.252
 clock rate 64000
 no fair-queue
!
interface FastEthernet0/1
 ip address 172.16.5.254 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 redistribute rip subnets
 network 172.16.6.248 0.0.0.3 area 0
 network 172.16.6.252 0.0.0.3 area 0
!
router rip
 version 2
 redistribute static
 network 172.16.0.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.6.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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 172.16.6.254 to network 0.0.0.0

172.16.0.0/16 is variably subnetted, 15 subnets, 3 masks

```
C      172.16.6.248/30 is directly connected, Serial0/0
R      172.16.5.253/32 [120/1] via 172.16.5.253, 00:00:27, FastEthernet0/1
C      172.16.5.252/30 is directly connected, FastEthernet0/1
C      172.16.6.252/30 is directly connected, FastEthernet0/0
O      172.16.7.252/30 [110/2] via 172.16.6.254, 00:17:07, FastEthernet0/0
R      172.16.4.0/24 [120/1] via 172.16.5.253, 00:00:27, FastEthernet0/1
R      172.16.4.1/32 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.1.1/32 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.0.0/24 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.1.0/24 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.0.1/32 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.3.1/32 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.2.0/24 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.3.0/24 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
R      172.16.2.1/32 [120/1] via 172.16.5.253, 00:00:28, FastEthernet0/1
S*    0.0.0.0/0 [1/0] via 172.16.6.254
```

CISCO 2600 MID

2600mid#sh run

Building configuration...

Current configuration : 722 bytes

!

version 12.3

service timestamps debug datetime msec


```

service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
    ip address 172.16.7.253 255.255.255.252
    duplex auto
    speed auto
!
interface Serial0/0
    ip address 172.16.6.250 255.255.255.252
!
interface Serial0/1
    no ip address
    shutdown
!
router ospf 1
    log-adjacency-changes
    network 172.16.6.248 0.0.0.3 area 0
    network 172.16.7.252 0.0.0.3 area 0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

172.16.0.0/16 is variably subnetted, 15 subnets, 3 masks

```
C      172.16.6.248/30 is directly connected, Serial0/0
O E2   172.16.5.253/32 [110/20] via 172.16.7.254, 00:17:57, FastEthernet0/0
O E2   172.16.5.252/30 [110/20] via 172.16.7.254, 00:17:57, FastEthernet0/0
O      172.16.6.252/30 [110/2] via 172.16.7.254, 00:17:57, FastEthernet0/0
C      172.16.7.252/30 is directly connected, FastEthernet0/0
O E2   172.16.4.0/24 [110/20] via 172.16.7.254, 00:17:57, FastEthernet0/0
O E2   172.16.4.1/32 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.1.1/32 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.0.0/24 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.1.0/24 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.0.1/32 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.3.1/32 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.2.0/24 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.3.0/24 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
O E2   172.16.2.1/32 [110/20] via 172.16.7.254, 00:17:58, FastEthernet0/0
```

CISCO 2900

2900#sh run

Building configuration...

Current configuration : 1274 bytes

!

! Last configuration change at 23:04:20 UTC Mon Nov 7 2011

!

version 15.0

service timestamps debug datetime msec

```

service timestamps log datetime msec
no service password-encryption
!
hostname 2900
!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
no ipv6 cef
ip source-route
ip cef
!
multilink bundle-name authenticated
!
license udi pid CISCO2921/K9 sn FGL150811PW
license boot module c2900 technology-package datak9
!
redundancy
!
interface GigabitEthernet0/0
 ip address 172.16.8.253 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 172.16.6.254 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 ip address 172.16.7.254 255.255.255.252
 duplex auto
 speed auto
!
router ospf 1
 log-adjacency-changes
 network 172.16.6.252 0.0.0.3 area 0
 network 172.16.7.252 0.0.0.3 area 0
!
router bgp 200
 no synchronization

```

```

bgp log-neighbor-changes
network 172.16.0.0 mask 255.255.192.0
neighbor 172.16.8.254 remote-as 100
no auto-summary
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 172.16.0.0 255.255.192.0 Null0
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is not set

```

172.16.0.0/16 is variably subnetted, 20 subnets, 4 masks
S       172.16.0.0/18 is directly connected, Null0
O E2    172.16.0.0/24 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.0.1/32 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.1.0/24 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.1.1/32 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.2.0/24 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.2.1/32 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1

```

```

O E2    172.16.3.0/24 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.3.1/32 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.4.0/24 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.4.1/32 [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.5.252/30
        [110/20] via 172.16.6.253, 01:32:14, GigabitEthernet0/1
O E2    172.16.5.253/32
        [110/20] via 172.16.6.253, 01:32:15, GigabitEthernet0/1
O       172.16.6.248/30
        [110/65] via 172.16.7.253, 01:42:43, GigabitEthernet0/2
        [110/65] via 172.16.6.253, 01:43:20, GigabitEthernet0/1
C       172.16.6.252/30 is directly connected, GigabitEthernet0/1
L       172.16.6.254/32 is directly connected, GigabitEthernet0/1
C       172.16.7.252/30 is directly connected, GigabitEthernet0/2
L       172.16.7.254/32 is directly connected, GigabitEthernet0/2
C       172.16.8.252/30 is directly connected, GigabitEthernet0/0
L       172.16.8.253/32 is directly connected, GigabitEthernet0/0
B       192.168.0.0/18 [20/0] via 172.16.8.254, 00:13:01

```

2900#sh ip bgp

BGP table version is 54, local router ID is 172.16.8.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.8.254	0		0 100	i

CISCO 2800

2800#sh run

Building configuration...

*Nov 8 01:08:45.238: %SYS-5-CONFIG_I: Configured from console by console

Current configuration : 1421 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

```
no service password-encryption
!
hostname 2800
!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
    no dspfarm
!
vlan internal allocation policy ascending
!
interface Loopback0
    ip address 192.168.10.0 255.255.255.255
!
interface GigabitEthernet0/0
    ip address 172.16.8.254 255.255.255.252
    duplex auto
    speed auto
!
interface GigabitEthernet0/1
    ip address 192.168.8.253 255.255.255.252
    duplex auto
    speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
    ip address 192.168.7.253 255.255.255.252
    ip router isis
    clock rate 64000
```

```

!
interface Vlan1
  no ip address
!
router isis
  net 49.0001.1921.6801.0000.00
  redistribute connected
  redistribute static ip
!
router bgp 100
  no synchronization
  bgp log-neighbor-changes
  network 192.168.0.0 mask 255.255.192.0
  neighbor 172.16.8.253 remote-as 200
  no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
ip route 192.168.0.0 255.255.252.0 192.168.8.254
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```
192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, GigabitEthernet0/1
192.168.10.0/32 is subnetted, 1 subnets
C      192.168.10.0 is directly connected, Loopback0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      172.16.8.252/30 is directly connected, GigabitEthernet0/0
B      172.16.0.0/18 [20/0] via 172.16.8.253, 00:13:37
192.168.11.0/32 is subnetted, 1 subnets
i L1   192.168.11.0 [115/10] via 192.168.7.254, Serial0/0/0
i L1   192.168.4.0/24 [115/20] via 192.168.7.254, Serial0/0/0
i L1   192.168.5.0/24 [115/20] via 192.168.7.254, Serial0/0/0
i L1   192.168.6.0/24 [115/20] via 192.168.7.254, Serial0/0/0
192.168.7.0/30 is subnetted, 1 subnets
```

2800#sh ip bgp

BGP table version is 53, local router ID is 192.168.10.0

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.8.253	0		0	200 i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

CISCO 2600 LOW

2600low#sh run

Building configuration...

Current configuration : 990 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption


```

!
hostname 2600low
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0

    ip address 192.168.11.0 255.255.255.255
!
interface Loopback1
    ip address 192.168.4.1 255.255.255.0
    ip router isis
!
interface Loopback2
    ip address 192.168.5.1 255.255.255.0
    ip router isis
!
interface Loopback3
    ip address 192.168.6.1 255.255.255.0
    ip router isis
!
interface FastEthernet0/0
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface Serial0/0
    ip address 192.168.7.254 255.255.255.252
    ip router isis
!
interface Serial0/1
    no ip address
    shutdown
!
router isis
    net 49.0001.1921.6801.1000.00

```

```

!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

      192.168.8.0/30 is subnetted, 1 subnets
i L2    192.168.8.252 [115/10] via 192.168.7.253, Serial0/0
      192.168.10.0/32 is subnetted, 1 subnets
i L2    192.168.10.0 [115/10] via 192.168.7.253, Serial0/0
      172.16.0.0/30 is subnetted, 1 subnets
i L2    172.16.8.252 [115/10] via 192.168.7.253, Serial0/0
      192.168.11.0/32 is subnetted, 1 subnets
C        192.168.11.0 is directly connected, Loopback0
C        192.168.4.0/24 is directly connected, Loopback1
C        192.168.5.0/24 is directly connected, Loopback2
C        192.168.6.0/24 is directly connected, Loopback3
      192.168.7.0/30 is subnetted, 1 subnets
C        192.168.7.252 is directly connected, Serial0/0
S*      0.0.0.0/0 [1/0] via 192.168.7.253
i L2 192.168.0.0/22 [115/10] via 192.168.7.253, Serial0/0

```

i L2 192.168.0.0/18 [115/10] via 192.168.7.253, Serial0/0

CISCO 3750

3750#sh run

Building configuration...

Current configuration : 1872 bytes

!

version 12.2

no service pad

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

ip routing

!

spanning-tree mode pvst

spanning-tree etherchannel guard misconfig

spanning-tree extend system-id

!

vlan internal allocation policy ascending

!

interface Loopback1

ip address 192.168.0.1 255.255.255.0

!

interface Loopback2

ip address 192.168.1.1 255.255.255.0

!

interface Loopback3

ip address 192.168.2.1 255.255.255.0

!

interface Loopback4

```
ip address 192.168.3.1 255.255.255.0
!
interface GigabitEthernet1/0/1
no switchport
ip address 192.168.8.254 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
```

```

interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
router isis
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.8.253
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

3750#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.8.253 to network 0.0.0.0

192.168.8.0/30 is subnetted, 1 subnets

```
C      192.168.8.252 is directly connected, GigabitEthernet1/0/1
C      192.168.0.0/24 is directly connected, Loopback1
C      192.168.1.0/24 is directly connected, Loopback2
C      192.168.2.0/24 is directly connected, Loopback3
C      192.168.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 192.168.8.253
```

PING RESULTS:

from alcatel:

*A:NS085167016# ping 192.168.0.1

PING 192.168.0.1 56 data bytes

64 bytes from 192.168.0.1: icmp_seq=1 ttl=252 time=1.11ms.

64 bytes from 192.168.0.1: icmp_seq=2 ttl=252 time=1.01ms.

64 bytes from 192.168.0.1: icmp_seq=3 ttl=252 time=1.02ms.

64 bytes from 192.168.0.1: icmp_seq=4 ttl=252 time=1.03ms.

64 bytes from 192.168.0.1: icmp_seq=5 ttl=252 time=6.16ms.

---- 192.168.0.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 1.01ms, avg = 2.07ms, max = 6.16ms, stddev = 2.05ms

*A:NS085167016# ping 192.168.1.1

PING 192.168.1.1 56 data bytes

64 bytes from 192.168.1.1: icmp_seq=1 ttl=252 time=1.03ms.

64 bytes from 192.168.1.1: icmp_seq=2 ttl=252 time=1.03ms.

64 bytes from 192.168.1.1: icmp_seq=3 ttl=252 time=1.02ms.

64 bytes from 192.168.1.1: icmp_seq=4 ttl=252 time=1.02ms.

64 bytes from 192.168.1.1: icmp_seq=5 ttl=252 time=1.08ms.

---- 192.168.1.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 1.02ms, avg = 1.04ms, max = 1.08ms, stddev = 0.022ms

*A:NS085167016# ping 192.168.2.1

PING 192.168.2.1 56 data bytes

64 bytes from 192.168.2.1: icmp_seq=1 ttl=252 time=1.04ms.

64 bytes from 192.168.2.1: icmp_seq=2 ttl=252 time=1.03ms.

64 bytes from 192.168.2.1: icmp_seq=3 ttl=252 time=1.08ms.

64 bytes from 192.168.2.1: icmp_seq=4 ttl=252 time=2.00ms.

64 bytes from 192.168.2.1: icmp_seq=5 ttl=252 time=1.01ms.

---- 192.168.2.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 1.01ms, avg = 1.23ms, max = 2.00ms, stddev = 0.384ms

*A:NS085167016# ping 192.168.3.1

PING 192.168.3.1 56 data bytes

64 bytes from 192.168.3.1: icmp_seq=1 ttl=252 time=1.56ms.

64 bytes from 192.168.3.1: icmp_seq=2 ttl=252 time=2.47ms.

64 bytes from 192.168.3.1: icmp_seq=3 ttl=252 time=1.06ms.

64 bytes from 192.168.3.1: icmp_seq=4 ttl=252 time=1.22ms.

64 bytes from 192.168.3.1: icmp_seq=5 ttl=252 time=1.09ms.

---- 192.168.3.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 1.06ms, avg = 1.48ms, max = 2.47ms, stddev = 0.525ms

*A:NS085167016# ping 192.168.4.1

PING 192.168.4.1 56 data bytes

64 bytes from 192.168.4.1: icmp_seq=1 ttl=252 time=2.55ms.

64 bytes from 192.168.4.1: icmp_seq=2 ttl=252 time=2.58ms.

64 bytes from 192.168.4.1: icmp_seq=3 ttl=252 time=2.45ms.

64 bytes from 192.168.4.1: icmp_seq=4 ttl=252 time=2.53ms.

64 bytes from 192.168.4.1: icmp_seq=5 ttl=252 time=2.55ms.

---- 192.168.4.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 2.45ms, avg = 2.53ms, max = 2.58ms, stddev = 0.044ms

*A:NS085167016# ping 192.168.5.1

PING 192.168.5.1 56 data bytes

64 bytes from 192.168.5.1: icmp_seq=1 ttl=252 time=2.48ms.

64 bytes from 192.168.5.1: icmp_seq=2 ttl=252 time=2.50ms.

64 bytes from 192.168.5.1: icmp_seq=3 ttl=252 time=2.52ms.

64 bytes from 192.168.5.1: icmp_seq=4 ttl=252 time=2.52ms.

64 bytes from 192.168.5.1: icmp_seq=5 ttl=252 time=2.48ms.

---- 192.168.5.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 2.48ms, avg = 2.50ms, max = 2.52ms, stddev = 0.017ms

*A:NS085167016# ping 192.168.6.1

PING 192.168.6.1 56 data bytes

64 bytes from 192.168.6.1: icmp_seq=1 ttl=252 time=2.50ms.

64 bytes from 192.168.6.1: icmp_seq=2 ttl=252 time=2.51ms.

64 bytes from 192.168.6.1: icmp_seq=3 ttl=252 time=2.49ms.

64 bytes from 192.168.6.1: icmp_seq=4 ttl=252 time=2.55ms.

64 bytes from 192.168.6.1: icmp_seq=5 ttl=252 time=2.48ms.

---- 192.168.6.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 2.48ms, avg = 2.51ms, max = 2.55ms, stddev = 0.024ms

from 2600low:

2600low#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

2600low#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600low#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

2600low#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/12 ms

2600low#ping 172.16.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

2600low#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

2600low#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/8 ms

2600low#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/8 ms

2600low#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

from 3750:

3750#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/9 ms

3750#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/9 ms

3750#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms

3750#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/8 ms

```
3750#ping 172.16.4.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.4.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms
```

```
3750#ping 192.168.4.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/9 ms
```

```
3750#ping 192.168.5.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/8 ms
```

```
3750#ping 192.168.6.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms
```

1.3.3 VLAN AND SWITCHING

SWITCH 1: 3750

```
3750#sh run
```

```
Building configuration...
Current configuration : 1901 bytes
!
version 12.2
no service pad
no service password-encryption
!
hostname 3750
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$5NvD$.LGE3IlzGGPruQjhzuSA.1
```

```

enable password mint709
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12

```

```

!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4

```

```

password letmein
login
line vty 5 15
password letmein
login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports
-----	-----	-----
1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24, Gi1/0/25 Gi1/0/26, Gi1/0/27, Gi1/0/28
31 red	active	Gi1/0/1
32 blue	active	Gi1/0/2
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

VLAN Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1 enet	100001	1500 -	-	-	-	-	0	0	
31 enet	100031	1500 -	-	-	-	-	0	0	
32 enet	100032	1500 -	-	-	-	-	0	0	
1002 fddi	101002	1500 -	-	-	-	-	0	0	
1003 tr	101003	1500 -	-	-	-	-	0	0	
1004 fdnet	101004	1500 -	-	-	ieee	-	0	0	
1005 trnet	101005	1500 -	-	-	ibm	-	0	0	

Remote SPAN VLANs

```

-----
Primary Secondary Type          Ports
-----

```

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```
!  
version 12.0  
no service pad  
no service password-encryption  
!  
hostname 3500  
!  
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/  
!  
ip subnet-zero  
!  
interface FastEthernet0/1  
    switchport access vlan 31  
!  
interface FastEthernet0/2  
    switchport access vlan 32  
!  
interface FastEthernet0/3  
    description connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/4  
    description second connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!  
interface FastEthernet0/11
```

```

!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4

```

```

password letmein
login
line vty 5 15
password letmein
login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2
31 red	active	Fa0/1
32 blue	active	Fa0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	1002	1003
31	enet	100031	1500	-	-	-	-	-	0	0
32	enet	100032	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	1	1003
1003	tr	101003	1500	1005	0	-	-	srb	1	1002
1004	fdnet	101004	1500	-	-	1	ibm	-	0	0
1005	trnet	101005	1500	-	-	1	ibm	-	0	0

ROUTER 2800

2800#sh run

```

Building configuration...
Current configuration : 1155 bytes
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption

```



```

!
hostname 2800
!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
    no dspfarm
!
interface GigabitEthernet0/0
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface GigabitEthernet0/1
    no ip address
    duplex auto
    speed auto
!
interface GigabitEthernet0/1.31
    encapsulation dot1Q 31
    ip address 192.168.50.51 255.255.255.240
!
interface GigabitEthernet0/1.32
    encapsulation dot1Q 32
    ip address 192.168.50.67 255.255.255.240
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0

```

```

no ip address
shutdown
no fair-queue
!
interface Vlan1
no ip address
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
login
!
scheduler allocate 20000 1000
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

1.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

Building configuration...

```
Current configuration : 1846 bytes
!
version 12.2
no service password-encryption
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
  switchport access vlan 31
  switchport mode access
!
interface GigabitEthernet1/0/2
  switchport access vlan 32
  switchport mode access
!
interface GigabitEthernet1/0/3
  description connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/4
  description second connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
```

```
interface GigabitEthernet1/0/8
!  
interface GigabitEthernet1/0/9
!  
interface GigabitEthernet1/0/10
!  
interface GigabitEthernet1/0/11
!  
interface GigabitEthernet1/0/12
!  
interface GigabitEthernet1/0/13
!  
interface GigabitEthernet1/0/14
!  
interface GigabitEthernet1/0/15
!  
interface GigabitEthernet1/0/16
!  
interface GigabitEthernet1/0/17
!  
interface GigabitEthernet1/0/18
!  
interface GigabitEthernet1/0/19
!  
interface GigabitEthernet1/0/20
!  
interface GigabitEthernet1/0/21
!  
interface GigabitEthernet1/0/22
!  
interface GigabitEthernet1/0/23
!  
interface GigabitEthernet1/0/24
!  
interface GigabitEthernet1/0/25
!  
interface GigabitEthernet1/0/26
!  
interface GigabitEthernet1/0/27
!  
interface GigabitEthernet1/0/28
!  
interface Vlan1
  no ip address
```

```
!  
ip classless  
ip http server  
!  
control-plane  
!  
line con 0  
line vty 5 15  
!  
end
```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```
!  
version 12.0  
no service pad  
no service password-encryption  
!  
hostname 3500  
!  
enable secret 5 $1$T1Z5$Seq5NjgeKIYdni348aUnoh/  
!  
spanning-tree vlan 32 priority 8192  
ip subnet-zero  
!  
interface FastEthernet0/1  
    switchport access vlan 31  
!  
interface FastEthernet0/2  
    switchport access vlan 32  
!  
interface FastEthernet0/3  
    description connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/4  
    description second connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!
```

```
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
```

```

interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID	Priority	32768		
	Address	0007.eb94.7200		
	Cost	19		
	Port	3 (GigabitEthernet1/0/3)		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec

Bridge ID	Priority	32769	(priority 32768 sys-id-ext 1)
	Address	0018.186e.7b00	
	Hello Time	2 sec	Max Age 20 sec Forward Delay 15 sec
	Aging Time	300 sec	

Interface	Role	Sts Cost	Prio.Nbr	Type
Gi1/0/3	Root	FWD 19	128.3	P2p
Gi1/0/4	Altn	BLK 19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/3	Desg	FWD	19	128.3	P2p
Gi1/0/4	Desg	FWD	19	128.4	P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 15 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2	P2p
Gi1/0/3	Root	FWD	19	128.3	P2p
Gi1/0/4	Altn	BLK	19	128.4	P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7200
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7201
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE
 ROOT ID Priority 8192
 Address 0007.eb94.7202
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192
 Address 0007.eb94.7202
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32768
 Address 0007.eb94.7200
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
 Address 0018.186e.7b00
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/4	Root	FWD	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/4	Desg	FWD	19	128.4	P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

```

Bridge ID   Priority    32800  (priority 32768 sys-id-ext 32)
Address     0018.186e.7b00
Hello Time  2 sec   Max Age 20 sec   Forward Delay 15 sec
Aging Time  300 sec

```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2	P2p
Gi1/0/4	Root	FWD	19	128.4	P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

```

Spanning tree enabled protocol IEEE
ROOT ID   Priority 32768
Address 0007.eb94.7200
This bridge is the root
Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID   Priority    32768
Address     0007.eb94.7200
Hello Time  2 sec   Max Age 20 sec   Forward Delay 15 sec

```

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28

Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

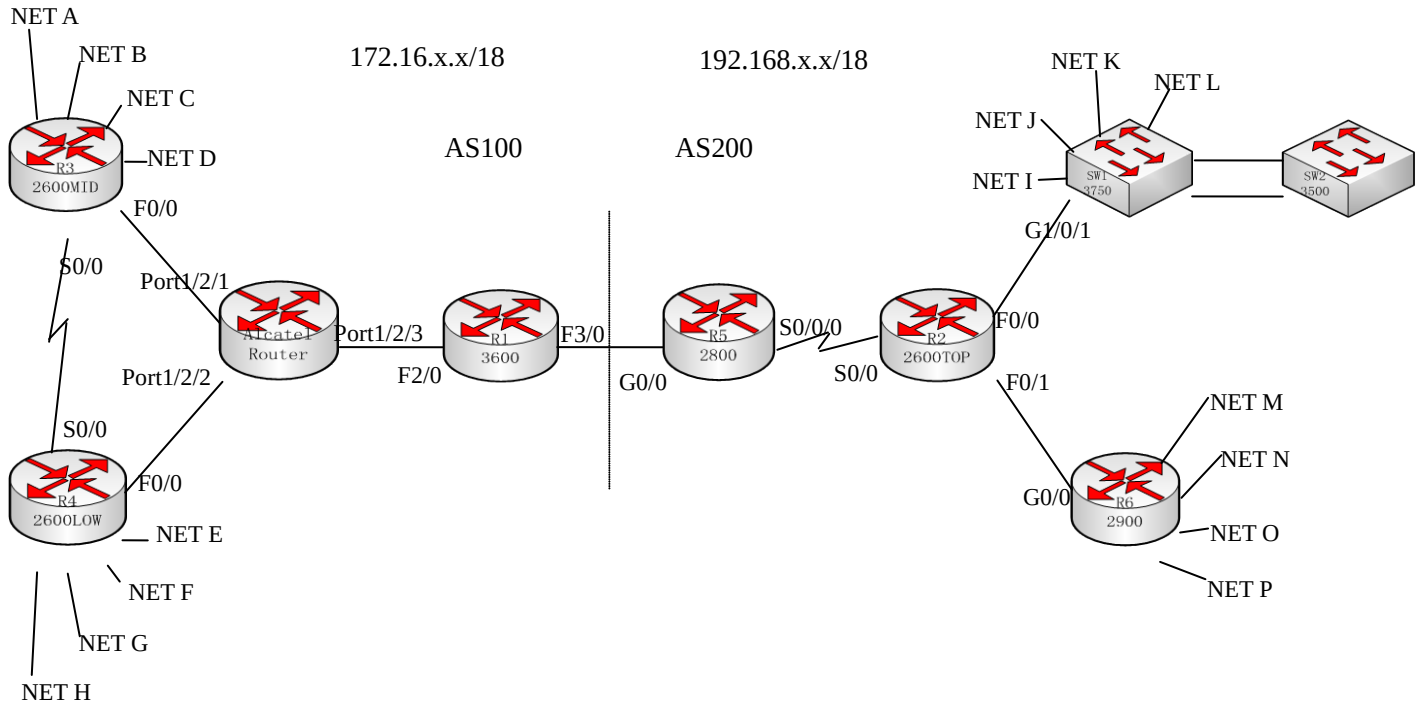
```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Chapter 2 Routing and switching lab exam 2

2.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2600, Cisco 3750 and Cisco 2900 according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')

2. Configure RIPv2 in Cisco 2600(R2) and Cisco 2900(R6) to let them reach each other. (10')

3. Configure OSPF in Cisco 2600(R3), Cisco 2600(R4), Alcatel router and Cisco 3600(R1) within area 0. (10')

4. Configure EBGP in Cisco 3600(R1) and Cisco 2800(R5), don't advertise autonomous system network topology behind R1 and R5. Instead you should be advertising /18 network. (20')

5. Configure ISIS in Cisco 2800(R5) and Cisco 2600(R2). (10')

6. Configure Static routes in Cisco 2600(R2) and Cisco 3750. (10')

7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')
8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

2.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2600(R3 and R4) to the nets of Cisco 3750 and Cisco 2900(R6) at the the other side of the whole network, and from Cisco 3750 and Cisco 2900(R6) to the nets of Cisco 2600(R3 and R4). For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 3600(R1).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

2.3 lab solution

2.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
R3 Cisco 2600	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	F0/0:172.16.8.253/30	S0/0:172.16.8.249/30
R4 Cisco 2600	Net E:172.16.4.1/24	Net F:172.16.5.1/24
	Net G:172.16.6.1/24	Net H:172.16.7.1/24
	S0/0:172.16.8.250/30	F0/0:172.16.9.253/30
Alcatel router	Port 1/2/1:172.16.8.254/30	Port 1/2/2:172.16.9.254/30
	Port 1/2/3:172.16.10.253/30	
R1 Cisco 3600	F2/0:172.16.10.254/30	F3/0:172.16.11.253/30
R5 Cisco 2800	G0/0:172.16.11.254/30	S0/0/0:192.168.10.254/30
R2 Cisco 2600	F0/0:192.168.8.254/30	F0/1:192.168.9.254/30
	S0/0:192.168.10.253/30	
R6 Cisco 2900	Net M:192.168.4.1/24	Net N:192.168.5.1/24
	Net O:192.168.6.1/24	Net P:192.168.7.1/24

	G0/0:192.168.9.253/30	
Cisco 3750	Net I:192.168.0.1/24	Net J:192.168.1.1/24
	Net K:192.168.2.1/24	Net L:192.168.3.1/24
	G1/0/1:192.168.8.253/30	

2.3.2 ROUTING TASK

Cisco 2600MID

2600mid#sh run

```

Building configuration...
Current configuration : 1177 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback1
 ip address 172.16.0.1 255.255.255.0
!
interface Loopback2
 ip address 172.16.1.1 255.255.255.0
!
interface Loopback3
 ip address 172.16.2.1 255.255.255.0
!
interface Loopback4
 ip address 172.16.3.1 255.255.255.0
!
interface FastEthernet0/0
 ip address 172.16.8.253 255.255.255.252

```

```

duplex auto
speed auto
!
interface Serial0/0
ip address 172.16.8.249 255.255.255.252
clock rate 64000
no fair-queue
!
interface Serial0/1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 172.16.0.0 0.0.0.255 area 0
network 172.16.1.0 0.0.0.255 area 0
network 172.16.2.0 0.0.0.255 area 0
network 172.16.3.0 0.0.0.255 area 0
network 172.16.8.248 0.0.0.3 area 0
network 172.16.8.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.8.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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 172.16.8.254 to network 0.0.0.0

172.16.0.0/16 is variably subnetted, 12 subnets, 3 masks

```
C      172.16.8.252/30 is directly connected, FastEthernet0/0
O      172.16.9.252/30 [110/65] via 172.16.8.250, 00:13:08, Serial0/0
O      172.16.10.252/30
        [110/1001] via 172.16.8.254, 00:13:08, FastEthernet0/0
C      172.16.8.248/30 is directly connected, Serial0/0
O      172.16.5.1/32 [110/65] via 172.16.8.250, 00:13:08, Serial0/0
O      172.16.4.1/32 [110/65] via 172.16.8.250, 00:13:08, Serial0/0
O      172.16.7.1/32 [110/65] via 172.16.8.250, 00:13:09, Serial0/0
O      172.16.6.1/32 [110/65] via 172.16.8.250, 00:13:09, Serial0/0
C      172.16.0.0/24 is directly connected, Loopback1
C      172.16.1.0/24 is directly connected, Loopback2
C      172.16.2.0/24 is directly connected, Loopback3
C      172.16.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 172.16.8.254
```

Cisco 2600LOW

2600low#sh run

Building configuration...

Current configuration : 1144 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600low

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

```

interface Loopback1
  ip address 172.16.4.1 255.255.255.0
!
interface Loopback2
  ip address 172.16.5.1 255.255.255.0
!
interface Loopback3
  ip address 172.16.6.1 255.255.255.0
!
interface Loopback4
  ip address 172.16.7.1 255.255.255.0
!
interface FastEthernet0/0
  ip address 172.16.9.253 255.255.255.252
  duplex auto
  speed auto
!
interface Serial0/0
  ip address 172.16.8.250 255.255.255.252
!
interface Serial0/1
  no ip address
  shutdown
!
router ospf 1
  log-adjacency-changes
  network 172.16.4.0 0.0.0.255 area 0
  network 172.16.5.0 0.0.0.255 area 0
  network 172.16.6.0 0.0.0.255 area 0
  network 172.16.7.0 0.0.0.255 area 0
  network 172.16.8.248 0.0.0.3 area 0
  network 172.16.9.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.9.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4

```

```
!  
!  
end
```

2600low#sh ip route

Codes: 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
i - IS-IS, su - IS-IS summary, 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 172.16.9.254 to network 0.0.0.0

```
172.16.0.0/16 is variably subnetted, 12 subnets, 3 masks  
O      172.16.8.252/30 [110/65] via 172.16.8.249, 00:13:54, Serial0/0  
C      172.16.9.252/30 is directly connected, FastEthernet0/0  
O      172.16.10.252/30  
        [110/1001] via 172.16.9.254, 00:13:54, FastEthernet0/0  
C      172.16.8.248/30 is directly connected, Serial0/0  
C      172.16.4.0/24 is directly connected, Loopback1  
C      172.16.5.0/24 is directly connected, Loopback2  
C      172.16.6.0/24 is directly connected, Loopback3  
C      172.16.7.0/24 is directly connected, Loopback4  
O      172.16.1.1/32 [110/65] via 172.16.8.249, 00:13:55, Serial0/0  
O      172.16.0.1/32 [110/65] via 172.16.8.249, 00:13:55, Serial0/0  
O      172.16.3.1/32 [110/65] via 172.16.8.249, 00:13:55, Serial0/0  
O      172.16.2.1/32 [110/65] via 172.16.8.249, 00:13:58, Serial0/0  
S*    0.0.0.0/0 [1/0] via 172.16.9.254
```

Alcatel Router

***A:NS091066068# admin display-config**

```
# TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.  
# All rights reserved. All use subject to applicable license agreements.  
# Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main  
  
# Generated FRI NOV 11 04:37:03 2011 UTC
```

```

exit all
configure
#-----
echo "System Configuration"
#-----
    system
        ccm 1
        exit
        snmp
            shutdown
        exit
        time
            sntp
                shutdown
            exit
            zone UTC
        exit
        thresholds
            rmon
            exit
        exit
    exit
#-----
echo "System Security Configuration"
#-----
    system
        security
            per-peer-queuing
        exit
    exit
#-----
echo "Log Configuration"
#-----
    log
    exit
#-----
echo "System Security Cpm Hw Filters Configuration"
#-----
    system
        security
        exit
    exit
#-----
echo "QoS Policy Configuration"

```

```

#-----
    qos
    exit
#-----
echo "Card Configuration"
#-----
    card 1
        card-type iom-9g
        mda 2
            mda-type c8-10/100eth-tx
        exit
    exit
#-----
echo "Port Configuration"
#-----
    port 1/2/1
        ethernet
        exit
        no shutdown
    exit
    port 1/2/2
        ethernet
        exit
        no shutdown
    exit
    port 1/2/3
        ethernet
        exit
        no shutdown
    exit
    port 1/2/4
        shutdown
        ethernet
        exit
    exit
    port 1/2/5
        shutdown
        ethernet
        exit
    exit
    port 1/2/6
        shutdown
        ethernet
        exit

```

```

exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit
#-----
echo "System Sync-If-Timing Configuration"
#-----
    system
        sync-if-timing
            begin
            commit
        exit
    exit
#-----
echo "Management Router Configuration"
#-----
    router management
    exit
#-----
echo "Router (Network Side) Configuration"
#-----
    router
        interface "system"
        exit
        interface "to2600low"
            address 172.16.9.254/30
            port 1/2/2
        exit
        interface "to2600mid"
            address 172.16.8.254/30
            port 1/2/1
        exit
        interface "to3600"
            address 172.16.10.253/30
            port 1/2/3
        exit
#-----

```



```

echo "Static Route Configuration"
#-----
        static-route 0.0.0.0/0 next-hop 172.16.10.254
#-----
echo "OSPFv2 Configuration"
#-----
        ospf
        export "ospf"
        area 0.0.0.0
            interface "to2600mid"
            exit
            interface "to2600low"
            exit
            interface "to3600"
            exit
        exit
    exit
exit
#-----
echo "Service Configuration"
#-----
    service
        customer 1 create
            description "Default customer"
        exit
    exit
#-----
echo "Router (Service Side) Configuration"
#-----
    router
#-----
echo "OSPFv2 Configuration"
#-----
        ospf
        exit
#-----
echo "Policy Configuration"
#-----
    policy-options
        begin
        policy-statement "ospf"
            entry 1
                from
                    protocol direct

```

```

        exit
        action accept
        exit
    exit
exit
commit
exit
exit

exit all

# Finished FRI NOV 11 04:37:10 2011 UTC

```

***A:NS091066068# show router route-table**

Route Table (Router: Base)					
Dest Prefix	Type	Proto	Age	Pref	Metric
Next Hop[Interface Name]					
0.0.0.0/0	Remote	Static	00h09m14s	5	1
172.16.10.254					
172.16.0.1/32	Remote	OSPF	02h49m13s	10	1001
172.16.8.253					
172.16.1.1/32	Remote	OSPF	02h49m13s	10	1001
172.16.8.253					
172.16.2.1/32	Remote	OSPF	02h49m13s	10	1001
172.16.8.253					
172.16.3.1/32	Remote	OSPF	02h49m13s	10	1001
172.16.8.253					
172.16.4.1/32	Remote	OSPF	02h47m40s	10	1001
172.16.9.253					
172.16.5.1/32	Remote	OSPF	02h47m40s	10	1001
172.16.9.253					
172.16.6.1/32	Remote	OSPF	02h47m40s	10	1001
172.16.9.253					
172.16.7.1/32	Remote	OSPF	02h47m41s	10	1001
172.16.9.253					
172.16.8.248/30	Remote	OSPF	02h47m11s	10	1064
172.16.8.253					
172.16.8.252/30	Local	Local	03h31m00s	0	0
to2600mid					

172.16.9.252/30 to2600low	Local	Local	03h17m00s	0	0
172.16.10.252/30 to3600	Local	Local	00h15m52s	0	0

No. of Routes: 13
=====

Cisco 3600

3600#sh run

Building configuration...

Current configuration : 959 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 3600

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface Ethernet0/0

no ip address

half-duplex

!

interface FastEthernet1/0

no ip address

duplex auto

speed auto

!

interface FastEthernet2/0

ip address 172.16.10.254 255.255.255.252

duplex auto

```

    speed auto
!
interface FastEthernet3/0
    ip address 172.16.11.253 255.255.255.252
    duplex auto
    speed auto
!
router ospf 1
    log-adjacency-changes
    network 172.16.10.252 0.0.0.3 area 0
!
router bgp 100
    no synchronization
    bgp log-neighbor-changes
    network 172.16.0.0 mask 255.255.192.0
    neighbor 172.16.11.254 remote-as 200
    no auto-summary
!
ip http server
ip classless
ip route 172.16.0.0 255.255.192.0 Null0
!
line con 0
line aux 0
line vty 0 4
    login
!
end

```

3600#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

172.16.0.0/16 is variably subnetted, 14 subnets, 3 masks

O 172.16.8.252/30

```

O      [110/1001] via 172.16.10.253, 00:15:39, FastEthernet2/0
      172.16.9.252/30
      [110/1001] via 172.16.10.253, 00:15:39, FastEthernet2/0
C      172.16.10.252/30 is directly connected, FastEthernet2/0
C      172.16.11.252/30 is directly connected, FastEthernet3/0
O      172.16.8.248/30
      [110/1065] via 172.16.10.253, 00:15:39, FastEthernet2/0
O      172.16.5.1/32 [110/1002] via 172.16.10.253, 00:15:40, FastEthernet2/0
O      172.16.4.1/32 [110/1002] via 172.16.10.253, 00:15:40, FastEthernet2/0
O      172.16.7.1/32 [110/1002] via 172.16.10.253, 00:15:40, FastEthernet2/0
O      172.16.6.1/32 [110/1002] via 172.16.10.253, 00:15:40, FastEthernet2/0
O      172.16.1.1/32 [110/1002] via 172.16.10.253, 00:15:41, FastEthernet2/0
S      172.16.0.0/18 is directly connected, Null0
O      172.16.0.1/32 [110/1002] via 172.16.10.253, 00:15:41, FastEthernet2/0
O      172.16.3.1/32 [110/1002] via 172.16.10.253, 00:15:41, FastEthernet2/0
O      172.16.2.1/32 [110/1002] via 172.16.10.253, 00:15:41, FastEthernet2/0
B      192.168.0.0/18 [20/0] via 172.16.11.254, 00:13:28

```

3600#sh ip bgp

BGP table version is 3, local router ID is 172.16.11.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.11.254	0		0 200	i

Cisco 2800

2800#sh run

Building configuration...

Current configuration : 1339 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2800

```

!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
  no dspfarm
!
vlan internal allocation policy ascending
!
interface Loopback0
  ip address 192.168.11.0 255.255.255.255
!
interface GigabitEthernet0/0
  ip address 172.16.11.254 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
  ip address 192.168.10.254 255.255.255.252
  ip router isis
  clock rate 64000
!
interface Vlan1

```

```

no ip address
!
router isis
net 49.0001.1921.6801.1000.00
passive-interface Loopback0
!
router bgp 200
no synchronization
bgp log-neighbor-changes
network 192.168.0.0 mask 255.255.192.0
neighbor 172.16.11.253 remote-as 100
no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

192.168.12.0/32 is subnetted, 1 subnets

i L2 192.168.12.0 [115/10] via 192.168.10.253, Serial0/0/0

```

192.168.8.0/30 is subnetted, 1 subnets
i L2    192.168.8.252 [115/10] via 192.168.10.253, Serial0/0/0
192.168.9.0/30 is subnetted, 1 subnets
i L2    192.168.9.252 [115/10] via 192.168.10.253, Serial0/0/0
192.168.10.0/30 is subnetted, 1 subnets
C        192.168.10.252 is directly connected, Serial0/0/0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        172.16.11.252/30 is directly connected, GigabitEthernet0/0
B        172.16.0.0/18 [20/0] via 172.16.11.253, 00:13:35
192.168.11.0/32 is subnetted, 1 subnets
C        192.168.11.0 is directly connected, Loopback0
i L2 192.168.4.0/24 [115/10] via 192.168.10.253, Serial0/0/0
i L2 192.168.5.0/24 [115/10] via 192.168.10.253, Serial0/0/0
i L2 192.168.6.0/24 [115/10] via 192.168.10.253, Serial0/0/0
i L2 192.168.7.0/24 [115/10] via 192.168.10.253, Serial0/0/0
i L2 192.168.0.0/22 [115/10] via 192.168.10.253, Serial0/0/0
S       192.168.0.0/18 is directly connected, Null0

```

2800#sh ip bgp

BGP table version is 24, local router ID is 192.168.10.254

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.11.253	0		0	100 i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

Cisco 2600TOP

2600top#sh run

Building configuration...

Current configuration : 1093 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600top


```

!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
  ip address 192.168.12.0 255.255.255.255
!
interface FastEthernet0/0
  ip address 192.168.8.254 255.255.255.252
  duplex auto
  speed auto
!
interface Serial0/0
  ip address 192.168.10.253 255.255.255.252
  ip router isis
  no fair-queue
!
interface FastEthernet0/1
  ip address 192.168.9.254 255.255.255.252
  duplex auto
  speed auto
!
interface Serial0/1
  no ip address
  shutdown
!
router isis
  net 49.0001.1921.6801.2000.00
  redistribute connected
  redistribute static ip
  redistribute rip
!
router rip
  version 2
  redistribute connected
  redistribute static
  network 192.168.9.0
!

```

```

ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.10.254
ip route 192.168.0.0 255.255.252.0 192.168.8.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.10.254 to network 0.0.0.0

```

192.168.12.0/32 is subnetted, 1 subnets
C      192.168.12.0 is directly connected, Loopback0
192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, FastEthernet0/0
192.168.9.0/30 is subnetted, 1 subnets
C      192.168.9.252 is directly connected, FastEthernet0/1
192.168.10.0/30 is subnetted, 1 subnets
C      192.168.10.252 is directly connected, Serial0/0
192.168.11.0/32 is subnetted, 1 subnets
i L1   192.168.11.0 [115/10] via 192.168.10.254, Serial0/0
R      192.168.4.0/24 [120/1] via 192.168.9.253, 00:00:04, FastEthernet0/1
R      192.168.5.0/24 [120/1] via 192.168.9.253, 00:00:04, FastEthernet0/1
R      192.168.6.0/24 [120/1] via 192.168.9.253, 00:00:04, FastEthernet0/1
R      192.168.7.0/24 [120/1] via 192.168.9.253, 00:00:05, FastEthernet0/1
S*     0.0.0.0/0 [1/0] via 192.168.10.254
S      192.168.0.0/22 [1/0] via 192.168.8.253

```

Cisco 3750

3750#sh run

Building configuration...

Current configuration : 1858 bytes

!

version 12.2

no service pad

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

ip routing

!

spanning-tree mode pvst

spanning-tree etherchannel guard misconfig

spanning-tree extend system-id

!

vlan internal allocation policy ascending

!

interface Loopback1

ip address 192.168.0.1 255.255.255.0

!

interface Loopback2

ip address 192.168.1.1 255.255.255.0

!

interface Loopback3

ip address 192.168.2.1 255.255.255.0

!

interface Loopback4

ip address 192.168.3.1 255.255.255.0

!

```
interface GigabitEthernet1/0/1
  no switchport
  ip address 192.168.8.253 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
```

```

interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.8.254
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

3750#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.8.254 to network 0.0.0.0

192.168.8.0/30 is subnetted, 1 subnets

```

C      192.168.8.252 is directly connected, GigabitEthernet1/0/1
C      192.168.0.0/24 is directly connected, Loopback1

```

```
C    192.168.1.0/24 is directly connected, Loopback2
C    192.168.2.0/24 is directly connected, Loopback3
C    192.168.3.0/24 is directly connected, Loopback4
S*   0.0.0.0/0 [1/0] via 192.168.8.254
```

Cisco 2900

2900#sh run

```
Building configuration...
Current configuration : 1323 bytes
!
! Last configuration change at 02:15:11 UTC Sat Nov 12 2011
!
version 15.0
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2900
!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
no ipv6 cef
ip source-route
ip cef
!
multilink bundle-name authenticated
!
license udi pid CISCO2921/K9 sn FGL150811PW
license boot module c2900 technology-package datak9
!
redundancy
!
interface Loopback1
 ip address 192.168.4.1 255.255.255.0
!
interface Loopback2
 ip address 192.168.5.1 255.255.255.0
```

```

!
interface Loopback3
 ip address 192.168.6.1 255.255.255.0
!
interface Loopback4
 ip address 192.168.7.1 255.255.255.0
!
interface GigabitEthernet0/0
 ip address 192.168.9.253 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
!
router rip
 version 2
 network 192.168.4.0
 network 192.168.5.0
 network 192.168.6.0
 network 192.168.7.0
 network 192.168.9.0
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 192.168.9.254
!
control-plane
!
line con 0
line aux 0
line vty 0 4
 login
!

```

```
scheduler allocate 20000 1000
end
```

2900#sh 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
i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is 192.168.9.254 to network 0.0.0.0

```
S*    0.0.0.0/0 [1/0] via 192.168.9.254
R     192.168.0.0/22 [120/1] via 192.168.9.254, 00:00:05, GigabitEthernet0/0
      192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.4.0/24 is directly connected, Loopback1
L     192.168.4.1/32 is directly connected, Loopback1
      192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.5.0/24 is directly connected, Loopback2
L     192.168.5.1/32 is directly connected, Loopback2
      192.168.6.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.6.0/24 is directly connected, Loopback3
L     192.168.6.1/32 is directly connected, Loopback3
      192.168.7.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.7.0/24 is directly connected, Loopback4
L     192.168.7.1/32 is directly connected, Loopback4
R     192.168.8.0/24 [120/1] via 192.168.9.254, 00:00:07, GigabitEthernet0/0
      192.168.9.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.9.252/30 is directly connected, GigabitEthernet0/0
L     192.168.9.253/32 is directly connected, GigabitEthernet0/0
R     192.168.10.0/24 [120/1] via 192.168.9.254, 00:00:07, GigabitEthernet0/0

R     192.168.12.0/24 [120/1] via 192.168.9.254, 00:00:07, GigabitEthernet0/0
```

PING RESULTS:

```
2600mid#ping 192.168.0.1
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/31/32 ms

2600mid#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/31/32 ms

2600mid#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/31/32 ms

2600mid#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/31/32 ms

2600mid#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600mid#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600mid#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600mid#ping 192.168.7.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.7.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/32/36 ms

2600low#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/31/32 ms

2600low#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

2600low#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

2600low#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 192.168.7.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.7.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3750#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 26/31/34 ms

3750#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/31/34 ms

3750#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/31/34 ms

3750#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/32/34 ms

3750#ping 172.16.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/31/34 ms

3750#ping 172.16.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 172.16.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.6.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 26/32/34 ms

3750#ping 172.16.7.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.7.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 25/32/34 ms

2900#ping 172.16.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.2.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.3.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.4.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.4.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2900#ping 172.16.5.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.7.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.7.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2.3.3 VLAN AND SWITHCING

SWITCH 1: 3750

3750#sh run

Building configuration...

Current configuration : 1901 bytes

!

version 12.2

no service pad

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

enable secret 5 \$1\$5NvD\$.LGE3IlzGGPruQjhzuSA.1

enable password mint709

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

!

spanning-tree vlan 31 priority 8192

!

interface GigabitEthernet1/0/1

```

switchport access vlan 31
switchport mode access
!
interface GigabitEthernet1/0/2
switchport access vlan 32
switchport mode access
!
interface GigabitEthernet1/0/3
description connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/4
description second connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/5
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17

```

```

!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name		Status	Ports

1	default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24, Gi1/0/25 Gi1/0/26, Gi1/0/27, Gi1/0/28
31	red	active	Gi1/0/1
32	blue	active	Gi1/0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2

1	enet	100001	1500	-	-	-	-	0	0
31	enet	100031	1500	-	-	-	-	0	0
32	enet	100032	1500	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	0	0
1005	trnet	101005	1500	-	-	-	ibm	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

!

version 12.0

no service pad

no service password-encryption

!

hostname 3500


```

!
enable secret 5 $1$T1Z5$Seq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!
interface FastEthernet0/1
    switchport access vlan 31
!
interface FastEthernet0/2
    switchport access vlan 32
!
interface FastEthernet0/3
    description connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/4
    description second connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16

```

```

!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name		Status	Ports

1	default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2
31	red	active	Fa0/1
32	blue	active	Fa0/2
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2

1	enet	100001	1500	-	-	-	-	-	1002	1003
31	enet	100031	1500	-	-	-	-	-	0	0
32	enet	100032	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	1	1003
1003	tr	101003	1500	1005	0	-	-	srb	1	1002
1004	fdnet	101004	1500	-	-	1	ibm	-	0	0
1005	trnet	101005	1500	-	-	1	ibm	-	0	0

Cisco 2600TOP

2600top#sh run

Building configuration...

Current configuration : 864 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600top

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

```

!
ip cef
!
interface FastEthernet0/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface FastEthernet0/0.31
  encapsulation dot1Q 31
  ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet0/0.32
  encapsulation dot1Q 32
  ip address 192.168.50.67 255.255.255.240
!
interface Serial0/0
  no ip address
  shutdown
  no fair-queue
!
interface FastEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface Serial0/1
  no ip address
  shutdown
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP address of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

2.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

Building configuration...

Current configuration : 1846 bytes

!

version 12.2

no service pa

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname Switch

!

boot-start-marker

boot-end-marker

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

!

```
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
```

```

interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0

```

```

no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
    switchport access vlan 31
!
interface FastEthernet0/2
    switchport access vlan 32
!
interface FastEthernet0/3
    description connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/4
    description second connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!

```



```

interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login

```

!
end

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32768
 Address 0007.eb94.7200
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/3	Root	FWD	19	128.3	P2p
Gi1/0/4	Altn	BLK	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/3	Desg	FWD	19	128.3	P2p
Gi1/0/4	Desg	FWD	19	128.4	P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192

Address 0007.eb94.7202
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 15 sec

Interface	Role	Sts Cost	Prio.Nbr	Type
Gi1/0/2	Desg	FWD 4	128.2	P2p
Gi1/0/3	Root	FWD 19	128.3	P2p
Gi1/0/4	Altn	BLK 19	128.4	P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE
 ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port Name	Port ID	Prio	Cost	Sts	Designated Cost	Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port Designated

Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

```

Bridge ID   Priority    8192
            Address      0007.eb94.7202
            Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```

C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID    Priority    32768
            Address      0007.eb94.7200
            Cost        19
            Port        4 (GigabitEthernet1/0/4)
            Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
            Address      0018.186e.7b00
            Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec
            Aging Time   300 sec

```

Interface	Role	Sts	Cost	Prio	Nbr	Type
-----------	------	-----	------	------	-----	------

```
-----
Gi1/0/4          Root FWD 19          128.4    P2p
```

VLAN0031

Spanning tree enabled protocol ieee

```
Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
```

```
Bridge ID  Priority    8223  (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time  300 sec
```

```
Interface          Role Sts Cost          Prio.Nbr Type
-----
```

```
Gi1/0/4          Desg FWD 19          128.4    P2p
```

VLAN0032

Spanning tree enabled protocol ieee

```
Root ID    Priority    8192
           Address    0007.eb94.7202
           Cost        19
           Port        4 (GigabitEthernet1/0/4)
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
```

```
Bridge ID  Priority    32800 (priority 32768 sys-id-ext 32)
           Address    0018.186e.7b00
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time  300 sec
```

```
Interface          Role Sts Cost          Prio.Nbr Type
-----
```

```
Gi1/0/2          Desg FWD 4          128.2    P2p
```

```
Gi1/0/4          Root FWD 19          128.4    P2p
```

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

```
ROOT ID    Priority 32768
           Address 0007.eb94.7200
           This bridge is the root
```

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7200

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7201
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE
 ROOT ID Priority 8192
 Address 0007.eb94.7202
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192
 Address 0007.eb94.7202
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

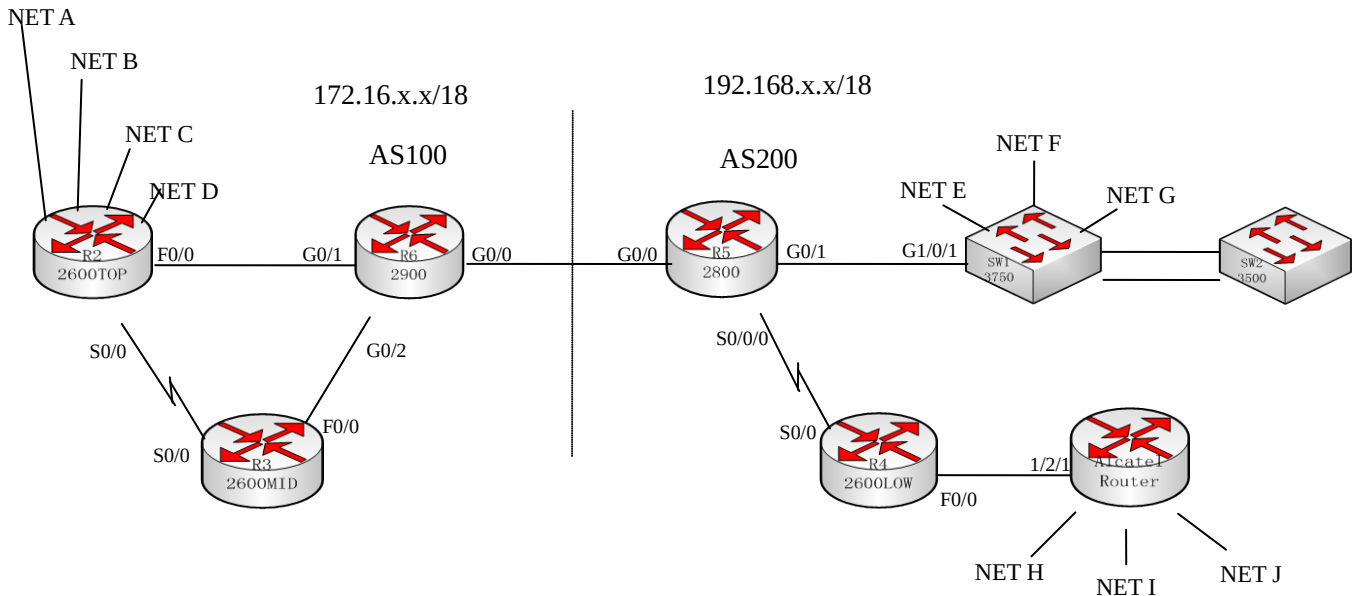

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Chapter3 Routing and switching lab exam 3

3.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2600(R2), Cisco 3750 and Alcatel router according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')
2. Configure RIPv2 in Cisco 2600(R4) and Alcatel router to let them reach each other. (10')
3. Configure OSPF in Cisco 2800(R5) and Cisco 2600(R4) within area 0. (10')
4. Configure EBGp in Cisco 2900(R6) and Cisco 2800(R5), don't advertise autonomous system network topology behind R5 and R6. Instead you should be advertising /18 network. (20')
5. Configure ISIS in Cisco 2900(R6),Cisco 2600(R2) and Cisco 2600(R3). (10')
6. Configure Static routes in Cisco 2800(R5) and Cisco 3750. (10')
7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')
8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in

Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

3.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2600(R2) to the nets of Cisco 3750 and Alcatel router at the the other side of the whole network, and from Cisco 3750 and Alcatel router to the nets of Cisco 2600(R2). For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2900(R6).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

3.3 lab solution

3.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
R2 Cisco 2600	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	F0/0:172.16.4.253/30	S0/0:172.16.4.249/30
R3 Cisco 2600	S0/0:172.16.4.250/30	F0/0:172.16.5.253/30
R6 Cisco 2900	G0/0:172.16.6.253/30	G0/1:172.16.4.254/30
	G0/2:172.16.5.254/30	
R5 Cisco 2800	G0/0:172.16.6.254/30	G0/1:192.168.6.253/30
	S0/0/0:192.168.7.253/30	
R4 Cisco 2600	S0/0:192.168.7.254/30	F0/0:192.168.8.253/30Net K:192.168.5.1/24
Alcatel router	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	Port 1/2/1:192.168.8.254/30
Cisco 3750	G1/0/1:192.168.8.254/30	Net E:192.168.0.1/24
	Net F:192.168.1.1/24	Net G:192.168.2.1/24
	Net H:192.168.3.1/24	

3.3.2 ROUTING TASK

2600top#sh run

```
Building configuration...
Current configuration : 1232 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
 ip address 172.16.8.0 255.255.255.255
!
interface Loopback1
 ip address 172.16.0.1 255.255.255.0
 ip router isis
!
interface Loopback2
 ip address 172.16.1.1 255.255.255.0
 ip router isis
!
interface Loopback3
 ip address 172.16.2.1 255.255.255.0
 ip router isis
!
interface Loopback4
 ip address 172.16.3.1 255.255.255.0
 ip router isis
!
interface FastEthernet0/0
 ip address 172.16.4.253 255.255.255.252
```

```

ip router isis
duplex auto
speed auto
!
interface Serial0/0
ip address 172.16.4.249 255.255.255.252
ip router isis
clock rate 64000
no fair-queue
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/1
no ip address
shutdown
!
router isis
net 49.0001.1720.1600.8000.00
passive-interface Loopback0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.4.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
i - IS-IS, su - IS-IS summary, 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 172.16.4.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks
C       172.16.4.248/30 is directly connected, Serial0/0
C       172.16.4.252/30 is directly connected, FastEthernet0/0
i L1    172.16.5.252/30 [115/20] via 172.16.4.254, FastEthernet0/0
        [115/20] via 172.16.4.250, Serial0/0
C       172.16.8.0/32 is directly connected, Loopback0
i L1    172.16.9.0/32 [115/10] via 172.16.4.250, Serial0/0
i L1    172.16.7.0/32 [115/10] via 172.16.4.254, FastEthernet0/0
C       172.16.0.0/24 is directly connected, Loopback1
C       172.16.1.0/24 is directly connected, Loopback2
C       172.16.2.0/24 is directly connected, Loopback3
C       172.16.3.0/24 is directly connected, Loopback4
S*     0.0.0.0/0 [1/0] via 172.16.4.254

```

2600mid#sh run

```

Building configuration...
Current configuration : 779 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef

```

```

!
interface Loopback0
 ip address 172.16.9.0 255.255.255.255
!
interface FastEthernet0/0
 ip address 172.16.5.253 255.255.255.252
 ip router isis
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.4.250 255.255.255.252
 ip router isis
!
interface Serial0/1
 no ip address
 shutdown
!
router isis
 net 49.0001.1720.1600.9000.00
 passive-interface Loopback0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks

```
C      172.16.4.248/30 is directly connected, Serial0/0
i L1   172.16.4.252/30 [115/20] via 172.16.5.254, FastEthernet0/0
      [115/20] via 172.16.4.249, Serial0/0
C      172.16.5.252/30 is directly connected, FastEthernet0/0
i L1   172.16.8.0/32 [115/10] via 172.16.4.249, Serial0/0
C      172.16.9.0/32 is directly connected, Loopback0
i L1   172.16.7.0/32 [115/10] via 172.16.5.254, FastEthernet0/0
i L1   172.16.0.0/24 [115/20] via 172.16.4.249, Serial0/0
i L1   172.16.1.0/24 [115/20] via 172.16.4.249, Serial0/0
i L1   172.16.2.0/24 [115/20] via 172.16.4.249, Serial0/0
i L1   172.16.3.0/24 [115/20] via 172.16.4.249, Serial0/0
```

2900#sh run

Building configuration...

Current configuration : 1310 bytes

!

! Last configuration change at 04:11:51 UTC Tue Nov 22 2011

!

version 15.0

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2900

!

boot-start-marker

boot-end-marker

!

no aaa new-model

!

no ipv6 cef

ip source-route

ip cef

!

multilink bundle-name authenticated


```

!
license udi pid CISCO2921/K9 sn FGL150811PR
license boot module c2900 technology-package datak9
!
redundancy
!
interface Loopback0
  ip address 172.16.7.0 255.255.255.255
!
interface GigabitEthernet0/0
  ip address 172.16.6.253 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 172.16.4.254 255.255.255.252
  ip router isis
  duplex auto
  speed auto
!
interface GigabitEthernet0/2
  ip address 172.16.5.254 255.255.255.252
  ip router isis
  duplex auto
  speed auto
!
router isis
  net 49.0001.1720.1600.7000.00
  passive-interface Loopback0
!
router bgp 100
  no synchronization
  bgp log-neighbor-changes
  network 172.16.0.0 mask 255.255.192.0
  neighbor 172.16.6.254 remote-as 200
  no auto-summary
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 172.16.0.0 255.255.192.0 Null0
!

```

```

control-plane
!

line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is not set

```

      172.16.0.0/16 is variably subnetted, 15 subnets, 4 masks
S       172.16.0.0/18 is directly connected, Null0
i L1    172.16.0.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.1.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.2.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.3.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.4.248/30 [115/20] via 172.16.5.253, GigabitEthernet0/2
          [115/20] via 172.16.4.253, GigabitEthernet0/1
C       172.16.4.252/30 is directly connected, GigabitEthernet0/1
L       172.16.4.254/32 is directly connected, GigabitEthernet0/1
C       172.16.5.252/30 is directly connected, GigabitEthernet0/2
L       172.16.5.254/32 is directly connected, GigabitEthernet0/2
C       172.16.6.252/30 is directly connected, GigabitEthernet0/0
L       172.16.6.253/32 is directly connected, GigabitEthernet0/0
C       172.16.7.0/32 is directly connected, Loopback0
i L1    172.16.8.0/32 [115/10] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.9.0/32 [115/10] via 172.16.5.253, GigabitEthernet0/2
B       192.168.0.0/18 [20/0] via 172.16.6.254, 00:10:23

```

2900#sh ip bgp

BGP table version is 3, local router ID is 172.16.7.0

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.6.254	0		0 200	i

2800#sh run

Building configuration...

Current configuration : 1400 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2800

!

boot-start-marker

boot-end-marker

!

no aaa new-model

memory-size iomem 10

!

ip cef

!

multilink bundle-name authenticated

!

voice-card 0

no dspfarm

!

vlan internal allocation policy ascending

!

interface GigabitEthernet0/0

ip address 172.16.6.254 255.255.255.252

duplex auto

speed auto

```

!
interface GigabitEthernet0/1
 ip address 192.168.6.253 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
 ip address 192.168.7.253 255.255.255.252
 no fair-queue
 clock rate 64000
!
interface Vlan1
 no ip address
!
router ospf 1
 log-adjacency-changes
 redistribute connected subnets
 redistribute static subnets
 network 192.168.7.252 0.0.0.3 area 0
!
router bgp 200
 no synchronization
 bgp log-neighbor-changes
 network 192.168.0.0 mask 255.255.192.0
 neighbor 172.16.6.253 remote-as 100
 no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
ip route 192.168.0.0 255.255.252.0 192.168.6.254
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0

```

```

line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks
O E2   192.168.8.252/30 [110/20] via 192.168.7.254, 00:21:46, Serial0/0/0
O E2   192.168.8.254/32 [110/20] via 192.168.7.254, 00:21:46, Serial0/0/0
192.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.6.252/30 is directly connected, GigabitEthernet0/0
B       172.16.0.0/18 [20/0] via 172.16.6.253, 00:10:43
192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
O E2   192.168.4.0/24 [110/20] via 192.168.7.254, 00:21:47, Serial0/0/0
O E2   192.168.4.1/32 [110/20] via 192.168.7.254, 00:21:47, Serial0/0/0
192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
O E2   192.168.5.1/32 [110/20] via 192.168.7.254, 00:21:47, Serial0/0/0
O E2   192.168.5.0/24 [110/20] via 192.168.7.254, 00:21:47, Serial0/0/0
192.168.6.0/30 is subnetted, 1 subnets
C       192.168.6.252 is directly connected, GigabitEthernet0/1
192.168.7.0/30 is subnetted, 1 subnets
C       192.168.7.252 is directly connected, Serial0/0/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
O E2   192.168.3.1/32 [110/20] via 192.168.7.254, 00:21:48, Serial0/0/0
O E2   192.168.3.0/24 [110/20] via 192.168.7.254, 00:21:48, Serial0/0/0
S      192.168.0.0/22 [1/0] via 192.168.6.254
S      192.168.0.0/18 is directly connected, Null0

```

2800#sh ip bgp

BGP table version is 3, local router ID is 192.168.7.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.6.253	0		0	100 i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

2600low#sh run

Building configuration...

Current configuration : 819 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600low

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface FastEthernet0/0

ip address 192.168.8.253 255.255.255.252

duplex auto

speed auto

!

interface Serial0/0

ip address 192.168.7.254 255.255.255.252

!

interface Serial0/1

no ip address

```

shutdown
!
router ospf 1
log-adjacency-changes
redistribute rip subnets
network 192.168.7.252 0.0.0.3 area 0
!
router rip
version 2
redistribute static
network 192.168.8.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.8.252/30 is directly connected, FastEthernet0/0
R      192.168.8.254/32 [120/1] via 192.168.8.254, 00:00:23, FastEthernet0/0
172.16.0.0/30 is subnetted, 1 subnets
O E2   172.16.6.252 [110/20] via 192.168.7.253, 00:16:12, Serial0/0

```

```

192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
R      192.168.4.0/24 [120/1] via 192.168.8.254, 00:00:23, FastEthernet0/0
R      192.168.4.1/32 [120/1] via 192.168.8.254, 00:00:24, FastEthernet0/0
192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
R      192.168.5.1/32 [120/1] via 192.168.8.254, 00:00:24, FastEthernet0/0
R      192.168.5.0/24 [120/1] via 192.168.8.254, 00:00:24, FastEthernet0/0
192.168.6.0/30 is subnetted, 1 subnets
O E2   192.168.6.252 [110/20] via 192.168.7.253, 00:23:22, Serial0/0
192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, Serial0/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
R      192.168.3.1/32 [120/1] via 192.168.8.254, 00:00:25, FastEthernet0/0
R      192.168.3.0/24 [120/1] via 192.168.8.254, 00:00:25, FastEthernet0/0
S*    0.0.0.0/0 [1/0] via 192.168.7.253
O E2 192.168.0.0/22 [110/20] via 192.168.7.253, 00:16:43, Serial0/0
O E2 192.168.0.0/18 [110/20] via 192.168.7.253, 00:16:43, Serial0/0

```

***A:NS085167007# admin display-config**

```

# TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.
# All rights reserved. All use subject to applicable license agreements.
# Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main
# Generated TUE NOV 22 05:21:13 2011 UTC
exit all
configure

#-----
echo "System Configuration"
#-----

```

```

system
  ccm 1
  exit
  snmp
    shutdown
  exit
  time
    sntp
      shutdown
    exit
  zone UTC

```



```
        exit
    thresholds
        rmon
        exit
    exit
exit
```

```
#-----
echo "System Security Configuration"
#-----
```

```
system
    security
        per-peer-queuing
    exit
exit
```

```
#-----
echo "Log Configuration"
#-----
```

```
log
exit
```

```
#-----
echo "System Security Cpm Hw Filters Configuration"
#-----
```

```
system
    security
    exit
exit
```

```
#-----
echo "QoS Policy Configuration"
#-----
```

```
qos
exit
```

```
#-----
echo "Card Configuration"
#-----
```

```
card 1
  card-type iom-9g
  mda 2
    mda-type c8-10/100eth-tx
  exit
exit
```

```
#-----
echo "Port Configuration"
#-----
```

```
port 1/2/1
  ethernet
  exit
  no shutdown
exit
port 1/2/2
  shutdown
  ethernet
  exit
exit
port 1/2/3
  shutdown
  ethernet
  exit
exit
port 1/2/4
  shutdown
  ethernet
  exit
exit
port 1/2/5
  shutdown
  ethernet
  exit
exit
port 1/2/6
  shutdown
  ethernet
  exit
exit
port 1/2/7
  shutdown
  ethernet
```

```

        exit
    exit
    port 1/2/8
        shutdown
        ethernet
    exit
exit

#-----
echo "System Sync-If-Timing Configuration"
#-----

    system
        sync-if-timing
            begin
            commit
        exit
    exit

#-----
echo "Management Router Configuration"
#-----

    router management
    exit

#-----
echo "Router (Network Side) Configuration"
#-----

    router
        interface "loop1"
            address 192.168.3.1/24
            loopback
        exit
        interface "loop2"
            address 192.168.4.1/24
            loopback
        exit
        interface "loop3"
            address 192.168.5.1/24
            loopback
        exit
        interface "system"

```

```

        exit
        interface "to2600low"
            address 192.168.8.254/30
            port 1/2/1
        exit

#-----
echo "Static Route Configuration"
#-----

        static-route 0.0.0.0/0 next-hop 192.168.8.253

#-----
echo "RIP Configuration"
#-----

        rip
            export "forrip"
            group "rip"
                neighbor "loop1"
                exit
                neighbor "loop2"
                exit
                neighbor "loop3"
                exit
                neighbor "to2600low"
                exit
            exit
        exit
    exit

#-----
echo "Service Configuration"
#-----

        service
            customer 1 create
                description "Default customer"
            exit
        exit

#-----
echo "Router (Service Side) Configuration"
#-----

```

```

router

#-----

echo "Policy Configuration"

#-----

    policy-options
    begin
    policy-statement "forrip"
        entry 1
            from
                protocol direct
            exit
            action accept
            exit
        exit
        default-action accept
        exit
    exit
    commit
exit
exit all

# Finished TUE NOV 22 05:21:20 2011 UTC

```

***A:NS085167007# show router route-table**

```

=====
Route Table (Router: Base)
=====

```

Dest Prefix	Type	Proto	Age	Pref
Next Hop[Interface Name]				Metric
0.0.0.0/0	Remote	Static	00h30m14s	5
192.168.8.253			1	
192.168.3.0/24	Local	Local	01h18m07s	0

loop1			0	
192.168.4.0/24	Local	Local	01h17m48s	0
loop2			0	
192.168.5.0/24	Local	Local	01h17m31s	0
loop3			0	
192.168.8.252/30	Local	Local	00h31m29s	0
to2600low			0	

 No. of Routes: 5
 =====

3750#sh run

```

Building configuration...
Current configuration : 1786 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3750
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
ip subnet-zero
ip routing
!
ip multicast-routing distributed
!
no file verify auto
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
vlan dot1q tag native
!
interface Loopback1
ip address 192.168.0.1 255.255.255.0

```

```

!
interface Loopback2
  ip address 192.168.1.1 255.255.255.0
!
interface Loopback3
  ip address 192.168.2.1 255.255.255.0
!
interface GigabitEthernet1/0/1
  no switchport
  ip address 192.168.6.254 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18

```

```

!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.6.253
ip http server
!
control-plane
!
line con 0
line vty 0 4
  no login
line vty 5 15
  no login
!
end

```

3750#sh ip route

Codes: 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, su - IS-IS summary, 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 192.168.6.253 to network 0.0.0.0

192.168.6.0/30 is subnetted, 1 subnets

C 192.168.6.252 is directly connected, GigabitEthernet1/0/1
C 192.168.0.0/24 is directly connected, Loopback1
C 192.168.1.0/24 is directly connected, Loopback2
C 192.168.2.0/24 is directly connected, Loopback3
S* 0.0.0.0/0 [1/0] via 192.168.6.253

PING RESULTS:

2600top#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600top#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600top#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600top#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600top#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

2600top#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

*A:NS085167007# ping 172.16.0.1

PING 172.16.0.1 56 data bytes

64 bytes from 172.16.0.1: icmp_seq=1 ttl=252 time=25.3ms.

64 bytes from 172.16.0.1: icmp_seq=2 ttl=252 time=25.0ms.

64 bytes from 172.16.0.1: icmp_seq=3 ttl=252 time=25.2ms.

64 bytes from 172.16.0.1: icmp_seq=4 ttl=252 time=25.2ms.

64 bytes from 172.16.0.1: icmp_seq=5 ttl=252 time=25.1ms.

---- 172.16.0.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.0ms, avg = 25.2ms, max = 25.3ms, stddev = 0.081ms

*A:NS085167007# ping 172.16.1.1

PING 172.16.1.1 56 data bytes

64 bytes from 172.16.1.1: icmp_seq=1 ttl=252 time=25.3ms.

64 bytes from 172.16.1.1: icmp_seq=2 ttl=252 time=25.1ms.

64 bytes from 172.16.1.1: icmp_seq=3 ttl=252 time=25.1ms.

64 bytes from 172.16.1.1: icmp_seq=4 ttl=252 time=25.2ms.

64 bytes from 172.16.1.1: icmp_seq=5 ttl=252 time=25.1ms.

---- 172.16.1.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.1ms, avg = 25.2ms, max = 25.3ms, stddev = 0.064ms

*A:NS085167007# ping 172.16.2.1

PING 172.16.2.1 56 data bytes

64 bytes from 172.16.2.1: icmp_seq=1 ttl=252 time=25.2ms.

64 bytes from 172.16.2.1: icmp_seq=2 ttl=252 time=25.2ms.

64 bytes from 172.16.2.1: icmp_seq=3 ttl=252 time=25.2ms.

64 bytes from 172.16.2.1: icmp_seq=4 ttl=252 time=25.2ms.

64 bytes from 172.16.2.1: icmp_seq=5 ttl=252 time=25.2ms.

---- 172.16.2.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.2ms, avg = 25.2ms, max = 25.2ms, stddev = 0.016ms

```
*A:NS085167007# ping 172.16.3.1
PING 172.16.3.1 56 data bytes
64 bytes from 172.16.3.1: icmp_seq=1 ttl=252 time=25.4ms.
64 bytes from 172.16.3.1: icmp_seq=2 ttl=252 time=25.2ms.
64 bytes from 172.16.3.1: icmp_seq=3 ttl=252 time=25.2ms.
64 bytes from 172.16.3.1: icmp_seq=4 ttl=252 time=25.3ms.
64 bytes from 172.16.3.1: icmp_seq=5 ttl=252 time=25.4ms.
---- 172.16.3.1 PING Statistics ----
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min = 25.2ms, avg = 25.3ms, max = 25.4ms, stddev = 0.080ms
```

```
3750#ping 172.16.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms
```

```
3750#ping 172.16.2.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms
```

```
3750#ping 172.16.3.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms
```

3.3.3 VLAN AND SWITHCING

SWITCH 1: 3750

3750#sh run

```
Building configuration...
Current configuration : 1901 bytes
!
version 12.2
no service pad
no service password-encryption
!
hostname 3750
```

```

!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$5NvD$.LGE3IlzGGPruQjhzuSA.1
enable password mint709
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!

```

```
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
```

```

!
control-plane
!
line con 0
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports

1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24, Gi1/0/25 Gi1/0/26, Gi1/0/27, Gi1/0/28
31 red	active	Gi1/0/1
32 blue	active	Gi1/0/2
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

VLAN Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2

1 enet	100001	1500	-	-	-	-	0	0	
31 enet	100031	1500	-	-	-	-	0	0	
32 enet	100032	1500	-	-	-	-	0	0	
1002 fddi	101002	1500	-	-	-	-	0	0	
1003 tr	101003	1500	-	-	-	-	0	0	
1004 fdnet	101004	1500	-	-	-	ieee	0	0	
1005 trnet	101005	1500	-	-	-	ibm	0	0	

Remote SPAN VLANs

Primary Secondary Type

Ports

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

!

version 12.0

no service pad

no service password-encryption

!

hostname 3500

!

enable secret 5 \$1\$T1Z5\$eq5NjgeKIYdni348aUnoh/

!

ip subnet-zero

!

interface FastEthernet0/1

switchport access vlan 31

!

interface FastEthernet0/2

switchport access vlan 32

!

interface FastEthernet0/3

description connection to 3750

switchport trunk encapsulation dot1q

switchport mode trunk

!

interface FastEthernet0/4

description second connection to 3750

switchport trunk encapsulation dot1q

switchport mode trunk

!

interface FastEthernet0/5

!

interface FastEthernet0/6

!

interface FastEthernet0/7

!

interface FastEthernet0/8

!

```

interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO

```



```

!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports

1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2
31 red	active	Fa0/1
32 blue	active	Fa0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2

1 enet	100001	1500	-	-	-	-	-	1002	1003
31 enet	100031	1500	-	-	-	-	-	0	0
32 enet	100032	1500	-	-	-	-	-	0	0
1002 fddi	101002	1500	-	-	-	-	-	1	1003
1003 tr	101003	1500	1005	0	-	-	srb	1	1002
1004 fdnet	101004	1500	-	-	1	ibm	-	0	0
1005 trnet	101005	1500	-	-	1	ibm	-	0	0

ROUTER 2800

2800#sh run

Building configuration...

```

Current configuration : 1155 bytes
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2800
!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
  no dspfarm
!
interface GigabitEthernet0/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
!
interface GigabitEthernet0/1.31
  encapsulation dot1Q 31
  ip address 192.168.50.51 255.255.255.240
!
interface GigabitEthernet0/1.32
  encapsulation dot1Q 32
  ip address 192.168.50.67 255.255.255.240
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!

```

```

interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
  no ip address
  shutdown
  no fair-queue
!
interface Vlan1
  no ip address
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

3.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

```
Building configuration...
Current configuration : 1846 bytes
!
version 12.2
no service pa
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
```

```
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
```

```

interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!
interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk

```

```
!  
interface FastEthernet0/4  
  description second connection to 3750  
  switchport trunk encapsulation dot1q  
  switchport mode trunk  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!  
interface FastEthernet0/11  
!  
interface FastEthernet0/12  
!  
interface FastEthernet0/13  
!  
interface FastEthernet0/14  
!  
interface FastEthernet0/15  
!  
interface FastEthernet0/16  
!  
interface FastEthernet0/17  
!  
interface FastEthernet0/18  
!  
interface FastEthernet0/19  
!  
interface FastEthernet0/20  
!  
interface FastEthernet0/21  
!  
interface FastEthernet0/22  
!  
interface FastEthernet0/23  
!
```

```

interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 000000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID	Priority	32768		
	Address	0007.eb94.7200		
	Cost	19		
	Port	3 (GigabitEthernet1/0/3)		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec

Bridge ID	Priority	32769	(priority 32768 sys-id-ext 1)
	Address	0018.186e.7b00	
	Hello Time	2 sec	Max Age 20 sec Forward Delay 15 sec
	Aging Time	300 sec	

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----------	------	-----	------	-------	-----	------


```

-----
Gi1/0/3          Root FWD 19          128.3    P2p
Gi1/0/4          Altn BLK 19          128.4    P2p

```

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address      0018.186e.7b00
           This bridge is the root
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    8223   (priority 8192 sys-id-ext 31)
           Address      0018.186e.7b00
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time    300 sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/3            Desg FWD 19          128.3    P2p
Gi1/0/4            Desg FWD 19          128.4    P2p

```

VLAN0032

Spanning tree enabled protocol ieee

```

Root ID    Priority    8192
           Address      0007.eb94.7202
           Cost          19
           Port          3 (GigabitEthernet1/0/3)
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    32800  (priority 32768 sys-id-ext 32)
           Address      0018.186e.7b00
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time    15   sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/2            Desg FWD 4          128.2    P2p
Gi1/0/3            Root FWD 19          128.3    P2p
Gi1/0/4            Altn BLK 19          128.4    P2p

```

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```

C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost      19
           Port      4 (GigabitEthernet1/0/4)
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time 300 sec

```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/4	Root	FWD	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    8223 (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time 300 sec

```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID
-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200

Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

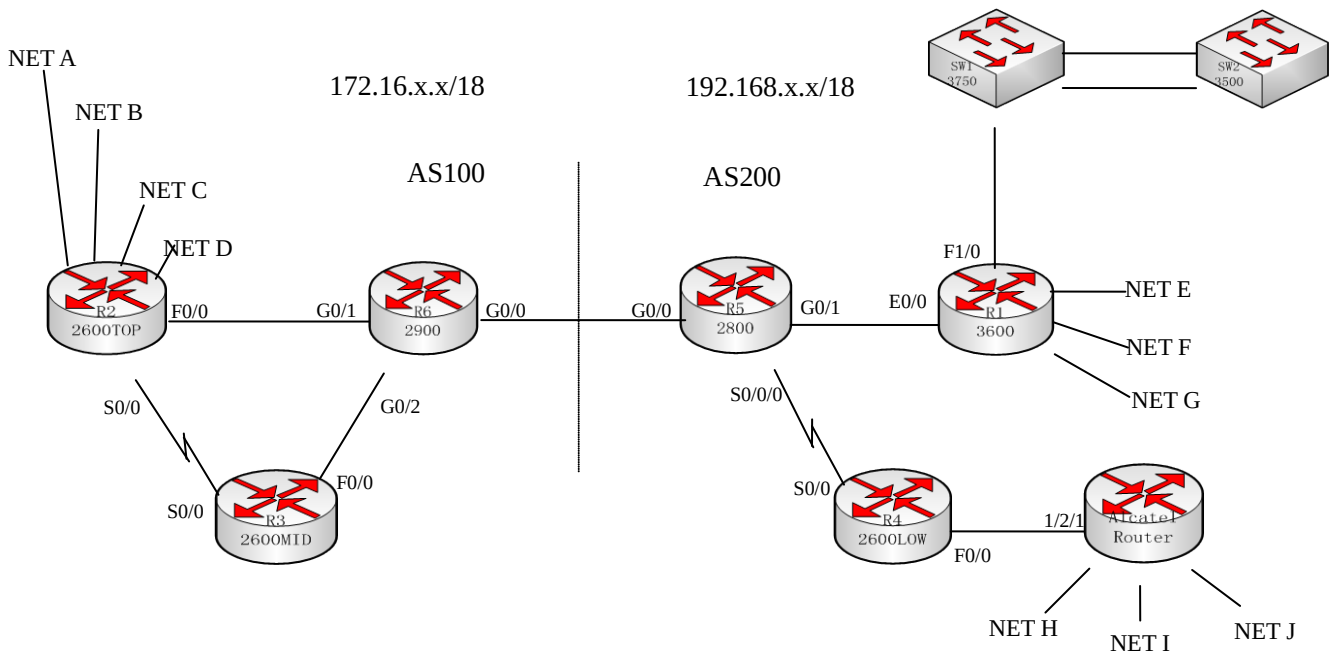
```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Chapter4 Routing and switching lab exam 4

4.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
 2. Submit hand drawn diagram.
 3. Do not save any config on Desktop or on the routers
 4. When done just let instructor know to copy your configs.
 5. Clean your rack after use by securing all cables.
-
1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2600(R2), Cisco 3600(R1) and Alcatel router according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')
 2. Configure RIPv2 in Cisco 2800(R5) and Cisco 3600(R1) to let them reach each other. (10')
 3. Configure OSPF in Cisco 2800(R5) and Cisco 2600(R4) within area 0. (10')
 4. Configure EBGP in Cisco 2900(R6) and Cisco 2800(R5), don't advertise autonomous system network topology behind R5 and R6. Instead you should be advertising /18 network. (20')
 5. Configure ISIS in Cisco 2900(R6), Cisco 2600(R2) and Cisco 2600(R3). (10')
 6. Configure Static routes in Cisco 2600(R4) and Alcatel router. (10')
 7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in

Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')

8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

4.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2600(R2) to the nets of Cisco 3600(R1) and Alcatel router at the the other side of the whole network, and from Cisco 3600(R1) and Alcatel router to the nets of Cisco 2600(R2). For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2900(R6).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

4.3 lab solution

4.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
R2 Cisco 2600	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	F0/0:172.16.4.253/30	S0/0:172.16.4.249/30
R3 Cisco 2600	S0/0:172.16.4.250/30	F0/0:172.16.5.253/30
R6 Cisco 2900	G0/0:172.16.6.253/30	G0/1:172.16.4.254/30
	G0/2:172.16.5.254/30	
R5 Cisco 2800	G0/0:172.16.6.254/30	G0/1:192.168.6.253/30
	S0/0/0:192.168.7.253/30	
R4 Cisco 2600	S0/0:192.168.7.254/30	F0/0:192.168.8.253/30Net K:192.168.5.1/24
Alcatel router	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	Port 1/2/1:192.168.8.254/30
R1 Cisco 3600	E0/0:192.168.8.254/30	Net E:192.168.0.1/24
	Net F:192.168.1.1/24	Net G:192.168.2.1/24
	Net H:192.168.3.1/24	

4.3.2 ROUTING TASK

2600top#sh run

```
Building configuration...
Current configuration : 1232 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
 ip address 172.16.8.0 255.255.255.255
!
interface Loopback1
 ip address 172.16.0.1 255.255.255.0
 ip router isis
!
interface Loopback2
 ip address 172.16.1.1 255.255.255.0
 ip router isis
!
interface Loopback3
 ip address 172.16.2.1 255.255.255.0
 ip router isis
!
interface Loopback4
 ip address 172.16.3.1 255.255.255.0
 ip router isis
!
interface FastEthernet0/0
 ip address 172.16.4.253 255.255.255.252
```

```

ip router isis
duplex auto
speed auto
!
interface Serial0/0
ip address 172.16.4.249 255.255.255.252
ip router isis
clock rate 64000
no fair-queue
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/1
no ip address
shutdown
!
router isis
net 49.0001.1720.1600.8000.00
passive-interface Loopback0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.4.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
i - IS-IS, su - IS-IS summary, 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 172.16.4.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks
C       172.16.4.248/30 is directly connected, Serial0/0
C       172.16.4.252/30 is directly connected, FastEthernet0/0
i L1    172.16.5.252/30 [115/20] via 172.16.4.254, FastEthernet0/0
        [115/20] via 172.16.4.250, Serial0/0
C       172.16.8.0/32 is directly connected, Loopback0
i L1    172.16.9.0/32 [115/10] via 172.16.4.250, Serial0/0
i L1    172.16.7.0/32 [115/10] via 172.16.4.254, FastEthernet0/0
C       172.16.0.0/24 is directly connected, Loopback1
C       172.16.1.0/24 is directly connected, Loopback2
C       172.16.2.0/24 is directly connected, Loopback3
C       172.16.3.0/24 is directly connected, Loopback4
S*     0.0.0.0/0 [1/0] via 172.16.4.254

```

2600mid#sh run

```

Building configuration...
Current configuration : 779 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef

```

```

!
interface Loopback0
 ip address 172.16.9.0 255.255.255.255
!
interface FastEthernet0/0
 ip address 172.16.5.253 255.255.255.252
 ip router isis
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.4.250 255.255.255.252
 ip router isis
!
interface Serial0/1
 no ip address
 shutdown
!
router isis
 net 49.0001.1720.1600.9000.00
 passive-interface Loopback0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks

```
C      172.16.4.248/30 is directly connected, Serial0/0
i L1   172.16.4.252/30 [115/20] via 172.16.5.254, FastEthernet0/0
      [115/20] via 172.16.4.249, Serial0/0
C      172.16.5.252/30 is directly connected, FastEthernet0/0
i L1   172.16.8.0/32 [115/10] via 172.16.4.249, Serial0/0
C      172.16.9.0/32 is directly connected, Loopback0
i L1   172.16.7.0/32 [115/10] via 172.16.5.254, FastEthernet0/0
i L1   172.16.0.0/24 [115/20] via 172.16.4.249, Serial0/0
i L1   172.16.1.0/24 [115/20] via 172.16.4.249, Serial0/0
i L1   172.16.2.0/24 [115/20] via 172.16.4.249, Serial0/0
i L1   172.16.3.0/24 [115/20] via 172.16.4.249, Serial0/0
```

2900#sh run

Building configuration...

Current configuration : 1310 bytes

!

! Last configuration change at 04:11:51 UTC Tue Nov 22 2011

!

version 15.0

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2900

!

boot-start-marker

boot-end-marker

!

no aaa new-model

!

no ipv6 cef

ip source-route

ip cef

!

multilink bundle-name authenticated

```

!
license udi pid CISCO2921/K9 sn FGL150811PR
license boot module c2900 technology-package datak9
!
redundancy
!
interface Loopback0
  ip address 172.16.7.0 255.255.255.255
!
interface GigabitEthernet0/0
  ip address 172.16.6.253 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 172.16.4.254 255.255.255.252
  ip router isis
  duplex auto
  speed auto
!
interface GigabitEthernet0/2
  ip address 172.16.5.254 255.255.255.252
  ip router isis
  duplex auto
  speed auto
!
router isis
  net 49.0001.1720.1600.7000.00
  passive-interface Loopback0
!
router bgp 100
  no synchronization
  bgp log-neighbor-changes
  network 172.16.0.0 mask 255.255.192.0
  neighbor 172.16.6.254 remote-as 200
  no auto-summary
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 172.16.0.0 255.255.192.0 Null0
!

```

```

control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000

end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is not set

```

      172.16.0.0/16 is variably subnetted, 15 subnets, 4 masks
S       172.16.0.0/18 is directly connected, Null0
i L1    172.16.0.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.1.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.2.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.3.0/24 [115/20] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.4.248/30 [115/20] via 172.16.5.253, GigabitEthernet0/2
          [115/20] via 172.16.4.253, GigabitEthernet0/1
C       172.16.4.252/30 is directly connected, GigabitEthernet0/1
L       172.16.4.254/32 is directly connected, GigabitEthernet0/1
C       172.16.5.252/30 is directly connected, GigabitEthernet0/2
L       172.16.5.254/32 is directly connected, GigabitEthernet0/2
C       172.16.6.252/30 is directly connected, GigabitEthernet0/0
L       172.16.6.253/32 is directly connected, GigabitEthernet0/0
C       172.16.7.0/32 is directly connected, Loopback0
i L1    172.16.8.0/32 [115/10] via 172.16.4.253, GigabitEthernet0/1
i L1    172.16.9.0/32 [115/10] via 172.16.5.253, GigabitEthernet0/2
B       192.168.0.0/18 [20/0] via 172.16.6.254, 01:18:16

```

2900#sh ip bgp

BGP table version is 3, local router ID is 172.16.7.0

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.6.254	0		0 200	i

2800#sh run

Building configuration...

Current configuration : 1361 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2800

!

boot-start-marker

boot-end-marker

!

no aaa new-model

memory-size iomem 10

!

ip cef

!

multilink bundle-name authenticated

!

voice-card 0

no dspfarm

!

vlan internal allocation policy ascending

!

interface GigabitEthernet0/0

ip address 172.16.6.254 255.255.255.252

duplex auto

```

    speed auto
!
interface GigabitEthernet0/1
    ip address 192.168.6.253 255.255.255.252
    duplex auto
    speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
    ip address 192.168.7.253 255.255.255.252
    no fair-queue
    clock rate 64000
!
interface Vlan1
    no ip address
!
router ospf 1
    log-adjacency-changes
    redistribute rip subnets
    network 192.168.7.252 0.0.0.3 area 0
!
router rip
    version 2
    network 192.168.6.0
!
router bgp 200
    no synchronization
    bgp log-neighbor-changes
    network 192.168.0.0 mask 255.255.192.0
    neighbor 172.16.6.253 remote-as 100
    no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
!
ip http server
no ip http secure-server
!

```

```

control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!

end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

192.168.8.0/30 is subnetted, 1 subnets
O E2   192.168.8.252 [110/20] via 192.168.7.254, 00:09:20, Serial0/0/0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.6.252/30 is directly connected, GigabitEthernet0/0
B       172.16.0.0/18 [20/0] via 172.16.6.253, 01:18:40
192.168.6.0/30 is subnetted, 1 subnets
C       192.168.6.252 is directly connected, GigabitEthernet0/1
192.168.7.0/30 is subnetted, 1 subnets
C       192.168.7.252 is directly connected, Serial0/0/0
R       192.168.0.0/24 [120/1] via 192.168.6.254, 00:00:10, GigabitEthernet0/1
R       192.168.1.0/24 [120/1] via 192.168.6.254, 00:00:10, GigabitEthernet0/1
R       192.168.2.0/24 [120/1] via 192.168.6.254, 00:00:10, GigabitEthernet0/1
R       192.168.3.0/24 [120/1] via 192.168.6.254, 00:00:10, GigabitEthernet0/1
O E2 192.168.4.0/22 [110/20] via 192.168.7.254, 00:09:23, Serial0/0/0
S     192.168.0.0/18 is directly connected, Null0

```

2800#sh ip bgp

BGP table version is 3, local router ID is 192.168.7.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.6.253	0		0 100	i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

2600low#sh run

```
Building configuration...
Current configuration : 837 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600low
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 192.168.8.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 192.168.7.254 255.255.255.252
!
interface Serial0/1
 no ip address
 shutdown
!
```

```

router ospf 1
  log-adjacency-changes
  redistribute connected subnets
  redistribute static subnets
  network 192.168.7.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
ip route 192.168.4.0 255.255.252.0 192.168.8.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!

end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

      192.168.8.0/30 is subnetted, 1 subnets
C        192.168.8.252 is directly connected, FastEthernet0/0
      192.168.6.0/30 is subnetted, 1 subnets
O E2     192.168.6.252 [110/20] via 192.168.7.253, 00:11:08, Serial0/0
      192.168.7.0/30 is subnetted, 1 subnets
C        192.168.7.252 is directly connected, Serial0/0
O E2 192.168.0.0/24 [110/20] via 192.168.7.253, 00:06:57, Serial0/0
O E2 192.168.1.0/24 [110/20] via 192.168.7.253, 00:06:57, Serial0/0
O E2 192.168.2.0/24 [110/20] via 192.168.7.253, 00:06:59, Serial0/0

```

O E2 192.168.3.0/24 [110/20] via 192.168.7.253, 00:06:59, Serial0/0

S* 0.0.0.0/0 [1/0] via 192.168.7.253

S 192.168.4.0/22 [1/0] via 192.168.8.254

***A:NS085167007# admin display-config**

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

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Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main

Generated TUE NOV 22 06:29:29 2011 UTC

exit all

configure

#-----

echo "System Configuration"

#-----

system

ccm 1

exit

snmp

shutdown

exit

time

sntp

shutdown

exit

zone UTC

exit

thresholds

rmon

exit

exit

exit

#-----

echo "System Security Configuration"

#-----

system

```

        security
            per-peer-queuing
        exit
    exit

#-----
echo "Log Configuration"
#-----

    log
    exit

#-----
echo "System Security Cpm Hw Filters Configuration"
#-----

    system
        security
        exit
    exit

#-----
echo "QoS Policy Configuration"
#-----

    qos
    exit

#-----
echo "Card Configuration"
#-----

    card 1
        card-type iom-9g
        mda 2
            mda-type c8-10/100eth-tx
        exit
    exit

#-----
echo "Port Configuration"
#-----

    port 1/2/1

```

```

        ethernet
        exit
        no shutdown
    exit
port 1/2/2
    shutdown
    ethernet
    exit
exit
port 1/2/3
    shutdown
    ethernet
    exit
exit
port 1/2/4
    shutdown
    ethernet
    exit
exit
port 1/2/5
    shutdown
    ethernet
    exit
exit
port 1/2/6
    shutdown
    ethernet
    exit
exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit
#-----
echo "System Sync-If-Timing Configuration"
#-----

system

```



```
        sync-if-timing
        begin
        commit
    exit
exit
```

```
#-----
echo "Management Router Configuration"
#-----
```

```
router management
exit
```

```
#-----
echo "Router (Network Side) Configuration"
#-----
```

```
router
    interface "loop1"
        address 192.168.4.1/30
        loopback
    exit
    interface "loop2"
        address 192.168.5.1/24
        loopback
    exit
    interface "loop3"
        address 192.168.6.1/24
        loopback
    exit
    interface "system"
    exit
    interface "to2600low"
        address 192.168.8.254/30
        port 1/2/1
    exit
```

```
#-----
echo "Static Route Configuration"
#-----
```

```
static-route 0.0.0.0/0 next-hop 192.168.8.253
exit
```

```
#-----
echo "Service Configuration"
#-----

service
    customer 1 create
        description "Default customer"
    exit
exit
```

```
#-----
echo "Router (Service Side) Configuration"
#-----
```

```
router
```

```
#-----
echo "Policy Configuration"
#-----
```

```
    policy-options
        begin
        policy-statement "forrip"
            entry 1
                from
                    protocol direct
                exit
                action accept
                exit
            exit
            default-action accept
            exit
        exit
    commit
exit
exit all
```

```
# Finished TUE NOV 22 06:29:39 2011 UTC
```

```
*A:NS085167007# show router route-table
```

```
=====
```

Route Table (Router: Base)

Dest Prefix	Type	Proto	Age	Pref
Next Hop[Interface Name]				Metric
0.0.0.0/0	Remote	Static	01h38m30s	5
192.168.8.253			1	
192.168.4.0/30	Local	Local	00h41m55s	0
loop1			0	
192.168.5.0/24	Local	Local	00h42m13s	0
loop2			0	
192.168.6.0/24	Local	Local	00h42m34s	0
loop3			0	
192.168.8.252/30	Local	Local	01h39m45s	0
to2600low			0	
No. of Routes: 5				

3600#sh run

```
Building configuration...
Current configuration : 990 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
```

```

ip cef
!
interface Loopback1
  ip address 192.168.0.1 255.255.255.0
!
interface Loopback2
  ip address 192.168.1.1 255.255.255.0
!
interface Loopback3
  ip address 192.168.2.1 255.255.255.0
!
interface Loopback4
  ip address 192.168.3.1 255.255.255.0
!
interface Ethernet0/0
  ip address 192.168.6.254 255.255.255.252
  half-duplex
!
interface FastEthernet1/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface FastEthernet2/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
router rip
  version 2
  network 192.168.0.0
  network 192.168.1.0
  network 192.168.2.0
  network 192.168.3.0
  network 192.168.6.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.6.253
!
line con 0
line aux 0

```

```
line vty 0 4
!  
end
```

3600#sh ip route

Codes: 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
i - IS-IS, su - IS-IS summary, 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 192.168.6.253 to network 0.0.0.0

```
192.168.6.0/30 is subnetted, 1 subnets  
C      192.168.6.252 is directly connected, Ethernet0/0  
C      192.168.0.0/24 is directly connected, Loopback1  
C      192.168.1.0/24 is directly connected, Loopback2  
C      192.168.2.0/24 is directly connected, Loopback3  
C      192.168.3.0/24 is directly connected, Loopback4  
S*    0.0.0.0/0 [1/0] via 192.168.6.253
```

PING RESULTS:

```
2600top#ping 192.168.0.1  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms
```

```
2600top#ping 192.168.1.1  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms
```

```
2600top#ping 192.168.2.1  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:
```

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600top#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

2600top#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

2600top#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2600top#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3600#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

3600#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

3600#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms

*A:NS085167007# ping 172.16.0.1

PING 172.16.0.1 56 data bytes

64 bytes from 172.16.0.1: icmp_seq=1 ttl=252 time=25.2ms.

64 bytes from 172.16.0.1: icmp_seq=2 ttl=252 time=25.2ms.

64 bytes from 172.16.0.1: icmp_seq=3 ttl=252 time=25.0ms.

64 bytes from 172.16.0.1: icmp_seq=4 ttl=252 time=25.2ms.

64 bytes from 172.16.0.1: icmp_seq=5 ttl=252 time=25.2ms.

---- 172.16.0.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.0ms, avg = 25.2ms, max = 25.2ms, stddev = 0.083ms

*A:NS085167007# ping 172.16.1.1

PING 172.16.1.1 56 data bytes

64 bytes from 172.16.1.1: icmp_seq=1 ttl=252 time=25.1ms.

64 bytes from 172.16.1.1: icmp_seq=2 ttl=252 time=25.1ms.

64 bytes from 172.16.1.1: icmp_seq=3 ttl=252 time=25.2ms.

64 bytes from 172.16.1.1: icmp_seq=4 ttl=252 time=25.0ms.

64 bytes from 172.16.1.1: icmp_seq=5 ttl=252 time=25.2ms.

---- 172.16.1.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.0ms, avg = 25.1ms, max = 25.2ms, stddev = 0.056ms

*A:NS085167007# ping 172.16.2.1

PING 172.16.2.1 56 data bytes

64 bytes from 172.16.2.1: icmp_seq=1 ttl=252 time=25.2ms.

64 bytes from 172.16.2.1: icmp_seq=2 ttl=252 time=25.2ms.

64 bytes from 172.16.2.1: icmp_seq=3 ttl=252 time=25.3ms.

64 bytes from 172.16.2.1: icmp_seq=4 ttl=252 time=25.1ms.

64 bytes from 172.16.2.1: icmp_seq=5 ttl=252 time=25.2ms.

---- 172.16.2.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.1ms, avg = 25.2ms, max = 25.3ms, stddev = 0.077ms

*A:NS085167007# ping 172.16.3.1

PING 172.16.3.1 56 data bytes

64 bytes from 172.16.3.1: icmp_seq=1 ttl=252 time=25.4ms.

```
64 bytes from 172.16.3.1: icmp_seq=2 ttl=252 time=25.1ms.
64 bytes from 172.16.3.1: icmp_seq=3 ttl=252 time=25.3ms.
64 bytes from 172.16.3.1: icmp_seq=4 ttl=252 time=25.2ms.
64 bytes from 172.16.3.1: icmp_seq=5 ttl=252 time=25.2ms.
---- 172.16.3.1 PING Statistics ----
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min = 25.1ms, avg = 25.3ms, max = 25.4ms, stddev = 0.116ms
```

4.3.3 VLAN AND SWITCHING

SWITCH 1: 3750

3750#sh run

```
Building configuration...
Current configuration : 1901 bytes
!
version 12.2
no service pad
no service password-encryption
!
hostname 3750
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$5NvD$.LGE3IlzGGPruQjhzuSA.1
enable password mint709
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
```



```

description connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/4
description second connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/5
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21

```

```

!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports
1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22

			Gi1/0/23, Gi1/0/24, Gi1/0/25
			Gi1/0/26, Gi1/0/27, Gi1/0/28
31	red	active	Gi1/0/1
32	blue	active	Gi1/0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	ieee	-	0	0	
1005	trnet	101005	1500	-	-	ibm	-	0	0	

Remote SPAN VLANs

Primary	Secondary	Type	Ports
---------	-----------	------	-------

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!

```

```

interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20

```

```

!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2

31	red	active	Fa0/1
32	blue	active	Fa0/2
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	1002	1003
31	enet	100031	1500	-	-	-	-	-	0	0
32	enet	100032	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	1	1003
1003	tr	101003	1500	1005	0	-	-	srb	1	1002
1004	fdnet	101004	1500	-	-	1	ibm	-	0	0
1005	trnet	101005	1500	-	-	1	ibm	-	0	0

3600#sh run

```

Building configuration...
Current configuration : 990 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Ethernet0/0
  no ip address
  shutdown
  half-duplex
  speed auto
!
interface FastEthernet1/0

```

```

no ip address
no shutdown
duplex auto
speed auto
!
interface FastEthernet1/0.31
 encapsulation dot1Q 31
 ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet1/0.32
 encapsulation dot1Q 32
 ip address 192.168.50.67 255.255.255.240
!

interface FastEthernet2/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
ip http server
ip classless
!
line con 0
line aux 0
line vty 0 4
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP address of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

4.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

```
Building configuration...
Current configuration : 1846 bytes
!
version 12.2
no service pa
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
```



```
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
```

```

interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!
interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk

```

```

!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!

```

```

interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 000000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID	Priority	32768		
	Address	0007.eb94.7200		
	Cost	19		
	Port	3 (GigabitEthernet1/0/3)		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec

Bridge ID	Priority	32769	(priority 32768 sys-id-ext 1)	
	Address	0018.186e.7b00		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec
	Aging Time	300 sec		

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----------	------	-----	------	-------	-----	------

```

-----
Gi1/0/3          Root FWD 19          128.3    P2p
Gi1/0/4          Altn BLK 19          128.4    P2p

```

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    8223  (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time  300 sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/3            Desg FWD 19          128.3    P2p
Gi1/0/4            Desg FWD 19          128.4    P2p

```

VLAN0032

Spanning tree enabled protocol ieee

```

Root ID    Priority    8192
           Address    0007.eb94.7202
           Cost        19
           Port        3 (GigabitEthernet1/0/3)
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    32800  (priority 32768 sys-id-ext 32)
           Address    0018.186e.7b00
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time  15  sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/2            Desg FWD 4          128.2    P2p
Gi1/0/3            Root FWD 19          128.3    P2p
Gi1/0/4            Altn BLK 19          128.4    P2p

```

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port						Designated	
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port						Designated	
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port						Designated	
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```

C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

When the second link between the two switches breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost        19
           Port        4 (GigabitEthernet1/0/4)
           Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time   300 sec

```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Root	FWD	19	128.4		P2p

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    8223 (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time   300 sec

```


Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID
-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200

Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

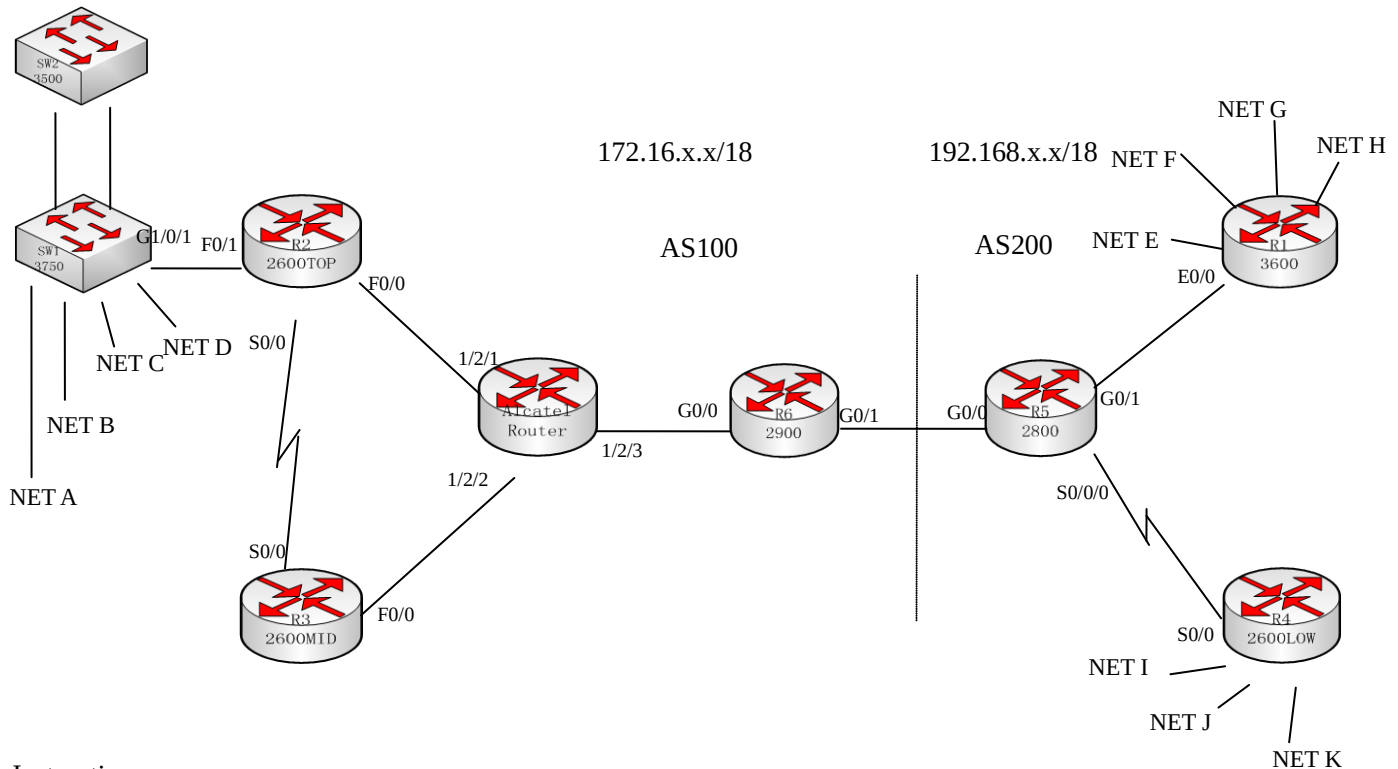
```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Chapter5 Routing and switching lab exam 5

5.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2600(R4), Cisco 3750 and Cisco 3600(R1) according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')
2. Configure RIPv2 in Cisco 2600(R2), Cisco 2600(R3), Alcatel router and Cisco 2900(R6) to let them reach each other. (10')
3. Configure OSPF in Cisco 2800(R5) and Cisco 3600(R1) within area 0. (10')
4. Configure EBGP in Cisco 2900(R6) and Cisco 2800(R5), don't advertise autonomous system network topology behind R5 and R6. Instead you should be advertising /18 network. (20')
5. Configure ISIS in Cisco 2800(R5) and Cisco 2600(R4). (10')
6. Configure Static routes in Cisco 2600(R2) and Cisco 3750. (10')
7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in

Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')

8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

5.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2600(R4) and Cisco 3600(R1) to the nets of Cisco 3750 at the the other side of the whole network, and from Cisco 3750 to the nets of Cisco2600(R4) and Cisco 3600(R1) . For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2900(R6).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

5.3 lab solution

5.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
Cisco 3750	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	G1/0/1:172.16.4.253/30	
R2 Cisco 2600	F0/0:172.16.5.253/30	F0/1:172.16.4.254/30
	S0/0:172.16.5.249/30	
R3 Cisco 2600	F0/0:172.16.6.253/30	S0/0:172.16.5.250/30
Alcatel router	Port 1/2/1:172.16.5.254/30	Port 1/2/2:172.16.6.254/30
	Port 1/2/3:172.16.7.253/30	
R6 Cisco 2900	G0/0:172.16.7.254/30	G0/1:172.16.8.253/30
R5 Cisco 2800	G0/0:172.16.8.254/30	G0/1:192.168.7.253/30
	S0/0/0:192.168.8.253/30	
R4 Cisco 2600	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	S0/0:192.168.8.254/30
R1 Cisco 3600	Net E:192.168.0.1/24	Net F:192.168.1.1/24
	Net G:192.168.2.1/24	Net H:192.168.3.1/24

	E0/0:192.168.7.254	
--	--------------------	--

5.3.2 ROUTING TASK

3750#sh run

Building configuration...

Current configuration : 1751 bytes

!

version 12.2

no service pad

service timestamps debug uptime

service timestamps log uptime

no service password-encryption

!

hostname 3750

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

ip subnet-zero

ip routing

!

no file verify auto

spanning-tree mode pvst

spanning-tree extend system-id

!

vlan internal allocation policy ascending

!

interface Loopback1

ip address 172.16.0.1 255.255.255.0

!

interface Loopback2

ip address 172.16.1.1 255.255.255.0

!

interface Loopback3

ip address 172.16.2.1 255.255.255.0

!

interface Loopback4

ip address 172.16.3.1 255.255.255.0

!

interface GigabitEthernet1/0/1

no switchport

```
ip address 172.16.4.253 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
```

```

interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.4.254
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

3750#sh ip route

Codes: 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, su - IS-IS summary, 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 172.16.4.254 to network 0.0.0.0

172.16.0.0/16 is variably subnetted, 5 subnets, 2 masks

```

C       172.16.4.252/30 is directly connected, GigabitEthernet1/0/1
C       172.16.0.0/24 is directly connected, Loopback1
C       172.16.1.0/24 is directly connected, Loopback2

```



```
C      172.16.2.0/24 is directly connected, Loopback3
C      172.16.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 172.16.4.254
```

2600top#sh run

```
Building configuration...
Current configuration : 909 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.5.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.249 255.255.255.252
 clock rate 64000
 no fair-queue
!
interface FastEthernet0/1
 ip address 172.16.4.254 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/1
```

```

no ip address
shutdown
!
router rip
 redistribute connected
 redistribute static
 network 172.16.0.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.5.254
ip route 172.16.0.0 255.255.252.0 172.16.4.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 172.16.5.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks
C       172.16.5.248/30 is directly connected, Serial0/0
R       172.16.6.254/32 [120/1] via 172.16.5.254, 00:00:27, FastEthernet0/0
C       172.16.4.252/30 is directly connected, FastEthernet0/1
C       172.16.5.252/30 is directly connected, FastEthernet0/0
R       172.16.7.253/32 [120/1] via 172.16.5.254, 00:00:27, FastEthernet0/0
R       172.16.6.252/30 [120/1] via 172.16.5.254, 00:00:27, FastEthernet0/0
        [120/1] via 172.16.5.250, 00:00:07, Serial0/0

```

```

R      172.16.7.252/30 [120/1] via 172.16.5.254, 00:00:28, FastEthernet0/0
R      172.16.5.254/32 [120/1] via 172.16.5.254, 00:00:28, FastEthernet0/0
R      172.16.8.252/30 [120/2] via 172.16.5.254, 00:00:28, FastEthernet0/0
S      172.16.0.0/22 [1/0] via 172.16.4.253
S*    0.0.0.0/0 [1/0] via 172.16.5.254

```

2600mid#sh run

```

Building configuration...
Current configuration : 657 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.6.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.250 255.255.255.252
 no fair-queue
!
interface Serial0/1
 no ip address
 shutdown
!
router rip

```

```

network 172.16.0.0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 172.16.6.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks
C       172.16.5.248/30 is directly connected, Serial0/0
R       172.16.6.254/32 [120/1] via 172.16.6.254, 00:00:04, FastEthernet0/0
R       172.16.4.252/30 [120/1] via 172.16.5.249, 00:00:07, Serial0/0
R       172.16.5.252/30 [120/1] via 172.16.6.254, 00:00:04, FastEthernet0/0
        [120/1] via 172.16.5.249, 00:00:07, Serial0/0
R       172.16.7.253/32 [120/1] via 172.16.6.254, 00:00:04, FastEthernet0/0
C       172.16.6.252/30 is directly connected, FastEthernet0/0
R       172.16.7.252/30 [120/1] via 172.16.6.254, 00:00:05, FastEthernet0/0
R       172.16.5.254/32 [120/1] via 172.16.6.254, 00:00:05, FastEthernet0/0
R       172.16.8.252/30 [120/2] via 172.16.6.254, 00:00:05, FastEthernet0/0
R       172.16.0.0/22 [120/2] via 172.16.6.254, 00:00:05, FastEthernet0/0
R*    0.0.0.0/0 [120/2] via 172.16.6.254, 00:00:05, FastEthernet0/0

```

***A:NS085167007# admin display-config**

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

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Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main

Generated WED NOV 23 03:32:36 2011 UTC

exit all

configure

#-----

echo "System Configuration"

#-----

system

ccm 1

exit

snmp

shutdown

exit

time

sntp

shutdown

exit

zone UTC

exit

thresholds

rmon

exit

exit

exit

#-----

echo "System Security Configuration"

#-----

system

security

per-peer-queuing

exit

exit

#-----

```

echo "Log Configuration"
#-----

    log
    exit

#-----
echo "System Security Cpm Hw Filters Configuration"
#-----

    system
        security
        exit
    exit

#-----
echo "QoS Policy Configuration"
#-----

    qos
    exit

#-----
echo "Card Configuration"
#-----

    card 1
        card-type iom-9g
        mda 2
            mda-type c8-10/100eth-tx
        exit
    exit

#-----
echo "Port Configuration"
#-----

    port 1/2/1
        ethernet
        exit
        no shutdown
    exit
    port 1/2/2
        ethernet

```

```

        exit
        no shutdown
    exit
    port 1/2/3
        ethernet
        exit
        no shutdown
    exit
    port 1/2/4
        shutdown
        ethernet
        exit
    exit
    port 1/2/5
        shutdown
        ethernet
        exit
    exit
    port 1/2/6
        shutdown
        ethernet
        exit
    exit
    port 1/2/7
        shutdown
        ethernet
        exit
    exit
    port 1/2/8
        shutdown
        ethernet
        exit
    exit

```

```

#-----
echo "System Sync-If-Timing Configuration"
#-----

```

```

system
    sync-if-timing
        begin
        commit
    exit
exit

```

```
#-----  
echo "Management Router Configuration"  
#-----
```

```
router management  
exit
```

```
#-----  
echo "Router (Network Side) Configuration"  
#-----
```

```
router  
  interface "system"  
  exit  
  interface "to2600mid"  
    address 172.16.6.254/30  
    port 1/2/2  
  exit  
  interface "to2600top"  
    address 172.16.5.254/30  
    port 1/2/1  
  exit  
  interface "to2900"  
    address 172.16.7.253/30  
    port 1/2/3  
  exit
```

```
#-----  
echo "Static Route Configuration"  
#-----
```

```
static-route 0.0.0.0/0 next-hop 172.16.7.254  
static-route 172.16.0.0/22 next-hop 172.16.5.253
```

```
#-----  
echo "RIP Configuration"  
#-----
```

```
rip  
  export "forrip"  
  group "rip"  
    neighbor "to2600top"  
  exit
```



```

        neighbor "to2600mid"
        exit
        neighbor "to2900"
        exit
    exit
exit
exit

#-----
echo "Service Configuration"
#-----

    service
        customer 1 create
            description "Default customer"
        exit
    exit

#-----
echo "Router (Service Side) Configuration"
#-----

    router

#-----
echo "Policy Configuration"
#-----

    policy-options
        begin
        policy-statement "forrip"
            entry 1
                from
                    protocol direct
                exit
                action accept
                exit
            exit
            default-action accept
            exit
        exit
    commit
exit
exit

```

exit all

Finished WED NOV 23 03:32:42 2011 UTC

***A:NS085167007# show router route-table**

=====
Route Table (Router: Base)
=====

Dest Prefix Next Hop[Interface Name]	Type	Proto	Age	Pref Metric
0.0.0.0/0	Remote	Static	00h05m50s	5
172.16.7.254			1	
172.16.0.0/22	Remote	Static	00h04m18s	5
172.16.5.253			1	
172.16.4.252/30	Remote	RIP	00h56m36s	100
172.16.5.253			2	
172.16.5.248/30	Remote	RIP	00h50m14s	100
172.16.6.253			2	
172.16.5.252/30	Local	Local	00h57m08s	0
to2600top			0	
172.16.6.252/30	Local	Local	01h03m34s	0
to2600mid			0	
172.16.7.252/30	Local	Local	00h47m50s	0
to2900			0	
172.16.8.252/30	Remote	RIP	00h03m35s	100
172.16.7.254			2	

No. of Routes: 8
=====

2900#sh run

Building configuration...

Current configuration : 1158 bytes

!

! Last configuration change at 02:32:12 UTC Wed Nov 23 2011

!

version 15.0

```

service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2900
!
boot-start-marker
boot-end-marker
!
no aaa new-model
!
no ipv6 cef
ip source-route
ip cef
!
multilink bundle-name authenticated
!
license udi pid CISCO2921/K9 sn FGL150811PR
license boot module c2900 technology-package datak9
!
redundancy
!
interface GigabitEthernet0/0
 ip address 172.16.7.254 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 172.16.8.253 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 no ip address
 shutdown
 duplex auto
 speed auto
!
router rip
 network 172.16.0.0
!
router bgp 100
 no synchronization
 bgp log-neighbor-changes

```

```

network 172.16.0.0 mask 255.255.192.0
neighbor 172.16.8.254 remote-as 200
no auto-summary
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 172.16.0.0 255.255.192.0 Null0
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is 172.16.7.253 to network 0.0.0.0

```

R*    0.0.0.0/0 [120/2] via 172.16.7.253, 00:00:17, GigabitEthernet0/0
      172.16.0.0/16 is variably subnetted, 13 subnets, 4 masks
S      172.16.0.0/18 is directly connected, Null0
R      172.16.0.0/22 [120/2] via 172.16.7.253, 00:00:17, GigabitEthernet0/0
R      172.16.4.252/30
      [120/2] via 172.16.7.253, 00:00:17, GigabitEthernet0/0
R      172.16.5.248/30
      [120/2] via 172.16.7.253, 00:00:17, GigabitEthernet0/0
R      172.16.5.252/30
      [120/1] via 172.16.7.253, 00:00:17, GigabitEthernet0/0

```

```

R      172.16.5.254/32
      [120/1] via 172.16.7.253, 00:00:17, GigabitEthernet0/0
R      172.16.6.252/30
      [120/1] via 172.16.7.253, 00:00:17, GigabitEthernet0/0
R      172.16.6.254/32
      [120/1] via 172.16.7.253, 00:00:18, GigabitEthernet0/0
C      172.16.7.252/30 is directly connected, GigabitEthernet0/0
R      172.16.7.253/32
      [120/1] via 172.16.7.253, 00:00:18, GigabitEthernet0/0
L      172.16.7.254/32 is directly connected, GigabitEthernet0/0
C      172.16.8.252/30 is directly connected, GigabitEthernet0/1
L      172.16.8.253/32 is directly connected, GigabitEthernet0/1
B      192.168.0.0/18 [20/0] via 172.16.8.254, 00:04:14

```

2900#sh ip bgp

BGP table version is 7, local router ID is 172.16.8.253
 Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
 r RIB-failure, S Stale
 Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.8.254	0		0 200	i

2800#sh run

```

Building configuration...
Current configuration : 1444 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2800
!
boot-start-marker
boot-end-marker
!

```

```

no aaa new-model
memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
  no dspfarm
!
vlan internal allocation policy ascending
!
interface Loopback0
  ip address 192.168.9.0 255.255.255.255
!
interface GigabitEthernet0/0
  ip address 172.16.8.254 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 192.168.7.253 255.255.255.252
  duplex auto
  speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
  ip address 192.168.8.253 255.255.255.252
  ip router isis
  no fair-queue
  clock rate 64000
!
interface Vlan1
  no ip address
!
router ospf 1
  log-adjacency-changes

```

```

network 192.168.7.252 0.0.0.3 area 0
!
router isis
net 49.0001.1921.6800.9000.00
passive-interface Loopback0
!
router bgp 200
no synchronization
bgp log-neighbor-changes
network 192.168.0.0 mask 255.255.192.0
neighbor 172.16.8.253 remote-as 100
no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

192.168.8.0/30 is subnetted, 1 subnets

C 192.168.8.252 is directly connected, Serial0/0/0

```

    192.168.9.0/32 is subnetted, 1 subnets
C       192.168.9.0 is directly connected, Loopback0
    192.168.10.0/32 is subnetted, 1 subnets
i L1    192.168.10.0 [115/10] via 192.168.8.254, Serial0/0/0
    172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.8.252/30 is directly connected, GigabitEthernet0/0
B       172.16.0.0/18 [20/0] via 172.16.8.253, 00:04:50
i L1 192.168.4.0/24 [115/20] via 192.168.8.254, Serial0/0/0
i L1 192.168.5.0/24 [115/20] via 192.168.8.254, Serial0/0/0
i L1 192.168.6.0/24 [115/20] via 192.168.8.254, Serial0/0/0
    192.168.7.0/30 is subnetted, 1 subnets
C       192.168.7.252 is directly connected, GigabitEthernet0/1
    192.168.0.0/32 is subnetted, 1 subnets
O       192.168.0.1 [110/11] via 192.168.7.254, 00:31:26, GigabitEthernet0/1
    192.168.1.0/32 is subnetted, 1 subnets
O       192.168.1.1 [110/11] via 192.168.7.254, 00:31:26, GigabitEthernet0/1
    192.168.2.0/32 is subnetted, 1 subnets
O       192.168.2.1 [110/11] via 192.168.7.254, 00:31:26, GigabitEthernet0/1
    192.168.3.0/32 is subnetted, 1 subnets
O       192.168.3.1 [110/11] via 192.168.7.254, 00:31:26, GigabitEthernet0/1
S       192.168.0.0/18 is directly connected, Null0

```

2800#sh ip bgp

BGP table version is 7, local router ID is 192.168.9.0
 Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
 r RIB-failure, S Stale
 Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.8.253	0		0	100 i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

3600#sh run

```

Building configuration...
Current configuration : 1090 bytes
!
version 12.3
service timestamps debug datetime msec

```



```

service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback1
  ip address 192.168.0.1 255.255.255.0
!
interface Loopback2
  ip address 192.168.1.1 255.255.255.0
!
interface Loopback3
  ip address 192.168.2.1 255.255.255.0
!
interface Loopback4
  ip address 192.168.3.1 255.255.255.0
!
interface Ethernet0/0
  ip address 192.168.7.254 255.255.255.252
  half-duplex
!
interface FastEthernet1/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface FastEthernet2/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
router ospf 1
  log-adjacency-changes
  network 192.168.0.0 0.0.0.255 area 0

```

```

network 192.168.1.0 0.0.0.255 area 0
network 192.168.2.0 0.0.0.255 area 0
network 192.168.3.0 0.0.0.255 area 0
network 192.168.7.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
!
line con 0
line aux 0
line vty 0 4
!
end

```

3600#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, Ethernet0/0
C      192.168.0.0/24 is directly connected, Loopback1
C      192.168.1.0/24 is directly connected, Loopback2
C      192.168.2.0/24 is directly connected, Loopback3
C      192.168.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 192.168.7.253

```

2600low#sh run

```

Building configuration...
Current configuration : 1034 bytes
!

```

```
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600low
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
  ip address 192.168.10.0 255.255.255.255
!
interface Loopback1
  ip address 192.168.4.1 255.255.255.0
  ip router isis
!
interface Loopback2
  ip address 192.168.5.1 255.255.255.0
  ip router isis
!
interface Loopback3
  ip address 192.168.6.1 255.255.255.0
  ip router isis
!
interface FastEthernet0/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface Serial0/0
  ip address 192.168.8.254 255.255.255.252
  ip router isis
  no fair-queue
!
interface Serial0/1
  no ip address
```

```

shutdown
!
router isis
 net 49.0001.1921.6801.0000.00
 passive-interface Loopback0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.8.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.8.253 to network 0.0.0.0

```

192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, Serial0/0
192.168.9.0/32 is subnetted, 1 subnets
i L1   192.168.9.0 [115/10] via 192.168.8.253, Serial0/0
192.168.10.0/32 is subnetted, 1 subnets
C      192.168.10.0 is directly connected, Loopback0
C      192.168.4.0/24 is directly connected, Loopback1
C      192.168.5.0/24 is directly connected, Loopback2
C      192.168.6.0/24 is directly connected, Loopback3
S*    0.0.0.0/0 [1/0] via 192.168.8.253

```

PING RESULT:

3750#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms

3750#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms

3750#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/9 ms

3750#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/9 ms

3750#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3600#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600low#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2600low#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

5.3.3 VLAN AND SWITCHING

SWITCH 1: 3750

3750#sh run

Building configuration...

Current configuration : 1901 bytes

!

version 12.2

no service pad

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

enable secret 5 \$1\$5NvD\$.LGE3IlzGGPruQjhzuSA.1

enable password mint709

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

!

spanning-tree vlan 31 priority 8192

!

interface GigabitEthernet1/0/1

switchport access vlan 31

switchport mode access

!

interface GigabitEthernet1/0/2

switchport access vlan 32

switchport mode access

!

interface GigabitEthernet1/0/3

```

description connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/4
description second connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/5
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21

```



```

!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports
1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22

```

                                Gi1/0/23, Gi1/0/24, Gi1/0/25
                                Gi1/0/26, Gi1/0/27, Gi1/0/28
31   red                        active   Gi1/0/1
32   blue                      active   Gi1/0/2
1002 fddi-default              act/unsup
1003 token-ring-default        act/unsup
1004 fddinet-default           act/unsup
1005 trnet-default             act/unsup

```

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	ieee	-	0	0	
1005	trnet	101005	1500	-	-	ibm	-	0	0	

Remote SPAN VLANs

Primary	Secondary	Type	Ports
---------	-----------	------	-------

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!

```

```

interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20

```

```

!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2

```

31    red                                active    Fa0/1
32    blue                                active    Fa0/2
1002 fddi-default                        active
1003 token-ring-default                  active
1004 fddinet-default                     active
1005 trnet-default                       active

```

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	1002	1003	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	1	1003	
1003	tr	101003	1500	1005	0	-	srb	1	1002	
1004	fdnet	101004	1500	-	1	ibm	-	0	0	
1005	trnet	101005	1500	-	1	ibm	-	0	0	

2600top#sh run

```

Building configuration...
Current configuration : 909 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
  no ip address
  duplex auto
  speed auto
!
interface Serial0/0

```

```

no ip address
clock rate 64000
no fair-queue
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
!
interface FastEthernet0/1.31
encapsulation dot1Q 31
ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet0/1.32
encapsulation dot1Q 32
ip address 192.168.50.67 255.255.255.240
!
interface Serial0/1
no ip address
shutdown
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

5.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

```

Building configuration...
Current configuration : 1846 bytes
!
version 12.2
no service password-encryption
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!

```

```

interface GigabitEthernet1/0/2
  switchport access vlan 32
  switchport mode access
!
interface GigabitEthernet1/0/3
  description connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/4
  description second connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!

```



```

interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$Seq5NjgeKIYdni348aUnoh/

```

```

!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
    switchport access vlan 31
!
interface FastEthernet0/2
    switchport access vlan 32
!
interface FastEthernet0/3
    description connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/4
    description second connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!

```

```

interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32768
 Address 0007.eb94.7200
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts Cost	Prio.Nbr	Type
Gi1/0/3	Root	FWD 19	128.3	P2p
Gi1/0/4	Altn	BLK 19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts Cost	Prio.Nbr	Type
Gi1/0/3	Desg	FWD 19	128.3	P2p
Gi1/0/4	Desg	FWD 19	128.4	P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)

Address 0018.186e.7b00
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 15 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/3	Root	FWD	19	128.3		P2p
Gi1/0/4	Altn	BLK	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE
ROOT ID Priority 32768
Address 0007.eb94.7200
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
Address 0007.eb94.7200
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29

Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE
 ROOT ID Priority 8223
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7201
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE
 ROOT ID Priority 8192
 Address 0007.eb94.7202
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192
 Address 0007.eb94.7202
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
------	------------	--	--	--	--	--	--

Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```
Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost        19
           Port        4 (GigabitEthernet1/0/4)
           Hello Time  2 sec    Max Age 20 sec    Forward Delay 15 sec
```

```
Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time  2 sec    Max Age 20 sec    Forward Delay 15 sec
           Aging Time  300 sec
```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Root	FWD	19	128.4	P2p	

VLAN0031

Spanning tree enabled protocol ieee

```
Root ID    Priority    8223
```

Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee
 Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE
 ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

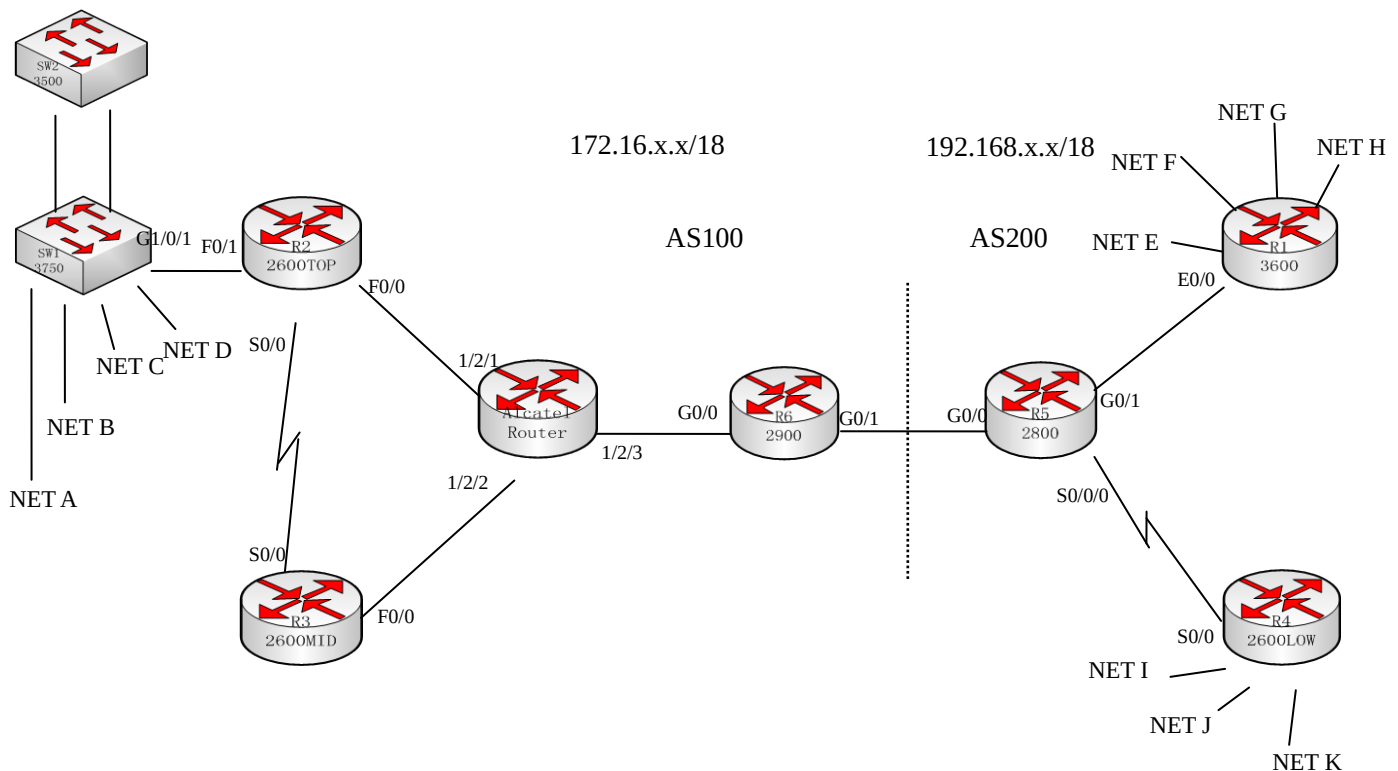
```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Chapter6 Routing and switching lab exam 6

6.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2600(R4), Cisco 3750 and Cisco 3600(R1) according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')
2. Configure OSPF in Cisco 2600(R2), Cisco 2600(R3), Alcatel router and Cisco 2900(R6) to let them reach each other. (10')
3. Configure RIPv2 in Cisco 2800(R5) and Cisco 3600(R1) within area 0. (10')
4. Configure EBGp in Cisco 2900(R6) and Cisco 2800(R5), don't advertise autonomous system network

- topology behind R5 and R6. Instead you should be advertising /18 network. (20')
5. Configure ISIS in Cisco 2800(R5) and Cisco 2600(R4). (10')
 6. Configure Static routes in Cisco 2600(R2) and Cisco 3750. (10')
 7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')
 8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

6.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2600(R4) and Cisco 3600(R1) to the nets of Cisco 3750 at the the other side of the whole network, and from Cisco 3750 to the nets of Cisco2600(R4) and Cisco 3600(R1) . For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2900(R6).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

6.3 lab solution

6.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
Cisco 3750	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	G1/0/1:172.16.4.253/30	
R2 Cisco 2600	F0/0:172.16.5.253/30	F0/1:172.16.4.254/30
	S0/0:172.16.5.249/30	
R3 Cisco 2600	F0/0:172.16.6.253/30	S0/0:172.16.5.250/30
Alcatel router	Port 1/2/1:172.16.5.254/30	Port 1/2/2:172.16.6.254/30
	Port 1/2/3:172.16.7.253/30	
R6 Cisco 2900	G0/0:172.16.7.254/30	G0/1:172.16.8.253/30
R5 Cisco 2800	G0/0:172.16.8.254/30	G0/1:192.168.7.253/30

	S0/0/0:192.168.8.253/30	
R4 Cisco 2600	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	S0/0:192.168.8.254/30
R1 Cisco 3600	Net E:192.168.0.1/24	Net F:192.168.1.1/24
	Net G:192.168.2.1/24	Net H:192.168.3.1/24
	E0/0:192.168.7.254	

6.3.2 ROUTING TASK

3750#sh run

Building configuration...

Current configuration : 1751 bytes

!

version 12.2

no service pad

service timestamps debug uptime

service timestamps log uptime

no service password-encryption

!

hostname 3750

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

ip subnet-zero

ip routing

!

no file verify auto

spanning-tree mode pvst

spanning-tree extend system-id

!

vlan internal allocation policy ascending

!

interface Loopback1

ip address 172.16.0.1 255.255.255.0

!

interface Loopback2

ip address 172.16.1.1 255.255.255.0

!

interface Loopback3

ip address 172.16.2.1 255.255.255.0

!

interface Loopback4

```
    ip address 172.16.3.1 255.255.255.0
!
interface GigabitEthernet1/0/1
    no switchport
    ip address 172.16.4.253 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
```

```

interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.4.254
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

3750#sh ip route

Codes: 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, su - IS-IS summary, 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 172.16.4.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 5 subnets, 2 masks
C      172.16.4.252/30 is directly connected, GigabitEthernet1/0/1
C      172.16.0.0/24 is directly connected, Loopback1
C      172.16.1.0/24 is directly connected, Loopback2
C      172.16.2.0/24 is directly connected, Loopback3
C      172.16.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 172.16.4.254

```

2600top#sh run

```

Building configuration...
Current configuration : 995 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.5.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.249 255.255.255.252
 clock rate 64000
 no fair-queue
!
interface FastEthernet0/1
 ip address 172.16.4.254 255.255.255.252

```



```

duplex auto
speed auto
!
interface Serial0/1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
redistribute connected subnets
redistribute static subnets
network 172.16.5.248 0.0.0.3 area 0
network 172.16.5.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.5.254
ip route 172.16.0.0 255.255.252.0 172.16.4.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
i - IS-IS, su - IS-IS summary, 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 172.16.5.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 6 subnets, 2 masks
C      172.16.5.248/30 is directly connected, Serial0/0

```

```
C      172.16.4.252/30 is directly connected, FastEthernet0/1
C      172.16.5.252/30 is directly connected, FastEthernet0/0
O      172.16.6.252/30 [110/65] via 172.16.5.250, 00:16:03, Serial0/0
O      172.16.7.252/30 [110/1001] via 172.16.5.254, 00:16:03, FastEthernet0/0
S      172.16.0.0/22 [1/0] via 172.16.4.253
S*    0.0.0.0/0 [1/0] via 172.16.5.254
```

2600mid#sh run

```
Building configuration...
Current configuration : 737 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.6.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.250 255.255.255.252
 no fair-queue
!
interface Serial0/1
 no ip address
 shutdown
!
```

```

router ospf 1
  log-adjacency-changes
  network 172.16.5.248 0.0.0.3 area 0
  network 172.16.6.252 0.0.0.3 area 0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

172.16.0.0/16 is variably subnetted, 6 subnets, 2 masks
C       172.16.5.248/30 is directly connected, Serial0/0
O E2    172.16.4.252/30 [110/20] via 172.16.5.249, 00:16:17, Serial0/0
O       172.16.5.252/30 [110/65] via 172.16.5.249, 00:16:22, Serial0/0
C       172.16.6.252/30 is directly connected, FastEthernet0/0
O       172.16.7.252/30 [110/1001] via 172.16.6.254, 00:16:22, FastEthernet0/0
O E2    172.16.0.0/22 [110/20] via 172.16.5.249, 00:04:04, Serial0/0

```

***A:NS085167007# admin display-config**

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

```
# All rights reserved. All use subject to applicable license agreements.  
# Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main  
# Generated WED NOV 23 04:00:44 2011 UTC
```

```
exit all  
configure
```

```
#-----  
echo "System Configuration"  
#-----
```

```
    system  
        ccm 1  
        exit  
        snmp  
            shutdown  
        exit  
        time  
            sntp  
                shutdown  
            exit  
            zone UTC  
        exit  
        thresholds  
            rmon  
            exit  
        exit  
    exit
```

```
#-----  
echo "System Security Configuration"  
#-----
```

```
    system  
        security  
            per-peer-queuing  
        exit  
    exit
```

```
#-----  
echo "Log Configuration"  
#-----
```

```
    log  
    exit
```

```
#-----  
echo "System Security Cpm Hw Filters Configuration"  
#-----
```

```
system  
    security  
    exit  
exit
```

```
#-----  
echo "QoS Policy Configuration"  
#-----
```

```
qos  
exit
```

```
#-----  
echo "Card Configuration"  
#-----
```

```
card 1  
    card-type iom-9g  
    mda 2  
        mda-type c8-10/100eth-tx  
  
    exit  
exit
```

```
#-----  
echo "Port Configuration"  
#-----
```

```
port 1/2/1  
    ethernet  
    exit  
    no shutdown  
exit  
port 1/2/2  
    ethernet  
    exit  
    no shutdown  
exit  
port 1/2/3
```

```
        ethernet
        exit
        no shutdown
    exit
port 1/2/4
    shutdown
    ethernet
    exit
exit
port 1/2/5
    shutdown
    ethernet
    exit
exit
port 1/2/6
    shutdown
    ethernet
    exit
exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit
```

```
#-----
echo "System Sync-If-Timing Configuration"
#-----
```

```
system
    sync-if-timing
        begin
        commit
    exit
exit
```

```
#-----
echo "Management Router Configuration"
#-----
```

```

router management
exit

#-----
echo "Router (Network Side) Configuration"
#-----

router
    interface "system"

    exit
    interface "to2600mid"
        address 172.16.6.254/30
        port 1/2/2
    exit
    interface "to2600top"
        address 172.16.5.254/30
        port 1/2/1
    exit
    interface "to2900"
        address 172.16.7.253/30
        port 1/2/3
    exit

#-----
echo "Static Route Configuration"
#-----

static-route 0.0.0.0/0 next-hop 172.16.7.254
static-route 172.16.0.0/22 next-hop 172.16.5.253

#-----
echo "OSPFv2 Configuration"
#-----

ospf
    export "forospf"
    area 0.0.0.0
        interface "to2600top"
        exit
        interface "to2600mid"
        exit
        interface "to2900"

```

```

        exit
    exit
exit

#-----
echo "Service Configuration"
#-----

    service
        customer 1 create
            description "Default customer"
        exit
    exit

#-----
echo "Router (Service Side) Configuration"
#-----

    router

#-----
echo "OSPFv2 Configuration"
#-----

    ospf
    exit

#-----
echo "Policy Configuration"
#-----

    policy-options
        begin
        policy-statement "forospf"
            entry 1
                from
                    protocol direct
                exit
                action accept
            exit
        exit
        default-action accept
    exit

```



```

        exit
      commit
    exit
  exit
exit all

```

Finished WED NOV 23 04:00:51 2011 UTC

***A:NS085167007# show router route-table**

```

=====
Route Table (Router: Base)
=====

```

Dest Prefix Next Hop[Interface Name]	Type	Proto	Age	Metric	Pref
0.0.0.0/0	Remote	Static	00h34m01s	5	
172.16.7.254			1		
172.16.0.0/22	Remote	Static	00h14m21s	5	
172.16.5.253			1		
172.16.4.252/30	Remote	OSPF	00h16m48s	150	
172.16.5.253			20		
172.16.5.248/30	Remote	OSPF	00h17m41s	10	
172.16.6.253			1064		
172.16.5.252/30	Local	Local	01h25m19s	0	
to2600top			0		
172.16.6.252/30	Local	Local	01h31m45s	0	
to2600mid			0		
172.16.7.252/30	Local	Local	01h16m01s	0	
to2900			0		

```

-----
No. of Routes: 7
=====

```

2900#sh run

```

Building configuration...
Current configuration : 1201 bytes
!
! Last configuration change at 02:46:32 UTC Wed Nov 23 2011

```

```
!  
version 15.0  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname 2900  
!  
boot-start-marker  
boot-end-marker  
!  
no aaa new-model  
!  
no ipv6 cef  
ip source-route  
ip cef  
!  
multilink bundle-name authenticated  
!  
license udi pid CISCO2921/K9 sn FGL150811PR  
license boot module c2900 technology-package datak9  
!  
redundancy  
!  
interface GigabitEthernet0/0  
  ip address 172.16.7.254 255.255.255.252  
  duplex auto  
  speed auto  
!  
interface GigabitEthernet0/1  
  ip address 172.16.8.253 255.255.255.252  
  duplex auto  
  speed auto  
!  
interface GigabitEthernet0/2  
  no ip address  
  shutdown  
  duplex auto  
  speed auto  
!  
router ospf 1  
  log-adjacency-changes  
  network 172.16.7.252 0.0.0.3 area 0  
!
```

```

router bgp 100
  no synchronization
  bgp log-neighbor-changes
  network 172.16.0.0 mask 255.255.192.0
  neighbor 172.16.8.254 remote-as 200
  no auto-summary
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 172.16.0.0 255.255.192.0 Null0
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is not set

```

      172.16.0.0/16 is variably subnetted, 10 subnets, 4 masks
S       172.16.0.0/18 is directly connected, Null0
O E2    172.16.0.0/22 [110/20] via 172.16.7.253, 00:05:41, GigabitEthernet0/0
O E2    172.16.4.252/30
        [110/20] via 172.16.7.253, 00:17:53, GigabitEthernet0/0
O       172.16.5.248/30
        [110/1065] via 172.16.7.253, 00:17:58, GigabitEthernet0/0

```

```

O      172.16.5.252/30
      [110/1001] via 172.16.7.253, 00:19:49, GigabitEthernet0/0
O      172.16.6.252/30
      [110/1001] via 172.16.7.253, 00:19:50, GigabitEthernet0/0
C      172.16.7.252/30 is directly connected, GigabitEthernet0/0
L      172.16.7.254/32 is directly connected, GigabitEthernet0/0
C      172.16.8.252/30 is directly connected, GigabitEthernet0/1
L      172.16.8.253/32 is directly connected, GigabitEthernet0/1
B      192.168.0.0/18 [20/0] via 172.16.8.254, 00:20:11

```

2900#sh ip bgp

BGP table version is 8, local router ID is 172.16.8.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.8.254	0		0 200	i

2800#sh run

Building configuration...

Current configuration : 1412 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2800

!

boot-start-marker

boot-end-marker

!

no aaa new-model

memory-size iomem 10

!

ip cef

```

!
multilink bundle-name authenticated
!
voice-card 0
  no dspfarm
!
vlan internal allocation policy ascending
!
interface Loopback0
  ip address 192.168.9.0 255.255.255.255
!
interface GigabitEthernet0/0
  ip address 172.16.8.254 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 192.168.7.253 255.255.255.252
  duplex auto
  speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
  ip address 192.168.8.253 255.255.255.252
  ip router isis
  no fair-queue
  clock rate 64000
!
interface Vlan1
  no ip address
!
router isis
  net 49.0001.1921.6800.9000.00
  passive-interface Loopback0
!
router rip
  version 2

```

```

    network 192.168.7.0
!
router bgp 200
    no synchronization
    bgp log-neighbor-changes
    network 192.168.0.0 mask 255.255.192.0
    neighbor 172.16.8.253 remote-as 100
    no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
    login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

    192.168.8.0/30 is subnetted, 1 subnets
C       192.168.8.252 is directly connected, Serial0/0/0
    192.168.9.0/32 is subnetted, 1 subnets
C       192.168.9.0 is directly connected, Loopback0
    192.168.10.0/32 is subnetted, 1 subnets
i L1    192.168.10.0 [115/10] via 192.168.8.254, Serial0/0/0

```

```

172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      172.16.8.252/30 is directly connected, GigabitEthernet0/0
B      172.16.0.0/18 [20/0] via 172.16.8.253, 00:05:54
i L1 192.168.4.0/24 [115/20] via 192.168.8.254, Serial0/0/0
i L1 192.168.5.0/24 [115/20] via 192.168.8.254, Serial0/0/0
i L1 192.168.6.0/24 [115/20] via 192.168.8.254, Serial0/0/0
192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, GigabitEthernet0/1
R      192.168.0.0/24 [120/1] via 192.168.7.254, 00:00:10, GigabitEthernet0/1
R      192.168.1.0/24 [120/1] via 192.168.7.254, 00:00:10, GigabitEthernet0/1
R      192.168.2.0/24 [120/1] via 192.168.7.254, 00:00:10, GigabitEthernet0/1
R      192.168.3.0/24 [120/1] via 192.168.7.254, 00:00:10, GigabitEthernet0/1
S      192.168.0.0/18 is directly connected, Null0

```

2800#sh ip bgp

BGP table version is 7, local router ID is 192.168.9.0
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.8.253	0		0	100 i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

3600#sh run

```

Building configuration...
Current configuration : 990 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!

```

```

no aaa new-model
ip subnet-zero

ip cef
!
interface Loopback1
  ip address 192.168.0.1 255.255.255.0
!
interface Loopback2
  ip address 192.168.1.1 255.255.255.0
!
interface Loopback3
  ip address 192.168.2.1 255.255.255.0
!
interface Loopback4
  ip address 192.168.3.1 255.255.255.0
!
interface Ethernet0/0
  ip address 192.168.7.254 255.255.255.252
  half-duplex
!
interface FastEthernet1/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface FastEthernet2/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
router rip
  version 2
  network 192.168.0.0
  network 192.168.1.0
  network 192.168.2.0
  network 192.168.3.0
  network 192.168.7.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253

```



```

!
line con 0
line aux 0
line vty 0 4
!
end

```

3600#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

      192.168.7.0/30 is subnetted, 1 subnets
C       192.168.7.252 is directly connected, Ethernet0/0
C       192.168.0.0/24 is directly connected, Loopback1
C       192.168.1.0/24 is directly connected, Loopback2
C       192.168.2.0/24 is directly connected, Loopback3
C       192.168.3.0/24 is directly connected, Loopback4
S*     0.0.0.0/0 [1/0] via 192.168.7.253

```

2600low#sh run

```

Building configuration...
Current configuration : 1034 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600low
!
boot-start-marker

```

```

boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
 ip address 192.168.10.0 255.255.255.255
!
interface Loopback1
 ip address 192.168.4.1 255.255.255.0
 ip router isis
!
interface Loopback2
 ip address 192.168.5.1 255.255.255.0
 ip router isis
!
interface Loopback3
 ip address 192.168.6.1 255.255.255.0
 ip router isis
!
interface FastEthernet0/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 192.168.8.254 255.255.255.252
 ip router isis
 no fair-queue
!
interface Serial0/1
 no ip address
 shutdown
!
router isis
 net 49.0001.1921.6801.0000.00
 passive-interface Loopback0
!
ip http server
ip classless

```

```

ip route 0.0.0.0 0.0.0.0 192.168.8.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.8.253 to network 0.0.0.0

```

      192.168.8.0/30 is subnetted, 1 subnets
C       192.168.8.252 is directly connected, Serial0/0
      192.168.9.0/32 is subnetted, 1 subnets
i L1    192.168.9.0 [115/10] via 192.168.8.253, Serial0/0
      192.168.10.0/32 is subnetted, 1 subnets
C       192.168.10.0 is directly connected, Loopback0
C       192.168.4.0/24 is directly connected, Loopback1
C       192.168.5.0/24 is directly connected, Loopback2
C       192.168.6.0/24 is directly connected, Loopback3
S*    0.0.0.0/0 [1/0] via 192.168.8.253

```

PING RESULT:

```

3750#ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!

```

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms

3750#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/9 ms

3750#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/9 ms

3750#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms

3750#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3600#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

3600#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

2600low#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2600low#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/56/164 ms

2600low#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

6.3.3 VLAN AND SWITCHING

SWITCH 1: 3750

3750#sh run

```
Building configuration...
Current configuration : 1901 bytes
!
version 12.2
no service pad
no service password-encryption
!
hostname 3750
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$5NvD$.LGE3IlzGGPruQjhzuSA.1
enable password mint709
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
  switchport access vlan 31
  switchport mode access
!
interface GigabitEthernet1/0/2
  switchport access vlan 32
  switchport mode access
!
interface GigabitEthernet1/0/3
  description connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/4
  description second connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
```

```

!
interface GigabitEthernet1/0/5
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25

```

```

!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name		Status	Ports

1	default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24, Gi1/0/25 Gi1/0/26, Gi1/0/27, Gi1/0/28
31	red	active	Gi1/0/1
32	blue	active	Gi1/0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	ieee	-	0	0	
1005	trnet	101005	1500	-	-	ibm	-	0	0	

Remote SPAN VLANs

Primary	Secondary	Type	Ports
---------	-----------	------	-------

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```
!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!
interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
```

```
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
```

```

!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name		Status	Ports

1	default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2
31	red	active	Fa0/1
32	blue	active	Fa0/2
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	
VLAN Type	SAID	MTU	Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2

```

-----
1    enet  100001    1500 -    -    -    -    -    1002  1003
31   enet  100031    1500 -    -    -    -    -    0    0
32   enet  100032    1500 -    -    -    -    -    0    0
1002 fddi  101002    1500 -    -    -    -    -    1    1003
1003 tr    101003    1500 1005 0    -    -    srb    1    1002
1004 fdnet 101004    1500 -    -    1    ibm  -    0    0
1005 trnet 101005    1500 -    -    1    ibm  -    0    0

```

2600top#sh run

Building configuration...

Current configuration : 909 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600top

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface FastEthernet0/0

no ip address

duplex auto

speed auto

!

interface Serial0/0

no ip address

clock rate 64000

no fair-queue

!

interface FastEthernet0/1

no ip address

duplex auto

speed auto

```

!
interface FastEthernet0/1.31
  encapsulation dot1Q 31
  ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet0/1.32
  encapsulation dot1Q 32
  ip address 192.168.50.67 255.255.255.240
!
interface Serial0/1
  no ip address
  shutdown
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

6.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

```
Building configuration...
Current configuration : 1846 bytes
!
version 12.2
no service pa
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
```

```
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
```

```

interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!
interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk

```



```

!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!

```

```

interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 000000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID	Priority	32768		
	Address	0007.eb94.7200		
	Cost	19		
	Port	3 (GigabitEthernet1/0/3)		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec

Bridge ID	Priority	32769	(priority 32768 sys-id-ext 1)	
	Address	0018.186e.7b00		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec
	Aging Time	300 sec		

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----------	------	-----	------	-------	-----	------

```

-----
Gi1/0/3          Root FWD 19          128.3    P2p
Gi1/0/4          Altn BLK 19          128.4    P2p

```

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address      0018.186e.7b00
           This bridge is the root
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    8223   (priority 8192 sys-id-ext 31)
           Address      0018.186e.7b00
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time    300 sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/3            Desg FWD 19          128.3    P2p
Gi1/0/4            Desg FWD 19          128.4    P2p

```

VLAN0032

Spanning tree enabled protocol ieee

```

Root ID    Priority    8192
           Address      0007.eb94.7202
           Cost          19
           Port          3 (GigabitEthernet1/0/3)
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    32800  (priority 32768 sys-id-ext 32)
           Address      0018.186e.7b00
           Hello Time    2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time    15   sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/2            Desg FWD 4          128.2    P2p
Gi1/0/3            Root FWD 19          128.3    P2p
Gi1/0/4            Altn BLK 19          128.4    P2p

```

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```

C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost      19
           Port      4 (GigabitEthernet1/0/4)
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time 300 sec

```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/4	Root	FWD	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID  Priority    8223 (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time 2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time 300 sec

```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID
-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200

Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

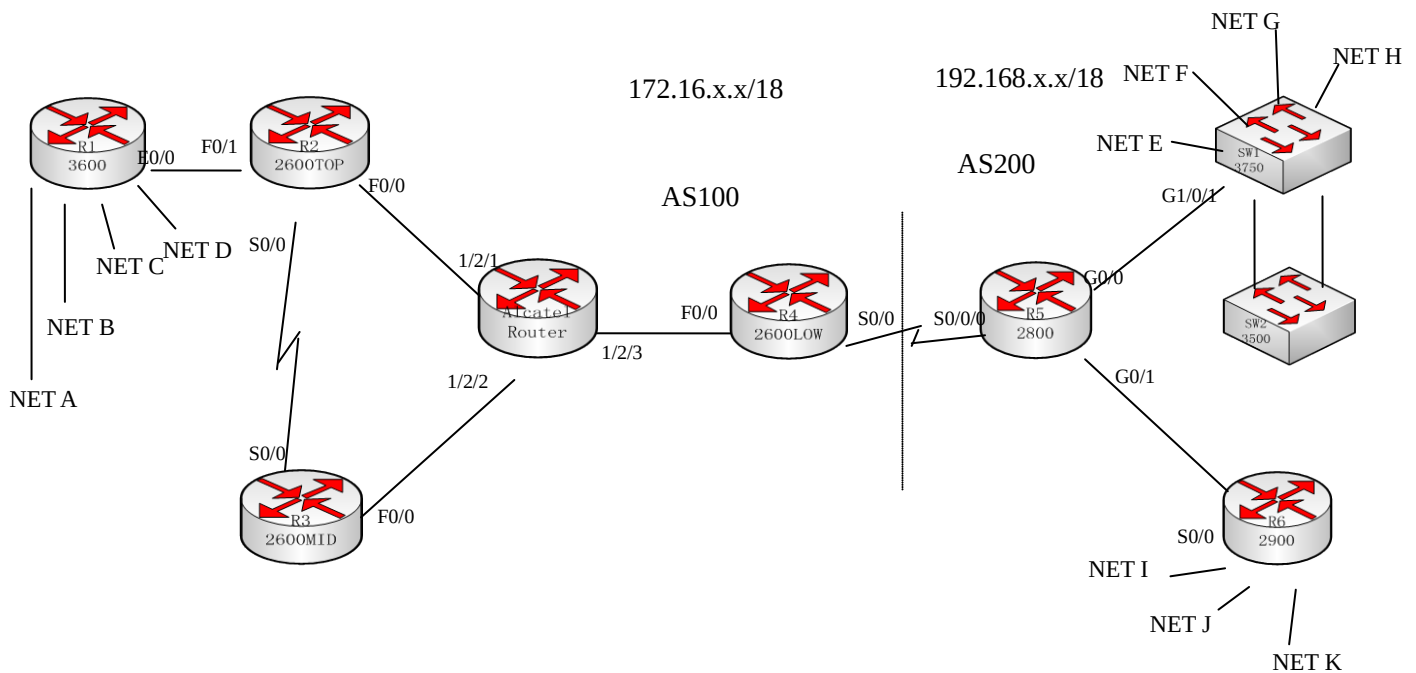
```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Chapter 7 Routing and switching lab exam 7

7.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 3600(R1), Cisco 3750 and Cisco 2900(R6) according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')

2. Configure RIPv2 in Cisco 2600(R2) and Cisco 3600(R1) to let them reach each other. (10')
3. Configure OSPF in Cisco 2600(R2), Cisco 2600(R3) and Alcatel router within area 0. (10')
4. Configure EBGP in Cisco 2600(R4) and Cisco 2800(R5), don't advertise autonomous system network topology behind R4 and R5. Instead you should be advertising /18 network. (20')
5. Configure ISIS in Cisco 2900(R6) and Cisco 2800(R5). (10')
6. Configure Static routes in Cisco 2800(R5) and Cisco 3750. (10')
7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')
8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

7.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2600(R2) to the nets of Cisco 3750 and Alcatel router at the the other side of the whole network, and from Cisco 3750 and Alcatel router to the nets of Cisco 2600(R2). For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2600(R4).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

7.3 lab solution

7.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
R1 Cisco 3600	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	E0/0:172.16.4.253/30	
R2 Cisco 2600	F0/0:172.16.5.253/30	F0/1:172.16.4.254/30
	S0/0:172.16.5.249/30	
R3 Cisco 2600	F0/0:172.16.6.253/30	S0/0:172.16.5.250/30
Alcatel router	Port 1/2/1:172.16.5.254/30	Port 1/2/2:172.16.6.254/30
	Port 1/2/3:172.16.7.253/30	

R4 Cisco 2600	F0/0:172.16.7.254/30	S0/0:172.16.8.253/30
R5 Cisco 2800	G0/0:192.168.7.253/30	G0/1:192.168.8.253/30
	S0/0/0:172.16.8.254/30	
R6 Cisco 2900	G0/1:192.168.8.254/40	Net I:192.168.4.1/24
	Net J:192.168.5.1/24	Net K:192.168.6.1/24
Cisco 3750	Net E:192.168.0.1/24	Net F:192.168.1.1/24
	Net G:192.168.2.1/24	Net H:192.168.3.1/24
	G1/0/1:192.168.7.254/30	

7.3.2 ROUTING TASK

3600#sh run

```

Building configuration...
Current configuration : 923 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback1
 ip address 172.16.0.1 255.255.255.0
!
interface Loopback2
 ip address 172.16.1.1 255.255.255.0
!
interface Loopback3
 ip address 172.16.2.1 255.255.255.0
!
interface Loopback4
 ip address 172.16.3.1 255.255.255.0

```

```

!
interface Ethernet0/0
 ip address 172.16.4.253 255.255.255.252
 half-duplex
!
interface FastEthernet1/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface FastEthernet2/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
router rip
 version 2
 redistribute connected
 network 172.16.0.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.4.254
!
line con 0
line aux 0
line vty 0 4
!
end

```

3600#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 172.16.4.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 7 subnets, 2 masks
R      172.16.5.248/30 [120/1] via 172.16.4.254, 00:00:08, Ethernet0/0
C      172.16.4.252/30 is directly connected, Ethernet0/0
R      172.16.5.252/30 [120/1] via 172.16.4.254, 00:00:08, Ethernet0/0
C      172.16.0.0/24 is directly connected, Loopback1
C      172.16.1.0/24 is directly connected, Loopback2
C      172.16.2.0/24 is directly connected, Loopback3
C      172.16.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 172.16.4.254

```

2600top#sh run

```

Building configuration...
Current configuration : 1010 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.5.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.249 255.255.255.252
 clock rate 64000
 no fair-queue

```

```

!
interface FastEthernet0/1
 ip address 172.16.4.254 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 redistribute connected subnets
 redistribute static
 redistribute rip subnets
 network 172.16.5.248 0.0.0.3 area 0
 network 172.16.5.252 0.0.0.3 area 0
!
router rip
 version 2
 network 172.16.0.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.5.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 172.16.5.254 to network 0.0.0.0

172.16.0.0/16 is variably subnetted, 9 subnets, 2 masks

C	172.16.5.248/30 is directly connected, Serial0/0
C	172.16.4.252/30 is directly connected, FastEthernet0/1
C	172.16.5.252/30 is directly connected, FastEthernet0/0
O	172.16.6.252/30 [110/65] via 172.16.5.250, 00:06:03, Serial0/0
O	172.16.7.252/30 [110/1001] via 172.16.5.254, 00:06:03, FastEthernet0/0
R	172.16.0.0/24 [120/1] via 172.16.4.253, 00:00:24, FastEthernet0/1
R	172.16.1.0/24 [120/1] via 172.16.4.253, 00:00:25, FastEthernet0/1
R	172.16.2.0/24 [120/1] via 172.16.4.253, 00:00:25, FastEthernet0/1
R	172.16.3.0/24 [120/1] via 172.16.4.253, 00:00:25, FastEthernet0/1
S*	0.0.0.0/0 [1/0] via 172.16.5.254

2600mid#sh run

```
Building configuration...
Current configuration : 737 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
ip address 172.16.6.253 255.255.255.252
duplex auto
```



```

    speed auto
!
interface Serial0/0
    ip address 172.16.5.250 255.255.255.252
    no fair-queue
!
interface Serial0/1
    no ip address
    shutdown
!
router ospf 1
    log-adjacency-changes
    network 172.16.5.248 0.0.0.3 area 0
    network 172.16.6.252 0.0.0.3 area 0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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

172.16.0.0/16 is variably subnetted, 9 subnets, 2 masks

C 172.16.5.248/30 is directly connected, Serial0/0

O E2 172.16.4.252/30 [110/20] via 172.16.5.249, 00:06:25, Serial0/0

```

O      172.16.5.252/30 [110/65] via 172.16.5.249, 00:06:25, Serial0/0
C      172.16.6.252/30 is directly connected, FastEthernet0/0
O      172.16.7.252/30 [110/1001] via 172.16.6.254, 00:06:25, FastEthernet0/0
O E2   172.16.0.0/24 [110/20] via 172.16.5.249, 00:06:25, Serial0/0
O E2   172.16.1.0/24 [110/20] via 172.16.5.249, 00:06:26, Serial0/0
O E2   172.16.2.0/24 [110/20] via 172.16.5.249, 00:06:26, Serial0/0
O E2   172.16.3.0/24 [110/20] via 172.16.5.249, 00:06:26, Serial0/0

```

***A:NS085167007# admin display-config**

```

# TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.
# All rights reserved. All use subject to applicable license agreements.
# Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main
# Generated WED NOV 23 04:45:59 2011 UTC

```

```
exit all
```

```
configure
```

```

#-----
echo "System Configuration"
#-----

```

```

system
  ccm 1
  exit
  snmp
    shutdown
  exit
  time
    sntp
      shutdown
    exit
    zone UTC
  exit
  thresholds
    rmon
    exit
  exit
exit

```

```

#-----
echo "System Security Configuration"

```

```

#-----

    system
        security
            per-peer-queuing
        exit
    exit

#-----
echo "Log Configuration"
#-----

    log
    exit

#-----
echo "System Security Cpm Hw Filters Configuration"
#-----

    system
        security
        exit
    exit

#-----
echo "QoS Policy Configuration"
#-----

    qos
    exit

#-----
echo "Card Configuration"
#-----

    card 1
        card-type iom-9g
        mda 2
            mda-type c8-10/100eth-tx
        exit
    exit

#-----
echo "Port Configuration"

```

#-----

```
port 1/2/1
    ethernet
    exit
    no shutdown
exit
port 1/2/2
    ethernet
    exit
    no shutdown
exit
port 1/2/3
    ethernet
    exit
    no shutdown
exit
port 1/2/4
    shutdown
    ethernet
    exit
exit
port 1/2/5
    shutdown
    ethernet
    exit
exit
port 1/2/6
    shutdown
    ethernet
    exit
exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit
```

#-----

```
echo "System Sync-If-Timing Configuration"
```

```
#-----
```

```
system
  sync-if-timing
    begin
    commit
  exit
exit
```

```
#-----
```

```
echo "Management Router Configuration"
```

```
#-----
```

```
router management
exit
```

```
#-----
```

```
echo "Router (Network Side) Configuration"
```

```
#-----
```

```
router
  interface "system"
  exit
  interface "to2600mid"
    address 172.16.6.254/30
    port 1/2/2
  exit
  interface "to2600top"
    address 172.16.5.254/30
    port 1/2/1
  exit
  interface "to2900"
    address 172.16.7.253/30
    port 1/2/3
  exit
```

```
#-----
```

```
echo "Static Route Configuration"
```

```
#-----
```

```
static-route 0.0.0.0/0 next-hop 172.16.7.254
```

```
#-----
```

```
echo "OSPFv2 Configuration"
```

```
#-----
```

```
    ospf
      export "forospf"
      area 0.0.0.0
        interface "to2600top"
        exit
        interface "to2600mid"
        exit
        interface "to2900"
        exit
      exit
    exit
  exit
```

```
#-----
```

```
echo "Service Configuration"
```

```
#-----
```

```
    service
      customer 1 create
        description "Default customer"
      exit
    exit
```

```
#-----
```

```
echo "Router (Service Side) Configuration"
```

```
#-----
```

```
    router
```

```
#-----
```

```
echo "OSPFv2 Configuration"
```

```
#-----
```

```
    ospf
    exit
```

```
#-----
```

```
echo "Policy Configuration"
```

```
#-----
```

```
    policy-options
```

```

begin
policy-statement "forospf"
  entry 1
    from
      protocol direct
    exit
    action accept
    exit
  exit
  default-action accept
  exit
exit
commit
exit
exit
exit all

# Finished WED NOV 23 04:46:05 2011 UTC

```

***A:NS085167007# show router route-table**

Route Table (Router: Base)

Dest Prefix Next Hop[Interface Name]	Type	Proto	Age	Pref Metric
0.0.0.0/0 172.16.7.254	Remote	Static	00h08m57s	5 1
172.16.0.0/24 172.16.5.253	Remote	OSPF	00h10m24s	150 20
172.16.1.0/24 172.16.5.253	Remote	OSPF	00h10m25s	150 20
172.16.2.0/24 172.16.5.253	Remote	OSPF	00h10m25s	150 20
172.16.3.0/24 172.16.5.253	Remote	OSPF	00h10m25s	150 20
172.16.4.252/30 172.16.5.253	Remote	OSPF	00h13m08s	150 20
172.16.5.248/30 172.16.6.253	Remote	OSPF	01h02m56s	10 1064
172.16.5.252/30 to2600top	Local	Local	00h35m36s	0 0
172.16.6.252/30	Local	Local	02h17m00s	0

to2600mid			0
172.16.7.252/30	Local	Local	00h08m58s 0
to2900			0

No. of Routes: 10

=====

2600low#sh run

```
Building configuration...
Current configuration : 896 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600low
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.7.254 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.8.253 255.255.255.252
 no fair-queue
!
interface Serial0/1
 no ip address
 shutdown
!
```



```

router ospf 1
  log-adjacency-changes
  network 172.16.7.252 0.0.0.3 area 0
!
router bgp 100
  no synchronization
  bgp log-neighbor-changes
  network 172.16.0.0 mask 255.255.192.0
  neighbor 172.16.8.254 remote-as 200
  no auto-summary
!
ip http server
ip classless
ip route 172.16.0.0 255.255.192.0 Null0
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

172.16.0.0/16 is variably subnetted, 11 subnets, 3 masks
O       172.16.5.248/30 [110/1065] via 172.16.7.253, 00:08:51, FastEthernet0/0
O E2    172.16.4.252/30 [110/20] via 172.16.7.253, 00:08:51, FastEthernet0/0
O       172.16.5.252/30 [110/1001] via 172.16.7.253, 00:08:51, FastEthernet0/0
O       172.16.6.252/30 [110/1001] via 172.16.7.253, 00:08:51, FastEthernet0/0
C       172.16.7.252/30 is directly connected, FastEthernet0/0

```

```

C      172.16.8.252/30 is directly connected, Serial0/0
O E2   172.16.0.0/24 [110/20] via 172.16.7.253, 00:08:52, FastEthernet0/0
S      172.16.0.0/18 is directly connected, Null0
O E2   172.16.1.0/24 [110/20] via 172.16.7.253, 00:08:52, FastEthernet0/0
O E2   172.16.2.0/24 [110/20] via 172.16.7.253, 00:08:52, FastEthernet0/0
O E2   172.16.3.0/24 [110/20] via 172.16.7.253, 00:08:52, FastEthernet0/0
B      192.168.0.0/18 [20/0] via 172.16.8.254, 00:08:29

```

2600low#sh ip bgp

BGP table version is 3, local router ID is 172.16.8.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.8.254	0		0 200	i

2800#sh run

Building configuration...

Current configuration : 1416 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2800

!

boot-start-marker

boot-end-marker

!

no aaa new-model

memory-size iomem 10

!

ip cef

!

multilink bundle-name authenticated

```

!
voice-card 0
  no dspfarm
!
vlan internal allocation policy ascending
!
interface Loopback0
  ip address 192.168.9.0 255.255.255.255
!
interface GigabitEthernet0/0
  ip address 192.168.7.253 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 192.168.8.253 255.255.255.252
  ip router isis
  duplex auto
  speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
  ip address 172.16.8.254 255.255.255.252
  no fair-queue
  clock rate 64000
!
interface Vlan1
  no ip address
!
router isis
  net 49.0001.1921.6800.9000.00
  passive-interface Loopback0
!
router bgp 200
  no synchronization
  bgp log-neighbor-changes
  network 192.168.0.0 mask 255.255.192.0

```

```

neighbor 172.16.8.253 remote-as 100
no auto-summary
!
ip route 192.168.0.0 255.255.192.0 Null0
ip route 192.168.0.0 255.255.252.0 192.168.7.254
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, GigabitEthernet0/1
192.168.9.0/32 is subnetted, 1 subnets
C      192.168.9.0 is directly connected, Loopback0
192.168.10.0/32 is subnetted, 1 subnets
i L1   192.168.10.0 [115/10] via 192.168.8.254, GigabitEthernet0/1
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      172.16.8.252/30 is directly connected, Serial0/0/0
B      172.16.0.0/18 [20/0] via 172.16.8.253, 00:08:25
i L1   192.168.4.0/24 [115/20] via 192.168.8.254, GigabitEthernet0/1
i L1   192.168.5.0/24 [115/20] via 192.168.8.254, GigabitEthernet0/1

```

```

i L1 192.168.6.0/24 [115/20] via 192.168.8.254, GigabitEthernet0/1
    192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, GigabitEthernet0/0
S      192.168.0.0/22 [1/0] via 192.168.7.254
S      192.168.0.0/18 is directly connected, Null0

```

2800#sh ip bgp

BGP table version is 9, local router ID is 192.168.9.0
 Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
 r RIB-failure, S Stale
 Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.8.253	0		0 100	i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

3750#sh run

```

Building configuration...
Current configuration : 1757 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3750
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
ip subnet-zero
ip routing
!
no file verify auto
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending

```

```

!
interface Loopback1
  ip address 192.168.0.1 255.255.255.0
!
interface Loopback2
  ip address 192.168.1.1 255.255.255.0
!
interface Loopback3
  ip address 192.168.2.1 255.255.255.0
!
interface Loopback4
  ip address 192.168.3.1 255.255.255.0
!
interface GigabitEthernet1/0/1
  no switchport
  ip address 192.168.7.254 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15

```

```

!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

3750#sh ip route

Codes: 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, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

192.168.7.0/30 is subnetted, 1 subnets

C 192.168.7.252 is directly connected, GigabitEthernet1/0/1

C 192.168.0.0/24 is directly connected, Loopback1

C 192.168.1.0/24 is directly connected, Loopback2

C 192.168.2.0/24 is directly connected, Loopback3

C 192.168.3.0/24 is directly connected, Loopback4

S* 0.0.0.0/0 [1/0] via 192.168.7.253

2900#sh run

Building configuration...

Current configuration : 1338 bytes

!

! Last configuration change at 03:43:36 UTC Wed Nov 23 2011

!

version 15.0

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2900

!

boot-start-marker

boot-end-marker

!

no aaa new-model

!

no ipv6 cef

ip source-route

ip cef


```

!
multilink bundle-name authenticated
!
license udi pid CISCO2921/K9 sn FGL150811PR
license boot module c2900 technology-package datak9
!
redundancy
!
interface Loopback0
  ip address 192.168.10.0 255.255.255.255
!
interface Loopback1
  ip address 192.168.4.1 255.255.255.0
  ip router isis
!
interface Loopback2
  ip address 192.168.5.1 255.255.255.0
  ip router isis
!
interface Loopback3
  ip address 192.168.6.1 255.255.255.0
  ip router isis
!
interface GigabitEthernet0/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 192.168.8.254 255.255.255.252
  ip router isis
  duplex auto
  speed auto
!
interface GigabitEthernet0/2
  no ip address
  shutdown
  duplex auto
  speed auto
!
router isis
  net 49.0001.1921.6801.0000.00
  passive-interface Loopback0

```

```

!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 192.168.8.253
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is 192.168.8.253 to network 0.0.0.0

```

S*    0.0.0.0/0 [1/0] via 192.168.8.253
      192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.4.0/24 is directly connected, Loopback1
L      192.168.4.1/32 is directly connected, Loopback1
      192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.5.0/24 is directly connected, Loopback2
L      192.168.5.1/32 is directly connected, Loopback2
      192.168.6.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.6.0/24 is directly connected, Loopback3
L      192.168.6.1/32 is directly connected, Loopback3
      192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.8.252/30 is directly connected, GigabitEthernet0/1
L      192.168.8.254/32 is directly connected, GigabitEthernet0/1

```

```
192.168.9.0/32 is subnetted, 1 subnets
i L1    192.168.9.0 [115/10] via 192.168.8.253, GigabitEthernet0/1
192.168.10.0/32 is subnetted, 1 subnets
C       192.168.10.0 is directly connected, Loopback0
```

PING RESULTS:

```
3600#ping 192.168.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms
```

```
3600#ping 192.168.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms
```

```
3600#ping 192.168.2.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms
```

```
3600#ping 192.168.3.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms
```

```
3600#ping 192.168.4.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms
```

```
3600#ping 192.168.5.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms
```

3600#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

3750#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3750#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

2900#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

7.3.3 VLAN AND SWITHCING

SWITCH 1: 3750

3750#sh run

Building configuration...

Current configuration : 1901 bytes

!

version 12.2

no service pad

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

enable secret 5 \$1\$5NvD\$.LGE3IlzGGPruQjhzuSA.1

enable password mint709

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

!

spanning-tree vlan 31 priority 8192

!

interface GigabitEthernet1/0/1

switchport access vlan 31

```

    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!

```

```

interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

```

```

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports
-----------	--------	-------

1	default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24, Gi1/0/25 Gi1/0/26, Gi1/0/27, Gi1/0/28
31	red	active	Gi1/0/1
32	blue	active	Gi1/0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	ieee	-	0	0	
1005	trnet	101005	1500	-	-	ibm	-	0	0	

Remote SPAN VLANs

Primary	Secondary	Type	Ports
---------	-----------	------	-------

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

!

version 12.0

no service pad

no service password-encryption

!

hostname 3500

!


```

enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!
interface FastEthernet0/1
    switchport access vlan 31
!
interface FastEthernet0/2
    switchport access vlan 32
!
interface FastEthernet0/3
    description connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/4
    description second connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!

```

```

interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
-----------	--------	-------

```

-----
1      default                                active  Fa0/4, Fa0/5, Fa0/6, Fa0/7,
                                           Fa0/8, 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, Gi0/1, Gi0/2
31     red                                  active  Fa0/1
32     blue                                  active  Fa0/2
1002 fddi-default                          active
1003 token-ring-default                    active
1004 fddinet-default                      active
1005 trnet-default                        active

```

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	1002	1003
31	enet	100031	1500	-	-	-	-	-	0	0
32	enet	100032	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	1	1003
1003	tr	101003	1500	1005	0	-	-	srb	1	1002
1004	fdnet	101004	1500	-	-	1	ibm	-	0	0
1005	trnet	101005	1500	-	-	1	ibm	-	0	0

ROUTER 2800

2800#sh run

```

Building configuration...
Current configuration : 1155 bytes
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2800
!
boot-start-marker
boot-end-marker
!
no aaa new-model
memory-size iomem 10
!
ip cef
!

```

```

multilink bundle-name authenticated
!
voice-card 0
  no dspfarm
!
interface GigabitEthernet0/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
!
interface GigabitEthernet0/1.31
  encapsulation dot1Q 31
  ip address 192.168.50.51 255.255.255.240
!
interface GigabitEthernet0/1.32
  encapsulation dot1Q 32
  ip address 192.168.50.67 255.255.255.240
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
  no ip address
  shutdown
  no fair-queue
!
interface Vlan1
  no ip address
!
ip http server
no ip http secure-server
!
control-plane

```

```

!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

7.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

Building configuration...

Current configuration : 1846 bytes

```

!
version 12.2
no service pa
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker

```

```

boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13

```

```

!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```
!  
version 12.0  
no service pad  
no service password-encryption  
!  
hostname 3500  
!  
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/  
!  
spanning-tree vlan 32 priority 8192  
ip subnet-zero  
!  
interface FastEthernet0/1  
    switchport access vlan 31  
!  
interface FastEthernet0/2  
    switchport access vlan 32  
!  
interface FastEthernet0/3  
    description connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/4  
    description second connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10
```



```

!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none

```

```

stopbits 1
line vty 0 4
password letmein
login
line vty 5 15
password letmein
login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost      19
           Port      3 (GigabitEthernet1/0/3)
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time 300 sec

```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/3	Root	FWD	19	128.3	P2p
Gi1/0/4	Altn	BLK	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    8223  (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time 300 sec

```

Interface	Role	Sts	Cost	Prio.Nbr	Type
-----------	------	-----	------	----------	------

```

-----
Gi1/0/3          Desg FWD 19          128.3    P2p
Gi1/0/4          Desg FWD 19          128.4    P2p

```

VLAN0032

Spanning tree enabled protocol ieee

```

Root ID      Priority    8192
              Address      0007.eb94.7202
              Cost        19
              Port        3 (GigabitEthernet1/0/3)
              Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID    Priority    32800   (priority 32768 sys-id-ext 32)
              Address      0018.186e.7b00
              Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec
              Aging Time   15      sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/2            Desg FWD 4          128.2    P2p
Gi1/0/3            Root FWD 19         128.3    P2p
Gi1/0/4            Altn BLK 19         128.4    P2p

```

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

```

ROOT ID      Priority 32768
              Address 0007.eb94.7200
              This bridge is the root
              Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Bridge ID    Priority    32768
              Address      0007.eb94.7200
              Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec

```

```

Port
Name      Port ID Prio Cost Sts   Cost Bridge ID      Port ID
-----
Fa0/3     128.15  128   19   FWD   0     0007.eb94.7200 128.15
Fa0/4     128.16  128   19   FWD   0     0007.eb94.7200 128.16
Fa0/5     128.17  128   19   BLK   0     0007.eb94.7200 128.17
Fa0/6     128.18  128   100  BLK   0     0007.eb94.7200 128.18
Fa0/7     128.19  128   100  BLK   0     0007.eb94.7200 128.19

```

Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32768

Address 0007.eb94.7200

Cost 19

Port 4 (GigabitEthernet1/0/4)

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Root	FWD	19	128.4		P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768

Address 0007.eb94.7200

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7200

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

```

-----
Fa0/24  128.38  128  100  BLK  0      0007.eb94.7200 128.38
Gi0/1   128.40  128  100  BLK  0      0007.eb94.7200 128.40
Gi0/2   128.48  128  100  BLK  0      0007.eb94.7200 128.48

```

VLAN31

```

Spanning tree enabled protocol IEEE
ROOT ID    Priority 8223
            Address 0018.186e.7b00
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    32768
            Address    0007.eb94.7201
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

```

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

```

Spanning tree enabled protocol IEEE
ROOT ID    Priority 8192
            Address 0007.eb94.7202
            This bridge is the root
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    8192
            Address    0007.eb94.7202
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

```

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2


```

C:\Users\joyce>ping 192.168.30.9

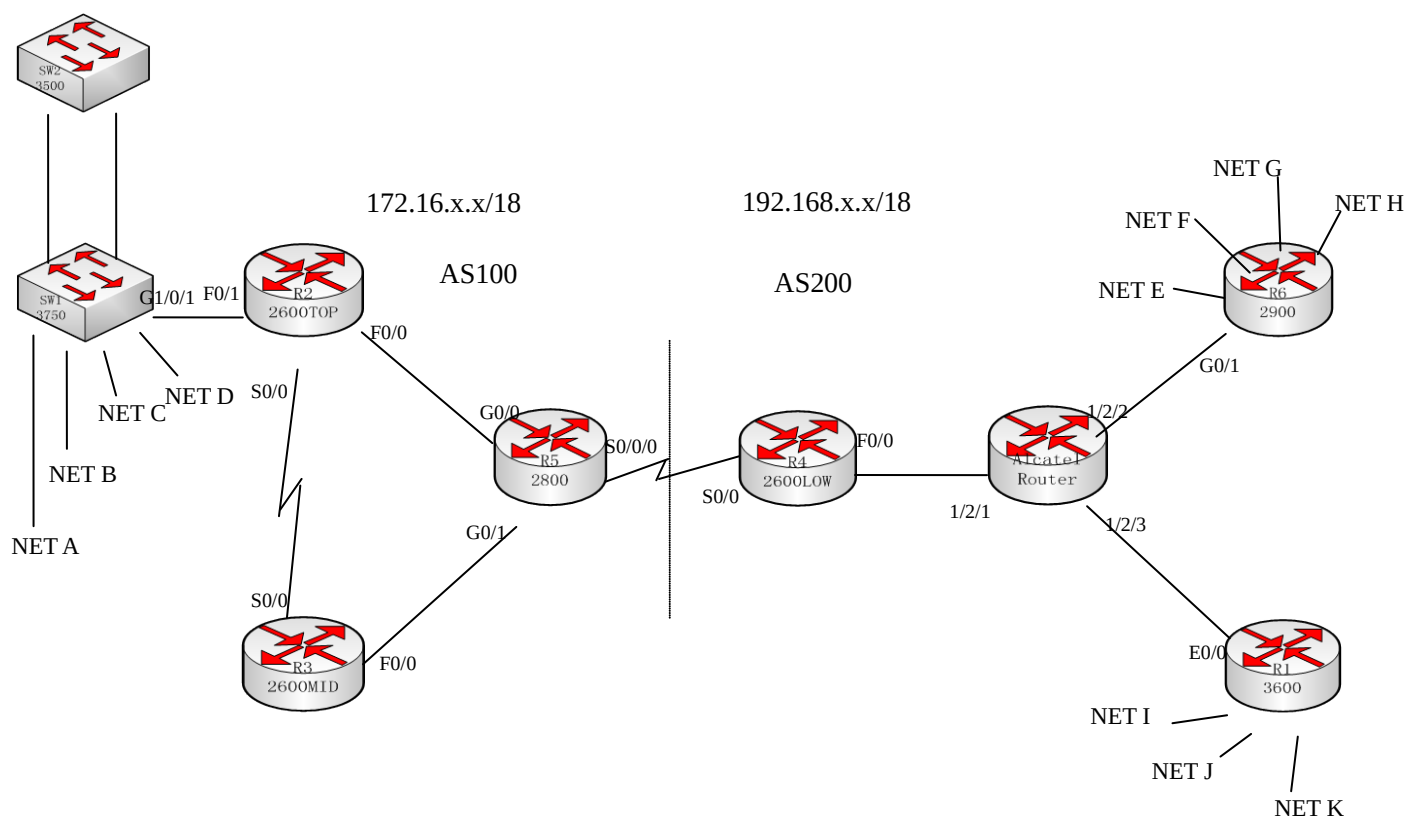
Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

Chapter 8 Routing and switching lab exam 8

8.1 lab topology and questions



Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.

3. Do not save any config on Desktop or on the routers
 4. When done just let instructor know to copy your configs.
 5. Clean your rack after use by securing all cables.
-
1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2900(R6), Cisco 3750 and Cisco 3600(R1) according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')
 2. Configure RIPv2 in Cisco 2600(R2), Cisco 2600(R3) and Cisco 2800(R5) to let them reach each other. (10')
 3. Configure OSPF in Cisco 2900(R6), Cisco 3600(R1), Alcatel router and Cisco 2600(R4) within area 0. (10')
 4. Configure EBGp in Cisco 2600(R4) and Cisco 2800(R5), don't advertise autonomous system network topology behind R4 and R5. Instead you should be advertising /18 network. (20')
 5. Configure ISIS in Cisco 2600(R2) and Cisco 2600(R3). (10')
 6. Configure Static routes in Cisco 2800(R5) and Cisco 3750. (10')
-
7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')
 8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

8.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2900(R6) and Cisco 3600(R1) to the nets of Cisco 3750 at the the other side of the whole network, and from Cisco 3750 to the nets of Cisco 2900(R6) and Cisco 3600(R1). For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2600(R4).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

8.3 lab solution

8.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
Cisco 3750	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	G1/0/1:172.16.4.253/30	
R2 Cisco 2600	F0/0:172.16.5.253/30	F0/1:172.16.4.254/30
	S0/0:172.16.5.249/30	
R3 Cisco 2600	F0/0:172.16.6.253/30	S0/0:172.16.5.250/30
R5 Cisco 2800	G0/0:172.16.5.254/30	G0/1:192.168.6.254/30
	S0/0/0:172.16.7.253/30	
R4 Cisco 2600	S0/0:172.16.7.254/30	F0/0:192.168.9.253/30
Alcatel router	Port 1/2/1:192.168.9.254/30	Port 1/2/2:192.168.7.253/30
	Port 1/2/3:192.168.8.253/30	
R6 Cisco 2900	Net E:192.168.0.1/24	Net F:192.168.1.1/24
	Net G:192.168.2.1/24	Net H:192.168.3.1/24
	G0/1:192.168.7.254/30	
R1 Cisco 3600	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	E0/0:192.168.8.254/30

8.3.2 ROUTING TASK

3750#sh run

```
Building configuration...
Current configuration : 1751 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3750
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
ip subnet-zero
```

```

ip routing
!
no file verify auto
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
interface Loopback1
 ip address 172.16.0.1 255.255.255.0
!
interface Loopback2
 ip address 172.16.1.1 255.255.255.0
!
interface Loopback3
 ip address 172.16.2.1 255.255.255.0
!
interface Loopback4
 ip address 172.16.3.1 255.255.255.0
!
interface GigabitEthernet1/0/1
 no switchport
 ip address 172.16.4.253 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!

```

```

interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.4.254
ip http server
!
control-plane
!

```

```
line con 0
line vty 5 15
!
end
```

3750#sh ip route

Codes: 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, su - IS-IS summary, 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 172.16.4.254 to network 0.0.0.0

```
172.16.0.0/16 is variably subnetted, 5 subnets, 2 masks
C      172.16.4.252/30 is directly connected, GigabitEthernet1/0/1
C      172.16.0.0/24 is directly connected, Loopback1
C      172.16.1.0/24 is directly connected, Loopback2
C      172.16.2.0/24 is directly connected, Loopback3
C      172.16.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 172.16.4.254
```

2600top#sh run

```
Building configuration...
Current configuration : 1129 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
```

```

memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
 ip address 172.16.8.0 255.255.255.255
!
interface FastEthernet0/0
 ip address 172.16.5.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.249 255.255.255.252
 ip router isis
 clock rate 64000
 no fair-queue
!
interface FastEthernet0/1
 ip address 172.16.4.254 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/1
 no ip address
 shutdown
!
router isis
 net 49.0001.1720.1600.8000.00
 redistribute connected
 redistribute static ip
 redistribute rip
 passive-interface Loopback0
!
router rip
 version 2
 redistribute connected
 redistribute static
 network 172.16.0.0
!
ip http server
ip classless

```

```

ip route 0.0.0.0 0.0.0.0 172.16.5.254
ip route 172.16.0.0 255.255.252.0 172.16.4.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 172.16.5.254 to network 0.0.0.0

```

172.16.0.0/16 is variably subnetted, 6 subnets, 3 masks
C       172.16.5.248/30 is directly connected, Serial0/0
C       172.16.4.252/30 is directly connected, FastEthernet0/1
C       172.16.5.252/30 is directly connected, FastEthernet0/0
C       172.16.8.0/32 is directly connected, Loopback0
i L1    172.16.9.0/32 [115/10] via 172.16.5.250, Serial0/0
S       172.16.0.0/22 [1/0] via 172.16.4.253
S*     0.0.0.0/0 [1/0] via 172.16.5.254

```

2600mid#sh run

```

Building configuration...
Current configuration : 777 bytes
!
version 12.3

```



```

service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600mid
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback0
  ip address 172.16.9.0 255.255.255.255
!
interface FastEthernet0/0
  ip address 172.16.6.253 255.255.255.252
  duplex auto
  speed auto
!
interface Serial0/0
  ip address 172.16.5.250 255.255.255.252
  ip router isis
  no fair-queue
!
interface Serial0/1
  no ip address
  shutdown
!
router isis
  net 49.0001.1720.1600.9000.00
  passive-interface Loopback0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0

```

```

line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

          172.16.0.0/16 is variably subnetted, 7 subnets, 3 masks
C          172.16.5.248/30 is directly connected, Serial0/0
i L2      172.16.4.252/30 [115/10] via 172.16.5.249, Serial0/0
i L2      172.16.5.252/30 [115/10] via 172.16.5.249, Serial0/0
C          172.16.6.252/30 is directly connected, FastEthernet0/0
i L1      172.16.8.0/32 [115/10] via 172.16.5.249, Serial0/0
C          172.16.9.0/32 is directly connected, Loopback0
i L2      172.16.0.0/22 [115/10] via 172.16.5.249, Serial0/0

```

2800#sh run

```

Building configuration...
Current configuration : 1242 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2800
!
boot-start-marker
boot-end-marker

```

```

!
no aaa new-model
memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
    no dspfarm
!
vlan internal allocation policy ascending
!
interface GigabitEthernet0/0
    ip address 172.16.5.254 255.255.255.252
    duplex auto
    speed auto
!
interface GigabitEthernet0/1
    ip address 172.16.6.254 255.255.255.252
    duplex auto
    speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
    ip address 172.16.7.253 255.255.255.252
    no fair-queue
    clock rate 64000
!
interface Vlan1
    no ip address
!
router rip
    network 172.16.0.0
!
router bgp 100
    no synchronization

```

```

bgp log-neighbor-changes
network 172.16.0.0 mask 255.255.192.0
neighbor 172.16.7.254 remote-as 200
no auto-summary
!
ip route 172.16.0.0 255.255.192.0 Null0
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

172.16.0.0/16 is variably subnetted, 8 subnets, 4 masks
R      172.16.5.248/30 [120/1] via 172.16.5.253, 00:00:05, GigabitEthernet0/0
R      172.16.4.252/30 [120/1] via 172.16.5.253, 00:00:05, GigabitEthernet0/0
C      172.16.5.252/30 is directly connected, GigabitEthernet0/0
C      172.16.6.252/30 is directly connected, GigabitEthernet0/1
C      172.16.7.252/30 is directly connected, Serial0/0/0
R      172.16.8.0/32 [120/1] via 172.16.5.253, 00:00:05, GigabitEthernet0/0
R      172.16.0.0/22 [120/1] via 172.16.5.253, 00:00:07, GigabitEthernet0/0
S      172.16.0.0/18 is directly connected, Null0
B      192.168.0.0/18 [20/0] via 172.16.7.254, 00:13:46

```

2800#sh ip bgp

BGP table version is 3, local router ID is 172.16.7.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.7.254	0		0	200 i

2600low#sh run

Building configuration...

Current configuration : 900 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600low

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface FastEthernet0/0

ip address 192.168.9.253 255.255.255.252

duplex auto

speed auto

!

interface Serial0/0

ip address 172.16.7.254 255.255.255.252

```

    no fair-queue
!
interface Serial0/1
    no ip address
    shutdown
!
router ospf 1
    log-adjacency-changes
    network 192.168.9.252 0.0.0.3 area 0
!
router bgp 200
    no synchronization
    bgp log-neighbor-changes
    network 192.168.0.0 mask 255.255.192.0
    neighbor 172.16.7.253 remote-as 100
    no auto-summary
!
ip http server
ip classless
ip route 192.168.0.0 255.255.192.0 Null0
!
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

192.168.8.0/30 is subnetted, 1 subnets
O 192.168.8.252 [110/10001] via 192.168.9.254, 00:01:27, FastEthernet0/0
192.168.9.0/30 is subnetted, 1 subnets
C 192.168.9.252 is directly connected, FastEthernet0/0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.16.7.252/30 is directly connected, Serial0/0
B 172.16.0.0/18 [20/0] via 172.16.7.253, 00:14:17
192.168.4.0/32 is subnetted, 1 subnets
O 192.168.4.1 [110/10002] via 192.168.9.254, 00:01:27, FastEthernet0/0
192.168.5.0/32 is subnetted, 1 subnets
O 192.168.5.1 [110/10002] via 192.168.9.254, 00:01:28, FastEthernet0/0
192.168.6.0/32 is subnetted, 1 subnets
O 192.168.6.1 [110/10002] via 192.168.9.254, 00:01:28, FastEthernet0/0
192.168.7.0/30 is subnetted, 1 subnets
O 192.168.7.252 [110/1001] via 192.168.9.254, 00:01:28, FastEthernet0/0
192.168.0.0/32 is subnetted, 1 subnets
O 192.168.0.1 [110/1002] via 192.168.9.254, 00:01:28, FastEthernet0/0
192.168.1.0/32 is subnetted, 1 subnets
O 192.168.1.1 [110/1002] via 192.168.9.254, 00:01:28, FastEthernet0/0
192.168.2.0/32 is subnetted, 1 subnets
O 192.168.2.1 [110/1002] via 192.168.9.254, 00:01:28, FastEthernet0/0
192.168.3.0/32 is subnetted, 1 subnets
O 192.168.3.1 [110/1002] via 192.168.9.254, 00:01:28, FastEthernet0/0
S 192.168.0.0/18 is directly connected, Null0

2600low#sh ip bgp

BGP table version is 3, local router ID is 192.168.9.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.7.253	0		0 100	i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

***A:NS085167007# admin display-config**

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

```
# All rights reserved. All use subject to applicable license agreements.
# Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main
# Generated WED NOV 23 05:40:00 2011 UTC
exit all
configure
```

```
#-----
echo "System Configuration"
#-----
```

```
system
  ccm 1
  exit
  snmp
    shutdown
  exit
  time
    sntp
      shutdown
    exit
  zone UTC
  exit
  thresholds
    rmon
    exit
  exit
exit
```

```
#-----
echo "System Security Configuration"
#-----
```

```
system
  security
    per-peer-queuing
  exit
exit
```

```
#-----
echo "Log Configuration"
#-----
```

```
log
exit
```



```
#-----  
echo "System Security Cpm Hw Filters Configuration"  
#-----
```

```
system  
    security  
    exit  
exit
```

```
#-----  
echo "QoS Policy Configuration"  
#-----
```

```
qos  
exit
```

```
#-----  
echo "Card Configuration"  
#-----
```

```
card 1  
    card-type iom-9g  
    mda 2  
        mda-type c8-10/100eth-tx  
    exit  
exit
```

```
#-----  
echo "Port Configuration"  
#-----
```

```
port 1/2/1  
    ethernet  
    exit  
    no shutdown  
exit  
port 1/2/2  
    ethernet  
    exit  
    no shutdown  
exit  
port 1/2/3  
    ethernet
```

```

        exit
        no shutdown
    exit
    port 1/2/4
        shutdown
        ethernet
        exit
    exit
    port 1/2/5
        shutdown
        ethernet
        exit
    exit
    port 1/2/6
        shutdown
        ethernet
        exit
    exit
    port 1/2/7
        shutdown
        ethernet
        exit
    exit
    port 1/2/8
        shutdown
        ethernet
        exit
    exit

#-----
echo "System Sync-If-Timing Configuration"
#-----

    system
        sync-if-timing
            begin
            commit
        exit
    exit

#-----
echo "Management Router Configuration"
#-----

```

```

router management
exit

#-----
echo "Router (Network Side) Configuration"
#-----

router
  interface "system"
  exit
  interface "to2600low"
    address 192.168.9.254/30
    port 1/2/1
  exit
  interface "to2900"
    address 192.168.7.253/30
    port 1/2/2
  exit
  interface "to3600"
    address 192.168.8.253/30
    port 1/2/3
  exit

#-----
echo "Static Route Configuration"
#-----

static-route 0.0.0.0/0 next-hop 192.168.9.253

#-----
echo "OSPFv2 Configuration"
#-----

ospf
  export "ospf"
  area 0.0.0.0
    interface "to2600low"
    exit
    interface "to2900"
    exit
    interface "to3600"
    exit
  exit
exit

```

```

        exit

#-----
echo "Service Configuration"
#-----

    service
        customer 1 create
            description "Default customer"
        exit
    exit

#-----
echo "Router (Service Side) Configuration"
#-----

    router

#-----
echo "OSPFv2 Configuration"
#-----

    ospf
    exit

#-----
echo "Policy Configuration"
#-----

    policy-options
        begin
        policy-statement "ospf"
            entry 1
                from
                    protocol direct
            exit
            action accept
        exit
    exit
    commit
exit
exit all

```

Finished WED NOV 23 05:40:06 2011 UTC

***A:NS085167007# show router route-table**

Route Table (Router: Base)					
Dest Prefix	Type	Proto	Age	Pref	
Next Hop[Interface Name]					Metric
0.0.0.0/0	Remote	Static	00h10m13s	5	
192.168.9.253			1		
192.168.0.1/32	Remote	OSPF	00h07m25s	10	
192.168.7.254			1001		
192.168.1.1/32	Remote	OSPF	00h07m25s	10	
192.168.7.254			1001		
192.168.2.1/32	Remote	OSPF	00h07m25s	10	
192.168.7.254			1001		
192.168.3.1/32	Remote	OSPF	00h07m25s	10	
192.168.7.254			1001		
192.168.4.1/32	Remote	OSPF	00h02m35s	10	
192.168.8.254			10001		
192.168.5.1/32	Remote	OSPF	00h02m36s	10	
192.168.8.254			10001		
192.168.6.1/32	Remote	OSPF	00h02m36s	10	
192.168.8.254			10001		
192.168.7.252/30	Local	Local	00h08m25s	0	
to2900			0		
192.168.8.252/30	Local	Local	00h03m25s	0	
to3600			0		
192.168.9.252/30	Local	Local	00h13m43s	0	
to2600low			0		
No. of Routes: 11					

2900#sh run

Building configuration...

Current configuration : 1422 bytes

```
!  
! Last configuration change at 04:36:37 UTC Wed Nov 23 2011  
!  
version 15.0  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname 2900  
!  
boot-start-marker  
boot-end-marker  
!  
no aaa new-model  
!  
no ipv6 cef  
ip source-route  
ip cef  
!  
multilink bundle-name authenticated  
!  
license udi pid CISCO2921/K9 sn FGL150811PR  
license boot module c2900 technology-package datak9  
!  
redundancy  
!  
interface Loopback1  
    ip address 192.168.0.1 255.255.255.0  
!  
interface Loopback2  
    ip address 192.168.1.1 255.255.255.0  
!  
interface Loopback3  
    ip address 192.168.2.1 255.255.255.0  
!  
interface Loopback4  
    ip address 192.168.3.1 255.255.255.0  
!  
interface GigabitEthernet0/0  
    no ip address  
    shutdown  
    duplex auto  
    speed auto  
!
```

```

interface GigabitEthernet0/1
  ip address 192.168.7.254 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/2
  no ip address
  shutdown
  duplex auto
  speed auto
!
router ospf 1
  log-adjacency-changes
  network 192.168.0.0 0.0.0.255 area 0
  network 192.168.1.0 0.0.0.255 area 0
  network 192.168.2.0 0.0.0.255 area 0
  network 192.168.3.0 0.0.0.255 area 0
  network 192.168.7.252 0.0.0.3 area 0
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 192.168.7.253
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is 192.168.7.253 to network 0.0.0.0

```
S* 0.0.0.0/0 [1/0] via 192.168.7.253
    192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.0.0/24 is directly connected, Loopback1
L    192.168.0.1/32 is directly connected, Loopback1
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, Loopback2
L    192.168.1.1/32 is directly connected, Loopback2
    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/24 is directly connected, Loopback3
L    192.168.2.1/32 is directly connected, Loopback3
    192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, Loopback4
L    192.168.3.1/32 is directly connected, Loopback4
    192.168.4.0/32 is subnetted, 1 subnets
O    192.168.4.1
        [110/10002] via 192.168.7.253, 00:02:59, GigabitEthernet0/1
    192.168.5.0/32 is subnetted, 1 subnets
O    192.168.5.1
        [110/10002] via 192.168.7.253, 00:03:00, GigabitEthernet0/1
    192.168.6.0/32 is subnetted, 1 subnets
O    192.168.6.1
        [110/10002] via 192.168.7.253, 00:03:00, GigabitEthernet0/1
    192.168.7.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.7.252/30 is directly connected, GigabitEthernet0/1
L    192.168.7.254/32 is directly connected, GigabitEthernet0/1
    192.168.8.0/30 is subnetted, 1 subnets
O    192.168.8.252
        [110/10001] via 192.168.7.253, 00:03:54, GigabitEthernet0/1
    192.168.9.0/30 is subnetted, 1 subnets
O    192.168.9.252
        [110/1001] via 192.168.7.253, 00:08:04, GigabitEthernet0/1
```

3600#sh run

Building configuration...

Current configuration : 992 bytes


```

!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
!
ip cef
!
interface Loopback1
 ip address 192.168.4.1 255.255.255.0
!
interface Loopback2
 ip address 192.168.5.1 255.255.255.0
!
interface Loopback3
 ip address 192.168.6.1 255.255.255.0
!
interface Ethernet0/0
 ip address 192.168.8.254 255.255.255.252
 half-duplex
!
interface FastEthernet1/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface FastEthernet2/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
router ospf 1
 log-adjacency-changes

```

```

network 192.168.4.0 0.0.0.255 area 0
network 192.168.5.0 0.0.0.255 area 0
network 192.168.6.0 0.0.0.255 area 0
network 192.168.8.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.8.253
!
line con 0
line aux 0
line vty 0 4
!
end

```

3600#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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 192.168.8.253 to network 0.0.0.0

```

192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, Ethernet0/0
192.168.9.0/30 is subnetted, 1 subnets
O      192.168.9.252 [110/1010] via 192.168.8.253, 00:03:38, Ethernet0/0
C      192.168.4.0/24 is directly connected, Loopback1
C      192.168.5.0/24 is directly connected, Loopback2
C      192.168.6.0/24 is directly connected, Loopback3
192.168.7.0/30 is subnetted, 1 subnets
O      192.168.7.252 [110/1010] via 192.168.8.253, 00:03:38, Ethernet0/0
192.168.0.0/32 is subnetted, 1 subnets
O      192.168.0.1 [110/1011] via 192.168.8.253, 00:03:39, Ethernet0/0
192.168.1.0/32 is subnetted, 1 subnets
O      192.168.1.1 [110/1011] via 192.168.8.253, 00:03:39, Ethernet0/0
192.168.2.0/32 is subnetted, 1 subnets
O      192.168.2.1 [110/1011] via 192.168.8.253, 00:03:39, Ethernet0/0
192.168.3.0/32 is subnetted, 1 subnets

```

O 192.168.3.1 [110/1011] via 192.168.8.253, 00:03:39, Ethernet0/0
S* 0.0.0.0/0 [1/0] via 192.168.8.253

PING RESULTS:

3750#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3750#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/33 ms

3750#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3750#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3750#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3750#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

2900#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/28 ms

2900#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2900#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2900#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

3600# ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

3600# ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3600# ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/36 ms

3600# ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

8.3.3 VLAN AND SWITHCING

SWITCH 1: 3750

3750#sh run

Building configuration...

Current configuration : 1901 bytes

!

version 12.2

no service pad

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

enable secret 5 \$1\$5NvD\$.LGE3IlzGGPruQjhzuSA.1

enable password mint709

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

!

spanning-tree vlan 31 priority 8192

!

interface GigabitEthernet1/0/1

switchport access vlan 31

switchport mode access

!

interface GigabitEthernet1/0/2

switchport access vlan 32

```

    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!

```

```

interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports
1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11,Gi1/0/12, Gi1/0/13

			Gi1/0/14, Gi1/0/15, Gi1/0/16
			Gi1/0/17, Gi1/0/18, Gi1/0/19
			Gi1/0/20, Gi1/0/21, Gi1/0/22
			Gi1/0/23, Gi1/0/24, Gi1/0/25
			Gi1/0/26, Gi1/0/27, Gi1/0/28
31	red	active	Gi1/0/1
32	blue	active	Gi1/0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	ieee	-	0	0	
1005	trnet	101005	1500	-	-	ibm	-	0	0	

Remote SPAN VLANs

Primary	Secondary	Type	Ports
---------	-----------	------	-------

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!

```



```

interface FastEthernet0/1
  switchport access vlan 31
!
interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!

```

```

interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 000000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2
31	red		active	Fa0/1
32	blue		active	Fa0/2
1002	fddi-default		active	
1003	token-ring-default		active	
1004	fddinet-default		active	
1005	trnet-default		active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	1002	1003	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	1	1003	
1003	tr	101003	1500	1005	0	-	srb	1	1002	
1004	fdnet	101004	1500	-	1	ibm	-	0	0	
1005	trnet	101005	1500	-	1	ibm	-	0	0	

2600top#sh run

```

Building configuration...
Current configuration : 909 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
  no ip address
  duplex auto

```

```

    speed auto
!
interface Serial0/0
    no ip address
    clock rate 64000
    no fair-queue
!
interface FastEthernet0/1
    no ip address
    duplex auto
    speed auto
!
interface FastEthernet0/1.31
    encapsulation dot1Q 31
    ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet0/1.32
    encapsulation dot1Q 32
    ip address 192.168.50.67 255.255.255.240
!
interface Serial0/1
    no ip address
    shutdown
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

8.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

```

Building configuration...
Current configuration : 1846 bytes
!
version 12.2
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!

```

```
interface GigabitEthernet1/0/2
  switchport access vlan 32
  switchport mode access
!
interface GigabitEthernet1/0/3
  description connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/4
  description second connection to 3500
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
```

```

interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$Seq5NjgeKIYdni348aUnoh/

```

```

!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
    switchport access vlan 31
!
interface FastEthernet0/2
    switchport access vlan 32
!
interface FastEthernet0/3
    description connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/4
    description second connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!

```



```

interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32768
 Address 0007.eb94.7200
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/3	Root	FWD	19	128.3	P2p
Gi1/0/4	Altn	BLK	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/3	Desg	FWD	19	128.3	P2p
Gi1/0/4	Desg	FWD	19	128.4	P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)

Address 0018.186e.7b00
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 15 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/3	Root	FWD	19	128.3		P2p
Gi1/0/4	Altn	BLK	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE
ROOT ID Priority 32768
Address 0007.eb94.7200
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
Address 0007.eb94.7200
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29

Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE
 ROOT ID Priority 8223
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7201
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
-----	-----	----	----	----	-----	-----	-----
Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE
 ROOT ID Priority 8192
 Address 0007.eb94.7202
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192
 Address 0007.eb94.7202
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated
------	------------

Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```
Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost        19
           Port        4 (GigabitEthernet1/0/4)
           Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec
```

```
Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time   2 sec   Max Age 20 sec   Forward Delay 15 sec
           Aging Time   300 sec
```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Root	FWD	19	128.4	P2p	

VLAN0031

Spanning tree enabled protocol ieee

```
Root ID    Priority    8223
```

Address 0018.186e.7b00
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
Address 0018.186e.7b00
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee
Root ID Priority 8192
Address 0007.eb94.7202
Cost 19
Port 4 (GigabitEthernet1/0/4)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
Address 0018.186e.7b00
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE
ROOT ID Priority 32768
Address 0007.eb94.7200
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
Address 0007.eb94.7200
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
-----	-----	-----	-----	-----	-----	-----	-----
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

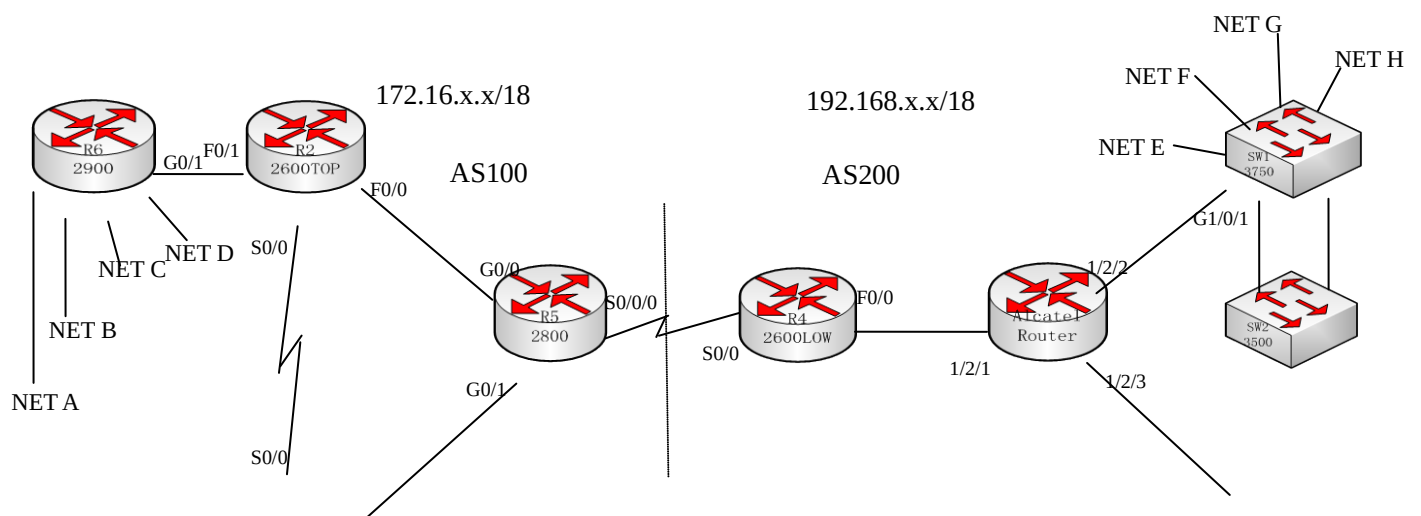
```
C:\Users\joyce>ping 192.168.30.9

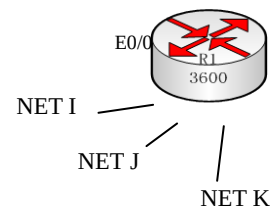
Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```


Chapter 9 Routing and switching lab exam 9

9.1 lab topology and questions





Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2900(R6), Cisco 3750 and Cisco 3600(R1) according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')
2. Configure RIPv2 in Cisco 2600(R4), Alcatel router and Cisco 3600(R1) to let them reach each other. (10')
3. Configure OSPF in Cisco 2800(R5), Cisco 2600(R2) and Cisco 2600(R3) within area 0. (10')
4. Configure EBGP in Cisco 2600(R4) and Cisco 2800(R5), don't advertise autonomous system network topology behind R4 and R5. Instead you should be advertising /18 network. (20')
5. Configure ISIS in Cisco 2900(R6) and Cisco 2600(R2). (10')
6. Configure Static routes in Alcatel router and Cisco 3750. (10')
7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')
8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

9.2 what to hand in

1. For the routing tasks, you should ping from Cisco 2900(R6) to the nets of Cisco 3750 and Cisco 3600(R1) at the the other side of the whole network, and from Cisco 3750 and Cisco 3600(R1)to the nets of Cisco 2900(R6). For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2600(R4).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before

and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

9.3 lab solution

9.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
R6 Cisco 2900	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	G0/1:172.16.4.253/30	
R2 Cisco 2600	F0/0:172.16.5.253/30	F0/1:172.16.4.254/30
	S0/0:172.16.5.249/30	
R3 Cisco 2600	F0/0:172.16.6.253/30	S0/0:172.16.5.250/30
R5 Cisco 2800	G0/0:172.16.5.254/30	G0/1:192.168.6.254/30
	S0/0/0:172.16.7.253/30	
R4 Cisco 2600	S0/0:172.16.7.254/30	F0/0:192.168.9.253/30
Alcatel router	Port 1/2/1:192.168.9.254/30	Port 1/2/2:192.168.7.253/30
	Port 1/2/3:192.168.8.253/30	
Cisco 3750	Net E:192.168.0.1/24	Net F:192.168.1.1/24
	Net G:192.168.2.1/24	Net H:192.168.3.1/24
	G1/0/1:192.168.7.254/30	
R1 Cisco 3600	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	E0/0:192.168.8.254/30

9.3.2 ROUTING TASK

2900#sh run

```
Building configuration...
Current configuration : 1407 bytes
!
! Last configuration change at 06:20:12 UTC Wed Nov 23 2011
!
version 15.0
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2900
!
```

```
boot-start-marker
boot-end-marker
!
no aaa new-model
!
no ipv6 cef
ip source-route
ip cef
!
multilink bundle-name authenticated
!
license udi pid CISCO2921/K9 sn FGL150811PR
license boot module c2900 technology-package datak9
!
redundancy
!
interface Loopback0
  ip address 172.16.8.0 255.255.255.255
!
interface Loopback1
  ip address 172.16.0.1 255.255.255.0
  ip router isis
!
interface Loopback2
  ip address 172.16.1.1 255.255.255.0
  ip router isis
!
interface Loopback3
  ip address 172.16.2.1 255.255.255.0
  ip router isis
!
interface Loopback4
  ip address 172.16.3.1 255.255.255.0
  ip router isis
!
interface GigabitEthernet0/0
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 172.16.4.253 255.255.255.252
  ip router isis
```

```

duplex auto
speed auto
!
interface GigabitEthernet0/2
no ip address
shutdown
duplex auto
speed auto
!
router isis
net 49.0001.1720.1600.8000.00
passive-interface Loopback0
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 172.16.4.254
!
control-plane
!
line con 0
line aux 0
line vty 0 4
login
!
scheduler allocate 20000 1000
end

```

2900#sh 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
 i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is 172.16.4.254 to network 0.0.0.0

```
S*    0.0.0.0/0 [1/0] via 172.16.4.254
```

```

172.16.0.0/16 is variably subnetted, 12 subnets, 3 masks
C      172.16.0.0/24 is directly connected, Loopback1
L      172.16.0.1/32 is directly connected, Loopback1
C      172.16.1.0/24 is directly connected, Loopback2
L      172.16.1.1/32 is directly connected, Loopback2
C      172.16.2.0/24 is directly connected, Loopback3
L      172.16.2.1/32 is directly connected, Loopback3
C      172.16.3.0/24 is directly connected, Loopback4
L      172.16.3.1/32 is directly connected, Loopback4
C      172.16.4.252/30 is directly connected, GigabitEthernet0/1
L      172.16.4.253/32 is directly connected, GigabitEthernet0/1
C      172.16.8.0/32 is directly connected, Loopback0
i L1   172.16.9.0/32 [115/10] via 172.16.4.254, GigabitEthernet0/1

```

2600top#sh run

Building configuration...

Current configuration : 1136 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600top

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface Loopback0

ip address 172.16.9.0 255.255.255.255

!

interface FastEthernet0/0

ip address 172.16.5.253 255.255.255.252

```

duplex auto
speed auto
!
interface Serial0/0
ip address 172.16.5.249 255.255.255.252
clock rate 64000
no fair-queue
!
interface FastEthernet0/1
ip address 172.16.4.254 255.255.255.252
ip router isis
duplex auto
speed auto
!
interface Serial0/1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
redistribute connected subnets
redistribute static subnets
redistribute isis level-1 subnets
network 172.16.5.248 0.0.0.3 area 0
network 172.16.5.252 0.0.0.3 area 0
!
router isis
net 49.0001.1720.1600.9000.00
passive-interface Loopback0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.5.254
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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 172.16.5.254 to network 0.0.0.0

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks

```
C      172.16.5.248/30 is directly connected, Serial0/0
C      172.16.4.252/30 is directly connected, FastEthernet0/1
C      172.16.5.252/30 is directly connected, FastEthernet0/0
O      172.16.6.252/30 [110/2] via 172.16.5.254, 00:15:55, FastEthernet0/0
i L1   172.16.8.0/32 [115/10] via 172.16.4.253, FastEthernet0/1
C      172.16.9.0/32 is directly connected, Loopback0
i L1   172.16.0.0/24 [115/20] via 172.16.4.253, FastEthernet0/1
i L1   172.16.1.0/24 [115/20] via 172.16.4.253, FastEthernet0/1
i L1   172.16.2.0/24 [115/20] via 172.16.4.253, FastEthernet0/1
i L1   172.16.3.0/24 [115/20] via 172.16.4.253, FastEthernet0/1
S*     0.0.0.0/0 [1/0] via 172.16.5.254
```

2600mid#sh run

Building configuration...

Current configuration : 737 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600mid

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10


```

no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
 ip address 172.16.6.253 255.255.255.252
 duplex auto
 speed auto
!
interface Serial0/0
 ip address 172.16.5.250 255.255.255.252
 no fair-queue
!
interface Serial0/1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 172.16.5.248 0.0.0.3 area 0
 network 172.16.6.252 0.0.0.3 area 0
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

172.16.0.0/16 is variably subnetted, 10 subnets, 3 masks

```
C      172.16.5.248/30 is directly connected, Serial0/0
O E2    172.16.4.252/30 [110/20] via 172.16.6.254, 00:02:22, FastEthernet0/0
O      172.16.5.252/30 [110/2] via 172.16.6.254, 00:16:23, FastEthernet0/0
C      172.16.6.252/30 is directly connected, FastEthernet0/0
O E2    172.16.8.0/32 [110/20] via 172.16.6.254, 00:16:17, FastEthernet0/0
O E2    172.16.9.0/32 [110/20] via 172.16.6.254, 00:02:22, FastEthernet0/0
O E2    172.16.0.0/24 [110/20] via 172.16.6.254, 00:16:18, FastEthernet0/0
O E2    172.16.1.0/24 [110/20] via 172.16.6.254, 00:16:18, FastEthernet0/0
O E2    172.16.2.0/24 [110/20] via 172.16.6.254, 00:16:18, FastEthernet0/0
O E2    172.16.3.0/24 [110/20] via 172.16.6.254, 00:16:18, FastEthernet0/0
```

2800#sh run

Building configuration...

Current configuration : 1322 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2800

!

boot-start-marker

boot-end-marker

!

no aaa new-model

memory-size iomem 10

!

ip cef

!

multilink bundle-name authenticated

!

voice-card 0

no dspfarm

```

!
vlan internal allocation policy ascending
!
interface GigabitEthernet0/0
 ip address 172.16.5.254 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 172.16.6.254 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
 ip address 172.16.7.253 255.255.255.252
 no fair-queue
 clock rate 64000
!
interface Vlan1
 no ip address
!
router ospf 1
 log-adjacency-changes
 network 172.16.5.252 0.0.0.3 area 0
 network 172.16.6.252 0.0.0.3 area 0
!
router bgp 100
 no synchronization
 bgp log-neighbor-changes
 network 172.16.0.0 mask 255.255.192.0
 neighbor 172.16.7.254 remote-as 200
 no auto-summary
!
ip route 172.16.0.0 255.255.192.0 Null0
!
ip http server

```

```

no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

172.16.0.0/16 is variably subnetted, 12 subnets, 4 masks
O      172.16.5.248/30
        [110/65] via 172.16.6.253, 00:16:58, GigabitEthernet0/1
        [110/65] via 172.16.5.253, 00:16:58, GigabitEthernet0/0
O E2    172.16.4.252/30
        [110/20] via 172.16.5.253, 00:02:57, GigabitEthernet0/0
C      172.16.5.252/30 is directly connected, GigabitEthernet0/0
C      172.16.6.252/30 is directly connected, GigabitEthernet0/1
C      172.16.7.252/30 is directly connected, Serial0/0/0
O E2    172.16.8.0/32 [110/20] via 172.16.5.253, 00:16:54, GigabitEthernet0/0
O E2    172.16.9.0/32 [110/20] via 172.16.5.253, 00:02:58, GigabitEthernet0/0
O E2    172.16.0.0/24 [110/20] via 172.16.5.253, 00:16:54, GigabitEthernet0/0
S      172.16.0.0/18 is directly connected, Null0
O E2    172.16.1.0/24 [110/20] via 172.16.5.253, 00:16:54, GigabitEthernet0/0
O E2    172.16.2.0/24 [110/20] via 172.16.5.253, 00:16:54, GigabitEthernet0/0
O E2    172.16.3.0/24 [110/20] via 172.16.5.253, 00:16:54, GigabitEthernet0/0
B      192.168.0.0/18 [20/0] via 172.16.7.254, 01:12:39

```

2800# sh ip bgp

BGP table version is 3, local router ID is 172.16.7.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.7.254	0		0	200 i

2600low#sh run

Building configuration...

Current configuration : 857 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600low

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface FastEthernet0/0

ip address 192.168.9.253 255.255.255.252

duplex auto

speed auto

!

interface Serial0/0

ip address 172.16.7.254 255.255.255.252

```

    no fair-queue
!
interface Serial0/1
    no ip address
    shutdown
!
router rip
    network 192.168.9.0
!
router bgp 200
    no synchronization
    bgp log-neighbor-changes
    network 192.168.0.0 mask 255.255.192.0
    neighbor 172.16.7.253 remote-as 100
    no auto-summary
!
ip http server
ip classless
ip route 192.168.0.0 255.255.192.0 Null0
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.9.254 to network 0.0.0.0

192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks

```

R      192.168.8.252/30 [120/1] via 192.168.9.254, 00:00:03, FastEthernet0/0
R      192.168.8.253/32 [120/1] via 192.168.9.254, 00:00:03, FastEthernet0/0
      192.168.9.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.9.252/30 is directly connected, FastEthernet0/0
R      192.168.9.254/32 [120/1] via 192.168.9.254, 00:00:03, FastEthernet0/0
      172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      172.16.7.252/30 is directly connected, Serial0/0
B      172.16.0.0/18 [20/0] via 172.16.7.253, 01:57:39
R      192.168.4.0/24 [120/2] via 192.168.9.254, 00:00:04, FastEthernet0/0
R      192.168.5.0/24 [120/2] via 192.168.9.254, 00:00:04, FastEthernet0/0
R      192.168.6.0/24 [120/2] via 192.168.9.254, 00:00:04, FastEthernet0/0
      192.168.7.0/24 is variably subnetted, 2 subnets, 2 masks
R      192.168.7.253/32 [120/1] via 192.168.9.254, 00:00:04, FastEthernet0/0
R      192.168.7.252/30 [120/1] via 192.168.9.254, 00:00:04, FastEthernet0/0
R*    0.0.0.0/0 [120/2] via 192.168.9.254, 00:00:04, FastEthernet0/0
R      192.168.0.0/22 [120/2] via 192.168.9.254, 00:00:04, FastEthernet0/0
S      192.168.0.0/18 is directly connected, Null0

```

2600low#sh ip bgp

BGP table version is 3, local router ID is 192.168.9.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.7.253	0		0	100 i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

*A:NS085167007# admin display-config

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

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Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main

Generated WED NOV 23 07:27:50 2011 UTC

exit all

configure

#-----

echo "System Configuration"

```
#-----
```

```
system
  ccm 1
  exit
  snmp
    shutdown
  exit
  time
    sntp
      shutdown
    exit
  zone UTC
  exit
  thresholds
    rmon
    exit
  exit
exit
```

```
#-----
```

```
echo "System Security Configuration"
```

```
#-----
```

```
system
  security
    per-peer-queuing
  exit
exit
```

```
#-----
```

```
echo "Log Configuration"
```

```
#-----
```

```
log
exit
```

```
#-----
```

```
echo "System Security Cpm Hw Filters Configuration"
```

```
#-----
```

```
system
  security
  exit
```



```

exit

#-----
echo "QoS Policy Configuration"
#-----

qos
exit

#-----
echo "Card Configuration"
#-----

card 1
    card-type iom-9g
    mda 2
        mda-type c8-10/100eth-tx
    exit
exit

#-----
echo "Port Configuration"
#-----

port 1/2/1
    ethernet
    exit
    no shutdown
exit
port 1/2/2
    ethernet
    exit
    no shutdown
exit
port 1/2/3
    ethernet
    exit
    no shutdown
exit
port 1/2/4
    shutdown
    ethernet
    exit
exit

```

```

    port 1/2/5
        shutdown
        ethernet
    exit
exit
port 1/2/6
    shutdown
    ethernet
    exit
exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit

#-----
echo "System Sync-If-Timing Configuration"
#-----

    system
        sync-if-timing
            begin
            commit
        exit
    exit

#-----
echo "Management Router Configuration"
#-----

    router management
    exit

#-----
echo "Router (Network Side) Configuration"
#-----

    router

```

```

interface "system"
exit
interface "to2600low"
    address 192.168.9.254/30
    port 1/2/1
exit
interface "to3600"
    address 192.168.8.253/30
    port 1/2/3
exit
interface "to3750"
    address 192.168.7.253/30
    port 1/2/2
exit

#-----
echo "Static Route Configuration"
#-----

    static-route 0.0.0.0/0 next-hop 192.168.9.253
    static-route 192.168.0.0/22 next-hop 192.168.7.254

#-----
echo "RIP Configuration"
#-----

    rip
        export "rip"
        group "rip"
            neighbor "to2600low"
            exit
            neighbor "to3600"
            exit
        exit
    exit
exit

#-----
echo "Service Configuration"
#-----

service
    customer 1 create
        description "Default customer"

```

```

        exit
    exit

#-----
echo "Router (Service Side) Configuration"
#-----

    router

#-----
echo "Policy Configuration"
#-----

    policy-options
        begin
        policy-statement "rip"
            entry 1
                from
                    protocol direct
                exit
                action accept
                exit
            exit
            default-action accept
            exit
        exit
    commit
exit
exit all

# Finished WED NOV 23 07:27:56 2011 UTC

```

***A:NS085167007# show router route-table**

```

=====
Route Table (Router: Base)
=====

```

Dest Prefix	Type	Proto	Age	Pref
Next Hop[Interface Name]			Metric	
0.0.0.0/0	Remote	Static	01h58m04s	5
192.168.9.253			1	
192.168.0.0/22	Remote	Static	00h39m00s	5

192.168.7.254			1	
192.168.4.0/24	Remote	RIP	01h02m01s	100
192.168.8.254			2	
192.168.5.0/24	Remote	RIP	01h02m01s	100
192.168.8.254			2	
192.168.6.0/24	Remote	RIP	01h01m58s	100
192.168.8.254			2	
192.168.7.252/30	Local	Local	00h39m00s	0
to3750			0	
192.168.8.252/30	Local	Local	01h51m16s	0
to3600			0	
192.168.9.252/30	Local	Local	02h01m34s	0
to2600low			0	

No. of Routes: 8

3750#sh run

```

Building configuration...
Current configuration : 1757 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3750
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
ip subnet-zero
ip routing
!
no file verify auto
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
interface Loopback1

```

```

    ip address 192.168.0.1 255.255.255.0
!
interface Loopback2
    ip address 192.168.1.1 255.255.255.0
!
interface Loopback3
    ip address 192.168.2.1 255.255.255.0
!
interface Loopback4
    ip address 192.168.3.1 255.255.255.0
!
interface GigabitEthernet1/0/1
    no switchport
    ip address 192.168.7.254 255.255.255.252
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16

```

```

!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
  shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

3750#sh ip route

Codes: 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, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, GigabitEthernet1/0/1
C      192.168.0.0/24 is directly connected, Loopback1
C      192.168.1.0/24 is directly connected, Loopback2
C      192.168.2.0/24 is directly connected, Loopback3
C      192.168.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 192.168.7.253
  
```

3600#sh run

```

Building configuration...
Current configuration : 898 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback1
 ip address 192.168.4.1 255.255.255.0
!
interface Loopback2
  
```



```

    ip address 192.168.5.1 255.255.255.0
!
interface Loopback3
    ip address 192.168.6.1 255.255.255.0
!
interface Ethernet0/0
    ip address 192.168.8.254 255.255.255.252
    half-duplex
!
interface FastEthernet1/0
    no ip address
    shutdown
    duplex auto
    speed auto
!
interface FastEthernet2/0
    no ip address
    shutdown
    duplex auto
    speed auto
!
router rip
    network 192.168.4.0
    network 192.168.5.0
    network 192.168.6.0
    network 192.168.8.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.8.253
!
line con 0
line aux 0
line vty 0 4
!
end

```

3600#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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 192.168.8.253 to network 0.0.0.0

```
192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.8.252/30 is directly connected, Ethernet0/0
R      192.168.8.253/32 [120/1] via 192.168.8.253, 00:00:06, Ethernet0/0
192.168.9.0/24 is variably subnetted, 2 subnets, 2 masks
R      192.168.9.252/30 [120/1] via 192.168.8.253, 00:00:06, Ethernet0/0
R      192.168.9.254/32 [120/1] via 192.168.8.253, 00:00:06, Ethernet0/0
C      192.168.4.0/24 is directly connected, Loopback1
C      192.168.5.0/24 is directly connected, Loopback2
C      192.168.6.0/24 is directly connected, Loopback3
192.168.7.0/24 is variably subnetted, 2 subnets, 2 masks
R      192.168.7.253/32 [120/1] via 192.168.8.253, 00:00:07, Ethernet0/0
R      192.168.7.252/30 [120/1] via 192.168.8.253, 00:00:07, Ethernet0/0
S*    0.0.0.0/0 [1/0] via 192.168.8.253
R      192.168.0.0/22 [120/2] via 192.168.8.253, 00:00:08, Ethernet0/0
```

PING RESULTS:

2900#ping 192.168.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2900#ping 192.168.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 192.168.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2900#ping 192.168.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2900#ping 192.168.4.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.4.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 192.168.5.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.5.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2900#ping 192.168.6.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.6.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3750#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/33 ms

3750#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/30/34 ms

3750#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3750#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 25/28/34 ms

3600#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3600#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3600#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

3600#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

9.3.3 VLAN AND SWITHCING

SWITCH 1: 3750

3750#sh run

Building configuration...

Current configuration : 1901 bytes

!

version 12.2

no service pad

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

```

enable secret 5 $1$5NvD$.LGE3IlzGGPruQjhzuSA.1
enable password mint709
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!

```

```

interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0

```

```

line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports

1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24, Gi1/0/25 Gi1/0/26, Gi1/0/27, Gi1/0/28
31 red	active	Gi1/0/1
32 blue	active	Gi1/0/2
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2

1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	-	ieee	0	0	
1005	trnet	101005	1500	-	-	-	ibm	0	0	

Remote SPAN VLANs

```

-----
Primary Secondary Type          Ports
-----

```

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```
!  
version 12.0  
no service pad  
no service password-encryption  
!  
hostname 3500  
!  
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/  
!  
ip subnet-zero  
!  
interface FastEthernet0/1  
    switchport access vlan 31  
!  
interface FastEthernet0/2  
    switchport access vlan 32  
!  
interface FastEthernet0/3  
    description connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/4  
    description second connection to 3750  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/5  
!  
interface FastEthernet0/6  
!  
interface FastEthernet0/7  
!  
interface FastEthernet0/8  
!  
interface FastEthernet0/9  
!  
interface FastEthernet0/10  
!
```



```

interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1

```

```

line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2
31 red	active	Fa0/1
32 blue	active	Fa0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1 enet	100001	1500	-	-	-	-	-	1002	1003
31 enet	100031	1500	-	-	-	-	-	0	0
32 enet	100032	1500	-	-	-	-	-	0	0
1002 fddi	101002	1500	-	-	-	-	-	1	1003
1003 tr	101003	1500	1005	0	-	-	srb	1	1002
1004 fdnet	101004	1500	-	-	1	ibm	-	0	0
1005 trnet	101005	1500	-	-	1	ibm	-	0	0

3600#sh run

```

Building configuration...
Current configuration : 990 bytes
!
version 12.3
service timestamps debug datetime msec

```

```

service timestamps log datetime msec
no service password-encryption
!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Ethernet0/0
    no ip address
    shutdown
    half-duplex
    speed auto
!
interface FastEthernet1/0
    no ip address
    no shutdown
    duplex auto
    speed auto
!
interface FastEthernet1/0.31
    encapsulation dot1Q 31
    ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet1/0.32
    encapsulation dot1Q 32
    ip address 192.168.50.67 255.255.255.240
!

interface FastEthernet2/0
    no ip address
    shutdown
    duplex auto
    speed auto
!
ip http server
ip classless
!
line con 0

```

```
line aux 0
line vty 0 4
!
end
```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

9.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

Building configuration...

Current configuration : 1846 bytes

!

version 12.2

no service pa

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname Switch

!

boot-start-marker

boot-end-marker

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

```

ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!

```

```

interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
    switchport access vlan 31
!
interface FastEthernet0/2
    switchport access vlan 32
!
interface FastEthernet0/3
    description connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/4
    description second connection to 3750
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!

```

```

interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15

```



```

password letmein
login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID      Priority      32768
              Address      0007.eb94.7200
              Cost        19
              Port        3 (GigabitEthernet1/0/3)
              Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec

```

```

Bridge ID    Priority      32769  (priority 32768 sys-id-ext 1)
              Address      0018.186e.7b00
              Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec
              Aging Time   300 sec

```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/3	Root	FWD	19	128.3		P2p
Gi1/0/4	Altn	BLK	19	128.4		P2p

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID      Priority      8223
              Address      0018.186e.7b00
              This bridge is the root
              Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec

```

```

Bridge ID    Priority      8223  (priority 8192 sys-id-ext 31)
              Address      0018.186e.7b00
              Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec
              Aging Time   300 sec

```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/3	Desg	FWD	19	128.3		P2p
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 3 (GigabitEthernet1/0/3)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 15 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/3	Root	FWD	19	128.3		P2p
Gi1/0/4	Altn	BLK	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated				
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202 128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202 128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202 128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

When the second link between the two switched breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32768

Address 0007.eb94.7200

Cost 19

Port 4 (GigabitEthernet1/0/4)

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/4	Root	FWD	19	128.4	P2p

VLAN0031

Spanning tree enabled protocol ieee

Root ID Priority 8223
 Address 0018.186e.7b00
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8223 (priority 8192 sys-id-ext 31)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/4	Desg	FWD	19	128.4	P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/2	Desg	FWD	4	128.2	P2p
Gi1/0/4	Root	FWD	19	128.4	P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768

Address 0007.eb94.7200

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7200

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```

C:\Users\joyce>ping 192.168.30.9

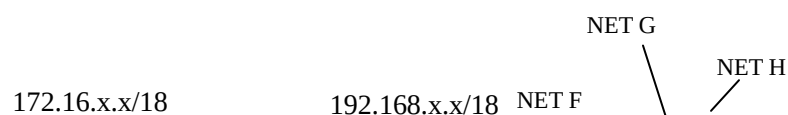
Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

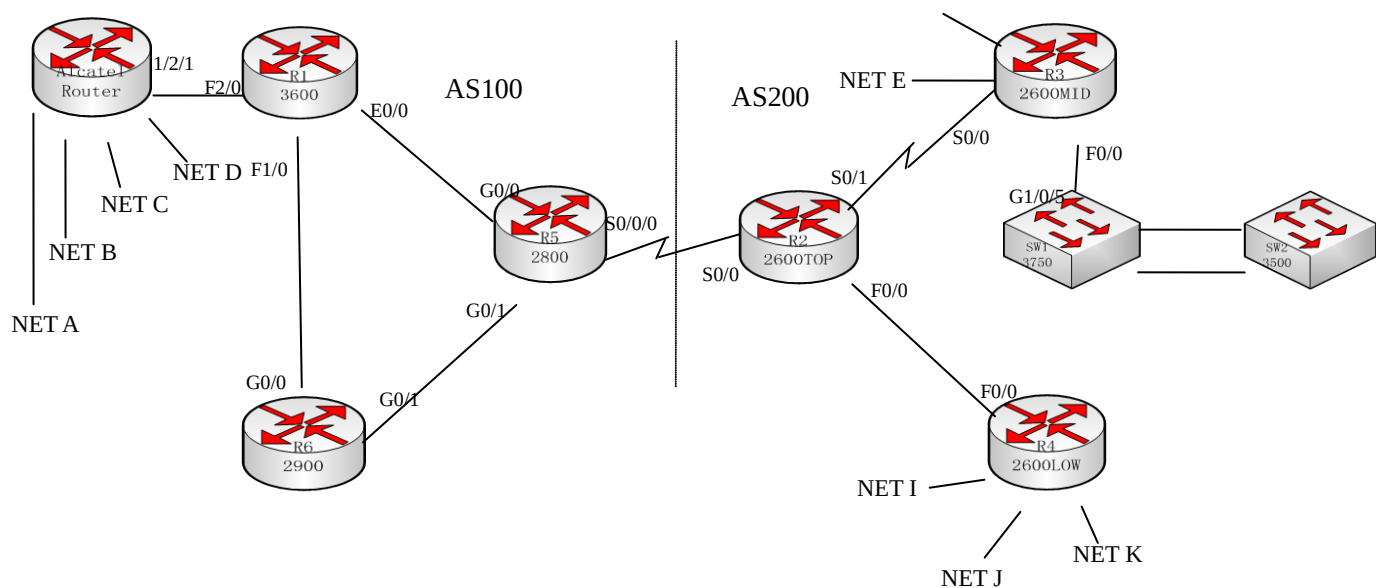
Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

Chapter 10 Routing and switching lab exam 10

10.1 lab topology and questions





Instructions:

1. Do not write anything on the manual.
2. Submit hand drawn diagram.
3. Do not save any config on Desktop or on the routers
4. When done just let instructor know to copy your configs.
5. Clean your rack after use by securing all cables.

1. Assign the IP addresses to the interfaces of each router and subnet for the nets of Cisco 2600(R3), Cisco 2600(R4) and Alcatel router according the IP range given above in the diagram. Submit hand drawn diagram with all ip addresses assigned. (20')

2. Configure RIPv2 in Cisco 2600(R4) and Cisco 2600(R2) to let them reach each other. (10')

3. Configure OSPF in Cisco 2800(R5), Cisco 3600(R1) and Cisco 2900(R6) within area 0. (10')

4. Configure EBGP in Cisco 2600(R2) and Cisco 2800(R5), don't advertise autonomous system network topology behind R2 and R5. Instead you should be advertising /18 network. (20')

5. Configure ISIS in Cisco 2600(R2) and Cisco 2600(R3). (10')

6. Configure Static routes in Cisco 3600(R1) and Alcatel router. (10')

7. Create VLANs in both CISCO 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco 3500 switch. Inter-connect these two vlans, and let they can communicate with each other. (10')

8. Create VLANs in both Cisco 3750 and 3500 switches where host A and B will be in different VLAN in Cisco 3750 and host C and D will in different vlan in Cisco3500 switch. Configure spanning tree protocol for the network, and let switch 3750 be root bridge for vlan 31, and switch 3500 be root bridge for vlan 32. Try to communicate between hosts in same vlan. If the second link between the two switches breaks up, try to communicate between hosts in same vlan. (10')

10.2 what to hand in

1. For the routing tasks, you should ping from Alcatel router to the nets of Cisco 2600(R2) and Cisco 2600(R3) at the the other side of the whole network, and from Cisco 2600(R2) and Cisco 2600(R3) to the nets of Alcatel router. For verifying the configuration, you should get the output of show run, show ip route commands and show ip bgp commands on Cisco 2800(R5) and Cisco 2600(R2).
2. you should ping from a host of vlan in Cisco 3750 to a host of another vlan in Cisco 3500, get the output of show run, show vlan commands.
3. you should ping from a host in Cisco 3750 to another host in Cisco 3500 which are in the same vlan before and after the second link breaks up, get the output of show run, show vlan and show spanning tree commands.

10.3 lab solution

10.3.1 IP ADDRESSING AND SUBNETTING

router	Interface and net address	Interface and net address
Alcatel router	Net A:172.16.0.1/24	Net B:172.16.1.1/24
	Net C:172.16.2.1/24	Net D:172.16.3.1/24
	Port 1/2/1:172.16.4.253/30	
R1 Cisco 3600	E0/0:172.16.5.253/30	F1/0:172.16.5.249/30
	F2/0:172.16.4.254/30	
R6 Cisco 2900	G0/0:172.16.5.250/30	G0/1:172.16.6.253/30
R5 Cisco 2800	G0/0:172.16.5.254/30	G0/1:192.168.6.254/30
	S0/0/0:172.16.7.253/30	
R2 Cisco 2600	S0/0:172.16.7.254/30	F0/0:192.168.7.253/30
	F0/1:192.168.8.253/30	
R3 Cisco 2600	F0/0:192.168.7.254/30	Net E:192.168.0.1/24
	Net F:192.168.1.1/24	Net G:192.168.2.1/24
	Net H:192.168.3.1/24	
R4 Cisco 2600	Net I:192.168.4.1/24	Net J:192.168.5.1/24
	Net K:192.168.6.1/24	F0/0:192.168.8.254/30

10.3.2 routing task

***A:NS085167007# admin display-config**

TiMOS-B-8.0.R10 both/hops ALCATEL SR 7710 Copyright (c) 2000-2011 Alcatel-Lucent.

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Built on Tue May 24 17:49:33 PDT 2011 by builder in /rel8.0/b1/R10/panos/main

Generated THU NOV 24 02:35:38 2011 UTC

exit all

configure

```
#-----  
echo "System Configuration"  
#-----
```

```
system  
    ccm 1  
    exit  
    snmp  
        shutdown  
    exit  
    time  
        sntp  
            shutdown  
        exit  
        zone UTC  
    exit  
    thresholds  
        rmon  
        exit  
    exit  
exit
```

```
#-----  
echo "System Security Configuration"  
#-----
```

```
system  
    security  
        per-peer-queuing  
    exit  
exit
```

```
#-----  
echo "Log Configuration"  
#-----
```

```
log  
exit
```

```
#-----  
echo "System Security Cpm Hw Filters Configuration"  
#-----
```

```

system
    security
    exit
exit

#-----
echo "QoS Policy Configuration"
#-----

qos
exit

#-----
echo "Card Configuration"
#-----

card 1
    card-type iom-9g
    mda 2
        mda-type c8-10/100eth-tx
    exit
exit

#-----
echo "Port Configuration"
#-----

port 1/2/1
    ethernet
    exit
    no shutdown
exit
port 1/2/2
    shutdown
    ethernet
    exit
exit
port 1/2/3
    shutdown
    ethernet
    exit
exit
port 1/2/4

```

```

        shutdown
        ethernet
        exit
    exit
port 1/2/5
    shutdown
    ethernet
    exit
exit
port 1/2/6
    shutdown
    ethernet
    exit
exit
port 1/2/7
    shutdown
    ethernet
    exit
exit
port 1/2/8
    shutdown
    ethernet
    exit
exit

#-----
echo "System Sync-If-Timing Configuration"
#-----

    system
        sync-if-timing
            begin
            commit
        exit
    exit

#-----
echo "Management Router Configuration"
#-----

    router management
    exit

#-----

```

```
echo "Router (Network Side) Configuration"
```

```
#-----
```

```
router
  interface "loop1"
    address 172.16.0.1/24
    loopback
  exit
  interface "loop2"
    address 172.16.1.1/24
    loopback
  exit
  interface "loop3"
    address 172.16.2.1/24
    loopback
  exit
  interface "loop4"
    address 172.16.3.1/24
    loopback
  exit
  interface "system"
  exit
  interface "to3600"
    address 172.16.4.253/30
    port 1/2/1
  exit
```

```
#-----
```

```
echo "Static Route Configuration"
```

```
#-----
```

```
static-route 0.0.0.0/0 next-hop 172.16.4.254
exit
```

```
#-----
```

```
echo "Service Configuration"
```

```
#-----
```

```
service
  customer 1 create
    description "Default customer"
  exit
exit
```

```
#-----
echo "Router (Service Side) Configuration"
#-----
```

```
router
exit
exit all
# Finished THU NOV 24 02:35:44 2011 UTC
```

***A:NS085167007# show router route-table**

```
=====
Route Table (Router: Base)
=====
```

Dest Prefix Next Hop[Interface Name]	Type	Proto	Age	Pref Metric
0.0.0.0/0 172.16.4.254	Remote	Static	00h47m44s	5 1
172.16.0.0/24 loop1	Local	Local	00h50m35s	0 0
172.16.1.0/24 loop2	Local	Local	00h50m22s	0 0
172.16.2.0/24 loop3	Local	Local	00h50m06s	0 0
172.16.3.0/24 loop4	Local	Local	00h50m50s	0 0
172.16.4.252/30 to3600	Local	Local	00h47m44s	0 0

```
-----
No. of Routes: 6
=====
```

3600#sh run

```
Building configuration...
Current configuration : 864 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
```

```

!
hostname 3600
!
boot-start-marker
boot-end-marker
!
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Ethernet0/0
 ip address 172.16.5.253 255.255.255.252
 half-duplex
!
interface FastEthernet1/0
 ip address 172.16.5.249 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet2/0
 ip address 172.16.4.254 255.255.255.252
 duplex auto
 speed auto
!
router ospf 1
 log-adjacency-changes
 redistribute connected
 redistribute static subnets
 network 172.16.5.248 0.0.0.3 area 0
 network 172.16.5.252 0.0.0.3 area 0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.5.254
ip route 172.16.0.0 255.255.252.0 172.16.4.253
!
!
line con 0
line aux 0
line vty 0 4
!
end

```


3600#sh ip route

Codes: 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

i - IS-IS, su - IS-IS summary, 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 172.16.5.254 to network 0.0.0.0

172.16.0.0/16 is variably subnetted, 5 subnets, 2 masks

```
C      172.16.5.248/30 is directly connected, FastEthernet1/0
C      172.16.4.252/30 is directly connected, FastEthernet2/0
C      172.16.5.252/30 is directly connected, Ethernet0/0
O      172.16.6.252/30 [110/2] via 172.16.5.250, 00:38:23, FastEthernet1/0
S      172.16.0.0/22 [1/0] via 172.16.4.253
S*    0.0.0.0/0 [1/0] via 172.16.5.254
```

2900#sh run

Building configuration...

Current configuration : 1042 bytes

!

! Last configuration change at 01:01:01 UTC Thu Nov 24 2011

!

version 15.0

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2900

!

boot-start-marker

boot-end-marker

!

no aaa new-model

!

no ipv6 cef

```

ip source-route
ip cef
!
multilink bundle-name authenticated
!
license udi pid CISCO2921/K9 sn FGL150811PR
license boot module c2900 technology-package datak9
!
redundancy
!
interface GigabitEthernet0/0
  ip address 172.16.5.250 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/1
  ip address 172.16.6.253 255.255.255.252
  duplex auto
  speed auto
!
interface GigabitEthernet0/2
  no ip address
  shutdown
  duplex auto
  speed auto
!
router ospf 1
  log-adjacency-changes
  network 172.16.5.248 0.0.0.3 area 0
  network 172.16.6.252 0.0.0.3 area 0
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000

```

end

2900#sh 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
i - IS-IS, su - IS-IS summary, 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, + - replicated route

Gateway of last resort is not set

```
172.16.0.0/16 is variably subnetted, 6 subnets, 3 masks
O E2    172.16.0.0/22 [110/20] via 172.16.5.249, 00:39:05, GigabitEthernet0/0
C       172.16.5.248/30 is directly connected, GigabitEthernet0/0
L       172.16.5.250/32 is directly connected, GigabitEthernet0/0
O       172.16.5.252/30
        [110/11] via 172.16.6.254, 00:38:55, GigabitEthernet0/1
        [110/11] via 172.16.5.249, 00:39:05, GigabitEthernet0/0
C       172.16.6.252/30 is directly connected, GigabitEthernet0/1
L       172.16.6.253/32 is directly connected, GigabitEthernet0/1
```

2800#sh run

```
Building configuration...
Current configuration : 1322 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2800
!
boot-start-marker
boot-end-marker
!
no aaa new-model
```

```

memory-size iomem 10
!
ip cef
!
multilink bundle-name authenticated
!
voice-card 0
    no dspfarm
!
vlan internal allocation policy ascending
!
interface GigabitEthernet0/0
    ip address 172.16.5.254 255.255.255.252
    duplex auto
    speed auto
!
interface GigabitEthernet0/1
    ip address 172.16.6.254 255.255.255.252
    duplex auto
    speed auto
!
interface FastEthernet0/1/0
!
interface FastEthernet0/1/1
!
interface FastEthernet0/1/2
!
interface FastEthernet0/1/3
!
interface Serial0/0/0
    ip address 172.16.7.253 255.255.255.252
    no fair-queue
    clock rate 64000
!
interface Vlan1
    no ip address
!
router ospf 1
    log-adjacency-changes
    network 172.16.5.252 0.0.0.3 area 0
    network 172.16.6.252 0.0.0.3 area 0
!
router bgp 100
    no synchronization

```

```

bgp log-neighbor-changes
network 172.16.0.0 mask 255.255.192.0
neighbor 172.16.7.254 remote-as 200
no auto-summary
!
ip route 172.16.0.0 255.255.192.0 Null0
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
scheduler allocate 20000 1000
!
end

```

2800#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

172.16.0.0/16 is variably subnetted, 6 subnets, 3 masks
O    172.16.5.248/30 [110/2] via 172.16.6.253, 00:39:13, GigabitEthernet0/1
C    172.16.5.252/30 is directly connected, GigabitEthernet0/0
C    172.16.6.252/30 is directly connected, GigabitEthernet0/1
C    172.16.7.252/30 is directly connected, Serial0/0/0
O E2 172.16.0.0/22 [110/20] via 172.16.6.253, 00:39:13, GigabitEthernet0/1
S    172.16.0.0/18 is directly connected, Null0
B    192.168.0.0/18 [20/0] via 172.16.7.254, 00:07:32

```

2800#sh ip bgp

BGP table version is 5, local router ID is 172.16.7.253

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	0.0.0.0	0		32768	i
*> 192.168.0.0/18	172.16.7.254	0		0 200	i

2600top#sh run

Building configuration...

Current configuration : 1117 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600top

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface Loopback0

ip address 192.168.9.0 255.255.255.255

!

interface FastEthernet0/0

ip address 192.168.8.253 255.255.255.252

duplex auto

speed auto

!

interface Serial0/0

```

ip address 172.16.7.254 255.255.255.252
no fair-queue
!
interface FastEthernet0/1
duplex auto
speed auto
!
interface Serial0/1
ip address 192.168.7.253 255.255.255.252
ip router isis
no fair-queue
!
router isis
net 49.0001.1921.6800.9000.00
passive-interface Loopback0
!
router rip
version 2
network 192.168.8.0
!
router bgp 200
no synchronization
bgp log-neighbor-changes
network 192.168.0.0 mask 255.255.192.0
neighbor 172.16.7.253 remote-as 100
no auto-summary
!
ip http server
ip classless
ip route 192.168.0.0 255.255.192.0 Null0
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600top#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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

```

192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, FastEthernet0/1
192.168.9.0/32 is subnetted, 1 subnets
C      192.168.9.0 is directly connected, Loopback0
192.168.10.0/32 is subnetted, 1 subnets
i L1   192.168.10.0 [115/10] via 192.168.7.254, FastEthernet0/0
172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      172.16.7.252/30 is directly connected, Serial0/0
B      172.16.0.0/18 [20/0] via 172.16.7.253, 00:08:32
R      192.168.4.0/24 [120/1] via 192.168.8.254, 00:00:15, FastEthernet0/1
R      192.168.5.0/24 [120/1] via 192.168.8.254, 00:00:15, FastEthernet0/1
R      192.168.6.0/24 [120/1] via 192.168.8.254, 00:00:15, FastEthernet0/1
192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, FastEthernet0/0
i L1   192.168.0.0/24 [115/20] via 192.168.7.254, FastEthernet0/0
i L1   192.168.1.0/24 [115/20] via 192.168.7.254, FastEthernet0/0
i L1   192.168.2.0/24 [115/20] via 192.168.7.254, FastEthernet0/0
i L1   192.168.3.0/24 [115/20] via 192.168.7.254, FastEthernet0/0
S      192.168.0.0/18 is directly connected, Null0

```

2600top#sh ip bgp

BGP table version is 5, local router ID is 192.168.9.0

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
 r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/18	172.16.7.253	0		0 100	i
*> 192.168.0.0/18	0.0.0.0	0		32768	i

2600mid#sh run

Building configuration...

Current configuration : 1111 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2600mid

!

boot-start-marker

boot-end-marker

!

memory-size iomem 10

no aaa new-model

ip subnet-zero

!

ip cef

!

interface Loopback0

ip address 192.168.10.0 255.255.255.255

!

interface Loopback1

ip address 192.168.0.1 255.255.255.0

ip router isis

!

interface Loopback2

ip address 192.168.1.1 255.255.255.0

ip router isis

!

interface Loopback3

ip address 192.168.2.1 255.255.255.0

ip router isis

!

interface Loopback4

ip address 192.168.3.1 255.255.255.0

ip router isis

!

interface FastEthernet0/0

duplex auto

speed auto

```

!
interface Serial0/0
 ip address 192.168.7.254 255.255.255.252
 ip router isis
 no fair-queue
!
interface Serial0/1
 no ip address
 shutdown
!
router isis
 net 49.0001.1921.6801.0000.00
 passive-interface Loopback0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.7.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600mid#sh ip route

Codes: 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
 i - IS-IS, su - IS-IS summary, 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 192.168.7.253 to network 0.0.0.0

```

192.168.9.0/32 is subnetted, 1 subnets
i L1    192.168.9.0 [115/10] via 192.168.7.253, FastEthernet0/0
192.168.10.0/32 is subnetted, 1 subnets

```

```

C      192.168.10.0 is directly connected, Loopback0
      192.168.7.0/30 is subnetted, 1 subnets
C      192.168.7.252 is directly connected, FastEthernet0/0
C      192.168.0.0/24 is directly connected, Loopback1
C      192.168.1.0/24 is directly connected, Loopback2
C      192.168.2.0/24 is directly connected, Loopback3
C      192.168.3.0/24 is directly connected, Loopback4
S*    0.0.0.0/0 [1/0] via 192.168.7.253

```

2600low#sh run

```

Building configuration...
Current configuration : 936 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600low
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface Loopback1
 ip address 192.168.4.1 255.255.255.0
!
interface Loopback2
 ip address 192.168.5.1 255.255.255.0
!
interface Loopback3
 ip address 192.168.6.1 255.255.255.0
!
interface FastEthernet0/0
 ip address 192.168.8.254 255.255.255.252

```

```

duplex auto
speed auto
!
interface Serial0/0
no ip address
shutdown
no fair-queue
!
interface Serial0/1
no ip address
shutdown
!
router rip
version 2
network 192.168.4.0
network 192.168.5.0
network 192.168.6.0
network 192.168.8.0
!
ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.8.253
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

2600low#sh ip route

Codes: 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
i - IS-IS, su - IS-IS summary, 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 192.168.8.253 to network 0.0.0.0

```
192.168.8.0/30 is subnetted, 1 subnets
C      192.168.8.252 is directly connected, FastEthernet0/0
C      192.168.4.0/24 is directly connected, Loopback1
C      192.168.5.0/24 is directly connected, Loopback2
C      192.168.6.0/24 is directly connected, Loopback3
S*    0.0.0.0/0 [1/0] via 192.168.8.253
```

PING RESULTS:

*A:NS085167007# ping 192.168.0.1

PING 192.168.0.1 56 data bytes

64 bytes from 192.168.0.1: icmp_seq=1 ttl=251 time=25.5ms.

64 bytes from 192.168.0.1: icmp_seq=2 ttl=251 time=25.3ms.

64 bytes from 192.168.0.1: icmp_seq=3 ttl=251 time=25.4ms.

64 bytes from 192.168.0.1: icmp_seq=4 ttl=251 time=25.4ms.

64 bytes from 192.168.0.1: icmp_seq=5 ttl=251 time=25.3ms.

---- 192.168.0.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.5ms, stddev = 0.079ms

*A:NS085167007# ping 192.168.1.1

PING 192.168.1.1 56 data bytes

64 bytes from 192.168.1.1: icmp_seq=1 ttl=251 time=25.3ms.

64 bytes from 192.168.1.1: icmp_seq=2 ttl=251 time=25.5ms.

64 bytes from 192.168.1.1: icmp_seq=3 ttl=251 time=25.4ms.

64 bytes from 192.168.1.1: icmp_seq=4 ttl=251 time=25.3ms.

64 bytes from 192.168.1.1: icmp_seq=5 ttl=251 time=25.4ms.

---- 192.168.1.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.5ms, stddev = 0.085ms

*A:NS085167007# ping 192.168.2.1

PING 192.168.2.1 56 data bytes

64 bytes from 192.168.2.1: icmp_seq=1 ttl=251 time=25.4ms.

64 bytes from 192.168.2.1: icmp_seq=2 ttl=251 time=25.3ms.

64 bytes from 192.168.2.1: icmp_seq=3 ttl=251 time=25.4ms.

64 bytes from 192.168.2.1: icmp_seq=4 ttl=251 time=25.3ms.

64 bytes from 192.168.2.1: icmp_seq=5 ttl=251 time=25.3ms.

---- 192.168.2.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.4ms, stddev = 0.065ms

*A:NS085167007# ping 192.168.3.1

PING 192.168.3.1 56 data bytes

64 bytes from 192.168.3.1: icmp_seq=1 ttl=251 time=25.4ms.

64 bytes from 192.168.3.1: icmp_seq=2 ttl=251 time=25.3ms.

64 bytes from 192.168.3.1: icmp_seq=3 ttl=251 time=25.4ms.

64 bytes from 192.168.3.1: icmp_seq=4 ttl=251 time=25.3ms.

64 bytes from 192.168.3.1: icmp_seq=5 ttl=251 time=25.3ms.

---- 192.168.3.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.4ms, stddev = 0.040ms

*A:NS085167007# ping 192.168.4.1

PING 192.168.4.1 56 data bytes

64 bytes from 192.168.4.1: icmp_seq=1 ttl=251 time=25.4ms.

64 bytes from 192.168.4.1: icmp_seq=2 ttl=251 time=25.3ms.

64 bytes from 192.168.4.1: icmp_seq=3 ttl=251 time=25.5ms.

64 bytes from 192.168.4.1: icmp_seq=4 ttl=251 time=25.3ms.

64 bytes from 192.168.4.1: icmp_seq=5 ttl=251 time=25.3ms.

---- 192.168.4.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.5ms, stddev = 0.079ms

*A:NS085167007# ping 192.168.5.1

PING 192.168.5.1 56 data bytes

64 bytes from 192.168.5.1: icmp_seq=1 ttl=251 time=25.3ms.

64 bytes from 192.168.5.1: icmp_seq=2 ttl=251 time=25.3ms.

64 bytes from 192.168.5.1: icmp_seq=3 ttl=251 time=25.3ms.

64 bytes from 192.168.5.1: icmp_seq=4 ttl=251 time=25.3ms.

64 bytes from 192.168.5.1: icmp_seq=5 ttl=251 time=25.7ms.

---- 192.168.5.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.7ms, stddev = 0.166ms

*A:NS085167007# ping 192.168.6.1

PING 192.168.6.1 56 data bytes

64 bytes from 192.168.6.1: icmp_seq=1 ttl=251 time=25.3ms.

64 bytes from 192.168.6.1: icmp_seq=2 ttl=251 time=25.4ms.

64 bytes from 192.168.6.1: icmp_seq=3 ttl=251 time=25.3ms.

64 bytes from 192.168.6.1: icmp_seq=4 ttl=251 time=25.3ms.

64 bytes from 192.168.6.1: icmp_seq=5 ttl=251 time=25.5ms.

---- 192.168.6.1 PING Statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min = 25.3ms, avg = 25.4ms, max = 25.5ms, stddev = 0.072ms

2600mid#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

2600mid#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600mid#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/31/36 ms

2600mid#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/36 ms

2600low#ping 172.16.0.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms

2600low#ping 172.16.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms

2600low#ping 172.16.2.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/30/32 ms

2600low#ping 172.16.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 28/34/56 ms

10.3.3 VLAN AND SWITCHING

SWITCH 1: 3750

3750#sh run

Building configuration...

Current configuration : 1901 bytes

!

version 12.2

no service pad

no service password-encryption

!

hostname 3750

!

boot-start-marker

boot-end-marker

!

enable secret 5 \$1\$5NvD\$.LGE3IlzGGPruQjhzuSA.1

enable password mint709

!

no aaa new-model

switch 1 provision ws-c3750g-24ps

system mtu routing 1500

ip subnet-zero

!

spanning-tree vlan 31 priority 8192

!

interface GigabitEthernet1/0/1

switchport access vlan 31

switchport mode access

!

interface GigabitEthernet1/0/2

switchport access vlan 32

switchport mode access

!

interface GigabitEthernet1/0/3


```

description connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/4
description second connection to 3500
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/5
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21

```

```

!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1

    no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 0 4
    password letmein
    login
line vty 5 15
    password letmein
    login
!
end

```

3750#sh vlan

VLAN Name	Status	Ports

1 default	active	Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22

			Gi1/0/23, Gi1/0/24, Gi1/0/25
			Gi1/0/26, Gi1/0/27, Gi1/0/28
31	red	active	Gi1/0/1
32	blue	active	Gi1/0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	Ring	No Bridge	No Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	0	0	
31	enet	100031	1500	-	-	-	-	0	0	
32	enet	100032	1500	-	-	-	-	0	0	
1002	fddi	101002	1500	-	-	-	-	0	0	
1003	tr	101003	1500	-	-	-	-	0	0	
1004	fdnet	101004	1500	-	-	ieee	-	0	0	
1005	trnet	101005	1500	-	-	ibm	-	0	0	

Remote SPAN VLANs

Primary	Secondary	Type	Ports
---------	-----------	------	-------

SWITCH 2:3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!

```

```

interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20

```

```

!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 00000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

3500#sh vlan

VLAN Name	Status	Ports
1 default	active	Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, 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, Gi0/1, Gi0/2

31	red	active	Fa0/1
32	blue	active	Fa0/2
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	1002	1003
31	enet	100031	1500	-	-	-	-	-	0	0
32	enet	100032	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	1	1003
1003	tr	101003	1500	1005	0	-	-	srb	1	1002
1004	fdnet	101004	1500	-	-	1	ibm	-	0	0
1005	trnet	101005	1500	-	-	1	ibm	-	0	0

2600top#sh run

```

Building configuration...
Current configuration : 909 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2600top
!
boot-start-marker
boot-end-marker
!
memory-size iomem 10
no aaa new-model
ip subnet-zero
!
ip cef
!
interface FastEthernet0/0
  no ip address
  duplex auto
  speed auto
!
interface FastEthernet0/0.31

```

```

encapsulation dot1Q 31
ip address 192.168.50.51 255.255.255.240
!
interface FastEthernet0/0.32
encapsulation dot1Q 32
ip address 192.168.50.67 255.255.255.240
!
interface Serial0/0
no ip address
clock rate 64000
no fair-queue
!
interface Serial0/1
no ip address
shutdown
!
ip http server
ip classless
!
voice-port 1/0/0
!
voice-port 1/0/1
!
line con 0
line aux 0
line vty 0 4
!
end

```

PING RESULTS:

from host D, ping host A

Setting the IP addressed of host A as 192.168.50.55/28, host D as 192.168.50.68/28

```

Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\joyce>ping 192.168.50.55

Pinging 192.168.50.55 with 32 bytes of data:
Reply from 192.168.50.55: bytes=32 time<1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63
Reply from 192.168.50.55: bytes=32 time=1ms TTL=63

Ping statistics for 192.168.50.55:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

10.3.4 VLAN AND SPANNING TREE PROTOCOL

SWITCH 1: 3750

Switch#sh run

```
Building configuration...
Current configuration : 1846 bytes
!
version 12.2
no service pa
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Switch
!
boot-start-marker
boot-end-marker
!
no aaa new-model
switch 1 provision ws-c3750g-24ps
system mtu routing 1500
ip subnet-zero
!
spanning-tree vlan 31 priority 8192
!
interface GigabitEthernet1/0/1
    switchport access vlan 31
    switchport mode access
!
interface GigabitEthernet1/0/2
    switchport access vlan 32
    switchport mode access
!
interface GigabitEthernet1/0/3
    description connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
interface GigabitEthernet1/0/4
    description second connection to 3500
    switchport trunk encapsulation dot1q
    switchport mode trunk
!
```



```
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
interface GigabitEthernet1/0/25
!
interface GigabitEthernet1/0/26
!
```

```

interface GigabitEthernet1/0/27
!
interface GigabitEthernet1/0/28
!
interface Vlan1
  no ip address
!
ip classless
ip http server
!
control-plane
!
line con 0
line vty 5 15
!
end

```

SWITCH 2: 3500

3500#sh run

Building configuration...

Current configuration:

```

!
version 12.0
no service pad
no service password-encryption
!
hostname 3500
!
enable secret 5 $1$T1Z5$eq5NjgeKIYdni348aUnoh/
!
spanning-tree vlan 32 priority 8192
ip subnet-zero
!
interface FastEthernet0/1
  switchport access vlan 31
!
interface FastEthernet0/2
  switchport access vlan 32
!
interface FastEthernet0/3
  description connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk

```

```

!
interface FastEthernet0/4
  description second connection to 3750
  switchport trunk encapsulation dot1q
  switchport mode trunk
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!

```

```

interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface VLAN1
  no ip address
  no ip directed-broadcast
  no ip route-cache
!
snmp-server engineID local 000000009010000A1B40A0A09
snmp-server community private RW
snmp-server community public RO
!
line con 0
  transport input none
  stopbits 1
line vty 0 4
  password letmein
  login
line vty 5 15
  password letmein
  login
!
end

```

Verify the spanning tree of the switches.

SWITCH 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID	Priority	32768		
	Address	0007.eb94.7200		
	Cost	19		
	Port	3 (GigabitEthernet1/0/3)		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec

Bridge ID	Priority	32769	(priority 32768 sys-id-ext 1)	
	Address	0018.186e.7b00		
	Hello Time	2 sec	Max Age 20 sec	Forward Delay 15 sec
	Aging Time	300 sec		

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----------	------	-----	------	-------	-----	------

```

-----
Gi1/0/3          Root FWD 19          128.3    P2p
Gi1/0/4          Altn BLK 19          128.4    P2p

```

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    8223  (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time  300 sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/3            Desg FWD 19          128.3    P2p
Gi1/0/4            Desg FWD 19          128.4    P2p

```

VLAN0032

Spanning tree enabled protocol ieee

```

Root ID    Priority    8192
           Address    0007.eb94.7202
           Cost        19
           Port        3 (GigabitEthernet1/0/3)
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

```

```

Bridge ID  Priority    32800  (priority 32768 sys-id-ext 32)
           Address    0018.186e.7b00
           Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time  15   sec

```

```

Interface          Role Sts Cost          Prio.Nbr Type
-----
Gi1/0/2            Desg FWD 4          128.2    P2p
Gi1/0/3            Root FWD 19          128.3    P2p
Gi1/0/4            Altn BLK 19          128.4    P2p

```

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7200	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200	128.16
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200	128.17
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200	128.18
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200	128.19
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200	128.20
Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port Name	Port ID	Prio	Cost	Sts	Cost	Designated Bridge ID	Port ID
Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	FWD	0	0018.186e.7b00	128.3
Fa0/4	128.16	128	19	BLK	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port		Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	FWD	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```

C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

When the second link between the two switches breaks up

SWITHC 1:3750

Switch#sh spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

```

Root ID    Priority    32768
           Address    0007.eb94.7200
           Cost        19
           Port        4 (GigabitEthernet1/0/4)
           Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec

```

```

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
           Address    0018.186e.7b00
           Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec
           Aging Time   300 sec

```

Interface	Role	Sts	Cost	Prio.	Nbr	Type
Gi1/0/4	Root	FWD	19	128.4		P2p

VLAN0031

Spanning tree enabled protocol ieee

```

Root ID    Priority    8223
           Address    0018.186e.7b00
           This bridge is the root
           Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec

```

```

Bridge ID  Priority    8223 (priority 8192 sys-id-ext 31)
           Address    0018.186e.7b00
           Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec
           Aging Time   300 sec

```


Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/4	Desg	FWD	19	128.4		P2p

VLAN0032

Spanning tree enabled protocol ieee

Root ID Priority 8192
 Address 0007.eb94.7202
 Cost 19
 Port 4 (GigabitEthernet1/0/4)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32800 (priority 32768 sys-id-ext 32)
 Address 0018.186e.7b00
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.	Nbr	Type
-----	-----	-----	-----	-----	-----	-----
Gi1/0/2	Desg	FWD	4	128.2		P2p
Gi1/0/4	Root	FWD	19	128.4		P2p

SWITCH 2:3500

3500#sh spanning-tree brief

VLAN1

Spanning tree enabled protocol IEEE

ROOT ID Priority 32768
 Address 0007.eb94.7200
 This bridge is the root
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768
 Address 0007.eb94.7200
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated					
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID
-----	-----	-----	-----	-----	-----	-----
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7200
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7200
Fa0/5	128.17	128	19	BLK	0	0007.eb94.7200
Fa0/6	128.18	128	100	BLK	0	0007.eb94.7200
Fa0/7	128.19	128	100	BLK	0	0007.eb94.7200
Fa0/8	128.20	128	100	BLK	0	0007.eb94.7200

Fa0/9	128.22	128	100	BLK	0	0007.eb94.7200	128.22
Fa0/10	128.23	128	100	BLK	0	0007.eb94.7200	128.23
Fa0/11	128.24	128	100	BLK	0	0007.eb94.7200	128.24
Fa0/12	128.25	128	100	BLK	0	0007.eb94.7200	128.25

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/13	128.26	128	100	BLK	0	0007.eb94.7200	128.26
Fa0/14	128.27	128	100	BLK	0	0007.eb94.7200	128.27
Fa0/15	128.28	128	100	BLK	0	0007.eb94.7200	128.28
Fa0/16	128.29	128	100	BLK	0	0007.eb94.7200	128.29
Fa0/17	128.31	128	100	BLK	0	0007.eb94.7200	128.31
Fa0/18	128.32	128	100	BLK	0	0007.eb94.7200	128.32
Fa0/19	128.33	128	100	BLK	0	0007.eb94.7200	128.33
Fa0/20	128.34	128	100	BLK	0	0007.eb94.7200	128.34
Fa0/21	128.35	128	100	BLK	0	0007.eb94.7200	128.35
Fa0/22	128.36	128	100	BLK	0	0007.eb94.7200	128.36
Fa0/23	128.37	128	100	BLK	0	0007.eb94.7200	128.37

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/24	128.38	128	100	BLK	0	0007.eb94.7200	128.38
Gi0/1	128.40	128	100	BLK	0	0007.eb94.7200	128.40
Gi0/2	128.48	128	100	BLK	0	0007.eb94.7200	128.48

VLAN31

Spanning tree enabled protocol IEEE

ROOT ID Priority 8223

Address 0018.186e.7b00

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768

Address 0007.eb94.7201

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port	Designated						
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/1	128.13	128	19	BLK	19	0007.eb94.7201	128.13
Fa0/3	128.15	128	19	BLK	19	0007.eb94.7201	128.15
Fa0/4	128.16	128	19	FWD	0	0018.186e.7b00	128.4

VLAN32

Spanning tree enabled protocol IEEE

ROOT ID Priority 8192

Address 0007.eb94.7202

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 8192

Address 0007.eb94.7202

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Port				Designated			
Name	Port ID	Prio	Cost	Sts	Cost	Bridge ID	Port ID

Fa0/2	128.14	128	19	FWD	0	0007.eb94.7202	128.14
Fa0/3	128.15	128	19	BLK	0	0007.eb94.7202	128.15
Fa0/4	128.16	128	19	FWD	0	0007.eb94.7202	128.16

PING RESULTS:

from host C, ping host A

Setting IP address of host A as 192.168.30.9, host C as 192.168.30.2

```
C:\Users\joyce>ping 192.168.30.9

Pinging 192.168.30.9 with 32 bytes of data:
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64
Reply from 192.168.30.9: bytes=32 time=1ms TTL=64

Ping statistics for 192.168.30.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

REFERENCE:

Configuring BGP

http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfbgp.html

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http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a008009478a.shtml

Redistributing routing protocols

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Alcatel-Lucent 7710 SR OS Routing Protocols Guide software version: 7710 SR OS 7.0 Rev.01

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