

Exam : 350-001-LAB

Title : CCIE-ROUTING AND SWITCHING QUALIFICATION (Lab exam)

Version : Demo







第一部分,桥接和排错

Briging and switching 1.1 vtp Sw1/Sw2/Sw3/Sw4

VTP domain:VTP+YY VTP mode:Transparent RackYYSw1/SW2/SW3/SW4: vtp domain VTPYY vtp mode transparent that's not need to use s'c modein VT 1.2 VLAN Sw1: 40 VLAN_BB1 55 VLAN_55 60 VLAN_BB3 100 VLAN_100 200 VLAN_200 Sw2: 50 VLAN_BB2 100 VLAN_100 200 VLAN_200 Sw3 60 VLAN_BB3 200 VLAN 200 Sw4 200 VLAN 200 RackYYSw1: **VLAN Name Status Ports** 1 default active F0/7,F0/8,F0/9,F0/11,F0/12,F0/13,F0/14Fa0/15,Fa0/17 Fa0/18,Gi0/1,Gi0/2 40 VLAN BB1 active Fa0/4, Fa0/10 Fa0/5 55 VLAN_55 active VLAN_BB3 active Fa0/6 60 100 VLAN_100 active Fa0/1, Fa0/2 200 VLAN_200 active RackYYSw2: VLAN Name Status Ports 1 default active F0/4,F0/5,F0/7,F0/8,F0/9,F0/11,F0/12,F0/13,F0/14,F0/16,F0/17 F0/18,Gi0/1,Gi0/2 50 VLAN BB2 active F0/6, F0/10 100 VLAN_100 active F0/1, F0/2

200 VLAN_200 active Po10

RackYYSw3: VLAN Name Status Ports 1 default active F0/1,F0/2,F0/3,F0/4 F0/5, F0/6, F0/7,F0/8,F0/9,F0/11,F0/12,F0/13, F0/14, F0/15, F0/16,F0/17,F0/18,Gi0/1,Gi0/2 60 VLAN_BB3 active Fa0/10 200 VLAN_200 active

RackYYSw4: VLAN Name Status Ports 1 default active F0/1,F0/2,F0/3,F0/4,F0/5,F0/6,F0/7,F0/8,F0/9,F0/10F0/11,F0/12 F0/13,F0/14,F0/15,F0/16,F0/17,F0/18,Gi0/1,Gi0/2 200 VLAN_200 active Po10 Verify: show vlan brief When u done, u must verify careful.

做完的时候,可以仔细核对下,注意大小写,我做的时候只要是二层的端口全使用 Swithport mode access

1.3 Port-channel between Sw1 a Sw2 Sw1 and Sw2 layer 3 Ether channel use port-channel 21 only Assign YY.YY.100.1/24 to Sw1 Port-channel 21 Assign YY.YY.100.2/24 to Sw2 Port-channel 21 ensure interface F0/23 and F0/24 are channel member for both Switch Do not reply on PAgP or LACP to facilitate the connection Verify layer 2 and layer 3 connectivity via the channel link

RackYYSw1: interface range FastEthernet0/23-24 shutdown no Switchport channel-group 21 mode on no shutdown interface Port-channel21 ip address YY.YY.100.1 255.255.255.0

RackYYSw2: interface range FastEthernet0/23-24 shutdown no Switchport channel-group 21 mode on no shutdown interface Port-channel21 ip address YY.YY.100.2 255.255.255.0 Verify: show vtp status; show etherchannel summary; show etherchannel port-channel;

1.4 Port-channel between Sw1-Sw3 and Sw2-Sw4

Sw1-Sw3 Sw2-Sw4 layer 2 Ether-channels use port 10 only F0/19 and F0/20 are members of the switches

On Sw2 and Sw4 assign all interface in the EC as static-access port on VLAN_200 unconditional enable PAGP to facility the connection

verify layer 2 connectivity via the channel link

RackYYSw1: interface range FastEthernet0/19-20 shutdown Switchport trunk encapsulation isl Switchport mode trunk channel-group 10 mode desirable no shutdown

RackYYSw3: interface range FastEthernet0/19-20 shutdown Switchport trunk encapsulation isl Switchport mode trunk channel-group 10 mode desirable no shutdown

RackYYSw2: interface range FastEthernet0/19-20 shutdown Switchport mode access Switchport access VLAN 200 channel-group 10 mode desirable no shutdown

RackYYSw4: interface range FastEthernet0/19-20 shutdown Switchport mode access Switchport access VLAN 200 channel-group 10 mode desirable no shutdown Verify: show etherchannel summary; show etherchannel portchannel; 结合下面的 VLAN,可以看到 Sw2 和 Sw4 的 po10 也在 VLAN200,在你做敲 channel-group 10 mode desirable

之前先 Switchport access VLAN 200,要不在 VLAN 的表中会看不到 po10.

在做完的时候一定要 Show 一下.看看 Port-channel 起来了没

1.5

Catalyst layer 3 configuration Configure Sw1 and Sw2 IP address as outlined n diagram Connectivity to R3 uses route ports R1 and R2 are members of vlan 100 on Sw1 and Sw2

1.6

Catalyst layer 3 configuration Configure Sw3 and Sw4 IP addressing Configure VLAN_200 in Sw1 with IP address YY.YY.34.1/24 Configure VLAN_200 in Sw2 with IP address YY.YY.43.1/24 Verify the connectivity between Sw1 and Sw2

RackYYSw1: VLAN 100 YY.YY.12.254/24 VLAN 200 YY.YY.34.1/24

RackYYSw2: VLAN 100 YY.YY.21.254/24 VLAN 200 YY.YY.43.1/24

RackYYSw3: VLAN 200 YY.YY.34.254/24

RackYYSw4: VLAN 200 YY.YY.43.254/24

RackYYSw1: ip routing interface VLAN100 ip address YY.YY.12.254 255.255.255.0 interface VLAN200 ip address sYY.YY.34.1 255.255.255.0

RackYYSw2: ip routing

interface VLAN100 ip address YY.YY.21.254 255.255.255.0 interface VLAN200 ip address YY.YY.43.1 255.255.255.0

RackYYSw3: ip routing interface VLAN200 ip address YY.YY.34.254 255.255.255.0

RackYYSw4: ip routing interface VLAN200 ip address YY.YY.43.254 255.255.255.0 Verify: show ip interface brief; show ip route

RackYYSw1: interface FastEthernet0/3 no Switchport ip address YY.YY.13.2 255.255.255.0

RackYYSw2: interface FastEthernet0/3 no Switchport ip address YY.YY.31.2 255.255.255.0 Verify: show interface status; show ip interface brief; show ip route

1.7Catalyst feature

Cofigure Sw1-F0/1 so that the interface will stop forwarding unicast traffic if the input rate exceeds 65 Mbps

RackYYSw1: interface Fa0/1 Storm-control unicast level 55.00 Verify: show storm-control unicast

1.8 Catalyst tunning

Cofigure the amount of tine a neighbou should hold CDP information sent by Sw2 before discarding it to 2 minutes

RackYYSw1: cdp holdtime 120 Verify: show cdp

1.9 Catalyst Feature

Configure Sw1 to control and block the flood of unknown Multicast traffic on the interface F0/5

RackYYSw1: interface Fa0/5 Switchport block multicast Ip Igmp snooping

或者'®p cg mp enabl'

Verify: show interface interface-id switchport

第二部分:IGP 和 BGP

IGP

2.1 OSPF Bbackbones

The link between Sw1 and Sw2 All interface in VLAN_100 on Sw1 Sw2 R1 and R2 R3 G0/0 and G0/1 and the fa0/3 on Sw1 and Sw2 Loop back 0 interface on Sw1 Sw2 R2 and R3 Verifying that all OSPF neighbor have built their adjacencies

RackYYR1: Router ospf YY network YY.YY.12.1 0.0.0.0 area 0 network YY.YY.21.1 0.0.0.0 area 0

RackYYR2: Router ospf YY network YY.YY.2.2 0.0.0.0 area 0 network YY.YY.12.2 0.0.0.0 area 0 network YY.YY.21.2 0.0.0.0 area 0

RackYYSw1: Router ospf YY network YY.YY.7.7 0.0.0.0 area 0 network YY.YY.12.254 0.0.0.0 area 0 network YY.YY.13.2 0.0.0.0 area 0 network YY.YY.100.1 0.0.0.0 area 0

RackYYSw2: Router ospf YY network YY.YY.8.8 0.0.0.0 area 0 network YY.YY.21.254 0.0.0.0 area 0 network YY.YY.31.2 0.0.0.0 area 0 network YY.YY.100.2 0.0.0.0 area 0

RackYYR3: Router ospf YY network YY.YY3.3 0.0.0.0 area 0 network YY.YY.13.1 0.0.0.0 area 0 network YY.YY.31.1 0.0.0.0 area 0 Verify: show ip ospf interface brief; show ip ospf neighbor

2.2 OSPF over NBMA

OSPF area 11 consist of the follow interface and attributes The Frame Relay network between R3 R4 R5 Loop back 0 on R4 and R5 VLAN_55 Ensure there is no DR/BDR

RackYYR3: interface s0/0/0.3 ip ospf network point-to-multipoint non-broadcast Router ospf YY network YY.YY.11.3 0.0.0.0 area 11 nei YY.YY.11.4 nei YY.YY.11.5

RackYYR4: interface s0/0/0.4 ip ospf network point-to-multipoint non-broadcast Router ospf YY network YY.YY.4.4 0.0.0.0 area 11 network YY.YY.11.4 0.0.0.0 area 11

RackYYR5: interface s0/0/0.5 ip os net point-to-multipoint non-broadcast Router ospf YY network YY.YY.5.5 0.0.0.0 area 11 network YY.YY.11.5 0.0.0.0 area 11 network YY.YY.55.254 0.0.0.0 area 11 Verify: show ip ospf interface brief; show ip ospf neighbor

2.3 OSPF ASBR and RIP version 2

Configure R4 to receive RIP v2 routes from Backbone 1

When properly configured you will receives RIP v2 routes in the class B address range 199.172.Z.Z

Configure R4 so that the external RIP routes are injected into area 11 and appear throughout that OSPF domain

Ensure external routes originates from Autonomous Systems Boundary Routers (ASBR) outside area 11 cannot be flooded within the area

Permit OSPF type-3 routes into area 11(在 R5 上看)

RackYYR4: ip prefix-list fbb1 per 199.172.0.0/16 le 32 Router rip version 2 no auto-summary network 150.1.0.0 distribute-list prefix fbb1 in Fa0/0 Router ospf YY redistribute rip metric-type 1 subnets area 11 nssa

RackYYR3: Router ospf YY area 11 nssa

RackYYR5: Router ospf YY area 11 nssa Verify: show ip protocol; show ip route rip; show ip ospf; show ip route ospf;

2.4 Area 34 and Area 43

OSPF area 34 consists of the VLAN_200 interfaces on Sw1 and Sw3 and loopback 0 in Sw3 OSPF area 43 consists of the VLAN_200 interfaces on Sw2 and Sw4 and loopback 0 in Sw4

RackYYSw1: Router ospf YY network YY.YY.34.1 0.0.0.0 area 34

RackYYSw2: Router ospf YY network YY.YY.43.1 0.0.0.0 area 43

RackYYSw3: Router ospf YY network YY.YY.9.9 0.0.0.0 area 34 network YY.YY.34.254 0.0.0.0 area 34

RackYYSw4: Router ospf YY network YY.YY.10.10 0.0.0.0 area 43 network YY.YY.43.254 0.0.0.0 area 43 Verify: show ip ospf interface brief; show ip ospf neighbor

2.5 OSPF ABR

Static routes are not permitted for this question inject a default route into area 0 area 11 area 34 area 43 Use fewest number of steps or commands to completes this

RackYYR3: Router ospf YY area 11 nssa default-information-originate default-information originate always Verify: show ip route ospf; show ip ospf database

2.6 OSPF Summary

Add the following interface on R2 to Area 0 Loopback 22 180.88.22.254/24 Loopback 32 180.88.32.254/24 Loopback 47 180.88.47.254/24 Summarize the above address into a single route Your summary route must be compact and not waste address space Verify the Summary is in the OSPF routing table on R5 and you can ping all the host address

R3、Sw1、Sw2都要做区域间汇总。

RackYYR2: int lo22 ip address 180.88.22.254 255.255.255.0 int lo32 ip address 180.88.32.254 255.255.255.0 int lo47 ip address 180.88.47.254 255.255.255.0 Router ospf YY network 180.88.0.0 0.0.63.255 area 0

这里我选择直接在 3 个 loopback 接口上使用 IOS12.4 版本后支持的接口宣告 ospf 的方法。即快捷,又不会出

错。

RackYYR3/Sw1/Sw2: Router ospf YY area 0 range 180.88.0.0 255.255.192.0 Verify; show ip ospf; show ip route ospf; show ip ospf database

(只要在 OSPF 中公告的 loop 口,ip add 是 24 位的,我全用的是点到点类型)

2.7 RIP version 2

Advertise all the individual YY.YY.0.0 network prefixes generated within your lab topology to backbone 1 Instruct the backbone 1 router that your networks are 5 hops away Filter all other prefixes to backbone 1

RackYYR4:

Access-list 4 per YY.YY.0.0 0.0.255.255 Router rip Redistribute ospf yy metric 1 Offset-list 4 out 4 g0/0 Distribute-list 4 out g0/0 Verify: debug ip rip

这个地方, 我用方法 2: router rip

Redistribute os 8 metric 5 route-map fromOSPF Route-map fromOSPF per 10 Match ip add prefix-list fromOSPF Ip prefix-list fromOSPF per 8.8.0.0/16 le 32

使用一个重分发的命令就解决了 3 个需求。我们的口号是用最少的策略解决问题,让 router 的 CPU 消耗降到

最低。并且注入到 RIP database 里的路由也只有 8.8.0.0/16 内的了。

或者使用我的方法3 : router rip

Redis os 8 route-map fromOSPF Default-metric 5 Route-map fromOSFP per 10 Match ip add fromOSPF Ip access-list standard fromOSPF Per 8.8.0.0 0.0.255.255

或者使用我的方法 4 : router rip

Redis os 8 route-map fromOSPF Route-map fromOSPF per 10 Set metric 5 Distribute-list prefix fromOSPF out os 8 Ip prefix-list fromOSPF per 8.8.0.0/16 le 32

源的方法最烂;让 router 执行了 3 次策略才完成了需求。

2.8 EIGRP

EIGRP 100 AS 100 consists of the following interface The Frame Relay network between R1 and R6 Loopback0 on R1 and R6 The BB2 interface on R6 should appear as an external EIGRP route on R1 R6 must have a single 16 bit prefix via R1 to the YY.YY.0.0 network. Do not use route filters or automatic summary

Redistribute EIGRP routes into ospf area

RackYYR1: Ip prefix-list eto per YY.YY.0.0/16 Route-map eto deny 10 Match ip add pre eto Route-map eto per 20

ip prefix-list ote seq 5 permit 0.0.0.0/0 route-map ote deny 10 match ip address prefix-list ote route-map ote permit 20

Router eigrp 100 No au Net YY.YY.16.1 0.0.0.0 Net YY.YY.1.1 0.0.0.0 Redistribute ospf YY metric 10000 100 255 1 1500 route-map ote

Router os yy Redistribute eigrp 100 subnets metric-type 1 route-map eto

Int s0/0/0 Ip summary ei 100 YY.YY.0.0 255.255.0.0

RackYYR6:

Route-map con per 10 Match interface E0/1

Router eigrp 100 No au Net YY.YY.16.6 0.0.0.0 Net YY.YY.6.6 0.0.0.0 Redistribute connected route-map CON metric 10000 100 255 1 1500 Verify: show ip protocol; show ip route eigrp; show ip route ospf;

2.9 EIGRP over BB3

The backbone 3 router will be sending some class A,B and C IP prefixes Create a prefix-list and apply it so that the EIGRP process will only accept prefixes in the class C address might on the routing table

Deny all routes to BB3

(这里要注意到 first octet=192-200)

前缀列表 访问列表

A:0.0.0.0/1 le 32 0.0.0.0 127.255.255.255 B:128.0.0.0/2 le 32 128.0.0.0 63.255.255.255 C:192.0.0.0/3 le 32 192.0.0.0 31.255.255.255

RackYYR6:

Ip prefix-list fbb3 per 192.0.0.0/5 le 32 Ip prefix-list fbb3 per 200.0.0.0/8 le 32 Ip prefix-list tbb3 deny 0.0.0.0/0 le 32 Router eigrp 100 Net 150.3.YY.1 0.0.0.0 Distribute-list prefix fbb3 in F0/0 Distribute-list prefix tbb3 out F0/0 Verify: show ip protocol; show ip route eigrp

2.10 IPV6 R1 G0/1 2033:YY:YY:21::1 S0/0/0 2033:YY:YY:16::1(FE80::217:94FF:FE15:8C90) R6 f0/1 2033:YY:YY:62::6 S0/3/0 2033:YY:YY:16::6(FE80::215:C6FF:FE4A:6210) All the interface run OSPF v3

RackYYR1#show ipv6 interface brief Gi0/0 [up/up] FE80::ZZZZ:ZZZZ:ZZZZ //link-local address 2038:YY:YY:11::1 Serial0/0/0 [up/up] FE80::ZZZZ:ZZZZ:ZZZZ 2038:YY:YY:61::1

RackYYR1#show ipv6 route IPv6 Routing Table -7 entries Codes: C -Connected, L -Local, S -Static, R -RIP, B -BGP U -Per-user Static route I1 -ISIS L1, I2 -ISIS L2, IA -ISIS inte area, IS -ISIS summary O - OSPF intr OI - OSPF inter, OE1 - OSPF ext 1, OE2 -OSPF ext 2 ON1 -OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2 C 2038:YY:YY:11::/64 [0/0] via ::, Gi0/0 L 2038:YY:YY:11::1/128 [0/0] via ::, Gi0/0 C 2038:YY:YY:61::/64 [0/0] via ::, Serial0/0/0 L 2038:YY:YY:61::1/128 [0/0] via ::, Serial0/0/0 O 2038:YY:YY:66::/64 [110/65] via FE80::ZZZZ:ZZZZ:ZZZZ, Serial0/0/0 L FE80::/10 [0/0] via ::, Null0 L FF00::/8 [0/0] via ::, Null0

RackYYR6#show ipv6 route

IPv6 Routing Table -7 entries Codes: C -Connected, L -Local, S -Static, R -RIP, B -BGP U -Per-user Static route I1 -ISIS L1, I2 -ISIS L2, IA -ISIS inter area, IS -ISIS summary O - OSPF intra, OI - OSPF inter, OE1 -OSPF ext 1, OE2 -OSPF ext 2 ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2 O 2038:YY:YY:11::/64 [110/65] via FE80::ZZZZ:ZZZZ; Serial0/0 C 2038:YY:YY:61::/64 [0/0] via ::, Serial0/0/0 L 2038:YY:YY:61::/6/128 [0/0] via ::, Serial0/0/0 C 2038:YY:YY:66::/64 [0/0] via ::, Gi0/0 L 2038:YY:YY:66::6/128 [0/0] via ::, Gi0/0 L FE80::/10 [0/0] via ::, Null0 L FF00::/8 [0/0] via ::, Null0 RackYYR1: ipv6 unicast-routing ipv6 Router ospf YY Router-id YY.YY.1.1 interface Serial0/0/0 ipv6 address 2033:YY:YY:16::1/64 ipv6 ospf network point-to-point ipv6 ospf 8 area 0 Frame-Relay map ipv6 2038:YY:YY:16::6 106 broadcast Frame-Relay map ipv6 "9i nk l oca;± 106 br oadcas interface g0/1 ipv6 address 2033:YY:YY:21::1/64 ipv6 ospf 1 area 0 RackYYR6: ipv6 unicast-routing ipv6 Router ospf YY Router-id YY.YY.6.6 interface Serial0/0/0 ipv6 address 2033:YY:YY:16::6/64 ipv6 ospf network point-to-point ipv6 ospf 6 area 0 Frame-Relay map ipv6 2033:YY:YY:16::1 601 broadcast Frame-Relay map ipv6 "9i nk l ocaj± 601 br oadcas interface g0/1 ipv6 address 2033:YY:YY:62::6/64 Ipv6 ospf 6 area 0 Verify: show ipv6 interface brief; show ipv6 route

BGP

R1: Loopback 200: 200.1YY.101.1/32 R2: Loopback 200: 200.1YY.102.1/32 R3: Loopback 200: 200.YY.3.1/32 R4: Loopback 200: 200.YY.4.1/32 R5: Loopback 200: 200.YY.5.1/32 R6: Loopback 200: 200.1YY.106.1/32

7.1 IBGP

Configure IBGP as follows

AS YY: Configure only R3 R4,and R5 to be part of the AS YY ,R3 is the Route-Reflector for this AS AS 1YY:Configure only R1,R2 and R6 to be part of the AS 1YY. Don'⁻t corfi gure RR or corfi eder at oni n

the AS

You can use any IP address to form the IBGP peers

Advertise the loopback 200 on all BGP routers through BGP and make sure you are able to ping these loopbacks from inside each AS

Loopback 200: AS YY: 200.YY.X.1/32 AS 1YY:200:1YY.10X.1/32

RackYYR3: Router bgp YY no auto-summary no synchronization bgp Router-id YY.YY.3.3 network 200.YY.3.1 mask 255.255.255.255 neighbor YY.YY.4.4 remote-as YY neighbor YY.YY.4.4 route-reflector-client neighbor YY.YY.5.5 remote-as yy neighbor YY.YY.5.5 update-source loop0 neighbor YY.YY.5.5 route-reflector-client

RackYYR4: Router bgp YY no auto-summary no synchronization bgp Router-id YY.YY.4.4 network 200.YY.4.1 mask 255.255.255.255 neighbor YY.YY.3.3 remote-as YY neighbor YY.YY.3.3 update-source Loopback0

RackYYR5: Router bgp YY no auto-summary no synchronization bgp Router-id YY.YY.5.5 network 200.YY.5.1 mask 255.255.255.255 neighbor YY.YY.3.3 remote-as YY neighbor YY.YY.3.3 update-source Loopback0

如果用 peer-group,配置如下:

RACK08R3#router bgp 8 no synchronization bgp router-id 8.8.3.3 bgp log-neighbor-changes network 200.8.3.1 mask 255.255.255.255 neighbor zhenglei peer-group neighbor zhenglei remote-as 8 neighbor zhenglei update-source Loopback0 neighbor zhenglei route-reflector-client neighbor 8.8.4.4 peer-group zhenglei neighbor 8.8.5.5 peer-group zhenglei no auto-summary

RackYYR1: Router bgp 10YY no auto-summary no synchronization bgp Router-id YY.YY.1.1 network 200.1YY.101. 1 mask 255.255.255.255 neighbor YY.YY.2.2 remote-as 10YY neighbor YY.YY.6.6 remote-as 10YY neighbor YY.YY.6.6 update-source Loopback0

RackYYR2: Router bgp 10YY no auto-summary no synchronization bgp Router-id YY.YY.2.2 network 200.1YY.102.1 mask 255.255.255.255 neighbor YY.YY.1.1 remote-as 10YY neighbor YY.YY.1.1 update-source Loopback0 neighbor YY.YY.6.6 remote as 10YY neighbor YY.YY.6.6 update-source Loopback0

RackYYR6: Router bgp 10YY no auto-summary no synchronization bgp Router-id YY.YY.6..6 network 200.1YY.106.1 mask 255.255.255.255 neighbor YY.YY.1.1 remote-as 10YY neighbor YY.YY.1.1 update-source Loopback0 neighbor YY.YY.2.2 remote-as 10YY neighbor YY.YY.2.2 update-source Loopback0 Verify: show ip bgp summary; show ip bgp

7.2 EGP

Configure EBGP as follows

R6 EBGP peers with BB2 IP address 150.2.YY.254 AS 254

R1 EBGP peers with R3

R2 EBGP peers with R3

You can use any IP address to form the EBGP peers

Make sure all routers in AS YY have the EBGP routes from AS 254 via 1YY on their BGP and IP routing tables. You do not need to ping these routes

Make sure you are able to ping the loop back 200 from all BGP routers on both AS. You are permitted to use 4 static routes within minimum mask to fulfill this Requirement

RackYYR6: Router bgp 10YY neighbor 150.2.YY.254 remote-as 254 neighbor 150.2.YY.254 local-as YY no-prepend

RackYYR1: Router bgp 10YY neighbor YY.YY.3.3 remote-as YY neighbor YY.YY.3.3 ebgp-multihop 255 neighbor YY.YY.3.3 update-source Loopback0

RackYYR2: Router bgp 10YY neighbor YY.YY.3.3 remote-as YY neighbor YY.YY.3.3 ebgp-multihop 255 neighbor YY.YY.3.3 update-source Loopback0

RackYYR3: Router bgp YY Neighbor YY.YY.1.1 remote-as 10YY Neighbor YY.YY.2.2 remote-as 10YY Neighbor YY.YY.1.1 update-source loop0 Neighbor YY.YY.2.2 update-source loop0 Neighbor YY.YY.1.1 ebgp-multihop 255 Neighbor YY.YY.2.2 ebgp-multihop 255

RackYYSw1: Ip route 200.1YY.100.0 255.255.252.0 valn 100 Ip route 200.1yy.106.1 255.255.255.255 Y.Y.1.1

RackYYSw2: Ip route 200.1YY.100.0 255.255.252.0 valn 100 Ip route 200.1yy.106.1 255.255.255.255 Y.Y.1.1 Verify: show ip bgp; ping all lo200 in ASYY and AS1YY

7.3 Path Selection

Configure R1 so it informs AS YY that the routes 200.1YY.101.1 and 200.1YY.106.1 are to preferable be reached via R1

Configure R2 so it informs AS YY ,that the routes 200.1YY.102.1 are to preferable be reached via R2 Route filtering is not permitted, DO NOT change any attributes coming from BGP AS 254

RackYYR1: ; ip prefix-list r2loop seq 5 permit 200.1YY.102.1/32 route-map MED permit 10 match ip address prefix r2loop set metric 100 route-map MED permit 20

Router bgp 10YY neighbor YY.YY.3.3 route-map MED out

RackYYR2: ip prefix-list r1r6loop per 200.1yy.101.1/32 ip prefix-list r1r6loop per 200.1yy.106.1/32 route-map MED permit 10 match ip address prefix r1r6loop set metric 100 route-map MED permit 20

Router bgp 10YY neighbor YY.YY.3.3 route-map MED out

RackYYR6: Router bgp 10YY Neighbor YY.YY.1.1 send-community Neighbor YY.YY.2.2 send-community

RackYYR1: Router bgp 10YY Neighbor YY.YY.2.2 send-community Neighbor YY.YY.3.3 send-community

RackYYR2: Router bgp 10YY Neighbor YY.YY.1.1 send-community Neighbor YY.YY.3.3 send-community

RackYYR3: Router bgp YY Neighbor YY.YY.4.4 send-community Neighbor YY.YY.5.5 send-community

Verify : show ip bgp; show ip bgp community

第三部分: IP Feature

(组播 8 分,安全 8 分,QOS8 分,IP 特性 8 分,合计 32 分)

IP IOS feature

3.1 Exception handling Configure R4 to enable exception handling Filename:R4-DUMP Username:ccie Password:cisco Ftp address: 150.1.YY.254

RackYYR4: ip ftp username ccie ip ftp password cisco exception protocol ftp exception dump150.1.YY.254 exception corefile R4-DUMP

- 3.2 System logging
- Buffer alert critical emergencies and error
- Set the buffer size to 8192
- · Indicate the date and time for each logged entry

RackYYR5: logging on logging buffered 8192 errors clock timezone GMT 8 clock set hh:mm:ss month year service timestamps log datetime local-time year show-timezone Verify: show logging;

(所有设备的时间好像是都预先配置好的,我最后看到所有的设备都一个时间,和 windows 的时间相差无几)

3.3 DHCP

Configure R5 to provide the following parameters for DHCP client on VLAN_55 IP address DNS server YY.YY.55.60 and YY.YY.55.67 Domain:cisco.com Default gateway Hosts must retain DHCP assigned address 10 days Permit only secure ARP entries to be installed in R5"s ARP table

RackYYR5:

Service dhcp ip dhcp excluded address YY.YY.55.254 ip dhcp excluded address YY.YY.55.60 ip dhcp excluded address YY.YY.55.67 ip dhcp pool cisco network YY.YY.55.0 255.255.255.0 default-router YY.YY.55.254 dns-server YY.YY.55.60 YY.YY.55.67 domain-name ccie.com lease 10 update arp

Security

6.1 Tracing Traffic Source to Device under Attack

It is suspected that Dos attack is being launched at host 150.3.YY.254 select an appropriate device to configure so that you can start tracing the source of this attack.

Your solution must meet the following criteria The result of the trace must be sent to syslog once a day This device is limited to trace to one IP address only DO NOT configure ACL to achieve this

RackYYR5:

ip source-track 150.1.YY.254 ip source-track address-limit 1 ip source-track syslog-interval 1440 Verify: show ip source-track; show ip source-track 6.2 IP Fragment Attacking

R4 上收到了一个来自 BB1,源是随要地址的攻击,目的地是一个 web 服务器:10.1.Y.5 要求

R4 阻止这些攻击流量,并允许其他流量通过

Rack11R4:

ip access-list extended FRAGMENT deny ip any host 10.1.yy.5 fragment permit ip any any

int g0/0 ip access-group FRAGMENT in

6.3 Catalyst Security

On Sw1-Fa0/7 configure 802.1.x authentication meeting the following When clients that do not

RackYYSw1: aaa new-model aaa authentication dot1x default group radius aaa authorization network default group radius dot1x system-auth-control dot1x guest-vlan supplicant

int Fa0/7 Switchport mode access dot1x port-control auto dot1x guest-vlan 55 dot1x host-mode multi-host Verify: show dot1x all; show dot1x interface interface-id details

QOS

4.1 Congestion Avoidance Notication

Configure R1-S0/0/0 such that is out bound traffic has utilized 75% of total bandwidth. R1 should sign that the network is congested and the recipients need to slow down sending packets. DO NOT configure Frame Relay BECN or FECN for this question

RackYYR1: Ip tcp ecn Policy-map QOS class class-default bandwidth percent 75 random-detect random-detect ecn interface s0/0/0 no random-detect service-policy output QOS Verify: show policy-map interface interface-id

4.2 Traffic policing

Client on VLAN_BB1 and VLAN_55 access a URL located on VLAN_BB2 frequently. This URL is http://www.this website.com/directory.

Select one suitable router to configure, so as to conserve bandwidth meeting the following criteria.

Traffic from this URL back to these clients should not exceed 640000 bits per second.

If the files download from this URL are image file then drop the traffic

You may assume image the names end with the suffix:*.gif*.jpg or *.jpeg

RackYYR6:

ip cef ip access-list extended TRAFFIC permit ip 150.2.YY.0 0.0.0.255 150.1.YY.0 0.0.0.255 permit ip 150.2.YY.0 0.0.0.255 YY.YY.55.0 0.0.0.255 class-map match-all url match access-group name TRAFFIC match protocol http host www.thiSwebsite.com match protocol http url /directory /* class-map match-all pic match class-map url match protocol http url *.jpg|*.jpeg|*.gif policy-map NBAR class pic drop class url police cir 64000 interface Gi0/1 service-policy input NBAR ip nbar protocol-discovery Verify: show policy-map interface interface-id

4.3 Discard Eligible and Traffic Shaping

The Frame Relay link on R5 is experiencing heavy congesting. Configure R5 so that the Frame Relay provider does not drop any routing protocol packets during

congesting and if the number of packets in R5"s Frame Relay interface queue exceeds 10,then the traffic rate will reduced to 32000 bps.

RackYYR5: access-list 105 deny ospf any any access-list 105 deny tcp any eq 179 any access-list 105 deny tcp any any eq 179 access-list 105 deny pim any any access-list 105 permit ip any any frame-relay de-list 1 protocol ip list 105 interface s0/0.5 frame-relay de-group 1 503 map-class frame-relay FRTS Frame-Relay adaptive-shaping interface-congestion 10 Frame-Relay mincir 32000 interface Serial0/0 Frame-Relay traffic-shaping interface Serial0/0.5 Frame-Relay interface-dlci 503 class FRTS Verify: show frame-relay pvc dlci

Multicast

5.1 Sparse Mode Multicasting

There is a multicast source for group 224.2.2.2 located at VLAN_BB2 and another source for group 224.3.3.3 located at VLAN_BB3.There are clients on VLAN_55 that would like to access these two groups.

Configure R5,R3, Sw1,R1 and R6 to meet the following requirements

Configure all devices using sparse mode

R1 will be the RP for both multicast groups and R3 will be backup RP. Use the most reliable way to achieve this objective and do not configure RP information statically

R5 needs to be able to ping both 224.2.2.2 and 224.3.3.3

RackYYR6: ip multicast-routing int g0/1 ip pim sparse-mode ip igmp join-group 224.2.2.2 (这是预配置) int g0/0 ip pim sparse-mode ip igmp join-group 224.3.3.3 (这是预配置) int s0/0/0 ip pim sparse-mode ip pim nbma-mode

RackYYR1: ip multicast-routing int s0/0/0 ip pim sparse-mode ip pim nbma-mode int g0/0 ip pim sparse-mode int lo200 ip pim sparse-mode ip pim send-rp-ann LO200 sco 10 group-list 11 ip pim send-rp-dis LO200 sco 10 access-list 11 per 224.2.2.2 access-list 11 per 224.3.3.3 RackYYSw1: ip multicast-routing int VLAN 100 ip pim sparse-mode int Fa0/3 ip pim sparse-mode RackYYR3: ip multicast routing int g0/0 ip pim sparse-mode int s0/0/0.3 ip pim sparse-mode ip pim nbma-mode ip pim dr-priority 200 int lo0 ip pim sparse-mode ip pim send-rp-ann Loopback0 sco 10 group-list 33 ip pim send-rp-dis Loopback0 sco 10 access-list 33 permit 224.2.2.2 access-list 33 permit 224.3.3.3

RackYYR5: ip multicast-routing int s0/0/0.5 ip pim sparse-mode ip pim nbma-mode

int g0/0

ip pim sparse-mode

Verify: show ip pim neighbor; show ip pim rp mapping; R5 ping group addresses 224.2.2.2 and 224.3.3.3;

5.2 Defense against Multicast Dos Attack

There is a concern that hacker launch Dos attack against R5 with multicast group membership traffic. Configure R5 so that accept only 100 IGMP reports at any time but this limit does not apply to the group 224.3.3.3.

RackYYR5: ip access-list extended 105 permit igmp any host 224.3.3.3

int g0/0 ip igmp limit 110 except 105 Verify: show ip igmp interface interface-id